1. Use of the option modules

There are two different calculator housings with which these same plug-in units can be used namely:
- Calculator housing 1 (PolluTherm until 2007 and PolluStat E) indicated by a lid that can be opened sideways which is closed by a black plastic latch
- Calculator housing 2 (PolluTherm from 2007 and PolluStat E) indicated by a lid that is opened from bottom to top with two locking latches on the two bottom corners.

The assignment of the modules for the calculators can be taken from the tables.

1.1. Communication (M-Bus) slot

Module name	Function	Order number	PolluTherm calculator		PolluStat E calculator	
			hous. 1 until 2007	hous. 2 from 2007	hous. 1 until 2009	hous. 2 from 2010
M-Bus	M-Bus communication	68504020	X	X	X	X
M-Bus-2PM	M-Bus and 2 pulse inputs	68504686		X		X
USB	USB communication	68504688	X	X	X	X
LON	LON Works communication	68505078	X	X	X	X

1.2. Pulse output slot

| Module name	Function	Order number	PolluTherm calculator		PolluStat E calculator	
			hous. 1 until 2007	hous. 2 from 2007	hous. 1 until 2009	hous. 2 from 2009
FZS/B	Remote reading for battery devices	68503922	X	X	X	X
FZS/N	Remote reading for power supply units *	68503920	X	X	X	X

2. Safety instructions
- The above mentioned modules may only be used for the devices provided for in the list as otherwise the modules or the heat meter could be damaged.
- The Remote read plug-in unit FZS/B for battery-operated PolluTherm and PolluStat E is equipped with a soldered-on lithium battery. This battery must not be recharged, short-circuited, put in contact with water or exposed to temperatures of more than 80 °C.
- Batteries and electronic waste may only be disposed at suitable collection centers for professional waste disposal.
- The retrofittable plug-in units for heat meters are delivered in the form of circuit boards. In order to not damage them handle the devices carefully after taking them out of the protective package; the circuit boards may only be touched on the edge. Insert the devices without any interim storage in the appropriate calculator.

3. Installing modules in the calculators

The slots for the retrofitted modules are identically arranged in both calculator housings. There is a slot in each calculator for the communication (M-Bus) modules (right rear) and the remote read module (left front). The modules which are acceptable for the calculator have to be mounted in the designated slots.
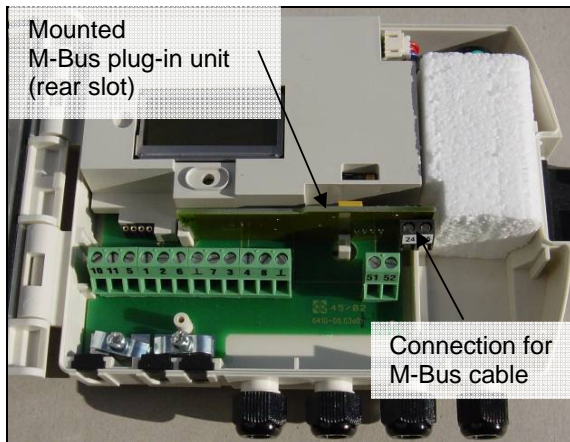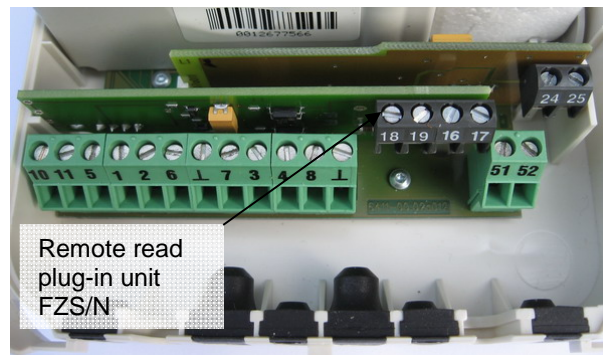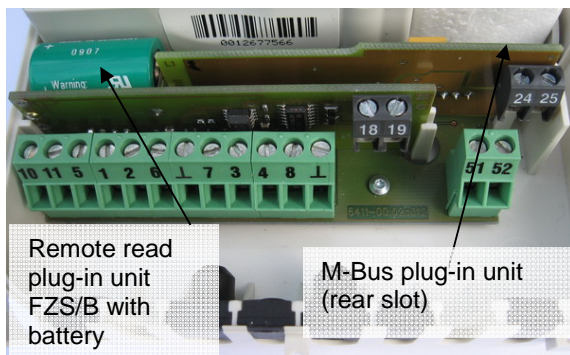

picture 1: slots in calculator housing 1
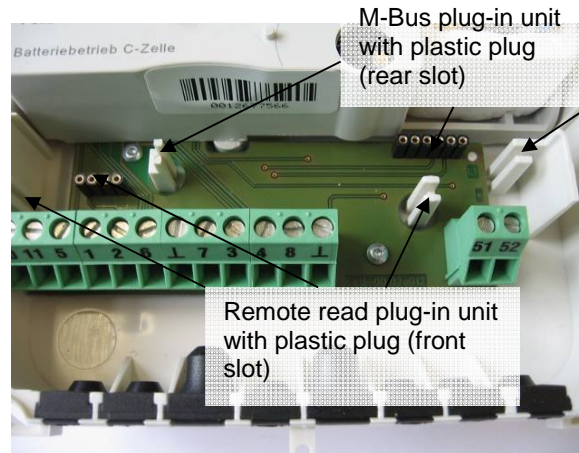
picture 2: slots in calculator housing 2

- Remove the lower user seal from the housing
- Calculator housing 1: Open the housing cover by opening the black housing latch
- Calculator housing 2: Open housing by pressing both closing clips at the two bottom corners
- Locate the plug-in units in the left and right white plastic guide
- The contact pins must not be bent and must slide easily into the designated contact sockets
- Route the connecting cable for the calculator housing 1 through an available cable fitting and for calculator housing 2 through the hole in the rubber moulding. Then make a pull relief with the included cable clip. Now connect the wires to the respective terminals and insert the rubber moulding again.

Picture 3 and 4: Calculator housing 1 with M-Bus and Remote read plug-in unit FZS/B (with battery) (left) and Remote read plug-in unit FZS/N (right)

4. M-Bus plug-in units and connections

4.1. M-Bus plug-in unit acc. EN1434-3 (68504020)

With this plug-in unit the meter can be read out via its primary or secondary address with an M-Bus-level converter (300 and 2400 Baud, automatic detection). The setting of both addresses can be done in the parameter menu or with the service software MiniCom version 3.6.0.28 or greater (note: the factory setting of secondary address and account number matches the device number indicated on the calculator housing). The primary address can be set between 0 and 250 and is set at 0 ex works.

The M-Bus cable is connected to the connection clamps 24 and 25 via a plug-in unit. The polarity doesn't have to be considered.

Reading frequency:
- **Battery-operated device**
  The calculator has a so-called "communication credit" to ensure that the battery doesn't get discharged by too frequent readouts. Therefore the basic measuring function is not interrupted. Every day a certain number of permitted data communications is added. In an M-Bus system the permitted readout frequency depends on the amount of meters and the number of data protocols per meter (1, 6 or 19 data protocols). For exact calculation please ask our service department.

- **Power supply unit**
  Unlimited reading

4.2. M-Bus plug-in unit with 2 inputs for external consumption meters (68504686)

With this plug-in unit two additional external consumption meters (cold water, warm water, electricity, gas or other) with passive pulse output (Reed switch, open collector) can be connected. The consumptions of those meters can then be read out via M-Bus-, Mini-Bus or the optical interface.
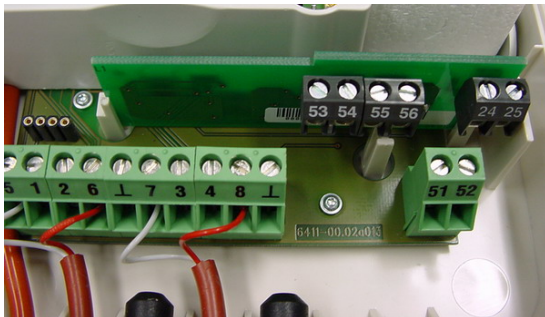
Picture 5: M-Bus plug-in unit with 2 pulse inputs

Required pulse duration: > 100 ms
Pulse input frequency: < 5Hz

Terminal connection "pulse inputs":   Terminal connection "M-Bus":
(Polarity has to be considered)   (Polarity doesn't have to be considered)
54 = signal external meter 1   24 = M-Bus
53 = ground external meter 1   25 = M-Bus
56 = signal external meter 2
55 = ground external meter 2

Only for devices with calculator housing 2: When using this module no Remote read plug-in unit can additionally be plugged into the calculator!
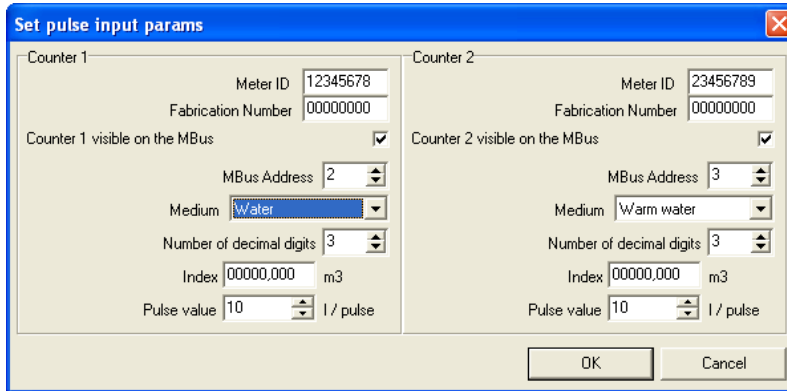
Both contact inputs preset in the factory to:

- input 1: cold water meter, pulse value 10 litres, initial meter reading 0.00 m³
- input 2: warm water meter, pulse value 10 litres, initial meter reading: 0.00 m³

The activation of the inputs has to be done via the service software MiniCom 3, menu item: „set pulse input parameters". The meter IDs of the pulse meters have to be set there as well as the primary M-Bus addresses if necessary; check "counter 1 (2) visible on the M-Bus". Starting meter reading and pulse value can also be adapted. Afterwards the pulse meters are available as independent M-Bus meters on M-Bus. The consumption of the pulse meters is not transferred in the standard M-Bus protocol of the heat meters.

The calculator display of external pulse meter consumption has to be set in menu item „set up LCD Option" MiniCom 3 (registered version only).

4.3. USB plug-in unit 68504688 (for M-Bus slot)

With this plug-in unit the calculator can be connected to a PC / Notebook or Handheld Computer with USB access. In case an M-Bus plug-in unit is built in it has to be removed first.

USB Port: 1.1 or 2.0
Connection plug: Type A
Cable length: approx. 1.5 m
Baud rate: $\leq$ 19.200 Baud

Picture 6: USB plug-in unit 68504688 in calculator housing 2

For connection you need a driver which will be delivered on a CD together with the card. A description of how to install the driver is also available.

4.4. LON-Works plug-in unit 68504857 (for M-Bus slot)

The LON-Works plug-in unit serves as a data communication of the calculator with a LON-Works network. A detailed description can be found in the installation and operating instructions MH 6130.

# 5. Remote read plug-in unit and connections

5.1 Remote read plug-in unit FZS/B for battery driven devices (68503922)

The Remote read plug-in unit is plugged into the front left slot (see picture 3 and 4). The Remote read plug-in unit for battery devices FZS/B has an own power supply by an additional lithium battery on the plug-in unit.

5.2. Remote read plug-in unit FZS/N for power supply units (68503920)

The remote read plug-in unit for power supply units FZS/N is fed by the power supply of the calculator and may only be used for power supply units.
The cable to the pulse receiver should be routed through a free cable entry and the wires connected to the appropriate terminals. The polarity doesn't have to be considered, the outputs are galvanic separated.
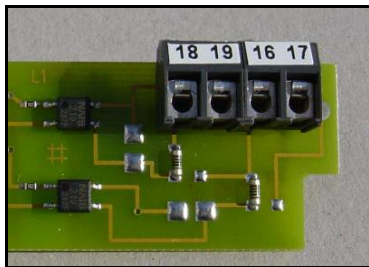
Closing time:	125 ms
Maximum pulse output frequency:	4 Hz
Bounce time:	None
Max. voltage:	28 V DC or AC
Max. power:	0,1 A
Protective resistance:	100 Ohm

Connection for FZS/N (power supply units only): Terminals 18 and 19 for volume pulses (FZS/N only)
                                                 Terminals 16 and 17 for heat energy pulses
Connection for FZS/B (battery or power supply units): Terminals 16 and 17 for heat energy pulses

Pulse values:

Input pulse of flow sensor in litres	Value of the heat energy output pulse in kWh	Value of the volume output pulse in litres *
0,25 or 1	1	1
2,5 or 10	10	10
25 or 100	100	100
250 or 1.000	1.000	1.000
10.000	1.000	1.000

* only for FZS/N