

VOLTAGE OUTPUT ISOLATED DIN RAIL TRANSMITTER TDU302-I



The Tekon Electronics Universal Temperature Transmitters are specifically designed to meet the most rigorous requirements of operation in the industrial process environments.

TDU302-I is an ultra-flexible universal temperature transmitter which accepts the most commonly used temperature sensors (resistance thermometers with 2, 3 or 4-wire system and thermocouples) and generates a linear 0 to 10 V voltage signal with high stability as output.

Dimensions 6,2 x 96,4 x 106,1 mm

Weight Approx. 55g

Material PA RAL 7035

Protection Index IP40 (enclosure) / IP20 (terminals)

KEY FEATURES

PT100, PT500 AND PT1000 INPUT SENSOR

THERMOCOUPLE SENSOR INPUT

J, K, N, R, S, T

1,5 kV AC GALVANIC ISOLATION

0 TO 10 V ANALOG OUTPUT

2 STATUS LEDS

HIGH MEASUREMENT ACCURACY

HIGH EMC PERFORMANCE

CONFIGURABLE OVER PC

TEKON CONFIGURATOR SOFTWARE

DS_DINR_TDU302-I_E01B

TECHNICAL SPECIFICATIONS

**INPUT
RESISTANCE THERMOMETER (RTD)**

Measured variable	Temperature
Sensor type	PT100, PT500, PT1000
Connection	1 Resistance thermometer (RTD) in 2, 3 and 4-wire system
Units	°C
Sensor current	200 µA
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Always active (cannot be disabled)
Measuring range	Configurable (see "Digital measuring accuracy" table)
Minimum measured span	50°C
Characteristic curve	Temperature-linear
Cable resistance per wire (max.)	50 Ω
Effect of sensor cable resistance	< 0,0015 Ω / Ω - 3 wires < 0,0005 Ω / Ω - 4 wires

**INPUT
THERMOCOUPLE (TC)**

Measured variable	Temperature
Sensor type	Thermocouples J, K, N, R, S, T
Units	°C
Connection	1 Thermocouple (TC)
Sensor current diagnostic	< 11 nA
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Not available
Cold junction compensation (CJC)	Integrated resistance thermometer
Measuring range	Configurable (see "Digital measuring accuracy" table)
Minimum measured span	50°C
Characteristic curve	Temperature-linear

USB

Type	Micro USB
Input voltage	5 V (*)

(*)If the external power and the micro USB are connected at the same time, the analog output loop can be inhibited. If that happen remove the power cord from the laptop and use it only with batteries.

OUTPUT

Output signal	0 to 10 V
Power supply	12 to 24V DC
Load (@ voltage output)	≥ 5 kΩ
Error signal (e.g. following sensor fault)	Software configurable 0 V or 11 V
Sample cycle	< 200ms
Protection	Against reversed polarity Surge protection

COMMON SPECIFICATIONS

Isolation voltage (test operation)	1,5 kV AC 48 V AC
Internal power dissipation	100 mW to 300 mW
Voltage drop	12 VDC
Effect of supply voltage variation	< 0,0001% of span/ V DC
Response time 90%	< 1s
Power-up time (TC)	< 600ms
Power-up time (RTD)	< 1s

MEASUREMENT ACCURACY

Reference conditions	
Auxiliary power	24V DC ± 1%
Ambient temperature	23°C
Warm-up time	2 min
Error in the analog output (digital/analog converter)	≤ ± 0,01% of span
Digital measuring errors	See table “Digital measuring accuracy” table
Error due to internal cold junction	< ± 0,35 °C
Influence of ambient temperature	
on RTD measurement	< ± 0,0042 °C / °C
on thermocouple	Thermocouples J, K, N: ≤ ± 0,0008 °C / °C Thermocouples R, S, T: ≤ ± 0,0012 °C / °C
on analog output	< ± 0,001% of span / °C
EMC - immunity influence (IEC 61326-1)	< ± 0,0891% of span
Extended EMC immunity (NAMUR NE 21, A criterion, burst)	< ± 0,433% of span

OPERATING ENVIRONMENT

Ambient temperature range	-40 to 80°C
Storage temperature range	-40 to 80°C
Relative humidity	≤95%, without condensation

FACTORY DEFAULT SETTINGS

Sensor	PT100 with 3-wire circuit
Measuring range	-200°C to 850°C
Temperature Format	Celsius [°C]
Fault voltage	0 V
Voltage offset	0 mV

CASING

Material	PA RAL 7035
Weight	Approx. 55g
Dimensions	See “Dimensional drawings”
Cross section	2.5 mm ²
Protection type	IP40 (enclosure) / IP20 (terminals)

CERTIFICATIONS AND APPROVALS

EN 61326-1- Class B - Industrial Requirements

IEC 61000-4-2

IEC 61000-4-3

IEC 61000-4-4

IEC 61000-4-5

IEC 61000-4-6

DIGITAL MEASURING ACCURACY

RESISTANCE THERMOMETER (RTD)

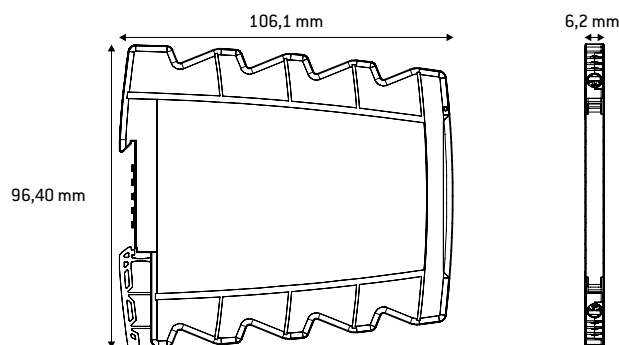
SENSOR	RANGE °C	DIGITAL ACCURACY °C
PT100	-200 to 850	< ± 0,2
PT500	-200 to 850	< ± 0,2
PT1000	-200 to 850	< ± 0,2

THERMOCOUPLES (TC)

SENSOR	RANGE °C	DIGITAL ACCURACY °C
J	-210 to 1200	< ± 0,5
K	-270 to 1372	< ± 0,5
N	-270 to 1270	< ± 0,5
R	-50 to 1768	< ± 1
S	-50 to 1768	< ± 1
T	-270 to 400	< ± 0,5

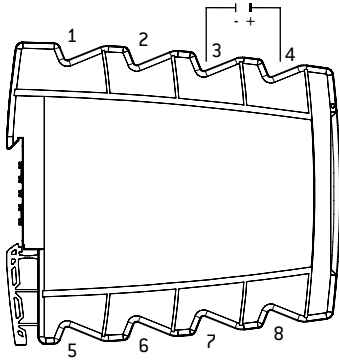
TECHNICAL DRAWINGS AND INFORMATION

DIMENSIONAL DRAWINGS & INSTALLATION DIAGRAM

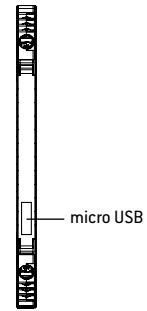


ELECTRICAL CONNECTIONS

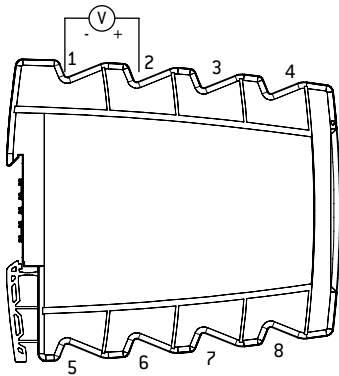
POWER SUPPLY



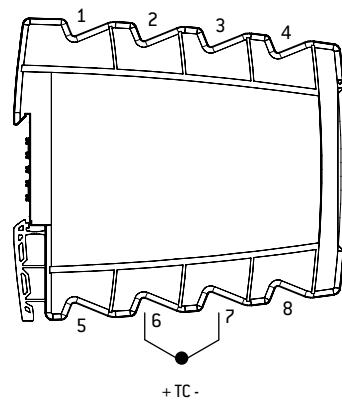
USB



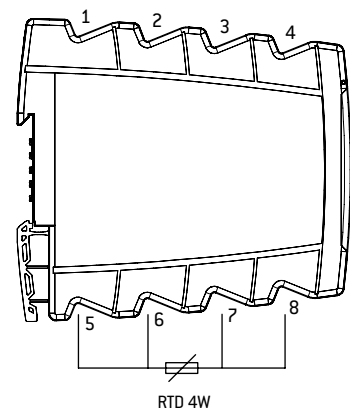
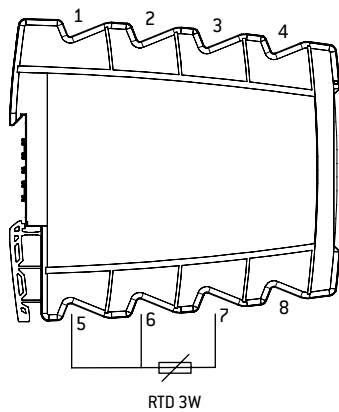
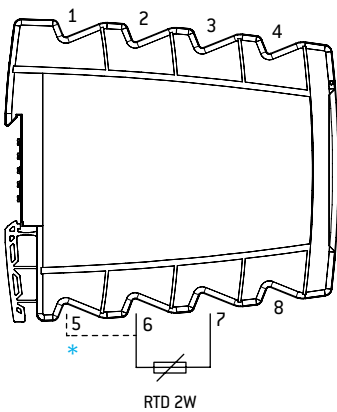
VOLTAGE OUTPUT



THERMOCOUPLE

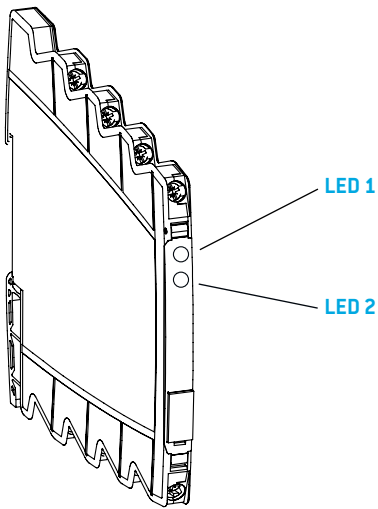


RESISTANCE THERMOMETER



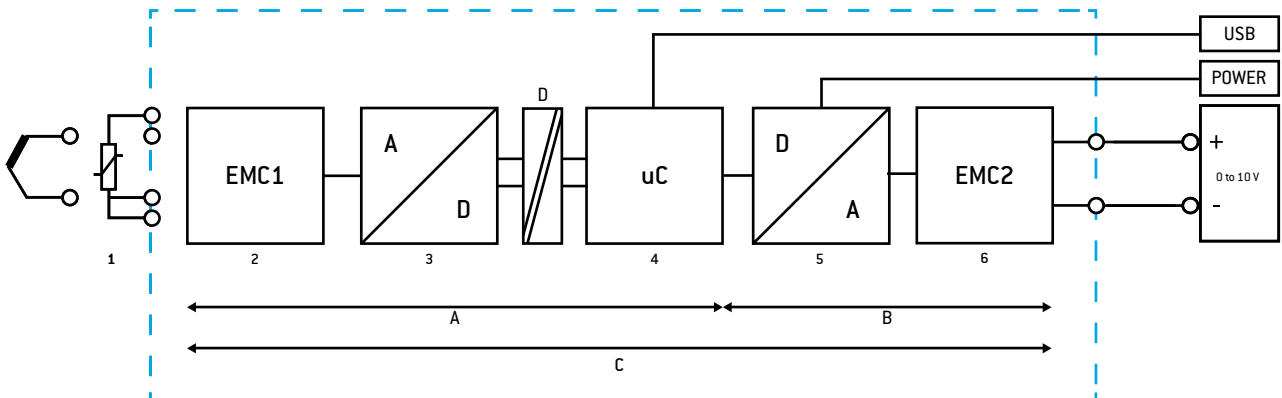
* The 2-wire connection requires an electrical connection between screw 5 and screw 6

STATUS LED



LED 1 (RED)	LED 2 (BLUE)	
OFF	BLINK	No sensor error Configuration mode
FLASH	BLINK	Sensor error Configuration mode
BLINK	BLINK	Temperature out of range Configuration mode
OFF	ON	No sensor error Normal mode
FLASH	ON	Sensor error Normal mode
BLINK	ON	Temperature out of range Normal mode

BLOCK DIAGRAM



- 1 - Sensor (RTD, TC)
- 2 - Sensor input protection module
- 3 - Analog-Digital converter (16 Bits)
- 4 - Microcontroller
- 5 - Digital-Analog converter (16 bits)
- 6 - Output protection module

- RL - Loop load
- Uaux - Power supply
- Iout - Output current
- A - Digital measure accuracy
- B - Digital / Analog conversion accuracy
- C - Total measure accuracy
- D - Electrical isolation

REVISION HISTORY

VERSION

E01B	Revision of product dimensions
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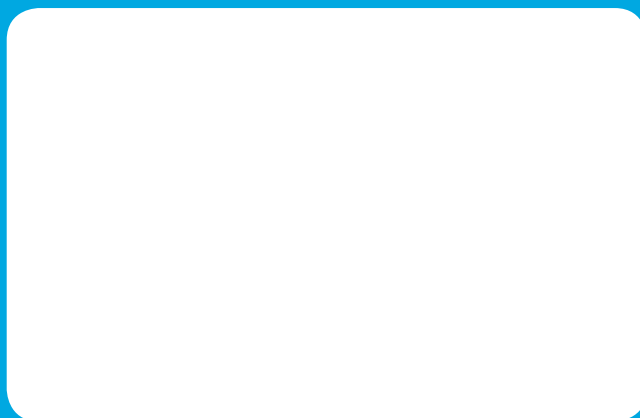
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