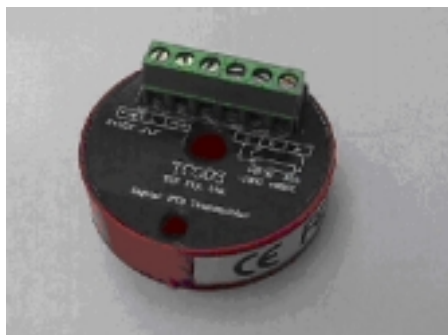


TC-003 Digital RTD Transmitter

What is it?

The TC-003 Digital RTD Temperature Transmitter is a unique device designed to transmit the temperature measured by a PT100 RTD sensor to a PLC digital input. Although it requires only one normal digital 24VDC input on the PLC, it provides an accurate temperature measurement for use in the PLC program.



What does it look like?

It is packaged in a standard ANSI 2", 50mm "hockey-puck" to be installed in the head of normal industrial temperature probe assembly. The TC-003 transmitter is connected to the normal PT100 RTD.

How does it work?

It measures the resistance of the PT100 RTD and then calculates the corresponding temperature. It

then outputs the measurement as a low speed serial pulse train to a standard PLC digital input.

The PLC receives 16 bits of data in a format ready to load into a 16 bit data register. The PLC register ends up containing the value of the measured temperature in degrees C x 10. For example if the measured temperature is -5°C the transmitted data will be -50, and if the measured temperature is +10°C the transmitted data will be 100.

Is it compatible?

The PLC digital input does not need to be a high speed or counter type input. Any normal 24VDC digital input is suitable.

The rate of data transmission is selected to allow non-time critical operation of the receiving PLC. The shortest pulse time is 100mS, so the PLC needs to have a maximum scan time of 50mS. This is normally very easy to achieve.

A small section of ladder program collects and interprets the pulses in sequence and loads a register with the measured temperature value.

There is no particular limit to the number of TC-003 transmitters that can be used with a single PLC. It depends only on the number of inputs and program and data memory available.

Specifications

Data format

Start pulse and 16 data bits, 2's complement binary code, MSB first, °C x 10.

Start pulse

500mS +ve, 100mS -ve

Data pulse

Binary 0 100mS +ve, 200mS -ve
Binary 1 200mS +ve, 100mS -ve

Rate

One reading every 8 seconds

Accuracy

Resistance $\pm 0.1\%$, equivalent to ± 0.3 °C at 0°C

Useful Range

-100°C to +850 °C

Resolution

0.1°C

Power Supply

24VDC, 20mA
min 18V, max 30V

Connection

3-Wire
+24VDC, 0VDC, output

Input

RTD PT 100, 3-wire
DIN 43760, $\alpha = 0.00385$

Output

- ❖ 24VDC "push-pull", 100mA.
- ❖ Output connection switches between 0V and +24VDC to operate correctly with normal PLC 24VDC sink or source input ("PNP" or "NPN").
- ❖ Output is short-circuit, overload and reverse polarity protected.

Transient protection

- ❖ Transients above 33V are absorbed by Tranzorb surge suppressors.
- ❖ Continuous DC operation above 33V will destroy the sensor.

Physical

- ❖ 50mm diameter ANSI standard
- ❖ Fully encapsulated electronics
- ❖ Screw terminal blocks

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