

PLUS WGW420 WIRELESS GATEWAY 868MHz

REF.: PA164510210



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: 36 x 90 x 56 mm

Weight: 135 g

Material: PA (UL 94 V-0) / Polycarbonate

Protection Index: IP40

KEY FEATURES

SCALABLE NETWORK

UP TO 55 PLUS TRANSMITTERS AND 12 REPEATERS

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

MODBUS RTU COMMUNICATION PROTOCOL

VIA RS-485 INTERFACE

8 ANALOG OUTPUTS

4..20 MA CURRENT LOOP

MULTI-HOP MESH NETWORK

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

PA164510210_DS.V01.3.2018

TECHNICAL SPECIFICATIONS Data applicable at 25°C

RADIO SPECIFICATIONS

Range ¹	4Km LoS (2.5mi)
Frequency Band	868.050 a 869.950MHz ²
Number of Channels	16 (configurable)
Receiver Sensitivity	-97 to -110 dBm ²
Transmit Power	25 to 27 dBm ²
Transmission Rate	19 a 76.8kbit/s ²
Encryption method	128-bit AES
Modulation	GFSK
Antenna	Articulated dipole antenna
Antenna gain	+3dBi
Antenna impedance	50Ω

WIRELESS NETWORK

Maximum Devices	55
Maximum Hops	13

RS-485 COMMUNICATION

Protocol	MODBUS RTU (Slave)
Baud Rate	4.8 to 115.2kbit/s (configurable)
Parity	none/even/odd (configurable)
Stop Bits	1 (even/odd parity) or 2 (none)
Adresses	1 to 247
Isolation	1kV galvanic

ANALOG OUTPUT - CURRENT

Output Range	4 to 20mA
Maximum Resistive Load	360Ω @ 12V DC / 1kΩ @ 24V DC
Out of range indication	[3.2;4.0]mA and [20.0;20.2]mA
Error indication	3.1mA and 20.4mA
Update Period	Equal to wireless communication period (transmitters)
Protection	Reverse Polarity Voltage Peaks

POWER SUPPLY

External	12 to 24V DC ± 5%
Maximum current	100mA DC to 24V DC / 200mA DC to 12V DC
Protection	Overvoltage ³ Reverse Polarity

¹ Range depends on the environment and line of sight. Always verify your wireless network's range by performing a Site Survey

² According to the radio channel selection

³ Transient phenomena

HMI

Indicators	Frontal Panel LED
Configuration	RS485 (through RS485 USB)
RS-485 Baudrate configuration	4800 to 115200 bit/s (configurable)
RS-485 Parity configuration	None/Even/Odd (configurable)

MECHANICAL

Supply Connection/Configuration	External push-in terminals
Maximum Wire section	2.5mm ² (0.0984 in ²)
Antenna Connection	Reverse polarity SMA Connector

OPERATING CONDITIONS

Operating Temperature	0 to 80°C
Storage Temperature	-20 a 80°C
Storage Relative Humidity	≤ 95% (non-condensing)

HOUSING

Dimensions	36 x 90 x 56 mm
Weight	135 g
Material	PA (UL 94 V-0) / Polycarbonate
Protection Index	IP40

DEFAULT SETTINGS

RF Frequency	869.525MHz
RF Strength	27dBm
RF Transmission rate	76.8kbit/s
Wireless Channel	13
Wireless Network ID	Device Serial Number
RS-485 Baud Rate	19.2kbit/s
RS-485 Parity	None
RS-485 Stop Bits	2
Modbus Address	1
RS-485 Configuration Specifications	19.2kbit/s, no parity, 2 stop bits

CERTIFICATIONS

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)

LED INDICATORS

LED	State	Gateway
Power	-	ON
Error	-	OFF
Wireless	Normal	Red LED on data reception Green LED on data delivery
	Start	OFF
	Configuration	OFF
Modbus	Normal	Green LED on data reception associated to the RS485 reception line Red LED on data delivery associated to the RS485 transmission line
	Start	Green LED on data reception associated to the RS485 reception line
	Configuration	Green LED on data reception associated to the RS485 reception line Red LED on data delivery associated to the RS485 transmission line
8 Analog Outputs	Normal	Red LED ON if respective current loop is open Green LED ON if current loop is closed and within the defined range of representation Flash 1 time between green and red alternately if respective current loop is closed and out of the defined range of representation
	Start	All green LEDs ON
	Configuration	Green LED animation

MODBUS MAPPING

HOLDING REGISTERS - TRANSMITTERS DATA					
Description	Address	Number of Words	Data Type	Data	
Serial Number	{Transmitter Modbus Index-1} x 20+0	2	UINT32	Transmitter serial number	
Transmitter Model	{Transmitter Modbus Index-1}x20+2	1	UINT16	09 (TWP4AI) ¹	
RSSI	{Transmitter Modbus Index-1}x20+3	1	UINT16	RSSI in dBm = RSSI / -2	
Communication Period	{Transmitter Modbus Index-1}x20+4	1	UINT16	Communication Period (seconds)	
Elapsed Time	{Transmitter Modbus Index-1}x20+5	1	UINT16	Elapsed Time since last communication	
Power Voltage	{Transmitter Modbus Index-1}x20+6	1	UINT16	Volts = Power Voltage / 10	
Data 0	{Transmitter Modbus Index-1}x20+7	2	FLOAT32	Transmitter internal temperature ²	
Data 1	{Transmitter Modbus Index-1}x20+9	2	FLOAT32	Analog Input value 1 • ³	
Data 2	{Transmitter Modbus Index-1}x20+11	2	FLOAT32	Analog Input value 2 • ³	
Data 3	{Transmitter Modbus Index-1}x20+13	2	FLOAT32	Analog Input value 3 • ³	
Data 4	{Transmitter Modbus Index-1}x20+15	2	FLOAT32	Analog Input value 4 • ³	
FW Version Major Minor	{Transmitter Modbus Index-1}x20+17	1	UINT16	Transmitter Firmware Version ⁴	
FW Version Revision	{Transmitter Modbus Index-1}x20+18	1	UINT16	Transmitter Firmware Version ⁴	
HW Version Major Minor	{Transmitter Modbus Index-1}x20+19	1	UINT16	Transmitter Hardware Version ⁵	

• Applicable to TWP4AI transmitter model

¹ Each transmitter model is codified with a unique ID number. Consult specified mapping tables for every transmitter model.

² Transmitter internal temperature in degrees Celsius.

³ Corrente em μ A; Tensão em μ V.

⁴ Versão de firmware: Major.Minor.Revision = 8 MSB.8 LSB.8 LSB

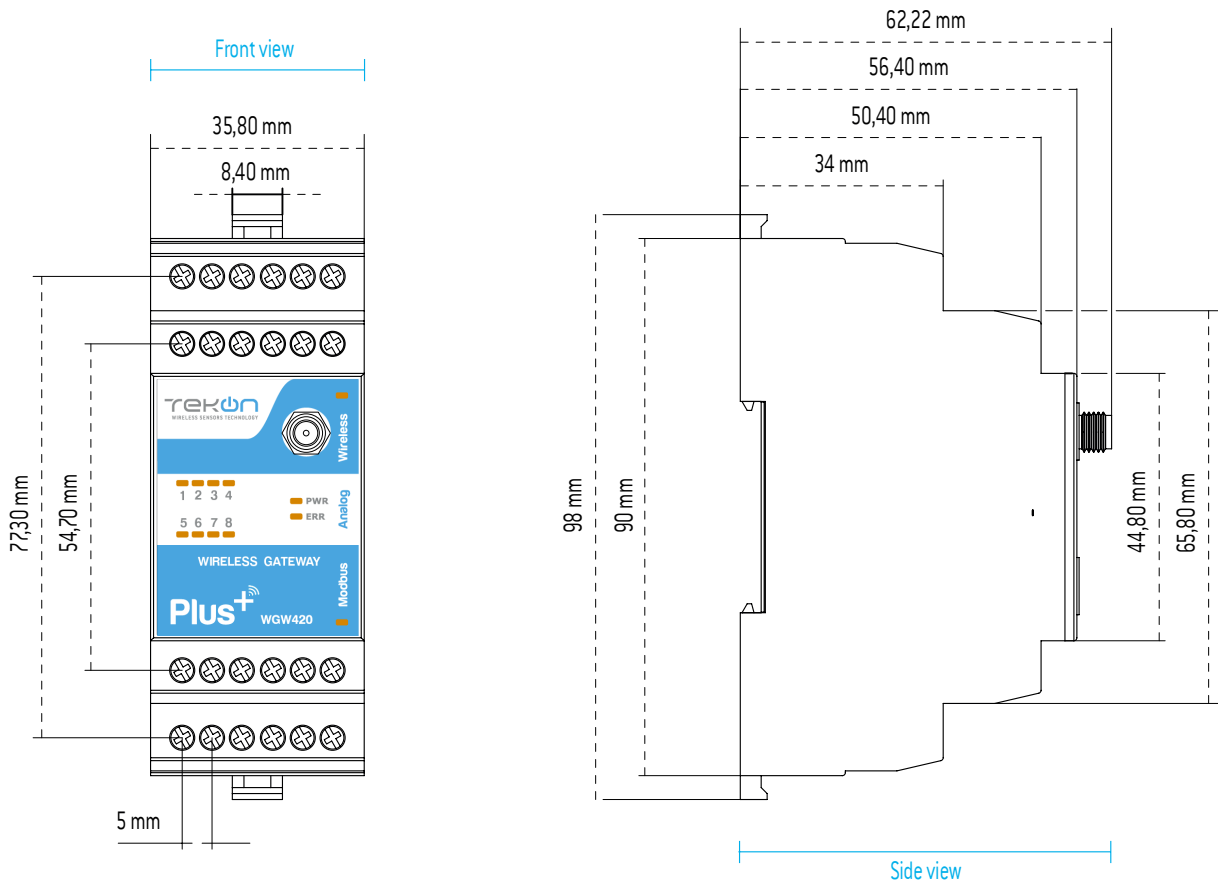
⁵ Versão de hardware: Major.Minor = 8 MSB.8 LSB

HOLDING REGISTERS - ANALOG OUTPUTS				
Description	Address	Number of Words	Data Type	Data
Minimum Value	$(\text{Analog Output Index}-1) \times 8 + 1100 + 0$	2	FLOAT32	Minimum Input Value for current conversion ->A 4mA
Maximum Value	$(\text{Analog Output Index}-1) \times 8 + 1100 + 2$	2	FLOAT32	Maximum Input Value for current conversion ->A 20mA
Output Offset	$(\text{Analog Output Index}-1) \times 8 + 1100 + 4$	1	UINT16	Output current offset in uA [-1000 to 1000]
Attempts Number	$(\text{Analog Output Index}-1) \times 8 + 1100 + 5$	1	UINT16	Number of Communication Periods to signalize current output error (transmitter disconnected)
Modbus Address Link	$(\text{Analog Output Index}-1) \times 8 + 1100 + 6$	1	UINT16	Words to convert to current. [Start address of Modbus FLOAT32 (2 words) is considered for conversion]
Actual Current Value	$(\text{Analog Output Index}-1) \times 8 + 1100 + 7$	1	UINT16	Actual output analogue current [mA=Actual Current Value/100]

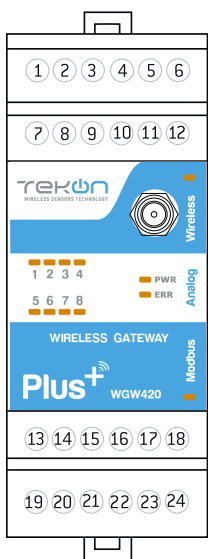
COILS REGISTERS

Description	Address	Data
Remote Control Output	$((\text{Modbus Transmitter Index}-1) \times 16) + 0$	Transmitter Remote control output controlled through Gateway
External Power Control Output	$((\text{Modbus Transmitter Index}-1) \times 16) + 1$	State of External Power Activation output to enable power-on of external devices
Communication Trigger Input	$((\text{Modbus Transmitter Index}-1) \times 16) + 2$	State of Trigger Input
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 3$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 4$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 5$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 6$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 7$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 8$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 9$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 10$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 11$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 12$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 13$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 14$	-
Reserved	$((\text{Modbus Transmitter Index}-1) \times 16) + 15$	-

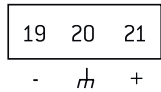
TECHNICAL DRAWINGS



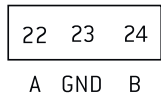
ELECTRICAL CONNECTIONS



POWER



RS-485



POWER - [12;24] VDC

ANALOG OUTPUTS

- 4 - ANALOG OUTPUT INDEX 0
- 5 - ANALOG OUTPUT INDEX 1
- 6 - ANALOG OUTPUT INDEX 2
- 10 - ANALOG OUTPUT INDEX 3
- 11 - ANALOG OUTPUT INDEX 4
- 12 - ANALOG OUTPUT INDEX 5
- 16 - ANALOG OUTPUT INDEX 6
- 17 - ANALOG OUTPUT INDEX 7

1,2,3,7,8,13,14,15,18 - ANALOG GND

ANALOG OUTPUT LED CODING

LED state	Color	Meaning
Fixed	RED	Analog current loop is open
Blinking	GREEN	The output is in error. Could be out of range temperature, sensor damaged or communication lost. Please see the device status values over the Modbus.
Fixed	GREEN	Correct operation. Current loop is closed, communication between node and gateway OK and rage temperature configured and measured is OK.

COMPLEMENTARY PRODUCTS



PLUS TWP4AI WIRELESS TRANSMITTER 868MHZ

REF.: PA164510110

- 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;
- Configurable communication period and/or event trigger via digital input;
- Up to 4Km communication distance (LoS) with 868 MHz and 128-bit AES encryption;
- Internal temperature, battery voltage and wireless link quality (RSSI) monitoring;
- Simple and intuitive USB configuration via Tekon Configurator (free software).



PLUS WRP001 WIRELESS REPEATER 868 MHZ

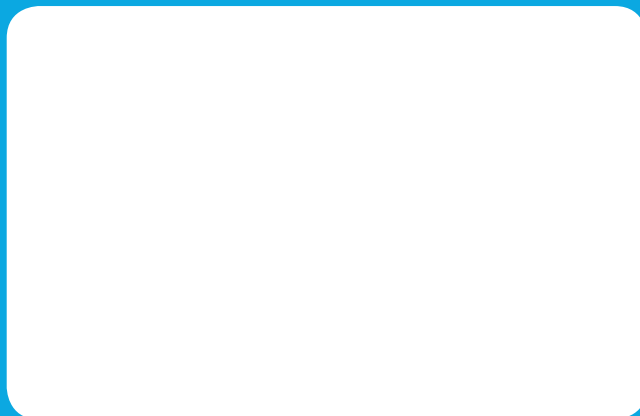
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- Up to 12 repeaters in series for extra-long range;
- Extra repeaters for network redundancy and robustness;
- Up to 4 Km communication distance (LoS) with 868 MHz and 128-bit AES encryption;
- Multi-hop mesh network with self-forming, self-healing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

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