

■ FC0181-L

1 channel – temperature converter for thermocouple with linearization

Description:

The module FC0181-L converts a low level DC signal from a thermocouple into a 4-20mA isolated signal. With each type of thermocouple two ranges of temperature can be selected using two switches in front side. Two other switches are used to select the Upscale or downscale drift for thermocouple burnout. Offset and span adjustments (+/- 15%) are easy using two trimmers located in the front side

Product options:

Option **ST**:FC0181-L-**ST**: thermocouple connected using Screw Terminals
 Option **CCT**:FC0181-L-**CCT**: thermocouple connected using Cage Clamp or spring Terminals



Main characteristics:

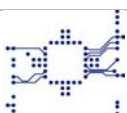
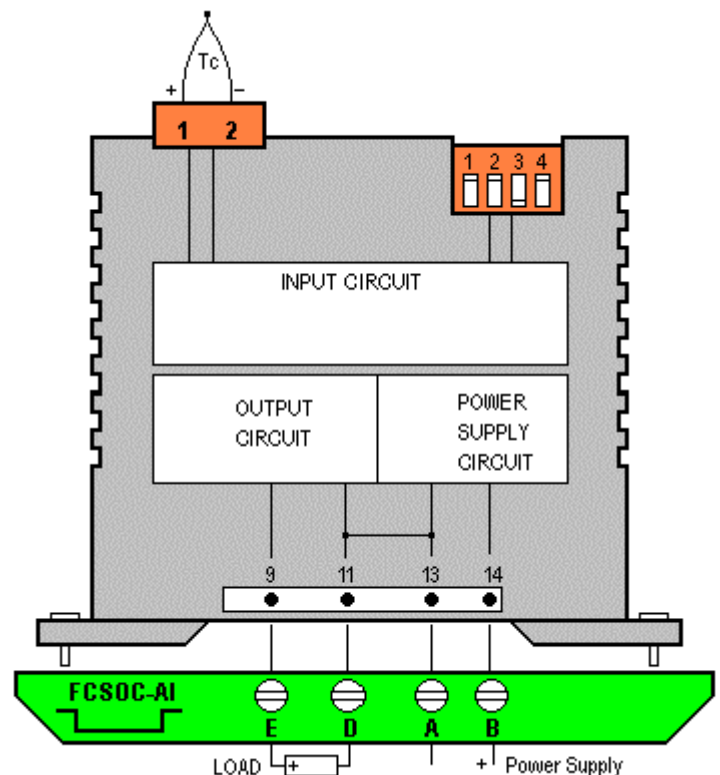
1 input channel for all type of thermocouple

4-20mA linearized output signal

Two temperature ranges selectable in each type of Tc (low range and high range)

Isolation between input and output

DIN rail mounting, on termination panel modulo 8 or modulo 16, or individual socket



Technical specifications

Power Supply

Voltage range:	21Vdc to 30Vdc
Power ON indication:	By green Led on front plate
Consumption (24Vdc):	70 mA with output at 20mA
Replaceable fuse:	100 mA 250V quick action

Input specifications

Thermocouple type:	J, K, T, E, R, S, B,.....
Input current at 25°C:	0.5nA maxi
Standard range for Tc "K"	Low:0 / 500°C, High:0 / 1000°C
Standard range for Tc "J"	Low:-100 / 300°C, High:0 / 800°C
Standard range for Tc "T"	Low:0 / 200°C, High:-100 / 400°C
Standard range for Tc "E"	Low:0 / 500°C, High:0 / 1000°C
Standard range for Tc "R,S,B"	Low:200 / 800°C, High:500 / 1750°C
Trimmer adjustment for zero (Z):	+/- 15% of the offset
Trimmer adjustment for span (S):	+/- 15% of the span
Burnout thermocouple:	Upscale or downscale

Output specifications

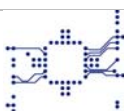
Current:	4-20mA
Low limit:	2mA (downscale burnout Tc)
High limit:	22mA (upscale burnout Tc)
Max load:	500 ohms at 20mA output

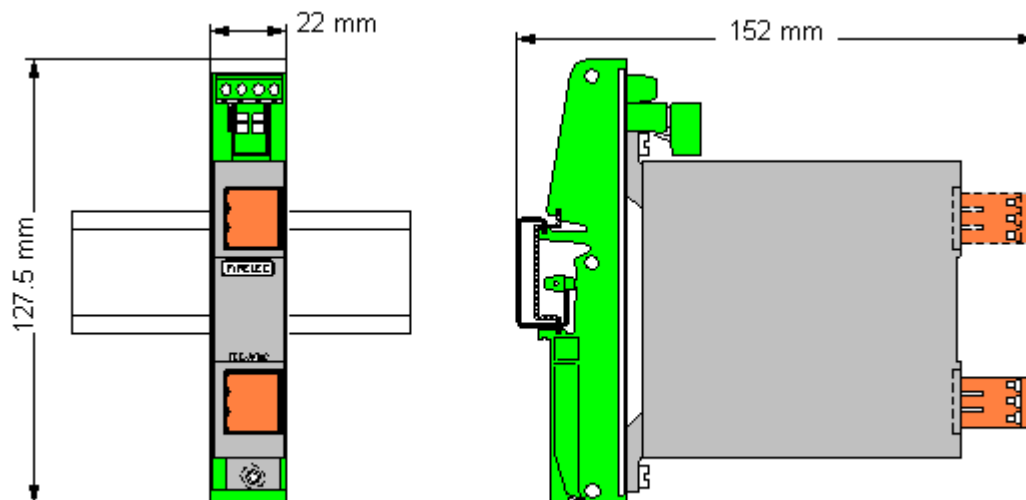
Transfer characteristics

Resolution	0,12%
Accuracy at 20°C ambient:	0.2% (linearized output included)
Response time:	90% of the final value within 250ms.
Cold junction compensation error:	+/- 1.5°C
Drift:	0,01%/°C
Isolation Voltage (Input / output - P.S):	1500Vdc
Common mode rejection at 220v:	DC: without measurable effect AC (50Hz): 120 dB

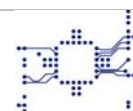
Mechanical and environment characteristics

Protection:	IP20
Wiring conductor section:	Option ST: 24 to 12 AWG (0.2 to 2.5 mm ²) Option CCT: 24 to 12 AWG (0.2 to 2.5 mm ²)
Weight:	100g
Size:	H=85mm W=16mm D=120mm with front connector
Operating temperature:	-10°C to 50°C
Storage temperature:	-20°C to 60°C
Relative humidity:	10 to 90% (no condensation)
Mounting:	<u>DIN rail</u> : panel modulo 8 type FC8308-1 or FC8308-2 or modulo 16 type FC8316-1 (see panel documenta- tion) or individual socket type FCSOC-AI <u>Rack 19"</u> : panel modulo 16 type FC5321



Socket for individual mounting on DIN rail

FC0181-L installed on FCSOC-AI socket
Individual socket characteristics

Reference of individual socket:	FCSOC-AI
Power Supply connection:	Screw Terminal B (+) and A (-) AWG 14 to 26 or 0.14 to 1.5mm ²
Fuse protection on power supply:	1A
Protection:	Against over voltage and reverse polarity
Output connection:	Screw terminals E (+) and D (-) AWG 14 to 26 or 0.14 to 1.5mm ²



Changing temperature range:

For each type of thermocouple, the FC0181-L module can be calibrated either within a high temperature range, or a low temperature range.

It is factory calibrated for one type of thermocouple within a high or low temperature range, depending on the customer requirement.

However, it is easy to switch from one range to the other by following the steps here under

Warning. Before switching from one temperature range to the other, disconnect the power supply from the module.

1. Select switches 1 and 2 according to the suited temperature range, as follow.

Low range			High range		
ON	switch 1			switch 1	OFF
	switch 2	OFF	ON	switch 2	

In case of burnout thermocouple, the output signal can go UPSCALE or DOWNSCALE depending of the switches 3 and 4

2. Select switches 3 and 4 as follow.

Downscale burnout			Upscale burnout		
ON	switch 3			switch 3	OFF
	switch 4	OFF	ON	switch 4	

Warning. Before proceeding to calibration, all switches must be well selected.

3. Connect compensation wires (according to the type of thermocouple used) from the thermocouple simulator to the input connector in front side of the module, with respect of polarity 1(+) and 2(-). The cold junction compensation of the "Tc" simulator must be ON.
4. Connect a 100 ohm 0.1% precision resistor between terminal E(+) and D(-) of the socket FCSOC-AI.
5. Connect the 24Vdc power supply, and wait few minutes before proceeding to calibration, to be sure that the cold junction compensation measures the right ambient temperature.
6. Set the input signal to the minimum range value (0%), and adjust the potentiometer "Z" in front side of the module to get 0.400V between terminal E(+) and D(-).
7. Set the input signal to the maximum range value (100%), and adjust the potentiometer "S" in front side of the module to get 2.000V between terminal E(+) and D(-).
8. Repeat operation 6 and 7, to get a fine adjustment.

