GREYSTONE
ENERGY SYSTEMS INC

RPC Series
Room Pressure Sensor
SETUP GUIDE BACnet® COMMUNICATION

BACnet Object List

Object Type	Dynamically Creatable	Dynamically Deletable	Object Identifier	Object Name
Device	No	No	381003	Room Pressure 003
Analog Input	No	No	AI 1	Pressure Sensor Value
Analog Value	No	No	AV 1 AV 2 AV 3 AV 4 AV 5 AV 6 AV 7	Pressure Averaging Time Alarm High Limit Alarm Low Limit Alarm On Delay Alarm Off Delay Alarm Silence Time Buzzer Volume
Binary Value	No	No	BV 1 BV 2 BV 3 BV 4 BV 5	Alarm Enable Alarm Test Backlight Enable Pressure Units Pressure Range
Binary Input	No	No	BI 1 BI 2 BI 3	Alarm Status Low Alarm Status High Alarm Status

BACnet Device object allows configuration of the room pressure device. Device object properties are shown below.

Property	Default Value	Property Data Type	Access
Object Identifier	381003	BACnetObjectIdentifier(numeric)	Read / Write
Object Name	Room Pressure Monitor 003	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	RPC	CharacterString	Read
Firmware Revision	1.4	CharacterString	Read
Application Software Version	V1.0	CharacterString	Read
Location	150 English Dr, Moncton, NB	CharacterString (32)	Read / Write
Description	Greystone RP Monitor	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
Maximum APDU Length Accepted	50, B'0000'	Unsigned	Read
Segmentation Supported	NO_SEGMENTATION (3)	BACnetSegmentation	Read
APDU Timeout	6,000	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_Indentifier Initial default number is 381003, where 381 is the vendor ID and 003 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 "Room_Pressure_Monitor_003" where 003 is the default network address. Can be written with a new string of maximum length of 32 characters and the value is saved. The "003" 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 0000000}

Object_List ((Device, Instance 3), (Analog Input, Instance 1), (Analog Value, Instance 1) ….(Analog Value, Instance 7)
(Binary Value, Instance 1) …… (Binary Value, Instance 5), (Binary Input, Instance 1)…..(Binary Input, Instance 3)

APDU_Timeout Value is 6,000. 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. Value is saved. Can be modified from 1 to 127.
Database_Revision Value is 0 to 255.

The analog input BACnet object allows reading of current pressure sensor value. AI object properties are shown below.

Analog input object Pressure_Sensor_Value (Present_Value is current sensor reading in the current units.)

Property	Default Value	Property Data Type	Access
Object Identifier	AI1 (Analog Input 1)	BACnetObjectIdentifier	Read
Object Name	Pressure_Sensor_Value	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	current reading	Real	Read
Description	Pressure Value in Pa or "wc	CharacterString (32)	Read
Device Type	Room Pressure 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	Pascals (53) or "wc (58)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

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

Analog value object Pressure_Averaging_Time (Present_Value defaults to 5 seconds. Can be set from 1 to 60 sec. Resolution is 1 sec)

Property	Default Value	Property Data Type	Access
Object Identifier	AV1 (Analog Value 1)	BACnetObjectIdentifier	Read
Object Name	Pressure_Averaging_Time	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	5	Real	Read / Write
Description	Pressure Averaging Time (1-60 seconds)	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	Seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object Alarm_High_Limit (Present_Value defaults to (+ range max x 50%)).

Property	Default Value	Property Data Type	Access
Object Identifier	AV2 (Analog Value 2)	BACnetObjectIdentifier	Read
Object Name	Alarm_High_Limit	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	0.5 (for example)	Real	Read / Write
Description	Alarm High Limit in Pa or "wc	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	Pascals (53) or "wc (58)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object Alarm_Low_Limit (Present_Value defaults to (- range max x 50%)).

Property	Default Value	Property Data Type	Access
Object Identifier	AV3 (Analog Value 3)	BACnetObjectIdentifier	Read
Object Name	Alarm_Low_Limit	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	-0.5 (for example)	Real	Read / Write
Description	Alarm Low Limit in Pa or "wc	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	Pascals (53) or "wc (58)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object Alarm_On_Delay (Present_Value defaults to 5 seconds. Can be set from 1 to 59 seconds and 1 to 10 minutes).

Property	Default Value	Property Data Type	Access
Object Identifier	AV4 (Analog Value 4)	BACnetObjectIdentifier	Read
Object Name	Alarm_On_Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	5	Real	Read / Write
Description	Alarm On Delay (1-600")	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	Seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object Alarm_Off_Delay (Present_Value defaults to 5 seconds. Can be set from 1 to 59 seconds and 1 to 10 minutes).

Property	Default Value	Property Data Type	Access
Object Identifier	AV5 (Analog Value 5)	BACnetObjectIdentifier	Read
Object Name	Alarm_Off_Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	5	Real	Read / Write
Description	Alarm Off Delay (1-600")	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	Seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog value object Alarm_Silence_Time (Present_Value defaults to 30 minutes. Can be set from 1 to 60 minutes or 0 for no reset).

Property	Default Value	Property Data Type	Access
Object Identifier	AV6 (Analog Value 6)	BACnetObjectIdentifier	Read
Object Name	Alarm_Silence_Time	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	30	Real	Read / Write
Description	Alarm Silence Time (1-60', 0 = no reset)	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 Buzzer_Volume (Present_Value defaults to 2 (high volume). Can be set to 0 (off) or 1(low volume)).

Property	Default Value	Property Data Type	Access
Object Identifier	AV7 (Analog Value 7)	BACnetObjectIdentifier	Read
Object Name	Buzzer_Volume	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	2	Real	Read / Write
Description	Buzzer Volume (0 = off, 1 = L, 2 = H)	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

The 5 binary value BACnet objects allow device parameter setting. Binary value object properties are shown below.

Binary value object Alarm_Enable (Present_Value is normally 1, set to 0 to disable the alarm functions)

Property	Default Value	Property Data Type	Access
Object Identifier	BV1 (Binary Value 1)	BACnetObjectIdentifier	Read
Object Name	Alarm_Enable	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	0 = Alarm Disable, 1 = Alarm 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 Alarm_Test (Present_Value is normally 0, set to 1 to test the alarm functions)

Property	Default Value	Property Data Type	Access
Object Identifier	BV2 (Binary Value 2)	BACnetObjectIdentifier	Read
Object Name	Alarm_Test	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	0 = Normal Operation, 1 = Alarm Test	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	BV3 (Binary Value 3)	BACnetObjectIdentifier	Read
Object Name	Backlight_Enable	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	0 = Disable, 1 = 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 Pressure_Units (Present_Value is normally 0 for "wc pressure units, set to 1 for Pa units)

Property	Default Value	Property Data Type	Access
Object Identifier	BV4 (Binary Value 4)	BACnetObjectIdentifier	Read
Object Name	Pressure_Units	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	0 = "wc, 1 = Pa	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 Pressure_Range (Present_Value is normally 1 for the highest pressure range, set to 0 for the low pressure range)

Property	Default Value	Property Data Type	Access
Object Identifier	BV5 (Binary Value 5)	BACnetObjectIdentifier	Read
Object Name	Pressure_Range	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	0 = Low Range, 1 = High Range	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 3 binary input BACnet objects indicates the alarm status.

Binary input object Alarm_Status (Present_Value is normally 0, will change to 1 if any alarm is present)

Property	Default Value	Property Data Type	Access
Object Identifier	BI1 (Binary Input 1)	BACnetObjectIdentifier	Read
Object Name	Alarm_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	Alarm Status	CharacterString (32)	Read
Device Type	0 = No Alarm, 1 = Pressure Alarm	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 Low_Alarm_Status (Present_Value is normally 0, will change to 1 if a low pressure alarm is present)

Property	Default Value	Property Data Type	Access
Object Identifier	BI2 (Binary Input 2)	BACnetObjectIdentifier	Read
Object Name	Low_Alarm_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	Low Alarm Status	CharacterString (32)	Read
Device Type	0 = No Low Alarm, 1 = Low Alarm	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 High_Alarm_Status (Present_Value is normally 0, will change to 1 if a high pressure alarm is present)

Property	Default Value	Property Data Type	Access
Object Identifier	BI3 (Binary Input 3)	BACnetObjectIdentifier	Read
Object Name	High_Alarm_Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	High Alarm Status	CharacterString (32)	Read
Device Type	0 = No High Alarm, 1 = High Alarm	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 : Nov 8, 2013
Vendor Name : Greystone Energy Systems
Product Name : Room Pressure Monitor
Product Model Number : RPC
Application Software Version : 1.0
Firmware Revision : 1.4
BACnet Protocol Revision : 7

Product Description : The Greystone RPC Series Room Pressure Monitor is a smart room sensor with native BACnet MS/TP protocol for network communication. It measures room differential pressure 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 : ANSI X3.4

