

### Introduction



- Extreme low power
- Long battery life
- Long distance range (5 Km LOS)
- Universal sensor input
- Real time transmission

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

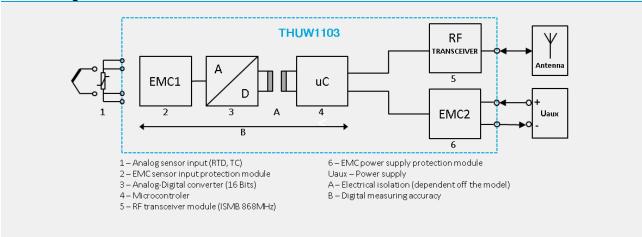
The THUW1103 has an extreme low power operation mode that guaranties a long battery life. In its high power mode it can communicate over a long distance range (up to 5 km line of sight). It accepts the most commonly used temperature sensors. The measured information (Sensor Temperature, Ambient Temperature, RF Signal Strength and Battery Status) is transmitted wireless to the receiver WGW1104 and become available on the RS485 interface with Modbus protocol.

The operating parameters like the sensor probe type and transmission interval can be easily configured using the OTA - Over The Air setup and configuration function. The Battery level and RF link quality may be verified on site during the installation process.

### Key features

- Long distance range communication (up to 5 Km *Line Of Sight*)
- Extreme low power operation mode for long battery life
- Real time transmission of sensor temperature, ambient temperature, RF signal strength and battery status
- Wide range supply voltage
- Over The Air setup and configuration
- On site battery and RF signal strength verification
- Universal sensor input: Resistance thermometers (2, 3 or 4wire system), Thermocouples, Resistance-based sensors and DC voltage sources.
- High measurement accuracy
- Sensor status monitoring
- Compact design for DIN Form B connection head mounting

### Block diagram



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# **THUW1103**

# 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 (50 µA)	
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	Parameterizable (see table "Digital measuring errors")
50 °C (90 °F)	50 °C (90 °F)
Temperature-linear	Temperature-linear

Output		
RF transmission		
Transmission frequency	868 MHz (Europe) 902 MHz (USA)	
Transmission interval	Adjustable from 1s to 24h	
Maximum output power	10 dBm	
Sensitivity	-110 dBm	
Open air range		
Standard version	500 m LOS	
High Power version	5 Km LOS	
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	

See table "Digital measuring errors"
24 V DC ± 1%
23 °C (73,4 °F)
> 5 min
< 0,5 °C (0,9 °F)
0,06 °C (0,11 °F) / 10 °C (18 °F)
0,6 °C (1,1 °F) / 10 °C (18 °F)

Digital measuring accuracy  Resistance thermometer (F		
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 meas	uring 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
Т	-200 to +400 (-328 to +752)	1

# NOTE:

The digital accuracy is the accuracy after the analog/digital conversion including linearization and calculation of the measured value.

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# **THUW1103**

EN 61326

# **Universal Wireless Temperature Transmitter**

# **Tekon Temperature Measurement Solutions**

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

Certificates and approvals	_
EN 61226	Electrical equipment for measurement, control and

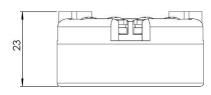
EN 61326	laboratory use. EMC requirements.
IEC 61000-4-2	Electrostatic discharge immunity test
IEC 61000-4-3	Radiated, Radio-Frequency, Electromagnetic Field Immunity

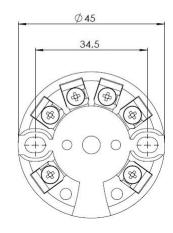
Test Electrical fast transient/burst IEC 61000-4-4 immunity test IEC 61000-4-5 Surge Immunity Test

Nylon 66
Approx. 50 g
See "Dimensional drawings"
2.5 mm <sup>2</sup>
IP40
SMB connector

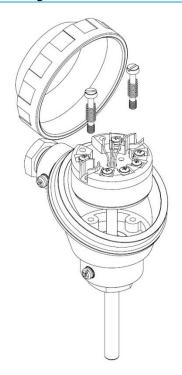
Factory settings		
Sensor	Pt100 with 3-wire circuit	
Measuring range	0100 °C (32 212 °F)	
Transmission interval	30 s	
Node ID	1	
Net ID	1	

# Dimensional drawings





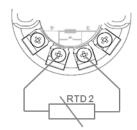
# Installation diagram

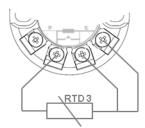


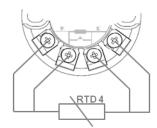
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# Electrical connections diagram

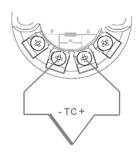
### Resistance thermometer



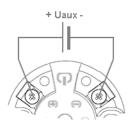




### **Termocouple**



### Power supply (Uaux)



### Installation procedure

- Select the Node ID and Net ID. The Net ID must have the same value configured in the receiver WGW1104. The Node ID
  must be unique for each Net ID.
- 2. Connect the temperature probe according to the electrical connections diagram.
- 3. Connect the power supply according to the electrical connections diagram.
- 4. Press the test button.
- 5. The THUW1102 will show the RSSI value in the status leds.
- 6. Next THUW1102 will show the value of the selected Node ID for confirmation.
- 7. Next THUW1102 will show the value of the selected Net ID for confirmation.

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# Selection and ordering data

Image	Partnumber	Partname
	PA110030100	THUW1103 Universal Wireless Temperature Transmitter
	PA110050100	THUW1103HP Universal Wireless Temperature Transmitter (High Power)
	Accessories	
		866MHz antenna with 3 m cable and SMB cable connector
		SMB to SMA 0,1 m cable extension
	Related products	
	PA110040100	WGW1104 Wireless Modbus Gateway
	PA110060100	WGW1104HP Wireless Modbus Gateway (High Power)

Tekon (1)

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