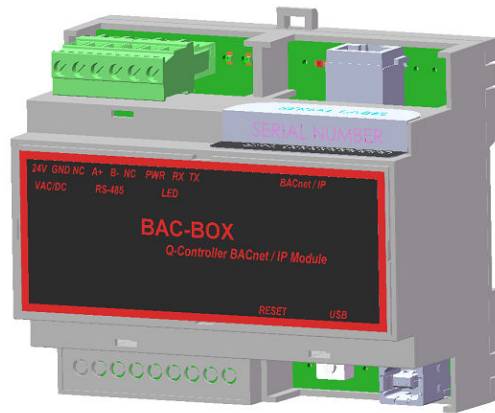


## **QC BAC-BOX PIC STATEMENT**



### **BACnet Protocol Implementation Conformance (PIC) Statement**

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## ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)

### Q-Controller BACnet Converter BACnet Protocol Implementation Conformance Statement

**Date:** 2016-06-03

**Vendor Name:** Quatrosense Environmental Ltd

**Product Name:** QC-BAC-BOX

**Product Model Number:** QC-BAC-BOX

**Application Software Version:** QC-MMI-V1.28

**Firmware Revision:** 0.7.0

**BACnet Protocol Revision:** Version 1, Revision 7

**Product Description:**

Q-Controller BAC-Box allows Q-Controller to communication on a BACnet network. The BAC-Box works as a translator between the two networks allowing Q-Controller 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 Gas System.

**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.

- |                                               |                                               |                                     |
|-----------------------------------------------|-----------------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> ANSI X3.4 | <input type="checkbox"/> IBM™/Microsoft™ DBCS | <input type="checkbox"/> ISO 8859-1 |
| <input type="checkbox"/> ISO 10646 (UCS-2)    | <input type="checkbox"/> ISO 10646 (UCS-4)    | <input type="checkbox"/> JIS X 0208 |

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

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**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.5.6 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/Write | Required         |
| object-name                     | "QC-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"                                                                                                                                               | Read/Write | Required         |
| firmware-revision               | "BAC-BOX-V1.01"                                                                                                                                              | Read       | Required         |
| application-software-version    | "QC-MMI-V1.28"                                                                                                                                               | Read       | Required         |
| Location                        | "Canada"                                                                                                                                                     | Read/Write | Optional         |
| description                     | "Q-Controller Gas Detection System"                                                                                                                          | Read/Write | Optional         |
| protocol-version                | 1                                                                                                                                                            | Read       | Required         |
| protocol-revision               | 10                                                                                                                                                           | Read       | Required         |
| protocol-services-supported     | ReadProperty, ReadPropertyMultiple<br>WriteProperty, DeviceCommunicationControl<br>ReinitializeDevice, TimeSynchronization<br>Who-is, UTCTimeSynchronization | Read       | Required         |
| protocol-object-types-supported | device, analog-input, analog-output, binary-input, binary-output                                                                                             | Read       | Required         |
| object-list                     | Device, 4005<br>Analog Input (max. 192)<br>Analog Output (max. 32)<br>Binary Input (max. 16)<br>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 |
|--------------------------|---------------------------------------------------------------------------|------------|------------------|
| <b>object-identifier</b> | analog-input, 0 – 191                                                     | Read       | Required         |
| <b>object-name</b>       | "Sensor 0 -127" and "AI-Box-x-x"                                          | Read       | Required         |
| <b>object-type</b>       | analog-input(0)                                                           | Read       | Required         |
| <b>present-value</b>     | xxxx                                                                      | Read/Write | Required         |
| <b>status-flag</b>       | health / overridden / fault / out of service                              | Read       | Required         |
| <b>event-state</b>       | normal(0)                                                                 | Read       | Required         |
| <b>out-of-service</b>    | false                                                                     | Read/Write | Required         |
| <b>units</b>             | Parts-per-million or Percent                                              | Read       | Required         |
| <b>description</b>       | "Digital Sensor Address 0 – 191 " and<br>"AI-Box-x Analog Input CH 1 - 8" | Read/Write | Optional         |

Binary Input 0 to 15:

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

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, Milliampere                               | 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         |

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<br>"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         |