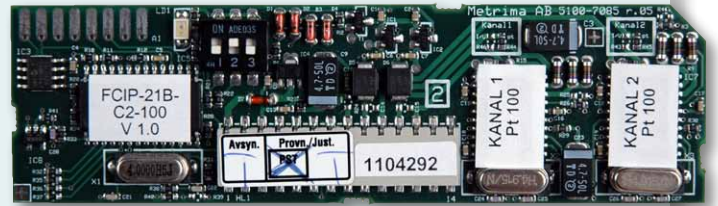


# SVM Analog input board PT100 (FCIP)

## DATA SHEET

- 1 or 2 channels
- For Pt100 temperature sensors
- Temperature range -50...+210°C
- Resolution 0.01°C
- Analog inputs accessible via M-Bus



## Analog input board Pt100 (FCIP)

The analog input board FCIP is useful for temperature monitoring in the range -50...+210°C. With this card installed in the F4 calculator, key operating information may be collected from the district heating or cooling substation.

The analog signal is sent via M-Bus to a monitoring system or an AMR system, eg. MCom. The analog input is updated with a 10Hz frequency, and can be read remotely via M-Bus or directly on the LCD.

With the service program "Plug & Play service utility" it is easy to customize the analog board with different resolutions to fit a specific application.

The analog input board is also available in a version for 0/2...10 V (FCIU), and a version for 0/4...20mA (FCII).



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### Calibration/Configuration

On delivery the FCIP option board is calibrated without compensation for cable resistance. Before using the option board, it should be calibrated for the sensor cable resistance. Use a service adapter and the "Plug and Play Configuration Utility" for this purpose. If the option board is not calibrated for the cable resistance, the measurement will be affected by an offset corresponding to the resistance in the temperature sensor cable. Use the following equation to calculate the resistance of the temperature sensor cable:

$$R_{\text{cable}} = k \times L / A, \text{ where}$$

$$k = 0.0172$$

**L = the length of the temperature sensor cable, in meters**

**A = the cross section of the temperature sensor cable, in mm<sup>2</sup>**

It is also possible to calculate the resistance of the temperature sensor cable by performing a measurement on a known temperature. The measurement error obtained corresponds to the resistance of the cable. Use the following equation to calculate the resistance:

$$R_{\text{cable}} = R_0 \times (1 + A \times t + B \times t^2), \text{ where}$$

$$R_0 = 100$$

$$A = 0.0039083$$

$$B = -0.0000005775$$

**t = offset in °C**

The latter equation also compensates for variations in the Pt sensor itself.

The service adapter and the Plug & Play software needed to configure the FCIP option board are included in the adapter kit for F4, with the ordering number FT-4-adapt-kk.

### Power failure

The option board FCIP may only be used in 230VAC mains supplied F4 calculators. In the event of a power failure the option board will not work, and the error code "ULOW" will be indicated in the relevant display sequence of the F4 for the option board slot in use. If the meter is read remotely during a power failure, the read value of the analog signals will be 0. When the power is restored, the FCIP option board will deliver proper values again within a minute. The inputs of the option board are protected against voltage and current transients.

### Technical data

Analog input board FCIP - Pt100	
Input signal	Pt100
Max. temperature sensor cable resistance	5 Ω
Output data, M-Bus	°C
Output data, LCD	°C
Resolution	0.01°C
Inaccuracy	± 0.5°C

Table 1, Technical data

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### Card slots

The analog input option board should be installed in card slots B or E. If no extra communication output is required, also slot A may be used.

### Dipswitches

Card lot	BY 1	BY 2	BY 3
A	On		
B		On	
E	On		On
Service	( )*	On	On

\* On/Off has no effect

Table 2, Dipswitch settings

**Important!** Never change the dipswitch setting when power is on.

### Installation

**NOTE:** Cut the power from mains and battery before installation to avoid damaging the meter or the option board.

**NOTE:** Disconnect any flow sensor connected to the meter, see below for more information.

**NOTE:** Install only one card at a time.

Recommended installation procedure:

1. Save data by short circuiting the “Save data” circuit.
2. Disconnect the flow sensor by removing at least one of the flow sensor cables.
3. Cut the power by disconnecting the four-pole connectors K2 and K3, cf. Fig.1.
4. Check that DIP switches are correctly set for the selected card slot and install the option board into the slot. The component side shall be turned towards the terminals. Align the chambered end of the board with the right side of the calculator box. Ensure that all pins on the option board are properly connected.
5. Turn power on, reconnect the four-pole connectors. 'K3' (battery) first and then “K2” (RawV).
6. Check that the board is properly installed; the LED “LD3” first blinks and is then turned off.
7. If another board is being installed, repeat steps 3-6.
8. Reconnect the flow sensor.

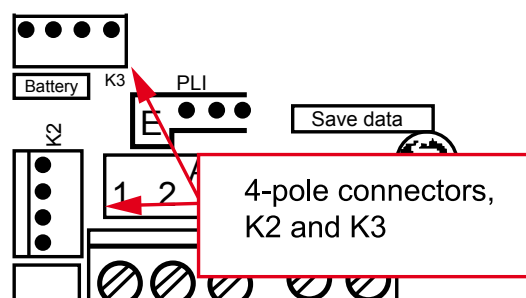


Fig 1, Connection terminal F4

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### Connection of analog inputs

Depending on the choice of card slot, use the terminal blocks A, B or E to connect the analog input signals. Also cf. table 3 below.

Card Slot	Channel	+	-
A	1	A1	A2
	2	A3	A4
B	1	B3	B4
	2	B1	B2
E	1	E3	E4
	2	E1	E2

Table 3, Card slots and terminals

The connection is polarity independent and this ensures correct installation as long as the proper two terminals are used.

**Example 1:** The analog board is installed in slot A, and a Pt100 temperature sensor shall be connected to channel 1:

Use terminals A1 and A2.

**Example 2:** The analog board is installed in slot B, and a Pt100 temperature sensor shall be connected to channel 1:

Use terminals B3 and B4.

**Example 3:** The analog board is installed in slot E, and a Pt100 temperature sensor shall be connected to channel 2:

Use terminals E1 and E2.

### Installation

Product designation: FCIP

Delivery options: ABCD

FCIP	A	B	C	D
1 input	1			
2 inputs	2			
Board delivered separately		1		
Board mounted inside F4		4		
Board for slot A			A	
Board for slot B			B	
Board for slot E			E	
One (1) Pt100 input				-C1-100
Two (2) Pt100 input				-C2-100

Table 4, Variable number for ordering

**Example:** Analog input board FCIP, 2 inputs, delivered separately, for slot B, standard configuration. Article number: FCIP-21B-C2-100.

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### Article number key

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Fill out the blanks to acquire the correct article number.

FCIP-	A	B	C	D

*Table 5, article number key*