

Data sheet/Manual

Additional M-Bus board (FCMB)

The calculator F4 can be equipped with an additional M-Bus board. The Additional M-Bus board enables the calculator to communicate with two separate M-Bus systems.

M-Bus

The additional M-Bus board provides a galvanic separated additional M-Bus output for the calculator F4.

The additional M-Bus board is normally set to emulate a F4 calculator, e.g. a remote reading system will see no difference when communicating with the additional M-Bus board compared with a F4 calculator.

The communication speed is maximal 9600 baud when the option board is installed at card slot A, and 2400 baud when it is installed at card slot B or E.

The additional M-Bus board must only be used in a mains supplied F4.

Card slots

The additional M-Bus board can only be installed in card slot A, B or E.

Configuration

Using the F4-adapterkit (*FT-1-adapt-kk*), and the *Plug & Play configuration utility*, the additional M-Bus board can be configured prior to installation.

Capacitance losses

An ordinary M-Bus loop has an approximate capacitive cable loss of 100 pF/meter. The additional M-Bus board also creates capacitance losses. These losses depend on in which card slot the board is installed. The losses can be converted to cable length to help dimensioning an M-Bus loop, see table 1 below.

Slot	Capacitance	Equivalent cable length in a M-Bus loop
A	-	-
B	10nF	50m
E	10nF	50m

Table 1, Capacitance losses depending on used card slot

To connect a M-Bus loop

The M-Bus loop shall be connected to the terminals marked with the same letter as the slot. E.g. if the board is installed in slot A, the loop shall be connected to the terminals marked A. The M-Bus is polarity insensitive. Inside the calculator the terminals 1 and 3 and the terminals 2 and 4 are connected in parallel.

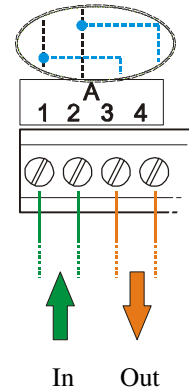


Fig. 1, Connection terminals for M-Bus

To connect using RS232

The connection shall be made to the terminals marked with the same letter as the used slot. E.g. if the board is installed in slot A, the connection shall be made to the terminals marked A.

Connect according to table 2 and 3 below.

Terminal no.	Signal	9-Pole connector	25-pole connector
A1	RXD ->	2	3
A2	DTR <-	4	20
A3	TXD <-	3	2
A4	GND --	5	7

Table 2, RS232 connection table for board in slot A

Terminal no.	Signal	9-Pole connector	25-pole connector
B/E1	TXD <-	3	2
B/E2	GND --	5	7
B/E3	RXD ->	2	3
B/E4	DTR <-	4	20

Table 3, RS232 connection table for board in slot B/E

PCB Layout

The additional M-Bus boards have different layout depending on connection type, 2-wire connection or RS232, see fig. 2 and 3 below.

1. Dipswitches
2. LD2, indicates active M-Bus loop
3. LD4, indicates communication on loop
4. Communication button enables remote configuration (only to be used in FWW mode)
5. LD3, installation indicator
6. Reset button (not to be used)
7. The facade side
8. Connector

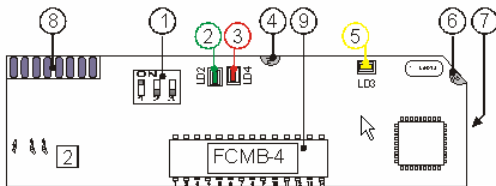


Fig. 2, PCB layout 2-wire connection

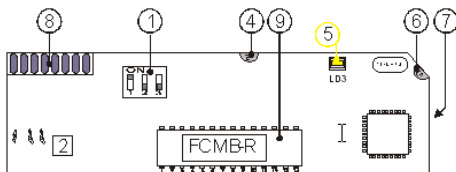


Fig. 3, PCB layout RS232 connection

Dipswitches

The dipswitches must be set correctly in order for the calculator to recognize the board.

Slot	BY 1	BY 2	BY 3
A	On		
B		On	
E	On		On
Service	()	On	On

Table 4, Dipswitch settings

Important! Never change the dipswitch settings during power on.

Installation

Important! Only one option board may be installed at the same time or else the installation will malfunction. Please follow this procedure:

1. Short circuit "Save data" to force the calculator to store all important data.
2. Disconnect the flow sensor by removing one flow sensor cable from the terminal.
3. Turn off the power by removing the 4-wire connectors "K3" and "K2".
4. Check that the dipswitches are correctly set for chosen slot.
5. Install the option board with the component side turned towards the terminals, e.g. align the board (facade side) to the right side of the calculator box. Ensure that all the pins are connected.
6. Turn the power on by reconnecting the 4-pole connector "K3" (back-up battery) and then "K2" (RawV). **Note:** The calculator must be connected to mains supply, otherwise the board will not be properly installed.
7. Check the installation sequence, the diode LD3 shall twinkle and then go out. The board shall present itself on display sequence 9x as "Mbus 75".
8. When additional boards shall be installed, repeat the steps 3-7 above for each board.
9. Reconnect the flow sensor.

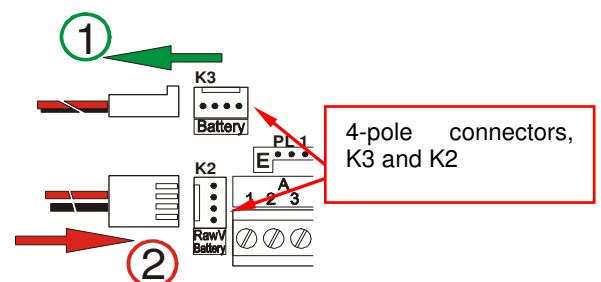


Fig 4, F4 connection terminal

Ordering

Product designation: **FCMB**
 Delivery options: **ABC**
 Parameter file: **XXXXXX**

Variable		Description
A	4	Option board for F4
A	R	RS232 armament
B	1	Board delivered separately
B	4	Board mounted inside F4
C	A	Board slot A
C	B	Board slot B
C	E	Board slot E

Table 5, Ordering key

Parameter files

2400bd – Standard parameter file for additional M-Bus 2400 baud

StandA – Standard parameter file for additional M-Bus 300 baud

Example: FCMB-44A-StandA, additional M-Bus board for slot A, two wire connection, mounted in F4.

The table below can be used to obtain the desired ordering key.

FCMB-	A	B	C	-	Parameter file
				-	

Table 5, Template for ordering key

Cables

TERM284-RS232-modem Cable for connecting RS232 board to modem (9pM)

TERM284-RS232-PC Cable for connecting RS232 board to PC (9pF)

TERM284-OPK4 Cable for connecting RS232 board to GS01 (GSM modem, 15pM)