

# 4 Appendix

## 4.1 General M-bus commands

Table 4.1.1

Main station request						Station response
		C	A	CS		
Initialize command	10h	40h	A	CS	16h	E5h
Level 2 user data request command	10h	5B/7Bh	A	CS	16h	The data message content refers to section 4.3.
Cancel the selection of level 2 addresses	10h	40h	FDh	CS	16h	E5h

Table 4.1.2

Main station request										Station response
		L	L		C	A	CI	CS		
Reset operation mode (standard mode) command	68h	04h	04h	68h	53h/73h	A	50h 00h	CS	16h	E5h

Table 4.1.3 Selection of Level 2 Addresses

68h 0Bh 0Bh 68h	Variable-length frame header, L=0Bh
53h/73h FDh 52h	Control field 53h/73h indicates that the master station transmits user data and expects a response, address field FDh indicates the primary address associated with the selected secondary address, and CI field 52h indicates the selection of the slave station.
78h 56h 34h 12h	Identification number=12345678,
8Fh 41h	Manufacturer ID=418Fh, wildcard FFh supported
02h	Version ID=02h; wildcard FFh supported
04h	Device type ID=04h i.e. heat meter, wildcard FFh supported
CS	validation bytes
16h	terminator

Table 4.1.4 Enhanced Select 2nd Address

68h 11h 11h 68h	Variable-length frame header, L=11h
53h/73h FDh 52h	Control field 53h/73h indicates that the master station transmits user data and expects a response, address field FDh indicates the primary address associated the selected secondary address, and CI field 52h indicates the selection of the slave station.
78h 56h 34h 12h	Identification number=12345678, wildcard FFh supported
0Dh 6Ah	Manufacturer ID=6A0Dh, wildcard FFh supported
02h	Version ID=02h, wildcard FFh supported
04h	Device type ID=04h i.e. heat meter, wildcard FFh supported
0Ch	DIF: 8-bit BCD code, instantaneous value
78h	VIF: Production code
04h 03h 02h 01h	Production code=01020304
CS	validation bytes

16h	terminator
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Table 4.1.5 Set 1st level address

68h 06h 06h 68h	Variable length frame header, L=06h
53h/73h A 51h	Control field 53h/73h indicates the master station transmits user data and expects a response, address field A, CI field 51h the master station to the slave station data transmission.
01h	DIF: 8-bit binary, instantaneous value
7Ah	VIF: first-level address
12h	The first-level address is 18, the default first-level address for unconfigured heat meters is 1;
CS	Validation bytes
16h	terminator

Table 4.1.6 Set 2nd-level Address

68h 09h 09h 68h	Variable length frame header, L=09h
53h/73h A 51h	Control field 53h/73h indicates the master station transmits user data and expects a response, address field A, CI field 51h indicates the master station to the slave station data transmission.
0Ch	DIF: 8-bit BCD code, instantaneous value
79h	VIF: second-level address
78h 56h 34h 12h	The secondary address is 12345678, the default secondary address of the heat meter is as shown on the sticker.
CS	Validation bytes
16h	terminator

Table 4.1.7 Set system time

68h 09h 09h 68h	Variable length frame header, L=09h
53h/73h A 51h	Control field 53h/73h indicates the master station transmits user data and expects a response, address field A, CI field 51h indicates the master station to the slave station data transmission.
04h	DIF: 32-bit binary, instantaneous value
6Dh	VIF: date and time(type F)
2Ah 2Dh 61h 19h	Date and time = September 1, 2011, 13:42 (seconds not included)
CS	Validation bytes
16h	terminator

## 4.2 Special M-bus command

Table 4.2.1.1.3.1 Equipment Status

	BIT8~BIT15	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	retain	Non-empty pipe		Return water temperature normal	Inlet water temperature normal		Voltage normal		
1		Empty pipe		Return water temperature error	Inlet water temperature error		Low voltage		

## 4.3 Station response message in standard mode

Table 4.3.1

68h L L 68h	Variable length frame header ,
08h A 72h	Control field 08h indicates a response data frame from the slave, address field A, CI field 72h indicates from the slave to the master: format data follows a 12-byte data header.
78h 56h 34h 12h	12-byte data header identification number = 12345678
0Dh 6Ah	12-byte data header Manufacturer ID = 6A0Dh
01h	12-byte data header version ID=01h
0Dh	Device type ID of 12-byte data head = 0Dh i.e. cold heat meter
Access NO.	Access sequence number of 12-byte data head, each time the station responds to data, the station actively adds 1 before or after, without counting the part.
00	Status byte of the 12-byte data header, default 00
00h 00h	Signature field of 12-byte data head
0Ch	DIF: 8-bit BCD code, instantaneous value
04h	VIF: Cooling capacity (unit: 1/100kWh) (for large bore units 0C 07: 1/00MWh)
78h 56h 34h 12h	123456.78kWh
0Ch	DIF: 8-bit BCD code, instantaneous value
04h	VIF: Heat (unit: 1/100kWh) (large bore unit is 0C 07: 1/100MWh)
78h 56h 34h 12h	123456.78kWh
0Ch	DIF: 8-bit BCD code, instantaneous value
14h	VIF: positive flow (unit: 1/100m <sup>3</sup> )
78h 56h 34h 12h	123456.78m <sup>3</sup>
0Bh	DIF: 6-bit BCD code, instantaneous value
59h	VIF: Inlet temperature (unit: 1/100℃)
56h 34h 12h	1234.56℃
0Bh	DIF: 6-bit BCD code, instantaneous value
5Dh	VIF: Return temperature (unit: 1/100℃)
56h 34h 12h	1234.56℃
0Ch	DIF: 8-bit BCD code, instantaneous value
2Ch	VIF: power (unit: 1/100kW)

78h 56h 34h 12h	123456.78kW
0Ch	DIF: 8-bit BCD code, instantaneous value
3Ah	VIF: Volume flow rate (unit: 1/10000m <sup>3</sup> /h)
78h 56h 34h 12h	1234.5678m <sup>3</sup> /h
0Ch	DIF: 8-bit BCD code, instantaneous value
26h	VIF: Working hours (unit: h)
78h 56h 34h 12h	12345678h
04h	DIF: 32-bit binary, instantaneous value
6Dh	VIF: Year Month Day Hour Minute
1E 26 2D 26	June 13 <sup>th</sup> , 2017 6:30 AM
0Fh	Manufacturer data structure start to user data end
00h 00h	Equipment status, see Table 4.2.1.1.3.1
CS	Validation bytes
16h	terminator

#### 1. Select heat meter

For example, with the secondary address 12345678:

Request message (Hex):

68 0B 0B 68 53 FD 52 78 56 34 12 FF FF FF FF B2 16

Waiting for the heat meter response

If the selected heat meter request message is correct, the heat meter will return a single-byte message: E5

#### 2. User data request message

10 7B FD 78 16

Heat meter returns user datagram

68 46 46 68 08 78 72 78 56 34 12 0D 6A 01 0D 00 00 00 00 0C 04 00 68 05 00 0C 04 00 52 04 00 0C 14 00 99 00 00 0B 59 00 00 00 0B 5D 00 00 00 0C 2C 00 00 00 00 0C 3A 00 00 00 00 0C 26 28 10 00 00 04 6D 01 20 E1 1B 0F B8 26 56 16

#### 3. Cancel specified heat meter response message

10 40 FD 3D 16

Summary:

The process of meter reading is as follows:

Select the heat meter - read the data - cancel the selection