

WIRELESS TRANSMITTER DUOS CO₂

IP67
PROTECTION



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.

DS_DUOS_CO2_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)	0m @ 10dBm (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	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 25°C 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	-40°C to 60°C (0-100%RH non-condensing)

TEMPERATURE MEASUREMENT INTERNAL PROBE	868MHZ	915MHZ	2,4GHZ
Range	-40 to 80 °C	-40 to 80 °C	-20 to 80 °C
Resolution	0,1 °C		
Accuracy	Typical: ± 0,25 °C / Maximum: ± 0,5 °C		
Sensor type	I2C digital sensor		
Sampling time	16 ³ to 3600 seconds (configurable)		

OPERATING ENVIRONMENT	868MHZ	915MHZ	2,4GHZ
Probe	-40 °C to 60 °C	-40 °C to 60 °C	-40°C to 60°C
Transmitter	-40 °C to 80 °C	-40 °C to 80 °C	-20°C to 80°C
95% maximum relative humidity (non-condensing)			

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 CO2 acquisition range available upon probe selection. Probe sold separately.

⁴ Factory setting.

SUPPLY VOLTAGE

3x3,6 AA lithium batteries (PN EVE ER14505)⁵

External power supply with 12 VDC ± 5%

Peak current draw of 250 mA²

Supply voltage measurement accuracy ± 1 V DC

Sleep mode current consumption < 8 μA

BATTERIES LIFETIME (EXAMPLE)	868MHZ	915MHZ	2,4GHZ
Communication Period (s)	Estimated Battery Lifetime (months)		
15	0,6	0,6	1,1
60	2,1	2,1	3,5
600	10,2	10,2	12,4
3600	15,9	15,9	16,3

VOLTAGE THRESHOLD (VDC)	TINT ⁶ > 25°C	-25°C < TINT < 25°C	TINT < -25°C
Low battery	8,5	(Tint / 50) + 8	7,5
Critical battery	8	(Tint / 50) + 7,5	7

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

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	869,525 MHz	904,000 MHz	2403,75 MHz
Radio Transmit Power	27 dBm	27 dBm	10 dBm
Radio Transmission Rate		76,8 kbit/s	
Wireless Channel	13	4	4
Transmitter ID		1	
Communication Period		16 seconds	
Configuration time window at startup		10 seconds	
Wireless Network ID		16777217	

⁵ Batteries not included.⁶ Internal Temperature.

CERTIFICATIONS AND APPROVALS

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

EN 300 228 - Electromagnetic 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 ($y=mx+b$)*

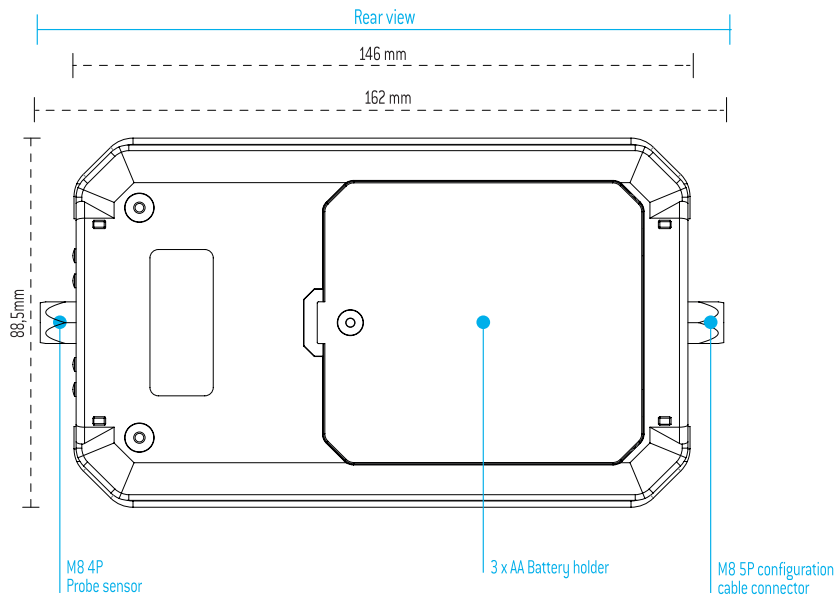
	m	b
CO ₂	1 (default)	0 (default)
Internal Temperature	1 (default)	0 (default)

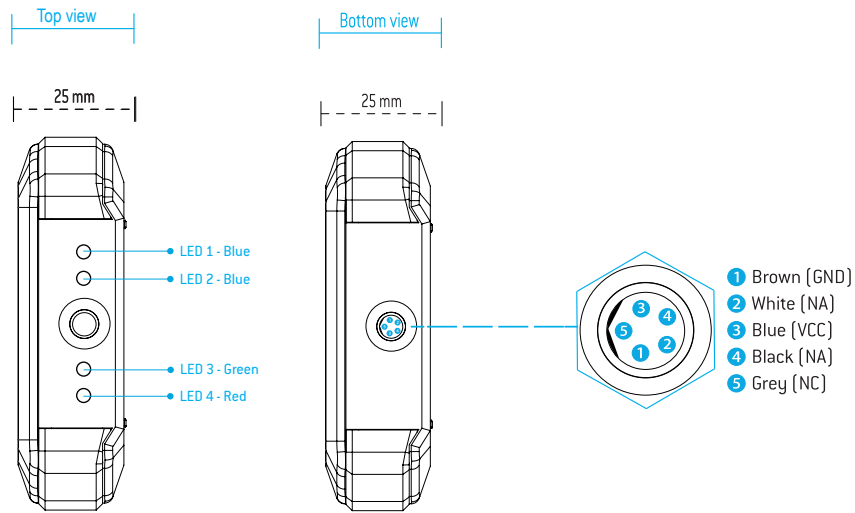
* Software configurable values

TECHNICAL DRAWINGS

DIMENSIONAL DRAWINGS AND INTERFACE DESIGN

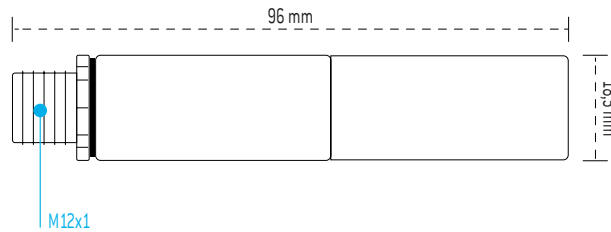
POWER SUPPLY AND COMMUNICATIONS CONNECTOR





DIMENSIONAL DRAWINGS AND INTERFACE DESIGN
PROBE

DIGITAL CO₂



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.

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;
- Simple, intuitive and free configuration software.



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;
- Simple, intuitive and free configuration software.



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;
- Simple, intuitive and free configuration software.

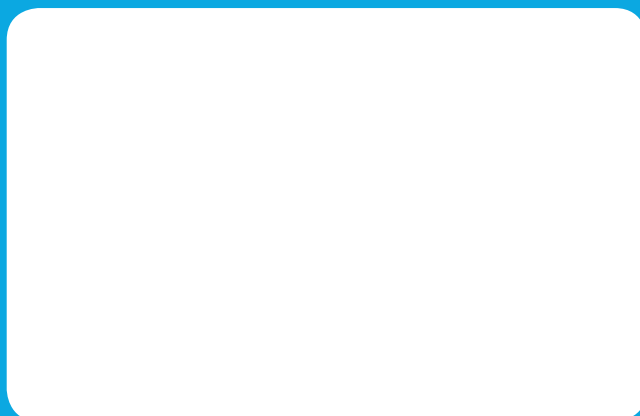
REVISION HISTORY

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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