kamstrup

Data sheet

BACnet® MS/TP-module

for MULTICAL® 403 and 603

- BTL certified and listed
- Compatible with ANSI/ASHRAE 135/ISO 16484-5
- Complies with BACnet® Application Specific Controller Profile
- Communication speed up to 115200 baud
- Two pulse inputs for additional water and electricity meters
- Supports multiple property reading and writing
- Supports automatic device and object discovery
- Supports BACnet® COV notifications
- Supports BACnet® automatic time synchronization
- RS-485 galvanic isolated from meter

Contents

Description

A new high performance and flexible BACnet® module has been introduced to the MULTICAL® 403 and MULTICAL® 603 energy meters. The BACnet® MS/TP communication module enables the MULTICAL® 403 and MULTICAL® 603 meters to be integrated into a building automation system or to participate in industrial applications. The BACnet® MS/TP is based on an RS-485 communication bus. The module is BTL certified and listed, which guarantees compatibility with the BACnet® standard.

Application
The BACnet® module is designed with focus on high flexibility to fulfill a wide pallet of applications. The BACnet® module supports rapid exchange of meter data, e.g. flow, energy and temperatures to facilitate monitoring and control tasks.

Analysis
The MULTICAL® 403 and 603 energy meters supports high quantities of data, and all relevant data for analysis can be read out.

Alarms
The MULTICAL® 403 and 603 info codes for general alarm, flow error, temperature, error, water leakage, pipe burst, air in the system, and wrong flow direction are available to the BACnet® system.

Controlling and regulating
The module supports Change Of Values (COV). This is part of a BACnet® event notification. BACnet® clients, e.g. a PLC, may subscribe on events available from the MULTICAL® 403 and 603 variables. This function results in fast response times, which is needed for alarm and control purposes.

Installation

The module is easily mounted into the module slot of the meter. Normally no configuration is necessary. A configuration might only be necessary if a specific address is required. Configuring of the BACnet® MAC address, object number or BACnet® object name, can be done with METERTOOL HCW either through the optical read-out head on the MULTICAL® or through the 10 pole connector on the module.

The module is power supplied from the meter's internal 230 VAC or 24 VAC supply module.

Cable connections

Wire size
Max cable size 1.5 mm²
BACnet® connection
Terminal 137: RS-485 A/-
Terminal 138: RS-485 B/+
Terminal 139: RS-485 GND
Pulse input connection
Terminal 65: Pulse input A/In-A (+)
Terminal 66: Pulse input A/In-A (-)
Terminal 67: Pulse input B/In-B (+)
Terminal 68: Pulse input B/In-B (-)

Cable connections

Screw terminals for the BACnet® RS-485 signals A/- , B/+ twisted pair and GND.

Pulse input connection

Screw terminals for connection of the two Pulse inputs. The pulse inputs are used to collect and accumulate pulses remotely, e.g. from water meters and electricity meters. The pulse inputs are physically placed on the BACnet® module, however the accumulation and data logging of values are made by the MULTICAL® 403 and 603 calculator.

Communication from module

Protocol
BACnet® BTL certified according with ASHRAE 135 and ISO 16484-5

BACnet® MS/TP Addressing
The module can be addressed as master in the MAC address range 1-127 and as a slave when configured in the MAC address range 128-254. Default the MAC address of the BACnet® module is determined by the last three digits of the meter's customer number. The BACnet® Object Number is per default set by the meter's costumer number. Both the MAC address and the object number can be read in the MULTICAL® display.

Note: When a module address is in the slave address range, 128 – 254, the BACnet® master will only know the presence of those slave-modules that are setup explicit in the master.

Module Identification
Apart from the addressing above, the BACnet® module also has a object name. This name is just a text describing the module in more detail. The default is name is "Kamstrup HC-003-66" followed by the customer number.

Communication speed
The modules support automatic baud rate detection from 9600 to 115200 baud.

Supported BACnet® Services
The BACnet® module supports the following services:

- BACnet® Application Specific Controller (B-ASC)
- BACnet® Master Mode using address range 1-127
- BACnet® Slave Mode using address range 128-254

BACnet® Object Map

Description	ID	Name	Used units	Present in MULTICAL®	
				403	603
Device	Last 5 digits of meter number	Kamstrup HC-003-66		•	•
Analog Input	AI-0	Flow 1	l/h, m^3/h	•	•
Analog Input	AI-1	Flow 2	l/h, m^3/h		•
Analog Input	AI-2	Actual power	W, kW, MW, j,kj,Gj	•	•
Analog Input	AI-3	Temp. 1 Inlet	°C	•	•
Analog Input	AI-4	Temp. 2 Outlet	°C	•	•
Analog Input	AI-5	Temp. 3	°C		•
Analog Input	AI-6	Temp. 4	°C		•
Analog Input	AI-7	Differential temp.	°K	•	•
Analog Input	AI-8	Pressure 1	bar		•
Analog Input	AI-9	Pressure 2	bar		•
Analog Input	AI-10	Heat energy E1	Wh,kWh, MWh	•	•
Analog Input	AI-11	Energy E2	Wh,kWh, MWh		•
Analog Input	AI-12	Cooling energy E3	Wh,kWh, MWh	•	•
Analog Input	AI-13	Energy E4	Wh,kWh, MWh		•
Analog Input	AI-14	Energy E5	Wh,kWh, MWh		•
Analog Input	AI-15	Energy E6	Wh,kWh, MWh		•

BACnet® Object Map

Description	ID	Name	Used units	Present in MULTICAL®	
				403	603
Analog Input	AI-16	Energy E7	Wh,kWh, MWh		•
Analog Input	AI-17	Energy E8 (T1*m3)	m^3 x C	•	•
Analog Input	AI-18	Energy E9 (T2*m3)	m^3 x C	•	•
Analog Input	AI-19	Energy E10	Wh,kWh, MWh, GWh		•
Analog Input	AI-20	Energy E11	Wh,kWh, MWh, GWh		•
Analog Input	AI-21	Tariff 2	-	•	•
Analog Input	AI-22	Tariff 3	-	•	•
Analog Input	AI-23	Tariff 4	-	•	•
Analog Input	AI-24	Heat with discount A1	kWh, MWh	•	•
Analog Input	AI-25	Heat with surcharge A2	kWh, MWh	•	•
Analog Input	AI-26	Volume V1	l, m^3	•	•
Analog Input	AI-27	Volume V2	l, m^3		•
Analog Input	AI-28	Pulse input A	l, m3, kWh, MWh	•	•
Analog Input	AI-29	Pulse input B	l, m3, kWh, MWh	•	•
Analog Input	AI-30	Pulse input A2	l, m3, kWh, MWh		•
Analog Input	AI-31	Pulse input B2	l, m3, kWh, MWh		•
Analog Input	AI-32	Coefficient of performance CP	-	•	•
Analog Input	AI-33	T5 Limit	°C	•	•
Analog Input	AI-34	VB Power	-	•	•
Analog Input	AI-35	QP Avg Time	Seconds,minutes	•	•
Analog Input	AI-36	Tariff Limit 2	-	•	•
Analog Input	AI-37	Tariff Limit 3	-	•	•
Analog Input	AI-38	Tariff Limit 4	-	•	•
Analog Input	AI-39	Mass 1	ton		•
Analog Input	AI-40	Mass 2	ton		•

BACnet® Object Map

Description	ID	Name	Used units	Present inMULTICAL®	
				403	603
Positive Integer Value	PIV-0	Info code	-	•	•
Positive Integer Value	PIV-1	HourCounter	Hours	•	•
Positive Integer Value	PIV-2	ErrorHourCounter	Hours	•	•
Positive Integer Value	PIV-3	Config No 1	-	•	•
Positive Integer Value	PIV-4	Config No 2	-	•	•
Positive Integer Value	PIV-5	Config No 3	-	•	•
Positive Integer Value	PIV-6	Config No 4	-	•	•
Positive Integer Value	PIV-7	Meter No (high)	-	•	•
Positive Integer Value	PIV-8	Meter No (low)	-	•	•
Positive Integer Value	PIV-9	Serial Number	-	•	•
Positive Integer Value	PIV-10	Meter Type	-	•	•
Positive Integer Value	PIV-11	Meter Main/Sub Type	-	•	•

BACnet® Interoperability Building Blocks (BIBB's)

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
		ConfirmedCOVNotification	X	
		UnconfirmedCOVNotification	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

Technical data

Physical	
Usage	Only suitable for installation in MULTICAL® 403 and 603
Communication	
Protocol	BACnet® MS/TP, ANSI/ASHRAE 135.1-2016
BACnet® vendor ID	546 (Kamstrup)
Object name	Kamstrup HC-003-66
Instance number	5 last digits of the serial number
MAC Address range	1 – 254
Baud rates (Auto)	9600 baud 19200 baud 38400 baud 57600 baud 76800 baud 115200 baud
Bus Specific	
Type	2-wire RS-485 with GND
Galvanic isolation	According to PTB-A50.1
Bus termination	External 120 Ω resistor between A/- and B/+
Supply	
Power supply	MULTICAL® 403 and 603 with 230 VAC supply module MULTICAL® 403 and 603 with 24 VAC supply module
Environment	
Operational temperature	5°C – 55 °C
Humidity	25 – 85 %RH non-condensing.
Programming	
Configuration and firmware update	Via the optical read-out head or via the multi-pole connector on the module using the METERTOOL HCW.
Markings/approvals	
CE and EN 1434 in conjunction with the type approval of MULTICAL® 403 and MULTICAL® 603	
BTL certification	BACnet® Application Specific Controller Profile (B-ASC)
Related documentation	BACnet® Protocol Implementation Conformance Statement (PICS) - (5512-2063)

Ordering

Description	Order No.
BACnet® MS/TP module + 2 pulse inputs	HC-003-66
Optical read-out head w/USB	6699-099
Optical read-out head w/RS-232 D-SUB 9F	6699-102
USB Configuration cable for HC modules	6699-035
METERTOOL HCW	www.kamstrup.com

Configuration

	XX	Y	Y	ZZZ
Product type of module				
BACnet® MS/TP modul + 2 pulse inputs (In-A, In-B)	66	0	0	100
Communication speed				
Auto		0		
Parity/Stop bits				
Auto			0	
Data content configuration				
Default datagram				100
Reserved				ZZZ

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