



MBusEvo

Service protocol

SONTEX version

V1.1

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Version history

Version	Date	Note
1.0	2020-06-24	First version
1.1	2020-07-28	Added Meter setup command (volume and medium configuration)

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1. General MBus commands

1.1. Introduction

This document describes the MBus protocol used to communicate Evo Modularis optical sensor. All command examples are in hexadecimal format (e.g. 10 means 0x10 hex)

1.2. M-Bus Protocol

All bytes transmitted over the M-bus have the format 8E1:

1	8	1	1
Start bit	Data bits	Parity bit (even)	Stop bit

For communication three different telegram types are used. These are:

1. Single character E5 (only used by slave)
2. Short frame (only used by master)
3. Long frame (used by both master and slave)

When multiple byte fields have to be transmitted, LSB-first byte ordering convention is used

1.3. Single character

The single character E5 (CON_ACK) is only used by the meter. It serves as an acknowledgement of the reception of a valid frame (it does not say anything about whether the command was accepted and executed or not)

1.4. MBus fields

Common MBus used fields are summarised in the following table. For any further explanation, please refer to european norm EN 13757-3 (Communication systems for and remote reading of meters – Part 3: Dedicated application layer), or refer to the MBus protocol (<http://www.m-bus.com/>):

„C“ field	Command field: 1 byte
„A“ field	Primary address field: 1 byte
„CI“ field	Type of application data to be transmitted: 1 byte
“csum”	MBus checksum: 1 byte
Long frame identifier	Start byte, long frame: 68 (1 byte)
Short frame identifier	Start byte, short frame: 10 (1 byte)
Stop byte	Stop byte, all frames: 16 (1 byte)
4-byte type A serial number	Secondary MBus address, lsb first (4 bytes)
2-byte manufacturer code	Manufacturer code as in EN 61107 (three uppercase letters codified in 2 bytes)
Medium code	medium type as in EN 13757-3: (1 byte)

1.5. SND_NKE

Deselection of a meter after selection by its secondary address.

Short frame identifier	10
„C“ field	40
„A“ field	primary adrs
Checksum	csum
Stop byte	16

Meter answer to command: E5.

1.6. Application reset

Deselects the device (secondary addressing).

Long frame identifier	68
Length bytes	03
Length bytes	03
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary adrs
„CI“ field	50
Checksum	csum
Stop byte	16

Meter answer to command: E5.

1.7. Set primary M-bus address

Changes the primary address to a new M-bus primary address

Long frame identifier	68
Length bytes	06
Length bytes	06
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary adrs
„CI“ field	51
Set primary M-bus address command	01 7A
New primary address	new primary adrs
Checksum	csum
Stop byte	16

Meter answer to command: E5.

1.8. Set secondary address

Changes the secondary 4 byte address to a new M-bus secondary address.

Warning: this command executes without actually changing the secondary address of FlowPulse.

Secondary address is written in Flash and represents the serial number of the device

Long frame identifier	68
Length bytes	09
Length bytes	09
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary adrs
„CI“ field	51
Set identification number command	0C
	79
4-byte BCD secondary address (LSB first)	IDlow... IDhigh
Checksum	csum
Stop byte	16

Meter answer to command: E5.

1.9. Select meter by secondary address

Long frame identifier	68
Length bytes	0B
Length bytes	0B
Long frame identifier	68
„C“ field	53 or 73
„A“ field	FD
„CI“ field	52
4-byte BCD secondary address (LSB first)	Slow... Shigh
2-byte manufacturer code (LSB first)	Manlow... Manhigh
Meter version number	Ver
Medium code	Med
Checksum	csum
Stop byte	16

The placeholder „F“ can be used at any decimal place of the serial number.

The placeholder “FF” can be used for “medium code“, „meter version number“ and „manufacturer code“

Meter answer to command: E5, if the secondary address is correct and found.

1.10. Set date and time

Long frame identifier	68
Length bytes	09
Length bytes	09
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary adrs
„CI“ field	51
DIF	04
VIF	6D
4-byte „type F“ date and time	dlow... dhigh
Checksum	csum
Stop byte	16

Meter answer to command: E5.

Date/time is represented as 4-byte „type F“ format as defined in EN13757-3

Note: Changing the date may influence the billing period and monthly values.

1.11. Change Baudrate

Changes the speed of the M-bus interface. Possible values: 300,2400 and 9600 baud.

Standard is 2400 baud.

Long frame identifier	68
Length bytes	03
Length bytes	03
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary adrs
„CI“ field	B8 for 300 baud BB for 2400 baud BD for 9600 baud
Checksum	csum
Stop byte	16

Meter answer to command: E5 at the old baud rate

2. Service Commands

2.1. Enter stop mode at next bus disconnection (80h)

This command freezes the device to reduce power consumption during stockage time. After bus disconnection the device will enter in deep low power mode. The device exits this mode at next reconnection. The frame is not an M-bus standard.

Long frame identifier	68
Length bytes	08
Length bytes	08
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary adrs
„CI“ field	51
Manufacturer's own data	0F
Command code: freeze device	80
Command code: freeze device	68
Command code: freeze device	73
Command code: freeze device	69
Checksum	csum
Stop byte	16

Meter answer to command: E5.

2.2. Write Serial Number and manufacturer codes (84h)

This command writes into device the 8 bytes serial number and manufacturer codes.

Note: for correct device identification manufacturer and generation must be written as follows:

- Manufacturer code: MAD (3424h)
- Generation: 33h

Long frame identifier	68
Length bytes	10
Length bytes	10
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary adrs
„CI“ field	51
Manufacturer's own data	0F
Command code: Write serial	84
Command code: Write serial	68

Command code: Write serial	73
Command code: Write serial	69
Serial number LSB	00..99
...	00..99
...	00..99
Serial number MSB	00..99
Manufacturer code LSB	00..FF
Manufacturer code MSB	00..FF
Generation	00..FF
Medium	00..FF
Checksum	csum
Stop byte	16

Meter answers E5 only if data is correctly flashed.

2.3. Secondary address reading

To read device secondary address issue a REQ_UD2 and extract the value from the long header just after CI code, DIF/VIF data can be ignored.
See below for associated frames.

Request for a data frame

Short frame identifier	10
„C“ field	5B or 7B
„A“ field	primary adrs
Checksum	csum
Stop byte	16

Response to a REQ_UD2 command.

Long frame identifier	68
Length bytes	len
Length bytes	len
Long frame identifier	68
„C“ field	08
„A“ field	primary adrs
„CI“ field	72
4-byte secondary address (LSB first)	ilow... ihigh
2-byte manufacturer code (LSB first)	Manlow... Manhigh
Meter version number	Ver
Medium code	Med
Transmission counter	TrCnt
MBus Status	Sta
Signature	00
	00

Data bytes read (see MBUS protocol)	b1...bn
Checksum	csum
Stop byte	16

2.4. Meter setup (06h)

This command allows to set current volume and medium. The frame is not an M-bus standard.

Long frame identifier	68
Length bytes	0B
Length bytes	0B
Long frame identifier	68
„C“ field	53 or 73
„A“ field	primary
„CI“ field	51
Manufacturer's own data	0F
Command code: setup meter	06
Initial meter reading in litres (4 bytes binary value, LSB first) (e.g. 1234567 litres= 0012D687 hex)	87 D6 12 00
Pulse weight code (fixed value at 1 liter/pulse)	01
Medium (as in EN 13757-3) the only accepted media are: 07 (water) 06 (warm water) 16 (cold water) 17 (dual water) (e.g. water=07 hex)	07
Checksum	csum
Stop byte	16

Meter answer to command: E5h