

Wired M-Bus inputs (In-A, In-B) outputs (Out-C, Out-D) Thermal Disconnect

MULTICAL® 403 MULTICAL® 603

- For billing, analysis and controlling purposes
- Configurable datagrams
- Readout of loggers
- Up to 19200 baud communication speed
- Primary/secondary/enhanced secondary addressing
- Remote software update
- According to M-Bus standard EN 13757:2013
- According to OMS TR02:2015



Contents

Introduction	3
Installation	3
Cable connections	4
Communication from the module	7
Supported M-Bus features	8
M-Bus datagrams	8
Examples of datagrams	9
Technical data	10
Ordering	11
Configuration	11
Displayed information	12

Introduction

With the high-performance M-Bus modules for the energy meters MULTICAL® 403, MULTICAL® 603 and MULTICAL® 803, you can read meters very often without reducing the meter's battery lifetime. The M-Bus modules can be configured with many different datagrams so that you can always adapt the read data to the application.

The modules comply with the M-Bus standard EN 13757:2013 as well as OMS TR02:2015 and can thus be read by common M-Bus reading systems.

Applications

The M-Bus module is designed with a focus on high flexibility to meet every conceivable application.

Analysis

MULTICAL® energy meters support large amounts of data and all analysis-relevant data can be read.

Billing

All data relevant to billing is of course supported in all meters.

Emulation

With the configuration of datagrams, MULTICAL® 403, 603 and 803 can emulate meters from different manufacturers.

Controlling and regulating

The M-Bus data can be read very rapidly and in combination with a high communication speed, applications for control and regulation can be implemented.

Customized datagrams

With the flexibility of the M-Bus modules, Kamstrup can offer our customers to customize the datagrams to their specific needs.

Installation

The module is easily mounted into a vacant module slot of the meter. A configuration may be required if a specific primary M-Bus address is required. Configuration of the M-Bus primary address can be done in three different ways: with METERTOOL HCW via the optical eye on MULTICAL®, with the meter's front keys, or via the M-Bus network.

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

Cable connections

Terminals

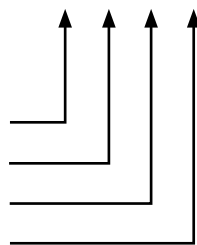
Max cable size 1.5 mm²

HC-003-20: Wired M-Bus, inputs (In-A, In-B)



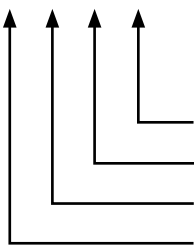
Pulse inputs

Terminal 65: Pulse In-A (+)
Terminal 66: Pulse In-A (-)
Terminal 67: Pulse In-B (+)
Terminal 68: Pulse In-B (-)



M-Bus

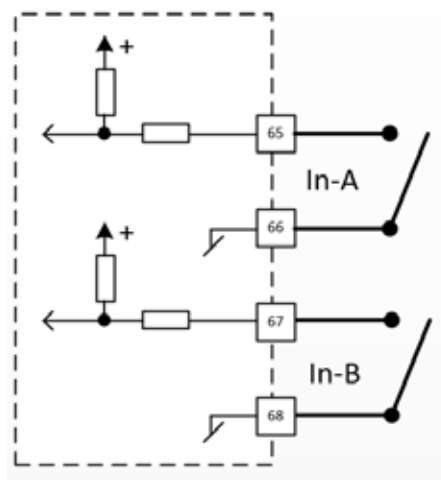
Terminal 25: M-Bus
Terminal 24: M-Bus
Terminal 25: M-Bus
Terminal 24: M-Bus



The module is equipped with two pulse inputs, In-A and In-B, to collect and accumulate pulses, e.g. from water and electricity meters.

The pulse inputs are physically placed on the module. However, the accumulation and logging of values are performed by the MULTICAL® calculator.

When installing a module with pulse inputs in slot 2 of MULTICAL® 603 and MULTICAL® 803, the pulse inputs will be registered in the meter as In-A2 and In-B2.

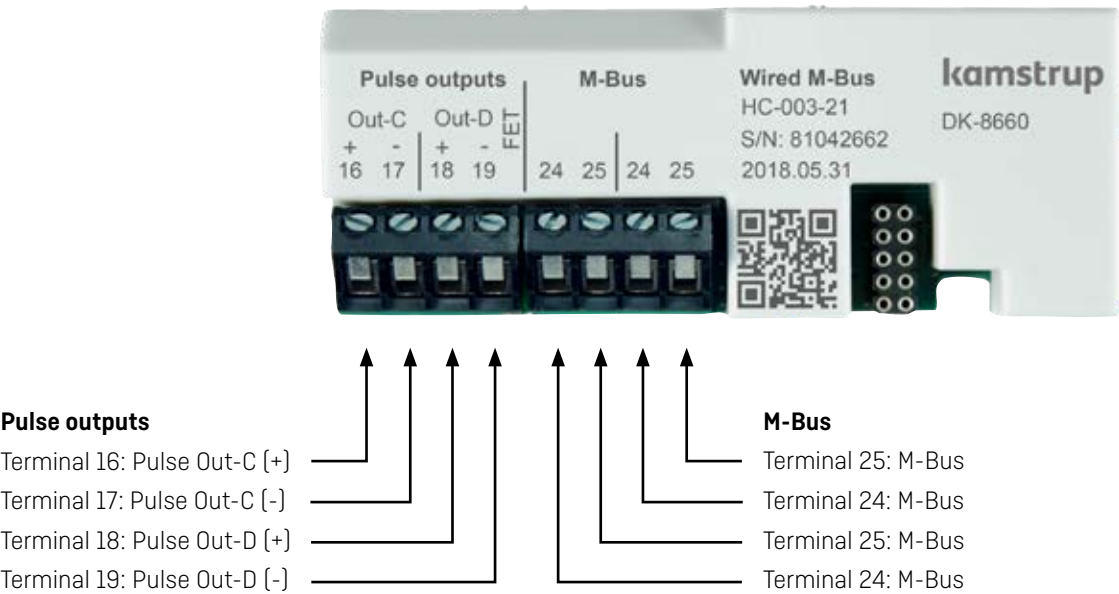


Cable connections

Terminals

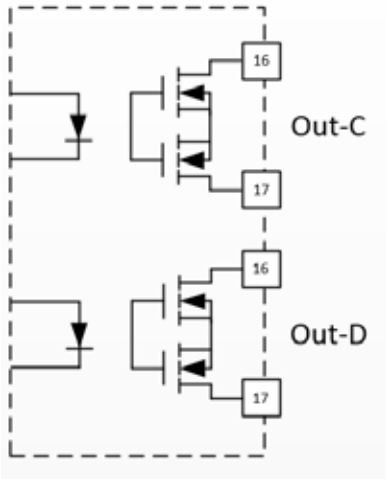
Max cable size 1.5 mm²

HC-003-21: Wired M-Bus, outputs (Out-C, Out-D)



The module has two configurable pulse outputs, Out-C and Out-D, which are used for pulsing out selected registers from the MULTICAL® calculator.

The pulse outputs are physically placed on the module, but the pulses are generated by the MULTICAL® calculator.

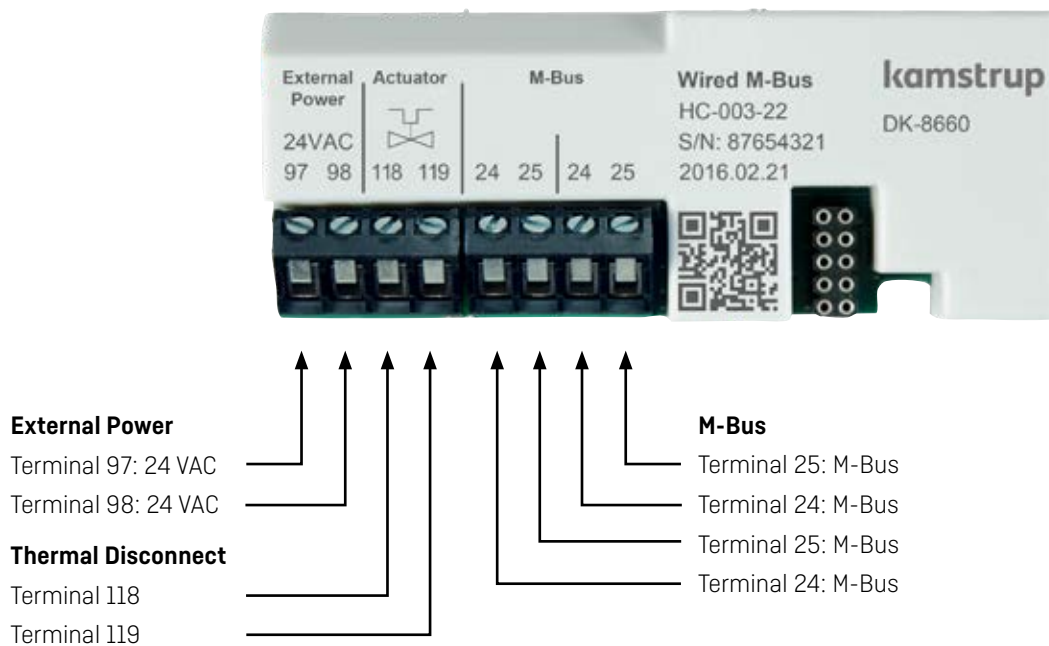


Cable connections

Terminals

Max cable size 1.5 mm²

HC-003-22: Wired M-Bus, Thermal Disconnect



The module has an output for connection of a normally open or normally closed thermal actuator powered by the external power terminals on the module. The output is physically placed on the module, but the control of the actuator is handled by MULTICAL® via commands sent via M-Bus.

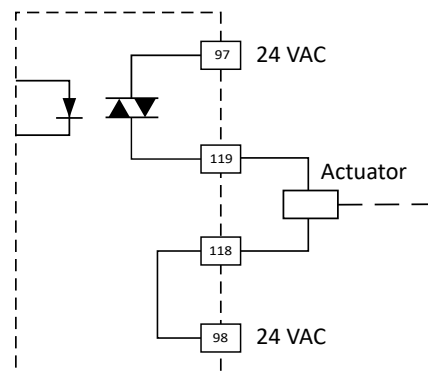
Thermal Disconnect allows remote control of flow as part of energy management, maintenance or due to leak detection.

The PP-configuration in the meter, must be set to 99 "Controlled output" to operate the module correctly.

The software USB Meter Reader can control Thermal Disconnect.

⚡ The meter must be AC-supplied.

🔌 The module requires an external power supply.



M-Bus

Two sets of M-Bus terminals enable the looping of the cable inside the meter. Because the M-Bus signal is not polarized, the wires can be connected arbitrarily.

Communication from the module

Protocol

The modules comply with the requirements of the M-Bus standard EN 13757:2013 and OMS TR02:2015 and can be used in a wide range of applications with M-Bus protocols.

M-Bus addressing

The modules support primary, secondary and enhanced secondary addressing.

In meters with multiple modular positions, each module slot has its own bus address (primary address).

The secondary and extended secondary addresses are common to all M-Bus modules.

Primary addressing

The primary address can be selected in the range from 0... 250.

If nothing else is specified, the M-Bus modules automatically use the last 2 or 3 digits of the meter's customer number as the primary address.

Secondary addressing

The secondary address M-BUS-ID contains 8 digits and can be selected in the range from 0...99999999.

The last 8 digits of the customer number are used as M-Bus ID for secondary addressing.

Configuration of M-Bus ID can be performed in three different ways: when ordering the module, through METERTOOL HCW via the optical eye on MULTICAL®, or via the M-Bus network.

Enhanced secondary addressing

The enhanced secondary address consists of M-BUS ID followed by M-Bus-Fabrication-Number.

Like M-Bus-ID, M-Bus-Fabrication-Number also consists of 8 digits whereby the total addressing area becomes 2 * 8 significant digits.

The primary address and secondary address can be changed, whereas M-Bus-Fabrication-Number is assigned to the meter serial number.

Quick search

The M-Bus modules support wildcard search, which allows the system to search for meters on the M-Bus network with an effective search algorithm.

Communication speed

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

Communication interval

There are no restrictions on how often you can read the M-Bus modules.

For battery-supplied meters, ensure that there are more than 10 seconds between each reading.

Supported M-Bus features

The following parameters in the meter can be set via M-Bus commands:

- Primary address
- M-Bus ID, for secondary addressing
- Setting counter offset for the pulse inputs
- Setting the meter clock
- Logger reading. All meter-logged data, yearly, monthly, daily and minute loggers can be read via M-Bus.

The M-Bus modules firmware and datagram can be updated via the M-Bus network. This is supported by Kamstrup's REAdy system solution.

M-Bus datagrams

The M-Bus modules can be used in all MULTICAL® XX3 meters.

Note, however, that some registers in MULTICAL® 803 are not available in MULTICAL® 403 and 603, and some registers in MULTICAL® 603 are not available in MULTICAL® 403. Likewise, the meter configuration influences which registers are available. If the meter does not have the relevant register, the module will simply refrain from sending this register via M-Bus.

The datagram can be changed using the USB configuration cable via METERTOOL.

Examples of datagrams

20-00-101: Standard Profile	20-00-105: DACH profile	20-00-401: Control Profile
Heat energy E1	Heat energy E1	Heat energy E1 extra digit
Cooling energy E3	Cooling energy E3	Cooling energy E3 extra digit
Cooling energy E3	Cooling energy E3	Cooling energy E3 extra digit
Energy E8	Heat energy A1	Volume V1 extra digit
Energy E9	Heat energy A2	t1 actual [2 decimals]
Volume V1	Volume V1	t2 actual [2 decimals]
Pulse input A1	Pulse input A1	t1-t2 diff. temp. [2 decimals]
Pulse input B1	Pulse input B1	Power actual
Operating hours	Tariff TA2	Flow V1 actual
Error hour counter	Tariff TA3	Info bits
t1 actual [2 decimals]	Tariff TA4	Meter type
t2 actual [2 decimals]	t1 actual [2 decimals]	Fabrication number
t1-t2 diff. temp. [2 decimals]	t2 actual [2 decimals]	Module type config No.
Power actual	t1-t2 diff. temp. [2 decimals]	Module SW revision
Power max month	t5 limit	
Flow V1 actual	Power actual	
Flow V1 max month	Power max month	
Info bits	Flow V1 actual	
Date and time	Flow V1 max month	
Heat energy E1	Info bits	
Cooling energy E3	Date and time	
Cooling energy E3	Heat energy E1	
Energy E8	Cooling energy E3	
Energy E9	Cooling energy E3	
Volume V1	Pulse input A1	
Pulse input A1	Pulse input B1	
Pulse input B1	Heat energy A1	
Power max year	Heat energy A2	
Flow V1 max year	Tariff TA2	
Date	Tariff TA3	
Meter type	Tariff TA4	
Fabrication number	Power max year	
Module type config No.	Date	
Module SW revision	Meter type	
	Fabrication number	
	Module type config No.	
	Module SW revision	

For a complete overview of datagrams, see [Logger Profiles and Datagrams](#).

Technical data

Physical

For installation in

MULTICAL® 403, MULTICAL® 603 and MULTICAL® 803

Mechanical data

Dimensions (L x W x D)

90 x 35 x 14 mm

Weight

< 45 g

MULTICAL® supply



Battery or AC supply

Communication

Protocol

M-Bus, EN 13757:2013

Baud rates [Auto]

300 bits/s

2400 bits/s

9600 bits/s

19200 bits/s

Addressing

Primary, secondary, enhanced secondary

Manufacture ID

KAM

M-Bus load

1 unit load

Rin / Cin

422 Ω/0.5nF

Cable parameters

29 Ω/km, 180 nF/km

Galvanic isolation

> 2 kV

Data refresh rate

Data from the meter to the module are refreshed each time the meter completes an integration. Integration mode is defined by the meter's L-code.

Pulse inputs

Input type

Contact input

Open voltage

3.6 V

Current

≤ 5 μA

Max cable length

10 m

Pulse outputs

Output type

Opto-FET

External voltage

5...45 VAC/VDC

Current

1...50 mA

RON

≤ 40 Ω

Max cable length

25 m

Thermal Disconnect

Output type

TRIAC

External voltage

24 VAC

Max load

5 W

Galvanic isolation

> 2 kV

External power

Voltage

24 VAC ±30 %

Max power

10 VA

Max current

< 1 A

Environment

Operational temperature

5 °C – 55 °C

Humidity

25 – 85 % RH non-condensing

Markings/approvals

CE, MID together with the type approval of MULTICAL® 403, MULTICAL® 603 and MULTICAL® 803

Compatibility

EN 13757

M-Bus standard

Programming

Configuration/firmware

Via the multipole connector on the module using METERT00L HCW
READY via M-Bus Master

Ordering

Description

Wired M-Bus, inputs (In-A, In-B)
 Wired M-Bus, outputs (Out-C, Out-D)
 Wired M-Bus, Thermal Disconnect  
 M-Bus Master MultiPort 250D
 M-Bus Master MultiPort 250L
 USB configuration cable for H/C-modules
 Infrared optical read-out head w/USB
 Transformer 230/24 VAC
 METERTOOL HCW
 USB Meter Reader
 READY

Order no.

HC-003-20
 HC-003-21
 HC-003-22
 MBM M210000
 MBM M200000
 6699 035
 6699 099
 6699 403
 www.kamstrup.com
 www.kamstrup.com
 www.kamstrup.com

 Meter must be AC-supplied.
 Module requires an external power supply.

Configuration

	XX	YY	ZZZ
Module type			
Wired M-Bus, inputs (In-A, In-B)	20		
Wired M-Bus, outputs (Out-C, Out-D)	21		
Wired M-Bus, Thermal Disconnect	22		
System configuration			
Standard		00	
Datagram			
Standard Profile Yearly Target Data			101
Standard Profile Monthly Target Data			102
Tariff Profile Yearly Target Data			103
Tariff Profile Monthly Target Data			104
...			...
Extended Pulse Input Profile Yearly Target Data			301
Extended Pulse Input Profile Monthly Target Data			302
Dual ULTRAFLOW Profile Yearly Target Data			303
Dual ULTRAFLOW Profile Monthly Target Data			304
...			...
9-Digit Control Profile			401
Control Energy Profile E2, E12			402
...			...

This list of datagrams is not complete as new datagrams are added regularly.

An updated overview can be found here: [Logger Profiles and Datagrams](#).

Displayed information

Module information can be read by selecting "TECH loop" on the MULTICAL® display.
Module in module slot 1: Select menu 2-101 in "TECH loop".
Module in module slot 2: Select menu 2-201 in "TECH loop".
Module in module slot 3: Select menu 2-301 in "TECH loop".
Module in module slot 4: Select menu 2-401 in "TECH loop".
The following module information is available:

Menu	Menu index	Information	Display example
2-x01	31	Module type and configuration	
2-x01-1	32	Module firmware and revision	
2-x01-2	33	Module serial number	
2-x01-4	34	Bus address	
2-x01-5	35	M-Bus secondary address	
2-x01-6	36	M-Bus enhanced secondary address	