W A L C H E M

IWAKI America Inc.

Intuition-6 BACnet Protocol Implementation Conformance Statement (PICS)

BACnet Protocol Implementation Conformance Statement

Date: 21 Apr 2023
Vendor Name: Iwaki America
Product Name: Intuition-6 Controller
Product Model Number: Intuition-6 (with optional 191733-2-x Ethernet board)
Application Software Version: 4.17-16091   **Firmware Revision:** 4.17-16092   **BACnet Protocol Revision:** 1.17

Product Description:

The Walchem Intuition-6 is a water treatment process controller. Intuition-6 controllers can support BACnet when equipped with the optional 191733-2-x Ethernet board.

BACnet Standardized Device Profiles Supported (Annex L):

☐ BACnet Cross-Domain Advanced Operator Workstation (B-XAWS)

☐ BACnet Advanced Operator Workstation (B-AWS)

☐ BACnet Operator Workstation (B-OWS)

☐ BACnet Operator Display (B-OD)

☐ BACnet Advanced Lighting Workstation (B-ALWS)

☐ BACnet Lighting Operator Display (B-LOD)

☐ BACnet Advanced Life Safety Workstation (B-ALSWS)

☐ BACnet Life Safety Workstation (B-LSWS)

☐ BACnet Life Safety Annunciator Panel (B-LSAP)

☐ BACnet Advanced Access Control Workstation (B-AACWS)

☐ BACnet Access Control Workstation (B-ACWS)

☐ BACnet Access Control Security Display (B-ACSD)

☐ BACnet Advanced Elevator Workstation (B-AEWS)

☐ BACnet Elevator Workstation (B-EWS)

☐ BACnet Elevator Display (B-ED)

☐ BACnet Advanced Lighting Control Station (B-ALCS)

☐ BACnet Lighting Control Station (B-LCS)

☐ BACnet Building Controller (B-BC)

☐ BACnet Advanced Application Controller (B-AAC)

☑ BACnet Application Specific Controller (B-ASC)

☐ BACnet Smart Actuator (B-SA)

☐ BACnet Smart Sensor (B-SS)

☐ BACnet Lighting Supervisor (B-LS)

☐ BACnet Lighting Device (B-LD)

☐ BACnet Advanced Life Safety Controller (B-ALSC)

☐ BACnet Life Safety Controller (B-LSC)

☐ BACnet Advanced Access Control Controller (B-AACC)

☐ BACnet Access Control Controller (B-ACC)

☐ BACnet Advanced Elevator Controller (B-AEC)

☐ BACnet Elevator Controller (B-EC)

☐ BACnet Elevator Monitor (B-EM)

- ☐ BACnet Router (B-RTR)
- ☐ BACnet Gateway (B-GW)
- ☐ BACnet Broadcast Management Device (B-BBMD)
- ☐ BACnet Access Control Door Controller (B-ACDC)
- ☐ BACnet Access Control Credential Reader (B-ACCR)
- ☐ BACnet Secure Connect Hub (B-SCHUB)
- ☐ BACnet General Controller (B-GENERAL)

BACnet Interoperability Building Blocks Supported (Annex K):

DS-RP-B Data Sharing – Read Property

- Intuition-6 supports reading of a single property at a time.

DS-RPM-B Data Sharing – Read Property Multiple

- Intuition-6 supports reading groups of properties with a single BACnet command.

- Intuition-6 does not support message segmentation, so it is possible to request more data than the Intuition-6 can fit into a reply message. In this case, Intuition-6 generates a *Segmentation Not Supported* response. Clients can then reissue smaller **ReadPropertyMultiple** requests or issue an equivalent series of **ReadProperty** requests (which will take longer).

DS-WP-B Data Sharing – Write Property

- Intuition-6 interprets the command to write a single property.

- Intuition-6 does not currently have any writable properties, so all requests generated failure responses.

DM-DDB-B Device Management – Device Dynamic Binding

- Intuition-6 responds to **Who-Is** requests with an **I-Am** packet.

- Intuition-6 supports the optional device instance range limits on the **Who-Is** request.

- Intuition-6 emits a single unsolicited **I-Am** message (1) at startup, (2) when the BACnet service restarts, and (3) whenever a change is made to the Intuition-6's BACnet Device ID.

DM-DOB-B Device Management – Dynamic Object Binding

- Intuition-6 responds to **Who-Has** requests with an **I-Have** packet.

- Intuition-6 supports both the **Who-Has** *<Object Identifier>* and **Who-Has** *<Object Name>* forms of this service, with optional device instance range limits.

- Intuition-6 supports both broadcast and unicast modes of this service.

- Intuition-6 does not emit unsolicited **I-Have** messages.

DM-DCC-B Device Management – Device Communication Control

- Intuition-6 allows BACnet clients to disable and re-enable BACnet communication via the **DeviceCommunicationControl** service.

- Communication can be disabled either until re-enabled, or with a timeout value.

- The **DeviceCommunicationControl** service's optional Password parameter is ignored if present.

Segmentation Capability:

- ☐ Able to transmit segmented messages
  Window Size _____

- ☐ Able to receive segmented messages
  Window Size _____

Standard Object Types Supported:

Device

Intuition-6 properties that apply to the device as a whole

Analog Input

Digital Input (other than DI State type) or Virtual Input

Analog Value

Analog Output or Pulse Relay

Binary Input

DI State input

Binary Value

Discrete Relay

Network Port

Ethernet

Properties supported by each Object Type

Unless otherwise noted, properties are Read-Only over BACnet.

Device Properties

Table 1. Supported Device Object properties

Property	Comments
Object_Identifier	**Object_Identifier** has a factory-assigned value for Device objects that can be changed by the operator. The Device Object_Identifier is required to be unique across all devices on the BACnet network.
Object_Name	The Device's **Object_Name** is the Intuition-6 Name that the operator sets via the Intuition-6's Global Settings. It is required to be unique across all devices on the BACnet network.
Object_Type	8 (Device)
System_Status	0 (Operational) when BACnet is active
Vendor_Name	Iwaki America
Vendor_Identifier	1057 (Iwaki America)
Model_Name	Product Name found on the Intuition-6's Controller Details page
Firmware_Revision	4.17-16092
Application_Software_Version	4.17-16091
Location	The Device's **Location** is the Intuition-6 Location that the operator sets via the Intuition-6's Global Settings.
Description	Intuition-6
Protocol_Version	1
Protocol_Revision	17
Protocol_Services_Supported	Read-Property, Read-Property-Multiple, Write-Property, Device-Communication-Control, Who-Has, Who-Is
Protocol_Object_Types_Supported	Analog Input, Analog Value, Binary Input, Binary Value, Device, Network Port
Object_List	List of BACnet objects currently configured in the controller
Max_APDU_Length_Accepted	832
Segmentation_Supported	3 (None)
Local_Time	
Local_Date	
APDU_Timeout	20000 milliseconds
Number_Of_APDU_Retries	3
Device_Address_Binding	Empty list
Database_Revision	
Serial_Number	Serial Number found on the Intuition-6's Controller Details page

Analog Object Properties

Table 2. Supported properties for Analog objects

Property ID	Analog Input	Analog Value	Comments
Object_Identifier	☑	☑	Assigned by the system. Cannot be modified by the operator.
Object_Name	☑	☑	Device-unique name constructed from operator-entered object name and the object's type/number identifier
Object_Type	☑	☑	0 (Analog Input) or 2 (Analog Value)
Present_Value	☑	☑	
Description	☑	☑	Operator-entered object name
Device_Type	☑	☐	Operator-selected object type
Status_Flags	☑	☑	
Event_State	☑	☑	Always NORMAL because Intuition-6 does not support event reporting
Reliability	☑	☑	
Out_Of_Service	☑	☑	
Units	☑	☑	See below
Min_Pres_Value	☑	☐	
Max_Pres_Value	☑	☐	
Resolution	☑	☑	

Analog Object Units

Supported values for the Units property include the BACnet Engineering Units defined in ASHRAE 135, along with the following proprietary Units values:

Table 3. Proprietary Units for Analog objects

Value	Units	Value	Units	Value	Units
512	mV/unit	513	mv/decade	514	µS/cm
515	mS/m	516	mS/cm	517	PPB/PPM ratio
518	counts	519	Millions of US Gallons	520	/gal
521	/l	522	/m^3	523	gallons/second
524	gallons/day	525	liters/day	527	MG/S
528	MG/M	529	MG/H	530	MG/D
531	ml/minute	532	pulses/minute	533	pulses
534	percent/degree Celsius	535	1/cm	536	mils/year
537	mm/year	538	oz/gal	539	1/seconds

Binary Object Properties

Table 4. Supported properties for Binary objects

Property ID	Binary Input	Binary Value	Comments
Object_Identifier	☑	☑	Assigned by the system. Cannot be modified by the operator.
Object_Name	☑	☑	Device-unique name constructed from operator-entered object name and the object's type/number identifier
Object_Type	☑	☑	3 (Binary Input) or 5 (Binary Value)
Present_Value	☑	☑	
Description	☑	☑	Operator-entered object name
Device_Type	☑	☐	Operator-selected object type
Status_Flags	☑	☑	
Event_State	☑	☑	Always NORMAL because Intuition-6 does not support event reporting
Reliability	☑	☑	
Out_Of_Service	☑	☑	
Polarity	☑	☐	0 (NORMAL)
Inactive_Text	☑	☑	
Active_Text	☑	☑	

Network Port Object Properties

Table 5. Supported properties for Network Port objects

Property ID	Comments
Object_Identifier	Assigned by the system. Cannot be modified by the operator.
Object_Name	Assigned by the system.
Object_Type	56 (Network Port)
Description	Assigned by the system.
Status_Flags	
Reliability	0 (No Fault Detected)
Out_Of_Service	
Network_Type	5 (IPv4)
Network_Number	0 (Local IP Network) because Intuition-6 is not a BACnet Router
Network_Number_Quality	0 (Unknown)
Changes_Pending	
MAC_Address	
APDU_Length	832
Link_Speed	
BACnet_IP_Mode	0 (Normal)
IP_Address	
BACnet_IP_UDP_Port	Data Port configured by operator in Remote Comms settings (default: 47808)
IP_Subnet_Mask	
IP_Default_Gateway	
IP_DNS_Server	
IP_DHCP_Enable	

BACnet Options

Data Link Layer Options:

- ☐ ARCNET (ATA 878.1), 2.5 Mb. (Clause 8)

- ☐ ARCNET (ATA 878.1), EIA-485 (Clause 8), baud rate(s) _____

- ☑ BACnet IP, (Annex J)

- ☐ BACnet IP, (Annex J), BACnet Broadcast Management Device (BBMD)

- ☐ BACnet IP, (Annex J), Network Address Translation (NAT Traversal)

- ☐ BACnet IPv6, (Annex U)

- ☐ BACnet IPv6, (Annex U), BACnet Broadcast Management Device (BBMD)

- ☐ BACnet/ZigBee (ANNEX O)

- ☐ Ethernet, ISO 8802-3 (Clause 7)

- ☐ LonTalk, (Clause 11), medium: _____

- ☐ MS/TP master (Clause 9), baud rate(s): _____

- ☐ MS/TP slave (Clause 9), baud rate(s): _____

- ☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____

- ☐ Point-To-Point, modem, (Clause 10), baud rate(s): _____

- ☐ BACnet Secure Connect (Annex AB)

    - ☐ BACnet Secure Connect Node If direct connections are supported:
      Maximum number of simultaneous direct connections initiated: _____
      Maximum number of simultaneous direct connections accepted: _____

    - ☐ BACnet Secure Connect Hub Function
      Maximum number of simultaneous direct connections accepted: _____

    - ☐ HTTPS Proxy Support
      List the type of HTTPS proxies supported: _____

    - ☐ Additional Cipher suites supported beyond those required for TLS v1.3
      The additional cipher suites supported using the cipher suite names as of the TLS Cipher Suite Registry at IANA (See RFC 8446): _____

    - ☐ Additional Transport Layer Security versions other than v1.3 supported
      The TLS versions other than v1.3 that are supported, including the supported cipher suites for the version beyond those required, using the cipher suite names as defined by the TLS version supported: _____

    - ☐ Generates private keys internally, and provides matching certificate signing requests

    - ☐ DNS host name resolution supported (RFC 1123)

    - ☐ mDNS host name resolution supported (RFC 6762)

- ☐ 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

Character Sets Supported:

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

- ☑ ISO 10646 (UTF-8)
- ☐ IBM™/Microsoft™ DBCS
- ☐ ISO 8859-1
- ☐ ISO 10646 (UCS-2)
- ☐ ISO 10646 (UCS-4)
- ☐ JIS X 0208

Gateway Options

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

n/a