

Data sheet

Wired M-Bus Modules

for MULTICAL® 403

- For billing, analysis and regulation purposes
- Configurable datagrams
- Read-out of loggers
- Up to 19200 baud communication speed
- Primary/secondary/enhanced secondary addressing
- Two pulse inputs or two pulse outputs
- Remote software update
- According to M-Bus standard EN 13757:2013
- According to OMS TR02:2015



Introduction

A new generation of advanced high-performance and flexible M-Bus modules has been introduced with the MULTICAL® 403 energy meter family.

A new unique power control design allows intensive readings without reducing the battery lifetime of the meter, while maintaining the galvanic isolation between the meter and the M-Bus network.

The modules can be factory or in-field configured with different pre-defined datagrams or configured with customer-specified datagram, that can be tailor-made for specific products and applications.

The modules fulfill the requirements of the M-Bus standard EN 13757:2013 as well as the OMS TR02:2015 and can be used in a wide variety of applications which use M-Bus protocol.

Applications

The M-Bus module is designed with focus on high flexibility to fulfill a wide range of applications.

Analysis

MULTICAL® 403 supports high quantities of data and all relevant data for analysis can be read out. This is valid for both actual meter data as well as for historical logger data.

Billing

All relevant data for billing purposes can be read out from the MULTICAL® 403.

Emulation

With the flexible data configuration, MULTICAL® 403 can be configured to send out datagrams that match a number of different meters and modules from different manufacturers.

Controlling and regulating

The module can deliver online data in 10 second intervals for controlling and regulating purposes at a very high communication speed.

M-Bus addressing

The modules support primary, secondary and enhanced secondary addressing.

Primary addressing (000-250)

When nothing else is specified, the M-Bus modules automatically use the last 2-3 digits of the MULTICAL® 403 customer number as the primary address.

During the order process or by use of the METERTOOL HCW programming software, dedicated primary addresses can be selected. Furthermore, the primary address can be changed via the M-Bus network using standardised M-Bus commands and via the front keys of the MULTICAL®.

Secondary addressing (M-Bus ID no. 00000000-99999999)

The last eight digits of the customer number are used as M-Bus ID number for secondary addressing. During the order process or by the use of METERTOOL HCW programming software, the secondary addresses can be selected. Furthermore, the M-Bus ID number for secondary addressing can be changed via the M-Bus network using standardised M-Bus commands.

Applications

M-Bus addressing

Enhanced secondary addressing

(M-Bus ID no. 00000000-99999999)/(M-Bus fabrication no. 00000000-99999999)

Enhanced secondary addressing is supported by adding the meter’s serial number as M-Bus fabrication number to the secondary address.

Wild card search with break detection (00000000-FFFFFFF)

The M-Bus modules supports wild card search for an easy search for connected meters. Some or all digits of the meter’s secondary and/or enhanced secondary addresses can be replaced with wild cards when searching for meters in an M-Bus network. The integrated break detection functionality eases the meter search on the M-Bus network.

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 primary address is required. Configuring the primary address can be done with METERTOOL HCW, directly via the meter’s front keys or via the M-Bus network.

By using the two sets of M-Bus screw terminals, the M-Bus cable can easily be looped through the meter whereby external junction boxes can be omitted.

The M-Bus modules can be used in meters with both battery and mains supply.

Wiring

Module with pulse inputs (HC-003-20)	Module with pulse outputs (HC-003-21)
Max cable size 1.5 mm ²	Max cable size 1.5 mm ²
M-Bus connection	M-Bus connection
Terminal 24: M-Bus connection, polarity independent	Terminal 24: M-Bus connection, polarity independent
Terminal 25: M-Bus connection, polarity independent	Terminal 25: M-Bus connection, polarity independent
Pulse input connection	Pulse output connection
Terminal 65: Pulse input A/In-A (+)	Terminal 16: Pulse output C/Out-C (+)
Terminal 66: Pulse input A/In-A (-)	Terminal 17: Pulse output C/Out-C (-)
Terminal 67: Pulse input B/In-B (+)	Terminal 18: Pulse output D/Out-D (+)
Terminal 68: Pulse input B/In-B (-)	Terminal 19: Pulse output D/Out-D (-)



Communication

Communication is in accordance with the M-Bus standard EN 13757:2013.

Communication speed

The modules support 300, 2400, 9600 and 19200 baud communication speed and automatically detect the communication speed used by the M-Bus master.

Communication interval

The modules do not have any form of communication limitations.

Reading intervals ≥ 10 seconds may not reduce the battery lifetime of the meter at any communication speed.

Communication via optical read-out head

Apart from the configurations in MULTICAL® 403 itself, the primary M-Bus address can be configured via the optical read-out head.

Communication from M-Bus master

The following parameters can be configured with M-Bus commands via the connected M-Bus master:

- Primary address
- M-Bus ID number for secondary addressing
- Preset of the meter's pulse inputs
- Meter clock synchronization

The M-Bus modules support download of new module software for implementing e.g. new functionality in already installed module, as well as for reconfiguring of the datagram. These functionalities are supported by the Kamstrup READY program platform.

Pulse inputs

The M-Bus module HC-003-20 is equipped with two pulse inputs, In-A and In-B, to collect and accumulate pulses remotely, e.g. from water meters and electricity meters. The pulse inputs are physically placed on the M-Bus module. However, the accumulation and data logging of values are made by the MULTICAL® 403 calculator.

Pulse outputs

The M-Bus module HC-003-21 has two configurable pulse outputs, Out-C and Out-D, which are suitable for pulsing out selected registers from MULTICAL® 403. The pulse outputs are physically placed on the M-Bus module, but the pulses are made by the MULTICAL® 403 calculator.

Communication from M-Bus module

A number of different datagrams are available when ordering meters. Further datagrams can be configured with METERTOOL HCW and READY.

Communication

Examples of available datagrams

MULTICAL® 403 Standard profile	MULTICAL® 403 Tariff profile	MULTICAL® 403 DACH profile	MULTICAL® 403 Control profile
Heat energy E1	Heat energy E1	Heat energy E1	Heat energy E1
Cooling energy E3	Cooling energy E3	Cooling energy E3	Cooling energy E3
Energy E8 (T1 x m ³)	Volume V1	Heat with discount A1	Volume V1
Energy E9 (T2 x m ³)	Pulse input A	Heat with surcharge A2	Temp. 1 Inlet
Volume V1	Pulse input B	Volume V1	Temp. 2 Outlet
Pulse input A	Tariff 2	Pulse input A	Differential temp.
Pulse input B	Tariff 3	Pulse input B	Actual power
Hour counter	Tariff 4	Tariff 2	Actual flow
Error hour counter	Hour counter	Tariff 3	Info
Temp. 1 Inlet	Error Hour Counter	Tariff 4	Meter type
Temp. 2 Outlet	Temp. 1 Inlet	Temp. 1 Inlet	Serial Number
Differential temp.	Temp. 2 Outlet	Temp. 2 Outlet	Module configuration
Actual power	Differential temp.	Differential temp.	Module SW version
Max power this month	Actual power	Temp. 5 Ref. Outlet	
Actual flow	Max power this month	Actual power	
Max flow this month	Actual flow	Max power this month	
Info	Max flow this month	Actual flow	
Date / time	Info	Max flow this month	
Heat energy E1, Target	Date / time	Info	
Cooling energy E3, Target	Heat energy E1, Target	Heat energy E1, Target	
Energy E8 (T1 x m ³), Target	Cooling energy E3, Target	Cooling energy E3, Target	
Energy E9 (T2 x m ³), Target	Volume V1, Target	Pulse input A, Target	
Volume V1, Target	Pulse input A, Target	Pulse input B, Target	
Pulse input A, Target	Pulse input B, Target	Heat with discount A1, Target	
Pulse input B, Target	Tariff 2, Target	Heat with surcharge A2, Target	
Max power, Target	Tariff 3, Target	Target	
Max flow, Target	Tariff 4, Target	Tariff 2, Target	
Target date	Max power, Target	Tariff 3, Target	
Meter type	Max flow, Target	Tariff 4, Target	
Serial Number	Target date	Max power, Target	
Module configuration	Meter type	Target date	
Module SW version	Serial Number	Meter type	
	Module configuration	Serial Number	
	Module SW version	Module configuration	
		Module SW version	

Data loggers via M-Bus

Data from the meter's historical loggers can be read out with M-Bus commands.

The following loggers are available for reading:

- Yearly logger
- Monthly logger
- Daily logger
- Minute loggers

The available registers depend on the meter configuration.

Reading the logger is very flexible, and both the number of logs as well as the log period can be selected.

Customer-specified datagrams

Dedicated datagrams can be specified in cooperation with Kamstrup A/S. The datagram can be sent to already installed meters via METERTOOL HCW, connected to the module via the connector on the module. Using READy, an update via the M-Bus network is also possible.

Module update

The module software as well as the module configuration can be updated with READy via the M-Bus master and directly through the connector on the module with METERTOOL HCW.

Technical specifications

Physical

Only suitable for installation in MULTICAL® 403.

Galvanic isolated according to PTB-A50.1.

Communication

Read-out speed 300/2400/9600/19200 baud with automatic speed detection

Communication interval ≥ 10 secs.

Protocol EN 13757:2013

Configuration METERTOOL HCW via module connector
READY via M-Bus master

Supply

Power supply Applicable in MULTICAL® 403 with battery and mains supply

Power consumption 1 unit load (1.5 mA) per M-Bus slave

Rin / Cin 422 Ω /0.5 nF

Max cable resistance 29 Ω /180 nF per pair

Operational temperature 5 - 55°C

Markings/approvals

EN 1434 in conjunction with the type approval of MULTICAL® 403

EN 13757

CE approval

Ordering

Description

Wired M-Bus module with pulse inputs for MULTICAL® 403
 Wired M-Bus module with pulse outputs for MULTICAL® 403
 M-Bus Master MultiPort 250D
 M-Bus Master MultiPort 250L
 USB configuration cable for H/C-modules
 Infrared optical read-out head w/USB A plug
 Infrared optical read-out head w/RS-232 D-SUB 9F
 METERTOOL HCW
 USB Meter Reader
 READY

Order no.

HC-003-20
 HC-003-21
 MBM-M210000
 MBM-M200000
 6699-035
 6699-099
 6699-102
 www.kamstrup.com
 www.kamstrup.com
 www.kamstrup.com

	XX	YY	ZZZ
Module type			
Wired M-Bus module + 2 pulse inputs	20		
Wired M-Bus module + 2 pulse outputs	21		
System configuration			
Standard		00	
Datagram			
MULTICAL® 403 Standard Profile Yearly Target Data			101
MULTICAL® 403 Standard Profile Monthly Target Data			102
MULTICAL® 403 Tariff Profile Yearly Target Data			103
MULTICAL® 403 Tariff Profile Monthly Target Data			104
MULTICAL® 403 DACH Profile Yearly Target Data			105
MULTICAL® 403 DACH Profile Monthly Target Data			106
MULTICAL® 403 Control Profile			107
MULTICAL® 403 CP Profile Yearly Target Data			108
...			...
MULTICAL® 402/602 compatible data (402020/670020) Yearly Target Data			998
MULTICAL® III compatible data (6604/660S) Yearly Target Data			999

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