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ROC800L (Liquids) Protocol Specifications Manual

Remote Automation Solutions

System Training

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Contents

Chapter 1 – Introduction

This manual provides information required to understand the ROC Plus protocol and its implementation within the ROC800L. It is written for personnel needing to implement a ROC Plus Protocol driver in the ROC800L or as a reference to understanding the ROC Plus communications protocols. This manual is intended for users experienced in the development of communication drivers. The protocol provides access to database configuration, real-time clock, event and alarm logs, and historically archived data.

The ROC Plus database is broken into individual parameters. Each database parameter is uniquely associated by parameter number and point type. See *Chapter 3, Parameter Lists for Point Types*, for detailed information.

1.1 Manual Organization

This manual is organized into the following chapters:

Chapter	**Description**
Chapter 1 Introduction	Describes this manual and provides a summary of the general protocol message format, summary of each opcode, and how to calculate data offsets.
Chapter 2 Opcodes	Lists each opcode the ROC Plus protocol uses.
Chapter 3 Parameter Lists for Point Types	Describes ROC Plus protocol point types and data types.
Chapter 4 CRC-16 Code	Provides information concerning the cyclical redundancy check the ROC protocol uses.
Chapter 5 IEEE Floating Point Format	Provides information about the binary representation of floating-point numbers.
Chapter 6 Spontaneous Report-by-Exception	Provides information on the ROC800L's Spontaneous Report-by-Exception (RBX or RBX) function.
Chapter 7 Device to Device Communications	Provides information detailing store and forward options in the ROC800L.
Index	Provides an alphabetic listing of items and topics contained in this manual.

1.2 General Protocol Message Format

Figure 1-1 shows the various ROC and host protocol message formats.

General Message Format - Station "A"' Polling Station "B" for Data/Action:

Destination (B)		Source (A)		Opcode	Data Length	m Data Bytes								CRC	
unit	group	unit	group		# of bytes	d1	d2	d3	–	–	–	–	dm	LSB	MSB

General Message Format - Station "B" Responding to Station "A":

Destination (A)		Source (B)		Opcode	Data Length	n Data Bytes								CRC	
unit	group	unit	group		# of bytes	d1	d2	d3	–	–	–	–	dn	LSB	MSB

Figure 1-1. General Message Format

A message generally contains the following fields, in order from left to right:

Field	Description	
Destination	Specifies the address for the destination device. Destination has two components:	
	Unit	One-byte unit code for the station address. The unit code for a ROC address is user-configurable. For a host, this must be a unique number. **0** represents "broadcast within group" and **240** is the "direct connect address."
	Group	Indicates the group code for the station address. This is user-configurable and usually set to **2**.
Source	Specifies the address for the source device. Source has two components:	
	Unit	One-byte unit code for the station address. The unit code for a ROC address is user-configurable. For a host, this must be a unique number. **0** represents "broadcast within group" and **240** is the "direct connect address."
	Group	Indicates the group code for the station address. This is user-configurable and usually set to **2.**
Opcode	Defines the operation code (opcode) action to perform.	
# of bytes	Indicates the number of bytes in the data byte field, consisting of the path, desired opcode, number of data bytes for the desired message, and the desired message itself.	
Data Bytes	Contains messages of varying lengths, consisting of the path, desired opcode, number of data bytes for the desired message, and the message itself.	
CRC	Confirms validity of message transmission.	

Field	Description	
	LSB	Least significant byte.
	MSB	Most significant byte.

Messages are of flexible length. The first six data bytes are used for the header information including: destination, source, opcode, and data length (number of bytes). The length of a message equals the number of data bytes transmitted plus eight overhead bytes (header information and CRC).

The minimum message length is eight bytes if the number of data bytes is zero (no data bytes transmitted). The maximum message length is 248 bytes (240 bytes of data). A "nibble" is a four-bit unit or half a byte.

Figure 1-2 provides examples of the messages exchanged if the host requests the current time and date from ROC800L 13 of Group 5.

Host Request to ROC800L:

ROC Address		Host Address		Opcode	Data Length	CRC	
unit	group	unit	group	–	# of bytes	LSB	MSB
13	5	1	0	7	0	1	m

ROC800L Response to Host:

Host Address		ROC Address		Opcode	Data Length	8 Data Bytes								CRC	
unit	group	unit	group	–	# of bytes	d1	d2	d3	–	–	–	–-	dn	LSB	MSB
1	0	13	5	7	8	sec	min	hr	day	mo	yr	lyr	dwk	l	m

Figure 1-2. Request/Response Example

Note: Addresses **240,240** and **0,x** are reserved and should not be used.

1.3 Broadcast

ROC800L firmware version 1.00 and higher supports message broadcasting. A broadcast message is an opcode that is sent to a unit of 0. In this case, all ROC800Ls with the group matching the request accept the opcode and process it (regardless of the unit designation that each ROC800L may have). The ROC800L does not respond to the request.

For example, you may need to synchronize several ROC800Ls to the same date and time. If the ROC800Ls were connected to the same radio link and configured for the same group, a host could send an opcode 8 (Set Real-Time Clock) request to Unit 0 that would then set all of the ROC800Ls configured in this group to the same date and time.

1.4 Calculating Data Offsets

A data byte offset is the offset (zero-based) from the beginning of a transmit or receive buffer for the data items that comprise the opcode data. The offset of the first data item is always **6** to allow for the header information (bytes 0-5).

Certain data offset values are determined based on the ROC800L's configuration, such as for Opcode 0. The data byte offset for each item may be calculated. To calculate the next data offset value, add the previous offset value to the length of the previous data item:

Offset = Previous Offset + Length of Previous Data Item

Chapter 2 – Opcodes

This section details each ROC800L protocol opcode.

2.1 Opcode Overview

Table 2-1 summarizes each opcode. The tables in this section provide detailed descriptions of the various opcodes used. For each opcode, a brief description of the data bytes is provided. In some cases, the number of data bytes returned for an opcode varies. For example, Opcode 0, a full update, always returns certain input/output (I/O) information along with optionally specified data.

Certain opcodes only send data and do not receive data back from the ROC800L. For example, Opcode 8 requests the ROC800L to set the time and date. The host transmits six to nine data bytes defining the new time and date. The ROC800L resets the time and date and sends back an acknowledgment in which the opcode is repeated, but no data bytes are transmitted back. All acknowledgments are 8-byte messages that repeat the opcode received, but do not transmit any data bytes.

Opcode 255 is an error message indicator. This is also an 8-byte message with no data bytes included. The opcode is set to 255 to indicate the message received by the ROC800L had valid Cyclical Redundancy Check (CRC), but contained invalid parameters. For example, if a request was made for information on Analog Input #11, but the ROC800L was configured for only eight analog inputs (0 to 7), the ROC800L would respond back with the 8-byte message with the opcode equal to 255 (error).

The number of analog inputs varies from ROC800L to ROC800L. This variability is indicated by listing the first analog input and indicating the remaining analog inputs by a period (“.”). In the following tables, a period in either the Data byte(s) column or the Description of Data column indicates a repetition of the proceeding item for the necessary number of instances.

Table 2-1. Summary of Opcodes

Opcode	Description
6	Sends ROC800L configuration.
7	Sends current time and date.
8	Sets new time and date.
10	Sends data from configurable opcode tables.
11	Sets data in configurable opcode tables.
17	Sets operator identification.
24	Stores and forwards.
50	Requests IO point position array.
100	Reads user-defined point information (Command 11)
105	Sends history point definition, min/max data, and current values for specified history point.
108	Sends tag and current history period for specified history points.
117	Sends specified number of weights and measures events starting at specified event index.

Opcode	Description
118	Sends specified number of alarms starting at specified alarm index.
119	Sends specified number of events starting at specified event index.
135	Requests history point data.
136	Requests history index data. .
137	Requests history index for a day.
138	Requests daily and periodic history for a day.
166	Sets specified contiguous block of parameters.
167	Sends specified contiguous block of parameters.
180	Sends specified parameters.
181	Sets specified parameters.
203	File transfer to and from ROC800L.
204	Sends specified number of events or weights and measures events starting at specified event index (supporting 40-byte old and new value on parameter change)
206	Reads transaction history data
224	Sends Report-by-Exception (SRBX) message to host.
225	Acknowledges Report-by-Exception message from ROC800L.
255	Transmits ROC800L error messages in response to a request with invalid parameters or format.

2.2 Opcode 6, System Configuration

Opcode 6 obtains the current configuration of the ROC800L. This opcode was introduced in version 1.00.

Table 2-2: Opcode 6, System Configuration

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 6: System Configura-tion	6		No data bytes	6	1	The system mode the unit is currently operating in. 0 = Firmware Update Mode – Extremely limited functionality is available. 1 = Run Mode
				7	2	Comm Port or Port Number that this request arrived on. This is not defined if the above value (offset 6) is 0.
				9	1	Security Access Mode for the port the request was received on.

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				10	1	Logical Compatibility Status – Version 1.00 See [Point Type 91,Logical 0,Parameter 50]: 0 = 16 points per slot (160 bytes total) – Compatibility Mode is 0 & 9 module slots max 1 = 16 points per slot (240 bytes total) – Compatibility Mode is 0 & 14 module slots max. NOTE: The 15th module slot can not be used. 2 = 8 points per slot (224 bytes total) – Compatibility Mode is 1 & 27 module slots max. See Opcode 50 for more information.
				11	1	Opcode 6 Revision 0 = Original (ROC800 Pre-1.00) 1 = Extended for Additional Point Types (offset 104 -220)
				12	12	Reserved for Future Use [zeros returned]
				24	1	Type of ROC: 1 = ROCPAC ROC 300 series 2 = FloBoss 407 3 = FlashPAC ROC 300 series 4 = FloBoss 503 5 = FloBoss 504 6 = ROC800 (827/809) 11=DL8000 15=ROC800L X = FB100
				25	1	Contains the number of logical for point type 60
				26	1	Contains the number of logical for point type 61
				27	1	Contains the number of logical for point type 62
				28	1	Contains the number of logical for point type 63
				29	1	Contains the number of logical for point type 64
				30	1	Contains the number of logical for point type 65
				31	1	Contains the number of logical for point type 66
				32	1	Contains the number of logical for point type 67
				33	1	Contains the number of logical for point type 68
				34	1	Contains the number of logical for point type 69
				35	1	Contains the number of logical for point type 70

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				36	1	Contains the number of logical for point type 71
				37	1	Contains the number of logical for point type 72
				38	1	Contains the number of logical for point type 73
				39	1	Contains the number of logical for point type 74
				40	1	Contains the number of logical for point type 75
				41	1	Contains the number of logical for point type 76
				42	1	Contains the number of logical for point type 77
				43	1	Contains the number of logical for point type 78
				44	1	Contains the number of logical for point type 79
				45	1	Contains the number of logical for point type 80
				46	1	Contains the number of logical for point type 81
				47	1	Contains the number of logical for point type 82
				48	1	Contains the number of logical for point type 83
				49	1	Contains the number of logical for point type 84
				50	1	Contains the number of logical for point type 85
				51	1	Contains the number of logical for point type 86
				52	1	Contains the number of logical for point type 87
				53	1	Contains the number of logical for point type 88
				54	1	Contains the number of logical for point type 89
				55	1	Contains the number of logical for point type 90
				56	1	Contains the number of logical for point type 91
				57	1	Contains the number of logical for point type 92
				58	1	Contains the number of logical for point type 93
				59	1	Contains the number of logical for point type 94
				60	1	Contains the number of logical for point type 95
				61	1	Contains the number of logical for point type 96
				62	1	Contains the number of logical for point type 97

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				63	1	Contains the number of logical for point type 98
				64	1	Contains the number of logical for point type 99
				65	1	Contains the number of logical for point type 100
				66	1	Contains the number of logical for point type 101
				67	1	Contains the number of logical for point type 102
				68	1	Contains the number of logical for point type 103
				69	1	Contains the number of logical for point type 104
				70	1	Contains the number of logical for point type 105
				71	1	Contains the number of logical for point type 106
				72	1	Contains the number of logical for point type 107
				73	1	Contains the number of logical for point type 108
				74	1	Contains the number of logical for point type 109
				75	1	Contains the number of logical for point type 110
				76	1	Contains the number of logical for point type 111
				77	1	Contains the number of logical for point type 112
				78	1	Contains the number of logical for point type 113
				79	1	Contains the number of logical for point type 114
				80	1	Contains the number of logical for point type 115
				81	1	Contains the number of logical for point type 116
				82	1	Contains the number of logical for point type 117
				83	1	Contains the number of logical for point type 118
				84	1	Contains the number of logical for point type 119
				85	1	Contains the number of logical for point type 120
				86	1	Contains the number of logical for point type 121
				87	1	Contains the number of logical for point type 122
				88	1	Contains the number of logical for point type 123
				89	1	Contains the number of logical for point type 124

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				90	1	Contains the number of logical for point type 125
				91	1	Contains the number of logical for point type 126
				92	1	Contains the number of logical for point type 127
				93	1	Contains the number of logical for point type 128
				94	1	Contains the number of logical for point type 129
				95	1	Contains the number of logical for point type 130
				96	1	Contains the number of logical for point type 131
				97	1	Contains the number of logical for point type 132
				98	1	Contains the number of logical for point type 133
				99	1	Contains the number of logical for point type 134
				100	1	Contains the number of logical for point type 135
				101	1	Contains the number of logical for point type 136
				102	1	Contains the number of logical for point type 137
				103	1	Contains the number of logical for point type 138
Included if Opcode 6 Revision (offset 11) ≥ 1				104	1	Contains the number of logical for point type 139
				105	1	Contains the number of logical for point type 140
				106	1	Contains the number of logical for point type 141
				107	1	Contains the number of logical for point type 142
				108	1	Contains the number of logical for point type 143
				109	1	Contains the number of logical for point type 144
				110	1	Contains the number of logical for point type 145
				111	1	Contains the number of logical for point type 146
				112	1	Contains the number of logical for point type 147
				113	1	Contains the number of logical for point type 148
				114	1	Contains the number of logical for point type 149
				115	1	Contains the number of logical for point type 150

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				116	1	Contains the number of logical for point type 151
				117	1	Contains the number of logical for point type 152
				118	1	Contains the number of logical for point type 153
				119	1	Contains the number of logical for point type 154
				120	1	Contains the number of logical for point type 155
				121	1	Contains the number of logical for point type 156
				122	1	Contains the number of logical for point type 157
				123	1	Contains the number of logical for point type 158
				124	1	Contains the number of logical for point type 159
				125	1	Contains the number of logical for point type 160
				126	1	Contains the number of logical for point type 161
				127	1	Contains the number of logical for point type 162
				128	1	Contains the number of logical for point type 163
				129	1	Contains the number of logical for point type 164
				130	1	Contains the number of logical for point type 165
				131	1	Contains the number of logical for point type 166
				132	1	Contains the number of logical for point type 167
				133	1	Contains the number of logical for point type 168
				134	1	Contains the number of logical for point type 169
				135	1	Contains the number of logical for point type 170
				136	1	Contains the number of logical for point type 171
				137	1	Contains the number of logical for point type 172
				138	1	Contains the number of logical for point type 173
				139	1	Contains the number of logical for point type 174
				140	1	Contains the number of logical for point type 175

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				141	1	Contains the number of logical for point type 176
				142	1	Contains the number of logical for point type 177
				143	1	Contains the number of logical for point type 178
				144	1	Contains the number of logical for point type 179
				145	1	Contains the number of logical for point type 180
				146	1	Contains the number of logical for point type 181
				147	1	Contains the number of logical for point type 182
				148	1	Contains the number of logical for point type 183
				149	1	Contains the number of logical for point type 184
				150	1	Contains the number of logical for point type 185
				151	1	Contains the number of logical for point type 186
				152	1	Contains the number of logical for point type 187
				153	1	Contains the number of logical for point type 188
				154	1	Contains the number of logical for point type 189
				155	1	Contains the number of logical for point type 190
				156	1	Contains the number of logical for point type 191
				157	1	Contains the number of logical for point type 192
				158	1	Contains the number of logical for point type 193
				159	1	Contains the number of logical for point type 194
				160	1	Contains the number of logical for point type 195
				161	1	Contains the number of logical for point type 196
				162	1	Contains the number of logical for point type 197
				163	1	Contains the number of logical for point type 198
				164	1	Contains the number of logical for point type 199
				165	1	Contains the number of logical for point type 200

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				166	1	Contains the number of logical for point type 201
				167	1	Contains the number of logical for point type 202
				168	1	Contains the number of logical for point type 203
				169	1	Contains the number of logical for point type 204
				170	1	Contains the number of logical for point type 205
				171	1	Contains the number of logical for point type 206
				172	1	Contains the number of logical for point type 207
				173	1	Contains the number of logical for point type 208
				174	1	Contains the number of logical for point type 209
				175	1	Contains the number of logical for point type 210
				176	1	Contains the number of logical for point type 211
				177	1	Contains the number of logical for point type 212
				178	1	Contains the number of logical for point type 213
				179	1	Contains the number of logical for point type 214
				180	1	Contains the number of logical for point type 215
				181	1	Contains the number of logical for point type 216
				182	1	Contains the number of logical for point type 217
				183	1	Contains the number of logical for point type 218
				184	1	Contains the number of logical for point type 219
				185	1	Contains the number of logical for point type 220
				186	1	Contains the number of logical for point type 221
				187	1	Contains the number of logical for point type 222
				188	1	Contains the number of logical for point type 223
				189	1	Contains the number of logical for point type 224
				190	1	Contains the number of logical for point type 225

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				191	1	Contains the number of logical for point type 226
				192	1	Contains the number of logical for point type 227
				193	1	Contains the number of logical for point type 228
				194	1	Contains the number of logical for point type 229
				195	1	Contains the number of logical for point type 230
				196	1	Contains the number of logical for point type 231
				197	1	Contains the number of logical for point type 232
				198	1	Contains the number of logical for point type 233
				199	1	Contains the number of logical for point type 234
				200	1	Contains the number of logical for point type 235
				201	1	Contains the number of logical for point type 236
				202	1	Contains the number of logical for point type 237
				203	1	Contains the number of logical for point type 238
				204	1	Contains the number of logical for point type 239
				205	1	Contains the number of logical for point type 240
				206	1	Contains the number of logical for point type 241
				207	1	Contains the number of logical for point type 242
				208	1	Contains the number of logical for point type 243
				209	1	Contains the number of logical for point type 244
				210	1	Contains the number of logical for point type 245
				211	1	Contains the number of logical for point type 246
				212	1	Contains the number of logical for point type 247
				213	1	Contains the number of logical for point type 248
				214	1	Contains the number of logical for point type 249
				215	1	Contains the number of logical for point type 250

Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				216	1	Contains the number of logical for point type 251
				217	1	Contains the number of logical for point type 252
				218	1	Contains the number of logical for point type 253
				219	1	Contains the number of logical for point type 254
				220	1	Contains the number of logical for point type 255

2.3 Opcode 7, Read Real-time Clock

Refer to *Table 2–3* when using Opcode 7 to return the current time and date, the number of years since the last leap year, and the day of week.

Version	Description
1.00	Introduced

Note: You can also read the time/date by specifying Point Type 136 (ROC Clock) or Opcode 167 (Request Single Point Parameters).

Table 2–3. Opcode 7, Read Real-time Clock

Opcode 7						
Communi-Cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 7: Send Current Time and Date			No data bytes.	6	1	Current second [UINT8]
				7	1	Current minute [UINT8]
				8	1	Current hour [UINT8]
				9	1	Current day [UINT8]
				10	1	Current month [UINT8]
				11	2	Current year [UINT16]
				13	1	Current day of week [UINT8] 1=Sunday → 7=Saturday

2.4 Opcode 8, Set Real-time Clock

Opcode 8 is the only way to set the real-time clock. The ROC800L calculates the current day of the week. When you set the clock, the microseconds in the ROC800L zero out.

Version	Description
1.00	Introduced

Table 2–4. Opcode 8, Set Real-time Clock

Opcode 8						
Communi-Cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data Offset	**Data Length**	**Description of Data**	**Data Offset**	**Data Length**	**Description of Data**
Opcode 8: Set	6	1	Current seconds [UINT8]			No data bytes.
Current Time	7	1	Current minutes [UINT8]			Time and date are set and acknowledgment sent back.
and Date	8	1	Current hour [UINT8]			
	9	1	Current day [UINT8]			
	10	1	Current month [UINT8]			
	11	2	Current year [UINT16]			

2.5 Opcode 10, Read Configurable Opcode Point Data

Opcode 10 reads data defined by Point Type 99 (Configurable Opcode). The value of the starting table location plus the number of table locations must be less than or equal to 44.

Table 2–5. Opcode 10, Read Configurable Opcode Point Data

Opcode 10						
Communi-Cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data Offset	**Data Length**	**Description of Data**	**Data Offset**	**Data Length**	**Description of Data**
Opcode 10:	6	1	Table Number (0-15)	6	1	Table Number (0-15)
Send Data from	7	1	Starting Table Location (0-43)	7	1	Starting Table Location (0-43)
Configurable Opcode Tables	8	1	Number of Table Locations (1-44)	8	1	Number of Table Locations (1-44)
				9	4	Table Version Number [float]
				13	x	Data

2.6 Opcode 11, Write Configurable Opcode Point Data

Opcode 11 writes data defined by Point Type 99 (Configurable Opcode). The value of the starting table location plus the number of table locations must be less than or equal to 44.

Version	Description
1.00	Introduced

Table 2–6. Opcode 11, Write Configurable Opcode Point Data

Opcode 11						
Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 11: Set Data in Configurable Opcode Tables	6	1	Table Number (0-7) – (ROC300-Series and FloBoss 407) Table Number (0-3) – (FloBoss 100-Series, FloBoss 500-Series, and RegFlo)			No data bytes.
	7	1	Starting Table Location (0-43)			Acknowledgment sent back.
	8	1	Number of Table Locations (1-44)			
	9	x	Data			

2.7 Opcode 17, Login Request

Opcode 17 sets an operator identification code for the communications port through which communications are occurring. The operator identification is logged with an event, indicating the operator responsible for creating the event. The ROC800L provides a default operator identification for each communications port.

Version	Description
1.00	Introduced

Once you set the operator identification, it remains set until changed by:

- Subsequent Opcode 17 requests;
- ROC800L initialized by a cold hard start;
- Firmware upgrade; or
- Timeout.

Table 2–7. Opcode 17, Login Request

Opcode 17						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 17: Set Operator ID **Note**: Access Level only sent if Security Mode (95, x, 44) is set to 2 where x = the logical of the port the request is being made on.	6 9 11	3 2 1	Operator ID [AC3] Password [UINT16] Access Level [UINT8]			Acknowledgment sent back without data.
Opcode 17: Logout Request **Note**: Logout string is the ASCII string "LOGOUT" in all capital letters	6 9 11	3 2 6	Operator ID [AC3] Password [UINT16] Logout String [AC6]			Acknowledgement sent back without data

2.8 Opcode 24, Store and Forward

Opcode 24 defines the requested store and forward action through up to three intermediate ROC800Ls to the final destination ROC800L. Refer to *Chapter 7, Device-to-Device Communications*, for details on how this opcode works.

Version	Description
1.00	Introduced

Table 2–8. Opcode 24, Store and Forward

Opcode 24						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 24: Store and Forward	6	1	Host Address			No response to host until message returns from Final Destination ROC800L.
	7	1	Host Group			
	8	1	1st Destination Address			
	9	1	1st Destination Group			
	10	1	2nd Destination Address			
	11	1	2nd Destination Group			
	12	1	3rd Destination Address			
	13	1	3rd Destination Group			
	14	1	4th Destination Address			
	15	1	4th Destination Group			
	16	1	Desired Opcode			
	17	1	Number of data bytes for the desired Opcode			
	18	x	Opcode request data (if any)			

2.9 Opcode 50, Request I/O Point Position

Opcode 50 is used to request either the *type* or the *logical number* of all the I/O points in the ROC800L, returned in the order of their physical location in the ROC800L. The system (diagnostic) inputs are also included.

Version	Description
1.00	Introduced

Table 2-9. Opcode 50, Request I/O Point Position

Opcode 50						
Communi-Cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 50: Send I/O Point Type or Logical Number associated with the Point Type.	6	1	Which I/O data to send (0 = I/O Point Type, 1 = I/O Logical Number)	6	160 240 224	I/O Point Types or Logical Numbers See Opcode 6 (offset 10) for length of response

2.10 Opcode 100, Access User-defined Information

Opcode 100 reads user-defined point type information.

Version	Description
1.00	Introduced (Command 11)

Table 2-10. Opcode 100, Access User-defined Information

Opcode 100						
Communi-Cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Get Point Type Information	6 7	1 1	Command (11) Start Point # (0 – 255)	6 7	1 1	Command (11) Start Point # (0 – 255)
Retrieve information about point types.	8	1	# Points (0 – 245)	8 9	1 1	# Points (0 – 245) Type of Point Type 0 – 7 User Program 253 – User Defined 254 – ROC Point Type 255 – No Point Type (Above repeated as necessary)

2.11 Opcode 105, Request Today's and Yesterday's Min/Max Values

Opcode 105 retrieves the occurrence of today's and yesterday's minimum and maximum values.

Version	Description
1.00	Introduced

Enumeration Historical archive method.

128	Archived every hour (Average)
129	Archived every hour (Accumulated)
130	Archived every hour (Current)
134	Archived every hour (Totalize)
67	Timestamp logged with FST-controlled timestamp. Timestamp is a TIME [UINT32] representing the number of seconds elapsed since 12:00AM Jan 1, 1970. Use FST command WTM (Write Current Time to History)
65	Database value logged when directed by FST command WDB (Write Results Register Value to History)
0	Not defined.

Table 2–11. Opcode 105, Request Today's and Yesterday's Min/Max Values

Opcode 105						
Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 105: Send History	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	History point number	7	1	Historical point number

Opcode 105						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Point Definition, Min and Max Data, and Current Value for Specified History Point				8	1	Historical Archival Method Type
				9	1	Point type
				10	1	Point/Logic number
				11	1	Parameter number
				12	4	Current value [float]
				16	4	Minimum value since contract hour [float]
				20	4	Maximum value since contract hour [float]
				24	5	Time of minimum value occurrence **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day, and month
				29	5	Time of maximum value occurrence. **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day, and month
				34	4	Minimum value yesterday [float]
				38	4	Maximum value yesterday [float]
				42	5	Time of yesterday's min value occurrence. **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day and month
				47	5	Time of yesterday's max value occurrence. **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day, and month
				52	4	Value during last completed period [float]

2.12 Opcode 108, Request History Tag and Periodic Index

Opcode 108 sends the tag and history period for specified history points, up to a maximum of 20 history points. All points must be within a single segment.

Version	Description
1.00	Introduced

Table 2–12. Opcode 108, Request History Tag and Periodic Index

Opcode 108						
Communication Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 108: Send Tag and Current History Period for Specified History Point(s)	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	# of historical points specified	7	1	# of historical points specified
	8	1	Historical point (0 – 199)	8	2	Periodic Index (common among all history points in segment)
		.	(above repeated as necessary 20 maximum)	(repeated as necessary)	1	History point
					10	Tag [AC10]

2.13 Opcode 117, Request Weights and Measures Event Data

Opcode 117 requests event data from the Event Log in the ROC800L. The Weights and Measures Event Log consists of 1000 events. Each event consistes of 22 bytes, organized according to one of the formats described below.

Version	Description
1.00	Introduced

Table 2–13. Opcode 117, Request Weights and Measures Event Data

Opcode 117						
Communication Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 117: Send Specified Number of Events Starting with the Specified Event Index	6	1	# of events requested (max 10) *SEE NOTE BELOW	6	1	Number of events being sent
	7	2	Starting Event Log index	7	2	Starting Event Log index
				9	2	Current Event Log index
				11	22	Event Data
					.	(above repeated as necessary)

Note: If no events are requested, the ROC800L does not return event data.

Event Data Format The event log stores the last 1000 event entries. Each event consists of 22 bytes and has the following general format:

Description:	Type	Time				Event Specific Data																
Byte:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Weights and Measures Event Type Identifies what type of event is stored in the event specific data. Valid values are:

0 - No Event
1 - Parameter Change Event
2 - System Event
4 - User Event

Parameter Change Event Logs any time a user makes a change to any TLP. The event data has the following format:

Description:	Operator ID			TLP			Data Type	New Value				Old Value				Spare	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.
- **TLP**: Identifies what parameter was changed.
- **Data Type**: Identifies the type of data stored in the new value and old value fields. Valid values are:

  0 - BIN
  1 - INT8
  2 - INT16
  3 - INT32
  4 - UINT8
  5 - UINT16
  6 - UINT32
  7 - FL
  8 - TLP
  9 - AC (3 bytes)
  10 - AC (7 bytes)
  11 - AC (10 bytes)
  12 - AC (12 bytes)
  13 - AC (20 bytes)
  14 - AC (30 bytes)
  15 - AC (40 bytes)
  16 – DOUBLE
  17 – TIME

- **New Value**: New value of the changed parameter. If the data size is larger than 4 bytes, the new value extends beyond its four-byte field and into the old value and spare fields.
- **Old Value**: Old value of the changed parameter. The old value always starts at byte offset 16. If the data type is too large to store both old value and new value, only the new value is stored.

System Event A system event is an event the ROC800L logs internally. The event data has the following format:

Description:	Code	Description															
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Code**: More specifically defines the type of event that occurred. See Opcode 119 for list of event codes.
- **Description**: Textual description of the alarm.

User Event An event a logged-in user causes. The data has the following format:

Description:	Operator Id			Code	Description												
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.
- **Code**: More specifically defines the type of event that occurred. See Opcode 119 for list of event codes.
- **Description**: Textual description of the alarm.

Timestamp The timestamp for the alarm represents the time the alarm was logged. The timestamp is a TIME [UINT32] representing the number of seconds that have elapsed since 12:00 a.m. Jan. 1, 1970.

2.14 Opcode 118, Request Alarm Data

Opcode 118 requests alarm data from the ROC800L's Alarm Log.

Version	Description
1.00	Introduced

Table 2–14. Opcode 118, Request Alarm Data

Opcode 118						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Opcode 118: Send Specified Number of Alarms Starting With Specified Alarm index.	6 7	1 2	# of alarms requested (max 10) *SEE NOTE BELOW Starting Alarm Log index	6 7 9 11	1 2 2 23 .	Number of alarms being sent Starting Alarm Log index Current Alarm Log index Alarm Data (above repeated as necessary)

Note If no alarms are requested, the ROC800L does not return alarm data.

Alarm Data

The alarm log stores the last 450 alarm entries. Each alarm consists of 23 bytes and has the following general format:

Description	Type	Time				Alarm-specific Data																	
Byte:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

Alarm Type

The alarm type (byte 0) is a packed one-byte field that also includes information identifying if the alarm indicates a set or clear condition, and if the alarm is an SRBX alarm.

Alarm Type Byte Breakdown

The alarm type (byte 0) is a packed one-byte field that also includes information identifying if the alarm indicates a set or clear condition, and if the alarm is an SRBX alarm. It has the following format:

Description	SRBX	Condition	Type					
Bit:	7	6	5	4	3	2	1	0

- **SRBX (most significant bit)**: Indicates whether the alarm was an SRBX alarm. An SRBX allows the ROC800L to notify a host about certain alarm conditions. The host may be notified when an alarm is either set or cleared. Refer to *Chapter 6*. Valid values are:

  0 - No SRBX
  1 - SRBX issued

- **Condition (bit 6):** Indicates if the alarm is being set or cleared. Valid values are:

  0 - Cleared
  1 – Set

- **Type (bits 5-0)**: Identifies what type of alarm is stored. See Alarm-specific Data for byte usage (5-22) of each type. Valid values are:

  0 - No Alarm
  1 - Parameter Alarm
  2 - FST Alarm
  3 - User Text Alarm
  4 - User Value Alarm

Time

Bytes 1 to 4 provide the timestamp for the alarm, which is the time the alarm was logged. The timestamp is a TIME [UINT32] which represents the number of seconds that have elapsed since 12:00 a.m. Jan. 1, 1970.

Alarm-specific Data

For each alarm type, bytes 5 to 22 provide an alarm description and value as appropriate:

Parameter Alarm This type of alarm is typically generated by a parameter reaching a particular value. The data for this particular alarm has the following format:

Description:	Code	TLP			Alarm Description										Value			
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- **Code**: Reason why the alarm was logged. Some codes have meaning only for certain TLPs. Valid values are:

  0 - Low Alarm
  1 - Low Low Alarm
  2 - High Alarm
  3 - High High Alarm
  4 - Rate Alarm
  5 - Status Change
  6 - Point Fail
  7 - Scanning Disabled
  8 - Scanning Manual
  9 - Redundant Total Counts
  10 - Redundant Flow Register
  11 - No Flow Alarm
  12 - Input Freeze Mode
  13 - Sensor Communication Failure
  14 - 485 Communication Failure
  15 - Off Scan Mode
  16 - Manual Flow Inputs.
  17 - Meter Temperature Failure Alarm
  18 - Compressibility Calculation Alarm
  19 - Sequence Out of Order
  20 - Phase Discrepancy
  21 - Pulse Synchronization Failure
  22 - Frequency Discrepancy
  23 - Pulse Input One Failure
  24 - Pulse Input Two Failure
  25 - Pulse Output Buffer Overrun
  26 - Pulse Output Buffer Warning
  27 - Relay Fault
  28 - Relay Failure
  29 - Static Pressure Low Limited
  30 - Temperature Low Limited
  31 - Analog Output Readback Errror
  32 - Bad Level A Pulse Stream
  33 - Marker Pulse Stream
  34 - Orifice Diamete Range Alarm
  35 - Pipe Diameter Range Alarm
  36 - Beta Range Alarm
  37 - Reynolds Number Range Alarm
  38 - Non Convergence Alarm

- **TLP**: Parameter that caused the alarm. In some situations only the Type and Logical of the TLP have meaning.
- **Alarm Description**: Short textual description of the alarm.

- **Value**: Value of the specified TLP when alarm was logged. Data is a floating-point value regardless of the type associated with the parameter for specified TLP.

FST Alarm Alarm that was logged from an FST. The data for this particular alarm has the following format:

Description:	FST #	Alarm Description													Value			
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- **FST #**: Indicates which running FST logged the alarm.
- **Alarm Description**: Short textual description of the alarm
- **Value**: Floating point value associated with alarm.

User Text Alarm Alarm that was logged by a User C++ program. The data for this particular alarm has the following format:

Description:	Alarm Description																	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- **Alarm Description**: Short textual description of the alarm

User Value Alarm Alarm that was logged by a User C++ program. The data for this particular alarm has the following format:

Description:	Alarm Description														Value			
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- **Alarm Description**: Short textual description of the alarm.
- **Value**: Floating point value associated with alarm.

2.15 Opcode 119, Request Event Data

Opcode 119 requests event data from ROC800L's Event Log. The Event Log consists of a maximum of 450 events. Each event consists of 22 bytes, organized according to one of the five formats described below.

Version	Description
1.00	Introduced

Table 2–15. Opcode 119, Request Event Data

Opcode 119						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Opcode 119: Send Specified Number of Events Starting with the Specified Event Index	6	1	# of events requested (max 10) *SEE NOTE BELOW	6	1	Number of events being sent
	7	2	Starting Event Log index	7	2	Starting Event Log index
				9	2	Current Event Log index
				11	22	Event Data
					.	(above repeated as necessary)

Note: If no events are requested, the ROC800L does not return event data.

Event Data The event log stores the last 450 event entries. Each event consists of 22 bytes and has the following general format:

Description:	Type	Time				Event Specific Data																
Byte:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Event Type The event type identifies what type of event is stored in the event specific data. Valid values are:

0 - No Event
1 - Parameter Change Event
2 - System Event
3 - FST Event
4 - User Event
5 - Power Lost Event
6 - Clock Set Event
7 - Calibrate Verify Event

Parameter Change Event A Parameter Change event is logged any time a user makes a change to any TLP. The data for the event has the following format::

Description:	Operator ID			TLP			Data Type	New Value				Old Value				Spare	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.
- **TLP**: Identifies what parameter was changed.
- **Data Type**: Identifies the type of data stored in the new value and old value fields. Valid values are:

0 - BIN
1 - INT8
2 - INT16
3 - INT32
4 - UINT8
5 - UINT16
6 - UINT32
7 - FL
8 - TLP
9 - AC (3 bytes)
10 - AC (7 bytes)
11 - AC (10 bytes)
12 - AC (12 bytes)
13 - AC (20 bytes)
14 - AC (30 bytes)
15 - AC (40 bytes)
16 – DOUBLE
17 – TIME

- **New Value**: New value of the changed parameter. New value will extend beyond its four byte field and into the old value and spare fields if the data size is larger than 4 bytes.
- **Old Value**: Old value of the changed parameter. The old value always starts at byte offset 16. If the data type is too large to store both old value and new value, only the new value will be stored.

System Event A System event logs internally in the ROC800L. The data for the event has the following format:

Description:	Code	Description															
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Code**: More specifically defines the type of event that occurred. Valid values are:

144 - Initialization Sequence
145 - All Power Removed
146 - Initialize from defaults.
147 - ROM CRC Error
148 - Database Initialization
150 - Program Flash
151 – Weights and Measures Switch Enabled
152 – Weights and Measures Switch Disabled
153 – Parameter access lookup failed
154 - Smart Module Inserted
155 - Smart Module Removed
200 - Clock Set
248 - Text Message
249 - Download Configuration
250 - Upload Configuration
251 - Calibration Timeout
252 - Calibration Cancel
253 - Calibration Success
254 - MVS Reset to Factory Defaults

- **Description**: Textual description of the alarm.

FST Event An FST event is logged by an FST. The data for the event has the following format:

Description:	FST #	Value				Description										Spare	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **FST #**: Identifies which FST logged the event.
- **Value**: Floating point value associated with event.
- **Description**: Textual description of the event.

User Event A User event is logged by the action of a logged in user. The data for the event has the following format:

Description:	Operator Id			Code	Description												
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.
- **Code**: More specifically defines the type of event that occurred. Valid values are:

  144 - Initialization Sequence
  145 - All Power Removed
  146 - Initialize from defaults.
  147 - ROM CRC Error
  148 - Database Initialization
  150 - Program Flash
  151 – Weights and Measures Switch Enabled
  152 – Weights and Measures Switch Disabled
  153 – Parameter access lookup failed
  154 - Smart Module Inserted
  155 - Smart Module Removed
  200 - Clock Set
  248 - Text Message
  249 - Download Configuration
  250 - Upload Configuration
  251 - Calibration Timeout
  252 - Calibration Cancel
  253 - Calibration Success
  254 - MVS Reset to Factory Defaults

- **Description**: Textual description of the alarm.

Power Lost Event A Power Lost event is logged when power to the ROC800L has been lost. The data for the event has the following format:

Description:	Time	Not Used

Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Time**: Time that power to the unit was lost.

Clock Set Event A Clock Set event is logged when the time is set on the ROC800L. The data for the event has the following format

Description:	Time				Not Used												
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Time**: Identifies the time on the ROC800L was set to.

Calibrate Verify Event A Calibrate Verify event is logged any time a user tests the calibration of an I/O point.

Description:	Operator ID			TLP			Raw Value				Calibrated Value				Spare		
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who tested the calibration.
- **TLP**: Identifies what parameter was tested.
- **Raw Value**: Value of input before calibration was applied. Data type is float.
- **Calibrated Value**: Value of input after calibration was applied. Data type is float.

Timestamp The timestamp for the alarm represents the time the alarm was logged. The timestamp is a TIME [UINT32] which represents the number of seconds that have elapsed since 12:00 a.m. Jan. 1, 1970.

2.16 Opcode 135, Request Single History Point Data

Opcode 135 requests a specified number of history data values for a single history point, starting at a specified history index.

Version	Description
1.00	Introduced

The history segment indicates where data is requested, according to the following format:

0 = General History #0
1 = General History #1
2 = General History #2
.
.
.
9 = General History #9
10 = General History #10

The history point can be referenced by point number only as zero (0) – x, where x is the number of history points defined for a History

Segment. For each history segment, you can retrieve three types of possible history: Minute (0), Periodic (1), and Daily (2).

You can also retrieve the Periodic (3) and Daily (4) timestamps.

The starting history index specifies the record from which the history values start:

- Minute History: 0 – 60.
- Periodic History: 0 – (#periodic entries in history point – 1) (24 hours per day repeated for a maximum of 35 days).
- Daily History: 0 – (#daily entries in history point – 1).

Opcode 135 returns the history values for the requested history point from the starting history index and continues until it completes the requested number of indexes. To read timestamps, specify the value in "Type of History".

The timestamp is a TIME [UINT32] representing the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970. This can be thought of as column addressing.

Table 2–16. Opcode 135, Request Single History Point Data

Opcode 135						
Communi-Cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 135: Send Specified # of History Data for Specified History Point Starting at Specified History Index	6	1	History Segment (0-10)	6	1	History Segment (0-10)
	7	1	Point number (0-(# of history points for history segment – 1))	7	1	Point number (0-(# of history points for history segment – 1))
	8	1	Type of History (Minute – 0, Periodic – 1, or Daily – 2, Periodic Time Stamps – 3; Daily Time Stamps – 4)	8	2	Current history segment index
	9	2	Starting history segment index {Minute 0 – 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}	10	1	# of values being sent
	11	1	# of values requested (max 60) *SEE NOTE BELOW	11	4	1st history value
					.	(above repeat as necessary)

Note: If no events are requested, the ROC800L does not return history values.

2.17 Opcode 136, Request Mutiple History Point Data

Opcode 136 requests a specified number of history data values for a specified starting history index for a specified number of time periods, starting at a specified history point for a specified number of history points.

Version	Description
1.00	Introduced

The history segment indicates where data is requested. Following are the history segments:

0 = General History #0
1 = General History #1
2 = General History #2
.
.
.
9 = General History #9
10 = General History #10

The history index specifies the record to be used:

- Minute History: 0 – 60.
- Periodic History: 0 – (#periodic entries in history point – 1) (24 hours per day repeated for a maximum of 35 days).
- Daily History: 0 – (#daily entries in history point – 1).

There are three types of history possible to be retrieved from each history segment: Minute (0), Periodic (1), or Daily (2).

The starting history point can be referenced by point number only as 0 – x, where x is the number of history points defined for a History Segment.

Opcode 136 returns the history values for the requested history index from the starting history point and continuing until the requested number of history points is completed. The time stamp for the history index will always be returned.

The timestamp is a TIME [UINT32] representing the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970. This can be thought of as row addressing. An error is returned if the day was not found.

Table 2–17. Opcode 136, Request Multiple History Point Data

Opcode 136						
Communi-Cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Opcode 136: Send Specified # of History Data for Specified History Index Starting at Specified	6	1	History Segment (0-10)	6	1	History Segment (0-10)
	7	2	History Segment Index {Minute 0 - 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}	7	2	History Segment Index {Minute 0 - 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}
	9	1	Type of History (Minute – 0, Periodic – 1, or Daily – 2)	9	2	Current history segment index

Opcode 136						
Communi-Cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
History Point	10	1	Starting history point (0-(# of history points for history segment – 1))	11	1	# of data elements being sent ((# history points + 1) * # time periods) Value is 0 if the request is invalid.
	11	1	# of history points	12	4	Time stamp for 1st time period
	12	1	# of time periods *SEE NOTE BELOW ((# history points + 1) * # time periods) must not be greater than 60	16	4	1st history point value
					.	(repeat for number of history points)
					(above repeated for number of time periods)	

Note: If no time periods are requested, the ROC800L does not return history values.

2.18 Opcode 137, Request History Index for a Day

Opcode 137 requests the Periodic and Daily Index for a specific day of a specified history point. If a day is not found, an opcode error is returned.

Version	Description
1.00	Introduced

Table 2–18. Opcode 137, Request History Index for a Day

Opcode 137						
Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 137: Send History Index for Specified History Point for Specified Day and Month	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	Day requested	7	2	Starting Periodic Index for day and month request.
	8	1	Month requested	9	2	# periodic entries for day
				11	2	Daily Index for day and month requested. Not valid if the number of daily entries for requested day is 0.
				13	2	# daily entries per contract day

2.19 Opcode 138, Request Daily and Periodic History for a Day

Opcode 138 requests the periodic and daily history for a given day. If a day is not found, the ROC800L returns an opcode error. An opcode error can also occur if there are more periodic and daily entries than can fit in a reply. Request history point 255 to retrieve timestamps for the specified day.

Version	Description

Version	Description
1.00	Introduced

Table 2–19. Opcode 138, Request Daily and Periodic History for a Day

Opcode 138						
Communication Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Opcode 138: Send Periodic and Daily Index for Specified History Point for Specified Day and Month	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	History point (0 – (# of history points for history segment – 1))	7	1	History point (0 – (# of history points for history segment – 1))
	8	1	Day requested	8	1	Day requested
	9	1	Month requested	9	1	Month requested
				10	2	# periodic entries
				12	2	# daily entries
				14	4	periodic value
						(above repeated for each periodic value)
					4	daily value
						(above repeated for each daily value)

2.20 Opcode 139, History Information Data

Opcode 139 requests various types of information from history. Depending on the command, you can retrieve the configured points, retrieve the data, or the timestamps.

Version	Description
1.00	Introduced

Table 2–20. Opcode 139, History Information Data

Opcode 139						
Communi-Cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 139: History	6	1	Command	6	1	Command
Command = 0 Request configured points.	7	1	History Segment	7	1	History Segment
				8	1	Number of configured points
				9	1	First configured point.
					.	(above repeated as necessary)
Command = 1 Request specified point data	7	1	History Segment	7	1	History Segment
If Request Timestamps is 0, Number of points * Number of Time Periods must not be greater than 60.	8	2	History Segment Index {Minute 0 - 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}	8	2	Current Index
	10	1	Type of History (Minute – 0, Periodic – 1, or Daily – 2)	10	1	Number of time periods
	11	1	Number of time periods	11	1	Request Timestamps
If Request Timestamps is 1, (Number of points + 1)* Number of Time Periods must not be greater than 60.	12	1	Request Timestamps	12	1	Number of points
				13	4	Timestamp for first index (not returned if Request Timestamps parameter is 0)
	13	1	Number of points	17	4	1^{st} history point value
	14	1	Requested history point	21	.	(repeat for number of history points
		.	(above repeated as necessary)	(Above repeated for number of time periods)		

2.21 Opcode 166, Set Single Point Parameters

Opcode 166 either configures a single point or configures a contiguous block of parameters for a single point. This opcode is more efficient than Opcode 181 when writing to the entire point, or even a contiguous portion of the point, is required.

Version	Description
1.00	Introduced

Table 2–21. Opcode 166, Set Single Point Parameters

Opcode 166						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 166: Set specified contiguous block of parameters	6 7 8 9 10	1 1 1 1 1→230	Point type Point/Logic Number Number of Parameters Starting parameter Number Data (a contiguous block)			No data bytes. Acknowledgment sent back.

2.22 Opcode 167, Request Single Point Parameters

Opcode 167 either reads the configuration of a single point or reads a contiguous block of parameters for a single point. Opcode 167 can be more efficient than reading the entire point, or even a contiguous portion of the point, using Opcode 180.

Version	Description
1.00	Introduced

Table 2–22. Opcode 167, Request Single Point Parameters

Opcode 167						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 167: Send specified contiguous block of parameters	6 7 8 9	1 1 1 1	Point type Point/Logic Number Number of Parameters Starting parameter Number	6 7 8 9 10	1 1 1 1 1→230	Point type Point/Logic Number Number of Parameters Starting parameter Number Data (a contiguous block)

2.23 Opcode 180, Request Parameters

Opcode 180 reads several parameters in a single request. The parameters can be from different points and of different point types. The opcode is intended to read any combination of parameters listed in this document.

Version	Description
1.00	Introduced

Errors The opcode responds with an error response if:

- The response is longer than 240 bytes
- If the request is for an invalid parameter, possibly due to a point that is not configured.

Table 2–23. Opcode 180, Request Parameters

Opcode 180						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data: Offset	**Data: Length**	**Description of Data**	**Data: Offset**	**Data: Length**	**Description of Data**
Opcode 180: Send Specified Parameters	6	1	Number of parameters requested	6	1	Number of parameters requested
	7	1	Point type	7	1	Point type
		1	Point/Logic number		1	Point/Logic number
		1	Parameter number		1	Parameter number
		.	(above repeated as necessary)		x	Data comprising the parameter
					.	(above repeated as necessary)

2.24 Opcode 181, Write Parameters

Opcode 180 writes several parameters with a single request. The parameters can be from different points and of different point types. The opcode is intended to write any combination of parameters listed in this document.

Version	Description
1.00	Introduced

Errors The opcode responds with an error response if:

- The response is longer than 240 bytes.
- The request is for an invalid parameter.
- A parameter's data is out of range.
- A parameter is read-only.

Table 2–24. Opcode 181, Write Parameters

Opcode 181						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data: Offset	**Data: Length**	**Description of Data**	**Data: Offset**	**Data: Length**	**Description of Data**
Opcode 181: Set Specified Parameters	6	1	Number of parameters requested			No data bytes.
	7	1	Point type			Acknowledgment sent back.
		1	Point/Logic number			
		1	Parameter number			
		x	Data comprising the parameter			
		.	(above repeated as necessary)			

2.25 Opcode 203, General File Transfer

Opcode 203 transfers files to and from the flash file system.

Version	Description
1.00	Introduced (Commands 1 – 5)

Paths /flash/userData (recommended for user C applications)

Opcode 255 Error Codes

Invalid file	FILE_DOES_NOT_EXIST	67
Flash file system full	FLASH_FILE_SYSTEM_FULL	69
Invalid path	INVALID_PATH	72
Invalid offset	INVALID_OFFSET	73
Invalid option	INVALID_OPTION	74
More than 10 files open	TOO_MANY_FILES_OPEN	75

Other Limitations/ Special Cases

- Maximum of 10 open files.
- Can create only one directory per open command. That is, if /flash/etc does not exist, you cannot open a file in /flash/etc/bin
- You would be able to open a file in /flash/etc, which would create the etc directory.
- You can delete both directories and files with the delete command.

Table 2–25. Opcode 203, General File Transfer

Opcode 203						
	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
Command	**Offset**	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Open (An open must be performed first before reading or writing to any file) When creating a new file the path must start with /flash/.	6 7 8 108	1 1 100 25	Command (1) Options 0 = Open file for reading 1 = Open file for writing 2 = Create new file for writing (if doesn't exist) 3 = Open file for update (reading and writing) 4 = Truncate to zero length or create file for writing Path File Name (25 byte filename must include null character)	6 7	1 4	Command (1) File Descriptor
Read (Must use File Descriptor returned by the open command)	6 7 11	1 4 4	Command (2) File Descriptor Offset	6 7 11 15 19 20	1 4 4 4 1 Number of bytes	Command (2) File Descriptor File Size Offset Number of bytes Data (maximum 230 bytes) (above repeated as necessary)
Write (Must use File Descriptor returned by the open command)	6 7 11 15 19 20	1 4 4 4 1 Number of bytes	Command (3) File Descriptor File Size Offset Number of bytes Data (maximum 230 bytes) (above repeated as necessary)	6 7 11	1 4 4	Command (3) File Descriptor Offset
Close (Closes opened file and removes descriptor)	6 7	1 4	Command (4) File Descriptor	6	1	Command (4)
Delete (Does not require file descriptor) Can delete file or directory within "/flash"	6 7 107	1 100 25	Command (5) Path File Name	6	1	Command (5)

Opcode 203						
	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
Command	Offset	Length	Description of Data	Offset	Length	Description of Data
Read Directory Contents Returns all filenames in the "./flash/data" directory including subdirectories	6	1	Command (6)	6	1	Command (5)
	7	100	Path	7	1	Additional filenames to read: 0 = No 1 = Yes
	107	2		8	1	Total number of filenames sent
				9	Num-ber of bytes	Filenames (each file or directory name is separated with a null character and the entire data section ends with a null character)

2.26 Opcode 204, Long Request Event Data

Opcode 204 requests event data from the Event Log or Weights and Measures log in the ROC800L. The Event Log consists of a maximum of 450 events and the Weights and Measures Log consists of a maximum of 1000 events. Each event consists of 92 bytes, organized according to one of the five formats described below.

Version	Description
1.00	Introduced

Table 2–26. Opcode 204, Long Request Event Data

Opcode 204						
Communi-cation Opcode	**Host Request to ROC**			**ROC Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Opcode 119: Send Specified Number of Events Starting with the Specified Event Index	6	1	Log type, 0 = standard events, 1 = weights and measures events	6	1	Number of events being sent
	7	1	# of events requested (max 10) *SEE NOTE BELOW	7	2	Starting Event Log index
	8	2	Starting Event Log index	9	2	Current Event Log index
				11	92	Event Data
					.	(above repeated as necessary)

Note: If no events are requested, then no event data returns.

Event Data The event log stores the last 450 event entries. The Weights & Measures log stores the last 1000 events. Each event consists of 92 bytes and has the following general format:

Description:	**Type**	**Time**				**Event Specific Data**
Byte:	0	1	2	3	4	5 - 91

Event Type The event type identifies what type of event is stored in the event-specific data.

0 - No Event
1 - Parameter Change Event
2 - System Event
3 - FST Event
4 - User Event
5 - Power Lost Event
6 - Clock Set Event
7 - Calibrate Verify Event

Parameter Change Event A Parameter Change Event is logged any time a user makes a change to any TLP. The data for the event has the following format:

Description:	**Type**	**Time**	**Operator ID**			**TLP**			**Data Type**	**New Value**	**Old Value**
Byte:	0	1	5	6	7	8	9	10	11	12 - 51	52 - 91

- **Operator ID**: Identifies who made the change.
- **TLP**: Identifies what parameter was changed.

- **Data Type**: Identifies the type of data stored in the new value and old value fields.

  0 - BIN
  1 - INT8
  2 - INT16
  3 - INT32
  4 - UINT8
  5 - UINT16
  6 - UINT32
  7 - FL
  8 - TLP
  9 - AC (3 bytes)
  10 - AC (7 bytes)
  11 - AC (10 bytes)
  12 - AC (12 bytes)
  13 - AC (20 bytes)
  14 - AC (30 bytes)
  15 - AC (40 bytes)
  16 – DOUBLE
  17 - TIME
- **New Value**: New value of the changed parameter.
- **Old Value**: Old value of the changed parameter. The old value always starts at byte offset 52.

System Event A system event is an event logged internally by the ROC. The data for the event has the following format:

Description	Code	Description	Spare
Byte:	5	6-21	22-91

- **Code**: More specifically defines the type of event that occurred.

  144 - Initialization Sequence
  145 - All Power Removed
  146 - Initialize from defaults.
  147 - ROM CRC Error
  148 - Database Initialization
  150 - Program Flash
  151 - Reserved for ROC 800 only
  152 - Reserved for ROC 800 only
  153 - Reserved for ROC 800 only
  154 - Smart Module Inserted
  155 - Smart Module Removed
  200 - Clock Set
  248 - Text Message
  249 - Download Configuration
  250 - Upload Configuration
  251 - Calibration Timeout
  252 - Calibration Cancel
  253 - Calibration Success
  254 - MVS Reset to Factory Defaults

- **Description**: Textual description of the alarm.

FST Event An event logged by an FST. The data for the event has the following format:

Description:	FST #	Value				Description										Spare
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 - 91

- **FST #**: Identifies which FST logged the Event.
- **Value**: Floating point value associated with event.
- **Description**: Textual description of the event.

User Event An event caused by the action of a logged in user. The data for the event has the following format:

Description	**Operator**			**Code**	**Description**													**Spare**
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22 -

- Operator ID: Identifies who made the change.
- Code: More specifically defines the type of event that occurred.

  144 - Initialization Sequence
  145 - All Power Removed
  146 - Initialize from defaults.
  147 - ROM CRC Error
  148 - Database Initialization
  150 - Program Flash
  151 - Reserved for ROC 800 only
  152 - Reserved for ROC 800 only
  153 - Reserved for ROC 800 only
  154 - Smart Module Inserted
  155 - Smart Module Removed
  200 - Clock Set
  248 - Text Message
  249 - Download Configuration
  250 - Upload Configuration
  251 - Calibration Timeout
  252 - Calibration Cancel
  253 - Calibration Success
  254 - MVS Reset to Factory Defaults

- **Description**: Textual description of the alarm.

Power Lost Event An event logged when power to the ROC800-Series has been lost. The data for the event has the following format:

Description:	**Time**				**Not Used**													**Spare**
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22 - 91

- **Time**: Time that power to the unit was lost.

Clock Set Event Event that is logged when the time is set on the ROC800-Series. The data for the event has the following format:

Description:	Time				Not Used													Spare
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22 - 91

- **Time**: What the time on the ROC800-Series was set to.

Calibrate Verify Event A Calibrate Verify Event is logged any time a user tests the calibration of an I/O point.

Description:	Operator ID			TLP			Raw Value				Calibrated Value				Spare
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19 - 91

- **Operator ID**: Identifies who tested the calibration.
- **TLP**: Identifies what parameter was tested.
- **Raw Value**: Value of input before calibration was applied. Data type is float.
- **Calibrated Value**: Value of input after calibration was applied. Data type is float.

Timestamp The timestamp for the alarm represents the time the alarm was logged. The timestamp is a TIME [UINT32] which represents the number of seconds that have elapsed since 12:00 a.m. Jan. 1, 1970.

2.27 Opcode 206, Read Transaction History Data

Opcode 206 requests a list of transaction numbers and the date those numbers were created from a transactional history segment (command 1) and retrieves data from a particular transaction (command 2).

Version	Description
1.30	Introduced (Commands 1 & 2)

Table 2–27. Opcode 206, Read Transactional History Data

Opcode 206						
	Host Request to ROC800L			ROC800L Response to Host		
	Data			Data		
Command	**Offset**	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
List Transactions	6	1	Command (1)	6	1	Command (1)
Gives a list of the transactions	7	1	Segment	7	1	Number of transactions in message
currently stored in the system.	8	2	Transaction offset (starts at first transaction stored in the Segment, which is index 0. After rollover, this is not necessarily the oldest transaction);	8	1	More transactions than those returned in this request. Valid values are 0 (No) and 1 (Yes)
				9	10	Description
			Command (1)	19	2	Payload Size (size of the data portion of this segment's transactions. This is the size of all data types and value pairs returned in Command 2.
				21	2	Transaction Number
				23	4	Date created
				(Above 6 bytes repeated for num transactions)		
Read Transaction	6	1	Command (2)	6	1	Command (2)
Reads data for the specified transaction	7	1	Segment	7	1	Message Data Size (size of data below this byte)
	8	2	Transaction Number	8	1	More data than included in this response. Valid values are 0 (No) and 1 (Yes)
	10	2	Offset into data (this is a byte index into the data type value pairs)	9	1	Data Type**1**
				10	Data size	Value
				(Above TLP, Data Type, Value repeated for num bytes)		

[1]Valid data types and the corresponding value returns:

U8 = 1	STRING10 = 11
S8 = 2	STRING12 = 12
U16 = 3	STRING20 = 13
U32 = 5	STRING30 = 14
S32 = 6	T_STRING40 = 15
FLOAT = 7	BINARY (1 byte) = 17
DOUBLE = 8	TLP (3 bytes) = 18
STRING3 = 9	TIME (4 bytes) = 20
STRING7 = 10	

2.28 Opcode 224, SRBX Signal

Opcode 224 represents the message that is sent to the host to signal an SRBX. Refer to *Chapter 6* for an example of spontaneous report-by-exception.

Version	Description
1.00	Introduced

Table 2–28. Opcode 224, SRBX Signal

Opcodes 224						
Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 224: Signal Report- by-Exception			Host could possibly use a variety of different ways to retrieve the alarm index.			No data bytes.

2.29 Opcode 225, Acknowledge SRBX

Opcode 225 acknowledges receipt of an SRBX alarm message. Refer to *Chapter 6* for an example of spontaneous report-by-exception.

Version	Description
1.00	Introduced

Table 2–29. Opcode 225, Acknowledge SRBX

Opcode 225						
Communi-cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 225: Acknowledge Report-by-Exception	6	2	Current Alarm Log index			No data bytes. Acknowledgment sent back. ROC800L clears SRBX status if the ROC800L's alarm index equals data received from the host.

2.30 Opcode 255, Error Indicator

Opcode 255 is an error message indicator. If an opcode request is invalid, a request contains invalid data, or a value parmeter is out of range, the response is Opcode 255.

Version	Description
1.00	Introduced

This special opcode's data consists of an error code byte and an offset byte, as shown below:

Error Code	Description	Byte that caused error
1	Invalid Opcode request.	Opcode
2	Invalid parameter number.	Parameter number
3	Invalid logical number.	Logical number
4	Invalid point type.	Point type
5	Received too many data bytes.	Length
6	Received too few data bytes.	Length
12	Obsolete (Reserved, but not used)	
13	Outside valid address range.	Address
14	Invalid history request.	History point number
16	Invalid event entry.	Event code
17	Requested too many alarms.	Number of alarms requested
18	Requested too many events.	Number of events requested
19	Write to read only parameter. Exception for Opcode 166 which can have multiple parameters. Some of these may be RO, and some may not.	Parameter number
20	Security error.	Opcode
21	Invalid security logon.	Login ID or Password
22	Invalid store and forward path.	Any address or group
24	History configuration in progress.	Opcode
25	Invalid parameter range	Parameter
29	Invalid 1 day history index request.	History Segment, point, day or month
30	Invalid history point.	History Point
31	Invalid Min/Max request.	History segment or point number
32	Invalid TLP.	Point type, parameter, or logical number
33	Invalid time.	Seconds, minutes, hours, days, months, or years
34	Illegal Modbus range	Point/Logical number
63	Requested Access Level Too High	Access Level
77	Invalid logoff string	Ignored

The offset is the byte offset into the message in which an error was detected. Multiple parameters may cause an error, so there may be multiple error codes in the Opcode 255 response. This enables the separation of good data from bad. A multiple set could have some errors returned as well as some data being set. *Table 2-34, Valid Error Codes for a Given Opcode*, contains all of the error codes and the opcodes that may cause them.

Table 2–30. Opcode 255, Request Multiple History Point Data

Opcode 255						
Communi-Cation Opcode	Host Request to ROC800L			ROC800L Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 255: Invalid Parameters in Request Received by ROC800L			Reserved for ROC800L use.	⎡6 ⎣7	1 1 .	Error code (see Opcode 200) Offset of the byte that caused the error. (above repeated as necessary). With the exceptions shown in the Note below:

Note: The following are special cases for the value returned in offset 7:

- For Opcodes 166 and 167:
  Returns the requested point type's Actual parameter. For example, if you request parameters 5 through 10 and 6 fails, the value of parameter 6 (not 2) is returned in offset 7.
- For Opcodes 180 and 181:
  Returns the TLP-Tuple offset. For example, if you request ten TLPs and the 9th TLP has an error, 9 values are returned.

Table 2–31. Valid Error Code for a Given Opcode

This chart shows the ROC Plus Protocol relationship between opcodes and the point types that they reference.

Error Codes

		Request current ROC800L configuration	Read data and time	Set real time clock	Read configurable opcode point data	Write configurable opcode point data	Set operator id code	Set store and forward action	Request I/O Point Position	Request today and yesterday min and max values	Request history tag and periodic index	Request alarm data	Request event data	Request history point data	Request history index data	Request history index for a day	Set single point parameters	Request single point parameters	Request parameters	Write parameters	RBX send to host	RBX Ack from host	Error indicator
Description	**#**	**6**	**7**	**8**	**10**	**11**	**17**	**24**	**50**	**105**	**108**	**118**	**119**	**135**	**136**	**137**	**166**	**167**	**180**	**181**	**224**	**225**	**255**
Invalid opcode request	**1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Invalid parameter number	**2**																				NA		NA
Invalid logical number	**3**																x	x	x	x	NA		NA
Invalid point type	**4**																				NA		NA
Received too many data bytes	**5**	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X	x	x	x	x	NA		NA
Received too few data bytes	**6**			x	x	x	x	x	x		x	x	x	X	x	X	x	x	x	x	NA	x	NA
Outside valid address range	**13**																				NA		NA
Invalid history request	**14**													x	x						NA		NA
Invalid FST request	**15**																				NA		NA
Invalid event entry	**16**																				NA		NA
Requested too many alarms	**17**											X									NA		NA
Requested too many events	**18**												X								NA		NA
Write to read only parameter	**19**																x*			x	NA		NA
Security error	**20**						x														NA		NA
Invalid security logon	**21**						x														NA		NA
Invalid store and forward path	**22**							x													NA		NA
Flash programming error	**23**																				NA		NA
History configuration in progress	**24**									x	x			x	x	x					NA		NA
Invalid parameter range	**25**			x		x											x			x	NA		NA

This chart shows the ROC Plus Protocol relationship between opcodes and the point types that they reference.

		Request current ROC800L configuration	Read data and time	Set real time clock	Read configurable opcode point data	Write configurable opcode point data	Set operator id code	Set store and forward action	Request I/O Point Position	Request today and yesterday min and max values	Request history tag and periodic index	Request alarm data	Request event data	Request history point data	Request history index data	Request history index for a day	Set single point parameters	Request single point parameters	Request parameters	Write parameters	RBX send to host	RBX Ack from host	Error indicator
Description	**#**	**6**	**7**	**8**	**10**	**11**	**17**	**24**	**50**	**105**	**108**	**118**	**119**	**135**	**136**	**137**	**166**	**167**	**180**	**181**	**224**	**225**	**255**
Invalid User C++ program number	**26**																				NA		NA
No room for User C++ program	**27**																				NA		NA
Out of sequence User C++ packet number	**28**																				NA		NA
Invalid 1 day history index request	**29**															x					NA		NA
Invalid history point	**30**										x										NA		NA
Invalid Min/Max request	**31**									x											NA		NA
Invalid TLP	**32**																x	x	x	x	NA		NA
Invalid time.	**33**			x																	NA		NA
Illegal Modbus range	**34**																x			x	NA		NA

* = Exception, for opcode 166 which can have multiple parameters. Some of these may be RO or Invalid State, and some may not.

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Chapter 3 – Parameter Lists for Point Types

Configuring the ROC800L requires you to be familiar with the structure of the database. The database is broken into individual parameters and each database parameter is uniquely associated by parameter number and point type.

This section details ROC point types, Data Types, and User Defined Point (UDP) Types.

3.1 Type, Location/Logical, and Parameter (TLPs)

You reference data in the ROC800L by **t**ype, **l**ocation or **l**ogical, and **p**arameter (TLP). *Type* refers to the number of the point type. The *location* or *logical number* is a value based on physical input or output. A *parameter* is a numeric value assigned to each piece of data contained in a given point type. The tables in this section list the parameters numbers and descriptions for each of the point types.

3.2 Logical/Location Details

Within a point type, you reference individual points by either a location or a logical number (the “L” in the TLP referencing scheme). The ROC Plus protocol uses *location* (which is based on a physical input or output [I/O] “module and point” location) for point types 101 through 109. All other point types use a *logical* number and are simply numbered in sequence.

- Location (Physical Point Numbers 1 – 160): For point types 101 through 109, use the following location numbers for the field I/O and for diagnostic inputs:
  - Location Numbers **0** to **15** are assigned to the system I/O. For example, the five diagnostic points in a ROC800L would be 0 through 4.
  - Location Numbers **16** to **160** are assigned to field I/O. For example, an I/O module in slot 1 with 4 I/O points would be assigned as points 16 through 19.
- Logical (Point Numbers 0 – 127): For all other point types (other than 101 through 109), the logical number is 0 to x, where x is one less than the total number of points that exist for that point type. For example, the 16 PIDs would be logical numbers 0 through 15.

Table 3-1 details data types.

Table 3–1. Data Type

Data Type	Definition	# of Bytes	Default Range
BIN	Binary	1	0→1 For each Bit
AC	ASCII character groups	1 per character	0x20 → 0x7E for each character
INT8	Signed Integer – 8 bits	1	-128→127
INT16	Signed Integer – 16 bits	2	-32,768→32,767
INT32	Signed Integer – 32 bits	4	-2,147,483,648→2,147,483,647
UINT8	Unsigned Integer – 8 bits	1	0→255
UINT16	Unsigned Integer – 16 bits	2	0→65,535
UINT32	Unsigned Integer – 32 bits	4	0→4,294,967,295
FL	Single Precision Floating Point – IEEE Format	4	Any valid IEEE double precision float (see Chapter 5)
DBL	Double Precision Floating Point – IEEE Format	8	Any valid IEEE double precision float (see Chapter 5)
TLP	Type, Point or Logical Number, Parameter Number	3	{0→255, 0→255, 0→255}
TIME	Arithmetic Time: Number of seconds since Jan 1 1970 @ 00:00:00. This is a UINT32.	4	0→0→4,294,967,296 Jan 1, 1970 00:00:00 → Feb. 7, 2106 06:28:15

3.3 Binary Field (BIN) Example

This section provides an example alarm code from an analog input point type to demonstrate how a binary parameter is returned. A **1** in any bit indicates that bit is active or enabled.

	Scanning Disabled Alarm	Point Fail Alarm	Not Used	Rate Alarm	High High Alarm	High Alarm	Low Low Alarm	Low Alarm
Bit	7	6	5	4	3	2	1	0
Response Code	1	0	0	0	0	0	0	0

3.4 Point Type Table Fields

Each point type table is prefaced by a short description, a statement of the number of logical points (or iterations) of the point type, and the storage location for point type information. Point type tables contain the following information:

Field	Description
Param#	Defines the specific parameter number associated with that point type.
Name	Provides the name of the parameter.
Access	Indicates if the parameter can be read from and written to (**R/W**) or if the parameter is read-only (**R/O**). Although Weights and Measures (W&M) parameters may always be read-from, they may only be written-to on a conditional basis. When they are written-to they are logged to the Weights and Measures log. This is Read-Write Conditional (**R/W_CNDL**). Finally, there are parameters that can always be written-to and read-from but are logged to the Weights and Masures log. These are a Read-Write-Log (**R/W_Log**)
System or User Update	Identifies who has write access to the data.
Data Type	Identifies the type of data being stored. Data types are defined in Chapter 2.
Length	Indicates the number of bytes the parameter uses.
Range	Identifies the range of accepted values for the parameter.
Default	Indicates the initial value of the parameter.
Ver	Identifies the version of program in which the parameter was first introduced.
Description	Provides a brief description of the parameter.

3.4.1 Point Type 82: Virtual Discrete Outputs

Description: Point type 82 provides the Virtual Discrete Outputs parameters for setting up discrete outputs.

Number of Logical Points: 24 logical points for Virtual Discrete Outputs may exist.

Storage Location: Point type 82 is saved to internal configuration memory.

Table 3-2: Point Type 82, Virtual Discrete Outputs

Point Type 82, Virtual Discrete Outputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"DO Default"	1.00	Identification name for specific DO. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Percent "	1.00	Describes the units used by the DO. Values must be printable ASCII characters.
2	Scanning Mode	R/W	User	UINT8	1	0 → 2	1	1.00	Indicates the scanning mode. Valid values are: 0 = Disabled (no changes to output occur) 1 = Automatic (anything changes DO values) 2 = Manual (only user can change DO values)
3	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
4	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
5	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
6	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
6.0	Not Used			Bit 0			0		Not Used
6.1	Not Used			Bit 1			0		Not Used
6.2	Not Used			Bit 2			0		Not Used
6.3	Not Used			Bit 3			0		Not Used
6.4	Not Used			Bit 4			0		Not Used
6.5	Scanning Manual Alarm			Bit 5			0	1.00	If set, the Scanning (parameter #2) has been set to Manual. If clear, the Scanning (parameter #2) has been set to either Disable or Automatic
6.6	Not Used			Bit 6			0		Not Used

Point Type 82, Virtual Discrete Outputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been set to either Automatic or Manual.
7	Failsafe on Reset	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) is set to the status indicated in 'Failsafe Status Value' (Parameter #22) on a restart of any kind. If disabled, the last Status before the restart will be used. Valid values are 0 (Output Last Status on Reset) and 1 (Use Failsafe value on Reset).
8	Auto Output	R/W	Both	UINT8	1	0 → 1	0	1.00	Controls the state of the DO when Scanning (parameter #2) is in auto mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Automatic.
9	Accumulated Value	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.00	Number of times the Status (parameter #8) goes from OFF to ON.
10	Momentary Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) is turned ON for the entered Time On (parameter #14) and then be turned OFF. Valid valules are 0 (Momentary Disabled) and 1 (Momentary Enabled).
11	Momentary Active	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates that the DO currently has the Momentary ability active. Valid values are 0 (Momentary Not Active) and 1 (Momentary Active).
12	Toggle Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) is ON for the entered Time On (parameter #14) and then turned OFF for the same Time On. The Status continues to cycle between the ON and OFF states. Vallid values are 0 (Toggle Disabled) and 1 (Toggle Enabled).
13	Timed Discrete Output (TDO) Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) is turned ON for a calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). After the Time On has expired, the Status is turned OFF and remains that way until a new EU Value is entered. Valid values are 0 (TDO Disabled) and 1 (TDO Enabled).
14	Time On	R/W	Both	FL	4	DO: 0.002 → 43,200.0 DOR: 0.05→ 43,200.0	1.0	1.00	Number of seconds the Status (parameter #8) is turned on for if in TDO, Toggle, or Momentary Mode.

Point Type 82, Virtual Discrete Outputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	Cycle Time	R/W	User	FL	4	>0.0 → 43,200.0	15.0	1.00	Number of seconds for when TDO Mode (parameter #13) and Toggle Mode (parameter #12) are selected. The Status (parameter #8) is ON for the calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). The Status is then turned OFF based upon the Cycle Time minus the Time On.
16	Low Reading Time	R/W	User	FL	4	0.0 → 43,200.0	3.0	1.00	Minimum number of seconds the calculated Time On (parameter #14) is when the entered EU Value (parameter #20) is less than or equal to the entered Low Reading EU (parameter #18).
17	High Reading Time	R/W	User	FL	4	0.0 → 43,200.0	12.0	1.00	Maximum number of seconds the calculated Time On (parameter #14) will be when the entered EU Value (parameter #20) is greater than or equal to the entered High Reading EU (parameter #19).
18	Low Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Minimum EU Value (parameter #20) possible.
19	High Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Maximum EU Value (parameter #20) possible.
20	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Value in Engineering Units.
21	Manual Output	R/W	Both	UINT8	1	0 → 1	0	1.00	Controls the state of the DO when Scanning (parameter #2) is in manual mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Automatic.
22	Failsafe Output	R/W	User	UINT8	1	0 → 1	1	1.00	The state the output is placed in when the unit is started and the Failsafe on Reset Parameter (Parameter 7) is set to 1, Use Failsafe value on reset.
23	RESERVED								Reserved for future use
24	Physical Output	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the current state of the DO. Valid values are 1 (ON) and 0 (OFF).
25	Invert Output Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Inverts the output of the DO channel, allowing you to use TDO mode to keep a channel OFF for a set amount of time and then bring the channel back ON. Valid values are 0 (Normal) and 1 (Inverted). **Note:** This **always** inverts the output, including the Failsafe Output.
26	DO Type	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the DO type. Valid values are 0 (DO Relay) or 1 (DO Solid State).

3.4.2 Point Type 84: HART Extended Point Type

Description: Point type 84 provides additional parameters associated with the HART 2 module.

Number of Logical Points: 4 logicals per installed module imay exist.

Storage Location: Any parameter noted as “persistent” is saved to internal configuration memory.

Table 3-3: Point Type 84, HART Extended Point Type

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Channel Alarming	R/W	User	UINT8	1	0-1	0	1.00	If enabled, generates channel alarms and sends them to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
1	Channel Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	1.00	Alarm value for the HART channel. **Note**: This parameter is **persistent**.
1.0	AI Low Alarm			Bit 0			0		If set, the HART AI EU value is less than or equal to the AI Low Alarm EU (parameter #2). If clear, the HART EU value is greater than the AI Low Alarm EU (parameter #2). Only applies when the channel is configured as an AI.
1.2	AI High Alarm			Bit 2			0		If set, the HART AI EU value is greater than or equal to the AI High Alarm EU (parameter #3). If clear, the HART EU value is less than the AI High Alarm EU (parameter #3). Only applies when the channel is configured as an AI.
1.5	AO Readback Alarm			Bit 5			0		If set, the HART module is not detecting a device on the output line. If clear, the analog output is functioning correctly. Only applies when the channel is configured as an AO.
1.6	Point Fail Alarm			Bit 6			0		If set, communicating with the HART module has failed. If clear, the HART’s hardware is operating properly.
2	AI Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	1.00	Alarm value for HART AI Low Alarm. **Note**: This parameter is **persistent**.
3	AI High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.00	Alarm value for HART AI High Alarm. **Note**: This parameter is **persistent**.

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the HART AI EU Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
5	Device 1 Alarming	R/W	User	UINT8	1	0-1	0	1.00	If enabled, generates device alarms and sends them to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
6	Device 1 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	1.00	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
6.0	Device 1 PV Low Alarm			Bit 0			0		If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
6.2	Device 1 PV High Alarm			Bit 2			0		If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
6.6	Device 1 Point Fail Alarm			Bit 6			0		If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.
7	Device 1 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	1.00	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
8	Device 1 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	1.00	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
9	Device 1 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Provides a range (±) that the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
10	Device 1 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	1.00	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
11	Device 1 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Device 1 In Use Mode	R/W_ LOG	User	UINT8	1	0-2	0	1.00	Determines what value is used to populate the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.
13	Device 1 In Use Status	R/O	System	UINT8	1	0-6	0	1.00	Status of what value is being used to populate the PV. Valid values are: 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value, 5 = set to download value, 6 = set to failsafe value **Note**: This parameter is **persistent**.
14	Device 2 Alarming	R/W	User	UINT8	1	0-1	0	1.00	If enabled, device alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
15	Device 2 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	1.00	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
15.0	Device 2 PV Low Alarm			Bit 0			0		If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
15.2	Device 2 PV High Alarm			Bit 2			0		If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
15.6	Device 2 Point Fail Alarm			Bit 6			0		If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.
16	Device 2 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	1.00	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
17	Device 2 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	1.00	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
18	Device 2 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Provides a range (±) within which the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19	Device 2 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	1.00	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
20	Device 2 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
21	Device 2 In Use Mode	R/W_ LOG	User	UINT8	1	0-2	0	1.00	Determines what value populates the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.
22	Device 2 In Use Status	R/O	System	UINT8	1	0-6	0	1.00	Status of what value is being used to populate the PV. Valid values are: 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value, 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value **Note**: This parameter is **persistent**.
23	Device 3 Alarming	R/W	User	UINT8	1	0-1	0	1.00	If enabled, device alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). . **Note**: This parameter is **persistent**.
24	Device 3 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	1.00	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
24.0	Device 3 PV Low Alarm			Bit 0			0		If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
24.2	Device 3 PV High Alarm			Bit 2			0		If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
24.6	Device 3 Point Fail Alarm			Bit 6			0		If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
25	Device 3 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	1.00	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
26	Device 3 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	1.00	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
27	Device 3 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Provides a range (±) that the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
28	Device 3 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	1.00	When the device Poll mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
29	Device 3 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	The current value of the PV returned from the card or last live value if Scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
30	Device 3 In Use Mode	R/W_ LOG	User	UINT8	1	0-2	0	1.00	Determines what value populates the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.
31	Device 3 In Use Status	R/O	System	UINT8	1	0-6	0	1.00	Status of what value is being used to populate the PV. Valid values are**:** 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value **Note**: This parameter is **persistent**.
32	Device 4 Alarming	R/W	User	UINT8	1	0-1	0	1.00	If enabled, device alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled. **Note**: This parameter is **persistent**.
33	Device 4 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	1.00	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33.0	Device 4 PV Low Alarm			Bit 0			0		If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
33.2	Device 4 PV High Alarm			Bit 2			0		If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
33.6	Device 4 Point Fail Alarm			Bit 6			0		If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.
34	Device 4 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	1.00	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
35	Device 4 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	1.00	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
36	Device 4 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Provides a range (±) that the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
37	Device 4 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	1.00	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
38	Device 4 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
39	Device 4 In Use Mode	R/W_ LOG	User	UINT8	1	0-2	0	1.00	Determines what value populates the PV parameter. Valid values are:: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Device 4 In Use Status	R/O	System	UINT8	1	0-6	0	1.00	Status of what value is being used to populate the PV. Valid values are: : 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value **Note**: This parameter is **persistent**.
41	Device 5 Alarming	R/W	User	UINT8	1	0-1	0	1.00	If enabled, device alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
42	Device 5 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	1.00	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
42.0	Device 5 PV Low Alarm			Bit 0			0		If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
42.2	Device 5 PV High Alarm			Bit 2			0		If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
42.6	Device 5 Point Fail Alarm			Bit 6			0		If set, communicating with the HART device has failed. If clear, the HART device is operating correctly.
43	Device 5 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	1.00	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
44	Device 5 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	1.00	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
45	Device 5 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) in which the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
46	Device 5 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	1.00	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
47	Device 5 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes.

Point Type 84, HART Extended

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
48	Device 5 In Use Mode	R/W_LOG	User	UINT8	1	0-2	0	1.00	Determines what value is used to populate the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode.
49	Device 5 In Use Status	R/O	System	UINT8	1	0-6	0	1.00	Status of what value is being used to populate the PV. Valid values are: : 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value **Note**: This parameter is **persistent**.
50	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"………"	1.02	Describes the units the HART AI uses. Values must be primarily ASCII characters. **Note**: This parameter is **persistent**.

3.4.3 Point Type 85: HART Point Type

Description: Point type 85 is a User Defined Point Type to allow storage for user defined data.

Number of Logical Points: 4 logicals per installed module may exist.

Storage Location: Any parameter noted as “persistent” is saved to internal configuration memory.

Table 3-4: Point Type 85, HART Point Type

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0 (HART 1)	Channel Version	R/O	System	AC	10	0x20 - 0x5F for each byte	"………"	1.00	Version number for the firmware in the channel.
0 (HART 2)	RESERVED	R/O	System	AC	10	0x20 - 0x5F for each byte	"………"	1.00	Version number for the firmware in the channel.
1 (HART 1)	Channel I/O	R/O	System	UINT8	1	0 – 1	0	1.00	Indicates if a channel is an analog input or output. Valid values are 0 (Input) and 1 (Output). **Note**: This parameter is **persistent**
1 (HART 2)	Channel II/O	R/W_ CNDL	User	UINT8	1	0 – 1	0	1.00	Indicates if a channel is an analog input or output. Valid values are 0 (Input,) and 1 (Output). **Note**: This parameter is **persistent**.
2 (HART 1)	HART Communication Mode	R/W_ CNDL	User	UINT8	1	0 – 2	1	1.00	If disabled, all HART communication stops and no changes occur unless manually entered. Valid values are: 0 = Disabled 1 = Point to Point, 2 = Multidrop **Note**: This parameter is **persistent**.
2 (HART 2)	HART Communication Mode	R/W_ CNDL	User	UINT8	1	Bits 0-6: 0 — 2 Bit7: 0 — 1	1	1.00	If disabled, all HART communication stops and no changes occur unless manually entered. Bits 0-6: 0 = Disabled 1 = Point to Point, 2 = Multidrop Bit 7: 0 = Primary Master 1 = Secondary Master **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
3	Number of Devices Connected	R/W_ CNDL	User	UINT8	1	1 – 5	1	1.00	Indicates the number of devices connected in multidrop mode. **Note**: This parameter is **persistent**.
4	HART COM Status	R/O	System	UINT8	1	0 – 4	1	1.00	0 = Not Scanning 1 = Scanning Normal 2 = Dual Master Detected 3 = Pass thru 4 = Device in Burst Mode Detected **Note**: This parameter is **persistent**.
5	Analog Mode	R/W_ LOG	User	UINT8	1	0– 4	1	1.00	Analog Input: 0 = Disabled 1 = Enabled 3 = Calibration – EU Value not longer updates and freezes at this value. 4 = Cancel Calibration (restore previous calibration) Analog Output: 0 = Disabled 1 = Enabled (Auto) 2 = Manual **Note**: This parameter is **persistent**.
6	ROC Protocol Pass Thru Enable	R/W_ CNDL	User	UINT8	1	0 – 2	1	1.00	Enables ROC protocol pass thru communication. 0 = Disabled, 1 = Enabled 0 = Disable 1 = Strip all bytes, including preambles, before message 2 = Don't alter the message, return all bytes. This parameter is only R/W (to other than 0) if the license is available for this feature. **Note**: This parameter is **persistent**.
7 (HART 1)	ROC Protocol Pass Thru Timeout	R/W	User	UINT32	4	0 - 4,294,967,295	5000	1.00	Timeout in milliseconds to resume polling of HART device after receiving ROC protocol pass thru communication. **Note**: This parameter is **persistent**.
7 (HART 2)	Internal Resistor Control	R/W	User	UINT32	4	0 - 4,294,967,295	5000	1.00	Enables or disables internal resistor. Bits 0-30 are unused. Valid values for Bit 31 are 0 (Enabled) and 1 (Disabled). **Note**: This parameter is **persistent**.
8	EU Value	R/O	Both	FL	4	Any valid IEEE 754 float	0	1.00	EU value of analog input or output. **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Failsafe on Reset	R/W	User	UINT8	1	0 – 1	0	1.00	0 = Use last EU Value on reset 1 = Use Failsafe value on Reset If enabled (1), the raw D/A Output will be set to the Failsafe value on a restart of any kind. If disabled, the last EU Value or the last saved EU Value will be used to determine the Raw D/A Output after a restart. **Note**: This parameter is **persistent**.
10	Failsafe Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	The value outputted when the unit is started and the Failsafe on Reset Parameter is set to 1, Use Failsafe value on reset. **Note**: This parameter is **persistent**.
11	Manual Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Indicates the EU value used as an output when Scanning is in manual mode. **Note**: This parameter is **persistent**.
12	Auto Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Indicates the EU value used as an output when Scanning is in auto mode. **Note**: This parameter is **persistent**.
13	Physical Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Indicates the current value of the output in Engineering Units. **Note**: This parameter is **persistent**.
14	Physical Raw D/A Output	R/O	System	UINT16	2	0 → 65,535	AI:0 AO: 5,257	1.00	Calculated Digital-to-Analog value based upon the EU value currently being outputted EU Value.
15	Cabribration Live Value	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Live value when calibrating an AI. **Note**: This parameter is **persistent**.
16	EU Calibration Value Zero	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Indicates the zero EU calibration value. **Note**: This parameter is **persistent**.
17	EU Calibration Value Span	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Indicates the span EU calibration value. **Note**: This parameter is **persistent**.
18	EU Raw Value	R/O	System	UINT16	2	0 - 65535	0	1.00	Indicates the raw EU value of analog input or output. **Note**: This parameter is **persistent**.
19	EU Raw Calibration Zero	R/W	System	UINT16	2	0 - 65535	AI: 740 AO: 5,150	1.00	Indicates the zero raw EU calibration value. **Note**: This parameter is **persistent**.
20	EU Raw Calibration Span	R/W	System	UINT16	2	0 - 65535	AI:3,700 AO: 26,400	1.00	Indicates the span raw EU calibration value. **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21 (HART 1)	Device 1 Poll Mode	R/W_ LOG	User	UINT8	1	0-5	0	1.00	Indicates the polling mode for device. Valid values are: : 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This parameter is **persistent**.
21 (HART 2)	Device 1 Poll Mode	R/W_ LOG	User	UINT8	1	Bit 7: 0 – 1 Bits 0-6: 0 –3	0	1.00	Bit 7: Update State: 1=update, 0=no update Bits 0-6: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This parameter is **persistent**.
22	Device 1 Polling Address	R/O	Both	UINT8	1	0-15	0	1.00	Polling address for device 1.
23	Device 1 Status	R/O	System	UINT8	1	0-1	0	1.00	0 = No Device Found 1 = Communicating 2 = Comm Error
24	Device 1 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Period at which device 1 is being updated.
25	Device 1 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	"………"	1.00	Tag that resides in device 1. **Note**: This parameter is **persistent.**
26	Device 1 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.00	Response code and status received from device 1.
27	Device 1 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.00	Active alarms reported by device 1.
28	Device 1 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current in milliamps reported by device 1.
29	Device 1 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Percent of range reported by device 1.
30 (HART 1)	Device 1 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enables the use of fail safe values for the dynamic variables when the unit resets for device 1: **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
30 (HART 2)	Device 1 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enables the use of fail safe or download values for the dynamic variables when the unit detects an error for device 1. Valid values are: : 0 = live or last live 1 = failsafe values 2 = download value for PV, failsafe values for other dynamic variables. **Note**: This parameter is **persistent.**
31	Device 1 PV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for primary variable reported by device 1.
32	Device 1 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of primary variable of device 1. **Note**: This parameter is **persistent**.
33	Device 1 PV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Primary fail safe value for device 1. **Note**: This parameter is **persistent**.
34	Device 1 SV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for secondary variable reported by device 1.
35	Device 1 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of secondary variable of device 1. **Note**: This parameter is **persistent**.
36	Device 1 SV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Secondary fail safe value for device 1. **Note**: This parameter is **persistent**.
37	Device 1 TV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for tertiary variable reported by device 1.
38	Device 1 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of tertiary variable of device 1. **Note**: This parameter is **persistent**.
39	Device 1 TV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Tertiary fail safe value for device 1. **Note**: This parameter is **persistent**.
40	Device 1 FV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for fourth variable reported by device 1.
41	Device 1 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of fourth variable of device 1. **Note**: This parameter is **persistent**.
42	Device 1 FV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Fourth fail safe value of device 1. **Note**: This parameter is **persistent**.
43	Device 1 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 0 variable to request from device 1. **Note**: This parameter is **persistent**.
44	Device 1 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 0 variable requested from device 1.
45	Device 1 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 0 variable requested from device 1.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
46	Device 1 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 1 variable to request from device 1. **Note**: This parameter is **persistent**.
47	Device 1 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 1 variable requested from device 1.
48	Device 1 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 1 variable requested from device 1.
49	Device 1 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 2 variable to request from device 1. **Note**: This parameter is **persistent**.
50	Device 1 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 2 variable requested from device 1.
51	Device 1 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 2 variable requested from device 1.
52	Device 1 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 3 variable to request from device 1. **Note**: This parameter is **persistent**.
53	Device 1 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 3 variable requested from device 1.
54	Device 1 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 3 variable requested from device 1.
55	Device 1 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.00	Device 1 message.
56	Device 1 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.00	Device 1 descriptor.
57	Device 1 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.00	Device 1 manufacture's ID and device's ID
58	Device 1 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 1 serial number.
59	Device 1 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 1 ID number.
60	Device 1 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 1 sensor units.
61	Device 1 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 1 upper sensor limit.
62	Device 1 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 1 lower sensor limit.
63	Device 1 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 1 minimum sensor span.
64	Device 1 Output Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 1 Output Units
65	Device 1 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 1 upper output limit.
66	Device 1 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 1 lower output limit.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
67	Device 1 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 1 damping value.
68 (HART 1)	Device 2 Poll Mode	R/W_ LOG	User	UINT8	1	0-5	0	1.00	Polling mode for device 2. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This parameter is **persistent**.
68 (HART 2)	Device 2 Poll Mode	R/W_ LOG	User	UINT8	1	0-5	0	1.00	Polling mode for device 2. Bit 7: Update State: 1=update, 0=no update Bits 0-6: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This parameter is **persistent**.
69	Device 2 Polling Address	R/O	Both	UINT8	1	0-15	0	1.00	Polling address for device 2.
70	Device 2 Status	R/O	System	UINT8	1	0-1	0	1.00	0 = No Device Found 1 = Communicating 2 = Comm Error
71	Device 2 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Period at which device 2 is being updated.
72	Device 2 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.00	Tag that resides in device 2. **Note**: This parameter is **persistent**.
73	Device 2 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.00	Response code and status received from device 2.
74	Device 2 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.00	Active alarms reported by device 2.
75	Device 2 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current in milliamps reported by device 2.
76	Device 2 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Percent of range reported by device 2.
77 (HART `1)	Device 2 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enables the use of fail values for the dynamic variables when the unit is reset for device 2: **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
77 (HART 2)	Device 2 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enables the use of fail safe or download values for the dynamic variables when the unit detects an error for device 2. Valid values are: : 0 = live or last live 1 = failsafe values 2 = download value for PV, failsafe values for other dynamic variables. **Note**: This parameter is **persistent**.
78	Device 2 PV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for primary variable reported by device 2.
79	Device 2 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of primary variable of device 2. **Note**: This parameter is **persistent**.
80	Device 2 PV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Primary fail-safe value for device 2. **Note**: This parameter is **persistent**.
81	Device 2 SV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for secondary variable reported by device 2.
82	Device 2 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of secondary variable of device 2. **Note**: This parameter is **persistent**.
83	Device 2 SV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Secondary fail-safe value for device 2. **Note**: This parameter is **persistent**.
84	Device 2 TV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for tertiary variable reported by device 2.
85	Device 2 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of tertiary variable of device 2. **Note**: This parameter is **persistent**.
86	Device 2 TV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Tertiary fail-safe value for device 2. **Note**: This parameter is **persistent**.
87	Device 2 FV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for fourth variable reported by device 2.
88	Device 2 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of fourth variable of device 2. **Note**: This parameter is **persistent**.
89	Device 2 FV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Fourth fail-safe value of device 2. **Note**: This parameter is **persistent**.
90	Device 2 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 0 variable to request from device 2. **Note**: This parameter is **persistent**.
91	Device 2 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 0 variable requested from device 2.
92	Device 2 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 0 variable requested from device 2.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
93	Device 2 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 1 variable to request from device 2. **Note**: This parameter is **persistent**.
94	Device 2 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 1 variable requested from device 2.
95	Device 2 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 1 variable requested from device 2.
96	Device 2 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 2 variable to request from device 2. **Note**: This parameter is **persistent**.
97	Device 2 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 2 variable requested from device 2.
98	Device 2 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 2 variable requested from device 2.
99	Device 2 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 3 variable to request from device 2. **Note**: This parameter is **persistent**.
100	Device 2 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 3 variable requested from device 2.
101	Device 2 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 3 variable requested from device 2.
102	Device 2 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.00	Device 2 message.
103	Device 2 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.00	Device 2 descriptor.
104	Device 2 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.00	Device 2 manufacture's ID and device's ID
105	Device 2 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 2 serial number.
106	Device 2 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 2 ID number.
107	Device 2 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 2 sensor units.
108	Device 2 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 2 upper sensor limit.
109	Device 2 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 2 lower sensor limit.
110	Device 2 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 2 minimum sensor span.
111	Device 2 Output Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 2 Output Units
112	Device 2 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 2 upper output limit.
113	Device 2 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 2 lower output limit.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
114	Device 2 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 2 damping value.
115 (HART 1)	Device 3 Poll Mode	R/W_ LOG	User	UINT8	1	0-5	0	1.00	Polling mode for device 3: Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This parameter is **persistent**.
115 (HART 2)	Device 3 Poll Mode	R/W_ LOG	User	UINT8	1	Bit 7: 0-1 Bits 0-6: 0-3	0	1.00	Bit 7: Update State: 1=update, 0=no update Bits 0-6 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This parameter is **persistent**.
116	Device 3 Polling Address	R/O	Both	UINT8	1	0-15	0	1.00	Polling address for device 3.
117	Device 3 Status	R/O	System	UINT8	1	0-1	0	1.00	0: No Device Found 1: Communicating 2: Comm Error
118	Device 3 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Period at which device 3 is being updated.
119	Device 3 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.00	Tag that resides in device 3. **Note**: This parameter is **persistent**.
120	Device 3 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.00	Response code and status received from device 3.
121	Device 3 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.00	Active alarms reported by device 3.
122	Device 3 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current in milliamps reported by device 3.
123	Device 3 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Percent of range reported by device 3.
124 (HART 1)	Device 3 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enable the use of fail-safe values for the dynamic variables when the unit si reset for device 3. **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
124 (HART 2)	Device 3 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enable the use of fail safe or download values for the dynamic variables when the unit detects an error for device 3. Valid values are: 0 = live or last live 1 = failsafe values 2 = download value for PV, failsafe values for other dynamic variables. **Note**: This parameter is **persistent**.
125	Device 3 PV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for primary variable reported by device 3.
126	Device 3 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of primary variable of device 3. **Note**: This parameter is **persistent**.
127	Device 3 PV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Primary fail-safe value for device 3. **Note**: This parameter is **persistent**.
128	Device 3 SV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for secondary variable reported by device 3.
129	Device 3 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of secondary variable of device 3. **Note**: This parameter is **persistent**.
130	Device 3 SV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Secondary fail-safe value for device 3. **Note**: This parameter is **persistent**.
131	Device 3 TV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for tertiary variable reported by device 3.
132	Device 3 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of tertiary variable of device 3. **Note**: This parameter is **persistent**.
133	Device 3 TV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Tertiary fail-safe value for device 3. **Note**: This parameter is **persistent**.
134	Device 3 FV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for fourth variable reported by device 3.
135	Device 3 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of fourth variable of device 3. **Note**: This parameter is **persistent**.
136	Device 3 FV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Fourth fail-safe value of device 3. **Note**: This parameter is **persistent**.
137	Device 3 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 0 variable to request from device 3 **Note**: This parameter is **persistent**. .
138	Device 3 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 0 variable requested from device 3.
139	Device 3 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 0 variable requested from device 3.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
140	Device 3 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 1 variable to request from device 3. **Note**: This parameter is **persistent**.
141	Device 3 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 1 variable requested from device 3.
142	Device 3 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 1 variable requested from device 3.
143	Device 3 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 2 variable to request from device 3. **Note**: This parameter is **persistent**.
144	Device 3 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 2 variable requested from device 3.
145	Device 3 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 2 variable requested from device 3.
146	Device 3 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 3 variable to request from device 3. **Note**: This parameter is **persistent**.
147	Device 3 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 3 variable requested from device 3.
`1	Device 3 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 3 variable requested from device 3.
149	Device 3 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.00	Device 3 message.
150	Device 3 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.00	Device 3 descriptor.
151	Device 3 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.00	Device 3 manufacture's ID and device's ID
152	Device 3 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 3 serial number.
153	Device 3 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 3 ID number.
154	Device 3 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 3 sensor units.
155	Device 3 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 3 upper sensor limit.
156	Device 3 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 3 lower sensor limit.
157	Device 3 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 3 minimum sensor span.
158	Device 3 Output Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 3 Output Units
159	Device 3 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 3 upper output limit.
160	Device 3 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 3 lower output limit.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
161	Device 3 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 3 damping value.
162 (HART 1)	Device 4 Poll Mode	R/W_ LOG	User	UINT8	1	0-5	0	1.00	Polling mode for device 4. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This parameter is **persistent**.
162 (HART 2)	Device 4 Poll Mode	R/W_ LOG	User	UINT8	1	Bit 7: 0-1 Bits 0-6: 0-3	0	1.00	Bit 7: Update State: 1=update, 0=no update Bits 0-6 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This parameter is **persistent**.
163	Device 4 Polling Address	R/O	Both	UINT8	1	0-15	0	1.00	Polling address for device 4.
164	Device 4 Status	R/O	System	UINT8	1	0-1	0	1.00	0: No Device Found 1: Communicating 2: Comm Error
165	Device 4 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Period at which device 4 is being updated.
166	Device 4 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.00	Tag that resides in device 4. **Note**: This parameter is **persistent**.
167	Device 4 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.00	Response code and status received from device 4.
168	Device 4 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.00	Active alarms reported by device 4.
169	Device 4 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current in milliamps reported by device 4.
170	Device 4 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Percent of range reported by device 4.
171 (HART 1)	Device 4 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enable the use of fail safe values for the dynamic variables when the unit is reset for device 4. **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
171 (HART 2)	Device 4 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enable the use of fail safe or download values for the dynamic variables when the unit detects an error for device 4: Valid values are: 0 = live or last live 1 = failsafe values 2 = download value for PV, failsafe values for other dynamic variables. **Note**: This parameter is **persistent**.
172	Device 4 PV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for primary variable reported by device 4.
173	Device 4 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of primary variable of device 4. **Note**: This parameter is **persistent**.
174	Device 4 PV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Primary fail-safe value for device 4. **Note**: This parameter is **persistent**.
175	Device 4 SV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for secondary variable reported by device 4.
176	Device 4 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of secondary variable of device 4. **Note**: This parameter is **persistent**.
177	Device 4 SV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Secondary fail-safe value for device 4. **Note**: This parameter is **persistent**.
178	Device 4 TV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for tertiary variable reported by device 4.
179	Device 4 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of tertiary variable of device 4. **Note**: This parameter is **persistent**.
180	Device 4 TV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Tertiary fail-safe value for device 4. **Note**: This parameter is **persistent**.
181	Device 4 FV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for fourth variable reported by device 4.
182	Device 4 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of fourth variable of device 4. **Note**: This parameter is **persistent**.
183	Device 4 FV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Fourth fail-safe value of device 4. **Note**: This parameter is **persistent**.
184	Device 4 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 0 variable to request from device 4. **Note**: This parameter is **persistent**.
185	Device 4 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 0 variable requested from device 4.
186	Device 4 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 0 variable requested from device 4.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
187	Device 4 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 1 variable to request from device 4. **Note**: This parameter is **persistent**.
188	Device 4 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 1 variable requested from device 4.
189	Device 4 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 1 variable requested from device 4.
190	Device 4 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 2 variable to request from device 4. **Note**: This parameter is **persistent**.
191	Device 4 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 2 variable requested from device 4.
192	Device 4 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 2 variable requested from device 4.
193	Device 4 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 3 variable to request from device 4. **Note**: This parameter is **persistent**.
194	Device 4 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 3 variable requested from device 4.
195	Device 4 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 3 variable requested from device 4.
196	Device 4 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.00	Device 4 message.
197	Device 4 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.00	Device 4 descriptor.
198	Device 4 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.00	Device 4 manufacture's ID and device's ID
199	Device 4 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 4 serial number.
200	Device 4 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 4 ID number.
201	Device 4 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 4 sensor units.
202	Device 4 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 4 upper sensor limit.
203	Device 4 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 4 lower sensor limit.
204	Device 4 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 4 minimum sensor span.
205	Device 4 Output Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 4 Output Units
206	Device 4 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 4 upper output limit.
207	Device 4 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 4 lower output limit.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
208	Device 4 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 4 damping value.
209 (HART 1)	Device 5 Poll Mode	R/W_ LOG	User	UINT8	1	0-5	0	1.00	Polling mode for device 5. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This parameter is **persistent**.
209 (HART 2)	Device 5 Poll Mode	R/W_ LOG	User	UINT8	1	Bit 7: 0 – 1 Bits 0-6: 0-3	0	1.00	Bit 7: Update State: 1=update, 0=no update Bits 0-6 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This parameter is **persistent**.
210	Device 5 Polling Address	R/O	Both	UINT8	1	0-15	0	1.00	Polling address for device 5.
211	Device 5 Status	R/O	System	UINT8	1	0-1	0	1.00	Valid values are: 0 = No Device Found 1 = Communicating 2 = Comm Error
212	Device 5 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Period at which device 5 is being updated.
213	Device 5 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.00	Tag that resides in device 5. **Note**: This parameter is **persistent**.
214	Device 5 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.00	Response code and status received from device 5.
215	Device 5 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.00	Active alarms reported by device 5.
216	Device 5 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current in milliamps reported by device 5.
217	Device 5 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Percent of range reported by device 5.
218 (HART 1)	Device 5 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enable the use of fail-safe values for the dynamic variables when the unit is reset for device 5. **Note**: This parameter is **persistent**.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
218 (HART 2)	Device 5 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.00	Enable the use of fail safe or download values for the dynamic variables when the unit detects an error for device 5. Valid values are: 0 = live or last live 1 = failsafe values 2 = download value for PV, failsafe values for other dynamic variables. **Note**: This parameter is **persistent**.
219	Device 5 PV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for primary variable reported by device 5.
220	Device 5 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of primary variable of device 5. **Note**: This parameter is **persistent**.
221	Device 5 PV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Primary fail-safe value for device 5. **Note**: This parameter is **persistent**.
222	Device 5 SV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for secondary variable reported by device 5.
223	Device 5 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of secondary variable of device 5. **Note**: This parameter is **persistent**.
224	Device 5 SV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Secondary fail-safe value for device 5. **Note**: This parameter is **persistent**.
225	Device 5 TV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for tertiary variable reported by device 5.
226	Device 5 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of tertiary variable of device 5. **Note**: This parameter is **persistent**.
227	Device 5 TV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Tertiary fail-safe value for device 5. **Note**: This parameter is **persistent**.
228	Device 5 FV Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units code for fourth variable reported by device 5.
229	Device 5 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of fourth variable of device 5. **Note**: This parameter is **persistent**.
230	Device 5 FV Fail Safe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Fourth fail safe value of device 5.
231	Device 5 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 0 variable to request from device 5. **Note**: This parameter is **persistent**.
232	Device 5 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 0 variable requested from device 5.
233	Device 5 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 0 variable requested from device 5.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
234	Device 5 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 1 variable to request from device 5. **Note**: This parameter is **persistent**.
235	Device 5 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 1 variable requested from device 5.
236	Device 5 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 1 variable requested from device 5.
237	Device 5 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 2 variable to request from device 5. **Note**: This parameter is **persistent**.
238	Device 5 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 2 variable requested from device 5.
239	Device 5 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 2 variable requested from device 5.
240	Device 5 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.00	Slot 3 variable to request from device 5. **Note**: This parameter is **persistent**.
241	Device 5 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.00	Units of slot 3 variable requested from device 5.
242	Device 5 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value of slot 3 variable requested from device 5.
243	Device 5 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.00	Device 5 message.
244	Device 5 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.00	Device 5 descriptor.
245	Device 5 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.00	Device 5 manufacture's ID and device's ID
246	Device 5 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 5 serial number.
247	Device 5 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.00	Device 5 ID number.
248	Device 5 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 5 sensor units.
249	Device 5 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 5 upper sensor limit.
250	Device 5 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 5 lower sensor limit.
251	Device 5 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 5 minimum sensor span.
252	Device 5 Output Units	R/O	System	UINT8	1	0 - 255	0	1.00	Device 5 Output Units
253	Device 5 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 5 upper output limit.
254	Device 5 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 5 lower output limit.

Point Type 85, HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
255	Device 5 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Device 5 damping value.

3.4.4 Point Type 91: System Variables

Description: Point type 91 provides the System Variables parameters for the system configuration.
Number of Logical Points: 1 logic point for this variable may exist.
Storage Location: Point type 91 is saved to internal configuration memory.

Table 3-5: Point Type 91, System Variables

Point Type 91, System Variables

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	ROC Address	R/W	User	UINT8	1	0 →255	1	1.00	One-byte unit code of the station address. You can configure the unit code for a ROC address. **Note**: 0 is used for broadcast and **should not** be used by the ROC.
1	ROC Group	R/W	User	UINT8	1	0 →255	2	1.00	Group code of the station address.
2	Station Name	R/W	User	AC	20	0x20→0x7E for each byte	'Remote Oprtns Cntrlr'	1.00	A 20-character ASCII field for the station name.
3	Part Number and Version	R/O	System	AC	20	0x20 → 0x7E for each byte	'W68xxx Ver y.yy'	1.00	The software part number and version number string.
4	Time Created	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1.00	The time and date stamp the firmware was created.
5	Manufacturer ID	R/O	System	AC	20	0x20 → 0x7E for each byte	'Emerson Process Mgmt'	1.00	The manufacturing identification string.
6	Product Description	R/O	System	AC	20	0x20 → 0x7E for each byte	'ROC800L'	1.00	The manufacturing description of product.
7	Serial Number	R/O	System	UINT32	4	0x0→ 0xFFFFFFFF	0xFFFFFFFF	1.00	The serial number for the unit.
8	Maximum Events	R/O	System	UINT16	2	450	450	1.00	The maximum number of events that the Event Log may store.
9	Maximum Alarms	R/O	System	UINT16	2	450	450	1.00	The maximum number of alarms that the Alarm Log may store.
10	Maximum PIDs	R/O	System	UINT8	1	0 →16	16	1.00	The maximum number of PID loops that may run on the system
11	Maximum Meter Runs	R/O	System	UINT8	1	0, 6, 12	0	1.00	The maximum number of gas meter runs that may run on the system (0, 6, or 12, based on the license key installed).

Point Type 91, System Variables

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Maximum FSTs	R/O	System	UINT8	1	6	6	1.00	The maximum number of FSTs that may run on the system
13	Event Index	R/O	System	UINT16	2	0 → 449	0	1.00	The current event index for the Event Log.
14	Alarm Index	R/O	System	UINT16	2	0 → 449	0	1.00	The current alarm index in the Alarm Log.
15	Active PIDs	R/W_ CNDL	System	UINT8	1	0 → 16	16	1.00	Number of active PIDs
16	Active Stations	R/W_ CNDL	User	UINT8	1	0 → Maximum # of Meter Runs	1	1.00	Number of active stations
17	Active Differential Meter Runs	R/W_ CNDL	User	UINT8	1	0 → Maximum # of Meter Runs	1	1.00	Number of active differential meter runs
18	Active Linear Meter Runs	R/W_ CNDL	User	UINT8	1	0 → Maximum # of Meter Runs	1	1.00	Number of active linear meter runs
19	FST Clear	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Clears all FST code from Flash ROM. Valid values are 0 (Do nothing) and 1 (Clear FST code).
20	Clear configuration memory	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Clears the internal configuration memory stored in flash ROM. Valid values are 0 (Do nothing) and 1 (Enable clearing of Configuration Memory).
21	Write to Configuration Memory	R/W	User	UINT8	1	0 → 1	0	1.00	Commands the ROC to store certain point types (indicated throughout this document) to flash configuration memory. Valid values are 0 (Do nothing) and 1 (Perform Write to Configuration Memory).
22	Configuration Memory Write Complete	R/O	System	UINT8	1	0 → 1	1	1.00	Indicates if the system is in the process of writing the configuration to flash ROM. Valid values are 0 (Currently Performing the Write) and 1 (Completed the Write).
23	MPU Loading	R/O	System	FL	4	0.0 →100.0	0.0	1.00	The current percentage of time the CPU is being loaded, updated every 5 seconds.
24	Unused	R/W	User	UINT8	1	0	0	1.00	Unused
25	I/O Scanning	R/W	User	UINT8	1	0 → 1	1	1.00	Used to enable or disable scanning of all I/O in the system. Valid values are 0 (Disabled) and 1 (Enabled).
26	Warm Start	R/W_ LOG	User	UINT8	1	0 → 1	0	1.00	Used to re-start the system. A warm start is a reboot of the system without performing all the power-on-self tests. Valid values are 0 (Do nothing) and 1 (Perform Warm Start).

Point Type 91, System Variables

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Cold start	R/W_ CNDL	User	UINT8	1	0 → 7	0	1.00	Used to re-start the system. A cold start always includes starting from the boot sector and performing power-on-self tests, plus the following options. Valid values are: 0 = Do nothing 1 = Restore Configuration from Flash 2 = Clear Alarms 3 = Clear Events 4 = Clear FSTs 5 = Clear History Data 6 = Restore Configuration from Flash, Clear Alarms/Events/FSTs/History Data 7 = Restore Configuration from Defaults
28	Unused	R/O	User	UINT8	1	0	0	1.00	Unused
29	Unused	R/W	User	UINT8	1	0	0	1.00	Unused
30	Reserved	R/W	User	UINT8	1	0	0	1.00	Unused
31	Baud Rate Generator #0 Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	19200		The baud rate that baud rate generator #0 is to be set to.
32	Baud Rate Generator #1 Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	9600		The baud rate that baud rate generator #1 is to be set to.
33	Baud Rate Generator #2 Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	38400		The baud rate that baud rate generator #2is to be set to.
34	Baud Rate Generator #3Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	57600		The baud rate that baud rate generator #3 is to be set to.
35	CRC Check	R/W	User	UINT8	1	0 → 1	1	1.00	The CRC check flag. If this flag is enabled, a CRC is appended to all messages and a CRC is expected on all received messages. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: Ethernet communications ignore the CRC since TCP/IP protocol already does error checking. **Note**: The CRC must still be sent over Ethernet communications.
36	LED Enable	R/W	User	UINT8	1	0 → 601	5	1.00	Indicates the number of minutes the LEDs are on before automatically turning themselves off. (The LED button activea the LEDs for the configured time). Valid values are 0 (LEDs always on) and 1 - 60 (Specifying the number of minutes LEDs are on).

Point Type 91, System Variables

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
37	Boot Part Number and Version	R/W	User	AC	20	0x20 → 0x7E for each byte	'W68xxx Ver y.yy'	1.00	Contains the boot software part number and version number string.
38	Boot Firmware Time Created	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1.00	Contains the time and date stamp that the boot firmware was created
39	Unused	R/W	User	UINT8	1	0	0	1.00	Unused
40	Clear History	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Clears history database and resets configuration back to factory defaults without power cycling the ROC. Valid values are 0 (Don't clear) and 1 (Clear).
41	Flash Disk Space Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	Varies	1.00	The amount of disk space that has been consumed.
42	Flash Disk Space Free	R/O	System	UINT32	4	0 → 0xFFFFFFFF	Varies	1.00	The amount of disk space that is available
43	Number of System Initializations	R/W	Both	UNIT16	2	0 → 65535	0	1.00	Number of system initializations. **Note**: A regular cold start (not a Cold Start and Clear All) **does not** reset this parameter. However, a firmware upgrade **does** reset this parameter.
44	Number of Warm Starts	R/W	Both	UNIT16	2	0 → 65535	0	1.00	Number of warm starts. **Note**: A regular cold start (not a Cold Start and Clear All) **does not** reset this parameter. However, a firmware upgrade **does** reset this parameter.
45	Number of Cold Starts	R/W	Both	UNIT16	2	0 → 65535	0	1.00	Number of cold starts. **Note**: A regular cold start (not a Cold Start and Clear All) **does not** reset this parameter. However, a firmware upgrade **does** reset this parameter.
46	Number of Power Cycles	R/W	Both	UNIT16	2	0 → 65535	0	1.00	Number of power cycles. **Note**: A regular cold start (not a Cold Start and Clear All) **does not** reset this parameter. However, a firmware upgrade **does** reset this parameter.
47	Last Power-Down Time	R/O	System	TIME	4	N/A	0	1.00	Contains the last power-down time in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
48	Last Power Up Time	R.O	System	TIME	4	N/A	0	1.00	Contains the last power-up time in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
49	RESERVED								Reserved for future use

Point Type 91, System Variables

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	Logical Compatibility Mode	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00	Indicates the logical compatibility mode. Valid values are: 0 = 16 points per slot [Opcode 50 information and logical indexing for I/O is used in the same way as with version 1.XX of firmware] 1 = 8 points per slot [Opcode 50 information and logical indexing for I/O is based on 8 points per module and allows for up to 27 modules to be accessed.] See Opcode 50 for more information.
51	W&M Status	R/O	System	UINT8	1	0 → 1	0	1.00	Weights and Measures status. Valid values are **0** (System is Unlocked) and **1**(System is Locked).
52	Weights and Measures Maximum Events	R/O	System	UNIT16	2	1000	1000	1.00	The maximum number of events that the Weights and Measures Event Log may store.
53	Weights and Measures Event Index	R/O	System	UINT16	2	0 → 999	0	1.00	The current event index for the Weights and Measures Event Log
54	ROC Series	R/O	System	AC20	20	0x20 → 0x7E for each byte	Series 2	1.00	Indicates the hardware version
55	Num Active Virtual DO	R/W_ CNDL	User	UINT8	1	0 → 24	0	1.00	Number of active virtual DO points.
56	System Rollover for Double Precision Parameters	R/W_ CNDL	User	DBL	8	Any positive valid IEEE double precision float - → 2.996 * 10^{306}	1000000	1.00	The value at which the double precision accumulators roll over.
57	Locked Configuration CRC	R/O	System	INT32	4	-1 → 65535	-1	1.00	The current CRC for all of the locked configuration parameters.
58	Locked Configuration Time Stamp	R/O	System	TIME	4	0→4,294,967,295	0	1.00	The time and date of when the current configuration was stored. Value represents the umber of seconds elapsed since 12:00 a.m. Jan 1, 1970.
59	Locked Configuration Version	R/O	System	FLOAT	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	The version of the current configuration.
60	Rollback Status	R/O	System	UINT8	1	0→3	0	1.00	Indicates if a rollback configuration exists. Valid values are: 0 = not available 1 = current available 2 = previous available 3 = current & previous available

Point Type 91, System Variables

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
61	Configuration Mode	R/W	User	UINT8	1	0 → 3	0	1.00	Indicates the current action for mode. Valid values are: 0 = Nothing 1 = Rollback to Current 2 = Rollback to Previous 3 = Create Constant Log
62	Configuration Status	R/O	System	UINT8	1	0 → 8	0	1.00	Indicates the current status of the mode. Valid values are: 0 = Nothing/Complete 1 = Calculating CRC 2 = Saving Configuration 3 = Rolling back configuration 4 = Creating Constant Log 5 = Error calculating CRC 6 = Error Saving configuration 7 = Error Rolling back configuration 8 = Error creating constant log
63	Constant Log Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indications if constant log exists. 0 = not available, 1 = available
64	Weights and Measures Log Enable	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00	Enables or disables the logging of Weights & Measures events to the separate Weights & Measures log. Valid values are: 0 = All events are logged in standard event log 1 = Weights & Measures events are logged in the Weights & Measures log

3.4.5 Point Type 92: Logon Parameters

Description: Point type 92 provides the parameters for logging onto the ROC800L.

Number of Logical Points: 32 logical points for this parameter may exist.

Storage Location: Point type 92 is saved to internal configuration memory.

Table 3-6: Point Type 92, Logon Parameters

Point Type 92, Logon Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Operator Identifier	R/W	User	AC	3	0x20 → 0x7E for each byte.	‡	1.00	A three-character ASCII operator identifier (such as LOI).
1	Unused #1	R/O	User	UINT8	1	0	0	1.00	
2	Unused #2	R/O	User	UINT8	1	0	0	1.00	
3	Unused #3	R/O	User	UINT8	1	0	0	1.00	
4	Password	R/W	User	UINT16	2	0000 → 9999	See note	1.00	A numerical value that is used as a password for the Operator Identifier (such as 1000). **Note**: The first point (logical 0) defaults to the familiar operator ID (**LOI**) and password (**1000**). The remaining 31 points default to operator ID " " and password of **0000**. You cannot use the defaults of "*" and 0000 to log in.
5	Access Level	R/W	User	UINT8	1	0→ 255	0	1.00	A value that is used to limit access to parameters when parameter (95, x, 44) is set to 2 (Security by User Access Level) where x = to the logical of the port that the request is being made on.
6	Group #1	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
7	Group #2	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
8	Group #3	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
9	Group #4	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.

Point Type 92, Logon Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Group #5	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
11	Group #6	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
12	Group #7	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
13	Group #8	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
14	Group #9	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
15	Group #10	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
16	Group #11	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
17	Group #12	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
18	Group #13	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
19	Group #14	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
20	Group #15	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
21	Group #16	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
22	Group #17	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
23	Group #18	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.

Point Type 92, Logon Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	Group #19	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
25	Group #20	R/W	User	UINT8	1	0→19,255	255	1.00	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.

3.4.6 Point Type 93: License Key Information

Description: Point type 93 provides all of the information for licenses and license keys.

Number of Logical Points: There are a maximum of 14 logicals (0→13).

Storage Location: Point type 93 is **not** saved to internal configuration memory.

Table 3-7: Point Type 93, License Key Information

Point Type 93, License Key Information

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	License Key Slot # (Hardware Slot Number)	R/O	System	UINT8	1	0→2	0 = Not Present or invalid key 1 = Slot 1 2 = Slot 2	1.00	Slot Number of HW Key
1	License Code # (SW License #)	R/O	System	UINT8	1	0→7	0 = Not Present or invalid key 1→7	1.00	This is the SW license located on the HW Key # (PT 93; Parameter 0).
2	Application Name	R/O	System	AC	20	0x20→0x7E for each ASCII character	" "	1.00	The application name for the SW license.
3	Provider Name	R/O	System	AC	20	0x20→0x7E for each ASCII character	" "	1.00	A text description of the application provider.
4	Application Code	R/O	System	UINT16	2	0→65535	0	1.00	An application specific code (dictated by the application provider).
5	Version	R/O	System	AC	10	0x20→0x7E for each ASCII character	"0.0.0"	1.00	A combination of the Major, Minor, and Letter portion of the version (such as **255.255.A**). "
6	Quantity Total	R/O	System	UINT8	1	0→255	0	1.00	The number of licenses contained in the code.
7	Quantity Remaining	R/O	System	UINT8	1	0→255	0	1.00	The number of licenses remaining to be allocated.
8	Expiration Date	R/O	System	TIME	4	0→4294967295	0	1.00	The date that the license expires. Value represents the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
9	SW License Validity	R/O	System	UINT8	1	0: Not Valid 1: Valid	0	1.00	States the validity of this License Code.
10	Time Created	R/O	System	TIME	4	0→4294967295	0	1.00	Time license was created. If license is a result of a merge, time represents when the merge was performed.

3.4.7 Point Type 94: User C++ Configuration

Description: Point type 94 provides the User C++ Configuration parameters for enabling or disabling user programs.

Number of Logical Points: 8 logical points for User C++ Configuration may exist.

Storage Location: Point type 94 is saved to internal configuration memory.

Table 3-8: Point Type 94 User C++ Configuration

Point Type 94, User C++ Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Program Identifier	R/O	System	AC	20	0x20 → 0x7E for each byte	'No Program'	1.00	The customizable name for this User C++ program.
1	Program Version String	R/O	System	AC	12	0x20 → 0x7E for each byte	' '	1.00	The version string for the User C++ program.
2	Program Time/Date Stamp	R/O	System	TIME	4	0 → 4294967295	0	1.00	The time and date stamp the User C++ program was created (number of seconds since Jan. 1, 1970)
3	Program Library Version	R/O	System	AC	12	0x20 → 0x7E for each byte	' '	1.00	The library version the program was linked with.
4	Program Enable	R/W_Log	User	UINT8	1	0 → 1	0	1.00	Enables User C++ program: Valid values are 0 (Stop program) and 1 (Start program).
5	Program Clear	R/W_Log	User	UINT8	1	0 → 1	0	1.00	Clears the User C++ program from memory. If program is currently running, it remains running. Only the disk space is cleared. Valid values are 0 (No clear program) and 1 (Clear program).
6	Program Status	R/O	System	UINT8	1	0 → 3	0	1.00	The status of the program. Valid values are: 0x00 = Program empty 0x01 = Program loaded 0x02 = Program running 0x03 = Program shutting down 0x04 = Library version error 0x8X = If the most significant bit is set, an internal error resulted
7	Program Disk Space Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	0	1.00	The amount of flash disk space the program occupies.
8	Program DRAM Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	0	1.00	The amount of RAM space the program consumes.

Point Type 94, User C++ Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Program Auto Restart Counter	R/W	System	UINT32	4	0 → 0xFFFFFFFF	0	1.00	If the program commits an illegal instruction while running, the program will be killed and restarted. If this occurs, this parameter will be incremented.
10	Program Entry Point	R/O	System	UINT32	4	0 → 0xFFFFFFFF	0	1.00	Program entry point in memory, used internally for debugging.
11	Program Handle	R/O	System	UINT32	4	0 → 0xFFFFFFFF	0	1.00	Program handle, used internally for debugging.
12	RESERVED								Reserved for future use

3.4.8 Point Type 95: Communication Ports

Description: Point type 95 defines the Communication Ports for configuring a communication port. Only the following parameters are valid for logical 1 (Ethernet port):

ROC Plus Protocol Valid Receive Counter
ROC Plus Protocol successful message time
Transmit counter
ROC Plus Protocol Security Status

All other parameters for logical 1 cannot be modified.

Number of Logical Points: 6 logical points for Communication Ports may exist.

Storage Location: Point type 95 is saved to internal configuration memory.

Table 3-9: Point Type 95, Communication Ports

Point Type 95, Communication Ports

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag Identification	R/W	User	AC	10	0x20 → 0x7E for each byte	"Local Port", "COMM1" → "COMM5"	1.00	The customizable name for this communications port.
1	Baud Rate Generator Used	R/W	User	UINT16	2	0→ 3	0	1.00	The baud rate generator used by this com port. Each port may use a different generator, however, only 4 generators exist. *See Point Type 91, System Variables, Parameters 31-34*.
2	Stop Bits	R/W	User	UINT8	1	1,2	1	1.00	The number of stop bits in a character.
3	Data Bits	R/W	User	UINT8	1	7, 8	8	1.00	The number of data bits in a character.
4	Parity	R/W	User	UINT8	1	0 →2	0	1.00	For parity error checking, the host adds a 1 or 0 bit to the character to make it even or odd. The receiver then decodes this. An error occurs if the sum of the bits is not correct. Valid values are: 0 = None 1 = Odd 2 = Even

Point Type 95, Communication Ports

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Comm Type	R/O	System	UINT8	1	0, 9→13, 15	LOI: 10 COMM1: 15 COMM2: 10 COMM3: 0 COMM4: 0 COMM5: 0	1.00	Indicates the communication module installed. The system updates this parameter wheneer a module is installed or removed. Valid values are : 0 = No Comm Module Installed 9 = MVS 10 = RS-232 11 = RS-485 12 = Modem 13 = HART 19 = Ethernet 39 = Network Radio Module
6	Store and forward port	R/W	User	UINT8	1	0 → 1	COMM1: 1 All others: 0	1.00	If this is enabled all store and forward messages will be sent out this port. If it is disabled, none will be sent. Valid values are 0 (Do not store and forward for this port) and 1 (Store and forward for this port).
7	Key On Delay	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	LOI: 0.0 Others: 0.01	1.00	The period to wait after turning the RTS signal on before a message can be sent. This value is in seconds.
8	Key Off Delay	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	LOI: 0.0 Others: 0.01	1.00	The period, in seconds, to delay turning the RTS signal off after a message has been sent.
9	Modem Status	R/O	System	UINT8	1	0→ 255	0	1.00	This is the numeric response from the modem. A non-Hayes compatible modem will not provide this information. 0 = OK.
10	Modem Type	R/W	Both	UINT8	1	0 →2	0	1.00	The type of modem. The ROC detects can changes the internal modem. Valid values are: 0 = None 1 = External 2 = Internal. **Note**: The user cannot write 2.
11	Connect Time	R/W	User	FL	4	0.0 → Max positive IEEE 754 float	60.0	1.00	The amount of time in seconds the ROC800-Series waits after initiating a call to receive a connect message before terminating a call. Enter 0 to disable.
12	Configuration Command	R/W	User	AC	40	0x20 → 0x7E for each byte	"AT&F0E0H 0V0X0&K3 S0=1S7=25 5S24=60"	1.00	The commands needed to initialize a modem.
13	Connect Command	R/W	User	AC	40	0x20 → 0x7E for each byte	"ATDT (number)"	1.00	The Hayes compatible modem command needed to dial out for SRBX communications.

Point Type 95, Communication Ports

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
14	Disconnect Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	60.0	1.00	Time in seconds that the ROC800-Series waitst before disconnecting if there is no activity. Enter 0 to disable.
15	Inactivity Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	900.0	1.00	Time in seconds that the ROC800-Series waits, without receiving a signal, before it resets the modem. The inactivity timer looks at the valid receive counter to determine if the signal has been received. Enter 0 to disable.
16	Modem disconnect command	R/W	User	AC	40	0x20 → 0x7E for each byte	"ATH0"	1.00	The user can use a different disconnect string for a modem.
17	SRBX Status	R/O	System	UINT8	1	0 → 1	0	1.00	Valid values are 0 (SRBX is currently inactive) and 1 (SRBX is currently active for this port).
18	Enable SRBX	R/W	User	UINT8	1	0 → 1	0	1.00	If this is enabled all SRBX messages will be sent out this port. If is disabled, none will be sent. Valid values are 0 (Disable SRBX for this port) and 1 (Enable SRBX for this port).
19	SRBX Alarm Index	R/O	System	UINT16	2	0 → [PT 91, parameter 10]	0	1.00	The index into the alarm table that corresponds to the alarm that caused an SRBX.
20	SRBX Time Base #1	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	20.0	1.00	Time in seconds that the ROC800-Series uses as the first SRBX delay.
21	SRBX Attempts #1	R/W	User	UINT8	1	0 → 255	1	1.00	The number of attempts for the first SRBX to use. Valid values are 0 (Disable) and 255 (Continuous).
22	SRBX Time Base #2	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	30.0	1.00	Time in seconds that the ROC800-Series will use as the second SRBX delay.
23	SRBX Attempts #2	R/W	User	UINT8	1	0 → 255	2	1.00	The number of attempts for the second SRBX to use. Valid values are 0 (Disable) and 255 (Continuous).
24	SRBX Time Base #3	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	45.0	1.00	Time in seconds that the ROC800-Series will use as the third SRBX delay.
25	SRBX Attempts #3	R/W	User	UINT8	1	0 → 255	3	1.00	The number of attempts for the third SRBX to use. Valid values are 0 (Disable) and 255 (Continuous).
26	SRBX Host Address	R/W	User	UINT8	1	0 → 255	1	1.00	Used to identify the SRBX host – Address portion.
27	SRBX Host Group	R/W	User	UINT8	1	0 → 255	0	1.00	Used to identify the SRBX host – Group portion.
28	Store & Forward Address #1	R/W	User	UINT8	1	0 → 255	0	1.00	Address of the first destination for the store and forward path. SRBX must be enabled for this to function.

Point Type 95, Communication Ports

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	Store & Forward Group #1	R/W	User	UINT8	1	0 → 255	0	1.00	Group number of the first destination for the store and forward path. SRBX must be enabled for this to function.
30	Store & Forward Address #2	R/W	User	UINT8	1	0 → 255	0	1.00	Address of the second destination for the store and forward path. SRBX must be enabled for this to function.
31	Store & Forward Group #2	R/W	User	UINT8	1	0 → 255	0	1.00	Group number of the second destination for the store and forward path. SRBX must be enabled for this to function.
32	Store & Forward Address #3	R/W	User	UINT8	1	0 → 255	0	1.00	Address of the third destination for the store and forward path. SRBX must be enabled for this to function.
33	Store & Forward Group #3	R/W	User	UINT8	1	0 → 255	0	1.00	Group number of the third destination for store and forward. SRBX must be enabled for this to function.
34	Unused	R/O	User	UINT8	1	0	0	1.00	Not currently used.
35	Unused	R/O	User	UINT8	1	0	0	1.00	Not currently used.
36	ROC Plus Protocol Valid Receive Counter	R/W	Both	UINT16	2	0 → 65535	0	1.00	The number of valid ROC Plus Protocol messages the ROC received for this port. It can be cleared by the user.
37	ROC Plus Protocol successful message time	R/O	System	TIME	4	0x0→ 0xFFFFFFFF	0x386D97E0	1.00	The time of the last successful Opcode received by the ROC800-Series. Indicated by the number of seconds since midnight Jan 1, 1970.
38	Modbus Valid Receive Counter	R/W	Both	UINT16	2	0 → 65535	0	1.00	The number of valid Modbus messages received the ROC received for this port. It can be cleared by the user.
39	Modbus successful message time	R/O	System	TIME	4	0x0→ 0xFFFFFFFF	0x386D97E0	1.00	The time of the last successful function code received by the ROC800-Series. Indicated by the number of seconds since midnight Jan 1, 1970.
40	Number of invalid message bytes	R/W	Both	UINT16	2	0 → 65535	0	1.00	The number of invalid ROC Plus Protocol or Modbus bytes received. This parameter always returns 0 for logical 1.
41	Invalid message byte time	R/O	System	TIME	4	0x0→ 0xFFFFFFFF	0x386D97E0	1.00	The time of the last unsuccessful message byte was received by the ROC800-Series. Indicated by the number of seconds since midnight Jan 1, 1970. This parameter always returns 0 for logical 1.
42	Transmit counter	R/W	Both	UINT16	2	0 → 65535	0	1.00	Number of messages sent.

Point Type 95, Communication Ports

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
43	Port owner	R/W	Both	UINT8	1	0 → 255	0	1.00	The program that currently owns the port. Messages will be routed directly to the owner, bypassing the ROC Plus Protocol. The owner will not be allowed to be changed if an MVS module is installed on the port. Valid values are: 0 = ROC Plus Protocol / Modbus Slave 1 = Modbus Master (Comm 2 – 5) 2 = DS800 (Not Valid for Comm 1 on ROC809E) 3 = LCD 4 = I/O Module (Read Only) 5 = User C++ Program 1 6 = User C++ Program 2 7 = User C++ Program 3 8 = User C++ Program 4 9 = User C++ Program 5 10 = User C++ Program 6 11 = User C++ Program 7 12 = User C++ Program 8 50 = ROC Plus Protocol Only 51 = Modbus Slave Only 52 = LCD/Roc Plus Protocol
44	ROC Plus Protocol Security Status	R/W	User	UINT8	1	0 → 2	0	1.00	Enables security for the communications port. Valid values are : 0 = Disabled 1 = Security by User ID 2 = Security by User Access Leve
45	RESERVED								Reserved for future use
46	RESERVED								Reserved for future use
47	Security Inactivity Timeout	R/W	User	UINT32	4	80 → 86400	3600	1.20	Indicates the number of seconds before the user is logged out because of inactivity.

3.4.9 Point Type 96: FST Parameters

Description: Point type 96 provides the parameters for setting up a FST or used by the FST.

Number of Logical Points: 6 logical points for FST Parameters may exist.

Storage Location: Point type 96 is saved to internal configuration memory.

Table 3-10: Point Type 96, FST Parameters

Point Type 96, FST Parameters

Param	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each byte	"FSTx"	1.00	This field contains a string to describe the FST. "X" in default name is a number that correlates to the FST logical number.
1	Result Register (RR)	R/W	System	FL	4	Any valid IEEE 754 float	0	1.00	Register used to store result of last FST operation.
2	Register 1 (R1)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
3	Register 2 (R2)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
4	Register 3 (R3)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
5	Register 4 (R4)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
6	Register 5 (R5)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
7	Register 6 (R6)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
8	Register 7 (R7)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
9	Register 8 (R8)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
10	Register 9 (R9)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
11	Register 10 (R10)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.00	Register used as an input to an FST or as a location to store FST data.
12	Timer #1	R/W	Both	UINT32	4	0 → 4294967295	0	1.00	Time left for count down timer. Timer resolution is 100ms.

Point Type 96, FST Parameters

Param	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Timer #2	R/W	Both	UINT32	4	0 → 4294967295	0	1.00	Time left for count down timer. Timer resolution is 100ms.
14	Timer #3	R/W	Both	UINT32	4	0 → 4294967295	0	1.00	Time left for count down timer. Timer resolution is 100ms.
15	Timer #4	R/W	Both	UINT32	4	0 → 4294967295	0	1.00	Time left for count down timer. Timer resolution is 100ms.
16	Message #1	R/W	System	AC	30	0x20 → 0x7E for each byte	“”	1.00	This parameter is updated with the first argument of the “MSG” FST command when the command executes.
17	Message #2	R/W	User	AC	30	0x20 → 0x7E for each byte	“”	1.00	This parameter is updated with the first argument of the “MS2” FST command when the command executes.
18	Message Data #1	R/O	System	AC	10	0x2D, 0x2E, 0x30 → 0x39 for each byte	“0.0”	1.00	This parameter is updated with the second argument of the “MSG” FST command when the command executes.
19	Miscellaneous 1	R/W	Both	UINT8	1	0 → 255	0	1.00	Single byte register that may be used by an FST.
20	Miscellaneous 2	R/W	Both	UINT8	1	0 → 255	0	1.00	Single byte register that may be used by an FST.
21	Miscellaneous 3	R/W	Both	UINT8	1	0 → 255	0	1.00	Single byte register that may be used by an FST.
22	Miscellaneous 4	R/W	Both	UINT8	1	0 → 255	0	1.00	Single byte register that may be used by an FST.
23	Compare Flag (SVD)	R/W	System	UINT8	1	0 → 255	0	1.00	Stores the result of a Boolean expression. Valid values are 0 (FALSE) and 1 (TRUE).
24	Run Status	R/W	Both	UINT8	1	0, 1, 5, 8, 9	0	1.00	This parameter stores the run state of the FST. Valid values are: 0 = FST is not running. 1 = FST is running. 5 = Indicates FST has shut down due to an invalid point reference. 8 = FST Editor initiates the Trace mode. 9 = Indicates that the FST in ROC800 is processing.
25	Code Size	R/O	System	UINT16	2	0 – 3000	0	1.00	Size, in bytes, of the FST code. This size does not include storage needed for register names, description, or version.

Point Type 96, FST Parameters

Param	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
26	Instruction Pointer	R/W	System	UINT16	2	0 – 3000	0	1.00	Contains the location of the FST function to be executed next. If an error occurs, the Instruction Pointer will be set to the location of the parameter that caused the error. This parameter may also be called a program counter.
27	Execution Delay	R/W	User	UINT16	2	0 → 65535	0	1.00	Execution delay between FST instructions. Resolution is tenths of a second.
28	FST Version	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Stores information about the version of the FST code. The user sets this before the FST is uploaded to the ROC800.
29	FST Description	R/O	System	AC	40	0x20 → 0x7E for each byte	“”	1.00	Contains a short description about the FST that is running. The user sets this before the FST is uploaded to the ROC800.
30	Message Data #2	R/O	System	AC	10	0x2D, 0x2E, 0x30 → 0x39 for each byte	“0.0”	1.00	This parameter is updated with the second argument of the “MS2” FST command when the command executes.
31	Steps / Task Cycle	R/W	User	UINT8	1	0 → 250	20	1.00	The requested number of steps to be executed each cycle of the FST task for this FST. The FST task nominally runs every 100 ms.
32	Actual Steps / Task Cycle	R/O	System	UINT8	1	0 → 250	20	1.00	The actual number of FST steps that the ROC800 executed for this FST during the most recent cycle of the FST task.
33	FST Cycle Time	R/O	System	FL	4	0 → Any valid positive IEEE 754 float	0.0	1.00	The amount of time in seconds from the beginning of the last execution of the FST (step 1) to the beginning of the current execution (step 1).
34	FST	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates the log to use to log FST events. Valid values are **0** (log events to standard event log) and **1** (log events in Weights and Measures log).

3.4.10 Point Type 97: FST Register Tags

Description: Point Type 97 provides the parameters for entering the register tags for the FST data. Each register name corresponds to a register in point type 96. It is only broken apart because of the length of the point type.

Number of Logical Points: 6 logical points for FST Register Tags may exist.

Storage Location: Point type 97 is saved to internal configuration memory.

Table 3-11: Point Type 97, FST Register Tags

Point Type 97, FST Register Tags

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Register Tag 1	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register1"	1.00	Text string used as a label for Register 1 (R1).
1	Register Tag 2	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register2"	1.00	Text string used as a label for Register 2 (R2).
2	Register Tag 3	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register3"	1.00	Text string used as a label for Register 3 (R3).
3	Register Tag 4	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register4"	1.00	Text string used as a label for Register 4 (R4).
4	Register Tag 5	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register5"	1.00	Text string used as a label for Register 5 (R5).
5	Register Tag 6	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register6"	1.00	Text string used as a label for Register 6 (R6).
6	Register Tag 7	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register7"	1.00	Text string used as a label for Register 7 (R7).
7	Register Tag 8	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register8"	1.00	Text string used as a label for Register 8 (R8).
8	Register Tag 9	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register9"	1.00	Text string used as a label for Register 9 (R9).
9	Register Tag 10	R/W	System	AC	10	0x20 → 0x7E for each byte	"Register10"	1.00	Text string used as a label for Register 10 (R10).

3.4.11 Point Type 98: Soft Point Parameters

Description: Point type 98 provides the soft point parameters for global storage that may be used by any part of the system.

Number of Logical Points: 32 logical points for Soft Point Parameters may exist.

Storage Location: Point type 98 is saved to internal configuration memory.

Table 3-12: Point Type 98, Soft Point Parameters

Point Type 98, Soft Point Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	ASCII Text 1	R/W	User	AC	40	Any printable ASCII text.	“Soft Pt x”	1.00	Text string used to label instance of soft point. The “x” in default is the number of the soft point.
1	Float 1	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
2	Float 2	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
3	Float 3	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
4	Float 4	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
5	Float 5	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
6	Float 6	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
7	Float 7	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
8	Float 8	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
9	Float 9	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
10	Float 10	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
11	Float 11	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
12	Float 12	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
13	Float 13	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
14	Float 14	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
15	Float 15	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
16	Float 16	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
17	Float 17	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
18	Float 18	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
19	Float 19	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
20	Float 20	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	Miscellaneous storage.
21	Long 1	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.

Point Type 98, Soft Point Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
22	Long 2	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
23	Short 1	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
24	Short 2	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
25	Short 3	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
26	Short 4	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
27	Short 5	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
28	Short 6	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
29	Short 7	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
30	Short 8	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
31	Short 9	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
32	Short 10	R/W	User	UINT16	2	0 → 65535	0	1.00	Miscellaneous storage.
33	Byte 1	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
34	Byte 2	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
35	Byte 3	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
36	Byte 4	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
37	Byte 5	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
38	Byte 6	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
39	Byte 7	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
40	Byte 8	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
41	Byte 9	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
42	Byte 10	R/W	User	UINT8	1	0 → 255	0	1.00	Miscellaneous storage.
43	Double 1	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
44	Double 2	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
45	Double 3	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
46	Double 4	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
47	Double 5	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
48	Double 6	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
49	Double 7	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.

Point Type 98, Soft Point Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	Double 8	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
51	Double 9	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
52	Double 10	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	1.00	Miscellaneous storage.
53	Long 3	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
54	Long 4	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
55	Long 5	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
56	Long 6	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
57	Long 7	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
58	Long 8	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
59	Long 9	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
60	Long 10	R/W	User	UINT32	4	0 → 4294967295	0	1.00	Miscellaneous storage.
61	Logging Enable	R/W	User	U8	1	0 → 1	1	1.00	Enabled/disables logging of events for changes to the soft point parameters on this logical. Valid values are 0 (Logging Disabled) and 1 (Logging Enabled).

3.4.12 Point Type 99: Configurable Opcode Table

Description: Point type 99 provides the Configurable Opcode table that hosts may use to collect data from a ROC in a specific order. There are 16 instances (logicals) of the Configurable Opcode table. Each instance of the Point Type is a grouping of up to 44 different ROC parameter definitions (Point **T**ype, **L**ogical Number, and **P**arameter Number = TLP). Once the parameter(s) have been defined, Opcodes 10 and 11 can be used to read/write data from/to the TLPs pointed to by the Configurable Opcode Table.

Number of Logical Points: 16 logical points for Configurable Opcodes may exist.

Storage Location: Point type 99 is saved to internal configuration memory.

Notes

- Any Valid TLP = values represented as TLP [(60→98, 100→143)[1], 0→xx[2],0→xx[3]].
- Point types present depend on the modules present and point type implementation
- The logical number corresponds on the last instance of the point type
- The parameter value corresponds to the number of parameters in the specified point type

Table 3-13: Point Type 99, Configurable Opcode

Point Type 99, Configurable Opcode

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Sequence/Revision #	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Identifies the revision number for this table.
1	Data 1	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
2	Data 2	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
3	Data 3	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
4	Data 4	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
5	Data 5	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
6	Data 6	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
7	Data 7	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
8	Data 8	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
9	Data 9	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
10	Data 10	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
11	Data 11	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
12	Data 12	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
13	Data 13	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
14	Data 14	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
15	Data 15	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
16	Data 16	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable

Point Type 99, Configurable Opcode

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
17	Data 17	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
18	Data 18	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
19	Data 19	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
20	Data 20	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
21	Data 21	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
22	Data 22	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
23	Data 23	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
24	Data 24	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
25	Data 25	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
26	Data 26	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
27	Data 27	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
28	Data 28	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
29	Data 29	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
30	Data 30	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
31	Data 31	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
32	Data 32	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
33	Data 33	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
34	Data 34	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
35	Data 35	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
36	Data 36	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
37	Data 37	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
38	Data 38	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
39	Data 39	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
40	Data 40	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
41	Data 41	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
42	Data 42	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
43	Data 43	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable
44	Data 44	R/W	User	TLP	3	Any Valid TLP	0,0,0	1.00	User configurable

3.4.13 Point Type 100: Power Control Parameters

Description: Point type 100 provides parameters for configuring radio power control.

Number of Logical Points: 6 logical points for Power Control Parameters may exist.

Storage Location: Point type 100 is saved to internal configuration memory.

Special Data Type
Name: HOURMINUTE
Length: 2 bytes
Description:
This is supposed to be viewed as a time listed as a decimal-based number, where the first two digits represent the hour and the last two digits represent the minute.
Range: 9999, 0 → 23 for 2 MS Digits; 0 → 59 for 2 LS Digits
Special Meanings: 9999, Disabled

Table 3-14: Point Type 100, Power Control Parameters

Point Type 100, Power Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Identification	R/W	User	AC	10	0x20 → 0x7E for each byte	LOI: "PWR_CTRL_0" COMM1: "PWR_CTRL_1" COMM2: "PWR_CTRL_2" COMM3: "PWR_CTRL_3" COMM4: "PWR_CTRL_4" COMM5: "PWR_CTRL_5"	1.00	Specifies a name used to identify this radio power control point.
1	Status	R/O	User	UINT8	1	0,1	0	1.00	Status of power control on this port. Valid values are 0 (Power Disabled) and 1 (Power Enabled).
2	Enable	R/W	User	UINT8	1	0,1	0	1.00	The enabled mode for the power control on this port. Valid values are 0 (Disabled) and 1 (Enabled).
3	Start Time #1	R/W	User	UNIT16	2	See Default Above	9999	1.00	Zone 1 start time.

Point Type 100, Power Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Start Time #2	R/W	User	UNIT16	2	See Default Above	9999	1.00	Zone 2 start time.
5	Start Time #3	R/W	User	UNIT16	2	See Default Above	9999	1.00	Zone 3 start time.
6	On Time #1	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.00	On time for Zone 1. The amount of time for this cycle, the DO associated with this power control is in the on state (in milliseconds).
7	On Time #2	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.00	On time for Zone 2. The amount of time for this cycle, the DO associated with this power control will be in the on state (in milliseconds).
8	On Time #3	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.00	On time for Zone 3. The amount of time for this cycle, the DO associated with this power control is in the on state (in milliseconds).
9	Off Time #1	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.00	Off time for Zone 1. The amount of time (in milliseconds) for this cycle, the DO associated with this power control is in the off state (following the on state)
10	Off Time #2	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.00	Off time for Zone 2. The amount of time (in milliseconds) for this cycle, the DO associated with this power control is in the off state (following the on state).
11	Off Time #3	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.00	On time for Zone 3. The amount of time (in milliseconds) for this cycle, the DO associated with this power control is in the off state (following the on state).
12	Active Time Zone	R/O	System	UINT8	1	1 → 3	1	1.00	This parameter is the current active power zone.
13	Hold Time	R/W	User	UINT32	4	0 → 4,294,967,295	10000	1.00	Time in milliseconds that the output is held on after detection of communications. Not applicable for logical 1 if Ethernet Port.
14	Power Timer	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Counts down the amount of time, in milliseconds, (On Time, Off Time, Hold Time) that the power control is currently using.
15	Discrete Output Number	R/W	User	TLP	3	[0,0,0] or Type: 102. Parameter: 8 Logical is 0→ (number of DO Points – 1).	0,0,0	1.00	The logical discrete output number.
16	Low Battery	R/W	User	FLOAT	4	Any IEEE 754 Floating point number.	11.0	1.00	The radio will not be turned on if the voltage drops below this value. In volts.
17	Cumulative On Time	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.00	The counter shows how many seconds the radio power control has been on.

Point Type 100, Power Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Cumulative Off Time	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.00	This counter shows how many seconds the radio power control has been off.
19	Low Battery Deadband	R/W	User	FLOAT	4	Any IEEE 754 Floating point number.	1.0	1.00	This is a dead-band for the low battery level in power control. This is used to keep from the radio continuously turning on and off.

3.4.14 Point Type 101: Discrete Inputs

Description: Point type 101 provides the parameters for setting up and reading discrete inputs.

Number of Logical Points: 8 logical points may exist for each installed module.

Storage Location: Point type 101 is saved to internal configuration memory.

Table 3-15: Point Type 101, Discrete Inputs

Point Type 101, Discrete Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"DI Default"	1.00	Identification name for specific DI. Values must be printable ASCII characters.
1	Scanning	R/W	User	UINT8	1	0 → 1	1	1.00	If disabled, field inputs are ignored and no changes will occur unless manually entered. Valid values are 0 (Disabled) and 1 (Enabled).
2	Filter	R/W	User	FL	4	0.00 → 43,200.0	0.3	1.00	Number of seconds that a DI must remain in the ON state before it is recognized as valid and the Status (parameter #3) is changed.
3	Status	R/W	Both	UINT8	1	0 → 1	0	1.00	Indicates the DI's current state. Valid values are 0 (OFF) and 1 (ON).
4	Invert Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the field input will be inverted in the Status (parameter #3 – ON becomes OFF and vice-versa). Valid values are 0 (Invert Status Disabled) and 1 (Invert Status Enabled).
5	Latch Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, then, on an active transition of the input, the Status (parameter #3) will change to ON and remain in the ON state until it is cleared manually. Valid values are 0 (Latch Status Disabled) and 1 (Latch Status Enabled).
6	Accumulated Value	R/W	Both	UINT32	4	0 → 16,000,000	0	1.00	Number of times the Status (parameter #3) goes from OFF to ON. Value rolls over once it reaches the maximum range.
7	Cumulative On Time	R/W	Both	FL	4	0.0→ 1,000,000	0.0	1.00	Number of seconds the Status (parameter #3) is in the ON state. Value rolls over once it reaches the maximum range.
8	Cumulative Off Time	R/W	Both	FL	4	0.0→ 1,000,000	0.0	1.00	Number of seconds the Status (parameter #3) is in the OFF state. Value rolls over once it reaches the maximum range.
9	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).

Point Type 101, Discrete Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
11	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
12	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
12.0	Not Used			Bit 0			0		Not Used
12.1	Not Used			Bit 1			0		Not Used
12.2	Not Used			Bit 2			0		Not Used
12.3	Not Used			Bit 3			0		Not Used
12.4	Not Used			Bit 4			0		Not Used
12.5	Status On Alarm			Bit 5			0	1.00	If set, the Status (parameter #3) is ON. If clear, the Status (parameter #3) is OFF.
12.6	Not Used			Bit 6			0		Not Used
12.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #1) has been disabled. If clear, the Scanning (parameter #1) has been enabled.
13	Scan Period	R/W	User	FL	4	0.004→43,200.0	0.05	1.00	Scan period in seconds
14	Actual Scan Time	R/O	System	FL	4	0.0 → 43,200.0	0.0	1.00	Actual number of seconds between updates of the DI.
15	Physical Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the hardware's current state. Valid values are 0 (OFF) and 1 (ON).

3.4.15 Point Type 102: Discrete Outputs

Description: Point type 102 provides the parameters for setting up discrete outputs.

Number of Logical Points: 5 logical points may exist for each installed standard DO Relay and DO module. 6 logical points may exist for each installed 6-point DO Relay module.

Storage Location: Point type 102 is saved to internal configuration memory.

Table 3-16: Point Type 102, Discrete Outputs

Point Type 102, Discrete Outputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"DO Default"	1.00	Identification name for specific DO. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Percent "	1.00	Describes the units used by the DO. Values must be printable ASCII characters.
2	Scanning Mode	R/W	User	UINT8	1	0 → 2	1	1.00	If disabled, no changes to the output will occur. If in Manual, only the user can change the values of the DO. If in Automatic, anything can change the values of the DO. Valid values are: 0 = Disabled 1 = Automatic 2 = Manual
3	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
4	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
5	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
6	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
6.0	Not Used			Bit 0			0		Not Used
6.1	Not Used			Bit 1			0		Not Used
6.2	Not Used			Bit 2			0		Not Used
6.3	Not Used			Bit 3			0		Not Used
6.4	Not Used			Bit 4			0		Not Used

Point Type 102, Discrete Outputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6.5	Scanning Manual Alarm			Bit 5			0	1.00	If set, the Scanning (parameter #2) has been set to Manual. If clear, the Scanning (parameter #2) has been set to either Disable or Automatic
6.6	Not Used			Bit 6			0		Not Used
6.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been set to either Automatic or Manual.
7	Failsafe on Reset	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) will be set to the status indicated in 'Failsafe Status Value' (Parameter #22) on a restart of any kind. If disabled, the last Status before the restart will be used. Valid values are 0 (Output Last Status on Reset) and 1 (Use Failsafe value on Reset).
8	Auto Output	R/W	Both	UINT8	1	0 → 1	0	1.00	Controls the state of the DO when Scanning (parameter #2) is in auto mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Automatic.
9	Accumulated Value	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.00	Number of times the Status (parameter #8) goes from OFF to ON.
10	Momentary Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) will be turned ON for the entered Time On (parameter #14) and then be turned OFF. Valid values are 0 (Momentary Disabled) and 1 (Momentary Enabled).
11	Momentary Active	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates that the DO currently has the Momentary ability active. Valid values are 0 (Momentary Not Active) and 1 (Momentary Active).
12	Toggle Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) will be turned ON for the entered Time On (parameter #14) and then turned OFF for the same Time On. The Status will continue to cycle between the ON and OFF states. Valid values are 0 (Toggle Disabled) and 1 (Toggle Enabled).
13	Timed Discrete Output (TDO) Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the Status (parameter #8) will be turned ON for a calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). After the Time On has expired, the Status will be turned OFF and remain that way until a new EU Value is entered. Valid values are 0 (TDO Disabled) and 1 (TDO Enabled).
14	Time On	R/W	Both	FL	4	DO: 0.002 → 43,200.0 DOR: 0.05→ 43,200.0	1.0	1.00	Number of seconds the Status (parameter #8) will be turned ON for if in TDO, Toggle, or Momentary Mode.

Point Type 102, Discrete Outputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	Cycle Time	R/W	User	FL	4	>0.0 → 43,200.0	15.0	1.00	Number of seconds for when TDO Mode (parameter #13) and Toggle Mode (parameter #12) are selected. The Status (parameter #8) will be ON for the calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). The Status will then be turned OFF based upon the Cycle Time minus the Time On.
16	Low Reading Time	R/W	User	FL	4	0.0 → 43,200.0	3.0	1.00	Minimum number of seconds the calculated Time On (parameter #14) will be when the entered EU Value (parameter #20) is less than or equal to the entered Low Reading EU (parameter #18).
17	High Reading Time	R/W	User	FL	4	0.0 → 43,200.0	12.0	1.00	Maximum number of seconds the calculated Time On (parameter #14) will be when the entered EU Value (parameter #20) is greater than or equal to the entered High Reading EU (parameter #19).
18	Low Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Minimum EU Value (parameter #20) possible.
19	High Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Maximum EU Value (parameter #20) possible.
20	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Value in Engineering Units.
21	Manual Output	R/W	Both	UINT8	1	0 → 1	0	1.00	Controls the state of the DO when Scanning (parameter #2) is in manual mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Manual.
22	Failsafe Output	R/W	User	UINT8	1	0 → 1	1	1.00	The state the output will be placed in when the unit is started and the Failsafe on Reset Parameter (Parameter 7) is set to 1, Use Failsafe value on reset.
23	Max Scan Period	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	2	1.00	Indicates, in seconds, how often the system rewrites to the DOs.
24	Physical Output	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the DO's current state. Valid values are 0 (OFF) and 1 (ON).
25	Invert Output Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Inverts the output of the ACIO channel. This allows you to use TDO mode to keep a channel OFF for a set amount of time and then bringing this channel back ON. Valid values are 0 (Normal) and 1 (Inverted). **Note**: This always inverts the output, including the Failsafe Output.
26	DO Type	R/O	System	UINT8	1	0 → 1, 3	0	1.00	Indicates the DO type (Relay or Solid State). Valid values are: 0 = DO Relay 1 = DO Solid State 3 = DO Relay 6-point

3.4.16 Point Type 103: Analog Inputs

Description: Point type 103 provides the parameters for setting up and reading analog inputs.

Number of Logical Points: 4 logical points may exist for each installed module.

Storage Location: Point type 103 is saved to internal configuration memory.

Table 3-17: Point Type 103, Analog Inputs

Point Type 103, Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"AI Default"	1.00	Identification name for specific AI. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	" "	1.00	Describes the units used by the AI. Values must be printable ASCII characters.
2	Scanning	R/W_Log	User	UINT8	1	0 → 1	1	1.00	If disabled, system ignores field inputs and no changes occur unless manually entered. Valid values are **0** (Disabled) and **1** (Enabled).
3	Scan Period	R/W_ CNDL	User	FL	4	0.05 → 43,200.0	1.0	1.00	Number of seconds between updates of the AI.
4	Actual Scan Time	R/O	System	FL	4	0.0 → 43,200.0	0.0	1.00	Actual number of seconds between updates of the AI.
5	Filter	R/W_ CNDL	User	UINT8	1	0 → 99	3	1.00	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.
6	Averaging	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	If enabled, the filtered raw A/D value is averaged over the Scan Period. If disabled, the current filtered raw A/D value is used when the Scan Period is reached. Valid values are 0 (Disabled) and 1 (Enabled).
7	Raw A/D Input	R/O	System	UINT16	2	0 → 65,535	0	1.00	Raw A/D reading used to calculate the EU Value (parameter #21).
8	Zero Raw	R/W_Log	User	UINT16	2	0 → 65,535	AI-12: 819 AI-16: 13,107	1.00	Lowest calibrated raw A/D input.
9	Mid Point Raw #1	R/W_Log	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI-16: 65,535	1.00	Second lowest calibrated raw A/D input.

Point Type 103, Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Mid Point Raw #2	R/W_Log	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI16: 65,535	1.00	Third lowest or highest calibrated raw A/D input.
11	Mid Point Raw #3	R/W_Log	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI-16: 65,535	1.00	Second highest calibrated raw A/D input.
12	Span Raw	R/W_Log	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI-16: 65,535	1.00	Highest calibrated raw A/D input.
13	Zero EU	R/W_Log	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Lowest calibrated EU value.
14	Mid Point EU #1	R/W_Log	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Second lowest calibrated EU value.
15	Mid Point EU #2	R/W_Log	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Third lowest or highest calibrated EU value.
16	Mid Point EU #3	R/W_Log	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Second highest calibrated EU value.
17	Span EU	R/W_Log	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Highest calibrated EU value. When this parameter changes, parameters 14, 15, and 16 are set equal to this value.
18	Offset (Zero Shift)	R/W_Log	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Value to be added to all calculated EU values.
19	Set Value	R/W_Log	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Desired EU value for a calibration point. **Note**: No event is logged for this .
20	Live Reading Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Current live reading. (Currently only live reading off scan, in the future this will always be the live reading)
21	EU Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Value in Engineering Units.
22	Clipping	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	If enabled, then the EU Value (parameter #21) cannot be less than the Low Low Alarm EU (parameter #23) or greater than the High High Alarm EU (parameter #26). Valid values are 0 (Disabled, no limiting of the EU value, Parameter 21, occurs) and 1 (Enabled).
23	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-20.0	1.00	Alarm value for Low Low Alarm and minimum EU Value (parameter #21) if clipping (parameter #22) is enabled.
24	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	1.00	Alarm value for Low Alarm.
25	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.00	Alarm value for High Alarm.
26	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	120.0	1.00	Alarm value for High High Alarm and maximum EU Value (parameter #21) if clipping (parameter #22) is enabled.

Point Type 103, Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.00	Alarm value for maximum change of EU Value (parameter #21) between Scan Periods.
28	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the EU Value (parameter #21) may move between without causing another alarm.
29	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
30	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
31	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
32	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
32.0	Low Alarm			Bit 0			0	1.00	If set, the EU Value (parameter #21) is less than or equal to the Low Alarm EU (parameter #24). If clear, the EU Value (parameter #21) is greater than the Low Alarm EU (parameter #24).
32.1	Low Low Alarm			Bit 1			0	1.00	If set, the EU Value (parameter #21) is less than or equal to the Low Low Alarm EU (parameter #23). If clear, the EU Value (parameter #21) is greater than the Low Low Alarm EU (parameter #23).
32.2	High Alarm			Bit 2			0	1.00	If set, the EU Value (parameter #21) is greater than or equal to the High Alarm EU (parameter #25). If clear, the EU Value (parameter #21) is less than the High Alarm EU (parameter #25).
32.3	High High Alarm			Bit 3			0	1.00	If set, the EU Value (parameter #21) is greater than or equal to the High High Alarm EU (parameter #26). If clear, the EU Value (parameter #21) is less than the High High Alarm EU (parameter #26).
32.4	Rate Alarm			Bit 4			0	1.00	If set, the EU Value (parameter #21) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #27). If clear, the EU Value (parameter #21) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #27).
32.5	Not Used			Bit 5			0		Not used
32.6	Point Fail Alarm			Bit 6			0	1.00	If set, the AI's hardware is reporting a malfunction. If clear, the AI's hardware is operating properly.

Point Type 103, Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been enabled.
33	Calibration Timer	R/O	System	FL	4	0.0 → 3,600.0	3,600.0	1.00	Number of seconds until a calibration timeout occurs.
34	Calibration Mode	R/W_Log	Both	UINT8	1	0 → 4	0	1.00	Indicates what the calibration for the AI is doing. Valid values are: 0 = Use Current Calibration 1 = Start Calibration 2 = Calibrate 3 = Restore Previous Calibration 4 = Stop Calibration. **Note**: No event is logged for this parameter.
35	Calibration Type	R/W_Log	Both	UINT8	1	0 → 6	0	1.00	During calibration, determines what value the Set Value (parameter #19) replaces. Valid values are: 0 = Nothing 1 = Set Zero 2 = Set Span 3 = Set Mid Point #1 4 = Set Mid Point #2 5 = Set Mid Point #3 6 = Set Offset (Zero Shift). **Note**: No event is logged for this parameter.
36	Failsafe Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Valid values are 0 (Disabled) and 1 (Enabled, the EU Value is set to the Failsafe value in the event of a point fail).
37	Failsafe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	The AI's EU Value is set to the Failsafe Value if Failsafe Mode is Enabled and the AI is in Point Fail.
38	AI Type	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the type of AI module (12 or 16 bit). Valid values are 0 (AI 12 Bit) and 1 (AI 16 Bit).
39	Equivalent Milliamp Value	R/O	System	FL	4	4 → 20	0	1.00	Output of module scaled to a 4 to 20 value to be equivalent to milliamps.
40	Off Scan Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Selection for action when scanning is disabled. Valid values are: 0 = EU value retain last live reading 1 = Set EU value to failsafe value (parameter 37) 2 = Set EU value to EU download value (parameter 42)

Point Type 103, Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
41	EU Value Status	R/O	System	UINT8	1	0 → 4	0	1.00	Current status of the EU value. Valid values are: 0 = Live reading, EU value within normal range 1 = Live reading, EU value in Point Fail 2 = Channel in point fail , EU value populated with failsafe value 3 = Offscan, EU value populated with Last live reading 4 = Offscan, EU value populated with failsafe value 5 = Offscan, EU value populated with EU download value
42	Eu Download Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.00	When Offscan Mode (parameter 40) is set to 2 = Download EU, the EU Value (parameter 21) is set to the EU Download Value. Changes to this parameter are not logged.

3.4.17 Point Type 104: Analog Outputs

Description: Point type 104 provides the parameters for setting up analog outputs.

Number of Logical Points: 4 logical points may exist for each installed module.

Storage Location: Point type 104 is saved to internal configuration memory.

Table 3-18: Point Type 104, Analog Outputs

Point Type 104, Analog Outputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“AO Default”	1.00	Identification name for specific AO. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“Percent “	1.00	Describes the units used by the AO. Values must be printable ASCII characters.
2	Scanning Mode	R/W	User	UINT8	1	0 → 2	1	1.00	If disabled, no changes to the output will occur. If in Manual, only the user can change the values of the AO. If in Automatic, anything can change the values of the AO. Valid values are: 0 = Disabled 1 = Automatic 2 = Manual
3	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
4	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
5	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
6	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
6.0	Not Used			Bit 0			0		Not Used
6.1	Not Used			Bit 1			0		Not Used
6.2	Not Used			Bit 2			0		Not Used
6.3	Not Used			Bit 3			0		Not Used
6.4	Not Used			Bit 4			0		Not Used
6.5	Scanning Manual Alarm			Bit 5			0	1.00	If set, the Scanning (parameter #2) has been set to Manual. If clear, the Scanning (parameter #2) has been set to either Disable or Automatic

Point Type 104, Analog Outputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6.6	Point Fail Alarm			Bit 6			0	1.00	If set, the AO's hardware is reporting a malfunction. If clear, the AO's hardware is operating properly.
6.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been set to Manual or Automatic.
7	Failsafe on Reset	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	If enabled, the Raw D/A Output (parameter #13) will be set to the Failsafe value (parameter #22) on a restart of any kind. If disabled, the last EU Value (parameter #13) or the last saved EU Value will be used to determine the Raw D/A Output (parameter #13) after a restart. Valid values are 0 (Use last EU Value on reset) and 1 (Use Failsafe value on reset).
8	Zero Raw	R/W	User	UINT16	2	$0 \rightarrow 65,535$	12,584	1.00	Minimum D/A count the calculated Raw D/A Output (parameter #13) will be when the entered EU Value (parameter #12) is less than or equal to the entered Zero EU (parameter #10).
9	Span Raw	R/W	User	UINT16	2	$0 \rightarrow 65,535$	62,923	1.00	Maximum D/A count the calculated Raw D/A Output (parameter #13) will be when the entered EU Value (parameter #12) is greater than or equal to the entered Span EU (parameter #11).
10	Zero EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Minimum EU Value (parameter #12) possible.
11	Span EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Maximum EU Value (parameter #12) possible.
12	Auto Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Controls the output when Scanning (parameter #2) is in auto mode.
13	Raw D/A Output	R/O	System	UINT16	2	$0 \rightarrow 65,535$	12,584	1.00	Calculated Digital-to-Analog value based upon EU Value (parameter #12).
14	Manual Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Controls the output when Scanning (parameter #2) is in manual mode.
15	Failsafe Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	This is the value that will be outputted when the unit is started and the Failsafe on Reset Parameter (Parameter 7) is set to 1, Use Failsafe value on reset.
16	Physical Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Indicates the current value of the output in Engineering Units.

3.4.18 Point Type 105: Pulse Inputs

Description: Point type 105 provides the parameters for setting up and reading pulse inputs.

Number of Logical Points: 4 logical points may exist for each installed module.

Storage Location: Point type 105 is saved to internal configuration memory.

Table 3-19: Point Type 105, Pulse Inputs

Point Type 105, Pulse Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“PI Default”	1.00	Identification name for specific PI. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“ “	1.00	Describes the units used by the PI. Values must be printable ASCII characters.
2	Scanning	R/W_Log	User	UINT8	1	0 → 1	1	1.00	If disabled, field inputs are ignored and no changes will occur unless manually entered. Valid values are 0 (Disabled) and 1 (Enabled).
3	Scan Period	R/W_ CNDL	User	FL	4	0.05 → 43,200.0	1.0	1.00	Number of seconds between updates of the PI.
4	Accumulated Value	R/W	Both	UINT32	4	0→16,000,000	0	1.00	Total number of pulses that the PI has received.
5	Contract Hour	R/W_ CNDL	User	UINT8	1	0 → 23	0	1.00	Hour, in military time, that represents the end of the day for the PI.
6	Pulses for Day	R/O	Both	UINT32	4	0 → 4,294,967,295	0	1.00	Total number of pulses that the PI has received for the contract day.
7	Current Rate Period	R/W_ CNDL	User	UINT8	1	0 → 3	2	1.00	Used to determine the calculation of the Current Rate (parameter #10): Valid values are: 0 = EU/second 1 = EU/minute 2 = EU/hour 3 = EU/day.
8	Conversion	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00	Determines if Conversion Value (parameter #9) will be multiplied or divided by the accumulated pulses to determine the units for the Current Rate (parameter #10). Valid values are 0 (EUs/pulse) and 1 (pulses/EU).
9	Conversion Value	R/W_ CNDL	User	FL	4	Any valid IEEE 754 float, except 0.0	1.0	1.00	Used to calculate the units of the Current Rate (parameter #10).
10	Current Rate	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Calculated rate of the pulses.

Point Type 105, Pulse Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11	EU Value Mode	R/W_ CNDL	User	UINT8	1	$0 \rightarrow 2$	0	1.00	Used to determine what the EU Value (parameter #13) represents. Valid values are: 0 = Rate 1 = Accumulator with Maximum Rollover 2 = Accumulator with Entered Rollover.
12	Rollover Maximum	R/W_ CNDL	User	FL	4	Any valid IEEE 754 float	1,000.0	1.00	This is the Entered Rollover Maximum for the EU Value Mode (parameter #11) when it is setup for Accumulator with Entered Rollover.
13	EU Value	R/W_ LOG	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Value in Engineering Units.
14	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Alarm value for Low Low Alarm when the EU Value Mode (parameter #11) is setup for Rate.
15	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	10.0	1.00	Alarm value for Low Alarm when the EU Value Mode (parameter #11) is setup for Rate.
16	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Alarm value for High Alarm when the EU Value Mode (parameter #11) is setup for Rate.
17	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.00	Alarm value for High High Alarm when the EU Value Mode (parameter #11) is setup for Rate.
18	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.00	Alarm value for maximum change of EU Value (parameter #13) between Scan Periods when the EU Value Mode (parameter #11) is setup for Rate.
19	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the EU Value (parameter #13) may move between without causing another alarm when the EU Value Mode (parameter #11) is setup for Rate.
20	Alarming	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
21	SRBX on Clear	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled,) and 1 (SRBX on Clear Enabled).
22	SRBX on Set	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
23	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
23.0	Low Alarm			Bit 0			0	1.00	If set, the EU Value (parameter #13) is less than or equal to the Low Alarm EU (parameter #15). If clear, the EU Value (parameter #13) is greater than the Low Alarm EU (parameter #15).

Point Type 105, Pulse Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23.1	Low Low Alarm			Bit 1			0	1.00	If set, the EU Value (parameter #13) is less than or equal to the Low Low Alarm EU (parameter #14). If clear, the EU Value (parameter #13) is greater than the Low Low Alarm EU (parameter #14).
23.2	High Alarm			Bit 2			0	1.00	If set, the EU Value (parameter #13) is greater than or equal to the High Alarm EU (parameter #16). If clear, the EU Value (parameter #13) is less than the High Alarm EU (parameter #16).
23.3	High High Alarm			Bit 3			0	1.00	If set, the EU Value (parameter #13) is greater than or equal to the High High Alarm EU (parameter #17). If clear, the EU Value (parameter #13) is less than the High High Alarm EU (parameter #17).
23.4	Rate Alarm			Bit 4			0	1.00	If set, the EU Value (parameter #13) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #18). If clear, the EU Value (parameter #13) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #18).
23.5	Not Used			Bit 5			0		Not Used
23.6	Point Fail Alarm			Bit 6			0	1.00	If set, the PI's hardware is reporting a malfunction. If clear, the PI's hardware is operating properly.
23.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been enabled.
24	Today's Total	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Calculated value of the accumulated pulses for the contract day multiplied by the Conversion Value (parameter #9).
25	Yesterday's Total	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Previous contract day's total.
26	Corrected Pulse Accumulation	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Running accumulation of pulses multiplied by **X,** where **X** is either the Conversion Value (when Parameter 8 is set to EU/Pulse) or is set to 1/Conversion Value if Pulses/EU. Rolls over at 1,000,000.0
27	Frequency	R/W_ CNDL	System	FL	4	0 → positive valid IEEE 754 float	0.0	1.00	Frequency of incoming pulses in pulses/second.

3.4.19 Point Type 106: RTD

Description: Point type 106 provides the parameters for setting up and reading a RTD.

Number of Logical Points: 2 logical points may exist for each installed RTD module. 3 logical points may exist for each installed 3-point RTD modules.

Storage Location: Point type 106 is saved to internal configuration memory.

Table 3-20: Point Type 106, RTD

Point Type 106, RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"RTD Deflt "	1.00	Identification name for specific RTD. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	" "	1.00	Describes the units used by the RTD. Values must be printable ASCII characters.
2	Scanning	R/W_ LOG	User	UINT8	1	0 → 1	1	1.00	If disabled, field inputs are ignored and no changes will occur unless manually entered. Valid values are 0 (Disabled) and 1 (Enabled).
3	Scan Period	R/W_ CNDL	User	FL	4	0.066 → 43,200.0	1.0	1.00	Number of seconds between updates of the RTD.
4	Actual Scan Time	R/O	System	FL	4	0.05 → 43,200.0	0.0	1.00	Actual number of seconds between updates of the RTD.
5	Filter	R/W_ CNDL	User	UINT8	1	0 → 99	3	1.00	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.
6	Averaging	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	If enabled, the filtered raw A/D value is averaged over the Scan Period. If disabled, the current filtered raw A/D value is used when the Scan Period is reached. Valid values are 0 (Disabled) and 1 (Enabled).
7	Alpha of RTD	R/W_ LOG	User	UINT8	1	0 → 1	0	1.00	Indicates what the alpha (α) of the RTD. Valid values are 0 (Alpha of 0.00385) and 1 (Alpha of 0.00392).
8	Raw A/D Input	R/O	Both	UINT16	2	0 → 65,535	0	1.00	Raw A/D reading used to calculate the EU Value (parameter #22).
9	Zero Raw	R/O	User	UINT16	2	0 → 65,535	42973	1.00	Lowest calibrated raw A/D input.
10	Mid Point Raw #1	R/O	User	UINT16	2	0 → 65,535	61963	1.00	Second lowest calibrated raw A/D input.
11	Mid Point Raw #2	R/O	User	UINT16	2	0 → 65,535	61963	1.00	Third lowest or highest calibrated raw A/D input.

Point Type 106, RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Mid Point Raw #3	R/O	User	UINT16	2	0 → 65,535	61963	1.00	Second highest calibrated raw A/D input.
13	Span Raw	R/O	User	UINT16	2	0 → 65,535	61963	1.00	Highest calibrated raw A/D input.
14	Zero EU	R/O	User	FL	4	Any valid IEEE 754 float	-50.0	1.00	Lowest calibrated EU value.
15	Mid Point EU #1	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.00	Second lowest calibrated EU value.
16	Mid Point EU #2	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.00	Third lowest or highest calibrated EU value.
17	Mid Point EU #3	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.00	Second highest calibrated EU value.
18	Span EU	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.00	Highest calibrated EU value.
19	Offset (Zero Shift)	R/W_ LOG	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Value to be added to all calculated EU values.
20	Set Value	R/W_ LOG	User	FL	4	Any valid IEEE 754 float	-50→350 °C -58→662 °F 401.67→ 1121.67 R 223.15→ 623.15 K 80.31→ 229.72 Ω (385) 80→ 231.89 Ω (392)	1.00	Desired EU value for a calibration point. **Note**: No event is logged for this parameter. The range is based upon the unit selected.
21	Manual Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Current EU Value of RTD while performing calibration.
22	EU Value	R/W_ LOG	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Value in Engineering Units.
23	Clipping	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	If enabled, then the EU Value (parameter #22) cannot be less than the Low Low Alarm EU (parameter #24) or greater than the High High Alarm EU (parameter #27). If disabled, no limiting of the EU Value (parameter #22) takes place. Valid values are 0 (Disabled) and 1 (Enabled).
24	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-20.0	1.00	Alarm value for Low Low Alarm and minimum EU Value (parameter #22) if clipping (parameter #23) is enabled.
25	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	1.00	Alarm value for Low Alarm.
26	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.00	Alarm value for High Alarm.
27	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	120.0	1.00	Alarm value for High High Alarm and maximum EU Value (parameter #22) if clipping (parameter #23) is enabled.

Point Type 106, RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
28	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.00	Alarm value for maximum change of EU Value (parameter #22) between Scan Periods.
29	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the EU Value (parameter #22) may move between without causing another alarm.
30	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
31	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
32	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
33	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
33.0	Low Alarm			Bit 0			0	1.00	If set, the EU Value (parameter #22) is less than or equal to the Low Alarm EU (parameter #25). If clear, the EU Value (parameter #22) is greater than the Low Alarm EU (parameter #25).
33.1	Low Low Alarm			Bit 1			0	1.00	If set, the EU Value (parameter #22) is less than or equal to the Low Low Alarm EU (parameter #24). If clear, the EU Value (parameter #22) is greater than the Low Low Alarm EU (parameter #24).
33.2	High Alarm			Bit 2			0	1.00	If set, the EU Value (parameter #22) is greater than or equal to the High Alarm EU (parameter #26). If clear, the EU Value (parameter #22) is less than the High Alarm EU (parameter #26).
33.3	High High Alarm			Bit 3			0	1.00	If set, the EU Value (parameter #22) is greater than or equal to the High High Alarm EU (parameter #27). If clear, the EU Value (parameter #22) is less than the High High Alarm EU (parameter #27).

Point Type 106, RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33.4	Rate Alarm			Bit 4			0	1.00	If set, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #28). If clear, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #28).
33.5	Not Used			Bit 5			0		Not Used
33.6	Point Fail Alarm			Bit 6			0	1.00	If set, the RTD's hardware is reporting a malfunction. If clear, the RTD's hardware is operating properly.
33.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been disabled.
34	Calibration Timer	R/O	System	FL	4	0.0 → 3,600.0	3,600.0	1.00	Number of seconds until a calibration timeout occurs.
35	Calibration Mode	R/W_ LOG	Both	UINT8	1	0 → 4	0	1.00	Describes what the calibration for the RTD is doing. Valid values are: 0 = Use Current Calibration 1 = Start Calibration 2 = Calibrate 3 = Restore Previous Calibration 4 = Stop Calibration. **Note**: No event is logged for this parameter.
36	Calibration Type	R/W_ LOG	Both	UINT8	1	0 → 6	0	1.00	During calibration, determines what the Set Value (parameter #20) is replacing. Valid values are : 0 = Nothing 1 = Set Zero 2 = Set Span 3 = Set Mid Point #1 4 = Set Mid Point #2 5 = Set Mid Point #3 6 = Unused. **Note**: No event is logged for this parameter.
37	Units	R/W_ CNDL	User	UINT8	1	0 → 4	1	1.00	Indicates units for the point. Valid values are: 0 = °F 1 = °C 2 = °K 3 = °R 4 = Ohms

3.4.20 Point Type 107: Thermocouple

Description: Point type 107 provides the parameters for setting up and reading a thermocouple.

Number of Logical Points: 5 logical points may exist for each installed Thermocouple module. 4 logical ponts may exist for each installed TC module.

Storage Location: Point type 107 is saved to internal configuration memory.

Table 3-21: Point Type 107, Thermocouple

Point Type 107, Thermocouple

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"TC Default"	1.00	Identification name for specific TC. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	" "	1.00	Describes the units used by the TC. Values must be printable ASCII characters.
2	Scanning	R/W	User	UINT8	1	0 → 1	1	1.00	If disabled, field inputs are ignored and no changes will occur unless manually entered. Valid values are 0 (Disabled) and 1 (Enabled).
3	Units	R/W	User	UINT8	1	0 → 3	1	1.00	Indicates the TC units. Valid values are: 0 = °F 1 = °C 2 = °K 3 = °R.
4	Type of Thermocouple	R/W	System	UINT8	1	0 → 1	0	1.00	Indicates which type of thermocouple is attached. Valid values are 0 (Type J) and 1 (Type K). TC-2 Module (version 1.20) supports the following types: 0 = Type J 1 = Type K 2 = Type B 3 = Type E 4 = Type R 5 = Type S 6 = Type T 9 = Type C 10= Type N
5	Scan Period	R/W	User	FL	4	0.1 → 43,200.0	1.0	1.00	Number of seconds between updates of the TC.

Point Type 107, Thermocouple

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Actual Scan Time	R/O	System	FL	4	0.00 → 43,200.0	0.0	1.00	Actual number of seconds between updates of the TC.
7	Filter	R/W	User	UINT8	1	0 → 99	0	1.00	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.
8	Averaging	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the filtered EU value is averaged over the Scan Period. If disabled, the current filtered EU value is used when the Scan Period is reached. Valid values are 0 (Disabled) and 1 (Enabled).
9	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Value in Engineering Units.
10	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-20.0	1.00	Alarm value for Low Low Alarm and minimum EU Value (parameter #22) if Clipping (parameter #23) is enabled.
11	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	1.00	Alarm value for Low Alarm.
12	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.00	Alarm value for High Alarm.
13	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	120.0	1.00	Alarm value for High High Alarm and maximum EU Value (parameter #22) if Clipping (parameter #23) is enabled.
14	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.00	Alarm value for maximum change of EU Value (parameter #22) between Scan Periods.
15	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the EU Value (parameter #22) may move between without causing another alarm.
16	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
17	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
18	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
19	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
19.0	Low Alarm			Bit 0			0	1.00	If set, the EU Value (parameter #22) is less than or equal to the Low Alarm EU (parameter #25). If clear, the EU Value (parameter #22) is greater than the Low Alarm EU (parameter #25).

Point Type 107, Thermocouple

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19.1	Low Low Alarm			Bit 1			0	1.00	If set, the EU Value (parameter #22) is less than or equal to the Low Low Alarm EU (parameter #24). If clear, the EU Value (parameter #22) is greater than the Low Low Alarm EU (parameter #24).
19.2	High Alarm			Bit 2			0	1.00	If set, the EU Value (parameter #22) is greater than or equal to the High Alarm EU (parameter #26). If clear, the EU Value (parameter #22) is less than the High Alarm EU (parameter #26).
19.3	High High Alarm			Bit 3			0	1.00	If set, the EU Value (parameter #22) is greater than or equal to the High High Alarm EU (parameter #27). If clear, the EU Value (parameter #22) is less than the High High Alarm EU (parameter #27).
19.4	Rate Alarm			Bit 4			0	1.00	If set, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #28). If clear, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #28).
19.5	Not Used			Bit 5			0		Not Used
19.6	Point Fail Alarm			Bit 6			0	1.00	If set, the TC's hardware is reporting a malfunction. If clear, the TC's hardware is operating properly.
19.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been disabled.
20	EU Offset	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Value to be added to EU value (parameter #9).
21	Failsafe Mode	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.30	Indicates, in event of a point fail, whether the system sets the EU Value to a failsafe. Valid values are 0 (disabled) and 1 (enabled).
22	Failsafe Value	R/W	User	FLOAT	4	Any valid IEEE 754 float.	0	1.30	Indicates the value the system uses if the Failsafe mode is enabled and the TC is in point fail.

3.4.21 Point Type 108: Multi-Variable Sensor

Description: Point type 108 provides the parameters for interfacing with a multi-variable sensor (MVS).

Number of Logical Points: 6 logical points may exist for each installed module.

Storage Location: Point type 108 is saved to internal configuration memory.

Table 3-22: Point Type 108, Multi-Variable Sensor

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Sensor Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“MVS Deflt “	1.00	Identification name for specific MVS. Values must be printable ASCII characters.
1	Sensor Address	R/W	User	UINT8	1	0 → 255	1	1.00	Unique address of MVS to allow for multi-drop communications.
2	Poll Mode	R/W_ LOG	Both	UINT8	1	0 → 2, 4 → 5	0	1.00	Sets the operation for the MVS module: Valid values are: 0 = Off Scan Mode 1 = Normal Poll Mode 2 = Input Freeze Mode 4 = Configuration Poll Mode 5 = Set Tag and Address Mode.
3	Units	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates the engineering units for the process variables. Valid values are 0 (English Units) and 1 (Metric Units).
4	Inches H_2O	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates the reference temperature for calculating pressure properly. Valid values are 0 (Inches H_2O at 60 °F) and 1 (Inches H_2O at 68 °F).
5	Pressure Tap Location	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00	Indicates if the static pressure is an upstream or downstream reading. Valid values are 0 (Downstream) and 1 (Upstream).
6	Action on Failure	R/W	User	UINT8	1	0 → 1	1	1.00	Indicates whether the DP Reading, SP Reading, TMP Reading, and DP Reverse Reading should retain last value or be set to the Fault Value parameters when a 485 or Sensor Communication Failure occurs. Valid values are 0 (Retain Last Value) and 1 (Use Fault Value parameters).
7	Software Revision MVS Interface	R/O	System	UINT8	1	0 → 255	0	1.00	Current software revision of the MVS Interface software.
8	Sensor Voltage	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Current voltage of MVS in volts.

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Sensor Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
10	Sensor Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
10.0	Not Used			Bit 0			0		Not Used
10.1	Not Used			Bit 1			0		Not Used
10.2	Not Used			Bit 2			0		Not Used
10.3	Not Used			Bit 3			0		Not Used
10.4	Input Freeze Mode			Bit 4			0	1.00	Indicates the Poll Mode (parameter #2) is in Input Freeze Mode. Valid values are 0 (Not in Input Freeze Mode) and 1 (Input Freeze Mode).
10.5	Sensor Communication Failure			Bit 5			0	1.00	Indicates the MVS is no longer communicating with the MVS Interface. Valid values are 0 (No Failure) and 1 (Sensor Communication Failure).
10.6	485 Communication Failure			Bit 6			0	1.00	Indicates the MVS Interface is no longer communicating with the ROC800-Series. Valid values are 0 (No Failure) and 1 (485 Communication Failure).
10.7	Off Scan Mode			Bit 7			0	1.00	Indicates the Poll Mode (parameter #2) is in Off Scan Mode. Valid values are 0 (Not in Off Scan Mode) and 1 (Off Scan Mode).
11	Sensor Range Status	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
11.0	DP less than DP Zero			Bit 0			0	1.00	Indicates if the DP Reading (parameter #19) is less than the calibrated DP Zero Calibration Point (parameter #13). Valid values are 0 (DP Reading greater than or equal to DP Zero Calibration Point) and 1 (DP Reading less than DP Zero Calibration Point).
11.1	SP less than SP Zero			Bit 1			0	1.00	Indicates if the SP Reading (parameter #35) is less than the calibrated SP Zero Calibration Point (parameter #29). Valid values are 0 (SP Reading greater than or equal to SP Zero Calibration Point) and 1 (SP Reading less than SP Zero Calibration Point).

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11.2	TMP less than TMP Zero			Bit 2			0	1.00	Indicates if the TMP Reading (parameter #50) is less than the calibrated TMP Zero Calibration Point (parameter #44). Valid values are 0 (TMP Reading greater than or equal to TMP Zero Calibration Point) and 1 (TMP Reading less than TMP Zero Calibration Point).
11.3	DP greater than DP Span			Bit 3			0	1.00	Indicates if the DP Reading (parameter #19) is greater than the calibrated DP Span Calibration Point (parameter #17). Valid values are 0 (DP Reading less than or equal to DP Span Calibration Point) and 1 (DP Reading greater than DP Span Calibration Point).
11.4	SP greater than SP Span			Bit 4			0	1.00	Indicates if the SP Reading (parameter #35) is greater than the calibrated SP Span Calibration Point (parameter #33). Valid values are 0 (SP Reading less than or equal to SP Span Calibration Point) and 1 (SP Reading greater than SP Span Calibration Point).
11.5	TMP greater than TMP Span			Bit 5			0	1.00	Indicates if the TMP Reading (parameter #50) is greater than the calibrated TMP Span Calibration Point (parameter #48). Valid values are 0 (TMP Reading less than or equal to TMP Span Calibration Point) and 1 (TMP Reading greater than TMP Span Calibration Point).
11.6	Not Used			Bit 6			0		Not Used
11.7	Not Used			Bit 7			0		Not Used
12	Static Pressure Effect	R/W_ LOG	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Calibrated Zero Shift for DP in inches of H_2O or kPa.
13	DP Zero Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Lowest calibrated DP Reading value in inches of H_2O or kPa.
14	DP Calibration Mid Point #1	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.00	Second lowest calibrated DP Reading value in inches of H_2O or kPa.
15	DP Calibration Mid Point #2	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.00	Third lowest or highest calibrated DP Reading value in inches of H_2O or kPa.
16	DP Calibration Mid Point #3	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.00	Second highest calibrated DP Reading value in inches of H_2O or kPa.
17	DP Span Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.00	Highest calibrated DP Reading value in inches of H_2O or kPa.

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Manual DP	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Current DP Reading while performing calibration in inches of H_2O or kPa.
19	DP Reading	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Current Differential Pressure in inches of H_2O or kPa.
20	DP Reverse Reading	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Current Differential Pressure Reversed in inches of H_2O or kPa.
21	DP Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Value that the DP Reading (parameter #19) will be set to if a 485 Communication Failure or Sensor Communication Failure occurs in inches of H_2O or kPa. The DP Reverse Reading (parameter #20) will be set to the same value of the opposite sign.
22	DP Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	DP Alarm value for DP Low Alarm in inches of H_2O or kPa.
23	DP High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	250.0	1.00	DP Alarm value for DP High Alarm in inches of H_2O or kPa.
24	DP Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the DP Reading (parameter #19) may move between without causing another alarm in inches of H_2O or kPa.
25	DP Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, DP alarms may be generated and sent to the Alarm Log. Valid values are 0 (DP Alarming Disabled) and 1 (DP Alarming Enabled).
26	DP SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
27	DP SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
28	DP Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
28.0	Low Alarm			Bit 0			0	1.00	If set, the DP Reading (parameter #19) is less than or equal to the DP Low Alarm EU (parameter #22). If clear, the DP Reading (parameter #19) is greater than the DP Low Alarm EU (parameter #22).
28.1	Not Used			Bit 1			0		Not Used

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
28.2	High Alarm			Bit 2			0	1.00	If set, the DP Reading (parameter #19) is greater than or equal to the DP High Alarm EU (parameter #23). If clear, the DP Reading (parameter #19) is less than the DP High Alarm EU (parameter #23).
28.3	Not Used			Bit 3			0		Not Used
28.4	Not Used			Bit 4			0		Not Used
28.5	Not Used			Bit 5			0		Not Used
28.6	Point Fail Alarm			Bit 6			0	1.00	Indicates a failure in the hardware or software of the MVS for Differential Pressure. Valid values are 0 (No Failure) and 1 (DP Failure).
28.7	Not Used			Bit 7			0		Not Used
29	SP Zero Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Lowest calibrated SP Reading value in PSI or kPa.
30	SP Calibration Mid Point #1	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.00	Second lowest calibrated SP Reading value in PSI or kPa.
31	SP Calibration Mid Point #2	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.00	Third lowest or highest calibrated SP Reading value in PSI or kPa.
32	SP Calibration Mid Point #3	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.00	Second highest calibrated SP Reading value in PSI or kPa.
33	SP Span Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.00	Highest calibrated SP Reading value in PSI or kPa.
34	Manual SP	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Current SP Reading while performing calibration in PSI or kPa.
35	SP Reading	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Current Static Pressure in PSI or kPa.
36	SP Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Value that the SP Reading (parameter #35) will be set to if a 485 Communication Failure or Sensor Communication Failure occurs in PSI or kPa.
37	SP Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	SP Alarm value for SP Low Alarm in PSI or kPa.
38	SP High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	800.6447	1.00	SP Alarm value for SP High Alarm in PSI or kPa.
39	SP Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the SP Reading (parameter #35) may move between without causing another alarm in PSI or kPa.
40	SP Alarming	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	If enabled, SP alarms may be generated and sent to the Alarm Log. Valid values are 0 (SP Alarming Disabled) and 1 (SP Alarming Enabled).

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
41	SP SRBX on Clear	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
42	SP SRBX on Set	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
43	SP Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
43.0	Low Alarm			Bit 0			0	1.00	If set, the SP Reading (parameter #35) is less than or equal to the SP Low Alarm EU (parameter #37). If clear, the SP Reading (parameter #35) is greater than the SP Low Alarm EU (parameter #37).
43.1	Not Used			Bit 1			0		Not Used
43.2	High Alarm			Bit 2			0	1.00	If set, the SP Reading (parameter #35) is greater than or equal to the SP High Alarm EU (parameter #38). If clear, the SP Reading (parameter #35) is less than the SP High Alarm EU (parameter #38).
43.3	Not Used			Bit 3			0		Not Used
43.4	Not Used			Bit 4			0		Not Used
43.5	Not Used			Bit 5			0		Not Used
43.6	Point Fail Alarm			Bit 6			0	1.00	Indicates a failure in the hardware or software of the MVS for Static Pressure. Valid values are 0 (No Failure) and 1 (SP Failure).
43.7	Not Used			Bit 7			0		Not Used
44	TMP Zero Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	-459.4	1.00	Lowest calibrated TMP Reading value in °F or °C.
45	TMP Calibration Mid Point #1	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.00	Second lowest calibrated TMP Reading value in °F or °C.
46	TMP Calibration Mid Point #2	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.00	Third lowest (or highest) calibrated TMP Reading value in °F or °C.
47	TMP Calibration Mid Point #3	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.00	Second highest calibrated TMP Reading value in °F or °C.
48	TMP Span Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.00	Highest calibrated TMP Reading value in °F or °C.
49	Manual TMP	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Current TMP Reading while performing calibration in °F or °C.

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	TMP Reading	R/W	Both	FL	4	Any valid IEEE 754 float	-459.4	1.00	Current temperature in °F or °C.
51	TMP Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	-459.4	1.00	Value that the TMP Reading (parameter #50) will be set to if a 485 Communication Failure or Sensor Communication Failure occurs in °F or °C.
52	TMP Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-459.4	1.00	TMP Alarm value for TMP Low Alarm in °F or °C.
53	TMP High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	800.6	1.00	TMP Alarm value for TMP High Alarm in °F or °C.
54	TMP Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.00	Provides a range (±) that the TMP Reading (parameter #50) may move between without causing another alarm in °F or °C.
55	TMP Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, TMP alarms may be generated and sent to the Alarm Log. Valid values are 0 (TMP Alarming Disabled) and 1 (TMP Alarming Enabled).
56	TMP SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
57	TMP SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
58	TMP Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
58.0	Low Alarm			Bit 0			0	1.00	If set, the TMP Reading (parameter #50) is less than or equal to the TMP Low Alarm EU (parameter #52). If clear, the TMP Reading (parameter #50) is greater than the TMP Low Alarm EU (parameter #52).
58.1	Not Used			Bit 1			0		Not Used
58.2	High Alarm			Bit 2			0	1.00	If set, the TMP Reading (parameter #50) is greater than or equal to the TMP High Alarm EU (parameter #53). If clear, the TMP Reading (parameter #50) is less than the TMP High Alarm EU (parameter #53).
58.3	Not Used			Bit 3			0		Not Used
58.4	Not Used			Bit 4			0		Not Used
58.5	Not Used			Bit 5			0		Not Used

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
58.6	Point Fail Alarm			Bit 6			0	1.00	Indicates a failure in the hardware or software of the MVS for Temperature. Valid values are 0 (No Failure) and 1 (TMP Failure).
58.7	Not Used			Bit 7			0		Not Used
59	Calibrate Command	R/W	Both	UINT8	1	$0 \rightarrow 6$	0	1.00	Tells the MVS Interface the process variable being calibrated. Valid values are: 0 = No Action 1 = Calibrate DP 2 = Calibrate SP 3 = Calibrate TMP 6 = Save MVS Calibration 7 = Set Defaults.
60	Calibrate Type	R/W	Both	UINT8	1	$0 \rightarrow 7$	0	1.00	Indicates the MVS Interface point being calibrated. Valid values are: 0 = None 1 = Set Zero 2 = Set Span 3 = Set Mid Point #1 4 = Set Mid Point #2 5 = Set Mid Point #3 6 = Sensor Setup 7 = Sensor Restore.
61	Calibrate Set Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Desired value for a calibration point.
62	Sensor SRBX on Clear	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled). **Note**: For 485 and Sensor Communication Failures only.
63	Sensor SRBX on Set	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled). **Note**: For 485 and Sensor Communication Failures only.
64	SP Zero Shift	R/W_Log	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Calibrated Zero Shift for SP in inches of H_2O or kPa
65	MVS Type	R/O	System	UINT8	1	$0 \rightarrow 2$	0	1.10	Specifies the module/sensor type. Valid values are: 0 = Standard MVS 1 = Smart MVS 2 = 3095

Point Type 108, Multi-Variable Sensor

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
66	Temperature Bias	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Calibrated temperature bias for the MVS temperature reading. Units based on value in Units parameter (#3)

3.4.22 Point Type 109: System Analog Inputs

Description: Point type 109 provides the parameters for setting up and reading analog inputs.

Number of Logical Points: 5 logical points for System Analog Inputs may exist.

Storage Location: Point type 109 is saved to internal configuration memory.

Table 3-23: Point Type 109, System Analog Inputs

Point Type 109, System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	Logic 0: "Battery " Logic 1: "Charge In " Logic 2: "Module " Logic 3: "AI Default" Logic 4: "OnBoardTmp "	1.00	Identification name for specific System AI. Values must be printable ASCII characters. **Note**: Point Tag ID on logical 1 is "Voltage In" when a PM-30 power module is installed (Version 1.30).
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	Logic 0: "Volts " Logic 1: "Volts " Logic 2: "Volts " Logic 3: " " Logic 4: "Degrees C "	1.00	Describes the units used by the System AI. Values must be printable ASCII characters.
2	Scanning	R/W	User	UINT8	1	0 → 1	1	1.00	If disabled, field inputs are ignored and no changes will occur unless manually entered. Valid values are 0 (Disabled) and 1 (Enabled).
3	Scan Period	R/W	User	FL	4	1.0 → 43,200.0	1.0	1.00	Number of seconds between updates of the System AI.
4	Actual Scan Time	R/O	System	FL	4	1.0 → 43,200.0	1.0	1.00	Actual number of seconds between updates of the System AI.
5	Filter	R/W	User	UINT8	1	0 → 99	0	1.00	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.

Point Type 109, System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Averaging	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the filtered raw A/D value is averaged over the Scan Period. If disabled, the current filtered raw A/D value is used when the Scan Period is reached. Valid values are 0 (Disabled) and 1 (Enabled).
7	Raw A/D Input	R/W	Both	UINT16	2	0 → 65,535	0	1.00	Raw A/D reading used to calculate the EU Value (parameter #21).
8	Zero Raw	R/O	System	UINT16	2	0 → 65,535	Logic 0:0 Logic 1:0 Logic 2:0 Logic 3:819 Logic 4:10	1.00	Lowest raw A/D input.
9	Span Raw	R/O	System	UINT16	2	0 → 65,535	Logic 0:255 Logic 1:255 Logic 2:255 Logic 3:4095 Logic 4:179	1.00	Highest raw A/D input.
10	Zero EU	R/O	User	FL	4	Any valid IEEE 754 float	Logic 0:0.0 Logic 1:0.0 Logic 2:0.0 Logic 3:0.0 Logic 4:-40.0	1.00	Lowest EU value.
11	Span EU	R/O	User	FL	4	Any valid IEEE 754 float	Logic 0:16.225 Logic 1:19.95 Logic 2:16.225 Logic 3: 100.0 Logic 4:125.0	1.00	Highest EU value.
12	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	Logic 0:12.0 Logic 1:13.5 Logic 2:12.0 Logic 3:0.0 Logic 4:20.0	1.00	Value in Engineering Units.
13	Clipping	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, then the EU Value (parameter #12) cannot be less than the Low Low Alarm EU (parameter #14) or greater than the High High Alarm EU (parameter #17). If disabled, no limiting of the EU Value (parameter #12) takes place. 0 = Disabled, 1 = Enabled.
14	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float EXCEPT +B, then it is >=9.00Volts	Logic 0:10.6 Logic 1:10.0 Logic 2:10.6 Logic 3:-20.0 Logic 4:-25.0	1.00	Alarm value for Low Low Alarm and minimum EU Value (parameter #12) if Clipping (parameter #13) is enabled. **Note**: Low Low alarm is 10 on logicals 0 and 2 when a PM-30 power module is installed (Version 1.30).

Point Type 109, System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0:11.0 Logic 1:11.0 Logic 2:11.0 Logic 3:-10.0 Logic 4:-15.0	1.00	Alarm value for Low Alarm.
16	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0:14.5 Logic 1:17.0 Logic 2:14.5 Logic 3:110.0 Logic 4:100.0	1.00	Alarm value for High Alarm.
17	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0:15.0 Logic 1:18.5 Logic 2:15.0 Logic 3:120.0 Logic 4:110.0	1.00	Alarm value for High High Alarm and maximum EU Value (parameter #12) if Clipping (parameter #13) is enabled.
18	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0:3.0 Logic 1:3.0 Logic 2:3.0 Logic 3:5.0 Logic 4:8.0	1.00	Alarm value for maximum change of EU Value (parameter #12) between Scan Periods.
19	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0:0.5 Logic 1:1.0 Logic 2:0.5 Logic 3:2.0 Logic 4:5.0	1.00	Provides a range (±) that the EU Value (parameter #12) may move between without causing another alarm.
20	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
21	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
22	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
23	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
23.0	Low Alarm			Bit 0			0	1.00	If set, the EU Value (parameter #12) is less than or equal to the Low Alarm EU (parameter #15). If clear, the EU Value (parameter #12) is greater than the Low Alarm EU (parameter #15).
23.1	Low Low Alarm			Bit 1			0	1.00	If set, the EU Value (parameter #12) is less than or equal to the Low Low Alarm EU (parameter #14). If clear, the EU Value (parameter #12) is greater than the Low Low Alarm EU (parameter #14).

Point Type 109, System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23.2	High Alarm			Bit 2			0	1.00	If set, the EU Value (parameter #12) is greater than or equal to the High Alarm EU (parameter #16). If clear, the EU Value (parameter #12) is less than the High Alarm EU (parameter #16).
23.3	High High Alarm			Bit 3			0	1.00	If set, the EU Value (parameter #12) is greater than or equal to the High High Alarm EU (parameter #17). If clear, the EU Value (parameter #12) is less than the High High Alarm EU (parameter #17).
23.4	Rate Alarm			Bit 4			0	1.00	If set, the EU Value (parameter #12) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #18). If clear, the EU Value (parameter #12) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #18).
23.5	Not Used			Bit 5			0		Not Used
23.6	Point Fail Alarm			Bit 6			0	1.00	If set, the System AI's hardware is reporting a malfunction. If clear, the System AI's hardware is operating properly.
23.7	Scanning Disabled Alarm			Bit 7			0	1.00	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been enabled.
24	Units	R/W	User	UINT8	1	Logic 0 → 3: 0 → 1 Logic 4: 0 → 3	Logic 0 → 3: 0 Logic 4: 1	1.00	Indicates the EUP value units: Valid values are For Logic 0 → 3, 0 (Volts) and 1 (milliVolts) For Logic 4: 0 = °F 1 = °C 2 = °K 3 = °R.

3.4.23 Point Type 110: PID Control Parameters

Description: Point type 110 provides the control parameters for configuring PID loops.

Number of Logical Points: 16 logical points for PID Control Parameters may exist. The number depends upon the number of active PIDs.

Storage Location: Point type 110 is saved to internal configuration memory.

Table 3-24: Point Type 110. PID Control Parameters

Point Type 110, PID Control Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"PID X" where X is the PID number	1.00	Identification name for specific PID. Values must be printable ASCII characters.
1	PID Mode	R/W	User	UINT8	1	0 → 3	0	1.00	Indicates whether the PID mode. Valid values are: 0 = PID Disabled 1 = Manual 2 = Automatic 3 = Remote Setpoint
2	Loop Period	R/W	User	FL	4	0.05 → Any positive valid IEEE 754 float	1.5	1.00	Desired frequency of execution of the PID algorithm in seconds.
3	Actual Loop Period	R/O	System	FL	4	0.05 → Any positive valid IEEE 754 float	0	1.00	Actual frequency of execution of the PID algorithm in seconds.
4	Action on Process Variable Failure (Reserved)	R/O	User	UINT8	1	0 → 1	0	1.00	Indicates what action to take if the process variable has questionable data. Valid values are 0 (No action) and 1 (Switch mode to manual).
5	Discrete Output Control	R/W	User	UINT8	1	0 → 1	2	1.00	0 = Analog Control 1 = DO Control 2 = Brooks Control (AC I/O, DO)
6	Reset Mode	R/W	User	UINT8	1	0 → 1	1	1.00	Indicates whether the PID is disabled on a restart of any kind or retain its last mode. Valid values are 0 (Retain last mode) and 1 (Disable after Reset).
7	Manual Tracking	R/W	User	UINT8	1	0 → 1	0	1.00	If in Manual Mode, the Primary Setpoint is set equal to the current Primary Process Variable. If disabled, nothing occurs. Valid values are 0 (Disable Manual Tracking) and 1 (Enable Manual Tracking).

Point Type 110, PID Control Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Primary Input Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,9 and TLP 112,0→11,53→54 and TLP 113,0→11,26 or 28 or 30 and 114,0→11,0→3 and TLP 115,0→11,14 or 16 or 18 and TLP 116,0→11,0→3	0,0,0	1.00	The parameter assigned to read the Primary Process Variable (parameter #9) from.
9	Primary Process Variable	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Input value for the Primary Loop.
10	Primary Setpoint Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,14 and TLP 112,0→11,53→54 and TLP 114,0→11,0→3 and TLP 116,0→11,0→3	0,0,0	1.00	The parameter assigned to read the primary setpoint (parameter #11) from.
11	Primary Setpoint	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Desired value of the Primary Process Variable (parameter #9).
12	Primary Setpoint Low Limit	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Lowest allowed value for the primary setpoint (parameter #11).
13	Primary Setpoint High Limit	R/W	User	FL	4	Any valid IEEE 754 float	1000000.0	1.00	Highest allowed value for the primary setpoint (parameter #11).

Point Type 110, PID Control Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
14	Primary Setpoint Maximum Change Rate	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	Maximum rate of change allowed for the actual setpoint used by the Primary Loop in engineering units per minute (EU/minute). A value of 0 disables this option.
15	Primary Proportional Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	Proportional gain (K_P) of the Primary Loop.
16	Primary Integral Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.5	1.00	Integral gain (K_I) of the Primary Loop.
17	Primary Derivative Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	Derivative gain (K_D) of the Primary Loop.
18	Primary Scale Factor	R/W	User	FL	4	Any valid IEEE 754 float	-0.004	1.00	Scale factor (F_S) of the Primary Loop.
19	Primary Integral Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Range (±) that the error at time t (e_t) must be greater than or equal to for the Primary Loop to include the K_I term for the change in output calculation.
20	Primary Change in Output	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Calculated change in output from the Primary Loop.
21	Override Loop Mode	R/W	User	UINT8	1	0 → 2	0	1.00	Indicates which loops have been enabled for control. Valid values are: 0 = Primary Loop Only 1 = Primary and Override Loop 2 = Override Loop Only.
22	Loop Switch Select	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates when to switch to the Override Loop based upon whether the Primary change in output is less than or greater than the Override change in output. Valid values are 0 (Low Override) and 1 (High Override).

Point Type 110, PID Control Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	Override Input Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,9 and TLP 112,0→11,53→54 and TLP 113,0→11,26 or 28 or 30 and 114,0→11,0→3 and TLP 115,0→11,14 or 16 or 18 and TLP 116,0→11,0→3	0,0,0	1.00	The parameter assigned to read the Override Process Variable (parameter #24) from.
24	Override Process Variable	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Input value for the Override Loop.
25	Override Setpoint Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,14 and TLP 112,0→11,53→54 and TLP 114,0→11,0→3 and TLP 116,0→11,0→3	0,0,0	1.00	The parameter assigned to read the override setpoint (parameter #26) from.
26	Override Setpoint	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Desired value of the Override Process Variable (parameter #24).
27	Override Setpoint Low Limit	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Lowest allowed value for the override setpoint (parameter #26).
28	Override Setpoint High Limit	R/W	User	FL	4	Any valid IEEE 754 float	1000000.0	1.00	Highest allowed value for the override setpoint (parameter #26).

Point Type 110, PID Control Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	Override Setpoint Maximum Change Rate	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	Maximum rate of change allowed for the actual setpoint used by the Override Loop in engineering units per minute (EU/minute).
30	Override Proportional Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	Proportional gain (K_P) of the Override Loop.
31	Override Integral Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.5	1.00	Integral gain (K_I) of the Override Loop.
32	Override Derivative Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	Derivative gain (K_D) of the Override Loop.
33	Override Scale Factor	R/W	User	FL	4	Any valid IEEE 754 float	-0.004	1.00	Scale factor (F_S) of the Override Loop.
34	Override Integral Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Range (±) that the error at time t (e_t) must be greater than or equal to for the Override Loop to include the K_I term for the change in output calculation.
35	Override Change in Output	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Calculated change in output from the Override Loop.
36	Switch Status	R/O	System	UINT8	1	0 → 2	0	1.00	Indicates what loop is currently being used to control the process variable. Valid values are: 0 = Neither 1 = Primary Loop 2 = Override Loop.
37	Current Output of PID	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Value that is sent to current output.
38	Output of PID point	R/W	User	TLP	3	TLP 0,0,0 and {if DO Control Off TLP 104,5→148,12 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 60→77, 0→255, 0→255 (must be float)}	0,0,0	1.00	The parameter assigned to write the analog control output of the PID loop to. **Note**: Used **only** if DO Control (parameter #5) is Off.
39	Discrete Open PID output	R/W	User	TLP	3	TLP 0,0,0 and {if DO Control On TLP 102,5→148,20 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 60→77, 0→255, 0→255 (must be float) }	0,0,0	1.00	The parameter assigned to write the increase/open output to. **Note**: Used **only** if DO Control (parameter #5) is On.

Point Type 110, PID Control Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Discrete Close PID output	R/W	User	TLP	3	TLP 0,0,0 and {if DO Control On TLP 102,5→148,20 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 60→77, 0→255, 0→255 (must be float) }	0,0,0	1.00	The parameter assigned to write the decrease/closed output to. **Note**: Used **only** if DO Control (parameter #5) is On.
41	Output Low Limit	R/W	User	FL	4	Any valid IEEE 754 float	-4.0	1.00	Minimum allowable PID output. If the change in output calculated by the loop would cause the current value of the output to go below this value, the output is set to this value.
42	Output High Limit	R/W	User	FL	4	Any valid IEEE 754 float	4.0	1.00	Maximum allowable PID output. If the change in output calculated by the loop would cause the current value of the output to go above this value, the output is set to this value.
43	Output Low Limit Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indication that the output of the PID loop has been clipped by the low output limit. Vaid values are 0 (Not limited) and 1 (Low output limited).
44	Output High Limit Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indication that the output of the PID loop has been clipped by the high output limit. Valid values are 0 (Not limited) and 1 (High output limited).
45	Primary Process Variable Status	R/O	System	UINT8	1	0 → 2	0	1.00	Indication of the status of the primary process variable. Valid values are: 0 = No error 1 = Questionable data 2 = Invalid TLP.
46	Primary Setpoint Low Limit Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indication that the primary setpoint has been clipped by the low setpoint limit. Valid values are 0 (Not limited) and 1 (Low setpoint limited).
47	Primary Setpoint High Limit Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indication that the primary setpoint has been clipped by the high setpoint limit. Valid values are 0 (Not limited) and 1 (High setpoint limited).
48	Primary Setpoint Rate Limited	R/O	System	UINT8	1	0 → 1	0	1.00	Indication that the primary setpoint currently being used by the PID calculation is currently being limited by the maximum setpoint change rate (parameter #14).
49	Override Process Variable Status	R/O	System	UINT8	1	0 → 2	0	1.00	Indication of the status of the override process variable. Valid values are: 0 = No error 1 = Questionable data 2 = Invalid TLP.

Point Type 110, PID Control Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	Override Setpoint Low Limit Status	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.00	Indication that the override setpoint has been clipped by the low setpoint limit. Valid values are 0 (Not limited) and 1 (Low setpoint limited).
51	Override Setpoint High Limit Status	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.00	Indication that the override setpoint has been clipped by the high setpoint limit. Valid values are 0 (Not limited) and 1 (High setpoint limited).
52	Override Setpoint Rate Limited	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.00	Indication that the override setpoint currently being used by the PID calculation is currently being limited by the maximum setpoint change rate (parameter #29).
53	Override Threshold Value	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	The override function takes control **only** if the override process variable is within the threshold value of the override setpoint.
54	Action Wait Time	R/W	User	FL	4	Any positive valid IEEE 754 float	1.0	1.00	When taking an action, this amount of time, in seconds, is added to make sure the process returns to a steady state before a new action is taken. **Note**: Used **only** if Brooks Control (parameter #5) is selected.
55	Upstream Output Point	R/W	User	TLP	3	TLP 0,0,0 TLP 140, X, 37 TLP 102, X, 20	0,0,0	1.00	The parameter assigned to write the upstream output to. Only used if Brooks Control (parameter #5) is selected. Only valid outputs are AC I/O EU TLP and DO EU TLP
56	Downstream Output Point	R/W	User	TLP	3	TLP 0,0,0 TLP 140, X, 37 TLP 102, X, 20	0,0,0	1.00	The parameter assigned to write the downstream output to. Only valid outputs are AC I/O EU TLP and DO EU TLP. **Note**: Used **only** if Brooks Control (parameter #5) is selected.
57	Valve Dead Time	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.00	An amount of time, in seconds, added to every TDO EU value passed to the AC I/O to account for extra time to break valve seal. **Note**: Used **only** if Brooks Control (parameter #5) is selected.

3.4.24 Point Type 111: Sampler/Odorizer Parameters

Description: Point type 111 provides the parameters for configurating a sampler or odorizer for a meter run or station.

Number of Logical Points: 12 logical points for Sampler/Odorizer may exist.

Storage Location: Point type 111 is saved to internal configuration memory.

Table 3-25: Point Type 111. Sampler/Odorizer Parameters

Point Type 111, Sampler/Odorizer Parameters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Mode	R/W_LOG	User	UINT8	1	0 → 1	0	1.00	Indicates whether a sampler or odorizer is being used. Valid values are 0 (Disabled) and 1 (Enabled).
1	Input Rate TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 112,0→11,53→54 and TLP 114,0→11,0→3 and TLP 116,0→11,0→3 and TLP 98,0→31,1→20 and TLP 96,0→5,2→11 and TLP 103,5→220,21 and TLP 105,5→220,10 or 13	0,0,0	1.00	Rate input being used for sampler or odorizer.
2	Input Rate Value	R/O	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Rate input value.
3	Time Basis for Rate	R/W_CNDL	User	UINT8	1	0 → 3	3	1.00	States the rate for the input value. Valid values are: 0 = Per Second 1 = Per Minute 2 = Per Hour 3 = Per Day.
4	Unit Accumulation	R/W_LOG	User	FL	4	>0.0 → Any positive valid IEEE 754 float	1000.0	1.00	Amount of units allowed past before activating sampler or odorizer.
5	Duration	R/W_LOG	User	FL	4	>0.0 → 43,200.0	1.0	1.00	Amount of time, in seconds, for sampler to collect gas or odorizer to inject odor.
6	Output TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 102,5→220,10	0,0,0	1.00	Indicates what DO is being used to control a sampler or odorizer.

3.4.25 Point Type 112: Station Parameters

Description: Point type 112 provides the parameters for configurating a station of meter runs.

Number of Logical Points: 12 logical points for station parameters may exist. The number depends on the number of active stations.

Storage Location: Point type 112 is saved to internal configuration memory.

Table 3-26: Point Type 112. Station Parameters

Point Type 112, Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Station X" where X is the station number	1.00	Identification name for specific station. Values must be printable ASCII characters.
1 (Series 1)	Calculation Standard	R/W_ CNDL	User	UINT8	1	0 → 2	0	1.00	Indicates what calculation standard is used to calculate the station's meter runs. Valid values are: 0 = AGA3/AGA7 (Gas) 1 = ISO5167/ISO9951(Gas) 2 = ISO5167/API Chapter 12 (Liquid).
1 (Series 2)	Calculation Standard	R/W_ CNDL	User	UINT8	1	0 → 3	0	1.00	Indicates what calculation standard is used to calculate the station's meter runs. Valid values are: 0 = AGA3/AGA7 (Gas) 1 = ISO5167-98/ISO9951(Gas) 2 = ISO5167-98/API Chapter 12 (Liquid) 3 = ISO5167-2003/ISO9951(Gas)
2	Edition of Calculations	R/O	System	UINT8	1	0	0	1.00	Indicates what edition of the meter run calculations is used for the calculation. Valid values are: 0 = 1992. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
3	Compressibility Calculation	R/W_ CNDL	User	UINT8	1	0 → 3	0	1.00	Indicates what method to use to calculate the compressibility of natural gas and other related hydrocarbons. Value values are: 0 = AGA Report #8 Detail Method 1 = AGA Report #8 Gross Method #1, 2 = AGA Report #8 Gross Method #2 3 = User Method (compressibility and density values will be R/W).

Point Type 112, Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Units	R/W_ CNDL	User	UINT8	1	0 → 2	0	1.00	Indicates the engineering units used for the process variables, inputs, and calculations. Valid values are: 0 = English Units 1 = Metric Units with kPa 2 = Metric Units with DP in mbar and pressure in bar.
5	Alarming	R/W	User	UINT8	1	0 → 2	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are: 0 = Disabled, 1 = Alarm on Corrected Volume / Day, 2 = Alarm on Mass / Day. Option 2 was added in firmware version 1.52.
6	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are: 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
7	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are: 0 = SRBX on Set Disabled 1 = SRBX on Set Enabled.
8	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
8.0	Low Alarm			Bit 0			0		This alarm is set if the Flow Rate per Day (parameter #53) is less than or equal to the Low Alarm Flow (parameter #9). This alarm is cleared if the Flow Rate per Day (parameter #53) is greater than the Low Alarm Flow (parameter #9) plus the alarm deadband (parameter #11).
8.1	Not Used			Bit 1			0		Not Used
8.2	High Alarm			Bit 2			0	1.00	This alarm is set if the Flow Rate per Day (parameter #53) is greater than or equal to the High Alarm Flow (parameter #10). This alarm clears if the Flow Rate per Day (parameter #53) is less than the High Alarm Flow (parameter #10) minus the alarm deadband (parameter #11).
8.3	Not Used			Bit 3			0		Not Used
8.4	Not Used			Bit 4			0		Not Used
8.5	Zb Calc Alarm			Bit 5			0	1.00	This alarm is set if the base temperature, base pressure, and composition values do not allow a valid base compressibility calculation. If condition occurs, the value of Zb is set to 1.0.

Point Type 112, Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8.6	No Flow Alarm			Bit 6			0	1.00	If set, then no flow conditions are present and the Flow Rate per Day (parameter #53) is zero. If clear, then flowing conditions exist and the Flow Rate per Day (parameter #53) is not zero.
8.7	Not Used			Bit 7			0		Not Used
9	Low Alarm Flow	R/W	User	FL	4	Any valid IEEE 754 float	1,000.0	1.00	Alarm value for Low Alarm in mft^3/day or km^3/day.
10	High Alarm Flow	R/W	User	FL	4	Any valid IEEE 754 float	10,000.0	1.00	Alarm value for High Alarm in mft^3/day or km^3/day.
11	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	The value that the Flow Rate Per Day (parameter #53) must be above the low alarm value (parameter #9) or below the high alarm value (parameter #10) before the associated alarm will clear.
12	History Segment	R/W_ CNDL	User	UINT8	1	0 → 10	0	1.00	The history segment that the station uses for storing history. Valid values are: 0 = No history stored 1 - 10 = Use history segment.
13	Base or Contract Pressure	R/W_ CNDL	User	FL	4	> 0.0 → 40,000 PSI (275,790.3 kPa)	14.73	1.00	Used to correct the standard volume flow rate to the base volume flow rate. Entered in PSI (lb/in^2), kPa, or bar. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
14	Base or Contract Temperature	R/W_ CNDL	User	FL	4	>= -200 Deg F (-128.9 Deg C) → 760 Deg F (404.4 Deg C)	60.0	1.00	Used to correct the standard volume flow rate to the base volume flow rate. Entered in °F or °C. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
15	Atmospheric Pressure Option	R/W_ LOG	User	UINT8	1	0 → 1	1	1.00	Indicates whether to calculate the atmospheric pressure or use the entered value. Valid values are 0 (Calculate Atmospheric Pressure) and 1 (Use Entered Atmospheric Pressure).
16	Atmospheric Pressure	R/W_ LOG	Both	FL	4	> 0 → 40,000 PSI (275,790.3 kPa)	14.45	1.00	Amount of pressure in PSI (lb/in^2), kPa, or bar that is added to the static pressure to calculate an absolute pressure from a gauge pressure. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
17	Gravity Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates whether to calculate the gravity or use the entered value. Valid values are 0 (Calculate Gravity) and 1 (Use Entered Gravity).

Point Type 112, Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Local Gravitational Acceleration	R/W_ CNDL	Both	FL	4	Any valid IEEE 754 float	32.14398	1.00	Local value of gravity at the station in ft/sec^2 or m/sec^2. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
19	Elevation	R/W_ CNDL	User	FL	4	>= -2000 ft (-609.6 m) → 29200 ft (8,900.2 m)	500.0	1.00	Distance from sea level in feet or meters for the station. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
20	Latitude	R/W_ CNDL	User	FL	4	0.0 → 90.0	35.0	1.00	Latitude of station in degrees. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
21	Heating Value Type	R/W_ CNDL	User	UINT8	1	0 → 2	0	1.00	Indicates the type of entered heating value. Valid values are: 0 = Dry 1 = Wet 2 = As Delivered.
22	Heating Value	R/W_ LOG	Both	FL	4	Any valid IEEE 754 float	1027.189	1.00	Gas property indicating how much energy it takes to heat the gas based upon a per-unit volume basis. For English units Btu/ft^3 are used and for Metric unitsr MJ/m^3 are used. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
23	Specific Gravity (Gr)	R/W_ LOG	Both	FL	4	>0.0 → Any positive valid IEEE 754 float	0.573538	1.00	Real gas relative density. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
24	Gas Quality	R/W_ LOG	User	UINT8	1	0 → 1	0	1.00	Indicates if the gas quality for the station is live or constant. Valid values are 0 (Constant Gas Quality) and 1 (Live Gas Quality).
25	Normalization Type	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates if the gas composition is adjusted to 100% by modifying the methane or using normalization. Valid values are 0 (Methane Adjust) and 1(Normalize Gas).
26	N2 Nitrogen	R/W_ LOG	User	FL	4	0.0 → 100.0	1.0	1.00	Percent of gas present.
27	CO2 Carbon Dioxide	R/W_ LOG	User	FL	4	0.0 →100.0	0.0	1.00	Percent of gas present.
28	CH4 Methane	R/W_ LOG	Both	FL	4	0.0 → 100.0	96.0	1.00	Percent of gas present.
29	C2H6 Ethane	R/W_ LOG	User	FL	4	0.0 → 100.0	3.0	1.00	Percent of gas present.

Point Type 112, Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
30	C3H8 Propane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
31	C4H10 n-Butane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
32	C4H10 i-Butane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
33	C5H12 n-Pentane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
34	C5H12 i-Pentane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
35	C6H14 n-Hexane	R/W_ LOG	Both	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present. When the Heavy Gas Option (parameter #46) is selected, this value will be determined by the ROC based on the Heavy Gas Percent (parameter #47) and the Heavy Gas Percent Hexane (parameter #48).
36	C7H16 n-Heptane	R/W_ LOG	Both	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present. When the Heavy Gas Option (parameter #46) is selected, this value will be determined by the ROC based on the Heavy Gas Percent (parameter #47) and the Heavy Gas Percent Heptane (parameter #49).
37	C8H18 n-Octane	R/W_ LOG	Both	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present. When the Heavy Gas Option (parameter #46) is selected, this value will be determined by the ROC based on the Heavy Gas Percent (parameter #47) and the Heavy Gas Percent Octane (parameter #50).
38	C9H20 n-Nonane	R/W_ LOG	Both	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present. When the Heavy Gas Option (parameter #46) is selected, this value will be determined by the ROC based on the Heavy Gas Percent (parameter #47) and the Heavy Gas Percent Nonane (parameter #51).
39	C10H22 n-Decane	R/W_ LOG	Both	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present. When the Heavy Gas Option (parameter #46) is selected, this value will be determined by the ROC based on the Heavy Gas Percent (parameter #47) and the Heavy Gas Percent Decane (parameter #52).
40	H2S Hydrogen Sulfide	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
41	H2O Water	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
42	He Helium	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.

Point Type 112, Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
43	O2 Oxygen	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
44	CO Carbon Monoxide	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
45	H2 Hydrogen	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
46	Heavy Gas Option	R/W_C NDL	User	UINT8	1	0 → 1	0	1.00	Indicates whether to separate Heavy Gas Percent (C6+) (parameter #47) into individual components in the percentages configured in parameters #48-52 and write to gas components hexane and heavier (parameters #35-39). 0 = C6+ not used, 1 = C6+ used.
47	Heavy Gas Percent (C6+)	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas that is a composite of hydrocarbons hexane and heavier. Values for C6+ should be written to this parameter.
48	Heavy Gas % C6H14 n-Hexane	R/W_ LOG	User	FL	4	0.0 → 100.0	100.0	1.00	Percent of hexane believed to be present in the composite heavy gas.
49	Heavy Gas % C7H16 n-Heptane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of heptane believed to be present in the composite heavy gas.
50	Heavy Gas % C8H18 n-Octane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of octane believed to be present in the composite heavy gas.
51	Heavy Gas % C9H20 n-Nonane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of nonane believed to be present in the composite heavy gas.
52	Heavy Gas % C10H22 n-Decane	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of decane believed to be present in the composite heavy gas.
53	Flow Rate per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Volume flow rate at base condition in mft^3/day or km^3/day.
54	Energy Rate per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Energy rate at base conditions in mmBtu/day or GJ/day.
55	Flow Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the current contract day in mft^3 or km^3.
56	Flow Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the previous contract day in mft^3 or km^3.
57	Energy Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the current contract day in mmBtu or GJ.
58	Energy Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the previous contract day in mmBtu or GJ.

Point Type 112, Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
59	Zs	R/W_ LOG	Both	FL	4	> 0.0→Any positive valid IEEE 754 float	0.9979234	1.00	Represents the compressibility at standard conditions. **Note**. Refer to API Chapter 14.2 (AGA Report No. 8 1992 2nd printing 1994).
60	Zb	R/W_ LOG	Both	FL	4	> 0.0→Any positive valid IEEE 754 float	0.9979234	1.00	Represents the compressibility at base conditions. **Note**. Refer to API Chapter 14.2 (AGA Report No. 8 1992 2nd printing 1994).
61	Base Density	R/W_ LOG	Both	FL	4	> 0.0→Any positive valid IEEE 754 float	0.043892	1.00	Represents the density of a fluid at base conditions in lb/ft^3 or kg/m^3. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
62	Ar Argon	R/W_ LOG	User	FL	4	0.0 → 100.0	0.0	1.00	Percent of gas present.
63	Mass Rate Per Day	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Mass flow rate in mlb/day or tonnes/day.
64	Mass Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of mass since the last contract hour in mlb or tonnes.
65	Mass Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the previous contract day in mlb or tonnes.
66	Maintenance Lock	R/W_ LOG	User	UINT8	1	0 → 1	0	1.00	Allows the station's meter runs to be set to maintenance mode. Valid values are 0 (Locked, do not allow the station's meter runs to be set to maintenance mode) and 1 (Unlocked).
67	Base Density Option	R/W_ LOG	User	UINT8	1	0 → 1	0	1.00	Selection to calculate base density by entering specific gravity (relative density) or molecular weight. Valid values are **0** (Enter Specific Gravity [Relative Density]) and **1** (Enter Molecular Weight).
68	Molecular Weight	R/W_ LOG	Both	FL	4	>0.0→Any positive valid IEEE 754 float	16.5834	1.00	Molecular weight of the gas

3.4.26 Point Type 113: Orifice Meter Run Configuration

Description: Point type 113 provides the parameters for configurating an orifice meter run.

Number of Logical Points: 12 logical points for orifice meter run configuration may exist. The number depends on licensing and the number of active orifice meter runs.

Storage Location: Point type 113 is saved to internal configuration memory.

Table 3-27: Point Type 113. Orifice Meter Run Configuration

Point Type 113, Orifice Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Orifice X" where X is the Orifice number	1.00	Identification name for specific Orifice Meter Run. Values must be printable ASCII characters.
1	Point Description	R/W	User	AC	30	0x20 → 0x7E for each ASCII character	" "	1.00	Description for specific meter run. Values must be printable ASCII characters.
2	Static Pressure Units	R/W_CNDL	User	UINT8	1	0 → 1	1	1.00	Indicates whether the static pressure is in gauge or absolute pressure units. Valid values are 0 (Gauge) and 1 (Absolute).
3	Static Pressure Tap	R/W_CNDL	User	UINT8	1	0 → 1	1	1.00	Indicates if the static pressure is an upstream or downstream reading. Valid valuesare 0 (Downstream) and 1 (Upstream).
4	Alarming	R/W	User	UINT8	1	0 → 4	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are: 0 = Disabled 1 = Alarm on Corrected Volume / Day 2 = Alarm on Mass / Day 3 = Alarm on Corrected Volume / Hour 4 = Alarm on Mass / Hour.
5	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1(SRBX on Clear Enabled).
6	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
7	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	

Point Type 113, Orifice Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7.0	Low Alarm			Bit 0			0	1.00	This alarm is set if the Flow Rate per Day (point type 114, parameter #0) is less than or equal to the Low Alarm Flow (parameter #8). This alarm clears if the Flow Rate per Day (point type 114, parameter #0) is greater than the Low Alarm Flow (parameter #8) plus the alarm deadband (parameter #10).
7.1	Not Used			Bit 1			0		Not Used
7.2	High Alarm			Bit 2			0	1.00	This alarm is set if the Flow Rate per Day (point type 114, parameter #0) is greater than or equal to the High Alarm Flow (parameter #9). This alarm clears if the Flow Rate per Day (point type 114, parameter #0) is less than the High Alarm Flow (parameter #9) minus the alarm deadband (parameter #10).
7.3	Not Used			Bit 3			0		Not Used
7.4	Temp Fail Alarm			Bit 4			0	1.00	This alarm is set if the meter temperature input value falls below –200 Deg F (–128.89 Deg C) or goes above 400 Deg F (204.44 Deg C). If this condition occurs, the flow rates are set to 0.0.
7.5	Zf1 Calc Alarm			Bit 5			0	1.00	This alarm is set if the meter temperature, pressure, and composition values do not allow a valid flowing compressibility calculation. If condition occurs, the value of Zf1 is set to 1.0.
7.6	No Flow Alarm			Bit 6			0	1.00	If set, then no flow conditions are present and the Flow Rate per Day (point type 114, parameter #0) is zero. If clear, then flowing conditions exist and the Flow Rate per Day (point type 114, parameter #0) is not zero.
7.7	Manual Inputs Alarm			Bit 7			0	1.00	If set, then one of the DP TLP (parameter #25), SP TLP (parameter #27), TMP TLP (parameter #29), or Low DP TLP (parameter #24), if Stacked DP is enabled, is set to Manual (0,0,0). If clear, then the DP TLP (parameter #25), SP TLP (parameter #27), TMP TLP (parameter #29), and Low DP TLP (parameter #24), if Stacked DP is enabled, are not set to Manual.
8	Low Alarm Flow	R/W	User	FL	4	Any valid IEEE 754 float	1,000.0	1.00	Alarm value for Low Alarm in mft^3/day or km^3/day.
9	High Alarm Flow	R/W	User	FL	4	Any valid IEEE 754 float	10,000.0	1.00	Alarm value for High Alarm in mft^3/day or km^3/day.
10	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	The value that the Flow Rate Per Day (Point Type 114, parameter #0) must be above the low alarm value (parameter #8) or below the high alarm value (parameter #9) before the associated alarm will clear.

Point Type 113, Orifice Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11	Station number	R/W_CNDL	User	UINT8	1	0 → 11	0	1.00	Indicates the station associated with the meter run.
12	Pipe Diameter	R/W_CNDL	User	FL	4	>0.0 → Any positive valid IEEE 754 float	8.071	1.00	Meter tube internal diameter in inches or millimeters. Must be greater than 0.0. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
13	Pipe Reference Temp	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	68.0	1.00	Reference temperature of the meter tube inside diameter in °F or °C. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
14	Pipe Material	R/W_CNDL	User	UINT8	1	0 → 2	2	1.00	Indicates the material for the meter tube, used in determining the linear coefficient of thermal expansion for the meter tube. Valid values are: 0 = Type 304 or 316 Stainless Steel 1 = Monel 2 = Carbon Steel. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
15	Orifice Diameter	R/W_LOG	User	FL	4	>0.0 → Any positive valid IEEE 754 float	4.0	1.00	Orifice plate bore diameter in inches or millimeters. Must be greater than 0.0 and less than Pipe Diameter (parameter #12). **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
16	Orifice Reference Temp	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	68.0	1.00	Reference temperature of the orifice plate bore diameter in °F or °C. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
17	Orifice Material	R/W_CNDL	User	UINT8	1	0 → 2	0	1.00	Indicates the material for the orifice plate, used in determining the linear coefficient of thermal expansion for the orifice plate. Valid values are: 0 = Type 304 or 316 Stainless Steel 1 = Monel 2 = Carbon Steel. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
18	Viscosity	R/W_LOG	User	FL	4	>0.0→Any positive valid IEEE 754 float	0.0000069	1.00	Absolute viscosity of flowing fluid in Lbm/Ft-Sec or centipoise. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).

Point Type 113, Orifice Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19	Specific Heat Ratio	R/W_LOG	User	FL	4	>0.0→Any positive valid IEEE 754 float	1.3	1.00	Isentropic exponent for natural gas. Must be greater than 0.0. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
20	Low DP Cutoff	R/W_LOG	User	FL	4	0.0 → Any positive valid IEEE 754 float	0.0	1.00	Indicates the cutoff point for the differential pressure, in inches of H_2O, kPa, or mbar to determine whether the meter run is flowing or not. **Note**: Refer to API Chapter 21.1 (September 1993).
21	Stacked DP	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates a stacked differential pressure for the meter run is being used. Valid values are 0 (Disabled) and 1 (Enabled).
22	High DP Setpoint	R/W_LOG	User	FL	4	Any valid IEEE 754 float	0.0	1.00	If a stacked differential pressure is enabled, this is the differential pressure value, in inches of H_2O or kPa, which indicates to start reading from the DP TLP (parameter #25).
23	Low DP Setpoint	R/W_LOG	User	FL	4	Any valid IEEE 754 float	0.0	1.00	If a stacked differential pressure is enabled, this is the differential pressure value, in inches of H_2O or kPa, which indicates to start reading from the Low DP TLP (parameter #24).
24	Low DP TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,16→63,19→20	0,0,0	1.00	Indicates what is being used to get the DP (parameter #26) if the stacked differential pressure says to use the lower DP.
25	DP TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108, 16→63,19→20	0,0,0	1.00	Indicates what is being used to get the DP (parameter #26).
26	DP (Differential Pressure, hw)	R/W_LOG	Both	FL	4	> 0.0 → Any positive valid IEEE 754 float	0.0	1.00	Indicates the differential pressure in inches of H_2O or kPa. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992) and to API Chapter 21.1 (September 1993).

Point Type 113, Orifice Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	SP TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108, 16→63,35	0,0,0	1.00	Indicates what is being used to get the SP (parameter #28).
28	SP (Static Pressure, P_f)	R/W_LOG	Both	FL	4	> 0.0 → 40,000 PSI (275,790.3 kPa)	0.0	1.00	Static pressure in PSI (lb/in^2) or kPa. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992) and to API Chapter 21.1 (September 1993).
29	TMP TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108, 16→63,50 and TLP 106,5→148,22 and TLP 107,5→148, 9	0,0,0	1.00	Indicates what is being used to get the TMP (parameter #30).
30	TMP (Temperature, T_f)	R/W_LOG	Both	FL	4	>= -200 Deg F (-128.9 Deg C) → 760 Deg F (404.4 Deg C)	0.0	1.00	Temperature in °F or °C. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992) and to API Chapter 21.1 (September 1993).
31	Static Pressure Deadweight Calibrator	R/W_LOG	User	UINT8	1	0 → 1	0	1.00	Expand the volume flow equation to include the local gravitational correction for the deadweight calibrator on Static Pressure ($F_{pwl(static)}$). Valid values are 0 (Do Not Use) and 1 (Use). **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A.
32	Differential Pressure Deadweight Calibrator	R/W_LOG	User	UINT8	1	0 → 1	0	1.00	Expand the volume flow equation to include the local gravitational correction for the deadweight calibrator on Differential Pressure ($F_{pwl(differential}$ Valid values are 0 (Do Not Use) and 1 (Use). **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A..
33	Calibration Weights Gravitational Acceleration	R/W_LOG	User	FL	4	>0.0→Any positive valid IEEE 754 float	32.1740	1.00	Used to calculate F_{pwl}. Entered in ft/sec^2 or m/sec^2. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A.
34	User Correction Factor	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	1.0	1.00	Variable multiplied through the volume flow equation to allow the user to modify the flow.

Point Type 113, Orifice Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	Differential Meter Type	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates the type of primary differential metering device. Valid values are 0 (Flange tapped orifice) and 1 (User defined device).
36	Maintenance Mode	R/W_Log	User	UINT8	1	0 → 1	0	1.00	Sets the meter run to maintenance mode. Valid values are 0 (Disabled; standard accumulators resume updating and maintenance mode accumulations move to the previous maintenance mode accumulators) and 1 (Enabled; standard accumulators are not updated but maintenance mode accumulators are updated).
37	Temperature Tap Location	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Selection for location of temperature measurement. Valid values are 0 (Downstream) and 1 (Upstream).
38	Joule-Thomson Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Selection to calculate an upstream temperature using the Joule-Thomson coefficient. Valid values are 0 (Disabled) and 1 (Enabled).
39	Joule-Thomson Coefficient Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00	Indicates whether to calculate or enter the Joule-Thomson coefficient. Valid values are 0 (Calculate) and 1 (Enter).
40	Pressure Loss Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00	Indicates whether to calculate or enter the permanent pressure loss across the differential meter. Valid values are 0 (Calculate) and 1 (Enter).
41	Flow Calculations Alarming	R/W	User	UINT8	1	0 → 4	0	1.00	Generates flow calculation alarms and sends them to the alarm log. Valid values are 0 (disable) and 1 (enable). r
42	Flow Calcluations Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
42.0	Orifice Diameter Range Alarm			Bit 0			0	1.00	Bit sets if the orifice diameter (parameter #15) is outside the range specified by ISO5167 or AGA 3, based on the calculation standard used for the station (point type #121, parameter #1).
42.1	Pipe Diameter Range Alarm			Bit 1			0	1.00	Bit sets if the pipe diameter (parameter #12) is outside the the range specified by ISO5167 or AGA 3, based on the calculation standard used for the station (point type #121 parameter #1)
42.2	Beta Range Alarm			Bit 2			0	1.00	Bit sets if the beta value (point type #114 parameter #14) is outside the the range specified by ISO5167 or AGA 3 based on the calculation standard used for the station (point type #121 parameter #1)

Point Type 113, Orifice Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42.3	Reynolds Number Range Alarm			Bit 3			0	1.00	Bit sets if the Reynolds number (point type #114 parameter #16) is outside the the range specified by ISO5167 or AGA 3 based on the calculation standard used for the station (point type #121 parameter #1)
42.4	Coefficient of Discharge Non-convergence Alarm			Bit 4			0	1.00	Bit sets if the coefficient of discharge (point type #114 parameter #5) did not converge to a value within tolerance during calcuation.
42.5	Not used			Bit 5			0	1.00	Not used
42.6	Not used			Bit 6			0	1.00	Not used
42.7	Not used			Bit 7			0	1.00	Not used

3.4.27 Point Type 114: Orifice Meter Run Values

Description: Point type 114 provides the parameters for displaying the orifice meter run calculations.

Number of Logical Points: 12 logical points for Orifice Meter Run Values may exist. The number depends on licensing and the number of active orifice meter runs.

Storage Location: Point type 114 is **not saved** to internal configuration memory.

Table 3-28: Point Type 114. Orifice Meter Run Values

Point Type 114, Orifice Meter Run Values

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Flow Rate per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Volume flow rate at base condition in mft^3/day or km^3/day.
1	Energy Rate per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Energy rate at base conditions in mmBtu/day or GJ/day.
2	Flow Rate per Hour	R/W_LOG	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Volume flow rate at base conditions in ft^3/hour or m^3/hour. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]). **Note**: You can write to this parameter **only** if you select a “user defined” differential meter type (point type 113, parameter 35 = 1).
3	Energy Rate per Hour	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Energy rate at base conditions in Btu/hour or MJ/hour.
4	Pressure Extension (hwPf)	R/W_LOG	Both	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Represents the square root of Differential Pressure times Static Pressure √(hw * Pf). (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992] and to API Chapter 21.1 [September 1993].) **Note**: You can write to this parameter **only** if you select a “user defined” differential meter type (point type 113, parameter 35 = 1).
5	CdFT	R/W_LOG	Both	FL	4	>0.0→Any positive valid IEEE 754 float	0.6	1.00	Represents the Coefficient of discharge at a specified pipe Reynolds number for flange-tapped orifice meter. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]). **Note**: You can write to this parameter **only** if you select a “user defined” differential meter type (point type 113, parameter 35 = 1).

Point Type 114, Orifice Meter Run Values

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Velocity of Approach (Ev)	R/W_LOG	Both	FL	4	>0.0→Any positive valid IEEE 754 float	1.031575	1.00	Represents the velocity of approach factor. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]). **Note**: You can write to this parameter **only** if you select a “user defined” differential meter type (point type 113, parameter 35 = 1).
7	Expansion Factor (Y_1)	R/W_LOG	Both	FL	4	0.0→Any positive valid IEEE 754 float	1.0	1.00	Represents the Expansion factor based on upstream absolute static pressure. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992] and to API Chapter 21.1 [September 1993].) **Note**: You can write to this parameter **only** if you select a “user defined” differential meter type (point type 113, parameter 35 = 1).
8	Orifice Plate Bore Diameter (d)	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	3.997484	1.00	Orifice plate bore diameter calculated at the average flowing temperature over the imp in inches. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]).
9	Zf1	R/W_LOG	Both	FL	4	>0.0→Any positive valid IEEE 754 float	1.0	1.00	Represents the compressibility at upstream flowing conditions. (Refer to API Chapter 14.2 [AGA Report No. 8 1992 2nd printing 1994].) **Note**: You can write to this parameter **only** if you select a “user method” of compressibility calculation (point type 112, parameter 3 = 1).
10	Fpb	R/O	System	FL	4	Any valid IEEE 754 float	1.0	1.00	Represents the base pressure factor. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992] and to API Chapter 21.1 [September 1993].)
11	Ftb	R/O	System	FL	4	Any valid IEEE 754 float	1.0	1.00	Represents the base temperature factor. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992] and to API Chapter 21.1 [September 1993].)
12	Multiplier Value	R/W_LOG	Both	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Represents the value multiplied by the square root of the product of differential and static pressure to calculate instantaneous flow rate. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]). **Note**: You can write to this parameter **only** if you select a “user defined” differential meter type (point type 113, parameter 35 = 1).
13	Meter Tube Internal Diameter (D)	R/O	System	FL	4	>0.0→Any positive valid IEEE 754 float	8.067597	1.00	Meter tube internal diameter calculated at the average flowing temperature over the imp in inches. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992].)

Point Type 114, Orifice Meter Run Values

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
14	Diameter Ratio (Beta)	R/W_LOG	Both	FL	4	>0.0→Any positive valid IEEE 754 float	0.4954987	1.00	Ratio of orifice plate bore diameter to meter tube internal diameter calculated at the average flowing temperature over the imp. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]). **Note**: You can write to this parameter **only** if you select a "user defined" differential meter type (point type 113, parameter 35 = 1).
15	Flowing Density	R/W_LOG	Both	FL	4	>0.0→Any positive valid IEEE 754 float	0.0	1.00	Represents the density of a fluid at flowing conditions in lbm/ft^3 or kg/m^3. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]). **Note**: You can write to this parameter **only** if you select a "user method" of compressibility calculation (point type 112, parameter 3 = 1).
16	Reynolds Number	R/W_LOG	Both	FL	4	>0.0→Any positive valid IEEE 754 float	0.0	1.00	Represents the pipe Reynolds number. (Refer to ANSI/API 2530-92 [AGA Report No. 3 1992]). **Note**: You can write to this parameter **only** if you select a "user defined" differential meter type (point type 113, parameter 35 = 1).
17	Upstream Static Pressure	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Represents the instantaneous upstream static pressure in psia or kPa.
18	SP Fpwl	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	1.0	1.00	Represents the local gravitational correction for the deadweight tester. (Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A.)
19	Flow Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the current contract day in mft^3 or km^3.
20	Flow Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the previous contract day in mft^3 or km^3.
21	Flow Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the current month in mft^3 or km^3.
22	Flow Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the previous month in mft^3 or km^3.
23	Flow Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3. The 1,000,000.0 rollover point ensures that flow accuracy is not lost due to the significant digits of a float data type.
24	Minutes Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the current contract day.
25	Minutes Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the previous contract day.
26	Minutes Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the current month.

Point Type 114, Orifice Meter Run Values

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Minutes Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the previous month.
28	Minutes Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of flowing minutes for the meter run. The 1,000,000.0 rollover point ensures that flow minutes accuracy is not lost due to the significant digits of a float data type.
29	Energy Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the current contract day in mmBtu or GJ.
30	Energy Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the previous contract day in mmBtu or GJ.
31	Energy Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the current month in mmBtu or GJ.
32	Energy Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the previous month in mmBtu or GJ.
33	Energy Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of energy for the meter run in mmBtu or GJ. The 1,000,000.0 rollover point ensures that energy accuracy is not lost due to the significant digits of a float data type.
34	Mass Rate Per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Mass flow rate in mlb/day or tonnes/day.
35	Mass Rate Per Hour	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Mass flow rate in lb/hr or kg/hr.
36	Mass Today	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass since the last contract hour in mlb or tonnes.
37	Mass Yesterday	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the previous contract day in mlb or tonnes.
38	Mass Month	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the current month in mlb or tonnes.
39	Mass Previous Month	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the previous month in mlb or tonnes.
40	Mass Accumulated	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the meter run in mlb or tonnes. The 1,000,000.0 rollover point ensures that accuracy is not lost due to the significant digits of a float data type.
41	DP Fpwl	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	1.0	1.00	Represents the local gravitational correction for the deadweight tester. (Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A.)
42	Flow Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3. Rollover is based upon the user defined rollover.

Point Type 114, Orifice Meter Run Values

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
43	Minutes Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flowing minutes for the meter run. Rollover is based upon the user defined rollover.
44	Energy Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of energy for the previous month in mmBtu or GJ. Rollover is based upon the user defined rollover.
45	Mass Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of mass for the meter run in mlb or tonnes. Rollover is based upon the user defined rollover.
46	Current Maintenance Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of uncorrected flow for the meter run in mft^3 or km^3, while the meter run was in maintenance mode. Rollover is based upon the user defined rollover.
47	Current Maintenance Uncorrected Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3, while the meter run was in maintenance mode. Rollover is based upon the user defined rollover.
48	Previous Maintenance Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3, during the previous period the meter run was in maintenance mode. Rollover is based upon the user defined rollover.
49	Previous Maintenance Uncorrected Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3, during the previous period the meter run was in maintenance mode. Rollover is based upon the user defined rollover.
50	Upstream Temperature	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Value of meter temperature in Deg F or Deg C, upstream of the differential meter.
51	Joule-Thomson Coefficient	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Calculated or entered value of Joule-Thomson coefficient in Deg F/psi, Deg C/kPa or Deg C/bar.
52	Pressure Loss	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Calculated or entered value of permanent pressure loss across the differential meter in % of DP.
53	Uncorrected Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the current contract day in mft^3 or km^3.
54	Uncorrected Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the previous contract day in mft^3 or km^3.
55	Uncorrected Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the current month in mft^3 or km^3.
56	Uncorrected Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the previous month in mft^3 or km^3.

Point Type 114, Orifice Meter Run Values

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57	Uncorrected Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of uncorrected flow for the meter run in mft^3 or km^3. The 1,000,000.0 rollover point ensures that uncorrected flow accuracy is not lost due to the significant digits of a float data type.
58	Uncorrected Flow Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of uncorrected flow for the meter run in mft^3 or km^3. Rollover is based upon the user defined rollover.
59	Flow Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the current hour in mft^3 or km^3.
60	Flow Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the previous hour in mft^3 or km^3.
61	Energy Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the current hour in mmBtu or GJ.
62	Energy Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the previous hour in mmBtu or GJ.
63	Mass Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the corrent hour in mlb or tonnes.
64	Mass Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the previous hour in mlb or tonnes.
65	Uncorrected Flow Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the current hour in mft^3 or km^3.
66	Uncorrected Flow Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the previous hour in mft^3 or km^3.

3.4.28 Point Type 115: Turbine Meter Run Configuration

Description: Point type 115 provides the parameters for configuring a turbine meter run.

Number of Logical Points: 12 logical points for Turbine Meter Run Configuration may exist. The number depends on licensing and the number of active turbine meter runs.

Storage Location: Point type 115 is saved to internal configuration memory.

Table 3-29: Point Type 115. Turbine Meter Run Configuration

Point Type 115, Turbine Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID .	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Turbine X" where X is the Turbine number	1.00	Identification name for specific Turbine Meter Run. Values must be printable ASCII characters.
1	Point Description	R/W	User	AC	30	0x20 → 0x7E for each ASCII character	" "	1.00	Description for specific Meter Run. Values must be printable ASCII characters.
2	Static Pressure Units	R/W_CNDL	User	UINT8	1	0 → 1	1	1.00	Indicates whether the static pressure is in gauge or absolute pressure units. Valid values are 0 (Gauge) and 1 (Absolute).
3	Alarming	R/W	User	UINT8	1	0 → 4	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are: 0 = Disabled 1 = Alarm on Corrected Volume / Day 2 = Alarm on Mass / Day 3 = Alarm on Corrected Volume / Hour 4 = Alarm on Mass / Hour.
4	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
5	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
6	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	

Point Type 115, Turbine Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6.0	Low Alarm			Bit 0			0	1.00	This alarm is set if the Flow Rate per Day (point type 116, parameter #0) is less than or equal to the Low Alarm Flow (parameter #7). This alarm is cleared if the Flow Rate per Day (point type 116, parameter #0) is greater than the Low Alarm Flow (parameter #7) plus the alarm deadband (parameter #9).
6.1	Not Used			Bit 1			0		Not Used
6.2	High Alarm			Bit 2			0	1.00	This alarm is set if the Flow Rate per Day (point type 116, parameter #0) is greater than or equal to the High Alarm Flow (parameter #8). This alarm is cleared if the Flow Rate per Day (point type 116, parameter #0) is less than the High Alarm Flow (parameter #8) minus the alarm deadband (parameter #9).
6.3	Not Used			Bit 3			0		Not Used
6.4	Not Used			Bit 4			0		Not Used
6.5	Not Used			Bit 5			0		Not Used
6.4	Temp Fail Alarm			Bit 4			0	1.00	This alarm is set if the meter temperature input value falls below –200 Deg F (–128.89 Deg C) or goes above 400 Deg F (204.44 Deg C). If this condition occurs, the flow rates are set to 0.0.
6.5	Zf Calc Alarm			Bit 5			0	1.00	This alarm is set if the meter temperature, pressure, and composition values do not allow a valid flowing compressibility calculation. If condition occurs, the value of Zf is set to 1.0.
6.6	No Flow Alarm			Bit 6			0	1.00	If set, then no flow conditions are present and the Flow Rate per Day (point type 116, parameter #0) is zero. If clear, then flowing conditions exist and the Flow Rate per Day (point type 116, parameter #0) is not zero.
6.7	Manual Inputs Alarm			Bit 7			0	1.00	If set, then one of the Uncorrected Flow Rate TLP (parameter #13), SP TLP (parameter #15), or TMP TLP (parameter #17) is set to Manual (0,0,0). If clear, then the Uncorrected Flow Rate TLP (parameter #13), SP TLP (parameter #15), and TMP TLP (parameter #17) are not set to Manual.
7	Low Alarm Flow	R/W	User	FL	4	Any valid IEEE 754 float	1,000.0	1.00	Alarm value for Low Alarm in mft^3/day or km^3/day.
8	High Alarm Flow	R/W	User	FL	4	Any valid IEEE 754 float	10,000.0	1.00	Alarm value for High Alarm in mft^3/day or km^3/day.

Point Type 115, Turbine Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	The value that the Flow Rate Per Day (Point Type 116, parameter #0) must be above the low alarm value (parameter #7) or below the high alarm value (parameter #8) before the associated alarm will clear.
10	Station number	R/W_CNDL	User	UINT8	1	0 → 11	0	1.00	Indicates the station associated with this meter run.
11	K-Factor	R/W_LOG	User	FL	4	Any positive, non-zero, valid IEEE 754 float	1.0	1.00	Indicates the linear meter constant (K-factor) in pulses/ft^3 or pulses/m^3. If a K-factor curve is being used (parameter #24), this represents the K-factor currently in use and becomes a read-only parameter. **Note**: Refer to API Chapter 21.1 (September 1993).
12	No Flow Time	R/W_LOG	User	UINT32	4	1 → 86,400	5	1.00	Amount of time in seconds without a pulse before the meter is considered not to have flow.
13	Uncorrected Flow Rate/Mass TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 105,5→148,10 or 13 and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20	0,0,0	1.00	Indicates what is being used to get the pulses from the turbine and the Uncorrected Flow Rate or Mass (parameter #14).
14	Uncorrected Flow/Mass Rate	R/W_LOG	Both	FL	4	Any positive valid IEEE 754 float	0.0	1.00	Indicates the uncorrected flow rate in mft^3/day or km^3/day for volume measurement and Lb/hour or Kg/hour for mass measurement. **Note**: Refer to API Chapter 21.1 (September 1993) and to AGA Report No. 7 (1996).
15	SP TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108, 16→63,35	0,0,0	1.00	Indicates what is being used to get the SP (parameter #16).
16	SP (Static Pressure, P_f)	R/W_LOG	Both	FL	4	> 0.0 → 40,000 PSI (275,790.3 kPa)	0.0	1.00	Static pressure in PSI (lb/in^2) or kPa. **Note**: Refer to API Chapter 21.1 (September 1993) and to AGA Report No. 7 (1996).

Point Type 115, Turbine Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
17	TMP TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108, 16→63,50 and TLP 106,5→148,22 and TLP 107,5→148, 9	0,0,0	1.00	Indicates what is being used to get the TMP (parameter #18).
18	TMP (Temperature, T_f)	R/W_LOG	Both	FL	4	>= -200 Deg F (-128.9 Deg C) → 760 Deg F (404.4 Deg C)	0.0	1.00	Temperature in °F or °C. **Note**: Refer to API Chapter 21.1 (September 1993) and to AGA Report No. 7 (1996).
19	Static Pressure Deadweight Calibrator	R/W_LOG	User	UINT8	1	0 → 1	0	1.00	Expand the volume flow equation to include the local gravitational correction for the deadweight calibrator on Static Pressure ($F_{pwl(static)}$). Valid values are 0 (Do Not Use) and 1 (Use). **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A.
20	Calibration Weights Gravitational Acceleration	R/W_LOG	User	FL	4	Any positive valid IEEE 754 float	32.1740	1.00	Used to calculate $F_{pwl(static)}$. Entered in ft/sec^2 or m/sec^2. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A.
21	User Correction Factor	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	1.0	1.00	Variable multiplied through the volume flow equation to allow the user to modify the flow (F_{uc}).
22	Low Flow Cutoff	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Indicates the cutoff point for the uncorrected flow rate if it is not obtained from a pulse input. If the uncorrected flow rate input is equal to or below this value, the uncorrected flow rate value (parameter #14) will be set to zero. If the uncorrected flow rate is obtained from a pulse input, all pulses are considered flow and this value is meaningless.
23	Speed Of Sound Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates the status of the speed of sound calculation. Valid values are 0 (Disabled) and 1 (Enabled). If enabled, the calculated value of the speed of sound is stored in point type116, parameter 33.

Point Type 115, Turbine Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	K-Factor Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates whether a single K-factor is used or the K-Factor table with interpolation between points. Valid values are 0 (Use Single K-factor) and 1 (Use K-factor table).
25	K-Factor 1	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #26).
26	K-Factor 1 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 1 (parameter #25).
27	K-Factor 2	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #28).
28	K-Factor 2 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 2 (parameter #27).
29	K-Factor 3	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #30).
30	K-Factor 3 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 3 (parameter #29).
31	K-Factor 4	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #32).
32	K-Factor 4 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 4 (parameter #31).
33	K-Factor 5	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #34).
34	K-Factor 5 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 5 (parameter #33).
35	K-Factor 6	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #36).
36	K-Factor 6 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 6 (parameter #35).
37	K-Factor 7	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #38).
38	K-Factor 7 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 7 (parameter #37).

Point Type 115, Turbine Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
39	K-Factor 8	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #40).
40	K-Factor 8 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 8 (parameter #39).
41	K-Factor 9	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #42).
42	K-Factor 9 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 9 (parameter #41).
43	K-Factor 10	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #44).
44	K-Factor 10 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 10 (parameter #43).
45	K-Factor 11	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #46).
46	K-Factor 11 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 11 (parameter #45).
47	K-Factor 12	R/W_LOG	User	FL	4	>0.0 → any valid IEEE 754 float	1.0	1.00	This is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz (parameter #48).
48	K-Factor 12 Frequency	R/W_LOG	User	FL	4	0.0 → any valid IEEE 754 float	0.0	1.00	Frequency in Hz that corresponds with K-Factor 12 (parameter #47).
49	Meter Input Type	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates whether the meter input is indicating an actual volume or a mass reading. 0 = Volume, 1 = Mass.
50	Mass Pressure Compensation Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Indicates whether the mass input requires compensation for pressure effect on the Coriolis tube. Valid values are 0 (Mass pressure compensation disabled) and 1 (Mass pressure compensation enabled). **Note**: This parameter is applicable **only** when mass has been selected for the Meter Input Type (parameter #49)
51	Calibration Pressure	R/W_CNDL	User	Float	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Pressure mass meter was calibrated at in PSIG. **Note**: This parameter is applicable **only** when mass has been selected for the Meter Input Type (parameter #49) and the Mass Pressure Compensation Option (parameter #50).

Point Type 115, Turbine Meter Run

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
52	Pressure Effect Mass Compensation Coefficient	R/W_CNDL	User	Float	4	Any negative valid IEEE 754 float → 0.0	-0.0002	1.00	Pressure correction coefficient for mass in percent per psi. This value is supplied by the manufacturer for the given model mass meter. This parameter is only applicable when mass has been selected for the Meter Input Type (parameter #49) and the Mass Pressure Compensation Option (parameter #50) has been enabled.
53	RESERVED	R/O	System	UINT8	1	0	0	1.41	Reserved for future use.
54	Meter Signal	R/W	User	UINT8	1	0 → 1	0	1.41	Sets the meter signal type. Valid values are 0 (Pulse/Analog) and 1 (Accumulator). When Accumulator is selected, the user is also prompted to enter the accumulator input point and the accumulator rollover value.
55	Accumulator Rollover Value	R/W	User	Float	4	0.0→Any positive valid IEEE 754 float	1000000.0	1.41	Sets the accumulator rollover value. This field indicates the rollover value for the accumulator input value and applies only when the selected meter signal type is “accumulator”.
56	Accumulator TLP	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 196→238 , 0→255, 0→255 (must be float) and TLP 239 → 254 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20	0,0,0	1.41	Indicates what is being used to get the accumulator input (parameter #57).
57	Accumulator Value	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.41	Accumulator input. **Note**: This value can either represent the mass accumulation or the volume accumulation depending on the meter input type selection (param #49). Note: If meter input type is “mass”, valid units are Lb for U.S units and Kg for Metric units. If meter input type is “volume”, valid units are MCF for U.S units and KM3 for metric units.

3.4.29 Point Type 116: Turbine Meter Run Values

Description: Point type 116 provides the parameters for displaying calculations of the turbine meter run.

Number of Logical Points: 12 logical points for Turbine Meter Run Values may exist. The number depends on licensing and the number of active turbine meter runs.

Storage Location: Point type 116 is **not saved** to internal configuration memory.

Table 3-30: Point Type 116. Turbine Meter Run Values

Point Type 116, Turbine Meter Run Values

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Flow Rate per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Volume flow rate at base condition in mft^3/day or km^3/day.
1	Energy Rate per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Energy rate at base conditions in mmBtu/day or GJ/day.
2	Flow Rate per Hour	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Volume flow rate at base conditions in ft^3/hour or m^3/hour. **Note**: Refer to AGA Report No. 7 (1996).
3	Energy Rate per Hour	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Energy rate at base conditions in Btu/hour or MJ/hour.
4	Pressure Multiplier	R/W_LOG	Both	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Represents the AGA 7 pressure factor (R/O) if station calculation method (pt type 112, parameter #1) has been configured for AGA3/7 (Gas) or ISO5167/ISO9951 (Gas). Represents CPL (R/W) if station calculation method (pt type 112, parameter #1) has been configured for ISO5167/API Ch.12 (Liquid). **Note**: Refer to API Chapter 21.1 (September 1993) and to AGA Report No. 7 (1996).
5	Temperature Multiplier	R/W_LOG	Both	FL	4	0.0→Any positive valid IEEE 754 float	1.130528	1.00	Represents the AGA 7 temperature factor (R/O) if station calculation method (pt type 112, parameter #1) has been configured for AGA3/7 (Gas) or ISO5167/9951 (Gas). Represents CTL (R/W) if station calculation method (pt type 112, parameter #1) has been configured for ISO5167/API Ch.12 (Liquid). **Note**: Refer to API Chapter 21.1 (September 1993) and to AGA Report No. 7 (1996).
6	Compressibility Multiplier	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.997923 4	1.00	Represents the compressibility factor. **Note**: Refer to API Chapter 21.1 (September 1993) and to AGA Report No. 7 (1996).

Point Type 116, Turbine Meter Run Values

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Zf1	R/W_LOG	Both	FL	4	> 0.0→Any positive valid IEEE 754 float	1.0	1.00	Represents the compressibility at upstream flowing conditions. **Note**: Refer to API Chapter 14.2 (AGA Report No. 8 1992 2nd printing 1994).
8	Multiplier Value	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0	1.00	Represents the product of the pressure multiplier, the temperature multiplier and the compressibility multiplier.
9	Pulses Accumulated	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Ongoing accumulation of the number of pulses input to this meter run. Not used if uncorrected flow rate is not configured for a pulse input point.
10	Density	R/W_LOG	Both	FL	4	> 0.0→Any positive valid IEEE 754 float	0.0	1.00	Represents the density of a fluid at flowing conditions in lbm/ft^3 or kg/m^3. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992).
11	Fpwl	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	1.0	1.00	Represents the local gravitational correction for the deadweight tester static pressure standard. **Note**: Refer to ANSI/API 2530-92 (AGA Report No. 3 1992), Appendix 3-A.
12	Flow Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the current contract day in mft^3 or km^3.
13	Flow Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the previous contract day in mft^3 or km^3.
14	Flow Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the current month in mft^3 or km^3.
15	Flow Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the previous month in mft^3 or km^3.
16	Flow Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3. The 1,000,000.0 rollover point ensures that flow accuracy is not lost due to the significant digits of a float data type.
17	Minutes Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the current contract day.
18	Minutes Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the previous contract day.
19	Minutes Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the current month.
20	Minutes Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flowing minutes for the previous month.

Point Type 116, Turbine Meter Run Values

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21	Minutes Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of flowing minutes for the meter run. The 1,000,000.0 rollover is to ensure that flow minutes accuracy is not lost due to the significant digits of a float data type.
22	Energy Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the current contract day in mmBtu or GJ.
23	Energy Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the previous contract day in mmBtu or GJ.
24	Energy Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the current month in mmBtu or GJ.
25	Energy Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the previous month in mmBtu or GJ.
26	Energy Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of energy for the meter run in mmBtu or GJ. The 1,000,000.0 rollover is to ensure that energy accuracy is not lost due to the significant digits of a float data type.
27	Uncorrected Today	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the current contract day in mft^3 or km^3.
28	Uncorrected Yesterday	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the previous contract day in mft^3 or km^3.
29	Uncorrected Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the current month in mft^3 or km^3.
30	Uncorrected Previous Month	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the previous month in mft^3 or km^3.
31	Uncorrected Accumulated	R/O	System	FL	4	0.0→1,000,000.0	0.0	1.00	Total accumulation of uncorrected flow for the meter run in mft^3 or km^3. The 1,000,000.0 rollover is to ensure that uncorrected flow accuracy is not lost due to the significant digits of a float data type.
32	Measured Speed Of Sound	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Speed of Sound measured by the ultrasonic flowmeter in feet/second or meters/second. This parameter is intended to store the value retrieved from the ultrasonic meter via Modbus protocol.
33	Calculated Speed Of Sound	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Speed of Sound calculated per AGA10 in feet/second or meters/second. Note: The system writes this value **only** if you **enable** the speed of sound calculation (point type 115, parameter 23).
34	Mass Rate Per Day	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Mass flow rate in mlb/day or tonnes/day.
35	Mass Rate Per Hour	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Mass flow rate in lb/hr or kg/hr.

Point Type 116, Turbine Meter Run Values

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
36	Mass Today	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass since the last contract hour in mlb or tonnes.
37	Mass Yesterday	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the previous contract day in mlb or tonnes.
38	Mass Month	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the current month in mlb or tonnes.
39	Mass Previous Month	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the previous month in mlb or tonnes.
40	Mass Accumulated	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the meter run in mlb or tonnes. The 1,000,000 rollover point ensures that accuracy is not lost due to the significant digits of a float data type.
41	Flow Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3. Rollover is based upon the user defined rollover.
42	Minutes Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flowing minutes for the meter run. Rollover is based upon the user defined rollover.
43	Energy Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of energy for the previous month in mmBtu or GJ. Rollover is based upon the user defined rollover.
44	Uncorrected Flow Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of uncorrected flow for the meter run in mft^3 or km^3. Rollover is based upon the user defined rollover.
45	Mass Accumulated Double Precision	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of mass for the meter run in mlb or tonnes. Rollover is based upon the user defined rollover.
46	Current Maintenance Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of uncorrected flow for the meter run in mft^3 or km^3, while the meter run is in maintenance mode. Copied to previous maintenance accumulator upon exit from maintenance mode. Rollover is based upon the user defined rollover.
47	Current Maintenance Uncorrected Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3, while the meter run was in maintenance mode. Copied to previous maintenance accumulator upon exit from maintenance mode. Rollover is based upon the user defined rollover.
48	Previous Maintenance Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3, during the previous period the meter run was in maintenance mode.

Point Type 116, Turbine Meter Run Values

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
49	Previous Maintenance Uncorrected Flow Accumulated	R/O	System	DBL	8	Any valid IEEE double precision float	0.0	1.00	Total accumulation of flow for the meter run in mft^3 or km^3, during the previous period the meter run was in maintenance mode.
50	Flow Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the current hour in mft^3 or km^3.
51	Flow Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of flow for the previous hour in mft^3 or km^3.
52	Energy Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the current hour in mmBtu or GJ.
53	Energy Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of energy for the previous hour in mmBtu or GJ.
54	Mass Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the corrent hour in mlb or tonnes.
55	Mass Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of mass for the previous hour in mlb or tonnes.
56	Uncorrected Flow Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the current hour in mft^3 or km^3.
57	Uncorrected Flow Previous Hour	R/O	System	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Total accumulation of uncorrected flow for the previous hour in mft^3 or km^3.

3.4.30 Point Type 117: Modbus Configuration Parameters

Description: Point type 117 provides the parameters for setting up the Modbus protocol.

Number of Logical Points: 6 logical points for Modbus Configuration Parameters may exist corresponding to LOI through Comm 5.

Storage Location: Point type 117 is saved to internal configuration memory.

Table 3-31: Point Type 117, Modbus Configuration Parameters

Point Type 117, Modbus Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Transmission Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Controls the type of transmission mode desired. Valid values are 0 (RTU Mode) and 1 (ASCII Mode).
1	Byte Order	R/W	User	UINT8	1	0 → 1	0	1.00	Controls which byte is sent out first for floats, short integers, and long integers. Valid values are 0 (LSB first , associated with little-endian processors) and 1 (MSB first, aAssociated with big-endian processors).
2	Event Log Enable	R/W	User	UINT8	1	0 → 1	1	1.00	Controls if changes to Modbus registers are logged to the event log or not (Slave mode only). Valid values are 0 (No Logging) and 1 (Log to Event Log).
3	Slave Exception Status	R/O	System	UINT8	1	0 → 3	0	1.00	Contains the error code for the last Modbus message received (Slave mode only). Valid values are: 0 = No Error 1 = Illegal Function 2 = Illegal Data Address 3 = Illegal Data Value
4	Master Poll Request Trigger	R/W	Both	UINT8	1	0 → 1	0	1.00	Controls the initiation of a Modbus master polling sequence (Master mode only). Valid values are 0 (No polling) and 1 (Begin polling with the entry in the Modbus master table indicated by the master starting request number [parameter #5] and continue through the table for the number of master requests [parameter #6]). The system resets this parameter when the polling sequence completes.
5	Master Starting Request Number	R/W	User	UINT16	2	1 - 75	1	1.00	Contains the request number in the Modbus master table to begin with when the Modbus master poll request trigger (parameter #4) is set (Master mode only).

Point Type 117, Modbus Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Master Number of Requests	R/W	User	UINT16	2	0 → 75	0	1.00	Contains the total number of Modbus requests to be made when the Modbus master poll request trigger (parameter #4) is set (Master mode only).
7	Master Continuous Polling Enable	R/W	User	UINT8	1	0 → 1	0	1.00	Controls whether the Modbus master poll request sequence specified is executed on a continuous basis (Master mode only). Valid values are 0 (Continuous polling disabled) and 1 (Continuous polling enabled).
8	Master Poll Request Delay	R/W	User	FL	4	0 → 86400 (24 hrs)	0	1.00	Contains the delay time in seconds between continuous master poll requests (Continuous poll mode only).
9	RESERVED	R/O	System	UINT8	1	0	0	1.00	Reserved for future use.
10	Low Integer Scale	R/W	User	INT16	2	–32768 → 32767	0	1.00	Contains the lower limit value when scaling floating-point data.
11	High Integer Scale	R/W	User	INT16	2	–32768 → 32767	4095	1.00	Contains the upper limit value when scaling floating-point data.
12	Low Float Scale 1	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 1 when converting integers to floats and vice-versa.
13	High Float Scale 1	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 1 when converting integers to floats and vice-versa.
14	Low Float Scale 2	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 2 when converting integers to floats and vice-versa.
15	High Float Scale 2	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 2 when converting integers to floats and vice-versa.
16	Low Float Scale 3	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 3 when converting integers to floats and vice-versa.
17	High Float Scale 3	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 3 when converting integers to floats and vice-versa.
18	Low Float Scale 4	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 4 when converting integers to floats and vice-versa.
19	High Float Scale 4	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 4 when converting integers to floats and vice-versa.

Point Type 117, Modbus Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Low Float Scale 5	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 5 when converting integers to floats and vice-versa.
21	High Float Scale 5	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 5 when converting integers to floats and vice-versa.
22	Low Float Scale 6	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 6 when converting integers to floats and vice-versa.
23	High Float Scale 6	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 6 when converting integers to floats and vice-versa.
24	Low Float Scale 7	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 7 when converting integers to floats and vice-versa.
25	High Float Scale 7	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 7 when converting integers to floats and vice-versa.
26	Low Float Scale 8	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the lower limit in float range 8 when converting integers to floats and vice-versa.
27	High Float Scale 8	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.00	Contains the upper limit in float range 8 when converting integers to floats and vice-versa.
28	Master Poll Timeout	R/W	User	U8	1	1 → 255	30	1.00	Amount of time in seconds Modbus master will wait for a slave response. (Master mode only).
29	Master Poll Number of Retries	R/W	User	U8	1	0 → 255	2	1.00	Number of retries Modbus Master will attempt on a particular request number in the Master Poll Table before giving-up and going to the next request number. (Master mode only).

3.4.31 Point Type 118: Modbus Register to TLP Mapping

Description: Point type 118 provides the Modbus Register to TLP Mapping parameters for mapping ROC Plus Protocol TLPs to Modbus Protocol Registers.

Number of Logical Points: 24 logical points for Modbus Register to TLP Mapping may exist.

Storage Location: Point type 118 is saved to internal configuration memory.

Table 3-32: Point Type 118, Modbus Register to TLP Mapping

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag ID	R/W	User	AC	10	0x20 → 0x7E for each byte	"Reg Map #"	1.00	String that describes the instance of the mapping table.
1	Start Register #1	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the first range of Modbus registers that map to ROC Plus Protocol TLP(s).
2	End Register #1	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the first range of Modbus registers that map to ROC Plus Protocol TLP(s).
3	ROC Parameter(s) (Reg Range 1)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the first range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
4	Indexing (Reg Range 1)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
5	Conversion Code (Reg Range 1)	R/W	User	UINT8	1	0 → 8, 25 →29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. Valid codes are: 0 = No Conversion 1 = Float to Signed Integer, Float Scale 1 2 = Float to Signed Integer, Float Scale 2 3 = Float to Signed Integer, Float Scale 3 4 = Float to Signed Integer, Float Scale 4 5 = Float to Signed Integer, Float Scale 5 6 = Float to Signed Integer, Float Scale 6 7 = Float to Signed Integer, Float Scale 7 8 = Float to Signed Integer, Float Scale 8 9 = Convert Anything to Signed Long with 1 Implied Decimal Place 10 = Convert Anything to Signed Long with 2 Implied

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									Decimal Places 11 = Convert Anything to Signed Long with 3 Implied Decimal Places 12 = Convert Anything to Signed Long with 4 Implied Decimal Places 13 = Convert Anything to Signed Long with 5 Implied Decimal Places 14 = Convert Anything to Signed Long with 6 Implied Decimal Places 15 = Convert Anything to Signed Long with 7 Implied Decimal Places 16 = Convert Anything to Signed Long with 8 Implied Decimal Places 17 = Convert Anything to Unsigned Long with 1 Implied Decimal Place 18 = Convert Anything to Unsigned Long with 2 Implied Decimal Places 19 = Convert Anything to Unsigned Long with 3 Implied Decimal Places 20 = Convert Anything to Unsigned Long with 4 Implied Decimal Places 21 = Convert Anything to Unsigned Long with 5 Implied Decimal Places 22 = Convert Anything to Unsigned Long with 6 Implied Decimal Places 23 = Convert Anything to Unsigned Long with 7 Implied Decimal Places 24 = Convert Anything to Unsigned Long with 8 Implied Decimal Places 25 = Convert Anything to Float, No Scaling 26 = Convert Anything to a Signed Short Integer 27 = Convert Anything to a Signed Long Integer 28 = Convert Anything to an Unsigned Short Integer 29 = Convert Anything to an Unsigned Long Integer 37 = Unsigned Byte to a Packed Bit 41 = Convert Anything to Signed Short with 1 Implied Decimal Place 42 = Convert Anything to Signed Short with 2 Implied Decimal Places 43 = Convert Anything to Signed Short with 3 Implied Decimal Places 44 = Convert Anything to Signed Short with 4 Implied Decimal Places 45 = Convert Anything to Signed Short with 5 Implied Decimal Places 46 = Convert Anything to Signed Short with 6 Implied Decimal Places 47 = Convert Anything to Signed Short with 7 Implied Decimal Places

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									48 = Convert Anything to Signed Short with 8 Implied Decimal Places 49 = Convert Anything to Unsigned Short with 1 Implied Decimal Place 50 = Convert Anything to Unsigned Short with 2 Implied Decimal Places 51 = Convert Anything to Unsigned Short with 3 Implied Decimal Places 52 = Convert Anything to Unsigned Short with 4 Implied Decimal Places 53 = Convert Anything to Unsigned Short with 5 Implied Decimal Places 54 = Convert Anything to Unsigned Short with 6 Implied Decimal Places 55 = Convert Anything to Unsigned Short with 7 Implied Decimal Places 56 = Convert Anything to Unsigned Short with 8 Implied Decimal Places 57 = Convert Anything to Signed Long 0, 1, 2, 3 58 = Convert Anything to Unsigned Long 0, 1, 2, 3 59 = Convert Anything to Signed Long 1, 0, 3, 2 60 = Convert Anything to Unsigned Long 1, 0, 3, 2 61 = Convert Anything to Signed Long 2, 3, 0, 1 62 = Convert Anything to Unsigned Long 2, 3, 0, 1 63 = Convert Anything to Signed Long 3, 2, 1, 0 1 64 = Convert Anything to Unsigned Long 3, 2, 1, 0 65 = IEEE Floating Point Number 0, 1, 2, 3 66 = IEEE Floating Point Number 0, 1, 2, 3, Disregard MSB flag 67 = IEEE Floating Point Number 1, 0, 3, 2 68 = IEEE Floating Point Number 1, 0, 3, 2, Disregard MSB flag 69 = IEEE Floating Point Number 2, 3, 0, 1 70 = IEEE Floating Point Number 2, 3, 0, 1, Disregard MSB flag 71 = IEEE Floating Point Number 3, 2, 1, 0 72 = IEEE Floating Point Number 3, 2, 1, 0, Disregard MSB flag 73 = Double 01, 23, 45, 67, Disregard MSB flag 74 = Double 23, 01, 67, 45, Disregard MSB flag 75 = Double 45, 67, 01, 23, Disregard MSB flag 76 = Double 67, 45, 32, 01, Disregard MSB flag 77 = Double 10, 32, 45, 67, Disregard MSB flag 78 = Double 32, 10, 76, 54, Disregard MSB flag 79 = Double 54, 76, 10, 32, Disregard MSB flag 80 = Double 76, 54, 32, 10, Disregard MSB flag 81 = ASCII, Two characters per 16-bit register

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Comm Port (Reg Range 1)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the first range of registers map. Vallid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
7	Start Register #2	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the second range of Modbus registers that map to ROC Plus Protocol TLP(s).
8	End Register #2	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the second range of Modbus registers that map to ROC Plus Protocol TLP(s).
9	ROC Parameter(s) (Reg Range 2)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the second range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
10	Indexing (Reg Range 2)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
11	Conversion Code (Reg Range 2)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
12	Comm Port (Reg Range 2)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the second range of registers map: Valid values are: . 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
13	Start Register #3	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the third range of Modbus registers that map to ROC Plus Protocol TLP(s).
14	End Register #3	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the third range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	ROC Parameter(s) (Reg Range 3)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the third range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
16	Indexing (Reg Range 3)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
17	Conversion Code (Reg Range 3)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
18	Comm Port (Reg Range 3)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the third range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
19	Start Register #4	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the fourth range of Modbus registers that map to ROC Plus Protocol TLP(s).
20	End Register #4	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the fourth range of Modbus registers that map to ROC Plus Protocol TLP(s).
21	ROC Parameter(s) (Reg Range 4)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the fourth range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
22	Indexing (Reg Range 4)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
23	Conversion Code (Reg Range 4)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. See note 2

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	Comm Port (Reg Range 4)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the fourth range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
25	Start Register #5	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the fifth range of Modbus registers that map to ROC Plus Protocol TLP(s).
26	End Register #5	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the fifth range of Modbus registers that map to ROC Plus Protocol TLP(s).
27	ROC Parameter(s) (Reg Range 5)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the fifth range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
28	Indexing (Reg Range 5)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
29	Conversion Code (Reg Range 5)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
30	Comm Port (Reg Range 5)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the fifth range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
31	Start Register #6	R/W	User	UINT16	2	0 – 65535	0	1.00	The starting register number for the sixth range of Modbus registers that map to ROC Plus Protocol TLP(s).
32	End Register #6	R/W	User	UINT16	2	0 – 65535	0	1.00	The ending register number for the sixth range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33	ROC Parameter(s) (Reg Range 6)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the sixth range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
34	Indexing (Reg Range 6)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
35	Conversion Code (Reg Range 6)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
36	Comm Port (Reg Range 6)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the sixth range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
37	Start Register #7	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the seventh range of Modbus registers that map to ROC Plus Protocol TLP(s).
38	End Register #7	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the seventh range of Modbus registers that map to ROC Plus Protocol TLP(s).
39	ROC Parameter(s) (Reg Range 7)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the seventh range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
40	Indexing (Reg Range 7)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
41	Conversion Code (Reg Range 7)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42	Comm Port (Reg Range 7)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the seventh range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
43	Start Register #8	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the eighth range of Modbus registers that map to ROC Plus Protocol TLP(s).
44	End Register #8	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the eighth range of Modbus registers that map to ROC Plus Protocol TLP(s).
45	ROC Parameter(s) (Reg Range 8)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the eighth range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
46	Indexing (Reg Range 8)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
47	Conversion Code (Reg Range 8)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
48	Comm Port (Reg Range 8)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the eighth range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
49	Start Register #9	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the ninth range of Modbus registers that map to ROC Plus Protocol TLP(s).
50	End Register #9	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the ninth range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
51	ROC Parameter(s) (Reg Range 9)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the ninth range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
52	Indexing (Reg Range 9)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
53	Conversion Code (Reg Range 9)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
54	Comm Port (Reg Range 9)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the ninth range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
55	Start Register #10	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the tenth range of Modbus registers that map to ROC Plus Protocol TLP(s).
56	End Register #10	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the tenth range of Modbus registers that map to ROC Plus Protocol TLP(s).
57	ROC Parameter(s) (Reg Range 10)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the tenth range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
58	Indexing (Reg Range 10)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
59	Conversion Code (Reg Range 10)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
60	Comm Port (Reg Range 10)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the tenth range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
61	Start Register #11	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the 11th range of Modbus registers that map to ROC Plus Protocol TLP(s).
62	End Register #11	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the 11th range of Modbus registers that map to ROC Plus Protocol TLP(s).
63	ROC Parameter(s) (Reg Range 11)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the 11th range of Modbus registers **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
64	Indexing (Reg Range 11)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
65	Conversion Code (Reg Range 11)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
66	Comm Port (Reg Range 11)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the 11th range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
67	Start Register #12	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the 12th range of Modbus registers that map to ROC Plus Protocol TLP(s).
68	End Register #12	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the 12th range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
69	ROC Parameter(s) (Reg Range 12)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the 12th range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
70	Indexing (Reg Range 12)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
71	Conversion Code (Reg Range 12)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
72	Comm Port (Reg Range 12)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the 12th range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
73	Start Register #13	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the 13th range of Modbus registers that map to ROC Plus Protocol TLP(s).
74	End Register #13	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the 13th range of Modbus registers that map to ROC Plus Protocol TLP(s).
75	ROC Parameter(s) (Reg Range 13)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the 13th range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
76	Indexing (Reg Range 13)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
77	Conversion Code (Reg Range 13)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
78	Comm Port (Reg Range 13)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the 13th range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
79	Start Register #14	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the 14th range of Modbus registers that map to ROC Plus Protocol TLP(s).
80	End Register #14	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the 14th range of Modbus registers that map to ROC Plus Protocol TLP(s).
81	ROC Parameter(s) (Reg Range 14)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the 14th range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
82	Indexing (Reg Range 14)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
83	Conversion Code (Reg Range 14)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
84	Comm Port (Reg Range 14)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the 14th range of registers map. Valid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
85	Start Register #15	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting register number for the 15th range of Modbus registers that map to ROC Plus Protocol TLP(s).
86	End Register #15	R/W	User	UINT16	2	0 → 65535	0	1.00	The ending register number for the 15th range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118, Modbus Register to TLP Mapping

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
87	ROC Parameter(s) (Reg Range 15)	R/W	User	TLP	3	See note	0, 0, 0	1.00	The starting ROC Plus Protocol TLP that maps to the 15th range of Modbus registers. **Note**: Any TLP is valid except for the Program Flash Parameters (PT 90).
88	Indexing (Reg Range 15)	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. Valid values are 0 (Logical indexing) and 1 (Parameter indexing).
89	Conversion Code (Reg Range 15)	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 5 for valid codes.
90	Comm Port (Reg Range 15)	R/W	User	UINT8	1	0 → 5, 255	255	1.00	Communication port to which the 15th range of registers map. Valkid values are: 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports

3.4.32 Point Type 119: Modbus Event, Alarm, and History Table

Description: Point type 119 provides the Modbus Event, Alarm, and History Table parameters for allowing Modbus to bring back the event log, the alarm log, and history archives.

Number of Logical Points: 1 logical point for Modbus Event, Alarm, and History Table may exist.

Storage Location: Point type 119 is saved to internal configuration memory.

Table 3-33: Point Type 119, Modbus Event, Alarm, and History Table

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Event/Alarm Register	R/W	User	UINT16	2	0 → 65535	32	1.00	Contains a unique register number that indicates the request is for Events and Alarm records.
1	Current Date Register	R/W	User	UINT16	2	0 → 65535	7046	1.00	Contains a unique register that allows a Modbus read/write command to access the current date in MMDDYY format
2	Current Time Register	R/W	User	UINT16	2	0 → 65535	7047	1.00	Contains a unique register that allows a Modbus read/write command to access the current time in HHMMSS format
3	Periodic History Register #1	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the first range of history points.
4	Daily History Register #1	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the first range of history points.
5	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 1.
6	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 1.
7	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 1.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. Valid conversion codes are: 0 = No Conversion 65 = IEEE Floating Point Number 0, 1, 2, 3 66 = IEEE Floating Point Number 0, 1, 2, 3, Disregard MSB flag 67 = IEEE Floating Point Number 1, 0, 3, 2 68 = IEEE Floating Point Number 1, 0, 3, 2, Disregard MSB flag 69 = IEEE Floating Point Number 2, 3, 0, 1 70 = IEEE Floating Point Number 2, 3, 0, 1, Disregard MSB flag 71 = IEEE Floating Point Number 3, 2, 1, 0 72 = IEEE Floating Point Number 3, 2, 1, 0, Disregard MSB flag
9	Periodic History Register #2	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the second range of history points.
10	Daily History Register #2	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the second range of history points.
11	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 2.
12	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 2.
13	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 2.
14	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
15	Periodic History Register #3	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the third range of history points.
16	Daily History Register #3	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the third range of history points.
17	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 3.
18	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 3.
19	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 3.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
21	Periodic History Register #4	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the fourth range of history points.
22	Daily History Register #4	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the fourth range of history points.
23	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 4.
24	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 4.
25	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 4.
26	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
27	Periodic History Register #5	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the fifth range of history points.
28	Daily History Register #5	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the fifth range of history points.
29	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 5.
30	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 5.
31	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 5.
32	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
33	Periodic History Register #6	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the sixth range of history points.
34	Daily History Register #6	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the sixth range of history points.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 6.
36	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 6.
37	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 6.
38	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
39	Periodic History Register #7	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the seventh range of history points.
40	Daily History Register #7	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the seventh range of history points.
41	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 7.
42	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 7.
43	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 7.
44	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
45	Periodic History Register #8	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the eighth range of history points.
46	Daily History Register #8	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the eighth range of history points.
47	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 8.
48	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 8.
49	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 8.
50	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
51	Periodic History Register #9	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the ninth range of history points.
52	Daily History Register #9	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the ninth range of history points.
53	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 9.
54	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 9.
55	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 9.
56	Conversion Code	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
57	Periodic History Register #10	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the tenth range of history points.
58	Daily History Register #10	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the tenth range of history points.
59	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 10.
60	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 10.
61	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 10.
62	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
63	Periodic History Register #11	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the eleventh range of history points.
64	Daily History Register #11	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the eleventh range of history points.
65	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 11.
66	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 11.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
67	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 11.
68	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
69	Periodic History Register #12	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the twelfth range of history points.
70	Daily History Register #12	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the twelfth range of history points.
71	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 12.
72	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 12.
73	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 12.
74	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
75	Periodic History Register #13	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the thirteenth range of history points.
76	Daily History Register #13	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the thirteenth range of history points.
77	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 13.
78	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 13.
79	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 13.
80	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
81	Periodic History Register #14	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the fourteenth range of history points.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
82	Daily History Register #14	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the fourteenth range of history points.
83	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 14.
84	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 14.
85	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 14.
86	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
87	Periodic History Register #15	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the fifteenth range of history points.
88	Daily History Register #15	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the fifteenth range of history points.
89	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 15.
90	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 15.
91	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 15.
92	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
93	Periodic History Register #16	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the sixteenth range of history points.
94	Daily History Register #16	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the sixteenth range of history points.
95	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 16.
96	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 16.
97	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 16.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
98	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
99	Periodic History Register #17	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the seventeenth range of history points.
100	Daily History Register #17	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the seventeenth range of history points.
101	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 17.
102	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 17.
103	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 17.
104	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
105	Periodic History Register #18	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the eighteenth range of history points.
106	Daily History Register #18	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the eighteenth range of history points.
107	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 18.
108	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 18.
109	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 18.
110	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-SEries data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
111	Periodic History Register #19	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the nineteenth range of history points.
112	Daily History Register #19	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the nineteenth range of history points.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
113	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 19.
114	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 19.
115	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 19.
116	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.
117	Periodic History Register #20	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for periodic values for the twentieth range of history points.
118	Daily History Register #20	R/W	User	UINT16	2	0 → 65535	0	1.00	Contains a unique register number that indicates the request is for daily values for the twentieth range of history points.
119	History Segment	R/W	User	UINT8	1	0→10	0	1.00	Contains the history segment for range 20.
120	Start History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the starting history point number for range 20.
121	End History Point	R/W	User	UINT16	2	0→199	0	1.00	Contains the ending history point number for range 20.
122	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.00	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter 8 for a list of codes.

Point Type 119, Modbus Event, Alarm, and History Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
123	History Index Mode	R/W	User	UINT8	1	0 →	0	1.00	Indicates the history indexing mode. Valid values are: 0 = EFM Extensions Mode: History Indexes (mapped to TLP[124,X,5] and [124,X,6]) will be returned as one less - accounting for roll-over - corresponding to last entry location. History data will be returned for the index requested. 1 = Override mode 1: History Indexes (mapped to TLP[124,X,5] and [124,X,6]) will be returned unmodified (index is to the next record to be written). History data will be returned for the index requested. 2 = Override mode 2: History Indexes (mapped to TLP[124,X,5] and [124,X,6]) will be returned unmodified (index is to the next record to be written). History data will be returned at an index one less than the index requested, accounting for rollover. If a request for history data at an index beyond the number of valid indices is received, the ROC will respond with history data at the last valid index (For example, if there are 35 daily entries, valid indices are 0-34. Requests for index 35, 36, 37, etc. will all return history for index 34). Override mode 2 was implemented in firmware version 1.00.

3.4.33 Point Type 120: Modbus Master Modem Configuration

Description: Point type 120 provides the configuration parameters for configuring Modbus Protocol master modem communication.

Number of Logical Points: 5 logical points for Modbus Master Modem Configuration may exist corresponding to Comm1 through Comm 5.

Storage Location: Point type 120 is saved to internal configuration memory.

Table 3-34: Point Type 120, Modbus Master Modem Configuration

Point Type 120, Modbus Master Modem Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag ID	R/W	User	AC	10	0x20 → 0x7E for each byte	'Modem #'	1.00	String that describes the instance of the Master modem table.
1	First RTU Address	R/W	User	UINT8	1	0 → 255	0	1.00	Associates an RTU address to the Connect Command.
2	First Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.00	A 40-character modem command typically used to represent the telephone number of the slave RTU.
3	Second RTU Address	R/W	User	UINT8	1	0 → 255	0	1.00	Associates an RTU address to the Connect Command.
4	Second Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.00	A 40-character modem command typically used to represent the telephone number of the slave RTU.
5	Third RTU Address	R/W	User	UINT8	1	0 → 255	0	1.00	Associates an RTU address to the Connect Command.
6	Third Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.00	A 40-character modem command typically used to represent the telephone number of the slave RTU.
7	Fourth RTU Address	R/W	User	UINT8	1	0 → 255	0	1.00	Associates an RTU address to the Connect Command.
8	Fourth Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.00	A 40-character modem command typically used to represent the telephone number of the slave RTU.
9	Fifth RTU Address	R/W	User	UINT8	1	0 → 255	0	1.00	Associates an RTU address to the Connect Command.
10	Fifth Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.00	A 40-character modem command typically used to represent the telephone number of the slave RTU.
11	Sixth RTU Address	R/W	User	UINT8	1	0 → 255	0	1.00	Associates an RTU address to the Connect Command.

Point Type 120, Modbus Master Modem Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Sixth Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.00	A 40-character modem command typically used to represent the telephone number of the slave RTU.

3.4.34 Point Type 121: Modbus Master Table

Description: Point type 121 provides the Modbus Master Table parameters for configuring Modbus Protocol master communication.

Number of Logical Points: 15 logical points for Modbus Master Table may exist (3 tables per communication port).

Storage Location: Point type 121 is saved to internal configuration memory.

Table 3-35: Point Type 121, Modbus Master Table

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag ID	R/W	User	AC	10	0x20 → 0x7E for each byte	'MastTbl #'	1.00	String that describes the instance of the Master table.
1	RTU 1 Address	R/W	User	UINT8	1	0 →255	0	1.00	Contains RTU 1 Address the Modbus Query is destined for
2	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 1. Valid Modbus function codes are: 0 = Disables the query. 1 = Send register contents to master (Read Coil Status) 2 = Send register contents to master (Read Input Status) 3 = Send register contents to master (Read Holding Registers) 4 = Send register contents to master (Read Input Registers) 5 = Set a single register value on slave (Force Single Coil) 6 = Set a single register value on slave (Preset Single Register) 8 = Return data sent to slave back to master (Loopback) 15 = Set multiple register values on a slave (Force Multiple Coils) 16 = Set multiple register values on a slave (Preset Multiple Registers)
3	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 1.
4	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
5	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. Valid communication status codes are: 0 = Inactive or start of transmission 1 = Received timeout error 2 = Received address check 3 = Received Function Code check 4 = Number of expected bytes check 8 = Valid slave response 128 = Write ROC data error 129 = Access ROC data error 130 = Master Table error Status values 0 and 3 through 8 are active on the master transmission. These values appear for a very short time and step to the next value if the process is without error. If an error occurs in the step, then the value is present until the next transmission is requested. A transmission without error has a status value of 8, valid slave response.
7	RTU 2 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 2 Address the Modbus Query is destined for
8	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 2. **Note**: See parameter 2 for a list of function codes.
9	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 2.
10	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
11	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
12	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
13	RTU 3 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 3 Address the Modbus Query is destined for.
14	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 3. **Note**: See parameter 2 for a list of function codes.
15	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 3.

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
16	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
17	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
18	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
19	RTU 4 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 4 Address the Modbus Query is destined for
20	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 4. **Note**: See parameter 2 for a list of function codes.
21	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 4.
22	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
23	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
24	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
25	RTU 5 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 5 Address the Modbus Query is destined for
26	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 5. **Note**: See parameter 2 for a list of function codes.
27	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 5.
28	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
29	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
30	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
31	RTU 6 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 6 Address the Modbus Query is destined for

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 6. **Note**: See parameter 2 for a list of function codes.
33	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 6.
34	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
35	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
36	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
37	RTU 7 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 7 Address the Modbus Query is destined for
38	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 7. **Note**: See parameter 2 for a list of function codes.
39	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 7.
40	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
41	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
42	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
43	RTU 8 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 8 Address the Modbus Query is destined for
44	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 8. **Note**: See parameter 2 for a list of function codes.
45	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 8.
46	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
47	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
48	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
49	RTU 9 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 9 Address the Modbus Query is destined for
50	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 9. **Note**: See parameter 2 for a list of function codes.
51	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 9.
52	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
53	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
54	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
55	RTU 10 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 10 Address the Modbus Query is destined for
56	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 10. **Note**: See parameter 2 for a list of function codes.
57	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 10.
58	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
59	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
60	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
61	RTU 11 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 11 Address the Modbus Query is destined for
62	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 11. **Note**: See parameter 2 for a list of function codes.
63	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 11.

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
64	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
65	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
66	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
67	RTU 12 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 12 Address the Modbus Query is destined for
68	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 12. **Note**: See parameter 2 for a list of function codes.
69	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 12.
70	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
71	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
72	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
73	RTU 13 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 13 Address the Modbus Query is destined for
74	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 13. **Note**: See parameter 2 for a list of function codes.
75	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 13.
76	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
77	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
78	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
79	RTU 14 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 14 Address the Modbus Query is destined for

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
80	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 14. **Note**: See parameter 2 for a list of function codes.
81	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 14.
82	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
83	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
84	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
85	RTU 15 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 15 Address the Modbus Query is destined for
86	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 15. **Note**: See parameter 2 for a list of function codes.
87	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 15.
88	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
89	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
90	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
91	RTU 16 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 16 Address the Modbus Query is destined for
92	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 16. **Note**: See parameter 2 for a list of function codes.
93	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 16.
94	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
95	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
96	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
97	RTU 17 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 17 Address the Modbus Query is destined for
98	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 17. **Note**: See parameter 2 for a list of function codes.
99	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 17.
100	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
101	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
102	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
103	RTU 18 Address	R/W	User	UINT8	1	0 – 255	0	1.00	Contains RTU 18 Address the Modbus Query is destined for
104	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 18. **Note**: See parameter 2 for a list of function codes.
105	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 18.
106	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
107	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
108	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
109	RTU 19 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 19 Address the Modbus Query is destined for
110	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 19. **Note**: See parameter 2 for a list of function codes.
111	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 19.

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
112	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
113	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
114	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
115	RTU 20 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 20 Address the Modbus Query is destined for
116	Function Code Number	R/W	User	UINT8	1	0 →15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 20. **Note**: See parameter 2 for a list of function codes.
117	Slave Register Number	R/W	User	UINT16	2	0 →535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 20.
118	Master Register Number	R/W	User	UINT16	2	0 →535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
119	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
120	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
121	RTU 21 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 21 Address the Modbus Query is destined for
122	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 21. **Note**: See parameter 2 for a list of function codes.
123	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 21.
124	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
125	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
126	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
127	RTU 22 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 22 Address the Modbus Query is destined for

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
128	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 22. **Note**: See parameter 2 for a list of function codes.
129	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 22.
130	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
131	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
132	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
133	RTU 23 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 23 Address the Modbus Query is destined for
134	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 23. **Note**: See parameter 2 for a list of function codes.
135	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 23.
136	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
137	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
138	Communication Status	R/W	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
139	RTU 24 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 24 Address the Modbus Query is destined for
140	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 24. **Note**: See parameter 2 for a list of function codes.
141	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 24.
142	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
143	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.

Point Type 121, Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
144	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.
145	RTU 25 Address	R/W	User	UINT8	1	0 → 255	0	1.00	Contains RTU 25 Address the Modbus Query is destined for
146	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.00	Specifies the Modbus Function Code to be sent to the slave device on RTU 25. **Note**: See parameter 2 for a list of function codes.
147	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the slave device for the query on RTU 25.
148	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.00	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read or provided for a write.
149	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.00	The number of registers for the master to either read or write.
150	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.00	Displays the status of the master query. **Note**: See parameter 6 for a list of status codes.

3.4.35 Point Type 122: DS800 Configuration

Description: This point type provides parameters used to configure DS800. This table is speculative, to be modified if/when more information is available

Number of Logical Points: 1 logical point for DS800 Configuration may exist.

Storage Location: Point type 122 is saved to internal configuration memory.

Table 3-36. Point Type 122, DS800 Configuration

Point Type 122, DS800 Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Power Switch	R/W	User	UINT8	1	0,1	1	1.00	Turns DS800 on and off. Valid values are 0 (OFF) and 1 (ON).
1	RSI Enable	R/W	User	UINT8	1	0,1	1	1.00	Enables/Disables the DS800 serial task. Valid values are 0 (Disable) and 1 (Enable). Changes to this parameter take affect when DS800 is stopped and started again.
2	ETCP Enable	R/W	User	UINT8	1	0,1	1	1.00	Enables/Disables the DS800 TCP/IP task. Valid values are 0 (Disable) and 1 (Enable). Changes to this parameter take affect when DS800 is stopped and started again.
3	IXD Enable	R/W	User	UINT8	1	0,1	1	1.00	Enables/Disables the DS800 IXD task. Valid values are 0 (Disable) and 1 (Enable). Changes to this parameter take affect when DS800 is stopped and started again.
4	RSI Running	R/O	System	UINT8	1	0,1	1	1.00	Indicates whether the DS800 serial task is currently running. Valid values are 0 (Not running) and 1 (Running).
5	ETCP Running	R/O	System	UINT8	1	0,1	1	1.00	Indicates whether the DS800 TCP/IP task is currently running. Valid values are 0 (Not running) and 1 (Running).
6	IXD Running	R/O	System	UINT8	1	0,1	1	1.00	Indicates whether the DS800 IXD task is currently running. Valid values are 0 (Not running) and 1 (Running).
7	Clean Stored Resources	R/W	User	UINT8	1	0,1	0	1.00	Setting this parameter to **1** removes all stored resources from file system. This does **not** stop resources that may be running but running resources will not be reloaded when you toggle the power switch.
8	Resource 1 Name	R/O	System	AC	20	0x02 → 0x7E for each byte	“ “	1.00	Indicates the name of the specified resource

Point Type 122, DS800 Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Resource 1 Status	R/O	System	INT8	1	0 → 120	0	1.00	Indicates the resource's status code. Valild values are: -1 = Fatal Error 0 = No resource available 1 = Stored resource available 2 = Ready to run 3 = Run in real time 4 = Run in cycle by cycle 5 = Run with breakpoint encountered (not currentl supported)
10	Resource 1 Programmed Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the defined cycle time for the specified resource
11	Resource 1 Current Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the current cycle time for the specified resource
12	Resource 2 Name	R/O	System	AC	20	0x02 → 0x7E for each byte	" "	1.00	Indicates the name of the specified resource
13	Resource 2 Status	R/O	System	INT8	1	0 → 120	0	1.00	Indicates the resource's status code. Valild values are: -1 = Fatal Error 0 = No resource available 1 = Stored resource available 2 = Ready to run 3 = Run in real time 4 = Run in cycle by cycle 5 = Run with breakpoint encountered (not currentl supported)
14	Resource 2 Programmed Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the defined cycle time for the specified resource
15	Resource 2 Current Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the current cycle time for the specified resource
16	Resource 3 Name	R/O	System	AC	20	0x02 → 0x7E for each byte	" "	1.00	Indicates the name of the specified resource
17	Resource 3 Status	R/O	System	INT8	1	0 → 120	0	1.00	Indicates the resource's status code. Valild values are: -1 = Fatal Error 0 = No resource available 1 = Stored resource available 2 = Ready to run 3 = Run in real time 4 = Run in cycle by cycle 5 = Run with breakpoint encountered (not currentl supported)
18	Resource 3 Programmed Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the defined cycle time for the specified resource

Point Type 122, DS800 Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19	Resource 3 Current Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the current cycle time for the specified resource
20	Resource 4 Name	R/O	System	AC	20	0x02 → 0x7E for each byte	" "	1.00	Indicates the name of the specified resource
21	Resource 4 Status	R/O	System	INT8	1	0 → 120	0	1.00	Indicates the resource's status code. Valild values are: -1 = Fatal Error 0 = No resource available 1 = Stored resource available 2 = Ready to run 3 = Run in real time 4 = Run in cycle by cycle 5 = Run with breakpoint encountered (not currentl supported)
22	Resource 4 Programmed Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the defined cycle time for the specified resource
23	Resource 4 Current Cycle Time	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates in milliseconds the current cycle time for the specified resource

3.4.36 Point Type 123: Security – Group Configuration

Description: Point type 123 provides the Group Configuration parameters used in conjunction with point type 92 to define which users are a member of which group.

Number of Logical Points: 1 logical point for this point type may exist.

Storage Location: Point type 123 is saved to internal configuration memory.

Table 3-37. Point Type 123, Security – Group Configuration

Point Type 123, Security – Group Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Group #1	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
1	Group #2	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
2	Group #3	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
3	Group #4	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
4	Group #5	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
5	Group #6	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
6	Group #7	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
7	Group #8	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
8	Group #9	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
9	Group #10	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
10	Group #11	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
11	Group #12	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
12	Group #13	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier

Point Type 123, Security – Group Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Group #14	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
14	Group #15	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
15	Group #16	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
16	Group #17	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
17	Group #18	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
18	Group #19	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier
19	Group #20	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.00	Group identifier

3.4.37 Point Type 124: History Segment Configuration

Description: Point Type 124 is used to configure the number of history points that exist in a history segment, as well as specifying the sizes of the history points in that segment. This point type also controls the sampling rate for periodic entries and allows the user to turn off archiving for history points in a given segment.

Number of Logical Points: 13 logical units of this point type may exist

Storage Location: Point type 124 is saved to configuration memory.

Table 3-38: Point Type 124, History Segment Configuration

Point Type 124, History Segment Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Segment Description	R/W	User	AC	10	0x20 → 0x7E for each byte	Logic 0: “General 00” Logic 1 – 10: Segment XX”	1.00	Identifies what the segment of history is used for. For logical points 1 – 10, “XX” is the ordered number of the history type.
1	Segment Size	Logic 0: R/O Logic 1 - 10: R/W	User	UINT16	2	0 – 200	Logic 0: 200 Logic 1 – 10: 0	1.00	Specifies how many history points are in the history segment. For Logic 0, this parameter is R/O. **Note**: You cannot modify this parameter from an FST, nor can you set this value to less than the value of parameter 12 (Number of Configured Points). .
2	Maximum Segment Size	R/O	System	UINT16	2	200	200	1.00	Specifies the maximum number of history points that may be configured for the history segment.
3	Periodic Entries	R/W	User	UINT16	2	0 - 65535	840	1.00	Number of periodic entries per history point in the history segment. Actual upper range is limited by available free space.
4	Daily Entries	R/W	User	UINT16	2	0 - 65535	35	1.00	Number of daily entries per history point in the history segment.
5	Periodic Index	R/O	System	UINT16	2	0 – (#Periodic Entries – 1)	0	1.00	Location in each history point for the segment where the next periodic entry will be saved.
6	Daily Index	R/O	System	UINT16	2	0 – (#Daily Entries – 1)	0	1.00	Location in each history point for the segment where the next daily entry will be saved.
7	Periodic Sample Rate	R/W	User	UINT8	1	1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60	60	1.00	The number of minute intervals that pass before an entry is made in the periodic history.
8	Contract Hour	R/W	User	UINT8	1	0 – 23	0	1.00	Hour that indicates the beginning of a new day.

Point Type 124, History Segment Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	ON/OFF Switch	R/W	User	UINT8	1	0 – 1	1	1.00	Switch that controls history logging for the history segment. Logging is suspended while the switch is off. Valid values are 0 (Off) and 1 (On).
10	Free Space	R/O	System	UINT32	4	0 - 187000	187000	1.00	Specifies the number of history entries that are unaccounted for and may be added to history points in various segments. This value applies to all history segments.
11	Force End of Day	R/W	User	UINT8	1	0 – 1	0	1.00	Allows the user to force an end of day for the history segment. Valid values are 0 (No Force) and 1 (Force End of Day).
12	Number of Configured Points	R/O	System	UINT16	2	0-200	0	1.00	Number of history points that are configured in the segment.
13	User Weighting TLP	R/W	User	TLP	3	Use any numerical parameter (excluding TLPs and ACs)	0,0,0	1.30	Indicates the parameter of the value to use as the weight when averaging type 6 (User Weighted Average).

3.4.38 Point Type 125: History Segment 0 Point Configuration

Description: Point Type 125 provides the history configuration parameters for History Segment 0.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 0.

Storage Location: Point type 125 is saved to internal configuration memory.

Table 3-39: Point Type 125, History Segment 0 Point Configuration

Point Type 125, History Segment 0 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Averaging:

Point Type 125, History Segment 0 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.39 Point Type 126: History Segment 1 Point Configuration

Description: Point Type 126 provides the history configuration parameters for History Segment 1.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 1.

Storage Location: Point type 126 is saved to internal configuration memory.

Table 3-40: Point Type 126, History Segment 1 Point Configuration

Point Type 126, History Segment 1 Point

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30)

Point Type 126, History Segment 1 Point

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.40 Point Type 127: History Segment 2 Point Configuration

Description: Point Type 127 provides the history configuration parameters for History Segment 2

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 2.

Storage Location: Point type 127 is saved to internal configuration memory.

Table 3-41: Point Type 127, History Segment 2 Point Configuration

Point Type 127, History Segment 2 Point

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See note	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note 2	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30)

Point Type 127, History Segment 2 Point

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.41 Point Type 128: History Segment 3 Point Configuration

Description: Point Type 128 provides the history configuration parameters for History Segment 3.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 3.

Storage Location: Point type 128 is saved to internal configuration memory.

Table 3-42: Point Type 128, History Segment 3 Point Configuration

Point Type 128, History Segment 3 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 128, History Segment 3 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.42 Point Type 129: History Segment 4 Point Configuration

Description: Point Type 129 provides the history configuration parameters for History Segment 4.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 4.

Storage Location: Point type 129 is saved to internal configuration memory.

Table 3-43: Point Type 129, History Segment 4 Point Configuration

Point Type 129, History Segment 4 Point

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 129, History Segment 4 Point

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.43 Point Type 130: History Segment 5 Point Configuration

Description: Point Type 130 provides the history configuration parameters for History Segment 5.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 5.

Storage Location: Point type 130 is saved to internal configuration memory.

Table 3-44: Point Type 130, History Segment 5 Point Configuration

Point Type 130, History Segment 5 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 130, History Segment 5 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.44 Point Type 131: History Segment 6 Point Configuration

Description: Point Type 131 provides the history configuration parameters for History Segment 6.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 6.

Storage Location: Point type 131 is saved to internal configuration memory.

Table 3-45: Point Type 131, History Segment 6 Point Configuration

Point Type 131, History Segment 6 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 131, History Segment 6 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.45 Point Type 132: History Segment 7 Point Configuration

Description: Point Type 132 provides the history configuration parameters for History Segment 7.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 7.

Storage Location: Point type 132 is saved to internal configuration memory.

Table 3-46: Point Type 132, History Segment 7 Point Configuration

Point Type 132, History Segment 7 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 132, History Segment 7 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.46 Point Type 133: History Segment 8 Point Configuration

Description: Point Type 133 provides the history configuration parameters for History Segment 8.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 8.

Storage Location: Point type 133 is saved to internal configuration memory.

Table 3-47: Point Type 133, History Segment 8 Point Configuration

Point Type 133, History Segment 8 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 133, History Segment 8 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.47 Point Type 134: History Segment 9 Point Configuration

Description: Point Type 134 provides the history configuration parameters for History Segment 9.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 9.

Storage Location: Point type 134 is saved to internal configuration memory.

Table 3-48: Point Type 134, History Segment 9 Point Configuration

Point Type 134, History Segment 9 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 134, History Segment 9 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.48 Point Type 135: History Segment 10 Point Configuration

Description: Point Type 135 provides the history configuration parameters for History Segment 10.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 10.

Storage Location: Point type 135 is saved to internal configuration memory.

Table 3-49: Point Type 135, History Segment 10 Point Configuration

Point Type 135, History Segment 10 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.00	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.00	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	See description	{0,0,0}	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (ver 1.30):

Point Type 135, History Segment 10 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.00	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.49 Point Type 136: ROC Clock

Description: Point type 136 provides the parameters for configuring the ROC real-time clock time and date.

Number of Logical Points: One logical point for ROC Clock may exist.

Storage Location: Point type 136 is **not saved** to internal configuration memory.

Table 3-50: Point Type 136, ROC Clock

Point Type 136, ROC Clock

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Seconds	R/O	System	UINT8	1	0 – 59	0	1.00	The seconds.
1	Minutes	R/O	System	UINT8	1	0 – 59	0	1.00	The minutes.
2	Hours	R/O	System	UINT8	1	0 – 23	0	1.00	The hours.
3	Day	R/O	System	UINT8	1	1 – 31	1	1.00	The day.
4	Month	R/O	System	UINT8	1	1 – 12	1	1.00	The month.
5	Year	R/O	System	UINT16	2	2000 – 2104	2000	1.00	The year.
6	Day of Week	R/O	System	UINT8	1	1 – 7	7	1.00	The day of the week. Valid values are: 1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday
7	Time	R/O	System	TIME	4	N/A	0	1.00	Number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
8	Daylight Savings Time Enable	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates if daylight savings time is enabled. Valid values are 0 (Disabled) and 1 (Enabled).
9	Microseconds	R/O	System	UINT32	4	0 - 999999	0	1.00	The microseconds .
10	DST Start Hour	R/W	User	UINT8	1	0 → 23	2	1.20	
11	DST Start Day of Week	R/W	User	UINT8	1	1-7 (corresponds to Sunday through Saturday)	1	1.20	
12	DST Start Week of Month	R/W	User	UINT8	1	1-6 (if set to 6, will be the last week of the month)	2	1.20	
13	DST Start Month	R/W	User	UINT8	1	0 → 12	3	1.20	
14	DST Start Date and Time	R/O	User	TIME	4	N/A	(based on	1.20	

Point Type 136, ROC Clock

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
							above)		
15	DST End Hour	R/W	User	UINT8	1	0 → 23	2	1.20	
16	DST End Day of Week	R/W	User	UINT8	1	1-7 (corresponds to Sunday through Saturday)	1	1.20	
17	DST End Week of Month	R/W	User	UINT8	1	1-5 (if set to 5, will be the last week of the month)	1	1.20	
18	DST End Month	R/W	User	UINT8	1	0 → 12	11	1.20	
19	DST End Date and Time	R/O	User	TIME	4	N/A	(based on above)	1.20	

3.4.50 Point Type 137: Internet Configuration Parameters

Description: Point type 137 provides configuration parameters for internet communications.

Number of Logical Points: One logical point for Internet Configuration Parameters may exist.

Storage Location: Point type 137 is saved to internal configuration memory.

Table 3-51: Point Type 137, Internet Configuration Parameters

Point Type 137, Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	MAC Address	R/O	System	AC12	12	N/A	Varies	1.00	Unique MAC address set by the factory.
1	IP Address	R/W	User	AC20	20	See description	10.0.0.2	1.00	IP Address for the ROC800. **Note**: These values must be in the format XXX.XXX.XXX.XXX (such as 10.0.0.1). The value 255.255.255.255 is **invalid**.
2	Subnet Mask	R/W	User	AC20	20	See description	255.255.255.0	1.00	Subnet Mask for the ROC800. **Note**: These values must be in the format XXX.XXX.XXX.XXX (such as 10.0.0.1). The value 255.255.255.255 is **invalid**.
3	Gateway Address	R/W	User	AC20	20	See description	10.0.0.1	1.00	Gateway used by the ROC800. **Note**: These values must be in the format XXX.XXX.XXX.XXX (such as 10.0.0.1). The value 255.255.255.255 is **invalid**.
4	ROC Plus Protocol IP Port Number	R/W	User	UINT16	2	0 → 65535	4000	1.00	The IP port number to which the ROC listens ROC Plus Protocol connections.
5	Current ROC Plus Protocol Connections	R/O	System	UINT8	1	0 → 255	0	1.00	This parameter shows the number of active ROC Plus Protocol TCP/IP connections.
6	ROC Plus Protocol Inactivity Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	3600.0	1.00	Time, in seconds, that the ROC800 waits, without receiving a valid message, before it closes the connection. Occurs in the Application Layer. Enter **0** to disable this feature.
7	Reset ROC Plus Protocol Connections	R/W	User	UINT8	1	0→1	0	1.00	Write **1** to this parameter to close all ROC Plus Protocol TCP/IP connections.
8	ROC Plus Protocol Keep-Alive Time	R/W	User	UINT32	4	0,64 → 86400	324	1.00	Specifies the amount of idle time (in seconds) before the first keep alive message is sent. Nine more keep-alive messages will be sent at an interval of 64 seconds before a connection is considered broken. Occurs in the Transport Layer. Enter **0** to disable this feature.

Point Type 137, Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Modbus IP Port Number	R/W	User	UINT16	2	0 → 65535	502	1.00	The IP port number to which the ROC800 listens for Modbus connections.
10	Current Modbus Connections	R/O	System	UINT16	2	0 → 65535	0	1.00	Shows the number of active modbus TCP/IP connections.
11	Modbus Inactivity Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	3600.0	1.00	Time, in seconds, that the ROC800 waits, without receiving a valid modbus message, before it closes the connection. Occurs in the Application Layer. Enter **0** to disable this feature.
12	Reset Modbus Connections	R/W	User	UINT8	1	0→1	0	1.00	Write **1** to this parameter to close all Modbus TCP/IP connections.
13	Modbus Keep-Alive Time	R/W	User	UINT32	4	0,64 → 86400	324	1.00	Specifies the amount of idle time (in seconds) before the first keep-alive message is sent for the modbus connection. Nine more keep-alive messages will be sent at an interval of 64 seconds before a connection is considered broken. Occurs in the Transport Layer. Enter **0** to disable this feature.
14	Modbus over TCP Address To Use	R/W	User	U8	1	0 → 2	2	1.00	Selects which address (ROC or Modbus over IP slave) modbus-over-IP should use. Valid values are: 0 = ROC Address (TLP: 91,0,0) 1 = Modbus over IP Slave Address (TLP: 138,0,15) 2 = Either ROC Address or Modbus TCP Address
15	Modbus over TCP Slave Address	R/W	User	U8	1	0 → 255	0	1.00	Specifies the Slave Address for Modbus over IP.
16	ARP Protection Enable	R/W	User	UINT16	2	0 → 1	0	1.00	Enables ARP store protection. Vaiid values are 0 (Disable) and 1 (Enable).
17	ARP Packet Queue Limit	R/W	User	UINT32	4	0 → 65535	500	1.00	Specifies the required number of ARP packets to be queued in or der for the ROC to shut down the Ethernet device due to an ARP storm.
18	Modbus Master TCP Option	R/W	User	UNIT8	1	0 → 1	0	1.10	Specifies the Modbus master TCP option for Master Table 1. Valid values are 0 (TCP Modbus format) and 1 (Modbus wrapped in TCP)
19	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 1
20	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 1
21	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 2
22	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 2

Point Type 137, Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 3
24	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 3
25	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 4
26	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 4
27	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 5
28	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 51
29	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 6
30	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 6
31	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 7
32	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 7
33	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 8
34	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 8
35	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 9
36	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 9
37	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 10
38	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 10
39	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 11
40	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 11
41	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 12
42	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 12
43	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 13
44	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 13
45	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 14
46	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 14
47	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 15
48	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 15
49	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 16
50	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 16
51	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 17
52	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 17
53	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 18
54	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 18
55	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 19
56	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 19

Point Type 137, Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 20
58	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 20
59	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 21
60	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 21
61	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 22
62	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 22
63	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 23
64	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 23
65	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 24
66	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 24
67	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 1, Server 25
68	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 1, Server 25
69	Modbus Master TCP Option	R/W	User	UNIT8	1	0 → 1	0	1.10	Specifies the Modbus master TCP option for Master Table 2. Valid values are 0 (TCP Modbus format) and 1 (Modbus wrapped in TCP)
70	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 1
71	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 1
72	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 2
73	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 2
74	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 3
75	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 3
76	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 4
77	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 4
78	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 5
79	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 5
80	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 6
81	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 6
82	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 7
83	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 7
84	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 8
85	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 8
86	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 9
87	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 9
88	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 10

Point Type 137, Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
89	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 10
90	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 11
91	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 11
92	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 12
93	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 12
94	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 13
95	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 13
96	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 14
97	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 14
98	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 15
99	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 15
100	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 16
101	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 16
102	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 17
103	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 17
104	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 18
105	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 18
106	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 19
107	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 19
108	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 20
109	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 20
110	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 21
111	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 21
112	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 22
113	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 22
114	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 23
115	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 23
116	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 24
117	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 24
118	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 2, Server 25
119	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 2, Server 25
120	Modbus Master TCP Option	R/W	User	UNIT8	1	0 → 1	0	1.10	Specifies the Modbus master TCP option for Master Table 3. Valid values are 0 (TCP Modbus format) and 1 (Modbus wrapped in TCP)

Point Type 137, Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
121	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 1
122	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 1
123	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 2
124	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 2
125	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 3
126	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 3
127	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 4
128	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 4
129	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 5
130	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 5
131	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 6
132	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 6
133	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 7
134	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 7
135	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 8
136	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 8
137	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 9
138	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 9
139	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 10
140	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 10
141	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 11
142	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 11
143	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 12
144	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 12
145	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 13
146	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 13
147	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 14
148	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 14
149	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 15
150	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 15
151	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 16
152	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 16
153	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 17
154	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 17

Point Type 137, Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
155	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 18
156	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 18
157	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 19
158	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 19
159	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 20
160	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 20
161	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 21
162	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 21
163	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 22
164	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 22
165	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 23
166	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 23
167	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 24
168	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 24
169	IP Address	R/W	User	UINT32	4	N/A	0	1.10	IP address for Table 3, Server 25
170	IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	IP port number for Table 3, Server 25
171	Modbus Master TCP Connection Timeout	R/W	User	UINT8	1	0 → 255	0	1.10	Specifies the number of seconds to wait for a successful connection.
172	Test IP Address	R/W	User	UINT32	4	N/A	0	1.10	Indicates the IP address to use when testing a connection.
173	Test IP Port	R/W	User	UINT16	2	0 → 65535	0	1.10	Indicates the IP port to use when testing a connection.
174	Test IP Start	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates when to test the IP connection. Valid values are 9 (Test connection complete/nothing) and 1 (Start connection test)
175	Test IP Status	R/O	System	UINT8	1	0 → 2	0	1.10	Indicates the start of the test connection. Valid values are: 0 = Success 1 = In Progress 2 = Failed

3.4.51 Point Type 138: User C++ Host Parameters

Description: Point type 138 provides parameters about the ROC with respect to hosting User C++ applications.

Number of Logical Points: One logical point for User C++ Host Parameters may exist.

Storage Location: Point type 138 is **not saved** to internal configuration memory.

Table 3-52: Point Type 138, User C++ Host Parameters

Point Type 138, User C++ Host Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Host Library Version	R/O	System	AC	12	0x20 → 0x7E for each byte	varies	1.00	The library version supported by the ROC.
1	Host SRAM Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.00	The amount of SRAM consumed by User Defined Points.
2	Host SRAM Free	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.00	The amount of SRAM available for User Defined Points.
3	Host DRAM Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.00	The amount of DRAM consumed by User C++ Programs.
4	Host DRAM Free	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.00	The amount of DRAM available for User C++ Programs.

3.4.52 Point Type 139: Smart I/O Module Information

Description: Point type 139 provides parameters for smart I/O modules.

Number of Logical Points: One logical for each I/O slot may exist, for a maximum of 27 logicals (0→26).

Storage Location: Point type 139 is **not saved** to internal configuration memory.

Table 3-53: Point Type 139, Smart I/O Module Information

Point Type 139, Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Module Type	R/O	System	UINT8	1	0 → 3	0	1.00	Indicates module type. Valid values are: 0 = No Module 1 = AC I/O 2 = PI 4 Point 3 = APM 26 = Smart MVS 27 = Application Module 28 = RTD 3-point 30 = DO Relay 6-point 33 = HART-2 Module 34 = Thermocouple 4-point 36 = IEC62591 Module 43 = Network Radio Module 50 = Unknow Aux IO module
1	System Mode	R/O	System	UINT8	1	0 → 1	0	1.00	States the run mode of the module. Valid values are: 0 = Run Mode 1 = Boot Mode (extremely limited functionality is available) 2 = Module Failure **Note**: If in Boot Mode then only parameters 0 – 4, 8, and 9 are valid.
2	Board Health	R/O	System	UINT8	1	0 → 2	1	1.00	Indicates the health of the module. Valid values are: 0 = OK 1 = Module not Installed 2 = Communications lost
3	Boot Version	R/O	System	AC	10	0x20 → 0x7E for each byte	'y.yy'	1.00	Software Version of boot Image
4	Boot Part Number	R/O	System	AC	20	0x20 → 0x7E for each byte	'W68xxx'	1.00	Part number of boot firmware

Point Type 139, Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
5	Boot Build Date	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1.00	The time and date stamp the boot firmware was created.
6	Flash Version	R/O	System	AC	10	0x20 → 0x7E for each byte	'y.yy'	1.00	Software Version of Flash Image
7	Flash Part Number	R/O	System	AC	20	0x20 → 0x7E for each byte	'W68xxx'	1.00	Part number off flash firmware
8	Flash Build Date	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1.00	The time and date stamp the flash firmware was created.
9	Module Specific Data	R/O	System	AC	20	0x20 → 0x7E for each byte	' '	1.00	General data that is specific for each module type.
10	Serial Number	R/O	System	AC	30	0x20 → 0x7E for each byte	' '	1.00	Serial Number
11	Flash Description	R/O	System	AC	20	0x20 → 0x7E for each byte	' '	1.00	Description that is specific for each module type
12	Module Specific Parameter #1	R/W	User	UINT32	4	0 → 4,294,967,296	SAM=0 IEC62591= 36863	1.10	For smart application modules, this value indicates the Module subtype (1.10): 0 = No subtype 10 = Modbus Master subtype IEC62591 Network ID (1.20) Bits 0-15 = Network ID Bits 16-31 = Unused Network Radio Module Bits 16-31 = Reserved, set to 0 Bits 8-15 = Frequency Hop Key (valid range 0-15) Bits 0-7 = Network ID (valid range is 0-255)

Point Type 139, Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
13	Module Specific Parameter #2	R/W	User	UINT32	4	0 → 4,294,967,296	SAM=0 IEC62591= 0x44553354	1.10	For smart application modules, this value indicates a Module Conflict substate, and is set when the Board Health is Module Conflict (1.10). Valid values are: 0 = No Conflict 1 = Too many application moduled (maximum of 3 modules) 2 = Duplicate application modules installed (only one of each application module subtype allowed) 3= Display Conflict (a user display or User C display is already loaded into a display slot used by the smart application module) IEC62591 Module: Join Key (bytes 0-3) (v1.20) Network Radio Module (v1.30) 0 = Slave Device 1 = Access Point 3 = Access Point with System Time Sync enabled
14	Module Specific Parameter #3	R/W	User	UINT32	4	0 → 4,294,967,296	0x4E455457	1.20	IEC62591 Join Key (Bytes 4-7) (v1.20) Network Radio Module (v1.30) 0 = 1-12 devices 1 = 1-24 devices Note: This value is writeable only when the NRM is an Access Point. The slave devices reflect back to this parameter the current Access Point.
15	Module Specific Parameter #4	R/W	User	UINT32	4	0 → 4,294,967,296	0x4F524B53	1.20	IEC62591 Join Key (Bytes 8-11) (v1.20) Network Radio Module (v1.30) Bits 8-31 = reserved, set to 0 Bits 0-7 = Radio Transmit Power in dBm. Minimum is 10 and maximum is either 20 or 27, depending on parameter #15 Maximum Radio Power.
16	Module Specific Parameter #5	R/W	User	UINT32	4	0 → 4,294,967,296	0x524F434B	1.20	IEC62591 Join Key (Bytes 12-15) (v1.20) Network Radio Module (v1.30) Network Configuration Revision 0-65535 Set by host and sent by Network Live List update.

Point Type 139, Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
17	Module Specific Parameter #6	R/W	System	UINT32	4	0 → 4,294,967,296	0	1.20	IEC62591 Status (v1.20). For Status: Bit 7: 1 = Radio Failue Bit 6: 1 = Server Failure For State: Bits 0-5: 0 = Initialization 1 = Detecting Radio 2 = Setting Network Confirmation 3 = Waiting to Join a Network 4 = Online Bits 8-31: Unused It is R/O. A write will not return an error, but is ignored. Network Radio Module (v1.30) Noise Level: 0-30 – Good 31-40 = Marginal 41-127 = Poor
18	Module Specific Parameter #7	R/W	System	UINT32	4	0 → 4,294,967,296	0	1.20	IEC62591 Interface ID (v1.20) For Bits 0-31: Interface ID It is R/O/ A write will not return an error, but is ignored. Network Radio Module (v1.30) Signal Strength 0 -127 (higher is better)
19	Module Specific Parameter #8	R/W	System	UINT32	4	0 → 4,294,967,296	0	1.20	IEC62591 Interface Type (v1.20) For Bits 0-15: Interface Type For Bits 16-21: Unused It is R/O/ A write will not return an error, but is ignored. Network Radio Module (v1.30) Percent Good Packets.
20	Module Specific Parameter #9	R/W	System	UINT32	4	0 → 4,294,967,296 (1,2)	0	1.30	Network Radio Module (v1.30) Start Auto Discovery Sequence 0 = Idle 1 = Start 2 = Stop[**Note**: The ROC800 automatically clears this parameter after the Auto Discovery Sequence completes.
21	Module Specific Parameter #10	R/W	System	UINT32	4	0 → 4,294,967,296 (not user writeable)	0	1.30	Network Radio Module (v1.30) Radio Address

Point Type 139, Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
22	Module Specific Parameter #11	R/W	User	UINT32	4	0 → 4,294,967,296 (1)	0	1.30	Network Radio Module (v1.30) Initialize Networ Import and Export Lists 0 = Idle 1 = Initialize **Note**: ROC800 automatically clears parameter.
23	Module Specific Parameter #12	R/W	System	UINT32	4	0 → 4,294,967,296 (not user writeable)	0	1.30	Network Radio Module (v1.30) Network Status 0 = Initializing 1 = Not Joined to Network 2 = Joined to Network – not commissioned 3 = Joined to Network and commissioned 128 = Radio Failure 129 = Invalid Network Configurator
24	Module Specific Parameter #13	R/W	User	UINT32	4	0 → 4,294,967,296 (1)	0	1.30	Network Radio Module (v1.30) Force Time Synchronization 0 = Idle 1 = Force Time Synch
25	Module Specific Parameter #14	R/W	System	UINT32	4	0 → 4,294,967,296 (1)		1.30	Network Radio Module (v1.30) Radio Address of the NRM
26	Module Specific Parameter #15	R/W	User	UINT32	4	0 → 4,294,967,296 (1)	0	1.30	Network Radio Module (v1.30) Passthru Lock Addresd Bits 16-31 = Reserved Bits 8 -15 = Address Bits 0-7 = Group
27	Module Specific Parameter #16	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.61) Stale Data Timeout in seconds (valid range is 10-3600)
28	Module Specific Parameter #17	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 1
29	Module Specific Parameter #18	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 2
30	Module Specific Parameter #19	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 3
31	Module Specific Parameter #20	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 4
32	Module Specific Parameter #21	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 5
33	Module Specific Parameter #22	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 6

Point Type 139, Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
34	Module Specific Parameter #23	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 7
35	Module Specific Parameter #24	R/W	User	UINT32	4	0->4,294,967,296	0	1.41	Network Radio Module (v3.70) Encryption Key 8

3.4.53 Point Type 140: Alternating Current Input / Output

Description: Point type 140 is the point type for controlling and accessing an AC Input / Output.

Number of Logical Points: 6 logicals per installed module may exit.

Storage Location: Point type 140 is saved to internal configuration memory.

Table 3-54: Point Type 140, Alternating Current Input / Output

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20→0x7E for each ASCII character	"ACIO"	1.00	A 10-character description of the channel
1	Power In	R/O	System	UINT8	1	0→1	0	1.00	Module power indicator – same for every channel. Valid values are **9** (AC power off) and **1** (AC power detected).
2	Channel Mode	R/O	System	UINT8	1	0→1	0	1.00	Channel mode is set via hardware dip switch. Valid values are **0** (channel set as input) and **1** (channel set as output).
3	Scanning Input	R/W	User	UINT8	1	0 → 1	1	1.00	Valid values are **0** (Disabled) and **1** (Enabled). If disabled, system ignores field inputs and no changes occur unless manually entered. **Note**: This parameter functions the same as "Scanning" in Point type 101 (parameter 1).
4	Filter	R/W	User	FL	4	0.00 → 43,200.0	0.3	1.00	Number of seconds that a DI must remain in the ON state before it is recognized as valid and the Status (parameter #5) is changed. **Note**: This parameter functions the same as "Filter" in Point type 101 (parameter 2).
5	Status Input	R/W	System	UINT8	1	0→1	0	1.00	Indicates the current state of the DI. Valid values are 0 (inactive) and 1 (input signal). Note: This parameter functions the same as Status" in Point type 101 (parameter 3).
6	Physical Input	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the current state of the hardware. Valid values are 1 (On) and 0 (Off). **Note**: This parameter functions the same as "Physical Status" in Point type 101 (parameter 15).

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
7	Scan Period	R/W	User	FL	4	0.02→43,200.0 (Slots 1-3 827 & 809) 0.05→43,200.0 (Slots 4-27 827)	0.05	1.00	Indicates scan period in seconds. Due to limitations on the ROC 827, slots 4-27 has a lower limit of 50mS. All other slots (1-3, 809) have a minimum limit of 20mS.
8	Actual Scan Time	R/O	System	FL	4	0.0 → 43,200.0	0.0	1.00	Actual number of seconds between updates of the DI. **Note**: This parameter functions the same as “Actual Scan Time” in Point type 101 (parameter 14).
9	Input Invert Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, the field input will be inverted in the Status (parameter #5 – ON becomes OFF and vice-versa). Valid values are 0 (Invert Status Disabled) and 1 (Invert Status Enabled). **Note**: This parameter functions the same as “Invert Mode” in Point type 101 (parameter 4).
10	Latch Mode	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, then, on an active transition of the input, the Status (parameter #5) will change to ON and remain in the ON state until it is cleared manually. 0 = Latch Status Disabled, 1 = Latch Status Enabled. **Note**: This parameter functions the same as “Latch Mode” in Point type 101 (parameter 5).
11	Input Accumulated Value	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.00	Indicates the number of times the Status (parameter 5) goes from OFF to ON. **Note**: This parameter functions the same as “Accumulated Value” in Point type 101 (parameter 6).
12	Cumulative On Time	R/W	Both	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Number of seconds when the Status (parameter #5) is in the ON state. **Note**: This parameter functions the same as “Cumulative On Time” in Point type 101 (parameter 7).
13	Cumulative Off Time	R/W	Both	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.00	Indicates the number of seconds when the Status (parameter #5) is in the OFF state. **Note**: This parameter functions the same as “Cumulative Off Time” in Point type 101 (parameter 8).
14	Input Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter functions the same as

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
									“Alarming” in Point type 101 (parameter 9).
15	Input Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
15.0	Not Used			Bit 0			0		Not Used
15.1	Not Used			Bit 1			0		Not Used
15.2	Not Used			Bit 2			0		Not Used
15.3	Not Used			Bit 3			0		Not Used
15.4	Not Used			Bit 4			0		Not Used
15.5	Status On Alarm			Bit 5			0		If set, the Status (parameter #5 is ON. If clear, the Status (parameter #5) is OFF (Parameter functions the same as “Status On Alarm” in Point type 101)
15.6	Not Used			Bit 6			0		Not Used
15.7	Input Scanning Disabled Alarm			Bit 7			0		If set, the Scanning (parameter #3) has been disabled. If clear, the Scanning (parameter #3) has been set to Enable. (Parameter functions the same as “Scanning Disabled Alarm” in Point type 101)
16	Input SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled. (Parameter functions the same as “SRBX on Clear” in Point type 101)
17	Input SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled. (Parameter functions the same as “SRBX on Clear“ in Point type 101)
18	Scanning Output	R/W	User	UINT8	1	0 → 2	1	1.00	If disabled, no changes to the output will occur. If in Manual, only the user can change the values of the DO. If in Automatic, anything can change the values of the DO. 0 = Disabled, 1 = Automatic , 2 = Manual (Parameter functions the same as “Scanning Mode” in Point type 102)
19	Auto Output	R/W	Both	UINT8	1	0 → 1	0	1.00	Controls the state of the DO when Scanning (parameter #5) is in auto mode. In other words, the physical output gets this status when Scanning (parameter # 18) is set to Automatic. (Parameter functions the

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
									same as “Auto Output” in Point type 102) . 0 = Off, 1 = On
20	Manual Output	R/W	Both	UINT8	1	0 → 1	0	1.00	Controls the state of the DO when Scanning (parameter #18) is in manual mode. In other words, the physical output gets this status when Scanning (parameter # 18) is set to Manual. 0 = Off, 1 = On (Parameter functions the same as “Manual Output” in Point type 102)
21	Failsafe Output	R/W	User	UINT8	1	0 → 1	0	1.00	The state the output will be placed in when the unit is started and the Failsafe on Reset Parameter (Parameter #24) = 1, Use Failsafe value on reset. 0 = Off, 1 = On (Parameter functions the same as “Failsafe Output” in Point type 102)
22	Physical Output	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the DO’s current state. Valid values are 0 (Off) and 1 (On). (Parameter functions the same as “Physical Output” in Point type 102)
23	Output Accumulated Value	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.00	Number of times the Physical Output (parameter #22) goes from OFF to ON. (Parameter functions the same as “Accumulated Value” in Point type 102)
24	Failsafe on Reset Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates the status on reset mode. Valid values are 0 (Output Last Status on Reset) and 1 (Use Failsafe value on Reset). If enabled, the Status (parameter #19) is set to the status indicated in “Failsafe Output” (Parameter #21) on a restart of any kind. If disabled, the last Status before the restart is used. **Note**: This parameter functions the same as “Failsafe on Reset” in Point type 102 (parameter 7).
25	Momentary Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Valid values are 0 (Momentary Disabled) and 1 (Momentary Enabled). If enabled, the Status (parameter #19) is turned ON for the entered Time On (parameter #30) and then be turned OFF. **Note**: This parameter functions the same as “Momentary Mode” in Point type 102 (parameter 10).

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
26	Momentary Active	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.00	Indicates whether the DO currently has the Momentary ability active. Valid values are 0 (Momentary Not Active) and 1 (Momentary Active). **Note**: This parameter functions the same as "Momentary Active" in Point Type 102 (parameter 11).
27	Toggle Mode	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Valid values are 0 (Toggle Disabled) and 1 (Toggle Enabled). If enabled, the Status (parameter #19) is be turned ON for the entered Time On (parameter #30) and then turned OFF for the same Time On. The Status continues to cycle between the ON and OFF states. Note: This parameter functions the same as "Toggle Mode" in Point type 102 (parameter 12).
28	Timed Discrete Output (TDO) Mode	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Valid values are 0 (TDO Disabled) and 1 (TDO Enabled). If enabled, the Status (parameter #19) is turned ON for a calculated Time On (parameter #30) based upon the entered EU Value (parameter #37). After the Time On has expired, the Status turns OFF and remains that way until a new EU Value is entered.
29	Invert Output Mode	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Inverts the output of the ACIO channel. Tthis allows you to use TDO mode to keep a channel OFF for a set amount of time and then bringing the channel back ON. **Note**: This always inverts the output; including the Failsafe Output. Valid values are 0 (Normal) and 1 (Inverted).
30	Time On	R/W	Both	FL	4	$0.02 \rightarrow 43{,}200.0$	1.0	1.00	Indicates the number of seconds for which the Status (parameter #19) is ON if in Toggle or Momentary Mode. **Note**: This parameter functions the same as "Time On" in Point type 102 (parameter 14).
31	Cycle Time	R/W	User	FL	4	$>0.0 \rightarrow 43{,}200.0$	15.0	1.00	Number of seconds for when Toggle Mode (parameter #27) is selected. The Status (parameter #19) will be ON for the calculated Time On and off for an equal amount of time. **Note**: Ths parameter functions the same as

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
									“Cycle Time” in Point type 102 (parameter 15).
32	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“Percent“	1.00	Describes the units used by the Output Parameters. Values must be printable ASCII characters. **Note**: This parameter functions the same as “Units Tag” in Point type 102 (parameter 1)
33	Low Reading Time	R/W	User	FL	4	0.0 → 43,200.0	3.0	1.00	Minimum number of seconds the calculated Time On (parameter #30) will be when the entered EU Value (parameter #37) is less than or equal to the entered Low Reading EU (parameter #35). **Note**: This parameter functions the same as “Low Reading TIme” in Point type 102 (parameter 16).
34	High Reading Time	R/W	User	FL	4	0.0 → 43,200.0	12.0	1.00	Maximum number of seconds the calculated Time On (parameter #30) will be when the entered EU Value (parameter #37) is greater than or equal to the entered High Reading EU (parameter #36). **Note**: This parameter functions the same as “High Reading Time” in Point type 102 (parameter 17).
35	Low Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.00	Minimum EU Value (parameter #37) possible. **Note**: This parameter functions the same as “Low Reading EU” in Point type 102) (parameter 18).
36	High Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.00	Maximum EU Value (parameter #37) possible. **Note**: This parameter functions the same as “High Reading EU” in Point type 102 (paramneter 19).
37	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.00	Value in Engineering Units. **Note**: This parameter functions the same as “EU Value” in Point type 102 (parameter 20).
38	Inrush Time	R/W	User	FL	4	0.02 → 0.5	0.05	1.00	Number of seconds that the initial inrush current is allowed to exceed the hardware limiting circuit before de-energizing the circuit. If this time is exceeded, the Fault Reset (parameter #40) is set to 1, scanning is disabled for the channel and if alarming is set, the correct alarm bit will be set.

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
39	Holding Current	R/O	System	FL	4	0.0 → 43,200.0	0	1.00	Detected current present in the channel in mA.
40	Fault Reset	R/W	Both	UINT8	1	0 → 1	0	1.00	This value will be set to 1 when Holding Current (parameter #39) is above 1500 mA for Inrush Time (parameter #38) seconds. This value will be set to 2 when a relay failure has been detected. The module will need to be serviced by the manufacturer to reset this value. When not set to 0 the Scanning output (parameter #18) will be disabled, an alarm (parameter #42.4) will be raised, and the channel relay will be de-energized. Note: User action is required to reset this field to 0. The firmware continually disables scanning as long as this field has a value of 1. Valid values are: 0 = Reset 1 = Fault 2 = Failure
41	Output Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). Note: This parameter functions the same as “Alarming” in Point type 102 (parameter 3).
42	Output Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00	
42.0	Not Used			Bit 0			0		Not Used
42.1	Not Used			Bit 1			0		Not Used
42.2	Not Used			Bit 2			0		Not Used
42.3	Relay Failure Alarm			Bit 3			0		If set, a relay failure has been detected. This is a hardware failure and cannot be reset by software. This alarm cannot be disabled.
42.4	Fault Current Alarm			Bit 4			0		If set, the Fault Reset (parameter #33) has been set to Fault. If clear, the Fault Reset (parameter #33) has been set to Reset. This alarm cannot be disabled.
42.5	Scanning Manual Alarm			Bit 5			0		If set, the Scanning (parameter #5) has been set to Manual. If clear, the Scanning (parameter #5) has been set to either Disable or Automatic **Note**: This parameter functions the same as

Point Type 140, AC I/O Point Type

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
									"Scanning Manual Alarm" in Point type 102 (parameter 6.5).
42.6	Point Fail			Bit 6			0		If set, the ACIO is reporting a malfunction. If clear, the ACIO is operating properly.
42.7	Output Scanning Disabled Alarm			Bit 7			0		If set, the Scanning (parameter #18) has been disabled. If clear, the Scanning (parameter #18) has been set to either Automatic or Manual. **Note**: This parameter functions the same as "Scanning Disabled Alarm" in Point type 102 (parameter 6.7).)
43	Output SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled). **Note**: This parameter functions the same as "SRBX on Clear" in Point type 102 (parameter 4).
44	Output SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled). **Note**: This parameter functions the same as "SRBX on Set" in Point type 102) (parameter 5).
45	AC Frequency	R/W	User	FL	4	47 → 63	60	1.00	The frequency of the AC input. This parameter must be correct for fault detection to function properly.
46	Failure Action	R/W	User	UINT8	1	0 → 2	0	1.00	This parameter dictates the action to be taken when a failure condition is detected. Valid values are: 0 = Channel Shutdown, alarm logged 1 = No action taken, alarm logged 2 = No action taken, alarm not logged In all cases the Relay Failure Alarm bit (parameter #42.3) is set. **WARNING:** Changing this parameter can cause relay protection to be disabled.

3.4.54 Point Type 141: Advance Pulse Module

Description: Point type 141 provides the parameters for the Advance Pulse Module.

Number of Logical Points: 1 logical point for each installed module may exist.

Storage Location: Point type 141 is saved to internal configuration memory.

Table 3-55: Point Type 141, Advance Pulse Module

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"APM Deflt"	1.00	A 10-character identification name for a specific APM. Values must be printable ASCII characters.
1	API Level Check Pair 1	R/W_CNDL	User	UINT8	1	0 → 4	4	1.00	Selects the API level to perform for the first check pair. . Valid values are: 0 = Level A 1 = Level B 2 = Level C 3 = Level D 4 = Level E 5 = Marker Pulse The output of the API Chapter 5.5 level checks will always be written to the API Pulse Counts Pair 1 (parameter #17)
2	API Level Check Pair 2	R/W_CNDL	User	UINT8	1	0 → 4	4	1.00	Selects the API level to perform for the second check pair. Valid values are: 1 = Level B 2 = Level C 3 = Level D 4 = Level E 5 = Marker Pulse The output of the API Chapter 5.5 level checks is always written to the API Pulse Counts Pair 2 (parameter #19)
3	Meter Input on Prove	R/W	User	UINT8	1	0 → 3	0	1.00	Indicates which pulse to use for the Meter Prove. Valid values are: 0 - Pulse Input 1 1 - Pulse Input 2 2 - Pulse Input 3 3 - Pulse Input 4

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Master Meter Input on Prove	R/W	User	UINT8	1	0 → 3	2	1.00	Indicates which pulse to use for the Master Meter Prove. Valid values are: 0 - Pulse Input 1 1 - Pulse Input 2 2 - Pulse Input 3 3 - Pulse Input 4 **Note**: This function activates **only** if you enable Software Detector Switch (parameter #42).
5	Raw Pulse Count PI One	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	The raw accumulated number of pulses for PI One
6	Frequency PI One	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Frequency of incoming pulses on PI One in pulses/second.
7	Scan Period PI One	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.00	Time period in seconds in which the parameters associated with the pulse input are evaluated.
8	Raw Pulse Count PI Two	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	The raw accumulated number of pulses for PI Two
9	Frequency PI Two	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Frequency of incoming pulses on PI Two in pulses/second.
10	Scan Period PI Two	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.00	Time period in seconds in which the parameters associated with the pulse input are evaluated.
11	Raw Pulse Count PI Three	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	The raw accumulated number of pulses for PI Three
12	Frequency PI Three	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Frequency of incoming pulses on PI Three in pulses/second.
13	Scan Period PI Three	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.00	Time period in seconds in which the parameters associated with the pulse input are evaluated.
14	Raw Pulse Count PI Four	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	The raw accumulated number of pulses for PI Four
15	Frequency PI Four	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Frequency of incoming pulses on PI Four in pulses/second.
16	Scan Period PI Four	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.00	Time period in seconds in which the parameters associated with the pulse input are evaluated.
17	API Pulse Counts Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	The accumulated number of pulses through the API level checks for pulse pair 1. This updates only when you set the API Level Check Pair 1 (parameter #1) to Level A, B, or C.
18	Frequency Pair 1	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Frequency of incoming pulses on Pair One in pulses/second.
19	API Pulse Counts Pair 2	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	The accumulated number of pulses through the API level checks for pulse pair 2. This updates only when you set the API Level Check Pair 2 (parameter #2) is set to Level A, B, or C.
20	Frequency Pair 2	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Frequency of incoming pulses on Pair Two in pulses/second.

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21	Meter Whole Pulse Count	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	Actual number of whole pulses accumulated between detector switches for a Meter Input (parameter #3). **Note**: Detector Reset clears this value.
22	Master Meter Whole Pulse Count	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	Actual number of whole pulses accumulated between detector switches for a Master Meter Input (parameter #4) **Note**: This activates **only** if you enable the Software Detector Switch Enabled (parameter #42). Detector Reset clears this value.
23	Meter Interpolated Pulse Count	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Actual Number of interpolated pulses accumulated between detector switches for a given meter pulse input.
24	Master Meter Interpolated Pulse Count	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Actual Number of interpolated pulses accumulated between software detector switches for a given master meter pulse input.
25	PI Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	Displays whether alarms may be generated and sent to the alarm log for a pulse input. Valid values are 0 (Alarming Disabled) and 1 (Alarming Enabled).
26	PI SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates an SRBX alarm is desired if an alarm condition clears for a pulse input. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
27	PI SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates an SRBX alarm is desired if an alarm condition occurs for a pulse input. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
28	API Pair 1 Alarm Status	R/O	System	BIN	1	0 → 255	0	1.00	API Level Alarm Status (Pair 1) **Note**: These values update in real time.
28.0	Sequence Out of Order Error			Bit 0			0		This alarm is present if the sequence of the pulses within the pair become out of order. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
28.1	Phase Discrepancy Detected			Bit 1			0		This alarm occurs if the phase of the pulses within the pair becomes skewed. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
28.2	Pulse Synchronization Error			Bit 2			0		This alarm occurs if the synchronization of the pulses fails. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
28.3	Frequency Discrepancy Detected			Bit 3			0		This alarm occurs if the frequencies of the two pulses are not equal. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
28.4	PI 1 Failure			Bit 4			0		This alarm occurs if PI 1 has failures (see bits 0-3). Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
28.5	PI 2 Failure			Bit 5			0		This alarm occurs if PI 2 has failures (see bits 0-3). Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
28.6	Level A Bad Pulse Stream			Bit 6			0	1.10	This alarm occurs if the number of bad pulses exceeds the bad pulse threshold in Level A. A bad pulse is either a missing pulse or a duplicate pulse. Valid values are 0 (No Alarm Present) and 1 (Alarm Present)
28.7	Market Pulse Alarm			Bit 7			0	1.10	This alarm occurs if the flow pulses drift from the expected number of pulses by more than the marker value deadbad for Pair 1. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
29	API Pair 2 Alarm Status	R/O	System	BIN	1	0 → 255	0	1.00	API Level Alarm Status (Pair 2). **Note**: These values update in real time.
29.0	Sequence Out of Order Error			Bit 0			0		This alarm occurs if the sequence of the pulses within the pair becomes out of order. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
29.1	Phase Discrepancy Detected			Bit 1			0		This alarm occurs if the phase of the pulses within the pair becomes skewed. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
29.2	Pulse Synchronization Error			Bit 2			0		This alarm occurs if the synchronization of the pulses fails. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
29.3	Frequency Discrepancy Detected			Bit 3			0		This alarm occurs if the frequencies of the two pulses are not equal. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
29.4	PI 3 Failure			Bit 4			0		This alarm occurs if PI 3 has failures (see bits 0-3). Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
29.5	PI 4 Failure			Bit 5			0		This alarm occurs if PI 4 has failures (see bits 0-3). Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
29.6	Not Used			Bit 6			0		Not Used
29.7	Market Pulse Alarm			Bit 7			0	1.10	This alarm occurs if the flow pulses drift from the expected number of pulses by morethan the market pulse deadband for Pair 2. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
30	API Phase Alarm Count Pair 1	R/O	System	UINT16	2	0 → 65535	0	1.00	Indicates the total number of phase alarms

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
31	API Same Channel Alarm Count Pair 1	R/O	System	UINT16	2	0 → 65535	0	1.00	Indicates the total number of same channel alarms
32	API Phase Alarm Count Pair 2	R/O	System	UINT16	2	0 → 65535	0	1.00	Indicates the total number of phase alarms
33	API Same Channel Alarm Count Pair 2	R/O	System	UINT16	2	0 → 65535	0	1.00	Indicates the total number of same channel alarms
34	Detector Reset	R/W	User	UINT8	1	0 → 1	0	1.00	This essentially notifies the APM of the start of a prove. All accumulated pulses clear and all alarms clear. Pulse accumulation starts at the transition of the first detector switch and stops at the transition of the second detector switch. Valid values are 0 (Idle) and 1 (Reset).
35	Detector Switch 1 Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the status of the physical detector switch. Valid values are 0 (Closed) and 1 (Open).
36	Detector Switch 2 Status	R/O	System	UINT8	1	0 → 1	0	1.00	Indicates the status of the physical detector switch. Valid values are 0 (Closed) and 1 (Open).
37	Detector Switch State	R/O	System	UINT8	1	0 → 3	3	1.00	Indicates the state of the detector switches. Valid values are: 0 = Reset; a reset has been received and the APM is expecting a detector switch transition. 1 = Counting; a detector switch transition has occurred and the APM is currently counting whole pulses. 2 = Complete; another detector switch transition has occurred, the Prove run is complete, and all values are stored until the next reset. 3 = Invalid, the accumulator does not contain good values. (This can be either at a power up or if communications are lost during a prove and the accumulators have reset to zero.)
38	Flow Direction Pair 1	R/O	System	UINT8	1	0 → 1	0	1.00	Identifies the direction of flow, based on 180 degrees out of phase for first pair of pulses. Level A or B API checks must be used (parameter #1). Valid values are 0 (Forward [< 180 degrees]} and 1 (Reverse [> 180 degrees]) **Note**: Forward/Reverse designators assume 90 degrees out of phase
39	Flow Direction Pair 2	R/O	System	UINT8	1	0 → 1	0	1.00	Identified the direction of flow, based on 180 degrees out of phase for the second pair of pulses. Level A or B API checks must be used (parameter #2). Valid values are 0 (Forward [< 180 degrees]) and 1 (Reverse [> 180 degrees]). **Note**: Forward/Reverse designators assume 90 degrees out of phase

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Software Detector Switch	R/W	User	UINT8	1	0 → 1	0	1.00	A 1 “triggers” the start/stop of counting pulses for a master meter or tank prove. Once the APM receives a trigger, it will set this back to Idle. Valid values are 0 (Idle) and 1 (Detector Switch Triggered). **Note**: This is valid **only** if you enable Software Detector Switch (parameter #42) is enabled.
41	Detector Switch Filter Time	R/W	User	UINT16	2	0 → 1500	300	1.00	Indicates, in milliseconds, the time allotted after a detector switch is triggered and before the next trigger is to occur. This provides a de-bounce filter for the detector switches.
42	Software Detector Switch Enabled	R/W	User	UINT8	1	0 → 1	0	1.00	Displays whether a master meter or tank prover is to be proved. Valid values are 0 (Disabled) and 1 (Enabled).
43	PI4/PO Configuration	R/O	System	UINT8	1	0 → 1	1	1.00	Gives the configuration of the PI4/PO terminal of the APM. Use a hardware switch to configure this. Valid values are 0 (Configured for a Pulse Input) and 1 (Configured for a Pulse Output).
44	PO Scan Period	R/W_CNDL	User	FL	4	0, 0.500 → 43,200.0	1.0	1.00	Time period in seconds in which the parameters associated with the pulse output are evaluated. Valid values are 0 (Disabled). All other output pulses are at a 50% duty cycle
45	Input TLP	R/W_CNDL	User	TLP	3		0,0,0	1.00	Input to be used in calculating output pulses
46	PO Input Mode	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00	Gives the interpretation of the Input TLP (parameter #45). Valid values are 0 (Input TLP is a rate) and 1 (Input TLP is an accumulation).
47	PO Accumulator	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	Indicates the accumulated number of pulses sent out.
48	Output Scaling Value	R/W_Log	User	FL	4	Any positive IEEE 754 float, except 0.0	1.0	1.00	Specifies the value that is applied to the accumulated pulse value.
49	Buffer Warning Alarm Set Point	R/W_Log	User	UINT16	2	0 → 65535	500	1.00	Indicates the maximum allowable number of buffered pulses before triggering the buffer warning alarm. **Note**: This value must be **less** than the maximum number of allowed buffered pulses (see parameter 50). .
50	Maximum Buffered Pulses	R/W_Log	User	UINT16	2	0 → 65535	1000	1.00	The maximum number of allowed buffered pulses.
51	Maximum Pulse Output Frequency	R/W_Log	User	UINT16	2	0 → 12000	12000	1.00	The maximum number of pulses per second which can be output by the PO (in Hz). If the calculated number of pulses exceeds this value then those pulses shall be placed in the buffer.

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
52	PO Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	Displays whether alarms may be generated and sent to the alarm log for a pulse output. Valid values are 0 (Alarming Disabled)(and 1 (Alarming Enabled).
53	PO Alarm Code	R/O	System	BIN	1	0 → 255	0	1.00	Defines the alarms for a pulse output
53.0	Not Used			Bit 0					Not Used
53.1	Buffer Overrun Alarm			Bit 1					Occurs when the number of buffered pulses has exceeded the max limit (parameter #50). Pulses are now being lost. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
53.2	Buffer Warning Alarm			Bit 2					Occurs when the number of buffered pulses reaches the set point (parameter #49). Adjust the scaling factor so that pulses are not lost. Valid values are 0 (No Alarm Present) and 1 (Alarm Present).
53.3	Not Used			Bit 3					Not Used
53.4	Not Used			Bit 4					Not Used
53.5	Not Used			Bit 5					Not Used
53.6	Not Used			Bit 6					Not Used
53.7	Not Used			Bit 7					Not Used
54	PO SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether an SRBX alarm occurs if an alarm condition clears for a pulse output. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
55	PO SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates whether an SRBX alarm occurs if an alarm condition occurs for a pulse output. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
56	Alarming	R/W	User	UINT8	1	0 → 1	0	1.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled).
57	Alarm Code	R/O	System	BIN	1	0 → 255	0	1.00	Defines the alarms for the APM.
57.0	Not Used			Bit 0					Not Used
57.1	Not Used			Bit 1					Not Used
57.2	Not Used			Bit 2					Not Used
57.3	Not Used			Bit 3					Not Used
57.4	Not Used			Bit 4					Not Used
57.5	Not Used			Bit 5					Not Used

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57.6	Point Fail Alarm			Bit 6					If set, the APM is reporting a malfunction. If cleared, the APM is operating properly
57.7	Not Used			Bit 7					Not Used
58	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates an SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
59	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates an SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
60	API Reverse Pulse Counts Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	Indicates the accumulated number of reverse pulses through the API level checks for pulse pair 1. The system updates this value only when the API Level Check Pair 1 (parameter #1) is set to Level A, B, or C.
61	API Reverse Pulse Counts Pair 2	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	Indicates the accumulated number of reverse pulses through the API level checks for pulse pair 2. The system updates this value only when the API Level Check Pair 2 (parameter #2) is set to Level A, B, or C.
62	Pulse Input 1 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 1Tag"	1.00	A 20-character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
63	Pulse Input 2 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 2Tag"	1.00	A 20-character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
64	Pulse Input 3 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 3Tag"	1.00	A 20-character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
65	Pulse Input 4 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 41Tag"	1.00	A 20-character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
66	Meter Interpolation Timer T1	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Time interval, in seconds, over which the whole flowmeter pulses were accumulated.
67	Meter Interpolation Timer T2	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Time interval, in seconds, between the first and second detector switch being triggered.
68	Master Meter Interpolation Timer T1	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Time interval, in seconds, over which the whole flowmeter pulses were accumulated on the master meter.

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
69	Master Meter Interpolation Timer T2	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.00	Time interval, in seconds, between the first and second detector switch being triggered for the master meter.
70	API Forward Pulse Counts Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	Indicates the accumulated number of forward pulses through the API level checks for pulse pair 1. The system updates this value only when the API Level Check Pair 1 (parameter #1) is set to Level A, B, or C.
71	API Forward Pulse Counts Pair 2	R/O	System	UINT32	4	0 → 16,000,000	0	1.00	Indicates the accumulated number of forward pulses through the API level checks for pulse pair 2. The system updates this value only when the API Level Check Pair 2 (parameter #2) is set to Level A, B, or C.
72	API Total Alarm Count Pair 1	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00	Total number of alarms on pair 1.
73	API Bad Pulse Threshold Pair 1	R/W	User	UINT32	4	0 → 4,294,967,295	1	1.00	Indicates the number of bad pulse pairs received before setting the API Pair 1 alarm status.
74	API Good Pulse Threshold Pair 1	R/W	User	UINT32	4	0 → 4,294,967,295	1	1.00	Indicates the number of good pulse pairs received before clearing the API Pair 1 alarm status.
75	API Low Frequency Cutoff Pair 1	R/W	User	FLT	4	Any positive IEEE 754 float.	0	1.00	Sets the frequency below which the Pair 1 alarm status no longer sets. Existing alarms will be cleared if the Pair 1 bad pulse reset mode is set to 1 (Clear) or the number of good pulse pairs received below the threshold is greater than the API good pulse threshold for Pair 1.
76	API Bad Pulse Reset Mode Pair 1	R/W	User	UINT8	1	0 → 1	0	1.00	Determines whether the system clears the number of bad pulse pairs (contributing towards the Pair 1 bad pulse threshold and the existing alarm bits) when the frequency falls below the low frequency cutoff for Pair 1. Valid values are 0 (Retain) and 1 (Clear).
77	Marker Pulse Alarm Deadband Pair 1	R/W	User	UINT16	2	0 → 65535	10	1.10	Allowed deviation of flow pulses from expected pulses at a marker pulse before the Marker Pulse Alarm bit is set. Applies only when using Marker Pulse level checking.
78	Flow Pulses Per Marker Pulse Pair 1	R/W	User	UINT16	2	0 → 65535	1000	1.10	Number of flow pulses expected between each marker pulse. Applies only when using Marker Pulse level checking.
79	Flow Pulse Accumulation at Marker Pulse Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	Accumulation of flow pulses, updated when a marker pulse is received. Applies only when using Marker Pulse level checking

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
80	Flow Pulse Drift From Expected Pair 1	R/O	System	INT32	4	-2,147,483,648 → 2,147,483,647	0	1.10	Drift from expected flow pulse value. Updated when a marker pulse is received. Applies only when using Marker Pulse level checking.
81	Marker Pulse Reset Pair 1	R/W	Both	UINT8	1	0 → 1	0	1.10	Resets the flow pulse accumulation and flow pulse drift for pair 1. Applied only when using Marker Pulse level checking. Valid values are 0 (Idle) and 1 (Reset)
82	Marker Pusle Deadband Pair 2	R/W	User	UINT16	2	0 → 65535	10	1.10	Allowed deviation of flow pulses from expected pulses at a marker pulse before the Marker Pulse Alarm bit is set. Applies only when using Marker Pulse level checking.
83	Flow Pulses per Marker Pulse Pair 2	R/W	User	UINT16	2	0 → 65535	1000	1.10	Number of flow pulses expected between each marker pulse. Applies only when using Marker Pulse level checking.
84	Flow Pulse Accumulation at Marker Pulse Pair 2	R/O	System	UINT32	3	0 → 16,000,000	0	1.10	Accumulation of flow pulses, updated when a marker pulse is received. Applies only when using Marker Pulse level checking.
85	Flow Pulse Drift from Expected Pair 2	R/O	System	INT32	3	-2,147,483,648 → 2,147,483,647	0	1.10	Drift from expected flow pulse value. Updated when a marker pulse is received. Applies only when using Marker Pulse level checking
86	Marker Pulse Reset Pair 2	R/W	Both	UINT8	1	0 → 1	0	1.10	Resets the flow pulse accumulation and flow pulse drift for pair 2. Applied only when using Marker Pulse level checking. Valid values are 0 (Idle) and 1 (Reset)
87	Contract Hour	R/W	User	UINT8	1	0 → 23	0	1.30	Hour, in 24-hour format, that represents the end of the day for the APM PIs.
88	Current Rate Period	R/W	User	UINT8	1	0 → 3	2	1.30	Detemines the calculation of the current rate (parameters 105 through 108). Valid values are: 0 = EU/second 1 = EU/minute 2 = EU/hour 3 = EU/day
89	Pulse Input 1 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“ “	1.30	Indicates the units used by PI1. Values must be printable ASCII characters.
90	Pulse Input 2 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“ “	1.30	Indicates the units used by PI2. Values must be printable ASCII characters.
91	Pulse Input 3 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“ “	1.30	Indicates the units used by PI3 Values must be printable ASCII characters.

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
92	Pulse Input 4 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	" "	1.30	Indicates the units used by PI4. Values must be printable ASCII characters.
93	Pulse Input 1 Pulses for Day	R/O	Both	UINT32	4	0 →4,294,967,295	0	1.30	Total number of pulses PI1 has received for the contract day.
94	Pulse Input 2 Pulses for Day	R/O	Both	UINT32	4	0 →4,294,967,295	0	1.30	Total number of pulses PI2 has received for the contract day.
95	Pulse Input 3 Pulses for Day	R/O	Both	UINT32	4	0 →4,294,967,295	0	1.30	Total number of pulses PI3 has received for the contract day.
96	Pulse Input 4 Pulses for Day	R/O	Both	UINT32	4	0 →4,294,967,295	0	1.30	Total number of pulses PI4 has received for the contract day.
97	Pulse Input 1 EU Today	R/W	Both	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Accumulated value in Engineering Units for this contract hour on PI1. Calculated using the conversion value for this PI and based on Pulses/EU.
98	Pulse Input 2 EU Today	R/W	Both	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Accumulated value in Engineering Units for this contract hour on PI2. Calculated using the conversion value for this PI and based on Pulses/EU.
99	Pulse Input 3 EU Today	R/W	Both	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Accumulated value in Engineering Units for this contract hour on PI3. Calculated using the conversion value for this PI and based on Pulses/EU.
100	Pulse Input 4 EU Today	R/W	Both	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Accumulated value in Engineering Units for this contract hour on PI4. Calculated using the conversion value for this PI and based on Pulses/EU.
101	Pulse Input 1 EU Yesterday	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Previous contract day's EU total for PI1.
102	Pulse Input 2 EU Yesterday	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Previous contract day's EU total for PI2.
103	Pulse Input 3 EU Yesterday	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Previous contract day's EU total for PI3.
104	Pulse Input 4 EU Yesterday	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Previous contract day's EU total for PI4.
105	Pulse Input 1 EU Rate	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Calculated rate of the pulses for PI1. Based upon the EU value and the Rate Period for the module (parameter 88)
106	Pulse Input 2 EU Rate	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Calculated rate of the pulses for PI2. Based upon the EU value and the Rate Period for the module (parameter 88)

Point Type 141, Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
107	Pulse Input 3 EU Rate	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Calculated rate of the pulses for PI3. Based upon the EU value and the Rate Period for the module (parameter 88)
108	Pulse Input 4 EU Rate	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Calculated rate of the pulses for PI4. Based upon the EU value and the Rate Period for the module (parameter 88)
109	Pulse Input 1 Conversion Rate	R/O	User	FLOAT	4	Any valid IEEE 754 float, except 0.0	1.0	1.30	Used to calculate the units of the EU values for PI1.
110	Pulse Input 2 Conversion Rate	R/W	User	FLOAT	4	Any valid IEEE 754 float, except 0.0	1.0	1.30	Used to calculate the units of the EU values for PI2.
111	Pulse Input 3 Conversion Rate	R/W	User	FLOAT	4	Any valid IEEE 754 float, except 0.0	1.0	1.30	Used to calculate the units of the EU values for PI3.
112	Pulse Input 4 Conversion Rate	R/W	User	FLOAT	4	Any valid IEEE 754 float, except 0.0	1.0	1.30	Used to calculate the units of the EU values for PI4.

3.4.55 Point Type 142: History Segment 11 Point Configuration

Description: Point type 142 provides the parameters for configuring History Segment 11.

Number of Logical Points: The number of logical points varies depending on the segment size parameter for History Segment 11.

Storage Location: Point type 142 is saved to internal configuration memory.

Table 3-56: Point Type 142, History Segment 11n

Point Type 142, History Segment 11

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	" "	1.00	Same value as the Point Tag of the Point Type in which the history log resides.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	" "	1.00	User-supplied text string used to identify the parameter being logged in the history point.
2	History Pont Log	R/W	User	TLP	3	See description	(0,0,0)	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See descripiont	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (v1.30):

Point Type 142, History Segment 11

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/)	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the minimum value was reached today.
8	Today Minimium Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the maximum value was reached yesterday.
14	Yesterday Maximumn Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.56 Point Type 143: History Segment 12 Point Configuration

Description: Point type 143 provides the parameters for History Segment 12.

Number of Logical Points: The number of logical points varies depending on the segment size parameter for History Segment 12. .

Storage Location: Point type 143 is saved to internal configuration memory.

Table 3-57: Point Type 143, History Segment 12

Point Type 143, History Segment 12

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“ “	1.00	Same value as the Point Tag of the Point Type in which the history log resides.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“ “	1.00	User-supplied text string used to identify the parameter being logged in the history point.
2	History Pont Log	R/W	User	TLP	3	See note 3	(0,0,0)	1.00	Indicates the TLP to which value is archived by history. Any parameter may be logged except parameters of Data Type TLP or AC.
3	Archive Type	R/W	User	UINT8	1	See description	0	1.00	Defines how the system archived a data point to history: Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See description	0	1.00	Defines, in conjunction with Archive Type parameters, how the system archives history data. This parameter defines the rate of accumulation of the averaging technique. Valid values are: For Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type = 128) 0 = None (history point not defined) 5 = Linear averaging 6 = User Weighted Linear Averaging (v1.30):

Point Type 143, History Segment 12

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Current value of parameter being logged.
6	Last Daily Value	R/)	System	FL	4	Any valid IEEE 754 float	0	1.00	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the minimum value was reached today.
8	Today Minimium Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0 → 4294967296	0	1.00	Time at which the maximum value was reached yesterday.
14	Yesterday Maximumn Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.00	Maximum value of logged parameter observed yesterday.

3.4.57 Point Type 144: Transactional History Configuration

Description: Point type 144 provides the parameters for configuring the transaction history for the logical.

Number of Logical Points: A maximum of 10 logicals (0 – 9) may exist.

Storage Location: Point type 144 is saved to internal configuration memory.

Table 3-58: Point Type 144, Transactional History Configuration

Point Type 144, Transactional History Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Num Transactions Allocated	R/W	User	UINT16	2	0 → [max based on memory usage]	0	1.30	Number of transactions allocated to this logical
1	Num Transactions Stored	R/O	System	UINT16	2	0 → [max based on memory usage]	0	1.30	Number of transactions stored for this logical
2	Space Reserved	R/O	System	UINT32	4	0 → [max based on memory usage]	0	1.30	Space reserved for this transaction logical
3	Total Space Remaining	R/O	System	S32	4	-2,147,483,648 → 105,480	105,480	1.30	Space remaining for allocations. This can be a negative value if more data is allocated that space available. However, logicalsd cannot be locked while this value is negative.
4	Overwrite Setting	R/W	User	UINT8	1	0 → 1	0	1.30	Indicates how the system handles overwrite settings when transaction limit is reached. Valid values are **0** (overwrite settings) or **1** (Stop).
5	Reset Switch	R/W	User	UNIT8	1	0 → 1	0	1.30	Reset; clears all transactions for this logical
6	Lock Setting	R/W	User	UINT8	1	0 → 1	0	1.30	Settng lock; locks configured for logical. All transactions have cleared for this logical on unlock.
7	Last Transaction Logged	R/O	System	UINT16	2	0 → 65,535	0	1.30	Last transaction number logged
8	Status	R/O	System	UINT8	1	0 → 3	0	1.30	Indicates the status of the last action on this logical. Valid values are: 0 = No Error 1 = Invalid CRC when retrieving data 2 = Error getting transcation 3 = Segment full

3.4.58 Point Type 145: Transactional History Point Configuration

Description: Point type 145 provides the parameters for storing transaction data.

Number of Logical Points: A maximum of 10 logicals (0 – 9) may exist.

Storage Location: Point type 145 is saved to internal configuration memory.

Table 3-59: Point Type 145, Transactional History Point Configuration

Point Type 145, Transactional History Point Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Write Trigger	R/W	User	UINT8	1	0 → 1	0	1.30	Indicates the write trigger. Valid values are 0 (Idle) and 1 (write transaction).
1	Transaction Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“ “	1.30	Transactional description (can be changed without losing transactional history)
2	Point Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“ “	1.30	Point description (can be changed without losing transactional history)
3	Point to Log	R/W	User	TLP	3	Any valid TLP value	0,0,0	1.30	Point to log.
4…201									Parameters 2 and 3 (as a pair) are repeated 100 times.

3.4.59 Point Type 172: RTU Network Discovery List Point Configuration

Description: Point type 172 provides information for the RTU Network Discovery List. .

Number of Logical Points: A maximum of 32 logicals (0 – 31) may exist.

Storage Location: Point type 172 is **not** saved to internal configuration memory.

Table 3-60: Point Type 172, RTU Network Discovery List

Point Type 172, RTU Network Discovery List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/W	User	AC	20	0x20 → 0x7E for each byte	"No Tag"	1.30	Tag of the Remote RTU
1	ROC Device ID	R/W	User	UINT32	4	0 → 4,294,967,296	0	1.30	Unique ID of the Remote RTU
2	Commission List Index	R/W	User	UINT8	1	0-12 or 0-24	0	1.30	Logical number of the commissioned list point type assigned to this Remote RTU
3	Commission Flag	R/W	User	UINT8	1	0, 1, 255	0	1.30	If reading: indicates if this list slot is occupied wth a live non-commissioned device. Valid values are 0 (Empty) and 1 (Occupied). If writing, commissions this device to the specified Commissioned List Index.

3.4.60 Point Type 173: Network Commissioned List

Description: Point type 173 provides information for the Network Commissioned List. .

Number of Logical Points: A maximum of 24 logicals (0 – 23) may exist.

Storage Location: Point type 173 is saved to internal configuration memory.

Table 3-61: Point Type 173, Network Commissioned List

Point Type 173, Network Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/O R/W	System	AC	20	0x20 → 0x7E for each byte	"No Tag"	1.30	Tage of the device
1	ROC Device ID	R/O R/W	System	UINT32	4	0 → 4,294,967,296	0	1.30	Unique ID of the commissioned device
2	Network ID	R/O R/W	System	UINT8	1	0 → 255	0	1.30	Network ID
3	ROC Group Addres	R/O R/W	System	UINT8	1	0 → 255	0	1.30	ROC Group Address
4	ROC Unit Address	R/O R/W	System	UINT8	1	0 → 255	0	1.30	ROC Unit Address
5	ROC Type	R/O R/W	System	UINT8	1	0 → 65535	0	1.30	ROC Type
6	RTU Backplane Type and Slot Usage	R/O R/W	System	UNIT32	4	0 → 4,294,967,296	0	1.30	Indicates the RTU backplane type and slot usage. Bits 0-2: For the 100-Series: 0 = 4 slot 1 = 8 slot For the 800-Series: 0 = 3 slot 1 = 9 slot 2 =- 15 slot 3 = 21 slot 4 = 27 slot Bits 3-31: Slot in use for slots 0-27

Point Type 173, Network Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Device Status	R/W	System	UINT8	1	0 → 255	0	1.30	Indicates the device's integrity status. Valild values are: 0 = Good Bit 1: 1 = I/O Integrity Fail Bit 2: 1 = I/O Alarm Fail Bit 3: 1 = Stale Data on Device Bit 7: 1 = Identifying **Note**: For ROC800s, the device status reports only the Device Status Good bit, the Stale Data on Device bit, and the Identifying bit.
8	Comm Status	R/O	System	UINT8	1	0 → 255	0	1.30	Indicates the device's communication status. Valid values are **0** (Good) and **1** (Comm Fail).
9	Battery Voltage	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Indicates the battery voltage on the ROC
10	Signal Strenght	R/O	System	UINT8	1	0 → 127	0.0	1.30	Indicates the strength of the radio signal. Units are FreeWave J, which is 0-127 value.
11	Noise Level	R/O	System	UINT8	1	0 → 127	0	1.30	Indicates the strength of the radio signal. Units are FreeWave J, which is 0-127 value.
12	Percent Packets Good from Master	R/O	System	UINT8	1	0 → 127	0	1.30	Percent of packets received as good from master radio.
13	Network Configuration Revision	R/O	System	UNIT16	2	0 → 65535	0	1.30	Indicates the revision of the network configuration.
14	Decommission Flag	R/W	User	UINT8	1	0, 1, 255	0	1.30	When reading, indicates if the device is decommissioned. Valid values are 0 (Not commissioned) and 1 (Commissioned). When writing, valid values are 0 (Not commissioned), 1 (Commissioned), and 255 (decommission device).
15	Reflected Power from Radio	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Reflected power from radio in dBm.
16	Passthru Enabled	R/W	User	UINT8	1	0 →1	0	1.30	Allows passthru to the remote node. Valid values are **0** (disabled) and **1** (passthru enabled)
17	Passthru Outgoing Message Count	R/W	User	UINT32	4	0 → 4,294,967,296	0	1.30	Outgoing passthrough message counter. The system resets this parameter to 0 after any type of restart.

3.4.61 Point Type 174: Network Export Data

Description: Point type 174 provides information for network export data. .

Number of Logical Points: A maximum of 30 logicals (0 – 29) may exist.

Storage Location: Point type 174 is saved to internal configuration memory.

Table 3-62: Point Type 174, Network Export Data

Point Type 174, Network Export Data

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/W	User	AC	10	0x20 → 0x7E for each byte	“No Tag”	1.30	Tag of the selected export value
1	Export TLP	R/W	User	TLP	4	Any valid TLP value	0,0,0	1.30	TLP of parameter to be exported
2	Network ID	R/W	User	UINT8	1	0 → 255	0	1.30	Network ID
3	Data ID	R/W	User	UINT16	2	0 → 65535	0	1.30	Unique ID associated with this TLP used to map the value on the import side. Zero indicates the logical is empty.
4	Value	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Current value of the export TLP. The system updates this parameter at the time of export.

3.4.62 Point Type 175: Network Import Data

Description: Point type 175 provides information for network import data. .

Number of Logical Points: A maximum of 128 logicals (0 – 127) may exist.

Storage Location: Point type 175 is saved to internal configuration memory.

Table 3-63: Point Type 175, Network Import Data

Point Type 175, Network Import Data

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/W	User	AC	10	0x20 → 0x7E for each byte	“No Tag”	1.30	Tag of the selected import value
1	Network ID	R/W	User	UINT8	1	0 → 255	0	1.30	Network ID
2	Data ID	R/W	User	UINT16	2	0 → 65535	0	1.30	Unique ID associated with this TLP used to map the value on the import side. Zero indicates the logical is empty.
3	Value	R/O	System	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	The current value.
4	Health/Status	R/O	User	UINT8	1	0 → 255	0	1.30	The health or status of the imported value. Valid values are: 0 = Good 1 = Data not updated (Stale) 2 = Remote Point Fail 3 = Point in Alarm
5	Fault Value	R/W	User	FLOAT	4	Any valid IEEE 754 float	0.0	1.30	Default value for the imported value if a fault condition occurs. A fault condition is defined as a status other than Good in the Health/Status parameter (#4).
6	Fault Enable	R/W	User	UINT8	1	0 → 1	0	1.30	Enables the fault value. Valid values are **0** (Disable) and **1** (Enable).
7	RESERVED								Reserved for future use
8	Source (R)RTU	R/W	User	UINT8	1	0 → 255	0	1.30	Network device ID of the remote RTU from which the TLP is being imported
9	Forward TLP	R/W	User	TLP	4	Any valid TLP value	0,0,0	1.30	TLP to receive imported value

3.4.63 Point Type 176: IEC62591 Live List

Description: Point type 176 provides the parameters for the IEC62591 Live List.

Number of Logical Points: A maximum of 60 logical (0 – 59) may exist.

Storage Location: Point type 176 is **not** saved to internal configuration memory.

Table 3-64: Point Type 176, IEC62591 Live List

Point Type 176, IEC62591 Live List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Device Tag	R/O	System	AC	40	0x20 → 0x7E for each byte	“No Tag “	1.20	Device Tag
1	Device ID	R/O	System	UINT32	4	0 → 65535	0	1.20	Device ID
2	Manufacturing ID	R/O	System	UINT16	2	0 → 65535	0	1.20	Manufacturing ID
3	Device Type	R/O	System	UNIT16	2	0 → 65535	0	1.20	Device Type
4	Commissioned List Index	R/W	System	UINT8	1	0 → 59	0	1.20	Logical number of the commissioned list point type which is assigned to the wireless device.
5	Commission Flag	R/W	System	UNIT8	1	0, 1, 254, 255	0	1.20	When reading, this parameter indicates if this live list slot is occupied with a live non-commissioned device. Valid values are **0** (Empty) and **1** (Occupied) When writing, this parameter commissions this device to the specified Commissioned List Index. Valid values are 254 (commission as a new device) and 255 (commission as a replacement device)
6	Adapter ID	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.20	Adapter ID
7	Adapter Type	R/O	System	UINT16	2	0 → 65535	0	1.20	Adapter Type

3.4.64 Point Type 177: IEC62591 Commissioned List

Description: Point type 177 provides the parameters for the IEC62591 Commissioned List.

Number of Logical Points: A maximum of 60 logicals (0 – 59) may exist.

Storage Location: Point type 177 is saved to internal configuration memory.

Table 3-65: Point Type 177, IEC62591 Commissioned List

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Device Tag	R/O	System	AC	40	0x20 → 0x7E for each byte	"No Tag "	1.20	Tag that resides in device.
1	Device Message	R/W	User	AC	40	0x20 → 0x7E for each byte	"No Message"	1.20	Device message
2	Device Description	R/W	User	AC	20	0x20 → 0x7E for each byte	"No Descriptor "	1.20	Device descriptor
3	Transducer Serial Number	R/O	System	UINT32	4	0 → 4,294,967,2950	0	1.20	Device serial number
4	Device ID	R/O	System	UINT32	4	0 → 4,294,967,2950	0	1.20	Device ID
5	Manufacturer ID	R/O	System	UINT16	2	0 → 65535	0	1.20	Manufacturer ID
6	Device Type	R/O	System	UINT16	2	0 → 65535	0	1.20	Device Type
7	Adapter ID	R/O	System	UINT32	4	0 → 4,294,967,2950	0	1.20	Adapter ID
8	Adapter Type	R/O	System	UINT16	2	0 → 65535	0	1.20	Adapter Type
9	De-commission Flat	R/W	User	UINT8	1	Read: 0-1 Write: 255	0	1.20	Flag used either to indicate commissioned status or to decommission a device. Read: Valid values are: 0 = Not commissioned 1 = Commissioned Write: Valid value is: 255 = De-commission device.
10	Battery Life	R/O	System	UINT16	2	0 → 65535	0	1.20	Indicates, in days, the remaining battery life. If the device does not have a battery or other energy storage component then the device may return 0xFFFF.
11	Response Code/Status	R/O		UINT8	1	0 → 255		1.20	Response Code/Status

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Poll Mode	R/W	User	UINT8	1	0 → 1	0	1.20	Poll mode. Valid values are: 0 = Normal polling of dynamic and slot variables 1 = Update all statis and dynamic device parameters. After the update completes, the IEC62591 module automatically sets this parameter back to 0.
13	Burst Rate	R/W	User	UINT16	2	0 → 65535	1o	1.20	Indicates, in seconds, the burst rate used for polling process variables.
14	Communication Status	R/O	System	UINT8	1	0 → 1	0	1.20	Indicates the device's communication status. Valid values are 0 (OK) and 1 (Communications failure)
15	Loop Current	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.20	Indicates, in mA, the loop current of the device.
16	Primary Variable Value	R/W		FL	4	Any valid IEEE 754 float	0	1.20	Value of primary variable.
17	Primary Variable Units	R/O		UINT8	1	0 → 255	0	1.20	Units code for primary variable.
18	Secondary Variable Value	R/W		FL	4	Any valid IEEE 754 float	0	1.20	Value of secondary variable.
19	Secondary Variable Units	R/O		UINT8	1	0 → 255	0	1.20	Units code for secondary variable.
20	Tertiary Variable Value	R/W		FL	4	Any valid IEEE 754 float	0	1.20	Value of tertiary variable.
21	Tertiary Variable Units	R/O		UINT8	1	0 → 255	0	1.20	Units code for tertiary variable.
22	Quaternary Variable Value	R/W		FL	4	Any valid IEEE 754 float	0	1.20	Value of quanternary variable.
23	Quanternary Variable Units	R/O		UINT8	1	0 → 255	0	1.20	Units code for quaternary variable.
24	Device Commision Status	R/O		UINT8	1	0 → 8	0	1.20	Device Commission Status 0 = Idle 1 = Configuring Burst Message 2 = Configuring Burst Variables 3 = Configuring Burst Rate 4 = Enabling Bursting 5 = Bursting 6 = Values Stale 7 = Communication Failure 8 = Disabling Bursting 9 = Bursting: Delayed Response 10=Comminssion Failure
25	Slot Variable 0 Assignment	R/W	User	UINT8	1	0 → 255	250	1.20	Slot 0 variable to request
26	Slot 0 Units	R/O	System			0 → 255	0	1.20	Units of slot 0 variable

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Slot 0 Value	R/W		FL	4	Any valid IEEE 754 float	0.0	1.20	Value of slot 0 variable
28	Slot Variable 1 Assignment	R/W	User	UINT8	1	0 → 255	250	1.20	Slot 1 variable to request
29	Slot 1Units	R/O	System			0 → 255	0	1.20	Units of slot 1 variable
30	Slot 1 Value	R/W		FL	4	Any valid IEEE 754 float	0.0	1.20	Value of slot 1 variable
31	Slot Variable 2 Assignment	R/W	User	UINT8	1	0 → 255	250	1.20	Slot 2 variable to request
32	Slot 2 Units	R/O	System			0 → 255	0	1.20	Units of slot 2 variable
33	Slot 2 Value	R/W		FL	4	Any valid IEEE 754 float	0.0	1.20	Value of slot 2 variable
34	Slot Variable 3 Assignment	R/W	User	UINT8	1	0 → 255	250	1.20	Slot 3 variable to request
35	Slot 3 Units	R/O	System			0 → 255	0	1.20	Units of slot 3variable
36	Slot 3 Value	R/W		FL	4	Any valid IEEE 754 float	0.0	1.20	Value of slot 3 variable
37	Number Discrete Channels	R/O	System	UINT8	1	0 → 4	0	1.40	Number of discrete channels.
38	Discrete Chan 1 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 classification for the setpoint
39	Discrete Chan 1 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 classification of the device for the live value
40	Discrete Chan 1 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 setpoint
41	Discrete Chan 1 Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 live value
42	Discrete Chan 2 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 classification for the setpoint
43	Discrete Chan 2 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 classification of the device for the live value
44	Discrete Chan 2 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 setpoint
45	Discrete Chan 2 Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 live value
46	Discrete Chan 3 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3classification for the setpoint
47	Discrete Chan 3 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3 classification of the device for the live value
48	Discrete Chan 3 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3 setpoint
49	Discrete Chan 3 Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3 live value
50	Discrete Chan 4 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 classification for the setpoint

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
51	Discrete Chan 4 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 classification of the device for the live value
52	Discrete Chan 4 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 setpoint
53	Discrete Chan 4Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 live value
54	Process Variable Failsafe Mode	R/W	User	UINT8	1	0 → 1	0	1.40	Determine the action on failure. Valid values are **0** (use last process variable values) and **1** (use failsafe value).
55	Primary Variable Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the primary variable value when the Failsafe Mode is set to Use Failsafe Value and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
56	Secondary Variable Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the secondary variable value when the Failsafe Mode is set to Use Failsafe Value and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
57	Tertiary Variable Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the tertiary variable value when the Failsafe Mode is set to Use Failsafe Value and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
58	Quaternary Variable Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the Quaternary variable value when the Failsafe Mode is set to Use Failsafe Value and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
59	NaN Flag	R/O	System	BIN	1	0 → 255	0	1.40	
59.0	PV NaN Flag		Bit 0						Indicates the PV value is not a number at the device
59.1	SV NaN Flag		Bit 1						Indicates the SV value is not a number at the device
59.2	TV NaN Flag		Bit 2						Indicates the TV value is not a number at the device
59.3	QA NaN Flag		Bit 3						Indicates the QA value is not a number at the device
59.4	Slot 1 NaN Flag		Bit 4						Indicates the slot 1 value is not a number at the device

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
59.5	Slot 2 NaN Flag		Bit 5						Indicates the slot 2 value is not a number at the device
59.6	Slot 3 NaN Flag		Bit 6						Indicates the slot 3 value is not a number at the device
59.7	Slot 4 NaN Flag		Bit 7						Indicates the slot 4 value is not a number at the device
60	PV Device Variable Status	R/O	System	BIN	1	0 → 255	0	1.41	PV Device Variable Status byte, which indicates for the primary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good
61	SV Device Variable Status	R/O	System	BIN	1	0 → 255	0	1.41	SV Device Variable Status byte, which indicates for the secondary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
62	TV Device Variable Status	R/O	System	BIN	1	0 → 255	0	1.41	TV Device Variable Status byte, which indicates for the tertiary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good
63	QV Device Variable Status	R/O	System	BIN	1	0 → 255	0	1.41	QV Device Variable Status byte, which indicates for the quaternary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good
64	Discrete Variable Status 1	R/O	System	BIN	1	0 →3	0	1.41	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved
65	Discrete Variable Status 2	R/O	System	BIN	1	0 →3	0	1.41	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
66	Discrete Variable Status 3	R/O	System	BIN	1	0 → 3	0	1.41	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved
67	Discrete Variable Status 4	R/O	System	BIN	1	0 → 3	0	1.41	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved
69	Burst Trigger Mode Message 0	R/W	Both	UINT8	1	0 → 4	0	1.41	Trigger setting for burst mode. 0 = Continuous – Bursts continually at the configured Burst Rate 1 = Windowed – Burst is triggered when source deviates more than the trigger value 2 = Rising – Burst is triggered when source rises above specified value 3 = Falling – Burst is triggered when source falls below specified value 4 = On-Change – Burst is triggered when any value changes
70	Burst Trigger Level Message 0	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.41	Trigger Mode supplementary data for Window, Rising, or Falling selections. See parameter 69.
71	Device Variable Classification Message 0	R/O	System	UINT8	1	0 → 255	0	1.41	The device variable classification code that is read at the time of device discovery (See HCF Spec 183 table 21 for list of codes)
72	Unit Code Message 0	R/O	System	UINT8	1	0 → 255	0	1.41	The device engineering unit code that is read at the time of device discovery (HCF Spec 183 table 2 for list of codes)
73	Update Period Message 0	R/W	Both	UINT16	2	1 → 3600	10	1.41	The time interval (in seconds) at which the device communicates. Determined by the Physical Layer and Data Link Layer requirements as well as the process and application requirements.
74	Event Notification Retry Time	R/W	Both	UINT16	2	1 → 3600	4	1.41	The time interval (in seconds) at which a device will publish its events. Must be less than or equal to Maximum Update Time (parameter 75).

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
75	Event Maximum Update Time	R/W	Both	UINT16	2	1 → 3600	4	1.41	When the Burst Trigger Mode (parameter 69) is anything other than Continuous, this value specifies the longest (in seconds) a device is allowed to remain silent without bursting.
76	Event De-bounce Interval	R/O	System	UINT16	2	1 → 3600	4	1.41	The amount of time in seconds that an event must persist before the event notification is sent.
77	Update Period Message 1	R/W	Both	UINT16	2	1 → 3600	10	1.41	Same as parameter 73 for hybrid transmitters which may send multiple messages.
78	Burst Rate Max Message 1	R/W	Both	UINT16	2	1 → 3600	10	1.41	Same as parameter 13 for hybrid transmitters which may send multiple messages. The device must burst at this frequency even if its configured trigger does not occur.
79	Burst Trigger Mode Message 1	R/W	Both	UINT8	1	0 → 4	0	1.41	Same as parameter 69 for hybrid transmitters which may send multiple messages.
80	Burst Trigger Level Message 1	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.41	Same as parameter 70 for hybrid transmitters which may send multiple messages.
81	Device Variable Classification Message 1	R/O	System	UINT8	1	0 → 255	0	1.41	Same as parameter 71 for hybrid transmitters which may send multiple messages.
82	Unit Code Message 1	R/O	System	UINT8	1	0 → 255	0	1.41	Same as parameter 72 for hybrid transmitters which may send multiple messages
83	Event Notification Time	R/O	System	UINT32	4	0 → 4294967295	0	1.41	Time of the current event. Number of 1/32 millisecond intervals that have passed since the start of the day.
84	Event Summary	R/O	System	UINT8	1	0 → 120	0	1.41	Indicates the Event Notification Control Code as well as the status of any pending events Bit 0-3 – Event Notification Control Code 0 = Off 1 = Enable on Token-Passing Data Link Layer 2 = Enable on TDMA Data Link Layer 3 = Enable on both TDMA and Token DLLs Bit 4 – Configuration Changed Event Pending Bit 5 – Device Status Event Pending Bit 6 – More Status Available Event Pending Bit 7 – Reserved
85	Reset Events	R/W	Both	UINT8	1	0 → 1	0	1.41	Writing a 1 to this parameter causes the acknowledgement of all device events.
86	Config Change Counter	R/O	System	UINT16	2	0 → 65535	0	1.41	The configuration change counter as read from the device.

Point Type 177, IEC62591 Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
87	Execution Command Status	R/O	System	UINT16	2	0 → 65535	0	1.41	In the event a HART command issued from the module to a sensor is not successful, this bitwise parameter indicates which command failed. Bit 0 – Command 103 Message 0 Bit 1 – Command 103 Message 1 Bit 2/3 – Command 104 Message 0/1 Bit 4/5 – Command 107 Message 0/1 Bit 6/7 – Command 108 Message 0/1 Bit 8/9 – Command 109 Message 0/1 Bit 10 – Command 117 Bit 11 – Command 118 Bits 12-15 – RESERVED **Note:** This field shows the status of important commands for Bursting and Events. ▪ Bursting o Command 103 Write Burst Period– Writes Min and Max burst update periods o Command 104 Write Burst Triggers– Sets burst trigger mode o Command 107 Write Burst Device Variables - Burst device variables returned by device on command 9 or 33 in burst mode o Command 108 Write Burst mode command number o Command 109 Burst Mode Control – Sets bursting ON/OFF ▪ **Event Notification** o Command 117 Write Event notification timing – Sets Event notification retry time, Maximum update time, Event De-bounce interval o Command 118 Event notification control - Enable/ Disable event notification
88	Formatted Event Notification Time	R/O	System	AC	10	0x20 → 0x7E for each byte	“00:00:00”	1.41	Parameter 83 converted to HH:MM:SS format

3.4.65 Point Type 200: Liquid Preferences

Description: Point type 200 provides parameters for liquid stations and meters.

Number of Logical Points: 1 logical points of point type 200 may exist.

Storage Location: Point type 200 is saved to internal configuration memory.

Table 3-66: Point Type 200, Liquid Preferenced

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Identification name. Values must be printable ASCII characters.
1	Program Status	R/O	System	UINT8	1	0 → 2	0	1.00.00	Indicates the current status of the Liquid Calcs program. Valid values are: 0 = Program Not Running 1 = Program Running 2 = License key not available
2	Calculation Period	R/W_Log	User	FL	8	0.25 → 5.0	1.0	1.00.00	Amount of time (in seconds) between volume correction factor calculations.
3	RESERVED								Reserved for future use
4	Pressure Units Option	R/W_CNDL	User	UINT8	1	0 → 3	0	1.00.00	Indicates the engineering units for pressure values. All units are in gauge. Valid values are: 0 = PSI 1 = kPa 2 = bar 3 = kg/cm2
5	Temperature Units Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00.00	Indicates the engineering units for temperature values. Valid values are 0 (Deg F) and 1 (Deg C).
6	Density Units Option	R/W_CNDL	User	UINT8	1	0 → 7	0	1.00.00	Indicates the engineering units for density input values. Valid values are: 0 = kg/m3 1 = g/cc 2 = lb/ft3 3 = lb/bbl 4 = lb/gal 5 = relative density 6 = API gravity 7 = kg/L

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Correction Table Units Option	R/W_CNDL	User	UINT8	1	0 → 2	0	1.00.00	Indicates the engineering units for density output values. Valid values are: 0 (Kg/m3 1 = relative density 2 = API gravity
8	Linear Units Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00.00	Indicates the engineering units for prover wall thickness. Valid values are 0 (Inches) and 1 (mm).
9	RESERVED								Reserved for future use
10	Volume Units Option	R/W_CNDL	User	UINT8	1	0 → 6	0	1.00.00	Indicates the engineering units for volume values. Valid values are: 0 = Bbls 1 = MCF 2 = km3 3 = Gallons (US) 4 = ft3 5 = m3 6 = Liters
11	Mass Units Option	R/W_CNDL	User	UINT8	1	0 → 3	0	1.00.00	Indicates the engineering units for mass values. Valid values are: 0 = lbs 1 = kg 2 = tons (short) 3 = tones
12	Flow Rate Option	R/W_LOG	User	UINT8	1	0 → 3	0	1.00.00	Indicates the time basis for calculating flow rates. Valid values are: 0 = per day 1 = per hour 2 = per minute 3 = per second
13	Rollover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1e12	1.00.00	Indicates the value at which on-going accumulator's rollover.
14	Calculation Alarm Status	R/O	User	UINT8	1	0 → 1	0	1.00.00	
15	Calculation Alarm Reset	R/W	User	UINT8	1	0 → 1	0	1.00.00	
16	Atmospheric Pressure	R/W	System	DOUBLE	8	0.0 → any valid IEEE double precision float	14.696	1.00.00	Local atmospheric pressure in the pressure units selected (parameter #4)
17	RESERVED								Reserved for future use
18	RESERVED								Reserved for future use
19	RESERVED								Reserved for future use

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Gas Constant	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	8.31451	1.00.00	Gas constant for use in COSTALD-Tait calculations in J · mol^{-1}· K^{-1}
21	Molecular Weight of Methane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	16.043	1.00.00	Molecular weight of methane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
22	Molecular Weight of Ethane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	30.070	1.00.00	Molecular weight of ethane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
23	Molecular Weight of Propane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	44.097	1.00.00	Molecular weight of propane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
24	Molecular Weight of n-Butane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	58.123	1.00.00	Molecular weight of n-butane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
25	Molecular Weight of i-Butane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	58.123	1.00.00	Molecular weight of i-butane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
26	Molecular Weight of n-Pentane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	72.150	1.00.00	Molecular weight of n-pentane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
27	Molecular Weight of i-Pentane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	72.150	1.00.00	Molecular weight of i-pentane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
28	Molecular Weight of n-Hexane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	86.177	1.00.00	Molecular weight of n-hexane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations
29	Molecular Weight of n-Heptane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	100.204	1.00.00	Molecular weight of n-heptane in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
30	Molecular Weight of Ethylene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	28.054	1.00.00	Molecular weight of ethylene in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
31	Molecular Weight of Propylene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	42.081	1.00.00	Molecular weight of propylene in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
32	Molecular Weight of 1-Butene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	56.108	1.00.00	Molecular weight of 1-butene in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.
33	Molecular Weight of Nitrogen	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	28.0135	1.00.00	Molecular weight of nitrogen in kg·$kmol^{-1}$ for use in COSTALD-Tait calculations.

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
34	Molecular Weight of Oxygen	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	31.9988	1.00.00	Molecular weight of oxygen in $kg \cdot kmol^{-1}$ for use in COSTALD-Tait calculations.
35	Molecular Weight of Carbon Dioxide	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	44.010	1.00.00	Molecular weight of oxygen in $kg \cdot kmol^{-1}$ for use in COSTALD-Tait calculations.
36	Molecular Weight of Hydrogen Sulfide	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	34.082	1.00.00	Molecular weight of hydrogen sulfide in $kg \cdot kmol^{-1}$ for use in COSTALD-Tait calculations.
37	Critical Temperature of Methane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	190.58	1.00.00	Critical temperature of methane in K for use in COSTALD-Tait calculations.
38	Critical Temperature of Ethane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	305.42	1.00.00	Critical temperature of ethane in K for use in COSTALD-Tait calculations.
39	Critical Temperature of Propane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	369.82	1.00.00	Critical temperature of propane in K for use in COSTALD-Tait calculations.
40	Critical Temperature of n-Butane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	425.18	1.00.00	Critical temperature of n-butane in K for use in COSTALD-Tait calculations.
41	Critical Temperature of i-Butane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	408.14	1.00.00	Critical temperature of i-butane in K for use in COSTALD-Tait calculations.
42	Critical Temperature of n-Pentane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	469.65	1.00.00	Critical temperature of n-pentane in K for use in COSTALD-Tait calculations.
43	Critical Temperature of i-Pentane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	460.43	1.00.00	Critical temperature of i-pentane in K for use in COSTALD-Tait calculations.
44	Critical Temperature of n-Hexane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	507.43	1.00.00	Critical temperature of n-hexane in K for use in COSTALD-Tait calculations.
45	Critical Temperature of n-Heptane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	540.26	1.00.00	Critical temperature of n-heptane in K for use in COSTALD-Tait calculations.
46	Critical Temperature of Ethylene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	282.36	1.00.00	Critical temperature of ethylene in K for use in COSTALD-Tait calculations.
47	Critical Temperature of Propylene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	364.76	1.00.00	Critical temperature of propylene in K for use in COSTALD-Tait calculations.

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
48	Critical Temperature of 1-Butene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	419.57	1.00.00	Critical temperature of 1-butene in K for use in COSTALD-Tait calculations.
49	Critical Temperature of Nitrogen	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	126.2	1.00.00	Critical temperature of nitrogen in K for use in COSTALD-Tait calculations.
50	Critical Temperature of Oxygen	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	154.58	1.00.00	Critical temperature of oxygen in K for use in COSTALD-Tait calculations.
51	Critical Temperature of Carbon Dioxide	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	304.21	1.00.00	Critical temperature of carbon dioxide in K for use in COSTALD-Tait calculations.
52	Critical Temperature of Hydrogen Sulfide	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	373.54	1.00.00	Critical temperature of hydrogen sulfide in K for use in COSTALD-Tait calculations.
53	Characteristic Volume of Methane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.09939	1.00.00	Characteristic Volume of methane in m3/kmol for use in COSTALD-Tait calculations.
54	Characteristic Volume of Ethane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1458	1.00.00	Characteristic Volume of ethane in m3/kmol for use in COSTALD-Tait calculations.
55	Characteristic Volume of Propane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2001	1.00.00	Characteristic Volume of propane in m3/kmol for use in COSTALD-Tait calculations.
56	Characteristic Volume of n-Butane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2544	1.00.00	Characteristic Volume of n-butane in m3/kmol for use in COSTALD-Tait calculations.
57	Characteristic Volume of i-Butane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2568	1.00.00	Characteristic Volume of i-butane in m3/kmol for use in COSTALD-Tait calculations.
58	Characteristic Volume of n-Pentane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.3113	1.00.00	Characteristic Volume of n-pentane in m3/kmol for use in COSTALD-Tait calculations.
59	Characteristic Volume of i-Pentane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.3096	1.00.00	Characteristic Volume of i-pentane in m3/kmol for use in COSTALD-Tait calculations.
60	Characteristic Volume of n-Hexane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.3682	1.00.00	Characteristic Volume of n-hexane in m3/kmol for use in COSTALD-Tait calculations.
61	Characteristic Volume of n-Heptane	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.4304	1.00.00	Characteristic Volume of n-heptane in m3/kmol for use in COSTALD-Tait calculations.

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
62	Characteristic Volume of Ethylene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1310	1.00.00	Characteristic Volume of ethylene in m3/kmol for use in COSTALD-Tait calculations.
63	Characteristic Volume of Propylene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1829	1.00.00	Characteristic Volume of propylene in m3/kmol for use in COSTALD-Tait calculations.
64	Characteristic Volume of 1-Butene	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2377	1.00.00	Characteristic Volume of 1-butene in m3/kmol for use in COSTALD-Tait calculations.
65	Characteristic Volume of Nitrogen	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.09012	1.00.00	Characteristic Volume of nitrogen in m3/kmol for use in COSTALD-Tait calculations.
66	Characteristic Volume of Oxygen	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.07382	1.00.00	Characteristic Volume of oxygen in m3/kmol for use in COSTALD-Tait calculations.
67	Characteristic Volume of Carbon Dioxide	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.09384	1.00.00	Characteristic Volume of carbon dioxide in m3/kmol for use in COSTALD-Tait calculations.
68	Characteristic Volume of Hydrogen Sulfide	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.09941	1.00.00	Characteristic Volume of hydrogen sulfide in m3/kmol for use in COSTALD-Tait calculations.
69	Methane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0074	1.00.00	Acentric factor for methane (unitless) for use in COSTALD-Tait calculations.
70	Ethane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0983	1.00.00	Acentric factor for ethane (unitless) for use in COSTALD-Tait calculations.
71	Propane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1532	1.00.00	Acentric factor for propane (unitless) for use in COSTALD-Tait calculations.
72	n-Butane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2008	1.00.00	Acentric factor for n-butane (unitless) for use in COSTALD-Tait calculations.
73	i-Butane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1825	1.00.00	Acentric factor for i-butane (unitless) for use in COSTALD-Tait calculations.
74	n-Pentane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2522	1.00.00	Acentric factor for n-pentane (unitless) for use in COSTALD-Tait calculations.
75	i-Pentane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2400	1.00.00	Acentric factor for i-pentane (unitless) for use in COSTALD-Tait calculations.

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
76	n-Hexane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.3007	1.00.00	Acentric factor for n-hexane (unitless) for use in COSTALD-Tait calculations.
77	n-Heptane Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.3507	1.00.00	Acentric factor for n-heptane (unitless) for use in COSTALD-Tait calculations.
78	Ethylene Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0882	1.00.00	Acentric factor for ehtylene (unitless) for use in COSTALD-Tait calculations.
79	Propylene Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1455	1.00.00	Acentric factor for propylene (unitless) for use in COSTALD-Tait calculations.
80	1-Butene Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1921	1.00.00	Acentric factor for 1-butene (unitless) for use in COSTALD-Tait calculations.
81	Nitrogen Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0358	1.00.00	Acentric factor for nitrogen (unitless) for use in COSTALD-Tait calculations.
82	Oxygen Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0298	1.00.00	Acentric factor for oxygen (unitless) for use in COSTALD-Tait calculations.
83	Carbon Dioxide Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.2373	1.00.00	Acentric factor for carbon dioxide (unitless) for use in COSTALD-Tait calculations.
84	Hydrogen Sulfide Acentric Factor	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1039	1.00.00	Acentric factor for hydrogen sulfide (unitless) for use in COSTALD-Tait calculations.
85	Neo-Pentane Molecular Weight	RW_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	83.268	1.01.02	Molecular weight of neo-pentane in kg mol for use in COSTALD-Tait calculations
86	Neo-Pentane Critical Temperature	R/W-CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	433.7	1.01.03	Critical temperature of neo-pentane in K for use in COSTALD-Tait calculations
87	Neo-Pentane Characteristic Volume	R/W_CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.3126	1.01.03	Characteristic volume of neo-pentane in m3.kmol for use in COSTALD-Tait calculations
88	Neo—Pentane Acentric Factor	R/W-CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.1975	1.01.03	Acentric factor for neo-pentane (unitless) for use in COSTALD-Tait calculations
89	Contract Hour	R/W	User	UINT8	1	0 → 23	0	1.03.00	Indicates the contract hour for all liquid meters and liquid stations

Point Type 200, Liquid Preferences

Parm#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
90	Last Iteration Time	R/O	System	Time	4	N/A	0	1.04.00	Indicates the saved time since the last iteration.

3.4.66 Point Type 201: Liquid Products

Description: Point type 201 defines the parameters for Liquid Products

Number of Logical Points: 24 logical points of point type 201 may exist.

Storage Location: Point type 201 is saved to internal configuration memory.

Table 3-67: Point Type 201, Liquid Products

Point Type 201, Liquid Products

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Product X" where X is the logical number	1.00.00	Identification name for specific Product. Values must be printable ASCII characters.
1	Fluid Type	R/W_CNDL	User	UINT8	1	0 → 7	0	1.00.00	Indicates the type of fluid for this product. Valid values are: 0 = Crude Oil 1 = Gasoline 2 = Jet Fuel 3 = Fuel Oil 4 = Lube Oil 5 = Special Applications (user-defined Alpha) 6 = Light Hydrocarbons 7 = Unknown Product (when selected no volume correction is applied) 8 = Transition 9 = Out of Range 10 = Water 11 = Ethanol
2	API Measurement Standard	R/W_CNDL	User	UINT8	1	0 → 2	1	1.00.00	Indicates which version of the API calculation standard to use. Valid values are: 0 = Not supported 1 = 1980 API/ASTM/IP/ISO Tables 2 = 2004 API/ASTM/IP Tables
3	Light Hydrocarbon Standard Version	R/W_CNDL	User	UINT8	1	0 → 2	0	1.00.00	Indicates which standard to use for calculating a temperature correction factor for light hydrocarbons. Valid values are: 0 = GPA TP27 1 = COSTALD-Tait) 2 = API 14.4.

Point Type 201, Liquid Products

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Compressibility Option	R/W_CNDL	User	UINT8	1	0 → 3	0	1.00.00	Indicates what method to use for calculating the product's compressibility. Valid values are:: 0 = Program determines method based on density of product and temperature units 1 = API 11.2.1 calculation 2 = API 11.2.2 calculation 3 = User-Entered compressibility. This selection is only valid if the 1980 version of the API MPMS Chapter 11.1 standard is selected (parameter 2).
5	Compressibility Factor	R/W_CNDL	User	DOUBLE	8	Any valid IEEE double	0.00000448	1.00.00	Compressibility factor value for this product. This value is writeable only if User-Entered Compressibility is selected (parameter 4).
6	Equilibrium/Base Pressure (Vapor Pressure)	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Equilibrium (bubble point) pressure for the current product in psig, barq, or kPa (gauge). The equilibrium pressure is the minimum pressure at which bubbles of gas appear in a liquid.
7	Alpha Coefficient	R/W_CNDL	User	DOUBLE	8	Any valid IEEE double	1.0	1.00.00	User-defined alpha coefficient. This value is used only if the fluid type selected (parameter 1) is Special Applications (5).
8	Base Density	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	737.0	1.00.00	Base density of the product at contract temperature and pressure. Density units based on Correction Table Units Option selection (point type 200, parameter 7).
9	VCF Rounding Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.01.00	Indicates if rounding should be performed for any stations/meter associated with this product. Valid values are: 0 = No Rounding 1 = Round per applicable standard
10	RESERVED								Reserved for future use
11	Meter 1 K-factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the K-factor for this product when used in Meter 1.
12	Meter 1 Meter Factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the Meter Factor for this product when used in Meter 1.
13	Meter 1 Prove Sequence Number	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.00.00	The prove sequence identifier for this meter and/or K-factor.
14	Meter 1 Prove Date and Time	R/W_LOG	Both	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
15	Meter 2 K-factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the K-factor for this product when used in Meter 2.
16	Meter 2 Meter Factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the Meter Factor for this product when used in Meter 2.

Point Type 201, Liquid Products

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
17	Meter 2 Prove Sequence Number	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.00.00	The prove sequence identifier for this meter and/or K-factor.
18	Meter 2 Prove Date and Time	R/W_LOG	Both	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
19	Meter 3 K-factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the K-factor for this product when used in Meter 3.
20	Meter 3 Meter Factor	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the Meter Factor for this product when used in Meter 3.
21	Meter 3 Prove Sequence Number	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.00.00	The prove sequence identifier for this meter and/or K-factor.
22	Meter 3 Prove Date and Time	R/W_LOG	Both	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
23	Meter 4 K-factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the K-factor for this product when used in Meter 4.
24	Meter 4 Meter Factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the Meter Factor for this product when used in Meter 4.
25	Meter 4 Prove Sequence Number	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.00.00	The prove sequence identifier for this meter and/or K-factor.
26	Meter 4 Prove Date and Time	R/W_LOG	Both	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
27	Meter 5 K-factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the K-factor for this product when used in Meter 5.
28	Meter 5 Meter Factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the Meter Factor for this product when used in Meter 5.
29	Meter 5 Prove Sequence Number	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.00.00	The prove sequence identifier for this meter and/or K-factor.
30	Meter 5 Prove Date and Time	R/W_LOG	Both	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
31	Meter 6 K-factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the K-factor for this product when used in Meter 6.
32	Meter 6 Meter Factor	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Value of the Meter Factor for this product when used in Meter 6.
33	Meter 6 Prove Sequence Number	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.00.00	The prove sequence identifier for this meter and/or K-factor.
34	Meter 6 Prove Date and Time	R/W_LOG	Both	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed

Point Type 201, Liquid Products

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									since 12:00 a.m. Jan. 1, 1970.
35	Low Density Alarm Limit	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	If selected this value can be used for low density alarm at the densitometer. Units defined by Correction Table Units Option (point type 200, parameter 7).
36	High Density Alarm Limit	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	1200.0	1.00.00	If selected this value can be used for high density alarm at the densitometer. Units defined by Correction Table Units Option (point type 200, parameter 7).
37	Density Alarm Deadband	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	If selected this value will be the alarm deadband value used at the densitometer.
38	Meter 1 Prove Sequence Counter	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.01.03	Indicates the last attempted (but not necessarily accepted) prove sequence number for this product for meter 1. The system uses this value and increments it as the prove sequence number when performing meter proves on a per-product per meter basis.
39	Meter 2 Prove Sequence Counter	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.01.03	Indicates the last attempted (but not necessarily accepted) prove sequence number for this product for meter 2. The system uses this value and increments it as the prove sequence number when performing meter proves on a per-product per meter basis.
40	Meter 3 Prove Sequence Counter	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.01.03	Indicates the last attempted (but not necessarily accepted) prove sequence number for this product for meter 3. The system uses this value and increments it as the prove sequence number when performing meter proves on a per-product per meter basis.
41	Meter 4 Prove Sequence Counter	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.01.03	Indicates the last attempted (but not necessarily accepted) prove sequence number for this product for meter 4. The system uses this value and increments it as the prove sequence number when performing meter proves on a per-product per meter basis.
42	Meter 5 Prove Sequence Counter	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.01.03	Indicates the last attempted (but not necessarily accepted) prove sequence number for this product for meter 5. The system uses this value and increments it as the prove sequence number when performing meter proves on a per-product per meter basis.
43	Meter 6 Prove Sequence Counter	R/W_LOG	Both	UINT32	4	0→ 4,294,967,296	0	1.01.03	Indicates the last attempted (but not necessarily accepted) prove sequence number for this

Point Type 201, Liquid Products

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									product for meter 6. The system uses this value and increments it as the prove sequence number when performing meter proves on a per-product per meter basis.
44	Ethanol Table Option	R/W_CNDL	User	UINT8	1	0→ 1	0	1.02.00	Indicates the calculation the system uses when the Fluid Type is set to Ethanol. Valid values are: 1 = OIML R22 International Alcholometric Tables 1973 2 = ABNT NBR 5992
45	Ethanol Mass Percentage	R/W_LOG	User	DOUBLE	8	0.0 → 100.0	90.0	1.02.00	Indicates the alcoholic strength by mass, expressed as a percentage. The system uses this value when the Fluid Type is set to Ethanol.
46	Volume Equivalent Option	R/W_CNDL	User	UINT8	1	0→ 1	0	1.03.00	Indicates the volume equivalent for the API 14.4 calculation. Valid values are: 0 = Gas Equivalent 1 = Liquid Equivalent
47	Base Pressure	R/W_CNDL	User	DOUBLE	8	Any valid IEEE double	14.696	1.04.00	The base pressure value in the API 14.4 gas equivalent volume calculation.

3.4.67 Point Type 202: Density Interface

Description: Point type 202 defines the parameters for Density Interface

Number of Logical Points: 6 logical points of point type 202 may exist.

Storage Location: Point type 202 is saved to internal configuration memory.

Table 3-68: Point Type 202, Density Interface

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Density X" where X is the densitometer number	1.00.00	Identification name for specific Density Interface. Values must be printable ASCII characters.
1	Density Input Type	R/W_Log	User	UINT8	1	0 → 4	0	1.00.00	Indicates the type of density input interface. Valid values are: 0 = Micro Motion 1 = ITT Barton 2 = UGC 3 = Sarasota 4 = Analog density
2	Raw Density Input TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105, 5→148,0→27 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20	0, 0, 0	1.00.00	Specifies the ROC parameter from which to retrieve the raw density input. The input may either be a frequency from a densitometer or an analog density from any source.
3	Raw Density Input	R/W	Both	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Raw input value. If the density input is a frequency input from a densitometer, this value contains the frequency. Otherwise, it contains the raw density input.

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Density Input Status Flag	R/O	System	UINT8	1	0 → 4	0	1.00.00	Current status of the density input. Valid values are: 0 = Live reading; Density value within normal range) 1 = Live reading; Failed (density value exceeds high or low density failure limits) 2 = Failed to backup value 3 = Density off scan – Last live reading 4 = Density off scan – Backup density reading 5 = Failed to download value 6 = Density off scan – Download value
5	Density Temperature TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 106, 5→148,22 and TLP 107, 5→148,9 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20	0, 0, 0	1.00.00	Specifies the ROC input parameter from which to retrieve the temperature at the density measurement.
6	Density Temperature	R/W	Both	DOUBLE	8	Any valid IEEE double	60.0	1.00.00	Temperature value at the density measurement site. Units defined by temperature units option (point type 200, parameter #5).
7	Density Pressure TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20	0, 0, 0	1.00.00	Specifies the ROC input parameter from which to retrieve the pressure at the densitometer.
8	Density Pressure	R/W	Both	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Pressure value at the density measurement site. Units defined by pressure units option (point type 200, parameter #4).
9	Density Correction Factor	R/W_Log	User	DOUBLE	8	Any valid IEEE double	1.0	1.00.00	Multiplier value to correct densitometer input.
10	Observed Density (In Use)	R/O	System	DOUBLE	8	Any valid IEEE double	1000.0	1.00.00	Observed Density in the selected density input units. Parameter #4 provides the status of this value.
11	Observed Relative Density (In Use)	R/O	User	DOUBLE	8	Any valid IEEE double	1.0	1.00.00	Observed density, relative to the density of water.
12	Observed API Gravity (In Use)	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Observed density in units of API gravity.

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Observed Density (Live Reading)	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	The live density reading in the selected density input units, after compensation for pressure and temperature effect on the densitometer and the density correction factor have been applied.
14	Density Backup Value	R/W_Log	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	User entered density value in the selected density input units. This value can be used as the observed density value if the densitometer fails or the density input is placed off scan.
15	Density Download Value	R/W	User	DOUBLE	8	0 → Any valid positive IEEE double	0.0	1.00.00	Remotely downloaded density value in the selected density input units. This value can be used as the observed density value if the densitometer fails or the density input is placed off scan. Changes to this parameter are not logged to the event log.
16	Hydrometer Correction Option	R/W_Log	User	UINT8	1	0 → 1	0	1.00.00	Selection of application of the glass hydrometer correction factor. Valid values are 0 (No correction) and 1 (Correction Applied).
17	Periodic Time	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	The microseconds in-between pulse wave peaks if density is obtained from a densitometer providing a frequency input.
18	Density Scanning Mode (Auto / Manual)	R/W	User	UINT8	1	0 → 1	1	1.00.00	Selection to use either the live reading or a fixed value for the observed density. Valid values are 0 (Fixed Value – Manual) and 1 (Live Reading – Auto).
19	Manual Mode (Off scan) Options	R/W	User	UINT8	1	0 → 1	0	1.00.00	Selection for behavior when density mode (parameter #18) is set to Fixed Value - Manual. Valid values are: 0 = Observed density holds last live reading before mode change 1 = Observed density is set to Density Backup Value (parameter #14). 2 = Observed density is set to Density Download Value
20	Auto Mode Failure Options	R/W	User	UINT8	1	0 → 1	0	1.00.00	Selection for behavior when observed density input fails (falls below the density failure low limit or above the density failure high limit). Valid values are: 0 = Continue using Observed Density Live Reading 1 = Observed density is set to Density Backup Value (parameter #14) 2 = Observed density is set to Density Download Value (parameter #15).

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21	Low Density Failure Value	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	–1000.0	1.00.00	Densitometer failure low value in selected units.
22	High Density Failure Value	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	100,000.0	1.00.00	Densitometer failure high value in selected units.
23	Product Change Alarm Delay	R/W	User	UINT16	2	0 → 600	0	1.00.00	Disable checking density alarms during a change of products. The alarm delay time is in seconds.
24	Density Alarm Option	R/W_LOG	User	UINT8	1	0 → 2	0	1.00.00	If enabled, alarms may be generated and sent to the Alarm Log. Alarm value limits are entered in the product point type. Valid values are 0 (Disabled) and 1 (Enabled).
25	SRBX on Clear	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
26	SRBX on Set	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled) .
27	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00.00	
27.0	Low Alarm			Bit 0			0	1.00.00	This alarm bit is set when Density alarming is enabled and the Observed Density In Use Reading is less than or equal to the Low Density Alarm Value.
27.1	Not Used			Bit 1			0	1.00.00	Not used.
27.2	High Alarm			Bit 2			0	1.00.00	This alarm bit is set when Density alarming is enabled and the Observed Density In Use Reading is greater than or equal to the high Density Alarm Value.
27.3	Not Used			Bit 3			0	1.00.00	Not Used
27.4	Not Used			Bit 4			0	1.00.00	Not Used
27.5	Not Used			Bit 5			0	1.00.00	Not Used
27.6	Point Fail Alarm			Bit 6			0	1.00.00	This alarm is set when Density Scanning is set to Live Reading and the Observed Density Live Reading is less than or equal to the Low Density Fail Value (parameter 21) or greater than or equal to the High Density Fail Value (parameter 22).
27.7	Scanning Disabled Alarm			Bit 7			0	1.00.00	This alarm is set when the Density Scanning selection (parameter 18) is set to use a fixed value.
28	RESERVED								Reserved for future use

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	RESERVED								Reserved for future use
30	RESERVED								Reserved for future use
31	Basic Transducer Constant K0/A0	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant from the calibration certificate of the selected densitometer. The system uses this constant in the general density calculation. Values are in ˚C and Bar.
32	Basic Transducer Constant K1/A1	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant from the calibration certificate of the selected densitometer. This system uses this constant in the general density calculation. Values are in ˚C and Bar.
33	Basic Transducer Constant K2/A2	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant from the calibration certificate of the selected densitometer. The system uses this constant in the general density calculation. Values are in ˚C and Bar.
34	RESERVED								Reserved for future use
35	RESERVED								Reserved for future use
36	Micro Motion Temperature Correction Constant K18	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant K18 from the calibration certificate of the Micro Motion densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in ˚C and Bar.
37	Micro Motion Temperature Correction Constant K19	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant K19 from the calibration certificate of the Micro Motion densitometer. This constant is used in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in ˚C and Bar.
38	Micro Motion Pressure Correction Constant K20A	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant K20A from the calibration certificate of the Micro Motion densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in ˚C and Bar.
39	Micro Motion Pressure Correction Constant K20B	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant K20B from the calibration certificate of the Micro Motion densitometer. This constant is used in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in ˚C and Bar.

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Micro Motion Pressure Correction Constant K21A	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant K21A from the calibration certificate of the Micro Motion densitometer. This constant is used in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in ˚C and Bar.
41	Micro Motion Pressure Correction Constant K21B	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant K21B from the calibration certificate of the Micro Motion densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in ˚C and Bar.
42	RESERVED								Reserved for future use
43	RESERVED								Reserved for future use
44	UGC Pressure Correction Constant Pc	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Pc from the calibration certificate of the UGC densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation.
45	UGC Pressure Correction Constant Kp1	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Kp1 from the calibration certificate of the UGC densitometer. This constant is used in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in ˚C and Bar.
46	UGC Pressure Correction Constant Kp2	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Kp2 from the calibration certificate of the UGC densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in ˚C and Bar.
47	UGC Pressure Correction Constant Kp3	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Kp3 from the calibration certificate of the UGC densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in ˚C and Bar.
48	UGC Temperature Correction Constant Tc	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Tc from the calibration certificate of the UGC densitometer. This constant is used in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in ˚C and Bar.

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
49	UGC Temperature Correction Constant Kt1	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Kt1 from the calibration certificate of the UGC densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in ˚C and Bar.
50	UGC Temperature Correction Constant Kt2	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Kt2 from the calibration certificate of the UGC densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in ˚C and Bar.
51	UGC Temperature Correction Constant Kt3	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Constant Kt3 from the calibration certificate of the UGC densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in ˚C and Bar.
52	RESERVED								Reserved for future use
53	RESERVED								Reserved for future use
54	Sarasota Constant K	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Sarasota calibration constant of spool
55	Sarasota Constant D0	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Density calibration constant of spool
56	Sarasota Constant Temperature Coefficient	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Temperature calibration correction constant value
57	Sarasota Constant Pressure Coefficient	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Pressure calibration correction constant value
58	Sarasota Constant T0	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Periodic calibration constant of spool
59	RESERVED								Reserved for future use
60	RESERVED								Reserved for future use
61	Velocity of Sound Option	R/W_LOG	User	U8	1	0→1	0	1.00.00	Selection to enable velocity of sound compensation for a Micro Motion densitometer type.
62	Liquid Velocity of Sound	R/W_LOG	User	Double	8	0→Any valid IEEE double	0.0	1.00.00	User entered velocity of sound of the measured liquid in m/s.
63	Calibration Velocity of Sound	R/O	System	Double	8	0→Any valid IEEE double	0.0	1.00.00	Calibration velocity of sound calculated from the pressure and temperature compensated density in m/s.

Point Type 202, Density Interface

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
64	Test Mode	R/W_LOG	System	U8	1	0→1	0	1.00.00	Selection to calculate the desnity using the test frequency (parameter #62) instead of the raw density input (parameter #3). Valid values are 0 (Normal; use raw density input) and 1 (Test; use test frequency).
65	Test Frequency	R/W_LOG	System	Double	8	0→Any valid IEEE double	0.0	1.00.00	User entered frequency used to calculate density when test mode (parameter #61) is set to Test.
66	RESERVED								Reserved for future use
67	Densitometer Constants Units Option	R/W_LOG	Both	UINT8	1	0 → 1	0	1.00.00	Option for selecting the calibration constants units used for the densitometer. Valid values are 0 (Imperial) and 1 (Metric).

3.4.68 Point Type 203: Liquid Station

Description: Point type 203 provides the parameters for Liquid Station
Number of Logical Points: 6 logical points of point type 203 may exist.
Storage Location: Point type 203 is saved to internal configuration memory.

Table 3-69: Point Type 203, Liquid Station

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W_LOG	User	AC	20	0x20 → 0x7E for each ASCII character	“L Station X” where X is the Station number	1.00.00	Identification name for specific station. Values must be printable ASCII characters.
1	Product	R/W_LOG	User	UINT8	1	0 → 23	0	1.00.00	Indicates which product is currently flowing through this station. The value is the logical number of the product point type.
2	Flowrate Alarming Option	R/W_CNDL	User	UINT8	1	0 → 5	0	1.00.00	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are: 0 = Disabled 1 = Enabled for Indicated Volume Flow Rate (parameter 29) 2 = Enabled for Gross Volume Flow Rate (parameter 30) 3 = Enabled for Gross Standard Volume Flow Rate (parameter 31) 4 = Enabled for Net Standard Volume Flow Rate (parameter 32) 5 = Enabled for Mass Flow Rate (parameter 34) 6 = Enabled for Unshrunk Volume Flow Rate (parameter 140)
3	SRBX on Clear	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
4	SRBX on Set	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
5	Flowrate Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00.00	

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5.0	Low Alarm			Bit 0			0	1.00.00	This alarm sets if the flow rate selected for alarming (see parameter 2) is less than or equal to the Low Flow Alarm (parameter 6). This alarm clears if the flow rate selected for alarming is greater than the Low Alarm Flow (parameter 6) plus the alarm deadband (parameter 8).
5.1	Not Used			Bit 1			0	1.00.00	Not used.
5.2	High Alarm			Bit 2			0	1.00.00	This alarm sets if the flow rate selected for alarming (see parameter 2) is greater than or equal to the High Alarm (parameter 7). This alarm clears if the flow rate selected for alarming is less than the High Alarm Flow (parameter 7) minus the alarm deadband (parameter 8).
5.3	Not Used			Bit 3			0	1.00.00	Not Used
5.4	Not Used			Bit 4			0	1.00.00	Not Used
5.5	Not Used			Bit 5			0	1.00.00	Not Used
5.6	No Used			Bit 6			0	1.00.00	Not Used
5.7	Not Used			Bit 7			0	1.00.00	Not Used
6	Low Flow Alarm Value	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	–1000.0	1.00.00	Alarm value for Low Alarm in units of selected flow rate (see parameter 2).
7	High Flow Alarm Value	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	100,000.0	1.00.00	Alarm value for High Alarm in units of selected flow rate (see parameter 2).
8	Alarm Deadband	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	100.0	1.00.00	The value that the selected flow rate (see parameter 2) must be above the low alarm value (parameter 6) or below the high alarm value (parameter 7) before the associated alarm clears.
9	Base Temperature Option	R/W_CNDL	User	UINT8	1	$0 \rightarrow 4$	0	1.00.00	Indicates which reference temperature has been selected for the net volume. Valid values are: 0 = 60 Deg F 1 = 15 Deg C 2 = 20 Deg C 3 = 30 Deg C 4 = Not supported at this time
10	Base Temperature Value	R/W	User	DOUBLE	8	Any valid IEEE double	60.0	1.00.00	The value of the selected base temperature or the user entered value.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11	Densitometer Option	R/W_LOG	User	UINT8	1	0 → 4	0	1.00.00	Indicates whether the station has a densitometer(s) that provides a density for all the meters in the station. Valid values are: 0 = No station densitometer 1 = Use densitometer “A” only 2 = Use densitometer “B” only 3 = Auto switch between “A” and “B”Dual station densitometers present
12	Density A Logical	R/W_LOG	User	UINT8	1	0 → 5	0	1.00.00	Specifies the first densitometer point from which to retrieve the density
13	Density B Logical	R/W_LOG	User	UINT8	1	0 → 5	0	1.00.00	Specifies the second densitometer point from which to retrieve the density.
14	Selected Density Input	R/W_LOG	User	UINT8	1	0 → 5	0	1.00.00	Current densitometer point in use.
15	RESERVED								Reserved for future use
16	Observed Density	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Current value of the fluid density observed at the station header under flowing conditions. Units are defined by Density Units Option (point type 200, parameter 6).
17	Base Density	R/O	System	DOUBLE	8	Any valid IEEE double	737.0	1.00.00	Current value of the fluid density at the selected base temperature and equilibrium pressure. Units are defined by Correction Table Units (point type 200, parameter 7).
18	Flow Calculation Alarm Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates whether flow calculation alarms should be generated and sent to the alarm log. Flow calculation alarms can be generated only at the station if a live density input is associated with the station (see parameter 11). Valid values are 0 (Disabled) and 1 (Enabled).
19	Flow Calculation Alarm Code	R/O	System	BIN	1	0x00 → 0XFF	0	1.00.00	See descriptions of individual bits below.
19.0	Temperature Ot of Bounds			Bit 0			0	1.00.00	Alarm occurs if the observed temperature is outside of the bounds set by the applicable standard.
19.1	Pressure Out of Bounds			Bit 1			0	1.00.00	Alarm occurs if the observed pressure is outside of the bounds set by the applicable standard.
19.2	Observed Density Out of Bounds			Bit 2			0	1.00.00	Alarm occurs if the observed density is outside of the bounds set by the applicable standard.
19.3	Base Density Out of Bounds			Bit 3			0	1.00.00	Alarm occurs if the base density is outside of the bounds set by the applicable standard.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19.4	Convergence Error			Bit 4			0	1.00.00	Alarm occurs if the maximum number of iterations is reached without convergence in the density calculation.
19.5	Refined Product Alarm			Bit 5			0	1.00.00	Alarm occurs if the base density does not match the base density of the selected product. **Note**: This alarm applies **only** to refined products.
19.6	Alpha Out of Bounds			Bit 6			0	1.00.00	Alarm occurs if the thermal coefficient of expansion (alpha) used in the CTL calculation is outside of the bounds set by the applicable standard. **Note**: This alarm applies **only** to special application products.
19.7	CTL/CPL Out of Bounds			Bit 7			0	1.00.00	Alarm occurs if a correction factor (such as the CTL, CPL, or CTLP) is less than 0.5 or greater than 1.5.
20	Temperature Correction Table	R/O	System	UINT8	1	0 → 20, 255	255	1.00.00	Indicates which temperature correction table has been selected based on the product type, density units, and base temperature. Valid values are: 0 = 1980 API2540 Table 5/6A 1 = 1980 API2540 Table 5/6B 2 = 1982 API2540 Table 5/6D 3 = 1980 API2540 Table 6C 4 = 1980 API2540 Table 23/24A 5 = 1980 API2540 Table 23/24B 6 = 1982 API2540 Table 23/24D 7 = TP27 Table 23/24E GPA Table 23/24E 8 = 1980 API2540 Table 24C 9 = 1980 API2540 Table 53/54A 10 = 1980 API2540 Table 53/54B 11 = 1982 API2540 Table 53/54D 12 = 1982 API2540 Table 53/54E 13 = 1980 API2540 Table 54C 14 = ISO / IP-3/ Table 59A/60A 15 = ISO / IP-3/ Table 59B/60B 16 = ISO / IP-3/ Table 59D/60D 17 = TP27 Table 59E/60E 18 = Procedure 11.1.6 2004 19 = Procedure 11.1.7 2004 20 = COSTALD-Tait 21 = API Chapter 11.4 2003 22 = 1970 OIML R22 23 = ABNT NBR 5992 255 = Invalid Table

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21	Pressure Correction Table	R/O	System	UINT8	1	0 → 6	0	1.00.00	Indicates which pressure correction table has been selected based on the density and temperature units. Valid values are: 0 = User compressibility 1 = 1984 API2540 Table 11.2.1 2 = 1984 API2540 Table 11.2.1M 3 = 1986 API2540 Table 11.2.2 4 = 1986 API2540 Table 11.2.2M 5 = Chapter 11.1 2004 6 = COSTALD-Tait 7 = API Chapter 11.4 2003 8 = None
22	K0	R/O	System	DOUBLE	8	Value per API VCF table	0.0	1.00.00	Coefficient in correlation for thermal expansion factor of the fluid at reference temperature of the selected standard (see selected standard for units).
23	K1	R/W	System	DOUBLE	8	Value per API VCF table	0.0	1.00.00	Coefficient in correlation for thermal expansion factor of the fluid at reference temperature of the selected standard (see selected standard for units).
24	K2	R/W	System	DOUBLE	8	Value per API VCF table	0.0	1.00.00	Coefficient in correlation for thermal expansion factor of the fluid at reference temperature of the selected standard (see selected standard for units).
25	RESERVED								Reserved for future use
26	RESERVED								Reserved for future use
27	RESERVED								Reserved for future use
28	RESERVED								Reserved for future use
29	Indicated Quantity Flow Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	Quantity flow rate as indicated by the meter. Volume or mass units defined by volume unit option (point type 200, parameters 10 or 11) and flow rate option (point type 200, parameter 12).
30	Gross Volume Flow Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	The indicated volume flow rate corrected for Meter Factor. Units are defined by volume or mass units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
31	Gross Standard Volume Flow Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 double	0.0	1.00.00	The volume flow rate at base conditions, also corrected for meter performance. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
32	Net Standard Volume Flow Rate	R/O	System	DOUBLE	8	Any valid IEEE 754 double	0.0	1.00.00	The gross standard volume flow rate corrected for non-merchantable quantities such as sediment and water. Applies to Crude Oil applications only. Is identical to Gross Standard Volume Flow Rate (parameter 31) for other fluid types. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
33	BSW Volume Rate	R/O	System	DOUBLE	8	Any valid IEEE 754 double	0.0	1.00.00	The volume flow rate of non-merchantable quantities such as sediment and water. Applies to Crude Oil applications only. Units as defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
34	Mass Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 double	0.0	1.00.00	Mass flow rate. Units are defined by mass units option (point type 200, parameter 11) and flow rate option (point type 200, parameter 12).
35	Indicated Quantity Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated quantity total for the current hour. Volume or mass units defined by option (point type 200, parameters 10 or 11)
36	Gross Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the current hour in volume units selected. Units are defined by volume units option (point type 200, parameter 10).
37	Gross Standard Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the current hour. Units are defined by volume units option (point type 200, parameter 10).
38	Net Standard Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current hour. Units are defined by volume units option (point type 200, parameter 10).

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
39	BSW Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the current hour. Units are defined by volume units option (point type 200, parameter 10).
40	Mass Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the current hour. Units are defined by mass units option (point type 200, parameter 11).
41	Indicated Quantity Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated quantity total for the last hour. Volume or mass units defined by option (point type 200, parameters 10 or 11)
42	Gross Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the last hour in volume units selected. Units are defined by volume units option (point type 200, parameter 10).
43	Gross Standard Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the last hour. Units are defined by volume units option (point type 200, parameter 10).
44	Net Standard Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the last hour. Units are defined by volume units option (point type 200, parameter 10).
45	BSW Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the last hour. Units are defined by volume units option (point type 200, parameter 10).
46	Mass Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the last hour. Units are defined by mass units option (point type 200, parameter 11).
47	Indicated Quantity Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated quantity total for today. Volume or mass units defined by option (point type 200, parameters 10 or 11) Roll-over occurs daily at the contract hour.
48	Gross Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the current contract day in volume units selected. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs daily at the contract hour.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Gross Standard Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the current contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs daily at the contract hour.
50	Net Standard Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs daily at the contract hour.
51	BSW Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the current contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs daily at the contract hour.
52	Mass Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the current contract day. Units are defined by mass units option (point type 200, parameter 11). Roll-over occurs daily at the contract hour.
53	Indicated Quantity Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated quantity total for yesterday. Volume or mass units defined by option (point type 200, parameters 10 or 11). Roll-over occurs daily at the contract hour.
54	Gross Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the previous contract day in volume units selected. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs daily at the contract hour.
55	Gross Standard Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the previous contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at contract hour each day.
56	Net Standard Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the previous contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs daily at the contract hour.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57	BSW Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the previous contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs daily at the contract hour.
58	Mass Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the previous contract day. Units are defined by mass units option (point type 200, parameter 11). Roll-over occurs daily at the contract hour.
59	Indicated Quantity This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated quantity total for the current month. Volume or mass units defined by option (point type 200, parameters 10 or 11) Roll-over occurs at the contract hour on the first day of the month.
60	Gross Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the current month in volume units selected. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at the contract hour on the first day of the month.
61	Gross Standard Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the current month. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at the contract hour on the first day of the month.
62	Net Standard Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current month. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at contract hour on the first day of the month.
63	BSW Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the current month. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at the contract hour on the first day of the month.
64	Mass This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the current month. Units are defined by mass units option (point type 200, parameter 11). Roll-over occurs at the contract hour on the first day of the month.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
65	Quantity Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated quantity total for the previous month. Volume or mass units defined by option (point type 200, parameters 10 or 11) Roll-over occurs at the contract hour on the first day of the month.
66	Gross Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the current contract day in volume units selected. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at the contract hour on the first day of the month.
67	Gross Standard Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the current contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at the contract hour on the first day of the month.
68	Net Standard Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at the contract hour on the first day of the month.
69	BSW Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the current contract day. Units are defined by volume units option (point type 200, parameter 10). Roll-over occurs at the contract hour on the first day of the month.
70	Mass Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the current contract day. Units are defined by mass units option (point type 200, parameter 11). Roll-over occurs at the contract hour on the first day of the month.
71	Indicated Quantity Total Accumulation	R/O	System	DOUBLE	8	Any valid IEEE double precision float	0.0	1.00.00	Indicated quantity total accumulation. Volume or mass units defined by option (point type 200, parameters 10 or 11)
72	Gross Volume Total Accumulation	R/O	System	DOUBLE	8	Any valid IEEE double precision float	0.0	1.00.00	Gross volumetric total in volume units selected. Units are defined by volume units option (point type 200, parameter 10).

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
73	Gross Standard Volume Total Accumulation	R/O	System	DOUBLE	8	Any valid IEEE double precision float	0.0	1.00.00	The ongoing accumulation of volume at base conditions, also corrected for meter performance. Units are defined by volume units option (point type 200, parameter 10).
74	Net Standard Volume Total Accumulation	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	The gross standard volume total corrected for non-merchantable quantities such as sediment and water. Applies to Crude Oil applications only. This parameter will be identical to Gross Standard Volume Total (parameter 73) for other fluid types. Units are defined by volume units option (point type 200, parameter 10).
75	BSW Volume Total Accumulation	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The volume total of non-merchantable quantities such as sediment and water. Applies to Crude Oil applications only. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
76	Mass Total Accumulation	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	Total accumulation of mass. Units defined by mass units option (point type 200, parameter 11).
77	Maintenance Mode Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Option to place the station in maintenance mode. Valid values are 0 (Normal Mode) and 1 (Maintenance Mode).
78	RESERVED								Reserved for future use
79	RESERVED								Reserved for future use
80	RESERVED								Reserved for future use
81	RESERVED								Reserved for future use
82	RESERVED								Reserved for future use
83	RESERVED								Reserved for future use
84	RESERVED								Reserved for future use
85	RESERVED								Reserved for future use
86	RESERVED								Reserved for future use
87	RESERVED								Reserved for future use
88	RESERVED								Reserved for future use
89	RESERVED								Reserved for future use
90	RESERVED								Reserved for future use
91	Flow Weighted Average Pressure Previous Hour	R/O	System	DOUBLE	8	Any valid IEEE double	0	1.00.00	Flow weighted average pressure for the previous clock hour.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
92	Flow Weighted Average Pressure Previous Day	R/O	System	DOUBLE	8	Any valid IEEE double	0	1.00.00	Flow weighted average pressure for the previous contract day.
93	Flow Weighted Average Temperature Previous Hour	R/O	System	DOUBLE	8	Any valid IEEE double	0	1.00.00	Flow weighted average temperature for the previous clock hour.
94	Flow Weighted Average Temperature Previous Day	R/O	System	DOUBLE	8	Any valid IEEE double	0	1.00.00	Flow weighted average temperature for the previous contract day.
95	Flow Weighted Average Observed Density Previous Hour	R/O	System	DOUBLE	8	Any valid IEEE double	0	1.00.00	Flow weighted average observed density for the previous contract hour.
96	Flow Weighted Average Observed Density Previous Day	R/O	System	DOUBLE	8	Any valid IEEE double	0	1.00.00	Flow weighted average observed density for the previous contract day.
97	Flow Weighted Base Density Previous Hour	R/O	System	DOUBLE	8	Any valid IEEE double	0	1.00.00	Flow weighted average base density for the previous contract day.
98	Flow Weighted Average Base Density Previous Day	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Flow weighted average base density for the previous contract day.
99	Average Flowrate Option	R/W_LOG	User	UINT8	1	0 → 4	0	1.00.00	Indicates which flow is used for the average flowrate values and the flow weighted averages. Valid values are: 0 = Indicated Volume 1 = Gross Volume 2 = Gross Standard Volume 3 = Net Volume 4 = Mass 5 = Unshrunk Volume
100	Average Flowrate Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Average flowrate for the previous hour. The flowrate being averaged is based on parameter 99 selection.
101	Average Flowrate Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Average flowrate for the previous day. The flowrate being averaged is based on parameter 99 selection.
102	RESERVED								Reserved for future use
103	RESERVED								Reserved for future use
104	Mole % Neo-Pentane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.01.03	Mole % of Neo-Pentane in Light Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon and COSTALD-Tait or API 14.4 is selected as the calculation method.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
105	Mole % Methane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Methane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait is selected as the calculation method.
106	Mole % Ethane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.9	1.00.00	Mole % Ethane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon and COSTALD-Tait or API 14.4 is selected as the calculation method.
107	Mole % Propane	R/W_LOG	User	DOUBLE	8	0.0→100.0	97.8	1.00.00	Mole % Propane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
108	Mole % n-Butane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % n-Butane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
109	Mole % i-Butane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % n-Butane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
110	Mole % n-Pentane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % n-Pentane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
111	Mole % i-Pentane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % i-Pentane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
112	Mole % Hexane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Hexane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
113	Mole % Heptane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Heptane in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
114	Mole % Ethene	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Ethene (Ethylene) in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or A API 14.4 is selected as the calculation method.
115	Mole % Propene	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Propene (Propylene) in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
116	Mole % n-Butene	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % n-Butene (Butylene) in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4is selected as the calculation method.
117	Mole % Nitrogen	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Nitrogen in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
118	Mole % Oxygen	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Oxygen in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
119	Mole % Carbon Dioxide	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Carbon Dioxide in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or A API 14.4 is selected as the calculation method.
120	Mole % Hydrogen Sulfide	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.00.00	Mole % Hydrogen Sulfide in Liqht Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
121	Critical Temperature	R/O	System	DOUBLE	8	Absolute zero in selected units → Any positive valid IEEE 754 double	0.0	1.00.00	Critical temperature of the Light Hydrocarbon mixture in Deg F or Deg C. **Note**: This parameter is **only** populated if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait is selected as the calculation method.
122	Critical Pressure	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Critical pressure of the Light Hydrocarbon mixture in PSIG, kPa(g) or barg. **Note**: This parameter is **only** populated if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait is selected as the calculation method.
123	Vapor Pressure Option	R/W_CNDL	User	UINT8	1	0→1	0	1.02.00	Calculates, if enabled, vapor pressure for all associated meters per the GPA TO-15 standard. If not enabled, the vapor pressure comes from the user-entered product vapor pressure (which has a default value of 0.0). Valid values are: 0 = Entered from associated product 1 = Calculated according to GPA TP-15
124	Mole % Octane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.02.00	Mole % Octane in Light Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** API 14.42 is selected as the calculation method.
125	Mole % Nonane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.02.00	Mole % Nonane in Light Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** API 14.4is selected as the calculation method.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
126	Mole % Decane	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.02.00	Mole % Decane in Light Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** API 14.4 is selected as the calculation method.
127	Mole % Helium	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.02.00	Mole % Helium in Light Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** API 14.4 is selected as the calculation method.
128	Mole % Water	R/W_LOG	User	DOUBLE	8	0.0→100.0	0.0	1.02.00	Mole % Water in Light Hydrocarbon product. **Note**: This parameter is **only** used if the product assigned to this station is Light Hydrocarbon **and** API 14.4 is selected as the calculation method.
129	Total Mole Percentage	R/O	System	DOUBLE	8	0.0→100.0	100.0	1.03.00	Indicates the total mole percentage for either the set of the Costald-Tait components or the set of the API 1.4. components, depending on the selected table option of the Light Hydrocarbon product.
130	History Segment	R/W	User	UNIT8	1	0→12	0	1.03.00	The station's assigned history segment. All historyical data for this station should be configured in this segment.
131	RESERVED								Reserved for future use.
132	Mole % Hexane+	R/W	User	DOUBLE	8	0.0→100.0	0.0	1.03.00	Mole % Haxane+ in Light Hydrocarbon product. **Note**: This parameter is used **only** if the product assigned to this station is Light Hydrocarbon **and** COSTALD-Tait or API 14.4 is selected as the calculation method.
133	Hexane Split Option	R/W	User	UINT8	1	0→1	0	1.03.00	Performs the hexane split according to the heavy gas distribution percentage. Valid values are **0** (hexane split is disabled) and **1** (hexane split is enabled).
134	Split Hexane Mole %	R/W	User	DOUBLE	8	0.0→100.0	0.0	1.03.00	Indicates the percentage of the hexane component in the Hexane+.
135	Split Heptane Mole %	R/W	User	DOUBLE	8	0.0→100.0	0.0	1.03.00	Indicates the percentage of the heptane component in the Hexane+.
136	Split Octane Mole %	R/W	User	DOUBLE	8	0.0→100.0	0.0	1.03.00	Indicates the percentage of the obtane component in the Hexane+.

Point Type 203, Liquid Station

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
137	Split Nonane Mole %	R/W	User	DOUBLE	8	0.0→100.0	0.0	1.03.00	Indicates the percentage of the nonane component in the Hexane+.
138	Split Decane Mole %	R/W	User	DOUBLE	8	0.0→100.0	0.0	1.03.00	Indicates the percentage of the decane component in the Hexane+.
139	Hexane Split Total	R/O	System	DOUBLE	8	0.0→100.0	0.0	1.03.00	Indicates the total percentage of the heavy gas distribution.
140	Unshrunk Volume Flow Rate	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The net standard volume flow rate without the shrinkage factor multiplier included in the equation. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
141	Unshrunk Volume Current Hour	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The quantity of unshrunk volume accumulated for the current hour. Units are defined by volume units option (point type 200, parameter 10).
142	Unshrunk Volume Last Hour	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The quantity of unshrunk volume accumulated in the previous hour. Units are defined by volume units option (point type 200, parameter 10).
143	Unshrunk Volume Today Hour	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The quantity of unshrunk volume accumulated for the current day. Units are defined by volume units option (point type 200, parameter 10).
144	Unshrunk Volume Yesterday	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The quantity of unshrunk volume accumulated in the previous day. Units are defined by volume units option (point type 200, parameter 10).
145	Unshrunk Volume This Month	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The quantity of unshrunk volume accumulated for the current month. Units are defined by volume units option (point type 200, parameter 10).
146	Unshrunk Volume Previous Month	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The quantity of unshrunk volume accumulated in the previous month. Units are defined by volume units option (point type 200, parameter 10).
147	Unshrunk Volume Total Acccumulation	R/O	System	DOUBLE	8	Any valid IEEE double	0.0	1.04.07	The total quantity of unshrunk volume accumulated on this meter since inception. Units are defined by volume units option (point type 200, parameter 10). This value is subject to the double precision accumulator rollover value (point type 91, parameter 56).

3.4.69 Point Type 204: Liquid Meters

Description: Point type 204 provides the parameters for Liquid Meters

Number of Logical Points: 6 logical points of point type 204 may exist.

Storage Location: Point type 204 is saved to internal configuration memory.

Table 3-70: Point Type 204, Liquid Meters

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"LiqMtr X" where X is the logical number	1.00.00	Identification name for specific Liquid Linear Meter Run. Values must be printable ASCII characters.
1	Meter Description	R/W_LOG	User	AC	30	0x20 → 0x7E for each ASCII character	" "	1.00.00	Description for specific Meter Run. Values must be printable ASCII characters.
2	Meter Name / Model	R/W_LOG	User	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Model name for the installed meter. Values must be printable ASCII characters.
3	Meter Serial Number	R/W_LOG	User	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Serial number of the installed meter. Values must be printable ASCII characters.
4	Meter Size	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The size of the installed meter.
5	Station number	R/W_LOG	User	UINT8	1	0 → 5	0	1.00.00	Indicates the station association for this meter run. This parameter indicates the logical number of the liquid station (point type 203).
6	Enabled / Disabled Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates whether flow should be calculated and accumulated for this meter point. Valid values are 0 (Disable Calculation) and 1 (Enable Calculation). **Note**: Disabling the flow calculation would normally only be done if the flow meter allows bi-directional flow and the flow is currently in the opposite direction from the direction of flow this point is measuring:
7	Volume / Mass Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00.00	Indicates whether the flow meter input provides an indicated volume or a mass value. Valid values are 0 (Indicated Volume) and 1 (Mass).
8	RESERVED								Reserved for future use
9	RESERVED								Reserved for future use

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Flowrate Alarm Option	R/W_CNDL	User	UINT8	1	0 → 5	0	1.00.00	If enabled, generated and sends alarms to the Alarm Log. Valid values are: 0 = Disabled 1 = Enabled for Indicated Volume Flow Rate (parameter 103) 2 = Enabled for Gross Volume Flow Rate (parameter 104) 3 = Enabled for Gross Standard Volume Flow Rate (parameter 105) 4 = Enabled for Net Standard Volume Flow Rate (parameter 106) 5 = Enabled for Mass Flow Rate (parameter 108) 6 = Enabled for Unshrunk Volume Flow Rate (Point Type 205, parameter 51)
11	SRBX on Clear	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates a SRBX alarm is desired if an alarm condition clears, Valid values are 0 (SRBX on Clear Disabled) and 1 (SRBX on Clear Enabled).
12	SRBX on Set	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are 0 (SRBX on Set Disabled) and 1 (SRBX on Set Enabled).
13	Flowrate Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00.00	
13.0	Low Alarm			Bit 0			0	1.00.00	This alarm occurs if the Flow Rate selected by (parameter 10) is less than or equal to the Low Flow Alarm (parameter 14). This alarm clears if the Flow Rate is greater than the Low Flow Alarm plus the alarm deadband (parameter 16).
13.1	Not Used			Bit 1			0	1.00.00	Not used.
13.2	High Alarm			Bit 2			0	1.00.00	This alarm occurs if the Flow Rate selected (parameter 10) is greater than or equal to the High Flow Alarm (parameter 15). This alarm clears if the Flow Rate is less than the High Flow Alarm minus the alarm deadband (parameter 16).
13.3	Not Used			Bit 3			0	1.00.00	Not used.
13.4	Not Used			Bit 4			0	1.00.00	Not used.
13.5	Not Used			Bit 5			0	1.00.00	Not used.
13.6	Not Used			Bit 6			0	1.00.00	Not used.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13.7	Manual Inputs Alarm			Bit 7			0	1.00.00	If set, then one of the following: Uncorrected Flow Rate TLP (parameter 27) Press TLP (parameter 28) or Temp TLP (parameter 29) is set to Manual (0,0,0). If clear, then the Uncorrected Flow Rate TLP (parameter 27), SP TLP (parameter 28), and Temp TLP (parameter 29) are not set to Manual.
14	Low Flow Alarm	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	–1000.0	1.00.00	Low Flow Alarm value in units of selected flow rate (parameter 10).
15	High Flow Alarm	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1,000,000.0	1.00.00	High Flow Alarm value in units of selected flow rate (parameter 10).
16	Alarm Deadband	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	100.0	1.00.00	The value that the selected flow rate (see parameter 10) must be above the low alarm value (parameter 14) or below the high alarm value (parameter 15) before the associated alarm clears.
17	Flow Calculation Alarm Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Indicates whether flow calculation alarms should be generated and sent to the alarm log. Valid values are 0 (Disabled) and 1 (Enabled).
18	Flow Calculation Alarm Code	R/O	System	BIN	1	0.x00 → 0xFF	0	1.00.00	See description of individual bits below.
18.0	Tempoerature Out of Bounds			Bit 0			0	1.00.00	This alarm occurs if the meter/observed temperature is outside the bounds set by the applicable standard.
18.1	Pressure Out of Bounds			Bit 1			0	1.00.00	This alarm occurs if the meter/observed pressure is outside the bounds set by the applicable standard.
18.2	Observed Density Out of Bounds			Bit 2			0	1.00.00	This alarm occurs if the density is outside the bounds set by the applicable standard.
18.3	Base Density Out of Bounds			Bit 3			0	1.00.00	This alarm occurs if the base density is outside the bounds set by the applicable standard.
18.4	Convergence Error			Bit 4			0	1.00.00	This alarm occurs if the maximum number of iterations is reached without convergence in the density calculation.
18.5	Refined Product Alarm			Bit 5			0	1.00.00	This alarm occurs if the base density does not match the base density of the selected product. **Note**: This alarm applies **only** to refined products.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18.6	Alpha Out of Bounds			Bit 6			0	1.00.00	This alarm occurs if the entered value of thermal expansion coefficient (alpha) is outside the bounds of the applicable standard. **Note**: This alarm applies **only** to specialty products.
18.7	CTL/CPL Out of Bounds			Bit 7			0	1.00.00	Alarm occurs if a correction factor (such as the CTL, CLP, or CTLP) is less than .05 or greater than 1.5.
19	Densitometer Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.00.00	Indicates whether the meter has a densitometer. Valid values are 0 (No densitometer, base density from station) and 1 (Densitometer present, calculate base density).
20	Density Logical	R/W_CNDL	User	UINT8	1	0 → 5	0	1.00.00	Specifies the logical number of the densitometer point to read the value of the observed density.
21	Meter Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	737	1.00.00	Represents the actual density at meter conditions. Units defined by density units option (point type 200, parameter 6).
22	Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	737	1.00.00	Represents the actual measured density of a fluid. Units defined by density units option (point type 200, parameter 6).
23	Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	737	1.00.00	Represents the density of a fluid at base or reference conditions. This value is either determined by the station base density or calculated from the observed density, depending on the density option selected.
24	RESERVED	R/O	System	UINT8	1	Any valid IEEE double	0	1.00.00	
25	Maintenance Accum Reset	R/W_LOG	System	UINT8	1	0 → 1	0	1.00.00	Command to reset maintenance accumulators. Valid values are 0 (No Action) and 1 (Reset).
26	Alternate Accum Reset	R/W_LOG	System	UINT8	2	0 → 1	0	1.00.00	Command to reset alternate accumulators. Valid values are 0 (No Action) and 1 (Reset).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Uncorrected Flow Rate / Mass Flow Rate Input	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 105,5→148,0→27 and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 141,0,6→TLP 141,0,20 (Freq or Raw Pulses)	0,0,0	1.00.00	The input point used to get pulses from the turbine meter as the Uncorrected Flow Rate.
28	Pressure Input TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20	0,0,0	1.00.00	The input point used to get the static pressure.
29	Temperature Input TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 108, 16→63,50 and TLP 106,5→148,22 and TLP 107,5→148, 9	0,0,0	1.00.00	The input point used to get the temperature.
30	BSW Input TLP	R/W_CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 108, 16→63,50 and TLP	0,0,0	1.00.00	The input point used to get the percent of base sediment and water (BSW).
31	Flow Input Frequency	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow Input frequency read from the associated APM card.
32	Flow Input Pulse Accumulation	R/O	System	UINT32	4	0→ 4,294,967,296	0	1.00.00	Total Input pulse accumulation read from the associated APM card.
33	Pressure Input Value	R/W	Both	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Static pressure input value. Units defined by pressure units option (point type 200, parameter #4).
34	Temperature Input Value	R/W	Both	DOUBLE	8	Any valid IEEE double	0.0	1.00.00	Meter temperature input value. Units are defined by temperature units option (point type 200, parameter #5).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	BSW Percent Value	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Percentage by volume of base sediment and water (BSW) in the fluid.
36	Low Flow Cutoff	R/W_LOG	User	DOUBLE	8	Any valid IEEE double precision float	0.0	1.00.00	Minimum acceptable flowrate value. Input flowrate below this value is set to zero.
37	RESERVED								Reserved for future use
38	RESERVED								Reserved for future use.
39	Combined Correction Factor (CCF)	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	CTL x CPL x Meter Factor.
40	Correction Factor for Sediment and Water (CSW)	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	The correction factor value for sediment and water.
41	Alpha	R/O	System	DOUBLE	8	Any valid IEEE double	0.000583	1.00.00	The coefficient of thermal expansion of the liquid at the standard temperature for the table selected.
42	CTPL Obs to Base In Use	R/O	System	DOUBLE	8	Any valid IEEE double	0.000583	1.00.00	Temperature and pressure correction factor from observed density conditions to base conditions as used in the flow calculation. If you select rounding (point type 201, parameter 9), this value rounds per API guidelines.
43	CTPL Base to Alt In Use	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Temperature and pressure correction factor from base conditions to alternate conditions as used in the flow calculation. If you select rounding (point type 201, parameter 9), this value rounds per API guidelines.
44	CTL Base to Alt	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Temperature base conditions to alternate conditions.
45	CPL Base to Alt	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Pressure base conditions to alternate conditions.
46	CTPL Base to Alt	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Temperature base and pressure base conditions to alternate conditions.
47	Compressibility Factor (F) Base to Alt	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Compressibility factor base conditions to alternate conditions.
48	CTL Observed to Base	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Temperature observed conditions to base conditions.
49	CPL Observed to Base	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Pressure observed conditions to base conditions.
50	CTPL Observed to Base	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Temperature and pressure observed conditions to base conditions.
51	Compressibility Factor (F) Observed to Base	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Compressibility factor observed conditions to base conditions.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
52	Spool Correction Option	R/W_LOG	User	UINT8	1	$0 \rightarrow 2$	0	1.00.00	Selects the option of applying the meter spool correction calculation. Valid values are 0 = No Spool Correction 1 = Apply Turbine Spool Correction 2 = Apply Ultrasonic Spool Correction.
53	Spool Linear Coefficient Option	R/W_LOG	User	UINT8	1	$0 \rightarrow 4$	0	1.00.00	Selects the material option for the linear coefficient. Valid values are: 0 = Carbon Steel 1 = 304 Stainless 2 = 316 Stainless 3 = 14-4 PH Stainless 4 = User Entered
54	Spool Rotor Coefficient Option	R/W_LOG	User	UINT8	1	$0 \rightarrow 4$	0	1.00.00	Selects the material option for the rotor coefficient. Valid values are: 0 = Carbon Steel 1 = 304 Stainless 2 = 316 Stainless 3 = 14-4 PH Stainless 4 = User Entered
55	Spool Modulus E Option	R/W_LOG	User	UINT8	1	$0 \rightarrow 4$	0	1.00.00	Selects the material option for the modulus E coefficient. Valid values are: 0 = Carbon Steel 1 = 304 Stainless 2 = 316 Stainless 3 = 14-4 PH Stainless 4 = User Entered
56	Spool - Meter Linear Coefficient	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0	1.00.00	Linear temperature expansion coefficient for the material of the meter housing (degF/degC). Define the units in point type 200, parameter 5.
57	Spool - Rotor Linear Coefficient	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0	1.00.00	Linear temperature expansion coefficient for the material of the meter rotor blades (degF/degC). Define the units in point type 200, parameter 5.
58	Spool - Modulus E	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	0	1.00.00	Youngs modulus of elasticity for the material of the spool body (PSI, kPa, bar, kg/cm2). Define the units in point type 200, parameter 4.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
59	Spool - Dimension	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the spool dimension. If you select the Turbine Spool Correction option, dimension 1 represents the radius of the meter housing (ft/m). If you select the Ultrasonic Spool Correction option, dimension 1 represents the inside diameter (ft or m). Define the units in point type 200, parameter 8.
60	Spool Dimension 2	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the thickness of the meter housing. If you select the Turbine Spool Correction option, dimension 2 represents the thickness of the meter housing (ft/m). If you select the Ultrasonic Spool Correction option, dimension 2 represents the outside diameter (ft or m). Define the units in point type 200, parameter 8.
61	Spool - Rotor Hub Area	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Area of the rotor hub (ft2 /m2). Define the units in point type 200, parameter 8.
62	Spool - Poisson Ratio	R/W_LOG	User	DOUBLE	8	Any valid IEEE double	.3	1.00.00	Poisson ratio (dimensionless)
63	Spool - Calibrated Temperature	R/W_LOG	User / System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Meter final average temperature at the last proving (degF/degC). Define the units in point type 200, parameter 5. .
64	Spool - Calibrated Pressure	R/W_LOG	User / System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Meter final average pressure at the last proving (PSI, kPa, bar, kg/cm2). Define the units in point type 200, parameter 4.
65	Spool - Meter CTS	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Correction factor for the effects of temperature on the spool.
66	Spool - Meter CPS	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Correction factor for the effects of pressure on the meter housing.
67	RESERVED								Reserved for tuture use
68	K Factor Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Selects the K factor value for the In Use K Factor parameter. Valid values are 0 (Manual Value) and 1 (Live Value)
69	Meter Factor Option	R/W_LOG	User	UINT8	1	0 → 1	0	1.00.00	Selects the Meter factor value for the In Use Meter Factor parameter. Valid values are 0 (Manual Value) and 1 (Live Value).
70	K Factor Manual Value	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Manually entered K Factor value.
71	Meter Factor Manual Value	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0M	1.00.00	Manually entered Meter Factor value.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
72	K-factor Live	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	The K Factor value that is updated from proving, a K Factor curve, or downloaded from a host system.
73	Meter Factor Live	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	The Meter Factor value that is updated from proving, a Meter Factor curve, or downloaded from a host system.
74	K Factor In Use	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float		1.00.00	The K Factor value currently being used in the 75meter calculations.
75	Meter Factor In Use	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float		1.00.00	The Meter Factor value currently being used in the meter calculations.
76	Meter Factor/ K-factor Option	R/W_LOG	User	UINT8	1	0 → 5	0	1.00.00	Indicates the source of the meter factor and K-factor. Valid values are: 0 = Single Meter Factor, Single K-factor 1 = Meter Factor Curve, Single K-factor 2 = K-factor Curve, Single Meter Factor 3 = Use Meter Factor from Product (such as 201, 0, 12), Single K-Factor 4 = Use K-Factor from Product (such as 201,0,11), Single Meter Factor 5 = Use Meter Factor from Product (such as 201,0,12) and Use K-factor from Product (such as 201, 0, 11)
77	Meter Factor 1 / K-factor 1	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-factor Curve, Single Meter Factor (parameter 76 = 3), this parameter is the linear meter constant (K-factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-factor (parameter 76 = 2), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
78	Meter Factor 1 Flow Rate / K-factor 1 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-factor Curve, Single Meter Factor (parameter 76 = 3), this parameter is the frequency in Hz that corresponds with the associated K-factor. If you select a Meter Factor Curve, Single K-factor (parameter 76 = 2), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
79	Meter Factor 2 / K-factor 2	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
80	Meter Factor 2 Flow Rate / K-factor 2 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
81	Meter Factor 3 / K-factor 3	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
82	Meter Factor 3 Flow Rate / K-factor 3 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
83	Meter Factor 4 / K-factor 4	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
84	Meter Factor 4 Flow Rate / K-factor 4 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
85	Meter Factor 5 / K-factor 5	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
86	Meter Factor 5 Flow Rate / K-factor 5 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
87	Meter Factor 6 / K-factor 6	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
88	Meter Factor 6 Flow Rate / K-factor 6 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
89	Meter Factor 7 / K-factor 7	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
90	Meter Factor 7 Flow Rate / K-factor 7 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
91	Meter Factor 8 / K-factor 8	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
92	Meter Factor 8 Flow Rate / K-factor 8 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
93	Meter Factor 9 / K-factor 9	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
94	Meter Factor 9 Flow Rate / K-factor 9 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
95	Meter Factor 10 / K-factor 10	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
96	Meter Factor 10 Flow Rate / K-factor 10 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
97	Meter Factor 11 / K-factor 11	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77
98	Meter Factor 11 Flow Rate / K-factor 11 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
99	Meter Factor 12 / K-factor 12	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Refer to parameter 77

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
100	Meter Factor 12 Flow Rate / K-factor 12 Frequency	R/W_LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Refer to parameter 78
101	RESERVED								Reserved for future use
102	Flowmeter Value	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	This value represents the indicated volume flow rate or the mass flow rate based on which option is enabled (parameter 7).
103	Indicated Quantity Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	Actual volume or mass flow rate as indicated by the meter. Units are defined by volume or units option (point type 200, parameter 10 or 11) and flow rate option (point type 200, parameter 12). Volume or mass determined by parameter 7.
104	Gross Volume Flow Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	The indicated volume flow rate corrected for Meter Factor. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
105	Gross Standard Volume Flow Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	The volume flow rate at base conditions, also corrected for meter performance. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
106	Net Standard Volume Flow Rate	R/O	System	DOUBLE	8	Any valid IEEE 754 float	0.0	1.00.00	The gross standard volume flow rate corrected for non-merchantable quantities such as sediment and water. Applies to Crude Oil applications **only**. Is identical to Gross Standard Volume Flow Rate (parameter 105) for other fluid types. Define units using the Volume Units option (point type 200, parameter 10) and the Flow Rate option (point type 200, parameter 12).
107	BSW Volume Rate	R/O	System	DOUBLE	8	0.0 → any valid IEEE 754 double	0.0	1.00.00	The volume flow rate of non-merchantable quantities such as sediment and water. Applies to Crude Oil applications **only**. Define units using the Volume Units option (point type 200, parameter 10) and the Flow Rate option (point type 200, parameter 12).
108	Mass Flow Rate	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	Mass flow rate. Units are defined by mass units option (point type 200, parameter 11) and flow rate option (point type 200, parameter 12).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
109	Indicated Quantity Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated volume or mass total for the current hour in units selected. Define units using the Volume or Mass Units options (point type 200, parameters 10 or 11). Determine volume or mass using parameter 7.
110	Gross Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the current hour in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
111	Gross Standard Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the current hour. Define units using the Volume Units option (point type 200, parameter 10).
112	Net Standard Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current hour. Define units using the Volume Units option (point type 200, parameter 10).
113	BSW Volume Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the current hour. Define units using the Volume Units option (point type 200, parameter 10).
114	Mass Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the current hour. Define units using the Mass Units option (point type 200, parameter 11).
115	Indicated Quantiy Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated volume or mass total for the previous hour in units selected. Units are defined by volume or mass units options (point type 200, parameters 10 or 11). Volume or mass determined by parameter 7.
116	Gross Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the last hour in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
117	Gross Standard Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the last hour. Define units using the Volume Units option (point type 200, parameter 10).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
118	Net Standard Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the last hour. Define units using the Volume Units option (point type 200, parameter 10).
119	BSW Volume Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the last hour. Define units using the Volume Units option (point type 200, parameter 10).
120	Mass Last Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the last hour. Define units using the Mass Units option (point type 200, parameter 11).
121	Indicated Quantity Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated volume or mass total for the current day in units selected. Units are defined by volume or mass units options (point type 200, parameters 10 or 11). Volume or mass determined by parameter 7.
122	Gross Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the current contract day in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
123	Gross Standard Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the current contract day. Define units using the Volume Units option (point type 200, parameter 10).
124	Net Standard Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current contract day. Define units using the Volume Units option (point type 200, parameter 10).
125	BSW Volume Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the current contract day. Define units using the Volume Units option (point type 200, parameter 10).
126	Mass Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the current contract day. Define units using the Mass Units option (point type 200, parameter 11).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
127	Indicated Quantity Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated volume or mass total for the previous day in units selected. Units are defined by volume or mass units options (point type 200, parameters 10 or 11). Volume or mass determined by parameter 7.
128	Gross Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the previous contract day in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
129	Gross Standard Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the previous contract day. Define units using the Volume Units option (point type 200, parameter 10).
130	Net Standard Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the previous contract day. Define units using the Volume Units option (point type 200, parameter 10).
131	BSW Volume Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the previous contract day. The Volume Units option (point type 200, parameter 10) defines the units.
132	Mass Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the previous contract day. Define units using the Mass Units option (point type 200, parameter 11).
133	Indicated Quantity This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated volume or mass total for the current month in units selected. Units are defined by volume or mass units options (point type 200, parameters 10 or 11). Volume or mass determined by parameter 7.
134	Gross Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the current month in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
135	Gross Standard Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the current month. Define units using the Volume Units option (point type 200, parameter 10).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
136	Net Standard Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current month. Define units using the Volume Units option (point type 200, parameter 10).
137	BSW Volume This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the current month. Define units using the Volume Units option (point type 200, parameter 10).
138	Mass This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the current month. The Mass Units option (point type 200, parameter 11) defines the units.
139	Indicated Quantity Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicated volume or mass total for the previous month in units selected. Units are defined by volume or mass units options (point type 200, parameters 10 or 11). Volume or mass determined by parameter 7.
140	Gross Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at flowing conditions, corrected for Meter Factor, for the previous month in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
141	Gross Standard Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance, for the previous month. Define units using the Volume Units option (point type 200, parameter 10).
142	Net Standard Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume at base conditions, also corrected for meter performance and BSW, for the previous month. Define units using the Volume Units option (point type 200, parameter 10).
143	BSW Volume Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of volume of non-merchantable quantities such as sediment and water for the previous month. Define units using the Volume Units option (point type 200, parameter 10).
144	Mass Previous Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The accumulation of mass for the previous month. Units are defined by mass units option (point type 200, parameter 11).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
145	Indicated Quantity Total Accumulation	R/O	System	DOUBLE	8	Any valid IEEE double precision float	0.0	1.00.00	Indicated volume or mass total in units selected. Units are defined by volume or mass units options (point type 200, parameters 10 or 11). Volume or mass determined by parameter 7.
146	Gross Volume Total Accumulation	R/O	System	DOUBLE	8	Any valid IEEE double precision float	0.0	1.00.00	Gross volume total in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
147	Gross Standard Volume Total Accumulation	R/O	System	DOUBLE	8	Any valid IEEE double precision float	0.0	1.00.00	The ongoing accumulation of volume at base conditions, also corrected for meter performance. Define units using the Volume Units option (point type 200, parameter 10).
148	Net Standard Volume Total Accumulation	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	The gross standard volume total corrected for non-merchantable quantities such as sediment and water. Applies to Crude Oil applications only. This parameter will be identical to Gross Standard Volume Total (parameter 147) for other fluid types. Define units using the Volume Units option (point type 200, parameter 10).
149	BSW Volume Total Accumulation	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The volume total of non-merchantable quantities such as sediment and water. Applies to Crude Oil applications only. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
150	Mass Total Accumulation	R/O	System	DOUBLE	8	0.0→Any positive valid IEEE 754 float	0.0	1.00.00	Total accumulation of mass. The Mass Units option (point type 200, parameter 11) defines the units.
151	Operating Mode Options	R/W_LOG	User	UINT8	1	0 → 2	1	1.00.00	Selects the operating mode for this meter. The operating mode determines which set of accumulators increments when there is flow through the meter. Valid values are: 0 = Normal Mode 1 = Maintenance Mode 2 = Alternate Mode
152	Maintenance Mode Comments Field	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“ “	1.00.00	Field used for operator entered comments concerning maintenance mode.
153	Maintenance Mode Time	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The elapsed time in minutes spent in maintenance mode.
154	RESERVED								Reserved for future use

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
155	Maintenance Mode Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Maintenance Mode Indicated volume or mass total in units selected. Define units using the Volume or Mass Units options (point type 200, parameters 10 or 11). Use parameter 7 to determine volume or mass.
156	Maintenance Mode Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Maintenance Mode accumulation of volume at flowing conditions, corrected for Meter Factor, in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).
157	Maintenance Mode Gross Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Maintenance Mode accumulation of volume at base conditions, also corrected for meter performance Define units using the Volume Units option (point type 200, parameter 10).
158	Maintenance Mode Net Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Maintenance Mode accumulation of volume at base conditions, also corrected for meter performance and BSW. Define units using the Volume Units option (point type 200, parameter 10).
159	Maintenance Mode BSW Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Maintenance Mode accumulation of volume of non-merchantable quantities such as sediment and water Define units using the Volume Units option (point type 200, parameter 10).
160	Maintenance Mode Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Maintenance Mode accumulation of mass. Units are defined by mass units option (point type 200, parameter 11).
161	Alternate Mode Comments Field	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	" "	1.00.00	Field used for operator entered comments concerning the previous maintenance mode.
162	Alternate Mode Time	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The elapsed time in minutes in alternate mode.
163	RESERVED								Reserved for future use
164	Alternate Mode Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Alternate Mode Indicated volume or mass total in units selected. Define units using Volume or Mass Units options (point type 200, parameters 10 or 11). Use parameter 7 to determine Volume or Mass.
165	Alternate Mode Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Alternate Mode accumulation of volume at flowing conditions, corrected for Meter Factor, in volume units selected. Define units using the Volume Units option (point type 200, parameter 10).

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
166	Alternate Mode Gross Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Alternate Mode accumulation of volume at base conditions, also corrected for meter performance. Define units using the Volume Units option (point type 200, parameter 10).
167	Alternate Mode Net Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Alternate Mode accumulation of volume at base conditions, also corrected for meter performance and BSW. Define units using the Volume Units option (point type 200, parameter 10).
168	Alternate Mode BSW Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Alternate Mode accumulation of volume of non-merchantable quantities such as sediment and water. Define units using the Volume Units option (point type 200, parameter 10).
169	Alternate Mode Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Alternate Mode accumulation of mass. Define units using the Mass Units option (point type 200, parameter 11).
170	Prove Sequence Number	R/W	Both	UINT32	4	0→ 4,294,967,296	0	1.00.00	Sequence number of the last prove for this meter.
171	Last Prove Date and Time	R/W	Both	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
172	Last Prove Flow Rate	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Contains the flow rate of the last successful prove for this meter in the selected units.
173	Prove Sequence Counter	R/W	System	UNIT32	4	0→ 4,294,967,296	0.0	1.01.03	Indicates the last attempted (but not necessarily accepted) prove sequence number. The system uses and increments this value when performing meter proves on a per meter basis.
174	Average Flowrate Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Average flowrate for the current hour. The flowrate being averaged is based on parameter 99 selection.
175	Average Flowrate Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Average flowrate for the previous hour. The flowrate being averaged is based on parameter 99 selection.
176	Average Flowrate Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Average flowrate for the current day. The flowrate being averaged is based on parameter 99 selection.
177	Average Flowrate Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Average flowrate for the previous day. The flowrate being averaged is based on parameter 99 selection.
178	Raw Pulses Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Raw pulses accumulated so far this hour.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
179	Raw Pulses Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Raw pulses accumulated in the previous hour.
180	Raw Pulses Today	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Raw pulses accumulated so far today.
181	Raw Pulses Yesterday	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Raw pulses accumulated yesterday.
182	Raw Pulses This Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Raw pulses accumulated so far this month.
183	Raw Pulses Last Month	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Raw pulses accumulated last month.
184	Raw Pulses Total Accumulation	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Raw pulses accumulated since last reset.
185	Current Meter Input Status Code	R/O	System	BIN	8	0x00 → 0x1F	0x1F	1.00.00	Current status of meter inputs
185.0	Current Temperature Status			Bit 0			1	1.00.00	Current temperature input integrity status. Set to **1** if the temperature input is not a live input.
185.1	Current Pressure Status			Bit 1			1	1.00.00	Current Pressure input integrity status. Set to **1** if the pressure input is not a live input.
185.2	Current Density Status			Bit 2			1	1.00.00	Current Density input integrity status. Set to **1** if the density input is not a live input.
185.3	Current K-Factor Status			Bit 3			1	1.00.00	Current K-Factor input integrity status. Set to **1** if the K-factor input is a manually entered value.
185.4	Current M-Factor Status			Bit 4			1	1.00.00	Current Meter Factor input integrity status. Set to **1** if the meter factor input is a manually entered value.
185.5	Current Temperature Download Status			Bit 5			0	1.00.00	Current temperature input download mode status. Set to **1** if the temperature input uses the download value.
185.6	Current Pressure Download Status			Bit 6			0	1.00.00	Current pressure input download mode status. Set to 1 if the pressure input uses the download value.
185.7	Current Density Download Status			Bit 7			0	1.00.00	Current density input download mode status. Set to **1** if the density input uses the download value.
186	Current Hour Meter Input Status Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00.00	Latched meter input point integrity status for the current hour. Statuses indicate a value of **1** if the input was in an abnormal state for any part of the current hour.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
186.0	Current Hour Temperature Status			Bit 0			0	1.00.00	Current hour temperature input integrity status. Set to **1** if the temperature was not live at any time during the current hour.
186.1	Current Hour Pressure Status			Bit 1			0	1.00.00	Current hour pressure input integrity status. Set to **1** if the pressure was not live at any time during the current hour.
186.2	Current Hour Density Status			Bit 2			0	1.00.00	Current hour density input integrity status. Set to **1** if the density was not live at any time during the current hour.
186.3	Current Hour K-Factor Status			Bit 3			0	1.00.00	Current hour k-factor input integrity status. Set to **1** if the K-factor was in manual mode at any time during the current hour.
186.4	Current Hour M-Factor Status			Bit 4			0	1.00.00	Current hour meter factor input integrity status. Set to **1** if the meter factor was in manual mode at any time during the current hour.
186.5	Current Hour Temperature Download Status			Bit 5			0	1.00.00	Current hour temperature input download mode status. Set to **1** if the temperature input used the download value at any time during the current hour.
186.6	Current Hour Pressure Download Status			Bit 6			0	1.00.00	Current hour pressure input download mode status. Set to **1** if the pressure input used the download value at any time during the current hour.
186.7	Current Hour Density Download Status			Bit 7			0	1.00.00	Current hour density input download mode status. Set to 1 if the density input used the download value at any time during the current hour.
187	Previous Hour Meter Input Status Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00.00	Latched meter input point integrity status for the previous hour. Statuses will indicate a value of **1** if the input was in an abnormal state for any part of the previous hour.
187.0	Previous Hour Temperature Status			Bit 0			0	1.00.00	Previous hour temperature input integrity status. Set to **1** if the temperature was not live at any time during the previous hour.
187.1	Previous Hour Pressure Status			Bit 1			0	1.00.00	Previous hour pressure input integrity status. Set to **1** if the pressure was not live at any time during the previous hour.
187.2	Previous Hour Density Status			Bit 2			0	1.00.00	Previous hour density input integrity status. Set to **1** if the density was not live at any time during the previous hour.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
187.3	Previous Hour K-Factor Status			Bit 3			0	1.00.00	Previous hour k-factor input integrity status. Set to **1** if the K-factor was in manual at any time during the previous hour.
187.4	Previous Hour M-Factor Status			Bit 4			0	1.00.00	Previous hour meter factor input integrity status. Set to **1** if the meter factor was in manual at any time during the previous hour.
187.5	Previous Hour Temperature Download Status			Bit 5			0	1.00.00	Previous hour temperature input download mode status. Set to **1** if the temperature ihput used the download value at any time durintg the previous hour.
187.6	Previous Hour Pressure Download Status			Bit 6			0	1.00.00	Previous hour pressure input download mode status. Set to **1** of the pressure input used the download value at any time during the previous hour.
187.7	Previous Hour Density Download Status			Bit 7			0	1.00.00	Previous hour density input download mode status. Set to **1** if the density input used the download value at any time during the previous hour.
188	Current Day Meter Input Status Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00.00	Latched meter input point integrity status for the current day.
188.0	Current Day Temperature Status			Bit 0			1	1.00.00	Current day temperature input integrity status. Set to **1** if the temperature was not live at any time during the current day.
188.1	Current Day Pressure Status			Bit 1			1	1.00.00	Current day pressure input integrity status. Set to **1** if the pressure was not live at any time during the current day.
188.2	Current Day Density Status			Bit 2			1	1.00.00	Current day density input integrity status. Set to **1** if the density was not live at any time during the current day.
188.3	Current Day K-Factor Status			Bit 3			1	1.00.00	Current day k-factor input integrity status. Set to **1** if the K-factor was in manual at any time during the current day.
188.4	Current Day M-Factor Status			Bit 4			1	1.00.00	Current day meter factor input integrity status. Set to **1** if the meter factor was in manual at any time during the current day.
188.5	Current Day Temperature Download Status			Bit 5			1	1.00.00	Current day temperature input download mode status. Set to 1 if the temperature input used the download value at any time during the current day.
188.6	Current Day Pressure Download Status			Bit 6			0	1.00.00	Current day pressure input download mode status. Set to **1** if the pressure input used the download value at any time during the current day.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
188.7	Current Day Density Download Status			Bit 7			0	1.00.00	Current day density input download mode status. Set to **1** if the density input used the download value at any time during the current day.
189	Previous Day Meter Input Status Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.00.00	Latched meter input point integrity status for the previous day.
189.0	Previous Day Temperature Status			Bit 0			1	1.00.00	Previous day temperature input integrity status. Set to **1** if the temperature was not live at any time during the previous day.
189.1	Previous Day Pressure Status			Bit 1			1	1.00.00	Previous day pressure input integrity status. Set to **1** if the pressure was not live at any time during the previous day.
189.2	Previous Day Density Status			Bit 2			1	1.00.00	Previous day density input integrity status. Set to **1** if the density was not live at any time during the previous day.
189.3	Previous Day K-Factor Status			Bit 3			1	1.00.00	Previous day k-factor input integrity status. Set to **1** if the K-factor was in manual at any time during the previous day.
189.4	Previous Day M-Factor Status			Bit 4			1	1.00.00	Previous day meter factor input integrity status. Set to **1** if the meter factor was in manual at any time during the previous day.
189.5	Previous Day Temperature Download Status			Bit 5			1	1.00.00	Previous day temperature input download status. Set to **1** if the temperature iinput used the download value at any time during the previous day.
189.6	Previous Day Pressure Download Status			Bit 6			0	1.00.00	Previouis day pressure input download status. Set to **1** if the pressure input used the download value at any time during the previous day.
189.7	Previous Day Density Download Status			Bit 7			0	1.00.00	Previous day density input download status. Set to **1** if the density input used the download at any time during the previous day.
190	Flow Weighted Average CTPL (VCF) Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Flow weighted average correction factor for temperatue and pressure for the current hour.
191	Flow Weighted Average CTPL (VCF) Previous Hour	R/O	System	DOUBL:E	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Flow weighted average correction factor for temperature and pressure for the previous hour.
192	Flow Weighted Average CTPL (VCF) Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Flow weighted average correction factor for temperature and pressure for the current day.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
193	Flow Weighted Average CTPL (VCF) Previous Day	R/O	System	DOUBLE	9	0.0 → any valid IEEE double precision float	0.0	1.00.00	Flow weighted average correction factor for temperature and pressure for the previous day.
194	Flow Weighted Average Pressure Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average pressure for the current clock hour.
195	Flow Weighted Average Pressure Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average pressure for the previous clock hour.
196	Flow Weighted Average Pressure Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average pressure for the current contract day.
197	Flow Weighted Average Pressure Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average pressure for the previous contract day.
198	Flow Weighted Average Temperature Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average temperature for the current clock hour.
199	Flow Weighted Average Temperature Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average temperature for the previous clock hour.
200	Flow Weighted Average Temperature Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average temperature for the current contract day.
201	Flow Weighted Average Temperature Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average temperature for the previous contract day.
202	Flow Weighted Average CPLm Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CPLm for the previous clock hour.
203	Flow Weighted Average CPLm Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CPLm for the previous clock hour.
204	Flow Weighted Average CPLm Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CPLm for the current contract day
205	Flow Weighted Average CPLm Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CPLm for the previous contract day
206	Flow Weighted Average CTLm Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CTLm for the current clock hour.
207	Flow Weighted Average CTLm Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CTLm for the previous clock hour.
208	Flow Weighted Average CTLm Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CTLm for the Current contract day.
209	Flow Weighted Average CTLm Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Flow weighted average CTLm for the previous contract day.
210	Flow Weighted Average Obs Density Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average observed density for the current clock hour.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
211	Flow Weighted Average Obs Density Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average observed density for the previous clock hour.
212	Flow Weighted Average Obs Density Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average observed density for the current contract day.
213	Flow Weighted Average Obs Density Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average observed density for the previous contract day.
214	Flow Weighted Average Base Density Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average base density for the current clock hour.
215	Flow Weighted Average Base Density Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average base density for the previous clock hour.
216	Flow Weighted Average Base Density Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average base density for the current contract day.
217	Flow Weighted Average Base Density Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average base density for the previous contract day.
218	Flow Weighted Average CPSm Current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CPSm for the current clock hour.
219	Flow Weighted Average CPSm Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CPSm for the previous clock hour.
220	Flow Weighted Average CPSm Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CPSm for the current contract day.
221	Flow Weighted Average CPSm Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CPSm for the previous contract day.
222	Flow Weighted Average CTSm current Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CTSm for the current clock hour.
223	Flow Weighted Average CTSm Previous Hour	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CTSm for the previous clock hour.
224	Flow Weighted Average CTSm Current Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CTSm for the current contract day.
225	Flow Weighted Average CTSm Previous Day	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Flow weighted average CTSm for the previous contract day.
226	Top of Hour Indicated Quantity Total Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Value the total accumulation at the top of the last hour.
227	Top of Hour Gross Volume Total Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Value the total accumulation at the top of the last hour.
228	Top of Hour Gross Standard Volume Total Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Value the total accumulation at the top of the last hour.
229	Top of Hour Net Standard Volume Total Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Value the total accumulation at the top of the last hour.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
230	Top of Hour S & W Volume Total Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Value the total accumulation at the top of the last hour.
231	Top of Hour Mass Total Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Value the total accumulation at the top of the last hour.
232	Top of Hour Raw Pulses Total Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Value the total accumulation at the top of the last hour.
233	Flow Weighted Average K-factor Current Hour	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average k-factor for the current clock hour.
234	Flow Weighted Average K-factor Previous Hour	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average k-factor for the current clock hour.
235	Flow Weighted Average K-factor Current Day	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average k-factor for the current contract day.
236	Flow Weighted Average K-factor Previous Day	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average k-factor for the previous contract day.
237	Flow Weighted Average MF Current Hour	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average meter factor for the current clock hour.
238	Flow Weighted Average MF Previous Hour	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average meter-factor for the current clock hour.
239	Flow Weighted Average MF Current Day	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average meter-factor for the current contract day.
240	Flow Weighted Average MF Previous Day	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.00.00	Flow weighted average meter-factor for the previous contract day.
241	Flow Minutes Current Hour	R/O	System	DOUBLE	8	0.0 → 60.0	0.0	1.00.00	Number of minutes selected flow rate was above the low flow cutoff during the current hour.
242	Flow Minutes Current Day	R/O	System	DOUBLE	8	0.0 → 1440.0	0.0	1.00.00	Number of minutes selected flow rate was above the low flow cutoff during the current contract day.
243	Vapor Pressure	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.02.00	Indicates the equilibrium (bubble point) pressure for the current product. The system uses this value when calculating the pressure correction (CPL). This value is either calculated or user-entered at the associated liquid product.

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
244	Shrinkage Factor	R/W	User	DOUBLE	8	0.0 → 1.0	1.0	1.02.00	Indicates a multiplier determined by the ratio of volume at a stock or some defined intermediate conditions to the same liquid volume at metering conditions. The system mutlplies this value by the gross standard volume as one part of calculating the net standard volume. **Note**: Setting this value to **1.0** negates its effect on volume calculations.
245	Flow Minute Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.02.00	Indicates the continuing flow minute accumulation, which rolls over at the system rollover value.
246	CFX Enable Toggle	R/W	User	UINT8	1	0 → 1	0	1.03.00	Enables the CFX file generation. Valid values are: 0 = Idle (reset on completion) 1 = Enable CFX file generation 2 = Abort CFX file generation
247	CFX Status	R/O	System	UINT8	1	0 → 255	0	1.03.00	Indicates the CFX status. Valid values are: Status Codes 0 = Idle 1 = Generating Section being written 2 = Meter Config 3 = User Defined Attributes 4 = User Defined Characteristics 5 = Meter Events 6 = Meter Alarms 7 = Period Flow Data History 8 = Alternate Flow Data History 9 = Ultrasonic Diagnostic History 10 = Meter Liquid Product 11 = Batch Report 12 = Batch Custom Data 13 = Flie Terminator Error Codes 247 = Aborted by User 248 = NA 249 = CPU Architecture Error (internal; will never see on current platform) 250 = File Error 251 = Unknown Error 252 = Invalid Meter Number 253 = No Liquid Calcs license

Point Type 204, Liquid Meters

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									254 = Missing Liquid Calcs TLPs 255 = No CFX license
248	RESERVED								Reserved for future use
249	RESERVED								Reserved for future use
250	Energy Rate	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Indicates the emergy rate value for the API 14.4 calculation
251	Energy Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Indicates the Energy Accumulation value for the API 14.4 calculation.
252	Flow Increment	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Indicates the flow increment value that is associated with the FWA option (203,x,99)
253	History Segment	R/W	User	UINT8	1	0 → 12	0	1.03.00	Indicates the meter's assigned history segment. All historical data for this meter should be configured in this segment.
254	Meter Type	R/W	Both	UINT8	1	0 → 1	0	1.04.07	Defines the type of meter to which this lliquid meter is interfaced. This is necessary to properly populate the Liquid CFX file with the Meter Type. Valid values are **0** (Turbine) and **1** (Coriolis).

3.4.70 Point Type 205: Liquid Meters Extended

Description: Point type 205 provides an extenstion to point type 204 and provides additional parameters for liquid meters.
Number of Logical Points: 6 logical points of point type 205 may exist.
Storage Location: Point type 205 is saved to internal configuration memory.

Table 3-71: Point Type 205, Liquid Meters Extended

Point Type 205, User Defined Point Type

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/W	User	AC	20	0x20 ➔ 0x7E for each ASCII character	“”	1.03.00	Identifying name for specific liquid meter extension run. Value must be printable ASCII characters.
1	Methane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The methane component’s mass total.
2	Ethane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The ethane component’s mass totals.
3	Propane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The propane component’s mass totals.
4	N-Butane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The n-butane component’s mass totals.
5	I-Butane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The i-butane component’s mass totals.
6	N-Pentane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The n-pentane component’s mass totals.
7	I-Pentane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The i-pentane component’s mass totals.
8	Hexane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The hexane component’s mass totals.
9	Heptane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The heptane component’s mass totals.
10	Propene Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The propene component’s mass totals.
11	Nirtogen Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The nitrogen component’s mass totals.
12	Oxygen Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The oxygen component’s mass totals.
13	Carbon Dioxide Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid	0.0	1.03.00	The carbon dioxide component’s mass totals.

Point Type 205, User Defined Point Type

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
						IEEE 754 double			
14	Hydrogen Sulfide Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The hydrogen sulfide component's mass totals.
15	Octane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The octane component's mass totals.
16	Nonane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The nonane component's mass totals.
17	Decane Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The decane component's mass totals.
18	Helium Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The helium component's mass totals.
19	Water Mass Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The water component's mass totals.
20	RESERVED	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Reserved for the buthene component's mass totals.
21	RESERVED	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Reserved for the etheme component's mass totals.
22	RESERVED	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Reserved for the neo-pentane component's mass totals.
23	Methane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The methane component's volume totals.
24	Ethane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The ethane component's volume totals.
25	Propane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The propane component's volume totals.
26	N-Butane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The n-butane component's volume totals.
27	I-Butane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The i-butane component's volume totals.
28	N-Pentane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The n-pentane component's volume totals.
29	I-Pentane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The i-pentane component's volume totals.
30	Hexane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The hexane component's volume totals.
31	Heptane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The heptane component's volume totals.

Point Type 205, User Defined Point Type

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32	Propene Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The propene component's volume totals.
33	Nitrogen Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The nitrogen component's volume totals.
34	Oxygen Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The oxygen component's volume totals.
35	Carbon Dioxide Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The carbon dioxide component's volume totals.
36	Hydrogen Sulfide Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The hydrogen sulfide component's volume totals.
37	Octone Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The octane component's volume totals.
38	Nonane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The nonane component's volume totals.
39	Decane Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The decane component's volume totals.
40	Helium Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The helium component's volume totals.
41	Water Volume Total	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	The water component's volume totals.
42	RESERVED	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Reserved for the buthene component's volume totals.
43	RESERVED	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Reserved for the ethane component's volume totals.
44	RESERVED	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.03.00	Reserved for the neo-pentane component's volume totals.
45	Liquid Equivalent Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.04.00	The liquid equivalent accumulator when calculating based on API 14.4
46	Gas Equivalent Accumulation	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.04.00	The gas equivalent accumulator when calculating based on API 14.4
47	Meter Signal Option	R/W_CNDL	User	UINT8	1	0 → 1	0	1.04.00	Indicates the signal setting for the meter. Valid values are 0 (meter is set to an analog/pu;se signal) and 1 (meter is set to an accumulator signal)
48	Accumultoar Input TLP	R/W_CNDL	User	TLP	3	Any valid TLP	0,0,0	1.04.00	The Coriolis accumulator TLP
49	Accumulator Input Value	R/O	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	0.0	1.04.00	The Coriolis accumulator input value.

Point Type 205, User Defined Point Type

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	Accumulator Rollover Value	R/W_ CNDL	System	DOUBLE	8	0.0 → Any positive valid IEEE 754 double	1,000,000.0	1.04.00	Indicates the Coriolis accumulator rollover value.
51	Unshrunk Volume Flow Rate	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The net standard volume flow rate without the shrinkage factor multiplier included in the equation. Units are defined by volume units option (point type 200, parameter 10) and flow rate option (point type 200, parameter 12).
52	Unshrunk Volume Current Hour	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The quantity of unshrunk volume accumulated for the current hour. Units are defined by volume units option (point type 200, parameter 10).
53	Unshrunk Volume Last Hour	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The quantity of unshrunk volume accumulated in the previous hour. Units are defined by volume units option (point type 200, parameter 10).
54	Unshrunk Volume Today	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The quantity of unshrunk volume accumulated for the current day. Units are defined by volume units option (point type 200, parameter 10).
55	Unshrunk Volume Yesterday	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The quantity of unshrunk volume accumulated in the previous day. Units are defined by volume units option (point type 200, parameter 10).
56	Unshrunk Volume This Month	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The quantity of unshrunk volume accumulated for the current month. Units are defined by volume units option (point type 200, parameter 10).
57	Unshrunk Volume Previous Month	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The quantity of unshrunk volume accumulated in the previous month. Units are defined by volume units option (point type 200, parameter 10).
58	Unshrunk Total Volume Accumulation	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	The total quantity of unshrunk volume accumulated on this meter since inception. Units are defined by volume units option (point type 200, parameter 10). This value is subject to the double precision accumulator rollover value defined at Point Type 91 Parameter 56.
59	Maintenance Mode Unshrunk Volume	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	Maintenance Mode accumulation of unshrunk volume. Define units using the Volume Units option (point type 200, parameter 10).

Point Type 205, User Defined Point Type

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
60	Altrnate Mode Unshrunk Volume	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	Alternate Mode accumulation of unshrunk volume. Define units using the Volume Units option (point type 200, parameter 10).
61	Top of Hour Unshrunk Volume Total Accumulation	R/O	System	DOUBLE	8	Any valid	0.0	1.04.07	Value of the total accumulation of unshrunk volume at the top of the last hour.
62	Mass Pressure Compensation Option	R/W	User	UINT8	1	$0 \rightarrow 1$	0.0	1.04.07	Indicates whether the mass input requires compensation for pressure effect on the Coriolis tube. Valid values are 0 (Mass pressure compensation disabled) and 1 (Mass pressure compensation enabled). **Note**: This parameter is applicable **only** when mass has been selected for the Meter Input Type [204,x,7].
63	Pressure Effect Mass Compensation Coefficient	R/W	User	DOUBLE		Any valid	0.0	1.04.07	Pressure correction coefficient for mass in percent per psi. This value is supplied by the manufacturer for the given model mass meter. **Note**: This parameter is applicable **only** when mass has been selected for the Meter Input Type [204,x,7] and the Mass Pressure Compensation Option [205,x,62] has been enabled.
64	Calibration Pressure	R/W	User	DOUBLE		Any valid	0.0	1.04.07	Pressure mass meter was calibrated at in PSIG. **Note**: This parameter is applicable **only** when mass has been selected for the Meter Input Type [204,x,7] and the Mass Pressure Compensation Option is Enabled [205,x,62].

3.4.71 Point Type 206: Prover Configuration

Description: Point type 206 provides the parameters for Prover Configuration

Number of Logical Points: 1 logical points of point type 206 may exist.

Storage Location: Point type 206 is saved to internal configuration memory.

Table 3-72: Point Type 206, Prover Configuration

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Prover"	1.00.00	Identification name for specific Prover. Values must be printable ASCII characters.
1	Prover Type	R/W_ CNDL	User	UINT8	1	0 → 2	0	1.00.00	Selection of the Class of prover. Valid values are: 0 = Large Volume 1 = Small Volume 2 = Master Meter
2	Prover Operation	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00.00	Selects the operation of the prover. Valid values are 0 (Uni-Directional) and 1 (Bi-Directional).
3	Detector Type	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00.00	Location of the prover detection switches. Valid values are 0 (Internal Detectors) and 1 (External Detectors).
4	Prove Method	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00.00	Accumulation to use when calculating the Meter Factor. Valid values are 0 (Volume) and 1 (Mass).
5	Master Meter Prove Criteria	R/W_ LOG	User	UINT8	1	0 → 2	0	1.00.00	Basis for master meter. Valid values are: 0 = Volume 1 = Pulses 2 = Time
6	Master Meter Quantity	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float up to and including 1,000,000.0	30.0	1.00.00	Indicates a value against which to compare the accumulation when conducting a Master Meter proof to ending the trial run. Depending on the value of parameter 5, this value would represent a volume, the number of pulses, or a duration of time in seconds
7	Prover Wall Option	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00.00	Selection of the prover wall construction type. Valid values are 0 (Single Wall) and 1 (Double Wall).

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Prover Manufacturer	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Enter up to 20 characters of text to describe the name of the manufacturer of the prover. This information is available for use on the prover report.
9	Prover Serial Number	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Enter up to 20 characters of text to indicate the serial number of the prover. This information is available for use on the prover report.
10	Prover Certification Date	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Last Prover Certification Date. Operator entered value. This is a place holder for the last time the prover was certified. This information is available for use on the prover report.
11	Prover Certification Number	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Current Certification Number. Operator entered value. This information is available for use on the prover report.
12	Prover Certified Base Volume 1 SVP Upstream Volume 1	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	14.0	1.00.00	Certified Prover Volume at the Certification temperature and Pressure in selected prover volume units (parameter #16).
13	Prover Certified Base Volume 2 SVP Downstream Volume 1	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	14.0	1.00.00	Certified Prover Volume at the Certification temperature and Pressure in selected prover volume units (parameter #16).
14	Prover Certified Base Volume 3 SVP Upstream Volume 2	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	14.0	1.00.00	Certified Prover Volume at the Certification temperature and Pressure in selected prover volume units (parameter #16).
15	Prover Certified Base Volume 4 SVP Downstream Volume 2	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	14	1.00.00	Certified Prover Volume at the Certification temperature and Pressure in selected prover volume units (parameter #16).
16	Prover Volume Units	R/W_ CNDL	User	UINT8	1	0 → 6	0	1.00.00	Selection for the volume units for the base prover volumes (parameters #12-15). Valid values are: 0 = Barrels 1 = MCF 2 = KM3 3 = Gallons 4 = FT3 5 = M3 6 = Liters
17	Prover Mass Units	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00.00	If the prover quantity is mass-based, indicates the selection for the mass units to be used with the prover. Valid values are 0 (lbs) and 1 (Kg).

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Prover Base Volume Option	R/W	User	UINT8	1	0 → 3	0	1.00.00	Indicates which of the base volumes (parameters 12-15) are used in the prove sequence. Valid values are: 0 = Use Base Volume 1 1 = Use Base Volume 2 2 = Use Base Volume 3 3 = Use Base Volume 4.
19	Prover Calibrated Temperature	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	60.0	1.00.00	Temperature at which the prover volume was calibrated. This temperature must be entered by the user in the same temperature units selected in the Liquid Preferences point type (TLP 200, 0, 2). Typical values are 60 Deg F, 15 Deg C or 20 Deg C.
20	Prover Calibrated Pressure	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Pressure at which the prover volume was calibrated. This pressure must be entered by the user in the same pressure units selected in the Liquid Preferences point type (TLP 200, 0, 1). Typical values are 0 PSIG or 101.325 kPA.
21	Prover Certified Internal Diameter	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	8.0	1.00.00	Prover Internal Diameter entered by the user in the same units selected in the Liquid Preferences point type (TLP 200, 0, 4).
22	Certified Prover Wall Thickness	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	0.322	1.00.00	Prover Wall Thickness entered by the user in the same units selected in the Liquid Preferences point type (TLP 200, 0, 4).
23	Cubical Coefficient Option (Gc, Gmp)	R/W_ CNDL	User	UINT8	1	0 → 4	0	1.00.00	Indicates the option for the Cubical Coefficient. Valid values are: 0 = Mild Carbon Steel 1=304 Stainless 2=316 Stainless 3=17-4PH-Stainless 4= Other If you select option 0, 1, 2, or 3, then parameter 24 is set according to Table 6 of API 12.2.3. If you select option 4, then enter parameters 24 accordingly.
24	Cubical Coefficient (Gc, Gmp)	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	1.86E-5	1.00.00	This value is either filled in by the ROC or by the user depending on what option parameter 23 is set to. If you set parameter 23 to 4, then you must enter the cubical coefficient of thermal expansion factor in the correct units (TLP 200, 0, 4 and TLP 200, 0, 2).

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
25	Area Coefficient Option (Ga)	R/W_ CNDL	User	UINT8	1	0 → 5	0	1.00.00	Indicates the option for the Gamma Area Coefficient. Valid values are: 0 = Mild Carbon Steel 1 = 304 Stainless 2 = 304 Stainless Cast 3 = 316 Stainless 4 = 17-4PH-Stainless 5 = Other If you select option 0, 1, 2, or 3, then parameter 26 is set according to Table 6 of API 12.2.3. If you select option 4, you must also enter parameter 26 accordingly.
26	Area Coefficient (Ga)	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	1.24E-5	1.00.00	This value is either filled in by the ROC or by the user depending on what the option in parameter 25 is set to. If parameter 25 is set to 4, then the user should enter gamma area coefficient of thermal expansion factor in the correct units (TLP 200, 0, 4 and TLP 200, 0, 2).
27	Modulus of Elasticity Option (E)	R/W_ CNDL	User	UINT8	1	0 → 4	0	1.00.00	Indicates the option for the Modulus of Elasticity. Valid values are: 0 = Mild Carbon Steel, 1 = 304 Stainless, 2 = 316 Stainless, 3 = 17-4PH-Stainless 4 = Other If you select option 0, 1, 2, or 3, then parameter 28 is set according to Table 6 of API 12.2.3. If you select option 4, you must also enter parameter 28 accordingly.
28	Modulus of Elasticity (E)	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	3.0E7	1.00.00	This value is either filled in by the ROC or by the user depending on what the option in parameter 27 is set to. If you set parameter 27 to 4, then you must also enter the prover modulus of elasticity in correct pressure units.(point type 200)

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	Detector Rod Material Option Detector Rod Material (Gl) Linear Coefficient (Gl)	R/W_ CNDL:	User	UINT8	4	0 → 5	4	1.00.00	Select the Rod Material Linear Coefficient. Valid values are: 0 = Mild Carbon Steel 1 = 304 Stainless 2 = 316 Stainless 3 = 17-4PH-Stainless 4 = Invar Rod 5 = Other (Reference SVP doc for associated R values. If you select option 0, 1, 2, 3, or 4, then parameter 30 is set according to Table 6 of API 12.2.3. If you select option 5, then you must also enter parameter 30 accordingly.
30	Linear Coefficient (Gl)	R/W_ LOG	User	DOUBLE	8	Any valid positive IEEE double precision float	8.0 E-7	1.00.00	This value is either filled in by the ROC or by the user depending on what the option in parameter 29 is set to. If parameter 29 is set to 5, then the user should enter the linear coefficient in selected temperature units (point type 200)
31	Plenum R Option	R/W_ CNDL	User	UINT8	4	0 → 7	0	1.00.00	Indicates the option for the Plenum R value. Valid values are: 0 = 8 1 = 12” Mini 2 = 12” 3 = 18” 4 = 24” Old 5 = 24” 6 = 34” 7 = 40” 8 = User Entered Refer to the SVP manual for associated R values.
32	Plenum R	R/W_ LOG	User	DOUBLE	8	0.0 → 10.0	3.5	1.00.00	This value is either filled in by the ROC or by the user depending on what the option in parameter 31 is set to. If parameter 31 is set to 8, then the user should enter the value to be used for the constant R.
33	Plenum Pressure Deadband	R/W	User	DOUBLE	8	0.0 → 100.0	+5%	1.00.00	Plenum pressure control deadband in selected units (TLP 200, 0, 1). This is the percentage (positive only) above the calculated required pressure allows the prove sequence to proceed.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
34	Pulse Interpolation Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	This selection allows the user to specify whether or not to use interpolated pulses. The ROC allows the user to select interpolated pulses for any prove operation. Valid values are 0 (Whole pulses only) and 1 (Use interpolated pulses).
35	Prove Sequence Number	R/W) CNDL	System	UINT32	4	0 → 4,294,967,295	1	1.00.00	Indicates the current unique prove number. This parameter increments when a prove sequence begins. It increments for unsuccessful sequences, aborted sequences, and successful sequences.
36	Calculation Method	R/W_ CNDL	User	UINT8	1	0 → 3	0	1.00.00	Indicates the method for evaluating the prove sequence. This parameter defines how the system applies repeatability to trial runs to determine which trial runs are included in the prove sequence for the final Meter Factor calculation. This parameter also determines which Meter Factor is shown on the prove report as the final Meter Factor for the prove sequence. Valid values are: 0 = Average Meter Factor Method 1 = Average Data Method, Meter Factor 2 = Average Data Method, K-factor 3 = Average K Factor Method Two Meter Factors are always calculated using both methods. This can be used for comparison purposes.
37	Meter K-Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the K-factor of the meter being proved. This value is copied from the meter being proved (TLP 204, x, 14).
38	Meter MF	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the current meter factor of the meter being proved. This value is copied from the meter being proved at the beginning of a new prove sequence from TLP 204, x, 15.
39	Meter Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flowing temperature of the meter being proved. This value is copied from the meter point TLP 204, x, 25. This is the value averaged between detector switch trips.
40	Meter Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flowing pressure of the meter being proved. This value is copied from the meter point TLP 204, x, 24. This is the value averaged between detector switch trips.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
41	Meter Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the observed density of the meter being proved. This value is copied from the meter point TLP 204, x, 18. This is the value averaged between detector switch trips.
42	Meter Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the base density of the meter being proved. This value is copied from the meter point TLP 204, x, 19.
43	Meter Flow Rate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides the Indicated Standard Volume (ISV) flow rate of the meter being proved. This value is calculated from the meter Gross Standard Volume (GSV) flow rate (TLP 204, x, 31) divided by the current Meter Factor (parameter 15).
44	Meter Vapor Pressure	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the vapor pressure from the associated meter to be proved.
45	Maximum Temperature Deviation	R/W_ CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	.5	1.00.00	Specifies the maximum temperature deviation in selected units (TLP 200,0,2) between the meter temperature and the prover temperature, which may be from a single value or from an average of the prover inlet and prover outlet temperatures.
46	Maximum Pressure Deviation	R/W_ CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.5	1.00.00	Specifes the maximum pressure deviation in selected units (TLP 200,0,1) between the meter pressure and the prover pressure, which may be from a single value or from an average of the prover inlet and prover outlet temperatures.
47	Prove Flow Rate	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicates the flow rate which the current meter flow rate must match within an acceptable deviation when in-between detectors.
48	Maximum Flow Rate Deviation	R/W_ CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The maximum deviation percentage allowable for the flow rate when comparing the meter flow rate (parameter 43) to the prove flow rate (parameter 47). If this value is zero, no flow rate checking occurs.
49	Prove Flow Rate Option	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00.00	Specifies the whether the Prove Flow Rate (TLP 206,0,47) should be automatically populated by the current associated meter Flow Rate. Valid values are 0 (User entered value) and 1 (Automatic population).

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	Meter Alignment Time	R/W	User	UINT16	2	1 → 65,535	90	1.00.00	Indicates the maximum amount of time (in seconds) the prover application waits for the alignment status to be updated (usually by an external program [parameter 83] to match the requested alignment command [parameter 82]) before aborting the prove.
51	Stability Time	R/W	User	UINT16	2	1 → 65,535	600	1.00.00	Indicates the maximum amount of time (in seconds) the prover application waits for the prover temperature and pressure to stabilize (after being notificated that the selected meter is now aligned and flowing through the prover) before aborting the prove. Stability is defined as the prover inlet/outlet temperature and pressure values being equal to the meter temperature value within the maximum deviations (parameters 45 and 46).
52	Launch Time	R/W	User	UINT16	2	1 → 65,535	30	1.00.00	The maximum amount of time (in seconds) the prover application waits for feedback that the launch command was successful before aborting the prove. For a bi-directional prover, this represents the maximum amount of time to wait for a status indicating the 4-way valve has completed its rotation. For a uni-directional prover this option is not used. For a compact prover it represents the maximum amount of time to wait for a status indicating the piston has been launched. If the timer expires, manual interaction should be required to rectify the physical prover problem.
53	Pass Time	R/W	User	UINT16	2	1 → 65,535	120	1.00.00	The maximum amount of time (in seconds) the application waits for the second detector switch to trip after beginning a pass. If this time expires before the second detector trips, the prove aborts.
54	Recovery Time	R/W	User	UINT16	2	1 → 65,535	30	1.00.00	The amount of time (in seconds) that the application waits to perform another launch command after reading the second detector switch.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
55	Soak Time	R/W	User	UINT16	2	1 → 65,535	600	1.00.00	The amount of time, in seconds, to allow for the temperature of the steel to measure closer to the temperature of the fluid. This timer is optional and can be disabled (see parameter 102).
56	Passes Per Run	R/W_ CNDL	User	UINT8	1	1 → 10	1	1.00.00	Indicates the number of passes of the displacer to be considered a trial run.
57	Minimum Trial Runs	R/W_ CNDL	User	UINT8	1	1 → 10	5	1.00.00	Indicates the minimum number of sequential runs required to be considered a successful prove.
58	Maximum Trial Runs	R/W_ CNDL	User	UINT8	1	1 → 10	10	1.00.00	Indicates the maximum number of runs allowed to try to get the minimum number of sequential runs in.
59	Maximum Acceptable Deviation Between Trial Runs	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.025	1.00.00	Indicates the maximum allowable deviation from one trial run to another. If the deviation is under this value then the run can be considered as a potentially valid run for the prove sequence. Depending on the Meter Factor method, this is the repeatability between the number of pulses per trial run or the variation of the Meter Factor for that trial run.
60	Prover Inlet Temperature Input TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC	0,0,0	1.00.00	Specifies the TLP for the prover inlet temperature, if available.
61	Prover Inlet Temperature Value	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value read from the Prover Inlet Temperature Input (parameter 60).
62	Prover Outlet Temperature Input TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC	0,0,0	1.00.00	Specifies the TLP for the outlet prover temperature.
63	Prover Outlet Temperature Value	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicates the value read from the prover outlet temperature input (parameter 62).
64	Prover Temperature Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If both the prover inlet temperature and prover outlet temperatures are defined, this value represents the average of those pressures. If only the outlet temperature is defined, this value represents the prover outlet temperature.
65	Prover Inlet Pressure Input TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC	0,0,0	1.00.00	Specifies the TLP for the prover inlet pressure, if available.
66	Prover Inlet Pressure Value	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value read from the Prover Inlet Pressure Input (parameter 65).
67	Prover Outlet Pressure Input TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC	0,0,0	1.00.00	Specifies the TLP for the outlet prover pressure.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
68	Prover Outlet Pressure Value	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value read from the Prover Outlet Pressure Input (parameter 67).
69	Prover Pressure Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	If both the prover inlet pressure and prover outlet pressures are defined, this value represents the average of those pressures. If only the outlet pressure is defined, this value represents the prover outlet pressure.
70	Plenum Pressure Input TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC of data type FL	0,0,0	1.00.00	The TLP definition for the plenum pressure for a compact prover. When set to undefined (0,0,0) it is assumed that the plenum is not automated, and the plenum control step of the prove sequence is skipped.
71	Plenum Pressure Value	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The value read from the Plenum Pressure Input (parameter 70).
72	Prover Valve Command 1 Output TLP	R/W_ CNDL	User	TLP	3	102, x, 8	0,0,0	1.00.00	Indicates one of the two commands used to conduct a trial run or prove sequence. The commands vary with the prover type: **Note**: Depending on the prover type, two different commands may be required. ▪ Uni-Directional: This command energizes the ram to “launch the displacer.”This command is turned off at the first detector trip. ▪ Bi-directional w/ a 4-Way Valve: This output is used for the forward launch command, or “rotate right” command. ▪ Compact Prover: The "Run" command. ▪ Master Meter: Not available.
73	Prover Valve Status 1 Input TLP	R/W_ CNDL	User	TLP	3	DI, SP, FST	0,0,0	1.00.00	Depending on the prover type, two different statuses can be used. This TLP points to the status input for those signals. ▪ Uni-directional – Not used ▪ Bi-directional w/ a 4-Way Valve – indicates the valve is in the forward position or “valve is rotated right”. ▪ Compact Prover – This status indicates the hydraulic valve is open.
74	Prover Valve Status 1	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates the current status of the TLP to which parameter 73 is pointing.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
75	Prover Valve Command 2 Output TLP	R/W_ CNDL	User	TLP	3	102, x, 8	0,0,0	1.00.00	This is the second launch command. ▪ Uni-directional & Compact: This command turns on the hydraulics commonly associated with a uni-directional prover. This command turns on at the start of a new prove sequence and stays on until the sequence either finishes or aborts. ▪ Bi-Directional w/ a 4-way valve: This output is used for the reverse launch command, or “rotate left” command. ▪ Master Meter: not used.
76	Prover Status 2 Input TLP	R/W_ CNDL	User	TLP	3	DI, SP, FST	0,0,0	1.00.00	This is the TLP that points to the second status commonly used in proving. ▪ Uni-directional & Compact – The “prover is on” and ready to initiate a trial run ▪ Bi-directional w/ a 4-Way Valve – indicates the valve is in the reverse position or “valve is rotated left.” ▪ Master Meter – not used.
77	Prover Valve Status 2	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates the current reading from the Prover Valve Status 2 Input (parameter 76).
78	Seal Status Input TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC of data type UINT8	0,0,0	1.00.00	This should be configured to point to the input status to which the proving valve seal signal is wired.
79	Seal Status	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates the current reading from the Seal Status Input. A good seal indication must be read before the first detector switch is tripped and must be maintained throughout the pass. This option can be enabled and disabled by parameter 104. Valid values are 0 (no seal) and 1 (good seal). .
80	Plenum Charge TLP	R/W_ CNDL	User	TLP	3	102, x, 8	0	1.00.00	Specifies the TLP for the command that pressurizes the plenum on a compact prover. This shall not change states during a prove sequence.
81	Plenum Vent TLP	R/W_ CNDL	User	TLP	3	102, x, 8	0	1.00.00	Specifies the TLP for the command that releases the pressure from the plenum on a compact prover. This shall not change states during a prove sequence.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
82	Requested Meter To Prove	R/W	User	UINT8	1	0 → 6	0	1.00.00	Selects the meter to be proved. This value must match the value in parameter 83 before the application can consider the correct meter is aligned. This parameter is also used to retrieve information about the meter being proved, such as the meter temperature, pressure, and K-factor. Valid values are: 0 = No meters currently aligned / on prove 1 = Requsts a prove of point type 204 (turbine meter) logical 0 (the first meter) 2 = Requests a prove of point type 204 (turbine meter) logical 1 (the second meter) 3 = Requests a prove of point type 204 (turbine meter) logical 2 (the third meter) 4 = Requests a prove of point type 204 (turbine meter) logical 3 (the fourth meter) 5 = Reqiests a prove of point type 204 (turbine meter) logical 4 (the fifth meter) 6 = Requests a prove of point type 204 (turbine meter) logical 5 (the sixth meter)
83	PLC Meter Alignment Status	R/W	Both	SINT8	1	-1 → 6	0	1.00.00	Indicates the current meter aligned for proving. Some external application (such as DS800, Modbus, or a button on a HMI screen) needs to set the parameter accordingly. In order for the prove sequence to proceed, and not to abort during a prove, this parameter must match parameter 82 at **all** times during the sequence. The prove sequence does not proceed until the meter is correctly aligned and waits only for the specified time entered in parameter 50. Valid values are: -1 = the current valve statuses do not reflect the correct statuses for the requested meter from parameter 82. (An external application or an HMI, may set this parameter to -1 for many different reasons: the application could not align the correct meter, the valves are in transition, etc.) 0 = All meters are properly aligned and bypassing the prover; all meters are “home”. 1 = The 1st meter aligned to the prover 2 = The 2nd meter aligned to the prover 3 = The 3rd meter aligned to the prover 4 = The 4th meter aligned to the prover 5 = The 5th meter aligned to the prover 6 = The 6th meter aligned to the prover.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
84	Align Meter Command	R/O	System	UINT8	1	0 → 1	0	1.00.00	This parameter is set to a value of 1 as the first step of a prove. It is used as an indication to an external device, such as a PLC or host, to perform any valve alignment needed for proving a meter. When the external device writes an appropriate value to parameter 83 (PLC Meter Alignment Status), indicating that the alignment is complete, the value of the parameter is set to 0.
85	Start Prove Command	R/W	User	UINT8	1	0 → 1	0	1.00.00	This parameter is set by the user to initiate a new prove sequence. When this parameter is set, the proving application being the sequence by looking for correct meter alignment, the proceeding to the temperature stabilization, etc… The user should always perform a “reset” by setting parameter 97 to a 1 prior to using this parameter (85) to start a new sequence. The application will then reset these parameters (85 and 97) to a 0 on its own.
86	Abort Prove Command	R/W	User	UINT8	1	0 → 255	0	1.00.00	Allows you to abort the prove for any reason. Set this to any non-zero number between 1 and 255.
87	Prover Status Number	R/O	System	UINT8	1	0 → 255	0	1.00.00	Indication of the current prove stage. Valid values are: : 0 = Reset 1 = Initialize 2 = Align 3 = Seat Sphere 4 = Stability Checks 5 = Forward Launch 6 = Forward Collect 7 = Forward Recovery 8 = Reverse Launch 9 = Reverse Collect 10 = Volume Calculations 11 = Repeatability Calculation 12 = Check Max Runs 13 = Final Calculations 14 = Prove Completed 15 = Factors Transferred 255 = Prove Aborted (See parameter 91 for explanation)
88	Prover Status Text	R/O	System	AC	40	0x40 → 0x7E for each ASCII character	“ ”	1.00.00	Indicates an ASCII text string portraying current state of the prover application.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
89	Trial Run Number In Progress	R/O	System	UINT8	1	0 → 10	0	1.00.00	Shows the number of the current trial run underway.
90	Abort Code	R/O	System	UINT8	1	0 → 7	0	1.00.00	A numeric representation of the reason the prove sequence aborted. Valid values are: 0 = No Error, 1 = Initial run alignment failure, 2 = Alignment failure during sequence, 3 = Lost Temperature Stability, 4 = Prover ready not received, 5 = Lost valve seal, 6 = Unexpected valve state, 7 = Pass timer expired, 8 = Flow rate stability lost, 9 = Can't complete sequence, 10 = No pulses counted, 11 = External Host Abort **Note**: This value clears on reset.
91	Abort Text	R/O	System	AC	40	0x40 → 0x7E for each ASCII character	" "	1.00.00	ASCII version of Abort Code A text string representation of (parameter 90) the reason the sequence aborted. This clears on reset. Abort text messages are: ▪ "Abort: Meter Alignment Failed" ▪ "Abort: Meter Alignment Lost During Seq" ▪ "Abort: No Pressure/Temperature Stabilization" ▪ "Abort: No Prover Ready Indication" ▪ "Abort: Prover Valve Did Not Seal" ▪ "Abort: 4-way Valve Not In Expected State" ▪ "Abort: Pass Timer Timed Out" ▪ "Abort: Flowrate Stability Lost" ▪ "Abort: Could Not Get X Out Of Y Runs" ▪ "Abort: APM Counted No Pulses"
92	Current Meter Tag	R/O	System	AC	20	0x40 → 0x7E for each ASCII character	" "	1.00.00	Tag from the associated meter run.
93	Prove in Progress	R/O	System	UINT8	1	0 → 1	0	1.01.04	Indicates whether a prove is in progress. Valid values are: 0 = No prove in progress 1 = Prove currently in progress
94	RESERVED								Reserved for future use

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
95	Prove Sequence Number Option	R/W	User	UINT8	1	0 → 2	0	1.00.00	Defines how prove sequence numbers increment (see TLP 209,x,90). Valid values are: 0 = System wide prove numbers 1 = Per meter prove numbers 2 = Per product prove numbers
96	Prover Maintenance Mode	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00.00	Sets the maintenance status of the prover. If set the prover cannot not start a prove sequence. Valid values are 0 (Normal) and 1 (Maintenance Mode - Proving disabled).
97	Reset Prove Sequence	R/W	User	UINT8	1	0 → 1	0	1.00.00	Clears all data from the last prove sequence conducted and resets the providng software. After issuing this command, you then issue a "Start Prove Command" (parameter 85) to start a new sequence.
98	Trial Run Underway	R/O	System	UINT8	1	0 → 10	0	1.00.00	Current Trial Number – this is redundant to parameter 89.
99	Good Bad Status	R/O	System	UINT16	2	0 → 1023	0	1.00.00	This value's lower 10 bits represent the "good"/"bad" status of all trial runs underway. A bit with the value of 1 means it was a good run, 0 means it was a bad run. The lease significant bit represents trial run 1. Example: 0000 0000 0000 1111 0000 means runs 5,6,7 and 8 were considered good runs for this sequence
100	Pulses This Pass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the total pulses measured between detector switches during a pass.
101	Max Old/New Factor Variation	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.05	1.00.00	Indicates the maximum allowable percent difference for the final proved factor in order to transfer the factor.
102	Soak Timer Control	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00.00	Indicates if the soak timer is used for an additional wait following the temperature stabilization timer. Valid values are 0 (Disabled) and 1 (Enabled).
103	Meter Alignment Control	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00.00	Indicates if the meter alignment step should be used at the start of a prove. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: If Disabled, the prove begins with the temperature stabilization phase.
104	Seal Status Option	R/W_ CNDL	User	UINT8	1	0 → 1	1	1.00.00	Indicates whether the seal status is check during a prove. Valid values are 0 (Disabled) and 1 (Enabled).

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
105	Plenum Orientation	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00.00	Indicates the mounting orientation for the plenum. Valid values are 0 (Horizontal) and 1 (Vertical). This value the value of the plenum N2K number used. If Horizontal, 60.0 is used; if vertical, 40.0 is used.
106	Calculated Plenum Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicates the plenum pressure required to proceed with a prove.
107	Master Meter Current Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	Indicates the value of the current quantity so far during a prove using a master meter.
108	Detector Shaft Temp Input TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC	0,0,0	1.00.00	Specifies the TLP for the temperature of the detector mounting shaft or the displacer shaft with external detectors. **Note**: Used **only** for small volume provers.
109	Detector Shaft Temperature	R/W	Both	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value read from the Detector Shaft Temperature Input (parameter 108).
110	Number of Pre Trial Samples	R/W_ LOG	User	UINT8	1	0 → 255	10	1.00.00	Indicates the number of samples to be taken to create an average of all prover variables which serve as inputs into calculations. **Note**: User **only** for small volume provers.
111	Temperature Option	R/W_ CNDL	User	UINT8	1	0 → 2	0	1.00.00	Selects which temperature input is used for calculations. Valid values are: 0 = Average of the inlet and outlet temperatures 1 = Inlet temperature 2 = Outlet temperature
112	Pressure Option	R/W_ CNDL	User	UINT8	1	0 → 2	0	1.00.00	Selects which pressure input is used for calculations. Valid values are: 0 = Average of the inlet and outlet pressures. 1 = Inlet pressure. 2 = Outlet pressure.
113	Prove Report Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	Selects whether a prove report automatically generates at the conclusion of a prove. Valid values are 0 (Disabled) and 1 (Enabled).

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
114	Prove Report Logical	R/W	User	UINT32	4	0 → 1023	1	1.00.00	Selects which instances are used for printing the Final Prove Report. The reporting application allows you to configure up to 10 logical instances. Each of this word's lower 10 bits enables or disables printing to one of the reporting application's logical instances – a bit with a value of 1 means use this instance, a bit with a value of 0 means do not. For example, **17 = 0000 0000 0001 0001** means print or save a report from the 1st and 5th reporting instances (logicals).
115	Prove Report Generate	R/W	User	UINT8	1	0 → 1	0	1.00.00	Command to generate a report. Set to a value of "1" to activate a logical of the reporting program.
116	Trial Report Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	Selects if a trial report should be automatically generated at the conclusion of a prove. Valid values are 0 (Disabled) and 1 (Enabled).
117	Trial Report Logical	R/W	User	UINT32	4	0 → 1023	2	1.00.00	Selects which instances are used for printing the Trial Report. The reporting application allows you to configure up to 10 logical instances. Each of this word's lower 10 bits enables or disables printing to one of the reporting application's logical instances – a bit with a value of 1 means use this instance, a bit with a value of 0 means do not. For example, **17 = 0000 0000 0001 0001** means print or save a report from the 1st and 5th reporting instances (logicals).
118	Trial Report Generate	R/W	User	UINT8	1	0 → 1	0	1.00.00	Generates a trial report. Set to **1** to activate a logical of the reporting program.
119	Pass Report Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	Selects if a trial report should automatically generate at the conclusion of a prove. Valid values are 0 (Disabled) and 1 (Enabled).

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
120	Pass Report Logical	R/W	User	UINT32	4	0 → 1023	4	1.00.00	selects which instances will be used for printing the Trial Report. The reporting application allows you to configure up to 10 logical instances. Each of this word's lower 10 bits enables or disables printing to one of the reporting application's logical instances. A bit with a value of 1 means use this instance, a bit with a value of 0 means do not. For example, **17 = 0000 0000 0001 0001** means print or save a report from the 1st and 5th reporting instances (logicals).
121	Pass Report Generate	R/W	User	UINT8	1	0 → 1	0	1.00.00	Generate a pass report. Set to a value of "1" to activate a logical of the reporting program.
122	RESERVED								Reserved for future use
123	RESERVED								Reserved for future use
124	RESERVED								Reserved for future use
125	RESERVED								Reserved for future use
126	Meter 1 Prove Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
127	Meter 2 Prove Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
128	Meter 3 Prove Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
129	Meter 4 Prove Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
130	Meter 5 Prove Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
131	Meter 6 Prove Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the last successful prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
132	Meter APM Input	R/W	User	UINT8	1	0 → 3	0	1.00.00	When proving with a master meter, both the pulse in for the meter and the master meter must be on the same APM card. This defines which input on the associated APM card is coming from the meter to be proved.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
133	Master Meter APM Input	R/W	User	UINT8	1	0 → 3	0	1.00.00	When proving with a master meter, both the pulse in for the meter and the master meter must be on the same APM card. This defines which input on the associated APM card is coming from the master meter.
134	Detector Switch Option	R/W	User	UINT8	1	0 → 3	1	1.00.00	When proving with a master meter, if both the meter and the master meter are attached to the same APM card, then that card's software detector switch should be used. If the meters are attached to different APM cards, then the hardware detector switch option should be used.n Valid values are 0 (Hardware) and 1 (Software).
135	Master Meter Factor Option	R/W_ CNDL	User	UINT8	1	0 → 2	0	1.00.00	Selects which Meter Factor and K-factor scheme is used for the master meter. Valid values are: 0 = Single MF/Single K-Factor 1 = MF Curve/Single K-Factor 2 = K-Factor Curve/Single MF
136	Master Meter MF	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Single Meter Factor for the master meter.
137	Master Meter K-Factor	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	Single K-factor for the master meter.
138	Meter Factor/K-Factor 1	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
139	Flowrate/Frequency 1	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
140	Meter Factor/K-Factor 2	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
141	Flowrate/Frequency 2	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (Parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
142	Meter Factor/K-Factor 3	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
143	Flowrate/Frequency 3	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
144	Meter Factor/K-Factor 4	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
145	Flowrate/Frequency 4	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
146	Meter Factor/K-Factor 5	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
147	Flowrate/Frequency 5	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
148	Meter Factor/K-Factor 6	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
149	Flowrate/Frequency 6	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
150	Meter Factor/K-Factor 7	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
151	Flowrate/Frequency 7	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
152	Meter Factor/K-Factor 8	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
153	Flowrate/Frequency 8	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
154	Meter Factor/K-Factor 9	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
155	Flowrate/Frequency 9	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
156	Meter Factor/K-Factor 10	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
157	Flowrate/Frequency 10	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
158	Meter Factor/K-Factor 11	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
159	Flowrate/Frequency 11	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
160	Meter Factor/K-Factor 12	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	1.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the linear meter constant (K-Factor) in pulses/ft^3 or pulses/m^3 for the associated frequency in Hz. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the dimensionless Meter Factor (MF) for the associated indicated volume flow rate.
161	Flowrate/Frequency 12	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	If you select a K-Factor Curve, Single Meter Factor (parameter 135 = 2), this parameter is the frequency in Hz that corresponds with the associated K-Factor. If you select a Meter Factor Curve, Single K-Factor (parameter 135 = 1), this parameter is the indicated volume flow rate that corresponds with the associated Meter Factor.
162	Meter APM Slot Number	R/W	Both	UINT8	1	0 → 9	0	1.00.00	Slot number of the APM card associated with the current meter to be proved. If value is 0, then there is no APM associated with the meter. APMs are associated with a LiquidCalcs turbine meter using the Turbine Meter's Flow Input parameter (TLP 204,X,20).
163	Master Meter APM Slot Number	R/W	Both	UINT8	1	0 → 9	0	1.00.00	Slot number of the APM card associated with the current master meter. If value is 0, then there is no APM associated with the meter. APMs are associated with a LiquidCalcs turbine meter using the Turbine Meter's Flow Input parameter (TLP 204,X,20).
164	Hardware Detector Switch 1 TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC	0,0,0	1.00.00	Defines the TLP for the parameter that triggers detector switch 1 for both the master meter and for the meter. Usually will be set to a Discrete output status (102,X,8). This is typically used when the meter and master meter are on different APM cards, and the Detector switch option (Parameter 130) is set to 0.
165	Hardware Detector Switch 2 TLP	R/W_ CNDL	User	TLP	3	Any TLP in the ROC	0,0,0	1.00.00	The TLP definition for the parameter that will trigger detector switch 2 for both the master meter and for the meter. Usually will be set to a Discrete output status (102,X,8). This is typically used when the meter and master meter are on different APM cards, and the Detector switch option (Parameter 130) is set to 0.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
166	Meter 1 Prove Sequence Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Unique prove number for the last successful prove for meter 1. This is copied from TLP 208,0,19 when the parameter (TLP 208,0,89) is set to 1.
167	Meter 2 Prove Sequence Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Unique prove number for the last successful prove for meter 2. This is copied from TLP 208,0,19 when the parameter TLP 208,0,89 is set to 1.
168	Meter 3 Prove Sequence Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Unique prove number for the last successful prove for meter 3. This is copied from TLP 208,0,19 when the parameter TLP 208,0,89 is set to 1.
169	Meter 4 Prove Sequence Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Unique prove number for the last successful prove for meter 4. This is copied from TLP 208,0,19 when the parameter TLP 208,0,89 is set to 1.
170	Meter 5 Prove Sequence Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Unique prove number for the last successful prove for meter 5. This is copied from TLP 208,0,19 when the parameter TLP 208,0,89 is set to 1.
171	Meter 6 Prove Sequence Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Unique prove number for the last successful prove for meter 6. This is copied from TLP 208,0,19 when the parameter TLP 208,0,89 is set to 1.
172	Meter Run #1 Status	R/W	User	UINT8	1	0 → 2	0	1.00.00	Tells the alignment program to ignore the status switches associated with this meter. Valid values are: 0 = Auto 1 = Manual 2 = Not Active
173	Meter Run #2 Status	R/W	User	UINT8	1	0 → 2	0	1.00.00	Tells the alignment program to ignore the status switches associated with this meter. Valid values are: 0 = Auto 1 = Manual 2 = Not Active
174	Meter Run #3 Status	R/W	User	UINT8	1	0 → 2	0	1.00.00	Tells the alignment program to ignore the status switches associated with this meter. Valid values are: 0 = Auto 1 = Manual 2 = Not Active

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
175	Meter Run #4 Status	R/W	User	UINT8	1	0 → 2	0	1.00.00	Tells the alignment program to ignore the status switches associated with this meter. Valid values are: 0 = Auto 1 = Manual 2 = Not Active
176	Meter Run #5 Status	R/W	User	UINT8	1	0 → 2	0	1.00.00	Tells the alignment program to ignore the status switches associated with this meter. Valid values are: 0 = Auto 1 = Manual 2 = Not Active
177	Meter Run #6 Status	R/W	User	UINT8	1	0 → 2	0	1.00.00	Tells the allignment program to ignore the status switches associated with this meter. Valid values are: 0 = Auto 1 = Manual 2 = Not Active
178	Max Original/New Meter Factor Variation	R/W_ LOG	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.5	1.00.00	Indicates the maximum allowable percent difference from the original meter factor to the final proved factor in order to transfer the factor.
179	Meter 1 Starting Original MF	R/W_ LOG	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the starting original meter factor of the meter being proved. This value is the meter factor at the time the meter was installed.
180	Meter 2 Starting Original MF	R/W_ LOG	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the starting original meter factor of the meter being proved. This value is the meter factor at the time the meter was installed.
181	Meter 3 Starting Original MF	R/W_ LOG	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the starting original meter factor of the meter being proved. This value is the meter factor at the time the meter was installed.
182	Meter 4 Starting Original MF	R/W_ LOG	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the starting original meter factor of the meter being proved. This value is the meter factor at the time the meter was installed.
183	Meter 5 Starting Original MF	R/W_ LOG	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the starting original Meter factor of the meter being proved. This value is the meter factor at the time the meter was installed.
184	Meter 6 Starting Original MF	R/W_ LOG	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the starting original Meter factor of the meter being proved. This value is the meter factor at the time the meter was installed.
185	Customer Name	R/W	User	AC	20	0x20 → oX7E for each ASCII character	“ “	1.02.00	Indicates the name of the customer for which the next prove will be performed. The system uses this information on the prover report.

Point Type 206, Prover Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
186	Indirect Mass Prove Density Input Source	R/W	User	UINT8	1	0 → 7	0	1.04.07	If proving a mass meter using eother a Large Volume or Small Volume prover, specifies the source of the density input used to correlate the data. Valid values are: 0 = Manual Value 1 = Density Interface 1 2 = Density Interface 2 3 = Density Interface 3 4 = Density Interface 4 5 = Density Interface 5 6 = Density Interface 6 7 = Density Interface 7
187	Indirect Mass Prove Manual Density INput	R/W_ CNDL	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.04.07	If Parameter 186 is set to 0 (manual), this field specifies the Average Density over the course of a user-entered prove.
188	Remote Automated Start Option	R/W	User	UINT8	1	0 → 1	0	1.04.07	If this Parameter is set to 1, the user sets the Meter Currently Aligned [206,0,83] to start a new prove. All normal checks are considered and aborted if not met.
189	Plenum Option	R/W	User	UINT8	1	0 → 1	0	1.04.07	Enables or disables the Plenum option. Valid values are **0** (disables the Plenum option and hides the Plenum Info frame) and **1** (enables the Plenum option and reveals the Plenum Info frame).

3.4.72 Point Type 207: Prover Trial Report

Description: Point type 207 provides the parameters for Prover Trial Report

Number of Logical Points: 10 logical points of point type 207 may exist.

Storage Location: Point type 207 is saved to internal configuration memory.

Table 3-73: Point Type 207, Prover Trial Report

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“Trial X” where X is the trial number	1.00.00	Identification name for specific trial run.
1	Prove Time/Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the timestamp of this trial run in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
2	Prove Sequence Number	R/O	System	UINT32	4	0□→ 4,294,967,295	0	1.00.00	Internally generated Identifier that associates this trial run data set with a prove sequence.
3	Average Meter Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated meter temperature while accumulating pulses for this trial run.
4	Average Meter Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated meter pressure while accumulating pulses for this trial run.
5	Average Meter Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated meter observed density while accumulating pulses for this trial run.
6	Meter Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This represents the meter base density used in this trial run.
7	Average Meter Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated meter flowrate while accumulating pulses for this trial run.
8	Trial Number	R/O	System	UINT8	1	0 → 10	0	1.00.00	Provides the number for this trial run.
9	Minimum Trial Runs	R/O	System	UINT8	1	0 → 10	0	1.00.00	This represents the desired number of minimum acceptable trial runs desired.
10	Maximum Trial Runs	R/O	System	UINT8	1	0 → 10	0	1.00.00	This represents the maximum trial run attempts to make in order to try to achieve the minimum number of trial runs.
11	Average Prover Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated prover temperature while accumulating pulses for this trial run.

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Average Prover Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated prover pressure while accumulating pulses for this trial run.
13	Seal Status	R/O	System	UINT8	1	0 → 1	0	1.00.00	Presents a record of the seal status during this trial run.
14	Pulse Count Forward	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Pulses accumulated from the meter between detector switches while flowing in one direction during a trial run.
15	Pulse Count Reverse	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Pulses accumulated from the meter between detector switches while flowing in the other direction, if applicable during a trial run.
16	Pulse Count Total	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The total of forward and reverse pulses for this trial run.
17	CTL Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this trial run, a function of the average meter observed density, average temperature of the observed density and the average meter temperature during pulse accumulation and applying any hydrometer correction. **Note**: When proving meters using COSTALD-Tait, this represents the CTPLm.
18	CPL Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this trial run, a function of the compressibility of the fluid, the base pressure and the average meter pressure during pulse accumulation.
19	CTL Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this trial run, a function of the average meter observed density, average temperature of the observed density and the average prover temperature during pulse accumulation and applying any hydrometer correction. **Note**: When proving meters using COSTALD-Tait, this represents the CTPLp.
20	CPL Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this trial run, a function of the compressibility of the fluid, the base pressure and the average prover pressure during pulse accumulation.
21	CTS Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this trial run, a function of the average prover temperature during pulse accumulation, Gc/Gmp and the temperature base.
22	CPS Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this trial run, a function of the average prover pressure during pulse accumulation, ID, WT and E.

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	CCF Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated for this trial run from parameters CTLm and CPLm
24	CCF Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated for this trial run from parameters CTSp, CPSp, CTLp and CPLp.
25	Indicated Volume Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated for this trial run using the total pulses for this run and the meter nominal K-factor for the meter.
26	Gross Standard Volume Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated for this trial run using the selected BVP and CCFp.
27	Proved Meter Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This represented the calculated meter factor for this trial run.
28	Factor Repeatability	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This represents the calculated factor repeatability for this run as specified in API when using the average factor method. This is a function of the calculated factor for each run deemed acceptable in a sequence.
29	Density Observed Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated density observed temperature while accumulating pulses for this trial run.
30	Indicated Standard Volume Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The indicated Standard volume calculated for this trial run. It is a function of the IVm and the CCFm.
31	Good Bad Flag	R/O	System	UINT8	1	0 → 2	2	1.00.00	Indicates if this trial run record is considered to be in tolerance and is then considered when creating the final meter factor. Valid values are: 0 = Trial Bad 1 = Trial Good 2 = Trial Not Run The decision to mark this data set as “Good” or “Bad” is based on the user-entered selection to use the Average Data method or the Average Meter Factor method to evaluate the repeatability among runs within the sequence. The good run flag is then initialized to 2 prior to conducting the trial run, then set to 0 or 1 accordingly. .
32	Pulses Repeatability	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the calculated pulses repeatability for this run as specified in API when using the average meter data method. This is a function of the recorded pulses for each run deemed acceptable in a sequence.

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33	Base Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the certified base volume of the prover used for this trial run. For a bi-directional prover the program multiplies this value by two to obtain the total combined volume for the trial run.
34	K Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the associated meter's K-factor used for calculations for this trial run.
35	Master Meter Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Pulses accumulated from the master meter between detector switches. **Note**: Used **only** for master meter proving.
36	Master Meter Meter Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the meter factor of the master meter, used in calculations. **Note**: Used **only** for master meter proving.
37	Master Meter K Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the K factor of the master meter, used in calculations. **Note**: Used **only** or master meter proving.
38	Average Master Meter Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average calculated meter flowrate while accumulation pulses for this trial run.
39	Trial Flight Time	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Total trial flight time (in seconds) for the trial run. Total combined detector to detector time for the trial run.
40	Average Meter Frequency	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average meter frequency for the trial run, calculated as the total trial run pulse count divided by the total trial run flight time.
41	RESERVED								Reserved for future use
42	RESERVED								Reserved for future use
43	RESERVED								Reserved for future use
44	RESERVED								Reserved for future use
45	RESERVED								Reserved for future use
46	RESERVED								Reserved for future use
47	RESERVED								Reserved for future use
48	RESERVED								Reserved for future use
49	RESERVED								Reserved for future use
50	Pass 1 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates pulses received on pass 1 for small volume prover
51	Pass 1 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates interpolated pulse count on pass 1 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
52	Pass 1 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates value for pass 1 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
53	Pass 1 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates value for pass 1 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
54	Pass 1 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates flow rate for pass 1 on small volume prover
55	RESERVED								Reserved for future use
56	RESERVED								Reserved for future use
57	RESERVED								Reserved for future use
58	RESERVED								Reserved for future use
59	RESERVED								Reserved for future use
60	Pass 2 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the pulses received on pass 2 for small volume prover.
61	Pass 2 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the interpolated pulse count on pass 2 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
62	Pass 2 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 2 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
63	Pass 2 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 2 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
64	Pass 2 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates flow rate for pass 2 on small volume prover
65	RESERVED								Reserved for future use
66	RESERVED								Reserved for future use
67	RESERVED								Reserved for future use
68	RESERVED								Reserved for future use
69	RESERVED								Reserved for future use
70	Pass 3 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates pulses received on pass 3 for small volume prover.

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
71	Pass 3 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates interpolated pulse count on pass 3 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
72	Pass 3 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 3 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
73	Pass 3 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 3 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
74	Pass 3 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates flow rate for pass 3 on small volume prover
75	RESERVED								Reserved for future use
76	RESERVED								Reserved for future use
77	RESERVED								Reserved for future use
78	RESERVED								Reserved for future use
79	RESERVED								Reserved for future use
80	Pass 4 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates pulses received on pass 4 for small volume prover
81	Pass 4 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates interpolated pulse count on pass 4 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
82	Pass 4 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 4 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
83	Pass 4 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 4 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
94	Pass 4 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flow rate for pass 4 on small volume prover.
85	RESERVED								Reserved for future use
86	RESERVED								Reserved for future use
87	RESERVED								Reserved for future use
88	RESERVED								Reserved for future use
89	RESERVED								Reserved for future use

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
90	Pass 5 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates pulses received on pass 5 for small volume prover
91	Pass 5 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates interpolated pulse count on pass 5 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
92	Pass 5 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 5 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
93	Pass 5 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 5 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
94	Pass 5 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flow rate for pass 5 on small volume prover
95	RESERVED								Reserved for future use
96	RESERVED								Reserved for future use
97	RESERVED								Reserved for future use
98	RESERVED								Reserved for future use
99	RESERVED								Reserved for future use
100	Pass 6 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates pulses received on pass 6 for small volume prover
101	Pass 6 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the interpolated pulse count on pass 6 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
102	Pass 6 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 6 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
103	Pass 6 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 6 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
104	Pass 6 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flow rate for pass 6 on small volume prover.
105	RESERVED								Reserved for future use
106	RESERVED								Reserved for future use
107	RESERVED								Reserved for future use

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
108	RESERVED								Reserved for future use
109	RESERVED								Reserved for future use
110	Pass 7 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates pulses received on pass 7 for small volume prover.
111	Pass 7 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the interpolated pulse count on pass 7 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
112	Pass 7 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 7 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
113	Pass 7 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 7 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
114	Pass 7 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flow rate for pass 7 on small volume prover.
115	RESERVED								Reserved for future use
116	RESERVED								Reserved for future use
117	RESERVED								Reserved for future use
118	RESERVED								Reserved for future use
119	RESERVED								Reserved for future use
120	Pass 8 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the pulses received on pass 8 for small volume prover
121	Pass 8 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the interpolated pulse count on pass 8 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
122	Pass 8 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 8 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
123	Pass 8 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 8 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
124	Pass 8 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flow rate for pass 8 on small volume prover.
125	RESERVED								Reserved for future use

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
126	RESERVED								Reserved for future use
127	RESERVED								Reserved for future use
128	RESERVED								Reserved for future use
129	RESERVED								Reserved for future use
130	Pass 9 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the pulses received on pass 9 for small volume prover
131	Pass 9 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the interpolated pulse count on pass 9 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
132	Pass 9 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 9 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
133	Pass 9 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 9 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops.
134	Pass 9 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flow rate for Pass 9 on small volume prover.
135	RESERVED								Reserved for future use
136	RESERVED								Reserved for future use
137	RESERVED								Reserved for future use
138	RESERVED								Reserved for future use
139	RESERVED								Reserved for future use
140	Pass 10 Pulse Count	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the pulses received on pass 10 for small volume prover.
141	Pass 10 Pulse Count Interpolated	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the interpolated pulse count on pass 10 for small volume prover. Interpolated pulses are calculated using timer 1 and timer 2.
142	Pass 10 Interpolation Timer T1	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 10 interpolation timer 1. The timer starts on the first detector switch and stops on the final detector switch.
143	Pass 10 Interpolation Timer T2	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the value for pass 10 interpolation timer 2. The timer starts on the leading edge of the first pulse after timer 1 starts and stops on the leading edge of the first pulse after timer 1 stops

Point Type 207, Prover Trial Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
144	Pass 10 Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the flow rate for Pass 10 on small volume prover.
145	RESERVED								Reserved for future use
146	RESERVED								Reserved for future use
147	RESERVED								Reserved for future use
148	RESERVED								Reserved for future use
149	RESERVED								Reserved for future use

3.4.73 Point Type 208: Prover Final Report

Description: Point type 208 provides the parameters for the Prover Final Report

Number of Logical Points: 1 logical point of point type 208 may exist.

Storage Location: Point type 208 is saved to internal configuration memory.

Table 3-74: Point Type 208, Prover Final Report

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“ ”	1.00.00	Identification name for final report.
1	Prove Time/Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the prove sequence in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
2	Product	R/O	System	UINT8	1	0 → 255	0	1.00.00	The product that was flowing through the meter at the time of this prove copied form TLP 202,x,1.
3	Prover Type	R/O	System	UINT8	1	0 → 255	0	1.00.00	For this prove sequence, copied from TLP 206,0,1.
4	Prover Operation	R/O	System	UINT8	1	0 → 255	0	1.00.00	For this prove sequence, copied from TLP 206,0,2.
5	Detector Type	R/O	System	UINT8	1	0 → 255	0	1.00.00	For this prove sequence, copied from TLP 206,0,3.
6	Prove Method	R/O	System	UINT8	1	0 → 255	0	1.00.00	For this prove sequence, copied from TLP 206,0,4.
7	Prover Wall Option	R/O	System	UINT8	1	0 → 255	0	1.00.00	For this prove sequence, copied from TLP 206,0,7.
8	Prover Manufacturer	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“ “	1.00.00	For this prove sequence, copied from TLP 206,0,8.
9	Prove Serial Number	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“ “	1.00.00	For this prove sequence, copied from TLP 206,0,9.
10	Prover Certification Date	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“ “	1.00.00	For this prove sequence, copied from TLP 206,0,10.
11	Prover Certification Number	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“ “	1.00.00	For this prove sequence, copied from TLP 206,0,11.
12	Prover Volume Units	R/O	System	UINT8	1	0 → 255	0	1.00.00	For this prove sequence, copied from TLP 206,0,16.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Prover Mass Units	R/O	System	UINT8	1	0 → 255	0	1.00.00	For this prove sequence, copied from TLP 206,0,17.
14	Prover Base Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Equals the base volume of the prove used during this prove sequence.
15	Prover Certified Internal Diameter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this prove sequence, copied from TLP 206,0,21.
16	Prover Certified Wall Thickness	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this prove sequence, copied from TLP 206,0,22.
17	Prover Gamma	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this prove sequence, copied from TLP 206,0,26.
18	Prover Modulus E	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	For this prove sequence, copied from TLP 206, 0, 28.
19	Prove Sequence Number	R/O	System	UINT32	4	0 → 4294967295	0	1.00.00	For this prove sequence, copied from TLP 206, 0, 35.
20	Calculation Method	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	0	1.00.00	For this prove sequence, copied from TLP 206,0,36.
21	Meter K-Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the K-factor used during this sequence.
22	Meter MF	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the meter factor from the meter prior to starting this prove sequence.
23	Average Meter Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs.
24	Average Meter Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs.
25	Average Meter Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs.
26	Meter Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs.
27	Average Meter Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs.
28	Meter Vapor Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs.
29	Minimum Trial Runs	R/O	System	UINT8	1	1 → 10	0	1.00.00	The minimum trial runs specified for this prove sequence.
30	Maximum Trial Runs	R/O	System	UINT8	1	1 → 10	0	1.00.00	The maximum trial run attempts specified for this prove sequence.
31	Maximum Trail Run Deviation %	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The maximum deviation specified for this prove sequence.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32	Average Prover Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected "good" trial runs.
33	Average Prover Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected "good" trial runs.
34	Meter To Prove Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Identifies the meter proved for this prove sequence.
35	Abort Text	R/O	System	AC40	40	0x40 → 0x7E for each ASCII character	" "	1.00.00	The abort text from this prove sequence
36	Pulse Count Forward Avg	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected "good" trial runs.
37	Pulse Count Reverse Avg	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected "good" trial runs.
38	Pulse Count Total Avg	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected "good" trial runs.
39	CTL Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CTL calculated by averaging the CTL for each "good" trial run. This is for informational use only. **Note**: When proving meters using COSTALD-Tait, this represents the CTPLm.
40	CPL Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CPL calculated by averaging the CPL for each "good" trial run. This is for informational use only.
41	CTL Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CTL calculated by averaging the CTL for each "good" trial run. This is for informational use only. **Note**: When proving meters using COSTALD-Tait, this represents the CTPLp.
42	CPL Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CPL calculated by averaging the CPL for each "good" trial run. This is for informational use only
43	CTS Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CTS calculated by averaging the CTS for each "good" trial run. This is for informational use only.
44	CPS Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CPS calculated by averaging the CPS for each "good" trial run. This is for informational use only.
45	CCF Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CCF calculated by averaging the CCF for each "good" trial run. This is for informational use only.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
46	CCF Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CCF calculated by averaging the CCF for each “good” trial run. This is for informational use only.
47	Indicated Standard Volume Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average ISVm calculated by averaging the ISVm for each “good” trial run. This is for informational use only.
48	Gross Standard Volume Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average GSVm calculated by averaging the GSVm for each “good” trial run. This is for informational use only.
49	Final MF Using Avg MF	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This Meter factor is calculated per API standards by averaging the calculated Meter factors from all “good” trial runs of the prove sequence.
50	Deviation for Prove Sequence	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This represents what the calculated repeatability for this run as specified in API when using the average meter data method. This is a function of the recorded pulses for each run deemed acceptable in a sequence.
51	CTL Table	R/O	System	UINT8	1	0 → 16	0	1.00.00	For reference, this value is copied from the associated station point type TLP 201,x,28
52	CPL Table	R/O	System	UINT8	1	0 → 4	0	1.00.00	For reference, this value is copied from the associated station point type TLP 201,x,29
53	Temperature Units	R/O	System	UINT8	1	0 → 1	0	1.00.00	For reference, this value is copied from TLP 200,0,5 and defines the units used during this prove sequence.
54	Pressure Units	R/O	System	UINT8	1	0 → 3	0	1.00.00	For reference, this value is copied from TLP 200,0,4 and defines the units used during this prove sequence.
55	Density Units	R/O	System	UINT8	1	0 → 7	0	1.00.00	For reference, this value is copied from TLP 200,0,6 and defines the units used during this prove sequence.
56	Volume Units	R/O	System	UINT8	1	0 → 6	0	1.00.00	For reference, this value is copied from TLP 200,0,10 and defines the units used during this prove sequence.
57	Rate Units	R/O	System	UINT8	1	0 → 3	0	1.00.00	For reference, this value is copied from TLP 200, 0,12 and defines the units used during this prove sequence.
58	Mass Units	R/O	System	UINT8	1	0 → 3	0	1.00.00	For reference, this value is copied from TLP 200,0,11 and defines the units used during this prove sequence.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
59	Average Density Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs. This is for informational use only.
60	Indicated Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs. This is for informational use only.
61	Base Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The base temperature for this sequence.
62	Base Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The base pressure for this sequence.
63	Hydrometer Correction Flag	R/O	System	UINT8	1	0 → 255	0	1.00.00	For reference, this value is coped from the associated density point type TLP 204,x,33.
64	Density Output Units	R/O	System	UINT8	1	0 → 2	0	1.00.00	For reference, this value is copied from TLP 200,0,7 and defines the units used during this prove sequence.
65	Linear Units	R/O	System	UINT8	1	0 → 1	0	1.00.00	For reference, this value is copied from TLP 200,0,8 and defines the units used during this prove sequence.
66	Viscosity Units	R/O	System	UINT8	1	0 → 1	0	1.00.00	For reference, this value is copied from TLP 200,0,9 and defines the units used during this prove sequence.
67	Average Viscosity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This is average viscosity, if applicable for the selected trial runs.
68	Meter Base Density Using Avg Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float		1.00.00	This is average base density used when calculating the MF using the Average Data Method.
69	CTSp Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CTSp calculated by averaging the input variables to the CTSp calculation for each “good” trial run. This is for informational use only.
70	CPSp Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CPSp calculated by averaging the input variables to the CPSp calculation for each “good” trial run. This is for informational use only.
71	CTLp Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CTLp calculated by averaging the input variables to the CPSp calculation for each “good” trial run. This is for informational use only. **Note**: When proving meters using COSTALD-Tait, this represents the CTPLp.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
72	CPLp Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CPLp calculated by using the correction factors calculated using averaged input values. This is for informational use only.
73	CCFp Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CCFp calculated by using the correction factors calculated using averaged input values. This is for informational use only.
74	GSVp Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The GSVp used in calculating the MF using the Average Data Method. This is for informational use only.
75	CTLm Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CTLm calculated by averaging the input variables to the CTLm calculation for each “good” trial run. This is for informational use only. **Note**: When proving meters using COSTALD-Tait, this represents the CTPLm.
76	CPLm Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average CPLm calculated by averaging the input variables to the CPLm calculation for each “good” trial run. This is for informational use only.
77	CCFm Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The CCFm used in calculating the MF using the Average Data Method. This is for informational use only.
78	ISVm Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The ISVm used in calculating the MF using the Average Data Method. This is for informational use only.
79	Final MF Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This Meter factor is calculated per API standards by averaging the input variable data from all “good” trial runs of the prove sequence.
80	CMF Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This represents CMF produced when following the Average Data Method.
81	IVm Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This is IVm used when calculating the MF using the Average Data Method.
82	Percent Run Deviation	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Depending on the calculation method, this is copied from either the last trial run calculated IMF repeatability TLP 207, x, 28 or the last trial run calculated N repeatability TLP 207,x,32.
83	Original Meter Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Meter factor being used by the associated meter prior to the prove.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
84	Final Meter Factor	R/W	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Final Meter Factor selected from either the average Meter Factor method or the average data method
85	Meter Factor Deviation	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The final Meter Factor minus the original meter factor, divided by the original meter factor to create a percent deviation.
86	Original K Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	K-factor being used by the associated meter prior to the prove.
87	Final K Factor	R/W	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Final K Factor selected from either the average K Factor method or the average data method
88	K Factor Deviation	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The final K-factor minus the original K factor, divided by the original K factor to create a percent deviation.
89	Transfer Factors	R/W	User	UINT8	1	0 → 255	0	1.00.00	Used to transfer the final meter factor (parameter 79) to the associated liquid meter.
90	Master Meter Pulse Count Total Avg	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected “good” trial runs for the master meter. Only used for master meter proving.
91	Official / Unofficial Proving	R/W	User	UINT8	1	0 → 255	0	1.00.00	Enables you to report the prove as official or unofficial. Valid values are 0 (Official Prove) and 1 (Unofficial Prove).
92	Prove Status Reason	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“ ”	1.00.00	Identification for the reason the prove was official or unofficial.
93	System And Valve Check	R/W	User	UINT8	1	0 → 255	0	1.00.00	Allows the user to certify that the prover was checked
94	Ambient Temperature	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Allows the user to enter the ambient temperature reading at the time of the prove.
95	Associated Station Number	R/W	User	UINT8	1	0 → 3	0	1.00.00	Number of the station the meter to be proved was assigned to. This value is zero based.
96	Associated Product Number	R/W	User	UINT8	1	0 → 4	0	1.00.00	Number of the product associated with the meter to be proved. This value is zero based.
97	Associated Density Number	R/W	User	UINT8	1	0 → 3	0	1.00.00	Number of the density associated with the meter to prove. This value is zero based
98	Associated Meter Number	R/W	User	UINT8	1	0 → 3	0	1.00.00	Number of the meter to prove. This value is zero based.
99	Final Factor Repeatability	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The final factor repeatability for this prove using the Average Meter Factor method.
100	Final Pulses Repeatability	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The final pulse repeatability for this prove using the Average Data method.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
101	Meter IV Total At Prove Start	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The total indicated volume accumulated for the meter under test at the start of the prove.
102	Meter GV Total At Prove Start	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The total gross volume accumulated for the meter under test at the start of the prove.
103	Meter GSV Total At Prove Start	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The total gross standard volume accumulated for the meter under test at the start of the prove.
104	Meter NSV Total At Prove Start	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The total net standard volume accumulated for the meter under test at the start of the prove.
105	Meter Mass Total At Prove Start	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.00.00	The total mass accumulated for the meter under test at the start of the prove.
106	Last Prove Sequence Number	R/O	System	UINT32	4	0 → 4294967295	0	1.00.00	The unique sequence number for the last prove that occurred.
107	Last Prove Time/Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the timestamp of the last prove in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
108	Original MF Deviation %	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	The % deviation between the original MF and this prove sequence final MF.
109	Average MF % Repeatability	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected "good" trial runs. This is for informational use only
110	Average Pulses % Repeatability	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	An average calculated from the selected "good" trial runs. This is for informational use only
111	Final KF Using Avg KF	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This K factor is calculated per API standards by averaging the calculated K factors from all "good" trial runs of the prove sequence.
112	Final KF Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	This K factor is calculated per API standards by averaging the input variable data from all "good" trial runs of the prove sequence.
113	Average Meter Frequency	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average meter frequency calculated from the good trial runs.
114	Average Flight Time	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Average detector to detector flight time calculated from the good trial runs.
115	Meter Temperature Report Flag	R/O	System	BIN	1	0x00 → 0xFF	0	1.00.00	Indicates the status of the meter temperature input during the prove. Value can be used on reports.
115.0	Temperature Simulate Status			Bit 0			0	1.00.00	The meter temperature input was in simulate (manual) status during the prove.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
115.1	Temperature Dowload Status			Bit 1			0	1.00.00	The meter temperature was in download mode status during the prove.
115.2	Not Used			Bit 2			0	1.00.00	
115.3	Not Used			Bit 3			0	1.00.00	
115.4	Not Used			Bit 4			0	1.00.00	
115.5	Not Used			Bit 5			0	1.00.00	
115.6	Not Used			Bit 6			0	1.00.00	
115.7	Not Used			Bit 7			0	1.00.00	
116	Meter Pressure Report Flag	R/O	System	BIN	1	0x00 → 0xFF	0	1.00.00	Indicates the status of the meter pressure input during the prove. Value can be used on reports.
116.0	Pressure Simulate Status			Bit 0			0	1.00.00	The meter pressure input was in simulate (manual) mode during the prove.
116.1	Pressure Download Status			Bit 1			0	1.00.00	The meter pressure was in download mode during the prove.
116.2	Not Used			Bit 2			0	1.00.00	
116.3	Not Used			Bit 3			0	1.00.00	
116.4	Not Used			Bit 4			0	1.00.00	
116.5	Not Used			Bit 5			0	1.00.00	
116.6	Not Used			Bit 6			0	1.00.00	
116.7	Not Used			Bit 7			0	1.00.00	
117	Prover Temperature Report Flag	R/O	System	BIN	1	0x00 → 0xFF	0	1.00.00	Indicates the status of the prover temperature input during the prove. Latches for either if you define both inlet and outlet temperatures. Value can be used on reports.
117.0	Temperature Simulate Status			Bit 0			0	1.00.00	The prover temperature input was in simulate (manual) mode during the prove.
117.1	Temperature Download Status			Bit 1			0	1.00.00	The prover temperature input was in download status during the prove.
117.2	Not Used			Bit 2			0	1.00.00	
117.3	Not Used			Bit 3			0	1.00.00	
117.4	Not Used			Bit 4			0	1.00.00	
117.5	Not Used			Bit 5			0	1.00.00	
117.6	Not Used			Bit 6			0	1.00.00	
117.7	Not Used			Bit 7			0	1.00.00	

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
118	Prover Pressure Report Flag	R/O	System	BIM	1	0x00 → 0xFF	0	1.00.00	Indicates the status of the prover pressure input during the prove. Latches for either if you define both inlet and outlet temperatures. Value can be used on reports.
118.0	Pressure Simuate Status			Bit 0			0	1.00.00	The prover pressure was in simulate (manual) status during the prove.
118.1	Pressure Download Status			Bit 1			0	1.00.00	The prover pressure was in download status during the prove.
118.2	Not Used			Bit 2			0	1.00.00	
118.3	Not Used			Bit 3			0	1.00.00	
118.4	Not Used			Bit 4			0	1.00.00	
118.5	Not Used			Bit 5			0	1.00.00	
118.6	Not Used			Bit 6			0	1.00.00	
118.7	Not Used			Bit 7			0	1.00.00	
119	Prover Meter Sequence Number	R/O	System	UINT32	4	0 → 4294967295	0	1.00.00	Indicates the prove's sequence number, as defined by the prove sequence number option (206,x,95). If you request system-wide sequence numbers, this parameter has the same value as TLP 208,x,19. If you request pre-product sequence numbers, this paramerer takes its valkue from TLP 201,x,13 or similar.
120	Product Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	" "	1.01.01	Tag description for the product that was in use at the time of the prove. Copied from Point Type 201, parameter 0.
121	CTPL Meter	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.01.01	An average CTPL for the meter, calculated by averaging the CTPL for each "good" trial run. This is for informational use only
122	CTPL Prover	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.01.01	An average CTPL for the prover, calculated by averaging the CTPL for each "good" trial run. This is for informational use only
123	CTPLm Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.01.01	An average CTPLm calculated by averaging the input variables to the CTPL calculation for each "good" trial run. This is the CTPL value as would be calculated using the average data method. This is for informational use only.

Point Type 208, Prover Final Report

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
124	CTPLp Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.01.01	An average CTPLp calculated by averaging the input variables to the CTPL calculation for each "good" trial run. This is the CTPL value as would be calculated using the average data method. This is for informational use only.
125	Meter Description	R/O	System	AC	30	0x20 → 0x7E for each ASCII character	" "	1.01.02	Description for the meter run that was proved. Values will be printable ASCII characters. Copied from Point Type 204, parameter 1.
126	Meter Name/Model	R/O	System	AC	20"	0x20 → 0x7E for each ASCII character	" "	1.01.02	Model name for the meter run that was proved. Values will be printable ASCII characters. Copied from Point Type 204, parameter 2.
127	Meter Serial Number	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	"."	1.01.02	Serial number of the installaed meter. Values must be printable ASCII characters. Copies from Point Type 204, parameter 3.
128	Meter Size	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.01.02	Size of the installed meter that was provde. Copied from Point Type 204, parameter 4.
129	Customer Name	R/O	System	AC	30	0x20 → 0x7E for each ASCII character	0.0	1.02.00	Name of the customer for whom this prove was performed. Values must be printable ASCII characters. Copied from Point Type 206, parameter 185.
130	Meter Alt Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.02.00	The alternate density (or meter density) calculated using the meter temperature and pressure.
131	Prover Alt Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.02.00	The alternate density calculated using the prover temperature and pressure.
132	Meter Alt Density Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.02.00	The alternate density (or meter density) calculated using the meter temperature and pressure. This is the value calculated using the average data method.
133	Prover Alt Density Using Average Data	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.02.00	The alternate density calculated using the prover temperature and pressure. This is the value calculated using the average data method.
134	Prover Average Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.0	1.04.07	The average observed density at the prover. This value is user-entered if Point Type 206, param 186 equals 0. Otherwise the system draws this value from one of the seven user-selected Density Interfaces.

3.4.74 Point Type 210: Batch Station Configuration

Description: Point type 210 provides the parameters for Batch Station Configuration

Number of Logical Points: 6 logical points of point type 210 may exist.

Storage Location: Point type 210 is saved to internal configuration memory.

Table 3-75: Point Type 210, Batch Station Configuration

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Station Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Station"	1.00.00	User entered point type tag; value transfers to current station batch.
1	Station Batch Description	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User entered description for the batch; value transfers to current station batch.
2	Deliver To	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User entered text field; value transfers to current station batch.
3	Station Ticket ID	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User entered text field; value transfers to current station batch.
4	Station Ticket Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Increments variable so each station batch has have a unique ID; value transfers to current station batch.
5	Batch Type	R/W	User	UINT8	1	0 → 2	0	1.00.00	Indicates the type of batch. Valid values are: 0 = Normal Batch 1 = Maintenance (Treated as normal) 2 = Unauthorized (Detected flow started this batch)
6	Meters Assigned	R/W	User	UINT32	4	0 → 1023	1	1.00.00	Assigns which Liquid Calc meters are included in this station batch. Each of this value’s lower 6 bits represents a corresponding meter assigned to this station batch. A bit with a value of 1 means “include this meter” while a bit with a value of 0 means “do not.” For example, **17 = 0000 0000 0001 0001 m**eans include the first and fifth meters (logicals).
7	Meter 1 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“Meter 1”	1.00.00	User entered text field; value transfers to the batch tag in the current meter batch.
8	Meter 2 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“Meter 2”	1.00.00	User entered text field; value transfers to the batch tag in the current meter batch.

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Meter 3 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Meter 3"	1.00.00	User entered text field; value transfers to the batch tag in the current meter batch.
10	Meter 4 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Meter 4"	1.00.00	User entered text field; value transfers to the batch tag in the current meter batch.
11	Meter 5 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Meter 5"	1.00.00	User entered text field; value transfers to the batch tag in the current meter batch.
12	Meter 6 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Meter 6"	1.00.00	User entered text field; value transfers to the batch tag in the current meter batch.
13	Continuous Batching Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	Indicates if the next batch should automatically start as soon as this batch ends. Valid values are 0 (No restart; batch just ends [Disabled]) and 1 (Restart; when the batch ends automatically start the next batch [Enabled]).
14	Batch Trigger Option	R/W	User	UINT32	1	0 → 127	0	1.00.00	Assigns the types of batches linked to this station. Valid values include, but are not limited to: 1 = Manual Batches Only 2 = Hourly Batches Only 4 = Daily Batches Only 8 = Weekly Batches Only 19 = Monthly Batche Onlys 32 = Measurement Based Only 64 = Time/Date Based Only Bit is a method of batch control. All methods require a manual start. Once a batch starts, it continues until one of the selected batch criteria is met. Each of this value's lower 7 bits enables or disables a type of station batch. A bit with a value of 1 means "implement this batch" while a bit with a value of 0 means "do not." For example, **13 = 0000 0000 0000 1101** means "do daily, weekly, and manual batches. Whichever occurs first terminates the batch."
15	Contract Hour	R/W	User	UINT8	1	0 → 23	0	1.00.00	Determines when a new hourly or daily batch starts. Valid values are 0 to 23: 0 = 12:00am 1 = 1:00am 2 = 2:00am … 23 = 11:00pm

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
16	Contract Week Day	R/W	User	UINT8	1	0 → 6	0	1.00.00	Determines when a new weekly batch starts. Valid values are 0 to 6: 0 = Sunday 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday
17	Contract Month Day	R/W	User	UINT8	1	0 → 28	0	1.00.00	Determines when a new monthly batch starts. Valid values are: 0 = The first of the month 1 = The second of the month 3 = The third of the month … 27 = the 28th day of the month 31 = the last day of the month
18	Hours Per Batch	R/W	User	UINT8	1	1,2,3,4,6,8,12	1	1.00.00	Describes the number of hours in between batches (used for hourly batches).
19	Measurement Type	R/W	User	UINT8	1	0 → 5	0	1.00.00	Determines what to measure for measurement–based batches. Valid values are: 0 = Indicated Volume 1 = Gross Volume 2 = Gross Standard Volume 3 = Net Standard Volume 4 = Sediment and Water Volume 5 = Gross Mass
20	Measurement Value	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Identifies, for measurement-based batches, a target value. The batch continues until it reaches this amount in the measured volume or mass.
21	Alert Percentage	R/W	User	UINT8	1	0 → 100	90	1.00.00	User entered percentage used with measurement based batches. Once a batch exceeds this percentage, then a flag occurs.
22	Batch Running Status	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates the batch's run status. Valid values are 0 (a batch is not running) and 1 (a batch is currently running). A running batch has taken starting values and is updating the flow weighted averages (FWA).
23	Start TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Defines a TLP that allows you to use external stimulus to start batches. If the target TLP is ever a non-zero value, the batch starts and writes a zero value back to the target TLP.

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	Start Command	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00.00	Manually starts a batch. Other than with the start TLP parameter, this is the only way to initially start a batch.
25	End TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Defines a TLP that allows you to use external stimulus to end batches. If the target TLP is ever a non-zero value, the batch ends and writes a zero value back to the target TLP.
26	End Command	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00.00	Manually ends a batch. Other than with the end TLP parameter, this is the only way to permanently end a batch.
27	Retro-Active Recalculation Option	R/W	User	UINT8	1	$0 \rightarrow 4$	0	1.00.00	Allows recalculation of the volume of a meter batch if a factor change occurs. Valid values are: 0 = None 1 = Single Meter Factor Adjustment 2 = Single K-factor Adjustment 3 = Multiple Meter Factor Adjustments 4 = Multiple K-factor Adjustments You can set this option to apply to only the first factor change or to every factor change, and to apply to either the meter factor or the K-factor.
28	Reporting Control	R/W	User	UINT8	1	$0 \rightarrow 3$	0	1.00.00	Indicates whether printing and saving at the end of a batch occurs manually or automatically. Valid values are: 0 = Manual 1 = Auto generate report at batch end 2 = Auto generate report on station level recalculation 3 = Auto generate report at batch end and station level recalculation
29	Report Logical	R/W	User	UINT32	4	$0 \rightarrow 1023$	1	1.00.00	The reporting application allows for configuration of up to 10 logical instances. This selects which instances are used for printing and saving the Station Batch Report. Each of this value's lower 10 bits enables or disables printing to one of the reporting application's logical instances. A bit with a value of 1 means "use this instance" and a bit with a value of 0 means "do not." For example, **17 = 0000 0000 0001 0001** means "print or save a report from the first and fifth reporting instances (logicals)."
30	RESERVED								Reserved for future use

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
31	Flowrate Averaging Option	R/W	User	UINT8	1	0 → □5	0	1.00.00	The flowrate selected for batch averaging. Valid values are: 0 = Indicated 1 = Gross 2 = Gross Standard 3 = Net Standard 4 = Sediment & Water 5 = Mass
32	Restart Event Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	Option for action to take if a restart event happens during an active batch. Valid values are 0 (Continue with current batch) and 1 (Stop the current batch and start a new batch).
33	Queue Interface	R/W	User	UINT8	1	0 → 15	0	1.00.00	User entered selection that determines the Batch Queue program status. Valid values are 0 (Disabled; do not take the next batch from the queue) and 1 (Enabled; when current batch completes, take next batch from the queue).
34	Clear Queue Option	R/W	User	UINT8	1	0 → 1	1	1.00.00	The option to clear out the batch configuration stored in the Batch Queue program after that configuration is loaded into Batching 800L user program. Valid values are 0 (No command) and 1 (clear setup). Option 1 clears the configuration parameters of the respective logical of Batch Setup point type. This sets all configuration parameters for this logical to the same values in the first logical.
35	External Write Back Option	R/W	User	UINT8	1	0 → 1	1	1.00.00	The option to write a “zero” to the parameter pointed to by the external controls. Expected to be used with latched IO.
36	User Text 1	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; value transfers to current station batch.
37	User Text 2	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; value transfers to current station batch.
38	User Text 3	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; value transfers to current station batch.
39	User Text 4	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; value transfers to current station batch.
40	User Text 5	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; value transfers to current station batch.

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
41	User Float 1	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; value transfers to current station batch.
42	User Float 2	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; value transfers to current station batch.
43	User Float 3	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; value transfers to current station batch.
44	User Float 4	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; value transfers to current station batch.
45	User Float 5	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; value transfers to current station batch.
46	User Integer 1	R/W	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; value transfers to current station batch.
47	User Integer 2	R/W	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; value transfers to current station batch.
48	User Integer 3	R/W	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; value transfers to current station batch.
49	User Integer 4	R/W	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; value transfers to current station batch.
50	User Integer 5	R/W	User	UINT32	4	0 → 4294967295	0	1.00.00	User entered Integer number; value transfers to current station batch.
51	User Defined Average 1 TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Identifies the TLP for the first user defined batch average parameter.
52	User Defined Average 2 TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Identifies the TLP for the second user defined batch average parameter.
53	User Defined Average 3 TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Identifies the TLP for the third user defined batch average parameter.
54	User Defined Accumulator 1 TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Identifies the TLP for the first user defined batch accumulation.
55	User Defined Accumulator 2 TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Identifes the TLP for the second user defined batch accumulation.
56	User Defined Accumulator 3 TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Identifies the TLP for the third user defined batch accumulation.
57	Generate Batch Report	R/W	User	UINT8	1	0 → 1	0	1.00.00	Option to generate a batch report. Valid values are 0 (Idle) and 1 (Generate a report; request manual report on the selected batch report total)

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
58	End Time/Date	R/W	User	TIME	4	N/A	0	1.00.00	Indicates the user-defined time at which the batch ends. Any time entered must be greater than the current time. Recorded as the number of seconds elapsed since 12:00 a.m. Jan 1, 1970.
59	Queue Control Option Selection	R/W	User	UINT8	1	0 → 127	1	1.01.02	This bitwise value selects which batch control types are used to advance the queue. This selection is not used unless you first **enable** the Queue Interface (parameter #33). This parameter mirrors the Batch Control Option (parameter #14) in format. Valid values include, but are not limited to: 1 = Manual Batches Only 2 = Hourly Batches Only 4 = Daily Batches Only 8 = Weekly Batches Only 16 = Monthly Batches Only 32 = Measurement Based Only 64 = Time/Date Based Only Each of this value's lower 7 bits selects a type of station batch control. A bit with a value of 1 means "use queue for this batch type" while a bit with a value of 0 means "do not." For example, **48 = 0011 0000** means apply the batch queue to monthly or measurement based batches only. This means if a batch ends, and the cause for the termination is the end of the month, then the next batch will be taken from the queue. However if a batch is manually ended, the next batch will not be taken from the queue
60	Associated Rounding Option Selection	R/O	System	UINT8	1	0 → 1	0	1.01.04	Indicates if the associated product in use has the rounding option enables. Valid values are: 0 = No Rounding 1 = Rounding per applicable standard
61	Correction Factor Rounding Option	R/W	User	UINT8	1	0 → 1	0	1.01.04	Indicates the discrimination at which the correction factors (such as DTL. DPL, CTPL, etc.) included with batch data should be rounded. Valid values are: 0 = 4 Decimals (per API 12.2.2) 1 = 5 Decimals (per API 11.1)

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
62	Configure History Command	R/W	User	UINT8	1	0 → 2	0	1.03.00	Automatically configures the device transactional history feature for use with the batching user program. The station and meter history logicals must first be configured before executing this command. Valid values are: 0 = No Command 1 = Configure Transaction History 2 = Clear transactional history configuration
63	Station History Logical	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transactional history point (Point Type 144) to be configured and used for storing previous station batches. Selections 1 through 10 correspond to the 10 points of transactional history. A selection of 0 means transactional history is not configured.
64	Meter 1 History Logical	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transactional history point (Point Type 144) to be configured and used for storing previous meter 1 batches. Selections 1 through 10 correspond to the 10 points of transactional history. A selection of 0 means transactional history is not to be configured and not to be used for meter 1.
65	Meter 2 History Logical	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transactional history point (Point Type 144) to be configured and used for storing previous meter 1 batches. Selections 1 through 10 correspond to the 10 points of transactional history. A selection of 0 means transactional history is not to be configured and not to be used for meter 2.
66	Meter 3 History Logical	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transactional history point (Point Type 144) to be configured and used for storing previous meter 1 batches. Selections 1 through 10 correspond to the 10 points of transactional history. A selection of 0 means transactional history is not to be configured and not to be used for meter 3.
67	Meter 4 History Logical	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transactional history point (Point Type 144) to be configured and used for storing previous meter 1 batches. Selections 1 through 10 correspond to the 10 points of transactional history. A selection of 0 means transactional history is not to be configured and not to be used for meter 4

Point Type 210, Batch Station Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
68	Meter 5 History Logical	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transactional history point (Point Type 144) to be configured and used for storing previous meter 1 batches. Selections 1 through 10 correspond to the 10 points of transactional history. A selection of 0 means transactional history is not to be configured and not to be used for meter 5.
69	Meter 6 History Logical	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transactional history point (Point Type 144) to be configured and used for storing previous meter 1 batches. Selections 1 through 10 correspond to the 10 points of transactional history. A selection of 0 means transactional history is not to be configured and not to be used for meter 6.
70	Transactional History Lock	R/W	User	UINT8	1	0 → 10	0	1.03.00	Locks the associated logicals of transactional history. This must be done before transactions can be recorded. Once locked, unlocking this parameter clears all associated transactional history. Valid values are **0** (unlocked) and **1** (Locked)

3.4.75 Point Type 211: Station Current Batch

Description: Point type 211 provides the parameters for Station Current Batch

Number of Logical Points: 6 logical points of point type 211 may exist.

Storage Location: Point type 211 is saved to internal configuration memory.

Table 3-76: Point Type 211, Station Current Batch

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Station Batch Tag	R/O	User	AC	20	0x20 → 0x7E for each ASCII character	"Batch"	1.00.00	User-entered point type tag; transfers from station batch configuration.
1	Station Batch Description	R/O	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered description for the batch; transfers from station batch configuration.
2	Deliver To	R/O	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from station batch configuration.
3	Station Ticket ID	R/O	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from station batch configuration
4	Station Ticket Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Increments variable so each station batch has a unique ID; transfers from station batch configuration.
5	Batch Type	R/O	User	UINT8	1	0 → 2	0	1.00.00	Indicates the batch type. Valid values are: 0 = Normal Batch 1 = Maintenance (Treated as normal) 2 = Unauthorized (Detected flow started this batch)
6	Product Number	R/O	System	UINT8	1	0 → □23	0	1.00.00	Indicates the product logical the batch is recording (taken from point type 201).
7	Product Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Indicates the product’s tag (taken from point type 201).

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Fluid Type Number	R/O	System	UINT8	1	0 → □8	0	1.00.00	The enumerated number of the product type. Valid values are: 0 = Crude oil 1 = Gasoline 2 = Jet fuel 3 = Fuel oil 4 = Lube oil 5 = Special product 6 = Light hydrocarbon 7 = Unknown product 8 = Transition 9 = Out of Range 10 = Water 11 = Ethanol
9	Fluid Type Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Indicates the product (expressed as a string), based on the previous parameter. Valid text strings are: “Crude Oil” “Gasoline” “Jet Fuel” “Fuel Oil “ “Lube Oil” “Special Application” “Light Hydrocarbon” “Unknown Product” “Transitopm” “Out of Range” “Water” “Ethanol””

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Temperature Table In Use	R/O	System	UINT8	1	0 → 23, 255	0	1.00.00	Indicates the temperature table in use, as entered at the Liquid Calc station and used in the display. Valid values are: 0 = 1980 API2540 Table 5/6A 1 = 1980 API2540 Table 5/6B 2 = 1982 API2540 Table 5/6D 3 = 1980 API2540 Table 6C 4 = 1980 API2540 Table 23/24A 5 = 1980 API2540 Table 23/24B 6 = 1982 API2540 Table 23/24D 7 = TP27 Table 23/24E GPA Table 23/24E 8 = 1980 API2540 Table 24C 9 = 1980 API2540 Table 53.54C 10 = 1980 API2540 Table 53/54A 11 = 1982 API2540 Table 53/54D 12 = 1982 API2540 Table 53/54E 13 = A982 API2540 Table 54C 14 = ISO/IP-3/Table 59A/60A 15 = ISO/IP-3/Table 59B/60B 16 = ISO/IP-3/Table 59D/60D 17 = TP27 Table 59E/60E 18 = Procedure 11.1.6 2004 19 = Procedures 11.1.7 2004 20 = COSTALD-Tait 21 = API Chater 11.4 2003 22 = 1970 OIML R22 23 = ABNT NBR 5992 255 = Invalid Table
11	Pressure Correction Table	R/O	System	UINT8	1	0 → 8	0	1.00.00	Indicates the selected pressure correction table based on the density and temperature units. Valid values are: 0 = User compressibility 1 = 1984 API2540 Table 11.2.1 2 = 1984 API2540 Table 11.2.1M 3 = 1986 API2540 Table 11.2.2 4 = 1986 API2540 Table 11.2.2M 5 = Chapter 11.1 2004 6 = COSTALD-Tait 7 = API Chapter 11.4 2003 8 = None
12	RESERVED								Reserved for future use

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Density Output Units	R/O	System	UINT8	1	0 → 2	0	1.00.00	Indicates the correction table density units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Kg/m3 1 = Relative 2 = API Gravity
14	Density Input Units	R/O	System	UINT8	1	0 → 6	0	1.00.00	Indicates the densitometer input density, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Kg/M3 1 = g/cm3 2 = Lb/ft3 3 = Lb/bbl 4 = Lb/gal 5 = Relative Density 6 = API Gravity
15	Temperature Units	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates temperature units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are 0 (Deg F) and 1 (Deg C).
16	Pressure Units	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates pressure units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Psi 1 = Kpa 2 = Bar 3 = Kg/cm2
17	Volume Units	R/O	System	UINT8	1	0 → 6	0	1.00.00	Indicates volume units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Bbl 1 = Mcf 2 = Km3 3 = Gal 4 = Ft3 5 = M3 6 = Liter

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Mass Units	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates mass units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Lb 1 = Kg 2 = Ton 3 = Tonne
19	Flow Rate Option	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates the time basis for calculating flow rates. Valid values are: 0 = per day 1 = per hour 2 = per minute 3 = per second
20	K Factor Units	R/O	System	UINT8	1	0 → 10	0	1.00.00	Indicates K-factor units, used only in the display. Valid values are: 0= Pulses/Bbl 1= Pulses/Mcf 2 = Pulses/KM3 3 = Pulses/Gal 4 = Pulses/ft3 5 = Pulses/m3 6 = Pulses/Liter 7 = Pulses/Lb 8 = Pulses/Kg 9 = Pulses/ton 10 = Pulses/tonne
21	Flowrate Averaging Option	R/O	System	UINT8	1	0 → 5	0	1.00.00	Indicates the flowrate selected for batch averaging. Valid values are: 0 = Indicated 1 = Gross 2 = Gross Standard 3 = Net Standard 4 = Sediment & Water 5 = Mass
22	Seconds of Active Batch Time	R/O	System	UINT32	4	0 → 4294967295	0	1.00.00	Indicates the number of one-second samples taken during the current batch.
23	Error Mode	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates that the values recorded by any of the current batches may not be valid. Valid values are: 0:= No Error 1 = Power cycle 2 = Time Skew (timers may not trigger properly 3 = Unit change (starting and ending values do not match units)

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	Alert Percentage Status	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.00.00	Indicates, on measurement-based batches, that the batch has exceeded a defined alert percentage. Valid values are 0 (No Alert) and 1 (Alert % exceeded).
25	Maintenance Mode Flag	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.00.00	Indicates if the station is put in maintenance mode. Valid values are 0 (Normal) and 1 (Maintenance Mode). **Note**: This flag resets at the end of the batch.
26	Meters Assigned	R/O	System	UINT32	4	$0 \rightarrow 1023$	1	1.00.00	Assigns the Liquid Calc meters included in this station batch. Each of this value's lower 6 bits represents a corresponding meter assigned to this station batch. A bit with a value of 1 means "include this meter" and a bit with a value of 0 means "do not." For example, **17 = 0000 0000 0001 0001** means "include the first and fifth meters (logicals)."
27	Rollover Value	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	1,000,000,000,000 Or $1x10^{12}$	1.00.00	Indicates the value at which all liquid turbine and liquid station on-going accumulators roll over.
28	Batch Start Time / Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time for the start of the batch in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
29	Batch End Time / Data	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time for the end of the batch in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
30	Current Indicated Quantity	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Indicated Quantity Calculated Value.
31	Current Gross Volume	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Volume Calculated Value.
32	Current Gross Standard Volume	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Standard Volume Calculated Value.
33	Current Net Standard Volume	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Net Standard Volume Calculated Value.
34	Current Sediment and Water Volume	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Sediment and Water Volume Calculated Value.
35	Current Gross Mass	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Mass Calculated Value.
36	Average Flowrate	R/O	System	DOUBLE	8	$0.0 \rightarrow$ any valid IEEE double precision float	0	1.00.00	Indicates the average flowrate of all meters assigned to this station.

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
37	Average Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average pressure of all meters assigned to this station.
38	Average Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average temperature of all meters assigned to this station.
39	Average Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average base density of all meters assigned to this station.
40	Average Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average observed density of all meters assigned to this station.
41	Average Meter Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average meter density of all meters assigned to this station.
42	User Average 1 Current Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined average 1.
43	User Average 2 Current Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined average 2.
44	User Average 3 Current Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined average 3.
45	User Accumulator 1 Current Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined accumulator 1.
46	User Accumulator 2 Current Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined accumulator 2.
47	User Accumulator 3 Current Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined accumulator 3.
48	User Accumulator 1 Starting Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined accumulator 1.
49	User Accumulator 2 Starting Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined accumulator 2.
50	User Accumulator 3 Starting Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current value of user defined accumulator 3.
51	RESERVED								Reserved for tuture use
52	RESERVED								Reserved for tuture use
53	RESERVED								Reserved for tuture use
54	User Text 1	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from station batch configuration.
55	User Text 2	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from station batch configuration.
56	User Text 3	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from station batch configuration.

Point Type 211, Station Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57	User Text 4	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	""	1.00.00	User-entered text field; transfers from station batch configuration.
58	User Text 5	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	""	1.00.00	User-entered text field; transfers from station batch configuration.
59	User Float 1	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers from station batch configuration.
60	User Float 2	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers from station batch configuration.
61	User Float 3	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers from station batch configuration.
62	User Float 4	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers from station batch configuration.
63	User Float 5	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers from station batch configuration.
64	User Integer 1	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers from station batch configuration.
65	User Integer 2	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers from station batch configuration.
66	User Integer 3	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers from station batch configuration.
67	User Integer 4	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers from station batch configuration.
68	User Integer 5	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers from station batch configuration.

3.4.76 Point Type 212: Station Batch History

Description: Point type 212 provides the parameters for Station Batch History

Number of Logical Points: 6 logical points of point type 212 may exist.

Storage Location: Point type 212 is saved to internal configuration memory.

Table 3-77: Point Type 212, Station Batch History

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Station Batch Tag	R/O	User	AC	20	0x20 → 0x7E for each ASCII character	"Batch"	1.00.00	User-entered point type tag; transfers from station batch configuration
1	Station Batch Description	R/O	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered description for the batch; transfers from station batch configuration
2	Deliver To	R/O	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from station batch configuration
3	Station Ticket ID	R/O	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from station batch configuration
4	Station Ticket Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Increments variable so each station batch has a unique ID; transfers from station batch configuration
5	Batch Type	R/O	User	UINT8	1	0 → 2	0	1.00.00	Indicates the type of batch. Valid values are: 0 = Normal Batch 1 = Maintenance (Treated as normal) 2 = Unauthorized (Detected flow started this batch)
6	Product Number	R/O	System	UINT8	1	0 → □23	0	1.00.00	Indicates which product logical the batch is recording (value taken from point type 201).
7	Product Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Indicates the product’s tag (value taken from point type 201).

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Fluid Type Number	R/O	System	UINT8	1	0 → □8	0	1.00.00	Indicates the enumerated number for the product type. Valid values are: 0 = Crude oil 1 = Gasoline 2 = Jet fuel 3 = Fuel oil 4 = Lube oil 5 = Special product 6 = Light hydrocarbon 7 = Unknown product 8 = Transition 9 = Out of range 10 = Water 11 = Ethanol
9	Fluid Type Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Indicates the product (expressed as a string) based on the previous parameter. Valid text strings are: “Crude Oil” “Gasoline” “Jet Fuel” “Fuel Oil” “Lube Oil” “Special Application” “Light Hydrocarbon” “Unknown Product” “Transition” “Out of Range” “Water” “Ethanol”

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Temperature Table In Use	R/O	System	UINT8	1	0 → 23, 255	0	1.00.00	Indicates the temperature table in use, as entered at the Liquid Calc station and used in the display. Valid values are: 0 = 1980 API2540 Table 5/6A 1 = 1980 API2540 Table 5/6B 2 = 1982 API2540 Table 5/6D 3 = 1980 API2540 Table 6C 4 = 1980 API2540 Table 23/24A 5 = 1980 API2540 Table 23/24B 6 = 1982 API2540 Table 23/24D 7 = TP27 Table 23/24E GPA Table 23/24E 8 = 1980 API2540 Table 24C 9 = 1980 API2540 Table 53.54C 10 = 1980 API2540 Table 53/54A 11 = 1982 API2540 Table 53/54D 12 = 1982 API2540 Table 53/54E 13 = A982 API2540 Table 54C 14 = ISO/IP-3/Table 59A/60A 15 = ISO/IP-3/Table 59B/60B 16 = ISO/IP-3/Table 59D/60D 17 = TP27 Table 59E/60E 18 = Procedure 11.1.6 2004 19 = Procedures 11.1.7 2004 20 = COSTALD-Tait 21 = API Chapter 11.4 2003 22 = 1970 OIML R22 23 = ABNT NBR 5992 255 = Invalid Table
11	Pressure Correction Table	R/O	System	UINT8	1	0 → 8	0	1.00.00	Indicates the selected pressure correction table based on the density and temperature units. Valid values are: 0 = User compressibility 1 = 1984 API2540 Table 11.2.1 2 = 1984 API2540 Table 11.2.1M 3 = 1986 API2540 Table 11.2.2 4 = 1986 API2540 Table 11.2.2M 5 = Chapter 11.1 2004 6 = COSTALD-Tait 7 = API Chpater 11.4 2003 8 = None
12	RESERVED								Reserved for future use

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Density Output Units	R/O	System	UINT8	1	0 → 2	0	1.00.00	Indicates the correction table density units, taken from the LiquidCalc preferences configuration at the start of the batch. Correction table density. 0 = Kg/m3 1 = Relative 2 = API Gravity
14	Density Input Units	R/O	System	UINT8	1	0 → 6	0	1.00.00	Indicates the densitometer input density, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Kg/M3 1 = g/cm3 2 = Lb/ft3 3 = Lb/bbl 4 = Lb/gal 5 = Relative Density 6 = API Gravity
15	Temperature Units	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates temperature units, taken from the LiquidCalc preferences configuration at the start of the batch. Value values are 0 (Deg F) and 1 (Deg C).
16	Pressure Units	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates pressure units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Psi 1 = Kpa 2 = Bar 3 = Kg/cm2
17	Volume Units	R/O	System	UINT8	1	0 → 6	0	1.00.00	Indicates volume units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Bbl 1 = Mcf 2 = Km3 3 = Gal 4 = Ft3 5 = M3 6 = Liter

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Mass Units	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates mass units, taken from the LiquidCalc preferences configuration at the start of the batch. Valid values are: 0 = Lb 1 = Kg 2 = Ton 3 = Tonne
19	Flow Rate Option	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates the time basis for calculating flow rates. Valid values are: 0 = per day 1 = per hour 2 = per minute 3 = per second
20	K Factor Units	R/O	System	UINT8	1	0 → 9	0	1.00.00	Indicates K-factor units, used only in the display. Valid values are: 0= Pulses/Bbl 1= Pulses/Mcf 2 = Pulses/KM3 3 = Pulses/Gal 4 = Pulses/ft3 5 = Pulses/m3 6 = Pulses/Lb 7 = Pulses/Kg 8 = Pulses/ton 9 = Pulses/tonne
21	Flowrate Averaging Option	R/O	System	UINT8	1	0 → □5	0	1.00.00	Indicates the flow rate selected for batch averaging. Valid values are: 0 = Indicated 1 = Gross 2 = Gross Standard 3 = Net Standard 4 = Sediment & Water 5 = Mass
22	Seconds of Active Batch Time	R/O	System	UINT32	4	0 → 4294967295	0	1.00.00	Indicates the number of one-second samples taken during the current batch.
23	Error Mode	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates that the values recorded by any of the current batches may not be valid. Valid values are: 0 = No error 1 = Power cycle 2 = Time skew (timers may not trigger properly) 3 = Unit change (starting and ending values do not match units)

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	Alert Percentage Status	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates, on measurement-based batches, that the batch has exceeded a defined alert percentage. Valid values are 0 (No Alert) and 1 (Alert % exceeded).
25	Maintenance Mode Flag	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates if the station is put in maintenance mode. Valid values are 0 (Normal) and 1 (Maintenance Mode) flag that is set if the station is put in maintenance mode. **Note**: The flag resets at the end of the batch.
26	Meters Assigned	R/O	System	UINT32	4	0 → 1023	1	1.00.00	Assigns the Liquid Calc meters included in this station batch. Each of this value's lower 6 bits represents a corresponding meter assigned to this station batch. A bit with a value of 1 means "include this meter" and a bit with a value of 0 means "do not." For example, **17 = 0000 0000 0001 0001** means "include the first and fifth meters (logicals)."
27	Rollover Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	1,000,000,000,000 Or 1x10^12	1.00.00	Indicates the value at which all liquid turbine and liquid station on-going accumulators roll over.
28	Batch Start Time / Date	R/O	System	TIME	4	N/A	0	1.00.00	Contains the batch start time in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
29	Batch End Time / Data	R/O	System	TIME	4	N/A	0	1.00.00	Contains the batch stop time in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
30	Total Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Indicated Quantity for the batch
31	Total Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the Total Gross Volume for the batch.
32	Total Gross Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the Total Gross Standard Volume for the batch.
33	Total Net Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the Total Net Standard Volume for the batch.
34	Total Sediment and Water Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the Total Sediment and Water Volume for the batch.
35	Total Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the Total Gross Mass for the batch.

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
36	Average Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average flowrate of all meters assigned to this station.
37	Average Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average pressure of all meters assigned to this station.
38	Average Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average temperature of all meters assigned to this station.
39	Average Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average base density of all meters assigned to this station.
40	Average Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average observed density of all meters assigned to this station.
41	Average Meter Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the average meter density of all meters assigned to this station
42	User Average 1 Final Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the final value of user defined average 1
43	User Average 2 Final Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the final value of user defined average 2
44	User Average 3 Final Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the final value of user defined average 3
45	User Accumulator 1 Total Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total accumulated value of user defined accumulator 1
46	User Accumulator 2 Total Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total accumulated value of user defined accumulator 2
47	User Accumulator 3 Total Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total accumulated value of user defined accumulator 3
48	User Accumulator 1 Ending Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the ending value of user defined accumulator 1
49	User Accumulator 2 Ending Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the ending value of user defined accumulator 2
50	User Accumulator 3 Ending Value	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the ending value of user defined accumulator 3
51	RESERVED								Reserved for future use
52	RESERVED								Reserved for future use
53	RESERVED								Reserved for future use
54	User Text 1	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from current batch configuration.
55	User Text 2	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from current batch configuration.

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
56	User Text 3	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from current batch configuration.
57	User Text 4	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from current batch configuration.
58	User Text 5	R/W	User / System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers from current batch configuration.
59	User Float 1	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfer from current batch configuration.
60	User Float 2	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfer from current batch configuration.
61	User Float 3	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfer from current batch configuration.
62	User Float 4	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfer from current batch configuration.
63	User Float 5	R/W	User / System	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfer from current batch configuration.
64	User Integer 1	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered integer number; transfers from current batch configuration.
65	User Integer 2	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered integer number; transfers from current batch configuration.
66	User Integer 3	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered integer number; transfers from current batch configuration.
67	User Integer 4	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered integer number; transfers from current batch configuration.
68	User Integer 5	R/W	User / System	UINT32	4	0 → 4294967295	0	1.00.00	User-entered integer number; transfers from current batch configuration.
69	RESERVED								Reserved for future use
70	RESERVED								Reserved for future use
71	RESERVED								Reserved for future use
72	RESERVED								Reserved for future use
73	RESERVED								Reserved for future use
74	RESERVED								Reserved for future use
75	RESERVED								Reserved for future use
76	Recalculation Flag	R/O	System	UNIT8	1	0 → 1	0	1.00.00	Indicates that a recalculation was performed on an associated meter. Valid values are 0 (No Recalculation) and 1 (Recalculation Performed).

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
77	Recalculation Time	R/O	System	TIME	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total recalculated indicated quantity accumulated for the batch. This value updates when a recalculation is performed on an associated meter.
79	Recalculated Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total recalculated indicated quantity accumulated for the batch. This value updates when a recalculation is performed on an associated meter.
79	Recalculated Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total recalculated gross volume accumulated for the batch. This value updates when a recalculation is performed on an associated meter.
80	Recalculated Gross Std Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total recalculated gross std volume accumulated for the batch. This value updates when a recalculation is performed on an associated meter.
81	Recalculated Net Std Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total recalculated net std volume accumulated for the batch. This value updates when a recalculation is performed on an associated meter.
82	Recalculated S&W Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total recalculated S&W accumulated for the batch. This value updates when a recalculation is performed on an associated meter.
83	Recalculated Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total recalculated gross mass accumulated for the batch. This value updates when a recalculation is performed on an associated meter.
84	Station Batch Recalculation Trigger	R?W	User	UINT8	1	0→ 1	0	1.00.00	Forces recalculation of all meters linked to this station when you set this value to 1. Batch program resets this value to 0.
85	Recalculation Base Density	R/W	User	DOUBLE	8	0.0→ 1164	0	1.00.00	User-entered parameter for recalculation.
86	Recalculation of Sediment and Water Percentage	R/W	User	DOUBLE	8	0.0→ 100.0	0	1.00.00	User-entered parameter for recalculation.
87	Recalculation Pressure	R/W	User	DOUBLE	8	0.0→ 10340	0	1.00.00	User-entered parameter for recalculation.
88	Recalculation Temperature	R/W	User	DOUBLE	8	–58 → 302	0	1.00.00	User-entered parameter for recalculation.
89	Previous Transaction Number	R/O	System	UINT16	2	0 → 65535	0	1.03.00	Contains the transaction number for the most recently completed station batch, if transaction history is in use.

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
90	Current Loaded Transaction Number	R/O	System	UINT16	2	0 → 65535	0	1.03.00	Contains the transaction number for the station batch data currently loaded into the station batch history point type (if transactional history is in use). The system overwrites this value with the previous transaction number when a batch ends.
91	Manual Transaction Number	R/W	User	UINT16	2	0 → 65535	0	1.03.00	Allows for retrieval of batches beyond the 10 most recent completed batches. Enter the number of any valid transaction here, and when parameter 92 is set to a value of 0, the manually entered transaction can be retrieved and populated into the station batch history point type. **Note**: Only valid transaction numbers are accepted.
92	Select Transaction Number	R/W	User	UINT8	1	0 → 10	0	1.03.00	Selects the transaction to be retrieved and populated into the station batch history point type, when a value of 1 is written to parameter 93. 0 = Manually Entered Transaction / Batch 1 = Most Recent Transaction / Batch 2 = 2nd Most Recent Transaction / Batch 3 = 3rd Most Recent Transaction / Batch 4 = 4th Most Recent Transaction / Batch 5 = 5th Most Recent Transaction / Batch 6 = 6th Most Recent Transaction / Batch 7 = 7th Most Recent Transaction / Batch 8 = 8th Most Recent Transaction / Batch 9 = 9th Most Recent Transaction / Batch 10 = 10th Most Recent Transaction / Batch
93	Transaction Retrieve Command	R/W	User	UINT8	1	0 → 1	0	1.03.00	Initiates the retrieval of a previous batch, which has been logged into transactional history. The batch data will be written into the station batch history point type. If configured, any associated meter batch history point types will be updated as well. Which transaction / batch is retrieved is determined by the selection made in parameter 92. Valid values are: 0 = No Command 1 = Retrieve Transaction
94	Previous Batch 1 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.

Point Type 212, Station Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
95	Previous Batch 2 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the second most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
96	Previous Batch 3 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the third most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
97	4revious Batch 4 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the fourth most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
98	Previous Batch 5 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the fifth most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
99	Previous Batch 6 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the sixth most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
100	Previous Batch 7 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the seventh most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
101	Previous Batch 8 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the eight most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
102	Previous Batch 9 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the ninth most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
103	Previous Batch 10 Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the tenth most recent batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
104	Manual Transaction Time/Date	R/O	System	TIME	4	N/A	0	1.03.00	Contains the time the manually entered previous batch was logged into transactional history, recorded as the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.

3.4.77 Point Type 213: Meter Current Batch

Description: Point type 213 provides the parameters for Meter Current Batch

Number of Logical Points: 6 logical points of point type 213 may exist.

Storage Location: Point type 213 is saved to internal configuration memory.

Table 3-78: Point Type 213, Meter Current Batch

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Batch Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“Batch ”	1.00.00	User entered batch tag; transfers from station configuration
1	Station Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“Station”	1.00.00	Indicates the station’s tag; transfers from station configuration
2	Station Number	R/O	System	UINT8	1	0 → 5	0	1.00.00	Indicates which station logical the batch is recording; transfers from station configuration
3	Station Ticket Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Increments variable so each station batch has a unique ID; transfers from station configuration
4	Meter Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“ ”	1.00.00	Indicates the meter’s tag (taken from point type 204).
5	Meter Ticket No	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Increments variable so each meter batch has a unique ID.
6	Meter Batch Type	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates the current batch type. Valid values are: 0 = Normal 1 = Maintenance 2 = Unauthorized 3 = Unknown **Note**: Anything other that Normal is an invalid batch.
7	Product Number	R/O	System	UINT8	1	0 → □23	0	1.00.00	Indicates which product logical the batch is recording (taken from point type 201).
8	Product Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Indicates the product’s tag (taken from point type 201)

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Fluid Type Number	R/O	System	UINT8	1	0 → □8	0	1.00.00	Indicates the enumerated number of the product type. Valid values are: 0 = Crude oil 1 = Gasoline 2 = Jet fuel 3 = Fuel oil 4 = Lube oil 5 = Special product 6 = Light hydrocarbon 7 = Transition 8 = Product out of range
10	Fluid Type Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Indicates the product (as a text string), based on the previous parameter. Valid values are: 0 = Crude Oil 1 = Gasoline 2 = Jet Fuel 3 = Fuel Oils 4 = Lube Oil 5 = Special Applications 6 = Light Hydrocarbons 7 = Transition 8 = Product out of range
11	Flow Input Option	R/O	System	UINT8	1	0 → 1	0	1.00.00	An option gathered from the Turbine. Used in the display. 0 = Volume 1 = Mass
12	Maintenance Mode Flag	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates if the meter is in maintenance mode. Valid values are 0 (Normal) and 1 (Maintenance Mode). **Note**: This flag resets at the end of the batch.
13	Prove Sequence Number	R/O	System	UINT32	4	0 → 4294967295	0	1.00.00	Indicates the last prove sequence number.
14	Prove Date and Time	R/O	System	TIME	4	N/A	0	1.00.00	Contains the timestamp of the last prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
15	RESERVED								
16	Current Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates current Indicated Quantity Calculated Value.
17	Current Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates current Gross Volume Calculated Value.
18	Current Gross Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates current Gross Standard Volume Calculated Value.

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19	Current Net Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates current Net Standard Volume Calculated Value.
20	Current Sediment and Water Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates current Sediment and Water Volume Calculated Value.
21	Current Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates current Gross Mass Calculated Value.
22	Flowrate Averaging Option	R/O	System	UINT8	1	0 → □5	0	1.00.00	Indicates the selected flow rate for batch averaging. Valid values are: 0 = Indicated 1 = Gross 2 = Gross Standard 3 = Net Standard 4 = Sediment & Water 5 = Mass
23	Average Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch.
24	FWA Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
25	FWA Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
26	FWA Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
27	FWA Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
28	FWA Meter Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	A value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
29	FWA CPLm	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	A value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
30	FWA CTLm	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
31	FWA CTPL	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
32	FWA CCF	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
33	FWA Meter Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
34	FWA K Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
35	FWA Sediment and Water Percent	R/O	System	DOUBLE	8	0.0 → 100.0	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
36	FWA Sediment and Water Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
37	RESERVED								Reserved for future use
38	FWA Densitometer Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
39	FWA Densitometer Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
40	FWA Spool CPSm	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
41	FWA Spool CTSm	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42	Retro-Calc Option	R/O	System	UINT8	1	0 → 2	0	1.00.00	Indicates, if the meter factor or K-factor changes during the batch, when the program performs a retro-calculation. Valid values are: 0 = None 1 = Single Meter Factor Adjustment 2 = Single K-factor Adjustment 3 = Multiple Meter Factor Adjustments 4 = Multiple K-factor Adjustments
43	Retro-Calc Flag	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates a flag set for the first retro-calc on the meter during the batch. Valid values are 0 (Normal) and 1 (Retro-calc). **Note**: This flag resets at the end of the batch.
44	Retro-Calc Time Stamp	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time the retro-calc was performed in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
45	Old Meter Factor	R/O	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the meter factor in use before a retro-calc.
46	Old K Factor	R/O	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the K factor in use before a retro-calc.
47	New Meter Factor	R/O	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the meter factor in use after the retro-calc.
48	New K Factor	R/O	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the K factor in use after the retro-calc.
49	Retro-Calc Ratio	R/O	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the old factor / new factor ratio produced at the time of the retro-calc.
50	Old Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Indicated Quantity at the time of a retro-calc.
51	Old Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Volume at the time of a retro-calc.
52	Old Gross Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Standard Volume at the time of a retro-calc.
53	Old Net Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Net Standard Volume at the time of a retro-calc.
54	Old Sediment and Water Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Sediment and Water Volume at the time of a retro-calc.
55	Old Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Mass at the time of a retro-calc.
56	RetroCalc IV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides a new starting volume after a retro-calc; calculated by applying the retro-calc ratio to the Indicated Volume.

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57	RetroCalc GV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides a new starting volume after a retro-calc; calculated by applying the retro-calc ratio to the Gross Volume.
58	RetroCalc GSV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides a new starting volume after a retro-calc; calculated by applying the retro-calc ratio to the Gross Standard Volume.
59	RetroCalc NSV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides a new starting volume after a retro-calc; calculated by applying the retro-calc ratio to the Net Standard Volume.
60	RetroCalc S&WV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides a new starting volume after a retro-calc; calculated by applying the retro-calc ratio to the S&W Volume.
61	RetroCalc GM	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides new starting volume after a retro-calc; calculated by applying the retro-calc ratio to the Gross Mass. .
62	RESERVED								Reserved for future use
63	Starting Raw Pulse Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Raw Pulse Starting Accumulator value.
64	Starting Indicated Quantity Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Indicated Quantity Starting Accumulator value.
65	Starting Gross Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Volume Starting Accumulator Value.
66	Starting Gross Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Standard Volume Starting Accumulator Value.
67	Starting Net Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Net Standard Volume Starting Accumulator Value.
68	Starting Sediment and Water Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Sediment and Water Volume Starting Accumulator Value.
69	Starting Gross Mass Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Mass Starting Accumulator Value.
70	Retro-Calc Indicated Quantity Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Indicated Quantity Accumulator value at retro-calc.
71	Retro-Calc Gross Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Volume Accumulator Value at retro-calc.
72	Retro-Calc Gross Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Standard Volume Accumulator Value at retro-calc.
73	Retro-Calc Net Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Net Standard Volume Accumulator Value at retro-calc.

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
74	Retro-Calc Sediment and Water Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Sediment and Water Volume Accumulator Value at retro-calc.
75	Retro-Calc Gross Mass Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Mass Accumulator Value at retro-calc.
76	Pressure Report Flag	R/O	System	BIN	1	0x00 → 0xFF	0	1.00.00	Indicates whether the pressure input was in manual or had failed during the batch. **Note**: This flag resets at the end of the batch.
76.0	Pressure Simulate Status			Bit 0				1.00.00	Presure input was in simulate (manual) mode during the batch.
76.1	Pressure Download Status			Bit 1				1.00.00	Pressure input was in download mode during the batch.
76.2	Not Used			Bit 2				1.00.00	
76.3	Not Used			Bit 3				1.00.00	
76.4	Not Used			Bit 4				1.00.00	
76.5	Not Used			Bit 5				1.00.00	
76.6	Not Used			Bit 6				1.00.00	
76.7	Not Used			Bit 7				1.00.00	
77	Temperature Report Flag	R/O	System	BIN	1	0x00 → 0xFF	0	1.00.00	Indicates whether the temperature input was in manual more or failure during the batch. **Note**: This flag resets at the end of the batch.
77.0	Temperature Simulate Status			Bit 0				1.00.00	Temperature input was in simulate (manual) mode during the batch.
77.1	Temperature Download Status			Bit 1				1.00.00	Temperature input was in download mode during the batch.
77.2	Not Used			Bit 2				1.00.00	
77.3	Not Used			Bit 3				1.00.00	
77.4	Not Used			Bit 4				1.00.00	
77.5	Not Used			Bit 5				1.00.00	
77.6	Not Used			Bit 6				1.00.00	
77.7	Not Used			Bit 7				1.00.00	
78	Density Report Flag	R/O	System	UINT8	1	0x00 → 0xFF	0	1.00.00	A flag that is set if the observed density input was in manual or had failed during the batch. **Note**: This flat resets at the end of the batch.
78.0	Density Simulate Status				Bit 0			1.00.00	Density input was in simulate (manual) mode during the batch.
78.1	Density Download Status				Bit 1			1.00.00	Density input was in download mode during the batch.

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
78.2	Not Used				Bit 2			1.00.00	
78.3	Not Used				Bit 3			1.00.00	
78.4	Not Used				Bit 4			1.00.00	
78.5	Not Used				Bit 5			1.00.00	
78.6	Not Used				Bit 6			1.00.00	
78.7	Not Used				Bit 7			1.00.00	
79	K factor Report Flag	R/O	System	UINT8	BIN	0x00 → 0xFF	0	1.00.00	A flag that is set if the K Factor was in manual (Keypad) mode during the batch. **Note**: This flag resets at the end of the batch.
79.0	K-factor Simulate Status				Bit 0				K-factor was in simulate (manual) mode during the batch.
79.1	Not Used				Bit 1				
79.2	Not Used				Bit 2				
79.3	Not Used				Bit 3				
79.4	Not Used				Bit 4				
79.5	Not Used				Bit 5				
79.6	Not Used				Bit 6				
79.7	Not Used				Bit 7				
80	Meter factor Report Flag	R/O	System	UINT8	BIN	0x00 → 0xFF	0	1.00.00	A flag that is set if the Meter Factor was in manual (Keypad) mode during the batch. **Note**: This flat resets at the end of the batch.
80.0	Meter Factor Simulate Status				Bit 0				Meter factor was in simulate (manual) mode during the batch.
80.1	Not Used				Bit 1				
80.2	Not Used				Bit 2				
80.3	Not Used				Bit 3				
80.4	Not Used				Bit 4				
80.5	Not Used				Bit 5				
80.6	Not Used				Bit 6				
80.7	Not Used				Bit 7				
81	RESERVED								Reserved for future use
82	RESERVED								Reserved for future use
82	RESERVED								Reserved for future use
84	RESERVED								Reserved for future use

Point Type 213, Meter Current Batch

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
85	RESERVED								Reserved for future use
86	RESERVED								Reserved for future use
87	RESERVED								Reserved for future use
88	RESERVED								Reserved for future use
89	FWA Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Half of the FWA calculation. The accumulator essentially counts how much flow has been recorded. Dividing the sum by this value results in the FWA value.

3.4.78 Point Type 214: Meter Batch History

Description: Point type 214 provides the parameters for Meter Batch History

Number of Logical Points: 6 logical points of point type 214 may exist.

Storage Location: Point type 214 is saved to internal configuration memory.

Table 3-79: Point Type 214, Meter Batch History

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Batch Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	"Batch "	1.00.00	User-entered batch tag; transfers from station configuration
1	Station Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	"Station"	1.00.00	Indicates the station's tag; transfers from station configuration
2	Station Number	R/O	System	UINT8	1	0 → 5	0	1.00.00	Indicates the station logical the batch is recording; transfers from station configuration
3	Station Ticket Number	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Increments variable so each station batch has a unique ID; transfers from station configuration
4	Meter Tag	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	" "	1.00.00	Indicates the meter's tag (taken from point type 204).
5	Meter Ticket No	R/O	System	UINT32	4	0 → 4,294,967,295	0	1.00.00	Increments variable so each meter batch has a unique ID.
6	Meter Batch Type	R/O	System	UINT8	1	0 → 3	0	1.00.00	Indicates the current batch type. Valid values are: 0 = Normal 1 = Maintenance 2 = Unauthorized 3 = Unknown **Note**: Anything other than "Normal" is an invalid batch.
7	Product Number	R/O	System	UINT8	1	0 → □23	0	1.00.00	Indicates the product logical the batch is recording (taken from point type 213).
8	Product Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	""	1.00.00	Indicates the product's tag (taken from point type 213).

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Fluid Type Number	R/O	System	UINT8	1	0 → □8	0	1.00.00	Indicates the enumerated number forf the product type. Valid values are: 0 = Crude oil 1 = Gasoline 2 = Jet fuel 3 = Fuel oil 4 = Lube oil 5 = Special product 6 = Light hydrocarbon 7 = Transition 8 = Product out of range
10	Fluid Type Name	R/O	System	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	Indicates the product (as a text string), based on the previous parameter. Valid values are: 0 = Crude Oil 1 = Gasoline 2 = Jet Fuel 3 = Fuel Oils 4 = Lube Oil 5 = Special Applications 6 = Light Hydrocarbons 7 = Transition 8 = Product out of range
11	Flow Input Option	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates the flow input option, gathered from the turbine and used in the display. Valid values are 0 (Volume) and 1 (Mass).
12	Maintenance Mode Flag	R/O	System	UINT8	1	0 → 1	0	1.00.00	Indicates if the meter is in maintenance mode. Valid values are 0 (Normal) and 1 (Maintenance Mode). **Note**: This flag resets at the end of the batch.
13	Prove Sequence Number	R/O	System	UINT32	4	0 → 4294967295	0	1.00.00	Indicates the last prove sequence number.
14	Prove Date and Time	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of the last prove for this meter in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
15	Total Pulse Accumulation	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Accumulated Pulses for the batch.
16	Total Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Indicated Quantity for the batch.
17	Total Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Volume for the batch.
18	Total Gross Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Standard Volume for the batch.
19	Total Net Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Net Standard Volume for the batch.

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Total Sediment and Water Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Sediment and Water Volume for the batch.
21	Total Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Mass for the batch.
22	Flowrate Average Option	R/O	System	UINT8	1	0 → 5	0	1.00.00	Indicates the flowrate selected for batch averaging. Valid values are: 0 = Indicated 1 = Gross 2 = Gross Standard 3 = Net Standard 4 = Sediment & Water 5 = Mass
23	Average Flowrate	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch.
24	FWA Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
25	FWA Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
26	FWA Base Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
27	FWA Observed Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
28	FWA Meter Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
29	FWA CPL	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
30	FWA CTL	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
31	FWA CTPL	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
32	FWA CCF	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
33	FWA Meter Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
34	FWA K Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
35	FWA Sediment and Water Percent	R/O	System	DOUBLE	8	0.0 → 100.0	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
36	FWA Sediment and Water Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
37	RESERVED								Reserved for future use
38	FWA Densitometer Temperature	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
39	FWA Densitometer Pressure	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
40	FWA Spool CPSm	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.
41	FWA Spool CTSm	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates a value taken periodically from the meter and averaged over the course of the batch with the average based on the flowrate selected.

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42	Retro-Calc Option	R/O	System	UINT8	1	0 → 2	0	1.00.00	Provides an option to have the program perform a Retro-Calc during the batch if the meter factor or K factor changes. Valid values are: 0 = None 1 = Single Meter Factor Adjustment 2 = Single K factor Adjustment 3 = Multiple Meter Factor Adjustments 4 = Multiple K-factor Adjustments
43	Retro-Calc Flag	R/O	System	UINT8	1	0 → 1	0	1.00.00	A flag that is set for the first retro-calc on the meter during the batch. Valid values are 0 (Normal) and 1 (Retro-calc). **Note**: This flag resets at the end of the batch.
44	Retro-Calc Time Stamp	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time of a retro-calc in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
45	Old Meter Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the meter factor in use before a retro-calc.
46	Old K Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the K-factor in use before a retro-calc.
47	New Meter Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the meter factor in use after the retro-calc.
48	New K Factor	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the K factor in use after the retro-calc.
49	Retro-Calc Ratio	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Indicates the old factor / new factor ratio produced at the time of the Retro-Calc.
50	Old Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Indicated Quantity at the time of a Retro-Calc.
51	Old Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Volume at the time of a Retro-Calc.
52	Old Gross Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Standard Volume at the time of a Retro-Calc.
53	Old Net Standard Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Net Standard Volume at the time of a Retro-Calc.
54	Old Sediment and Water Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Sediment and Water Volume at the time of a Retro-Calc.
55	Old Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the current Gross Mass at the time of a Retro-Calc.

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
56	RetroCalc IV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides new starting volume after a retro-calc by applying the retro-calc ratio to the Indicated Volume.
57	RetroCalc GV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides new starting volume after a retro-calc by applying the retro-calc ratio to the Gross Volume.
58	RetroCalc GSV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides new starting volume after a retro-calc by applying the retro-calc ratio to the Gross Standard Volume.
59	RetroCalc NSV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides new starting volume after a retro-calc by applying the retro-calc ratio to the Net Standard Volume.
60	RetroCalc S&WV	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides new starting volume after a retro-calc by applying the retro-calc ratio to the S&W Volume.
61	RetroCalc GM	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Provides new starting volume after a retro-calc by applying the retro-calc ratio to the Gross Mass.
62	RESERVED								Reserved for future use
63	Starting Raw Pulse Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Raw Pulses Starting Accumulator value.
64	Starting Indicated Quantity Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Indicated Quantity Starting Accumulator value.
65	Starting Gross Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Volume Starting Accumulator Value.
66	Starting Gross Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Standard Volume Starting Accumulator Value.
67	Starting Net Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Net Standard Volume Starting Accumulator Value.
68	Starting Sediment and Water Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Sediment and Water Volume Starting Accumulator Value.
69	Starting Gross Mass Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Mass Starting Accumulator Value.
70	Retro-Calc Indicated Quantity Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Indicated Quantity Accumulator value at Retro-Calc.
71	Retro-Calc Gross Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Volume Accumulator Value at Retro-Calc.
72	Retro-Calc Gross Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Standard Volume Accumulator Value at Retro-Calc.

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
73	Retro-Calc Net Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Net Standard Volume Accumulator Value at Retro-Calc.
74	Retro-Calc Sediment and Water Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Sediment and Water Volume Accumulator Value at Retro-Calc.
75	Retro-Calc Gross Mass Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Mass Accumulator Value at Retro-Calc.
76	Pressure Report Flag	R/O	System	BIN	1	0X00 → 0xFF	0	1.00.00	Indicates the status of the pressure input during the batch.
76.0	Pressure Simulate Status			Bit 0					Pressure input was in simulate (manual) mode during the batch.
76.1	Pressure Download Status			Bit 1					Pressure input was in download mode during the batch.
76.2	Not Used			Bit 2					
76.3	Not Used			Bit 3					
76.4	Not Used			Bit 4					
76.5	Not Used			Bit 5					
76.6	Not Used			Bit 6					
76.7	Not Used			Bit 7					
77	Temperature Report Flag	R/O	System	BIN	1	0X00 → 0xFF	0	1.00.00	Indicates the status of the temperature input during the batch.
77.0	Temperature Simulate Status			Bit 0					Temperature input was in simulate (manual) mode during the batch.
77.1	Temperature Download Status			Bit 1					Temperature input was in download mode during the batch.
77.2	Not Used			Bit 2					
77.3	Not Used			Bit 3					
77.4	Not Used			Bit 4					
77.5	Not Used			Bit 5					
77.6	Not Used			Bit 6					
77.7	Not Used			Bit 7					
78	Density Report Flag	R/O	System	BIN	1	0X00 → 0xFF	0	1.00.00	Indicates the status of the density input during the batch.
78.0	Density Simulate Status			Bit 0					Density input was in simulate (manual) mode durit the batch.
78.1	Density Download Status			Bit 1					Density input was in download mode during the batch.

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
78.2	Not Used			Bit 2					
78.3	Not Used			Bit 3					
78.4	Not Used			Bit 4					
78.5	Not Used			Bit 5					
78.6	Not Used			Bit 6					
78.7	Not Used			Bit 7					
79	K factor Report Flag	R/O	System	BIN	1	0X00 → 0xFF	0	1.00.00	Indicates the status of the K-factor during the batch.
79.0	K-factor Simulate Status			Bit 0-					K-factor was in simulate (manual) status during the batch.
79.1	Not Used			Bit 1					
79.2	Not Used			Bit 2					
79.3	Not Used			Bit 3					
79.4	Not Used			Bit 4					
79.5	Not Used			Bit 5					
79.6	Not Used			Bit 6					
79.7	Not Used			Bit 7					
80	Meter factor Report Flag	R/O	System	BIN	1	0X00 → 0xFF	0	1.00.00	Indicates the status of the meter factor during the batch.
80.0	Meter Factor Simulate Status			Bit 0					Meter factor was in simulate (manual) status during the batch.
80.1	Not Used			Bit 1					
80.2	Not Used			Bit 2					
80.3	Not Used			Bit 3					
80.4	Not Used			Bit 4					
80.5	Not Used			Bit 5					
80.6	Not Used			Bit 6					
80.7	Not Used			Bit 7					
81	RESERVED								Reserved for future use
82	RESERVED								Reserved for future use
83	RESERVED								Reserved for future use
84	RESERVED								Reserved for future use
85	RESERVED								Reserved for future use
86	RESERVED								Reserved for future use

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
87	RESERVED								Reserved for future use
88	RESERVED								Reserved for future use
89	Ending Raw Pulse Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Raw Pulses Ending Accumulator Value.
90	Ending Indicated Quantity Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Indicated Quantity Ending Accumulator Value.
91	Ending Gross Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Volume Ending Accumulator Value.
92	Ending Gross Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Standard Volume Ending Accumulator Value.
93	Ending Net Standard Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Net Standard Volume Ending Accumulator Value.
94	Ending Sediment and Water Volume Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Sediment and Water Volume Ending Accumulator Value.
95	Ending Gross Mass Accumulator	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total Gross Mass Ending Accumulator Value.
96	RESERVED								Reserved for future use
97	RESERVED								Reserved for future use
98	Recalculation Flag	R/W	User	UINT8	1	0 → 255	0	1.00.00	Indicates that a recalculation has been performed. This parameter also initiates a recalculation. It does not reset to 0 when written to. When a batch ends, this parameter initially contains a value of 0. When a recalculation is requested, a 1 is written. If a second recalculation is requested, a 2 is writer, and so no.
99	Recalculation Time Stamp	R/O	System	TIME	4	N/A	0	1.00.00	Contains the time a recalculation was performed in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970. The time will update with each new recalculation.
100	Recalculation Meter Factor	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	User entered parameter for recalculations.
101	Recalculation K Factor	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	User entered parameter for recalculations.
102	Recalculation Base Density	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	User entered parameter for recalculations.
103	Recalculation Sediment and Water Percentage	R/W	User	DOUBLE	8	0.0 → 100.0	0	1.00.00	User entered parameter for recalculations.

Point Type 214, Meter Batch History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
`04	Recalculation Pressure	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	User entered parameter for recalculations.
105	Recalculation Temperature	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	User entered parameter for recalculations.
106	RESERVED								Reserved for future use
107	Recalculated Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated by applying the KF ratio to IV upon a recalculation.
108	Recalculated Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated by applying the MF to IV upon a recalculation.
109	Recalculated Gross Std Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated by applying the CCF to IV upon a recalculation.
110	Recalculated Net Std Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated by subtracting the S&WV from the GSV upon a recalculation.
111	Recalculated S&W Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated by applying the S&W factor to GSV upon a recalculation.
112	Recalculated Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Calculated by applying the GV to the Flowing density.
113	Recalculated CPL	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Recalculated Average value.
114	Recalculated CTL	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Recalculated Average value.
115	Recalculated Meter Density	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0	1.00.00	Recalculated Average value.
116	Alternate Mode Time	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total meter accumulated alternate time for the batch.
117	Alternate Mode Indicated Quantity	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total meter alternate indicated quantity accumulated for the batch.
118	Alternate Mode Gross Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total meter alternate gross volume accumulated for the batch.
119	Alternate Mode Gross Std Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total meter alternate gross standard volume accumulated for the batch.
120	Alternate Mode Net Std Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total meter alternate net standard volume accumulated for the batch.
121	Alternate Mode S&W Volume	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total meter alternate S&W accumulated for the batch.
122	Alternate Mode Gross Mass	R/O	System	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Indicates the total meter alternate gross mass accumulated for the batch.

3.4.79 Point Type 215: Station Batch Queue Configuration

Description: Point type 215 provides a User Defined Point Type to allow storage for user defined data.

Number of Logical Points: 255 logical points of point type 215 may exist.

Storage Location: Point type 215 is saved to internal configuration memory.

Table 3-80: Point Type 215, Station Batch Queue Configuration

Point Type 215, Station Batch Queue Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Station Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"Station Batch"	1.00.00	User-entered point type tag; transfers to current station batch.
1	Station Batch Description	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered description for the batch; transfers to current station batch.
2	Deliver To	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to current station batch.
3	Station Ticket ID	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to current station batch.
4	Product Number	R/W	User	UINT8	1	1 → Number of logicals of product point type (Presently it is 24)	1	1.00.00	Indicates the product number written to Liquid calc Station point type (203,x,1).]
5	Batch Type	R/W	User	UINT8	1	0 → 2	0	1.00.00	Indicates the batch type. Valid values are: 0 = Normal Batch 1 = Maintenance (Treated as normal) 2 = Unauthorized (Detected flow started this batch)
6	RESERVED								Reserved for future use
7	Meter 1 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to the batch tag in the current meter batch.
8	Meter 2 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to the batch tag in the current meter batch.
9	Meter 3 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to the batch tag in the current meter batch.
10	Meter 4 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to the batch tag in the current meter batch.
11	Meter 5 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to the batch tag in the current meter batch.
12	Meter 6 Batch Tag	R/W	User	AC	20	0x20 → 0x7E for each	“”	1.00.00	User-entered text field; transfers to the batch tag

Point Type 215, Station Batch Queue Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
						ASCII character			in the current meter batch.
13	Restart Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	Determines if the next batch should automatically start as soon as this batch ends. Valid values are 0 (Disabled; no restart and batch just ends) and 1 (Enabled; when the batch ends automatically start next batch).
14	Batch Trigger Option	R/W	User	UINT32	1	0 → 127	0	1.00.00	Assigns the types of batches linked to this station. Method of batch control. All methods require a manual start. Once started, a batch continues until it meets its criteria.Valid values are: 0 = User Signaled Only 1 = Hourly Batches 2 = Daily Batches 3 = Weekly Batches 4 = Monthly Batches 5 = Measurement Based 6 = Time/Date Method Each of this value's lower 6 bits enables or disables a station batch. A bit with a value of 1 means "implement this batch" and a bit with a value of 0 means "do not." For example, **12 = 0000 0000 0000 1100** means "do daily and weekly batches."
15	Contract Hour	R/W	User	UINT8	1	0 → 23	0	1.00.00	Determines when a new batch starts (used for **hourly** and **daily** batches). . 0 = 12:00am 1 = 1:00am 2 = 2:00am 3 = 3:00am … 22 = 10:00pm 23 = 11:00pm
16	Contract Week Day	R/W	User	UINT8	1	0 → 6	0	1.00.00	Determines when a new batch starts (used for **weekly** batches). Valid values are: 0 = Sunday 1= Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday

Point Type 215, Station Batch Queue Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
17	Contract Month Day	R/W	User	UINT8	1	0 → 27, 31	0	1.00.00	Determines when a new batch starts (used for **monthly** batches). Valid values are: 0 = The first of the month 1 = The second of the month 3 = The third of the month … 27 = The 28th day of the month 31 = Last day of the month
18	Hours Per Batch	R/W	User	UINT8	1	1,2,3,4,6,8,12	1	1.00.00	Describes the number of hours in between batches (used for **hourly** batches).
19	Measurement Type	R/W	User	UINT8	1	0 → 5	0	1.00.00	Determines what to measure for measurement-based batches. Valid values are: 0 = Indicated Volume 1 = Gross Volume 2 = Gross Standard Volume 3 = Net Standard Volume 4 = Sediment and Water Volume 5 = Gross Mass
20	Measurement Value	R/W	User	DOUBLE	8	0.0 → any valid IEEE double precision float	0.000000	1.00.00	Continues the measurement-based batch until it reaches this value in the measured volume or mass.
21	Alert Percentage	R/W	User	DOUBLE	8	0.0 → 100.0	90	1.00.00	Triggers a flag when a measurement-based batch exceeds this user-defined percentage.
22	RESERVED								Reserved for future use
23	Start TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Defines a TLP that allows you to use external stimulus to start batches. If the target TLP is ever a non-zero value, the batch starts and writes a zero value to the target TLP.
24	RESERVED								Reserved for future use
25	End TLP	R/W	User	TLP	3	{0,0,0} or any other valid TLP	0,0,0	1.00.00	Defines a TLP that allows you to use external stimulus to end batches. If the target TLP is ever a non-zero value, the batch ends and writes a zero value back to the target TLP.
26	RESERVED								Reserved for future use

Point Type 215, Station Batch Queue Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Retro-Active Recalculation Option	R/W	User	UINT8	1	0 → 2	0	1.00.00	Allows recalculation of the volume of a meter batch if a factor change occurs. You can set this recalculation to occur only for the first factor change or for every factor change, for either K-factors or meter factors. Valid values are: 0 = None 1 = Single Meter Factor Adjustment 2 = Single K factor Adjustment 3 = Multiple Meter Factor Adjustments 4 = Multiple K-factor Adjustments
28	Reporting Control	R/W	User	UINT8	1	0,2,3,4	0	1.00.00	Indicates whether batch-end printing and saving occurs automatically or manually. Valid values are: 0 = manual 1 = Auto generate report on batch end 2 = Auto generate report on station level recalculation 3 = Auto generate report on batch end and station level recalculation
29	Report Logical	R/W	User	UINT32	4	0 ® 1023	1	1.00.00	Selects which logical instance (of 10 allowable) is used to print and save the station ratch report. Each of this value's lower 10 bits enables or disables printing to one of the reporting application's logical instances. A bit with a value of 1 means "use this instance" and a bit with a value of 0 means "do not." For example, **17 = 0000 0000 0001 0001** means "print or save a report from the 1st and 5th reporting instances (logicals)."
30	RESERVED								Reserved for future use
31	Flowrate Averaging Option	R/W	User	UINT8	1	0 → □5	0	1.00.00	Indicates the flow rate selected for batch averaging. Valid values are: 0 = Indicated 1 = Gross 2 = Gross Standard 3 = Net Standard 4 = Sediment & Water 5 = Mass
32	Restart Event Option	R/W	User	UINT8	1	0 → 1	0	1.00.00	Indicates option to take if a restart event happens during an active batch. Valid values are 0 (Continue with current batch) and 1 (Stop the current batch and start a new batch).
33	RESERVED								Reserved for future use

Point Type 215, Station Batch Queue Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
34	Clear Queue Option	R/W	User	UINT8	1	0 -> 1	1	1.00.00	The option to clear out the batch configuration stored in the BatchQueue program after if has been used. Valid values are 0 (No command) and 1 (Clear setup). **Note**: Option 1 clears the configuration parameters of the respective logical of the Batch Setup point type. This sets all configuration parameters for this logical to the same value configures for the first logical. .
35	External Write Back Option	R/W	User	UINT8	1	0 -> 1	1	1.00.00	The option to write a “zero” to the parameter pointed to by the external controls. Expected to be used with latched IO.
36	User Text 1	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to current station batch.
37	User Text 2	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to current station batch.
38	User Text 3	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to current station batch.
39	User Text 4	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to current station batch.
40	User Text 5	R/W	User	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	User-entered text field; transfers to current station batch.
41	User Float 1	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers to current station batch.
42	User Float 2	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers to current station batch.
43	User Float 3	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers to current station batch.
44	User Float 4	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers to current station batch.
45	User Float 5	R/W	User	DOUBLE	8	Any valid IEEE double precision float	0	1.00.00	User-entered floating point number; transfers to current station batch.
46	User Integer 1	R/w	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers to current station batch.
47	User Integer 2	R/w	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers to current station batch.
48	User Integer 3	R/w	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers to current station batch.
49	User Integer 4	R/w	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers to current station batch.

Point Type 215, Station Batch Queue Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	User Integer 5	R/w	User	UINT32	4	0 → 4294967295	0	1.00.00	User-entered Integer number; transfers to current station batch.
51	User Defined Average 1 TLP	R/W	User	TLP	3	(0,0,0) or any other valid TLP	0,0,0	1.00.00	Indicates the TLP for the first user defined batch average parameter.
52	User Defined Average 2 TLP	R/W	User	TLP	3	(0,0,0) or any other valid TLP	0,0,0	1.00.00	Indicates the TLP for the second user defined batch average parameter.
53	User Defined Average 3 TLP	R/W	User	TLP	3	(0,0,0) or any other valid TLP	0,0,0	1.00.00	Indicates the TLP for the third user defined batch average parameter.
54	User Defined Accumulator 1 TLP	R/W	User	TLP	3	(0,0,0) or any other valid TLP	0,0,0	1.00.00	Indicates the TLP for the first user defined batch accumulation.
55	User Defined Accumulator 2 TLP	R/W	User	TLP	3	(0,0,0) or any other valid TLP	0,0,0	1.00.00	Indicates the TLP for the second user defined batch accumulation.
56	User Defined Accumulator 3 TLP	R/W	User	TLP	3	(0,0,0) or any other valid TLP	0,0,0	1.00.00	Indicates the TLP for the third user defined batch accumulation.
57	RESERVED								Reserved for future use
58	End Time/Date	R/W	User	TIME	4	N/A	0	1.00.00	Indicates the user-specified time at which the batch ends. Any entered time must be greater than the current time. Recorded as the number of seconds elapsed since 12:00 a.m. Jan 1, 1970.

3.4.80 Point Type 216: Station Batch Queue

Description: Point type 216 provides a User Defined Point Type to allow storage for user defined data.

Number of Logical Points: 255 logical points of point type 216 may exist.

Storage Location: Point type 216 is saved to internal configuration memory.

Table 3-81: Point Type 216, Station Batch Queue

Point Type 216, Station Batch Queue

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User / System	AC	20	0x20 → 0x7E for each ASCII character	"Station X Queue" where X is the logical number	1.00.00	Provides a user-entered description of the queue.
1	Batch 1 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
2	Batch 2 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
3	Batch 3 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
4	Batch 4 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
5	Batch 5 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
6	Batch 6 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
7	Batch 7 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
8	Batch 8 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.

Point Type 216, Station Batch Queue

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Batch 9 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
10	Batch 10 Setup Number	R/W	User / System	UINT8	1	0 → 10	0	1.00.00	Provides a user-entered variable referring to one of the logical numbers (1 through 11) in the Batch Setup point type.
11	Batch 1 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch in this queue position; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 1 setup number [parameter 1].
12	Batch 2 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 2 setup number [parameter 2].
13	Batch 3 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 3 setup number [parameter 3.
14	Batch 4 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 4 setup number [parameter 4].
15	Batch 5 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 5 setup number [parameter 5].
16	Batch 6 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 6 setup number [parameter 6].
17	Batch 7 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 7 setup number [parameter 7].

Point Type 216, Station Batch Queue

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Batch 8 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	This will be set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 8 setup number [parameter 8].
19	Batch 9 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 9 setup number [parameter 9].
20	Batch 10 Description	R/O	System	AC	40	0x20 → 0x7E for each ASCII character	“”	1.00.00	Describes the batch; value is set by the Batch Queue program after extracting the Batch configuration tag [205,X,0] from the logical of Batch setup point type referred to by the batch 10 setup number [parameter 10].
21	Synchronize All	R/W	User	UINT8	1	0 → 1	0	1.00.00	The program contains 6 station batch queues, one for each possible in-uise station. This option synchronizes the batch queues in all other meters to batch queue data in this meter logical. Valid values are 0 (Disable) and 1 (Enable). Ideally you enable this feature on only one station queue and any changes in that queue reflect to other meters. If you change any batch queue (logical) changed in this point type and you enable Synchronize All for the logical, then other logicals are synced with changed logical. On booting, if this parameter is enabled for any logical then data of that logical is copied to all other logicals. Batch Queue will start looking from first logical.

Point Type 216, Station Batch Queue

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
22	Queue Command	R/W	User	UINT8	1	0 → 5	0	1.00.00	Specify the action to perform on the queue. Valid values are: 0 = No command 1 = Remove first item in the queue and move all other items in the queue upward by one position. 2 = Move the item selected (parameter 22) in the queue **upwards** by one position and decrement item selected parameter if it is not pointing to the top of the queue. 3 = Move the item selected (parameter 22) in the queue **downwards** by one position and increment item selected parameter by 1 if it is not pointing to last element in the queue (10) 4 = Move the item selected (parameter 22) in the queue at top position(parameter Item selected=1 5 = Delete the item selected (parameter 22) in the queue and decrement parameter Item selected by 1.
23	Item Selected	R/W	User/System	UINT8	1	0 → 9	0	1.00.00	Identifies the item for which the Queue command applies in case of certain options which require the position number. Batch queue also updates this parameter when different Queue commands are used. For more information, refer to parameter 21.

3.4.81 Point Type 219: Reporting Program

Description: Point type 219 defines the parameters for the Reporting Program

Number of Logical Points: 10 logical points of point type 219 may exist.

Storage Location: Point type 219 is saved to internal configuration memory.

Table 3-82: Point Type 219 Reporting

Point Type 219, Reporting

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag ID	R/W	USER	AC	20	0-10x20 → 0x7E for each ASCII character	Reporting	1.00.00	Provides an identification name for specific printer. Values must be printable ASCII characters.
1	Printer IP Address	R/W	USER	AC	20	0x30 → 0x39 or 0x2E for each ASCII character; must make 4 groups of numbers with a dot (“.”) between	0	1.00.00	Standard IPv4 address (such as 192.168.0.1). If you enter an invalid IPv4 address, an error occurs (Bad IP Address) and printing is disabled. Any additional characters after the address are ignored.
2	Printer Port	R/W	USER	UINT16	2	0 → 65,535	9100	1.00.00	Identifies the port the printer monitors for incoming print jobs. Most printers use port 9100, although 515, and 631 are also common.
3	Manual Generate Report Command	R/W	USER	UINT8	1	0 → 1	0	1.00.00	Allow manual execution of printing. Valid values are 0 (Do Nothing) and 1 (Execute the selected action in parameter 4)
4	Manual Report Action Select	R/W	USER	UINT8	1	0 → 3	0	1.00.00	Indicates the action to take when generate report command is received. Valid values are: 0 = Send to Printer 1 = Save to device 2 = Both Send and Save
5	Command Trigger	R/W	USER	UINT8	1	0 → 4	0	1.00.00	Indicates the report options. Valid values are: 0 = Idle 1 = N/A 2 = Send report to printer 3 = Send report to flash drive 4 = Send report to both printer and flash drive.
6	Target Display File Name	R/O	SYSTEM	AC	40	0x20 → 0x7E for each ASCII character		1.00.00	Indicates the filename associated with the display to be printed. Filled in when you select parameter #7.
7	Target Display To Print	R/W	USER	UINT8	1	0 → 246	0	1.00.00	Selects the display to print. These can be found in the Display Administrator, under “User Display.”

Point Type 219, Reporting

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Target Logical	R/W	USER	UINT8	1	0 → 255	0	1.00.00	Selects which logical to print. If a display is tied to a point type, then all text boxes associated with that point type ignore the logical and use this value instead.
9	Characters Per Inch	R/W	USER	UINT8	1	0 → 255	12	1.00.00	Indicates the number of characters printed per inch. This effectively is an inverse font size setting. Use it to fit large displays onto the printable area
10	Display Print Error	R/W	USER	UINT16	2	0 → 255	0	1.00.00	Indicates errors that could stop the application. If set, printing is disabled and a text message appears on the display. These are cleared by a button on the display.
10.0	Bad IP Address			Bit 0			0	1.00.00	Set whenever the user enters an invalid IP address (such as a text address or attempting to use a hex value).
10.1	Reserved			Bit 1			0	1.00.00	
10.2	Cannot Acquire Socket			Bit 2			0	1.00.00	
10.3	Cannot Connect			Bit 3			0	1.00.00	Indicates that program cannot connect to printer. This also occurs when timing out.
10.4	Cannot Allocate Memory			Bit 4			0	1.00.00	Cannot allocate dynamic (heap) memory. Each display takes approximately 5KB of memory in the process of forming a file.
10.5	Cannot Find Display			Bit 5			0	1.00.00	Indicates that the associated file does not exist. For example, if display #7 appears on the display administrator and you select 7 in parameter 7, the system tries to find the file "/flash/user_c/dsp/6." If the system cannot find that file, this error occurs. **Note**: The file is one **less** than the number of its display.
10.6	Inet Error			Bit 6			0	1.00.00	An Inet error occurred.
10.7	Sending Error			Bit 7			0	1.00.00	An error occurred while sending.
10.8	Flash Drive Full			Bit 8			0	1.00.00	Indicates that the report failed to save to the flash drive.
10.9	Cannot Edit Report Queue			Bit 9			0	1.00.00	An error occurred while editing the Report Queue.
10.10	Bad Base Filename			Bit 10			0	1.00.00	Indicates that the file name contains unacceptable characters. Use 0-9, a-z, A-Z, and _ when naming files.
10.11	RESERVED			Bit 11				1.00.00	
10.12	RESERVED			Bit 12				1.00.00	

Point Type 219, Reporting

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10.13	RESERVED			Bit 13				1.00.00	
10.14	RESERVED			Bit 14				1.00.00	
10.15	RESERVER			Bit 15				1.00.00	
11	RESERVED							1.00.00	
12	Landscape Option	R/W	USER	UINT8	1	0 → 1	0	1.00.00	Indicates the orientation of printing. Valid values are 0 (Portrait) and 1 (Landscape).
13	Flash Filename	R/W	USER	AC	20	0x20 → 0x7E for each ASCII character	Rep	1.00.00	Indicates the base name used for the file saved to flash. The date and time appended to this name.
14	Max Number Of Reports	R/W	USER	UINT8	1	0 → 255	0	1.00.00	Indicates the user-defined maximum number of flash files to keep before deleting the oldest. For a 4.5KB report it hits the flashdrive limit around 120 reports.
15	Reset Saved Report Queue	R/W	USER	UINT8	1	0 → 1	0	1.00.00	Prevents all current reports on the flash drive from being deleted. Care must be taken not to fill up the flash drive.
16	Automated Reports Enabled	R/W	USER	UINT8	1	0 → 1	0	1.00.00	Valid values are 0 (Disabled) and 1 (Enabled).
17	Type of Automatic Report	R/W	USER	UINT8	1	1 → 4	1	1.00.00	Valid values are: 1 = Hourly Reports 2 = Daily Reports 3 = Weekly Reports 4 = Monthly Reports
18	Automated Report Action Select	R/W	USER	UINT8	1	0 → 2	0	1.00.00	Valid values are: 0 = Send report to printer 1 = Send report to flash drive 2 = Send report to both printer and flash drive.
19	Contract Hour	R/W	USER	UINT8	1	0 → 23	0	1.00.00	Indicates the beginning hour of the day. Valid values are 0 = 12AM 1 = 1AM 2 = 2AM … 23 = 11PM
20	Hours Per Report	R/W	USER	UINT8	1	1 → 12	1	1.00.00	Indicates the number of hours between reports in hourly mode.

Point Type 219, Reporting

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21	Contract Week Day	R/W	USER	UINT8	1	0 → 6	0	1.00.00	Indicates the first day of the week for weekly reports. Valid values are: 0 = Sunday 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday
22	Contract Month Day	R/W	USER	UINT8	1	0 → 27	0 (1 ST)	1.00.00	Indicates the first day of the month for monthly reports.
23	Printer Type	R/W	USER	UINT8	1	0 → 1	0	1.00.00	Indicates the printer connection. Valid values are 0 (Ethernet) and 1 (Serial).
24	Serial Port	R/W	USER	UINT8	1	0, 2→ 5	2	1.00.00	Selects which serial port to use. Valid values are: 0 = Local Port 2 =Comm Port 2 3 =Comm Port 3 4 = Comm Port 4 5 = Comm Port 5
25	Remove Control Characters	R/W	USER	UINT8	1	0 → 1	0	1.00.00	Removes all pirnter control language (PCL) characters from any messages sent through the Ethernet port. Valid values are: 0 = No Action 1 = Remove control characters **Note**: Use this feature with devices able to record ASCII text. The feature is not intended for use with a printer.
26	Completed Report Number	R/W	USER	UINT16	1	0 → 65535	0	1.00.00	Indicates host use of the number of completed reports. This value increments one count for each new report processed.
27	Last Report Filename	R/W	USER	AC	40	0x20 → 0x7Efor each ASCII character	“”	1.00.00	Indicates the file name for the latest report file saved to flash.
28	Report Delay Time	R/W	USER	UINT8	1	0 → 255	0	1.00.00	Indicates the number of seconds to delay printing and / or saving a report.
29	Expected Report Time	R/O	System	TIME	4	N/A	0	1.00.00	Indicates, for automatic reporting, the time of the next scheduled report, expressed as the number of seconds elapsed since 12:00a.m. Jan 1, 1970.

Point Type 219, Reporting

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
30	Number of Retries Ethernet	R/W	User	UINT8	1	$0 \rightarrow 10$	1	1.01.02	When using an Ethernet printer, in the event a connection can not be established, this value indicates the number of retries that will be attempted.
31	Number of Retries Flash	R/W	User	UINT8	1	$0 \rightarrow 10$	1	1.01.02	When saving a report text file to the device's flash file system, if an error should occur, this value indicates the number of retries that will be attempted.

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Chapter 4 – CRC-16 Code

The ROC Plus protocol applies a cyclical redundancy check (CRC) to the message string to produce a 16-bit remainder. This remainder is referred to as the CRC-16 code. The CRC-16 code is appended to the end of the message string.

The ROC800L uses the 16-bit polynomial CRC-16:

X16 + X15 + X2 + 1

The ROC800L uses the standard GPLIB CRC routine, and calculates CRC by table lookup, with the initial condition (seed) of 0000 (zeros).

ROC800L Address		**Host Address**		**Opcode**	**Data Length**	**8 Data Bytes**			**CRC**	
unit	group	unit	group	–	# of bytes	d1	d2	d3	LSB	MSB
1	2	1	0	17	3	‘M’	‘O’	‘C’	133	24

Note: Ethernet communication ignores the CRC, since TCP/IP protocol already does error checking. However, the CRC still needs to be sent over Ethernet communications.

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Chapter 5 – IEEE Floating Point Format

In general, the ROC800L uses IEEE format for binary representation of floating-point numbers.

The single-precision format consists of a sign bit, 8-bit biased exponent, and a 23-bit mantissa. The sign bit is either **0** for positive or **1** for negative.

Sign-m	Exponent		Mantissa	
1 bit	8 bits		23 bits	
31	30	23	22	0

The double-precision format consists of a sign bit, 11-bit biased exponent, and a 52-bit mantissa. The sign bit is either **0** for positive or **1** for negative.

Sign-m	Exponent		Mantissa	
1 bit	11 bits		52 bits	
63	62	52	51	0

And, the following binary representation of integers:

Integer format:

LSB	MSB

Long Integer format:

LSB	LSB +1	MSB – 1	MSB

Single Precision Floating Point format:

LSB	LSB +1	MSB – 1	MSB

Double Precision Floating Point format:

LSB	LSB + 1	LSB+2	LSB+3	MSB - 3	MSB - 2	MSB – 1	MSB

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Chapter 6 – Spontaneous-Report-By-Exception

This section details the sequence of events describing the ROC800L Spontaneous-Report-by-Exception (SRBX or RBX)

An alarm occurs, which enables the spontaneous report by exception.

The DL800 sends a request to the host computer at the next available chance. The request from the ROC800L appears as:

ROC800L Request to Host Computer

Host Address		**ROC800L Address**		**Opcode**	**Data Length**	**CRC**	
unit	group	unit	group	–	# of bytes	LSB	MSB
1	0	1	2	224	0	232	45

The host computer receives the report-by-exception request from the ROC800L and begins a general update of any existing alarms.

Once the host computer finishes polling the ROC800L, the host computer sends a pointer to the last alarm received to acknowledge the ROC800L's SRBX request:

Host Computer Response to ROC800L

ROC800L Address		**Host Address**		**Opcode**	**Data Length**	**8 Data Bytes**		**CRC**	
unit	group	unit	group	–	# of bytes	d1	d2	LSB	MSB
1	2	1	0	225	2	7	0	118	17

Note: The alarm index is 7.

The ROC800L compares the index, determines if the host computer has polled for all outstanding alarms, and then clears the report-by-exception status.

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Chapter 7 – Device-To-Device Communications

Store and forward messages can be received on any ROC800L communications port. They are then transmitted out any port that has enabled the store and forward port feature.

Opcode 24 defines the requested store and forward action (refer to *Table 7-1*). This opcode follows the general protocol message format used for ROC800L communications, with the exception that there is an embedded message within the message.

Note: Each message can be a maximum of 255 bytes.

Table 7-1. Opcode 24

Opcode 24						
Communi-cation Opcode	**Host Request to ROC800L**			**ROC800L Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 24: Store and Forward	6	1	Host Address			No response sent back.
	7	1	Host Group			
	8	1	1st Destination Address			
	9	1	1st Destination Group			
	10	1	2nd Destination Address			
	11	1	2nd Destination Group			
	12	1	3rd Destination Address			
	13	1	3rd Destination Group			
	14	1	4th Destination Address			
	15	1	4th Destination Group			
	16	1	Desired Opcode			
	17	1	Number of data bytes for the desired Opcode			
	18	x	Opcode data			

Specify the address and group as **(0,0)** for the destinations that are not used.

The following example reads the clock, where the message is forwarded through one ROC800L to the last ROC800L. For this example, the desired path of communication is Host (1,0), ROC800L#1 (1,2), ROC800L#2 (2,2).

Host Request to ROC800L#1:

Destination Address		**Source Address**			
Unit	Group	Unit	Group	Opcode	Number Bytes
1	2	1	0	24	12

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Opcode	Number Bytes	CRC	
		LSB	MSB
7	0	X	X

ROC800L#1 Request to ROC2 (final destination):

Destination Address		Source Address			
Unit	Group	Unit	Group	Opcode	Number Bytes
2	2	1	2	24	12

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Opcode	Number Bytes	CRC	
		LSB	MSB
7	0	X	X

ROC800L#2 Response Back to ROC800L#1:

Destination Address		Source Address			
Unit	Group	Unit	Group	Opcode	Number Bytes
1	2	2	2	24	20

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Op-code	# of Bytes	d1	d2	d3	d4	d5	d6	d7	d8	CRC LSB	CRC MSB
7	8	Sec	Min	Hour	Day	Month	Year	Leap Year	Day of Week	–	–

ROC800L#1 Request to Host:

Host Address		**ROC Address**			
Unit	Group	Unit	Group	Opcode	Number Bytes
1	0	1	2	24	20

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Op-code	**# of Bytes**	**d1**	**d2**	**d3**	**d4**	**d5**	**d6**	**d7**	**d8**	**CRC LSB**	**CRC MSB**
7	8	Sec	Min	Hour	Day	Month	Year	Leap Year	Day of Week	–	–

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Index

P

R

S

T

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