

# TEMPERATURE WIRELESS TRANSMITTER PLUS TWPH-1UT



The Wireless Temperature Transmitter TWPH-1UT is specifically designed to meet the most rigorous requirements of temperature monitoring in industrial process environments. In its high power mode it can communicate over a long distance range.

The Wireless Temperature Transmitter TWPH-1UT accepts the most commonly used temperature sensors.

Its dual operating mode allows it to work as an end device for temperature measure and as a repeater to improve network redundancy.

Dimensions: 45 mm x 23 mm

Weight: Approx. 50g

Material: Nylon 66

Protection Index: IP40

## KEY FEATURES

### ULTRA LOW POWER MODE

### UP TO 4 KM COMMUNICATION DISTANCE (LoS)

### WIRELESS SITE SURVEY FUNCTION

FOR EASY INSTALLATION AND FAST DEVELOPMENT

### WIDE RANGE SUPPLY VOLTAGE

FROM 5 TO 24V DC

### MULTI-HOP MESH NETWORK

WITH SELF-FORMING, SELF-HEALING, SELF-OPTIMIZING FEATURES

### UNIVERSAL SENSOR INPUT

PT100, C, J, K, N, R, S, T

### 6 STATUS LEDS

**TECHNICAL SPECIFICATIONS**

RADIO SPECIFICATIONS	868MHZ	915MHZ
Range <sup>1</sup>	Up to 4 Km LoS	
Frequency band <sup>2</sup>	868 to 869 MHz	902 to 928 MHz <sup>3</sup>
Number of channels	16	50 <sup>4</sup>
Reception sensivity <sup>2</sup>	-97 to -110 dBm	
Transmit power <sup>2</sup>	25 to 27 dBm	8 to 27 dBm
Radio transmission rate <sup>2</sup>	19 to 76,8 kbit/s	
Encryption method	AES 128(Advanced Encryption Standard)	
Modulation	GFSK	
Antenna connector	SMB	
Antenna	Articulated dipole antenna	
Antenna impedance	50	

WIRELESS NETWORK	
Maximum devices	55
Maximum hops	13
Communication period	1 to 43200 seconds (configurable)

INPUT RESISTANCE THERMOMETER (RTD)	
Measured variable	Temperature
Sensor type	PT100
Units	°C
Connection	1 Resistance thermometer (RTD) in 2-wire, 3-wire or 4-wire system
Sensor current	200µA
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Always active (cannot be disabled)
Measuring range	See "Digital measuring accuracy" table
Cable resistance per wire (max.)	50 Ω

INPUT THERMOCOUPLES (TC)	
Measured variable	Temperature
Sensor type	Thermocouples: C, J, K, N, R, S, T
Units	°C
Connection	1 Thermocouple
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Not available
Cold junction compensation (CJC)	Integrated resistance thermometer
Measuring range	See "Digital measuring accuracy" table

POWER SUPPLY	
Voltage Range	5 to 24V DC
Measurement accuracy	± 50mV
Power consumption (sleep)	22 µA @ 12V DC

Protection	Against reversed polarity
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**MEASUREMENT ACCURACY**

Reference conditions	
Power supply	12V DC ± 1%
Ambient temperature	23°C
Digital measuring errors	See table “Digital measuring accuracy” table
Internal cold junction	
Accuracy	< ± 0,50 °C
Resolution	0,01 °C
Influence of ambient temperature	
on RTD measurement	< ± 0,001 °C / °C
on thermocouple	Thermocouples C, J, K, N, T: ≤ ± 0,005 °C / °C Thermocouple R: ≤ ± 0,010 °C / °C Thermocouple S: ≤ ± 0,2 °C / °C
EMC - immunity influence (IEC 61326-1)	[To Be Defined]

**OPERATING ENVIRONMENT**

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

**FACTORY DEFAULT SETTINGS**

	868MHZ	915MHZ
Frequency	869,525MHz	915,000MHz
Radio transmit power		27dBm
Radio transmission rate		76,8kbit/s
Wireless channel	13	26
Wireless network ID		13042017
Communication period		10 seconds
Gateway modbus index		1
Operating mode		End Device
Transmitter description		TekOnElectronics
Sensor type		PT100 3W

**CASING**

Material	Nylon 66
Weight	Approx. 50g
Dimensions	See “Dimensional drawings”
Cross section	2,5 mm
Protection type	IP40

**CERTIFICATIONS AND APPROVALS**

EN 61326-1 - Class B - Industrial Requirements
EN 300 220-2 V3.1.1
EN 301 489-1 V2.2.1
EN 301 489-3 V2.1.1

EN 60950-1:206

EN 61326-1:2013

ETSI EN 301 489-1 V1.9.2

<sup>1</sup> Range depends on the RF propagation environment and Line of Sight (LoS). Always verify your wireless network's range by performing a Site Survey.

<sup>2</sup> Dependent on radio channel selection.

<sup>3</sup> In some countries, the frequency band admitted is not so extended as the default range.

<sup>4</sup> The radio frequencies admitted in Australia are available from channel 26 to channel 50.

**DIGITAL MEASURING ACCURACY**

**RESISTANCE THERMOMETER (RTD)**

Sensor	Range °C	Accuracy °C	Resolution °C
PT100	-210 to 850	< ± 0,2	0,05

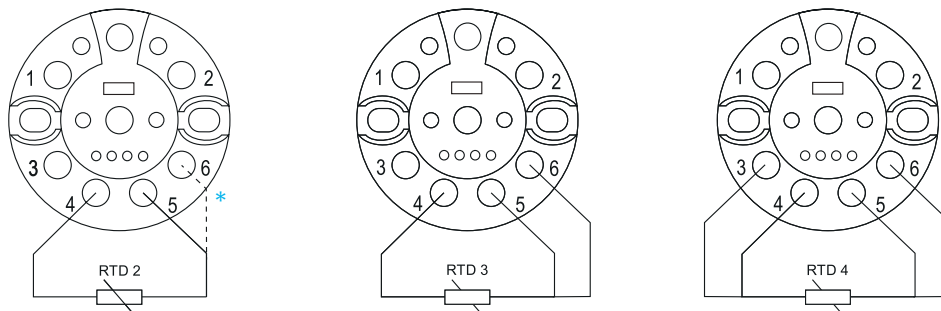
**THERMOCOUPLES (TC)**

Sensor	Range °C	Accuracy °C	Resolution °C
C	0 to 2300	< ± 1,0	0,400
J	-210 to 1200	< ± 1,0	0,077
K	-270 to 1370	< ± 1,0	0,098
N	-270 to 1270	< ± 1,0	0,151
R	-50 to 1760	< ± 1,2	0,189
S	-50 to 1760	< ± 2,0	0,185
T	-270 to 400	< ± 1,0	0,026

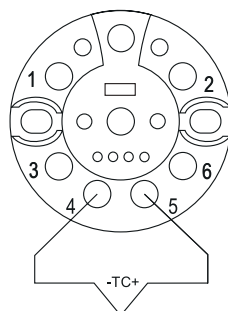
**TECHNICAL DRAWINGS AND INFORMATION**

**ELECTRICAL CONNECTIONS**

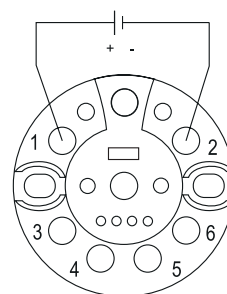
RESISTANCE THERMOMETER



THERMOCOUPLE

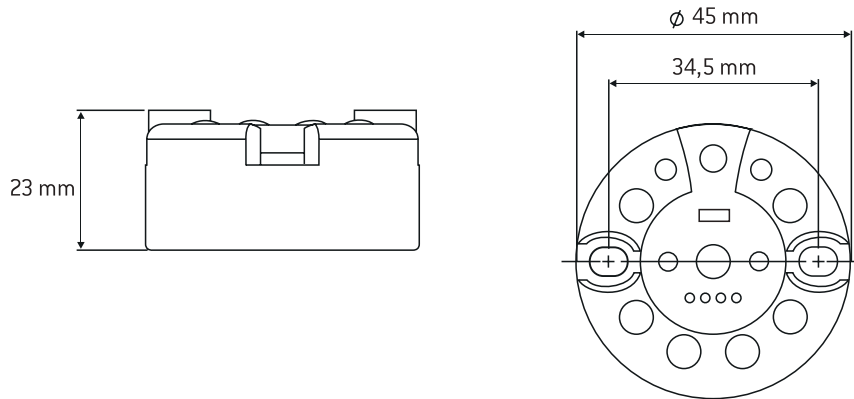


POWER SUPPLY

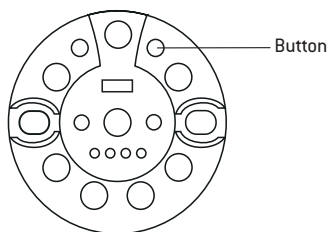


\* The 2-wire connection requires an electrical connection between screw 5 and screw 6

DIMENSIONAL DRAWINGS

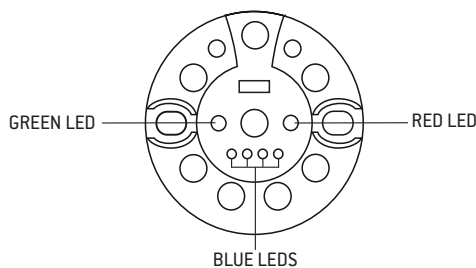


OPERATIONS BUTTON ACTIONS



OPERATION	ACTION*	DESCRIPTION
SITE SURVEY	PRESS 3 seconds to enter/exit	- Transmitter will perform a site survey; - Red LED and green LED stay on; - RSSI power level is indicated by the 4 blue LEDs;
LOAD DEFAULT SETTINGS	PRESS 10 seconds	- Transmitter will load the default settings; - The 4 blue LEDs will light up gradually until the operation be completed;

STATUS LED



GREEN AND RED LEDS	BLUE LEDS	DESCRIPTION
ON	BLINK EVERY SECOND	- Transmitter in Configuration Mode;
RED LED BLINK	OFF	- Quit Configuration Mode and starting connection to the gateway;
FLASH ALTERNATELY 1 MINUTE	OFF	- Connected to the gateway; - After 1 minute, LEDs go off;
OFF	OFF	- Transmitter in Sleep/Normal Mode;
RED LED BLINK OVER 1 MINUTE	OFF	- Transmitter did not connect to the gateway; - It will continue to try to establish communication;

\* Operations button has only two possible actions. Any action beside the documented will have no effect on the transmitter

**RELATED PRODUCTS**



**WGW420 WIRELESS MODBUS GATEWAY 868 MHZ / 915 MHZ WITH 8 ANALOG OUTPUTS**

REF.: PA164510210 / PA164510220

- Supports up to 55 devices;
- Up to 4 Km communication distance (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.



**PLUS WRP001 WIRELESS REPEATER 868 MHZ / 915 MHZ**

REF.: PA164510310 / PA164510320

- Up to 12 repeaters in series for extra-long range;
- Extra repeaters for network redundancy and robustness;
- Up to 4 Km communication distance (LoS) with 868 MHz/915 MHz;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Simple and intuitive USB configuration via Tekon Configurator (free software).

**REVISION HISTORY**

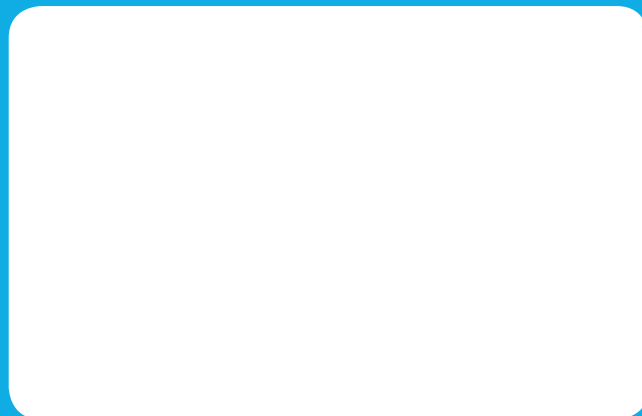
VERSION	
E01B	Inclusion of information about the frequency range used in Australia.
E01C	Revision of "Certifications and Approvals" table.



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