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AT-1I

Analog Temperature Transmitters [4-20mA]

www.fif.com.pl

F&F products are covered by an 24 months warranty from date of purchase

PURPOSE

AT-1I module is designed to measure temperature with an external temperature sensor and converting the measured quantity to an unified analog output signal the current from range 4-20mA.

FUNCTIONING

AT-1I shall keep under continuous transformation the resistance of external temperature sensor to output current signal from the range 4-20mA. As a result of the transformation appears on the output current proportional to the temperature of the environment in which is the temperature sensor
The module cooperate with a resistive temperature sensor KTY61-210 (or analogous) Dedicated the temperature probes of the production of F&F: RT probe or probe Rt823. Probes are available separately. The output signal of module is protected by noise filter, which eliminates interference network, affecting the accuracy of the transmitted signal. This allows the use of signal

Installation

1. Take OFF the power.
2. Put the module on the rail.
3. Temperature probe conect to joints 10-12 (arbitrary polarity)
4. Signal output 1-3 connect to power and analog input (AI) current of receiver device (arbitrary polarity).
ATTENTION!!! Maximum lenght of UTP cable - 300m

ATTENTION!!

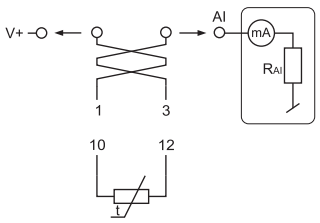
Due to the differences between the inner resistance (R_{AI}), analog current devices that can be used with AT-1I module is necessary power to the appropriate voltage V +. The minimum voltage can be calculated from the formula:

$$U_{V+} > \frac{R_{AI}[\Omega]+400}{50}\ [V]$$

R_{AI} - inner resistance of input of receiver device.

in the case of the module supply voltage lower than the required outcome measurements will be saddled with a mistake.

WIRING DIAGRAM



Auxiliary calculation formulas

*Based on a linear function y=a*x+b calculate formulas*

[1] $Iw = [0,106667 \times Tm + 9,334] \pm 0,5\%$

$$Where\ a = \frac{20-4}{100-(-50)} = 0,106667$$

[2] $Tm = [9,375 \times Iw - 87,5] \pm 0,5\%$

$$Where\ a = \frac{100-(-50)}{20-4} = 9,375$$

Iw - output current [mA]
Tm - environment temperature of sensor
4÷20mA - range of output current signal
-50÷100[°C] - measure range of temperature sensor
±0,5% - precision of processing

Assembly

General assumptions

- recommended the use of filters and surge suppression (eg, OP-230)
-recommended is wiring to UTP (twisted pair) for connecting the module to another device
- In the case of shielded cables grounded screens performed only on one side and as close to the device
- not installed parallel signal wires in close proximity to the line and high voltage średniegi
- do not install the module in close proximity to electrical devices, high-power electromagnetic measuring instruments, devices with phase power regulation, and other devices which can introduce distortions

TECHNICAL DATA

supply	*9÷30V DC*
measure range	*-50°C÷+100°C*
mistake precision	*±1,5°C*
max. current load	*4÷20mA*
temperature sensor	*KTY81-210*
working temperature	*-40°C÷+85°C*
storage temperature	*-40°C÷+85°C*
relative humidity	*85% to +30°C*
connection	*screw terminals 2,5mm²*
dimensions	*1 module (18mm)*
protection level	*IP20*

Dedicated temperature probe

mark	*RT*
temperature sensor	*KTY81-210*
sensor dimensions	*Ø5; h=20mm*
sensor isolation	*heat shrink*
cable	*OMY 2x0,34mm²;l=2,5m*

mark	*RT823*
temperature sensor	*KTY81-210*
sensor dimensions	*Ø8; h=40mm*
sensor isolation	*metal bushing*
cable	*refractory SIHF 2x05mm²;l=2,5m*

Working with programming controller MAX [F&F]

Example of program instruction in ForthLogic Language, reading of input current and convert the value of the measured to temperature.
1 AI? 9.37 F 87,5 F-*
More information in the user programming in ForthLogic language

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