
Red text = **Writer Notes**

| Cyan text = **SME Questions**

Magenta text = **M9 Only**

Olive text = **M5310C Only**



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Identification Records

Analyzer serial number¹:

Analyzer serial number¹:

Date Analyzer Received and Installed²:

-
1. The serial number is located on the rear panel of the Laboratory and Portable Analyzers, and on the side panel of the On-Line TOC Analyzer.
 2. This is the warranty date.

Table of Contents

Identification Records	3
Sievers M9 and M9^e TOC Analyzers	16
Sievers M5310 C TOC Analyzer	16
Document Revision History	16
Trademarks and Patents	16
Confidentiality	17
Declaration of Conformity	17
Standard Limited Warranty	17
Chapter 1: Introduction	23
Chapter 2: System Specifications	25
Sievers M9 and M9 ^e On-Line TOC Analyzers	25
Sievers M5310 C On-Line TOC Analyzer	27
Sievers MC9 and MC9 ^e Laboratory TOC Analyzers	29
Sievers M5310 C Laboratory TOC Analyzer	31
Sievers M9 and M9 ^e Portable TOC Analyzers	33
Chapter 3: System Overview	37
The Sample Flow Path	38
CO ₂ Transfer Modules	41
The Analyzer's Major Subsystems	42
Sample Inlet System	43
The iOS System	44
Inorganic Carbon Remover (ICR)	45
Chemical Reagent System	46
Oxidizer Reactor	46
CO ₂ Measurement Module	47
Fluidics Module	48
Electronics	49

Electronic Controller and Processing Boards	49
Data/User Controller (DUC) Board	50
Instrument Controller Board	51
Fluidics Controller Board	53
Dual Cell Signal Processor (DCSP) Board	54
I/O Controller Board	55
Single-Cell Signal Processor Board	56
Touch Panel Display	57
Radio Frequency ID (RFID)	57
Optional Configurations	59
Sample Conductivity	60
Two-Stream Inlet	60
Inorganic Carbon Remover (ICR)	61
Turbo Operation Mode	61
Optional Accessories	61
Point-of-Service (POS) Printer	61
GE Autosampler and Sievers DataPro Software	62
Sievers DataPro Software	62
Secure Data	63
DataGuard Software	64
Chapter 4: Installation	65
Overview	65
Installation Instructions	65
Step 1: Unpack and Inspect the Analyzer	66
Additional Equipment Requirements	67
Step 2: Complete the Identification Records	68
Step 3: Select a Location for the Analyzer	68
Sievers On-Line TOC Analyzer	68
Sievers Laboratory and Portable TOC Analyzers	71
On-Line Sampling	72
GE Autosampler System	72
Step 4: Install Power and I/O Control Wiring	72
Installing the Power Source	73
Power Cord Installation	73

Conduit Installation	73
<i>To wire the AC conduit</i>	74
Installing I/O Control Wiring	75
Installing Serial and 4-20 mA Analog Outputs	76
<i>To install 4-20 mA and alarm outputs — On-Line TOC Analyzer</i>	76
<i>To install 4-20 mA and alarm outputs — Portable TOC Analyzer</i>	77
Pinout Tables and Wiring Diagrams	78
Installing the Remote Start (Binary Input) Connection	80
<i>To install the binary input connections</i>	81
Step 5: Install the Reagent Cartridges	81
<i>To install the reagent cartridges—Laboratory and Portable TOC Analyzers</i>	82
<i>To install the reagent cartridges—On-Line TOC Analyzer</i>	84
Step 6: Install the DI Water System	85
<i>To fill the DI water reservoir</i>	86
<i>To set the DI resin cartridge and prime the DI pump</i>	87
<i>To prime the DI Water pump</i>	87
Step 7: Install Ethernet and External Devices	89
Installing an Ethernet Connection	89
<i>To install the Ethernet Connection</i>	89
Installing a USB Connection	90
USB Device Port	90
<i>To install a USB connection — Device Port (Optional)</i>	90
USB Host Ports	91
<i>To install a USB Host port connection — GE Autosampler (Optional)</i>	91
<i>To install a USB Host port connection — Printer (Optional)</i>	91
<i>To install a USB Host port connection — Portable USB Memory Device</i>	92
Installing a Printer	92
<i>To install a USB POS printer</i>	92
<i>To configure the printer in the Analyzer</i>	92
Step 8: Connect an On-Line Sample Inlet System	93
<i>To connect the inlet tubing to the iOS</i>	94
Step 9: Install the Waste Outlet (Laboratory Model)	97
<i>To install the waste outlet</i>	97
Step 10: Configure Basic Analyzer Settings	98
Powering On and Off the Analyzer	98

<i>To power On the Analyzer</i>	99
<i>To power Off the Analyzer</i>	99
Enabling Password Protection or DataGuard (Optional)	99
<i>To enable Password Protection</i>	100
<i>To enable DataGuard</i>	100
<i>To create a new Administrator Account (DataGuard Only)</i>	101
<i>To deactivate the Default Administrator account</i>	101
Naming the Analyzer Location (Optional)	102
<i>To name an Analyzer Location</i>	102
Setting the Analyzer Mode and Reagent Flow Rates	102
<i>To set the Analyzer mode and reagent flow rates</i>	102
Setting Up the Data History	103
<i>To set up the Data History</i>	103
Activating the Ethernet Connection and Modbus	103
<i>To activate the Ethernet Connection and Modbus</i>	103
Setting Up the Printer (Optional)	104
<i>To set up the printer</i>	104
Enabling Turbo	104
<i>To enable Turbo</i>	104
Exporting and Printing System Constants	104
<i>To export the settings to a comma-separated text file</i>	104
<i>To print a copy of the settings</i>	105
Setting up the Data I/O	105
<i>To set up the Data I/O</i>	105
Step 11: Flush and Rinse the Analyzer	105
<i>To flush the reagent syringes</i>	105
<i>To rinse the sample flow path</i>	107
How to Install Valco Tube Fittings	110
Step 12: Install a GE Autosampler	110
Chapter 5: Operation	113
Overview	113
Miscellaneous Notes for Sections to Add	113
<i>To sample using the iOS</i>	113
Sampling Using a Sipper Tube	114
Grab Sample Installation — From a Sampling Container	114
<i>To collect grab samples from a container</i>	114

Introduction to the Analyzer Screens.....	115
Navigating in the Screens.....	116
Buttons	116
Tabs and Scrolling	117
Field Selections.....	118
Using The Home Screen.....	118
Creating Sample Setup Configurations OVERVIEW	119
Understanding Analysis Time	119
Fast Flush and Normal Flush	119
Selecting a Measurement Mode.....	119
Setting Reagent Flow Rates	119
Using an ICR	120
Running Samples in Turbo Mode	120
Fast Flush Normal Flush	120
<i>To create or change a Sampling Method? – GRAB MODE</i>	120
<i>To create or change a Sampling Method? – ONLINE MODE</i>	123
Running a sample	126
<i>To run a sample</i>	126
Reviewing the Home Screen	127
Viewing Consumables Levels.....	128
Shutting Down the Instrument	128
Using the Protocols Screen	128
Using The Configuration Screen	129
Overview information.....	129
System Settings (Constants) Export.....	129
<i>To export system settings (constants)</i>	129
The Result Preferences Tab	130
<i>To set result preferences</i>	130
The Environment Preferences Tab.....	131
<i>To set the language</i>	131
<i>To set environment preferences</i>	132
The Keyword Search Tab	133
<i>To set keyword search options</i>	133
The System Setup Tab	134
Setting the System Clock.....	134
<i>To set the system clock</i>	135
Configuring a Printer.....	135
<i>To configure a printer connection (optional)</i>	135

Configuring the Network.....	136
<i>To configure the network connection.....</i>	<i>136</i>
Configuring 4-20mA output.....	137
<i>To configure the 4-20mA output (optional).....</i>	<i>137</i>
Configuring Binary I/O Input.....	137
<i>To configure the binary I/O input (optional).....</i>	<i>137</i>
Pharmacopoeia Overview.....	138
Selecting a Pharmacopoeia Monograph.....	140
<i>To specify the pharmacopoeia (optional).....</i>	<i>140</i>
Using The Maintenance Screen.....	141
Overview.....	141
Settings (Constants) Export.....	142
<i>To export system settings (constants).....</i>	<i>142</i>
The Consumables Tab.....	142
<i>To renew an expiration date.....</i>	<i>142</i>
The Error History Tab.....	143
<i>To view error and warning history.....</i>	<i>143</i>
The Diagnostics Tab.....	145
The Advanced Tab.....	146
Cleaning the Analyzer.....	146
<i>To clean the external housing.....</i>	<i>146</i>
<i>To clean the touchscreen.....</i>	<i>147</i>
Flushing the syringes.....	147
Upgrading the Firmware.....	147
Activating DataGuard and Turbo Options.....	148
Calibrating the Touch Panel.....	148
Backing up the Database.....	149
Using The Data View Screen.....	149
Using the Security/DataGuard Screen.....	149
Using the Help Screen.....	149
Using the Ethernet Connection and Modbus.....	149
Using The Security/DataGuard Screen.....	150
Chapter 6: Password Protection.....	153
Overview.....	153

Chapter 7: Calibration and Verification	155
Overview	155
Using The Protocols Screen	155
Protocol 1 test	156
Test SingleSource	156
heading 2	156
heading 3	156
Chapter 8: Maintenance	159
Overview	159
Interior Views of the Analyzer	160
Using The Maintenance Screen	160
Overview	160
Performing Routine Maintenance Tasks	161
Flushing Reagent Syringes	161
<i>To flush the reagent syringes</i>	161
Maintaining the DI Water Reservoir Level	162
<i>To fill the DI water reservoir</i>	162
Cleaning the Analyzer	162
<i>To clean the external housing</i>	162
<i>To clean the touchscreen</i>	162
Replacing Consumables Overview	163
Maintenance Schedule	163
Tracking Consumables Expiration Dates	163
<i>To renew an expiration date</i>	164
Replacing Consumable Items	164
Replacing the Resin Cartridge	165
<i>To replace the resin cartridge</i>	165
Replacing the Chemical Reagents	165
<i>To replace the reagent cartridges</i>	165
Replacing the UV Lamp	165
<i>To replace the UV Lamp</i>	165
Replacing the Pump Heads	165
<i>To replace the pump heads</i>	165
Replacing the In-Line Filter Element	165

<i>To replace the in-line filter element</i>	166
Replacing the ICR Chemical Trap (ICR users ONLY).....	166
<i>To replace the chemical trap</i>	166
Chapter 9: Troubleshooting	167
Overview.....	167
The Diagnostics Tab	167
Warning and Error Messages.....	167
Overfilling the DI Water reservoir.....	168
<i>To drain excess water from the DI water reservoir</i>	168
The Error History Tab	169
<i>To view error and warning history</i>	169
The Diagnostics Tab	170
Chapter 10: Turbo Operation	173
Overview.....	173
Appendix A: WARNINGS	175
English.....	175
Hazardous Material Disposal.....	179
Operational Cautions	179
中文 (Chinese).....	181
有害物质处理	182
操作注意事项	183
日本語 (Japanese).....	184
有害物質処分	186
操作上の注意	186
Deutsch	188
ENTSORGUNG VON GEFAHRSTOFFEN.....	190
VORSICHTSMASSNAHMEN BEIM BETRIEB.....	191
Français	192
PRÉCAUTIONS DE FONCTIONNEMENT.....	195
Italiano	197
SMALTIMENTO DI MATERIALI PERICOLOSI	199
AVVERTENZE PER IL FUNZIONAMENTO.....	200
Español	201
DESECHO DE MATERIALES PELIGROSOS.....	203
PRECAUCIONES OPERATIVAS	204
Portuguese	205
DESCARTE DE MATERIAIS PERIGOSOS.....	207

CUIDADOS OPERACIONAIS	207
Appendix B: Modbus Map	209
Using PuTTY	209
<i>To install the serial connection:</i>	209

List of Tables

Table 1	Sample Inlet Systems by Analyzer Model	43
Table 2	Serial and 4-20 mA Outputs (J4).....	79
Table 3	Alarm Outputs (J6)	80
Table 4	Binary Inputs (Terminal BlockJ5)	81
Table 5	Recommended Acid Flow Rates.....	119
Table 6	Recommended Oxidizer Flow Rates.....	120

List of Figures

Figure 1	Analyzer Schematic—On-Line and Portable Models	38
Figure 2	Analyzer Schematic—Laboratory Model	39
Figure 3	Sample Flow through the CO ₂ Transfer Module	41
Figure 4	The Analyzer’s Major Subsystems	42
Figure 5	The Analyzer’s Major Subsystems	43
Figure 6	Electronics Block Diagram — Sievers M9 and M9 ^e TOC Analyzers	49
Figure 7	Sievers M5310 C TOC Analyzer	49
Figure 8	The Data/User Controller (DUC) Board	50
Figure 9	The Instrument Controller Board	51
Figure 10	Ethernet and USB Port Locations	52
Figure 11	The Fluidics Controller Board	53
Figure 12	The Dual Cell Signal Processor (DCSP) Board	54
Figure 13	The I/O Controller Board	55
Figure 14	The Single-Cell Signal Processor Board	56
Figure 15	Required Installation Clearances — On-Line TOC Analyzer	69
Figure 16	Left Side Dimensions — On-Line TOC Analyzer	70
Figure 17	Right Side Dimensions — On-Line TOC Analyzer	71
Figure 18	Wiring AC Power Conduit	75
Figure 19	Wiring 4-20 mA Connections	78
Figure 20	Wiring Option for Binary Input Using Analyzer’s Internal Supply	81
Figure 21	Wiring Option for Binary Input Using External Supply	81
Figure 22	Inserting the DI Loop Fill Tube	87
Figure 23	Filling the DI Water Reservoir	87
Figure 24	DI Cartridge Inlet Fittings for Priming Activity	88
Figure 25	DI Cartridge Positioning for Analyzer Operation	88
Figure 26	USB Ports	92
Figure 27	iOS Waste Outlet Fitting — On-Line and Portable TOC Analyzers	94
Figure 28	This iOS	95
Figure 29	Flow Rate Adjustment Screw	96
Figure 30	Waste Outlet Fitting — Laboratory TOC Analyzer	98
Figure 31	Modify Online Method Dialog Box	108

Figure 32	Modify Timed Online Method Dialog Box	108
Figure 33	Modify TOC Removal Online Method Dialog Box	108
Figure 34	Stainless Steel Tubing — Connecting the Analyzer and iOS	110
Figure 35	Nut and Ferrule Orientation	110
Figure 36	Modify Online Method Dialog Box	124
Figure 37	Modify Timed Online Method Dialog Box	124
Figure 38	Modify TOC Removal Online Method Dialog Box	124
Figure 39	USB Connection Locations	149
Figure 40	XX	150
Figure 41	Interior Overview — On-Line TOC Analyzer	160
Figure 42	Interior Overview — Laboratory TOC Analyzer	160
Figure 43	Interior Overview — Portable TOC Analyzer	160
Figure 44	1-Year Maintenance Record Log	163
Figure 45	Dispensing Bottle Tip	168

Sievers M9 and M9^e TOC Analyzers

Sievers M5310 C TOC Analyzer

DOCUMENT REVISION HISTORY

Document Version	Firmware/Software Version	Date
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1

INTRODUCTION

The [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#) from GE Analytical Instruments includes patented¹ high-sensitivity Analyzers used to measure the concentration of total organic carbon (TOC), total inorganic carbon (TIC), and total carbon (TC = TOC + TIC) in water samples.

The Analyzer is based on the oxidation of organic compounds to form carbon dioxide (CO₂) using UV radiation and a chemical oxidizing agent (ammonium persulfate). Carbon dioxide is measured using a sensitive, selective membrane-based conductometric detection technique as described by Godec et al. (R. Godec et al., "Method and Apparatus for the Determination of Dissolved Carbon in Water," U.S. Patent No. 5,132,094). For each TOC measurement, the concentration of inorganic carbon species (CO₂, HCO₃⁻, and CO₃⁻²) is determined and, after oxidation of the organic compounds, the total carbon (TC) content of the sample is measured. The concentration of the organic compounds is then calculated from the difference between the concentrations of TC and total inorganic carbon (TIC), generally referred to simply as inorganic carbon (IC).

$$(TOC = TC - IC)$$

You can use the Analyzer to monitor water samples ranging from high-purity water containing 0.03 parts per billion (ppb) TOC to water samples containing up to 50 parts per million (ppm) TOC. The Analyzer is easy to operate, with extremely low maintenance, and requiring no special training or chemical knowledge. The Analyzer is calibrated at the factory, and calibration remains stable for approximately one year. Recalibration and validation is easily performed at your location site.

This manual presents operation and maintenance information for the [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#). This information, including step-by-step instructions, applies to ALL three models (*On-Line*, *Lab*, and *Portable*), except where specifically noted.

1. For a complete list of patents issued to GE Analytical Instruments, see "Trademarks and Patents" on page 16.

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2

SYSTEM SPECIFICATIONS



This chapter provides a system specifications¹ for each model (*On-Line, Laboratory, and Portable*) of the Sievers M9 and M9^e TOC Analyzers are Sievers M5310 C TOC Analyzer is included in this section.

Sievers M9 and M9^e On-Line TOC Analyzers

Sampling

<u>LINEAR RANGE</u>	<u>0.03 ppb – 50 ppm TOC</u>
<u>PRECISION</u>	<u><1% of RSD</u>
<u>ACCURACY</u>	<u>±2% or ±0.5 ppb, whichever is greater</u>
<u>ANALYSIS TIME</u>	<u>2 min</u>
<u>SAMPLE FLOW RATE (NOMINAL)</u>	<u>Analysis mode: 0.5 mL/min</u> <u>Fast flush (between samples): 2.0 mL/min</u> <u>(optional) Turbo mode: 1.0 mL/min</u>
<u>REQUIRED SAMPLE LINE FLOW RATE</u>	<u>On-line mode: 50 mL - 300 mL/min</u>
<u>SAMPLE TEMPERATURE</u>	<u>1 °C to 95 °C via iOS² (withstands short-term steam exposure)</u>
<u>AMBIENT TEMPERATURE</u>	<u>10 °C to 40 °C</u>
<u>SAMPLE PRESSURE (IN IOS SYSTEM)</u>	<u>Up to 250 psig</u>
<u>CALIBRATION STABILITY</u>	<u>Typically stable for 12 months</u>
<u>CHEMICAL REAGENTS</u>	<u>GE Analytical Instruments pre-packaged reagents: 300 mL acid and 300 mL or 150 mL oxidizer</u>

1. Stated analytical performance is achievable under controlled laboratory conditions that minimize operator and standards errors.
2. If the sample temperature and pressure are above 60° C and 100 psi, the Sievers M9 and M9^e On-Line TOC Analyzers model with the Kymar or PVDF iOS is required.

Chapter 2 SYSTEM SPECIFICATIONS

Turbo (Optional)

<u>LINEAR RANGE</u>	xx
<u>PRECISION</u>	xx
<u>ACCURACY</u>	xx
<u>ANALYSIS TIME</u>	xx

Electronics

<u>POWER REQUIREMENTS</u>	<u>100-240 ±10% VAC, 100 VA, 50/60 Hz</u>
<u>DO NOT CHANGE FUSES</u>	<u>No user-replaceable fuses</u>
<u>OUTPUTS</u>	<u>4-20 mA, two alarms, binary output, Ethernet port</u>
<u>INSTALLATION/ OVER-VOLTAGE CATEGORY</u>	<u>II</u>
<u>RFID</u>	<u>Radio tracking and controlling of reagents; Meets Part 15 of the FCC Rules & Industry Canada license (exempt RSS standards)</u>

Environment

<u>NORMAL OPERATING ENVIRONMENT</u>	<u>Intended for indoor use ONLY</u>
<u>MAXIMUM RELATIVE HUMIDITY</u>	<u>Up to 95%, non-condensing</u>
<u>MAXIMUM ALTITUDE</u>	<u>3,000 m (9,843 ft)</u>
<u>POLLUTION DEGREE</u>	<u>2</u>
<u>DISPLAY</u>	<u>Color, touch-sensitive WVGA LCD</u>
<u>SIZE</u>	<u>35.6 cm height x 22.3 cm width x 46.5 cm depth (14.0 in x 8.8 in x 18.3 in) 62.4 cm height x 45.2 cm width x 26.4 cm depth (24.6 in x 17.8 in x 10.4 in) 48.3 cm height x 19.2 cm width x 48.0 cm depth (19.0 in x 7.6 in x 18.9 in)</u>
<u>WEIGHT</u>	<u>16.4 kg (36.2lb)</u>

Certifications

<u>SAFETY CERTIFICATIONS</u>	<u>CE, ETL listed. Conforms to UL Std. 61010-1</u> <u>Certified to CSA C22.2 No. 61010-1</u> <u>ISO?Any mention in addition to or instead of for CB Scheme.</u>
<u>IP RATING</u>	<u>IP 45</u>

Sievers M5310 C On-Line TOC Analyzer

Sampling

<u>LINEAR RANGE</u>	<u>0.03 ppb – 50 ppm TOC</u>
<u>PRECISION</u>	<u><1% of RSD</u>
<u>ACCURACY</u>	<u>±2% or ±0.5 ppb, whichever is greater</u>
<u>ANALYSIS TIME</u>	<u>2 min</u>
<u>SAMPLE FLOW RATE (NOMINAL)</u>	<u>Analysis mode: 0.5 mL/min</u> <u>Fast flush (between samples): 2.0 mL/min</u> <u>(optional) Turbo mode: 1.0 mL/min</u>
<u>REQUIRED SAMPLE LINE FLOW RATE</u>	<u>On-line mode: 50 mL - 300 mL/min</u>
<u>SAMPLE TEMPERATURE</u>	<u>1 °C to 95 °C via iOS³ (withstands short-term steam exposure)</u>
<u>AMBIENT TEMPERATURE</u>	<u>10 °C to 40 °C</u>
<u>SAMPLE PRESSURE (IN iOS SYSTEM)</u>	<u>Up to 250 psig</u>
<u>CALIBRATION STABILITY</u>	<u>Typically stable for 12 months</u>
<u>CHEMICAL REAGENTS</u>	<u>GE Analytical Instruments pre-packaged reagents: 300 mL acid and 300 mL or 150 mL oxidizer</u>

Electronics

<u>POWER REQUIREMENTS</u>	<u>100-240 ±10% VAC, 100 VA, 50/60 Hz</u>
<u>DO NOT CHANGE FUSES</u>	<u>No user-replaceable fuses</u>
<u>OUTPUTS</u>	<u>4–20 mA, two alarms, binary output, Ethernet port, and one USB device port⁴ and two USB host ports⁵</u>
<u>INSTALLATION/ OVER-VOLTAGE CATEGORY</u>	<u>II</u>
<u>RFID</u>	<u>Radio tracking and controlling of reagents; Meets Part 15 of the FCC Rules & Industry Canada license (exempt RSS standards)</u>

Environment

<u>NORMAL OPERATING ENVIRONMENT</u>	<u>Intended for indoor use ONLY</u>
<u>MAXIMUM RELATIVE HUMIDITY</u>	<u>Up to 95%, non-condensing</u>
<u>MAXIMUM ALTITUDE</u>	<u>3,000 m (9,843 ft)</u>

- If the sample temperature and pressure are above 60° C and 100 psi, the Sievers M9 and M9^e On-Line TOC Analyzers model with the Kymar or PVDF iOS is required.
- The USB device port is used for connecting to a computer when operating with a GE Autosampler.
- The two USB host ports are used for connecting a GE Autosampler, printer, or portable USB memory device (for installing updates or exporting data).

Chapter 2 SYSTEM SPECIFICATIONS

POLLUTION DEGREE

2

DISPLAY

Color, touch-sensitive WVGA LCD

SIZE

35.6 cm height x 22.3 cm width x 46.5 cm depth

(14.0 in x 8.8 in x 18.3 in) 62.4 cm height x 45.2 cm width x 26.4 cm depth

(24.6 in x 17.8 in x 10.4 in) 48.3 cm height x 19.2 cm width x 48.0 cm depth

(19.0 in x 7.6 in x 18.9 in)

WEIGHT

16.4 kg (36.2lb)

Certifications

SAFETY CERTIFICATIONS

CE, ETL listed; Conforms to UL Std. 61010-1

instead of for CB Scheme.

Certified to CSA C22.2 No. 61010-1 ISO? Any mention in addition to or

IP RATING

IP 45

Sievers MC9 and MC9^e Laboratory TOC Analyzers

Sampling

<u>LINEAR RANGE</u>	<u>0.03 ppb – 50 ppm TOC</u>
<u>PRECISION</u>	<u><1% of RSD</u>
<u>ACCURACY</u>	<u>±2% or ±0.5 ppb, whichever is greater</u>
<u>ANALYSIS TIME</u>	<u>2 min</u>
<u>SAMPLE FLOW RATE (NOMINAL)</u>	<u>Analysis mode: 0.5 mL/min</u> <u>Fast flush (between samples): 2.0 mL/min</u> <u>(optional) Turbo mode: 1.0 mL/min</u>
<u>REQUIRED SAMPLE LINE FLOW RATE</u>	<u>On-line mode: 50 mL - 300 mL/min</u>
<u>SAMPLE TEMPERATURE</u>	<u>1 °C to 95 °C via iOS⁶ (withstands short-term steam exposure)</u>
<u>AMBIENT TEMPERATURE</u>	<u>10 °C to 40 °C</u>
<u>SAMPLE PRESSURE (IN iOS SYSTEM)</u>	<u>Up to 250 psig</u>
<u>CALIBRATION STABILITY</u>	<u>Typically stable for 12 months</u>
<u>CHEMICAL REAGENTS</u>	<u>GE Analytical Instruments pre-packaged reagents: 300 mL acid and 300 mL or 150 mL oxidizer</u>

Turbo (Optional)

<u>LINEAR RANGE</u>	<u>xx</u>
<u>PRECISION</u>	<u>xx</u>
<u>ACCURACY</u>	<u>xx</u>
<u>ANALYSIS TIME</u>	<u>xx</u>

Stage II Sample Conductivity (Optional)

<u>RAW CONDUCTIVITY RANGE</u>	<u>0.01 - 35 µS/cm</u>
<u>CONDUCTIVITY ACCURACY</u>	<u>x</u>
<u>CONDUCTIVITY PRECISION</u>	<u>x</u>
<u>MAXIMUM SAMPLE CONDUCTIVITY</u>	<u>x</u>

Electronics

<u>POWER REQUIREMENTS</u>	<u>100-240 ±10% VAC, 100 VA, 50/60 Hz</u>
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6. If the sample temperature and pressure are above 60° C and 100 psi, the Sievers M9 and M9^e On-Line TOC Analyzers model with the Kymar or PVDF iOS is required.

Chapter 2 SYSTEM SPECIFICATIONS

DO NOT CHANGE FUSES

Replace with same type and size. T1.6 A, 250 VAC (SloBlo), size 5 x 20 mm (appliance inlet)

OUTPUTS

4–20 mA, two alarms, binary output, Ethernet port

INSTALLATION/ OVER-VOLTAGE CATEGORY

II

RFID

Radio tracking and controlling of reagents; Meets Part 15 of the FCC Rules & Industry Canada license (exempt RSS standards)

Environment

NORMAL OPERATING ENVIRONMENT Intended for indoor use ONLY

MAXIMUM RELATIVE HUMIDITY Up to 95%, non-condensing

MAXIMUM ALTITUDE 3,000 m (9,843 ft)

POLLUTION DEGREE 2

DISPLAY Color, touch-sensitive WVGA LCD

SIZE 35.6 cm height x 22.3 cm width x 46.5 cm depth

(14.0 in x 8.8 in x 18.3 in) 62.4 cm height x 45.2 cm width x 26.4 cm depth

(24.6 in x 17.8 in x 10.4 in) 48.3 cm height x 19.2 cm width x 48.0 cm depth

(19.0 in x 7.6 in x 18.9 in)

WEIGHT

16.4 kg (36.2lb)

Certifications

SAFETY CERTIFICATIONS CE, ETL listed; Conforms to UL Std. 61010-1

Certified to CSA C22.2 No. 61010-1[ISO?Any mention in addition to or instead of for CB Scheme.](#)

IP RATING IP 45

Sievers M5310 C Laboratory TOC Analyzer

Sampling

<u>LINEAR RANGE</u>	<u>0.03 ppb – 50 ppm TOC</u>
<u>PRECISION</u>	<u><1% of RSD</u>
<u>ACCURACY</u>	<u>±2% or ±0.5 ppb, whichever is greater</u>
<u>ANALYSIS TIME</u>	<u>2 min</u>
<u>SAMPLE FLOW RATE (NOMINAL)</u>	<u>Analysis mode: 0.5 mL/min</u> <u>Fast flush (between samples): 2.0 mL/min</u> <u>(optional) Turbo mode: 1.0 mL/min</u>
<u>REQUIRED SAMPLE LINE FLOW RATE</u>	<u>On-line mode: 50 mL - 300 mL/min</u>
<u>SAMPLE TEMPERATURE</u>	<u>1 °C to 95 °C via iOS⁷ (withstands short-term steam exposure)</u>
<u>AMBIENT TEMPERATURE</u>	<u>10 °C to 40 °C</u>
<u>SAMPLE PRESSURE (IN IOS SYSTEM)</u>	<u>Up to 250 psig</u>
<u>CALIBRATION STABILITY</u>	<u>Typically stable for 12 months</u>
<u>CHEMICAL REAGENTS</u>	<u>GE Analytical Instruments pre-packaged reagents: 300 mL acid and 300 mL or 150 mL oxidizer</u>

Stage II Sample Conductivity (Optional)

<u>RAW CONDUCTIVITY RANGE</u>	<u>0.01 - 35 µS/cm</u>
<u>CONDUCTIVITY ACCURACY</u>	<u>X</u>
<u>CONDUCTIVITY PRECISION</u>	<u>X</u>
<u>MAXIMUM SAMPLE CONDUCTIVITY</u>	<u>X</u>

Electronics

<u>POWER REQUIREMENTS</u>	<u>100-240 ±10% VAC, 100 VA, 50/60 Hz</u>
<u>DO NOT CHANGE FUSES</u>	<u>Replace with same type and size. T1.6 A, 250 VAC (SloBlo), size 5 x 20 mm (appliance inlet)</u>
<u>OUTPUTS</u>	<u>4–20 mA, two alarms, binary output, Ethernet port</u>
<u>INSTALLATION/ OVER-VOLTAGE CATEGORY</u>	<u>II</u>
<u>RFID</u>	<u>Radio tracking and controlling of reagents; Meets Part 15 of the FCC Rules & Industry Canada license (exempt RSS standards)</u>

7. If the sample temperature and pressure are above 60° C and 100 psi, the Sievers M9 and M9^e On-Line TOC Analyzers model with the Kymar or PVDF iOS is required.

Chapter 2 SYSTEM SPECIFICATIONS

Environment

<u>NORMAL OPERATING ENVIRONMENT</u>	<u>Intended for indoor use ONLY</u>
<u>MAXIMUM RELATIVE HUMIDITY</u>	<u>Up to 95%, non-condensing</u>
<u>MAXIMUM ALTITUDE</u>	<u>3,000 m (9,843 ft)</u>
<u>POLLUTION DEGREE</u>	<u>2</u>
<u>DISPLAY</u>	<u>Color, touch-sensitive WVGA LCD</u>
<u>SIZE</u>	<u>35.6 cm height x 22.3 cm width x 46.5 cm depth</u> <u>(14.0 in x 8.8 in x 18.3 in) 62.4 cm height x 45.2 cm width x 26.4 cm depth</u> <u>(24.6 in x 17.8 in x 10.4 in) 48.3 cm height x 19.2 cm width x 48.0 cm depth</u> <u>(19.0 in x 7.6 in x 18.9 in)</u>
<u>WEIGHT</u>	<u>16.4 kg (36.2lb)</u>

Certifications

<u>SAFETY CERTIFICATIONS</u>	<u>CE, ETL listed; Conforms to UL Std. 61010-1</u> <u>Certified to CSA C22.2 No. 61010-1ISO?Any mention in addition to or</u> <u>instead of for CB Scheme.</u>
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<u>IP RATING</u>	<u>IP 45</u>
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Sievers M9 and M9^e Portable TOC Analyzers

Sampling

<u>LINEAR RANGE</u>	<u>0.03 ppb – 50 ppm TOC</u>
<u>PRECISION</u>	<u><1% of RSD</u>
<u>ACCURACY</u>	<u>±2% or ±0.5 ppb, whichever is greater</u>
<u>ANALYSIS TIME</u>	<u>2 min</u>
<u>SAMPLE FLOW RATE (NOMINAL)</u>	<u>Analysis mode: 0.5 mL/min</u> <u>Fast flush (between samples): 2.0 mL/min</u> <u>(optional) Turbo mode: 1.0 mL/min</u>
<u>REQUIRED SAMPLE LINE FLOW RATE</u>	<u>On-line mode: 50 mL - 300 mL/min</u>
<u>SAMPLE TEMPERATURE</u>	<u>1 °C to 95 °C via iOS⁸ (withstands short-term steam exposure)</u>
<u>AMBIENT TEMPERATURE</u>	<u>10 °C to 40 °C</u>
<u>SAMPLE PRESSURE (IN iOS SYSTEM)</u>	<u>Up to 250 psig</u>
<u>CALIBRATION STABILITY</u>	<u>Typically stable for 12 months</u>
<u>CHEMICAL REAGENTS</u>	<u>GE Analytical Instruments pre-packaged reagents: 300 mL acid and 300 mL or 150 mL oxidizer</u>

Stage II Sample Conductivity (Optional)

<u>RAW CONDUCTIVITY RANGE</u>	<u>0.01 - 35 µS/cm</u>
<u>CONDUCTIVITY ACCURACY</u>	<u>×</u>
<u>CONDUCTIVITY PRECISION</u>	<u>×</u>
<u>MAXIMUM SAMPLE CONDUCTIVITY</u>	<u>×</u>

Turbo (Optional)

<u>LINEAR RANGE</u>	<u>×</u>
<u>PRECISION</u>	<u>×</u>
<u>ACCURACY</u>	<u>×</u>
<u>ANALYSIS TIME</u>	<u>×</u>

Electronics

<u>POWER REQUIREMENTS</u>	<u>100-240 ±10% VAC, 100 VA, 50/60 Hz</u>
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8. If the sample temperature and pressure are above 60° C and 100 psi, the Sievers M9 and M9^e On-Line TOC Analyzers model with the Kymar or PVDF iOS is required.

Chapter 2 SYSTEM SPECIFICATIONS

<u>DO NOT CHANGE FUSES</u>	<u>Replace with same type and size. T1.6 A, 250 VAC (SloBlo), size 5 x 20 mm (appliance inlet)</u>
<u>OUTPUTS</u>	<u>4-20 mA, two alarms, binary output, Ethernet port</u>
<u>INSTALLATION/ OVER-VOLTAGE CATEGORY</u>	<u>II</u>
<u>RFID</u>	<u>Radio tracking and controlling of reagents; Meets Part 15 of the FCC Rules & Industry Canada license (exempt RSS standards)</u>

Environment

<u>NORMAL OPERATING ENVIRONMENT</u>	<u>Intended for indoor use ONLY</u>
<u>MAXIMUM RELATIVE HUMIDITY</u>	<u>Up to 95%, non-condensing</u>
<u>MAXIMUM ALTITUDE</u>	<u>3,000 m (9,843 ft)</u>
<u>POLLUTION DEGREE</u>	<u>2</u>
<u>DISPLAY</u>	<u>Color, touch-sensitive WVGA LCD</u>
<u>SIZE</u>	<u>35.6 cm height x 22.3 cm width x 46.5 cm depth (14.0 in x 8.8 in x 18.3 in) 62.4 cm height x 45.2 cm width x 26.4 cm depth (24.6 in x 17.8 in x 10.4 in) 48.3 cm height x 19.2 cm width x 48.0 cm depth (19.0 in x 7.6 in x 18.9 in)</u>
<u>WEIGHT</u>	<u>16.4 kg (36.2lb)</u>

Certifications

<u>SAFETY CERTIFICATIONS</u>	<u>CE, ETL listed; Conforms to UL Std. 61010-1 Certified to CSA C22.2 No. 61010-1</u> <u>ISO?Any mention in addition to or instead of for CB Scheme.</u>
<u>IP RATING</u>	<u>IP 45</u>

Sievers M5310 C Portable TOC Analyzer

Sampling

<u>LINEAR RANGE</u>	<u>0.03 ppb – 50 ppm TOC</u>
<u>PRECISION</u>	<u><1% of RSD</u>
<u>ACCURACY</u>	<u>±2% or ±0.5 ppb, whichever is greater</u>
<u>ANALYSIS TIME</u>	<u>2 min</u>
<u>SAMPLE FLOW RATE (NOMINAL)</u>	<u>Analysis mode: 0.5 mL/min</u> <u>Fast flush (between samples): 2.0 mL/min</u> <u>(optional) Turbo mode: 1.0 mL/min</u>
<u>REQUIRED SAMPLE LINE FLOW RATE</u>	<u>On-line mode: 50 mL - 300 mL/min</u>
<u>SAMPLE TEMPERATURE</u>	<u>1 °C to 95 °C via iOS⁹ (withstands short-term steam exposure)</u>
<u>AMBIENT TEMPERATURE</u>	<u>10 °C to 40 °C</u>
<u>SAMPLE PRESSURE (IN IOS SYSTEM)</u>	<u>Up to 250 psig</u>
<u>CALIBRATION STABILITY</u>	<u>Typically stable for 12 months</u>
<u>CHEMICAL REAGENTS</u>	<u>GE Analytical Instruments pre-packaged reagents: 300 mL acid and 300 mL or 150 mL oxidizer</u>

Stage II Sample Conductivity (Optional)

<u>RAW CONDUCTIVITY RANGE</u>	<u>0.01 - 35 µS/cm</u>
<u>CONDUCTIVITY ACCURACY</u>	<u>X</u>
<u>CONDUCTIVITY PRECISION</u>	<u>X</u>
<u>MAXIMUM SAMPLE CONDUCTIVITY</u>	<u>X</u>

Electronics

<u>POWER REQUIREMENTS</u>	<u>100-240 ±10% VAC, 100 VA, 50/60 Hz</u>
<u>DO NOT CHANGE FUSES</u>	<u>Replace with same type and size. T1.6 A, 250 VAC (SloBlo), size 5 x 20 mm (appliance inlet)</u>
<u>OUTPUTS</u>	<u>4–20 mA, two alarms, binary output, Ethernet port</u>
<u>INSTALLATION/ OVER-VOLTAGE CATEGORY</u>	<u>II</u>
<u>RFID</u>	<u>Radio tracking and controlling of reagents; Meets Part 15 of the FCC Rules & Industry Canada license (exempt RSS standards)</u>

9. If the sample temperature and pressure are above 60° C and 100 psi, the Sievers M9 and M9^e On-Line TOC Analyzers model with the Kymar or PVDF iOS is required.

Chapter 2 SYSTEM SPECIFICATIONS

Environment

<u>NORMAL OPERATING ENVIRONMENT</u>	<u>Intended for indoor use ONLY</u>
<u>MAXIMUM RELATIVE HUMIDITY</u>	<u>Up to 95%, non-condensing</u>
<u>MAXIMUM ALTITUDE</u>	<u>3,000 m (9,843 ft)</u>
<u>POLLUTION DEGREE</u>	<u>2</u>
<u>DISPLAY</u>	<u>Color, touch-sensitive WVGA LCD</u>
<u>SIZE</u>	<u>35.6 cm height x 22.3 cm width x 46.5 cm depth</u> <u>(14.0 in x 8.8 in x 18.3 in) 62.4 cm height x 45.2 cm width x 26.4 cm depth</u> <u>(24.6 in x 17.8 in x 10.4 in) 48.3 cm height x 19.2 cm width x 48.0 cm depth</u> <u>(19.0 in x 7.6 in x 18.9 in)</u>
<u>WEIGHT</u>	<u>16.4 kg (36.2lb)</u>

Certifications

<u>SAFETY CERTIFICATIONS</u>	<u>CE, ETL listed; Conforms to UL Std. 61010-1</u> <u>Certified to CSA C22.2 No. 61010-1ISO?Any mention in addition to or</u> <u>instead of for CB Scheme?</u>
<u>IP RATING</u>	<u>IP 45</u>

SYSTEM OVERVIEW



This chapter provides an overview of the Sievers M9 and M9^e TOC Analyzers Sievers M5310 C TOC Analyzer system, including:

- [The Sample Flow Path](#)
- [The Analyzer's Major Subsystems](#) – [Sample Inlet System](#), [Inorganic Carbon Remover \(ICR\)](#), [Chemical Reagent System](#), [Oxidizer Reactor](#), [CO₂ Measurement Module](#), [Fluidics Module](#), and [Electronics](#)
- [Optional Configurations](#) – [Sample Conductivity](#), [Two-Stream Inlet](#), [Inorganic Carbon Remover \(ICR\)](#), and [Turbo Operation Mode](#)
- [Optional Accessories](#) – [Point-of-Service \(POS\) Printer](#), [GE Autosampler and Sievers DataPro Software](#), and [DataGuard Software](#)

SYSTEM OVERVIEW

THE SAMPLE FLOW PATH

This section provides an overview of the sample's path through the [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#). As you read about the details of the process, you may find it helpful to periodically refer to [Figure 1: Analyzer Schematic—On-Line and Portable Models](#) and [Figure 2: Analyzer Schematic—Laboratory Model](#) [Figure 2: Analyzer Schematic—Laboratory Model](#).

PLACEHOLDER FROM 500

Figure 1: Analyzer Schematic—On-Line and Portable Models

ADD GRAPHIC

Figure 2: Analyzer Schematic—Laboratory Model

The process begins by introducing sample into the Analyzer with [a one or two-stream¹](#) sample-line and inlet connection(s) for continuous monitoring with ALL models (*On-Line, Lab, and Portable*) of the [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#). Or, you can introduce discrete grab samples with one of the following *model-specific* sampling methods.

- **On-Line TOC Analyzer** — Measure discrete grab samples by inserting a 40 mL sample vial into the iOS System, located on the right side of the instrument.

You can also set up the *On-Line TOC Analyzer* for single grab samples to accommodate spot checks of TOC samples from various points in the water system. With this method, you will use a sipper tube² and laboratory glassware (such as a flask or beaker).

- **Laboratory TOC Analyzer** — Measure discrete grab samples by inserting a 40 mL sample vial into the vial port located on the front of the Analyzer, or by using the optional GE Autosampler to introduce samples from up to 120 vials. To establish the sample flow path, connect the needle's attached sample tubing to the sample inlet port located on the back of the Analyzer.

The *Laboratory TOC Analyzer* also accommodates single grab samples for spot checks of TOC samples from various points in the water system. With this method, you will use a sipper tube² and laboratory glassware (such as a flask or beaker).

- **Portable TOC Analyzer** — Measure discrete grab samples by inserting a 40 mL sample vial into the iOS System, or via a sipper tube bypassing the iOS System. You can also use the optional GE Autosampler to introduce samples from up to 120 vials. To establish the

1. A two-stream configuration is available as an option with the Sievers M5310 C TOC Analyzer.

2. The preferred methods for sampling are on-line and grab samples using the iOS system or vial port. Testing using a grab method with a sipper tube and laboratory glassware shows additional risk for contamination by sample preparation and handling. Contamination can be minimized with this method by using good sampling techniques including covering the open portion of the glassware, sampling and analyzing in the absence of volatile organics, and using scrupulously clean glassware. For additional information, reference GE Analytical Instruments, "On-Line or Grab Sample Monitoring," Application Note 300 00001 Rev. A, 2005.

SYSTEM OVERVIEW

sample flow path, connect the needle's attached sample tubing to the sample inlet port located to the left of the iOS.

As with the other models, you can set up the *Portable TOC Analyzer* for single grab samples to accommodate spot checks of TOC samples from various points in the water system. With this method, you will use a sipper tube² and laboratory glassware (such as a flask or beaker).

For step-by-step setup instructions, refer to ["Sampling Using a Sipper Tube" on page 114](#).

After sample is introduced into the Analyzer, 6M phosphoric acid (H₃PO₄) is injected into the sample³ at the programmed flow rate to reduce sample pH to 2. This allows for accurate measurement of TC and IC.

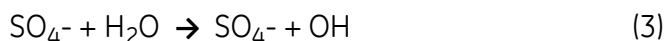
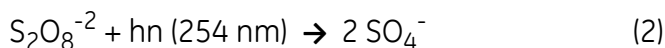
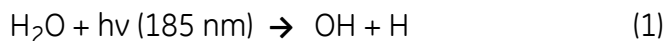
An (optional) Inorganic Carbon Remover (ICR) may be used to remove excess IC by vacuum degasification. [See "Inorganic Carbon Remover \(ICR\)" on page 45](#). [See "Inorganic Carbon Remover \(ICR\)" on page 61 for more information on this optional configuration](#). If the ICR unit is utilized, additional acid may need to be added to the sample to remove excess IC by the ICR.

The acidified sample is then combined⁴ with 15% ammonium persulfate [(NH₄)₂S₂O₈] to promote oxidation of the organics.⁵ The sample travels through a mixing coil and on to a stream splitter.

The stream splitter divides the sample stream into two equal, but separate flows. One stream is processed for the measurement of IC. The other is processed for measurement of TC.

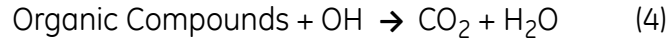
The TC stream passes to an oxidation reactor where the sample is exposed to UV light. The combination of UV light and (depending on the application) persulfate oxidizes the organic compounds in the sample, converting carbon to CO₂.

The reactor is a spiral quartz tube wrapped around the UV lamp. The UV lamp emits light at 185 nm and 254 nm resulting in the formation of powerful chemical oxidizing agents in the form of hydroxyl radicals produced by the photolysis of water (equation 1) and persulfate (equations 2 and 3):



3. The phosphoric acid is referred to as *Acid* in the user interface.
4. Depending on the application, some samples do NOT require the addition of persulfate. For example, when the TOC concentration in the sample is low (<1 ppm), complete oxidation can usually be achieved using only the hydroxyl radicals from the photolysis of water.
5. The ammonium persulfate is referred to as *Oxidizer* in the user interface.

The hydroxyl radicals (OH) will completely oxidize organic compounds, converting the carbon atoms of the organic compound into CO₂ (equation 4):



When the TOC concentration in the sample is low (<1 ppm), complete oxidation can usually be achieved using only the hydroxyl radicals from the photolysis of water (example 1) without the addition of persulfate.

The IC stream passes through a delay coil, which is designed to make the total transit time of the IC stream through the Analyzer the same as the transit time of the TC stream through the Analyzer.

CO₂ Transfer Modules

Figure 3: Sample Flow through the CO₂ Transfer Module

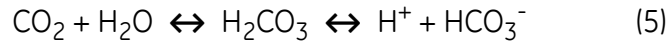
When the TC stream exits the oxidation reactor and the IC stream exits the delay coil, each stream moves to the CO₂ Transfer Module, and through its respective channel. The CO₂ Transfer Module is our patented *Sievers Selective Membrane Conductometric* design, utilizing a gas-permeable membrane that allows the transfer of CO₂ across the membrane. A graphic depiction of this technology representative for either the TC or IC channel is shown in [Figure 3: Sample Flow through the CO₂ Transfer Module on page 41](#).

NOTE: If you are reading this manual in an Adobe® PDF® format, click the Figure 3 graphic to activate a flow animation, and click any of the numbered processes for more information.

The membrane for each respective channel separates the sample side of the Analyzer from the DI side. The DI side of the Analyzer is a closed loop, and consists of two conductivity cells (*one for the TC stream and one for the IC stream*), a DI water pump, a DI water reservoir, and an ion exchange resin bed.

SYSTEM OVERVIEW

CO₂ from the sample passes through the membrane into the DI water supplied by the integrated DI Loop, while interfering compounds and other oxidation by-products are blocked by the membrane and remain on the sample side. The CO₂ forms carbonic acid upon reaction with water, and the carbonic acid disassociates into hydrogen ions and bicarbonate ions (equation 5):



DI water is continuously pumped through the DI side of the Analyzer, collecting the H⁺ and HCO₃⁻ ions and H₂CO₃ and CO₂ molecules from the CO₂ transfer modules, delivering it to the conductivity cell for measurement. Then the ion exchange resin removes the HCO₃⁻ and other ions. The water is then pumped back to the CO₂ transfer module to repeat the sequence.

The TC and IC conductivity cells each contain a thermistor, and all conductivity readings are temperature corrected. The CO₂ from the TC and IC sample streams are measured by the respective conductivity cells, and the conductivity readings are used to calculate the concentration of TC and IC. After the values are measured, TOC is calculated as the difference (equation 6):

$$\text{TOC} = \text{TC} - \text{IC} \quad (6)$$

THE ANALYZER'S MAJOR SUBSYSTEMS

With the sample flow path (presented in the previous section) in mind, let's take a closer look inside the Analyzer. The [Sievers M9 and M9^e TOC Analyzers](#) consist of [Sievers M5310 C TOC Analyzer](#) consists of [six](#) [seven](#) major subsystems. Each subsystem is discussed briefly in this section.

Figure 4: [The Analyzer's Major Subsystems](#)



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Figure 5: The Analyzer's Major Subsystems

Sample Inlet System

The sample inlet system introduces continuous sample into the Analyzer using a dual pump system and a one or two-stream sample line connection to the Analyzer's sample inlet port(s). The two-stream inlet option enables efficient sampling of two independent sample sources, without the need to alter the initial inlet setup. This optional configuration is discussed in more detail in the "Optional Configurations" section, under "Two-Stream Inlet" on page 60.

The Analyzer introduces discrete grab samples from the Integrated On-Line Sampling (iOS) System in both the *On-Line and Portable TOC Analyzers*, and from the vial port on the *Laboratory TOC Analyzer*.

You can also use the GE Autosampler system to automatically introduce up to 120 vial samples from the unit's vial rack(s) into the sample inlet port on the *Laboratory and Portable TOC Analyzers*. This optional system for high-volume laboratory applications is described in the section, "GE Autosampler and Sievers DataPro Software" on page 62.

All Analyzer models also accommodate single grab samples for spot checks of TOC samples from various points in the water system using a sipper tube² (on page 39) and laboratory glassware.

A summary of available inlet systems by Analyzer model is included in the following Table 1.

TABLE 1: SAMPLE INLET SYSTEMS BY ANALYZER MODEL

<i>Available Inlet Systems</i>	<i>Analyzer Model</i>
Continuous On-Line Sampling	<i>On-Line and Portable TOC Analyzers</i>
On-Line Sample (iOS) System	<i>On-Line and Portable TOC Analyzers</i>

SYSTEM OVERVIEW

TABLE 1: SAMPLE INLET SYSTEMS BY ANALYZER MODEL

<i>Available Inlet Systems</i>	<i>Analyzer Model</i>
Grab Sampling by Vial Port	<i>Laboratory TOC Analyzer</i>
Grab Sampling by Sipper Tube	<i>On-Line, Laboratory, and Portable Analyzers</i>
GE Autosampler	<i>Laboratory and Portable TOC Analyzers</i>

For additional information on the optional iOS and GE Autosampler, see the following sections, ["The iOS System"](#) and ["GE Autosampler and Sievers DataPro Software" on page 62](#) ["GE Autosampler and Sievers DataPro Software" on page 62](#).

THE IOS SYSTEM

The patented Integrated On-Line Sampling (iOS) System enables easy introduction of external samples and standards. Simply stop analysis, slide the iOS System door open to the left, wait 30 seconds for sample to drain from the iOS System, and then insert a 40-mL vial containing sample or a standard.

You can conveniently switch between on-line sampling and discrete sampling using the iOS. After the initial iOS setup, you do NOT need to change the configuration to analyze a standard with the iOS System. This unique feature allows you to introduce calibration, validation, and system suitability standards directly without removing the instrument from the continuous sample source or changing the sample inlet configuration. The Analyzer automatically shuts off on-line water flow when it detects that the iOS door is closed and/or a vial is inserted into the iOS.

The iOS operational steps are minimal and initial setup is brief, as described in [“To sample using the iOS” on page 113](#) and [“To connect the inlet tubing to the iOS” on page 94](#).

For step-by-step instructions on spot checking TOC samples from other locations in the water system using a sipper tube² (on page 39) and laboratory glassware (such as a beaker or flask), see [“Grab Sample Installation – From a Sampling Container” on page 114](#).

Inorganic Carbon Remover (ICR)

PHOTO Placeholder

To reduce high levels of inorganic carbon (IC) in sample streams with high IC/TOC ratios (such as raw surface and ground waters) before measurement, the Analyzer contains an inorganic carbon remover (ICR) for more accurate results. Typically, if the TOC is 10% or less of the IC concentration, the ICR is required. For example, if the IC is 1 ppm, then use the ICR if the TOC is 100 ppb or less for accurate TOC measurements. The Analyzer will calculate the TOC/IC ratio for each measurement. If this ratio is less than 0.1, the Analyzer issues a *Warning* message on the Touch Panel screen, which can also be viewed on the *Warnings and Errors* list. You can bypass the ICR at any time, as needed, using the *ICR On/Off* setting located on the *Modify On-Line Method* screen.

The ICR consists of a Teflon[®] degassing module and a vacuum pump. In the sampling process, the Analyzer introduces the sample flow into the Analyzer and acid is added to the sample. The stream is then directed through the ICR's Teflon degasser before continuing on through the Analyzer's sample flow path. (See “The Sample Flow Path” on page 38.) Carbon

SYSTEM OVERVIEW

dioxide produced from the reaction of bicarbonate and carbonate with acid is removed from the sample stream by the vacuum. The sample is then returned to the Analyzer and is directed by the stream splitter for measurement of IC and TC. Approximately 98% of the IC is removed at concentrations up to 25 ppm.

Chemical Reagent System

PHOTO Placeholder

Phosphoric acid (H_3PO_4) and ammonium persulfate $[(NH_4)_2S_2O_8]$, referred to respectively as *Acid* and *Oxidizer* in the User Interface and this manual, are introduced as reagents into the sample at different points in the flow path. The Acid brings about a chemical reaction to reduce the sample pH to 2, which is needed in order to allow for the accurate measurement of TC and IC.

The acidified sample is then combined with the Oxidizer to create oxidation of the organics, to promote accurate TC and IC measurements. The sample then goes through a mixing coil and on to a stream splitter, where it is divided into two separate flows for TC and IC processing.

Separate cartridge reservoirs hold the Acid and Oxidizer inside the Analyzer on the fluidics (right) side. Each reservoir is connected to a needle-and-syringe pump mechanism. The Analyzer activates each syringe pump at pre-programmed intervals and lengths [\(using the Auto Reagent setting\)](#) to dispense the optimal amount of Acid and Oxidizer into the sample.

The modular assembly of the chemical reagent system is designed for easy removal and replacement of the reagent cartridges. See [“Replacing Consumable Items” on page 164](#).

Oxidizer Reactor

PHOTO Placeholder

After the acidified sample is combined with Oxidizer, the TC sample passes into the oxidizer reactor, a spiral quartz tube wrapped around an ultraviolet (UV) lamp. The UV lamp emits light at 185 nm and 254 nm, and this exposure along with the persulfate⁶ utilizes the UV-promoted photolysis of water to convert carbon to CO₂.

The UV lamp is a consumable item and replacement is recommended every six months to ensure the intensity of the beam. See [“Replacing the UV Lamp” on page 165](#).

CO₂ Measurement Module

PHOTO Placeholder

After the TC stream passes the oxidizer reactor, and the IC stream simultaneously exits the delay coil, each stream moves to the CO₂ measurement module. The CO₂ measurement module consists of a:

- [Our patented CO₂ Transfer manifold](#), a fluidics block [with separate TC and IC channels to the gas-permeable membrane](#) that allows the transfer of CO₂
- Two quartz conductivity cells, one for the TC channel and the other for the IC channel
- Dual Conductivity Signal Processor (CSP), processing data from each TC and IC channel

The membrane separates the sample side of the Analyzer from the DI side. In each TC and IC stream channel, CO₂ from the sample passes freely through the membrane to the DI side, while interfering compounds and oxidation by-products are blocked by the membrane and remain on the sample side, thus eliminating interference from non-carbon based compounds and byproducts.

The CO₂ that has passed through to the DI side reacts with water supplied by the integrated DI Loop to form carbonic acid. The carbonic acid disassociates into hydrogen ions and bicarbonate ions. The concentration of CO₂ and ions increases until they both approach equilibrium on both sides of the membrane.

⁶ When the TOC concentration in the sample is low (<1 ppm), complete oxidation can usually be achieved using only the hydroxyl radicals from the photolysis of water without the addition of persulfate.

SYSTEM OVERVIEW

The Analyzer opens the valve of each TC and IC channel in the CO₂ transfer manifold, and CO₂ and ions transfer to the respective conductivity cell. Each conductivity cell contains a thermistor, which the Analyzer uses to temperature-correct all conductivity readings. The conductivity readings are then used to calculate the concentration of TC and IC. TOC is calculated as the difference:

$$\text{TOC} = \text{TC} - \text{IC}$$

The Analyzer pumps the sample remaining on the sample side out through the waste outlet. The water on the DI side continues through the DI loop, as described in the following section.

Fluidics Module

The fluidics module subsystem contains the:

- TC and IC sample pumps
- DI water loop
 - DI water reservoir
 - Ion exchange resin column
 - Circulation pump

A dual-pump system (one for TC flow and one for IC) draws sample through the sample flow path in the Analyzer. (See [“The Sample Flow Path” on page 38.](#))

An enclosed DI water loop serves to deliver deionized water to the CO₂ transfer module. The circulation pump continuously pushes deionized water from the DI water reservoir in a continuous loop into the CO₂ transfer manifold ([and through both the inside TC and IC channels](#)), and [then out the manifold to](#) the related conductivity cell for measurement. The water continues on the loop path to the ion exchange resin column where CO₂ and the ions are removed, producing freshly deionized water. This is then fed back into the DI side of the CO₂ transfer module. And, the loop is repeated on a continuous basis while the Analyzer is running (whether or not you are sampling).

Electronics

Figure 6: Electronics Block Diagram — [Sievers M9 and M9^e TOC Analyzers](#)

Figure 7: [Sievers M5310 C TOC Analyzer](#)

The electronics subsystem of the [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#) includes:

- [Electronic Controller and Processing Boards](#)
 - [Ethernet Port](#)
 - [USB Ports](#)
- [Touch Panel Display](#)
- [Radio Frequency ID \(RFID\)](#)

ELECTRONIC CONTROLLER AND PROCESSING BOARDS

The Analyzer controls all operations using six electronic boards designed with microcontrollers and microprocessors, as shown in [Figure 6: Electronics Block Diagram — Sievers M9 and M9^e TOC Analyzers](#). A brief description of the following electronic controller and processing boards is included in this section:

SYSTEM OVERVIEW

- [Data/User Controller \(DUC\) Board](#)
- [Instrument Controller Board](#)
- [Fluidics Controller Board](#)
- [Dual Cell Signal Processor \(DCSP\) Board](#)
- [I/O Controller Board](#)
- [Single-Cell Signal Processor Board](#)

DATA/USER CONTROLLER (DUC) BOARD

Figure 8: The Data/User Controller (DUC) Board

The Analyzer uses the *Data/User Controller (DUC)* board to control the user interface, display, and data processing operations using a 64-bit microprocessor running at 1 GHz. The microprocessor has 1 GB of onboard Dynamic Random Access Memory (DRAM) and two card slots for USB flash memory cards. One slot holds a 1 GB program memory card and the other holds a 1 GB data memory card.

The DUC board communicates with external devices and systems over Ethernet and USB serial interfaces. This board also controls the optional GE Autosampler and a GEAI-supported Point of Service (POS) printer.

The DUC board controls power to the rest of the electronics in the Analyzer and communicates to the Instrument Control Board over a full-speed USB serial port.

INSTRUMENT CONTROLLER BOARD

Figure 9: The Instrument Controller Board

The Analyzer uses the *Instrument Controller Board* to distribute power and communicate to the other circuit boards in the Analyzer. Power is distributed over a ribbon cable and communications are sent to the other circuit boards over a dual serial CAN bus.

The Instrument Controller board also provides power to the UV lamp, monitors the output from the UV lamp, controls and monitors the [\(optional\)](#) Inorganic Carbon Remover (ICR), controls and monitors the reagent syringes, manages the Radio Frequency ID (RFID) tags on the reagent containers, monitors the vial door position, drives and monitors the vial door LED, and controls and monitors the sample valve.

This board also contains connection ports for both Ethernet and USB. These ports are positioned for convenient access from outside the Analyzer, as follows:

SYSTEM OVERVIEW

PHOTO Placeholder

Figure 10: Ethernet and USB Port Locations

USB Ports

There are two types of USB ports:

- **One Device Port** — This USB port is ONLY used for connecting a computer when operating with Sievers DataPro Software.
- **Host Port** — This USB port is used for connecting a *GE Autosampler, printer, or portable USB memory device.*)

For additional information, please refer to ["USB Device Port"](#) and ["USB Host Ports" on page 91](#) in the ["Installation"](#) chapter in this manual.

Ethernet Port

The Instrument Controller board also contains the Ethernet connection port. You can export historical data from the Analyzer to your computer or computer network via this Ethernet port, and using an Ethernet cable and the Modbus communications protocol. For more information on the types of data available for export, as well how-to instructions, refer to ["Installing an Ethernet Connection" on page 89](#) and ["Using the Ethernet Connection and Modbus" on page 149](#).

FLUIDICS CONTROLLER BOARD

Figure 11: The Fluidics Controller Board

The *Fluidics Controller Board* is used to control and monitor the sample pumps and the sample valve. This board also monitors sample flow, the IOS flow switches, and the iOS vial door position.

SYSTEM OVERVIEW

DUAL CELL SIGNAL PROCESSOR (DCSP) BOARD

Figure 12: The Dual Cell Signal Processor (DCSP) Board

The Analyzer uses the *Dual Cell Signal Processor (DCSP) Board* to control and monitor the flow valve, measure the conductivity of the water in the IC and TC cells, and monitor the temperature of both cells and the manifold.

I/O CONTROLLER BOARD

(On-Line and Portable TOC Analyzers Only)

Figure 13: The I/O Controller Board

The *I/O Board* is an optional configuration for *On-Line and Portable TOC Analyzers*. This board provides three 4-20 mA current loop analog outputs, six alarm relay outputs, and one binary input to remotely control the start and stop of analysis.

SYSTEM OVERVIEW

The three 4-20 mA current loop analog outputs are independently isolated, so they may be connected to different remote locations [(such as multiple industrial control systems (ICS))] without causing inadvertent ground loops.

SINGLE-CELL SIGNAL PROCESSOR BOARD

(Laboratory and Portable TOC Analyzers Only)

Figure 14: The Single-Cell Signal Processor Board

The *Single Cell Signal Processor (SCSP) Board* is available as an optional configuration in *Laboratory and Portable TOC Analyzers*. This board measures the conductivity of the incoming water sample.

Touch Panel Display

The Analyzer has a 7-in. diagonal touch panel display. This color touch panel consists of a Wide Video Graphics Array (WVGA) liquid crystal display (LCD), with a light emitting diode (LED) backlight and a resistive-touch panel. Use this touchscreen display to navigate through the Analyzer's intuitive menu-driven interface. Simply touch the screen with your finger in a touch-and-lift motion. You can operate the resistive-touch panel even when you are wearing laboratory gloves.

Radio Frequency ID (RFID)

The Analyzer uses a Radio Frequency ID (RFID) antenna to obtain and track data from each Acid and Oxidizer reservoir cartridge. The antenna is located on the inside floor of the Analyzer near the front of the syringe assemblies. The RFID collects the following information from the labels on reagent cartridges sold by GE Analytical Instruments⁷:

- Reagent type (Acid or Oxidizer)
- Lot number
- Part number
- Initial and remaining volume
- Manufactured date
- Expiration date

The Analyzer uses this information to automatically track the remaining volume, based on the number of syringe extractions. You can view the remaining Acid and Oxidizer level indicators on the *Home* screen. (See [“Viewing Consumables Levels” on page 128.](#)) The Analyzer also reminds you to replace each reagent reservoir by displaying a Warning message at the top of the screen when each reagent level reaches 10% of its original capacity, and an Error message when the reservoir reaches 5% capacity. For additional information, refer to [“Warning and Error Messages” on page 167.](#)

⁷. GE Analytical Instruments directs operators to ONLY use reagents manufactured and sold by GE Analytical Instruments in the Analyzer, as these reagents and their cartridges have been designed for optimal operation and sampling results. The RFID does NOT read data from any other manufacturer's label, and therefore will not be able to automatically track expiration volumes or other data. If using other manufacturer's reagents, you can manually enter the installation date on the *Consumables* tab on the *Maintenance* screen, however, GE Analytical Instruments cannot guarantee optimal Analyzer operation or sampling results.

SYSTEM OVERVIEW

WARNINGS
<p>Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</p>
<p>This device complies with Part 15 of the FCC Rules & Industry Canada license-exempt RSS standards. Operation is subject to the following two conditions:</p> <ol style="list-style-type: none">(1) This device may not cause harmful interference, and(2) This device must accept any interference received, including interference that may cause undesired operation.
<p>The RFID antenna is a Part 15 & RSS-210 - Class A digital device: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</p>
<p>This equipment complies with FCC electromagnetic radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum separation distance of 20cm (7 in.) between the RFID antenna and your body. The antenna is located on the inside floor of the Analyzer near the front of the syringe assemblies.</p>



AVERTISSEMENT
<p>Les changements ou modifications à la radio RFID non explicitement approuvés par la partie responsable de la conformité peuvent annuler l'autorité de l'utilisateur à utiliser l'équipement.</p>
<p>Cet appareil est conforme à la Partie 15 de la réglementation FCC et des normes RSS exemptes de licence d'Industry Canada. Le fonctionnement est assujéti aux deux conditions suivantes :</p> <p>(1) Cet appareil ne peut pas provoquer d'interférences nocives, et (2) Cet appareil doit accepter toute interférence reçue, y compris l'interférence qui peut provoquer un fonctionnement indésirable.</p>
<p>L'antenne RFID est un appareil digital conforme à la partie 15 et RSS-210 - Classe A : Cet appareil a été testé et a été trouvé conforme avec les limites d'un appareil digital de classe A, selon la partie 15 des normes FCC. Ces limites sont conçues pour fournir une protection raisonnable contre l'interférence nocive lorsque l'appareil fonctionne dans un environnement commercial. Cet appareil produit, utilise et peut émettre de l'énergie de fréquence radio et, s'il n'est pas installé et utilisé selon le manuel d'instruction, il peut provoquer une interférence nocive aux communications radio. Le fonctionnement de cet appareil dans une zone résidentielle peut probablement provoquer des interférences nocives et, dans ce cas, l'utilisateur devra corriger l'interférence à ses propres frais.</p>
<p>Cet appareil est conforme aux limites d'exposition de radiation électromagnétique FCC établies pour un environnement non contrôlé. Cet appareil doit être installé et utilisé avec une distance de séparation minimum de 20cm (7 pouces) entre l'antenne RFID et le corps. L'antenne est située à l'intérieur du fond de l'analyseur à proximité de la partie avant de la seringue.</p>

OPTIONAL CONFIGURATIONS

The following optional configurations and accessories (including software) are available for the [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#):

Configurations

- Sample Conductivity
- [Two-Stream Inlet](#)
- [Inorganic Carbon Remover \(ICR\)](#)

SYSTEM OVERVIEW

- Turbo Operation Mode

Accessories (including software)

- Printer
- GE Autosampler with Sievers DataPro Software
- Sievers DataGuard Software
 - DataGuard Software for DataPro
 - Sievers DataGuard Software for M-Series Analyzers

Sample Conductivity

(Laboratory and Portable TOC Analyzers Only)

The [Sievers M9 and M9^e Laboratory and Portable Analyzers](#) Sievers M5310 C Laboratory and Portable TOC Analyzers can be configured to include a conductivity cell to measure and report the amount of conductivity in your samples. The conductivity cell is located at the beginning of the IC sample flow path and can detect a raw conductivity range between 0.01 - 35 $\mu\text{S}/\text{cm}$. Pharmaceutical customers will find this range to meet USP Chapter <645> conductivity measurement. For additional conductivity specifications, refer to Chapter 2, "02-00_System Specifications.fm."

Two-Stream Inlet

(On-Line and Portable TOC Analyzers Only)

The Sievers M5310 C Laboratory and Portable TOC Analyzers are available with a two-stream sample line connection to the Analyzer's sample inlet port(s). The two-stream inlet option enables efficient sampling of two independent sample sources, without the need to alter the initial inlet setup.

Just select one of the two streams to sample at a time using the *Setup* screen, and run the sample analysis for this stream. You can save one or more methods for Stream 1 and one or more methods for Stream 2 (each with unique settings) to use again. You can then easily switch between streams by just selecting the stream and method, and without having to re-plumbing the inlet.

Inorganic Carbon Remover (ICR)

To reduce high levels of inorganic carbon (IC) in sample streams with high IC/TOC ratios before measurement, GE Analytical Instruments offers an optional Analyzer configuration containing an inorganic carbon remover (ICR) for more accurate results. Typically, if the TOC is 10% or less of the IC concentration, the ICR is required. For example, if the IC is 1 ppm, then use the ICR if the TOC is 100 ppb or less for accurate TOC measurements. The Analyzer will calculate the TOC/IC ratio for each measurement. If this ratio is less than 0.1, the Analyzer issues a *Warning* message on the Touch Panel screen, which can also be viewed on the *Warnings and Errors* list. You can bypass the ICR at any time, as needed, using the *ICR On/Off* setting located on the *Modify On-Line Method* screen.

The ICR consists of a Teflon[®] degassing module, a vacuum pump, and a carbon-and-soda lime trap. In the sampling process, the Analyzer introduces the sample flow into the Analyzer and acid is added to the sample as usual. The stream is then directed through the ICR's Teflon degasser. Carbon dioxide produced from the reaction of bicarbonate and carbonate with acid is removed from the sample stream by the vacuum. The sample is then returned to the Analyzer and is directed by the stream splitter for measurement of IC and TC. Approximately 98% of the IC is removed at concentrations up to 25 ppm. The activated carbon-and-soda lime trap prevents contamination of the sample stream from organic compounds and CO₂ in the atmosphere.

Turbo Operation Mode

A Turbo Sampling Mode is available as an optional configuration to Sievers M9 and M9^e TOC Analyzers [Sievers M5310 C TOC Analyzer](#). This turbo mode is well suited to a wide range of reclaim water applications where quick process control feedback is required. The Turbo feature provides an expanded range of 0.20–10,000 ppb. TOC, IC, and TC measurements are updated every four seconds, assuring that even short-lived excursions are captured.

OPTIONAL ACCESSORIES

Point-of-Service (POS) Printer

The Analyzer is designed to work with the following USB point-of-service (POS) printers. Each is available as an optional accessory directly from GE Analytical Instruments:

- Bixolon/Samsung SRP-275
- Citizen CD-S500A
- Epson TM-722OD

SYSTEM OVERVIEW

GE Autosampler and Sievers DataPro Software

(Laboratory and Portable TOC Analyzers Only)

[Any M9e electronics industry application?](#)

The GE Autosampler system can be used to automatically transfer up to 120 vial samples from the unit's vial rack(s) into the sample inlet port on a [Sievers MC9 and MC9^e Laboratory or Portable TOC Analyzer](#) [Sievers M5310 C Laboratory or Portable TOC Analyzer](#). Sampling results are displayed and stored on your computer via the Sievers DataPro Software.

This optional system for high-volume laboratory applications consists of the following:

- GE Autosampler
- Sievers DataPro Software, running on a your computer with a Windows[®] Operating Systems [Windows XP (SP2 or higher), Windows 7, Windows 8, Windows Server 2008, or Windows Server 2012]

[7/8 Vamsi is providing which systems are supported on both 32-bit and 64-bit systems.](#)

- [Sievers MC9 and MC9^e Laboratory or Portable TOC Analyzer](#) or [Sievers M5310 C Laboratory or Portable TOC Analyzer](#)
- Printer (optional)

SIEVERS DATAPRO SOFTWARE

Sievers DataPro Software integrates the GE Autosampler with [Sievers M9 and M9^e TOC Analyzers](#) [the Sievers M5310 C TOC Analyzer](#), giving you the ability to operate the GE Autosampler with up to two Analyzers. The software runs on the following Microsoft operating systems with a familiar Windows interface design:

- Windows XP (SP2 or higher)
- Windows 7
- Windows 8
- Windows Server 2008
- Windows Server 2012

[7/8 Vamsi is providing which systems are supported on both 32-bit and 64-bit systems.](#)

Automated User and System Protocols

You can use the Sievers DataPro Software to create automated customer user protocols and summary reports for running sample analyses. The following ready-to-use system protocols are also included in the software:

- [Single-Point Calibration \(250 ppb M9 only-Is DP used by M9e market?\), 1 ppm, 5 ppm, 25 ppm, 50 ppm\)](#)
- [Turbo Single-Point Calibration](#)
- Multi-Point Calibration
- Single-Point Verification ([250 ppb](#), 1 ppm, 5 ppm, 10 ppm, 25 ppm, 50 ppm)
- [Turbo Single-Point Verification](#)
- System Suitability
- Autoreagent Calibration ([not in M5310 C?](#))
- Autoreagent Verification
- TC/IC Cell Conductivity Autozero
- Accuracy/Precision ([250 ppb](#), 1 ppm, 2 ppm, 5 ppm, 25 ppm, 50 ppm)
- Autoreagent Verification

Additionally, the following system protocols for Performance Qualification (PQ) activities are available with the optional Sievers M9 TOC Analyzers Validation Package, Volume II:

- [Accuracy and Precision \(1 ppm, 2 ppm, 5 ppm, 10 ppm, 25 ppm, 50 ppm\)](#)
- [Linearity](#)
- [Robustness](#)
- [Specificity](#)
- [JP](#)
- [LOD/LOQ??](#)
- [Validation?](#)

SECURE DATA

To ensure the integrity of all protocol results, ALL result files are fixed and cannot be altered. You can then save the data to a network (or a static media such as CD or tape archive) to provide the secure environment required by the FDA.

Sievers DataPro Software also supports 21 CFR Part 11 TOC Analyzer compliance by providing secure data, audit information, the ability to save results to a static media.

SYSTEM OVERVIEW

For additional information, refer to *Sievers GE Autosampler Installation Guide* and the *Sievers M Series DataPro Software + DataGuard Software User Guide*.

DataGuard Software

Sievers DataGuard Software for DataPro⁸ and Sievers DataGuard Software for M-Series Analyzers⁹ are available options offering a complete 21 CFR Part 11 TOC Analyzer compliance solution using the following:

- Administratively controlled user-level security control
- Electronic signatures that assign ownership to all controlled system actions
- An audit trail system that records system changes including file creation, viewing, and modification

For additional information, refer to the *Sievers M Series DataPro Software + DataGuard Software User Guide*.

8. Sievers DataGuard Software for DataPro is compatible with Sievers *Laboratory and Portable TOC Analyzers ONLY*.
9. [Sievers DataGuard Software for M-Series Analyzers](#) can be used directly with ALL? [Laboratory and Portable TOC Analyzers in configurations not using a GE Autosampler.](#)

4

INSTALLATION



OVERVIEW


This chapter provides installation instructions for the [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#), and applies to ALL models (*On-Line, Laboratory, and Portable*), except where noted.

An [interior overview diagram of each Analyzer model](#) is provided for your reference in Chapter 8, "Maintenance." If you need additional assistance, contact GE Analytical Instruments Technical Support at 303.444-2009 or 888.245.2595. Technical Support in the United Kingdom is available at 44 (0) 161.864.6800. In other countries, visit www.geinstruments.com to locate your representative. Installation and training by a qualified service technician is also available.

INSTALLATION INSTRUCTIONS

Perform the following steps, in the listed order, to install and configure the Analyzer for operation.

STEP 1: UNPACK AND INSPECT THE ANALYZER

Warnings	
	<p>Shipping boxes containing an Analyzer with built-in optional components may weigh over 40 lb—necessitating a two-person lift technique when handling. Such boxes are labeled with this warning, supporting OSHA standards intended to protect employees from injury.</p> <p>We recommend that our customers use a two-person lift, and GE requires that ALL employees use this handling technique when lifting items weighing over 40 lb.</p>



NOTE: Save ALL original packing materials! If you need to return the Analyzer now or in the future, you MUST pack it in the ORIGINAL carton to ensure that no damage occurs during shipment. Also, always insure the Analyzer in any return shipments.

Unpack the shipping carton(s) and verify that the shipment contains the following [\(Accessories Kits WIP\)](#):

- [Sievers M9 and M9^e TOC Analyzers Operation and Maintenance Manual](#) [Sievers M5310 C TOC Analyzer Operation and Maintenance Manual](#)
- PVC tubing (*On-Line and Portable TOC Analyzers Only*)
- Accessory Kit (*Laboratory TOC Analyzer Only*)
 - Teflon tubing, with fittings
 - Dispensing bottle (with attached filling fixture), and elbow fitting
 - Shut-off Fitting, 1/4"
 - C-flex tubing
 - 1/4" Teflon tubing with in-line filter (GEAI or customer provided?)
- Accessory Kit (*On-Line and Portable TOC Analyzers Only*)
 - Tubing with filter
 - Teflon tubing with fittings
 - Dispensing bottle (with attached DI reservoir filling fitting)
 - Shut-off fitting, 1/4"
 - C-flex tubing

- 1/4" Teflon tubing with in-line filter (GEAI or customer provided?)
- Waste outlet fitting
- Certificate of Calibration
- *DataGuard* Activation key (optional)
- Reagents carton (shipped separately)

Additional Equipment Requirements

You will also need to provide the following for the installation process:

- ESD protection
- 3/4" OD plastic tubing for the waste outlet (in kit or customer supplied??)
- Ethernet cable (optional)

(On-Line TOC Analyzer Only)

- Conduit connector (strain relief hubs) for power conduit wiring
- Sealing washer for conduit connector
- Ring terminal for AC conduit ground wire, 16-14 American Wire Gauge (AWG)
- Insulated wire for AC power conduit¹ (18-12 AWG), rated to 300 Volts. Strip length should be 8-9 mm (.33 in.) (Metallic conduit is required for the Analyzer to meet CE Mark electrical requirements.)
- External circuit breaker or switch that disconnects both poles of the supply voltage, rated appropriately
- Strain relief hub (conduit connector) and washer for I/O wiring
- Analog (4-20 mA) recorder (optional)
- Wire for 4-20 mA and alarm output (28-16 AWG), rated to 300 Volts

(On-Line TOC Analyzer Only)

- Mounting hardware to support the Analyzer — Mounting bolts should support four times the weight of the Analyzer [Total of 64.20 kg (141.50 lb)]. For more information, see ["Step 3: Select a Location for the Analyzer."](#)

(Portable TOC Analyzer Only)

- Analog (4-20 mA) recorder (optional)

¹ Metallic conduit is required for the Analyzer to meet CE Mark electrical requirements.

STEP 2: COMPLETE THE IDENTIFICATION RECORDS

Complete the Identification Records information on [page 4](#) by recording the Analyzer serial number and the date of installation. The serial number is located on the rear outside panel of *Laboratory and Portable TOC Analyzers*, and on the left outside panel of the *On-Line TOC Analyzer*.

STEP 3: SELECT A LOCATION FOR THE ANALYZER

The enclosure for the On-Line TOC Analyzer is rated IP 45 to withstand the hazards of industrial process environments. [The Portable TOC Analyzer is rated \(a WIP\) IP 21 for incidental exposure to water.](#)

Select a location away from direct sunlight and extreme temperatures. Avoid operating at elevated temperatures [greater than 40 °C](#), which can prevent proper operation. Also avoid operating at temperatures [lower than 10 °C](#), which can cause errors in the measurements. [Make sure that the back of the Analyzer is protected from water spray](#) to ensure the electrical and data connections remain dry.

In addition to these general instructions, refer to the sections that follow for information pertaining to the specific model of your Analyzer.

Sievers On-Line TOC Analyzer

Sievers M9 or M9^e On-Line TOC Analyzers are designed to be mounted on a wall or support stand. When selecting the location, mount the Analyzer so that the display screen is approximately at eye-level. For illustrations of required clearances, see Figures [15](#), [16](#), and [17](#). Allow a minimum of 5 cm clearance between the back of the Analyzer and the wall for heat dissipation. Plan for 30.5 cm of clearance on the sides, top, and bottom of the Analyzer for the plumbing and electrical connections. This clearance provides for the proper circulation for temperature and humidity control.

You will need to provide hardware for mounting the Analyzer on a wall or instrument rack, as hardware should be selected based on site-specific circumstances. Choose mounting bolts to support four times the weight of the unit² [total = 65.68 kg (144.80 lb)].

². 4 x 26.42 kg = 65.68 kg (4 x 35.2 lb = 144.80 lb)

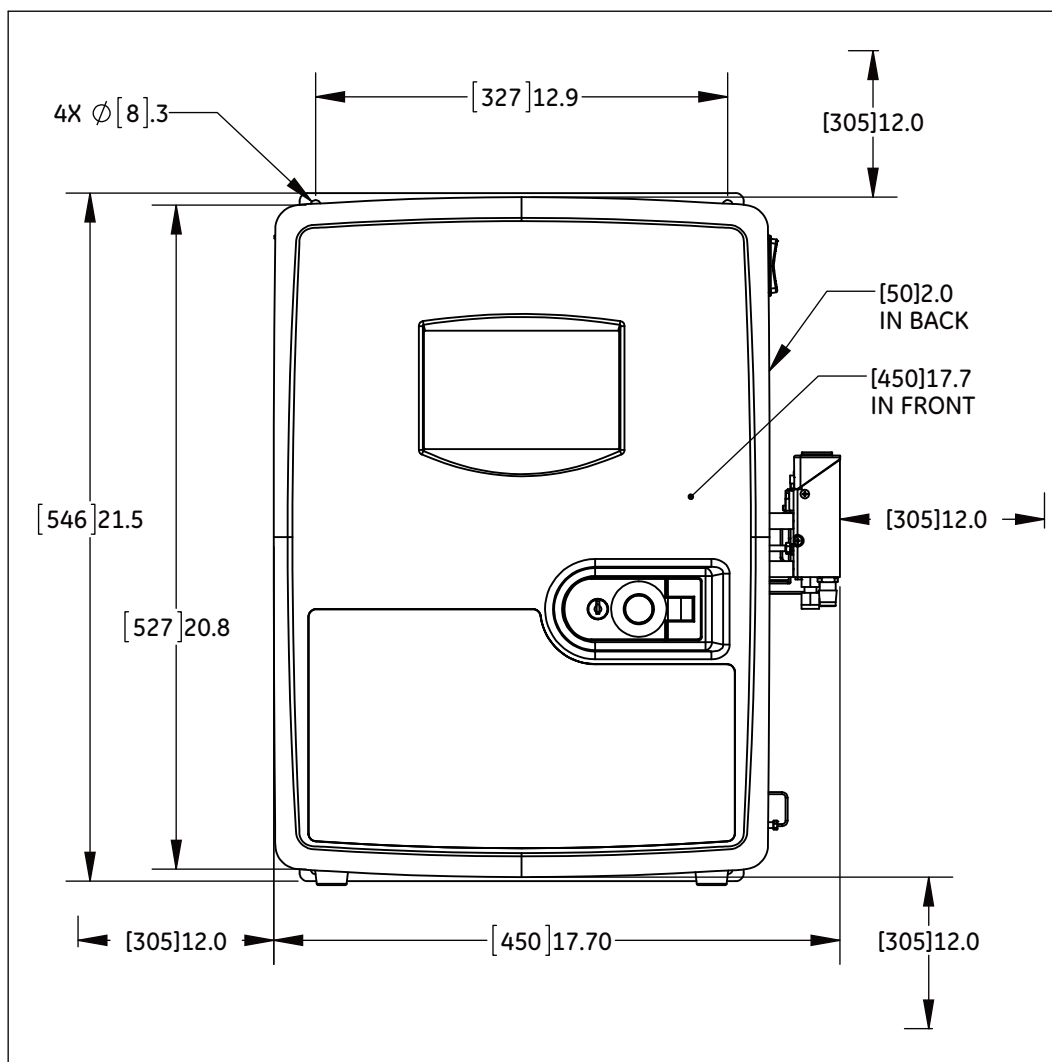


Figure 15: Required Installation Clearances — On-Line TOC Analyzer

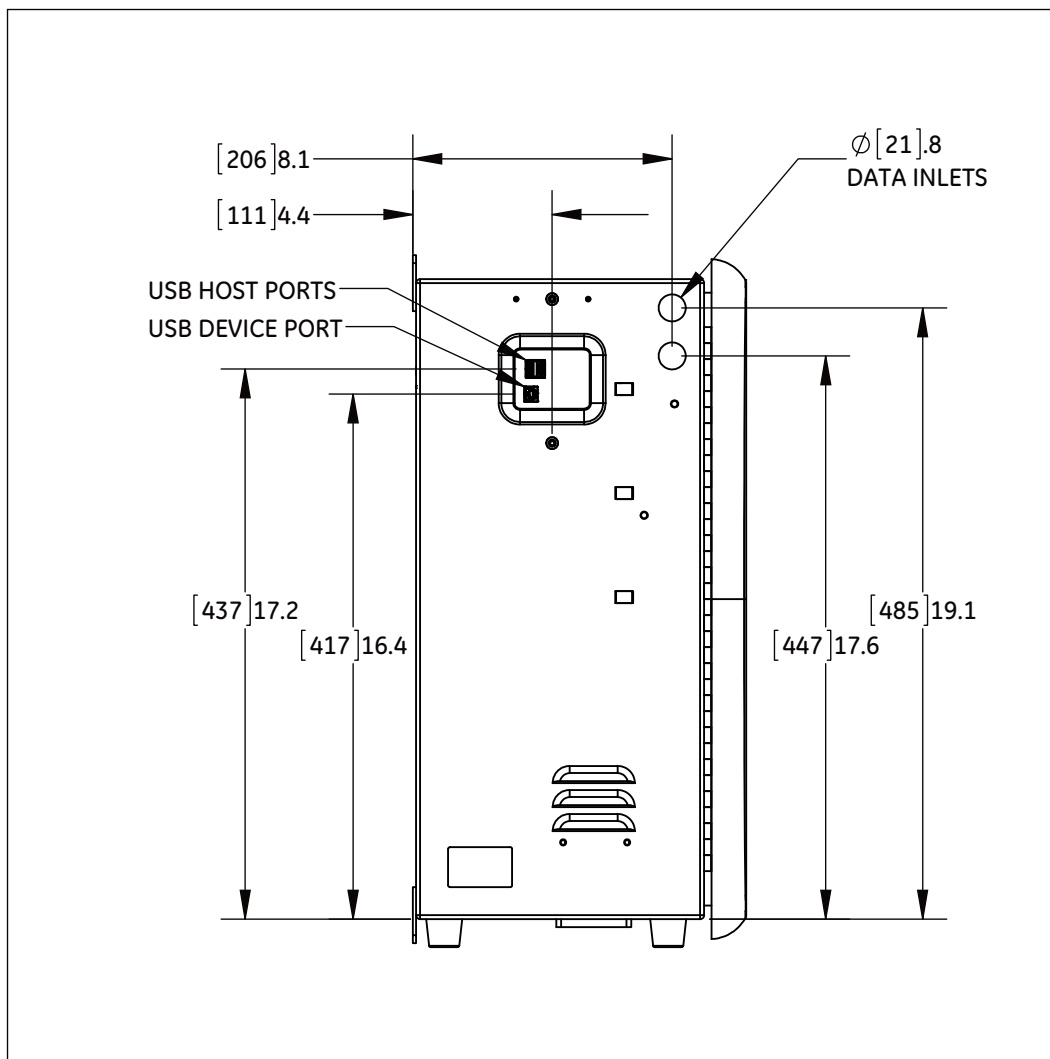


Figure 16: Left Side Dimensions – On-Line TOC Analyzer

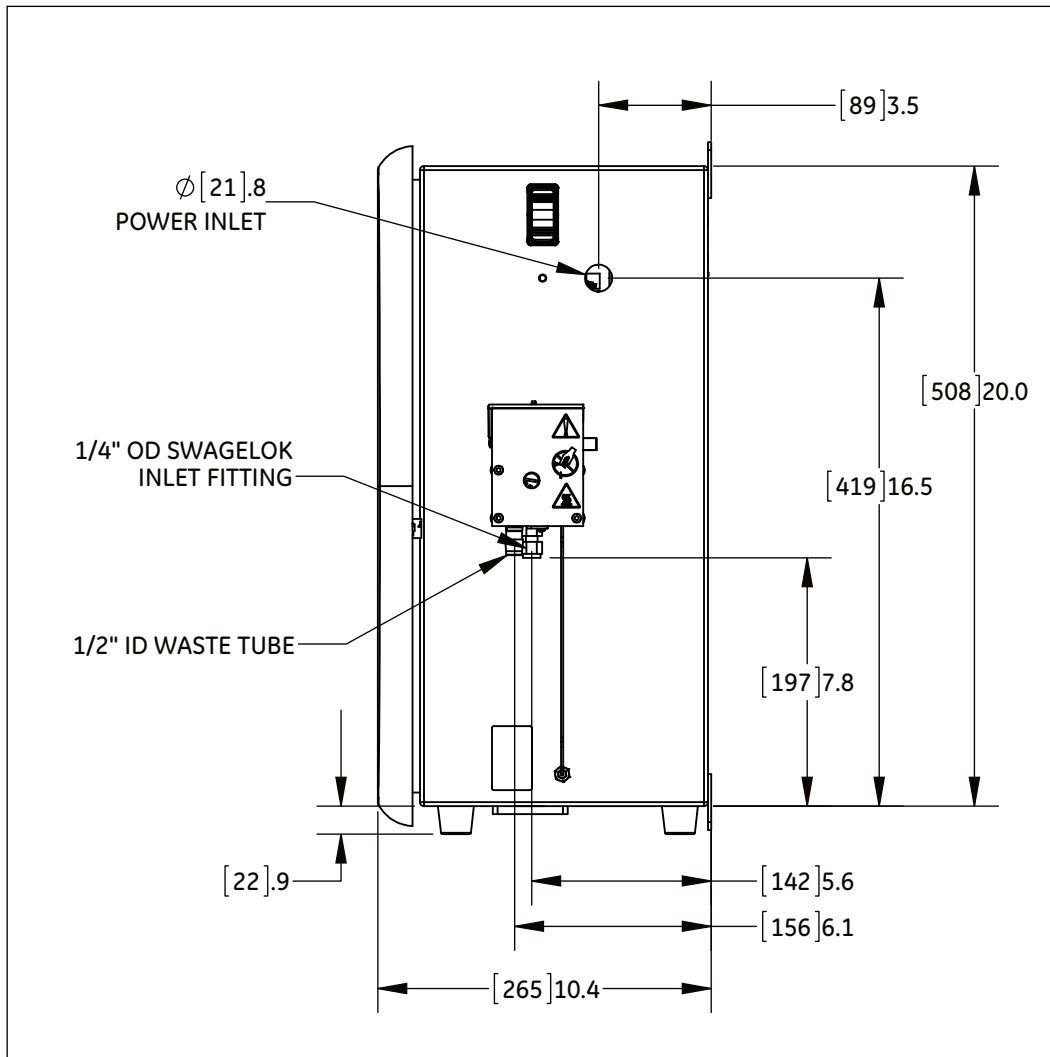


Figure 17: Right Side Dimensions – On-Line TOC Analyzer

Sievers Laboratory and Portable TOC Analyzers

The Analyzer is designed to be operated right-side up, resting on the rubber feet. Place the Analyzer on a clean, unobstructed surface that can accommodate the instrument's dimensions and weight. For information regarding the specific specifications for your Analyzer model, refer to the corresponding model section under Chapter 2, "System Specifications." . Also, for proper heat dissipation, ensure that 16 cm is available at the rear and on both sides of the Analyzer.

ON-LINE SAMPLING

For on-line sampling in the Portable TOC Analyzer, place the Analyzer within 3 m of the sampling port or beaker to be tested.


GE AUTOSAMPLER SYSTEM

If you will be using the Analyzer with an Autosampler system, allow approximately 1" of space between the GE Autosampler and Analyzer to ensure the proper functioning of both instruments. The front edge of the Autosampler should be parallel with the front edge of the Analyzer. Also, plan for room to accommodate a computer and (if applicable) a printer near the Analyzer and Autosampler. For more details, refer to the *GE Autosampler Installation Guide*.

STEP 4: INSTALL POWER AND I/O CONTROL WIRING

This section contains information about how to install power to the Analyzer. Both the *Laboratory and Portable TOC Analyzers* come supplied with power cords. The *On-Line TOC Analyzer* requires the installation of conduit to provide an external source of AC power, which is connected to the enclosure using a water-tight conduit connector. This type of electrical connection should be performed by a qualified electrician.

This section also includes instructions for installing I/O control wiring, including: I/O controller board connections, 4-20 mA outputs, alarm outputs, and binary remote start and stop.

Warning	
	To avoid damaging the DI water pump, Do NOT turn the Analyzer to <i>On</i> until Step 6: Install the DI Water System , after you have completed Steps 5-7 to ensure the DI water reservoir is filled and properly primed, as described in Step 6: Install the DI Water System .

The following step-by-step instructions are included for guiding the installation process:

- **Installing the Power Source**
 - Power Cord Installation (*Laboratory and Portable TOC Analyzers*)
 - Power Conduit Installation (*On-Line TOC Analyzer*)
 - *On* and *Off* Powering Guidelines
- **Installing I/O Control Wiring**

- I/O Controller Board Connections
- 4-20 mA Outputs
- Alarm Outputs
- Binary Remote Start/Stop

Installing the Power Source


Instructions for connecting to a power source follow. Proceed to the section that applies to your specific model of Analyzer:

- **Laboratory and Portable Analyzers** — [“Power Cord Installation”](#) section
- **On-Line Analyzers** — [“Conduit Installation”](#) section

POWER CORD INSTALLATION

(Laboratory and Portable TOC Analyzers Only)

The [Sievers M9 and M9^e Laboratory and Portable Analyzers](#) [Sievers M5310 C Laboratory and Portable TOC Analyzers](#) come supplied with power cords. Attach the connector end of the power cord into the connection labeled “Power” on the Analyzer, and then insert the plug end into a grounded power source. Make sure the cord is seated securely at both ends.

Warning	
	<p>The Analyzer requires an A/C mains supply of 100-240 volts, and requires the correct power cord for safe operation. ONLY use the power cord supplied in the Analyzer’s Accessory Kit with the Analyzer, which meets this A/C mains supply requirement.</p>

CONDUIT INSTALLATION

(On-Line TOC Analyzer Only)

The [Sievers M9 or M9^e On-Line TOC Analyzers](#) require [Sievers M5310 C On-Line TOC Analyzer](#) requires the installation of an external source of AC power connected to the enclosure using a water-tight conduit connector. The electrical connection MUST be performed by a qualified electrician. We recommend an external switch or circuit breaker to facilitate maintenance and servicing of the Analyzer. Install it near the Analyzer and clearly mark it as the disconnecting device for the Analyzer.

Warning



Electrical conduit should be installed by a qualified electrician. Also, before installing any wiring inside the Analyzer, make sure you are wearing ESD protection.

To wire the AC conduit

You will need to provide the following:

- Insulated wire for AC power conduit (18-12 AWG), rated to 300 Volts. Strip length should be 8-9 mm (.33 in.).
 - Metallic AC power conduit³ (optional)
 - Strain relief hub (conduit connector) and washer
 - Terminal ring for AC conduit ground wire, 16-14 American Wire Gauge (AWG)
 - External circuit breaker or switch that disconnects both poles of the supply voltage, rated appropriately (recommended)
1. Before working with any of the Analyzer's inside components, ensure that you are exercising ESD protection.
 2. Unlatch and open the door to the Analyzer (Push the release button first).
 3. Remove the electrical enclosure cover at the top of the instrument by using a Phillips-head (crosshead) screwdriver #2 to loosen the two captive screws securing the cover.
 4. Remove the cap from the pass-through port located on the right side-panel of the Analyzer. Squeeze the conical side of the cap, and then push it outside of the Analyzer.
 5. Route the AC power conduit¹ through this same pass-through port, and secure a strain relief hub (conduit connector) and washer to the conduit and Analyzer bulkhead.
 6. Connect the conduit *Line* (brown or black wire) to the bottom of the Terminal block in the left port, and connect the *Neutral* (blue or white wire) in the right port. Refer to [Figure 18: Wiring AC Power Conduit](#).

When connecting the wire to the terminal block, loosen the screws on the front of the block and then insert the wires as designated. Tighten the screws to secure the wires.

3. Metallic conduit is required for the Analyzer to meet CE Mark electrical requirements

7. After connecting the wires, pull on each connection gently to make sure the connection is secure.
8. Attach a terminal ring to the grounding conductor (green OR green/yellow wire), and connect it to the ground stud. [Figure 18: Wiring AC Power Conduit.](#)
9. Replace the electrical enclosure cover at the top of the instrument, and using a Phillips-head (crosshead) screwdriver #2 to tighten the two captive screws for securing the cover.
10. Close and latch the door to the Analyzer. (Or, proceed directly to the next section to install the I/O control wiring.)

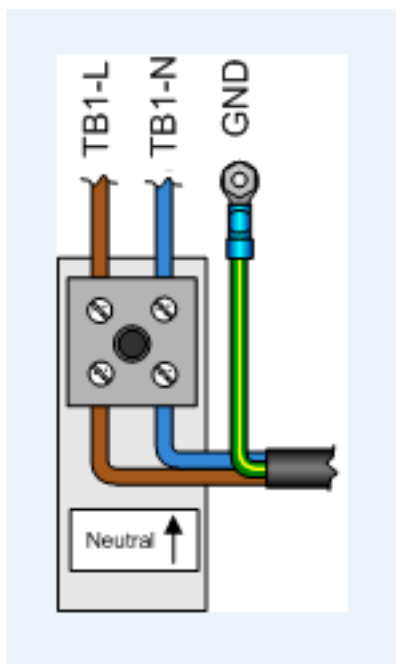


Figure 18: [Wiring AC Power Conduit](#)

Installing I/O Control Wiring

(On-Line and Portable TOC Analyzers Only)

An I/O Controller Board is available as an option in the [Sievers M9 or M9^e On-Line and Portable TOC Analyzers](#) [Sievers M5310 C On-Line and Portable TOC Analyzers](#). With this board, you can install up to three 4-20 mA analog outputs and four alarm outputs on the Analyzer. Additionally, you can wire one binary input connection for communicating remote start and stop commands to the Analyzer.

Warning



The output and alarm connections should be installed by a qualified electrician. Also, before installing any wiring inside the Analyzer, make sure you are wearing ESD protection.

The J4, J5, and J6 terminal blocks contain the following:

- **(J4) Serial and 4-20 mA Outputs 1-3** — Use these outputs to record Analyzer data. The analog output is calibrated at the factory prior to shipping. Each pin has a power isolation level of 500 V and is individually isolated. The maximum 4-20 mA load is 600 ohms.
- **(J5) Binary Input** — Use these connections to execute “Start Analysis” and “Stop Analysis” commands to the Analyzer from a remote location, such as a Process Logic Control System or Center (PLC).
- **(J6) Alarm Output 1-4** — Use these outlets for alarm outputs. Each pin has a power isolation level of 500 V and is individually isolated. The maximum load for the alarm ports is 30 VDC at 1.0 A or 125 VAC at 0.5 A.

INSTALLING SERIAL AND 4-20 MA ANALOG OUTPUTS

This section includes step-by-step instructions for wiring 4-20 mA and alarm connections. [Pinout Tables and Wiring Diagrams](#) are also provided for your reference.

To install 4-20 mA and alarm outputs — *On-Line TOC Analyzer*

Use this instruction to install 4-20 mA and alarm output connections on the I/O board inside the On-Line TOC Analyzer.

You will need a small flat-blade screwdriver and wire to complete this procedure. The wire should be 28-16 AWG, rated to 300 Volts. The strip length for each pin should be 8-9 mm (.33 in).

1. Before working with any of the Analyzer’s inside components, ensure that you are exercising ESD protection.
2. To access the I/O board, open the door to the Analyzer (push the release button and then pull the tab to unlatch). Remove the enclosure cover located on the back of the door by using a Phillips-head (crosshead) screwdriver #2 to loosen the two captive screws securing the cover. The I/O board is located behind the inside panel of the Analyzer’s door, and the board is mounted in the lower-left area of the door.
3. Remove the cap from the pass-through cut-out (labeled “XXX” Decision not final), located on the left side-panel. Squeeze the conical side of the cap, and then push it out of the Analyzer.

4. Route the cables to the terminal blocks through this pass-through port. Terminal block J4 is designated for 4-20 mA outputs and terminal block J6 is for the alarm outputs.

To install the wires in a terminal block, first remove it from the I/O board. Note the orientation of the terminal block before removing it, and then firmly grasp the terminal block and pull it straight out from the terminal header on the board.

5. Identify the correct pin position for each wire you are installing according to Tables 2 and 3.
6. Use a small, flat blade screwdriver to completely loosen the screw for that pin. (The screws are located underneath the terminal block.) Insert the wire into the clamp for the pin (located on the side of the terminal block), and then tighten the pin screw to secure the wire.
7. Repeat steps [5](#) and [6](#) for each pin you will be using.
8. Gently pull on each connection to make sure the connection is secure.
9. Plug the terminal block into the terminal header on the I/O board.
10. Repeat steps [5](#) through [9](#) for each terminal block, as needed.

To install 4-20 mA and alarm outputs — *Portable TOC Analyzer*

You will need a small flat-blade screwdriver, a #2 Phillips head screwdriver, and wire to complete this procedure. The wire should be 28-16 AWG, rated to 300 Volts. The strip length for each pin should be 8-9 mm (.33 in).

1. Before working with any of the Analyzer's inside components, ensure that you are exercising ESD protection.
2. To access the I/O board, detach the protective cover from the rear of the instrument by removing the two Phillips-head screws.

The I/O board is mounted perpendicular to the back of the Analyzer, and the terminal blocks extend outside the instrument through cutouts in the housing. These terminal blocks are accessible from the back of the instrument and are labeled "Alarms," "Binary," and "4-20 mA."

3. To install the wires in a terminal block, first pull out the terminal block for ease in the installation process. Note the orientation of the terminal block before removing it, and then firmly grasp the terminal block and pull it straight out from the terminal header on the board.
4. Identify the correct pin location for each wire you are installing according to Tables 2 and 3.
5. Use a small flat-blade screwdriver to completely loosen the screw for that pin. The screws are located underneath the terminal block. Insert the wire into the clamp

- for the pin (located on the side of the terminal block), and then tighten the pin screw to secure the wire.
- Repeat steps [4](#) and [5](#) for each pin you will be using.
 - Gently pull on each connection to make sure the connection is secure.
 - Plug the terminal block into the terminal header on the I/O board.
 - Repeat steps [3](#) through [8](#) for each terminal block, as needed.
 - Replace the Analyzer's enclosure panel, making sure that the magnets are secured.

PINOUT TABLES AND WIRING DIAGRAMS

Reference the following information, as needed, when wiring 4-20 mA outputs and alarms. [Allen providing new wiring diagrams from Mike Cunningham.](#)

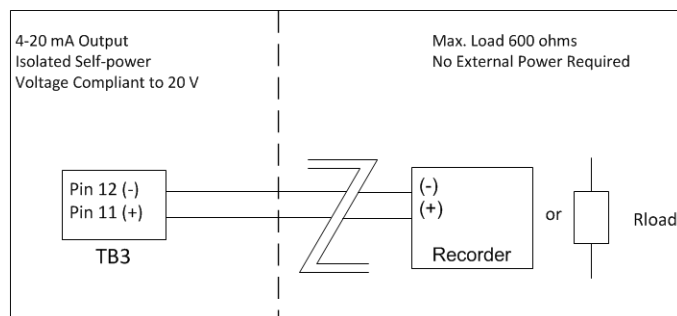


Figure 19: Wiring 4-20 mA Connections

J4 Board Wiring

The 4-20 mA analog outputs are isolated from system ground. You can configure the analog outputs to output IC, TC, or TOC.

The 4-20 mA outputs are also individually isolated from each other, and therefore may be connected to multiple industrial control systems (ICS) with differences in ground potential.

TABLE 2: SERIAL AND 4-20 mA OUTPUTS (J4)

<i>Pin Number</i>	<i>Output</i>
1	#1 4-20 mA (Return) -
2	#1 4-20 mA (Out) +
3	#2 4-20 mA (Return) -
4	#3 4-20 mA (Out) +
5	#3 4-20 mA (Return) -
6	#3 4-20 mA (Out) +

J6 Board Wiring

The *alarm outputs* are isolated from system ground and from each other. You can configure each of the alarm outputs.

The *outputs* are implemented by relays, which are intended for low voltage use only. The maximum switching capacity (resistive load) is 62.5 VA, 33 Watts.

TABLE 3: ALARM OUTPUTS (J6)

Pin Number	Outputs
1	Alarm 1 (Common) output
2	Alarm 1 (NC*) output
3	Alarm 1 (NO*) output
4	Alarm 2 (Common) output
5	Alarm 2 (NC*) output
6	Alarm 2 (NO*) output
7	Alarm 3 (Common) output
8	Alarm 3 (NC*) output
9	Alarm 3 (NO*) output
10	Alarm 4 (Common) output
11	Alarm 4 (NC*) output
12	Alarm 4 (NO*) output

* NC = normally closed, NO = normally open

INSTALLING THE REMOTE START (BINARY INPUT) CONNECTION

The remote start (binary input) connection is intended to execute “Start Analysis” and “Stop Analysis” commands to the Analyzer from a remote location, such as a Process Logic Control System or Center (PLC).

J5 Board Wiring

The J5 terminal block is used for the binary input. Refer to Table 20, “Wiring Option for Binary Input Using Analyzer’s Internal Supply for the pin references.

The *binary start/stop analysis input* is isolated from system ground. You can configure the polarity of operation.

The + *input* should be supplied with a voltage from +11 volts to +24 volts and the -*input* should be controlled by a relay or an open collector transistor.

TABLE 4: BINARY INPUTS (TERMINAL BLOCKJ5)

Pin Number	Output
1	+24 V
2	In+
3	In-
4	GND



NOTE: The +24 volts (0.5A max) and system ground are provided for local use only and are not intended for connections more than 15 ft away from the analyzer.

To install the binary input connections

You can wire the binary input connection in a variety of ways, such as the examples shown in [Figure 20: Wiring Option for Binary Input Using Analyzer's Internal Supply](#) and [Figure 21: Wiring Option for Binary Input Using External Supply](#).

Before using the binary input connection, you must activate the *Binary Input* feature in the Analyzer firmware. You will do this later during the installation process in ["Step 10: Configure Basic Analyzer Settings"](#) on page 98.



NOTE: Make sure to confirm the correct signal strength before setting the Binary Input to On in order to avoid unexpectedly starting or stopping analysis.

Figure 20: [Wiring Option for Binary Input Using Analyzer's Internal Supply](#)

Figure 21: [Wiring Option for Binary Input Using External Supply](#)





STEP 5: INSTALL THE REAGENT CARTRIDGES

The oxidizer and acid reagents are shipped separately from GE Analytical Instruments in specific packaging for safe transit. Carefully read the attached MSDS sheets prior to opening the packaging. You will find two reagent cartridges inside the packaging, one clearly identified as “OXIDIZER (15% ammonium persulfate and water)” and one as “UN 1805 PHOSPHORIC ACID SOLUTION.”

After you install these reagent cartridges, the RFID antenna obtains and tracks data from each label attached to the Acid and Oxidizer reservoir cartridges, including: Reagent type (Acid or Oxidizer), lot number, part number, initial and remaining volume, manufactured date and expiration date. The Analyzer uses this information to automatically track the remaining volume, based on the number of syringe extractions. For additional information, see [“Radio Frequency ID \(RFID\)” on page 57.](#)

The following instructions are specific to the Analyzer model. Refer to the applicable section for your instrument:

- [To install the reagent cartridges—Laboratory and Portable TOC Analyzers](#)
- [To install the reagent cartridges—On-Line TOC Analyzer](#)

Know These Safety Warnings	
	Hazardous reagents (ammonium persulfate and phosphoric acid) are used in the Analyzer. Before installing a reagent, read the corresponding Material Safety Data Sheet (MSDS) for proper handling precautions, and spill or leak procedures. The MSDS are contained in the pouch located on the outside of the reagent shipping box.
	Installation of reagents and most Analyzer maintenance requires access to the inside of the Analyzer. To avoid potentially dangerous shock—BEFORE opening the Analyzer—first stop any analysis, stop the operating system (using HALT SYSTEM button in the Analyzer’s firmware), and then turn <i>off</i> power and disconnect from the power supply.
	To avoid exposure to the chemical reagents, wear acid-resistant gloves and safety goggles.
	Reagent containers are for single-use only. Do NOT refill. Any refilling or reusing of reagent containers will void all Analyzer and parts warranties, and nullify any performance claims.

To install the reagent cartridges—*Laboratory and Portable TOC Analyzers*

1. Before opening and working with the chemical reagents, and working inside the Analyzer, ensure that you are:
 - Ensure that Analyzer switch is *Off* and the power cord is disconnected. (You MUST always Halt the firmware before turning the power switch to Off.)
 - Wearing the recommended personal protective equipment (PPE), as outlined in the previous Safety Warning
 - Exercising electrostatic discharge (ESD) protection
2. Open the Analyzer, as follows:
 - *Laboratory TOC Analyzer* — Remove the right side panel. Stabilize the instrument with one hand on the top panel, and then grasp the edge of the right side panel from the back of the Analyzer. Pull the entire panel away from the instrument. (The panel is attached to Analyzer by magnets.)
 - *Portable TOC Analyzer* — Remove the right side panel. Stabilize the instrument with one hand on the top handle, and then grasp the edge of the panel from the back of the Analyzer. Pull the entire right panel away from the instrument. (The panel is attached to Analyzer by magnets.)
3. Locate and remove the reagent tray, and set it next to the Analyzer for the assembly process. Position the labeled side toward you with the cut-out end pointed toward the left (the front of the Analyzer).

The tray is attached by magnets to the RFID antenna⁴ (rectangular) cover, which is located on the floor of the unit.
4. Remove each reagent container from its shipping packaging.
5. Stand each container on the long end next to the Analyzer for this connection process.

Place the *Oxidizer* container in front position (for the convenience of earlier replacement anticipated by typical consumption timing).
6. Locate the acid supply line, indicated by the *Acid* label. Attach the supply-line PEEK nut to the inlet at the top of the acid reagent container, and then tighten finger-tight. Verify if Engineering is adding Acid label.

(Delete later when new cartridge is implemented.) Slide the valve on the acid container to the open position by pushing the green button all the way in. Refer to the labeling on the container for proper positioning.
7. Locate the oxidizer supply line, indicated by the *Oxidizer* label. Attach the supply-line PEEK nut to the oxidizer container and tighten finger-tight.

⁴. Radio Frequency ID used to track expiration dates off the reagent containers.

- (Delete later when new cartridge is implemented.) Slide the valve on the oxidizer container to the open position by pushing the green button all the way in. Refer to the labeling on the container for proper positioning.
- Verify that the labeled side of the reagent tray is facing you and the cut-out side of the tray is facing left toward the front of the Analyzer.
 - Place the *Acid* container into the back compartment of the reagent tray, and then place the *Oxidizer* container into the front compartment of the reagent tray. Make sure to position the tubing-end of each container toward the cut-out side of the tray.
 - Now, lift the entire reagent tray (with the *Acid* and *Oxidizer* containers in place), and set the tray back on the RFID antenna⁵ (rectangular) cover, which is located on the floor of the unit. The magnet feet of the tray fit into the corner grooves on the RFID cover. You will feel the magnets secure the tray into place.



NOTE: When installing the reagent tray, make sure the labeled side of the tray is facing you and the tubing-ends of the reagent containers are pointed left (toward the front of the Analyzer).

- You will flush the reagent syringes later in the installation process, as described in [“To flush the reagent syringes” on page 105](#).

To install the reagent cartridges—On-Line TOC Analyzer

- Before opening and working with the chemical reagents, and working inside the Analyzer, ensure that:
 - The Power switch is *Off* and the power cord is disconnected (*Laboratory and Portable TOC Analyzers*), or the Mains turned off (*On-Line TOC Analyzer*). (You MUST always Halt the firmware to turn off power to the Analyzer.)
 - You are wearing the recommended personal protective equipment (acid-resistant gloves and safety goggles).
 - You are Exercising electrostatic discharge (ESD) protection
- Open the door to the Analyzer. Push the release button and then pull the tab to unlatch the door.
- Loosen the thumbscrews on the reagent housing cover, which is located on the (lower front) floor of the Analyzer. Lift the cover straight up to remove, and then set aside the cover during the assembly process.
- Remove each reagent container from its shipping packaging.

⁵ Radio Frequency ID used to track expiration dates off the reagent containers.




4. Locate the acid supply line, indicated by the *Acid* label. Attach the supply-line PEEK nut to the inlet at the top of the acid reagent container, and then tighten finger-tight. Verify if Engineering is adding Acid label.
(Delete later when new cartridge is implemented.) Slide the valve on the acid container to the open position by pushing the green button all the way in. Refer to the labeling on the container for proper positioning.
5. Place the *Acid* container into the back compartment of the reagent tray, positioning the container horizontally with the tubing-end facing toward the right and open-side of the tray.
6. Locate the oxidizer supply line, indicated by the *Oxidizer* label. Attach the supply-line PEEK nut to the oxidizer container and tighten finger-tight.
(Delete later when new cartridge is implemented.) Slide the valve on the oxidizer container to the open position by pushing the green button all the way in. Refer to the labeling on the container for proper positioning.
7. Place the *Oxidizer* container into the front compartment of the reagent tray, positioning the container horizontally with the tubing-end facing toward the right and open-side of the tray.
8. Carefully lower the reagent housing cover over the reagents, sliding the guide pin (located toward the back and on top of the reagent cradle) through the guide hole on the cover.

Also, make sure that the two tubing lines are carefully positioned between the cover and cradle-side cushions.
9. Tighten the thumbscrews on the reagent housing cover to secure.
10. You will flush the reagent syringes later in the installation process, as described in ["To flush the reagent syringes" on page 105,](#)

STEP 6: INSTALL THE DI WATER SYSTEM

The Analyzer is shipped with an empty DI water reservoir and a (separately-packed) DI resin cartridge. You will need to fill the DI water reservoir with DI water. Next, you will need to install the DI resin cartridge into the *Prime* position and prime the DI water pump. After the priming process, you will move the DI resin cartridge into the *Run* position for normal Analyzer operation.

Warning	
	<p>To avoid damaging the DI water pump, Do NOT turn the Analyzer to <i>On</i> before ensuring that the DI water reservoir is filled and properly primed, as described in <u>Step 6: Install the DI Water System.</u></p>



NOTE: Each port (Prime, Run, and DI Pump Outlet) has a metal latch to use when inserting and detaching a fitting. Press the latch and hold when inserting a fitting. This protects the fitting and opens the valve. Press the latch with your finger to release a fitting and close the valve. When inserting or detaching the DI resin cartridge, insert or detach both end-fittings simultaneously to avoid damaging movement to the cartridge.

To fill the DI water reservoir

1. Before working inside the Analyzer, ensure that:
 - The Power switch is *Off* and the power cord is disconnected (*Laboratory and Portable TOC Analyzers*), or the Mains turned off (*On-Line TOC Analyzer*). (You MUST always Halt the system in the firmware before pressing the power switch to Off.)
 - You are wearing the recommended personal protective equipment (acid-resistant gloves and safety goggles).
 - You are Exercising electrostatic discharge (ESD) protection.
2. Locate the following in the Analyzer's Accessories Kit:
 - Dispensing bottle (with attached filling fixture)
 - Individual (loose) elbow fitting

You may also want to have a paper towel nearby, in case of any leakage during the installation and priming processes.

3. Press the latch of the *Prime* port down and insert the individual (loose) elbow fitting,
4. Unscrew the lid of the dispensing bottle (leaving the filling fixture attached to the top of the lid), and fill the bottle with low-TOC (<50 ppb) DI water. Replace and tighten the lid to secure it.
5. Press the latch of the *DI pump* outlet up and insert the elbow-fitting end of the dispensing bottle into the *DI pump* outlet. (The outlet is located between the IC and TC sample pumps). Reference [Figure 22: Inserting the DI Loop Fill Tube.](#))

Gently squeeze the bottle to fill the DI reservoir, filling the DI reservoir until the water line reaches JUST BELOW the top of the reservoir, as shown in [Figure 23: Filling the DI Water Reservoir](#). DO NOT OVERFILL.



NOTE: It is important to *ONLY* fill the reservoir to the suggested level. Otherwise, the water in the portion of the reservoir that you can see may overflow to another level in the reservoir (which you cannot see from the viewing window). If you do overfill the reservoir, drain the excess water by following the troubleshooting

[procedure, "To drain excess water from the DI water reservoir" on page 168.](#)

6. Press the latch of the *Prime* port down to release the individual elbow fitting for removal.
7. Press the latch of the *DI pump* outlet up to release the dispensing bottle's elbow-fitting for removal of the dispensing bottle accessory.
8. Proceed to the next section to set the DI resin cartridge and prime the DI pump.

Figure 22: [Inserting the DI Loop Fill Tube](#)

[graphic showing cut-out area above the IC and TC sample pumps and DI pump outlet](#)

Figure 23: [Filling the DI Water Reservoir](#)

To set the DI resin cartridge and prime the DI pump

You will first install the DI resin cartridge into the *Prime* position and prime the DI water pump, and then reset the DI resin cartridge into the *Run* position for normal Analyzer operation.


1. Ensure that the DI water reservoir is filled, according to the instructions in the previous section.
2. Locate the DI resin cartridge in the Analyzer's Accessories kit, and remove it from its shipping packaging.
3. Install the DI resin cartridge. Press the latches on the *Prime* port and the *DI Pump Outlet* port. Insert the elbow-fitting ends of the cartridge into the ports.


Verify that the ends are secure before moving to the next step.

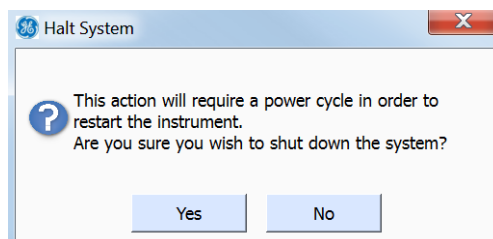
Refer to [Figure 24: DI Cartridge Inlet Fittings for Priming Activity](#), as needed.

4. Go to the next instruction section to prime the DI water pump.

To prime the DI Water pump

Warning	
	<p>In order to avoid the possibility of corrupting the system database, always FIRST halt system operations <i>from within the firmware</i> before pushing the Analyzer's power switch to the <i>Off</i> position.</p>

1. Ensure that the DI resin cartridge is set in place with the top valve securely connected to the *Prime* position, according to the instructions in the previous section.
2. Plug in the Analyzer's power cord (*Laboratory and Portable TOC Analyzers*) or turn on the Mains (*On-Line TOC Analyzer*).
3. Press the Analyzer's power switch to the *On* position, and let the Analyzer run 10 minutes to allow the DI pump to circulate water in the DI loop.
4. After 10 minutes, on the *Home* screen (in the Analyzer's firmware), press the **HALT SYSTEM** button  located in the lower-right portion of the screen. The Halt System dialog box appears.



5. Turn the power switch to the *Off* position.
6. View the reservoir water level and verify that the water level reaches JUST BELOW the top of the reservoir, as shown in [Figure 23: Filling the DI Water Reservoir](#).
7. The water level may be lower than when you started, as water will circulate in the DI loop and saturate the DI resin cartridge during the priming process. Fill the DI reservoir with water if needed, repeating the procedure, "[To fill the DI water reservoir](#)" on page 86. You will also need to repeat this priming procedure beginning from step [1](#).
8. After you have verified that the water level has stabilized to JUST BELOW the top of the reservoir, remove the DI resin cartridge from the prime position. While holding the DI cartridge, simultaneously press the latches on the *Prime* port and the *DI Pump Outlet* port to eject the cartridge.
9. Install the DI resin cartridge into the *Run* position. Press the latches on the *Run* port and the *DI Pump Outlet* port. Insert the elbow-fitting ends of the cartridge into the ports. Hold the cartridge tightly in place.
Verify that the ends are secure before moving to the next step.
10. Do we want to run for any amount of time in *Run* position before moving to next installation step?
11. Close and latch the Analyzer's door (*On-Line TOC Analyzer*) or replace the panel (*Laboratory and Portable TOC Analyzers Only*).

[graphic](#).

Figure 24: [DI Cartridge Inlet Fittings for Priming Activity](#)

[graphic](#).

Figure 25: [DI Cartridge Positioning for Analyzer Operation](#)

STEP 7: INSTALL **ETHERNET** AND EXTERNAL DEVICES

[Update Intro](#)

- Installing an Ethernet connection
- Installing a Printer
- Installing USB connections
 - One Device Port (*ONLY Used for connecting a computer when operating with Sievers DataPro Software.*)
 - Host Port (*Used for connecting a GE Autosampler, printer, or portable USB memory device.*)

Installing an Ethernet Connection

You can export historical data from the Analyzer to your computer or computer network via Ethernet, and using the Modbus communications protocol. For more information on the types of data available for export, as well how-to instructions, refer to [“Using the Ethernet Connection and Modbus” on page 149](#).

This section describes installing the Ethernet connection. You will then need to activate the Ethernet Connection in the Analyzer’s firmware later in “Step 10: Configure Basic Analyzer Settings.” You may need more assistance from your network administrator or Information Technology (IT) professional to configure PuTTY⁶ for working with exported data, or to configure the Modbus communications protocol when you are connecting to a PLC (Process Logic Control System or Center).



NOTE: You can alternately export data directly to your computer using a USB device connection, and use the optional DataPro Software to work with the data. Refer to [“Installing a USB Connection” on page 90](#) for additional information.

6. PuTTY is a free and open-source terminal emulator, serial console, and network file transfer protocol.

To install the Ethernet Connection

You will need to provide either a cross-over Ethernet cable (for connecting directly to a computer) or a straight-through Ethernet cable (for connecting to a computer network).

1. Attach one end of the Ethernet cable to the *Ethernet* port on the Analyzer, and then attach the other end of the cable either to an Ethernet port on the your network or to a computer.
2. You will activate the Ethernet connection and Modbus later in [“Step 10: Configure Basic Analyzer Settings”](#) as described in the section, [“To activate the Ethernet Connection and Modbus” on page 103.](#)



NOTE: *The USB ports on the Analyzer are NOT intended for Ethernet connectivity, and cannot not be used with an Ethernet to USB adapter. For acceptable uses of the USB ports, refer to the next section “Installing a USB Connection.”*

INSTALLING A USB CONNECTION

The On-Line and Portable TOC Analyzers each contain three USB ports on the [back of the instrument](#). One *device* port is labeled “USB Computer,” and two *host* ports are labeled “USB.” The (*Laboratory TOC Analyzer*) also contains three similar USB ports on the [back of the instrument](#), as well as one additional USB *host* port on the front of the instrument, labeled “USB.” Refer to USB port locations in [Figure 26: USB Ports](#), as needed.

USB DEVICE PORT

The Analyzer has one USB device port (labeled “USB Computer”) for connecting the Analyzer directly to your computer, when using the optional DataPro Software to control the Analyzer and the GE Autosampler. The USB device port is uniquely shaped with a rounded square connector in contrast to the typical (flat) USB host connector. A *USB-device to USB-host* cable is included in the GE Autosampler Accessories Kit.



NOTE: *The USB Device port is intended solely for connecting the Analyzer to the computer for operation with the DataPro Software. It is NOT possible to export data to a computer through this USB Device port without the use of the DataPro Software.*

You can export data from the Analyzer to a USB portable drive using one of the Host ports or through an Ethernet connection. Refer to [“USB Host Ports” on page 91](#) or [“Installing an Ethernet Connection” on page 89](#), as needed.

To install a USB connection — Device Port (Optional)

1. Install the DataPro Software on your computer now, or come back to and perform this instruction after you have installed the software.

Instructions for installing the DataPro Software are included in the *GE Autosampler Installation Guide*.

2. Locate one of the *USB-Device to USB-Host* cables in the GE Autosampler Accessories Kit. [You will use the other cable later in this section.]
3. Connect the Device *USB-Device* connection end of the cable into the “Computer” USB port on the Analyzer.
4. Connect the other end of the cable with the *host USB* connection end into your computer’s USB (host) port.
5. [“To install a USB Host port connection — GE Autosampler \(Optional\)” on page 91.](#)]

USB HOST PORTS

The *On-Line and Portable TOC Analyzers* have two USB host ports (labeled “USB”) on the back of the instrument. The (*Laboratory TOC Analyzer*) also contains two USB host ports (labeled “USB”) on the back of the instrument, as well one additional USB host port (labeled “USB”) on the front of the instrument.

The USB host ports are designed for use with the following peripheral accessories:

- **GE Autosampler**
- **Printer** (*Must be one of the specific brands/models identified in the [“Installing a Printer”](#) section.*)
- **Portable USB memory device**

To install a USB Host port connection — GE Autosampler (Optional)

1. Complete this instruction after you have installed the **DataPro Software** on your computer, or come back to and perform this instruction after you have installed the software.
2. Ensure that you have connected the Analyzer to your computer, as described in [“To install a USB connection — Device Port \(Optional\)” on page 90.](#)
3. Locate the remaining *USB-Device to USB-Host* cable in the GE Autosampler Accessories Kit.
4. Connect the *Device-USB* connection end of the cable into the “Computer” USB port on the GE Autosampler.

5. Connect the other end of the cable with the host-USB connection end into one of the Analyzer's USB (host) ports.

To install a USB Host port connection — Printer *(Optional)*

Refer to the section, [“Installing a Printer” on page 92](#), for step-by-step instructions.

To install a USB Host port connection — Portable USB Memory Device

You can export data from the Analyzer to a portable USB memory device using any of the USB Host ports on the Analyzer. Insert the USB memory device into a Host port, and then follow the step-by-step instructions for exporting data history included in [“” on page 150](#).

Graphic for USB Ports [\(three models\)](#)

Figure 26: USB Ports

Installing a Printer


The Analyzer is designed to work with the following USB point-of-service (POS) printers, which are available as an optional accessory directly from GE Analytical Instruments:

- Bixolon/Samsung SRP-275
- Citizen CD-S500A
- Epson TM-7220D

To install a USB POS printer

1. Connect the USB connector-end of the printer cable into one of the USB device ports (marked “USB”) on the Analyzer.
2. Connect the other end of the cable into the printer.
3. Consult the instructions that come with the printer for additional help, as needed.
4. Continue to the next section to configure the printer in the Analyzer.

To configure the printer in the Analyzer

1. Connect the printer to the Analyzer, as described in the previous section.
2. On the *Configuration*  screen, press the *System Setup* tab.
3. Press **PRINTER SETUP** to display the *Printer Configuration* dialog.

4. Select one of the following printers to install:

- **Bixolon/Samsung SRP-275**
- **Citizen CD-S500A**
- **Epson TM-722OD**

5. Press **TEST PRINT** to verify that printer is working.

If the page does not print, verify that the printer you have installed is the exact brand and model selected on the *Printer Configuration* dialog, and that you have connected the cable as described in the previous section.

6. Press **OK** to enable the printer.

STEP 8: CONNECT AN ON-LINE SAMPLE INLET SYSTEM

(On-Line and Portable TOC Analyzers Only)

Add two-stream connection information.....The two-stream inlet option enables efficient sampling of two independent sample sources, without the need to alter the initial inlet setup. This optional configuration is discussed in more detail in the “Optional Configurations” section, under “Two-Stream Inlet” on page 60.



NOTE: If you are using a GE Autosampler with your Laboratory or Portable TOC Analyzer model, DO NOT proceed with this section. Instead, refer to the GE Autosampler User Guide. The information for connecting the sample tubing to the inlet port is located in the section, “Route the Sample Tubing.”

Connect a sample inlet line to the integrated On-Line Sampling (iOS) for continuous on-line measuring. As part of the sample-inlet installation process, you will also install a waste line. With this inlet system installed, you can conveniently switch between on-line sampling and discrete sampling using vials in the iOS.

There is no further installation required for On-Line and Portable TOC Analyzers to measure discrete grab samples from a vial. The iOS is ready for measuring grab samples without the need to disconnect the on-line inlet tubing. The Analyzer automatically shuts off on-line water flow when it detects that the iOS door is closed and/or a vial is inserted into the iOS.

You will need to select an appropriate *On-line* or *Grab* measurement mode on the *Setup* screen in the Analyzer’s firmware, and then start the sampling on the *Home* screen. For complete step-by-step instructions, refer to [“Running a sample” on page 126](#).



NOTE: The Laboratory TOC Analyzer arrives ready to measure discrete grab samples using the vial port (located on the front) of the instrument. It is not designed for continuous on-line sampling. Go to the next

section, "[Step 9: Install the Waste Outlet \(Laboratory Model\)](#)" on [page 97](#), to install the waste outlet.

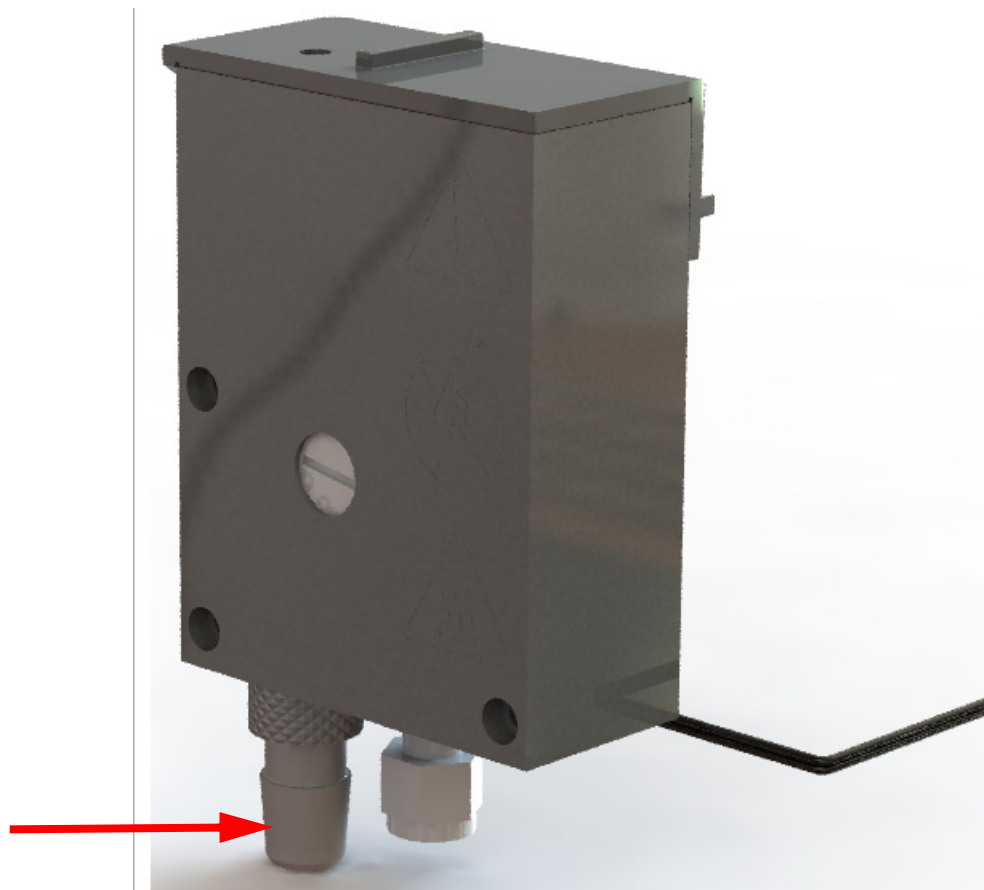


Figure 27: iOS Waste Outlet Fitting — On-Line and Portable TOC Analyzers


To connect the inlet tubing to the iOS

You will need the 1/4" Teflon inlet tubing (with in-line filter) from the Analyzer's Accessories Kit. You will also need to provide You will also need to provide 3/4" OD plastic waste tubing.

Refer to [Figure 28: This iOS](#), as needed, when performing this instruction.

1. Ensure that the power to the Analyzer is *Off* and disconnected.
2. Verify that the water source is disabled until you have completely installed the sample inlet system and the Analyzer is ready to begin analysis.
3. Locate the 1/4" Teflon inlet tubing (with the in-line filter) in the Accessories Kit.
4. Pull out the waste fitting from the bottom of the iOS to gain more working room for this procedure. You may need to twist it slightly to remove it.

5. Connect the inlet tubing into the sample inlet on the iOS System. Using a 9/16" open-end wrench, secure the nut. Do NOT over-tighten the nut.
6. Replace the waste outlet fitting (you removed in step 4) to the bottom of the iOS.
7. Slide one end of the waste tubing over the waste outlet (barb) fitting, See [iOS Waste Outlet Fitting – On-Line and Portable TOC Analyzers](#).
8. Position the tubing for a gravity drain of the waste water, collecting the waste in a glass laboratory container or facility-approved waste or return line.

	<h3>Warning</h3>
<p>Hazardous reagents (ammonium persulfate and phosphoric acid) are used in the Analyzer. The waste stream from the instrument is acidic and must be disposed of properly. Consult your federal, state, and local government regulations.</p>	

9. Establish a water flow to the iOS System.
10. Using a flow meter measure the flow rate, and then adjust to between 50-300 mL/min using the flow rate adjustment screw.



NOTE: The flow rate is controlled by a needle valve, which you can adjust by turning the screw located on the iOS. Turn the screw clockwise to decrease flow, or counter-clockwise to increase flow. (See [Figure 29: Flow Rate Adjustment Screw](#).)

Graphic placeholder showing iOS and the waste outlet fitting and inlet port

Figure 28: This iOS

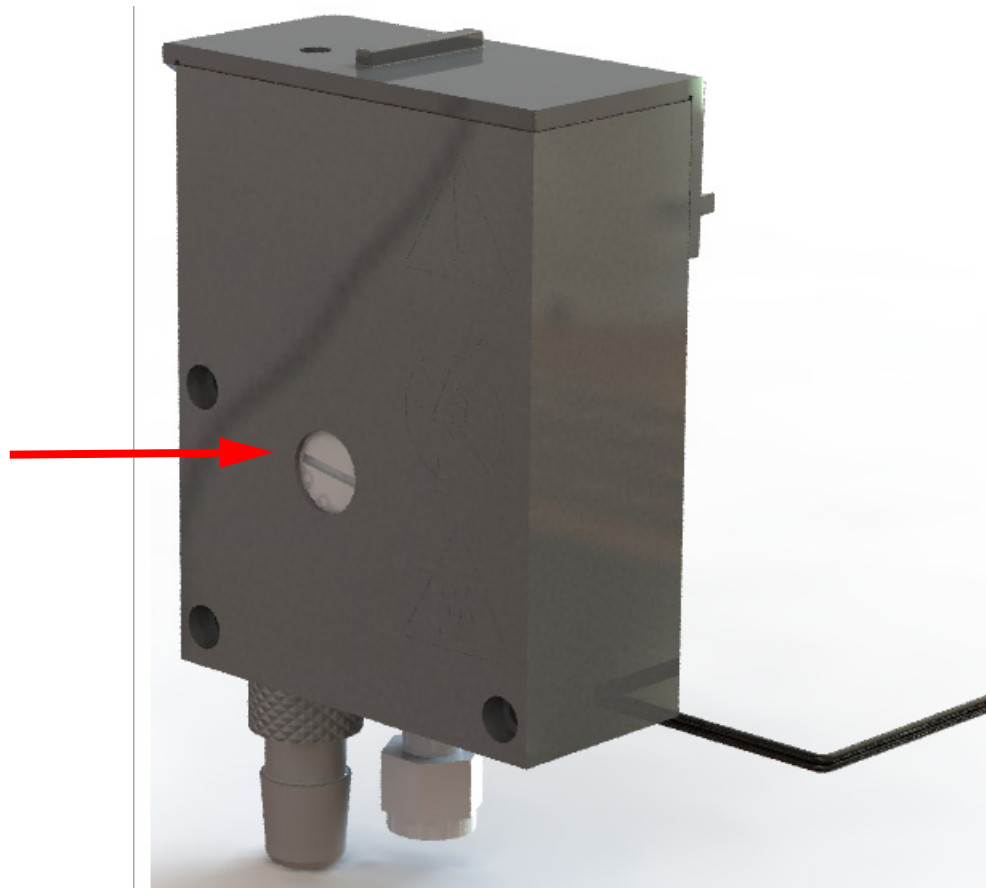




Figure 29: Flow Rate Adjustment Screw

Warnings	
	<p>(On-Line and Portable TOC Analyzers) Operation of the Analyzer without the in-line filter on the sample inlet line will damage the Analyzer and void the warranty. To avoid damaging the Analyzer, install the filter and replace the filter element, as needed.</p>
	<p>To avoid false TOC readings and possible damage to the Analyzer, always make sure the sample is flowing through the iOS System and the DI water reservoir is filled before starting analysis.</p>

STEP 9: INSTALL THE WASTE OUTLET (LABORATORY MODEL)

(Laboratory TOC Analyzer Only)



NOTE: If you have an On-Line or Portable TOC Analyzer, IGNORE this section. Directions for installing the waste outlet are included as part of the previous section, [“Step 8: Connect an On-Line Sample Inlet System” on page 93.](#)

To install the waste outlet

You will need the 1/8” OD plastic waste tubing with Swagelok® fitting (provided in the Accessories Kit).

1. Using a 7/16” open-end wrench, disconnect the nut that connects to the Waste port.
2. Locate the 1/8” OD plastic waste tubing with Swagelok® fitting (provided in the Accessories Kit).
3. Attach the Swagelok® fitting to the Waste port, and use the 7/16” open-end wrench to tighten securely.
4. Position the hose for a gravity drain⁷ of the waste water, collecting the waste in a glass laboratory container or facility-approved waste or return line.

Warnings



Hazardous reagents (ammonium persulfate and phosphoric acid) are used in the Analyzer. The waste stream from the instrument is acidic and must be disposed of properly. Consult your federal, state, and local government regulations.

Graphic Placeholder

^{7.} The collecting laboratory container or line should be positioned lower than the iOS waste outlet to facilitate a gravity-induced flow.

Figure 30: Waste Outlet Fitting – Laboratory TOC Analyzer

STEP 10: CONFIGURE BASIC ANALYZER SETTINGS

ALL OF THIS SECTION IS A WIP

Before placing your Analyzer into service, you will need to configure various basic settings in the Analyzer's firmware using the intuitive touchscreen display (located on the front of the Analyzer). You will not need to change most of these settings unless you move the Analyzer, or reconfigure the operational environment.

This section includes how to configure basic analyzer settings, including:

- [Powering On and Off the Analyzer](#)
- [Enabling Password Protection or DataGuard \(Optional\)](#)
- [Naming the Analyzer Location \(Optional\)](#)
- [Setting the Analyzer Mode and Reagent Flow Rates](#)
- [Setting Up the Data History](#)
- [Setting Up the Printer \(Optional\)](#)
- [Enabling Turbo](#)
- [Exporting and Printing System Constants](#)
- [Setting up the Data I/O](#)

Powering On and Off the Analyzer

Each Analyzer model (*On-Line*, *Laboratory*, and *Portable*) has an *On/Off* power switch⁸. However, before pushing the power switch to *Off*, you MUST first shut down the Analyzer's operating system in the firmware in order to avoid the possibility of corrupting the database. You can then press the power switch to *Off* to complete the power-down cycle.


When performing maintenance inside the Analyzer, we also recommend that you disconnect the power cord from the A/C outlet (*Laboratory and Portable TOC Analyzers*) or shut down the Mains power supply (*On-Line TOC Analyzer*).

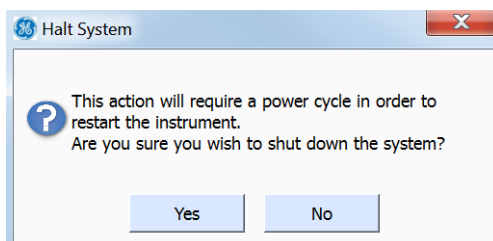
8. [A power On/Off switch is located on the back of the Laboratory and Portable TOC Analyzers and on the side of the On-Line TOC Analyzer.](#)

To power *On* the Analyzer

Press the power switch to *On* to initiate power in the Analyzer. The firmware screen illuminates for immediate operation.

To power *Off* the Analyzer

1. On the *Home* screen (in the Analyzer's firmware), press the **HALT SYSTEM** button  located in the lower-right portion of the screen. The *Halt System* dialog box appears.




2. Press **YES** to confirm that you want to halt the Analyzer's operating system. The system will automatically shut down and the screen will de-illuminate (go blank).
3. Locate the power switch on the outside of the Analyzer, and press the power switch to *Off* to complete the power-down cycle.



NOTE: *The power cycle is NOT complete until you have pressed the power switch to Off. This ensures that power to ALL circuit boards is disconnected.*

4. If you are planning to perform maintenance inside the Analyzer, disconnect the Analyzer's power cord from the A/C outlet (*Laboratory and Portable TOC Analyzers*) or shut down the Mains power supply (*On-Line TOC Analyzer*).

Warning	
	In order to avoid the possibility of corrupting the system database, always FIRST halt system operations <i>from within the firmware</i> before pushing the Analyzer's power switch to the <i>Off</i> position.

Enabling Password Protection or DataGuard (Optional)

[Update this section with firmware development completion](#)

The Sievers 900 Series of TOC Analyzers offers two levels of security, *Password Protection* and *DataGuard*. The *Password Protection* feature is included with ALL Analyzers and provides a

basic level of security. The *DataGuard* feature is available as an upgrade and provides support for the electronic signature regulation 21 CFR Part 11. You can enable one of these security features, but not both.

This section includes information for enabling *Password Protection* or *DataGuard*. Also included are instructions on how to create a new Administrator account, and how to deactivate the Default Administrator account. You should perform both of these procedures during the installation process. For additional information about *Password Protection* and *DataGuard*, refer to Chapter 6.

To enable Password Protection



NOTE: *If you are planning to activate DataGuard, there is no need to additionally activate this Password Protection feature. Instead, go to next section, "To enable DataGuard."*

1. Select the *DataGuard* tab.
2. Press the **ENABLE PASSWORD** button.
3. After *Password Protection* is enabled, the Analyzer will immediately require you to log in with the following default Administrator User ID and Password:
 - User ID: ADMIN
 - Password: GEAI
4. For security purposes, change the default password. Select the *DataGuard* tab.
5. Press the **CHANGE PASSWORD** button.
6. Enter the old password (*GEAI*), and press **ENTER**.
7. Enter a new password, and press **ENTER**.
8. Verify the new password, and press **ENTER**.
9. Record the new password in a secure location. ALL users will be required to enter this log in information to access the Analyzer's menus.

To enable DataGuard

1. Insert the USB flash drive containing the *DataGuard* activation into the Analyzer's USB port.
2. Press the **MENU** button, select the *Maintenance* tab, and press the **ADVANCED** button.
3. Press the **ACTIVATE OPTIONS** button.
4. Press the **OK** button and wait for the Analyzer to detect the USB flash drive.
5. Press the **ACTIVATE** button to enable *DataGuard*.



6. After *DataGuard* is enabled, the Analyzer will immediately require you to log in with the default Administrator User ID and Password. Enter the following:
 - User ID: ADMIN
 - Password: GEAI
7. Go to the next section and create a new Administrator account.

To create a new Administrator Account (DataGuard Only)

After you activate *DataGuard*, create a new Administrator Account to ensure Analyzer security. Step-by-step instructions follow.

1. Press the **MENU** button and select the *DataGuard* tab.
2. Press the **ADD USER** button.
3. Specify a new User ID for the administrator and press the **ENTER** button.
4. Specify the Password for the administrator User ID and press **ENTER**.
5. Verify the Password and press **ENTER**.
6. Press the **USER LEVEL** button and select Administrator.
7. Press the **PASSWORD EXPIRED** button and select *False*.
8. Press the **BACK** button.
9. Press the **LOGOUT** button.
10. Go to the next section and delete the default Administrator account.

To deactivate the Default Administrator account

After you have created a new Administrator account, as described in the previous section, deactivate the Default Administrator account as follows.

1. Press the **LOGIN** button and enter the new User ID and Password you created in the previous section.
2. Press the **MENU** button and select the *DataGuard* tab.
3. Press the Edit User button.
4. Use the arrow buttons to highlight the Default Administrator account and press OK.
5. Press the User Status button and select *Inactive*.
6. Press the Back button to return to the *Menu* screen.

Naming the Analyzer Location (Optional)

To name an Analyzer Location

You can assign a name to the Analyzer, and this name will appear with printed and exported data. This is useful if you have multiple Analyzers at your facility and want to readily distinguish data collected from each unit.

1. Select the **MAINTENANCE** tab.
2. Press the **ADVANCED** button.
3. Press the **ADVANCED SETUP** button.
4. Press the **LOCATION** button.
5. Use the keypad to specify a name for the Analyzer, and then press **ENTER**.
6. Press the **NUMBER** button or **ALPHA** button to toggle between numbers and letters.
7. Press the **BACK** button to return to the XX.
8. Press the **BACK** button to return to the *Maintenance* tab.

Setting the Analyzer Mode and Reagent Flow Rates



NOTE: If you are using your Laboratory or Portable TOC Analyzer model with a GE Autosampler, do NOT proceed with this section. The Analyzer mode and reagent flow rates will be controlled by the DataPro Software.

Set the Analyzer mode for either **ON-LINE** or **GRAB** measurements.

By default, the Analyzer uses automatically-calculated reagent flow rates. However, if you know the specific flow rates you want to use for each reagent, you can manually set the flow rates according to Table 5 on page 93 and Table 6 on page 93. For more information on setting flow rates, see “Setting Reagent Flow Rates” on page 89.

To set the Analyzer mode and reagent flow rates

1. On the *Home* screen, press the **SETUP** button. The *Modify Current Method* screen appears, with the currently selected mode (**GRAB** or **ONLINE**) showing in the *Measurement Mode* field.
2. Press the *Measurement Mode* arrow to select another mode:
 - **ON-LINE**— Select to measure TOC continuously from a sample stream.
 - **GRAB** — Select to measure TOC directly from a sample flask or the vial port.

The *Method Name* field and **NEW** button appear.

3. Press the keys on the keypad to assign a name to the method you are defining, and then press **OK**.
4. For more information on mode selection, see “Setup” on page 88.
5. Press the **CONFIGURE** button.
6. By default the Analyzer uses the reagent flow rates that are automatically calculated. If you know the specific flow rates you want to use for each reagent, you can manually set the flow rates, according to Table 5 on page 93 and Table 6 on page 93. For more information on setting flow rates, see “Setting Reagent Flow Rates” on page 89.
7. Press the **MENU** button to exit and save your settings.

Setting Up the Data History

To set up the Data History

Before taking measurements, review the Archive Data setting to ensure that data is collected in the best way for your environment. By default, data is stored in the Analyzer’s flash memory, so that all measurements will be retained. If you want to change the Archive Data setting, follow these steps:

1. Select the **DATA** tab.
2. Press the **SETUP HISTORY** button.
3. Confirm that *Archive Data* is set to *On*.



NOTE: If DataGuard is enabled, data must either be sent to storage or the serial port. See xxx for more information.

Activating the Ethernet Connection and Modbus

To activate the Ethernet Connection and Modbus

XXXX

- 1.
- 2.

Setting Up the Printer (Optional)

To set up the printer

If you installed a printer in Step 6, configure the printer port to match the printer.

1. Select the **I/O** tab and press the **PRINTER** button.
2. Press the **PRINTER** button and select your printer model, either Citizen, Seiko, or Epson. If you do not have a printer, make sure *No Printer* is selected.
3. Press the **HEADER FREQ.** button and select *First Page* to print a header only on the first page of output or select *All Pages* to print a header on all pages of output.
4. Press the **PRINT FREQ.** button and select how often you would like to print TOC data information.

Enabling Turbo

To enable Turbo

Brief description of Turbo, optional accessory purchase from Turn the Turbo indicator on

1. ;lkjasdf
2. a;lkjadf

Exporting and Printing System Constants

Calibration constants, reagent flow rates, and other key parameters are stored in the Analyzer's memory. You should export and print the factory settings for future reference.

To export the settings to a comma-separated text file

1. Select the **MAINTENANCE** tab.
2. Press the **ADVANCED** button.
3. Press the **USB I/O** button. Make sure that the USB flash memory drive from the Analyzer's accessory kit is attached to the USB port, then press the **SAVE SYSTEM** button. Archive the exported files in a secure location on your computer.
4. Press the **BACK** button and then press the **MENU** button.

To print a copy of the settings

If you have a printer attached to the Analyzer, you can print these settings for future reference by following these steps:

1. Select the tab.
2. Press the **ADVANCED** button.
3. Press the **PRINT CONSTANTS** button.
4. Press each of the four buttons, one at a time, to print the different constants.

Setting up the Data I/O

To set up the Data I/O

UPDATE

If you are installing binary input, alarms, or the 4-20 mA output, configure settings for those features now. Select the I/O tab and configure the appropriate settings. Note that you may need to consult with your remote operations center to determine some values. See page 99 through page 103 for details on configuring these settings.

If you installed a 4-20 mA connection or a serial connection, configure the appropriate settings now. Refer to "Setting Up Analyzer Input and Output" on page 95 for additional information.

Step 11: Flush and Rinse the Analyzer

Before placing the Analyzer into normal operation, flush the reagents to remove any gas bubbles that may have formed in the reagent lines. Next, run the Analyzer in *On-line* mode for 12 hours to thoroughly rinse the sample flow path.

To flush the reagent syringes

If using a flask water supply, you will need the sipper tubing (with Valco fitting) from the Analyzer's Accessories Kit. and a 1/4" open-end wrench.

1. Connect to a supply of low-TOC (<50 ppb) DI water in preparation for both this reagent flush and the Analyzer rinse (described in the next section, [To rinse the sample flow path on page 107](#)).

Connect to one of the following supplies of low TOC (<50 ppb) DI water:

- *A continuously flowing on-line stream* — No additional setup is required if you connected an inlet line from a continuous low TOC (<50 ppb) DI water source in [Step 8: Connect an On-Line Sample Inlet System](#). Proceed to step [5](#).

- *A large flask (1000-2000 mL) (On-Line and Portable TOC Analyzers Only)* — Bypass the iOS system by removing the stainless steel tubing that connects the iOS to the Analyzer. Then, attach a sipper tube to the *Inlet* port located on the back of the Analyzer. Proceed to step [2](#).
 - *A large flask (1000-2000 mL) (Laboratory TOC Analyzer Only)* — Attach a sipper tube to the *Inlet* port located on the back of the Analyzer. Proceed to step [3](#).
2. Use a 1/4" open-end wrench to loosen the Valco nut that connects the stainless steel tubing from the iOS System to the sample *Inlet* port.

Carefully pull the stainless steel tubing out of the sample *Inlet* port. See [Figure 34: Stainless Steel Tubing — Connecting the Analyzer and iOS on page 110](#).
 3. Insert the sipper tube's Valco fitting into the sample *Inlet* port, and then tighten the Valco nut until it is finger-tight. Using a 1/4" open-end wrench, tighten the nut an additional 1/8 turn.
 4. Place the other end of the sipper tube into a large flask containing 1000-2000 mL of low TOC (<50 ppb) DI water.
 5. Verify that the Analyzer is powered *On*.
 6. If you have an ICR, verify that the ICR is configured to *On* (see the Analyzer's *Setup* screen).
 7. On the *Maintenance* screen, select the *Advanced* tab.
 8. Press **FLUSH**. The Flush screen appears.
 9. Press the *Number of Times to Move the Syringe* field, and select a number from **1-20**. (The default value is **3**).
 10. Press **Flush**. The Analyzer begins the syringe flush process and reports the time remaining on the screen.

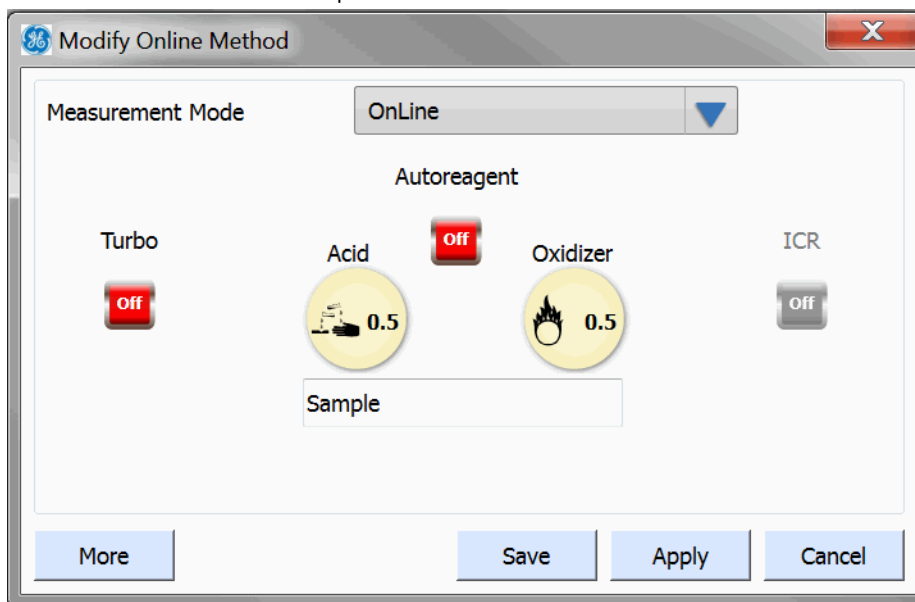
When the syringe flush concludes, xxxxx.
 11. Halt the system within the firmware (*Home* screen) and turn the power switch to *Off*.
 12. Visually inspect inside the Analyzer for any leaks, especially around the DI water reservoir. If a leak is detected, make sure all fittings are tight and secure.
 13. Continue to the next section, ["To rinse the sample flow path."](#)

To rinse the sample flow path

Before you begin, ensure that you have connected to a supply of low TOC (<50 ppb) DI water, as described in the previous section, [“To flush the reagent syringes” on page 105](#).

Create a Rinse Method

1. On the **HOME** screen, press **SETUP** to display the *Modify Method* dialog box. Replace this screenshot.



2. Select Online in the Measurement Mode field.

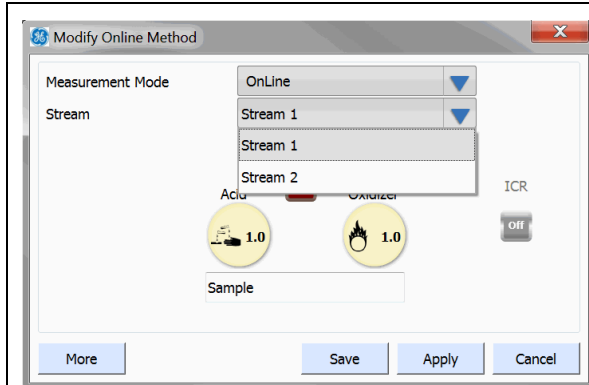


Figure 31: Modify Online Method Dialog Box

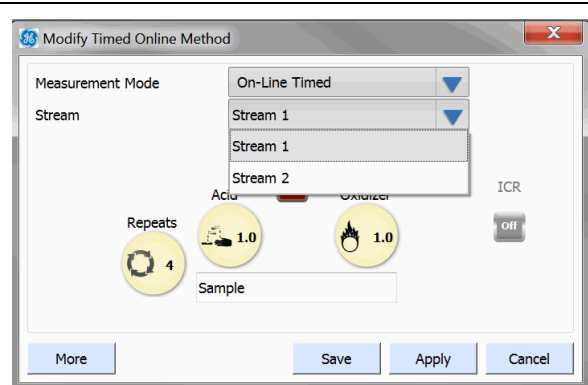


Figure 32: Modify Timed Online Method Dialog Box

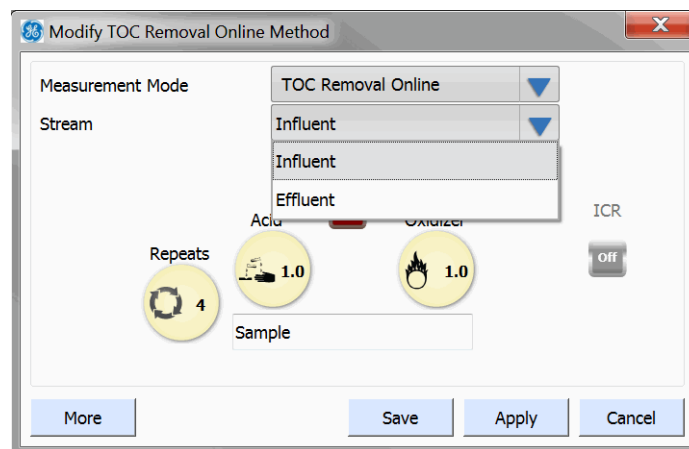


Figure 33: Modify TOC Removal Online Method Dialog Box

3. Select one of the following in the **MEASUREMENT MODE** field to display the corresponding Modify Method dialog box:
 - **Online** – (Figure 31: Modify Online Method Dialog Box)
 - **Online Timed** – (Figure 32: Modify Timed Online Method Dialog Box)
 - **TOC Removal Online** – (Figure 33: Modify TOC Removal Online Method Dialog Box)
4. If you selected **Online** or **Online Timed** in the previous step, select **Stream 1** or **Stream 2** in the **STREAM** field.

To set the measurement cycle (hh:mm) for **Online Timed** measurements, go to the **Configuration** screen, select the **System Setup** tab, and press **ONLINE SETUP**. After you have set the measurement cycle, return to the **Modify TOC Removal Online Method Dialog Box**
5. If you selected **TOC Removal Online** in the previous step, select **Influent** or **Effluent** in the **STREAM** field.




6. To assign/name Influent or Effluent to a specific stream (Stream 1 or Stream 2), go to the Configuration screen, select the System Setup tab, and press ONLINE SETUP.
7. Press the **STREAM NAME** field to display the alpha/numeric keypad. Use the keypad to enter **RINSE**, and then press **OK**.
8. Set the *Autoreagent* indicators to *Off*.
9. Press each of the following to display a numeric keypad. Use the keypad to enter **0**, and then press **OK**.
 - **ACID**
 - **OXIDIZER**
10. Press **FLUSH** to display a numeric keypad. Use the keypad to enter **720**. (This value = 60 min X 12 hours.) Press **OK**.
11. If your Analyzer has an ICR, set the indicator to *Off*.
12. If you have purchased the Turbo mode configuration, set the **TURBO** indicator to *Off*.



NOTE: Turbo (a product option available from GE Analytical Instruments) must be installed and enabled before the Turbo feature is active on the screen. See "To enable Turbo" on page 104.

13. Press **SAVE**. This will overwrite the previous *Online* method file, and erase any earlier settings.
14. Press **APPLY** to return to the **HOME** screen.

Run an Analysis with the New RINSE Method

1. On the **HOME** screen, press **RUN**  to begin the rinse. The rinse will run for 12 hours.
2. After the rinse completes, the **XX** appears.
3. Press **XXX** to close the *Summary* screen.
4. Do one of the following:
 - *If you used a continuously flowing on-line stream* — No additional steps are required. Your Analyzer is ready to begin normal sample analyses.
 - *If you used a large flask (1000-2000 mL) (On-Line and Portable TOC Analyzers Only)* — Reconnect the iOS system by reattaching the stainless steel tubing that connects the iOS to the Analyzer. Remove the sipper tube from the *Inlet* port located on the back of the Analyzer, and connect the inlet tubing from your on-line water source. (You can also choose not connect an on-line water source.)

Your *On-Line or Portable TOC Analyzer* is ready to begin normal sample analyses.

- If you used a large flask (1000-2000 mL) (*Laboratory TOC Analyzer Only*) — Remove the sipper tube from the *Inlet* port located on the back of the Analyzer.

Your *Laboratory TOC Analyzer* is ready to begin normal sample analyses.

Graphic placeholder

Figure 34: Stainless Steel Tubing — Connecting the Analyzer and iOS

How to Install Valco Tube Fittings

Evaluate where to place this section after determining which tubing the user will need to install a Valco fitting, and how many section reference the tubing installation.

1. Locate the sipper, sample, or other tubing? from the Analyzer's Accessories Kit? .
2. Slide the Valco fitting and the ferrule onto the sample tubing. Leave at least several millimeters of tubing extend beyond the tip of the ferrule. Make sure the orientation of nut to ferrule is as show in Figure on page 110 [Figure 35: Nut and Ferrule Orientation](#)
3. Push the tubing into the Sample Inlet port on the Analyzer until there is resistance, and then hold the tubing in place.
4. Still holding the tubing in place, slide the ferrule and nut down the tubing into the sample *Inlet* port and tighten the nut until it is finger-tight.
5. Use a 1/4" open-end wrench to then turn the nut 1/4 turn past finger-tight. Do not over-tighten the fitting.



NOTE: It is only necessary to turn the nut 1/4 past finger-tight to swage the nut on initial installation. During future operations, only turn the nut 1/8 turn past finger-tight.

Graphic placeholder

Figure 35: Nut and Ferrule Orientation

STEP 12: INSTALL A GE AUTOSAMPLER

Laboratory and Portable TOC Analyzers

If you are planning to use a GE Autosampler with your Analyzer, you can install it now. Refer to the *GE Autosampler Installation Guide* for complete installation instructions.



5

OPERATION

.....

OVERVIEW

THIS CHAPTER IS NOT READY FOR REVIEW AT THIS TIME. Need to update with recent firmware changes/research.

WIP notes only Add this info: to text in correct places:

MISCELLANEOUS NOTES FOR SECTIONS TO ADD

To sample using the iOS

With the Analyzer configured in an on-line configuration (see xxx), you can conveniently switch between on-line sampling and discrete sampling using the iOS. You do NOT need to change the configuration to analyze a standard with the iOS System. The Analyzer automatically shuts off on-line water flow when it detects that the iOS door is closed and/or a vial is inserted into the iOS.

The iOS is simple to use. Simply stop analysis, slide the iOS System door open to the left, wait 30 seconds for sample to drain from the iOS System, and then insert a 40-mL vial containing sample? or the standard. Also, refer to xx for additional calibrating and operation safety x xx when operating the iOS for the first time.

Additionally (one time procedure or each time?), after you establish water flow to the iOS System, you should adjust the flow rate so that flow exiting the waste line is between 30 - 300 mL/min. The flow rate is controlled by a needle valve, which is adjusted by the screw on the iOS. Turn the screw clockwise to decrease flow, and turn the screw counter-clockwise to increase flow. How do you measure the flow rate? separate stand-alone flow meter?

Always stop analysis before opening the iOS System door to avoid generating erroneous measurement data. If the flow sensor is On, opening the iOS System door while analysis is taking place causes the flow sensor to activate and halt analysis. If the flow sensor is Off, opening the iOS System door while analysis is taking place results in air being drawn into the Analyzer.

Warning

The iOS System contains sharp needles designed to pierce the septa of sample vials. Do not put fingers or inappropriate materials into the iOS System.

XXXXXSievers M9 and M9^e TOC Analyzers Operation and Maintenance Manual

SAMPLING USING A SIPPER TUBE

The Analyzer Configured for Use with a Sipper Tube (Grab Mode)

The Vial Port

The vial port provides a convenient sample inlet for analyzing standards in 40-mL vials. You do not need to change the sample figuration to analyze a standard in the vial port. Simply stop analysis, slide the vial port door open, and insert the 40-mL vial containing the standard.

Always stop analysis before opening the vial port door to avoid generating erroneous measurements. Opening the door while analysis is taking place results in air being drawn into the Analyzer.

Warning

The vial port contains two sharp needles designed to pierce the septa of sample vials. Do not put fingers or inappropriate materials into the vial port.

~~GRAB SAMPLE INSTALLATION — FROM A SAMPLING CONTAINER~~

Move to operations chapter

To run grab samples from a container, collect the sample using a sipper tube connected to Analyzer's *Inlet* port. If your Analyzer has an iOS system, you must bypass the iOS in the grab sample setup process, as described in the following instruction.

~~To collect grab samples from a container~~

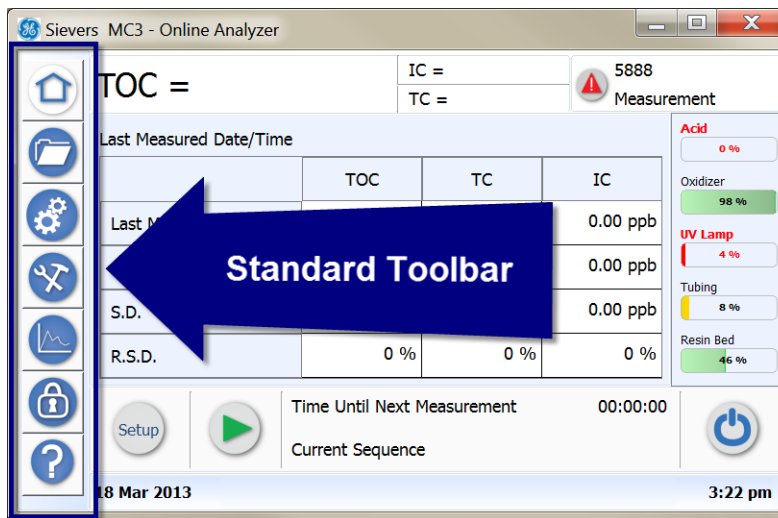
1. If your Analyzer does NOT have an iOS, go directly to step [4](#)
2. Locate the 1/16" OD stainless steel tubing that runs from the iOS System to the bulkhead fitting labeled *Sample Inlet*.

3. Use a 1/4" open-end wrench to loosen the Valco[®] fitting at the *Sample Inlet* port. Carefully rotate the tubing away from the Analyzer so that tubing is clear of the inlet.
4. Locate the sipper tube (1/16" Teflon tubing with Valco nut) that is provided in the Accessories Kit.
5. Insert the Valco fitting into the *Sample Inlet* port, located on the left side of the Analyzer.
6. Tighten the Valco fitting until it is finger-tight, and then tighten an additional 1/8 turn using a 1/4" open-end wrench.
7. Place the open end of the sipper tube into the sample container, making sure that the end of the tubing is immersed in the sample.
8. Place parafilm over the container opening. Do NOT push the sipper tube through the parafilm or it may clog the tube.
9. Operate the Analyzer in *Grab* mode. For more information on *Grab* mode, [see "Setting the Analyzer Mode" on page 88.](#)








INTRODUCTION TO THE ANALYZER SCREENS

EDITING NOTE: Screen title does NOT show on Analyzer screen. Also, there are no arrows by tabs, as all tabs are sized smaller. Screen background color may be slightly different.

The Analyzer's touchscreen display changes according to the screen you select from the *Standard* toolbar (located on left side of the screen).



Simply press one of the following buttons on the Analyzer's Standard Toolbar to display the related screen.

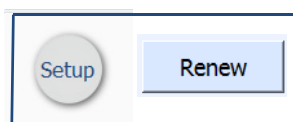
	HOME <i>(For more screen details, go to page 118.)</i>	Indicators for DataGuard enabled and Password Protection. Research these further
	PROTOCOLS	System Protocols and User Defined Methods Calibration, Pharmacopoeia Tests , Municipal Test , Validation Refer to page X for more details.
	CONFIGURATION	Single Point Calibration, Sample Conductivity, Multi-Point Calibration, TOC Autozero, TC / IC Cell Conductivity Autozero
	MAINTENANCE	
	DATA VIEW	
	SECURITY / DATAGUARD	
	HELP	

Navigating in the Screens

You will find using the Analyzer Display screens is easy and intuitive. When first using the [Sievers M9 or M9^e TOC Analyzer](#) [Sievers M5310 C TOC Analyzer](#), you may find the following navigational information helpful.

BUTTONS

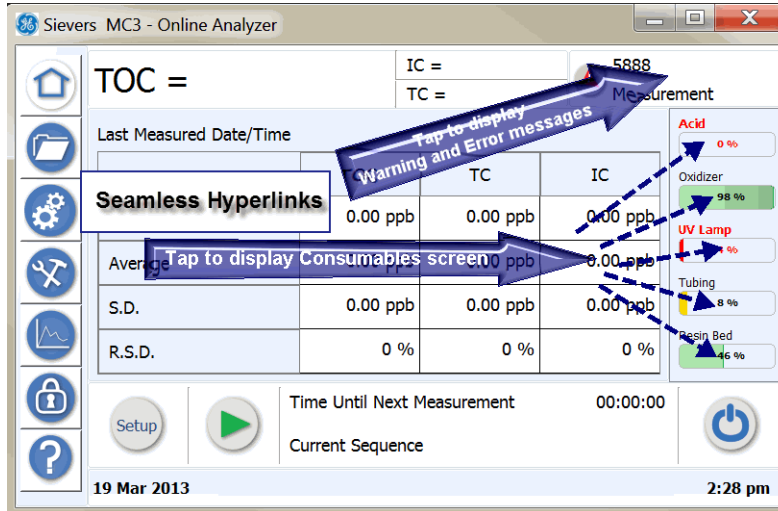
Screens include various buttons that may either initiate an action (such as, to start sampling) or display a related screen or dialog box. The button appearance may vary as shown in the following examples. [Buttons may change with xxx selections.....](#)



Seamless Hyperlinks

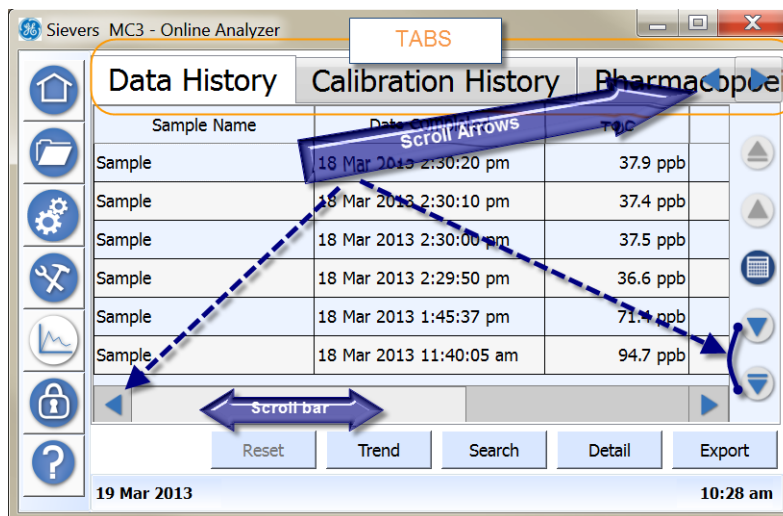
The *Home* screen also contains some seamless (hidden) hyperlink functionality in the consumables level and warning and error alert areas. You can [tap](#) a consumables level indicator to display the *Consumables* tab on the *Maintenance* screen, or [tap](#) the warnings and

error alert area to display a separate dialog box with message details and functionality. To exit screen, you MUST either click OK (intuitively I want to exit instead. What happens when I click OK? It clears or does it remain for me to go back to? would I need to as a user?



TABS AND SCROLLING

Several screens have individual tabs that you can press to display additional related screens. Left and right arrows appear if there are additional tabs extending beyond the screen view. To see these additional tabs, flick press? the right scroll arrow. You can then use the right and left scroll arrows to navigate to the various tabs, as needed. Some screens may also include scroll arrows (left, right, up, down) to enable viewing additional data that extends beyond the border of the screen. On Analyzer screen, there are no arrows by tabs, as all tabs are sized smaller.



Field Selections

Tap the down arrow to display field options for selection....

create one or more setup configurations measurement mode Grab or On-Line Name and save a method Select

set number of repeats and rejects set acid and oxidizer levels

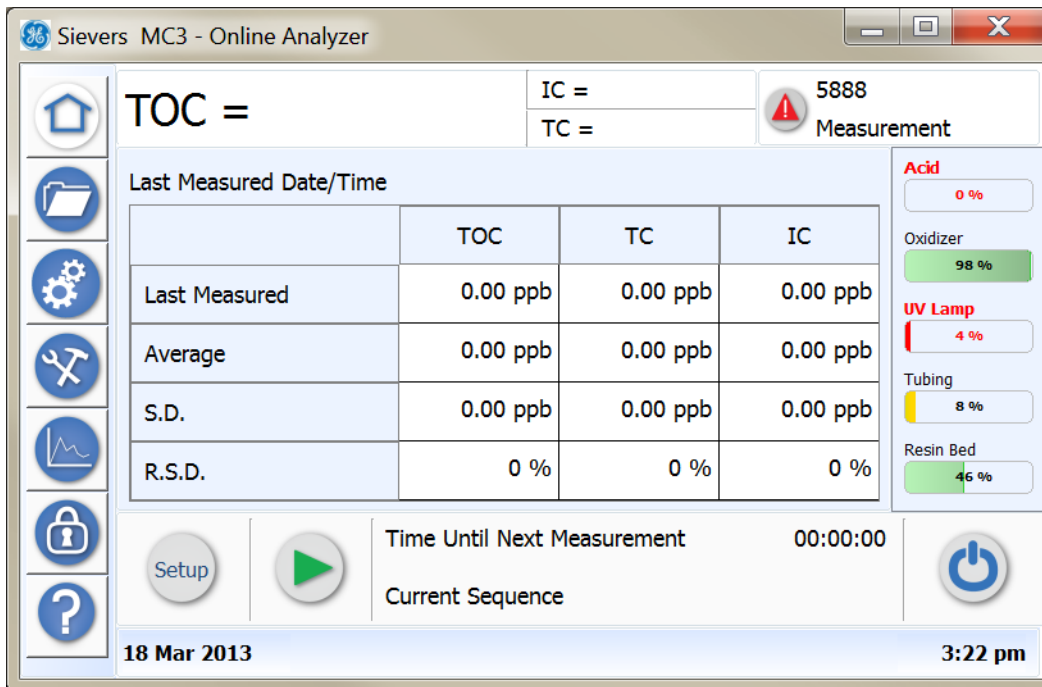
More fast flush and normal flush time

Autoreagent on or off

Turbo on or off

ICR on or off

USING THE HOME SCREEN



Use this screen to set up and run sample analyses of TOC measurements. The Analyzer reports the sampling status and data on this screen during the process. Any warnings or errors appear on the top right of the screen, which you can tap to view the specific message(s) and access to the *Diagnosis* screen. You can also monitor remaining consumables' levels from the *Home* screen.



- Create sample setup configurations
- Run a sample (view any errors).
- Quick view consumables
- Shut down the instrument

Creating Sample Setup Configurations OVERVIEW

Before you begin, useful overview information about xxxxxxxxxxxxuseful in creating sample setup configurations....

UNDERSTANDING ANALYSIS TIME

FAST FLUSH AND NORMAL FLUSH .

SELECTING A MEASUREMENT MODE

Grab

TOC Removal Grab

On-Line....

- [Online](#)
- [Online Timed](#)
- [TOC Removal Online](#)

SETTING REAGENT FLOW RATES

XXXX

TABLE 5: RECOMMENDED ACID FLOW RATES



NOTE: For municipal applications, we recommend decreasing the acid flow rate to 1.0 µL/min for municipal water application with an alkalinity of less than 100 mg/L CaCO₃. Always check the pH of your undiluted water to ensure it is below pH3, but not less than pH2.

DO we need to change the tables to reflect municipal water application flow rates only for the M5310 C manual?

USING AN ICR

XXXX

RUNNING SAMPLES IN TURBO MODE

TABLE 6: RECOMMENDED OXIDIZER FLOW RATES

Autoreagent

Manual

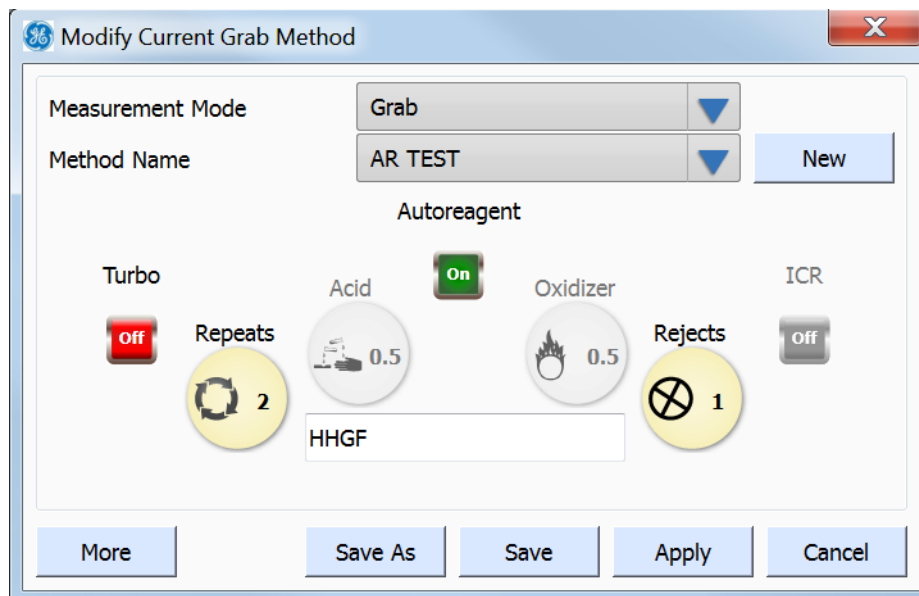
FAST FLUSH NORMAL FLUSH

;lkjasdf

To create or change a **Sampling Method?** – GRAB MODE

Create and save to useinclude overview grab, TOC removal grab, online, online timed, XXXX

1. On the *Home* screen, press **SETUP** to display the *Modify Method* dialog box.



2. Select *Grab* or *TOC Removal Grab* in the *Measurement Mode* field.
3. Do one of the following:
 - **To create a new configuration** – Press **NEW** to display the numeric keypad. Use the keypad to enter a name for the method, and then press **OK**. The new name appears in the Method name field.
 - **To change an existing configuration** – Select the configuration in the **METHOD NAME** field. Enter new values, as needed, in steps X to X, and then go to step X to save the changes.
4. Select one of the following in the *Measurement Mode* field:
 - **Grab**
 - **TOC Removal Grab** – With this measurement mode selection, also select either *Influent* or *Effluent* in the **Vial Name** field.
5. Do the following:
 - Press **REPEATS** to display the numeric keypad. Use the keypad to enter a value, and then press **OK**.
 - Press **REJECTS** to display the numeric keypad. Use the keypad to enter a value, and then press **OK**.
6. To use the Autoreagent feature (RECOMMENDED), set the **AUTOREAGENT** indicator to *On*. The Oxidizer and Acid indicators are now inactive.

The Analyzer will automatically calculate and implement the proper reagent flow rates.



NOTE: Refer to [Setting Reagent Flow Rates](#) for more information on using the Autoreagent feature.

Can the user still modify the Autoreagent rate? RICHARD CHECKING 3/21 Kurt/Paul checking 4/10(Set in manual first and then autoreagent?)

- To manually set the flow rate of the reagents, do the following:
 - Verify that the Autoreagent indicator is set to *Off* to ensure that the **ACID** and **OXIDIZER** buttons are in an active state.
 - Press **ACID** to display the numeric keypad. Use the keypad to enter a value, and then press **OK**.
 - Press **OXIDIZER** to display the numeric keypad. Use the keypad to enter a value, and then press **OK**.



NOTE: For recommended reagent rates, refer to [Recommended Acid Flow Rates](#) and [Recommended Oxidizer Flow Rates](#) on page 120.

- To set a new value (the default value is XX) for a fast or normal flush time, press MORE to display the More Method Configuration dialog box. Do the following:
 - Press inside the Fast Flush Time field to display the numeric keypad. Enter a value (in minutes), and then press OK.
 - Press inside the Normal Flush Time field to display the numeric keypad. Enter a value (in minutes), and then press OK.
- To operate the Analyzer with an ICR, set the **ICR** indicator to *On*. Otherwise, if your instrument does NOT have an ICR (or you want to bypass the ICR), go to the next step.
- To operate the Analyzer in Turbo mode, set the **TURBO** indicator to *On*. Otherwise, if your instrument does NOT have Turbo (or you want to run in regular mode), go to the next step.

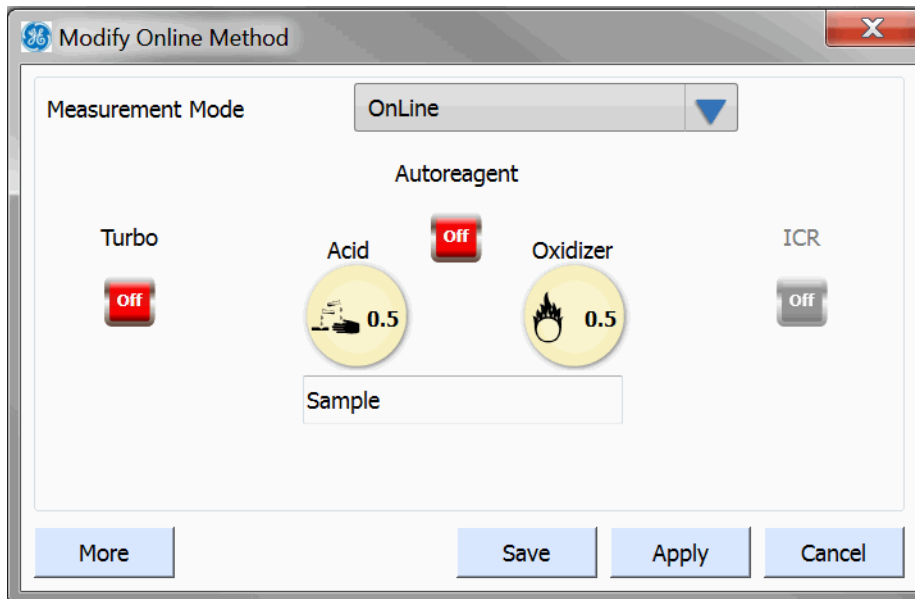
For information on Turbo mode, see “Running Samples in Turbo Mode” on page 120.
- Do one of the following:
 - To save as the method name showing in the Method Name field** — Press **SAVE**. This will overwrite any previous settings saved to this name.
 - To save as the method with a NEW name** — Press **SAVE AS** to display the *Enter Protocol Name* dialog box. Use the alpha/numeric keypad to enter a unique name, and then press **OK**.

ICR BUTTON DOES NOT WORK

Where do I schedule (are we having) autoreagent adjustments in On-Line Mode?

To create or change a **Sampling Method?** – ONLINE MODE

1. On the **HOME** screen, press **SETUP** to display the *Modify Method* dialog box.



2. Select Online in the Measurement Mode field.

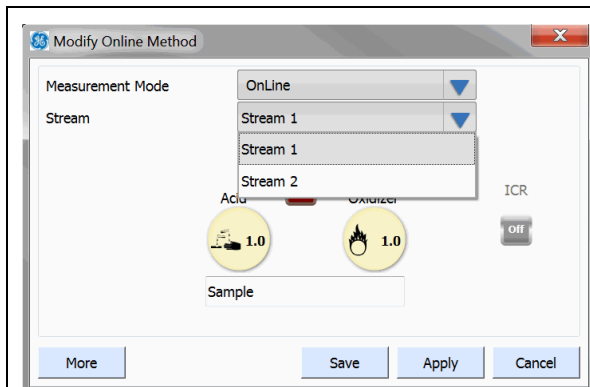


Figure 36: Modify Online Method Dialog Box

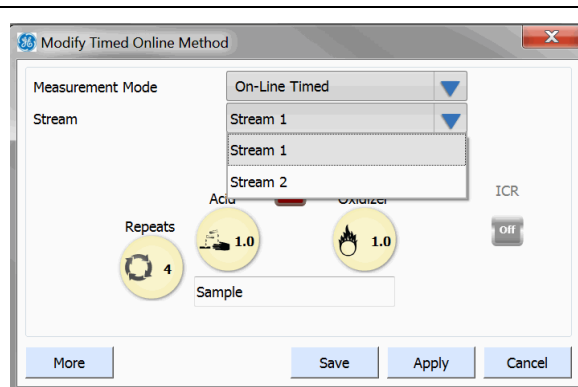


Figure 37: Modify Timed Online Method Dialog Box

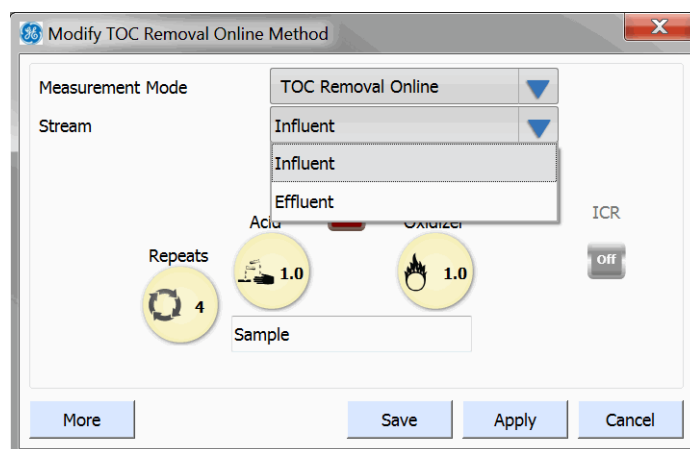


Figure 38: Modify TOC Removal Online Method Dialog Box

3. Select one of the following in the **MEASUREMENT MODE** field to display the corresponding Modify Method dialog box:
 - **Online** – (Figure 36: Modify Online Method Dialog Box)
 - **Online Timed** – (Figure 37: Modify Timed Online Method Dialog Box)
 - **TOC Removal Online** – (Figure 38: Modify TOC Removal Online Method Dialog Box)
4. If you selected **Online** or **Online Timed** in the previous step, select **Stream 1** or **Stream 2** in the **STREAM** field.

To set the measurement cycle (hh:mm) for **Online Timed** measurements, go to the **Configuration** screen, select the **System Setup** tab, and press **ONLINE SETUP**. After you have set the measurement cycle, return to the Modify TOC Removal Online Method Dialog Box
5. If you selected **TOC Removal Online** in the previous step, select **Influent** or **Effluent** in the **STREAM** field.



To assign/name Influent or Effluent to a specific stream (Stream 1 or Stream 2), go to the Configuration screen, select the System Setup tab, and press ONLINE SETUP.

6. Press inside the **SAMPLE NAME** field (located under the **ACID** and **OXIDIZER** buttons) to display the alpha/numeric keypad. Use the keypad to enter a name (such as XYZ Building Waste Line) for the Online method, and then press **OK**.
7. To use the Autoreagent feature (RECOMMENDED), set the **AUTOREAGENT** indicator to *On*. The Oxidizer and Acid indicators are now inactive.

The Analyzer will automatically calculate and implement the proper reagent flow rates.



NOTE: Refer to [Setting Reagent Flow Rates](#) for more information on using the Autoreagent feature.

Can the user still modify the Autoreagent rate? RICHARD CHECKING 3/21(Set in manual first and then autoreagent?)

8. To manually set the flow rate of the reagents, do the following:
 - Verify that the Autoreagent indicator is set to *Off* to ensure that the **ACID** and **OXIDIZER** buttons are in an active state.
 - Press **ACID** to display the numeric keypad. Use the keypad to enter a value, and then press **OK**.
 - Press **OXIDIZER** to display the numeric keypad. Use the keypad to enter a value, and then press **OK**.



NOTE: For recommended reagent rates, refer to [Recommended Acid Flow Rates](#) and [Recommended Oxidizer Flow Rates](#) on page [page 120](#).

9. To set a value for a fast or normal flush time, press **MORE** to display the *More Method Configuration* dialog box. Do the following:
 - Press inside the *Fast Flush Time* field to display the numeric keypad. Enter a value (in minutes), and then press **OK**.
 - Press inside the *Normal Flush Time* field to display the numeric keypad. Enter a value (in minutes), and then press **OK**.
10. To operate the Analyzer with an ICR, set the **ICR** indicator to *On*. Otherwise, if your instrument does NOT have an ICR (or you want to bypass the ICR), go to the next step.
11. To operate the Analyzer in Turbo mode, set the **TURBO** indicator to *On*. Otherwise, if your instrument does NOT have Turbo (or you want to run in regular mode), go to the next step.



NOTE: Turbo (a product option available from GE Analytical Instruments) must be installed and enabled before the Turbo feature is active on the screen. See "To enable Turbo" on page 104.

12. Press **SAVE**. This will overwrite the previous Online method file, and erase any earlier settings.

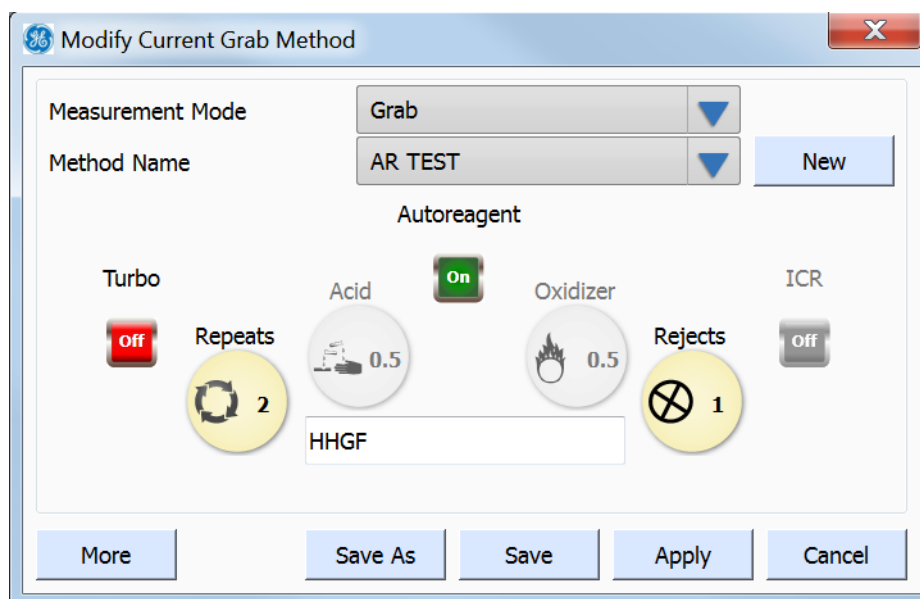
Running a sample

WIP overview.....Add note All setup and then run a sample?take TOC measurement

To run a sample

When taking a TOC measurement of your sample, you can assign a unique sample name.

1. On the *Home* screen, press **SETUP** to display the *Modify . . . Method* dialog box.



2. Select the measurement mode to use (*Grab* or *TOC Removal Grab* or *On-Line*) in the *Measurement Mode* field.
3. Select the method to use in the **METHOD NAME** field.
4. (Optional) Assign a sample name. Press inside the Sample Name field to display the numeric keypad. Use the keypad to enter a name for the sample, and then press **OK**. The new name appears in the Sample Name field.
5. Click **APPLY** to use this method and return to the *Home* screen.

6. Press **RUN** to begin the sampling. The sampling progress and measurement data appears on the screen in real time.



NOTE: For additional information on measurement status and data, refer to ["Reviewing the Home Screen" on page 127.](#)

Reviewing the Home Screen

You can also see an alert for active Warnings and Errors and percent indicators of remaining consumables' levels.

and start and stop sample analyses.

, open related messages (and go to *Diagnostics* screen.

Data from your last measured sample stays

A table containing data from the last measured sample appears on the *Home* screen to provides TOC (IC and TC) data along with mean standard deviation (S.D.) and relative standard deviation (RSD) of the sample.

percent indicators of remaining consumables' levels,

[Table Last Measurement](#)

[TOC \(IC and TC\)](#)

[Last measured](#)

[Average](#)

[S.D.](#)

[R.S.D.](#)

[To the right, Consumables Life visual status](#)

[Acid](#)

[Oxidizer](#)

[UV Lamp](#)

[Tubing](#)

[Resin Bed](#)

[Setup button](#)

[\(Arrow\) Start Analysis](#)

[Time Until Next Measurement](#)

[Current Sequence](#)

[Shut Down button](#)

[Lower current date and time](#)

VIEWING CONSUMABLES LEVELS

Quick view consumables

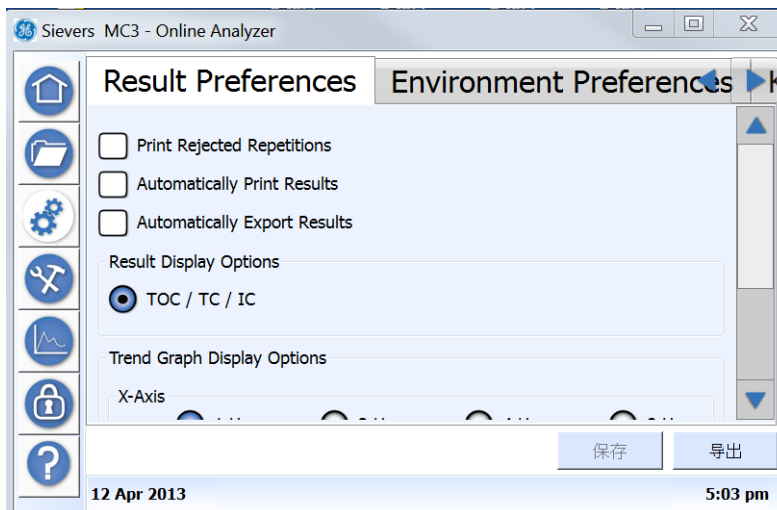
SHUTTING DOWN THE INSTRUMENT

WIP If they just power off, there is a danger of corrupting database. We are running an OS just like your computer. You don't want to just power cycle.

USING THE PROTOCOLS SCREEN

Overview and then cross-reference to Chapter 5 Password Protection and DataGuard

USING THE CONFIGURATION SCREEN



Overview information

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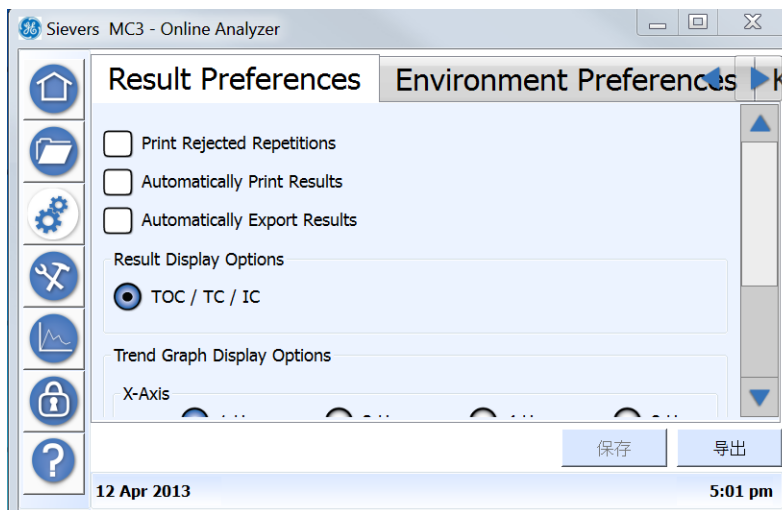
System Settings (Constants) Export

You can save system settings for any tab on the screen XXXXX Suggest before and after?(Do you have to export for each tab? Or, does it automatically export constants from every tab?)
An **EXPORT** button is available on each tab on the *Configuration* window. XXXXX

To export system settings (constants)

1. On the *Configuration* screen, select the appropriate *Configuration* window tab,
2. Verify the options selected, and press **SAVE** if you make any changes.
3. To export the saved configuration settings, do one of the following:
 - To export to a USB memory device — Insert the USB memory device into one of the Analyzer's Host USB ports, and then press **EXPORT**. The settings will be exported to the USB memory device.
 - To export through an Ethernet connection — Press **EXPORT**. The settings will be exported to the designated MODBUS register via Ethernet. The data can then be accessed from your company's SCADA system or a third-party data acquisition software.

The Result Preferences Tab



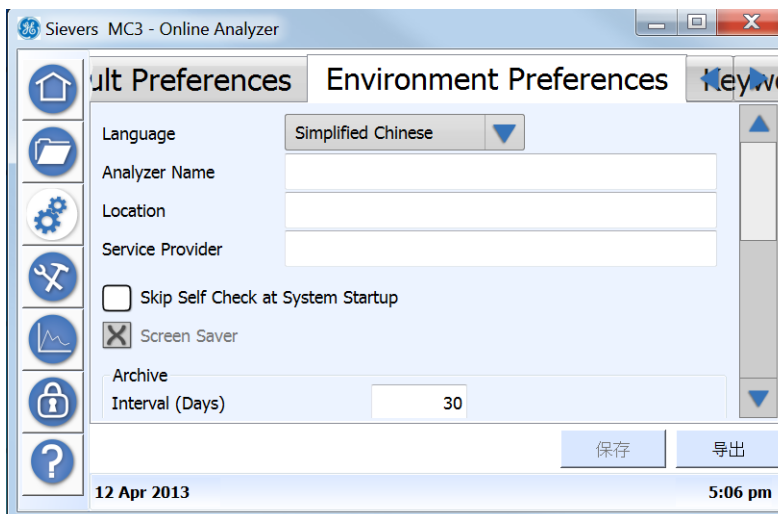
Use this procedure to set your preferences for printing and exporting results, as well as to define settings for the trend graph. The trend graph appears on the *Home* screen, when the **ON-LINE** mode is selected as the *Measurement Mode* on the *Modify Current Online Method* dialog box.

To set result preferences

1. On the *Configuration* screen, select the *Result Preferences* tab.
2. Select any or all of the following options to set your preferences for printing and exporting results:
 - Print Rejected Repetitions
 - Automatically Print Results
 - Automatically Export Results
3. Select one of the following result display options for the type of data to graph:
 - TOC/IC/TC
 - TOC/TCond
 - TOC/rCond/Temp
 - rCond/Temp/tCond (This option shows measurements for conductivity only, and data is indicated on the X-axis.)
4. Select one of the following time ranges for the data on the X-Axis:
 - 1 Hour
 - 2 Hours
 - 4 Hours

- 8 Hours
 - 1 Day
 - 2 Days
 - 1 Week
5. Select one of the following options for the TOC range on the Y-Axis:
 - Auto — Select to have the Analyzer automatically calculates the appropriate TOC range.
 - Manual — Select to activate the Min and Max fields, and then enter a specific value in ppb units in each field.
 6. Press **SAVE**. Just for the tab or all tabs on screen?

The Environment Preferences Tab



Use this tab to set the language ~~xxx~~. You can assign a name to the Analyzer that appears on printed and exported data, a name, location, and service provider for the Analyzer. This feature is particularly useful if you have multiple Analyzers at your facility and want to easily distinguish data collected from each instrument.

To set the language

To change to a new language other than the default language configured at the factory, perform the following steps.

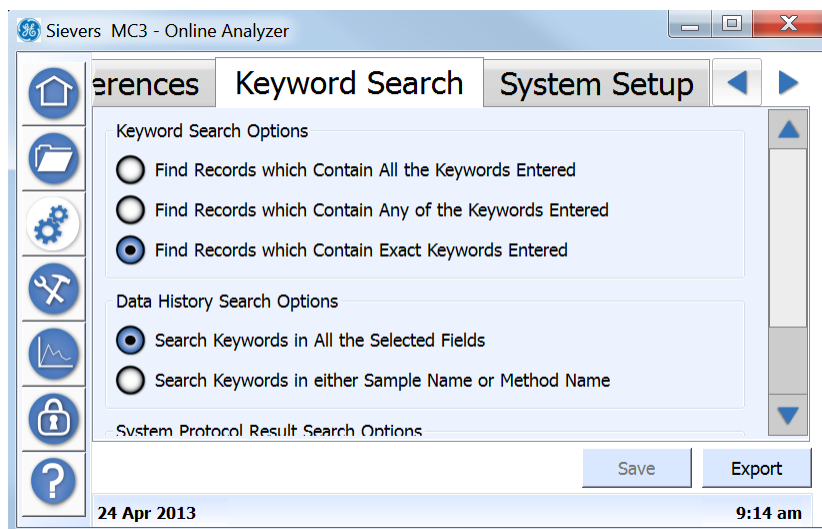
1. On the *Configuration* screen, select the *Environment Preferences* tab.
1. Select one of the preferred languages for the Analyzer:
 - English (*1st position in language option list*)
 - Simplified Chinese (*2nd position in language option list*)

- Japanese (3rd position in language option list)
2. Press **SAVE** (1st button on the lower-right of screen).
 3. You must restart the Analyzer for this change to take effect. On the *Home* screen, press the **SHUT DOWN** button and then restart the Instrument.

To set environment preferences

1. On the *Configuration* screen, select the *Environment Preferences* tab.
2. (Optional) To set the Analyzer Name and Location (and Service Provider? what is meant here?), Press inside each of the following fields to display the numeric keypad. Use the keypad to enter a name, and then press **OK**. The new name appears in the corresponding field.
 - Analyzer Name
 - Location
 - Service Provider
3. Select or de-select the following display preferences:
 - Skip Self Check at System Startup
 - Screensaver
4. Set the timing values for archiving and backing up data. Press inside each of the following fields to display the numeric keypad. Use the keypad to enter the value (in days), and then press **OK**. The new number of days appears in the corresponding field.
 - Archive Interval (Days)
 - Data Age (Days)
 - Backup Interval (Days)
5. Select one of the following for the time formats to display:
 - 01:42:58 (am/pm)
 - 13:42:58 (24 Hour)
6. Select one of the following date formats to display:
 - 16 Jan 2012 (Text Based)
 - 01/16/2012 (Month First)
 - 16/01/2012 (Day First)
 - 2012/01/16 (Year First)
7. Press **SAVE**.

The Keyword Search Tab



Select parameter options for the keyword search and that is accessed through the *Data History* tab on the *Configuration* screen. Select whether to search ALL selected fields, or only the Sample Name or Method Name field. (Need help understanding the intent of these options, as the search seems to work the same for each option??) Is the system protocol result search for searching results in all of the following? Validation History, Pharmacopoeia History, Calibration History, and Data History ...whether to search ALL selected fields, or only the Protocol Name and Vial Name?

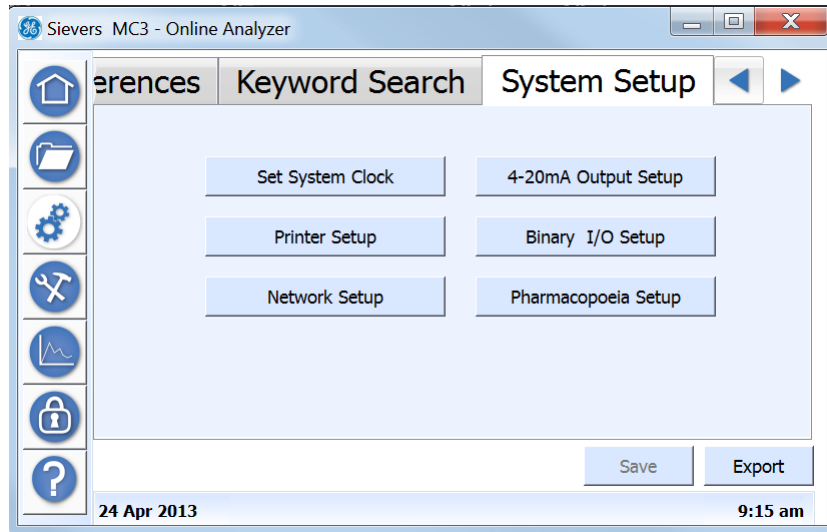
To set keyword search options

1. On the *Configuration* screen, select the *Keyword Search* tab.
2. Select one of the following *keyword search* options:
 - Find Records which contain All the Keywords Entered
 - Find Records which contain Any of the Keywords Entered
 - Find Records which contain Exact Keywords Entered
3. Select one of the following *data history* search options:
 - Search keywords in All the Selected Fields
 - Search keywords in either Sample Name or Method Name
4. Select one of the following system protocol result search options:
 - Search Keywords in All the Selected Fields
 - Search Keywords in either Protocol Name or Vial Name
5. Press **SAVE**.



NOTE: For more information on MODBUS, refer to [“Using the Ethernet Connection and Modbus” on page 149.](#)

The System Setup Tab



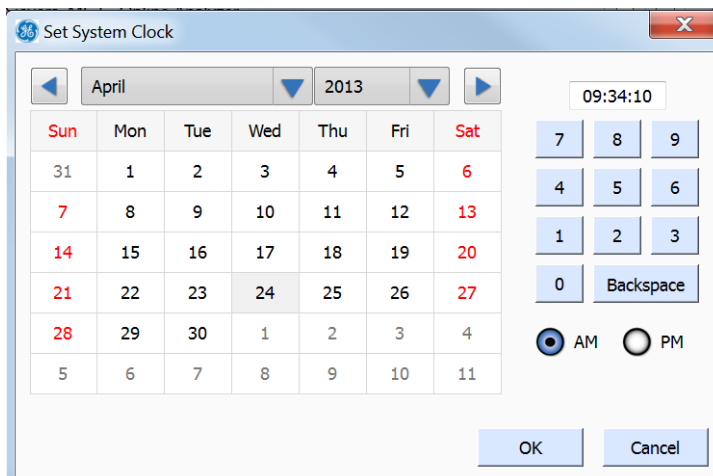
XXX

- Set System Clock
- Printer Setup
- Network Setup
- 4-20mA Output Setup
- Binary I/O Setup
- Phamacopoeia Setup

SETTING THE SYSTEM CLOCK

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To set the system clock



1. On the *Configuration* screen, select the *System Setup* tab.
2. Press **SET SYSTEM CLOCK** to display the *Set System clock* dialog box.
3. Using the calendar, set today's current date.
4. Using the numeric keypad to the right, set the current time and select either the **AM** or **PM** option.
5. Press **OK** to accept the settings and return to the *System Setup* tab.
6. Press another button to change the related setting.

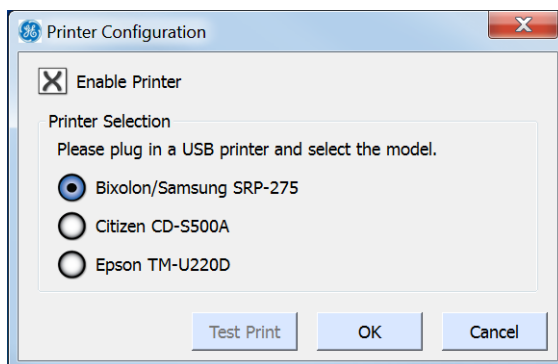
CONFIGURING A PRINTER

;lkjasdf

To configure a printer connection (optional)

Connect the printer as described in xxxx

1. On the *Configuration* screen, select the *System Setup* tab.
2. Press **PRINTER SETUP** to display the *Printer Configuration* dialog box.



3. Select **ENABLE PRINTER**.
4. Select one of the following printer models:
 - Bixolon/Samsung SRP-275
 - Citizen CD-S500A
 - Epson TM-U220D
5. Press **OK** to accept the settings and return to the *System Setup* tab.

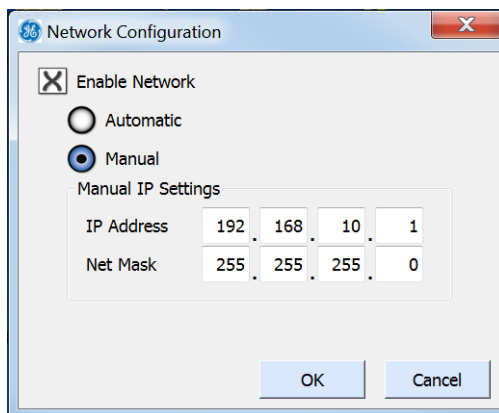
CONFIGURING THE NETWORK

lkjasdf;lkjasdf

To configure the network connection

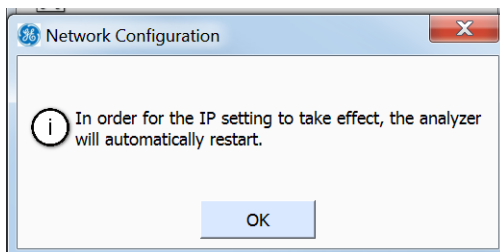
Connect the xxx as described in xxxx. Work with your IT department to xxxx .

1. On the **CONFIGURATION** screen, select the *System Setup* tab.
2. Press **NETWORK SETUP** to display the *Network Configuration* dialog box.



3. Select **ENABLE NETWORK**.
4. To use a dynamic IP address, select **Automatic**, and then **OK**. Otherwise, to the next step.
5. To use a fixed IP address, select **MANUAL**.
6. Enter the IP and net mask addresses. Press inside each field to display the numeric keypad. Use the keypad to enter the appropriate number, and then press **OK**. The new number appears in the individual field.

- After you have entered the full IP Address and Net Mask addresses, press **OK**. A confirmation message appears.



- Press **OK** to confirm the restart. The Analyzer automatically shuts down and restarts in order to implement the new IP setting.

CONFIGURING 4-20mA OUTPUT

;lkjasdf

To configure the 4-20mA output (optional)

Connect the xxx as described in xxxx.

- On the *Configuration* screen, select the *System Setup* tab.
- Press **4-20MA OUTPUT SETUP** to display the *4-20mA Output Configuration* dialog box.

- Select **4-20MA OUTPUT**. (development WIP)
- Press **OK** to accept the settings and return to the *System Setup* tab.

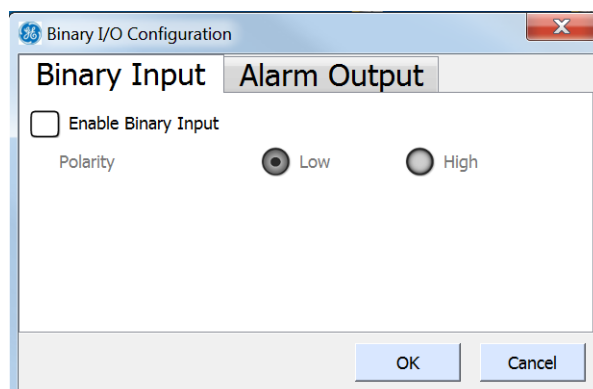
CONFIGURING BINARY I/O INPUT

;lkjer

To configure the binary I/O input (optional)

Connect the xxx as described in xxxx.

1. On the *Configuration* screen, select the *System Setup* tab.
2. Press **BINARY I/O SETUP** to display the *Binary I/O Configuration* dialog box.



3. Select **ENABLE BINARY INPUT**.
4. Select either the **LOW** or **HIGH** Polarity option,
5. Press **OK** to accept the settings and return to the *System Setup* tab.

PHARMACOPOEIA OVERVIEW

Because pharmacopoeia TOC and conductivity (consider changing terminology) monographs diverge, the Analyzer allows you to specify which pharmacopoeia monograph is applicable to your environment. (You can also use the Analyzer without selecting a pharmacopoeia.) (Does one of these apply as a default?). Pharmacopoeia monographs shape the criteria for Conductivity limits and pass/fail results, as well as temperature and conductivity guidelines.

Pass/Fail Reporting

The TOC Analyzer will report a Pharmacopoeia “Pass” result, if all of the selected pharmacopoeia tests pass identified criteria and limits. The TOC Analyzer will report a Pharmacopoeia “Failure” result, if any of the selected tests fail. Conductivity and TOC tests can be independently tested with the alarms, an alarm can be set for each of TOC Limit, Cond Limit, or Limits. Limits will trigger if any of the TOC or conductivity tests fail. TOC Limit only if any of the TOC tests fail, and Cond Limit only if any of the conductivity tests fail.

Pharmacopoeia Options

You can select any combination (or none) of the following Pharmacopoeia options:

USP WFI/PW: The Analyzer meets the test requirements for the United States Pharmacopoeia (USP) monographs; USP<643> Total Organic Carbon and USP<645> Conductivity. The water passes the USP<643> TOC test if its measured TOC (ru) is not more than the Limit Response, (rs – rw). The water sample passes the Stage 1 conductivity test if the measured conductivity is not greater than the table value (at the first temperature in the chart that is not greater than the measured water temperature).

EP WFI/HPW: The Analyzer meets the test requirements of the following European Pharmacopoeia (EP) monographs; EP (2.2.44) Total Organic Carbon in Water for Pharmaceutical Use and the Conductivity Requirements of the EP monographs “Water for Injections” (WFI) and “Water, Highly Purified” (HPW). The TOC test passes if the measured TOC of the pharmaceutical water sample is not less than the lower of the Limit Response or 500 ppbC (per the requirements of the EP WFI and HPW monographs). The Stage 1 conductivity test passes if the measured non-temperature compensated conductivity value is not greater than the conductivity value in the table for WFI at the next lower temperature (in the table), than the measured temperature of the water (Stage 1 test in the WFI or HPW monographs).

CP WFI: The Analyzer meets the test requirements of the following Chinese Pharmacopoeia (CP) monographs; CP TOC Measurement in Pharmaceutical Water- Appendix VIII R for Water for Injection and CP Conductivity- Appendix VIII S for Water for Injection. The TOC test passes if the sample of WFI has a measured TOC value not greater than (rs – rw) or 0.50 g/L. The conductivity test passes Step 1 if the measured non-temperature compensated conductivity is not greater than the table conductivity value at the next lower temperature value in the table that is not greater than the measured temperature.

IP WFI: The Analyzer meets the test requirements of the India Pharmacopoeia (IP) monographs for Water for Injection: IP 2.4.30 Total Organic Carbon in Water and IP 2.4.9 Conductivity for Water for Injections in Bulk. The TOC test is passed if the measured TOC of the sample (rt) is not greater than (rs – rw) or not more than 0.5 mg/L. The Stage 1 conductivity test is passed if the non-temperature corrected conductivity is not greater than the table value for WFI at the next lowest temperature value in the table that is not greater than the measured water temperature.

JP TOC: The Analyzer meets the test requirements of the Japanese Pharmacopoeia (JP) monographs; JP<2.59> Total Organic Carbon for Water for Injection and Purified Water. The test passes if the measured Water for Injection or Purified Water sample TOC value is not greater than 0.50 mg/L.

EP PW: The Analyzer meets the testing requirements of the following European Pharmacopoeia (EP) monograph for Purified Water (PW); EP<2.2.44 Total Organic Carbon in Water for Pharmaceutical Use and the Conductivity Requirements of the EP monographs “Water, Purified”. The TOC test passes if the measured TOC of the pharmaceutical water sample is not less than the lower of the Limit Response or 500 ppbC (per the requirements of the EP PW monograph). The conductivity test passes if the measured conductivity (not the temperature compensated conductivity) is not greater than the value in the “Temperature and Conductivity requirements table” (in the EP PW monograph) at the measured temperature of the water. For temperatures not listed in the table, the maximal permitted conductivity is calculated by interpolation between the next lower and next higher temperature data points in the table.

CP PW: The Analyzer meets the testing requirements for the following Chinese Pharmacopoeia (CP) monographs; CP TOC Measurement in Pharmaceutical Water-

Appendix VIII R for Water for Injection and CP Conductivity- Appendix VIII S for Water for Injection. The TOC test passes if the sample of WFI has a measured TOC value not greater than (rs - rw) or 0.50 g/L. The conductivity test passes if the measured conductivity (not the temperature compensated conductivity) is not greater than the value in the "Temperature and Conductivity requirements table" in the CP Conductivity- Appendix VIII S (for purified water) monograph at the measured temperature of the water. For temperatures not listed in the table, the maximal permitted conductivity is calculated by linear interpolation between the next lower and next higher temperature data points in the table.

IP PW: The Analyzer meets the testing requirements of the India Pharmacopoeia (IP) monographs for Water for Injection: IP<2.4.30> Total Organic Carbon in Water and IP 2.4.9 and Conductivity IP<2.4.9> for Purified Water. The TOC test is passed if the measured TOC of the sample (rt) is not greater than (rs - rw) or not more than 0.5 mg/L. The conductivity test passes Step 1, if the measured non-temperature compensated conductivity is not greater than the conductivity value in the table for Purified Water at the next lower temperature value in the table, that is not greater than the measured temperature.

JP COND: The Analyzer meets the testing requirements of the Japanese Pharmacopoeia (JP) Conductivity <2.51>. The test passes if the temperature corrected conductivity is not more than 2.1 uS/cm.

SELECTING A PHARMACOPOEIA MONOGRAPH

Because pharmacopoeia TOC and conductivity monographs diverge, the Analyzer allows you to specify which pharmacopoeia monograph is applicable to your environment. You can also use the Analyzer without selecting a pharmacopoeia. Refer to XX for pharmacopoeia descriptions.

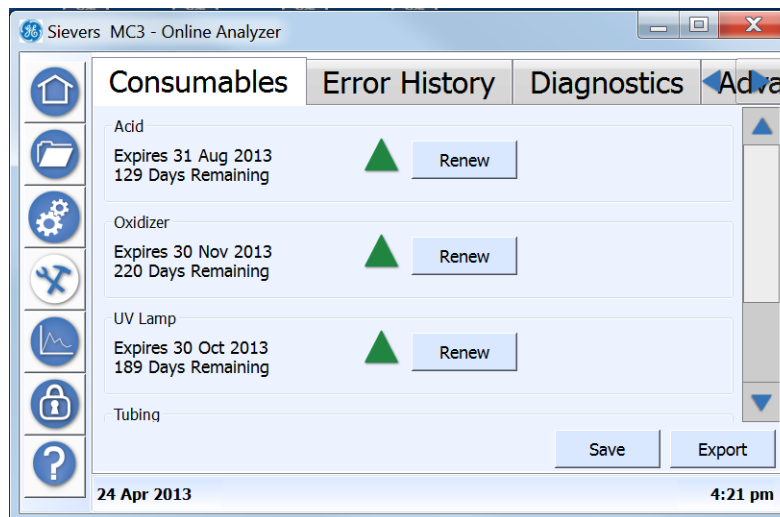
To specify the pharmacopoeia (optional)

1. On the *Configuration* screen, select the *System Setup* tab.
2. Press **PHARMACOPOEIA SETUP** to display the *Pharmacopoeia Configuration* dialog box.(development WIP)
3. Select one or more of the following pharmacopoeia options (in any combination). Or, to use the Analyzer without selecting a pharmacopoeia, deselect ALL of the options.
4. Press **OK** to accept the settings and return to the *System Setup* tab.

THE SAVE button is not active? Should it be? When to use it-after each dialog box, tab, other change?

USING THE MAINTENANCE SCREEN

Revise this section by summarizing the sections that describe preventative maintenance, as this is detailed in the Maintenance Chapter. Also move the troubleshooting tasks to the Troubleshooting Chapter.



Overview

Use this screen in the process of performing the following preventative maintenance tasks:

- Enter and track consumables expiration (*Consumables* Tab)
- Flush reagent syringes (*Advanced* Tab)
- Temporarily disable the screen for cleaning (*Advanced* Tab)

You will also use this Maintenance screen to access the tabs for the following operational maintenance tasks, as described in other chapters (as listed):

- *Error History* Tab — Review the list of errors and warnings issued by the Analyzer during operation of the instrument. Step-by-step instructions, and error/warning descriptions, are included in Chapter 9, "Troubleshooting."
- *Diagnostics* Tab — Use this tab to perform diagnostic activities when troubleshooting operational and analyses issues, Information and instructions are included in Chapter 9, "Troubleshooting."
- *Advanced* Tab — Use this tab to upgrade firmware, activate options, back up the database, back up settings, archive the database, calibrate the touch panel, restore the database,

and restore settings. This tab and the related step-by-step instructions are included in Chapter 5, "Operation."

SETTINGS (CONSTANTS) EXPORT

You can save system settings for any tab on the screen XXXXX Suggest before and after?(Do you have to export for each tab? Or, does it automatically export constants from every tab?) An **EXPORT** button is available on each tab on the *Configuration* window. XXXX

To export system settings (constants)

1. On the *Maintenance* screen, select the appropriate *Maintenance* tab,
2. Verify the options selected, and press **SAVE** if you make any changes.
3. To export the saved maintenance settings, do one of the following:
 - To export to a USB memory device — Insert the USB memory device into one of the Analyzer's Host USB ports, and then press **EXPORT**. The settings will be exported to the USB memory device.
 - To export through an Ethernet connection — Press **EXPORT**. The settings will be exported to the designated MODBUS register via Ethernet. The data can then be accessed from your company's SCADA system or a third-party data acquisition software.

The Consumables Tab

You can view the expiration date and number of remaining days for the following consumables on this tab:

- Acid
- Oxidizer
- UV Lamp
- Tubing
- Resin Bed

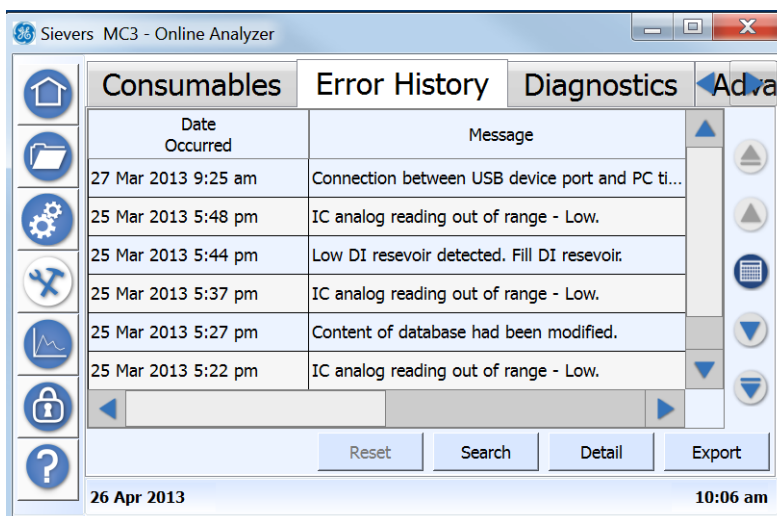
A triangle icon appears next to the **RENEW** button to indicate the severity of the expiration date: green (adequate time frame) Is there a yellow(?), or red (Expiration nearing). Use this tab to reset the expiration date after replacing a consumable item.

To renew an expiration date

After replacing the consumables item in the Analyzer.....






1. On the *Maintenance* screen, select the *Consumables* tab.
2. Press the **RENEW** button next to the consumable item you have replaced. (feature not yet implemented)
3. xxx
4. xxx
5. Press **SAVE**.

The Error History Tab



You can use this tab to search and view a cumulative list of recent and historical errors and warnings.

To view error and warning history

1. Use the vertical scrollbar to move through a list of recent messages (listed most recent to oldest). Or, use one of the following buttons to scroll through the messages:
 - Use the **UP**  and **DOWN**  arrows to skip forward and backward by a page.
 - Use the **START**  and **END**  arrows to take you to the most recent or oldest message (respectively).
2. To search for messages for a specific date, press the **CALENDAR**  icon to display the *Calendar* dialog box. Use the navigation arrows (as needed) to locate the date, and then press the day to view.

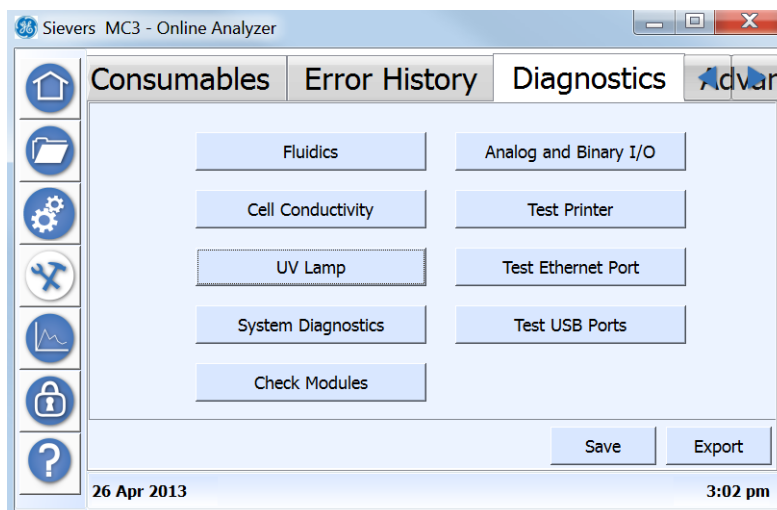
The Analyzer automatically returns you to the *Validation History* tab with any messages from the selected date displayed.

3. To search for messages by a keyword, [User ID, Is this separate from keyword or combined with/how? AND/OR the date acknowledged, press SEARCH. Can you change the categories by which to search by?](#)The *Search dialog box* appears.
Otherwise, go to step [4](#).
4. [\(Return to verify these steps after Search development is completed.\)](#)To include a keyword or keyword string in the search, select **KEYWORD SEARCH**, and then press inside the *Keyword Search* field to display the alpha/numeric keypad. Type a word or string of words to find.

The word (or string of words) appears in the *Keyword Search* field.
5. To include a date range in the search, do the following:
 - Select **DATE ACKNOWLEDGED**, and then press inside the *Start Date* field to display the *Start Date* dialog box. Use the navigation arrows (as needed) to locate the date, and then press the first day in the range to view.

The Analyzer automatically returns you to the *Search* dialog box.
 - Press inside the **END DATE** field to display the *End Date* dialog box. Use the navigation arrows (as needed) to locate the date, and then press the last day date in the range to view.
6. Press **SEARCH**. The Analyzer returns to the *Search dialog box*, and displays the messages meeting the search criteria. [\(Return to modify these steps after Search development is completed.\)](#)
7. Use the horizontal scrollbar to move to the right and back to left to view message information, such as *Date Occurred*, *Message (Text)*, *Acknowledged By*, and *Date Acknowledged*.
8. To view additional details of any message, select the message line and press **DETAIL**. A summary of the message appears including additional information, such as error level (Error or Warning) and module reported.
9. Press **OK** to return to the *Error History* tab.

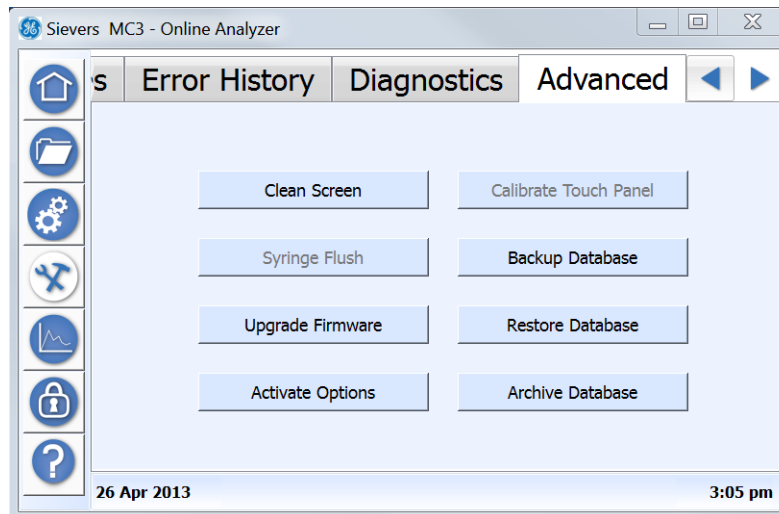
The Diagnostics Tab



WIP

- xxfluidics
- xxcell conductivity
- xxUV lamp
- xxsystem diagnostics
- xxcheck modules
- xxanalog and binary I/O
- xxtest printer
- xxtest Ethernet port
- xxtest USB port

The Advanced Tab



Use the *Advanced* tab to xxxx

- Disable the touchscreen while cleaning
- Flush the syringes
- upgrade firmware
- activate options
- calibrate touch panel
- back up the database
- restore database
- archive database

Cleaning the Analyzer

This section includes suggested cleaning supplies and instructions for cleaning the Analyzer's external housing and touchscreen.

To clean the external housing

You will need a clean, soft cloth dampened with water or a non-abrasive cleaner, and another clean, *dry* soft cloth.

1. Turn *off* power to the Analyzer and disconnect it from the main power source.
2. Wipe the external housing with a clean cloth dampened with water or a non-abrasive cleaner.



WARNING
<p>Always apply liquid to the cloth directly, and do NOT spray liquids directly on the Analyzer.</p> <p>Do NOT use water or cleaners on the touchscreen, as water can damage or discolor the polarizer. Refer to the next section for recommendations on cleaning the touchscreen.</p>

3. Wipe dry with another clean, *dry* soft cloth.

To clean the touchscreen

You will need a clean, soft (and *dry*) cloth or cotton pad. You may add a small amount of methanol or isopropyl alcohol to the cloth, but ensure that all solvent residue is removed first.

1. Disable the screen for cleaning. On the *Maintenance* screen, select the *Advanced* tab.
2. Press **CLEAN SCREEN** to temporarily disable the screen for 30 seconds. Repeat, as needed, if the 30-second time frame expires while cleaning.
3. Wipe the touchscreen with a clean, soft (and dry) cloth or cotton pad.

WARNING
<p>Do NOT use water as water can damage or discolor the polarizer. Clean any condensation or moisture immediately.</p>

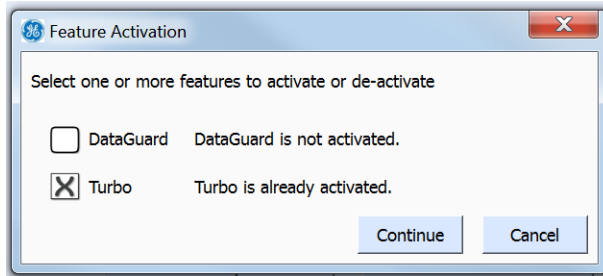
Flushing the syringes

[Firmware development in progress.](#)

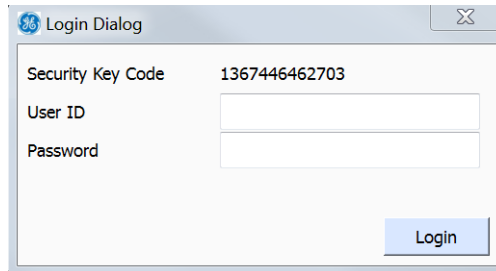
Upgrading the Firmware

[Research - information is not available in Demo.](#)

Activating DataGuard and Turbo Options



1. On the *Maintenance* screen, select the *Advanced* tab.
1. Select the option or options to activate. add text about must purchase.
2. Press **CONTINUE** to display the *Login Dialog* box.



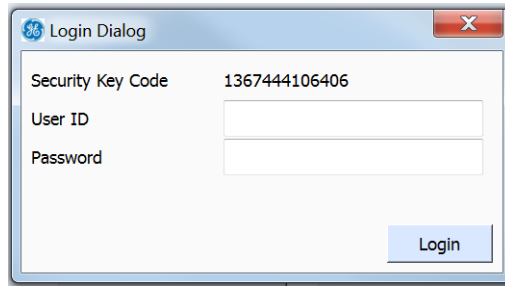
3. Development in progress?

Calibrating the Touch Panel

xxxxx Under development

1. ;lkjadf
2. ;lkjadf
3. ;lkjadf
- 4.

Backing up the Database



xxxxx Is the ability to perform this action set up in DataGuard (thus the user ID/password)?

1. ;lkjadf
 2. ;lkjadf
- - back up the database
 - restore database
 - archive database

USING THE DATA VIEW SCREEN

exporting data history

USING THE SECURITY/DATAGUARD SCREEN

Overview information

USING THE HELP SCREEN

Overview Information

USING THE ETHERNET CONNECTION AND MODBUS

different from 900

Figure 39: USB Connection Locations

Figure 40: XX

USING THE SECURITY/DATAGUARD SCREEN

Separate maintenance and troubleshooting chapter????



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6

PASSWORD PROTECTION

OVERVIEW

XXXXX

Add note DataGuard does NOT apply to MC3e.

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7

CALIBRATION AND VERIFICATION

.....

OVERVIEW

XXXXX

Verify not including System Suitability in 900e.

USING THE PROTOCOLS SCREEN

System Protocols and User Defined Methods

System Protocols

Calibration

Single Point Calibration

Sample Conductivity

Multi-point Calibration

TOC Autozero

TC / IC Cell Conductivity Autozero

Pharmacopoeia Test

System Suitability

Accuracy / Precision

Validation

PROTOCOL 1 TEST

TEST SINGLE SOURCE

;lkjasdf;kljadsf

- ;lkjasdf;lkjasdf
- asd;flkjasdf;lkjasdf
- ;lkjasdf;lkjasdf

heading 2

;lkjasdf;lkjasdf

as;lkjsdf

HEADING 3

;lkjaadf;lkjasdf

;lkjasdf;lkjafd

Heading 4

;lkj;lkj;kljasdf

;lkjasdf;lkjasdf



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8

MAINTENANCE

.....

This chapter is a WIP. An outline (as requested) is provided for the safety review.

OVERVIEW

To ensure optimum performance of the Analyzer, perform the routine maintenance tasks described in this chapter, and follow the recommended maintenance schedule outlined in this chapter for the routine replacement of Analyzer consumables. Chemical reagents, the in-line filter, UV lamp, and pump tubing MUST be purchased from GE Analytical Instruments.



NOTE: *The use of reagents from other sources—or the failure to replace the reagents on the prescribed replacement schedule—will invalidate the Analyzer's warranty.*

This chapter applies to ALL [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C TOC Analyzer](#) instrument models, except where noted. Step-by-step instructions for replacing consumables are included, along with a convenient one-year Preventative Maintenance record log. See Figure 44: 1-Year Maintenance Record Log (in the following section) for the recommended maintenance schedule. Review and complete this record log to help you track and ensure that all required preventive maintenance is performed on a regular schedule.

Service Kits for non-routine maintenance items are available from GE Analytical Instruments, and come with step-by-step instructions, as needed.

If you need additional assistance when performing this preventative maintenance, contact GE Analytical Instruments Technical Support at 800.255.6964. Technical Support in the United

Kingdom is available at 44 (0) 161 864 6800. In other countries, visit www.geinstruments.co to locate your representative. Training by a qualified service technician also can be provided.

Interior Views of the Analyzer

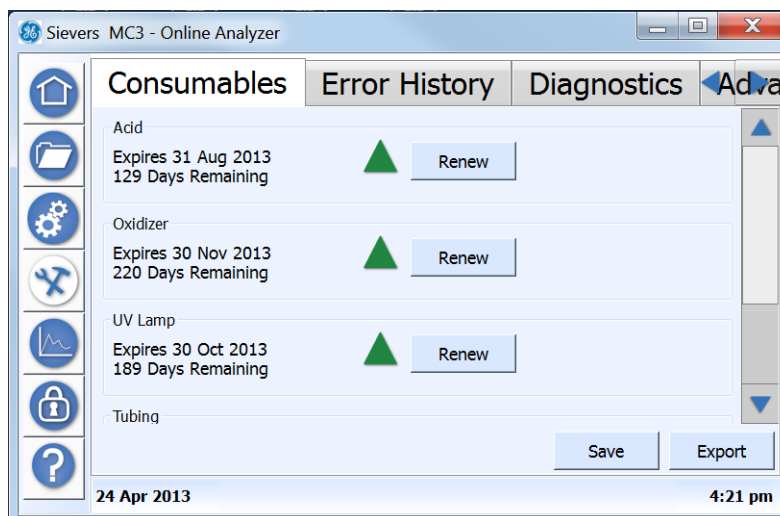
Locate the diagram for your Analyzer model (**On-Line, Laboratory, or Portable**) in this section, and refer to it as needed for performing the preventative maintenance described in this chapter.

Figure 41: Interior Overview – On-Line TOC Analyzer

Figure 42: Interior Overview – Laboratory TOC Analyzer

Figure 43: Interior Overview – Portable TOC Analyzer

USING THE MAINTENANCE SCREEN



Overview

You will use this screen in the process of performing the following preventative maintenance tasks:

- Entering and tracking consumables expiration (*Consumables* Tab)
- Flushing reagent syringes (*Advanced* Tab)
- Temporarily disabling the screen for cleaning (*Advanced* Tab)

You will also use this Maintenance screen to access the tabs for the following operational maintenance tasks, as described in other chapters (as listed):

- *Error History* Tab — Review the list of errors and warnings issued by the Analyzer during operation of the instrument. Step-by-step instructions, and error/warning descriptions, are included in Chapter 9, "Troubleshooting."
- *Diagnostics* Tab — Use this tab to perform diagnostic activities when troubleshooting operational and analyses issues, Information and instructions are included in Chapter 9, "Troubleshooting."
- *Advanced* Tab — Use this tab to upgrade firmware, activate options, back up the database, back up settings, archive the database, calibrate the touch panel, restore the database, and restore settings. This tab and the related step-by-step instructions are included in Chapter 5, "Operation."

PERFORMING ROUTINE MAINTENANCE TASKS

;lkjasdf;kljadsf:

- [Flushing Reagent Syringes](#)
- [Maintaining the DI Water Reservoir Level](#)
- [Cleaning the Analyzer](#)

Flushing Reagent Syringes

If the Analyzer has not been used for over 24 hours, the decomposition of persulfate can produce oxygen bubbles in the syringe pump and the reagent addition lines. To prevent bubbles from entering the sample stream and interfering in the TOC measurement, a reagent flush is used to remove the bubbles and fill the syringe with fresh reagent. A reagent flush also is recommended after installing new chemical reagents.

For the reagent flush, the Analyzer must be connected to a water supply. A 40-mL vial of water, or on-line water, may be used for the reagent flush.

[Firmware development in progress.](#)

xxxxUse the Advanced Tab

To flush the reagent syringes

1. ;lkjadsf
- 2.

Maintaining the DI Water Reservoir Level

Periodically check xxxxx and fill the reservoir as needed

[Single-source from Installation Chapter.](#)

To fill the DI water reservoir

1. ;lkjasdf
2. ;lkjasdf
3. ;lkjasdf

Cleaning the Analyzer

Along with replacing consumables, you will need to clean the house and touchscreen, as part of your routine preventative maintenance tasks.

This section includes suggested cleaning supplies and instructions for cleaning the Analyzer's external housing and touchscreen.

To clean the external housing

You will need a clean, soft cloth dampened with water or a non-abrasive cleaner, and another clean, *dry* soft cloth.

1. Turn *off* power to the Analyzer and disconnect it from the main power source.
2. Wipe the external housing with a clean cloth dampened with water or a non-abrasive cleaner.

WARNING

Always apply liquid to the cloth directly, and do NOT spray liquids directly on the Analyzer.
Do NOT use water or cleaners on the touchscreen, as water can damage or discolor the polarizer. Refer to the next section for recommendations on cleaning the touchscreen.

3. Wipe dry with another clean, *dry* soft cloth.

To clean the touchscreen

You will need a clean, soft (and *dry*) cloth or cotton pad. You may add a small amount of methanol or isopropyl alcohol to the cloth, but ensure that all solvent residue is removed first.

1. Disable the screen for cleaning. On the *Maintenance* screen, select the *Advanced* tab.
2. Press **CLEAN SCREEN** to temporarily disable the screen for 30 seconds. Repeat, as needed, if the 30-second time frame expires while cleaning.
3. Wipe the touchscreen with a clean, soft (and dry) cloth or cotton pad.

WARNING
Do NOT use water as water can damage or discolor the polarizer. Clean any condensation or moisture immediately.

REPLACING CONSUMABLES OVERVIEW

XXXXX:

- [Replacing Consumable Items](#)
- [Replacing the UV Lamp](#)
- [Replacing the Pump Heads](#)
- [Replacing the Resin Cartridge](#)
- [Replacing the UV Lamp](#)
- [Replacing the In-Line Filter Element](#)
- [Replacing the ICR Chemical Trap \(ICR users ONLY\)](#)

Maintenance Schedule

XXXXX

[Add Maintenance table - Mention reagent replacement data collected by RFID](#)

Why write these down when they are available in the instrument?

chemical trap (ICR-optional) - 1 yr.

Figure 44: 1-Year Maintenance Record Log

Tracking Consumables Expiration Dates

You can view the expiration date and number of remaining days for the following consumables on this tab:

- Acid
- Oxidizer
- UV Lamp
- Tubing
- Resin Bed

A triangle icon appears next to the **RENEW** button to indicate the severity of the expiration date: green ([adequate time frame](#)) [Is there a yellow\(?\)](#), or red ([Expiration nearing](#)). Use this tab to reset the expiration date after replacing a consumable item.

To renew an expiration date

[Include a note about the RFID tracking of Reagent Consumables. This Consumables section should only be used to enter older GE manufactured cartridges that do not include RFID technology \(i.e. Model 900 cartridges\).](#)

[Include a second note that the Analyzer automatically configures reagent information using the RFID technology.](#)

After replacing the consumables item in the Analyzer.....

1. On the *Maintenance* screen, select the *Consumables* tab.
2. Press the **RENEW** button next to the consumable item you have replaced. [\(feature not yet implemented\)](#)
3. xxx
4. xxx
5. Press **SAVE**.

Replacing Consumable Items

;lkjasdf;lkjasdf:

- [Replacing the Resin Cartridge](#)
- [Replacing the Chemical Reagents](#)
- [Replacing the UV Lamp](#)
- [Replacing the Pump Heads](#)
- [Replacing the In-Line Filter Element](#)
- [Replacing the ICR Chemical Trap \(ICR users ONLY\)](#)

REPLACING THE RESIN CARTRIDGE

Replacing the Ion Exchange xxx

[Single-Source from the installation chapter.](#)

To replace the resin cartridge

1. ;lkjadsf
- 2.

REPLACING THE CHEMICAL REAGENTS

;lkjasdfFollow with flushing the reagent syringes as described in the previous section.

To replace the reagent cartridges

1. ;lkjadsf
- 2.

[Using a vial](#)

REPLACING THE UV LAMP

;lkjasdf

To replace the UV Lamp

1. ;lkjadsf
- 2.

REPLACING THE PUMP HEADS

xxxx(previously replacing the sample pump tubing...mention this advantage)

To replace the pump heads

1. ;lkjadsf
- 2.

REPLACING THE IN-LINE FILTER ELEMENT

xxxx

To replace the in-line filter element

1. ;lkjadsf
- 2.
- 3.

REPLACING THE ICR CHEMICAL TRAP (ICR USERS ONLY)

XXXX

To replace the chemical trap

1. ;lkjadsf
- 2.
- 3.
- 4.

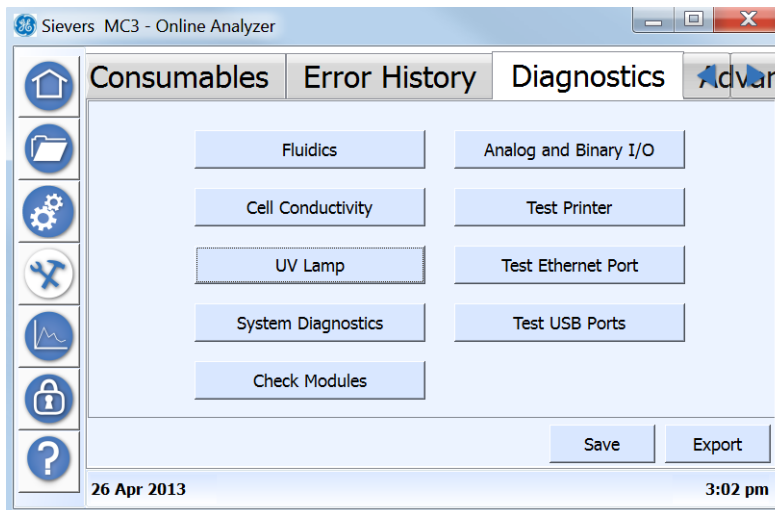
9

TROUBLESHOOTING

OVERVIEW

XXXXX

The Diagnostics Tab



WARNING AND ERROR MESSAGES

[Add link messages.](#)

Inspect

Constants

Error

Diagnostics

ICEFOME

Flow Backflow

Oxidizer

Data

USING THE HELP SCREEN

Overfilling the DI Water reservoir

xxxxx

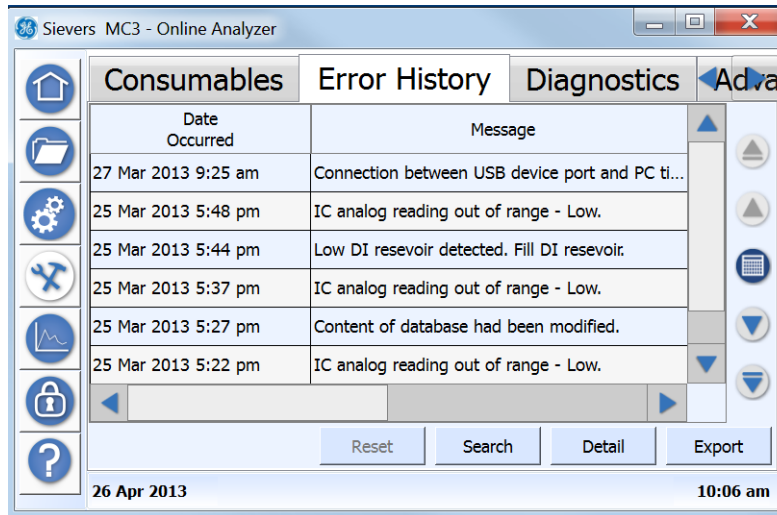
To drain excess water from the DI water reservoir

You will need the Dispensing bottle (with attached filling fixture) and the individual (loose) elbow fitting from the Analyzer's Accessories Kit. You will also need a flask or beaker (size?) to collect the excess DI water.

1. Press the latch of the *Prime* port down and insert the individual (loose) elbow fitting,
2. Remove the tip of the dispensing bottle from the tubing of the Dispensing bottle assembly. See [Figure 45: Dispensing Bottle Tip](#).
3. Press the latch of the *DI pump* outlet up and insert the elbow-fitting end of the tubing into the *DI pump* outlet. **(The outlet is located between the IC and TC sample pumps).** Reference [Figure 22: Inserting the DI Loop Fill Tube](#).)
4. Direct the other end of the tubing into a flask or beaker, located below the DI pump outlet. The water will automatically flow out the tubing in this gravity-drain position.
5. Verify that the water line is JUST BELOW the top of the reservoir, as shown in [Figure 23: Filling the DI Water Reservoir](#) (with attached filling fixture).





Figure 45: Dispensing Bottle Tip


The Error History Tab



You can use this tab to search and view a cumulative list of recent [and historical](#) errors and warnings.

To view error and warning history

1. Use the vertical scrollbar to move through a list of recent messages (listed most recent to oldest). Or, use one of the following buttons to scroll through the messages:
 - Use the **UP**  and **DOWN**  arrows to skip forward and backward by a page.
 - Use the **START**  and **END**  arrows to take you to the most recent or oldest message (respectively).

2. To search for messages for a specific date, press the **CALENDAR**  icon to display the *Calendar* dialog box. Use the navigation arrows (as needed) to locate the date, and then press the day to view.

The Analyzer automatically returns you to the *Validation History* tab with any messages from the selected date displayed.

3. To search for messages by a keyword, [User ID, Is this separate from keyword or combined with/how? AND/OR the date acknowledged, press **SEARCH**. \[Can you change the categories by which to search by?\]\(#\)The *Search dialog box* appears.](#)

Otherwise, go to step 4.

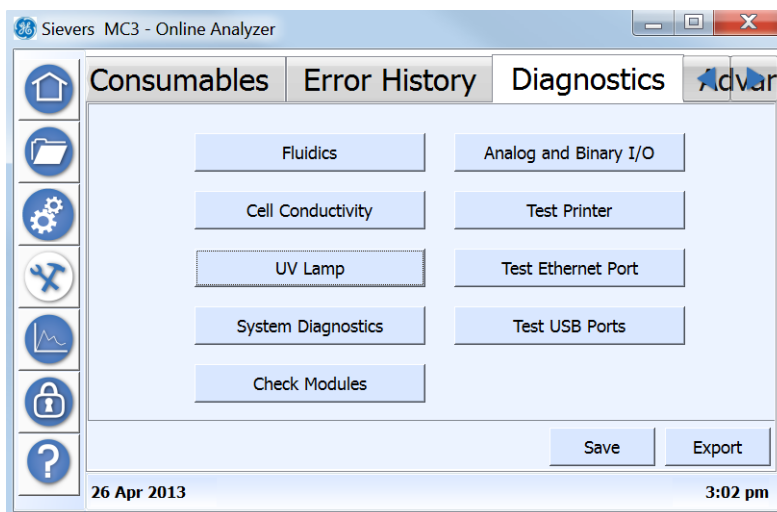
4. [\(Return to verify these steps after Search development is completed.\)](#)To include a keyword or keyword string in the search, select **KEYWORD SEARCH**, and then press inside the *Keyword Search* field to display the alpha/numeric keypad. Type a word or string of words to find.

The word (or string of words) appears in the *Keyword Search* field.

5. To include a date range in the search, do the following:
 - Select **DATE ACKNOWLEDGED**, and then press inside the *Start Date* field to display the *Start Date* dialog box. Use the navigation arrows (as needed) to locate the date, and then press the first day in the range to view.

The Analyzer automatically returns you to the *Search* dialog box.
 - Press inside the **END DATE** field to display the *End Date* dialog box. Use the navigation arrows (as needed) to locate the date, and then press the last day date in the range to view.
6. Press **SEARCH**. The Analyzer returns to the *Search dialog box*, and displays the messages meeting the search criteria. [\(Return to modify these steps after Search development is completed.\)](#)
7. Use the horizontal scrollbar to move to the right and back to left to view message information, such as *Date Occurred*, *Message (Text)*, *Acknowledged By*, and *Date Acknowledged*.
8. To view additional details of any message, select the message line and press **DETAIL**. A summary of the message appears including additional information, such as error level (Error or Warning) and module reported.
9. Press **OK** to return to the *Error History* tab.

The Diagnostics Tab



WIP

- xxfluidics
- xxcell conductivity
- xxUV lamp



- xxsystem diagnostics
- xxcheck modules
- xxanalog and binary I/O
- xxtest printer
- xxtest Ethernet port
- xxtest USB port

10

TURBO OPERATION

OVERVIEW

XXXXX

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A









Appendix A: WARNINGS





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Working with Intertek

English

WARNINGS	
	<p>Shipping boxes containing an Analyzer with built-in optional components may weigh over 40 lb — necessitating a two-person lift technique when handling. Such boxes are labeled with this warning, supporting OSHA standards intended to protect employees from injury.</p> <p>We recommend that our customers use a two-person lift, and GE requires that ALL employees use this handling technique when lifting items weighing over 40 lb.</p>
	<p>This symbol on the instrument indicates that the user should refer to the manual for operating instructions.</p>
	<p>If this instrument is used in a manner not specified by GE Analytical Instruments, the safety protection provided by the instrument may be impaired.</p>

WARNINGS	
	(On-Line TOC Analyzer) This symbol indicates the protective earth terminal (ground) for the Analyzer.
	The Analyzer requires an A/C mains supply of 100-240 volts, and requires the correct power cord for safe operation. ONLY use the power cord supplied in the Analyzer's Accessory Kit with the Analyzer, which meets this A/C mains supply requirements.
	For safety reasons and to avoid the possibility of corrupting the database, ALWAYS follow this procedure when shutting down the Analyzer. First stop analysis AND stop the operating system (using the HALT SYSTEM button in the Analyzer's firmware) BEFORE pressing the Analyzer's power switch to <i>Off</i> or unplugging the power cord,
	Any operation requiring access to the inside of the Analyzer, including installation of maintenance items, could result in injury. To avoid potentially dangerous shock—BEFORE opening the Analyzer—first stop any analysis, stop the operating system (using HALT SYSTEM button in the Analyzer's firmware), and then turn <i>off</i> power and disconnect from the power supply
	Electrical conduit should be installed by a qualified electrician. Also, before installing any wiring inside the Analyzer, make sure you are wearing ESD protection.
	The output and alarm connections should be installed by a qualified electrician. Also, before installing any wiring inside the Analyzer, make sure you are wearing ESD protection.
	This is a Class A product. In a domestic environment, this product may cause electromagnetic interference in which case the user may be required to take adequate measures to correct the interference.
	To protect against accidental exposure to ultra-violet radiation, do not operate the UV lamp outside of its protective housing.

WARNINGS	
	(On-Line and Portable TOC Analyzers) Water in the iOS System may be hot. Before inserting a vial into the iOS System after operating in on-line mode, slide the door open and wait 30 seconds to allow sample to completely drain. Inserting a vial before draining can result in hot water spray projecting upward out of the iOS System or vial port.
	The iOS System and vial ports contain sharp needles designed to pierce the septa of sample vials. Do NOT put fingers or inappropriate materials into the iOS System or vial port.
	When servicing parts inside the Analyzer, ensure that power to the Analyzer is off, and keep hands clear of the reagent syringe assemblies. The syringes are controlled by moving parts that can pinch skin.
	(Laboratory and Portable TOC Analyzers) For continued protection against fire hazard, replace fuse with same type and rating.



WARNINGS

Changes or modifications to the RFID radio not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules & Industry Canada license-exempt RSS standards. Operation is subject to the following two conditions:



- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

The RFID antenna is a Part 15 & RSS-210 - Class A digital device: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This equipment complies with FCC electromagnetic radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum separation distance of 20cm (7 in.) between the RFID antenna and your body. The antenna is located on the inside floor of the Analyzer near the front of the syringe assemblies.


HAZARDOUS MATERIAL DISPOSAL

The following guidelines are provided to aid you in discarding and the disposal of hazardous substances related to the [Sievers M9 and M9^e TOC Analyzers](#) [Sievers M5310 C Analyzer](#).

 HAZARDOUS MATERIAL DISPOSAL	
<p>Hazardous reagents (ammonium persulfate and phosphoric acid) are used in the Analyzer. The waste stream from the instrument is acidic and must be disposed of properly. Consult your federal, state, and local government regulations.</p>	
<p>The UV lamp and the display screen contain mercury and may be considered hazardous material in your local area. Dispose of these items in accordance with federal, state, or local government regulations.</p>	
<p>In the case of any broken or damaged UV lamp, handle the remains in accordance with your organization's toxic waste handling procedure and dispose of them in accordance with federal, state, or local government regulations.</p>	
<p>This symbol indicates the European Union Directive 2002/96/EC for waste electrical and electronic equipment (WEEE) requires disposing the Analyzer separately from standard waste.</p>	

OPERATIONAL CAUTIONS

To ensure optimal sampling results and to protect the instrument from any damage, review and implement the following Caution statements.

 CAUTIONS	
<p>Make sure the DI water Reservoir is full, particularly when running samples with high TOC or high salt concentrations. After running high TOC or salt samples, always rinse the Analyzer by running low-TOC DI water through a sample cycle.</p>	
<p>To avoid false TOC readings and possible damage to the Analyzer, always make sure the sample inlet is open and the DI water reservoir is filled before starting analysis</p>	
<p>Operation of the Analyzer without the in-line filter on the sample inlet line will damage the Analyzer and void the warranty. To avoid damaging the Analyzer, install the filter and replace the filter element, as needed.</p>	



CAUTIONS

To avoid false TOC readings and possible damage to the Analyzer, always make sure the sample is flowing through the iOS System and the DI water reservoir is filled before starting analysis.







For performance within specifications on ozonated water systems, an Ozone Destruct Kit must be purchased from GE Analytical Instruments and installed according to instructions.

When cleaning the Analyzer, always apply liquid to the cloth directly, and do NOT spray liquids directly on the Analyzer.

Do NOT use water or cleaners on the touchscreen, as water can damage or discolor the polarizer. Refer to the next section for recommendations on cleaning the touchscreen.
Wipe away any condensation immediately.


中文 (Chinese)

警告	
	<p>装有分析仪及内置可选组件的发货箱的重量可能超过 40 磅，移动时需要由两个人抬起。此类重量的箱子贴有此警告，意在遵循保护员工免受伤害的 OSHA 标准。</p> <p>我们建议用户由两个人抬起重物，GE 要求所有员工在移动 40 磅重量以上的物体时，均采用两人抬起的方法。</p>
	<p>仪器上标有此符号表示用户应参考手册上的操作说明。</p>
	<p>如果该仪器以 GE Analytical Instruments 公司所未规定的方式使用，该仪器所提供的保护作用可能会被削弱。</p>
	<p>(在线型 TOC 分析仪) 此符号表示分析仪的保护性接地端 (地线)。</p>
	<p>分析仪要求 100-240 伏的 A/ C 电源及正确的电源线，以保证安全工作。只可使用分析仪配件包中提供的电源线，该电源线符合分析仪的 A/ C 电源要求。</p>
	<p>出于安全考虑，并且为了避免损坏数据库，在关机时应始终按照以下操作程序。在将分析仪的电源开关切换到关闭或拔掉电源线之前，应首先停止分析，并且停止正在运行的系统 (用分析仪固件中的系统停机按键)。</p>
	<p>任何需要接触分析仪内部的操作，包括安装维修件，均可能导致人身伤害。为避免可能的电击伤害，在打开分析仪机壳之前，应首先停止任何分析，并停止正在运行的系统 (用分析仪固件中的系统停机按键)，然后关闭电源开关，并断开电源连接。</p>
	<p>应由合格的电工来安装电气管路。在分析仪内安装和布线之前，应确保佩戴 ESD 保护。</p>
	<p>应由合格的电工来安装输出和警报连接。在分析仪内安装和布线之前，应确保佩戴 ESD 保护。</p>

警告	
	本产品为 A 类产品。在家庭环境中，本产品可能导致电磁干扰，用户可能需要采取适当措施以减少干扰。
	为防止意外暴露在紫外线放射下而导致伤害，请勿将紫外线灯置于保护罩之外。
	（在线型和便携式 TOC 分析仪）iOS 系统中的水可能会很热。在在线模式下运行之后，请将门滑开，等待 30 秒，使样品完全排空，然后将样品瓶插入 iOS 系统。如果在排空之前插入样品瓶，可能导致热水向上喷射出 iOS 系统或样瓶端口。
	iOS 系统和试剂瓶槽含有两个锐利的针头，用于刺穿试样试剂瓶的封口膜。请不要将手指或其它不适当的物体放入 iOS 系统或试剂瓶槽。
	在维修分析仪中的部件时，应先确保关闭分析仪的电源，不可将手靠近试剂注射器部件。注射器由移动部件控制，可能会夹伤皮肤。
	（实验室型和便携式 TOC 分析仪）为预防火灾，请使用相同类型和规格的保险丝进行更换。

有害物质处理

以下指导帮助您正确处理和弃置 Sievers M9 and M9^e M5310 C TOC 分析仪使用的有害物质。

 有害物质处理
此分析仪使用危险试剂（过硫酸铵和磷酸）。分析仪排出的废液呈酸性，必须妥善处理。应按照联邦、州 / 省或地方政府的相关规定进行处理。
紫外线灯和显示屏含有汞，在您所在的地区可能被视为危险材料。处理这些材料时，请遵循国家、州 / 省或地方政府的相关规定。
如果紫外线灯破损或损坏，应根据您所在单位的有毒废料处理程序以及联邦、州 / 省或地方政府的相关规定进行处理。



有害物质处理



此符号表示根据欧盟废电机电子设备 (WEEE) 指令 2002/96/EC, 分析仪应以不同于普通废品的方式处理。

操作注意事项

为了确保最佳取样结果, 并且保护仪器不受损坏, 请阅读并执行注意事项。



注意事项

应确保 DI 水容器中装满水, 特别是在测试高 TOC 或高盐浓度的试样时尤其如此。在测试完高 TOC 或高盐浓度的试样后, 请务必使用低 TOC 的 DI 水冲洗样品环路。

为避免 TOC 读数错误或损坏分析仪, 在开始分析前必须保证试样进口打开且 DI 水容器已满。

在进样管中没有安装联线过滤器的情况下操作分析仪, 会损坏仪器并使保修失效。为了避免损坏分析仪, 应安装过滤器, 并根据需要按时更换滤芯。

为了避免错误的 TOC 读数, 为了避免损坏分析仪, 在开始分析之前, 请务必确保样品流经 iOS 系统, 确保 DI 水容器中装满水。









对于在臭氧水系统规格内的运行, 必须从 GE Analytical Instruments 购买臭氧破坏套件, 并按说明进行安装。

在清洁分析仪时, 应将清洁液放在抹布上, 不可将清洁液直接喷洒在分析仪上。

不可在触摸屏上使用水或清洁剂, 水可以使偏振片损坏或褪色。请参阅后面的章节了解触摸屏的清洁方法。应立即擦去触摸屏上的冷凝水。



日本語 (Japanese)

警告	
	<p>内蔵のオプション コンポーネントを備えた分析装置を含む発送用箱は 40 lb (18 kg) を超える重さがある可能性があり、取り扱う時には 2 人で持ち上げる方法が必要になります。このような箱にはこの警告が記されたラベルが貼られ、従業員を怪我から守ることを目的とした OSHA 基準に対応しています。</p> <p>お客様は 2 人で持ち上げる方法を用いることをお勧めします。そして GE では、40 lb (18 kg) を超える重さがある製品を持ち上げる時にはすべての従業員がこの取扱方法を用いることを求めています。</p>
	<p>機器についているこの記号は、ユーザーが操作指示書を参照する必要があることを示します。</p>
	<p>この機器が GE Analytical Instruments によって指定された方法で使用されなかった場合、機器に組み込まれた保護機能は損なわれます。</p>
	<p>(オンライン型 TOC 分析装置) このマークは、分析装置の保護アース端子 (グラウンド) を示しています。</p>
	<p>分析装置は 100 ~ 240 ボルトの A/C 主電源を必要とし、安全な運転のために正しい電源コードを必要とします。分析装置アクセサリ キットに付属の電源コードのみを使用してください。このコードは A/C 主電源の要件を満足します。</p>
	<p>安全のため、そしてデータベースを破損する可能性を避けるため、分析装置の電源を切る時には必ずこの手順に従ってください。分析装置の電源スイッチを押してオフ (Off) にするか、電源コードを抜く前に、まず分析を停止し、かつオペレーティング システムを停止します (分析装置のファームウェアのシステム停止 (HALT SYSTEM) ボタンを用いて)。</p>
	<p>保守品目の取り付けを含む、分析装置内部にアクセスするいかなる操作も、人身傷害につながる可能性があります。分析装置を開ける前に、潜在的に危険な衝撃を避けるために、まず分析を停止し、オペレーティング システムを停止し (分析装置のファームウェアにあるシステム停止 (HALT SYSTEM) ボタンを用いて)、その後、電源を切り、電源供給から切り離します。</p>

警告	
	電気導管は、有資格の電気技術者が行ってください。また、分析装置内部の配線を行う前に、静電気放電防止用ストラップを着用するようにしてください。
	出力および警報の接続は、有資格の電気技術者が行ってください。また、分析装置内部の配線を行う前に、静電気放電防止用ストラップを着用するようにしてください。
	これはクラス A の製品です。屋内環境においては、この製品は電磁干渉を発生することがあり、その場合はユーザーが適切な是正措置を取る必要があります。
	紫外線への偶発的な曝露から身を守るために、保護容器の外で UV ランプを作動させないでください。
	(オンライン型およびポータブル型 TOC 分析装置) iOS システム内の水が加熱している場合があります。オンライン モードでの運転後にバイアルを iOS システムに挿入する前に、ドアをスライドさせて開け、30 秒間待ち、サンプルが完全に排水されるようにしてください。排水前にバイアルを挿入すると、iOS システムまたはバイアル ポートから熱水が噴出するおそれがあります。
	iOS システムおよびバイアル ポートには、サンプルバイアルのセプタムを穿孔するように設計された鋭利なニードルが含まれています。指や不適切な物質を iOS システムやバイアル ポートに入れないようにしてください。
	分析装置の内部にある部品を修理する際、分析装置への電源が切れていることを確認し、試薬シリンジアセンブリに手を近付けないようにしてください。シリンジは、指を挟む危険のある可動部品によって制御されています。
	(ラボ型およびポータブル型 TOC 分析装置) 火災の危険から引き続き守るために、同じ型式で定格のフューズと交換してください。


有害物質処分

以下の指針は、Sievers [M9 and M9^e](#) [M5310 C](#) TOC 分析装置に関連した有害物質を廃棄および処分するうえで支援するために示されています。

 有害物質処分	
<p>分析装置には危険な試薬（過硫酸アンモニウムやリン酸）が使用されています。機器から出る排水は酸性であり正しい方法で廃棄する必要があります。国、州、および地方自治体の政府規制に従ってください。</p>	
<p>UV ランプおよびディスプレイ画面には水銀が含まれており、地域によっては水銀が有害物質に指定されている場合があります。これらの部品は、国や地方自治体の規制に従って処分してください。</p>	
<p>UV ランプが切れたか損傷を受けた場合は、社内の有害廃棄物取扱手順に従って残留物を取り扱い、国、都道府県、または地方自治体の規則に従って処分してください。</p>	
	<p>この記号は、廃電気電子機器 (WEEE) に関する EU 指令 2002/96/EC では、標準の廃棄物とは別に分析装置を処分することを求めていることを示します。</p>

操作上の注意

最適なサンプリング結果を確保するため、そして機器を損傷から守るために、以下の注意に関する記述を見直し、実践してください。

 注意	
<p>DI 水リザーバーが満杯になっていることを確認してください。特に、TOC または塩分の濃度が高いサンプルを使用する場合に重要です。TOC または塩分の濃度が高いサンプルを使用した後は、サンプル サイクルを通じて 低 TOC の DI 水を流すことで、必ず分析装置を洗浄してください。</p>	
<p>誤った TOC 測定値および分析装置に対する損傷の可能性を避けるために、分析を開始する前に、サンプル注入口が開いていて、DI 水リザーバーが満杯になっていることを必ず確認してください。</p>	
<p>サンプル注入口ラインにインライン フィルターを取り付けていない状態で分析装置を操作すると、分析装置に損傷を及ぼし、保証が無効になります。分析装置の損傷を防ぐために、フィルターを取り付け、必要に応じてフィルター エレメントを交換してください。</p>	

**注意**







誤った TOC 測定値や分析装置に対する損傷の可能性を避けるために、分析を開始する前に、サンプルが iOS システムを流れていて、DI 水リザーバーが満杯になっていることを必ず確認してください。

オゾン処理水システムの仕様範囲内の性能を得るために、オゾン分解キットを GE Analytical Instruments から購入し、指示に従って取り付ける必要があります。








分析装置を洗浄する場合、必ず液体は布に直接付けてください。そして、分析装置には液体を直接噴霧しないでください。



水が偏光板に損傷を与えたり、変色させる可能性があるため、タッチスクリーンに水またはクリーナーを使用しないでください。タッチスクリーンの洗浄に関する推奨事項については、次のセクションを参照してください。凝縮物は直ちに拭き取ってください。

Deutsch

WARNUNG	
	<p>Versandkartons, die einen Analysator mit eingebauten optionalen Komponenten enthalten, können mehr als 40 Pfund wiegen; dies erfordert beim Verladen eine Hebetechnik mit zwei Personen. Solche Kartons sind mit diesem Warnhinweis gekennzeichnet, um Angestellte vor Verletzungen zu schützen und die OSHA-Standards zu erfüllen.</p> <p>Wir empfehlen unseren Kunden, ein Hebezeug für zwei Personen zu verwenden, und GE macht es zur Auflage, dass ALLE Mitarbeiter diese Technik beim Bewegen von Gegenständen mit einem Gewicht von mehr als 40 Pfund anwenden.</p>
	<p>Dieses Symbol auf dem Gerät zeigt an, dass der Benutzer die Betriebsanweisungen des Handbuchs lesen muss.</p>
	<p>Wenn das Gerät auf eine nicht von GE Analytical Instruments bezeichnete Weise verwendet wird, kann der Schutz, den das Gerät bietet, beeinträchtigt werden.</p>
	<p>(On-Line TOC-Analysator) Dieses Symbol zeigt die Schutzleiter (Masse)-Klemme des Analysators an.</p>
	<p>Der Analysator benötigt eine Energieversorgung mit 100-240 V Wechselstrom (AC) und es muss für einen sicheren Betrieb das richtige Netzkabel verwendet werden. Verwenden Sie AUSSCHLIESSLICH das mit dem Zubehörkit des Analysator gelieferte Netzkabel, das die AC-Energieversorgungsanforderungen erfüllt.</p>
	<p>Befolgen Sie zum Ausschalten des Analysators aus Sicherheitsgründen und um zu verhindern, dass die Datenbank beschädigt wird, IMMER das folgende Verfahren. Beenden Sie zuerst die Analyse UND beenden Sie das Betriebssystem (mit der Taste "SYSTEM STOPPEN" (HALT SYSTEM) in der Analysator-Firmware), BEVOR Sie den Netzschalter des Analysators auf Aus schalten oder das Netzkabel trennen.</p>





WARNUNG	
	Jeder Tätigkeit, die Zugang zum Inneren des Analysators erfordert, einschließlich Installation von Wartungsteilen, kann zu Verletzungen führen. Um einen gefährlichen Stromschlag zu vermeiden, beenden Sie zuerst – BEVOR Sie den Analysator öffnen – die Analyse und das Betriebssystem (mit der Taste " SYSTEM STOPPEN " (HALT SYSTEM) in der Analysator-Firmware), und schalten dann das Gerät aus und trennen es vom Netz.
	Elektrische Schaltkreise müssen von einem qualifizierten Elektriker installiert werden. Stellen Sie außerdem vor Installation von Verdrahtungen im Analysator sicher, dass Sie ESD-Schutz tragen.
	Die Ausgabe- und Alarmschlüsse müssen von einem qualifizierten Elektriker installiert werden. Stellen Sie außerdem vor Installation von Verdrahtungen im Analysator sicher, dass Sie ESD-Schutz tragen.
	Es handelt sich um ein Klasse A-Produkt. In einer Wohngegend kann das Produkt Elektromagnetische Beeinflussung verursachen; in diesem Fall muss der Anwender möglicherweise geeignete Maßnahmen zum Beheben der Beeinflussung ergreifen.
	Betreiben Sie zum Schutz gegen versehentliche Exposition mit UV-Strahlung die UV-Lampe nicht außerhalb ihres Schutzgehäuses.
	(On-Line- und portable TOC-Analysatoren) Das Wasser im iOS-System kann heiß sein. Schieben Sie vor dem Einführen eines Röhrchens in das iOS-System nach Betrieb im Online-Modus die Tür auf und warten Sie 30 Sekunden, damit die Probe vollständig ablaufen kann. Das Einführen eines Röhrchens vor dem Abfließen kann dazu führen, dass heißes Wasser nach oben aus dem iOS-System oder dem Röhrchenport spritzt.
	Das iOS-System und die Röhrchenports enthalten spitze Nadeln zum Durchstechen der Septa von Probenröhrchen. Stecken Sie weder Finger noch ungeeignetes Material in das iOS-System oder einen Röhrchenport.

WARNUNG	
	Stellen Sie vor dem Warten von Teilen im Analysator sicher, dass der Analysator ausgeschaltet ist und kommen Sie mit den Händen nicht in die Nähe der Reagenzienspritzen-Baugruppen. Die Spritzen werden durch bewegliche Teile gesteuert und können die Haut einklemmen.
	(Labor- und portable TOC-Analysatoren) Tauschen Sie eine Sicherung nur gegen eine Sicherung des gleichen Typs und mit den gleichen Nennwerten aus, damit der Schutz gegen Brandgefahr erhalten bleibt.

ENTSORGUNG VON GEFÄHRSTOFFEN

Folgende Richtlinien werden als Anleitung zur Entsorgung von Gefahrstoffen bereitgestellt, die im Zusammenhang mit den Sievers [M9 and M9^e](#) [M5310 C](#) TOC-Analysatoren auftreten.







 ENTSORGUNG VON GEFÄHRSTOFFEN	
	Es werden in dem Analysator gefährliche Reagenzien (Ammoniumpersulfat und Phosphorsäure) verwendet. Der Abfallfluss des Geräts ist sauer und muss regelgerecht entsorgt werden. Befolgen Sie die Regularien des Bundes, der Länder und der örtlichen Behörden.
	Die UV-Lampe und der Anzeigenbildschirm enthalten Quecksilber und können in Ihrem Gebiet als gefährliches Material eingestuft sein. Entsorgen Sie diese Teile gemäß den Regularien des Bundes, der Länder und der örtlichen Behörden.
	Behandeln Sie im Fall einer zerbrochenen oder beschädigten UV-Lampe die Überreste gemäß dem Verfahren für den Umgang mit toxischen Abfällen Ihrer Organisation und entsorgen Sie ihn gemäß den Regularien des Bundes, der Länder und der örtlichen Behörden.
	Dieses Symbol zeigt an, dass der Analysator zur Einhaltung der EU-Richtlinie 2002/96/EC zur Entsorgung von Elektro- und Elektronik-Altgeräten getrennt vom Normalmülle zu entsorgen ist.

VORSICHTSMASSNAHMEN BEIM BETRIEB








Lesen und befolgen Sie zur Gewährleistung optimaler Probenergebnisse und zum Schutz des Geräts vor Beschädigung die folgenden Vorsichtsmaßnahmen.



 VORSICHTSMASSNAHMEN
<p>Stellen Sie sicher, dass der DI-Wassertank gefüllt ist, insbesondere bei Probenläufen mit hohem TOC-Gehalt oder hohen Salzkonzentrationen. Spülen Sie den Analysator nach dem Lauf von Proben mit hohem TOC- oder Salzgehalt immer mit DI-Wasser mit niedrigem TOC-Gehalt über einen Probenzyklus.</p>
<p>Stellen Sie zur Vermeidung falscher TOC-Messwerte und zur Vermeidung möglicher Schäden am Analysator immer sicher, dass der Probeneingang frei ist und der DI-Wassertank gefüllt ist, bevor Sie eine Analyse starten.</p>
<p>Der Betrieb des Analysators ohne Inline-Filter am Probeneingang führt zur Beschädigung des Analysators und lässt die Garantie erlöschen. Installieren Sie zur Vermeidung von Schäden am Analysator den Filter und tauschen Sie das Filterelement entsprechend der Erfordernisse aus.</p>
<p>Stellen Sie zur Vermeidung falscher TOC-Messwerte und möglicher Schäden am Analysator immer sicher, dass die Probe durch das iOS-System fließt und der DI-Wassertank gefüllt ist, bevor Sie eine Analyse starten.</p>
<p>Zum Betrieb in ozonhaltigen Wasseranlagen innerhalb der Spezifikationen muss ein Ozonabbau (Ozone Destruct)-Kit von GE Analytical Instruments erworben und gemäß den Anweisungen installiert werden.</p>
<p>Geben Sie zum Reinigen des Analysators die Flüssigkeit immer auf ein Tuch und sprühen Sie Flüssigkeiten nicht direkt auf den Analysator.</p> <p>Verwenden Sie für den Touchscreen KEIN Wasser und KEINE Reinigungsmittel, da Wasser den Polarisator beschädigen oder entfärben kann. Im nächsten Abschnitt finden sich Empfehlungen zum Reinigen des Touchscreens. Wischen Sie etwaige Kondensate sofort ab.</p>

Français

AVERTISSEMENT	
	<p>Les boîtes de transport contenant un analyseur avec les composants incorporés en option peuvent peser plus de 40 lb – veuillez prévoir deux personnes pour les soulever. Ces boîtes sont étiquetées avec cet avertissement, selon les normes OSHA prévues pour protéger les employés contre les accidents.</p> <p>Nous recommandons que nos clients prévoient deux personnes pour la manipulation, et GE exige que TOUS les employés utilisent cette technique en soulevant les éléments pesant plus de 40 lb.</p>
	<p>Ce symbole présent sur l'instrument indique que l'utilisateur doit consulter le manuel pour le mode d'emploi.</p>
	<p>Si cet instrument est utilisé d'une manière non spécifiée par GE Analytical Instruments, la protection offerte par l'instrument peut s'en trouver affaiblie.</p>
	<p><i>(Analyseur COT En ligne)</i> Ce symbole indique la prise de terre (masse) pour l'Analyseur.</p>
	<p>L'Analyseur nécessite une alimentation principale C/A de 100-240 volts, ainsi que le cordon d'alimentation adéquat pour un fonctionnement correct. Utilisez UNIQUEMENT le cordon d'alimentation fourni dans le kit d'accessoires de l'Analyseur, qui est conforme à ces exigences d'alimentation principale C/A.</p>
	<p>Pour des raisons de sécurité et pour éviter la possibilité de corrompre la base de données, vous devez TOUJOURS suivre cette procédure lors de mise hors tension de l'Analyseur. Arrêtez d'abord l'analyse ET arrêtez le système d'exploitation (en utilisant le bouton HALT SYSTEM dans le micrologiciel de l'Analyseur) AVANT d'appuyer le commutateur d'alimentation sur Off ou de débrancher le cordon d'alimentation,</p>



AVERTISSEMENT	
	Toute intervention nécessitant d'accéder à l'intérieur de l'analyseur, y compris l'installation d'éléments de maintenance, pourrait occasionner des blessures. Afin d'éviter les chocs potentiellement dangereux -AVANT d'ouvrir l'Analyseur- arrêtez d'abord l'analyse, arrêtez le système d'exploitation (en utilisant le bouton HALT SYSTEM dans le micrologiciel de l'Analyseur), et ensuite coupez l'alimentation et déconnectez la source d'alimentation.
	La canalisation électrique doit être installée par un technicien qualifié. De même, avant d'installer le câblage à l'intérieur de l'Analyseur, assurez-vous que vous portez la protection ESD.
	Les connexions de sortie et d'alarme doivent être installées par un technicien qualifié. De même, avant d'installer le câblage à l'intérieur de l'Analyseur, assurez-vous que vous portez la protection ESD.
	Ceci est un produit de classe A. Dans un environnement domestique, ce produit peut causer des interférences électromagnétiques, auquel cas l'utilisateur peut être contraint de prendre les mesures adéquates pour y remédier.
	Pour se protéger contre l'exposition accidentelle aux rayons ultraviolets, n'utilisez pas la lampe UV à l'extérieur du boîtier de protection.
	<i>(Analyseurs COT En ligne et Portable)</i> L'eau dans le système iOS System peut être chaude. Avant d'insérer une fiole dans le système iOS après avoir utilisé le mode en ligne, ouvrez en coulissant la porte et attendez 30 secondes pour permettre que l'échantillon sèche complètement. Si vous insérez une fiole avant le séchage vous risquez de recevoir un jet d'eau chaude pulvérisé vers le haut et hors du système iOS ou de l'orifice à fioles.
	Le système iOS et les orifices à fioles contiennent des aiguilles pointues conçues pour percer le septum des fioles à échantillon. NE placez PAS de matériels inappropriés dans le système iOS ou l'orifice à fioles.

AVERTISSEMENT	
	<p>Lors de la maintenance des pièces à l'intérieur de l'analyseur, assurez-vous que l'alimentation est sur off, et éloignez les mains du montage de la seringue à réactif. Les seringues sont contrôlées par des pièces mobiles qui peuvent piquer la peau.</p>
	<p>(Analyseurs COT Laboratoire et Portable) Pour assurer la protection contre le risque d'incendie, le fusible ne doit être remplacé qu'avec le même type et la même valeur nominale.</p>

 AVERTISSEMENT
<p>Les changements ou modifications à la radio RFID non explicitement approuvés par la partie responsable de la conformité peuvent annuler l'autorité de l'utilisateur à utiliser l'équipement.</p>
<p>Cet appareil est conforme à la Partie 15 de la réglementation FCC et des normes RSS exemptes de licence d'Industry Canada. Le fonctionnement est assujéti aux deux conditions suivantes :</p> <ol style="list-style-type: none"> (1) Cet appareil ne peut pas provoquer d'interférences nocives, et (2) Cet appareil doit accepter toute interférence reçue, y compris l'interférence qui peut provoquer un fonctionnement indésirable.
<p>L'antenne RFID est un appareil digital conforme à la partie 15 et RSS-210 - Classe A : Cet appareil a été testé et a été trouvé conforme avec les limites d'un appareil digital de classe A, selon la partie 15 des normes FCC. Ces limites sont conçues pour fournir une protection raisonnable contre l'interférence nocive lorsque l'appareil fonctionne dans un environnement commercial. Cet appareil produit, utilise et peut émettre de l'énergie de fréquence radio et, s'il n'est pas installé et utilisé selon le manuel d'instruction, il peut provoquer une interférence nocive aux communications radio. Le fonctionnement de cet appareil dans une zone résidentielle peut probablement provoquer des interférences nocives et, dans ce cas, l'utilisateur devra corriger l'interférence à ses propres frais.</p>
<p>Cet appareil est conforme aux limites d'exposition de radiation électromagnétique FCC établies pour un environnement non contrôlé. Cet appareil doit être installé et utilisé avec une distance de séparation minimum de 20cm (7 pouces) entre l'antenne RFID et le corps. L'antenne est située à l'intérieur du fond de l'analyseur à proximité de la partie avant de la seringue.</p>


MISE AU REBUT DES MATÉRIAUX DANGEREUX

Les directives suivantes sont fournies pour vous aider au ramassage et mise au rebut des substances dangereuses concernant les Analyseurs COT Sievers [M9 and M9^eM5310 C](#).

 MISE AU REBUT DES MATÉRIAUX DANGEREUX	
<p>Des réactifs dangereux (persulfate d'ammonium et acide phosphorique) sont utilisés dans l'Analyseur. Le flux de déchet de l'instrument est acide et doit être mis au rebut de manière adéquate. Consultez les réglementations fédérales, provinciales ou locales.</p>	
<p>La lampe UV et l'écran contiennent du mercure et peuvent être considérés des matériaux dangereux dans votre région. Mettez au rebut ces éléments selon les réglementations fédérales, provinciales ou locales.</p>	
<p>Dans le cas de lampe UV cassée ou endommagée, manipulez les restes selon les procédures de traitement des déchets de votre organisation et mettez-les au rebut selon les réglementations fédérales, provinciales ou locales.</p>	
	<p>Ce symbole indique la Directive 95/46/CE de l'Union européenne relative aux déchets d'équipements électriques et électroniques (DEEE) et exige que l'Analyseur soit mis au rebut séparément des déchets standard.</p>

PRÉCAUTIONS DE FONCTIONNEMENT

Afin d'assurer des résultats d'échantillonnage optimaux et de protéger l'instrument de tout endommagement, réviser et mettez en œuvre les mises en garde suivantes.

 PRÉCAUTIONS	
<p>Assurez-vous que le réservoir d'eau DI est rempli, en particulier avec des échantillons contenant des concentrations élevées de COT ou de sel. Avec des échantillons à concentrations élevées de COT ou de sel, rincez toujours l'analyseur en utilisant de l'eau DI à faible COT dans un cycle à échantillon.</p>	



PRÉCAUTIONS

Afin d'éviter de fausses lectures de COT et de possibles dommages à l'Analyseur, assurez-vous toujours que l'entrée de l'échantillon est ouverte et que le réservoir d'eau DI est rempli avant de démarrer l'analyse.

L'utilisation de l'Analyseur sans le filtre en ligne sur la ligne d'entrée d'échantillons peut endommager l'Analyseur et invalider la garantie. Afin d'éviter d'endommager l'Analyseur, installez le filtre et remplacez l'élément de filtration, si nécessaire.







Afin d'éviter de fausses lectures de COT et de possibles dommages à l'Analyseur, assurez-vous toujours que l'échantillon circule dans le système iOS et que le réservoir d'eau DI est rempli avant de démarrer l'analyse.








Pour une performance selon les spécifications dans les systèmes d'eau ozonées, un kit de destruction de l'ozone doit être acquis auprès de GE Analytical Instruments et installé selon les instructions.

Lors du nettoyage de l'Analyseur, appliquez toujours du liquide au chiffon directement, et NE pulvérisez PAS de liquide directement sur l'Analyseur.



N'utilisez PAS d'eau ou de nettoyant sur l'écran tactile, l'eau peut endommager ou décolorer le polariseur. Consultez la section suivante pour lire les recommandations concernant le nettoyage de l'écran tactile. Essuyez immédiatement toute condensation.

Italiano

AVVERTENZA	
	<p>Le scatole contenenti l'Analizzatore con componenti integrati opzionali possono pesare oltre 40 lb (20 kg) e devono essere sollevate da due persone. Le scatole sono etichettate con questa avvertenza, in conformità agli standard OSHA per la tutela dei lavoratori dipendenti da lesioni.</p> <p>Raccomandiamo ai nostri clienti l'uso di tecniche di sollevamento a due persone. Inoltre, GE richiede a tutti i lavoratori dipendenti l'utilizzo di tali tecniche per il sollevamento di oggetti di peso superiore a 40 lb (20 kg).</p>
	<p>Questo simbolo, situato sullo strumento, indica che l'utente deve fare riferimento al manuale per le istruzioni d'uso.</p>
	<p>Se lo strumento viene utilizzato secondo modalità non indicate da GE Analytical Instruments, la protezione fornita dallo strumento potrebbe risultarne compromessa.</p>
	<p><i>(Analizzatore di TOC on-Line)</i> Questo simbolo indica il terminale del conduttore di protezione (terra) dell'Analizzatore.</p>
	<p>L'Analizzatore richiede un'alimentazione principale CA da 100-240 V e il cavo di alimentazione adeguato per la sicurezza del funzionamento. Usare esclusivamente il cavo di alimentazione in dotazione con il kit di accessori dell'Analizzatore che soddisfa i requisiti dell'alimentazione principale CA.</p>
	<p>Per motivi di sicurezza e per evitare di corrompere il database, quando si arresta l'Analizzatore seguire sempre la seguente procedura. Arrestare l'analisi e il sistema operativo (usando il pulsante HALT SYSTEM (arresto sistema) nel firmware dell'Analizzatore) prima di premere l'interruttore dell'analizzatore su Off o di scollegare il cavo dell'alimentazione.</p>



AVVERTENZA	
	Le operazioni che comportano l'accesso alle parti interne dell'analizzatore, comprese la parti relative all'installazione e alla manutenzione, possono causare lesioni. Per evitare scosse potenzialmente pericolose, prima di aprire l'analizzatore, fermare l'analisi in corso, arrestare il sistema operativo (usando il pulsante HALT SYSTEM (arresto sistema) nel firmware dell'analizzatore), quindi spegnere l'alimentazione e scollegare l'analizzatore dall'alimentazione.
	La condotta elettrica deve essere installata da un elettricista qualificato. Inoltre, prima di installare cavi all'interno dell'Analizzatore, assicurarsi di indossare protezioni ESD.
	I collegamenti di allarme e di output devono essere installati da un elettricista qualificato. Inoltre, prima di installare cavi all'interno dell'Analizzatore, assicurarsi di indossare protezioni ESD.
	Questo è un prodotto di Classe A. In un ambiente domestico, questo prodotto può causare interferenza elettromagnetica. In tal caso, l'utente deve adottare le misure adeguate per correggere l'interferenza.
	Per proteggersi dall'esposizione accidentale alle radiazioni ultraviolette, non azionare la lampada UV fuori dal suo alloggiamento protettivo.
	<i>(Analizzatori di TOC On-Line e portatili)</i> L'acqua all'interno del sistema iOS potrebbe essere calda. Prima di inserire una fiala all'interno del sistema iOS dopo il funzionamento in modalità on-line, aprire lo sportello e attendere 30 secondi per consentire al campione di prosciugarsi completamente. L'inserimento di una fiala prima del prosciugamento può comportare la fuoriuscita di spruzzi d'acqua verso l'alto dal sistema iOS o dalla porta della fiala.
	Il sistema iOS e le porte delle fiale contengono aghi taglienti studiati per perforare i setti delle fiale dei campioni. NON mettere le dita o materiali inappropriati all'interno del sistema iOS o della porta della fiala.



AVVERTENZA	
	Durante la manutenzione di componenti interni dell'Analizzatore, accertarsi che l'alimentazione dell'Analizzatore sia scollegata e tenere le mani lontane dal gruppo reagente con siringa. Le siringhe devono essere controllate spostando i componenti che potrebbero fregare la pelle.
	<i>(Analizzatori di TOC portatili e da laboratorio)</i> Per protezione continua contro i pericoli di incendio, sostituire il fusibile con uno dello stesso tipo e classificazione.


SMALTIMENTO DI MATERIALI PERICOLOSI

Le seguenti linee guida hanno lo scopo di aiutare l'utente a smaltire sostanze pericolose legate all'uso degli Analizzatori di TOC Sievers [M9 and M9^e](#) [M5310 C](#).







 SMALTIMENTO DI MATERIALI PERICOLOSI	
	Insieme all'Analizzatore vengono usati reagenti pericolosi (persolfato di ammonio e acido fosforico). Il flusso di rifiuti dello strumento è acido e deve essere adeguatamente smaltito. Consultare la normativa federale, statale e locale.
	La lampada UV e lo schermo del display contengono mercurio e possono essere considerati pericolosi dalla normativa locale. Smaltire questi prodotti in conformità alla normativa federale, statale o locale.
	In caso di lampada UV rotta o danneggiata, gestire i resti seguendo la procedura per la gestione di rifiuti tossici della propria organizzazione e smaltirli in conformità alla normativa federale, statale o locale.
	Questo simbolo indica che la Direttiva 2002/96/CE dell'Unione Europea per lo smaltimento di apparecchiature elettriche ed elettroniche (AEE), prevede lo smaltimento dell'Analizzatore separatamente rispetto ai rifiuti standard.








AVVERTENZE PER IL FUNZIONAMENTO

Per garantire risultati di campionamento ottimali e per proteggere lo strumento da danni, leggere e seguire le seguenti avvertenze.

 AVVERTENZE
Accertarsi che il serbatoio di acqua distillata sia pieno, in particolare durante l'analisi di campioni con un elevato TOC o concentrazioni di sale elevate. Dopo l'analisi di campioni con concentrazioni di TOC o sale elevate, sciacquare l'Analizzatore facendo passare acqua distillata con TOC basso lungo il ciclo del campione.
Per evitare letture TOC false e possibili danni all'Analizzatore, prima di iniziare l'analisi accertarsi che l'ingresso del campione sia aperto e che il serbatoio di acqua distillata sia pieno.
Se si utilizza l'Analizzatore senza il filtro sulla linea d'ingresso del campione, si potrebbero arrecare danni all'Analizzatore e rendere nulla la garanzia. Per evitare danni all'Analizzatore, installare il filtro e sostituire l'elemento del filtro, secondo necessità.
Per evitare letture TOC false e possibili danni all'Analizzatore, prima di iniziare l'analisi accertarsi che il campione stia scorrendo lungo il sistema iOS e che il serbatoio di acqua distillata sia pieno.
Per prestazioni entro le specifiche su sistemi di acqua ozonati, acquistare un kit di distruzione dell'ozono da GE Analytical Instruments e installarlo seguendo le istruzioni.
Durante la pulizia dell'analizzatore, applicare sempre il liquido sul panno invece di spruzzarlo direttamente sull'Analizzatore. NON usare acqua o detersivi sul touchscreen. L'acqua potrebbe danneggiare o decolorare il polarizzatore. Fare riferimento alla sezione successiva per raccomandazioni sulla pulizia del touchscreen. Rimuovere immediatamente la condensa.

Español

ADVERTENCIA	
	<p>Las cajas de envío que contienen el Analizador con los componentes opcionales incorporados pueden pesar más de 18 kg (40 lb). Se necesita a dos personas para levantarlas cuando se las manipule. Las cajas presentan una etiqueta con esta advertencia, conforme a las normas OSHA destinadas a la protección del empleado contra lesiones.</p> <p>Recomendamos a nuestros clientes emplear la ayuda de dos personas y GE requiere que TODOS los empleados utilicen la técnica de manejo de materiales cuando se deban levantar elementos que superen los 18 kg (40 lb).</p>
	<p>Este símbolo en el instrumento indica que el usuario debe consultar el manual para conocer las instrucciones de funcionamiento.</p>
	<p>Si este instrumento se utiliza de una manera que no sea la especificada por GE Analytical Instruments, es posible que se vea disminuida la protección provista por el instrumento.</p>
	<p>(Analizador de TOC En Línea) Este símbolo indica el terminal de protección a tierra (masa) para el Analizador.</p>
	<p>El Analizador requiere una alimentación por red de CA de 100 a 240 voltios, y necesita el cable de energía correcto para un funcionamiento seguro del instrumento. Utilice SOLAMENTE el cable de energía suministrado en el Juego de Accesorios del Analizador junto con el Analizador, que cumple con estos requisitos de alimentación por red de CA.</p>
	<p>Por razones de seguridad y para evitar la posibilidad de corromper la base de datos, SIEMPRE siga este procedimiento cuando corte el Analizador. Primero pare el análisis Y detenga el sistema operativo (utilizando el botón Detener Sistema [Halt System] en el Firmware del Analizador) ANTES de pulsar el interruptor de energía del analizador en la posición Off o desenchufar el cable de energía.</p>


ADVERTENCIA	
	Toda operación que necesite el acceso al interior del Analizador, incluyéndose la instalación de los elementos de mantenimiento, podría provocar lesiones. Para evitar el peligro de una posible descarga eléctrica, ANTES de abrir el Analizador, primero pare el análisis, detenga el sistema operativo (utilizando el botón Detener Sistema [HALT SYSTEM] en el Firmware del Analizador), y luego apague la energía y desconecte de la alimentación por red.
	Un electricista matriculado debe instalar un conductor eléctrico de tipo "conduit". Además, antes de instalar cualquier cableado dentro del Analizador, asegúrese de usar protección electrostática.
	La instalación de las conexiones para las salidas y alarmas debe ser instalada por un electricista matriculado. Además, antes de instalar cualquier cableado dentro del Analizador, asegúrese de usar protección electrostática.
	Este es un producto de Clase A. En un entorno doméstico, este producto puede causar interferencia electromagnética, en cuyo caso el usuario tal vez deba tomar medidas adecuadas para corregir dicha interferencia.
	Para proteger contra la exposición accidental a la radiación de rayos ultravioletas, no ponga a funcionar la lámpara UV fuera de su carcasa de protección.
	<i>(Analizadores de TOC En Línea y Portátil)</i> El agua en el Sistema iOS puede estar caliente. Antes de introducir un vial en el Sistema iOS después de hacer funcionar el instrumento en modo en línea, deslice la puerta para abrirla y espere 30 segundos para que la muestra drene totalmente. Cuando se introduce un vial antes de drenar puede que el agua caliente se expulse y salpique hacia arriba del Sistema iOS o el puerto de viales.
	El Sistema iOS y los puertos de viales contienen dos agujas filosas diseñadas para perforar los septa de los viales con las muestras. NO ponga los dedos o materiales inadecuados dentro del Sistema iOS o el puerto de viales.



ADVERTENCIA	
	Cuando se realice el servicio de partes dentro del Analizador, asegúrese de que la energía al Analizador esté desconectada y mantenga las manos alejadas de los conjuntos de jeringa con reactivos. Las jeringas se controlan mediante partes móviles que puede pellizcar la piel.
	<i>(Analizadores de TOC de laboratorio y portátil)</i> Reemplace el fusible del mismo tipo y potencia para contar con una protección contra incendios.


DESECHO DE MATERIALES PELIGROSOS

Las directrices que se ofrecen a continuación sirven para ayudar a apartar y desechar las sustancias peligrosas relacionadas con los Analizadores de TOC Sievers M9 and M9^eM5310 C.







 DESECHO DE MATERIALES PELIGROSOS	
En el Analizador se utilizan reactivos peligrosos (persulfato de amonio y ácido fosfórico). El flujo de drenaje del instrumento es ácido y se debe desechar correctamente. Consulte la normativa del gobierno federal, estatal y local.	
La lámpara UV y la pantalla contienen mercurio y puede considerarse material peligroso en su área local. Deseche estos elementos de conformidad con la normativa del gobierno federal, estatal o local.	
Si la lámpara UV se rompe o deteriora, los restos de la misma deben manejarse de conformidad con el procedimiento de manejo de residuos tóxicos de su compañía y desecharse conforme a la normativa del gobierno federal, estatal o local.	
	Este símbolo indica que para cumplir con la Directriz de la Unión Europea 96/2002/CE relacionada con el desecho de equipos eléctricos y electrónicos (WEEE), el Analizador deberá desecharse por separado de los residuos comunes.









PRECAUCIONES OPERATIVAS

Para asegurar resultados óptimos en la toma de muestras y proteger el instrumento de todo daño, revise y ponga en práctica los siguientes enunciados relacionados con las Precauciones.

 PRECAUCIONES
Asegúrese de que el reservorio de agua DI (pizeta) esté lleno, en especial cuando se analizan muestras con TOC elevado o altas concentraciones de sal. Después de analizar muestras con TOC elevado o alto contenido de sal, siempre enjuague del Analizador haciendo correr agua DI de bajo TOC por el ciclo de muestra.
Para evitar lecturas falsas de TOC y posible daño en el Analizador, cerciórese siempre de que la entrada de muestra esté abierta y que el reservorio de agua DI (pizeta) esté lleno antes de comenzar con el análisis.
El funcionamiento del Analizador sin el filtro en línea en el conducto de entrada de muestra dañará el Analizador y anulará la garantía. Para evitar los daños al Analizador, instale el filtro y reemplace elemento filtrante según sea necesario.
Para evitar lecturas falsas de TOC y posible daño en el Analizador, cerciórese siempre de que la muestra fluya por el Sistema iOS y que el reservorio de agua DI (pizeta) esté lleno antes de comenzar con el análisis.
Para lograr un rendimiento que cumpla con las especificaciones en los sistemas de agua ozonizada, se debe adquirir un Juego de Destrucción de Ozono en GE Analytical Instruments e instalarlo de acuerdo con las instrucciones.
Cuando se limpie el Analizador, siempre ponga el líquido directamente en el paño y NO pulverice líquidos directamente sobre el Analizador. NO utilice agua ni limpiadores sobre la pantalla táctil, puesto que el agua puede deteriorar o decolorar el polarizador. Consulte con la sección siguiente para conocer las recomendaciones sobre la limpieza de la pantalla táctil. Seque toda condensación de inmediato.

PORTUGUESE

AVISO	
	<p>As embalagens de transporte que contêm um analisador com componentes opcionais integrados podem pesar mais de 18 kg e precisam que duas pessoas as levistem quando forem manuseadas. Essas embalagens apresentam etiquetas com este aviso para estarem de acordo com as normas OSHA de proteção de funcionários contra ferimentos.</p> <p>Nós recomendamos que nossos clientes usem duas pessoas ao levantá-las, e a GE requer que TODOS os funcionários usem essa técnica de manuseio quando levantam itens que pesam mais de 18 kg.</p>
	Este símbolo no instrumento indica que o usuário deve consultar o manual para obter instruções de operação.
	Se o instrumento for usado de forma não especificada pela GE Analytical Instruments, a proteção fornecida pelo instrumento pode ser prejudicada.
	(<i>On-Line TOC Analyzer</i>) Este símbolo indica o terminal protetor de aterramento (terra) do analisador.
	O analisador requer uma fonte de alimentação A/C de 100-240 Volts e requer o cabo de energia correto para operar com segurança. Use APENAS o cabo de energia fornecido no kit de acessórios do analisador, que atende às exigências de fonte de alimentação A/C.
	Por razões de segurança e para evitar a possibilidade de corromper o banco de dados, siga SEMPRE este procedimento quando desligar o analisador: primeiro, interrompa a análise e pare o sistema operacional (use o botão PARAR SISTEMA no firmware do analisador) ANTES de posicionar o interruptor do analisador em Off ou desconectar o cabo de energia.

AVISO	
	Qualquer operação que exija acesso ao interior do analisador, entre elas, a instalação de itens de manutenção, pode causar ferimentos. Para evitar possíveis choques perigosos, ANTES de abrir o analisador, interrompa a análise, pare o sistema operacional (use o botão PARAR SISTEMA no firmware do analisador), desligue a energia e desconecte a fonte de alimentação.
	O conduíte elétrico deve ser instalado por um eletricista qualificado. Além disso, antes de instalar qualquer fiação dentro do analisador, certifique-se de usar proteção contra descarga eletroestática.
	As conexões de saída e de alarme devem ser instaladas por um eletricista qualificado. Além disso, antes de instalar qualquer fiação dentro do analisador, certifique-se de usar proteção contra descarga eletroestática.
	Este é um produto Classe A. Em um ambiente doméstico, este produto pode causar interferência eletromagnética. Nesse caso, pode ser necessário que o usuário tome as medidas adequadas para corrigi-la.
	Para se proteger da exposição acidental à radiação ultravioleta, não opere a lâmpada UV fora da sua caixa de proteção.
	<i>(Analisadores de TOC em linha e portáteis)</i> A água no sistema iOS pode estar quente. Antes de introduzir um frasco no sistema iOS, depois de operar no modo em linha, abra a porta e espere 30 segundos para que a amostra drene completamente. Introduzir um frasco antes da drenagem pode causar a pulverização de água quente lançada do sistema iOS ou da porta do frasco.
	O sistema iOS e as portas de frascos contêm agulhas afiadas projetadas para perfurar as membranas dos frascos de amostra. NÃO coloque os dedos ou materiais impróprios no sistema iOS ou na porta de frasco.
	Quando fizer a manutenção de peças dentro do analisador, garanta que a energia do analisador esteja desligada e afaste as mãos dos conjuntos de seringas de reagentes. As seringas são controladas por peças que se movem que podem beliscar a pele.



AVISO



(Analisadores de TOC portáteis e de laboratório) Para ter proteção constante contra risco de incêndios, substitua o fusível por outro do mesmo tipo e categoria.


DESCARTE DE MATERIAIS PERIGOSOS

As seguintes diretrizes são fornecidas para ajudar a eliminar e descartar substâncias perigosas relacionadas aos Analisadores de TOC Sievers [M9 and M9^e](#) [M5310 C](#).

 DESCARTE DE MATERIAIS PERIGOSOS	
<p>Reagentes perigosos (persulfato de amônio e ácido fosfórico) são usados no analisador. O fluxo de resíduos do instrumento é acidífero e deve ser eliminado de forma adequada. Consulte as regulamentações dos governos federal, estadual ou local.</p>	
<p>A lâmpada UV e a tela contêm mercúrio e podem ser consideradas material perigoso na sua localidade. Descarte esses itens de acordo com as regulamentações dos governos federal, estadual ou local.</p>	
<p>Se a lâmpada UV quebrar ou for danificada, manuseie os vestígios de acordo com o procedimento de manipulação de resíduos tóxicos da organização e os descarte de acordo com as regulamentações do governo federal, estadual ou local.</p>	
	<p>Este símbolo indica que a Diretiva da União Europeia 2002/96/EC para resíduos de equipamentos elétricos e eletrônicos (REEE) requer que o analisador seja descartado separadamente dos resíduos comuns.</p>

CUIDADOS OPERACIONAIS

Para garantir resultados ideais da amostragem e para proteger o instrumento contra danos, analise e implemente as seguintes indicações de cuidado.

 CUIDADOS	
<p>Certifique-se de que o reservatório de água DI está cheio, especialmente, quando analisar amostras com TOC elevado ou concentrações altas de sal. Depois de analisar amostras com teor de sal ou TOC elevado, enxágue sempre o analisador operando um ciclo de amostra com água DI com TOC baixo.</p>	



CUIDADOS

Para evitar leituras de TOC falsas e possíveis danos ao analisador, verifique sempre se a entrada de amostras está aberta e se o reservatório de água deionizada está cheio antes de começar a análise.

A operação do analisador sem filtro em linha na entrada de amostras danificará o analisador e cancelará a garantia. Para evitar danificar o analisador, instale o filtro e substitua o elemento de filtro quando necessário.

Para evitar leituras de TOC falsas e possíveis danos ao analisador, verifique sempre se a amostra flui através do sistema iOS e se o reservatório de água deionizada está cheio antes de começar a análise.

Para operar dentro das especificações para sistemas de água ozonizada, um kit Ozone Destruct deve ser adquirido na GE Analytical Instruments e instalado de acordo com as instruções.

Quando limpar o analisador, aplique sempre o líquido no pano e NÃO pulverize líquidos diretamente no analisador.

NÃO use água ou líquidos de limpeza na tela touchscreen, pois a água pode danificar ou descolorir o polarizador. Consulte a seção a seguir para obter recomendações para limpar a tela touchscreen. Limpe qualquer condensação imediatamente.

B

Appendix B: Modbus Map



USING PUTTY

HyperTerminal is a Microsoft communications program that can be used to communicate with Ethernet devices, such as the Analyzer. To use HyperTerminal, you must first connect your Analyzer to the computer with a crossover Ethernet cable, or connect the Analyzer to your computer network using a straight-through Ethernet cable. Ethernet cables are available at many computer and office supply retail stores.

To install the serial connection:

- 1: For direct connection of the Analyzer to a PC, select the crossover Ethernet cable from the Accessories Kit. Attach one end to the Ethernet port on the back of the Analyzer, and the other end to an Ethernet port on the PC.
- 2: For connection of the Analyzer to a network, select the straight-through Ethernet cable from the Accessories Kit. Attach one end of the cable to the Ethernet port on the back of the Analyzer, and plug the other end into a convenient network port.
- 3: Open HyperTerminal on the PC. The Connection Description screen displays. Enter a name for the new connection and click OK.
- 4: The Connect To screen then display. In the Connect using Field, select TCP/IP (Winsock). Then, in the Host Address field, enter the IP address of your Analyzer. The IP address is displayed on the System Info screen (Menu @ Maintenance @ System Info).
- 5: Next, enter the appropriate Port number for the type of information you are going to collect.
- 6: If you are collecting real-time data that will be generated during measurements you are planning to make, enter 10801.
- 7: If you are planning to save historical data (Data History, or Cal/Ver History) that you will export from the Analyzer, enter 10802.
- 8: Click the OK button.
- 9: To save the data from the Analyzer, select Transfer @ Capture Text. When prompted, specify the file name and location for saving the data file.
- 10:

Appendix B MODBUS MAP

Index

I
Installing a USB Connection 90

NOTES

