



**GREYSTONE**  
ENERGY SYSTEMS INC

CMD Series

Carbon Monoxide Transmitter

**SETUP GUIDE BACnet® COMMUNICATION**



## Network Communication

The device parameters must be set before connection to the network and will ensure each device will have a unique MAC address and Device Instance for startup. On startup, the MAC address is appended to the Device Object : Vendor Identifier to create the unique Device Instance (Device Object : Object Identifier). Once connected to a network, the Device Object : Object Identifier can be written to any unique value via BACnet and then the MAC address will no longer be appended to the value. Once set, all parameters are saved in non-volatile memory. The local menu and LCD are used to set the BACnet MAC device address (0-127) and the baud rate. The factory defaults are address 4 and 9600 baud.

Note that the BACnet network can be used to query values and change parameters of the device only, it cannot be used to implement a control system. As such, the BACnet object list contains no event driven object types, only query type objects.

Using the BACnet system software, only map the point objects that are installed and required. Excessive point mapping will lower the network performance. On the CO Transmitter some objects will not have any meaning if the hardware option is not installed. For example, AV 6 (Relay 2 Setpoint) will not be functional if there is no Relay 2 installed on the pcb. To reduce network traffic, these points should not be polled.

The CO Transmitter has 31 BACnet objects to identify the device, read current values, configure the device, control the alarm setpoints, etc. There are five standard supported BACnet object types as shown below.

Object Type	Dynamically Creatable	Dynamically Deletable	Object Identifier	Object Name
Device	No	No	381004	CO Detector 004
Analog Input	No	No	AI 1 AI 2	CO Sensor Value Temperature
Analog Value	No	No	AV 1 AV 2 AV 3 AV 4 AV 5 AV 6 AV 7 AV 8 AV 9 AV 10 AV 11 AV 12 AV 13	Buzzer Setpoint Buzzer Delay Relay 1 Setpoint Relay 1 Hysteresis Relay 1 Delay Relay 2 Setpoint Relay 2 Hysteresis Relay 2 Delay Test Mode Time Output Test Fault Mode Time ReCal Mode Time Temperature Offset
Binary Value	No	No	BV 1 BV 2 BV 3 BV 4 BV 5 BV 6 BV 7 BV 8 BV 9 BV 10 BV 11	Buzzer Enable/Disable Fault Mode Enable/Disable Fault Mode Reset Display Mode Backlight Enable/Disable Test Mode Enable/Disable ReCal Mode Enable/Disable ReCal Mode Reset Temperature Units Relay 1 Operation Relay 2 Operation
Binary Input	No	No	BI 1 BI 2 BI 3 BI 4 BI 5 BI 6	CO Status Buzzer Status Relay 1 Status Relay 2 Status Test Mode Status Fault Status

## **BACnet Trouble-shooting**

This device operates as a slave and will not communicate unless a master sends a request for information, then it will answer. If the device does not communicate properly, first check that the communication wires are not reversed. Then check communication parameters set in the menu.

The default MAC address is 4 and each device must have a unique address to communicate properly. Use the menu to change the address to a unique number for each unit. Ensure the device object name and object identifier are unique on the entire BACnet network, not just on the MS/TP sub-net. Both of these properties are writable.

The device automatically selects a device object name for itself using the format `CMD_CO_Detector_xxx`, where `xxx` is the MS/TP MAC address (000 to 127) as set in the menu. If this name is changed by writing to the device `Object_Name` property via BACnet, then the MAC number will no longer be appended to the object name.

The CO Transmitter also selects a device object identifier for itself using the format `381xxx`, where `xxx` is the MS/TP MAC address (000 to 127) as set by the menu. If this ID is changed by writing to the device `Object_Identifier` property via BACnet, then the MAC number will no longer be appended to the object ID.

Ensure the application software is not set to poll the devices too frequently. For example, if the software is polling the devices every 500 mS, the network could be heavily congested with the network traffic and may not operate reliably. A slower polling rate such as 5 to 10 seconds will usually produce better results on a typical network segment.

Use care when setting the MS/TP MAC address and the device object `Max_Master` property since both can have a significant effect on the network efficiency. Some MAC address and `Max_Master` combinations will operate more efficiently than others. MAC addresses should be selected sequentially, starting at the lowest possible value.

For example, on a five node segment, the MAC addresses should be set to 1, 2, 3, 4 and 5. In this case, if the `Max_Master` property value is left at the 127 default, then there will be a lot of wasted time on the network polling for masters that are not present. In this example, the five CO nodes should be set such that `Max_Master` is equal to 5. The `Max_Master` value initially defaults to 127 so that any master can be found when the CO2 device first starts.

The BACnet Device object allows configuration of the CO Transmitter. Device object properties are shown below.

Property	Default Value	Property Data Type	Access
Object Identifier	381004	BACnetObjectIdentifier (numeric)	Read / Write
Object Name	CMD CO Detector 004	CharacterString (32)	Read / Write
Object Type	DEVICE (8)	BACnetObjectType	Read
System Status	OPERATIONAL (0)	BACnetDeviceStatus	Read
Vendor Name	Greystone Energy Systems	CharacterString	Read
Vendor Identifier	381	Unsigned16	Read
Model Name	CMD5B	CharacterString	Read
Firmware Revision	1.2	CharacterString	Read
Application Software Version	V1.0	CharacterString	Read
Location	150 English Dr, Moncton, NB	CharacterString (32)	Read / Write
Description	Greystone CO Gas Detector	CharacterString (32)	Read / Write
Protocol Version	1	Unsigned	Read
Protocol Revision	14	Unsigned	Read
Protocol Services Supported	See description below	BACnetServicesSupported	Read
Protocol Object Types Supported	See description below	BACnetObjectTypesSupported	Read
Object List	See description below	BACnetArray	Read
Max APDU Length Accepted	50, B'0000'	Unsigned	Read
Segmentation Supported	NO_SEGMENTATION (3)	BACnetSegmentation	Read
APDU Timeout	6000	Unsigned	Read / Write
Number of APDU Retries	3	Unsigned	Read / Write
Max Master	127	Unsigned	Read / Write
Max Info Frames	1	Unsigned	Read
Device Address Binding	empty	BACnetAddressBinding	Read
Database Revision	0	Unsigned	Read
Property List		BACnetArray	Read

**Object\_Identifier** Initial default number is 381004, where 381 is the vendor ID and 004 is the default network MAC address. When the MAC address is initially changed the value is updated and saved. For example, if the MAC address is set to 50 via the menu for startup, then the device instance will be set to 381050. This property is also writable via BACnet. If the Device:Object\_Identifier is written to via BACnet then the MAC address is no longer appended to the vendor ID to create this value.

**Object\_Name** Initial string is "CMD CO Detector 004" where 004 is the default network address. Can be written with a new string of maximum length of 32 characters and the value is saved. The "004" is the MAC address as set by the menu and is automatically changed if the MAC address is changed. Once written to via BACnet, the MAC address no longer gets appended to the value.

**Protocol\_Services\_Supported** readProperty, writeProperty, deviceCommunicationControl, who-Has, who-Is  
Binary bit string = {00000000 00001001 01000000 00000000 01100000 0}

**Protocol\_Object\_Types\_Supported** Analog\_Input, Analog\_Value, Binary\_Input, Binary\_Value, Device  
Binary bit string = {10110100 10000000 00000000 00000000 00000000 00000000 00000000}

**Object\_List** ((Device, Instance 4), (Analog Input, Instance 1), (Analog Value, Instance 1) ... (Analog Value, Instance 12), (Binary Value, Instance 1) ..... (Binary Value, Instance 8), (Binary Input, Instance 1).....(Binary Input, Instance 6)

**APDU\_Timeout** Value is 6000. Can be modified from 1 to 10,000.

**Number\_Of\_APDU\_Retries** Value is 3. Can be modified from 1 to 10.

**Max\_Master** Value is 127. Can be modified from 1 to 127.

**Database\_Revision** Value is 0 to 255.

**The analog input BACnet objects** allows reading of CO and temperature sensor values. AI object properties are shown below.

Analog input object **CO Sensor Value** (Present\_Value is current sensor reading in ppm. Resolution is 1 ppm)

Property	Default Value	Property Data Type	Access
Object Identifier	AI1 (Analog Input 1)	BACnetObjectIdentifier	Read
Object Name	CO_Sensor_Value	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	current reading	Real	Read
Description	CO Level	CharacterString (32)	Read
Device Type	0-100, 150, 300, 400 or 500 ppm CO Sensor	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Units	parts-per-million (96)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog input object **Temperature** (Present\_Value is current temperature sensor reading in °C or °F, resolution is 0.1°)  
(The temperature units default to °C but can be changed to °F using BV9)

Property	Default Value	Property Data Type	Access
Object Identifier	AI2 (Analog Input 2)	BACnetObjectIdentifier	Read
Object Name	Temperature	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	current reading	Real	Read
Description	Temperature	CharacterString (32)	Read
Device Type	Temperature Sensor	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Note: The temperature reading will only be valid for space type products (sensor on front cover) when the product is mounted flat on a wall with the sensor facing the operator and the LCD to the top. Changing the position will create reading inaccuracies.

The temperature object will not give accurate duct temperature values for duct style products (air flow pickup tube on the rear of the enclosure).

The analog value BACnet objects allow configuration of the buzzer, relays, etc. AV object properties are shown below.

Analog value object (Present\_Value defaults to 150 ppm. Can be set from 20 to 500 ppm. Resolution is 10 ppm)

**Buzzer Setpoint**

Property	Default Value	Property Data Type	Access
Object Identifier	AV1 (Analog Value 1)	BACnetObjectIdentifier	Read
Object Name	Buzzer_Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	150	Real	Read / Write
Description	Buzzer Setpoint	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Parts-per-million (96)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object (Present\_Value defaults to 5 minutes. Can be set from 0 to 10 minutes. Resolution is 1 minute)

**Buzzer Delay**

Property	Default Value	Property Data Type	Access
Object Identifier	AV2 (Analog Value 2)	BACnetObjectIdentifier	Read
Object Name	Buzzer_Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	5	Real	Read / Write
Description	Buzzer Delay	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Minutes (72)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object (Present\_Value defaults to 50 ppm. Can be set from 20 to 500 ppm. Resolution is 10 ppm)

**Relay1 Setpoint**

Property	Default Value	Property Data Type	Access
Object Identifier	AV3 (Analog Value 3)	BACnetObjectIdentifier	Read
Object Name	Relay1_Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	50	Real	Read / Write
Description	Relay1 Setpoint	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Parts-per-million (96)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**Relay1 Hysteresis**

(Present\_Value defaults to 10 ppm. Can be set from 10 to 100 ppm. Resolution is 5 ppm)

Property	Default Value	Property Data Type	Access
Object Identifier	AV4 (Analog Value 4)	BACnetObjectIdentifier	Read
Object Name	Relay1_Hysteresis	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	10	Real	Read / Write
Description	Relay1 Hysteresis	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Parts-per-million (96)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**Relay1 Delay**

(Present\_Value defaults to 2 minutes. Can be set from 0 to 10 minutes. Resolution is 1 minute)

Property	Default Value	Property Data Type	Access
Object Identifier	AV5 (Analog Value 5)	BACnetObjectIdentifier	Read
Object Name	Relay1_Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	2	Real	Read / Write
Description	Relay1 Delay	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Minutes (72)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**Relay2 Setpoint**

(Present\_Value defaults to 150 ppm. Can be set from 20 to 500 ppm. Resolution is 10 ppm)

Property	Default Value	Property Data Type	Access
Object Identifier	AV6 (Analog Value 6)	BACnetObjectIdentifier	Read
Object Name	Relay2_Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	150	Real	Read / Write
Description	Relay2 Setpoint	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Parts-per-million (96)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**Relay2 Hysteresis**

(Present\_Value defaults to 20 ppm. Can be set from 10 to 100 ppm. Resolution is 5 ppm)

Property	Default Value	Property Data Type	Access
Object Identifier	AV7 (Analog Value 7)	BACnetObjectIdentifier	Read
Object Name	Relay2_Hysteresis	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	20	Real	Read / Write
Description	Relay2 Hysteresis	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Parts-per-million (96)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**Relay2 Delay**

(Present\_Value defaults to 2 minutes. Can be set from 0 to 10 minutes. Resolution is 1 minute)

Property	Default Value	Property Data Type	Access
Object Identifier	AV8 (Analog Value 8)	BACnetObjectIdentifier	Read
Object Name	Relay2_Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	2	Real	Read / Write
Description	Relay2 Delay	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Minutes (72)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**Test Mode Time**

(Present\_Value defaults to 5 minutes. Can be set from 1 to 15 minutes. Resolution is 1 min)

Property	Default Value	Property Data Type	Access
Object Identifier	AV9 (Analog Value 9)	BACnetObjectIdentifier	Read
Object Name	Test_Mode_Time	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	5	Real	Read / Write
Description	Test Mode Time	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Minutes (72)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read



Analog value object  
**Output Test**

(Present\_Value defaults to 0. Can be set from 0 to 6. Resolution is 1)

Property	Default Value	Property Data Type	Access
Object Identifier	AV10 (Analog Value 10)	BACnetObjectIdentifier	Read
Object Name	Output_Test	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	0	Real	Read / Write
Description	Output Test	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	No-units (95)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**Fault Mode Time**

(Present\_Value defaults to 3 years. Can be set to 3, 4, 5 or 6 years).

Property	Default Value	Property Data Type	Access
Object Identifier	AV11 (Analog Value 11)	BACnetObjectIdentifier	Read
Object Name	Fault_Mode_Time	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	3	Real	Read / Write
Description	Fault Mode Time	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Years (67)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object  
**ReCal Mode Time**

(Present\_Value defaults to 1 years. Can be set to 1, 2 or 3 years).

Property	Default Value	Property Data Type	Access
Object Identifier	AV12 (Analog Value 12)	BACnetObjectIdentifier	Read
Object Name	ReCal_Mode_Time	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	1	Real	Read / Write
Description	Recalibration Mode Time	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Years (67)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object (Present Value defaults to 0 for no offset. Can be set from -10 to +10 Δ°F or -5.0 to +5.0 Δ°C)  
**Temperature Offset** (Units depend on the device units, either °C or °F), (°C resolution = 0.5, °F resolution = 1)

Property	Default Value	Property Data Type	Access
Object Identifier	AV13 (Analog Value 13)	BACnetObjectIdentifier	Read
Object Name	Temperature Offset	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	0	Real	Read / Write
Description	Temperature Offset	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	delta-degrees-Celsius (121) or Δ°F (120)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The binary value BACnet objects allow basic control of the device I/O. Binary value object properties are shown below.

Binary value object (Present\_Value is normally 1, set to 0 to disable the buzzer)  
**Buzzer Enable**

Property	Default Value	Property Data Type	Access
Object Identifier	BV1 (Binary Value 1)	BACnetObjectIdentifier	Read
Object Name	Buzzer_Enable	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Buzzer Enable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object (Present\_Value is normally 0, set to 1 to enable the fault mode alarm)  
**Fault Mode Enable**

Property	Default Value	Property Data Type	Access
Object Identifier	BV2 (Binary Value 2)	BACnetObjectIdentifier	Read
Object Name	Fault_Mode_Enable	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Fault Mode Enable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object  
**Fault Mode Reset**

(Present\_Value is normally 0, set to 1 to reset the fault mode and it's timer)

Property	Default Value	Property Data Type	Access
Object Identifier	BV3 (Binary Value 3)	BACnetObjectIdentifier	Read
Object Name	Fault Mode Reset	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Fault_Mode_Reset	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object  
**Display Mode**

(Present\_Value is normally 1, set to 0 to suppress the CO reading)

Property	Default Value	Property Data Type	Access
Object Identifier	BV4 (Binary Value 4)	BACnetObjectIdentifier	Read
Object Name	Display_Mode	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Display Mode	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object  
**Backlight Enable**

(Present\_Value is normally 1, set to 0 to disable the LCD backlight)

Property	Default Value	Property Data Type	Access
Object Identifier	BV5 (Binary Value 5)	BACnetObjectIdentifier	Read
Object Name	Backlight_Enable	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Backlight Enable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object  
**Test Mode Enable**

(Present\_Value is normally 0, set to 1 to enable the test mode)

Property	Default Value	Property Data Type	Access
Object Identifier	BV6 (Binary Value 6)	BACnetObjectIdentifier	Read
Object Name	Test_Mode_Enable	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Test Mode Enable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object  
**ReCal Mode Enable**

(Present\_Value is normally 1, set to 0 to disable the ReCal mode alarm)

Property	Default Value	Property Data Type	Access
Object Identifier	BV7 (Binary Value 7)	BACnetObjectIdentifier	Read
Object Name	ReCal_Mode_Enable	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Recalibration Mode Enable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object  
**ReCal Mode Reset**

(Present\_Value is normally 0, set to 1 to reset the ReCal mode and it's timer)

Property	Default Value	Property Data Type	Access
Object Identifier	BV8 (Binary Value 8)	BACnetObjectIdentifier	Read
Object Name	ReCal_Mode_Reset	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Recalibration Mode Reset	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object (Present Value defaults to 0 (INACTIVE) for Celsius. Can be set to 1 (ACTIVE) for Fahrenheit)  
**Temperature Units**

Property	Default Value	Property Data Type	Access
Object Identifier	BV9 (Binary Value 9)	BACnetObjectIdentifier	Read
Object Name	Temperature Units	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Celsius (0) or Fahrenheit (1)	CharacterString (32)	Read
Status Flags	{ false, false, false, false } (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object (Present\_Value is normally 0 for Direct, set to 1 for Reverse operation)  
**Relay 1 Operation**

Property	Default Value	Property Data Type	Access
Object Identifier	BV10 (Binary Value 10)	BACnetObjectIdentifier	Read
Object Name	Relay 1 Operation	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	0 = Direct, 1 = Reverse	CharacterString (32)	Read
Status Flags	{ false, false, false, false } (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary value object (Present\_Value is normally 0 for Direct, set to 1 for Reverse operation)  
**Relay 2 Operation**

Property	Default Value	Property Data Type	Access
Object Identifier	BV11 (Binary Value 11)	BACnetObjectIdentifier	Read
Object Name	Relay 2 Operation	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	0 = Direct, 1 = Reverse	CharacterString (32)	Read
Status Flags	{ false, false, false, false } (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

The binary input BACnet objects indicates the device status.

Binary input object (Present\_Value is normally 0, will change to 1 if any alarm is present)  
**CO Status**

Property	Default Value	Property Data Type	Access
Object Identifier	BI1 (Binary Input 1)	BACnetObjectIdentifier	Read
Object Name	CO_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	CO Status	CharacterString (32)	Read
Device Type	Indicates CO Alarm Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	NORMAL (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary input object (Present\_Value is normally 0, will change to 1 if the buzzer activates)  
**Buzzer Status**

Property	Default Value	Property Data Type	Access
Object Identifier	BI2 (Binary Input 2)	BACnetObjectIdentifier	Read
Object Name	Buzzer_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	Buzzer Status	CharacterString (32)	Read
Device Type	Indicates Buzzer Alarm Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	NORMAL (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary input object  
**Relay1 Status**

(Present\_Value is normally 0, will change to 1 if relay1 activates)

Property	Default Value	Property Data Type	Access
Object Identifier	BI3 (Binary Input 3)	BACnetObjectIdentifier	Read
Object Name	Relay1_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	Relay1 Status	CharacterString (32)	Read
Device Type	Indicates Relay1 Alarm Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	NORMAL (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary input object  
**Relay2 Status**

(Present\_Value is normally 0, will change to 1 if relay2 activates)

Property	Default Value	Property Data Type	Access
Object Identifier	BI4 (Binary Input 4)	BACnetObjectIdentifier	Read
Object Name	Relay2_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	Relay2 Status	CharacterString (32)	Read
Device Type	Indicates Relay2 Alarm Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	NORMAL (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary input object  
**Test Mode Status**

(Present\_Value is normally 0, will change to 1 if the test mode is activated)

Property	Default Value	Property Data Type	Access
Object Identifier	BI5 (Binary Input 5)	BACnetObjectIdentifier	Read
Object Name	Test_Mode_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	Test Mode Status	CharacterString (32)	Read
Device Type	Indicates Test Mode Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	NORMAL (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary input object  
**Fault Status**

(Present\_Value is normally 0, will change to 1 if the fault alarm is activated)

<b>Property</b>	<b>Default Value</b>	<b>Property Data Type</b>	<b>Access</b>
Object Identifier	BI6 (Binary Input 6)	BACnetObjectIdentifier	Read
Object Name	Fault_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	Fault Status	CharacterString (32)	Read
Device Type	Indicates CO Fault Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Reliability	NO_FAULT_DETECTED (0)	BACnetReliability	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	NORMAL (0)	BACnetPolarity	Read
Property List		BACnetArray	Read



## BACnet Protocol Implementation Conformance Statement (PICS)

**Date :** Feb 15, 2016  
**Vendor Name :** Greystone Energy Systems  
**Product Name :** Carbon Monoxide Detector  
**Product Model Number :** CMD5B  
**Application Software Version :** 1.0  
**Firmware Revision :** 1.2  
**BACnet Protocol Revision :** 14

**Product Description :** The Greystone CO Detector uses an electrochemical carbon monoxide sensor to measure air quality and features a native BACnet MS/TP protocol for network communication. It measures CO levels and reports this value back to a building automation system (BAS). The device features an alarm function and has an LCD to display measured values.

**BACnet Standardized Device Profile (Annex L) :** BACnet Application Specific Controller (B-ASC)

**BACnet Interoperability Building Blocks Supported (Annex K) :** DS-RP-B, DS-WP-B,  
 DM-DDB-B, DM-DOB-B  
 DM-DCC-B

**Segmentation Capability :** Not supported

### Standard Object Types Supported :

Object Type	Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
Device	No	No	Location, Description, Max_Master, Max_Info_Frames	Object_Identifier, Object_Name, Location, Description, APDU_Timeout, Max_Master, Number_Of_APDU_Retries
Analog Input	No	No	Description, Reliability, Device_Type	
Analog Value	No	No	Description	Present_Value
Binary Value	No	No	Description, Reliability	Present_Value
Binary Input	No	No	Description, Reliability, Device_Type	

**Data Link Layer Options :** MS/TP master (Clause 9), baud rates : 9600, 19200, 38400, 76800

**Device Address Binding :** Not supported

**Networking Options :** None

**Character Set Supported :** ISO 10646 (UTF-8)