

Sensor HPD2 BACnet PICS

BACnet Protocol

Implementation Conformance Statement

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1. General Information

Date: 15.2.2019
Vendor name: STEINEL
Product name: HPD2
Product model number: HPD2

Application Software version: testing version 1.0
Firmware revision: 1.0
Bacnet Protocol version: 1
Bacnet Protocol revision: 12

Product description:

Temperature, humidity, person and lux detection BACnet Smart Sensor device HPD2.

2. 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)

3. List of all supported BACnet interoperability building blocks (ANNEX K):

DS-RP-B	Data Sharing – Read Property – B
DS-WP-B	Data Sharing – Write Property – B
DS-RPM-B	Data Sharing – Read Property Multiple – B
DS-WPM-B	Data Sharing – Write Property Multiple – B
DS-COVU-B	Data Sharing – Change of Value – Unsolicited – B
DM-TS-B	Device Management – Time Synchronization – B

4. Segmentation capability

- Able to transmit segmented messages
- Able to receive segmented messages

5. BACnet standard object types supported

- | | | |
|--|--|---|
| <input type="checkbox"/> Accumulator | <input type="checkbox"/> Command | <input type="checkbox"/> Multistate Output |
| <input checked="" type="checkbox"/> Analog Input | <input checked="" type="checkbox"/> Device | <input type="checkbox"/> Multistate Value |
| <input type="checkbox"/> Analog Output | <input type="checkbox"/> Event Enrollment | <input type="checkbox"/> Notification Class |
| <input type="checkbox"/> Analog Value | <input type="checkbox"/> File | <input type="checkbox"/> Program |
| <input type="checkbox"/> Averaging | <input type="checkbox"/> Group | <input type="checkbox"/> Pulse Converter |
| <input checked="" type="checkbox"/> Binary Input | <input type="checkbox"/> Live Safety Point | <input type="checkbox"/> Schedule |
| <input type="checkbox"/> Binary Output | <input type="checkbox"/> Live Safety Zone | <input checked="" type="checkbox"/> Trend Log |
| <input type="checkbox"/> Binary Value | <input type="checkbox"/> Loop | |
| <input type="checkbox"/> Calendar | <input type="checkbox"/> Multistate Input | |

6. Datalink layer options

- BACnet IP, (Annex J)
- 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, 57600, 76800, 115200
- 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):
- LonTalk, medium (Clause 11):
- BACnet/Zigbee (Annex O):
- Other:

7. Device address binding

Is static device binding supported? (This is necessary for two-way communication with MS/TP slaves and certain other devices. Yes No

8. Networking options

- Router (Clause 6) – List of all routing configurations, e.g., ACNET-Ethernet, Ethernet-MS/TP, etc.
- Annex H, BACnet Tunneling Router over IP
- BACnet/IP Broadcast Management Device (BBMD)
 - Does the BBDM support registrations by Foreign Devices? Yes No
 - Does the BBDM support network address translation? Yes No

9. 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)

10. Character sets supported

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

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

11. BACnet objects

This part describes the various BACnet objects in detail.

11.1 Device Object

Property	Data Type	Initial Value	R/O/P	Persistence
Apdu Timeout	Unsigned	3000	R (R)	Fixed
Application Software Version	CharacterString[16]	1.0	R (R)	Fixed
Database Revision	Unsigned	0	R (W)	Non Volatile
Daylight Saving Status	Boolean	False	R (W)	Non Volatile
Description	CharacterString[64]	hpd	O (W)	Non Volatile
Device Address Binding	List of BACnetAddressBinding	NULL	R (R)	Fixed
Firmware Revision	CharacterString	0.8.3	R (R)	Fixed
Local Date	BACnet_Date	MM/DD/YYYY	R (W)	Non Volatile
Local Time	BACnet_Time	HH:MM:SS	R (W)	Non Volatile
Location	CharacterString[64]	USA	O (W)	Non Volatile
Max Apdu Length Accepted	Unsigned16	1476	R (R)	Fixed
Number of Apdu Retries	Unsigned8	3	R (R)	Fixed
Object Identifier	BACnetObjectIdentifier	OBJECT_DEVICE	R (W)	Non Volatile
Object List	BACnetARRAY[N] of BACnetObjectIdentifier	HPD Temperature AI-0 Humidity AI-1 Global Illuminance Lux AI-2 Zone 1 - Lux Value AI-3 Zone 2 - Lux Value AI-4 Zone 3 - Lux Value AI-5 Zone 4 - Lux Value AI-6 Zone 5 - Lux Value AI-7 Zone 6 - Lux Value AI-8 Zone 7 - Lux Value AI-9 Zone 8 - Lux Value AI-10 Zone 9 - Lux Value AI-11 Zone 10 - Lux Value AI-12 Detection Zones Present AI-13 Detection Persons AI-14 Zone 1 – Detected Persons AI-15 Zone 2 – Detected Persons AI-16 Zone 3 – Detected Persons AI-17 Zone 4 – Detected Persons AI-18 Zone 5 – Detected Persons AI-19 Zone 6 – Detected Persons AI-20 Zone 7 – Detected Persons AI-21 Zone 8 – Detected Persons AI-22 Zone 9 – Detected Persons AI-23 Zone 10 – Detected Persons AI-24 Trend Log 0 Trend Log 1	R (R)	Fixed
Object Name	CharacterString[32]	HPD	R (W)	Non Volatile
Object Type	BACnetObjectType (Enum.)	Object Device	R (R)	Fixed
Protocol Object Types Supported	BACnetObjectTypes Supported (Bit-String)	Device Analog Input Binary Input Trend Log	R (R)	Fixed

Protocol Revision	Unsigned8	12	R (R)	Fixed
Protocol Services Supported	BACnetProtocolServices Supported (Bit-String)	Read Property Write Property Who-Is Who-Has	R (R)	Fixed
Protocol Version	Unsigned8	1	R (R)	Fixed
Segmentation Supported	BACnetSegmentation (Enum.)	None	R (R)	Fixed
System Status	BACnetDeviceStatus (Enum.)	Operational	R (R)	Non Volatile
Utc Offset	Unsigned32	0	R (R)	Fixed
Vendor Identifier	Unsigned16	1128	R (R)	Fixed
Vendor Name	CharacterString[32]	STEINEL GmbH	R (R)	Fixed

- R (R)Required Property (Readable)
- R (W)Required Property (Read-/Writable)
- O (R)Optional Property (Readable)
- O (W)Optional Property (Read-/Writable)
- P (R)Proprietary Property (Readable)
- P (W)Proprietary Property (Read-/Writable)

11.2 Analog Input Objects

Each analog input object has the same structure.

Property	Data Type	Initial Value	R/O/P	Persistence
Cov Increment	Real	1	O (W)	Non Volatile
Description	CharacterString[64]	HPD Temperature HPD Humidity Global Illuminance Light intensity in this zone (10x) Number of detected zones Total persons number Number of persons in this zone(10x)	O (W)	Fixed
Event State	BACnetEventState	NORMAL	R	Volatile
Object Identifier	BACnetObjectIdentifier	0 ... Temperature 1 ... Humidity 2 ... Global Illuminance Lux 3 ... Zone 1 - Lux Value 4 ... Zone 2 - Lux Value 5 ... Zone 3 - Lux Value 6 ... Zone 4 - Lux Value 7 ... Zone 5 - Lux Value 8 ... Zone 6 - Lux Value 9 ... Zone 7 - Lux Value 10 ... Zone 8 - Lux Value 11 ... Zone 9 - Lux Value 12 ... Zone 10 - Lux Value 13 ... Detection Zones Present 14 ... Detection Persons 15 ... Zone 1 – Detected Persons 16 ... Zone 2 – Detected Persons 17 ... Zone 3 – Detected Persons 18 ... Zone 4 – Detected Persons 19 ... Zone 5 – Detected Persons 20 ... Zone 6 – Detected Persons 21 ... Zone 7 – Detected Persons 22 ... Zone 8 – Detected Persons 23 ... Zone 9 – Detected Persons 24 ... Zone 10 – Detected Persons	R	Fixed
Object Name	CharacterString[32]	Temperature AI-0 Humidity AI-1 Global Illuminance Lux AI-2 Zone 1 - Lux Value AI-3 Zone 2 - Lux Value AI-4 Zone 3 - Lux Value AI-5	R	Fixed

		Zone 4 - Lux Value AI-6 Zone 5 - Lux Value AI-7 Zone 6 - Lux Value AI-8 Zone 7 - Lux Value AI-9 Zone 8 - Lux Value AI-10 Zone 9 - Lux Value AI-11 Zone 10 - Lux Value AI-12 Detection Zones Present AI-13 Detection Persons AI-14 Zone 1 – Detected Persons AI-15 Zone 2 – Detected Persons AI-16 Zone 3 – Detected Persons AI-17 Zone 4 – Detected Persons AI-18 Zone 5 – Detected Persons AI-19 Zone 6 – Detected Persons AI-20 Zone 7 – Detected Persons AI-21 Zone 8 – Detected Persons AI-22 Zone 9 – Detected Persons AI-23 Zone 10 – Detected Persons AI-24		
Object Type	BACnetObjectType (Enum.)	OBJECT_ANALOG_INPUT	R	Fixed
Out of Service	Boolean	False	R (W)	Volatile
Present Value	Real	0.0	R (W) ^{a.)}	Volatile
Reliability	BACnetReliability (Enum.)	NO_FAULT_DETECTED	R (W)	Volatile
Status Flags	BACnetStatusFlags (Bit-String)	false, false, false, false	R	Volatile
Units	BACnetEngineeringUnits (Enum.)	(for temperature) - 62 : Degrees Celsius (for humidity) - 29 : Percent Relative Humidity (for luxes) - 37 : Luxes (for persons) - 95 : No Units	R (W)	Non Volatile

a.) When "Out of Service" flag is true, value is writable. Default writeable value is 50.0f for all Analog Inputs.

Status Flags Property:

The following table describes the possible states of the "Status Flags" property:

Flag	State	Reason
IN_ALARM	false	Value of "Event State" property is NORMAL (0)
	true	Value of "Event State" property is not NORMAL (0)
FAULT	false	Value of "Reliability" property is NO_FAULT_DETECTED
	true	Value of "Reliability" property is not NO_FAULT_DETECTED
OVERRIDDEN	false	Always false
OUT_OF_SERVICE	false	"Present Value" and "Reliability" properties are not writeable via BACnet
	true	"Present Value" and "Reliability" properties are writeable via BACnet

COV Increment Property:

Default value is 1.0f. When the "COV Increment Property" is NaN or greater than 1000,000,000.0 then COV reporting is disabled.

Event State:

The following table describes the possible states of the "Event State" property:

State	Reason
NORMAL(0)	Value of "Reliability" property is NO_FAULT_DETECTED
FAULT(1)	Value of "Reliability" property is not NO_FAULT_DETECTED

Reliability:

The following table describes the possible states of the "Reliability" property:

State	Reason
NO_FAULT_DETECTED (0)	No fault detected
NO_SENSOR (1)	Sensor is damaged or not connected

11.3 Binary Input Objects

Each binary input object has the same structure.

Property	Data Type	Initial Value	R/O/P	Persistence
Description	CharacterString[64]	Is a person present in any zone Is a person present in this zone (10x) Global Illuminance Light intensity in this zone (10x) Number of detected zones Total persons number Number of persons in this zone(10x)	O (W)	Fixed
Event State	BACnetEventState	NORMAL	R	Volatile
Object Identifier	BACnetObjectIdentifier	0 ... Person Presence 1 ... Zone 1 - Person Presence 2 ... Zone 2 - Person Presence 3 ... Zone 3 - Person Presence 4 ... Zone 4 - Person Presence 5 ... Zone 5 - Person Presence 6 ... Zone 6 - Person Presence 7 ... Zone 7 - Person Presence 8 ... Zone 8 - Person Presence 9 ... Zone 9 - Person Presence 10 ... Zone 10 - Person Presence	R	Fixed
Object Name	CharacterString	Person Presence BI-0 Zone 1 - Person Presence BI-1 Zone 2 - Person Presence BI-2 Zone 3 - Person Presence BI-3 Zone 4 - Person Presence BI-4 Zone 5 - Person Presence BI-5 Zone 6 - Person Presence BI-6 Zone 7 - Person Presence BI-7 Zone 8 - Person Presence BI-8 Zone 9 - Person Presence BI-9 Zone 10 - Person Presence BI-10	R	Fixed
Object Type	BACnetObjectType (Enum.)	OBJECT_BINARY_INPUT	R	Fixed
Out of Service	Boolean	False	R (W)	Volatile
Polarity	Boolean	False	R (W)	Volatile
Present Value	Boolean	0	R (W) ^{a.)}	Volatile

a.) When "Out of Service" flag is true, value is writable.

Polarity:

The following table describes the possible states of the "Polarity" property:

State	Reason
NORMAL(0)	Value of "Reliability" property is NO_FAULT_DETECTED
REVERSE(1)	Value of "Reliability" property is not NO_FAULT_DETECTED

11.4 Trend Log Objects

Trend Log 0 - is set by default for temperature measuring.

Trend Log 1 - is set by default for humidity measuring.

Property	Data Type	Initial Value	R/O/P	Persistence
Align Intervals	Boolean	True	R (W)	Volatile
Buffer Size	BACnetEventState	NORMAL	R	Volatile
Description	CharacterString[64]	Trend Log - Temperature Measuring Trend Log - Humidity Measuring	R	Fixed
Enable	Boolean	False	R (W)	Volatile
Event State	BACnetEventState	NORMAL	R	Volatile
Interval Offset	Unsigned32	0	R (W)	Volatile
Log Device Object Property	BACnetDeviceObjectType Reference	Reference to OBJECT_ANALOG_INPUT:0 Reference to OBJECT_ANALOG_INPUT:1		
Log Interval	Unsigned32	100	O (W)	Fixed
Logging Type		0	R (W)	Volatile
Object Identifier	BACnetObjectIdentifier	0 ... Trend Log 0 1 ... Trend Log 1	R	Fixed
Object Name	CharacterString[64]	Trend Log 0 Trend Log 1	R	Fixed
Object Type	BACnetObjectType (Enum.)	OBJECT_TRENDLOG	R	Fixed
Event State	BACnetEventState	NORMAL	R	Volatile
Record Count	Unsigned32	1000	R (W)	Volatile
Start Time	BACnet_Date_Time	1/1/2009 11:59 PM	R (W)	Fixed
Status Flags	BACnetStatusFlags (Bit-String)	false, false, false, false	R	Volatile
Stop Time	BACnet_Date_Time	12/22/2020 11:59 PM	R (W)	Volatile
Stop When Full	Boolean	False	R (W)	Volatile
Total Record Count	Unsigned32	0	R (W)	Volatile
Trigger	Boolean	False	R (W)	Volatile

Enable:

The following table describes the possible states of the “Enable” property:

State	Reason
False	Trend Log is not running
True	Trend Log is running

Log Interval:

The following table describes the possible states of the “Log Interval” property:

Initial Value	Reason
100	Value 100 means logging ANALOG_INPUT value every 1 second ... etc.

Stop When Full:

The following table describes the possible states of the “Stop When Full” property:

State	Reason
False	When Trend Log buffer is full, logging will be continue with rewriting this buffer
True	When Trend Log buffer is full, logging will be stopped

12. First setup

The most important thing for proper Trend Log working is to realize Time Synchronization (update actual time from Client). Device HPD2 has not any backed up RTC.