

# 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 2Km 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 2KM DISTANCE (LoS)

TRANSMISSION UP TO 2KM 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

PA123720200-PA123720200.DS.ENG.V01.2.2018

**TECHNICAL SPECIFICATIONS**

**INPUT**  
RESISTANCE THERMOMETER (RTD) / THERMOCOUPLES (TC)

Measured variable	Temperature
Sensor type	PT100, PT500, PT1000/ E, J, K, N, R, S, T
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 / 1 Thermocouple (TC)
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) / Not available
Cold junction compensation (CJC)	Integrated resistance thermometer
Measuring range	Parameterizable (see table "Digital measuring errors") / 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
Range	2 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

**MEASUREMENT ACCURACY**

Digital measurement errors	See table "Digital measurement 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 thermocouples	0.6°C (1.1°F)/10°C (18°F)

**OPERATING ENVIRONMENT**

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

**HOUSING**

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

**FACTORY SETTINGS**

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

**DIGITAL MEASUREMENT ACCURACY**  
mV

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

**DIGITAL MEASUREMENT ACCURACY <sup>1</sup>**  
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 MEASUREMENT 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

**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

<sup>1</sup> 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).

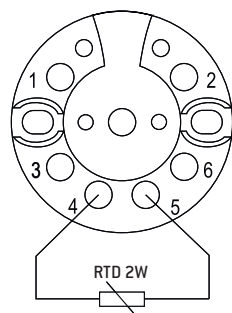
CERTIFICATES AND APPROVALS

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

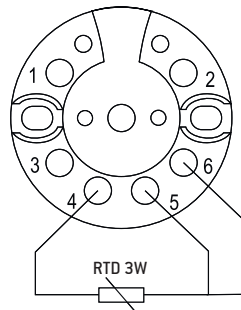
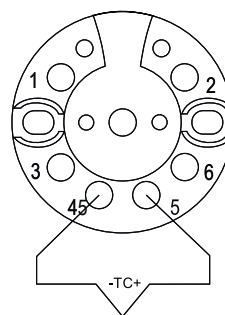
TECHNICAL DRAWINGS AND INFORMATION

ELECTRICAL CONNECTIONS

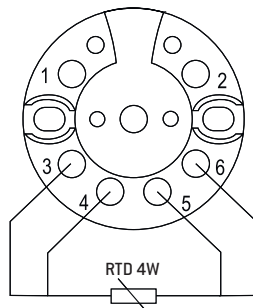
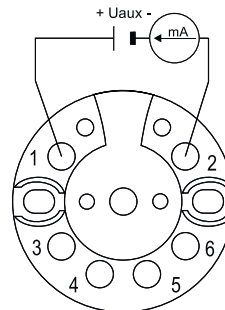
RESISTANCE THERMOMETER



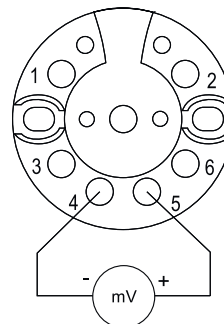
THERMOCOUPLE



POWER SUPPLY [Uaux]

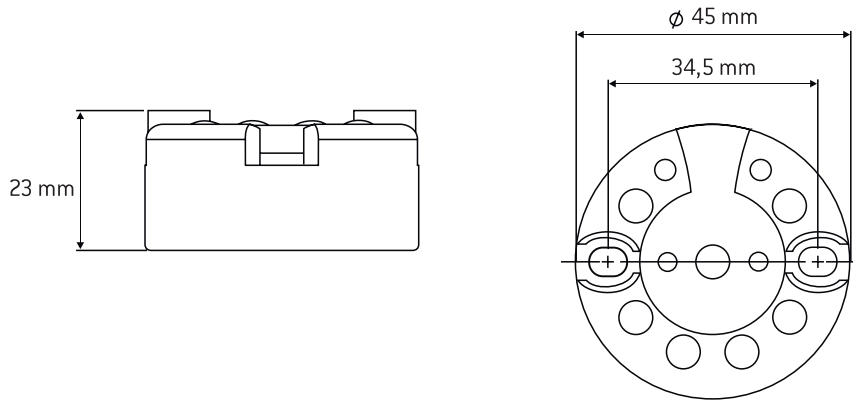


mV SENSOR

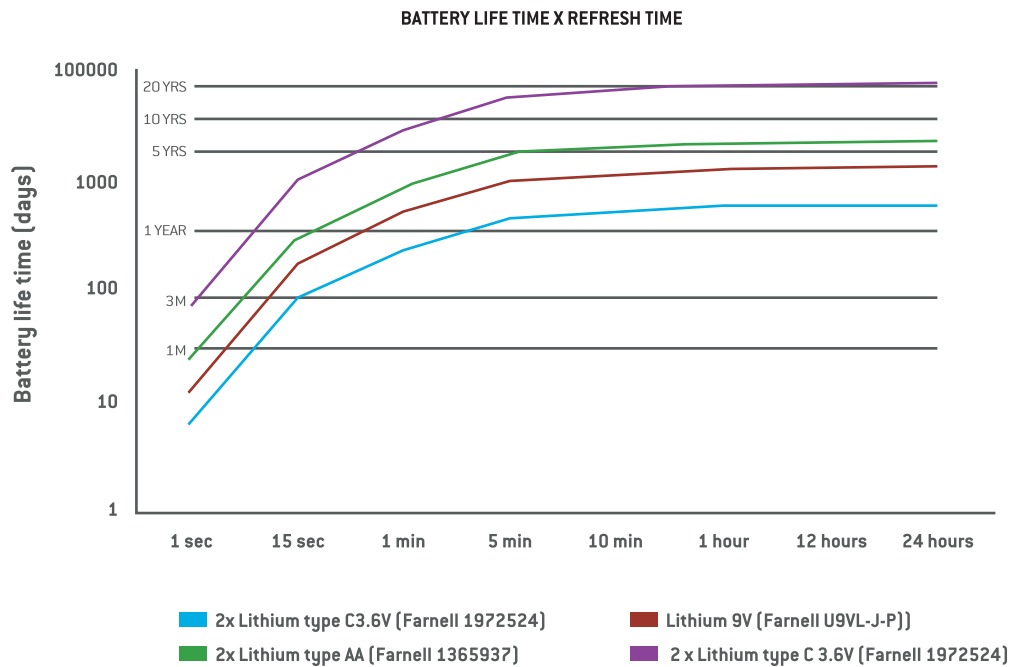


W = WIRES

DIMENSIONAL DRAWINGS



BATTERY LIFE TIME



COMPLEMENTARY PRODUCTS



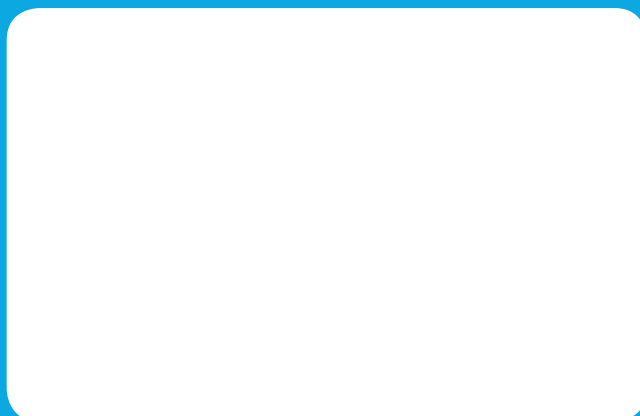
**WGW410 WIRELESS MODBUS GATEWAY 2,4GHZ WITH 8 ANALOG OUTPUTS**

- 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.

**TEKON ELECTRONICS**  
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