tekon
WIRELESS SENSORS TECHNOLOGY

WIRELESS TRANSMITTER DUOS CO_2

REF.: PA160411110 / PA160412410

IP67 PROTECTION

IoT ready

Tekon Wireless Transmitter DUOS CO2 is an accurate solution for measurement and monitoring of CO2 for demanding applications. Taking advantage from all the features of the DUOS product family, it's the perfect solution for air quality monitoring, agriculture, wine cellars and fermentation processes.

This device uses a dual wavelength NDIR CO2 sensor with automatic temperature compensation for ageing effects and high accuracy over the entire temperature operating range. The sensor IP65 enclosure together with transmitter IP67 protection level, ensures operation in harsh, wet and polluted environments.

Dimensions: 162 x 88.5 x 25 mm
Weight: 100 g
Material: ABS UL94HB
Protection Index: IP67

KEY FEATURES

–40 °C TO 60°C
TEMPERATURE SENSOR MEASUREMENT RANGE*

AGRIFOOD INDUSTRY COMPATIBILITY
COMPATIBLE WITH AGRIFOOD INDUSTRY STANDARDS

DUAL PROBE
INTERNAL TEMPERATURE AND EXTERNAL CO2 PROBE

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

MULTIPLE CO2 MEASUREMENT RANGES
2.000PPM, 5.000PPM, 10.000PPM, 3% AND 5%

WATER RESISTANT
IP67 PROTECTION (TRANSMITTER)
IP65 PROTECTION (CO2 PROBE)

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

PA160411110.DS.ENG.V01.3.2018

TEKON ELECTRONICS | AVEIRO, PORTUGAL
P.: +351 234 303 320 M.: +351 933 033 250 E.: sales@tekonelectronics.com

TECHNICAL SPECIFICATIONS

RADIO SPECIFICATIONS	868MHZ	2.4GHZ
Range[1]	Up to 4 Km LoS, 868MHz, 27 dBm (500mW)	Up to 2 Km, 2.4GHz, 10dBm (10mW)
Minimum Separation Distance	3 m, 868MHz, 27 dBm (500mW)	até 2 Km, 2.4GHz, 10dBm (10mW)
Radio Transmit Power	0 to 27 dBm[2]	-10 a 17dBm[2]
Radio Receiver Sensitivity	-97 to -110 dBm[2]	-91 até -108dBm[2]
Frequency Band	868.050 to 869.575 MHz[2]	2400.75 até 2482.75 MHz[2]
Radio Channels	16, 868MHz	83, 2.4GHz
Radio Transmission Rate	1.2 to 76.8 kbit/s[2]	
Modulation	GFSK	
Encryption method	AES 128 (Advanced Encryption Standard)	

WIRELESS NETWORK	
Maximum Devices	55
Maximum Hops	13
Communication Period	16 to 3600 seconds (configurable)

CO2 MEASUREMENT – EXTERNAL PROBE	
Connector	M8 female socket, 4 poles
Acquisition Range[3]	0-2000ppm 0-5000ppm 0-10000ppm 0-3% 0-5%
Precision at 25ºC and 1013 mbar	0 to 2000ppm: +- 50ppm + 2% measured value 0 to 5000ppm +- 50ppm + 3% measured value 0 to 10000ppm +- 100ppm + 5% measured value 0 to 3%: +- 1.5% of the scale + 2% measured value 0 to 5%: +-1.5% of the scale + 2% measured value
Sampling Time	16[4] to 3600 seconds (configurable)
T90 (90% step response)	60 seconds (16 second sampling)
Operating Temperature	-40ºC to 60ºC (0-100%RH non-condensing)

TEMPERATURE MEASUREMENT INTERNAL PROBE	868MHZ	2.4GHZ
Range	-40 to 80 ºC	-20 to 80 ºC
Resolution	0.1 ºC	
Accuracy	Typical: ± 0.25 ºC / Maximum: ± 0.5 ºC	
Sensor Type	I2C digital sensor	
Sampling Time	16[3] to 3600 seconds (configurable)	

[1] Range depends on the environment and line of sight. Always verify your wireless network's range by performing a Site Survey.
[2] Dependent on radio channel selection.
[3] CO2 acquisition range available upon probe selection. Probe sold separately.
[4] Factory setting.

SUPPLY VOLTAGE
3x3.6 AA lithium batteries (SAFT LS14500)[5]
External power supply with 12 VDC ± 5%
Peak current draw of 500 mA
Supply voltage measurement accuracy ± 1 V DC

BATTERIES LIFETIME (EXAMPLE)	868MHZ	2.4GHZ
Communication Period (s)	Estimated Battery Lifetime (months)	
15	0.6	1.1
60	2.1	3.5
600	10.2	12.4
3600	15.9	16.3

LOW BATTERY			
	Tint[6] > 25ºC	-25 < Tint < 25	Tint < -25
Voltage Threshold (VDC)	8,5	(Tint / 50) + 8	7,5

CRITICAL BATTERY			
	Tint > 25ºC	-25 < Tint < 25	Tint < -25
Voltage Threshold (VDC)	8	(Tint / 50) + 7,5	7

INTERFACE
2 blue LED for wireless network address identification and general operation status
1 red LED and 1 green LED 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	868MHZ	2.4GHZ
Probe	–40 °C to 60 °C	-40ºC to 60ºC
Transmitter	–40 °C to 80 °C	-20ºC to 80ºC
95% maximum relative humidity (non-condensing)		

HOUSING	
Dimensions:	162 x 88.5 x 25 mm
Weight:	100 g
Material:	ABS UL94HB
Protection Index:	IP67

FACTORY DEFAULT CONFIGURATION	868MHZ	2.4GHZ
Frequency	869.525 MHz	2403.75 MHz
Radio Transmit Power	27 dBm	10dBm
Radio Transmission Rate	76.8 kbit/s	
Wireless Channel	13	4
Transmitter ID	55	
Communication Period	16 seconds	
Configuration time window at startup	10 seconds	
Wireless Network ID	16777217	

[5] Batteries not included.
[6] Internal Temperature.

CALIBRATION SETTINGS

Linear Calibration (y=mx+b)	m	b
CO_2	1 (default)	0 (default)
Internal Temperature	1 (default)	0 (default)
	Software configurable values	

CERTIFICATIONS AND COMPLIANCE

EN 61326 Electrical equipment for measurement, control and laboratory use. EMC requirements.

IEC 61000-4-2 Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

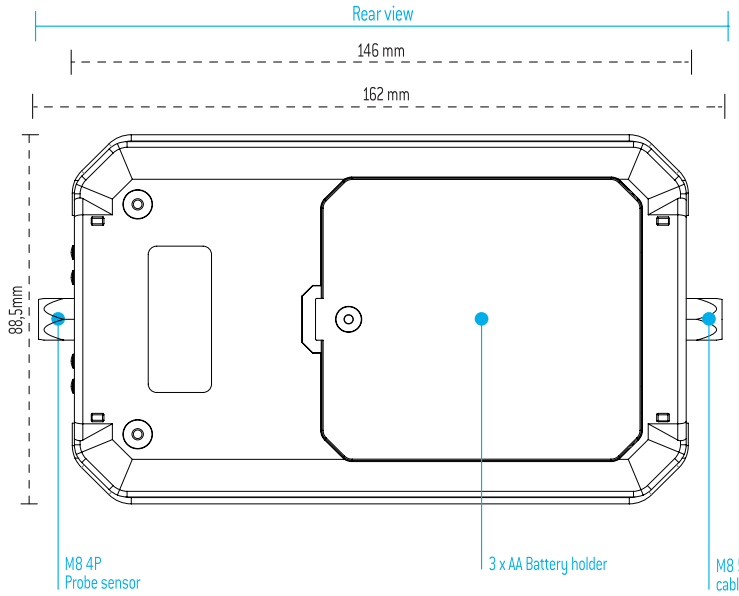
IEC 61000-4-3 Electrical fast transient/burst immunity Test

IEC 61000-4-4 Surge Immunity Test

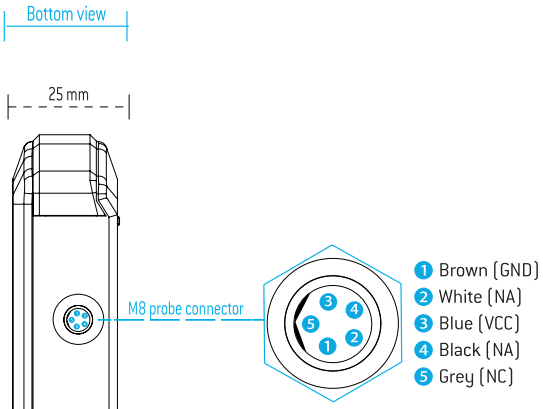
IEC 61000-4-5 Electrostatic discharge immunity test

TECHNICAL DRAWINGS

DIMENSIONAL DRAWINGS AND INTERFACE DESIGN

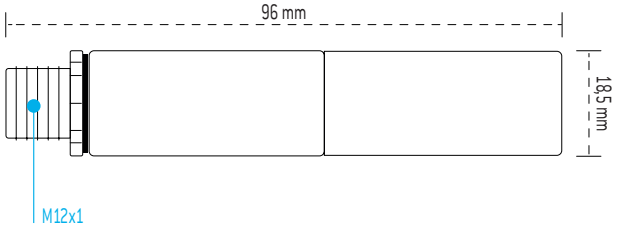


POWER SUPPLY AND COMMUNICATIONS CONNECTOR



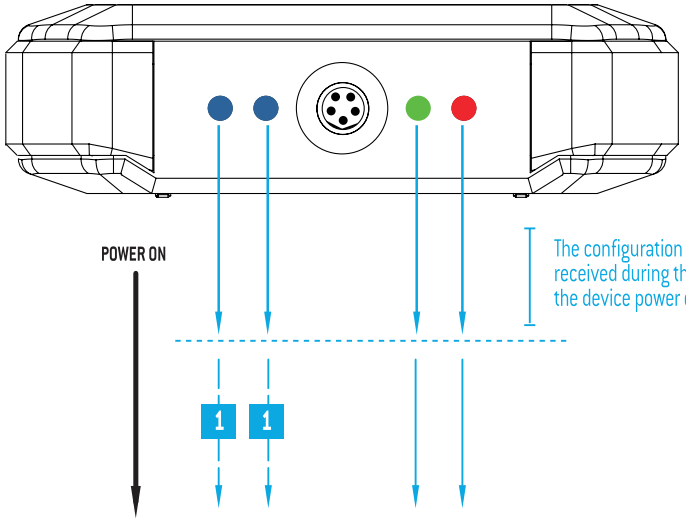
DIMENSIONAL DRAWINGS AND INTERFACE DESIGN

DIGITAL CO2 PROBE



LEDS INDICATION

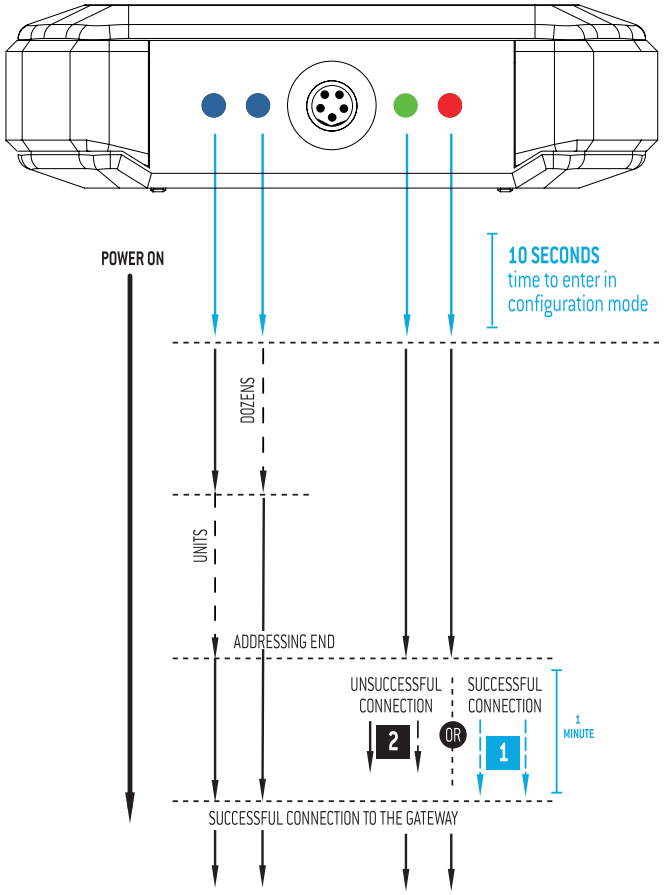
STARTING EQUIPMENT IN CONFIGURATION MODE



1 - - - → LEDs flash quickly and simultaneously after received the configuration input command

——→ LED stays on and fixed

STARTING EQUIPMENT NORMALLY



1 - - - → Successful connection to the Gateway
Both LEDs flash

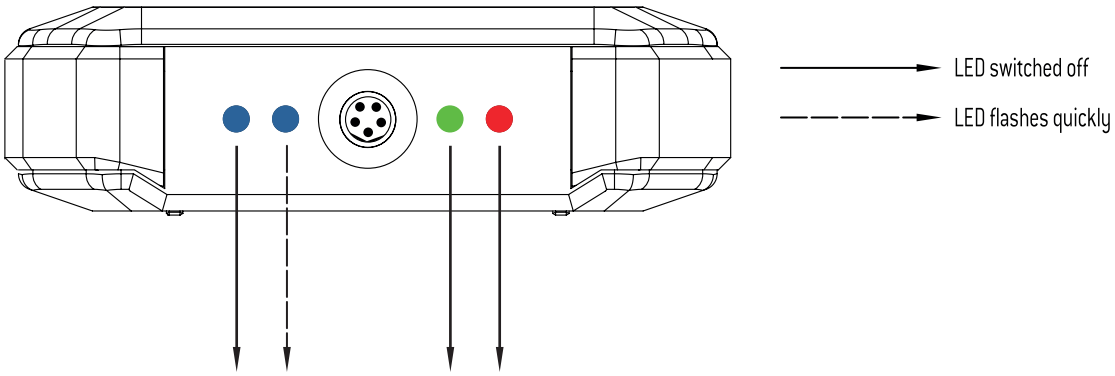
2 ——→ Time to connection to the network (approx. 10 - 15 seconds).
2 - - - → In case of fail of communication, the red LED flashes during a minute and switches off after that.

——→ LED switched off

- - - → LED flashes slowly

——→ LED switched on and fixed

TRANSMITTER FAILURE

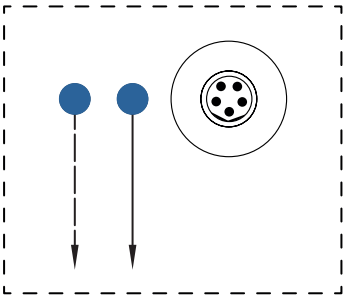


CRITICAL BATTERY LEVEL

CRITICAL BATTERY LEVEL

Device stops communication with Gateway
One LED stays permanently flashing at 0.5Hz (1 second on, 1 second off) and the remaining LEDs are switched off.

LED switched off
LED flashes slowly



ACCESSORIES

DUOS CO2 PROBE TK871-HR5000J2 (A) WITH 2 METER CABLE (B)

REF.: PA160410010 (A) / PA160410011 (B)

5000 ppm CO2 probe for Wireless Transmitter DUOS CO2 868 MHz

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.

DUOS EXTERNAL POWER CABLE

REF.: PA160410008

DUOS transmitter power supply cable.

COMPLEMENTARY PRODUCTS

WIRELESS GATEWAY DUOS

REF.: PA160410210 / PA160411910

- Scalable network up to 55 transmitters;
- Supports up to 12 repeaters in series;
- Up to 4Km (868MHz) / 2Km (2.4GHz) communication distance (LoS) with 128-bit AES encryption;
- Automatic Mesh Network Management;
- Automatic communication quality mechanisms;
- Multiple networks simultaneously;
- AES KEY Data encryption 128bits;
- Modbus RTU communication for process;
- Simple, intuitive and free configuration software.

WIRELESS REPEATER DUOS

REF.: PA160410310 / PA160412010

- Up to 4Km (868MHz) / 2Km (2.4GHz) communication distance (LoS);
- Auto discovery of the best wireless link;
- Automatic forwarding of communication;
- Simple, intuitive and free configuration software.

TEKON ELECTRONICS
a brand of Bresimar Automação S.A.

Quinta do Simão
3800-230 Aveiro
PORTUGAL

P.: +351 234 303 320
M.: +351 933 033 250
E.: sales@tekonelectronics.com

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