

Protocol Implementation
Conformance Statement (PICS)

MULTICAL[®] 403
MULTICAL[®] 603
MULTICAL[®] 803



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BACnet® Protocol Implementation Conformance Statement

Date: 2022.01.17
Vendor Name: Kamstrup A/S
Vendor ID: 546
Product Name: BACnet IP, Inputs (In-A, In-B)
Product Model Number: HC-003-81
Application Software Version: A26
Firmware Revision: 1.0.0
BACnet Protocol Revision: 19

Product Description

The BACnet IP module for MULTICAL® heat cooling and water meters communicates BACnet/IP via IPv4.
The module is supported by following products: MULTICAL® 403/603/803.

BACnet Standardized Device Profile (Annex L)

BACnet Application Specific Controller (B-ASC)

List all BACnet Interoperability Building Blocks Supported (Annex K)

| BIBB | Name | BACnet Service | Init | Exec |
|---------------------------|--------------------------------|---------------------------------|------|------|
| Data Sharing | | | | |
| DS-RP-B | Read Property-B | ReadProperty | | X |
| DS-RPM-B | Read Property Multiple-B | ReadPropertyMultiple | | X |
| DS-WP-B | Write Property-B | WriteProperty | | X |
| DS-WPM-B | Write Property Multiple-B | WritePropertyMultiple | | X |
| DS-COV-B | Change Of Value-B | SubscribeCOV | | X |
| | | ConfirmedCOVNotification | X | |
| | | UnconfirmedCOVNotification | X | |
| Device Management | | | | |
| DM-DDB-B | Dynamic Device Binding-B | Who -Is | | X |
| | | I-Am | X | |
| DM-DOB-B | Dynamic Object Binding-B | Who-Has | | X |
| | | I-Have | X | |
| DM-DCC-B | Device Communication Control-B | DeviceCommunicationControl | | X |
| DM-TS-B | Time Synchronization-B | TimeSynchronization | | X |
| DM-UTC-B | UTC Time Synchronization-B | UTCTimeSynchronization | | X |
| DM-RD-B | Reinitialize Device-B | ReinitializeDevice | | X |
| Network Management | | | | |
| NM-FDR-A | Foreign Device Registration-A | Register-Foreign-Device | X | |
| | | Distribute-Broadcast-To-Network | X | |
| | | Forwarded-NPDU | | X |
| | | Original-Unicast-NPDU | X | X |

Segmentation Capability

- Able to transmit segmented messages Window Size ____
 Able to receive segmented messages Window Size ____

List of objects

| Description | ID | Name | Most often used units | Read/Write |
|--------------|-------------------------------|-------------------------------|----------------------------------|------------|
| Device | Last 5 digits of meter number | HC-003-81 | Dimensionless | Read |
| Analog Input | AI-0 | Flow 1 | l/h, m3/h | Read |
| Analog Input | AI-1 | Flow 2 | l/h, m3/h, No Units | Read |
| Analog Input | AI-2 | Actual power | W, kW, MW, j, kj, Gj, (No Units) | Read |
| Analog Input | AI-3 | Actual Power E14/E16 | W, kW, MW, j, kj, Gj, (No Units) | Read |
| Analog Input | AI-4 | Temp. 1 Inlet | degrees Celcius | Read |
| Analog Input | AI-5 | Temp. 2 Outlet | degrees Celcius | Read |
| Analog Input | AI-6 | Temp. 3 | degrees Celcius, No Units | Read |
| Analog Input | AI-7 | Temp. 4 | degrees Celcius, No Units | Read |
| Analog Input | AI-8 | Differential temp. | degrees Kelvin | Read |
| Analog Input | AI-9 | Pressure 1 | Bar, No Units | Read |
| Analog Input | AI-10 | Pressure 2 | Bar, No Units | Read |
| Analog Input | AI-11 | Heat energy E1 | Wh, kWh, MWh | Read |
| Analog Input | AI-12 | E1 high res. | Wh, kWh, MWh | Read |
| Analog Input | AI-13 | Energy E2 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-14 | Cooling energy E3 | Wh, kWh, MWh | Read |
| Analog Input | AI-15 | E3 high res. | Wh, kWh, MWh | Read |
| Analog Input | AI-16 | Energy E4 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-17 | Energy E5 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-18 | Energy E6 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-19 | Energy E7 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-20 | Energy E8 (T1*m3) | m3 x C (No Units) | Read |
| Analog Input | AI-21 | Energy E9 (T2*m3) | m3 x C (No Units) | Read |
| Analog Input | AI-22 | Energy E10 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-23 | Energy E11 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-24 | Energy E12 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-25 | Energy E13 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-26 | Energy E14 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-27 | Energy E15 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-28 | Energy E16 | Wh, kWh, MWh, No Units | Read |
| Analog Input | AI-29 | Tariff 2 | | Read |
| Analog Input | AI-30 | Tariff 3 | | Read |
| Analog Input | AI-31 | Tariff 4 | | Read |
| Analog Input | AI-32 | Heat with discount A1 | kWh, MWh | Read |
| Analog Input | AI-33 | Heat with surcharge A2 | kWh, MWh | Read |
| Analog Input | AI-34 | Volume V1 | l, m3 | Read |
| Analog Input | AI-35 | V1 high res. | l, m3 | Read |
| Analog Input | AI-36 | Volume V2 | l, m3, No Units | Read |
| Analog Input | AI-37 | Pulse input A | l, m3, kWh, MWh | Read |
| Analog Input | AI-38 | Pulse input B | l, m3, kWh, MWh | Read |
| Analog Input | AI-39 | Pulse input A2 | l, m3, kWh, MWh, No Units | Read |
| Analog Input | AI-40 | Pulse input B2 | l, m3, kWh, MWh, No Units | Read |
| Analog Input | AI-41 | Coefficient of performance CP | | Read |
| Analog Input | AI-42 | T5 Limit | | Read |
| Analog Input | AI-43 | VB Power | | Read |
| Analog Input | AI-44 | QP Avg Time | Seconds, Minutes | Read |
| Analog Input | AI-45 | Tariff Limit 2 | | Read |
| Analog Input | AI-46 | Tariff Limit 3 | | Read |
| Analog Input | AI-47 | Tariff Limit 4 | | Read |
| Analog Input | AI-48 | Mass 1 | Ton, No Units | Read |
| Analog Input | AI-49 | Mass 2 | Ton, No Units | Read |

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| | | | | |
|------------------------|--------|---------------------------------------|-----------------|------------|
| Analog Input | AI-50 | Mass 3 | Ton, No Units | Read |
| Analog Input | AI-51 | Mass 4 | Ton, No Units | Read |
| File | F-0 | Firmware upgrade file | - | Read/Write |
| Network Port | N-0 | Ethernet port | - | Read/Write |
| Positive Integer Value | PIV-0 | Info code | No Units | Read |
| Positive Integer Value | PIV-1 | Hour Counter | Hours | Read |
| Positive Integer Value | PIV-2 | Error Hour Counter | Hours | Read |
| Positive Integer Value | PIV-3 | Config No 1 | No Units | Read |
| Positive Integer Value | PIV-4 | Config No 2 | No Units | Read |
| Positive Integer Value | PIV-5 | Config No 3 | No Units | Read |
| Positive Integer Value | PIV-6 | Config No 4 | No Units | Read |
| Positive Integer Value | PIV-7 | Meter No (high) | No Units | Read |
| Positive Integer Value | PIV-8 | Meter No (low) | No Units | Read |
| Positive Integer Value | PIV-9 | Serial Number | No Units | Read |
| Positive Integer Value | PIV-10 | Meter type | No Units | Read |
| Positive Integer Value | PIV-11 | Meter Main/Sub Type | No Units | Read |
| Positive Integer Value | PIV-12 | Fluid type and Concentration | No Units | Read |
| Positive Integer Value | PIV-13 | PQT Flow set point | l/h | Read/Write |
| Positive Integer Value | PIV-14 | PQT Power set point ($x*10^{-1}$) | kW | Read/Write |
| Positive Integer Value | PIV-15 | PQT Delta t set point ($x*10^{-2}$) | degrees Kelvin | Read/Write |
| Positive Integer Value | PIV-16 | PQT t2 set point ($x*10^{-2}$) | degrees Celcius | Read/Write |

The module have no objects that are dynamically creatable or deletable.

Device Object

| Property Identifier | Property Datatype | Conformance Code | Value |
|---------------------------------|--|------------------|---|
| Active COV Subscriptions | BACnetLIST of BACnetCOVSubscription | R | {} |
| APDU_Timeout | Unsigned | R | 3000 |
| Application_Software_Version | CharacterString | R | "A26" |
| Database_Revision | Unsigned | R | 0 |
| Daylight_Savings_Status | BOOLEAN | R | FALSE |
| Description | CharacterString | R | "BACnet/IP module for MULTICAL xx3" |
| Device_Address_Binding | List of DeviceAddressBinding | R | {} |
| Firmware_Revision | CharacterString | R | "1.0.0" |
| Last_Restart_Reason | BACnetRestartReason | R | UNKNOWN, COLDSTART, WARMSTART, ACTIVATE_CHANGES |
| Local_Date | Date | R | yy:mm:dd, wday |
| Local_Time | Time | R | hh:mm:ss:ms |
| Max_APDU_Length_Accepted | Unsigned | R | 1476 |
| Model_Name | CharacterString | R | "HC-003-81" |
| Number_Of_APDU_Retries | Unsigned | R | 3 |
| Object_Identifier | BACnetObjectIdentifier | W | (Device, 0-4194303) |
| Object_List | BACnetArray[N] of BACnetObjectIdentifier | R | { (device, last 5 digits of meter number), (analog-input 0-51), (file 0), (network-port 0), (positive-integer-value,0-16) } |
| Object_Name | CharacterString | W | "HC-003-81" (Max. 31 characters) |
| Object_Type | BACnetObjectType | R | Device |
| Property List | BACnetARRAY[N] of BACnetPropertyIdentifier | R | {{26 Elements}} |
| Protocol_Object_Types_Supported | ProtocolObjectTypesSupported | R | Analog Input Device File Positive Integer Value Network Port |
| Protocol_Revision | Unsigned | R | 19 |
| Protocol_Services_Supported | BACnetServicesSupported | R | subscribeCOV atomicReadFile atomicWriteFile readProperty readPropertyMultiple writeProperty writePropertyMultiple deviceCommunicationControl reinitializeDevice timeSynchronization whoHas whols utcTimeSynchronization |
| Protocol_Version | Unsigned | R | 1 |
| Restart Notification Recipients | BACnetList of BACnetRecipient | R | |
| Segmentation_Supported | BACnetSegmentation | R | no-segmentation |
| System_Status | BACnetDeviceStatus | R | OPERATIONAL |
| Time Of Device Restart | BACnetTimeStamp | R | yy:mm:dd hh:mm:ss:ms |
| UTC_Offset | INTEGER | W | 0 (-1440 to 1440) |
| Vendor_Identifier | Unsigned16 | R | 546 |
| Vendor_Name | CharacterString | R | "Kamstrup A/S" |

Analog-input Object

| Property Identifier | Property Datatype | Conformance Code | Value |
|---------------------|--|------------------|--|
| COV_Increment | REAL | W | 1 |
| Description | CharacterString | R | Object Name plus unit description |
| Event_State | BACnetEventState | R | NORMAL |
| Object_Identifier | BACnetObjectIdentifier | R | (analog-input, 0-51) |
| Object_Name | CharacterString | R | See standard object table above |
| Object_Type | BACnetObjectType | R | analog-input |
| Out_Of_Service | BOOLEAN | W | TRUE or FALSE |
| Present_value | REAL | R (W) | - |
| Property List | BACnetARRAY[N] of BACnetPropertyIdentifier | R | {[8 Elements]} |
| Reliability | BACnetReliability | R (W) | NO_FAULT_DETECTED, NO_SENSOR |
| Status_Flags | BACnetStatusFlags | R | { IN_ALARM, FAULT, OVERRIDDEN, OUT_OF_SERVICE } |
| Unit | BACnetEngineeringUnits | R | See standard object table above |

Positive Integer Value

| Property Identifier | Property Datatype | Conformance Code | Value |
|---------------------|--|------------------|--|
| COV_Increment | REAL | W | 1 |
| Description | CharacterString | R | Object Name plus unit description |
| Object_Identifier | BACnetObjectIdentifier | R | (positive-integer-value, 0-16) |
| Object_Name | CharacterString | R | See standard object table above |
| Object_Type | BACnetObjectType | R | positive-integer-value |
| Out_Of_Service | BOOLEAN | W | TRUE or FALSE |
| Present_value | REAL | R (W) | - |
| Property List | BACnetARRAY[N] of BACnetPropertyIdentifier | R | {[7 Elements]} |
| Reliability | BACnetReliability | R (W) | NO_FAULT_DETECTED, NO_SENSOR |
| Status_Flags | BACnetStatusFlags | R | { IN_ALARM, FAULT, OVERRIDDEN, OUT_OF_SERVICE } |
| Unit | BACnetEngineeringUnits | R | See standard object table above |

File Object

| Property Identifier | Property Datatype | Conformance Code | Value |
|---------------------|--|------------------|---|
| Archive | BOOLEAN | W | TRUE or FALSE |
| Description | CharacterString | R | "fwupgrade.bin" |
| File_Access_Method | BACnetFileAccessMethod | R | STREAM_ACCESS |
| File_Size | Unsigned | W | 0 |
| File_Type | CharacterString | R | "FIRMWARE" |
| Modification_Date | BACnetDateTime | R | Timestamp for last time filestream or file size was modified. |
| Object_Identifier | BACnetObjectIdentifier | R | (file-object, 0) |
| Object_Name | CharacterString | R | "Firmware upgrade file" |
| Object_Type | BACnetObjectType | R | FILE |
| Property List | BACnetARRAY[N] of BACnetPropertyIdentifier | R | {[7 Elements]} |
| Read_Only | BOOLEAN | R | FALSE |

Network-port Object

| Property Identifier | Property Datatype | Conformance Code | Value |
|--------------------------|--|------------------|--|
| APDU_Length | Unsigned | R | 1476 |
| BACnet_IP_Mode | BACnetIPMode | W | NORMAL, FOREIGN |
| BACnet_IP_UDP_Port | Unsigned16 | W | Range 1-65535 |
| Changes_Pending | BOOLEAN | R | TRUE or FALSE |
| Description | CharacterString | R | Object Name plus unit description |
| FD_BBMD_Address | BACnetHostNPort | W | Valid IP Address or DNS name and port |
| FD_Subscription_Lifetime | Unsigned16 | W | |
| IP_Address | OCTET STRING | W | - |
| IP_Default_Gateway | OCTET STRING | W | - |
| IP_Dhcp_Enable | BOOLEAN | W | TRUE or FALSE |
| IP_Dns_Server | BACnetARRAY[N] of OCTET STRING | W | - |
| IP_Subnet_Mask | OCTET STRING | W | - |
| Link_Speed | Real | R | 0 (UNKNOWN) |
| MAC_Address | OCTET STRING | R | Six octet combination of IP Address and BACnet_IP_UDP_Port |
| Network_Number | Unsigned16 | R | 0 |
| Network_Number_Quality | BACnetNetworkNumberQuality | R | UNKNOWN |
| Network_Type | BACnetNetworkType | R | IPV4 |
| Object_Identifier | BACnetObjectIdentifier | R | (positive-integer-value, 0-12) |
| Object_Name | CharacterString | R | See standard object table above |
| Object_Type | BACnetObjectType | R | positive-integer-value |
| Out_Of_Service | BOOLEAN | R | FALSE |
| Property List | BACnetARRAY[N] of BACnetPropertyIdentifier | R | {[21 Elements]} |
| Protocol_Level | BACnetProtocolLevel | R | BACNET_APPLICATION |
| Reliability | BACnetReliability | R | NO_FAULT_DETECTED, REFERENCED_OBJECT_FAULT |
| Status_Flags | BACnetStatusFlags | R | { IN_ALARM, FAULT, OVERRIDDEN, OUT_OF_SERVICE } |

Data Link Layer Options

- BACnet IP, (Annex J)

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 ANSIX3.4
 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: N/A