

E-Link Gateway Protocol Implementation Conformance Statement

Technical Bulletin

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Document Introduction

This document contains the Protocol Implementation Conformance Statement (PICS) and BACnet® Interoperability Building Blocks for the E-Link Gateway as required by the American National Standards Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 135-2004, BACnet protocol.

The PICS is a written document created by the manufacturer of a device to identify the particular options specified in the BACnet standard and implemented in the device.

BACnet interoperability building blocks are collections of one or more BACnet services. This document includes a listing of the BIBBs currently supported by the E-Link Gateway.

Annex A - Protocol Implementation Conformance Statement (Normative)

Table 1: BACnet Protocol Implementation Conformance Statement

Date	January 2, 2008
Vendor Name	Johnson Controls, Inc.
Product Name	E-Link Gateway
Product Model Numbers	YK-ELNK100-0, YK-ELNKE00-0
Applications Software Version	STD.001.NNN (NNN = Application Version)
Firmware Version	2.3.2.YYY-A (YYY = Firmware Build Number)
BACnet Protocol Revision	Version 1, Revision 4

Product Description

The E-Link Gateway is a specifically designed gateway that is used to enable equipment access to the N2, Modbus Rooftop Unit (RTU), LON, and BACnet Master-Slave/Token-Passing (MS/TP) standard open protocols. All of the data retrieved from the equipment is normalized into Multistate Value (MSV), Analog Value (AV), and Binary Value (BV) standard BACnet objects, and supports the BACnet MS/TP data link layer.

The same firmware may also be packaged as a library and then used within certain pieces of equipment to deliver native BACnet connectivity. The only difference between this application and the E-Link Gateway is that the raw data is coupled in through an Application Programming Interface (API) instead of a hardware link.

BACnet Standardized Device Profile (Annex L)

- BACnet Operator Workstation (B-OWS)**
- BACnet Building Controller (B-BC)**
- BACnet Advanced Application Controller (B-AAC)**
- BACnet Application Specific Controller (B-ASC)¹**
- BACnet Smart Sensor (B-SS)**
- BACnet Smart Actuator (B-SA)**

Note: For a complete listing of the additional BIBBs supported (Annex K), see the *Annex K - BACnet Interoperability Building Blocks (BIBBs) (Normative)* section of this document.

1. Listing pending.

BACnet Interoperability Building Blocks (BIBBs) (Annex K)

Table 2 lists all the BIBBs that are required for the BACnet Application Specific Controller (B-ASC) profile and the support for these BIBBs within the Metasys® system. The BIBBs that are not required are also listed.

Table 2: BACnet B-ASC BIBBs Support

Application Service (B-ASC)	Designation	Supported
Required for B-ASC Profile		
Data Sharing - Read Property - B	DS-RP-B	☒
Data Sharing - Write Property - B	DS-WP-B	☒
Device Management - Dynamic Device Binding - B	DM-DDB-B	☒
Device Management - Dynamic Object Binding - B	DM-DOB-B	☒
Device Management - Device Communication Control - B	DM-DCC-B	☒
Not Required for B-ASC Profile		
Data Sharing - Read Property - A	DS-RP-A	☒
Data Sharing - Read Property Multiple - B	DS-RPM-B	☒
Data Sharing - Write Property - A	DS-WP-A	☒
Data Sharing - Write Property Multiple - B	DS-WPM-B	☒
Data Sharing - COV - A ¹	DS-COV-A	☒
Data Sharing - COV - B ¹	DS-COV-B	☒
Device Management - Dynamic Device Binding - A	DM-DDB-A	☒
Device Management - Reinitialize Device - B	DM-RD-B	☒
Device Management - Time Synchronization - B	DM-TS-B	☒
Device Management - UTC Time Synchronization - B	DM-UTC-B	☒
Device Management - Private Transfer - A ¹	DM-PT-A	☒
Device Management - Private Transfer - B ¹	DM-PT-B	☒
Device Management - Backup and Restore - B	DM-BR-B	☒
A = Initiates B = Executes		

1. Supports Unconfirmed only.

Standard Object Types Supported

The following is a list of the standard object types as defined by ASHRAE. The objects checked are currently supported by this product. See the section in this document for the supported object type for details.

- Accumulator
- Analog Input
- Analog Output
- Analog Value
- Averaging
- Binary Input
- Binary Output
- Binary Value
- Calendar
- Command
- Device
- Event Enrollment
- File
- Group
- Life Safety Point
- Life Safety Zone
- Loop
- Multistate Input
- Multistate Output
- Multistate Value
- Notification Class
- Program
- Pulse Converter
- Schedule
- Trend Log

Analog Value

Dynamically Creatable: No

Dynamically Deletable: No

Table 3: Analog Value

Property Name	Optional	Proprietary	Writable	Range	Property ID	Data Type
OUT_OF_SERVICE			√ ¹		81	Boolean
PRESENT_VALUE			√ ²		85	Real
UNITS			√ ³		117	BACnet engineering units
DESCRIPTION	√		√ ³	24 characters max	28	Character string
RELIABILITY	√				103	BACnet reliability
RELINQUISH_VALUE⁴	√		√		104	Real
PRIORITY_ARRAY⁴	√				87	BACnet priority array
MAX_PRES_VALUE	√				65	Real
MIN_PRES_VALUE	√				69	Real

1. Writable if permitted by the applications.
2. Writable only when the object's source is set to R-Set Point or Network.
3. Any data written to this property is not saved after a power outage.
4. Only supported when the object's source is set to R-Set Point.

Binary Value

Dynamically Creatable: No

Dynamically Deletable: No

Table 4: Binary Value

Property Name	Optional	Proprietary	Writable	Range	Property ID	Data Type
OUT_OF_SERVICE			√ ¹		81	Boolean
PRESENT_VALUE			√ ²		85	
ACTIVE_TEXT ³	√				4	Character string
INACTIVE_TEXT ³	√				46	Character string
DESCRIPTION	√		√ ⁴	24 characters max		
RELIABILITY	√				103	BACnet reliability
RELINQUISH_VALUE ⁵	√		√		104	BACnet binary PV
PRIORITY_ARRAY ⁵	√				87	BACnet priority array

1. Writable if permitted by the applications.
2. Writable only when the object's source is set to R-Setup Flag or Network.
3. Selectable locally. Cannot be changed through BACnet services.
4. Any data written to this property is not saved after a power outage.
5. Only supported when the object's source is set to R-Setup Flag.

Device

Dynamically Creatable: No

Dynamically Deletable: No

Table 5: Device

Property Name	Optional	Proprietary	Writable	Range	Property ID	Data Type
APDU_SEGMENT_TIMEOUT			√ ¹		10	Unsigned
NUMBER_OF_APDU_RETRIES			√ ¹		73	Unsigned
MAX_MASTER			√ ¹	1-127	64	Unsigned
APDU_TIMEOUT	√		√ ¹		11	Unsigned
BACKUP_FAIL_TIMEOUT	√		√ ¹		153	Unsigned
CONFIGURATION_FILES					154	Sequence of BACnet object
DESCRIPTION	√		√ ¹	20 characters max	28	Character string
DST_STATUS	√				24	Boolean
LAST_RESTORE_TIME	√				157	BACnet time stamp
LOCAL_DATE	√				56	Date
LOCAL_TIME	√				57	Time
MAX_INFO_FRAMES	√		√ ¹		63	Unsigned
MAX_SEGMENTS_ACCEPTED	√				107	Unsigned
UTC_OFFSET	√		√ ¹	-900 to 900	119	Integer
LOCATION				20 characters max	58	Character string
LON_PROFILE			√		94302	Character string

1. Any data written to this property is not saved after a power outage.

File

Dynamically Creatable: No

Dynamically Deletable: No

The E-Link Gateway supports only the required properties for the File object.

Multistate Value

Dynamically Creatable: No

Dynamically Deletable: No

Table 6: Multistate Value

Property Name	Optional	Proprietary	Writable	Range	Property ID	Data Type
DESCRIPTION	√		√ ¹	24 characters max	28	Character string
RELIABILITY	√				103	BACnet reliability
STATE_TEXT	√		√ ¹	31 characters max	110	Sequence of character strings
OUT_OF_SERVICE ²			√		81	Boolean
NUMBER_OF_STATES			√		74	Unsigned

1. Any data written to this property is not saved after a power outage.
2. Writable if permitted by the applications.

Data Link Layer Option

- BACnet Internet Protocol (IP) (Annex J)
- BACnet IP (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ANSI/ATA 878.1, 2.5 MB ARCNET network (Clause 8)
- ANSI/ATA 878.1, RS-485 ARCNET network (Clause 8), baud rates: _____
- Master-Slave/Token-Passing (MS/TP) master (Clause 9), baud rates: Auto (default), 9600, 19,200, 38,400, 76,800
- Point-to-Point, EIA 232 (Clause 10), baud rates: _____
- Point-to-Point, modem (Clause 10), baud rates: _____
- LonTalk® protocol (Clause 11), medium: _____
- Other: _____

Segmentation Capability

- Segmented requests supported: Window Size: 2
 Segmented responses supported: Window Size: 2

Device Address Binding

- Yes No **Is static device binding supported?** (required for two-way communication between MS/TP slaves and other devices)

Networking Options

- Router, Clause 6: _____
 Annex H, BACnet Tunneling Router over IP
 BACnet/IP Broadcast Management Device (BBMD)
Does the BBMD support registrations by Foreign Devices? Yes No

Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

- ANSI X3.4 IBM®/Microsoft® Double-Byte Character Set (DBCS) ISO 8859-1
 ISO 10646 Universal Character Set-2 (UCS-2) ISO 10646 (UCS-4) Japanese Industrial Standard (JIS) C 6226

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

None

E-Link Gateway Supported Devices

Table 7 lists all the BACnet standard application services. The checked services are supported by the E-Link Gateway.

**Table 7: BACnet Standard Application Services Support
(Part 1 of 2)**

Application Service	Initiates Requests	Executes Requests
AcknowledgeAlarm	<input type="checkbox"/>	<input type="checkbox"/>
AddListElement	<input type="checkbox"/>	<input type="checkbox"/>
AtomicReadFile	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AtomicWriteFile	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Authenticate	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedCOVNotification	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedEventNotification	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedPrivateTransfer	<input type="checkbox"/>	<input type="checkbox"/>
ConfirmedTextMessage	<input type="checkbox"/>	<input type="checkbox"/>
CreateObject	<input type="checkbox"/>	<input type="checkbox"/>
DeleteObject	<input type="checkbox"/>	<input type="checkbox"/>
DeviceCommunicationControl	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GetAlarmSummary	<input type="checkbox"/>	<input type="checkbox"/>
GetEnrollmentSummary	<input type="checkbox"/>	<input type="checkbox"/>
GetEventInformation	<input type="checkbox"/>	<input type="checkbox"/>
I-Am	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
I-Have	<input type="checkbox"/>	<input checked="" type="checkbox"/>
LifeSafetyOperation	<input type="checkbox"/>	<input type="checkbox"/>
ReadProperty	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ReadPropertyConditional	<input type="checkbox"/>	<input type="checkbox"/>
ReadPropertyMultiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ReadRange	<input type="checkbox"/>	<input type="checkbox"/>
ReinitializeDevice	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RemoveListElement	<input type="checkbox"/>	<input type="checkbox"/>
RequestKey	<input type="checkbox"/>	<input type="checkbox"/>
SubscribeCOV	<input type="checkbox"/>	<input type="checkbox"/>
SubscribeCOVProperty	<input type="checkbox"/>	<input type="checkbox"/>
TimeSynchronization	<input type="checkbox"/>	<input checked="" type="checkbox"/>
UnconfirmedCOVNotification	<input type="checkbox"/>	<input type="checkbox"/>
UnconfirmedEventNotification	<input type="checkbox"/>	<input type="checkbox"/>
UnconfirmedPrivateTransfer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**Table 7: BACnet Standard Application Services Support
(Part 2 of 2)**

Application Service	Initiates Requests	Executes Requests
UnconfirmedTextMessage	<input type="checkbox"/>	<input type="checkbox"/>
UTCTimeSynchronization	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VT-Close	<input type="checkbox"/>	<input type="checkbox"/>
VT-Data	<input type="checkbox"/>	<input type="checkbox"/>
VT-Open	<input type="checkbox"/>	<input type="checkbox"/>
Who-Has	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Who-Is	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WriteProperty	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WritePropertyMultiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>



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