

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



Tekon Wireless Transmitter DUOS inCO<sub>2</sub> is an accurate solution for measurement and monitoring of temperature, CO<sub>2</sub>, CO<sub>2</sub> average and barometric pressure 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.

DUOS inCO<sub>2</sub> has a built-in sensor and its able to monitor the state of an open/close digital input type.

## Product References

### White

868MHz	PA210310310
915MHz	PA210310320

## KEY FEATURES

### −40 °C TO 60°C

TEMPERATURE SENSOR MEASUREMENT RANGE

### 0 TO 5000 PPM

CO<sub>2</sub> SENSOR MEASUREMENT RANGE

### DIGITAL INPUT

### BUILT-IN SENSOR

### WIRELESS LINK INDICATION (RSSI)

AUTO DISCOVERY OF THE BEST WIRELESS LINK

### LOW POWER AND LONG BATTERY LIFE

MEASUREMENT AND TRANSMISSION OF BATTERY VOLTAGE

### IP65 PROTECTION

DS\_DUOS\_INCO2\_E01A

## 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	2-FSK
Encryption method	AES 128 (Advanced Encryption Standard)	

## WIRELESS NETWORK

Maximum devices	55
Maximum hops	13
Communication period	5 to 43200 seconds (configurable)

## TEMPERATURE MEASUREMENT

Range	-40 to 60 °C
Resolution	0,1 °C
Accuracy	Typical: ± 0,25 °C / Maximum: ± 0,5 °C
Sensor type	I2C digital sensor
Response time	1 second

## CO2 MEASUREMENT

Range	0 to 5000 ppm
Accuracy (at 25°C and 1013 mbar)	0 ... 5000 ppm < ± (50 ppm + 3% of measured value)
Sampling time	5 to 3600 seconds (configurable)
Response time (t <sub>63</sub> )	75 seconds
Temperature dependency	± (1 + CO2 concentration [ppm] / 1000) ppm / °C (-20 to 45 °C)
Sensor type	I2C digital sensor

## BAROMETRIC PRESSURE MEASUREMENT

Range	700 to 1100 mbar
Accuracy (at 25°C)	± 2 mbar (20 to 80% RH)
Temperature dependency	± 0,015 mbar/K
Sensor type	I2C digital sensor

## 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

3x1,5 V AA lithium/alkaline/Ni-MH batteries <sup>3</sup>External power supply with 5 VDC  $\pm$  5%Peak current <100 mA <sup>2</sup>Supply voltage measurement accuracy  $\pm$  100 mVSleep mode current consumption < 30  $\mu$ A

## OPERATING ENVIRONMENT

Temperature range -40 °C to 60° C

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 red LED (LED 4) and 1 green LED (LED 3) for wireless network operation status

1 magnetic reed switch for system reset

1 M8 female socket with 5 poles for device configuration through host computer

## 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	10 seconds	
Configuration time window at startup	10 seconds	
Wireless network ID	16777217	

## CASING

Dimensions 162 x 88,5 x 25 mm

Weight 100 g

Material ABS UL94HB

Protection index IP65

## CERTIFICATIONS AND APPROVALS

EN 301 489-1 V2.2.1

<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> Batteries not included.

<sup>4</sup> Considering a communication period of 10 minutes, and maximum transmit power (27dBm) at 25 °C.

<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.

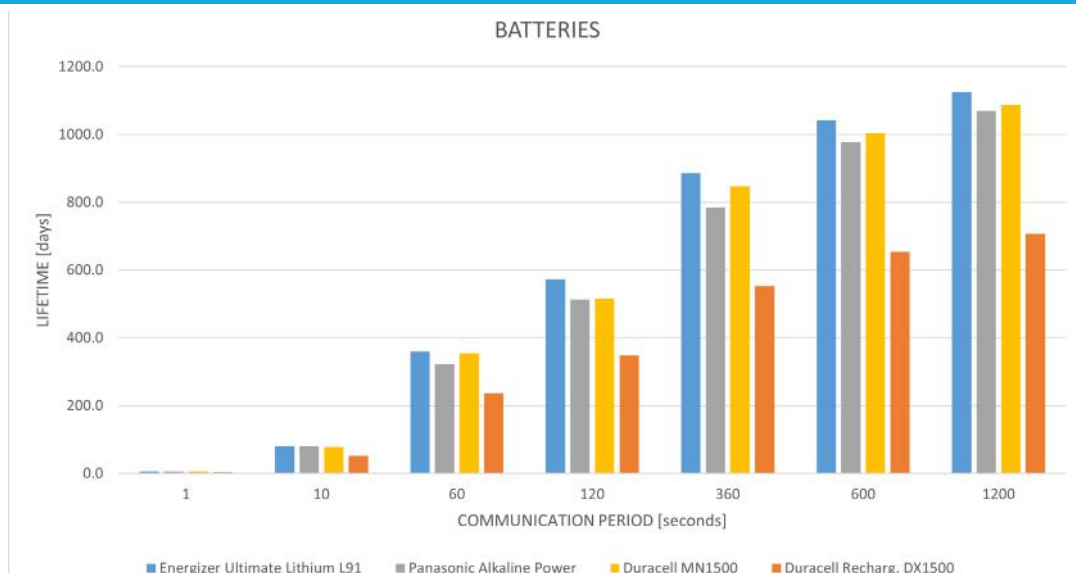
## BATTERIES

### RECOMMENDED BATTERIES

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

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

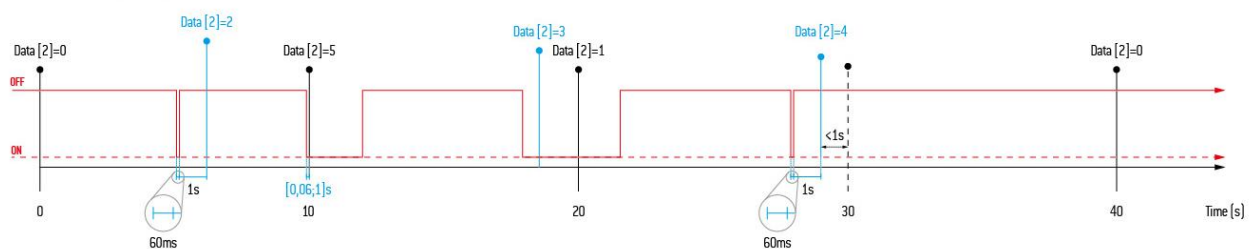
### PERFORMANCE TESTS



## DIGITAL INPUT

### TRANSMITTER DI OPERATION

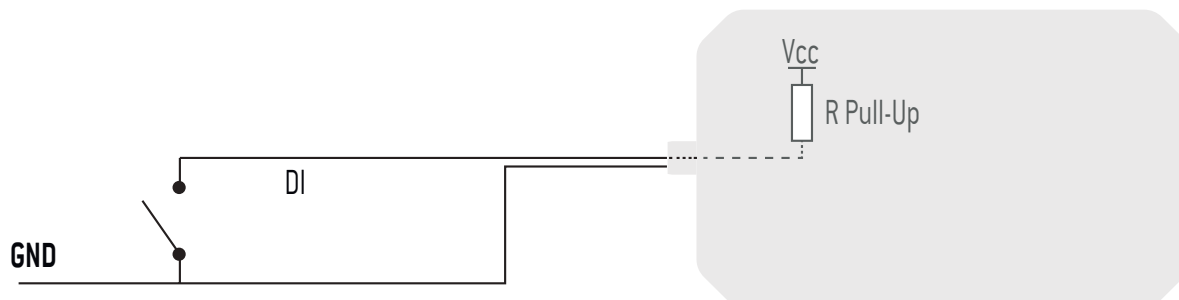
- Transmission triggered by C.P.  
CP - Communication Period = 10 seg
- DI - Digital Input State
- TX-DI - Transmission triggered by DI



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



## CALIBRATION SETTINGS

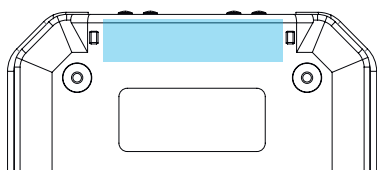
Linear Calibration (y=mx+b)*	m	b
CO <sub>2</sub>	1 (default)	0 (default)
Temperature	1 (default)	0 (default)
Barometric Pressure	1 (default)	0 (default)

\* 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.

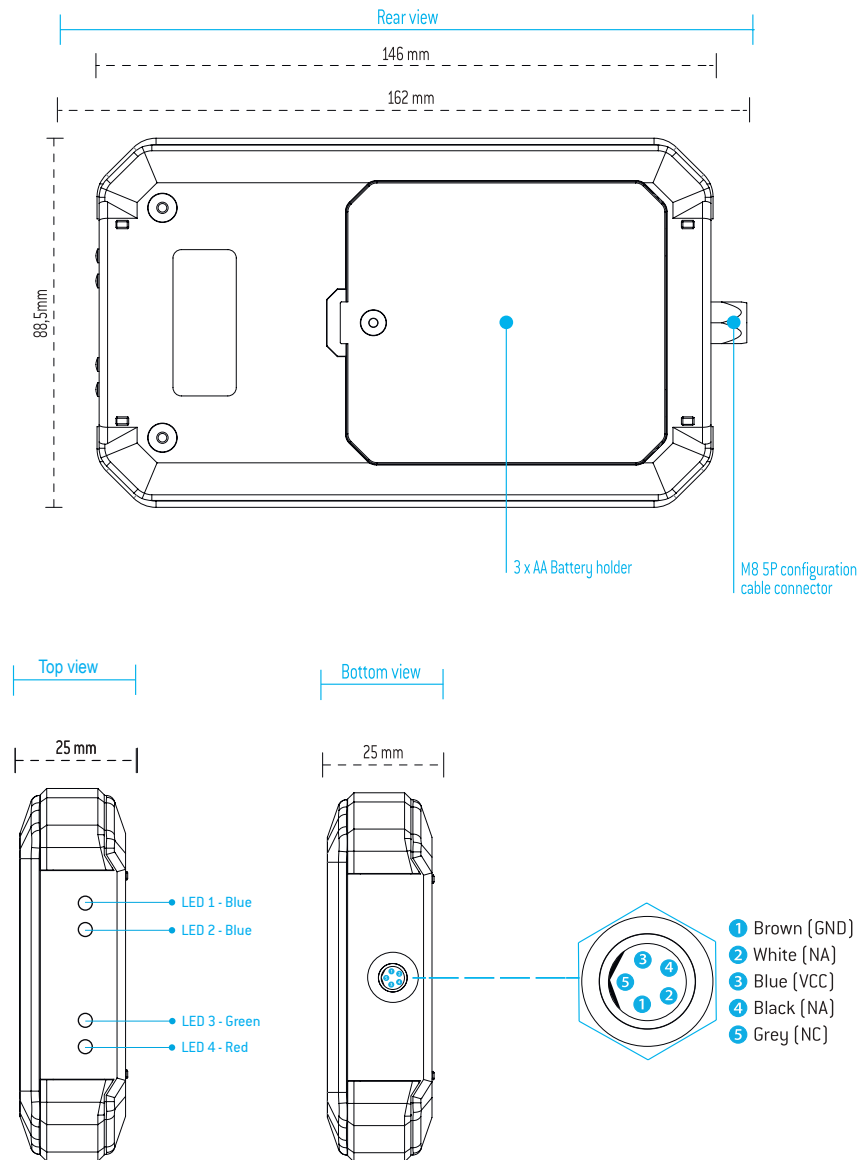
**Operation Mode:**

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 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 TRANSMITTER SARC

REF.: PA160410005

Cable used to configure DUOS Transmitter using Tekon Configuration software.



### DUOS POWER SUPPLY 230V AC / 5V DC

REF.: PA160413610

230V/50Hz Power supply cable to be used with the wireless gateway and repeater DUOS.

## REVISION HISTORY

## VERSION

E01B

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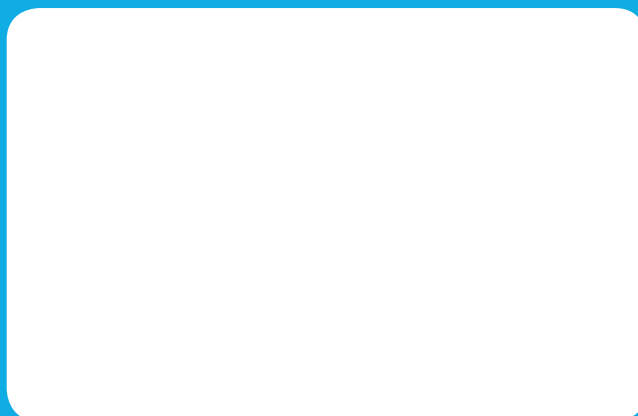
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