

WIRELESS TRANSMITTER DUOS inHYGROTEMP



Tekon Wireless Transmitter DUOS inHygrotemp is the perfect wireless solution for monitoring applications, automation and centralization of temperature and relative humidity measurements throughout the production process, distribution and storage of refrigerated substances, frozen and deep-frozen, HVAC and other industry processes.

This device combines a built-in temperature and relative humidity sensor allowing a wide range of temperature and relative humidity measurements (from -40 to 60°C and 0 to 100%).

Product References

| | White |
|--------|-------------|
| 868MHz | PA210310210 |
| 915MHz | PA210310220 |

KEY FEATURES

0% TO 100%

HUMIDITY SENSOR MEASUREMENT RANGE

-40 °C TO 60 °C

TEMPERATURE SENSOR MEASUREMENT RANGE

DIGITAL INPUT

BUILT-IN SENSOR

WIRELESS LINK STRENGTH (RSSI)

AUTO DISCOVERY OF THE BEST WIRELESS LINK

LOW POWER AND LONG BATTERY LIFE

MEASUREMENT AND TRANSMISSION OF BATTERY VOLTAGE

IP65 PROTECTION

DS_DUOS_INHYGROTEMP_E01B

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

WIRELESS NETWORK

| | |
|----------------------|-----------------------------------|
| Maximum devices | 55 |
| Maximum hops | 13 |
| Communication period | 1 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 |

HUMIDITY MEASUREMENT

| | |
|--|----------------------|
| Range | 0 to 100 % |
| Resolution | 0,01 % |
| Full precision range | 20 to 90 % (0..60°C) |
| Response time (t ₆₃) at 25°C | 8 seconds |
| Accuracy at 25°C | ± 5% ⁷ |
| 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 ³ |
| External power supply with 5 VDC ± 5% |
| Peak current < 100 mA ² |

Supply voltage measurement accuracy ± 100 mV

Sleep mode current consumption $< 30 \mu A$

OPERATING ENVIRONMENT

Temperature range -10 °C to 60° C

Humidity 95% maximum relative humidity (non-condensing)⁸

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 | |
| Reconnection period | 30 minutes | |
| 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

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 °C.

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.

⁷ Range 20 - 80% RH, 25°C.

⁸ Accuracy can be reduced at relative humidity levels lower than 20% and higher than 80%.

BATTERIES

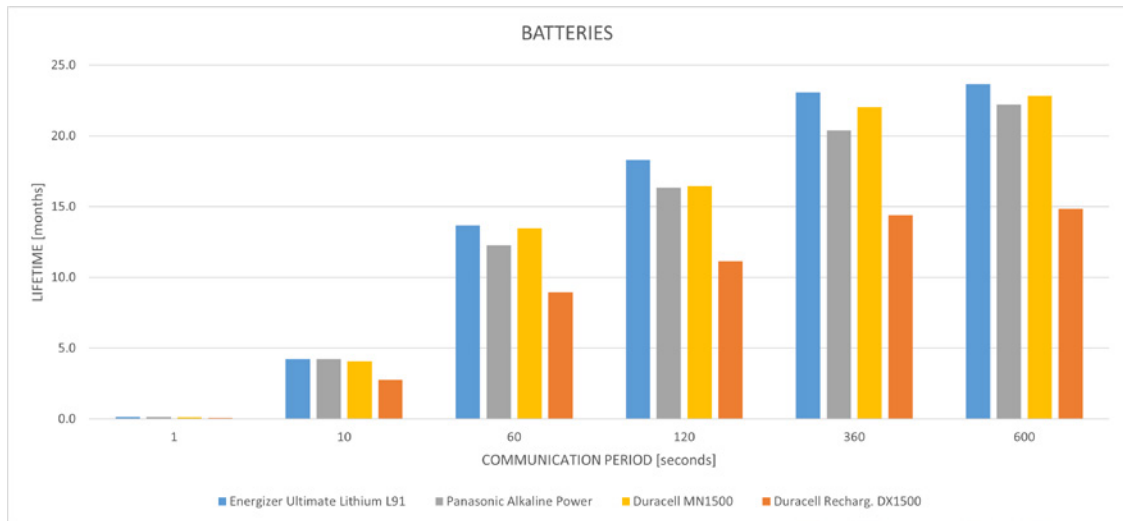
RECOMMENDED BATTERIES

| 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 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 | -40°C to 60°C | -20°C to 54°C | -20°C to 54°C | -10°C to 50°C |

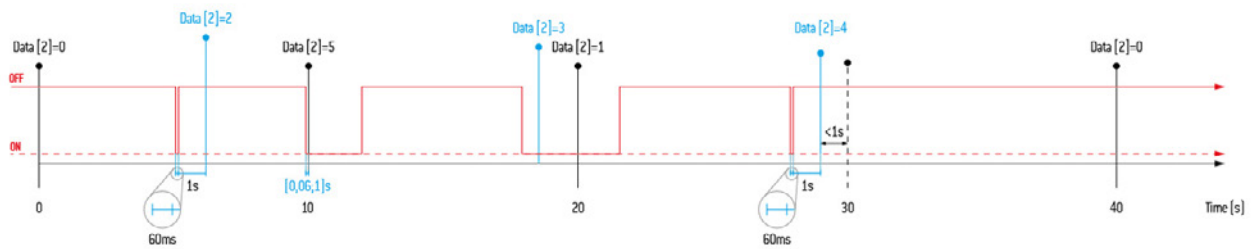
| VOLTAGE THRESHOLD (VDC) | INTERNAL TEMP. ≥ -10° | INTERNAL TEMP. < -10° |
|-------------------------|-----------------------|-----------------------|
| Critical battery | 3 V | 2,5 V |

PERFORMANCE TESTS



DIGITAL INPUT
TRANSMITTER DI OPERATION

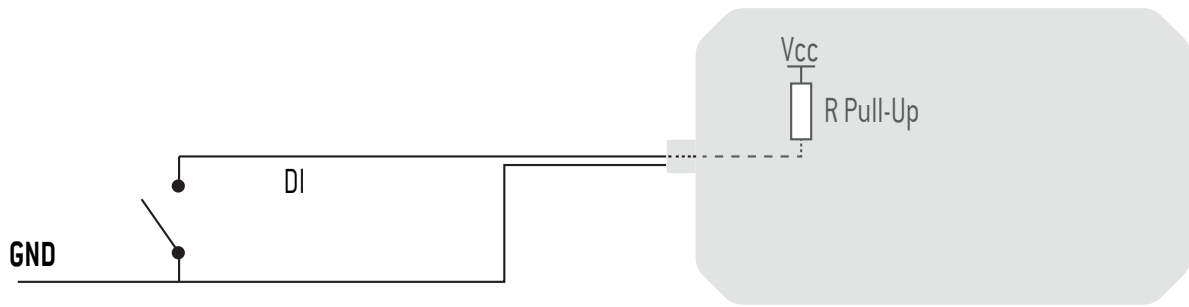
- Transmission triggered by C.P.
- CP - Communication Period = 10 seg
- DI - Digital Input State
- TX-DI - Transmission triggered by DI



| 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

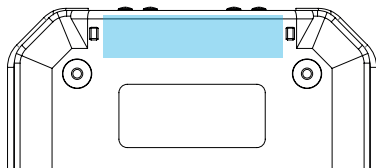
| Linear Calibration (y=mx+b)* | m | b |
|------------------------------|-------------|-------------|
| Humidity | 1 (default) | 0 (default) |
| Temperature | 1 (default) | 0 (default) |

* 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.

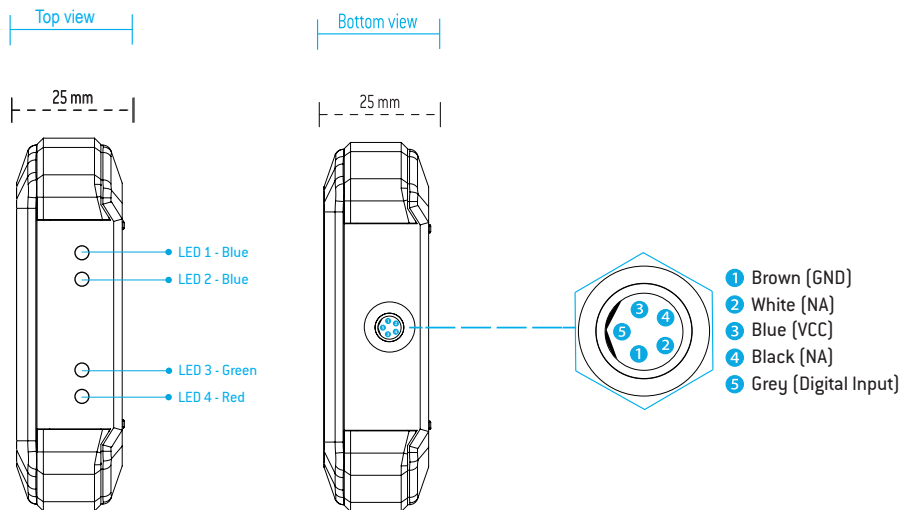
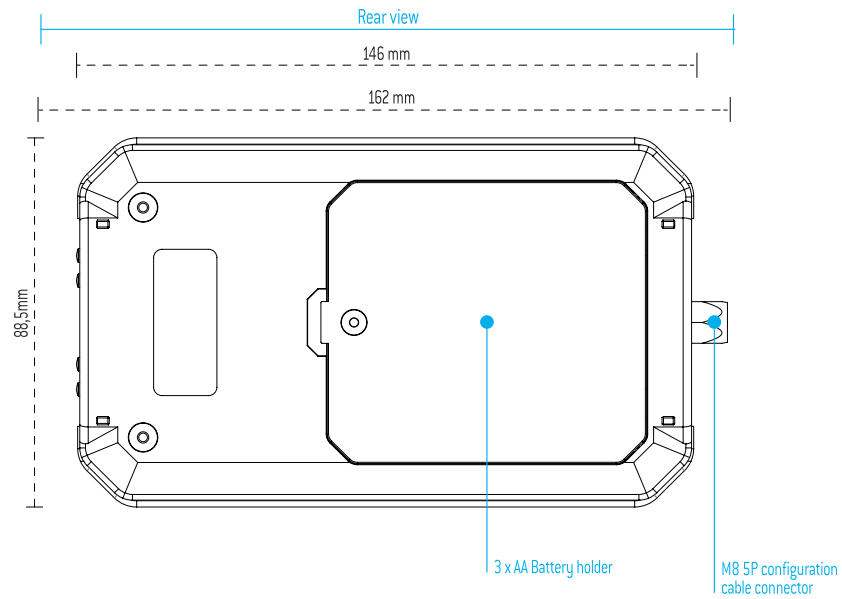
Operation Mode:

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 EXTERNAL POWER CABLE

REF.: PA160410008

DUOS Transmitter external power supply 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.



DUOS DI+TEMP EXTERNAL CABLE

REF.: PA160410009

DUOS DI+TEMP Digital Input cable.

REVISION HISTORY

VERSION

| | |
|------|---|
| E01B | Inclusion of Reconnection Period on "Factory Default Settings Table". Product image update. Change of values and addition of notes in the "Humidity Measurement" table. Change of values and addition of notes in the "Operating Environment" table. |
|------|---|

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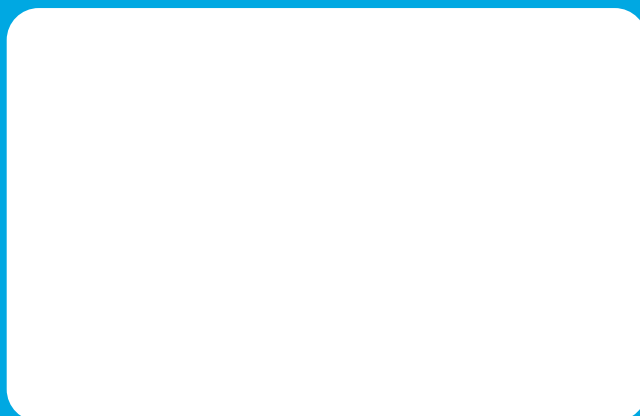
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a brand of Bresimar Automação S.A.

Avenida Europa, 460
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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