

# PLUS TWP4AI WIRELESS TRANSMITTER 868MHz

REF.: PA164510110



An easy-to-use system that allows wireless reception and transmission of any process variables that could be transformed into an analogue signal.

PLUS wireless system was designed to monitor 4..20 mA / 0..10V signals, providing a secure communication, without cable requirements of a complex wired solution. Conductivity, PH, vibration, humidity, flow, level, pressure or temperature, are some examples of industrial process variables, possible to be monitored and controlled.

Dimensions: 120 x 90 x 50 mm

Weight: 314 g

Material: ASA+PC-FR (UL 94 V-0) / Polycarbonate

Protection Index: IP65

## KEY FEATURES

### -30°C TO 80°C

TEMPERATURE MEASUREMENT SENSOR RANGE

### UP TO 4 KM COMMUNICATION DISTANCE (LOS)

### 4 CONFIGURABLE ANALOG INPUTS

(0..20 MA OR 0..10 V) PROVIDING CABLE REPLACEMENT FEATURES

### 3 CONFIGURABLE DIGITAL OUTPUTS

GENERIC, RF LINK LOST INDICATION AND EXTERNAL POWER CONTROL

### MULTI-HOP MESH NETWORK

WITH SELF-FORMING, SELF-HEALING AND SELF-OPTIMIZING FEATURES

### OPERATING MODE

AS END DEVICE / AS REPEATER

### SITE SURVEY FEATURE

### IP65 PROTECTION

PA164510110.DS.ENG.V01.3.2018

**TECHNICAL SPECIFICATIONS** Data applicable at 25°C

**RADIO SPECIFICATIONS**

Range	4Km LoS (2.5mi)
Frequency Band	868.050 a 869.950MHz
Number of Channels	16 (configurable)
Reception Sensitivity	-97 to -110 dBm <sup>1</sup>
Power	25 to 27 dBm <sup>1</sup>
Transmission Rate	19 a 76.8kbit/s <sup>1</sup>
Encryption method	AES 128 (Advanced Encryption Standard)
Modulation	GFSK
Connection	SMA
Antenna	Articulated dipole antenna
Antenna gain	+3dBi
Antenna impedance	50Ω

**WIRELESS NETWORK**

Maximum Devices	55
Maximum Hops	13
Communication Period	1 to 43200 seconds (configurable)

**INTERNAL TEMPERATURE**

Range	-30 a 80°C
Resolution	0.0625°C
Accuracy	± 1°C
Sensor Type	Digital sensor

**ANALOG INPUT - CURRENT**

Range	0 a 24mA
Resolution	0.96uA (15bit)
Accuracy	<100uA (<0.5% FS)
Input Impedance	100Ω
Protection	Overvoltage <sup>2</sup>

**ANALOG INPUT - VOLTAGE**

Range	0 a 12V DC
Resolution	0.38mV (15bit)
Accuracy	<5mV (<0.05% FS)
Input Impedance	>100kΩ
Protection	Overvoltage <sup>2</sup>

<sup>1</sup> According to the channel

<sup>2</sup> Transient phenomena

## DIGITAL INPUT - TRIGGER

Range	0V DC to Supply Voltage
ON Detection Level	>4.5V
OFF Detection Level	<2.5V
Type	Sinking / NPN
Impedance	>4k $\Omega$
Input Current	4.5mA @ 12V DC / 6mA @ 24V DC
Maximum Current Protection	10mA
Detection Type	State change
Activation Detection	Falling Edge / Rising Edge / Both <sup>1</sup>

## DIGITAL OUTPUT - COMMUNICATION LOSS

Range	5 a 24V DC
Type	Sinking / NPN
Maximum Current Protection	90mA
Overvoltage <sup>2</sup> Protection	>30V
Start State	ON / OFF / last state <sup>1</sup>
Communication loss State	ON / OFF / last state <sup>1</sup>
Event Number Activation	1 to 10 <sup>1</sup>

## DIGITAL OUTPUT - REMOTE OUTPUT

Range	5 a 24V DC
Type	Sinking / NPN
Maximum Current Protection	90mA
Overvoltage <sup>2</sup> Protection	>30V
Start State	ON / OFF / last state <sup>1</sup>
Communication loss State	ON / OFF / last state <sup>1</sup>

## DIGITAL OUTPUT - EXTERNAL SUPPLY

Range	5 a 24V DC
Type	Sinking / NPN
Maximum Current Protection	90mA
Overvoltage <sup>2</sup> Protection	>30V
Activation Period before Communication	0 to 255 segundos <sup>1</sup>
Start State	ON / OFF / last state <sup>1</sup>
Communication loss State	ON / OFF / last state <sup>1</sup>

## SUPPLY VOLTAGE

Range	5 to 24V DC
Accuracy	$\pm 100$ mV

## HMI

Indication	Frontal Panel LED
Indicators	External - Site Survey activation Internal - Load Default Factory Settings
Configuration	Internal micro USB connector

<sup>1</sup> Configurable<sup>2</sup> Transient phenomena

#### POWER SUPPLY

External	5 to 24V DC $\pm$ 5%
USB	Only in configuration
Maximum Current	500mA DC @ 5V DC / 100mA DC @ 24V DC
Protection	Overvoltage <sup>2</sup> Reverse Polarity

#### MECHANICAL

Supply Connection	Push-in spring terminal blocks (internal)
Wire Fixation	Bucins PG-7
Maximum Wire section	1.5mm <sup>2</sup> (0.0591in <sup>2</sup> )
Configuration Connection	Micro USB internal connector

#### OPERATING CONDITIONS

Operating Temperature	-30 a 80°C
Storage Temperature	-30 a 80°C
Storage Relative Humidity	$\leq$ 95% (non- condensing)

#### HOUSING

Dimensions	120 x 90 x 50 mm
Weight	314 g
Material	ASA+PC-FR (UL 94 V-0) / Polycarbonate
Protection Index	IP65

#### DEFAULT SETTINGS

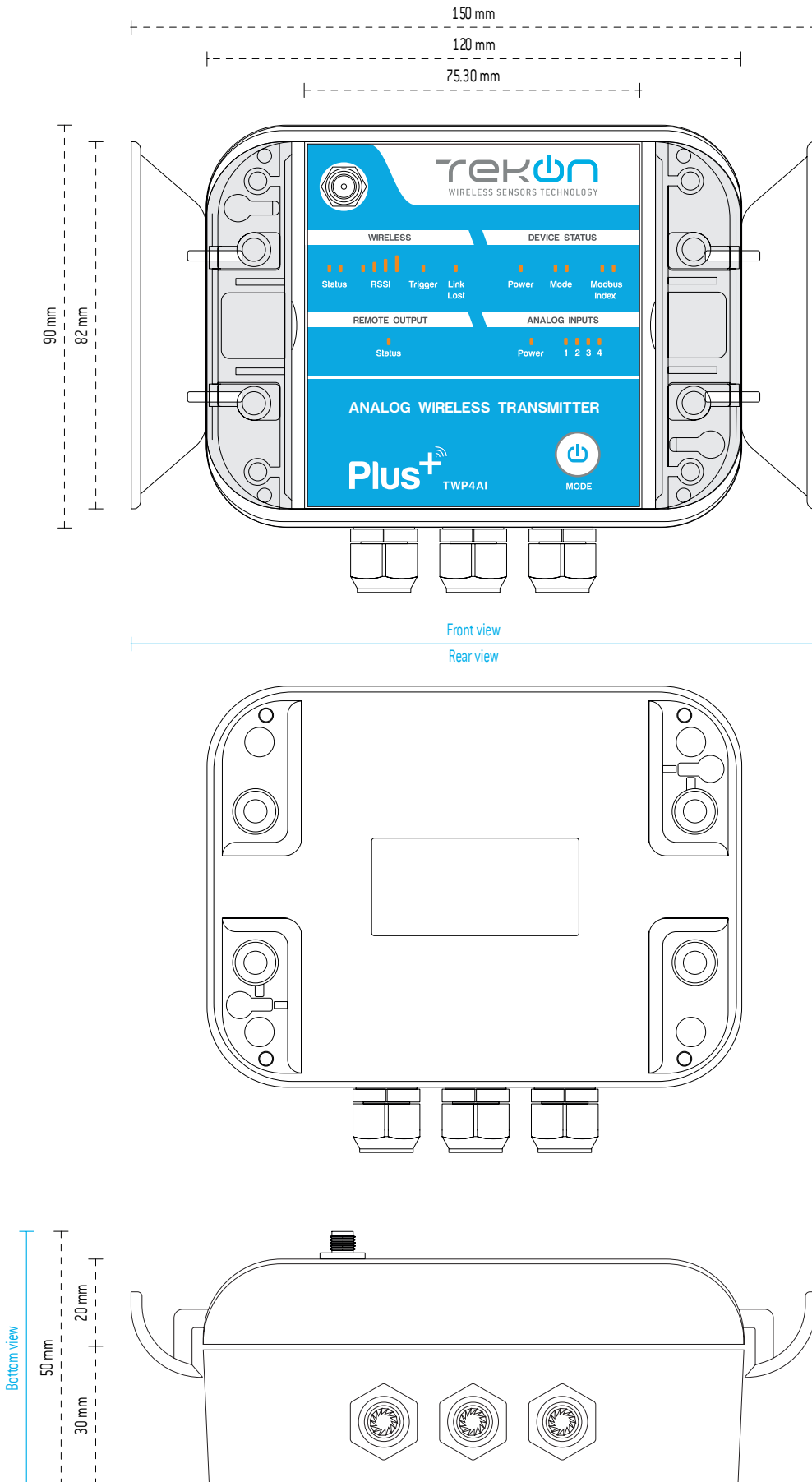
Wireless Frequency	869.525MHz
Wireless Strength	27dBm
Wireless Transmission rate	76.8kbit/s
Wireless Channel	13
Wireless Network ID	13042017
Communication Period	10 seconds
Gateway Modbus Index	1
Analog Inputs	Inactive
Digital Input - Trigger	Inactive
Digital Output - Communication Loss	OFF
Digital Output - Remote Output	OFF
Digital Output - External Supply	OFF
Operating Mode	End Device

#### CERTIFICATIONS AND COMPLIANCE

RED - Diretiva 2014/53/EU
EN 300 220-2 V3.1.1 - Short range equipment (SRD)
EN 301 489-1 V2.2.0 - Electromagnetic compatibility and Radio spectrum Matters (ERM)
EN 301 489-3 V2.1.1 - Electromagnetic compatibility and Radio spectrum Matters (ERM)

TECHNICAL DRAWINGS

DIMENSIONAL DRAWINGS AND INTERFACE DESIGN

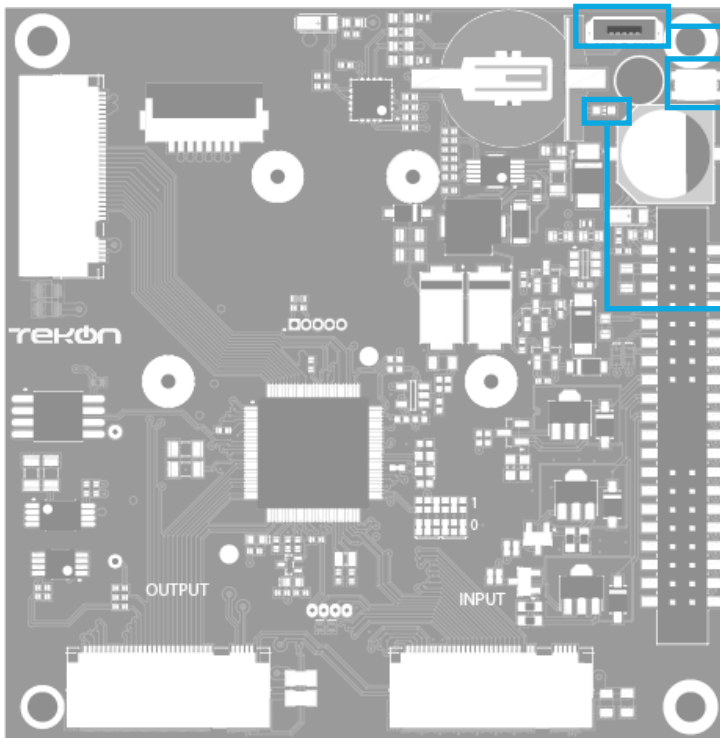


**LEDS SIGNAGE**

LED	State	Transmitter Mode	Repeater Mode
Power	Network search	ON while wireless connection isn't established and RF module won't go into sleep mode	ON
	Configuration	ON	Idem
	Connected	OFF <sup>1</sup>	ON
Mode (Left)	Configuration	Flashes 2 times with right mode alternately	Idem
	Network Search	Flashes every second	Idem
	Site Survey	Flashes 2 times with right mode simultaneously	Idem
Mode (Right)	Configuration	Flashes 2 times with left mode alternately	Idem
	Site Survey	Flashes 2 times with left mode simultaneously	Idem
Modbus Index (Left)	Start	Flashes as much as the corresponding digit of Modbus Index units	Idem
Modbus Index (Right)	Start	After left modbus index signage, flashes as much as the corresponding digit of Modbus Index units	Idem
Wireless Status (Left) (controlled by RF module)	Network Search	Flashes slowly - 2 seconds ON and 2 seconds OFF (off 60 seconds after start)	Idem - never goes OFF
	Connected	Flashes according to the RSSI level (OFF 60 seconds after start)	Idem - never goes OFF
	Configuration	ON	Idem
	Site Survey	ON	Idem
Wireless Status (Right) (controlled by RF module)	Network search	OFF	Idem
	Connected	Flashes 5 times if connected to the Gateway or 1 time if connected to a repeater	Idem - never goes OFF
	Configuration	ON	Idem
	Site Survey	ON	Idem
RSSI	Site Survey	Number of LED's ON according to the RSSI level of Gateway or Repeater packets received; Flashes 2 times simultaneously if no packets are received	Idem
Trigger	Connected (active function)	ON when state change is detected; Remains ON during Warm Up time set and data is being successfully transmitted.	Idem
Link Loss	Disconnected (active function)	ON when there's loss of network connection and the number of reconnection attempts equals Cicles Number; ON or Last State according Startup State definitions	Idem
	Connected (active function)	OFF when recovers network connection.	Idem
Status (remote switch)	-	Remotely defined at corresponding Modbus register ; ON or Last State according to the Startup State and Link Loss State settings	Idem
Power (analog inputs)	Disconnected (active function)	ON if Warm-up time above 0	Idem
	Connected (active function)	ON during the time preceding a communication and as defined in Warm-up time	Idem
1-2-3-4 (analog inputs)	-	OFF <sup>1</sup>	ON on respective configurated inputs in current or voltage

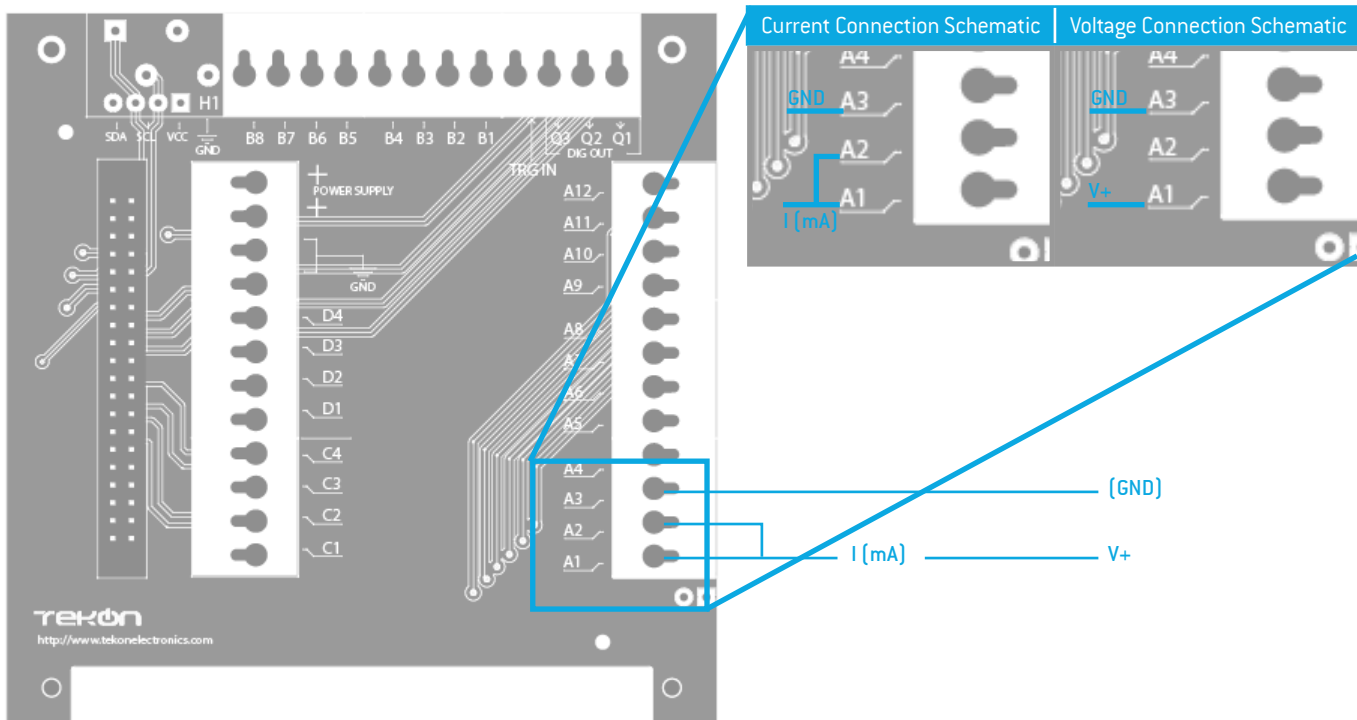
<sup>1</sup> For battery improvement

WIRING DIAGRAM

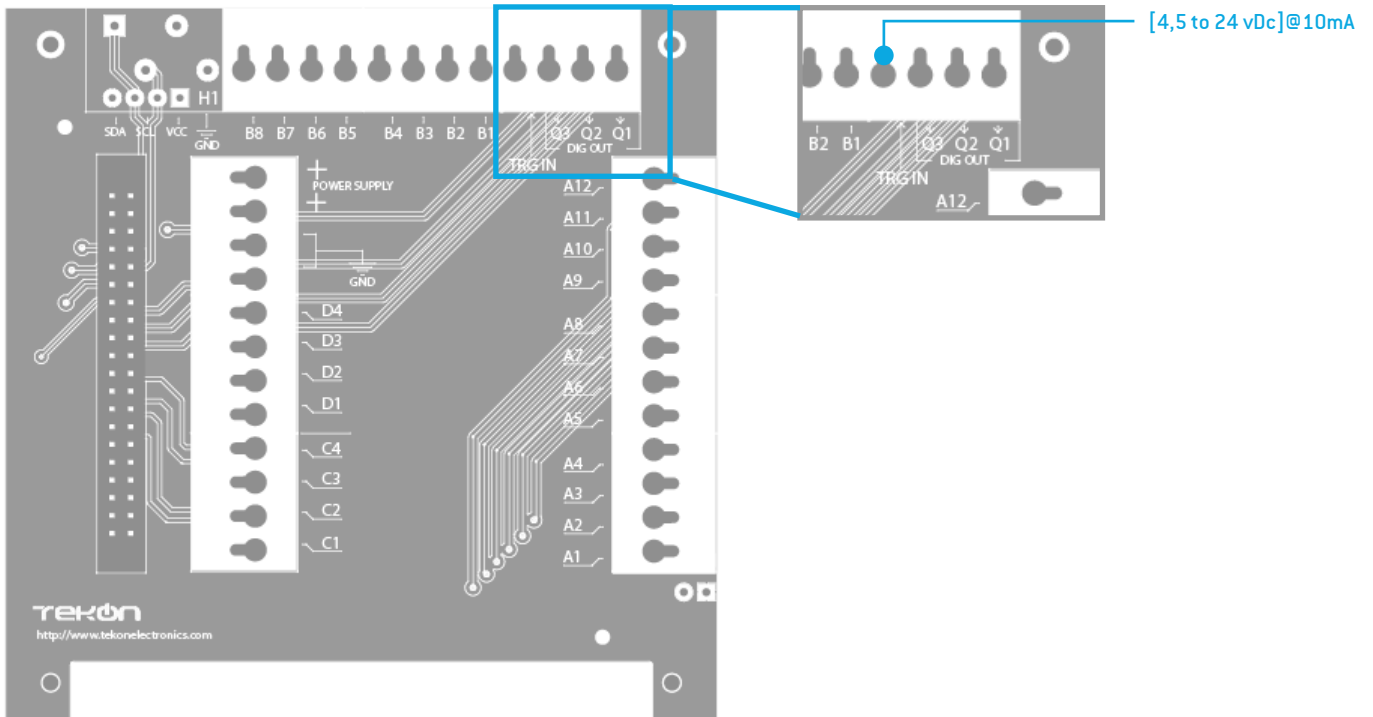


- USB Configuration Port**  
Allows Tekon device Configuration
- Load factory setting button (2 methods)**
  - Pressing this button during 3 seconds forces the factory settings load and reboot.
  - Power ON the device with the button pressed during 3 seconds forces the factory settings load and reboot
- Internal LED**

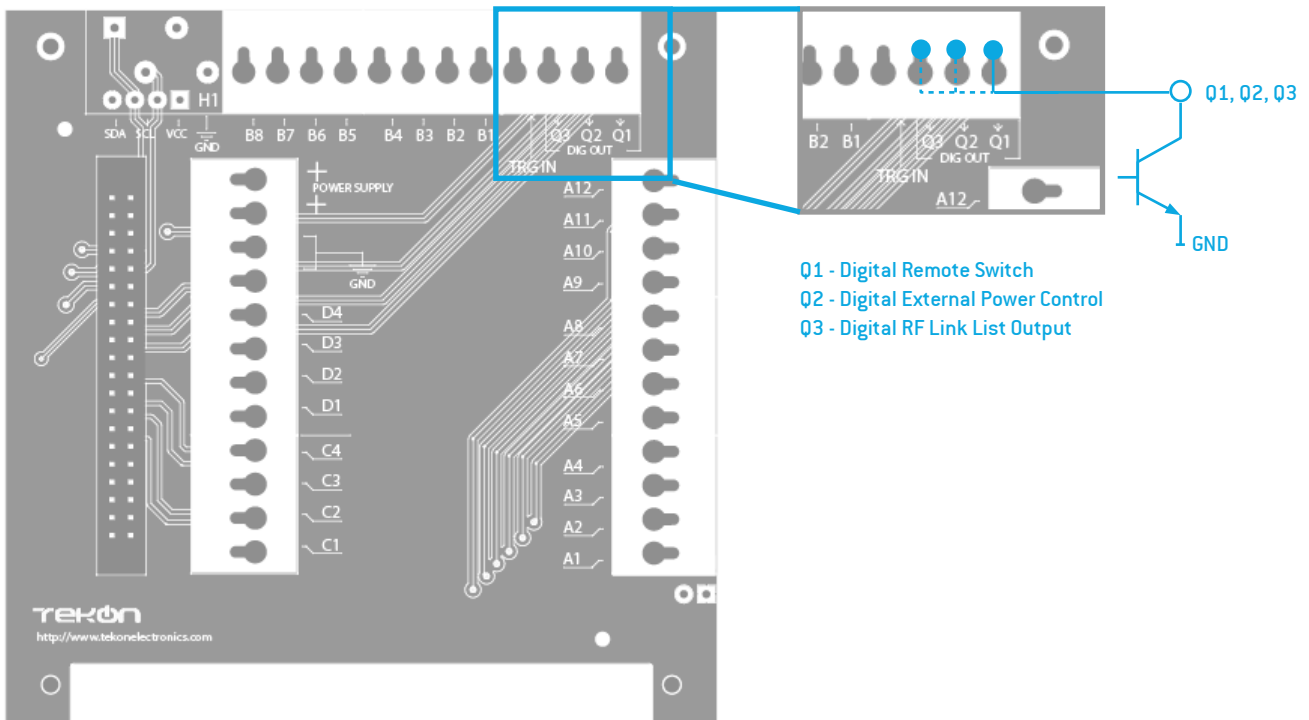
Analog Inputs



Digital Input - NPN - SINKING



Digital Output - SINKING - NPN





		Transmitter	
PIN		Functionality	
		Current Mode	Voltage Mode
A1	Analog Input 1	I (mA)	V+
A2		I (mA)	NC
A3		GND	GND
A4	Analog Input 2	I (mA)	V+
A5		I (mA)	NC
A6		GND	GND
A7	Analog Input 3	I (mA)	V+
A8		I (mA)	NC
A9		GND	GND
A10	Analog Input 4	I (mA)	V+
A11		I (mA)	NC
A12		GND	GND
B1	Not used		
B2	Not used		
B3	Not used		
B4	Not used		
B5	Not used		
B6	Not used		
B7	Not used		
B8	Not used		
TRIG IN	Digital Trigger Input		
Q1	Digital Remote Switch Output		
Q2	Digital External Power Control Output		
Q3	Digital RF Link Lost Output		

COMPLEMENTARY PRODUCTS



**PLUS WGW420 WIRELESS GATEWAY 868 MHZ**

REF.: PA164510210

- Scalable network up to 55 PLUS transmitters;
- Up to 4 Km communication distance (LoS) with 868 MHz and 128-bit AES encryption;
- Multiple networks with extra gateways and extra long range with several repeaters;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Modbus RTU communication protocol via RS-485 interface;
- 8 analog outputs (4..20 mA current loop);
- Simple and intuitive USB configuration via Tekon Configurator (free software);
- DIN rail mounting.



**PLUS WRP001 WIRELESS REPEATER 868 MHZ**

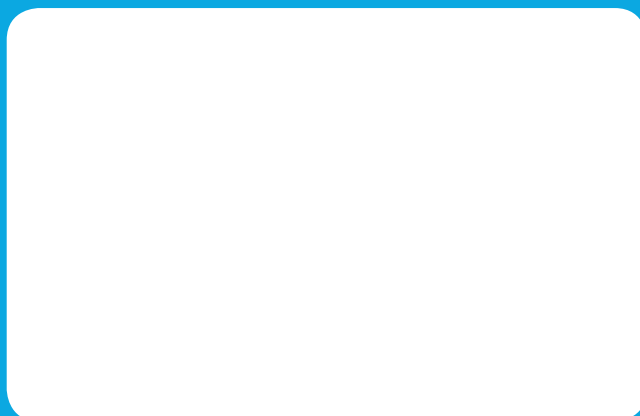
REF.: PA164510310

- Up to 12 repeaters in series for extra-long range;
- Extra repeaters for network redundancy and robustness;
- Up to 4 Km communication distance (LoS) with 868 MHz and 128-bit AES encryption;
- Multi-hop mesh network with self-forming, self-healing and self-optimizing features;
- Simple and intuitive USB configuration via Tekon Configurator (free 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](mailto:sales@tekonelectronics.com)



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