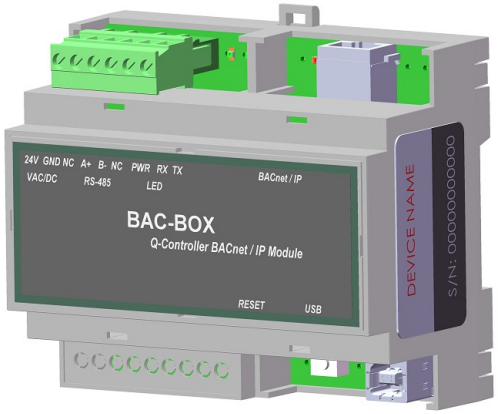
BAC-BOX
PIC STATEMENT



BACnet
Protocol Implementation Conformance (PIC) Statement

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ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)

GES Controller BACnet Converter "BAC-BOX"
BACnet Protocol Implementation Conformance Statement

Date: 2021-04-02
Vendor Name: Quatrosense Environmental Ltd
Product Name: BAC-BOX
Product Model Number: QC-BAC-Converter or MC-BAC-Converter or Q4C-BAC-Converter
Application Software Version: QC-MMI-V1.xx or MCII-VER6.xx or Q4C-II-V2.xx
Firmware Revision: 0.7.0
BACnet Protocol Revision: Version 1, Revision 7

Product Description:
BAC-Box allows GES Controllers to communication on a BACnet network. The BAC-Box works as a translator between the two networks allowing Q-Controller or M-Controller II or Q4-Controller II Gas System (gas concentrations, switch status and relay status) to show up as individual BACnet-compliant devices on a BACnet /IP network.

- It supports up to 192 AI objects, 32 AO objects, 16 BI objects and 64 BO objects for a Q-Controller
- It supports 40 AI objects, 8 AO objects, 2 BI objects and 64 BO objects for an M-Controller II

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
Analog Output Object
Binary Input 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 BULDING 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
ReadPropertyMuliple		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		

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.5.6 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

*M-Controller II and Q4-Controller do not support TimeSynchronization

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

*M-Controller II and Q4-Controller do not support UTCTimeSynchronization

Property List of Objects
Note: all string size should be less than 32 characters.

Device:

Property	Default Value for Q-Controller or M-Controller II or Q4-Controller	Access	Conformance Code
object-identifier	device, 4005 for QC device, 4006 for MCII device, 4007 for Q4CII	Read/Write	Required
object-name	"QC-BAC-Converter" “MC-BAC-Converter” “Q4C-BAC-Converter”	Read/Write	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	"Q-Controller" “M-Controller II” “Q4-Controller II”	Read/Write	Required
firmware-revision	“BAC-BOX-V1.05”	Read	Required
application-software-version	“QC-MMI-V1.xx” / “MCII-VER6.xx” / “Q4C-II-V2.xx”	Read	Required
Location	“Canada”	Read/Write	Optional
description	“Q/M/Q4C-Controller Gas Detection System”	Read/Write	Optional
protocol-version	1	Read	Required
protocol-revision	10	Read	Required
protocol-services-supported	ReadProperty, ReadPropertyMultiple WriteProperty, DeviceCommunicationControl ReinitializeDevice, TimeSynchronization Who-is, UTCTimeSynchronization	Read	Required
protocol-object-types-supported	device, analog-input, analog-output, binary-input, binary-output	Read	Required
object-list	Device, 4005 Analog Input (max. 192) Analog Output (max. 32) Binary Input (max. 16) Binary Output (max. 64)	Read	Required
max-APDU-length-accepted	1476	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
Local_Time	Time	Read	Optional
Local_Date	Date	Read	Optional
UTC_Offset	Integer	Read	Optional
Daylight_Savings_Status	Boolean	Read	Optional

Analog Input 0 to 191:

Property	Default Value	Access	Conformance Code
object-identifier	analog-input, 0 – 191	Read	Required
object-name	"Sensor 0 -127" and "AI-Box-x-x"	Read	Required
object-type	analog-input(0)	Read	Required
present-value	xxxx	Read/Write*	Required
status-flag	health / overridden / fault / out of service	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read/Write*	Required
units	Parts-per-million or Percent	Read	Required
description	"Digital Sensor Address 0 – 191 " and "AI-Box-x Analog Input CH 1 - 8"	Read/Write	Optional

*M-Controller II and Q4-Controller do not support "Write Access"

Binary Input 0 to 15:

Property	Default Value	Access	Conformance Code
object-identifier	binary-input, 0 - 15	Read	Required
object-name	"Switch 1 - 4" and "BI-Box-x-x"	Read	Required
object-type	binary-input (3)	Read	Required
present-value	active / inactive	Read/Write*	Required
status-flag	health / overridden / fault / out of service	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read/Write*	Required
description	"Onboard Switch4: Switch Input 1 - 4" and "BI-Box-x Switch Input CH 1 - 4"	Read/Write	Optional
Polarity	Normal (0)	Read	Optional

*M-Controller II and Q4-Controller do not support "Write Access"

Analog Output 0 - 31:

Property	Default Value	Access	Conformance Code
object-identifier	analog-output, 0 - 31	Read	Required
object-name	"AO-Box-x-x"	Read	Required
object-type	analog-output(1)	Read	Required
present-value	xxxx	Read/Write*	Required
units	2, Milliamperes	Read	Required
status-flag	health / overridden / fault / out of service	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read/Write*	Required
priority	normal	Read	Required
description	"AO-BOX-X: Analog Output CH 1 - 8"	Read/Write*	Optional
priority-array	BAC-Box priority is 10	Read	Required
relinquish-default	0.00	Read	Required

*M-Controller II and Q4-Controller do not support "Write Access"

Binary Output 0 - 63:

Property	Default Value	Access	Conformance Code
object-identifier	binary-output, 0 - 63	Read	Required
object-name	"Relay 1 - 4" or "BO-Box-x-x"	Read	Required
object-type	binary-output(4)	Read	Required
present-value	active / inactive	Read/Write*	Required
status-flag	health / overridden / fault / out of service	Read	Required
event-state	normal(0)	Read	Required
out-of-service	false	Read/Write*	Required
priority	normal	Read	Required
description	"Onboard Relay 1 – 4: 10A Pluggable" and "BO-Box-x: Relay Output CH 1 - 4"	Read/Write*	Optional
priority-array	BAC-Box priority is 10	Read	Required
relinquish-default	Inactive	Read	Required

*M-Controller II and Q4-Controller do not support "Write Access"