

**LOW
POWER
OP. MODE**

**COMPACT
DESIGN**

UNIVERSAL WIRELESS TEMPERATURE TRANSMITTER THW401



The Universal Wireless Temperature Transmitter THW401 is specifically designed to meet the most rigorous requirements of operation in the industrial process environments. Due to its reduced dimensions, it may be installed in the DIN Form B sensor connection head, in place of the traditional terminal blocks or current loop temperature transmitter.

In its high power mode it can communicate over a long distance range (up to 3.5Km line of sight).

It accepts the most commonly used temperature sensors.

Dimensions: 23 mm x 45 mm

Weight: Approx. 50g

Material: Nylon 66

Protection Index: IP40

KEY FEATURES

EXTREME LOW POWER

OPERATION MODE FOR LONG BATTERY LIFE

UP TO 3,5KM DISTANCE (LoS)

TRANSMISSION UP TO 3.5KM DISTANCE (LoS)

REAL TIME TRANSMISSION

PROCESS AND AMBIENT TEMPERATURE, RF SIGNAL STRENGTH AND BATTERY STATUS

WIDE RANGE SUPPLY VOLTAGE

UNIVERSAL SENSOR INPUT

RESISTANCE THERMOMETERS, THERMOCOUPLES, RESISTANCE-BASED SENSORS AND DC VOLTAGE SOURCES

COMPACT DESIGN

DIN FORM B CONNECTION HEAD MOUNTING

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TECHNICAL SPECIFICATIONS

**INPUT
RESISTANCE THERMOMETER (RTD)**

Measured variable:	Temperature
Sensor type:	PT100, PT500, PT1000
Units:	°C or °F
Connection:	1 Resistance thermometer (RTD) in 2-wire, 3-wire or 4-wire system Resistance compensation in 2-wire systems available through software
Sensor current:	<0.05 mA (50µA)
Response time:	<500 ms
Open-circuit monitoring:	Always active (cannot be disabled)
Short-circuit monitoring:	Always active (cannot be disabled)
Measuring range:	Parameterizable (see table "Digital measuring errors")
Minimum measured span:	50°C (90°F)
Characteristic curve:	Temperature-linear

**INPUT
THERMOCOUPLES (TC)**

Measured variable:	Temperature
Sensor type:	E, J, K, N, R, S, T
Units:	°C or °F
Connection:	1 Thermocouple (TC)
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 table "Digital measuring errors")
Minimum measured span:	50°C (90°F)
Characteristic curve:	Temperature-linear

**OUTPUT
RF TRANSMISSION**

Transmission frequency:	2.4GHz [2400; 2483] MHz
Transmission interval:	Adjustable from 1s to 24h
Maximum output power:	18 dBm
Sensitivity:	-110dBm
Open air range:	3.5 Km LoS
Modulation:	GFSK
Output signals:	
Temp probe (RTD or TC):	Temperature °C (°F)
Internal Temp:	Temperature °C (°F)
RSSI:	Absolute value
Power supply level:	Voltage V
Configurable parameters:	Sensor type, Transmission interval

MEASURING ACCURACY

Digital measuring errors:	See table "Digital measuring errors"
Reference conditions:	
Auxiliary power:	9V DC ± 1%
Ambient temperature:	23°C (73,4°F)
Warming-up time:	>5min
Error due to internal cold junction:	<0.5°C (0.9°F)
Influence of ambient temperature:	
with resistance thermometers:	0.06°C (0.11°F)/10°C (18°F)
with thermocouples:	0.6°C (1.1°F)/10°C (18°F)

AMBIENT CONDITIONS

Ambient temperature range:	-20 to 80°C (-4 a 176°F)
Storage temperature range:	-20 to 80°C (-4 a 176°F)
Relative humidity:	≤95%, without condensation

CASING

Material:	Nylon 66
Weight:	Approx. 50g
Dimensions:	See "Dimensional drawings"
Cross-selection of cables:	2.5 mm
Protection type:	IP40

FACTORING SETTINGS

Sensor:	Thermocouple K
Measuring range:	0...100°C (32...212°F)
Transmission interval:	300s
Node ID:	1
Net ID:	1

DIGITAL MEASURING ACCURACY
mV

Sensor	Range °C (°F)	Accuracy (mV)
mV	-8 to 100 mV	<40 μV

DIGITAL MEASURING ACCURACY
RESISTANCE THERMOMETER (RTD)

Sensor	Range °C (°F)	Digital accuracy °C (°F)
PT100:	-200 to 850 (-328 to +1562)	0.1 (0.18)
PT500:	-200 to 850 (-328 to +1562)	0.2 (0.40)
PT1000:	-200 to 350 (-328 to +662)	0.2 (0.40)

DIGITAL MEASURING ACCURACY
THERMOCOUPLES (TC)

Sensor	Range °C (°F)	Digital accuracy °C (°F)
E:	-200 to 1000 (-328 to 1832)	1
J:	-210 to 1200 (-346 to 2192)	1
K:	-230 to 1370 (-382 to 2498)	1
N:	-200 to 1300 (-328 to 2372)	1
R:	-50 to 1760 (-58 to 3200)	2
S:	-50 to 1760 (-58 to 3200)	2
T:	-200 to 400 (-328 to 752)	1

Note: The "Digital Measuring Accuracy" is the accuracy value after the analog/digital conversion including linearization and calculation of the measured one.

POWER SUPPLY

Voltage Range:	[5; 24] VDC
Power Consumption (Sleep):	< 0.2 mA
Battery Life:	For a 9V battery, with 1200 mAh with a transmission interval of 2 minutes, the battery life is higher than 2 years

The "Digital Measuring Accuracy" is the value after the analog/digital conversion including linearization and calculation of the measured one. An additional error is generated in the output current 4 to 20mA 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-analog error [poss. Thermocouple measurements].

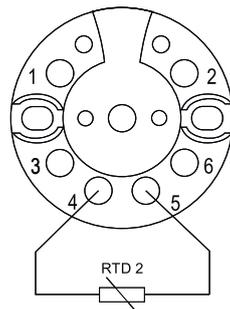
CERTIFICATES AND APPROVALS

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/brust/immunity test
IEC61000-4-5:	Surge immunity test

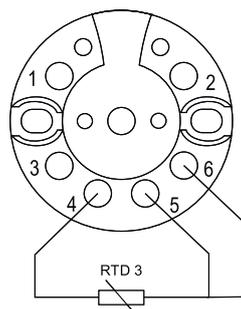
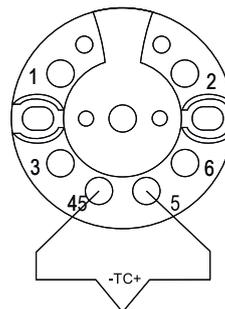
TECHNICAL DRAWINGS AND INFORMATION

ELECTRICAL CONNECTIONS

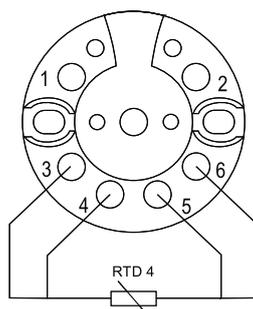
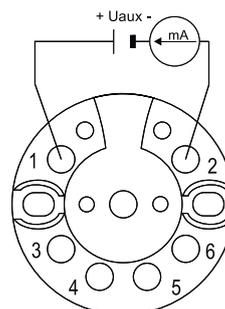
RESISTANCE THERMOMETER



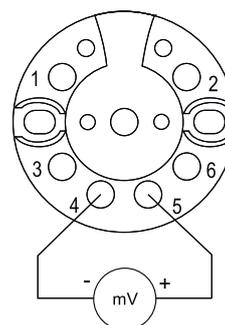
THERMOCOUPLE



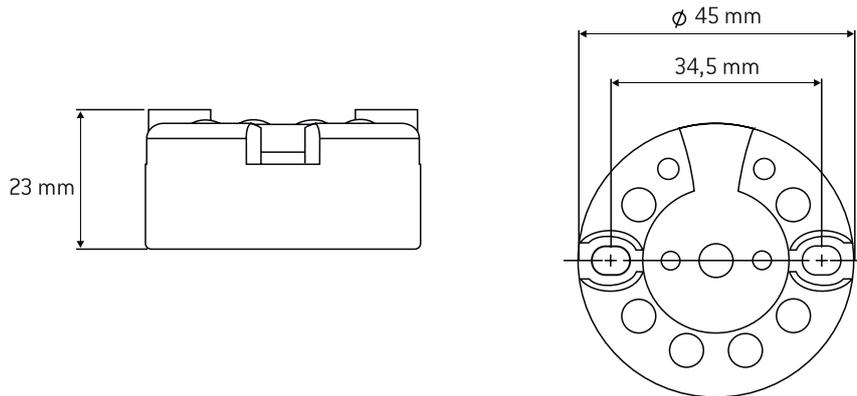
POWER SUPPLY [Uaux]



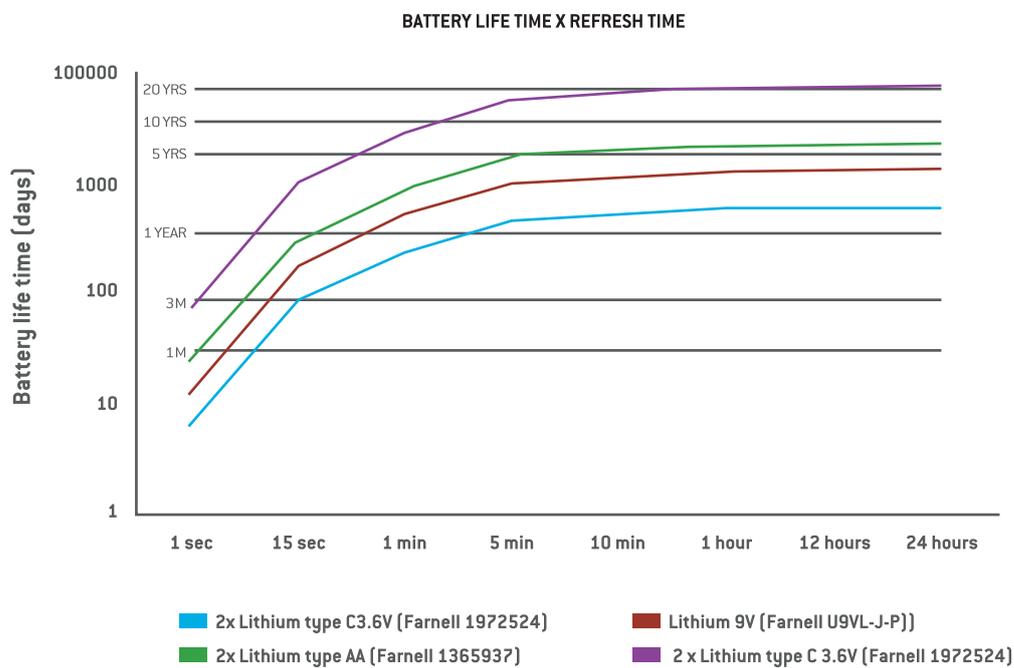
mV SENSOR



DIMENSIONAL DRAWINGS



BATTERY LIFE TIME



COMPLEMENTARY PRODUCTS



WGW410 WIRELESS MODBUS GATEWAY 2,4GHZ WITH 8 ANALOG OUTPUTS

- Supports up to 16 THW401 temperature transmitters;
- Long distance range (3.5 km LOS);
- 1sec network refresh time;
- RS485 interface with Modbus protocol;
- 8 Analog Outputs;
- Transmitters battery status and RF link quality information;
- Configurable over USB;
- DIN rail mounting.