

ISOLATED UNIVERSAL TEMPERATURE DIN RAIL TRANSMITTER TDU1219



The Tekon Electronics Isolated Universal Temperature Din Rail Transmitter is specifically designed to meet the most rigorous requirements of operation in the industrial process environments. Due to the reduced dimensions, can be easily installed in junction boxes or in the control cabinet.

TDU1219 is an universal temperature transmitter which accepts the most often used temperature sensors (resistance thermometers: 2, 3 or 4-wire system, thermocouples, resistance-based sensors and DC voltage sources).

Parameters like sensor probe type, connection method, measuring range can be configured using Tekon Configurator software.

Dimensions 17,5 x 98 x 56,4 mm

Weight Approx. 50g

Material Nylon 66

Protection Index IP40

KEY FEATURES

UNIVERSAL SENSOR INPUT

RTD / RESISTANCE / THERMOCOUPLES / mV

4 TO 20 MA ANALOG OUTPUT

DIAGNOSTICS LED

HIGH PRECISION AND ACCURACY

WITH LOW OPERATING TEMPERATURE DRIFT

NAMUR NE 43 FAULT DETECTION

CONTINUOUS OPERATING STATUS MONITORING AND SELF-DIAGNOSTIC

OUTPUT SIGNAL COMPENSATION

CONFIGURABLE OVER PC

TEKON CONFIGURATOR SOFTWARE

DS_DINR_TDU1219_E01A

TECHNICAL SPECIFICATIONS

INPUT RESISTANCE THERMOMETER (RTD)

Measured variable	Temperature
Sensor type	PT100, PT500, PT1000
Connection	1 Resistance thermometer (RTD) in 2-wire, 3-wire or 4-wire system Resistance compensation in 2-wire systems available through software
Units	°C
Sensor current	<0,05 mA [50 µA]
Response time	<500 ms
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

INPUT RESISTANCE-BASED SENSORS (R)

Measured variable	Resistance
Sensor type	Resistance, potentiometers
Units	Ω
Connection	1 Resistance thermometer (RTD) in 2, 3 or 4-wire system Resistance compensation in 2-wire systems available through software
Sensor current	<0,05 mA [50 µA]
Response time	<500 ms
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	25 Ω
Characteristic curve	Resistance-linear

INPUT THERMOCOUPLES (TC)

Measured variable	Temperature
Sensor type	E, J, K, N, R, S, T
Units	°C
Connection	1 Thermocouple (TC)
Sensor current diagnostic	<0,05 mA [50 µA]
Response time	<500 ms
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

INPUT (MV)

Measured variable	DC Voltage
Sensor type	DC Voltage source
Units	mV
Response time	< 500 ms
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Not available
Measuring range	- 100mV to 100mV
Minimum measured span	2mV or 20mV
Overload capability of the input	-1,2V to 3V
Input resistance	> 1MΩ
Characteristic curve	Voltage-linear

OUTPUT

Output signal	4 to 20 mA
Power supply (Uaux)	9 to 30 V DC
Max. load	$(U_{aux} - 9) / 0,022 \text{ A}$
Overrange	3 to 22 mA
Error signal (e.g. following sensor fault) (conforming to NE43)	Software configurable $\leq 3,6\text{mA}$ or $\geq 21\text{mA}$
Sample cycle	< 1s
Protection	Against reversed polarity Surge protection

MEASUREMENT ACCURACY

Reference conditions	
Auxiliary power	24V DC $\pm 1\%$
Ambient temperature	23°C
Warm up time	> 5min
Error in the analog output (digital/analog converter)	< 0,08% of span
Digital measuring errors	See "Digital measuring accuracy" table
Error due to internal cold junction	< 0,5°C
Influence of ambient temperature	
with resistance thermometers	0,06°C / 10°C
with thermocouples	0,6°C / 10°C
Analog measuring error	0,02% of span / 10°C

OPERATING ENVIRONMENT

Ambient temperature range	-20 to 80°C
Storage temperature range	-20 to 80°C
Relative humidity	$\leq 95\%$, without condensation

ELECTRICAL ISOLATION

Electrical isolation	3000 V AC / 10 sec
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CASING

Material	Nylon 66
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Weight	Approx. 50g
Dimensions	See "Dimensional drawings"
Cross section	2.5 mm ²
Protection type	IP40

CERTIFICATIONS AND APPROVALS

EN 61326	Electrical equipment for measurement, control and laboratory use. EMC requirements.
IEC 61000-4-2	Electrostatic discharge immunity test
IEC 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4	Electrical fast transient/burst/immunity test
IEC61000-4-5	Surge immunity test

FACTORY DEFAULT SETTINGS

Sensor	PT100 with 3-wire circuit
Measuring range	0 to 100°C
Fault current	NAMUR NE 43
Sensor offset	0° C
Damping	0,0 s

DIGITAL MEASURING ACCURACY

RESISTANCE THERMOMETER (RTD)

SENSOR	RANGE °C	DIGITAL ACCURACY °C
PT100	-200 to 850	0,1
PT500	-200 to 850	0,2
PT1000	-200 to 350	0,2

THERMOCOUPLES (TC)

SENSOR	RANGE °C	DIGITAL ACCURACY °C
E	-200 to 1000	1
J	-210 to 1200	1
K	-230 to 1370	1
N	-200 to 1300	1
R	-50 to 1760	2
S	-50 to 1760	2
T	-200 to 400	1

RESISTANCE-BASED SENSORS (R)

SENSOR	RANGE Ω	DIGITAL ACCURACY Ω
Resistance	0 to 2200	0,25

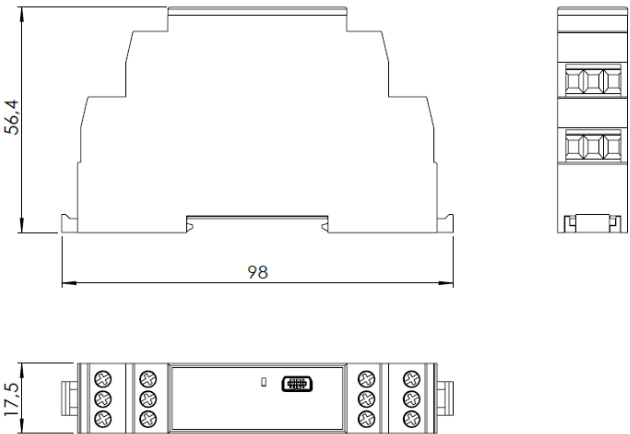
mV INPUT

	RANGE °C	DIGITAL ACCURACY Ω
mV	-100 to 1100	0,40

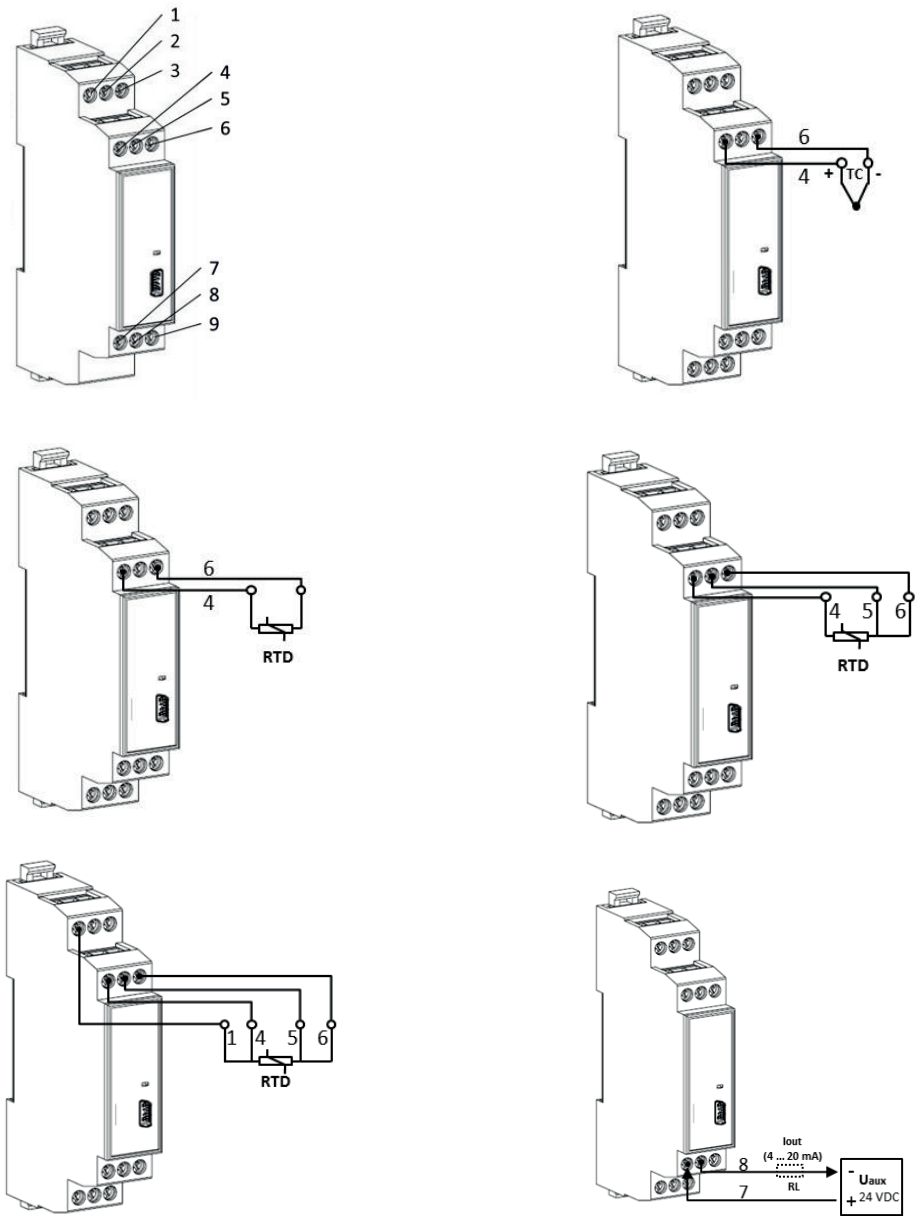
The digital accuracy is the accuracy after the analog/digital conversion including linearization and calculation of the measured value. An additional error is generated in the output current 4 to 20 mA as a result of the digital/analog conversion of 0.025 % of the set span (digital-analog error). The total error under reference conditions at the analog output is the sum from the digital error and the digital-analog error (poss. with the addition of cold junction errors in the case of thermocouple measurements).

TECHNICAL DRAWINGS AND INFORMATION

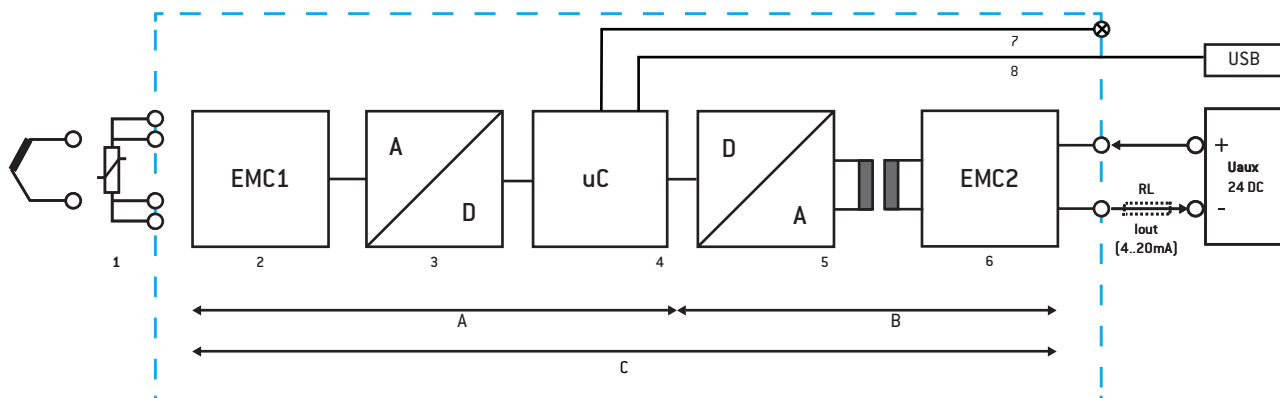
DIMENSIONAL DRAWINGS & INSTALLATION DIAGRAM



ELECTRICAL CONNECTIONS



BLOCK DIAGRAM



- 1 - Sensor (RTD, TC, Ohm, mV)
- 2 - Sensor input protection module
- 3 - Analog-Digital converter (16 Bits)
- 4 - Microcontroller
- 5 - Digital-Analog converter (16 bits)
- 6 - Output protection module
- 7 - Operation status LED
- 8 - USB Port for configuration

- RL - Loop load
- Uaux - Power supply
- lout - Output current
- A - Digital measure accuracy
- B - Digital / Analog conversion accuracy
- C - Total measure accuracy

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