

## Configurable Measuring Transducer for Resistance Thermometer (RTD)

**PT2**

Characteristics:

- Universal 2- /3- /4 –wire technology
- PT100, PT200, PT500 or PT1000 sensor
- Accuracy < 0, 1%
- Measurement range configurable -200°C ...+850°C
- Current- or voltage output configurable
- Galvanic 3-way isolation between input - output – power supply
- Sensor monitoring
- Supply 24VDC
- Mountable on 35mm cap rail TS35
- Clear terminal labeling
- Shape 6,2mm
- High reliability, 5 years warranty



Description:

The devices of the series PT2 temperature-measuring transducers have been developed for linearized converting of PT100-, PT200-, PT500- resp. PT1000 signals to norm signals 0/4...20mA, 0/2...10mA resp. 0/2...10V, 0/1...5V. The module has a true 4-wire measurement. But there also sensors in 2- and 3-wire technology can be connected. At a 2-wire connection is the compensation of the wire resistance by software parameterization possible. The transducer is configurable in the range of -200...+850°C, see table. The smallest measurement range is fixed at 50°C. Via Dip-switch the starting temperature in the range of -200°...0°C and the end temperature in the range of 0°...850°C can be adjusted. The behavior of the analog output in case of a sensor fault can also be determined. It is possible to clamp the output value if the measurement range reaches its limit or in case of wire breakage or short circuit. Via one LED each in the front panel the operational condition H2 and error message H1 are signaled.

Optional the devices can be configured via an integrated USB interface. (All Dip-switches in position „off“). You only need the LEG parameterization software LEGset and a USB wire, an additional adapter is **not** necessary.

Input, output and supply power are isolated with a true 3-wire isolation.

For supply of the measuring transducer an auxiliary supply power of 24V is needed.

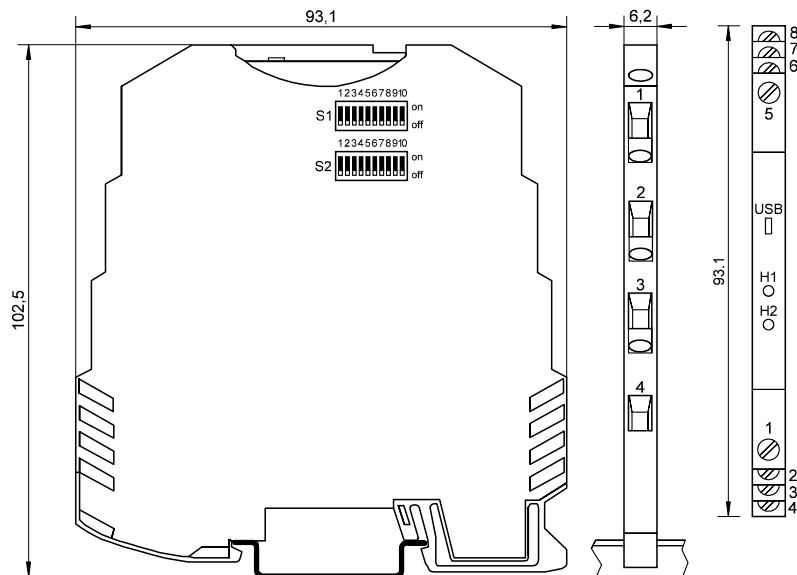
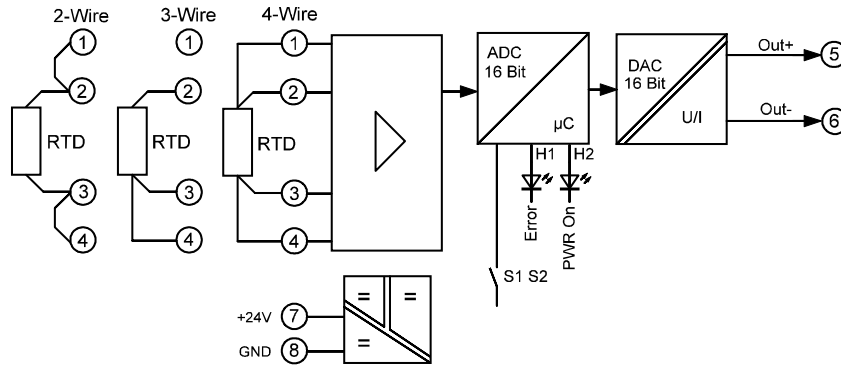


Table 1:

| DIP switch S1 (● = On) |       |             |   |        |               |   |             |   |    |                             |                              |                      |                                |
|------------------------|-------|-------------|---|--------|---------------|---|-------------|---|----|-----------------------------|------------------------------|----------------------|--------------------------------|
| Connection             |       | Sensor type |   |        | Output signal |   |             |   |    | Measurement range underflow | Measurement range over range | Wire breakage        | Short circuit                  |
| 1                      | 2     | 3           | 4 | 5      | 6             | 7 | 8           | 9 | 10 |                             |                              |                      |                                |
|                        | 2-way |             |   | PT 100 |               |   | 0...10V     |   |    | Output range start - 5%* ** | Output range end +2,5%*      | Output range end+5%* | Output range start - 12,5%* ** |
| ●                      | 3-way | ●           |   | PT 200 | ●             |   | 2...10V     |   |    |                             |                              |                      |                                |
|                        | 4-way |             | ● | PT 500 |               | ● | 0...5V      | ● |    | Output range start          | Output range end +2,5%       | Output range end +5% | Output range start             |
|                        |       | ●           | ● | PT1000 | ●             | ● | 1...5V      |   |    |                             |                              |                      |                                |
|                        |       |             |   |        |               |   | ● 0...20 mA | ● |    | Output range start          | Output range end             | Output range end +5% | Output range end +5%           |
|                        |       |             |   |        |               |   | ● 4...20 mA |   |    |                             |                              |                      |                                |
|                        |       |             |   |        |               |   | ● 0...10mA  | ● |    | Output range start          | Output range end             | Output range start   | Output range start             |
|                        |       |             |   |        | ●             | ● | 2...10mA    | ● |    |                             |                              |                      |                                |

\* ac. NAMUR NE43

\*\* but not at output 0V or 0mA

Table 2:

| DIP switch S2 (● = On) |   |   |   |                 |      |   |   |   |   |   |    |    |     |     |     |   |   |   |    |    |    |
|------------------------|---|---|---|-----------------|------|---|---|---|---|---|----|----|-----|-----|-----|---|---|---|----|----|----|
| Start temperature      |   |   |   | End temperature |      |   |   |   |   |   |    |    |     |     |     |   |   |   |    |    |    |
| 1                      | 2 | 3 | 4 | °C              | °F   | 5 | 6 | 7 | 8 | 9 | 10 | °C | °F  | 5   | 6   | 7 | 8 | 9 | 10 | °C | °F |
|                        |   |   |   |                 |      |   |   |   |   |   |    |    |     | ●   |     |   |   |   |    | ●  |    |
|                        |   |   |   |                 |      |   |   |   |   |   |    |    |     | 75  | 167 |   |   |   |    | ●  |    |
| ●                      |   |   |   | -200            | -328 | ● |   |   |   |   |    | 0  | 32  | ●   |     |   |   |   |    | ●  |    |
|                        | ● |   |   | -175            | -283 |   | ● |   |   |   |    | 5  | 41  | ●   |     |   |   |   |    | ●  |    |
|                        |   | ● |   | -150            | -238 | ● | ● |   |   |   |    | 10 | 50  | ●   | ●   |   |   |   |    | ●  |    |
|                        |   |   | ● | -125            | -193 |   |   | ● |   |   |    | 15 | 59  |     | ●   |   |   |   |    | ●  |    |
| ●                      | ● |   |   | -100            | -148 | ● |   | ● |   |   |    | 20 | 68  | ●   | ●   |   |   |   |    | ●  |    |
|                        | ● | ● |   | -90             | -130 |   | ● | ● |   |   |    | 25 | 77  | ●   | ●   |   |   |   |    | ●  |    |
| ●                      | ● | ● |   | -80             | -112 | ● | ● | ● |   |   |    | 30 | 86  | ●   | ●   |   |   |   |    | ●  |    |
|                        |   |   | ● | -70             | -94  |   |   |   | ● |   |    | 35 | 95  |     |     | ● |   |   |    | ●  |    |
| ●                      |   |   | ● | -60             | -76  | ● |   |   | ● |   |    | 40 | 104 | ●   |     | ● |   |   |    | ●  |    |
|                        | ● | ● |   | -50             | -58  |   | ● |   | ● |   |    | 45 | 113 | ●   |     | ● |   |   |    | ●  |    |
| ●                      | ● | ● |   | -40             | -40  | ● | ● |   | ● |   |    | 50 | 122 | ●   | ●   |   |   |   |    | ●  |    |
|                        |   | ● | ● | -30             | -22  |   |   | ● |   |   |    | 55 | 131 |     | ●   | ● |   |   |    | ●  |    |
| ●                      | ● | ● | ● | -20             | -4   | ● |   | ● |   |   |    | 60 | 140 | ●   | ●   | ● |   |   |    | ●  |    |
|                        | ● | ● | ● | -10             | 14   |   | ● | ● |   |   |    | 65 | 149 | ●   | ●   | ● |   |   |    | ●  |    |
| ●                      | ● | ● | ● | 0               | 32   | ● | ● | ● |   |   |    | 70 | 158 | ●   | ●   | ● |   |   |    | ●  |    |
|                        |   |   |   |                 |      |   |   |   |   |   |    |    |     | 200 | 392 | ● | ● | ● |    | ●  |    |
|                        |   |   |   |                 |      |   |   |   |   |   |    |    |     |     |     |   |   |   |    | ●  |    |

The smallest measurement range is fixed at 50°C, a wrong setting is signaled by red LED H1

**Standard setting**

| In delivery condition all Dip-switches are switched on position "off". This is the necessary setting to configure the devices via USB interface. |          |
|--|----------|
| Function   | Setting  |
| Connection   | 4-wire   |
| Measurement sensor   | PT100    |
| Measurement range start  | 0 °C     |
| Measurement range end  | 200 °C   |
| Output   | 0...10 V |
| Measurement cycle  | 100 ms   |
| Measurement range underflow  | 0 V      |
| Measurement range over range   | 10 V     |
| Wire breakage  | 0 V      |

## Technical data

### Auxiliary power:

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Supply voltage : 19...32V DC  
Power consumption : < 0,7VA

### Inputs:

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Temperature sensor : PT100, PT200, PT500 or PT1000  
Way of measurement : 2-wire/ 3-wire / 4-wire  
Sensor current : 500µA at 2/4-wire/ 250µA at 3-wire  
Measurement range : -200°C...+850°C resp. -328°F...+1562°F adjustable, see table 2  
Max. wire resistance : 25Ω each wire at 4/3-wire , 10 Ω at 2-wire  
Step response : 100ms at DIP-switch configuration  
3, 5, 7, 5, 14, 26, 50, 100, 200, 400 or 800ms at software configuration

### Analog outputs:

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Voltage output : 0(2)...10 V resp. 0(1)...5V / Last > 10KΩ  
Current output : 0(4)...20 mA resp. 0(2)...10 mA / load resistor max. 500Ω  
Load error : < 0, 01%

### Accuracy:

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Measurement accuracy : < 0, 1% at complete measurement range (-200°C...850°C)  
Measurement accuracy : ((10K / measurement range [K]) + 0, 1) %  
Of measurement range :  
Resolution : 15 Bit conforms 0, 1°  
Temperature coefficient : < 0, 01% / K

### General data:

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Operating temperature : 0...50°C  
Storage temperature : -25...+85°C, condensation before putting into operation is not allowed  
MTBF : 168 years Mean Time Between Failures – according to EN 61709 (SN 29500).  
Requirements: Stationary operation in clean rooms, average ambient temperature 40 ° C, no forced ventilation, continuous operation  
CE conformity : EN 61326-1, EN 61000-4-2/3\*/4/5/6\*, EN 61000-6-4  
\* during measurements small deviations are possible

### Body:

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Dimension : 6,2mm terminal block body, 6,2x93,1x102,5  
Material : PA / V0  
Protection category : IP20  
Connection : M3-screw-type terminal 0, 14 - 2,5mm², flexible or inflexible  
Fixing : Snap-on mounting for norm rail TS35  
Weight : 60g

#### **Note on safety:**

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Disconnect the power supply before attempting to open the unit.

During the operation of this module it is possible that parts of the module, even there is extra-low voltage, (for example shunt measurement) are under dangerous voltage! Therefore a non-observance of this caution may cause damage of property or physical injury.

Only trained qualified personnel should install or operate the unit. Before installation the qualified personnel should read the documentation and should familiarize themselves with the unit.

If there is visible damage to the body of the unit it should be immediately replaced and not put into operation.



Please ensure that there is a sufficient prevention against electrostatic discharge during installation of the unit.

#### **Installation Information:**

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Pay attention and make sure the unit is far away from mounted sources that may disturb the device such as magnetic coils, transformers, frequency converters etc.

#### **Wiring advise:**

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Use only shielded cables. The shield is to be connected extensively to ground. Do not mix power- and signal-wires/cables in the same cable tray.

#### **Limited guarantee:**

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The LEG Industrie-Elektronik GmbH warranted that the product does not have any material or processing defects in a period of 5 years after date of delivery.

It is up to the choice of LEG to repair or to exchange an inoperative unit.

Subsequent damages or any claim for indemnification above the functionality of the unit are excluded.

This limited warranty is only valid if ...

1. the product was installed and put into operation according to the LEG operation documentation;
2. the technical configuration of the power supply was abided;
3. the product was not used for unintended purposes;
4. there were no unauthorized modifications or manipulations, misuse or repairs without previous agreement from LEG .

Our Terms of Trade are based on the "General Conditions for the supply of products and services of the Electrical and Electronics Industry" including the "Complementary Clause: Extended Reservation of Property" of the ZVEI e.V. (German Association of Electrical Manufacturers).

#### **Miscellaneous:**

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We expressly reserve the right, without previous notice, to correct errors contained in any data of this information brochure, and to make alterations to the program and technical modifications.