Remote Terminal Units - Data sheet

PT100 input 530PTD01

RTU530 product line

Temperature module for 4 PT100 inputs

- 4 PT100 inputs
- 2/3/4 wires per per channel
- Resolution: 16 bit
- Accuracy: Class B with a corresponding sensor
- Measuring range: -25 °C…150 °C
- Overrange: -200 °C…200 °C
- Measuring current: 1 mA

Application

The 530PTD01 module is used to connect PT100 temperature transmitter directly. Up to four transmitters can be connected to the board.

The module is available in two versions (rubrics):

- 530PTD01 R0001
- 530PTD01 R1001 conformal coated

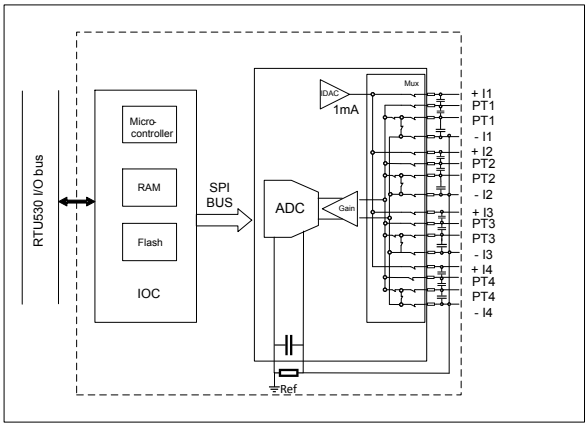

Figure 1: Block diagram 530PTD01

Characteristics

Basic checks and computing of intensive, cyclical processing functions will already be done on the module and remove therefore the burden from the communication unit. Relevant changes are transmitted as event via the I/O bus.

The 4 differential inputs are not potentially isolated against the RTU500 series power supply.

The 530PTD01 converts the analog signals into 65535 steps (16 bit) for 100 % of the measuring value.

The differential inputs are protected against static and dynamic over-voltages by a protection circuit. A low-pass filter suppresses non line frequency AC disturbance.

The line frequency is to be configured in the configuration tool. The micro controller uses these configurations parameters to setup the A/D-converter.

Line-frequency	Conversion time per input	Scan cycle per module
16,6 Hz	152 ms	608 ms

Table 1: Sensor wiring: 2/4 wire

Line-frequency	Conversion time per input	Scan cycle per module
50 Hz	52 ms	208 ms
60 Hz	52 ms	208 ms

Table 1: Sensor wiring: 2/4 wire

Line-frequency	Conversion time per input	Scan cycle per module
16,6 Hz	304 ms	1216 ms
50 Hz	104 ms	416ms
60 Hz	104 ms	416ms

Table 2: Sensor wiring: 3 wire

The micro controller controls the A/D converter and executes all of the processing functions of the configured measured values within the conversion time. Furthermore the micro controller is responsible for the communication with the RTU system bus. All configuration characteristics and processing parameters are downloaded from the CMU via the RTU530 I/O.

In connection with an RTU530 communication unit or an I/O adapter (e. g. 530ADD01) the module is connected to the RTU530 I/O bus.

The module provides a data buffer for temporally storing of up to 50 event messages including time stamps. The events are stored in chronological order designated for transmission to the communication unit (CMU).

During initialization and operation the module carries out a number of tests. If a fault occurs it is reported to the CMU. A failure of the module is detected by the communication unit.

Power supply input

The required power for the module is supplied via the RTU530 I/O bus connector.

Technical data

In addition to the RTU500 series general technical data, the following applies:

General standards	
Safety tested according to	• IEC 61010-1 • IEC 61010-2-201
Environmental conditions tested according to	• IEC 60255-21-1 class 1 • IEC 60255-21-2 class 1 • IEC 60870-2-2 class Bm and C1
Electromagnetic compatibility (EMC) tested according to	• IEC 61000-6-2 • IEC 61000-6-4 • IEC 61000-6-5
Insulation classification according to	IEC 60664-1 • Pollution degree 2 • Overvoltage category II • Altitude: ≤ 3,000 m

Environmental conditions - climatic	
Operating temperature EN 60068-2-14	-25 °C ... 70 °C
Start up EN 60068-2-1	-40 °C
Max. operating temperature, max. 96h EN 60068-2-2	+85 °C
Relative humidity EN 60068-2-30	5 ... 95 % (non condensing)

Environmental conditions - mechanical	
Vibration sinusoidal, Test Fc , IEC 60068-2-6	3.5 mm (3...9 Hz) 10 m/s² (9...35 Hz) 1 octave/ min, 1 cycle per axis IEC 60255-21-3 class 1 3 mm (3...9 Hz) 10 m/s² (9...200 Hz) 15 m/s² (200...500 Hz) 1 octave/ min, 10 cycles per axis IEC 60870-2-2 class Bm 0.035 mm (10 Hz...60 Hz) 5 m/s² (60 Hz...150 Hz) 1 octave/ min, 1 cycle per axis IEC 60255-21-1 class 1
Shock and Bump, Test Ea, IEC 60068-2-27	250 m/s², 10 ms 4 shocks per direction IEC 60721-3-3 class 3M5 150 m/s², 11 ms 3 shocks per direction IEC 60255-21-2 class 1 IEC 60870-2-2 class Bm 100 m/s², 16 ms 1000 shocks per direction IEC 60255-21-2 class 1

Emission test	
Radiated emissions - enclosure ports (30 Mhz to 1 GHz), CISPR 16-2-3/ EN 55016-2-3	EN 55011/ CISPR 11 class A

Immunity test	
Electrostatic discharge, IEC 61000-4-2	8 kV air / 6 kV contact (level 3), criterion A
Radiated radio-frequency electromagnetic field, IEC 61000-4-3	80 MHz to 1 GHz: 10 V/m (level 3), criterion A 1 GHz to 2.7 GHz: 10 V/m (level 3), criterion A
Power frequency magnetic field, IEC 61000-4-8	100 A/m (level 5), criterion A
Impulse magnetic field, IEC 61000-4-9	100 A/m (level 3), criterion A

Mean time between failure (MTBF)	
Calculation according to Telcordia III 40°C	10,349,817 h

Mechanical layout	
Dimensions	30 mm x 125 mm x 85 mm (Width x Height x Depth)
Housing type	Plastic housing (V-2), RAL 7035 light gray
Mounting	DIN rail mounting (EN 50022 TS35: 35 mm x 15 mm or 35 mm x 7.5 mm)
Weight	0.15 kg

Conformal coating	
Material base	Acrylate resins (AR)
Standards	• IPC-CC-830B • MIL-I-46058C • UL 94 • UL 746E
Noxious gas protection (coating material)	noxious gas test according to DIN EN 60068-2-60 or BMW GS 95003-4
Dielectric strength (coating material)	60 kV/ mm according to IPC-TM-650 or DIN EN 60243-1
Resistance to condensation (coating material)	1.0 x 10^{10} Ohm based on DIN EN ISO 6270-2

Connection type	
Process connector (X4)	1 x 17 pole 5.08 mm pluggable screw terminals (included in delivery), 0.2... 2.5 mm²/ AWG 24 - AWG 12
Connector from CMU/ADD or other I/O module (X2)	2 x 6 pin, male
Connector to next I/O module (X3)	2 x 6 pin, female

Current consumption for power supplied via RTU530 I/O bus	
5 V DC	25 mA
24 V DC	--

Analog input channels 530PTD01	
Inputs	4 differential inputs
A/D converter resolution	16 bit
Accuracy	± (0,30 °C + 0,005 x ITI)
Temperature range	-25 °C ... 150 °C
Temperature overrange	-200 °C ... 200 °C
Temperature drift	<150ppm/K
Common mode rejection	115 db
Configurable line frequency f_N	• 16.6 Hz • 50 Hz • 60 Hz
Line frequency interference suppression	79 dB @ ± 1 Hz

Analog inputs - EMC tests	
Electrical fast transient / Burst, IEC 61000-4-4	4 kV (level 4), criterion A
Surge 1.2/50 µs, IEC 61000-4-5	2 kV (level 3), criterion A
Conducted disturbances, induced by radio-frequency fields, IEC 61000-4-6	10 V (level 3), criterion A
Ring wave, IEC 61000-4-12	2 kV (level 3), criterion A
Conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz, IEC 61000-4-16	30 V continuous disturbance/ 300 V short duration disturbance (level 4), criterion A
Damped oscillatory wave, IEC 61000-4-18	2.5 kV (level 3), criterion A

Ordering information	
530PTD01 R0001	1KGT051000R0001
530PTD01 R1001 conformal coated	1KGT051000R1001

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