

# WIRELESS TRANSMITTER DUOS CO<sub>2</sub>



Tekon Wireless Transmitter DUOS CO<sub>2</sub> is an accurate solution for measurement and monitoring of CO<sub>2</sub> 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 CO<sub>2</sub> 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.

## Product References

	Black	White
868MHz	PA160411110	PA160411120
915MHz	PA160411130	PA160411140

## 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 CO<sub>2</sub> PROBE

### WIRELESS LINK INDICATION (RSSI)

AUTO DISCOVERY OF THE BEST WIRELESS LINK

### MULTIPLE CO<sub>2</sub> MEASUREMENT RANGES

2.000PPM, 5.000PPM, 10.000PPM, 3% AND 5%

### WATER RESISTANT

IP67 PROTECTION (TRANSMITTER)  
IP65 PROTECTION (CO<sub>2</sub> PROBE)

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

DS-DUOS-CO<sub>2</sub>-E02A

## TECHNICAL SPECIFICATIONS

RADIO SPECIFICATIONS	868MHZ	915MHZ
Range <sup>1</sup>	Up to 4 Km LoS	
Minimum communication distance	3 m @ 27 dBm (500mW)	
Radio transmit power <sup>2</sup>	0 to 27 dBm	8 to 27 dBm
Radio receiver sensitivity <sup>2</sup>	-97 to -110 dBm	
Frequency band <sup>2</sup>	868 to 869 MHz	902 to 928 MHz <sup>5</sup>
Radio channels	16	50 <sup>6</sup>
Radio transmission rate <sup>2</sup>	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 <sup>3</sup>	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 <sup>4</sup> 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

Range	-40 to 60 °C
Resolution	0,1 °C
Accuracy	Typical: ± 0,25 °C / Maximum: ± 0,5 °C
Sensor type	I2C digital sensor
Sampling time	16 <sup>5</sup> to 3600 seconds (configurable)

## OPERATING ENVIRONMENT

Probe / Transmitter	-40 °C to 60 °C
	95% maximum relative humidity (non-condensing)

## POWER SUPPLY (HARDWARE VERSION <4.2)

3x3,6 AA lithium batteries <sup>7</sup>
External power supply with 12 VDC ± 5%

Peak current draw of 250 mA<sup>2</sup>Supply voltage measurement accuracy  $\pm 1$  V DCSleep mode current consumption  $< 8 \mu\text{A}$ **POWER SUPPLY (HARDWARE VERSION  $\geq 4.2$ )**3x1,5 V AA lithium/alkaline/Ni-MH batteries<sup>3</sup>3 years of estimated battery life<sup>4</sup>External power supply with 5 VDC  $\pm 5\%$ Peak current  $< 100$  mA<sup>2</sup>Supply voltage measurement accuracy  $\pm 1$  V DCSleep mode current consumption  $< 40 \mu\text{A}$ 

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

**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
Frequency	869,525 MHz	915,000 MHz
Radio Transmit Power	27 dBm	
Radio Transmission Rate	76,8 kbit/s	
Wireless Channel	13	26
Transmitter ID	1	
Communication Period	16 seconds	
Configuration time window at startup	10 seconds	
Wireless Network ID	16777217	

**CERTIFICATIONS AND APPROVALS**

EN 61326 -1 -Class B - Industrial Requirements

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-SOCl <sub>2</sub>	Li-SOCl <sub>2</sub>
Nominal Voltage	3,6 V	3,6 V
Type	AA	AA
Operating Temperature	-60°C to 85°C	-55°C to 85°C

### 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 <sub>2</sub>	Zn/MnO <sub>2</sub>	Zn/MnO <sub>2</sub>	Ni-MH
Nominal Voltage	1,5 V	1,5 V	1,5 V	1,2 V
Type	AA	AA	AA	AA
Operating Temperature	-40°C to 60°C	-20°C to 54°C	-20°C to 54°C	-10°C to 50°C

<sup>1</sup> Range depends on the RF propagation environment and Line of Sight (LoS). Always verify your wireless network's range by performing a Site Survey.

<sup>2</sup> Dependent on radio channel selection.

<sup>3</sup> CO<sub>2</sub> acquisition range available upon probe selection. Probe sold separately.

<sup>4</sup> Factory setting.

<sup>5</sup> In some countries, the frequency band admitted is not so extended as the default range.

<sup>6</sup> The radio frequencies admitted in Australia are available from channel 26 to channel 50.

<sup>7</sup> Batteries not included.

## CALIBRATION SETTINGS

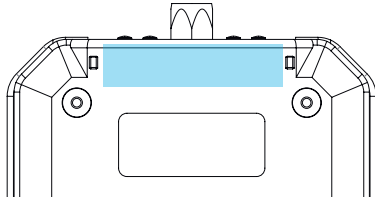
Linear Calibration (y=mx+b)*	m	b
CO <sub>2</sub>	1 (default)	0 (default)
Internal Temperature	1 (default)	0 (default)

\* Software configurable values

## 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.

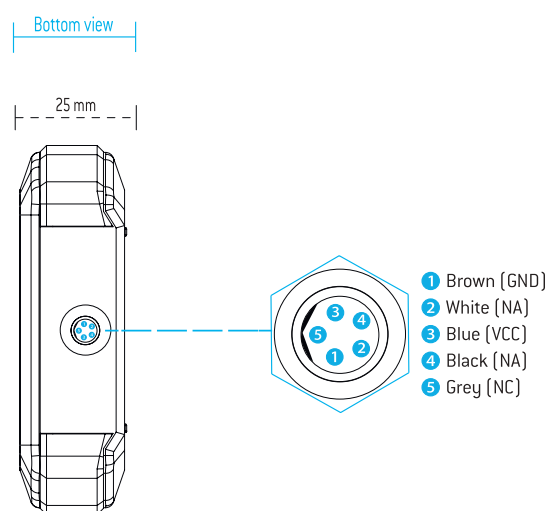
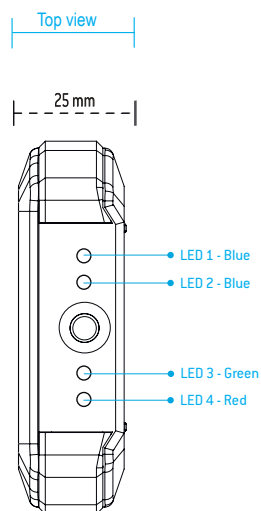
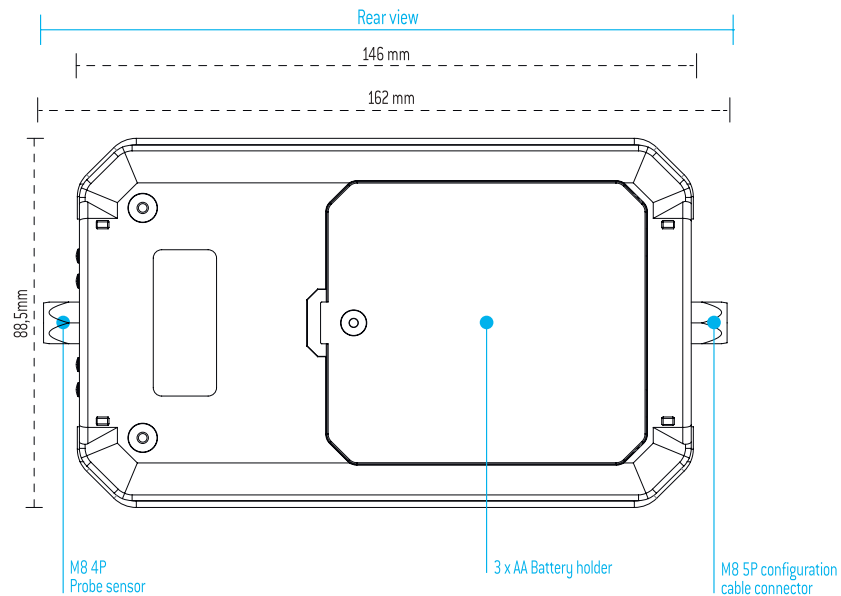
**Operation Mode:**

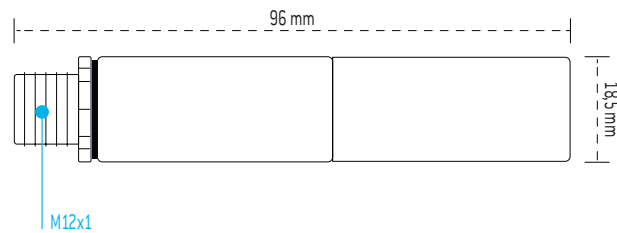
Slide a magnet in the area marked in the image. All LED's will be active and the transmitter will be restarted.

## TECHNICAL DRAWINGS

## DIMENSIONAL DRAWINGS AND INTERFACE DESIGN

## POWER SUPPLY AND COMMUNICATIONS CONNECTOR





## ACCESSORIES



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

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

5000 ppm CO<sub>2</sub> probe for Wireless Transmitter DUOS CO<sub>2</sub> 868 MHz



### DUOS TRANSMITTER SARC

REF.: PA160410005

Cable used to configure DUOS Transmitter using Tekon Configuration software.



### 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



### 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 communication distance (LoS);
- Automatic Mesh Network Management;
- 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 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 communication distance (LoS);
- AES KEY Data encryption 128bits;
- Simple, intuitive and free configuration software.

### REVISION HISTORY

#### VERSION

E01B	Inclusion 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	Inclusion 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 >=4.2.0 Reorganization of "Recommended batteries" table Inclusion of information about industrial property. Inclusion of new external power supply on "Accessories" table.

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