Controller Unit

301C
User Manual

M-510324
September 2014

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continued…

Notices and Trademarks

This manual covers software version 3.086 and optional BACnet module firmware version 1.3.19.

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Symbol Definitions

The following table lists the symbols used in this document to denote certain conditions:

Symbol	Definition
	**ATTENTION**: Identifies information that requires special consideration
	**TIP**: Identifies advice or hints for the user, often in terms of performing a task
	**REFERENCE _ INTERNAL:** Identifies an additional source of information within the bookset.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	**CAUTION**: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. **CAUTION:** Symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	**WARNING**: Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death. **WARNING** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.

Introduction

The 301C controllers act as nerve centers for gas detection networks, providing continuous monitoring for up to 96 connected units (plus 1 301ADI). Once installed and connected, the controllers allow the user to monitor, adjust, or reconfigure an entire network of units.

Intended Use

The controller is intended to monitor an entire gas detection network around the clock. The unit offers logging capabilities, creating log files of all transmitter concentrations and alarms for analysis. The unit is also equipped with grouping or zoning capabilities that allow users to query and monitor specific groups of transmitters or specific transmitter zones.

Receiving and Unpacking

Upon receiving the controller unit:

• Check that the package is undamaged
• Carefully open the package.
• Locate the packing slip or purchase order and verify that all items on the order are present and undamaged

Note: *If the package or any of its contents are damaged, please refer to the Warranty section at the back of the manual for instructions.*

Installation Instructions

Basic Guidelines

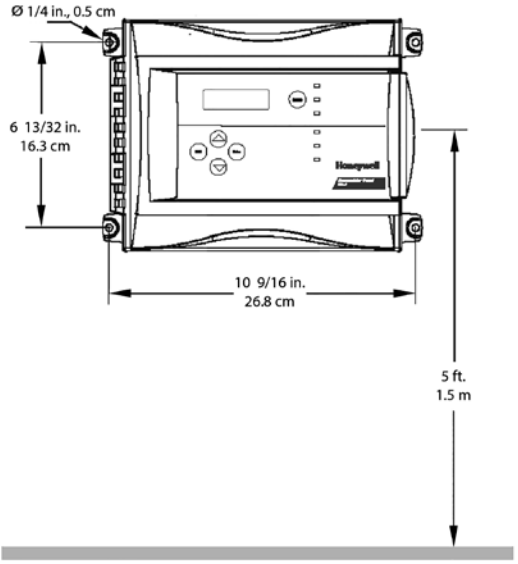
For proper operation of the controller, follow the instructions in this manual carefully.

- Locate all units in areas easily accessible for service.
- Avoid locations where instruments are subject to vibrations
- Avoid locating units near sources of electromagnetic interference
- Avoid locating units in areas subject to significant temperature swings

Verify local requirements and existing codes that may impact choice of location.

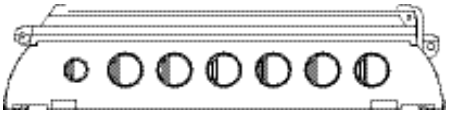
Surface Mount Installation

It is recommended that controllers be installed 5 feet (1.5 m) above the floor, at approximate eye level.



Mark the holes as shown:

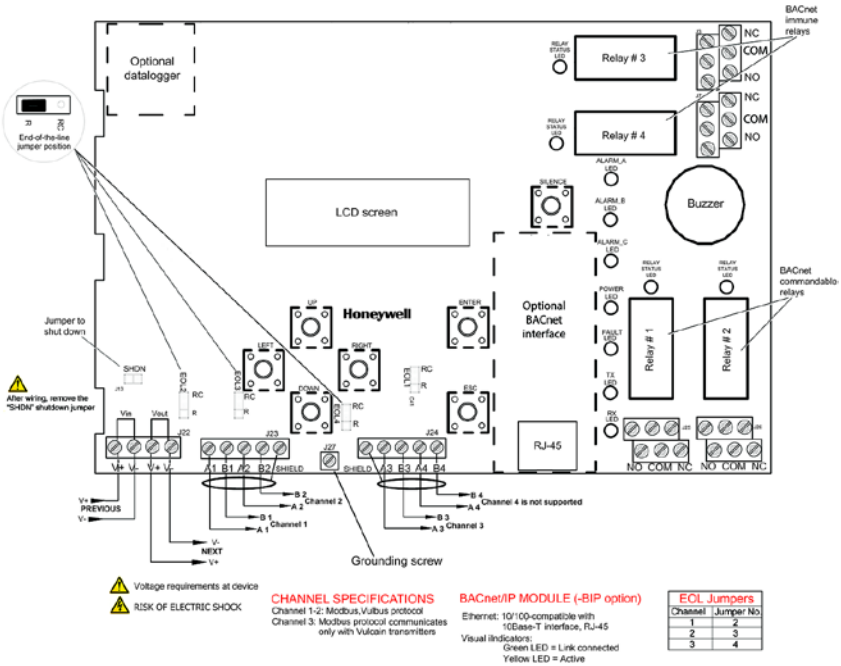
- Height markers 6 13/32” (16.3 cm) apart
- Width markers 10 9/16” (26.8 cm) apart
- Pre-drill 1/4” mounting holes as needed
- Securely mount the 301C using the appropriate screws



Wiring for the unit must be passed through the knock-outs provided at the bottom of the unit.

Wiring Details

The diagram below provides the details required to connect the 301C controller with power, transmitters, external relay loads, and BACnet. Details concerning power supply, cables, capacities, etc., are provided in the Specifications section at the back of this manual.



J22 Power Input:	Connect the power supply to the controller (see Wiring Details for cabling diagrams)
J23, J24 Communication inputs:	Connect communication cables to channels 1 through 3.
Relay Outputs 1-4:	Depending on the desired configuration, connect the relay cables to either N.O. or N.C. Relays 1 and 2 are commandable by either internal events or by BACnet; relays 3 and 4 are driven only by internal events.
SHDN jumper	Place the jumper over the Shutdown header pins to reset or restart the system.
EOL Resistors 1-4:	Place the jumper over the header pins to include resistors to attenuate communication echoes.

Power Connections

The 301C requires a power range of 17-27 Vac, 50/60 Hz (8.64 VA), 18-36 Vdc, 350 mA @24 Vdc (8.4 VA). Polarization is not important in either AC or DC mode. The system must be grounded on the transformer and a dedicated circuit breaker must be used.

Communication Connections

Communication cables must be grounded using the shield terminal, using twisted and shielded pair Belden 2-24 AWG #9841 cable (or equivalent).
The network cabling can extend up to a limit of 2000 feet (609 m) per channel.
The length of a T-tap can reach 65 feet (20 m), up to a maximum of 130 feet (40 m) for all T-taps.
The 301C controller communicates with gas sensors over a Modbus RS-485 network. This transmission line requires that 120Ω termination resistors be fitted at both ends of each network segment to absorb the

signal and thus prevent reflections. Fortunately, the controller makes network termination simple as resistors are included on the board. These can be switched in and out of network by moving the “EOL” jumpers as shown in the figure on page 12. More information on RS-485 wiring is published by Maxim Integrated in the TUTORIAL 763 Guidelines for Proper Wiring of an RS-485 (TIA/EIA-485-A) Network .

Settings for Specific Transmitters

Honeywell Sensepoint XCD Transmitters must be configured for 9600 baud, no parity, and a unique address. Honeywell XNX Universal Transmitters must be configured for 9600 baud and a unique address. Information on configuring each transmitter is in the associated technical manual.

Relay Output

The relay output can withstand up to 5A at 30Vdc or 250Vac resistive load. Relays can be used to activate horns and strobes. Although each relay is programmed with a default setting (below), they can be configured using the controller programming menu.

If relays are set to normally closed, the relay is powered up with the controller and the device linked to the relay is functioning. The relay will shut down when the associated event is activated.

If the relay is set to normally open, the relay will remain off when the controller is powered up and the device connected to the relay will only be activated when the associated event is activated.

Note: *These functions are reversed if the controller Failsafe mode has been activated.*

Jumper Use Instructions

The jumpers on the controller PCB allow a variety of operations to be performed manually:

EOL 1-4: Enables the user to add End-Of-Line jumpers that improve communication signals. Put the jumper in R position (as shown on wiring diagram) to activate the End-of-Line termination. (R provides a resistance termination and RC provides resistance and condensator termination.)

SHDN: Enables the microcontroller to be reset or temporarily shut down. This function is used mainly when system wiring adjustments are needed (power off for safety).

CAUTION	Power may still be present on the relay terminals even after powering off.

Relays J29-J32 These jumpers allow the relay to be tested by activating it without having any effect on Events.

Initial Startup

Make sure that all wiring has been completed according to specifications in the wiring details before powering up the unit. When all is secure, remove the SHDN jumper to power-up the unit. Within sixty seconds the controller will be fully operational.

Datalogger (SD card)

The DLC (Data Logger Card) option for the controller collects data and stores it on a digital Flash memory card (SDCard). In the event that the card memory becomes full:

- Information logging is stopped
- No SDcard flag is displayed on-screen
- The SDcard LED blinks

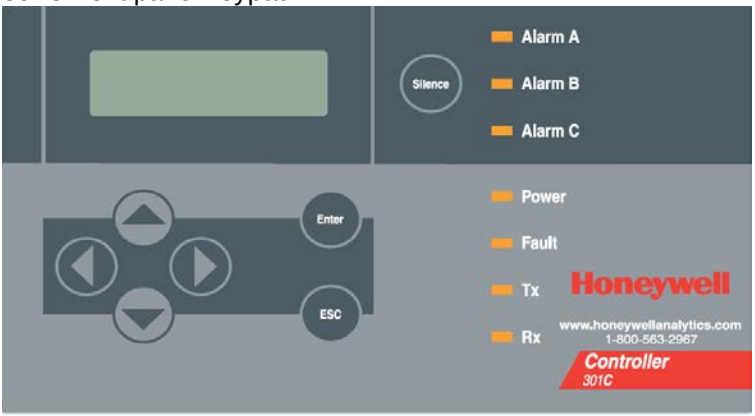
See the Acquisition section for more details on starting and stopping the datalogging function. SDHC cards are not supported; use only SD cards.

CAUTION	Always deactivate datalogging function before removing the SDcard. Never remove the card when its LED is on.

Programming Interface

The front panel of the 301C provides a programming keypad (buttons) and LEDs.

301C front panel keypad:



Keypad Functions

Each unit has 7 keypad keys, or buttons:

Arrows: Used to move the cursor through the various programming fields (Up, Down, Left and Right), or to adjust the display contrast (press and hold the up or down arrow until desired contrast is reached and release).

ESC: Used to exit the programming menu or to cancel a change or input.

Enter: Used to access the programming menu and to modify programming fields.

Silence: Turns off the controller's buzzer.

LED Definitions

The controller is equipped with 7 LEDs that provide a status for each function related to that indicator:

Alarm A:	A blinking red light indicates that an event has been activated. A constant red light indicates that one or more transmitters has reached Alarm A or Alarm 1.
Alarm B	When the red indicator is on, one or more transmitters has reached Alarm B or Alarm 2.
Alarm C	When the red indicator is on, one or more transmitters has reached Alarm C.
Power:	Green indicates that the unit is powered up and functional
Fault:	When the amber LED is on, it indicates a fault (i.e. a communication, maintenance or device problem)
Tx:	When the amber LED is blinking, it indicates that the controller is *sending* information or requests on the communication channel.
Rx:	When the green LED is blinking, it indicates that the controller is *receiving* information.

Each of these functions is linked to parameters programmed in the control unit, which we will discuss in the following section.

System Operation

The system operates in four different modes that allow it to use, analyze, debug, and simulate the actions that the system can perform. These modes are: Normal, Single Tx, Debug and Simulate. The default system operation mode is Normal. The other modes are available through the Tests menu (option 8 from the Main Menu).

Note: *Systems services may be disrupted by some menu operations. Specifically, viewing the "events" dialogue may inhibit event operation.*

System Programming

The system's Normal programming mode offers several menu options that are accessible from the main menu screen:

1. Tx Info: Allows transmitter parameters to be programmed
2. Groups: Allows sets of multiple transmitters to be aggregated for simpler programming of a common response.
3. Events: Facilitates creation of logical terms which respond to transmitters or events. These Boolean outputs can respond to concentration, alarm, or fault status. These events facilitate voting within a group and can drive relay outputs.
4. Acqui: Allows the datalogging feature to be activated or deactivated
5. Copy: Allows data or parameters to be copied from the (controller) configuration to parameters
6. Config: Allows system parameters and password to be set
7. Network: Allows actions on the network to be performed, communication statistics to be consulted, and remote calibrations to be performed
8. Tests: Allows each device to be tested sequentially (inputs, outputs, communications, events, etc.) and operation of various parameters to be validated
9. BACNet: Allows a device's BACNet parameters to be set
10. Wireless: Not supported.

Note: *Access to the programming functions is password protected. The default password is 2967.*

The screen display shown below appears initially. This display can be configured to scroll among the information screens for each device connected to the controller.

If one or more of the connected devices is in an alarm mode, the controller will only scroll between the main information screen and the

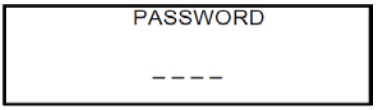
screens for device(s) in alarm mode. In this case, you must scroll manually to view screens for other devices.

The information screen also displays icons representing certain system functions. Here is a list of possible icons and their meaning:

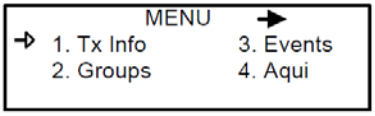
Icon	Description
	BACNet: Indicates that there is a BACNet module present and that it is communicating with the controller.
	BACNet error: Indicates that a BACNet module is present but communication with the controller has failed (error)
	Debug: Indicates whether the controller is in debug mode (Single TX, Debug or Simulation modes). When in simulation mode, SIM appears next to this icon.
	Log: Indicates that either “Tx Logging” or “Event logging” is enabled.
	Log error: Indicates that an error occured during TX or Event logging. All logging functions are stopped.
	SDC: Indicates that an SDcard is present and functionning. The icon “fills” (from white to black) progressively as memory is used. A white icon indicates empty memory and black indicates full memory.
	SDC error: If this symbol persists for more than 5 seconds, an SD card card is present but not functioning properly.
	Wireless network: Indicates that the wireless network coordinator (wireless communication module) is present and communicating with the controller.
	Wireless network error: Indicates that the wireless network coordinator (wireless communication module) is present but is not communicating with the controller.

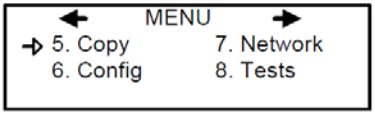
Since the controller's programming functions are password protected, it is necessary to access the login screen:

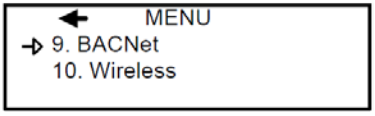
- Press Enter to access the programming options. The password screen appears:
- Use the keypad Up or Down arrows to increase or decrease the value, one digit at a time, starting with the first digit
- When all the digits of the password are correct, press Enter to access the programming functions.



The first MENU options screen appears. Use the keypad arrows to navigate through multiple screens to the desired function and press Enter to access it.



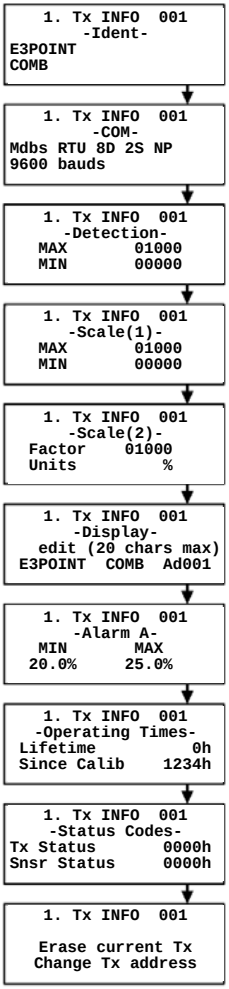




1. Tx Info Menu

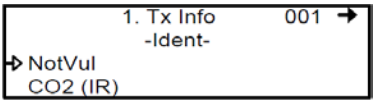
Tx Info is the menu option that is dedicated to transmitter information and contains several sub-menu options. The exact list of screens will vary depending on the transmitter type. A summary is presented below with details on the following pages.

Ident:	Allows the network component's identification information to be viewed.
COM:	Allows the communication protocol to be viewed or changed
Detection or Scale(1) and Scale(2):	Allows the detection range and the unit of measurement parameters to be viewed and changed
Display:	Allows the label (or name) of a specific component to be changed
Alarms:	Allow alarm thresholds to be viewed and sometimes changed. There can be significant variations in this screen depending on transmitter type.
Status Displays:	Transmitter and node status (in hexadecimal values)
Erase or Current Tx:	Erases or changes the Tx address



Ident Menu

The Ident, or identification menu allows a component's network ID to be consulted:



The upper right corner of the screen shows the component's address. If the address of the device whose information must be viewed is known:

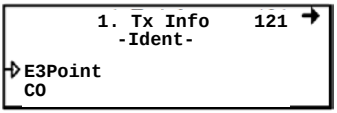
- Use the arrows to move the cursor arrow to the on-screen address
- Press Enter (the value can be edited while the number is flashing)
- Use the up or down arrows to increase or decrease the value
- Press Enter again to validate the entry and display the information for the desired device.

The bottom left corner of the display shows the transmitter name (ex.: 301D2 - product name) and the sensor type (ex.: CH4 - methane sensor). These values can also be changed for Group or Vulbus product types. The procedure is identical for both fields:
Programming or changing a product or sensor type

- Use the arrows to move the cursor to the product type field.
- Press Enter to select the field (the value can be modified when flashing)
- Use the arrows to scroll through the list of product types and press Enter when the desired product or sensor appears

Product and Sensor Types

This is a list of all the (preprogrammed) product types available from the Identification option in the Tx Info menu.



Compatible products:

- E3Point
- 420MDBS
- ECFX
- 301R
- 301EM
- SQN8X
- XCD
- XNX
- IAQPoint2
- Legacy Vulcain products

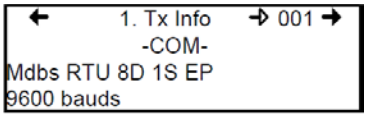
Note: *When Group is selected as a product type, the remaining Tx INFO screens are not accessible (because each product in the group has already been individually programmed). Only the Ident and Erase current Tx screens will be available.*

The sensor type list applies to address ranges 1-96 and is not dependent on the type of product selected. Devices in the address range from 97-170 will display a BACNet object identifier, rather than a sensor type.

*An additional Product Type, simply called “Group”, represents a group created in the Groups Menu in the controller. When scrolling through the available product type list, this name will appear as many times as there are groups created in the controller (example: Group 1, Group 2, Group 3, etc.). If a group is selected as the product type, then the sensor type options are limited to MIN, MAX and MEAN.

COM Menu

This screen displays the selected communication protocol for device addresses from 1 to 96. Each transmitter's protocol is defined by the controller (see Network Auto-configuration section)



If a transmitter is compatible with several different protocols, it can be modified using to one of the following options:

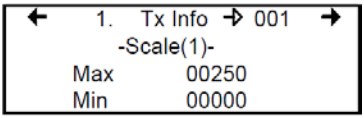
- Vulbus
- Mdbs ASCII 7D 2S NP 9600 bauds
- Mdbs RTU 8D 2S NP 9600 bauds
- Mdbs RTU 8D 1S NP 9600 bauds
- Mdbs RTU 8D 1S OP 9600 bauds

When a transmitter is configured with the Modbus communication protocol, the transmitters automatically sends the programmable parameters to the controller.

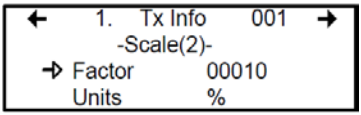
Note: *Vulbus transmitter parameters must be programmed manually.*

Scale Menus (1 and 2)

These menus appear only for certain devices. Scale(1) allows the detection range, minimum and maximum, to be defined for the selected device. Whatever value is specified is the value that will appear at the device display (if applicable). The Minimum value is generally left at 0. Parameters for the XNX and XCD gas detectors can be viewed here but can be changed only at the transmitter.



Scale(2) allows the factor by which to divide the scale (between 0 and 65535) and the unit of measurement for the selected scale to be determined.



The factor allows precise scale limits for detection to be set. By dividing the maximum scale value in the first Scale screen (250 in this example) by 10, a scale value of 25.0 can then be displayed.

The “Units” allow the device’s unit of measurement to be selected:

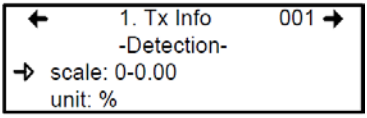
°F:	Sets degree Farenheit as the unit of measurement
°C	Sets degree Centigrade as the unit of measurement
%RH	Sets Relative Humidity as the unit of measurement
mV	Sets millivolts as the unit of measurement
V	Sets volts as the unit of measurement
mA	Sets milliamps as the unit of measurement
%	Sets the percentage of gas as the point unit of measurement
ppm	Sets parts per million of gas as the point unit of measurement

Detection Menu

The detection menu (available only for devices with addresses between 1 and 96) displays the detection range (scale: 0-100.0) and the unit of measurement (unit: %) for the selected component. If a transmitter uses the Modbus protocol, the detection parameters are automatically defined during network configuration and are not editable. Vulbus protocols must be manually defined by the programmer.

The detection scale is between 0 and the maximum value (0.00) and the unit of measurement is either ppm or percent (% for oxygen and % LEL for combustibles).

The detection menu is not available for the VA301R or VA301AP.



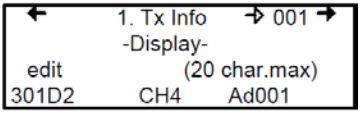
Programming or modifying the scale range or unit:

- Use the arrows to move the cursor to the scale or unit option
- Press Enter and use the arrow to increase or decrease the value
- Press Enter when the desired value is obtained

Display Menu

This option allows a specific label or name to be assigned to the selected component (transmitters, relay modules, annunciators). Up to 20 characters, including spaces, can be used in the label (example: BOILER ROOM). The default Modbus transmitter labels are composed of the component (or transmitter) name, sensor type and address.

Vulbus transmitter labels contain 20 blank characters (spaces).



Alarm A, B, and C Menus

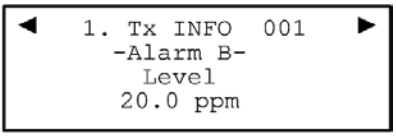
The screens for viewing alarm thresholds are combined in this manual. There will be either two or three levels, depending on transmitter type.

If present, separate “MIN” and “MAX”levels permit manual control of the hysteresis of each alarm. Normally, the “MAX” level is set greater than “MIN.” However, alarms can be made to trigger on falling concentration (as with oxygen) by setting the “MAX” threshold smaller than the “MIN” threshold.

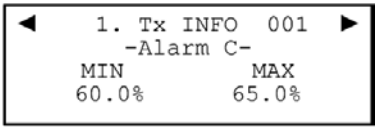
With certain transmitters, only one threshold will be displayed.

Additionally, with certain transmitters, the alarm thresholds are read-only at the controller. These thresholds can be set only at the transmitter.

These are typical screens:



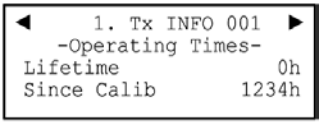
Typical screen for viewing alarms A or B on XCD and XNX transmitters

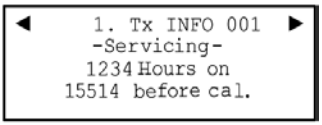


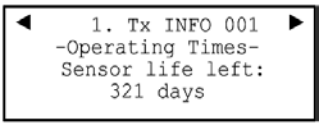
Typical screen for viewing or changing alarm A, B, or C thresholds on other transmitters.

Servicing and Operating Menus

These functions vary depending on the transmitter type. These displays show the total time the device has been in service and the amount of time remaining until the next required calibration or replacement.



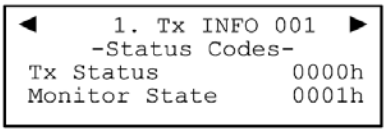




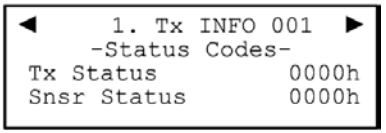
Status Code

These screens display transmission or node status and sensor status for the selected transmitter. This read-only information can assist service personnel in troubleshooting.

The XNX and XCD gas detectors will report the warning or fault number (iFaultWarnNumber) in hexidecimal on the third line. These transmitters will also report the monitoring state (iMonitoringState) in the fourth line. See the transmitter documentation for interpretation of fault numbers and monitoring states.



Typical display for XNX or XCD

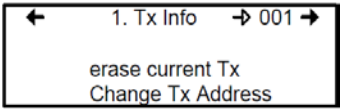


Typical display for other transmitters

Erase Current Tx

This function allows the configuration to be erased or the Tx address for the displayed component to be changed.

Note: *Selecting erase current Tx only erases the current device entry Tx Info configuration. No other data is erased.*



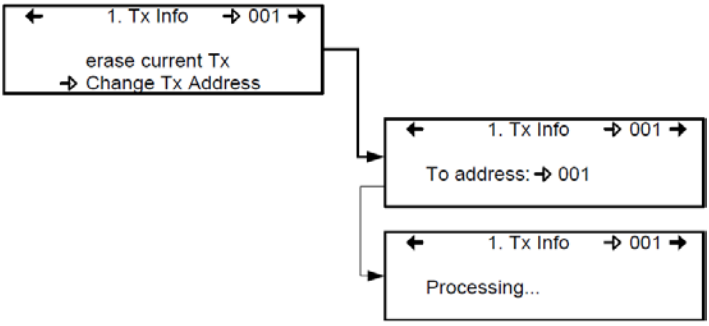
Change Tx Address

Selecting Change Tx Address allows users to move a device from one TX address to another:

- Use the arrows to scroll to Change Tx Address and press Enter to select
- In the next screen, scroll to the address number and press Enter to select
- Use the up or down arrows to increase or decrease the address value and press Enter to validate the new address.

The Change Tx address option is only available (active) for device address 1 to 96 and if there is a Modbus device connected.

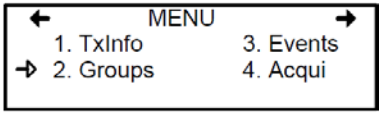
If the address is valid, the screen will display “Processing”. If the address is invalid, the screen will display “Invalid Tx” and return to the Change Tx Address screen (the address for GasPoint devices cannot be changed). A final screen will display either “Error” or “Success” (re-start procedure if Error is displayed).

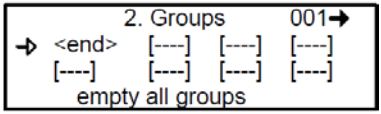


Note: *If a device address is changed to one already associated with another device, the existing data will be overwritten. Customers should know their network’s address assignments and be careful when changing a Tx address. Delete the original Tx address to avoid duplicate entries.This feature is not supported with XNX and XCD transmitters.*

2. Groups Menu

Programming groups of transmitters allows several units to be combined which then enables actions (events) to be taken based on a series of units rather than each unit, individually.





A group is a stack containing the addresses from each of the transmitters included in the group.

Groups are displayed in a single line; if a group contains more than four components, the arrows must be used to scroll left and right of the display window to view all members of a group.

The cursor in the Group screen is represented by the blinking brackets (<end>). Any information between the brackets can be edited.

Creating Groups

- Use the arrows to move the cursor to a group line and press Enter
- The field can be edited when the brackets stop blinking and the word “end” blinks
- Use the up or down arrows to scroll through the list of all units connected to the 301C, until the desired address is displayed .
- Press Enter again to validate the address.
- The address is added to the group and the <end> bracket is shifted one position to the right.

The process can be repeated until all the desired transmitters in the group (up to 126) have been added. The address for each transmitter added in the Tx Info menu is available when creating groups.

Note: *Groups created in the Groups menu will appear in the product type list (Tx Info - Ident screen) as “Group xx” (the number assigned to the group when it was created).*

Deleting Groups

Use the *empty all groups* command to delete all groups previously programmed in the controller.

Single groups can be deleted with a simple procedure:

- Scroll to the first transmitter in the group list,
- Select the transmitter (its address blinks) and scroll to <del> (<del> erases the entry and <end> marks the end of the stack)
- Press enter and the group is emptied.

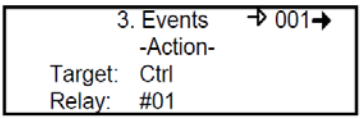
This procedure makes it possible to delete one, several or all entries previously included in a group.

Note: *Up to 126 groups, with a maximum of 128 members each, can be created.*

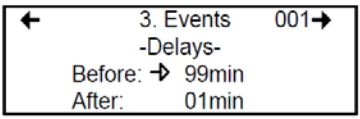
3. Events Menu

The Event menu is programmable. Event programming lets specific actions to be defined:

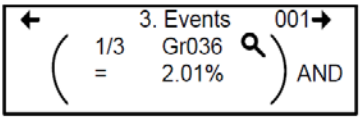
Action:
What will be done if programmed criteria are reached



Delays:
Defines the length of time to wait before taking an action on an event and time to wait after an event has returned to normal before the action output is returned to normal state.

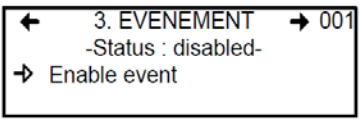


Conditions:
AND, OR or none (---); equations that allow more detailed control of an event

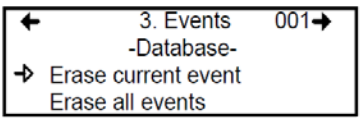


Coverage period:
Determines the period during which the event is applicable

Status disabled:
Disables or enables a programmed Event

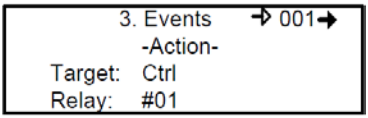


Database:
Erases the selected event or all events



Action Menu

Actions are comprised of two parameters:



Target — Indicates which component is responsible for the action to be taken;
Tx (transmitter)
Re (Relay/Annunciator)
Ctrl (Controller)

Relay — Indicates which of three possible outputs will be activated when the event is true;
#XX (activates the component's #xx relay), Buzzer (activates the component's audible alarm)
ALL (activates the relays and audible alarms)

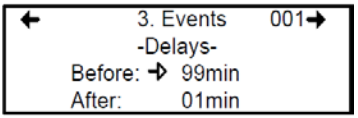
Example: Tx 007 detects a concentration exceeding the set values. The target (controller) triggers relay 1 connected to that event (a fan perhaps). Multiple events may be associated with a single relay. If so, the relay will be activated if any of the associated events are true.

Delays Menu

This option allows Before and After settings that will delay the activation or deactivation of an action to be programmed.

Before — Delays the action for the specified length of time. If the condition persists beyond this delay, the defined action is executed.

After — The time to wait after an event has returned to normal before returning action output to normal state. The after delay also offers a Latch option, described below.



Before and After delays can be configured at either 30 or 45 seconds or from 1 to 99 minutes, in one minute increments. Five dashes (-----) indicates that no delay has been programmed.

- Use the keypad arrows to scroll to the desire option
- Press Enter to select the option
- Use the keypad arrows to scroll through the second or minute settings
- Press Enter at the desired setting. The delay is set.

Latch Mode

- The Latch function is executed on an Event state
- It is possible to select the Latch mode by changing the after delay to “latch”
- The Event stays active until the Silence keypad button is pressed
- The Silence keypad button has two functions: Silence the buzzer and unlatch the event.
- When the Silence keypad button is pressed, events in Latch mode are unlatched and reevaluated. If the Event condition persists, the Event remains active and returns to Latch mode. If the condition does not persist, the event is deactivated.

Note: *If the Event has a Before delay and the Silence button is pressed while the Event conditions are still true, the buzzer will be silenced only for the length of the programmed delay.*

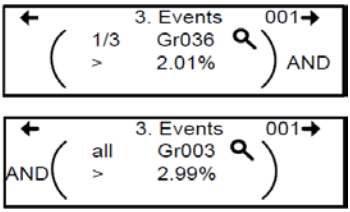
Conditions

Conditions are the parameters that define what makes an Event true. Each condition is defined by four elements and can be combined with other conditions to provide greater flexibility. A condition, as in the example provided below, defines:

IF at least 1/3 of group 36 detects concentrations greater than 2.01% of specified gas AND all of group 03 detects a concentration greater than 2.99% of gas, then the specified action (Actions were set at the first Event screen) for that Event will be triggered.

Since the display screens offer limited space, scroll left and right to view and edit further information.

Condition programming screens



The portion of the Events condition screen that is within the brackets is divided into four editable list fields:

The top left portion contains the statistic quantifier (available only for Groups) that take only the specified part of the group into the equation. Options available in this field are:

all:	includes all transmitters in the group
mean:	includes the average concentration for the group's transmitters
max:	includes the group's maximum concentration
min:	includes the group's minimum concentration
1/4:	includes at least a quarter of the group's transmitters that meets set conditions
1/3:	includes at least a third of the group's transmitters that meets set conditions
1/2:	includes at least half of the group's transmitters that meets set conditions
2/3:	includes at least two thirds of the group's transmitters that meets set conditions
3/4:	includes at least three quarters of the group's transmitters that meets set conditions
1 or +:	at least one or more than one of the group's transmitters that meets set conditions

The bottom left portion contains the logic, or operator, quantifier that determines how conditions are calculated. Options available in this field are:

Operator Symbol	Meaning
---	No operator
=	Equal to
<=	Equal to or smaller than
<	Smaller than
>=	Equal to or larger than
>	Larger than
!=	Not equal to
max	When the maximum value is reached, an action is triggered. It will not be deactivated until levels fall below minimum value
min	When concentrations fall below minimum value, an action is triggered. It will not be deactivated until concentrations rise above set maximum value

The top right portion contains the source, which defines what device or group of devices the Event will be based on. The list provides the following options:

GrAll: Includes all transmitters (see note)

Gr_ _ _: Includes only the devices in the specified group (see note)

Tx000: Includes only the specified transmitter (connected to the controller)

Clock: Includes only information gathered between the specified times. Selecting clock sets a condition that is applied only between the start and end time frame. It is possible to set one condition screen to specific parameters and the second to clock, which means that the specified condition will trigger an event only if it occurs during the set time period.

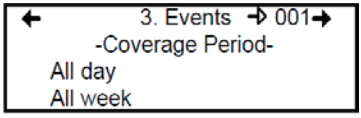
Note: *Clicking on the magnifying glass to the right of a Group number on the display opens a view of the Group for consultation or editing. Press Esc to close the group view and return to the Event condition screen.*

The bottom right portion contains the operand, which defines what device or group of devices on which the Event will be based. The list provides the following options:

OFF Used for status on binary inputs (ex.: used with 301ADI)
ON: Used for status on binary inputs (ex.: used with 301ADI)
Fault: Bases trigger on maintenance alarm, communication failure or device failure
Alrm A: If the chosen device or group has an Alarm A or Alarm 1, an event will be triggered.
Alrm B: If the chosen device or group has an Alarm B or Alarm 2, an event will be triggered
Alrm C: If the chosen device or group has an Alarm C, an event will be triggered.

The Coverage Period screen allows the period that will be covered by the Event to be defined. (The time frames for each of these periods can be defined in the controller Config menu.) This option provides two further selection fields:

Day definition field: allows All day, Daytime, or Nighttime to be selected
Week definition field: Weekend, Working Days, All week

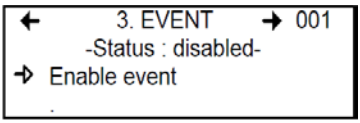


1. Use the keypad up or down arrows to scroll to either All day or All week
2. Press Enter to select. The value can now be changed
3. Use the keypad up or down arrows to scroll through options (see above)
4. Press Enter to select.

Status

This screen displays the current event status and allows it to be either enabled or disabled, depending on the current status.

Enable event: Toggles between Enable and Disable.



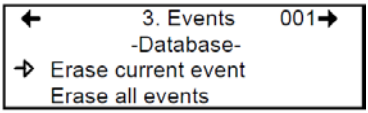
After going through all the steps and programming an event, this screen will display “Enable event”. Press Enter to activate all the parameters and enable the Event.

If an existing Event is being consulted, this screen would display “Disable event”. Press Enter to disable an Event (it will not be deleted but will not function). The programming of this Event is always present, which means that it easily can be reactivated by scrolling to this screen and pressing Enter.

Database

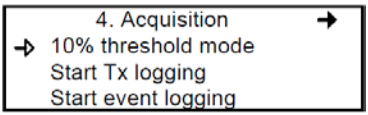
This screens displays the options linked to the database:

Erase current event: Lets user erase the current event
Erase all events: Lets user erase all events



4. Acqui Menu

The Acquisition mode is accessible only when there is an SD card present (controllers with the Data Logging, or DLC function). It is used to enable or disable the logging of system Events or transmitter information. The information is logged (or recorded) on an SD card. Intervals or conditions must be defined before using this option.



The first line of the Acquisition screen offers either:

Delay mode:	Allows for delay intervals of 10 to 59 seconds or 1 to 60 minutes.
Threshold mode:	Allows log values to be set according to set variation thresholds (based on last reading) of 3% or more, 5% or more or 10% or more of last detected concentration.

If a 3% threshold is selected, the system will not log a value at 3% but will log a value of 3.1%. Remember that the sampling rate (system refresh rate) may have an impact on logging.

Here is an example of threshold logging. The logs a semi-colon delineated text files.

```
2005-04-27  11:05:20;1_CO2_ppm;574;-normal-:
2005-04-27  11:06:02;1_CO2_ppm;503;-normal-:
2005-04-27  11:06:15;1_CO2_ppm;562;-normal-:
2005-04-27  11:06:28;1_CO2_ppm;645;-normal-:
2005-04-27  11:06:39;1_CO2_ppm;557;-normal-:
2005-04-27  11:30:45;1_CO2_ppm;715;-normal-:
```

Starting and Stopping Tx Logging

In the previous step, “Acquisition”, the frequency at which Tx logs would be recorded can be configured. To start the logging function:

When “Start Tx logging” appears on the display, it indicates that the acquisition, or logging, mode is inactive. When “Stop Tx logging” appears, it indicates that Tx data is being logged. The log message is displayed on the screen according to the chosen mode and LED 1 will light up.

Press the Enter keypad button to stop or start Tx logging.

When Tx data is logged, the system creates files named **tayymmdd.log, tbyymmdd.log** and **tcyymmdd.log**, each representing one third of the network. The record includes the transmitter’s date, time and address, the sensor type, the concentration read, as well as the alarm status. Here is a sample of what a Tx log looks like:

2004-01-23 17;54;25; 001_CO_ppm;0;-normal-;002_NO2_ppm;1.5;-normal-;003_CO_ppm;0;-normal-
2004-01-23 17;55;25; 001_CO_ppm;0;-normal-;002_NO2_ppm;0.5;-normal-;003_CO_ppm;0;-normal-
2004-01-23 17;56;25; 001_CO_ppm;0;-normal-;002_NO2_ppm;0.5;-normal-;003_CO_ppm;0;-normal-
2004-01-23 17;57;25; 001_CO_ppm;0;-normal-;002_NO2_ppm;1.0;-normal-;003_CO_ppm;0;-normal-
2004-01-23 17;58;25; 001_CO_ppm;0;-normal-;002_NO2_ppm;1.5;-normal-;003_CO_ppm;0;-normal-

These log files are delimited by semicolons and are thus easily read by popular spreadsheet programs such as Microsoft Excel. The first column of the Tx log displays the date (yyyy-mm-dd) and the time (hh:mm:ss) of the log. In this example, the “Delay mode” was set to one minute intervals.

The third column of the Tx log displays the transmitter address and the fourth displays the gas type, gas concentration and unit of measurement.

The display then lists the next transmitter address with its gas type, concentration and unit of measurement, and so on until all the transmitters have been listed.

Starting and Stopping Event Logging

The Acquisition menu offers an event logging option. Event Logging records controller transactions, events, Tx and alarm flags and relay status.

When “Start Event logging” appears on the display, it indicates that the acquisition, or logging, mode is inactive. When “Stop Event logging” appears, it indicates that Event data is being logged.

Press the Enter keypad button to stop or start Event logging.

When Event data is logged, the system creates a file named **evyymmdd.log**. The record includes the date, time and the event. Here is a sample of what an Event log looks like:

```
2004-01-23 17:54:25: Event logging enable
2004-01-23 17:55:25: Event logging enabled
2004-01-23 19:05:47; Simulation sequence activated
2004-01-23 19:05:48; Tx 6 communication no more in fault
2004-01-23 19:05:48; Tx 8 communication no more in fault
```

The first column of the Event log displays the date (yyyy-mm-dd) and time (hh:mm:ss) of the log. Column A displays the date and time of the log. In this example, the event’s “Delay mode” was set to one minute intervals.

The system logs the following types of events:

- Event Log
- Event status changed
- Alarm A, B, C, Fault, and X status changed

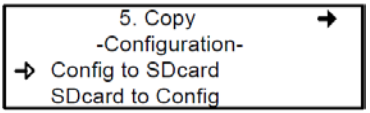
Note: *New log files are created when the existing files reach 32 000 lines or at the start of a new week (0h00 Sunday)*

5. Copy Menu

The Copy menu allows programmed parameters to be copied and transferred. Data from the SD card can be transferred to a controller or from a controller to the SD card or copy parameters from one device to the next. The Copy option offers three screens: Configuration, Parameters and System Log.

Configuration

If the controller is equipped with an SD card, the configuration function allows data to be transferred either from the 301C to the SD card or the reverse. This makes it possible to transfer the controller's programming to a computer or from a computer to the controller.



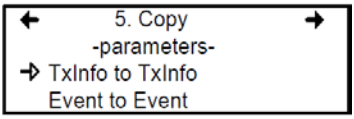
The first option in the configuration screen is 301C to SDcard. Selecting this option copies the controller's configuration and parameters into a "config.ini" file [1].

Note: The second option is SDcard to 301C allows the configuration and parameters of the "config.ini" file on an SDcard to be copied to the controller. Power must be cycled to fully implement the SD card's configuration by stowing the jumper on the SHDN pin (see the illustration on page 12.) The "config.ini" file contents can be modified at any time and from any computer.

Parameters

The "parameters" function allows one transmitter's configuration to be copied to another or one event's parameters to be copied to another event. This allows several devices that share identical or similar parameters to be quickly configured.

[1]When transferring data, the system will automatically search for an existing "config.ini" file before proceeding. If one exists, the system searches for a "config.bak" file. If found, the file is deleted. Then, the pre-existing "config.ini" file is renamed "config.bak", making it possible to save the new "config.ini" file and keep a backup copy of the previous one.
After inserting an SD card into the controller, the controller's system looks for an existing "config.ini" file that contains an "autoload" tag equal to 1 (yes). If the tag is found, the system loads the contents of the file and re-sets "autoload" to 0 (no). This is a useful feature for editing the file on a computer without having any impact on the controller (such as recorded Events).

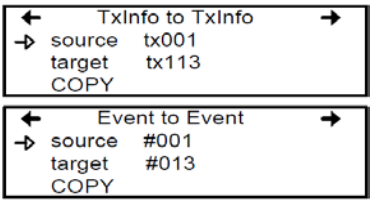


The options within this screen are:

Tx Info to Tx Info copies transmitter parameters from one device to another.

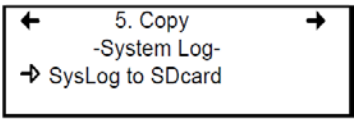
Event to Event copies parameters from Event to Event.
The process is identical for both options:

- Select source, (the data to be copied) using the up/down keypad arrows and press Enter.
- When the transmitter address is flashing, use the up/down keypad buttons to search for the desired device address.
- Press Enter to select the new address
- Select the target address (where the data is to be copied to) in exactly the same way as source
- Select COPY and press Enter. The parameters have been copied.



System Log Menu

The controller will record log information to its internal memory. If the controller is equipped with an SD card, the system log function allows users to save system log information to the memory card in text format.



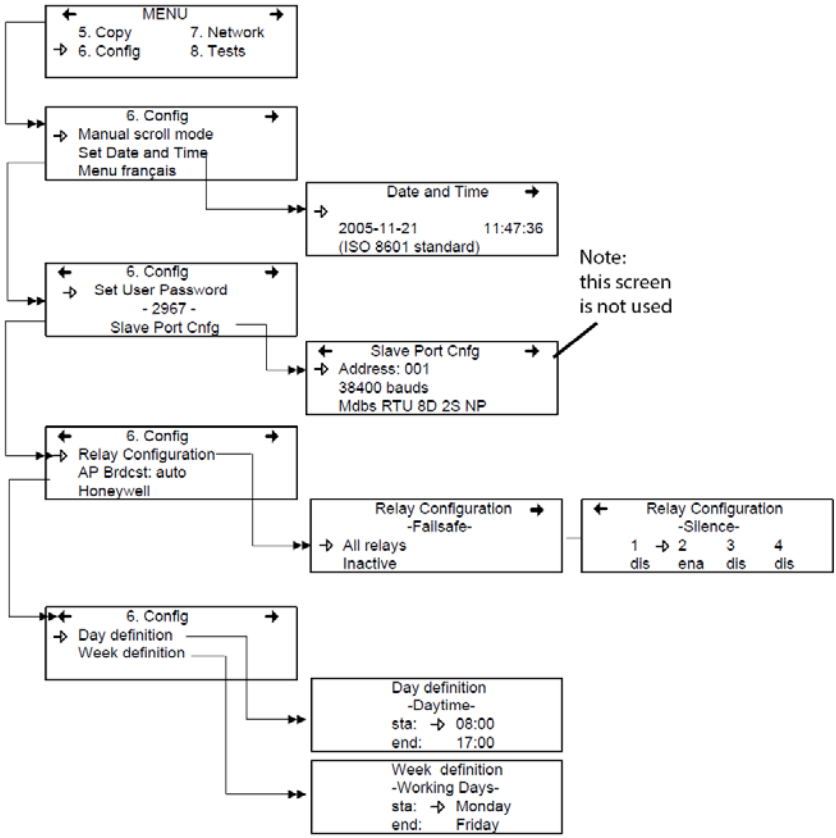
When this option is selected, a log of all the last actions performed on the controller is copied to the SDcard, with the filename **slyymmdd.log**. This file can contain up to a maximum of 64Kb of information in text format. Once the memory card is full, the oldest log entries are erased and replaced by new entries.
Here is an example of a system log:

```
--- START of system log dump : 2007-04-18 13:19:05 ---
2007-04-04 18:42:06;Accessing menu;
2007-04-04 18:43:47;Event 1 definition modified;
2007-04-04 18:48:12;Exiting menu;
2007-04-04 18:54:49;System power-down;
2007-04-04 18:56:40;System power-up;
2007-04-04 19:02:44;Accessing menu;
2007-04-04 19:03:07;Event 6 definition modified;
2007-04-04 19:03:21;Exiting menu;
2007-04-05 10:51:28;Accessing menu;
2007-04-05 10:54:59;Database reset;
2007-04-05 10:55:18;Tx 25 parameters modified;
2007-04-05 10:55:29;Group 0 definition modified;
2007-04-05 10:55:36;Group 0 definition modified;
2007-04-05 10:55:46;Group 0 definition modified;
2007-04-05 10:55:55;Group 4 definition modified;
2007-04-05 10:55:57;Exiting menu;
2007-04-05 10:56:02;Accessing menu;
2007-04-05 10:56:19;Tx 24 parameters modified;
```

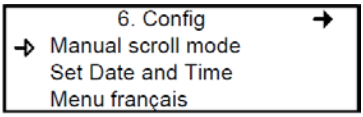
6. Config Menu

The Config menu contains several main configuration screens and is used to program the controller display mode, adjust the date and time, select the display language, change the controller access password, set the Relay Configuration, and select the AP Broadcast mode.

Each main screen offers further programming options, as shown.


MENU
5. Copy
7. Network
6. Config
8. Tests
6. Config
Manual scroll mode
Set Date and Time
Menu français
Date and Time
2005-11-21
11:47:36
(ISO 8601 standard)
6. Config
Set User Password
- 2967 -
Slave Port Cnfg
Note:
this screen
is not used
Slave Port Cnfg
Address: 001
38400 bauds
Mdbs RTU 8D 2S NP
6. Config
Relay Configuration
AP Brdcst: auto
Honeywell
Relay Configuration
-Failsafe-
All relays
Inactive
Relay Configuration
-Silence-
1
2
3
4
dis
ena
dis
dis
6. Config
Day definition
Week definition
Day definition
-Daytime-
sta: 08:00
end: 17:00
Week definition
-Working Days-
sta: Monday
end: Friday

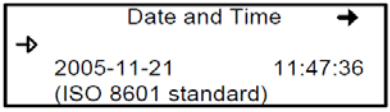
Selecting the first line of the first screen allows selection from three display modes: Manual scroll, 3-second scroll, 5-second scroll. If Manual scroll mode is chosen, the screen will only advance if you press on the arrow keypad buttons. If either 3 or 5 second scroll mode is chosen, the screens will automatically scroll display readings for all devices connected to the controller after 3 or 5 seconds.



3 or 5 second scroll modes do not prevent the keypad arrows to be used to return to a previous screen or move ahead through the screens manually.

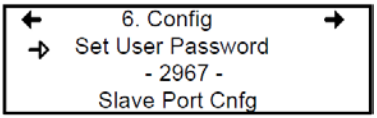
Selecting the second line allows the date and time in a new screen to be adjusted; Date and Time. When a number is flashing, the value can be changed using the up/down keypad arrows. The year, month, day and the hour, minute and second values can be changed.

The controller does not manage Daylight Savings Time, therefore, users must manually adjust any time changes.



Selecting the third line allows the display language to be changed. If the display is already in English, it will then display the Menu français option (and vice-versa). Simply scroll to the line and press Enter to change the language.

The second main screen in the Config menu allows a new user password to be set.

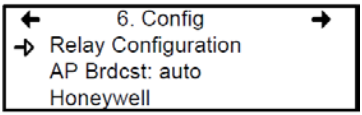


The default password is 2967. Select Set User Password to change the password:

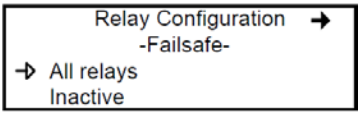
- When the first digit blinks, change the value by using the up/down keypad arrows to increase or decrease the number
- Use the left/right keypad arrows to move from one digit to the next.
- When the desired password has been set, press Enter to validate it and exit the editing mode.

Note: *Contact Honeywell technical support for help with lost passwords at 1-800-563-2967.*

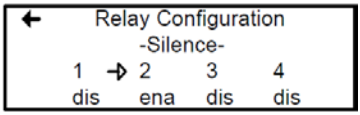
Scroll through the main Config menu screens using the left (previous) or right (next) keypad arrows.
The third main screen in the Config menu allows the relay configuration to be set, the AP broadcast mode and to select from four separate manufacturers for the given controller.



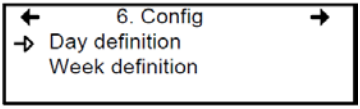
When *Relay Configuration* is selected, two further options to configure the relays are available: The first screen, Failsafe, appears allowing the failsafe to be activated for all relays using the Enter keypad button. This function inverts relay operation to be normally energized. If power is cut, the relay will activate the connected device. (ex. a light.)



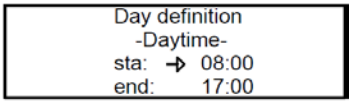
Scrolling to the right displays the “Silence” screen that enables or disables the silence option for each relay, using the Enter keypad button.

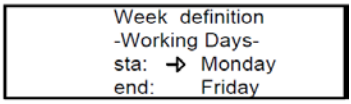


The fourth screen in the Config menu allows a definition of a day and a week to be programmed.



Day and Week definition allows hours (time frames) to be defined for either Daytime and Working Days respectively.





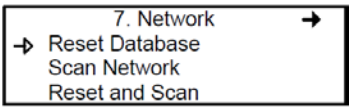
Note: *Remember, the controller uses a 24 hour clock (0:00 to 23:59). Any time changes (e.g., for Daylight Savings Time) must be made manually or through BACNet time synchronization (BACNet module required).*

7. Network Menu

The Modbus network menu allows network device information to be either scanned or reset.

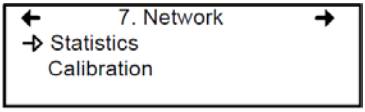
This menu offers four options, divided into two screens; the first screen contains three options:

Reset Database:	Resets all network device Tx information in the database. This only resets the Tx infomation for the network device. It does not affect programmed Groups or Events.
Network Scan:	Begins an auto-detect of all network devices that allows the system to configure the Tx database for network devices (i.e. it will scan and add new devices but will not overwrite or erase the old database). This process takes approximately one minute.
Reset and Scan:	Performs both previous functions simultaneously.

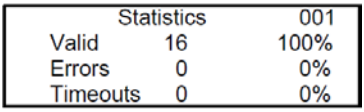


Note: *Once one of these options has been set, wait until the controller completes the process. Do not interrupt or stop the process once it has begun.*

The second Network screen offers the Statistics and Calibration options.



Selecting Statistics from the Network menu displays a screen containing the statistics for the selected device address.



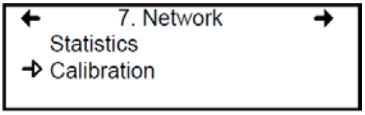
Valid: Indicates the number of valid responses for the last 16 requests

Errors: Indicates the number of errors in the response for the last 16 requests

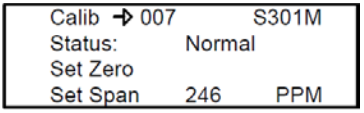
Timeouts: Indicates the number of timeouts (no response) for the last 16 requests

Remote Calibration

The network menu also offers a Calibration option for use with devices that support network calibration.

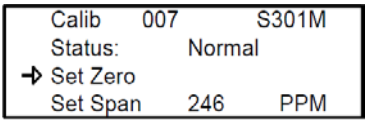


The Calibration screen contains four lines of information:



Line 1: Indicates the mode (Calib, meaning calibration), the (Modbus) address of the device to calibrate (001) and the type of device to calibrate (301D2)
Line 2: Indicates the status (Normal or In calib…) of the specified device
Line 3: Displays the function to perform (Set Zero)
Line 4: Displays the function to perform (Set Span) and the span gas concentration value (246 ppm)

1. On the first line, scroll to the device address and press Enter
2. Scroll through the devices to display the desired device* and press Enter to select.
3. The second line displays the device's status
4. Scroll to select the desired function, Set Zero to set the device's zero, and press Enter to select.
5. Upon pressing Set Zero, the controller requests confirmation.

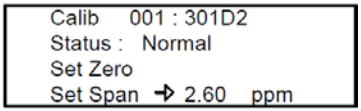


**The device must be configured in the 301C's database in order to be included in the device addresses displayed on screen.*

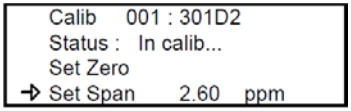
6. Press Enter to confirm or Esc to cancel. If confirmed, the controller calibrates the sensor's Zero. This takes only a few moments and the display returns to the default calibration screen.

Note: *Never calibrate any unit's Zero with ambient air. Always use Nitrogen (N_2) at the calibration port to calibrate the Zero.*

7. To calibrate the device, scroll to Set Span** and change the span gas calibration value using this procedure;



a. Using the right arrow, move the cursor to xxx PPM (span value field). Press Enter to select the field (it is editable when flashing).
b. Use the up or down arrows to increase or decrease the value, press Enter to validate the new value.
c. Move the cursor back to Set Span and press Enter to start the calibration.

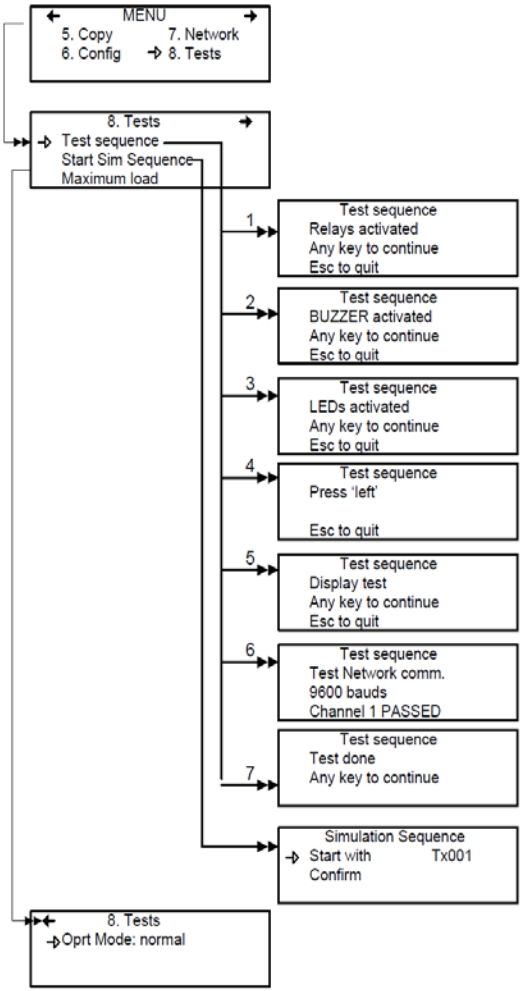


The device Span is being calibrated. The screen will display the device's status as "In calib..." until the calibration is complete.

***When selecting Set Span, make sure that the device has been supplied with the appropriate calibration gas before and during the calibration process.*

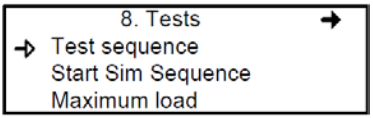
8. Tests Menu

The Tests menu allows a variety of tests to be performed on components and on the network communications. It also allows the system to be operated in four different modes which, in turn, provide different functionalities.



The Tests menu provides four main options, divided between two screens. Each of these options offers different capabilities.

The first screen presents three options:

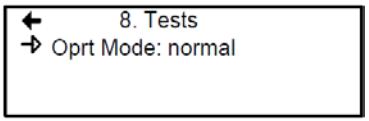


Test sequence: Enables each output to be activated and validates operation of each controller keypad buttons, display pixels, and various communication protocols.

Start Sim Sequence: This options starts or stops the Simulation mode, which allows a simulation of a gas concentration over an associated scale range on all transmitters. The simulated gas concentration values are local (on the controller) and do not affect logging functions. (Events will be activated for the simulation but detection devices are not affected.)

Maximum load: Activates all controller components

The second screen option is “Oprt Mode”, which offers three separate operation settings: Normal, Single Tx or Debug.



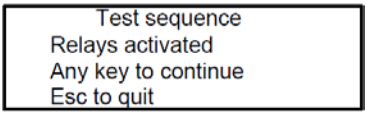
Normal: Normal controller operation mode

Single Tx: Activates the polling mode on a single transmitter.

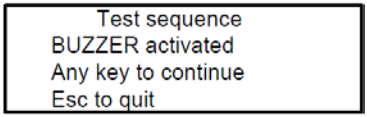
Debug: Activates the service mode to perform a calibration and to test Events without triggering actions.

Test Sequence

When test sequence is selected from the main Tests menu, the controller will display the Test sequence screen.

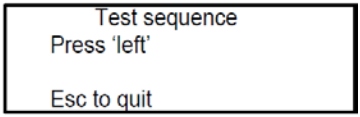


If Esc is pressed on the keypad, the main Tests menu screen will be displayed. However, to perform system tests, press any key to proceed to the first test screen.

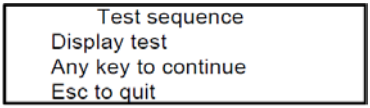


- This screen tests each component individually and will advance only to the next component when a key is pressed. This option will display 13 screens. Screens 1, 2, and 3 test Relays, BUZZER and LEDs.

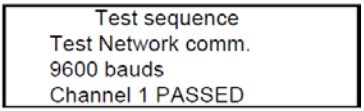
The following six screens prompt the user to press the keypad buttons, in turn: left, right, up, down, Silence, Enter and Esc. The system will not advance until a key is pressed.



The system then moves to the Display test. When the blank screen is displayed, it is testing for display pixels. Press any key to proceed to the next step.

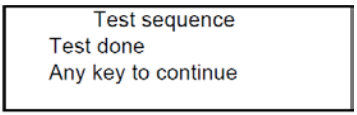


The final test that the system performs is a network communication test:



Once these tests have begun, do not interrupt or stop them.

When the system has completed the test, it displays the final Tests screen. Press any key to return to the main Tests menu.



Normal Mode

This is the system's normal (default) operation mode. When the system is in normal mode, some values can be changed without interrupting services. When a value has been changed in any of the menu fields, the change will take effect upon returning to the main menu screen.

Single Tx Mode

This mode allows transmitters to be analyzed one at a time. The controller polls only the selected device, which subsequently has its information updated. This mode does not interfere with Event Evaluation functions.

Debug Mode

This mode allows complete system operation to be evaluated and tested without affecting operations (outside of debug mode). **Events are evaluated and displayed as necessary but no action is triggered**.

Simulation Mode

This mode deactivates network communication Information Updates. It can be combined with any of the three previous modes (example: using the Simulation mode when in Debug mode allows the user to test the entire system [groups, events, etc] without triggering any actions or using any additional material such as gases). It allows gas concentrations to be simulated over an associated scale for each transmitter, sequentially:

Alarm levels A, B and C are evaluated according to the simulated gas concentration and events are evaluated and actions are taken.

This type of alarm simulation at the controller does not work with certain transmitters with falling alarms. In these cases, an alarm can be simulated at the transmitter.

While in simulation mode, the controller is unaware of the device's actual network status. This mode can be stopped at any time in the Test menu (see Normal System Operation).

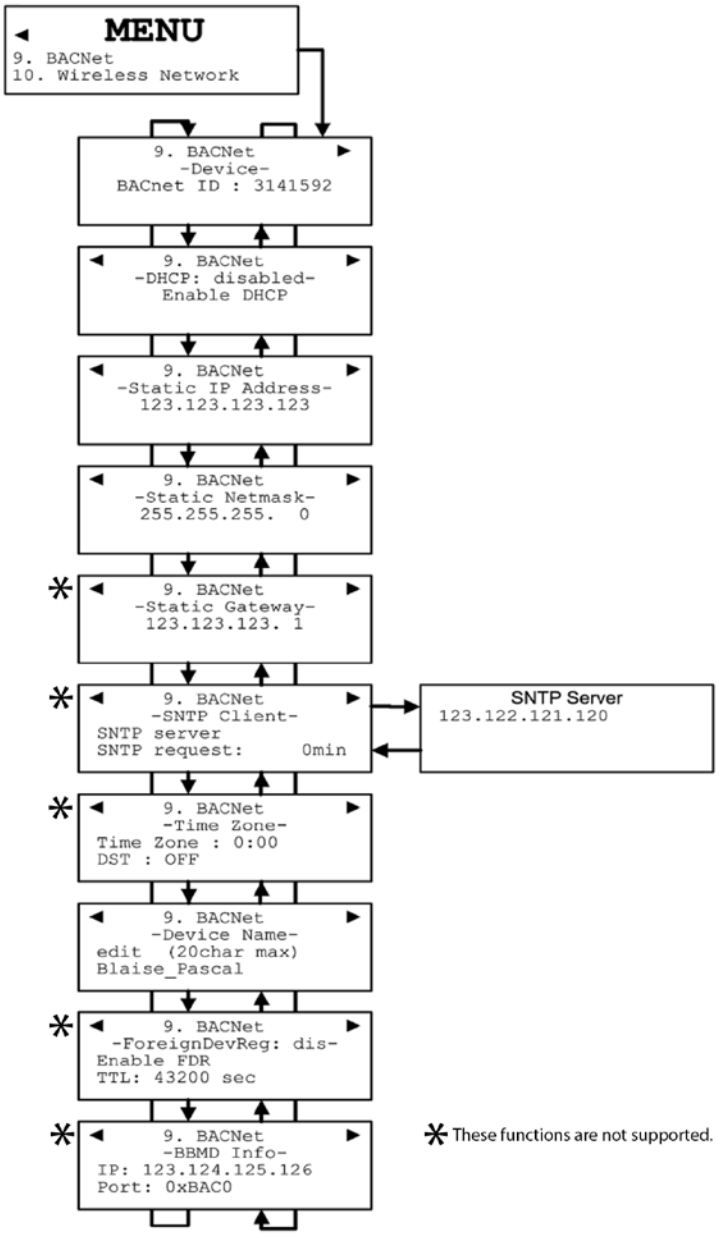
If one of these modes has been activated, the system will automatically return to Normal Mode after 12 hours of inactivity. (No changes will be lost.)

9. BACnet Menu

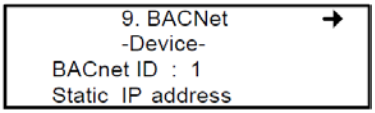
The BACNet menu on the following page offers several main menu screens to configure the BACNET IP connection, DHCP, server, time zone information and more. Communications parameter changes to the BACnet interface may not be implemented for up to 30 seconds after modification. These parameters include the device ID, the IP address, and the subnet mask.

The 301C controller does not function as a BACnet broadcast management device. If a BBMD is needed, for example when BACnet communications must go through a router, an external BBMD is required.

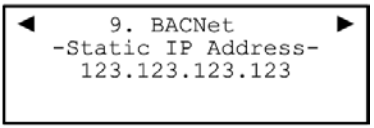
The 301C foreign device registration feature is not functional.


MENU
9. BACNet
10. Wireless Network
9. BACNet
-Device-
BACnet ID : 3141592
9. BACNet
-DHCP: disabled-
Enable DHCP
9. BACNet
-Static IP Address-
123.123.123.123
9. BACNet
-Static Netmask-
255.255.255. 0
9. BACNet
-Static Gateway-
123.123.123. 1
9. BACNet
-SNTP Client-
SNTP server
SNTP request: 0min
SNTP Server
123.122.121.120
9. BACNet
-Time Zone-
Time Zone : 0:00
DST : OFF
9. BACNet
-Device Name-
edit (20char max)
Blaise_Pascal
9. BACNet
-ForeignDevReg: dis-
Enable FDR
TTL: 43200 sec
9. BACNet
-BBMD Info-
IP: 123.124.125.126
Port: 0xBAC0
* These functions are not supported.

The first of these screens allows the identification and address to be configured:



BACnet ID: (Building Automation and Control Networks) is the device ID number assigned to this particular controller on a network.

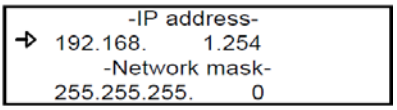


Static IP address: This is an address that is used when DHCP is disabled.

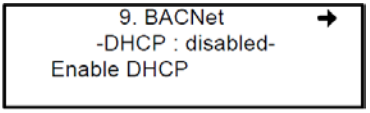
Changing BACNet values

- Use the keypad arrows to scroll down to select the desired line and press Enter to select it.
- Selecting BACnet ID activates the field. The ID value (0-4194303) can be increased or decreased using the up or down keypad arrows

If the Static IP address option is selected, the following screen appears. All controllers are shipped with a preset IP address as shown in the example below.

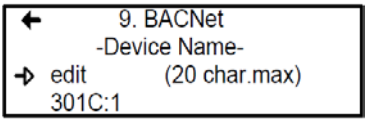


The next screen allows the device DHCP (Dynamic Host Configuration Protocol) to be enabled or disabled.



- Press Enter to change the field value.

The Device Name screen allows a specific name to be assigned to the BACNet device.



For more information on this subject, please consult the ASHRAE standard number 135-2001, Annex J, section J5.

The BACnet port number is fixed at hexidecimal 0xBAC0 or decimal 47808. It will not function with other port numbers.

Relay Priority

When computing the status of binary outputs such as relays, the 301C prioritizes BACnet commands higher than internal gas events. This is shown graphically below.

BACnet write priority 1 - Manual-Life Safety
BACnet write priority 2 - Automatic-Life Safety
BACnet write priority 3 -
BACnet write priority 4 -
BACnet write priority 5 - Critical Equipment Control
BACnet write priority 6 - Minimum On/Off
BACnet write priority 7 -
BACnet write priority 8 - Manual Operator
BACnet write priority 9 -
BACnet write priority 10 -
BACnet write priority 11 -
BACnet write priority 12 -
BACnet write priority 13 -
BACnet write priority 14 -
BACnet write priority 15 -
BACnet write priority 16 -
Internal 301C events

This can compromise the integrity of the gas detection system in cases where erroneous or malicious BACnet traffic is present. In order to mitigate this risk, version 19 and later BACnet software make some of the relays immune to BACnet commands. This affects 301C relays 3 and 4 and 301R relays 5 to 8 on all 301R modules. Other relays and all buzzers remain BACnet commandable. The E³Point relay remains BACnet commandable.

Network designers are advised to use these BACnet-immune relays for critical safety functions when malicious BACnet traffic is present. In cases where an output must activate in response to both gas events or a BACnet command, Honeywell recommends wiring the contacts of two relays in parallel for a hardwired OR gate.

APDU_segment_timeout

The 301C dynamically instantiates BACnet objects whenever the "Reset and Scan" operation is performed. Several objects are created for each transmitter. The number depends on the type of transmitter. For example each E^{3}Point causes the 301C to create nine objects. Thus the number of BACnet objects can be large – up to 869 in the worst case of 96 E^{3}Points.

One of the results of this is that the controller can be somewhat slow to respond to external BACnet clients. Unfortunately, some BACnet clients have a value of APDU_segment_timeout set too small for use with the 301C controller. This is sometimes manifested as the controller appearing to not respond to discovery requests. Therefore, Honeywell recommends that all BACnet clients which communicate with the 301C controller have timeouts set as listed in the table below:

Number of Transmitters Connected to the 301C Controller	APDU_segment_timeout value (in milliseconds) for BACnet clients which must discover the 301C objects
0 to 10	5000
11 to 34	10,000
35 to 96	20,000

BACnet/IP Module

(BIP option)

Specifications

Ethernet Port : 10 Base-T, RJ-45

Visual Indicators : Green LED LINK
Yellow LED ACT

Network Configuration: See 301C BACnet menu section.

BACnet/IP protocol

UDP Port: 47808. This value is not modifiable using the 301C.

The module has been developed as per ANSI/ASHRAE Standard 135-2001 : BACnet®— A Data Communication Protocol for Building Automation and Control Networks. The Data Link Layer option is per BACnet/IP (Annex J).

http://www.ashrae.org/

The tables on pages 74-96 are also available on the Honeywell Analytics' Commercial Products CD that accompanied the 301C Controller and from the Honeywell Analytics technical library (*www.honeywellanalytics.com > Products > Commercial Solutions > 301C > Technical Library*).

Device Objects

Group	Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Device	object_identifier	unsigned	R	N	N	Set from LUI
	object_type	enumerated	R	C	N	device (8)
	vendor_identifier	enumerated	R	C	N	Honeywell Inc. (17)
	apdu_timeout	unsigned	R	C	N	0
	application_software_version	character string	R	C	N	"1.1"
	firmware_revision	character string	R	C	N	"1.3.18"
	max_apdu_length_accepted	unsigned	R	C	N	1476
	model_name	character string	R	C	N	"301C-BIP"
	number_of_apdu_retries	unsigned	R	C	N	0
	object_name	character string	R	N	N	default "VA301C:1", settable from LUI.
	protocol_object_types_supported	bit string	R	C	N	analog_input, analog_output, analog_value, binary_input, binary_value, device
	protocol_services_supported	bit string	R	C	N	readProperty, readPropertyMultiple, writeProperty, deviceCommunicationControl, reinitializeDevice, i_Am, i_Have, timeSynchronization, who_Has, who_Is,
	protocol_version	unsigned	R	C	N	1
	segmentation_supported	enumerated	R	C	N	no_segmentation (3)
	system_status	enumerated	R	C	N	operational (0)
	vendor_name	character string	R	C	N	Honeywell
	protocol_revision	unsigned	R	C	N	2
	database_revision	unsigned	R	C	N	not meaningful

Notes

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Base Objects

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Binary Outputs	rel1 to rel4	object_identifier		R	C	N	46344 (or 0xB508) for Relay #1 up to 46347 (or 0xB50B) for Relay #4
		object_type	enumerated	R	C	N	binary_output (4)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	*"device_object_name*.rel*X", where device_object_name* is programmed on the LUI and defaults to "VA301C:1" and *X* is relay number (1 to 4). Thus the default object_name for Relay #4 will be "VA301C:1.rel4"
		out_of_service	boolean	R	C	N	FALSE
		polarity	enumerated	R	C	N	always Normal (0)
		present_value	enumerated	R	R	Only Rly1&2. Not Rly 3or4.	True state of the relays. These take the value of the highest-priority BACnet command. If no BACnet command, this takes the value of the associated event.
		priority_array		R	R	N	last value written
		reliability	enumerated	0	C	N	no_fault_detected (0)
		relinquish_default		R	C	N	not meaningful
		active_text	character string	O	C	N	"ON"
		inactive_text	character string	O	C	N	"OFF"
		status_flags					
		in_alarm	boolean	R	C	N	always "false" (0)
		fault	boolean	R	C	N	always "false" (0)
		overridden	boolean	R	R	N	always "false" (0)
		out_of_service	boolean	R	R	N	always "false" (0)
	buzz	object_identifier		R	C	N	46360 (or 0xB518)
		object_type	enumerated	R	C	N	binary_output (4)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	*"device_object_name*.buzz*", where device_object_name* is programmed on the LUI and defaults to "VA301C:1" . Thus the default object_name will be "VA301C:1.buzz"
		out_of_service	boolean	R	C	N	FALSE
		polarity	enumerated	R	C	N	always Normal (0)
		present_value	enumerated	R	R	Y	True state of the buzzer. This takes the value of the highest-priority BACnet command. If no BACnet command, this takes the value of the associated event.
		priority_array		R	R	N	last value written
		reliability	enumerated	0	C	N	no_fault_detected (0)
		relinquish_default		R	C	N	not meaningful
		status_flags					
		in_alarm	boolean	R	C	N	always "false" (0)
		fault	boolean	R	C	N	always "false" (0)
		overridden	boolean	R	C	N	always "false" (0)
		out_of_service	boolean	R	C	N	always "false" (0)

Notes

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IAQPoint2

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Inputs	IAQPoint CO2	object_identifier		R	C	N	Modbus address * 256 + 1. For example an IAQPoint2 at Modbus address 005 will appear as 1281 or 0x0501.
		object_type	enumerated	R	C	N	analog_input (0)
		event_state	enumerated	R	R	N	if gas sensor fault Fault (1), else normal (0)
		object_name	character string	R	N	N	"IAQPoint CO2 Ad*XXX*.CO2" where *XXX* is the Modbus address.
		out_of_service	boolean	R	R	N	FALSE
		present_value	real	R	R	N	Gas reading if CO2 fitted, 0 to 5000 if VOC fitted, 0 to 100
		reliability	enumerated	O	R	N	As appropriate reports no_fault_detected (0) or no_sensor (1) or unreliable other (7) Fault is detected within 60 seconds
		status_flags					
		in_alarm	boolean	R	R	N	if faulty "true" (1) else "false" (0)
		fault	boolean	R	R	N	if faulty "true" (1) else "false" (0)
		overridden	boolean	R	R	N	"false" (0)
		out_of_service	boolean	R	R	N	"false" (0)
		units	enumerated	R	N	N	if CO2 fitted, ppm (96) if VOC fitted, % (98)
	IAQPoint ToC	object_identifier		R	C	N	Sensor number * 256 + 1. Sensor number for temperature is Modbus address + 1. For example an IAQPoint2 at Modbus address 005 will appear as 1537 or 0x0601.
		object_type	enumerated	R	C	N	analog_input (0)
		event_state	enumerated	R	R	N	if temp sensor fault, fault (1), else normal (0)
		object_name	character string	R	N	N	"IAQPoint ToC Ad*XXX*.ToC" where *XXX* is the Modbus address plus one.
		out_of_service	boolean	R	R	N	FALSE
		present_value	real	R	R	N	Temperature reading in Celcius, regardless of IAQPoint2 configuration.
		reliability	enumerated	O	R	N	As appropriate reports no_fault_detected (0) or no_sensor (1) or unreliable other (7) Fault is detected within 60 seconds
		status_flags					
		in_alarm	boolean	R	R	N	if not purchased or faulty "true" (1) else "false" (0)
		fault	boolean	R	R	N	if not purchased or faulty "true" (1) else "false" (0)
		overridden	boolean	R	C	N	False (0)
		out_of_service	boolean	R	R	N	"false" (0)
		units	enumerated	R	N	N	Celcisus (62)

Notes

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IAQPoint2 continued

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Inputs	IAQPoint RH	object_identifier		R	C	N	Sensor number * 256 + 1. Sensor number for RH is Modbus address + 2. For example an IAQPoint2 at Modbus address 005 will appear as 1793 or 0x0701.
		object_type	enumerated	R	C	N	analog_input (0)
		event_state	enumerated	R	R	N	if temp sensor fault, fault (1), else normal (0)
		object_name	character string	R	N	N	"IAQPoint RH Ad*XXX*.RH" where *XXX* is the Modbus address plus two.
		out_of_service	boolean	R	R	N	FALSE
		present_value	real	R	R	N	Relative Humidity in percent
		reliability	enumerated	O	R	N	As appropriate reports no_fault_detected (0) or no_sensor (1) or unreliable other (7) Fault is detected within 60 seconds
		status_flags					
		in_alarm	boolean	R	R	N	if not purchased or faulty "true" (1) else "false" (0)
		fault	boolean	R	R	N	if not purchased or faulty "true" (1) else "false" (0)
		overridden	boolean	R	C	N	False (0)
		out_of_service	boolean	R	R	N	False (0)
		units	enumerated	R	N	N	percent_relative_humidity (29)

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continued...

IAQPoint2 continued

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Amin	object_identifier		R	N	N	Modbus address * 256 + 2. For example an IAQPoint2 at Modbus address 005 will appear as 1282 or 0x0502.
		object_type	enumerated	R	C	N	analog_value (2)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	IAQPoint CO2 Ad*XXX*.Amin" where *XXX* is the Modbus address.
		out_of_service	boolean	R	C	N	FALSE
		present_value	real	R	N	Y	Gas threshold less hysterisis. This is copied from the sensor via the 301C. BACnet permits writing. But this has no effect and the value reverts in a few seconds.
		reliability	enumerated	O	C	N	no_fault_detected (0)
		status_flags					
		in_alarm	boolean	R	C	N	always false (0)
		fault	boolean	R	C	N	always false (0)
		overridden	boolean	R	C	N	always false (0)
		out_of_service	boolean	R	C	N	always false (0)
		units	enumerated	R	C	N	if CO2 fitted, ppm (96) if VOC fitted, % (98)
	Amax	object_identifier		R	N	N	Modbus address * 256 + 3. For example an IAQPoint2 at Modbus address 005 will appear as 1283 or 0x0503.
		object_type	enumerated	R	C	N	analog_value (2)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	IAQPoint CO2 Ad*XXX*.Amax" where *XXX* is the Modbus address.
		out_of_service	boolean	R	C	N	FALSE
		present_value	real	R	N	Y	Gas threshold. This is copied from the sensor via the 301C. BACnet permits writing. But this has no effect and the value reverts in a few seconds.
		reliability	enumerated	O	C	N	no_fault_detected (0)
		status_flags					
		in_alarm	boolean	R	C	N	always false (0)
		fault	boolean	R	C	N	always false (0)
		overridden	boolean	R	C	N	always false (0)
		out_of_service	boolean	R	C	N	always false (0)
		units	enumerated	R	C	N	if CO2 fitted, ppm (96) if VOC fitted, % (98)

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continued...

IAQPoint2 continued

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Bmin	object_identifier			R	N	N	Modbus address * 256 + 4. For example an IAQPoint2 at Modbus address 005 will appear as 1284 or 0x0504.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	IAQPoint CO2 Ad*XXX*.Bmin" where *XXX* is the Modbus address.
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. This is copied from the sensor via the 301C. BACnet permits writing. But this has no effect and the value reverts in a few seconds.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	if CO2 fitted, ppm (96) if VOC fitted, % (98)
	Bmax	object_identifier			R	N	N	Modbus address * 256 + 5. For example an IAQPoint2 at Modbus address 005 will appear as 1285 or 0x0505.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	IAQPoint CO2 Ad*XXX*.Bmax" where *XXX* is the Modbus address.
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. This is copied from the sensor via the 301C. BACnet permits writing. But this has no effect and the value reverts in a few seconds.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	if CO2 fitted, ppm (96) if VOC fitted, % (98)

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E³Point

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
analog_input	gas	object_identifier			R	C	N	Modbus address * 256 + 1. For example an E3Point at Modbus address 009 will appear as 2305 or 0x0901.
		object_type		enumerated	R	C	N	analog_input (0)
		event_state		enumerated	R	R	N	if gas sensor fault Fault (1), else normal (0)
		object_name		character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.*GGGG*" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service		boolean	R	R	N	FALSE
		present_value		real	R	R	N	Gas reading
		reliability		enumerated	O	R	N	As appropriate reports no_fault_detected (0) or unreliable other (7) Fault is detected within 60 seconds
		status_flags						
			in_alarm	boolean	R	R	N	if alarm or fault "true" (1) else "false" (0)
			fault	boolean	R	R	N	if faulty "true" (1) else "false" (0)
			overridden	boolean	R	R	N	"false" (0)
			out_of_service	boolean	R	R	N	"false" (0)
		units		enumerated	R	N	N	ppm (96) or % (98)

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continued...

E³Point continued

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Amin	object_identifier			R	N	N	Modbus address * 256 + 2. For example an E3Point at Modbus address 000 will appear as 2306 or 0x0902.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.Amin" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold less hysterisis. Synchronization is maintained with the 301C and the E3Point. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	ppm (96) or % (98)
	Amax	object_identifier			R	N	N	Modbus address * 256 + 3. For example an E3Point at Modbus address 009 will appear as 2307 or 0x0903.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.Amax" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the E3Point. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	ppm (96) or % (98)

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continued...

E³Point continued

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Bmin	object_identifier		R	N	N	Modbus address * 256 + 4. For example an E3Point at Modbus address 009 will appear as 2308 or 0x0904.
		object_type	enumerated	R	C	N	analog_value (2)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.Bmin" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service	boolean	R	C	N	FALSE
		present_value	real	R	N	Y	Gas threshold less hysterisis. Synchronization is maintained with the 301C and the E3Point. Whichever value is written last is distributed to the other two locations.
		reliability	enumerated	O	C	N	no_fault_detected (0)
		status_flags					
		in_alarm	boolean	R	C	N	always false (0)
		fault	boolean	R	C	N	always false (0)
		overridden	boolean	R	C	N	always false (0)
		out_of_service	boolean	R	C	N	always false (0)
		units	enumerated	R	C	N	ppm (96) or % (98)
	Bmax	object_identifier		R	N	N	Modbus address * 256 + 5. For example an E3Point at Modbus address 009 will appear as 2309 or 0x0905.
		object_type	enumerated	R	C	N	analog_value (2)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.Bmax" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service	boolean	R	C	N	FALSE
		present_value	real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the E3Point. Whichever value is written last is distributed to the other two locations.
		reliability	enumerated	O	C	N	no_fault_detected (0)
		status_flags					
		in_alarm	boolean	R	C	N	always false (0)
		fault	boolean	R	C	N	always false (0)
		overridden	boolean	R	C	N	always false (0)
		out_of_service	boolean	R	C	N	always false (0)
		units	enumerated	R	C	N	ppm (96) or % (98)

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continued...

E³Point continued

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Cmin	object_identifier			R	N	N	Modbus address * 256 + 6. For example an E3Point at Modbus address 009 will appear as 2310 or 0x0906.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.Cmin" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold less hysterisis. Synchronization is maintained with the 301C and the E3Point. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	ppm (96) or % (98)
	Cmax	object_identifier			R	N	N	Modbus address * 256 + 7. For example an E3Point at Modbus address 009 will appear as 2311 or 0x0907.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.Cmax" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the E3Point. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	ppm (96) or % (98)

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continued...

E³Point continued

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Binary Outputs	rel1 (really buzzer)	object_identifier		R	C	N	Modbus address * 256 + 8. For example an E3Point at Modbus address 009 will appear as 2312 or 0x0908.
		object_type	enumerated	R	C	N	binary_output (4)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.rel1" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service	boolean	R	C	N	FALSE
		polarity	enumerated	R	C	N	always Normal (0)
		present_value	enumerated	R	R	Y	Reading this reports the true state of the buzzer. Mixing BACnet and event control of this output is not supported.
		priority_array		R	R	N	last value written
		reliability	enumerated	O	C	N	no_fault_detected (0)
		relinquish_default		R	C	N	not meaningful.
		active_text	character string	O	C	N	"ON"
		inactive_text	character string	O	C	N	"OFF"
		status_flags					
		in_alarm	boolean	R	C	N	always "false" (0)
		fault	boolean	R	C	N	always "false" (0)
		overridden	boolean	R	R	N	always "false" (0)
		out_of_service	boolean	R	R	N	always "false" (0)
	rel2 (physical relay)	object_identifier		R	C	N	Modbus address * 256 + 9. For example an E3Point at Modbus address 009 will appear as 2313 or 0x0909.
		object_type	enumerated	R	C	N	binary_output (4)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"E3POINT *GGGG* Ad*XXX*.rel2" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "CO" and "COMB".
		out_of_service	boolean	R	C	N	FALSE
		polarity	enumerated	R	C	N	always Normal (0)
		present_value	enumerated	R	R	Y	Reading this reports the true state of the relay. Mixing BACnet and event control of this output is not supported.
		priority_array		R	R	N	last value written
		reliability	enumerated	O	C	N	no_fault_detected (0)
		relinquish_default		R	C	N	not meaningful.
		status_flags					
		in_alarm	boolean	R	C	N	always "false" (0)
		fault	boolean	R	C	N	always "false" (0)
		overridden	boolean	R	C	N	always "false" (0)
		out_of_service	boolean	R	C	N	always "false" (0)

Notes

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XNX and XCD

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
analog_input	gas	object_identifier			R	C	N	Modbus address * 256 + 1. For example an XNX at Modbus address 010 will appear as 2561 or 0x0A01.
		object_type		enumerated	R	C	N	analog_input (0)
		event_state		enumerated	R	R	N	if gas sensor fault Fault (1), else normal (0)
		object_name		character string	R	N	N	"SSS GGGG AdAAA.GGGGG" where SSS is the sensor type, GGGG is the gas name and AAA is the Modbus address. Gas names are truncated to 4 and 5 characters. Values for sensor type are "XNX" or "XCD" For example, an XNX at address 10 with a Methane sensor will populate this object name with "XNX Meth Ad010.Metha"
		out_of_service		boolean	R	R	N	FALSE
		present_value		real	R	R	N	Gas reading
		reliability		enumerated	O	R	N	As appropriate reports no_fault_detected (0) or unreliable other (7) Fault is detected within 60 seconds
		status_flags						
			in_alarm	boolean	R	R	N	if faulty "true" (1) else "false" (0)
			fault	boolean	R	R	N	if faulty "true" (1) else "false" (0)
			overridden	boolean	R	R	N	"false" (0)
			out_of_service	boolean	R	R	N	"false" (0)
		units		enumerated	R	N	N	96 (ppm) or 98 (percent) or 95 (no_units)

Notes

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continued...

XNX and XCD continued

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	AlarmA	object_identifier			R	N	N	Modbus address * 256 + 2. For example an XNX at Modbus address 010 will appear as 2562 or 0x0A02.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"SSS GGGG AdAAA.AlarmA" where SSS is the sensor type, GGGG is the gas name and AAA is the Modbus address. Values for gas name include "CO" and "COMB". Gas names are truncated to 4 characters. Values for sensor type are "XNX" or "XCD" For example, an XNX at address 10 with a Methane sensor will populate this object name with "XNX Meth Ad010.AlarmA"
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	N	Alarm1 threshold copied from sensor through the 301C. This may only be modified on the sensor.
		reliability		enumerated	O	C	N	always false (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	96 (ppm) or 98 (percent) or 95 (no_units)
	AlarmB	object_identifier			R	N	N	Modbus address * 256 + 4. For example an XCD at Modbus address 011 will appear as 2820 or 0x0B04.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"SSS GGGG AdAAA.AlarmB" where SSS is the sensor type, GGGG is the gas name and AAA is the Modbus address. Gas names are truncated to 4 characters. Values for sensor type are "XNX" or "XCD" For example, an XCD at address 11 with an H2S sensor will populate this object name with "XCD H2S Ad011.AlarmB"
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	N	Alarm2 threshold copied from sensor through the 301C. This may only be modified on the sensor.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	96 (ppm) or 98 (percent) or 95 (no_units)

Notes

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'N' indicates the property is stored in non-volatile memory

Objects for 301EM

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
analog_input	Gas (One instance per sensor on the 301EM.)	object_identifier		R	C	N	TxNumber * 256 + 1. The TxNumber is the Modbus address plus the sensor number in the 301EM. For example, sensor 2 on a 301EM at Modbus address 030 will appear as 7937 or 0x1F01.
		object_type	enumerated	R	C	N	analog_input (0)
		event_state	enumerated	R	R	N	not meaningful
		object_name	character string	R	N	N	"VA301EM *GGGG* Ad*XXX*.*GGGG*" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "R11" and "NH3".
		out_of_service	boolean	R	R	N	FALSE
		present_value	real	R	R	N	Gas reading
		reliability	enumerated	O	R	N	As appropriate reports no_fault_detected (0), no_sensor (1), or unreliable other (7) Fault is detected within 60 seconds
		status_flags					
		in_alarm	boolean	R	R	N	not meaningful
		fault	boolean	R	R	N	if faulty "true" (1) else "false" (0)
		overridden	boolean	R	R	N	"false" (0)
		out_of_service	boolean	R	R	N	"false" (0)
		units	enumerated	R	N	N	From 301EM, usually ppm (96)
Analog Values (six instances for each sensor on the 301EM, up to 120).	Amin, Amax, Bmin, Bmax, Cmin, Cm	object_identifier		R	N	N	For Amin, TxNumber * 256 + 2, For Amax, TxNumber * 256 + 3, For Bmin, TxNumber * 256 + 4, For Bmax, TxNumber * 256 + 5, For Cmin, TxNumber * 256 + 6, For Cmax, TxNumber * 256 + 7 The TxNumber is the Modbus address plus the sensor number in the 301EM.
		object_type	enumerated	R	C	N	analog_value (2)
		event_state	enumerated	R	C	N	not meaningful.
		object_name	character string	R	N	N	"VA301EM GGGG AdXXX.LLLL" where GGGG is the gas name, XXX is the Modbus address plus the sensor number in the 301EM and LLLL is a member of the set {Amin, Amax, Bmin, Bmax, Cmin and Cmax}.
		out_of_service	boolean	R	C	N	FALSE
		present_value	real	R	N	N	Writing alarm thresholds over BACnet not supported.
		reliability	enumerated	O	C	N	not meaningful.
		status_flags					
		in_alarm	boolean	R	C	N	not meaningful.
		fault	boolean	R	C	N	not meaningful.
		overridden	boolean	R	C	N	always false (0)
		out_of_service	boolean	R	C	N	always false (0)
		units	enumerated	R	C	N	ppm (96) or % (98)

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'R' indicate the property is computed constantly and stored in RAM.

Objects for 301EM continued

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Binary Values (Four instances per 301EM, regardless of number of sensors.)	rel1 to rel4	object_identifier		R	C	N	For rel1, Modbus address * 256 + 8, For rel2, Modbus address * 256 + 9, For rel3, Modbus address * 256 + 10, For rel4, Modbus address * 256 + 11
		object_type	enumerated	R	C	N	binary_values (5)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"VA301EM *GGGG* Ad*XXX*.Rel*L*" where *GGGG* is the gas name, *XXX* is the Modbus address and *L* is the relay number.
		out_of_service	boolean	R	C	N	FALSE
		present_value	enumerated	R	R	N	current state of relay
		reliability	enumerated	0	C	N	not meaningful.
		active_text	character string	O	C	N	"ON"
		status_flags					
		in_alarm	boolean	R	C	N	not meaningful.
		fault	boolean	R	C	N	not meaningful.
		overridden	boolean	R	R	N	always "false" (0)
		out_of_service	boolean	R	R	N	always "false" (0)
	buzzer, out1 to out3	object_identifier		R	C	N	For Buzzer, Modbus address * 256 + 24, For Out1, Modbus address * 256 + 25, For Out2, Modbus address * 256 + 26, For Out3, Modbus address * 256 + 27
		object_type	enumerated	R	C	N	binary_value (5)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"VA301EM GGGG AdXXX.buzz" "VA301EM GGGG AdXXX.out1" "VA301EM GGGG AdXXX.out2" "VA301EM GGGG AdXXX.out3" where *GGGG* is the gas name, and *XXX* is the Modbus address.
		out_of_service	boolean	R	C	N	FALSE
		polarity	enumerated	R	C	N	always Normal (0)
		present_value	enumerated	R	R	N	state of buzzer and three 24VDC outputs.
		reliability	enumerated	0	C	N	not meaningful.
		relinquish_default		R	C	N	not meaningful.
		status_flags					
		in_alarm	boolean	R	C	N	not meaningful.
		fault	boolean	R	C	N	not meaningful.
		overridden	boolean	R	C	N	always "false" (0)
		out_of_service	boolean	R	C	N	always "false" (0)

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EC-FX

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
analog_input	gas	object_identifier			R	C	N	Modbus address * 256 + 1. For example an EC-F9 at Modbus address 003 will appear as 769 or 0x0301.
		object_type		enumerated	R	C	N	analog_input (0)
		event_state		enumerated	R	R	N	if gas sensor fault Fault (1), else normal (0)
		object_name		character string	R	N	N	"EC-F9 GGGG AdXXX.GGGG" where GGGG is the gas name and XXX is the Modbus address. The gas name is often "NH3".
		out_of_service		boolean	R	R	N	FALSE
		present_value		real	R	R	N	Gas reading
		reliability		enumerated	O	R	N	As appropriate reports no_fault_detected (0) or unreliable other (7) Fault is detected within 60 seconds
		status_flags						
			in_alarm	boolean	R	R	N	if faulty "true" (1) else "false" (0)
			fault	boolean	R	R	N	if faulty "true" (1) else "false" (0)
			overridden	boolean	R	R	N	"false" (0)
			out_of_service	boolean	R	R	N	"false" (0)
		units		enumerated	R	N	N	Usually ppm (96)
Analog Values	Amin	object_identifier			R	N	N	Modbus address * 256 + 2. For example an EC-F9 at Modbus address 003 will appear as 770 or 0x0302.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"EC-F9 GGGG AdXXX.Amin" where GGGG is the gas name and XXX is the Modbus address. The gas name is often "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the EC-F9. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Usually ppm (96)
	Amax	object_identifier			R	N	N	Modbus address * 256 + 3. For example an EC-F9 at Modbus address 009 will appear as 771 or 0x0303.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"EC-F9 GGGG AdXXX.Amax" where GGGG is the gas name and XXX is the Modbus address. The gas name is often "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the EC-F9. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Usually ppm (96)

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continued...

EC-FX continued

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Bmin	object_identifier		R	N	N	Modbus address * 256 + 4. For example an EC-F9 at Modbus address 003 will appear as 772 or 0x0304.
		object_type	enumerated	R	C	N	analog_value (2)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"EC-F9 GGGG AdXXX.Bmin" where GGGG is the gas name and XXX is the Modbus address. The gas name is often "NH3".
		out_of_service	boolean	R	C	N	FALSE
		present_value	real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the EC-F9. Whichever value is written last is distributed to the other two locations.
		reliability	enumerated	O	C	N	no_fault_detected (0)
		status_flags					
		in_alarm	boolean	R	C	N	always false (0)
		fault	boolean	R	C	N	always false (0)
		overridden	boolean	R	C	N	always false (0)
		out_of_service	boolean	R	C	N	always false (0)
		units	enumerated	R	C	N	Usually ppm (96)
	Bmax	object_identifier		R	N	N	Modbus address * 256 + 5. For example an EC-F9 at Modbus address 003 will appear as 773 or 0x0305.
		object_type	enumerated	R	C	N	analog_value (2)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"EC-F9 GGGG AdXXX.Bmax" where GGGG is the gas name and XXX is the Modbus address. The gas name is often "NH3".
		out_of_service	boolean	R	C	N	FALSE
		present_value	real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the EC-F9. Whichever value is written last is distributed to the other two locations.
		reliability	enumerated	O	C	N	no_fault_detected (0)
		status_flags					
		in_alarm	boolean	R	C	N	always false (0)
		fault	boolean	R	C	N	always false (0)
		overridden	boolean	R	C	N	always false (0)
		out_of_service	boolean	R	C	N	always false (0)
		units	enumerated	R	C	N	Usually ppm (96)

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continued...

EC-FX continued

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Cmin	object_identifier			R	N	N	Modbus address * 256 + 6. For example an EC-F9 at Modbus address 003 will appear as 774 or 0x0306.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"EC-F9 GGGG AdXXX.Cmin" where GGGG is the gas name and XXX is the Modbus address. The gas name is often "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the EC-F9. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Usually ppm (96)
	Cmax	object_identifier			R	N	N	Modbus address * 256 + 7. For example an EC-F9 at Modbus address 003 will appear as 775 or 0x0307.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"EC-F9 GGGG AdXXX.Cmax" where GGGG is the gas name and XXX is the Modbus address. The gas name is often "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold. Synchronization is maintained with the 301C and the EC-F9. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Usually ppm (96)

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420MDBS_IR-F9

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
analog_in	gas	object_identifier			R	C	N	Modbus address * 256 + 1. For example an 420MDBS at Modbus address 002 will appear as 513 or 0x0201.
		object_type		enumerated	R	C	N	analog_input (0)
		event_state		enumerated	R	R	N	if gas sensor fault Fault (1), else normal (0)
		object_name		character string	R	N	N	"420MDBS *GGGG* Ad*XXX*.*GGGG*" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "NH3".
		out_of_service		boolean	R	R	N	FALSE
		present_value		real	R	R	N	Gas reading
		reliability		enumerated	O	R	N	As appropriate reports no_fault_detected (0) or unreliable other (7)
		status_flags						
			in_alarm	boolean	R	R	N	if alarm or fault "true" (1) else "false" (0)
			fault	boolean	R	R	N	if faulty "true" (1) else "false" (0)
			overridden	boolean	R	R	N	"false" (0)
			out_of_service	boolean	R	R	N	"false" (0)
		units		enumerated	R	N	N	Depends on configuration of 420MDBS factory configuration or 301C configuration, usually ppm (96)

Notes

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420MDBS_IR-F9 continued

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Amin	object_identifier			R	N	N	Modbus address * 256 + 2. For example an 420MDBS at Modbus address 002 will appear as 514 or 0x0202.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"420MDBS *GGGG* Ad*XXX*.Amin" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold from 301C. Synchronization is maintained with the 301C and the 420MDBS. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Depends on configuration of 420MDBS factory configuration or 301C configuration, usually ppm (96)
	Amax	object_identifier			R	N	N	Modbus address * 256 + 3. For example an 420MDBS at Modbus address 002 will appear as 515 or 0x0203.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"420MDBS *GGGG* Ad*XXX*.Amin" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold from 301C. Synchronization is maintained with the 301C and the 420MDBS. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Depends on configuration of 420MDBS factory configuration or 301C configuration, usually ppm (96)

Notes

1 -- 'R' indicates that this property is required by ASHRAE Standard 135
'O' indicates that the property is optional in ASHRAE Standard 135

2 -- 'C' indicates the property is hard-coded as a constant
'N' indicates the property is stored in non-volatile memory
'R' indicate the property is computed constantly and stored in RAM.

continued...

420MDBS_IR-F9 continued

Group		Property		Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Analog Values	Bmin	object_identifier			R	N	N	Modbus address * 256 + 4. For example an 420MDBS at Modbus address 002 will appear as 516 or 0x0204.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"420MDBS *GGGG* Ad*XXX* .Amin" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold from 301C. Synchronization is maintained with the 301C and the 420MDBS. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Depends on configuration of 420MDBS factory configuration or 301C configuration, usually ppm (96)
	Bmax	object_identifier			R	N	N	Modbus address * 256 + 5. For example an 420MDBS at Modbus address 002 will appear as 517 or 0x0205.
		object_type		enumerated	R	C	N	analog_value (2)
		event_state		enumerated	R	C	N	normal (0)
		object_name		character string	R	N	N	"420MDBS *GGGG* Ad*XXX* .Amin" where *GGGG* is the gas name and *XXX* is the Modbus address. Values for gas name include "NH3".
		out_of_service		boolean	R	C	N	FALSE
		present_value		real	R	N	Y	Gas threshold from 301C. Synchronization is maintained with the 301C and the 420MDBS. Whichever value is written last is distributed to the other two locations.
		reliability		enumerated	O	C	N	no_fault_detected (0)
		status_flags						
			in_alarm	boolean	R	C	N	always false (0)
			fault	boolean	R	C	N	always false (0)
			overridden	boolean	R	C	N	always false (0)
			out_of_service	boolean	R	C	N	always false (0)
		units		enumerated	R	C	N	Depends on configuration of 420MDBS factory configuration or 301C configuration, usually ppm (96)

Notes

1 -- 'R' indicates that this property is required by ASHRAE Standard 135
'O' indicates that the property is optional in ASHRAE Standard 135

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'N' indicates the property is stored in non-volatile memory
'R' indicate the property is computed constantly and stored in RAM.

301ADI

Group	Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
analog_inputs (Up to 16 if configured enabled on the 301ADI user interface.)	object_identifier		R	C	N	(Modbus address+channel number) * 256 - 255, where channel number is 1 to 16. For example analog input 7 from a 301ADI at address 097 will appear as 26369 or 0x6107.
	object_type	enumerated	R	C	N	analog_input (0)
	event_state	enumerated	R	R	N	not meaningful.
	object_name	character string	R	N	N	"VA301ADI AI.*CC* Ad*XXX*.AI.CC" where *CC* is the channel number from 1 to 16 and *XXX* is the Modbus address.
	out_of_service	boolean	R	R	N	FALSE
	present_value	real	R	R	N	Reading from 301C, mA by default. Scaling in the 301C is supported.
	reliability	enumerated	O	R	N	not meaningful.
	status_flags					
	in_alarm	boolean	R	R	N	not meaningful.
	fault	boolean	R	R	N	"false" (0)
	overridden	boolean	R	R	N	"false" (0)
	out_of_service	boolean	R	R	N	"false" (0)
	units	enumerated	R	N	N	mA (02) by default. Reconfiguration in the 301C is possible. New units may not propagate until a power cycle.
Binary Inputs (up to 8) (Up to 8 if configured enabled on the 301ADI user interface.)	object_identifier		R	N	N	(Modbus address + channel number)*256+ 3865, where channel number is 1 to 8. For example binary input 4 from a 301ADI at address 097 will appear as 29721 or 0x7419.
	object_type	enumerated	R	C	N	binary_input (3)
	event_state	enumerated	R	C	N	normal (0)
	object_name	character string	R	N	N	"VA301ADI BI.*CC* AdXXX.BI.CC" where *CC* is the channel number from 1 to 16 and *XXX* is the Modbus address plus the channel number plus 15.
	out_of_service	boolean	R	C	N	FALSE
	present_value	real	R	N	N	0 if input is an open circuit, 1 if input is shorted to VDC out
	reliability	enumerated	O	C	N	no_fault_detected (0)
	status_flags					
	in_alarm	boolean	R	C	N	always false (0)
	fault	boolean	R	C	N	always false (0)
	overridden	boolean	R	C	N	always false (0)
	out_of_service	boolean	R	C	N	always false (0)
	polarity	boolean	R	C	N	always 0
	active_text	character string	O	C	N	"ON"

Notes

1 -- 'R' indicates that this property is required by ASHRAE Standard 135
'O' indicates that the property is optional in ASHRAE Standard 135

2 -- 'C' indicates the property is hard-coded as a constant
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'R' indicate the property is computed constantly and stored in RAM.

301R

Group		Property	Data Type	Required[1]	Storage Type[2]	BACnet Writeable?	Value
Binary Outputs	rel1 to rel8	object_identifier		R	C	N	RelayNumber + Modbus address * 256 + 7. For example Relay 4 in a 301R at Modbus address 095 will appear as 24331 or 0x5F0B.
		object_type	enumerated	R	C	N	binary_output (4)
		event_state	enumerated	R	C	N	normal (0)
		object_name	character string	R	N	N	"VA301R AdXXX.relR" where XXX is the Modbus address and R is the relay number.
		out_of_service	boolean	R	C	N	FALSE
		polarity	enumerated	R	C	N	always Normal (0)
		present_value	enumerated	R	R	Only Rly 1to4. Not Rly 5to8.	True state of the relays. These take the value of the highest-priority BACnet command. If no BACnet command, this takes the value of the associated event.
		priority_array		R	R	N	last value written
		reliability	enumerated	0	C	N	no_fault_detected (0)
		relinquish_default		R	C	N	not meaningful
		active_text	character string	O	C	N	"ON"
		status_flags					
		in_alarm	boolean	R	C	N	always "false" (0)
		fault	boolean	R	C	N	always "false" (0)
		overridden	boolean	R	R	N	always "false" (0)
		out_of_service	boolean	R	R	N	always "false" (0)

Notes

1 -- 'R' indicates that this property is required by ASHRAE Standard 135
'O' indicates that the property is optional in ASHRAE Standard 135

2 -- 'C' indicates the property is hard-coded as a constant
'N' indicates the property is stored in non-volatile memory
'R' indicate the property is computed constantly and stored in RAM.

Protocol Implementation Conformance Statement

(Normative)

BACnet Protocol Implementation Conformance Statement

Date : August 1, 2005

Vendor Name : Honeywell Analytics
Product Name : 301C -BIP
Product Model Number: N/A
Applications Software Version : 1.0
Firmware Revision : 1.0
BACnet Protocol Revision : 1.0

Product Description:

The 301C -BIP has a module that uses BACnet communication. As such, the components of a Vulcain network can be connected to a BACnet network via the 301C controller.

BACnet Standardized Device Profile (Annex L)

☐ BACnet Operator Workstation (B-OWS)
☐ BACnet Building Controller (B-BC)
☐ BACnet Advanced Application Controller (B-AAC)
☐ BACnet Application Specific Controller (B-ASC)
☑ BACnet Smart Sensor (B-SS)
☑BACnet Smart Actuator (B-SA)

List all BACnet Interoperability Building Blocks Supported (Annex K)

Data Sharing

☐ Data Sharing-ReadProperty-A (DS-RP-A)
☑ Data Sharing-ReadProperty-B (DS-RP-B)
☐ Data Sharing-ReadPropertyMultiple-A (DS-RPM-A)
☑ Data Sharing-ReadPropertyMultiple-B (DS-RPM-B)
☐ Data Sharing-ReadPropertyConditional-A (DS-RPC-A)
☐ Data Sharing-ReadPropertyConditional-B (DS-RPC-B)
☐ Data Sharing-WriteProperty-A (DS-WP-A)
☑ Data Sharing-WriteProperty-B (DS-WP-B)
☐ Data Sharing-WritePropertyMultiple-A (DS-WPM-A)
☐ Data Sharing-WritePropertyMultiple-B (DS-WPM-B)
☐ Data Sharing-COV-A (DS-COV-A)
☐ Data Sharing-COV-B (DS-COV-B)
☐ Data Sharing-COVP-A (DS-COVP-A)
☐ Data Sharing-COVP-B (DS-COVP-B)
☐ Data Sharing-COV-Unsolicited-A (DS-COVU-A)
☐ Data Sharing-COV-Unsolicited-B (DS-COVU-B)

Scheduling

☐ Scheduling-A (SCHED-A)
☐ Scheduling-Internal-B (SCHED-I-B)
☐ Scheduling-External-A (SCHED-E-B)

Trending

☐ Viewing and Modifying Trends-A (T-VMT-A)
☐ Trending-Viewing and Modifying Trends-Internal-B (T-VMT-I-B)
☐ Trending-Viewing and Modifying Trends-External-B (T-VMT-E-B)
☐ Trending-Automated Trend Retrieval-A (T-ATR-A)
☐ Trending-Automated Trend Retrieval-B (T-ATR-B)

Network Management

☐ Network Management-Connection Establishment-A (NM-CE-A)
☐ Network Management-Connection Establishment-B (NM-CE-B)
☐ Network Management-Router Configuration-A (NM-RC-A)
☐ Network Management-Router Configuration-B (NM-RC-B)

Alarm and Event Management

☐ Alarm and Event-Notification-A (AE-N-A)
☐ Alarm and Event-Notification Internal-B (AE-N-I-B)
☐ Alarm and Event-Notification External-A (AE-N-E-B)
☐ Alarm and Event-ACK-A (AE-ACK-A)
☐ Alarm and Event-ACK-B (AE-ACK-B)
☐ Alarm and Event-Alarm Summary-A (AE-ASUM-A)
☐ Alarm and Event-Alarm Summary-B (AE-ASUM-B)
☐ Alarm and Event-Enrollment Summary-A (AE-ESUM-A)
☐ Alarm and Event-Enrollment Summary-B (AE-ESUM-B)
☐ Alarm and Event-Information-A (AE-INFO-A)
☐ Alarm and Event-Information-B (AE-INFO-B)
☐ Alarm and Event-LifeSafety-A (AE-LS-A)
☐ Alarm and Event-LifeSafety-B (AE-LS-B)

Device Management

☐ Device Management-Dynamic Device Binding-A (DM-DDB-A)
☑ Device Management-Dynamic Device Binding-B (DM-DDB-B)
☐ Device Management-Dynamic Object Binding-A (DM-DOB-A)
☐ Device Management-Dynamic Object Binding-B (DM-DOB-B)
☐ Device Management-DeviceCommunicationControl-A (DM-DCC-A)
☑ Device Management-DeviceCommunicationControl-B (DM-DCC-B)
☐ Device Management-Private Transfer-A (DM-PT-A)
☐ Device Management-Private Transfer-B (DM-PT-B)
☐ Device Management-Text Message-A (DM-TM-A)
☐ Device Management-Text Message-B (DM-TM-B)
☐ Device Management-TimeSynchronization-A (DM-TS-A)
☑ Device Management-TimeSynchronization-B (DM-TS-B)
☐ Device Management-UTCTimeSynchronization-A (DM-UTC-A)
☐ Device Management-UTCTimeSynchronization-B (DM-UTC-B)

☐ Device Management-ReinitializeDevice-A (DM-RD-A)
☑ Device Management-ReinitializeDevice-B (DM-RD-B)
☐ Device Management-Backup and Restore-A (DM-BR-A)
☐ Device Management-Backup and Restore-B (DM-BR-B)
☐ Device Management-List Manipulation-A (DM-LM-A)
☐ Device Management-List Manipulation-B (DM-LM-B)
☐ Device Management-Object Creation and Deletion-A (DM-OCD-A)
☐ Device Management-Object Creation and Deletion-B (DM-OCD-B)
☐ Device Management-Virtual Terminal-A (DM-VT-A)
☐ Device Management-Virtual Terminal-B (DM-VT-B)

Segmentation Capability :

☐ Segmented requests supported Window Size __

☐ Segmented responses supported Window Size : Take maximum Windows size supported by the other device

Standard Object Types Supported :

Analog Input	For all objects
Analog Output	1) cannot be dynamically createable using Create Object service
Analog Value	2) cannot be dynamically deletable using DeleteObject sercice
Binary Input	3) No additional writable properties exist
Binary Output	4) No proprietary properties exist
Binary Value	5) No range restriction
Device	

Data Link Layer Options

☑ BACnet IP, (Annex J)
☐ BACnet IP, (Annex J), Foreign Device
☐ ISO 8802-3, Ethernet (Clause 7)

☐ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
☐ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s)
☐ MS/TP master (Clause 9), baud rate(s):
☐ MS/TP slave (Clause 9), baud rate(s):
☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):
☐ Point-To-Point, modem, (Clause 10), baud rate(s):
☐ LonTalk, (Clause 11), medium:
☐ Other:

Device Address Binding :

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.)
☐Yes ☑ No

Networking Options

☐ Router, BACnet / Modbus.
☐ Annex H, BACnet Tunneling Router over IP
☐ BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by Foreign Devices?
☐ Yes ☑ No

Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

☑ ANSI X3.4 ☐ IBM™/Microsoft™ DBCS
☐ ISO 8859-1
☐ ISO 10646 (UCS-2) ☐ ISO 10646 (UCS-4)
☐ JIS C 6226

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports :

Specifications

Power requirements 301C	17-27 Vac, 50/60 Hz, 8.64 VA
	18-36 Vdc, 350mA @ 24 Vdc (8.4 VA)
Operating temperature range	-20°C to 50°C (-4°F to 122°F)
Operating humidity range	0 to 95% RH (non-condensing)
Operating altitude	Up to 3000 m (9843 ft)
Network capacity	Up to 96 transmitters, 32 per channel
	Channels 1, 2 = Modbus and Vulbus
	Channel 3 = Modbus only
Communication	Up to 609m (2,000 ft) per channel
User interface	Graphic 122 x 32 dot matrix backlit display
	User friendly keypad
Visual indicators	Power Green LED
	Alarm A, B, C Red LED
	Fault Amber LED
	Tx Amber LED
	Rx Green LED
Outputs	4 DPDT relays
Output rating	5A, 30Vdc or 250 Vac (resistive load)
Audible alarm	65dBA at 1 m (3 ft)
Time delays	Programmable Before and After delays
Battery	3 volt lithium battery
Enclosure	ABS-polycarbonate - indoor use
Dimensions (HxWxD)	28 x 20.3 x 7cm (7.99” x 11.02” x 2.76”)
Certifications	ANSI/UL 61010-1
	CAN/CSA C22.2 No. 61010-1
	ETL 116662

Limited Warranty

Limited Warranty

Honeywell Analytics, Inc. warrants to the original purchaser and/or ultimate customer ("Purchaser") of Vulcain products ("Product") that if any part thereof proves to be defective in material or workmanship within twelve (12) months, such defective part will be repaired or replaced, free of charge, at Honeywell Analytics' discretion if shipped prepaid to Honeywell Analytics at 4005 Matte Blvd., Unit G, Brossard, Quebec, J4Y 2P4, in a package equal to or in the original container. The Product will be returned freight prepaid and repaired or replaced if it is determined by Honeywell Analytics that the part failed due to defective materials or workmanship. The repair or replacement of any such defective part shall be Honeywell Analytics' sole and exclusive responsibility and liability under this limited warranty.

Re-Stocking Policy

The following restocking fees will apply when customers return products for credit:

- 15% restocking fee will be applied if the product is returned within **1 month** following the shipping date
- 30% restocking fee will be applied if the product is returned within **3 months** following the shipping date

A full credit (less restocking fee) will only be issued if the product is in perfect working condition. If repairs are required on the returned product, the cost of these repairs will be deducted from the credit to be issued.

No credits will be issued beyond the three month period.

Exclusions

A. If Gas sensors are part of the Product, the gas sensor is covered by a twelve (12) month limited warranty of the manufacturer.
B. If gas sensors are covered by this limited warranty, the gas sensor is subject to inspection by Honeywell Analytics for extended exposure to excessive gas concentrations if a claim by the Purchaser is made under this limited warranty. Should such inspection indicate that the gas sensor has been expended rather than failed prematurely, this limited warranty shall not apply to the Product.
C. This limited warranty does not cover consumable items, such as batteries, or items subject to wear or periodic replacement, including lamps, fuses, valves, vanes, sensor elements, cartridges, or filter elements.

Warranty Limitation and Exclusion

Honeywell Analytics will have no further obligation under this limited warranty. All warranty obligations of Honeywell Analytics are extinguishable if the Product has been subject to abuse, misuse, negligence, or accident or if the Purchaser fails to perform any of the duties set forth in this limited warranty or if the Product has not been operated in accordance with instructions, or if the Product serial number has been removed or altered.

Disclaimer of Unstated Warranties

The warranty printed above is the only warranty applicable to this purchase. All other warranties, express or implied, including, but not limited to, the implied warranties of merchantability or fitness for a particular purpose are hereby disclaimed.

Limitation of Liability

It is understood and agreed that Honeywell Analytics' liability, whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the amount of the purchase price paid by the purchaser for the product and under no circumstances shall Honeywell Analytics be liable for special, indirect, or consequential damages. The price stated for the product is a consideration limiting Honeywell Analytics' liability. No action, regardless of form, arising out of the transactions under this warranty may be brought by the purchaser more than one year after the cause of actions has occurred.