



GREYSTONE
ENERGY SYSTEMS INC

B5 GAS TRANSMITTER



BACnet Protocol Implementation Conformance (PIC) Statement

Greystone Energy Systems Inc.
PHONE: +1 (506) 853-3057 Web: www.greystoneenergy.com

Copyright © Greystone Energy Systems, Inc. All Rights Reserved

ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)

B5 BACnet Protocol Implementation Conformance Statement

Date: 2024-03-28

Vendor Name: Quatrosense Environmental Ltd

Product Name: B5 Gas Transmitter

Product Model Number: B5-xxx-xxxx-x

Application Software Version: B5-AMCU-2-16

Firmware Revision: B5-BMCU-2-4

BACnet Protocol Revision: Version 1, Revision 7

Product Description:

B5 is a Gas Detection Transmitter/Sensor that communicates via BACnet protocol MS/TP. B5 is an end device in term of BACnet protocol. Available with electrochemical sensor to detect toxic gases, catalytic sensor to detect combustible gases and NDIR infrared sensor to detect CO2 and CH4.

BACnet Standardized Device Profile (Annex L):

- BACnet Operator Workstation (B-OWS)
- BACnet Advanced Operator Workstation (B-AWS)
- BACnet Operator Display (B-OD)
- 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):

BIBB-Data sharing-ReadProperty-B (DB-RP-B)

BIBB-Data sharing-ReadPropertyMultiple-B (DB-RPM-B)

BIBB-Data sharing-WriteProperty-B (DB-WP-B)

BIBB-Device Management-Device Communication Control-B (DM-DCC-B)

BIBB-Device Management-TimeSynchronization-B (DM-TS-B)

BIBB-Device Management-UTCTimeSynchronization-B (DM-UTC-B)

Segmentation Capability:

- Able to transmit segmented messages Window Size _____
- Able to receive segmented messages Window Size _____

Standard Object Types Supported:

Device Object

Analog Input Object

Binary Value Object

Binary Output Object

Data Link Layer Options:

- BACnet IP, (Annex J)
- BACnet IP, (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s) _____
- MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 76800
- MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400, 76800
- Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____
- Point-To-Point, modem, (Clause 10), baud rate(s): _____
- LonTalk, (Clause 11), medium: _____
- BACnet/ZigBee (ANNEX O)
- 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, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
- Annex H, BACnet Tunneling Router over IP
- BACnet/IP Broadcast Management Device (BBMD)
 - Does the BBMD support registrations by Foreign Devices? Yes No
 - Does the BBMD support network address translation? Yes No

Network Security Options:

- Non-secure Device - is capable of operating without BACnet Network Security
- Secure Device - is capable of using BACnet Network Security (NS-SD BIBB)
 - Multiple Application-Specific Keys:
 - Supports encryption (NS-ED BIBB)
 - Key Server (NS-KS BIBB)

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 X 0208

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

ANNEX K – BACnet INTEROPERABILITY BUILDING BLOCK (BIBBs) (NORMATIVE)

K.1.2 BIBB – Data Sharing – ReadProperty – B (DS-RP-B)

The B device is a provider of data to device A

BACnet Service	Initiate	Execute
ReadProperty		X

K.1.4 BIBB – Data Sharing – ReadPropertyMultiple – B (DS-RPM-B)

The B device is a provider of data to device A and returns multiple values at one time.

BACnet Service	Initiate	Execute
ReadPropertyMultiple		X

K.1.8 BIBB – Data Sharing – WriteProperty – B (DS-WP-B)

The B device is a provider of data to device A.

BACnet Service	Initiate	Execute
WriteProperty		X

K.5.2 BIBB – Device Management – Dynamic Device Binding – B (DM-DDB-B)

The B device provides information about its device attributes and responds to requests to identify itself.

BACnet Service	Initiate	Execute
Who-Is		X
I-Am	X	

K.5.4 BIBB – Device Management – Dynamic Object Binding – B (DM-DOB-B)

The B device provides address information about its objects upon requests.

BACnet Service	Initiate	Execute
Who-Has		X
I-Have	X	

K.5.6 BIBB – Device Management – DeviceCommunicationControl – B (DM-DCC-B)

The B device responds to communication control exercised by the A device.

BACnet Service	Initiate	Execute
DeviceCommunicationControl		X

K.5.12 BIBB – Device Management – TimeSynchronization – B (DM-TS-B)

The B device interprets time synchronization messages from the A device.

BACnet Service	Initiate	Execute
TimeSynchronization		X

K.5.13 BIBB – Device Management – UTCTimeSynchronization – B (DM-UTC-B)

The B device interprets time synchronization messages from the A device.

BACnet Service	Initiate	Execute
UTCTimeSynchronization		X

Property List of Objects

Note: all string size should be less than 32 characters.

Device:

Property	Default Value	Access	Conformance Code
object-identifier	device, 4005	Read	Required
object-name	"B5-(gastype) MAC: (address)"	Read	Required
object-type	device	Read	Required
system-status	operational	Read	Required
vendor-name	"QEL (Quatrosense Environmental Ltd)"	Read	Required
vendor-identifier	464	Read	Required
model-name	"B5-(gastype)"	Read	Required
firmware-revision	"B5-BMCU-x-xx"	Read	Required
application-software-version	"B5-BMCU-x-xx"	Read	Required
Location	"Canada"	Read/Write	Optional
description	"B5 GAS: (gastype) SPAN: (span) MAC: (address)"	Read/Write	Optional
protocol-version	1	Read	Required
protocol-revision	7	Read	Required
protocol-services-supported	ReadProperty, ReadPropertyMultiple WriteProperty, DeviceCommunicationControl ReinitializeDevice, TimeSynchronization Who-has, Who-is, UTCTimeSynchronization	Read	Required
protocol-object-types-supported	device, analog-input, binary-output, binary-value	Read	Required
object-list	Device, 4005 Analog Input 0 (Gas Concentration) Analog Input 1 (STEL) Analog Input 2 (TWA) Analog Input 3 (Daily Peak) Analog Input 4 (MCU Temperature) Binary Value 0-7 (Alarm1 to Alarm8) Binary Output 0-2 (Relay1 to Relay3) Binary Output 3-5 (Buzzer1 to Buzzer3)	Read	Required
max-APDU-length-accepted	480	Read	Required
segmentation-supported	NO-SEGMENTATION	Read	Required
apdu-timeout	3000 (ms)	Read	Required
number-of-apdu-retries	3	Read	Required
device-address-binding	()	Read	Required
database-revision	1	Read	Required
max-master	127	Read/Write	Required
max-info-frames	1	Read/Write	Required
Local_Time	Time	Read	Optional
Local_Date	Date	Read	Optional
UTC_Offset	Integer	Read	Optional
Daylight_Savings_Status	Boolean	Read	Optional

Analog Input 0:

Property	Default Value	Access	Conformance Code
object-identifier	analog-input, 0	Read	Required
object-name	"Gas Concentration"	Read	Required
object-type	analog-input(0)	Read	Required
present-value	xxxx	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
units	Parts-per-million	Read	Required
description	"Instantaneous Reading"	Read/Write	Optional

Analog Input 1:

Property	Default Value	Access	Conformance Code
object-identifier	analog-input, 1	Read	Required
object-name	"STEL"	Read	Required
object-type	analog-input(0)	Read	Required
present-value	xxxx	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
units	Parts-per-million	Read	Required
description	"Short Term Exposure Limit"	Read/Write	Optional

Analog Input 2:

Property	Default Value	Access	Conformance Code
object-identifier	analog-input, 2	Read	Required
object-name	"TWA"	Read	Required
object-type	analog-input(0)	Read	Required
present-value	xxxx	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
units	Parts-per-million	Read	Required
description	"Time Weighted Average"	Read/Write	Optional

Analog Input 3:

Property	Default Value	Access	Conformance Code
object-identifier	analog-input, 3	Read	Required
object-name	“Daily Peak”	Read	Required
object-type	analog-input(0)	Read	Required
present-value	Xxxx	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	False	Read	Required
units	Parts-per-million	Read	Required
description	“24 Hours Peak Reading”	Read/Write	Optional

Analog Input 4:

Property	Default Value	Access	Conformance Code
object-identifier	analog-input, 4	Read	Required
object-name	“MCU Temperature”	Read	Required
object-type	analog-input(0)	Read	Required
present-value	xxxx	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
units	Degrees-Celsius	Read	Required
description	“Microcontroller Temperature”	Read/Write	Optional

Binary Value 0:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 0	Read	Required
object-name	“Alarm1 Status”	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
description	“BV(0): Alarm1 Status”	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Value 1:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 1	Read	Required
object-name	"Alarm2 Status"	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
description	"BV(1): Alarm2 Status"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Value 2:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 2	Read	Required
object-name	"Alarm3 Status"	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
description	"BV(2): Alarm3 Status"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Value 3:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 3	Read	Required
object-name	"Alarm4 Status"	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	False	Read	Required
description	"BV(3): Alarm4 Status"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Value 4:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 4	Read	Required
object-name	"Alarm5 Status"	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
description	"BV(4): Alarm5 Status"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Value 5:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 5	Read	Required
object-name	"Alarm6 Status"	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
description	"BV(5): Alarm6 Status"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Value 6:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 6	Read	Required
object-name	"Alarm7 Status"	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
description	"BV(6): Alarm7 Status"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Value 7:

Property	Default Value	Access	Conformance Code
object-identifier	binary-value, 7	Read	Required
object-name	"Alarm8 Status"	Read	Required
object-type	binary-value(5)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
description	"BV(7): Alarm8 Status"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Optional
relinquish-default	inactive	Read	Optional

Binary Output 0:

Property	Default Value	Access	Conformance Code
object-identifier	binary-output, 0	Read	Required
object-name	"Relay1 Status"	Read	Required
object-type	binary-output(4)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
priority	normal	Read	Required
description	"BO(0): Relay1 Output"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Required
relinquish-default	inactive	Read	Required

Binary Output 1:

Property	Default Value	Access	Conformance Code
object-identifier	binary-output, 1	Read	Required
object-name	"Relay2 Status"	Read	Required
object-type	binary-output(4)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
priority	normal	Read	Required
description	"BO(1): Relay2 Output"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Required
relinquish-default	Inactive	Read	Required

Binary Output 2:

Property	Default Value	Access	Conformance Code
object-identifier	binary-output, 2	Read	Required
object-name	"Relay3 Status"	Read	Required
object-type	binary-output(4)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
priority	normal	Read	Required
description	"BO(2): Relay3 Output"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Required
relinquish-default	Inactive	Read	Required

Binary Output 3:

Property	Default Value	Access	Conformance Code
object-identifier	binary-output, 3	Read	Required
object-name	"Buzzer1 Status"	Read	Required
object-type	binary-output(4)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
priority	normal	Read	Required
description	"BO(3): Buzzer1 Output"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Required
relinquish-default	Inactive	Read	Required

Binary Output 4:

Property	Default Value	Access	Conformance Code
object-identifier	binary-output, 4	Read	Required
object-name	"Buzzer2 Status"	Read	Required
object-type	binary-output(4)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
priority	normal	Read	Required
description	"BO(4): Buzzer2 Output"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Required
relinquish-default	Inactive	Read	Required

Binary Output 5:

Property	Default Value	Access	Conformance Code
object-identifier	binary-output, 5	Read	Required
object-name	"Buzzer3 Status"	Read	Required
object-type	binary-output(4)	Read	Required
present-value	active / inactive	Read	Required
status-flag	health / overridden	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read	Required
priority	normal	Read	Required
description	"BO(5): Buzzer3 Output"	Read/Write	Optional
priority-array	B5 priority is 12	Read	Required
relinquish-default	Inactive	Read	Required