# TEKON
## WIRELESS SENSORS TECHNOLOGY

**IP67**
PROTECTION

# WIRELESS TRANSMITTER DUOS TEMP

*REF.: PA160410110 / PA160411810*

**IoT ready**

Tekon Wireless Transmitter DUOS Temp is the perfect wireless solution for monitoring applications, automation and centralization of temperature measurements throughout the production substances, distribution and storage of refrigerated foods, frozen and deep-frozen, HVAC and other industry processes.

Equipped with a smart dual probe transmitter, it allows the user to monitor not only the air temperature but also the product temperature, thanks to the second enclosed probe.

**Dimensions:** 162 x 88.5 x 25 mm

**Weight:** 100 g

**Material:** ABS UL94HB

**Protection Index:** IP67

## KEY FEATURES

**−40 ºC TO 125ºC**
TEMPERATURE SENSOR MEASUREMENT RANGE*

**AGRIFOOD INDUSTRY COMPATIBILITY**
COMPATIBLE WITH AGRIFOOD INDUSTRY STANDARDS

**LONG COMMUNICATION RANGE**

**DUAL TEMPERATURE PROBE**
INTERNAL AND EXTERNAL PROBE

**WIRELESS LINK STRENGTH (RSSI)**
AUTO DISCOVERY OF THE BEST WIRELESS LINK

**LOW POWER AND LONG BATTERY LIFE**
MEASUREMENT AND TRANSMISSION OF BATTERY VOLTAGE

**WATER RESISTANT**
IP67 PROTECTION

* The temperature measurement sensor range is related with the external temperature probes.

DS_DUOS_TEMP_E01B

## TECHNICAL SPECIFICATIONS

| RADIO SPECIFICATIONS | 868MHZ | 915MHZ | 2,4GHZ |
|---|---|---|---|
| Range[1] | Up to 4 Km LoS, 27 dBm (500mW) | Up to 4 Km LoS, 27 dBm (500mW) | Up to 2 Km LoS, 10dBm (10mW) |
| Minimum communication distance | 3 m @ 27 dBm (500mW) | 3 m @ 27 dBm (500mW) | 0 m @ 10 dBm (10mW) |
| Radio transmit power[2] | 0 to 27 dBm | 8 to 27 dBm | -10 to 17dBm |
| Radio receiver sensitivity[2] | -97 to -110 dBm | -97 to -110 dBm | -91 to -108dBm |
| Frequency band[2] | 868 to 869 MHz | 902 to 928 MHz | 2,4 to 2,5 GHz |
| Radio channels | 16 | 50 | 83 |
| Radio transmission rate[2] | | 1,2 to 76,8 kbit/s | |
| Modulation | | GFSK | |
| Encryption method | | AES 128 (Advanced Encryption Standard) | |

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

| TEMPERATURE MEASUREMENT – EXTERNAL PROBE | |
|---|---|
| Range | -40 to 125ºC |
| Resolution | 0,1 ºC |
| Accuracy | Typical: ± 0,25 ºC / Maximum: ± 0,5 ºC |
| Sensor type | I2C digital sensor |
| Response time | 1 second |
| Connector | M8 female socket, 4 poles |

| TEMPERATURE MEASUREMENT INTERNAL PROBE | 868MHZ | 915MHZ | 2,4GHZ |
|---|---|---|---|
| Range | -40 to 80 ºC | -40 to 80 ºC | -20 to 80ºC |
| Resolution | | 0,1 ºC | |
| Accuracy | | Typical: ± 0,25 ºC / Maximum: ± 0,5 ºC | |
| Sensor type | | I2C digital sensor | |
| Response time | | 1 second | |

| POWER SUPPLY |
|---|
| 3x3,6 AA lithium batteries (PN EVE ER14505M)[3] |
| 3 years of estimated battery life[4] |
| External power supply with 12 VDC ± 5% |
| Peak current draw of 250 mA[2] |
| Supply voltage measurement accuracy ± 1 V DC |
| Sleep mode current consumption < 8 $\mu$A |

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[1] Range depends on the RF propagation environment and Line of Sight (LoS). Always verify your wireless network's range by performing a Site Survey.
[2] Dependent on radio channel selection.
[3] Batteries not included.
[4] Considering a communication period of 10 minutes, and maximum transmit power (27dBm) at 25 ºC, with PN EVE ER14505 batteries.

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| VOLTAGE THRESHOLD (VDC) | TINT > 25ºC | -25ºC < TINT < 25ºC | TINT < -25ºC |
|---|---|---|---|
| Low battery | 8,5 | (Tint / 50) + 8 | 7,5 |
| Critical battery | 8 | (Tint / 50) + 7,5 | 7 |

| OPERATING ENVIRONMENT | 868MHZ | 915MHZ | 2,4GHZ |
|---|---|---|---|
| Temperature range | -40 ºC to 80º C | -40 ºC to 80º C | -20º C to 80ºC |
| Humidity | 95% maximum relative humidity (non-condensing) | | |

| INTERFACE |
|---|
| 2 blue LED (LED 1 and LED 2) for wireless network address identification and general operation status |
| 1 green LED (LED 3) and 1 red LED (LED 4) for wireless network operation status |
| 1 magnetic reed switch for system reboot |
| 1 M8 female socket with 5 poles for device configuration through host computer |

| CASING | |
|---|---|
| Dimensions | 162 x 88.5 x 25 mm |
| Weight | 100 g |
| Material | ABS UL94HB |
| Protection index | IP67 |

| FACTORY DEFAULT SETTINGS | 868MHZ | 915MHZ | 2,4GHZ |
|---|---|---|---|
| Frequency (MHz) | 869,525 | 904,000 | 2403,750 |
| Radio transmit power | 27 dBm | 27 dBm | 10dBm |
| Radio transmission rate | | 76,8 kbit/s | |
| Wireless channel | 13 | 4 | 4 |
| Transmitter ID | | 1 | |
| Communication period | | 10 seconds | |
| Configuration time window at startup | | 10 seconds | |
| Wireless network ID | | 16777217 | |

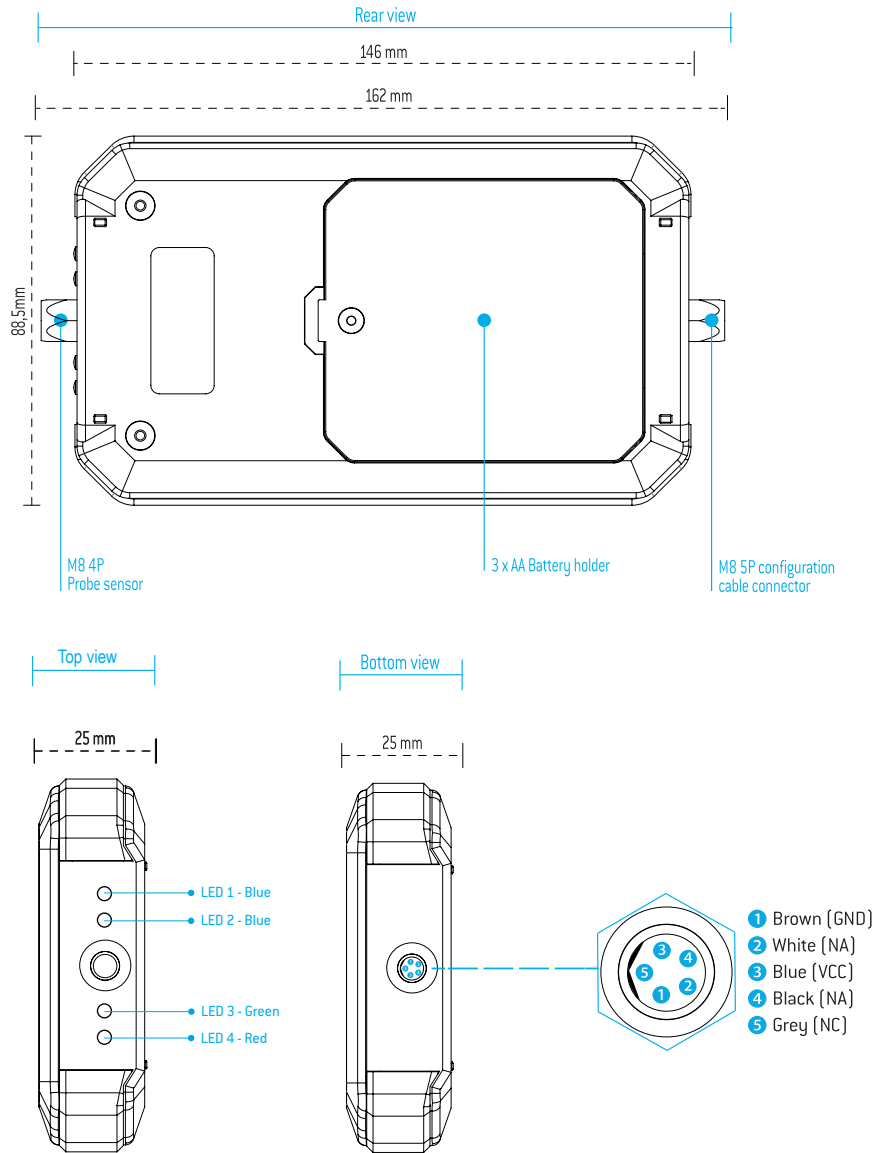| CERTIFICATIONS AND APPROVALS |
|---|
| EN 61326 - Electrical equipment for measurement, control and laboratory use. EMC requirements. |
| EN 300 228 - Electromagntetic compatibility and Radio Spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive. |
| EN 300 440 - Electromagnetic compatibility and Radio Spectrum Matters (ERM); Short Range Devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive. |
| IEC 61000-4-2 - Radiated, Radio-Frequency, Electromagnetic Field Immunity Test |
| IEC 61000-4-3 - Electrical fast transient/burst immunity Test |
| IEC 61000-4-4 - Surge Immunity Test |
| IEC 61000-4-5 - Electrostatic discharge immunity test |

| CALIBRATION SETTINGS |
|---|

| Linear Calibration (y=mx+b)* | m | b |
|---|---|---|
| External temperature | 1 (default) | 0 (default) |
| Internal temperature | 1 (default) | 0 (default) |

* Software configurable values

## TECHNICAL DRAWINGS

DIMENSIONAL DRAWINGS AND INTERFACE DESIGN | POWER SUPPLY AND COMMUNICATIONS CONNECTOR

Rear view

146 mm

162 mm

88,5 mm

M8 4P
Probe sensor

3 x AA Battery holder

M8 5P configuration
cable connector

Top view

Bottom view

25 mm

25 mm

LED 1 - Blue
LED 2 - Blue
LED 3 - Green
LED 4 - Red

1 Brown (GND)
2 White (NA)
3 Blue (VCC)
4 Black (NA)
5 Grey (NC)

## ACCESSORIES

**DUOS DIGITAL TEMPERATURE PROBE PLUG AND PLAY (PROBE PG)**
*REF.: PA160410001*
Plug and Play DUOS external temperature probe with M8 connector.

**DUOS DIGITAL TEMPERATURE PROBE 2M AND 5M**
*REF.: PA160410002 (2M) / REF.: PA160410003 (5M)*
2M or 5M cable DUOS external temperature probe with M8 connector.

**DUOS TRANSMITTER SARC**
*REF.: PA160410005*
Cable used to configure DUOS Transmitter using Tekon Configuration software.

**DUOS POWER SUPPLY 230VAC/ 12V DC**
*REF.: PA160410006*
230V/50Hz Power supply cable to be used with the wireless gateway and repeater DUOS.

**DUOS GATEWAY EXTERNAL POWER CABLE**
*REF.: PA160410007*
Cable for external power and communication with the wireless gateway DUOS.

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## RELATED PRODUCTS

**DUOS WIRELESS GATEWAY**
*REF.: PA160410210 / PA160411910*
- Scalable network up to 55 transmitters;
- Supports up to 12 repeaters in series;
- Up to 4Km (868MHz/915Mhz) / 2Km (2.4GHz) communication distance (LoS);
- Automatic Mesh Network Management;
- Automatic communication quality mechanisms;
- Multiple networks simultaneously;
- AES KEY Data encryption 128bits;
- Modbus RTU communication for process;

**DUOS WIRELESS GATEWAY IOT**
*REF.: PA160410240 / PA160411920*
- Ethernet TCP/IP communication;
- Integration with Tekon IoT Platform;
- Scalable network up to 55 transmitters;
- Multiple networks simultaneously;
- Automatic Mesh Network Management;
- Up to 4Km (868MHz/915MHz) / 2Km (2.4GHz) communication distance (LoS);
- Multiple networks simultaneously;
- AES KEY Data encryption 128bits;

**DUOS WIRELESS REPEATER**
*REF.: PA160410310 / PA160412010*
- Up to 4Km (868MHz/915Mhz) / 2Km (2.4GHz) communication distance (LoS);
- Auto discovery of the best wireless link;
- Automatic forwarding of communication;
- Improvement of mesh network with reliability;
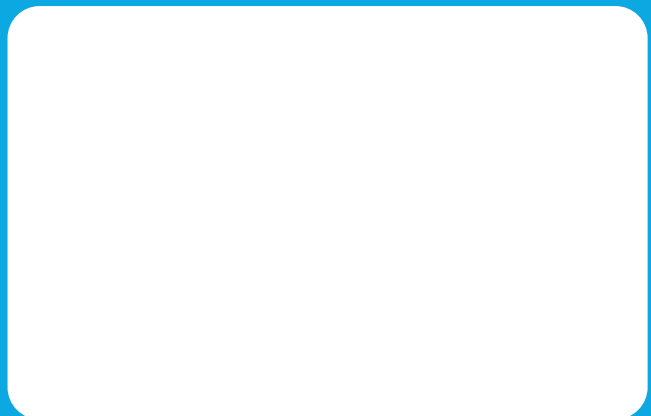
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## REVISION HISTORY

| VERSION | |
|---|---|
| E01B | Addition of 915MHz frequency information in "Radio Specifications", "Temperature Measurement Internal Probe", "Operating Environment" and "Factory Default Settings" tables; |
| | Revision of "Peak current" topic in "Power Supply" table; |
| | Reform of "Voltage Threshold" table; |
| | Identification of led number in "Interface" table; |
| | Reform of "Certifications and approvals" table; |
| | Led layout in "Technical Drawings"; |
| | Inclusion of "DUOS Wireless Gateway IoT" in "Related Products" table; |

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