tekon
WIRELESS SENSORS TECHNOLOGY

IP67
PROTECTION

WIRELESS TRANSMITTER DUOS DI+TEMP

IoT ready

Tekon Wireless Transmitter DUOS DI+Temp is the perfect temperature 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.

	Product References	
	Black	White
868MHz	PA160411210	PA160411220
915MHz	PA160411230	PA160411240

KEY FEATURES

−40 °C TO 125°C
TEMPERATURE MEASUREMENT SENSOR RANGE*

DIGITAL INPUT EVENT TRIGGER COMMUNICATION

AGRIFOOD INDUSTRY COMPATIBILITY
COMPATIBLE WITH AGRIFOOD INDUSTRY STANDARDS

DUAL TEMPERATURE PROBE
INTERNAL AND EXTERNAL PROBE

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

LOW POWER AND LONG BATTERY LIFE
MEASURING AND TRANSMITTING BATTERY VOLTAGE

WATER RESISTANT
IP67 PROTECTION

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

DS_DUOS_DI+TEMP_E02B

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TECHNICAL SPECIFICATIONS

RADIO SPECIFICATIONS	868MHZ	915MHZ
Range[1]	Up to 4 Km LoS	
Minimum communication distance	3 m @ 27 dBm (500mW)	
Radio transmit power[2]	0 to 27 dBm	8 to 27 dBm
Radio receiver sensitivity[2]	-97 to -110 dBm	
Frequency band[2]	868 to 869 MHz	902 to 928 MHz [5]
Radio channels	16	50 [6]
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	
Range	-40 to 60ºC
Resolution	0,1 ºC
Accuracy	Typical: ± 0,25 ºC / Maximum: ± 0,5 ºC
Sensor type	I2C digital sensor
Response time	1 second

DIGITAL INPUT - ELECTRICAL AND TIME FEATURES	
Contact type	Dry contact
Standby state	Open / OFF
Current consumption	DI ON: 28uA / DI OFF: 0uA
Communication time after DI activation	< 1,1 seconds
DI debounce time	60ms
Edge trigger	Open -> Close
DI event buffer	8

POWER SUPPLY *(HARDWARE VERSION < 4.2)*
3x3.6 AA lithium batteries [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 µA

POWER SUPPLY *(HARDWARE VERSION >= 4.2)*
3x1,5 V AA Lithium/Alkaline/Rechargeable (Ni-MH) batteries [3]
3 years of estimated battery life [4]
External power supply with 5 VDC ± 5%
Peak current < 100 mA [2]
Supply voltage measurement accuracy ± 100 mV
Sleep mode current consumption < 30 µA

INTERFACE
2 blue LED (LED 1 and LED 2) for wireless network address identification and general operation status
1 red LED (LED 4) and 1 green LED (LED 3) 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

OPERATING ENVIRONMENT	
Temperature range	-40 to 60ºC
Humidity	95% maximum relative humidity (non-condensing)

CASING	
Dimensions	162 x 88,5 x 25 mm
Weight	100 g
Material	ABS UL94HB
Protection index	IP67

FACTORY DEFAULT SETTINGS	868MHZ	915MHZ
Frequency (MHZ)	869,525 MHz	915,000 MHz
Radio transmit power	27 dBm	
Radio transmission rate	76,8 kbits/s	
Wireless channel	13	26
Transmitter ID	1	
Communication period	10 seconds	
Configuration time window at startup	10 seconds	
Reconnection period	30 minutes	
Wireless network ID	16777217	

CERTIFICATIONS AND APPROVALS
EN 300 220 -2 V3.1.1
EN 301 489-1 V2.2.0
EN 301 489-3 V2.1.1

BATTERIES

RECOMMENDED BATTERIES *(HARDWARE VERSION < 4.2)*

BRAND	SAFT	EVE
Model	LS14500	ER14505
Classification	Lithium-thionyl	Lithium-thionyl
Chemical System	$Li\text{-}SOCl_2$	$Li\text{-}SOCl_2$
Nominal Voltage	3,6 V	3,6 V
Type	AA	AA
Operating Temperature	-60ºC to 85ºC	-55ºC to 85ºC

RECOMMENDED BATTERIES *(HARDWARE VERSION >= 4.2)*

BRAND	ENERGIZER	PANASONIC	DURACELL	DURACELL
Model	Ultimate Lithium L91	Alkaline Power	MN1500	DX1500H
TME Part Number	BAT-FR6/EGL-B4	BAT-LR06/P-B4	BAT-LR6/DR-B12	ACCU-R6/2500/DR
Classification	Lithium	Alkaline	Alkaline	Rechargeable
Chemical System	Li/FeS_2	Zn/MnO_2	Zn/MnO_2	Ni-MH
Nominal Voltage	1,5 V	1,5 V	1,5 V	1,2 V
Type	AA	AA	AA	AA
Operating Temperature	-40ºC to 60ºC	-20ºC to 54ºC	-20ºC to 54ºC	-10ºC to 50ºC

VOLTAGE THRESHOLD (VDC)	INTERNAL TEMP. ≥ -10º	INTERNAL TEMP. < -10º
Critical battery	3 V	2,5 V

[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 and Digital Input OFF.
[5] In some countries, the frequency band admitted is not so extended as the default range.
[6] The radio frequencies admitted in Australia are available from channel 26 to channel 50.

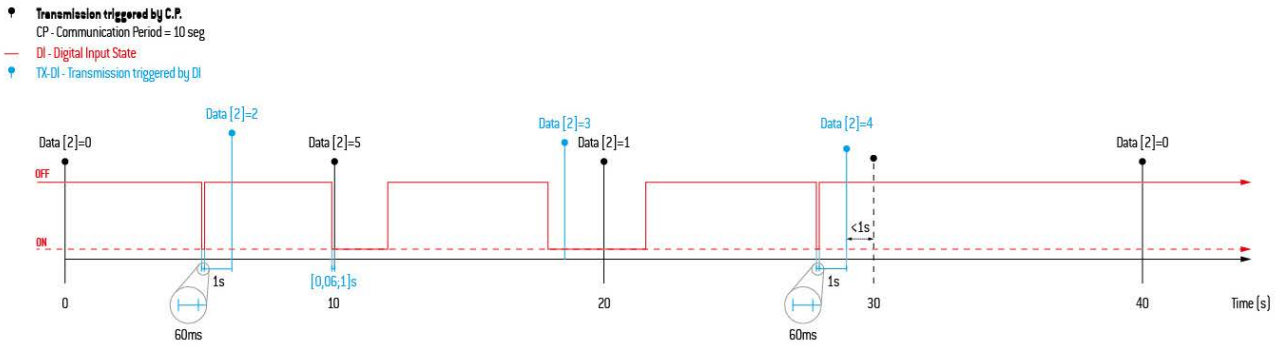
CALIBRATION SETTINGS

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

* Software configurable values

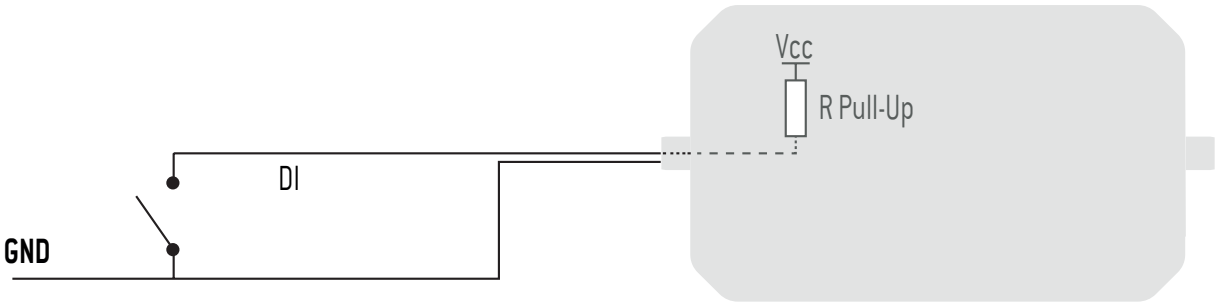
DIGITAL INPUT

TRANSMITTER DI OPERATION



DI STATE / AWAKENED BY	Time	DI	DI+Time
OFF	0	2	4
ON	1	3	5
Note: If Communication Period is equal to 1 second, possible values are: 0, 1, 4 and 5.			

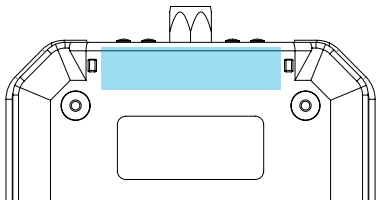
CONNECTION DIAGRAM



RSSI LEVELS

SIGNAL (DBM)	QUALITY
0 to -50	Excellent
-51 to -60	Good
-61 to -70	Acceptable
-71 to -100	Poor

MAGNETIC SWITCH

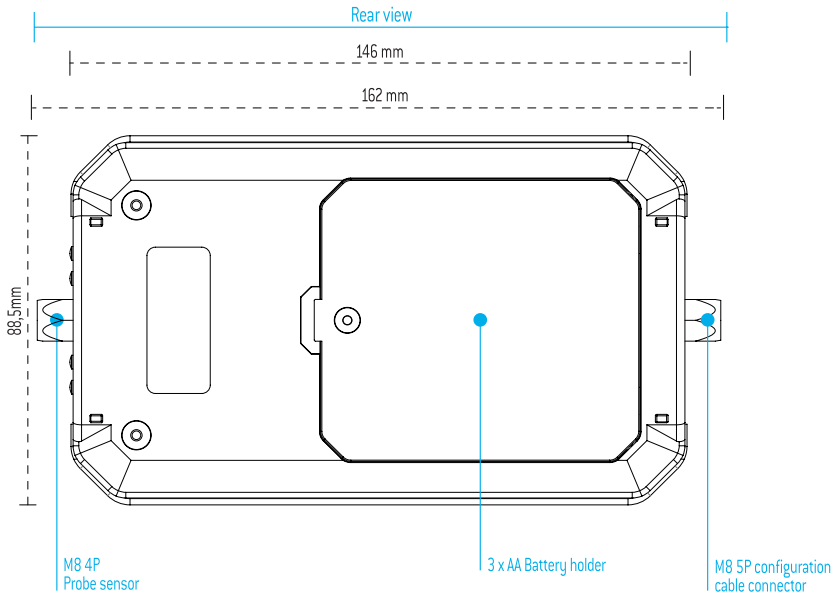


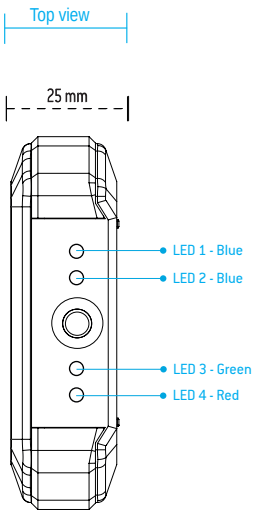
The DUOS Wireless Transmitters have a magnetic switch that allows to reset the devices.

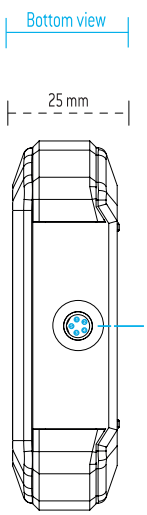
Operation Mode:
Slide a magnet in the area marked in the image. All LED's will be active and the transmitter will be restarted.

TECHNICAL DRAWINGS

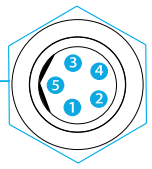
DIMENSIONAL DRAWINGS AND INTERFACE DESIGN







M8X5P PINOUT DIAGRAM



1. Brown (GND)
2. White (NA)
3. Blue (VCC)
4. Black (NA)
5. Grey (Digital Input)

ACCESSORIES

DUOS EXTERNAL POWER CABLE

REF.: PA160410008

DUOS Transmitter external power supply cable.

DUOS DI+TEMP EXTERNAL CABLE

REF.: PA160410009

DUOS DI+TEMP Digital Input cable.

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 POWER SUPPLY 230VAC/ 5V DC

REF.: PA160413610

230V/50Hz Power supply cable to be used with DUOS wireless transmitters with the new hardware version.

RELATED PRODUCTS

DUOS WIRELESS GATEWAY

REF.: PA160410210 / PA160411910

- Scalable network up to 55 transmitters;
- Supports up to 12 repeaters in series;
- Up to 4Km 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 REPEATER

REF.: PA160410310 / PA160412010

- Up to 4Km communication distance (LoS);
- Auto discovery of the best wireless link;
- Automatic forwarding of communication;

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 communication distance (LoS);
- AES KEY Data encryption 128bits;

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;
E01C	Addiction of information about the frequency range used in Australia. Changing the default configuration of radio channel on 915 MHz models.
E01D	Inclusion of “RSSI Levels“ and “Magnetic Switch” tables
E01E	Removal of 2,4 GHz frequency
E01F	Removal of “Voltage Threshold” table Inclusion of “Recommended batteries” table
E02A	Inclusion of “Power Supply” information for hardware version >= 4.2 Reorganization of “Recommended batteries” table Inclusion of information about industrial property. Inclusion of new external power supply on “Accessories” table.
E02B	Inclusion of Reconnection Period on “Factory Default Settings Table”

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