WIRELESS SENSORS TECHNOLOGY

PLUS WIRELESS SYSTEM
INSTALLATION GUIDE

IG_PLUS_E01C

TEKON ELECTRONICS | AVEIRO, PORTUGAL
P.: +351 234 303 320 **M.:** +351 933 033 250 **E.:** sales@tekonelectronics.com

TEKONELECTRONICS.COM

PLUS WIRELESS SYSTEM
INSTALLATION GUIDE

Table of contents

PLUS WIRELESS SYSTEM
INSTALLATION GUIDE

Table of contents

PLUS WIRELESS SYSTEM
INSTALLATION GUIDE

Table of contents

PLUS WIRELESS SYSTEM
INSTALLATION GUIDE

Table of contents

step

01

WGW420 PLUS WIRELESS GATEWAY CONFIGURATION

step **01**

WGW420 PLUS WIRELESS GATEWAY CONFIGURATION

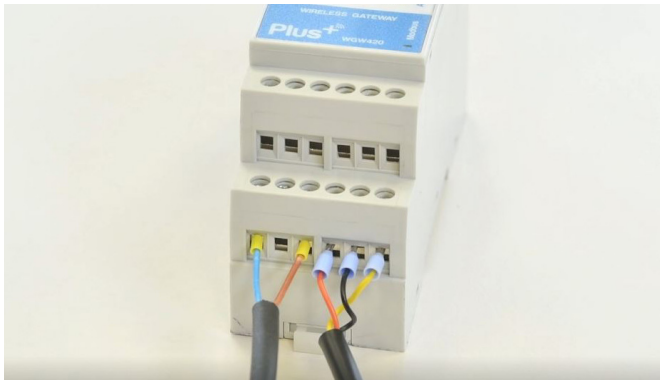
TEKON CONFIGURATOR SOFTWARE is only compatible with the Microsoft® Windows® Operating System.

01 Connect the antenna to the *Gateway*.

02

Wiring

Connect the power supply and then the *RS485-USB* cable to the *Gateway*.

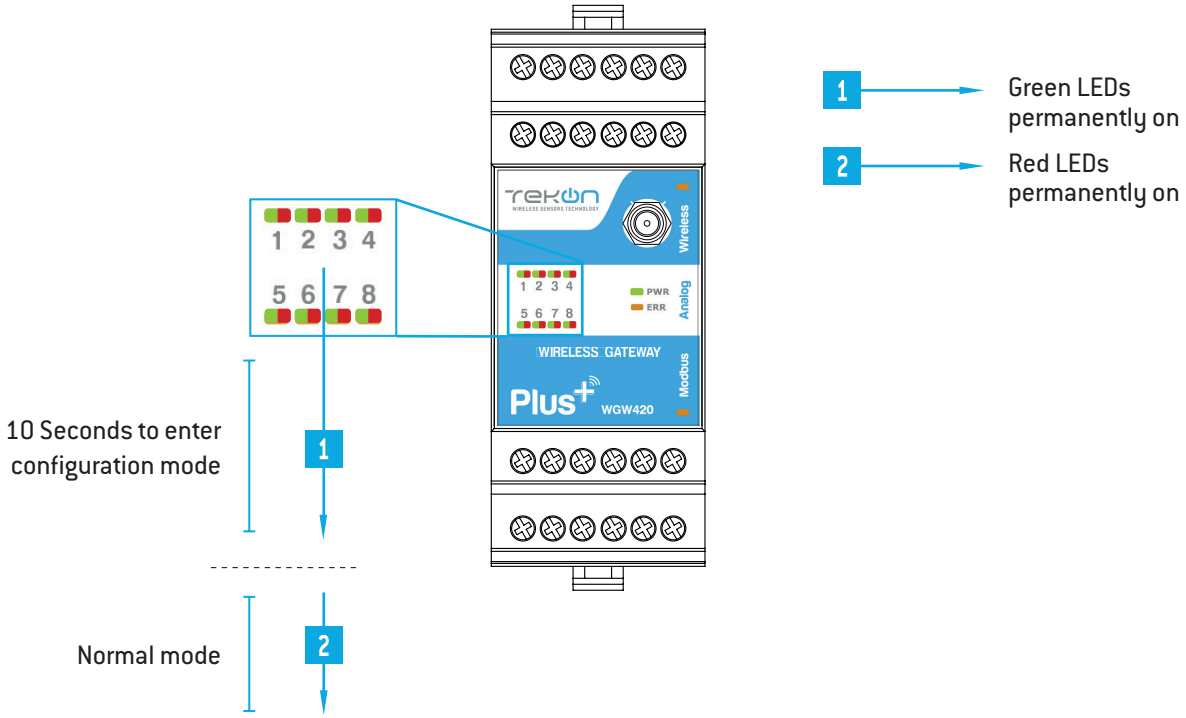


Wire Indication:
Blue - GND; Brown - +24 VDC; Orange - Data+ (A); Black - GND; Yellow - Data - (B)

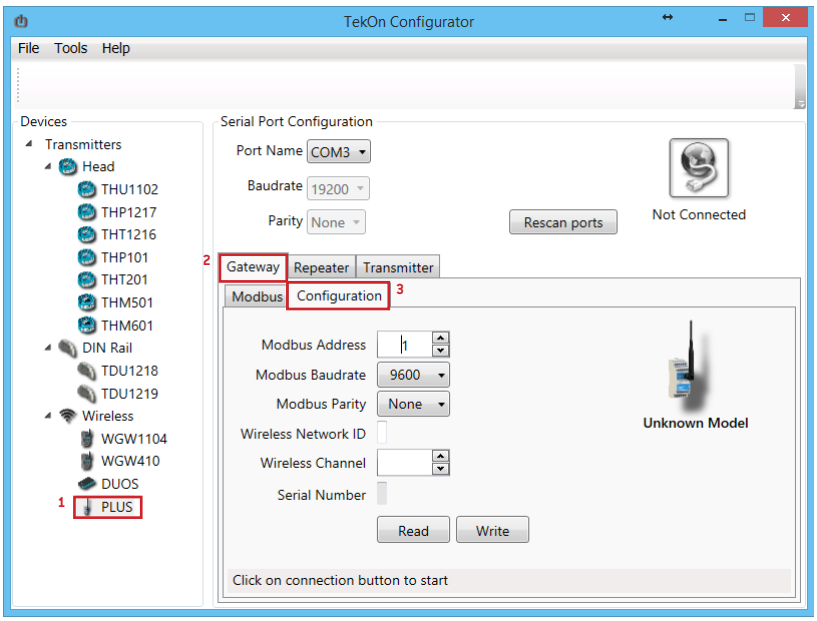
03 Power ON the device.

step
01
WGW420 PLUS WIRELESS GATEWAY CONFIGURATION

04 Check device connection state by LED indication.



05 Open *Tekon Configurator Software*[1] and select *PLUS* >> *Gateway* >> *Configuration*

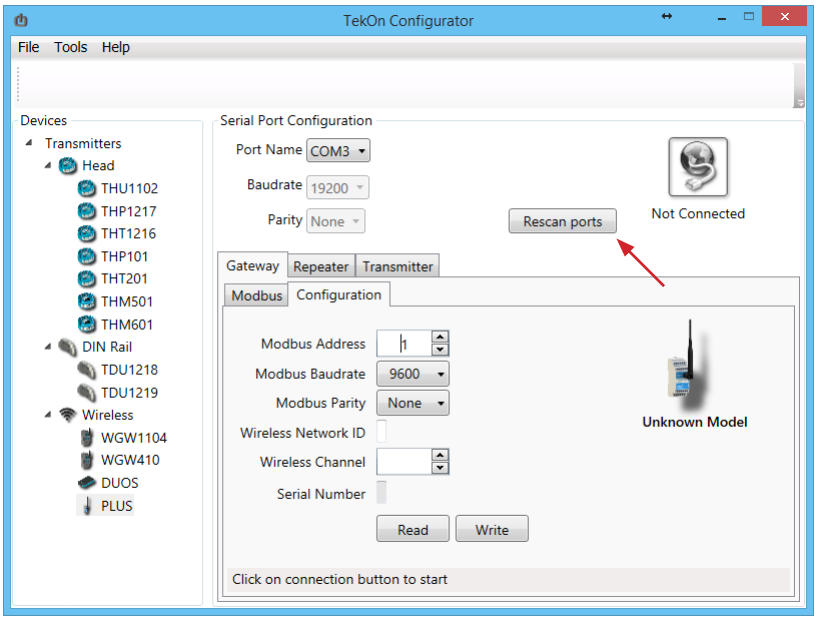


[1] Tekon Configurator software is free of charge and available at www.tekonelectronics.com

06

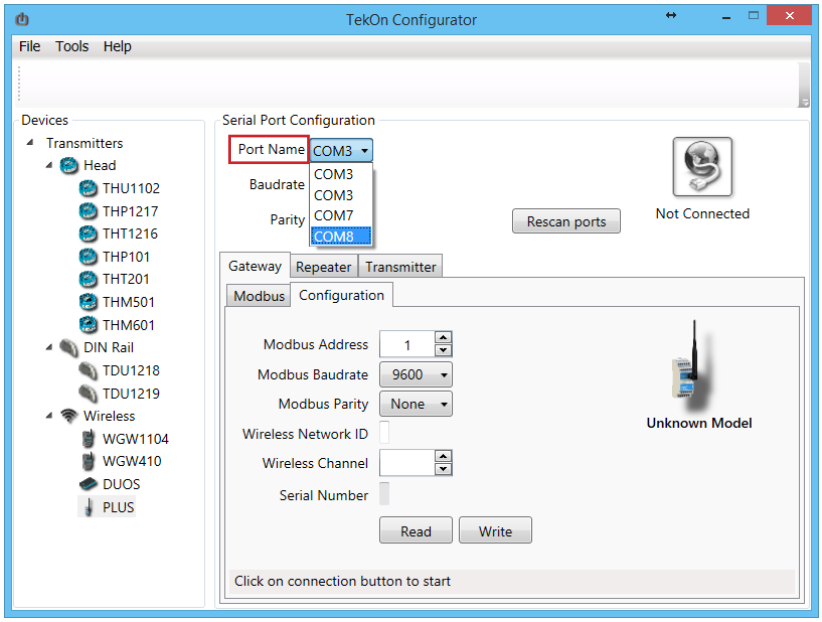
Select serial port corresponding to WGW420 PLUS Wireless Gateway

Click on the *Rescan Ports* button.



07

Select corresponding *Port name*[2].



[2] You can check device's serial port name in "Device Manager" on Microsoft ® Windows® operating system.

step
01
WGW420 PLUS WIRELESS GATEWAY CONFIGURATION

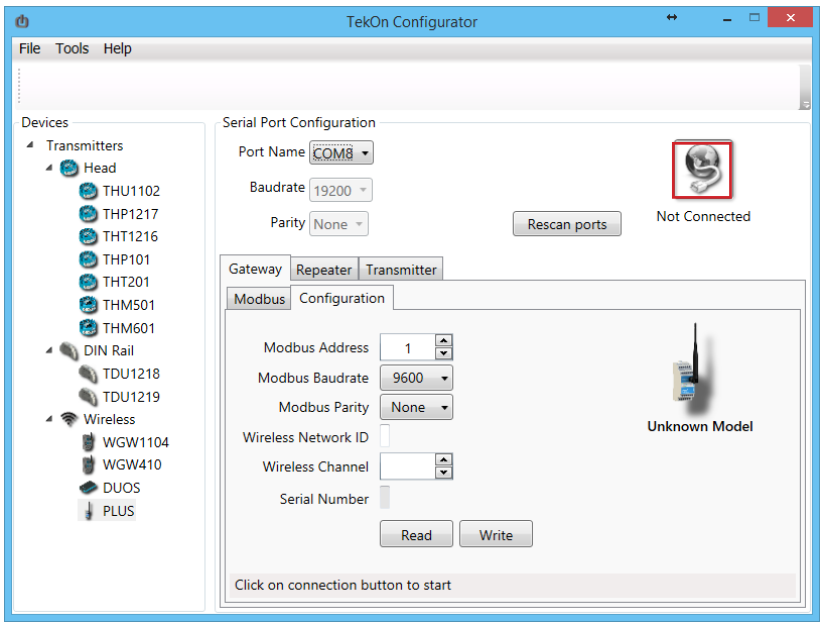
08

Perform a power cycle on the *Gateway*.

NOTE:
After power up, you have 10 seconds to enter configuration mode by clicking on Connect button ( ) (while green LEDs are permanently on).
In this mode, you can manage device parameters: *Modbus Address*, *Modbus Baudrate*, *Modbus Parity*, *Wireless Network ID* and *Wireless Channel*.

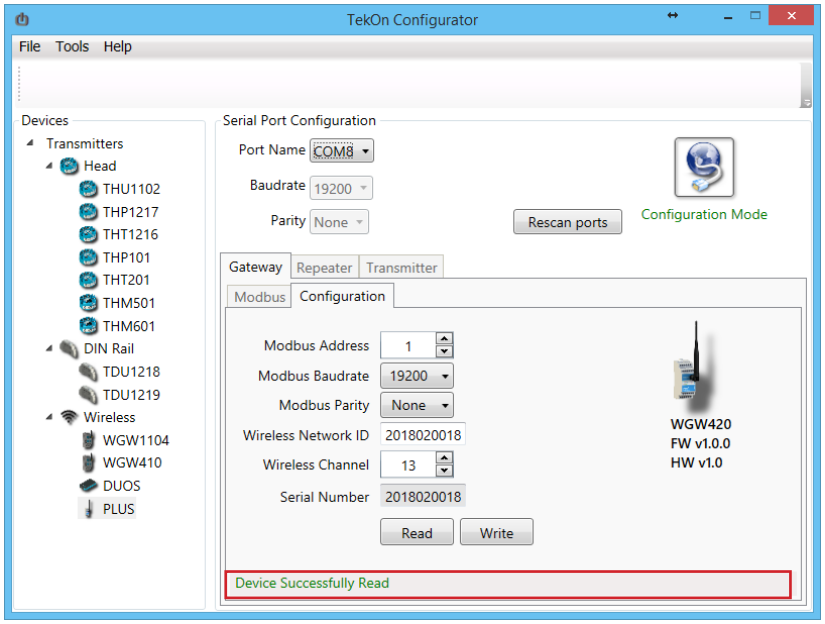
09

Click on *Connect* ( ) button to enter configuration mode.

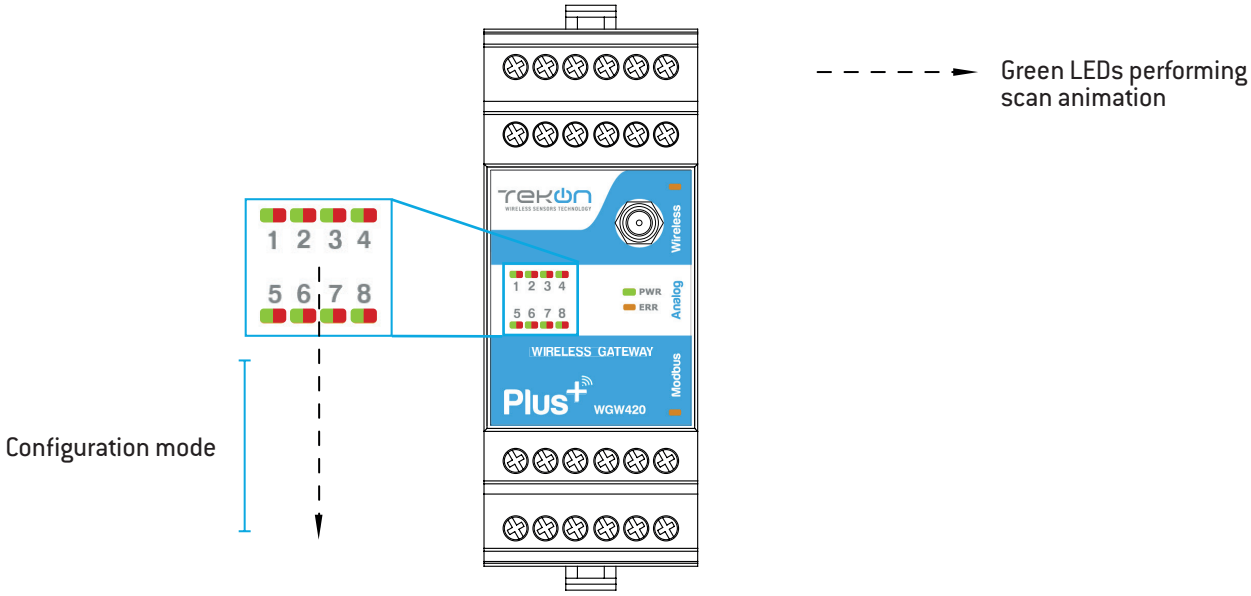


09

The status string at the bottom of the software window provides feedback on ongoing operations.



You can also verify configuration mode activation by checking LEDs on the gateway.

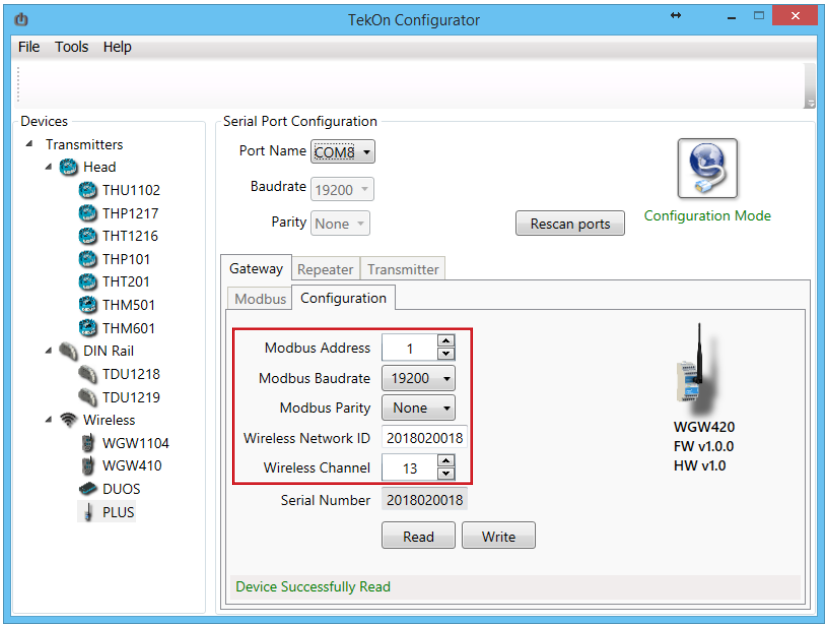


NOTE:
When the 10-second time frame to enter configuration mode is exceeded, the LEDs will turn permanently red and the gateway will enter normal operation mode.
To get back in configuration mode, you need to perform a power cycle - step 8.

step
01
WGW420 PLUS WIRELESS GATEWAY CONFIGURATION

10

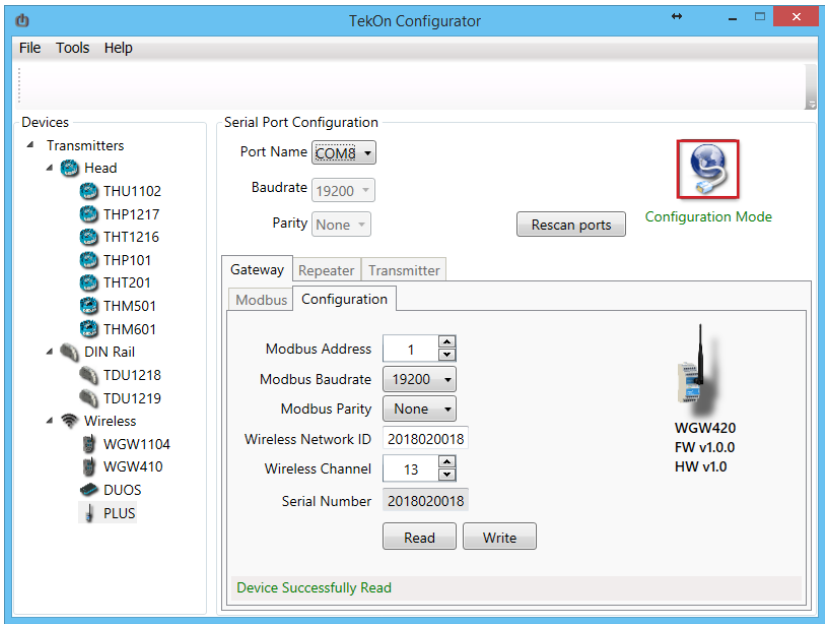
Take note of device configuration data available, namely: *Modbus Address*, *Modbus Baudrate*, *Modbus Parity*, *Wireless Network ID* and *Wireless Channel*.



NOTE:
The wireless network connection between devices is ensured by setting the same *Wireless Network ID* and *Wireless Channel* parameters.

11

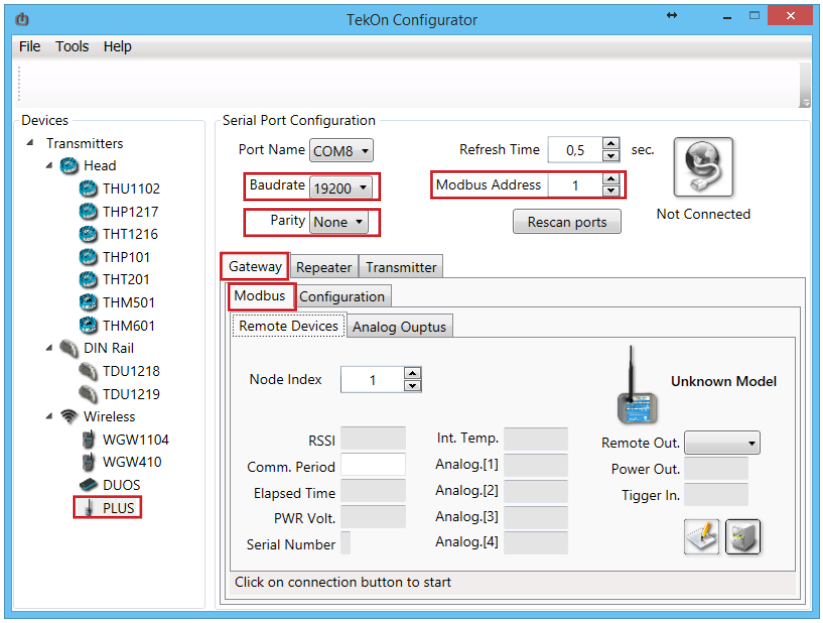
Click on *Disconnect* ( ) button.



12

Modbus Communication

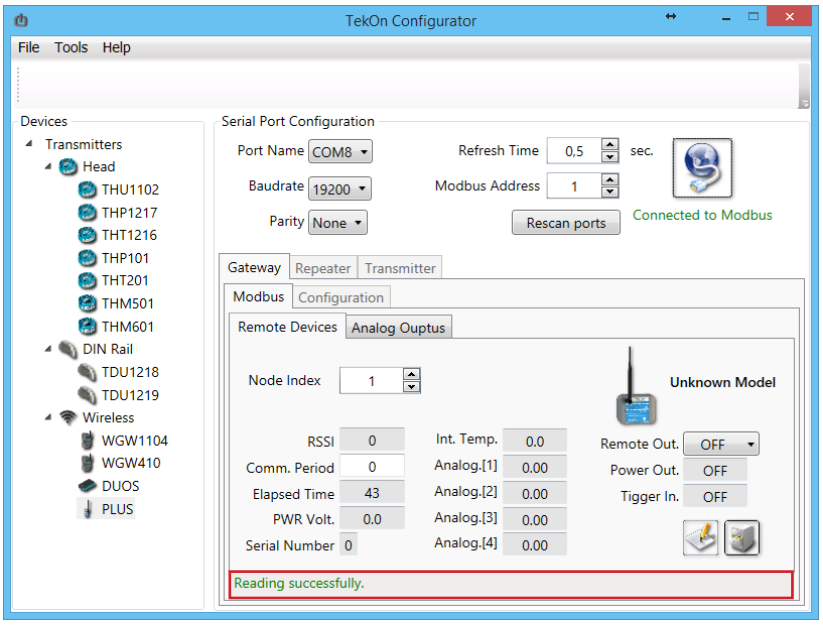
Select *Modbus* tab of the *Gateway* and set the previously saved configurations.



Ensure that *Port name*, *Baudrate*, *Parity* and *Modbus Address* fields are the same as those obtained in configuration mode.

13

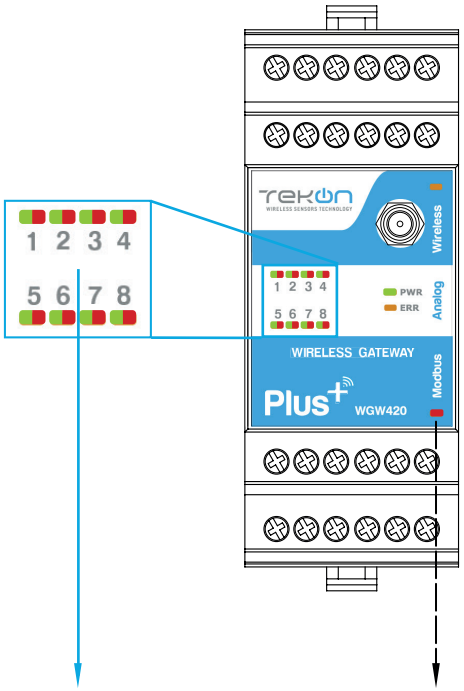
Click on *Connect* ( ) button and check operation status at the bottom of the window.



The messages *Connected to Modbus* and *Reading successfully* will appear if *Serial Port* configuration parameters are correct and the Modbus connection is established.

step
01
WGW420 PLUS WIRELESS GATEWAY CONFIGURATION

NOTE:
See WGW420 Datasheet to access LED indication information - page 4.



Red LEDs permanently on

LED flashes on each wireless communication

step

02

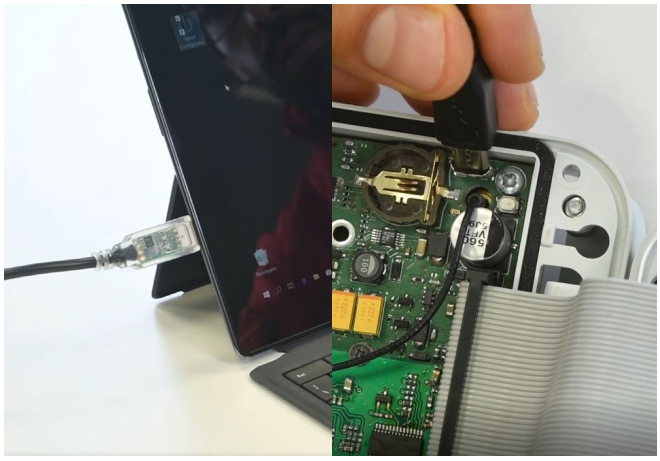
TWP4AI PLUS WIRELESS TRANSMITTER CONFIGURATION

step 02

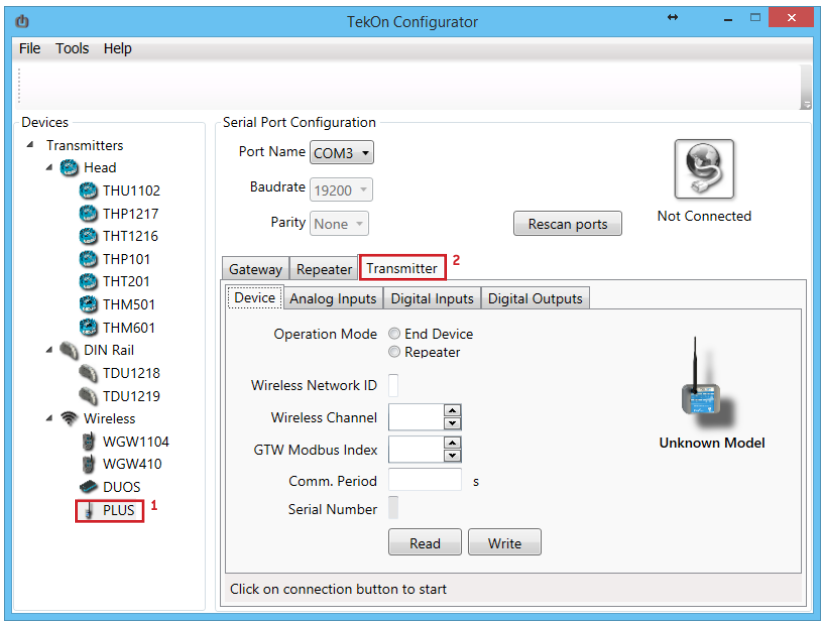
TWP4AI PLUS WIRELESS TRANSMITTER CONFIGURATION

01 Loosen the 4 screws of the case and open it.

02 Connect a micro USB cable to the computer and then to *TWP4AI PLUS Wireless Transmitter*.

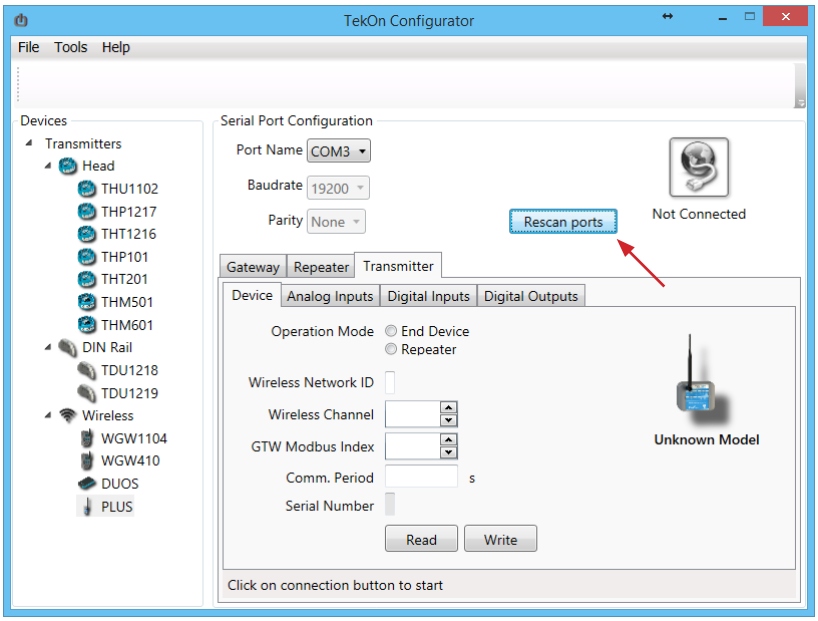


03 Open a new window of *Tekon Configurator Software* and select *PLUS* >> *Transmitter* menu.



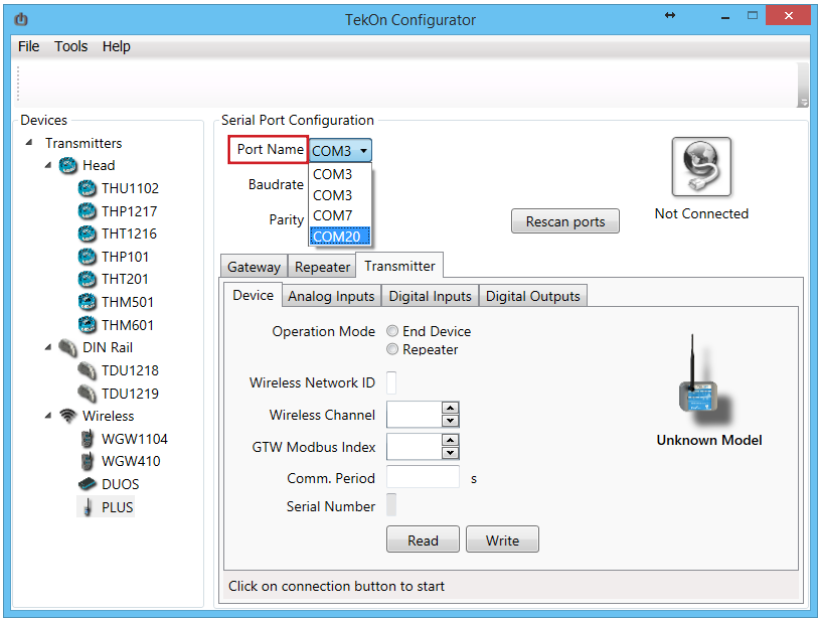
04

Click on *Rescan Ports* button.



05

Select corresponding *Port name*[1].

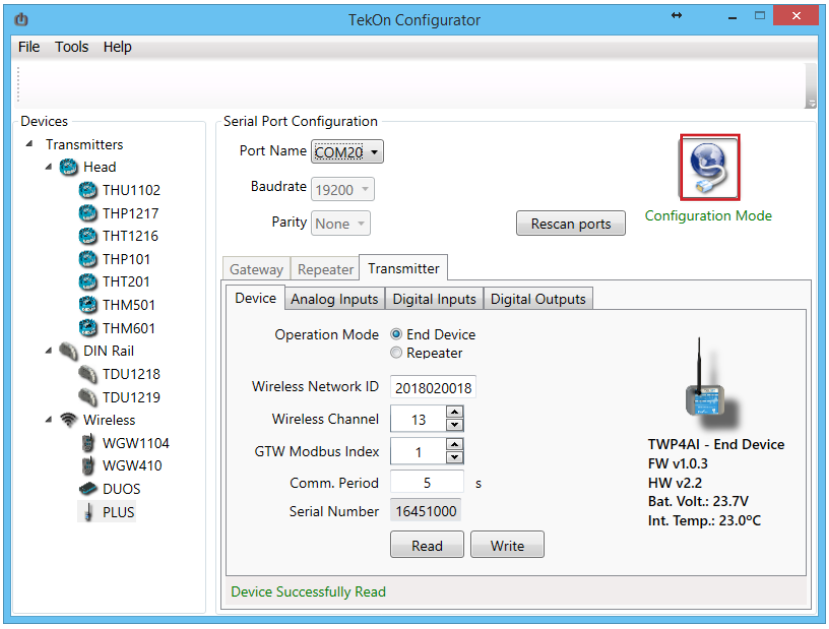


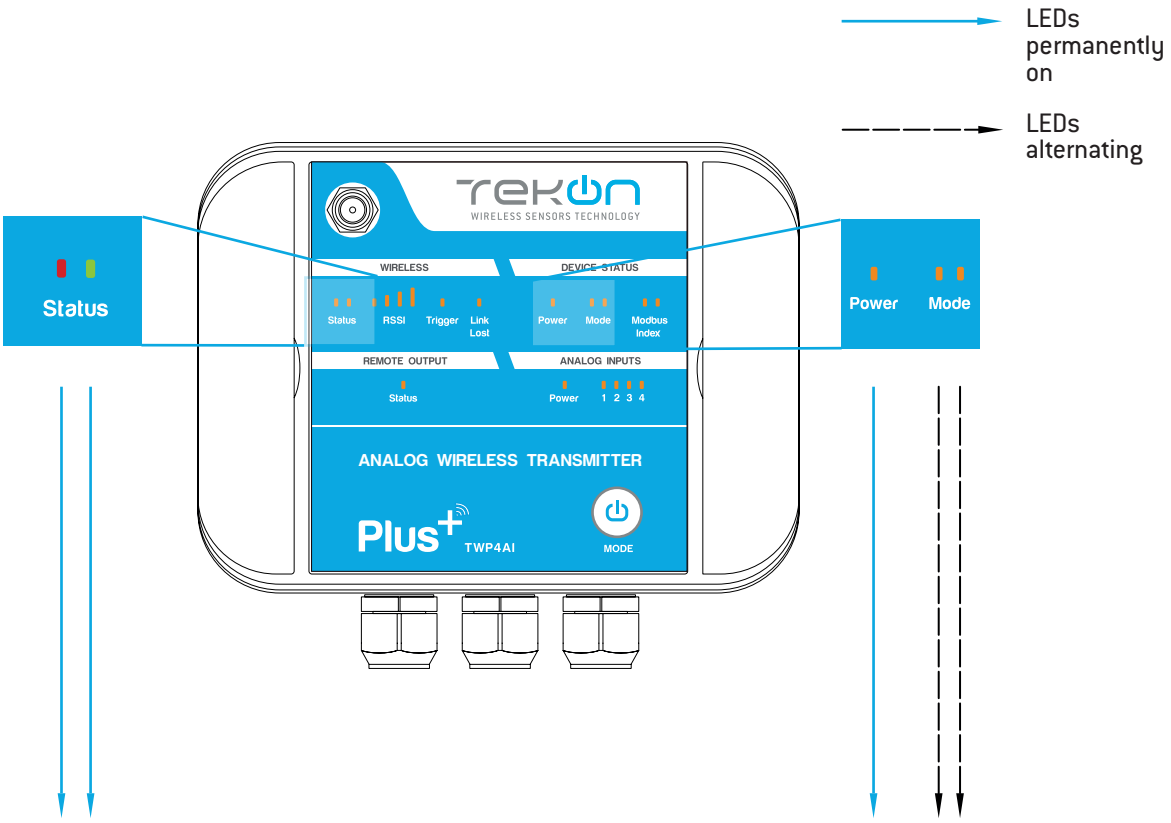
[1] You can check device's serial port name in "Device Manager" on Microsoft® Windows® operating system.

step
02
TWP4AI PLUS WIRELESS TRANSMITTER CONFIGURATION

06

Click on *Configuration Mode* ( ) button.





step 02

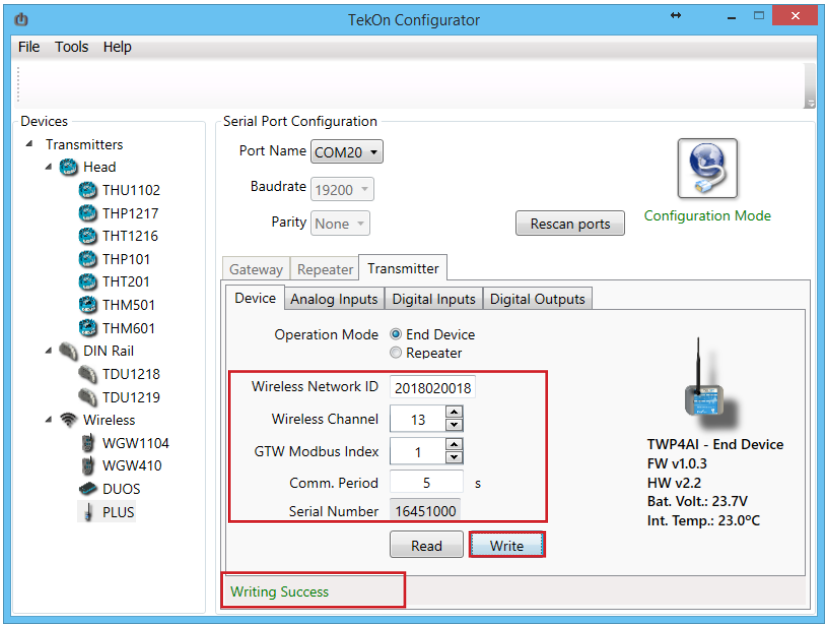
TWP4AI PLUS WIRELESS TRANSMITTER CONFIGURATION

07

Configure *Wireless Network ID* and *Wireless Channel* previously obtained from *Gateway*.

The wireless connection between both devices is ensured by setting the same *Wireless Network ID* and *Wireless Channel* parameters.
Gateway Modbus Index will define the modbus registers window used to store information sent by the transmitter.
Each transmitter should have a different *Gateway Modbus Index* in order to avoid information override.

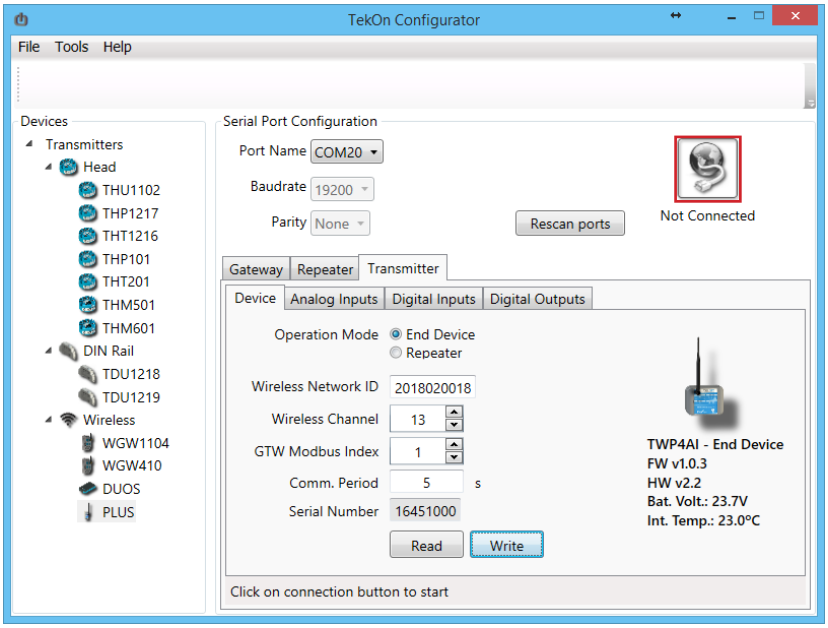
Click on *Write* button to update *Transmitter* settings.

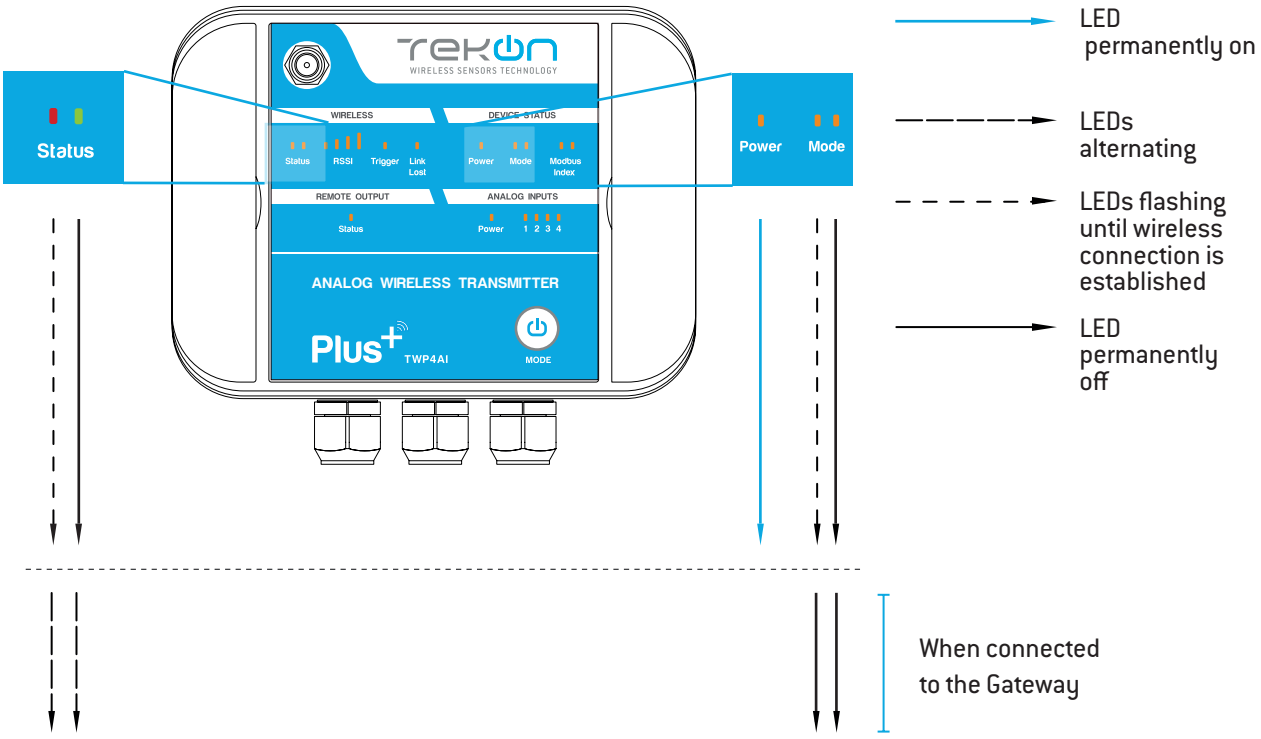


step
02
TWP4AI PLUS WIRELESS TRANSMITTER CONFIGURATION

08

Click on *Configuration Mode* ( ) button to exit setup and resume normal operating mode.





step 02

TWP4AI PLUS WIRELESS TRANSMITTER CONFIGURATION

After clicking on *Disconnect* button, the device will permanently attempt to connect to a wireless network.
If there is no communication, the Status LED flashes slowly and the Mode LED flashes quickly. When there's a successful connection directly to a wireless network, both status LEDs alternate quickly - during 1 minute if the transmitter is operating as end device or permanently if operating as repeater.

NOTE:
Make sure that the devices are at a distance of at least 3 meters or remove the antenna from the gateway (in case both devices are near each other).

step

03

TWP4AI TRANSMITTER ANALOG INPUT CONFIGURATION

step **03**

TWP4AI TRANSMITTER ANALOG INPUT CONFIGURATION

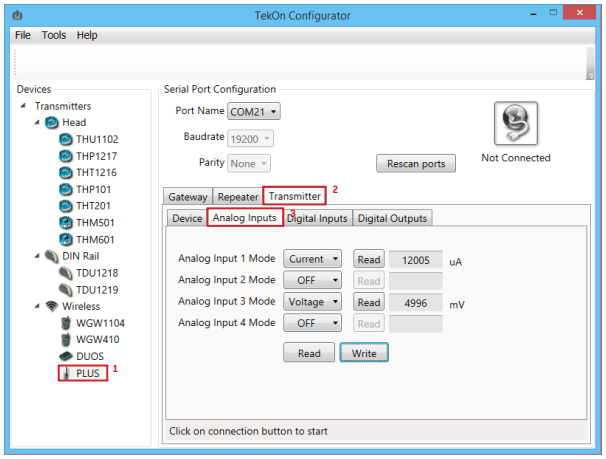
NOTE:
By default, analog inputs are switched OFF for power optimization.
Each analog input can be configured independently, as current input [0..20mA] or voltage input [0..10V]

01

To enter in *Configuration Mode* follow steps 01 to 05 of TWP4AI PLUS Wireless *Transmitter* Configuration.

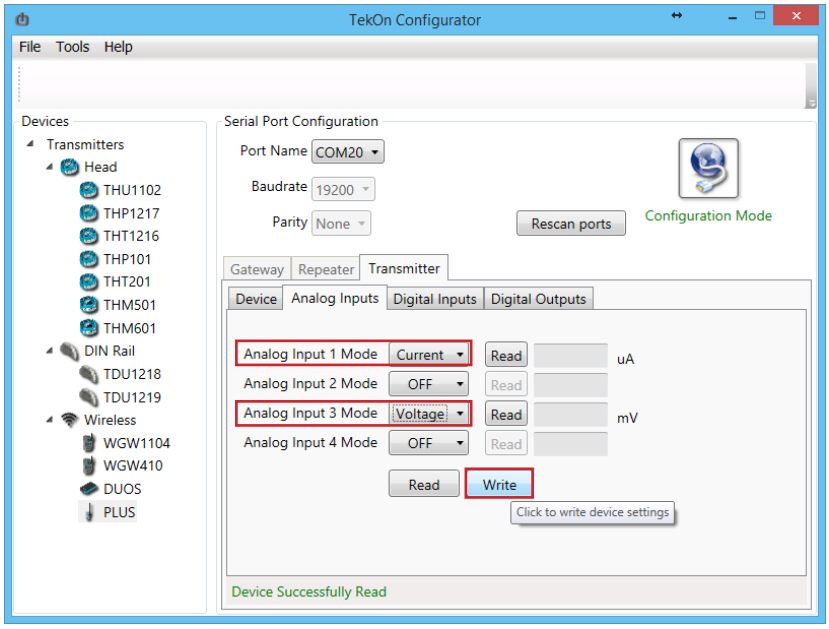
02

In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Analog Inputs* menu



03

Select *Current* option on Analog Input 1 and *Voltage* option on Analog Input 3 operation mode and click *Write*.

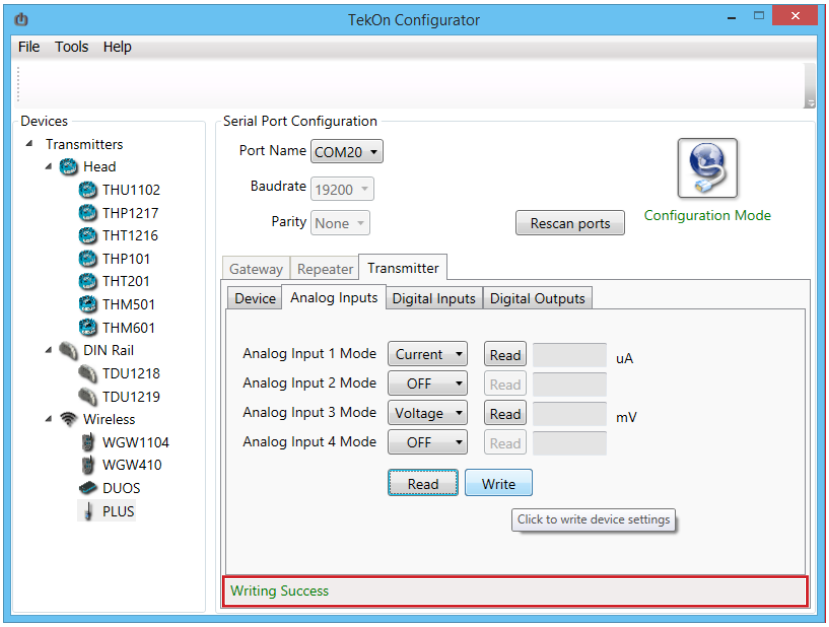


step 03

TWP4AI TRANSMITTER ANALOG INPUT CONFIGURATION

04

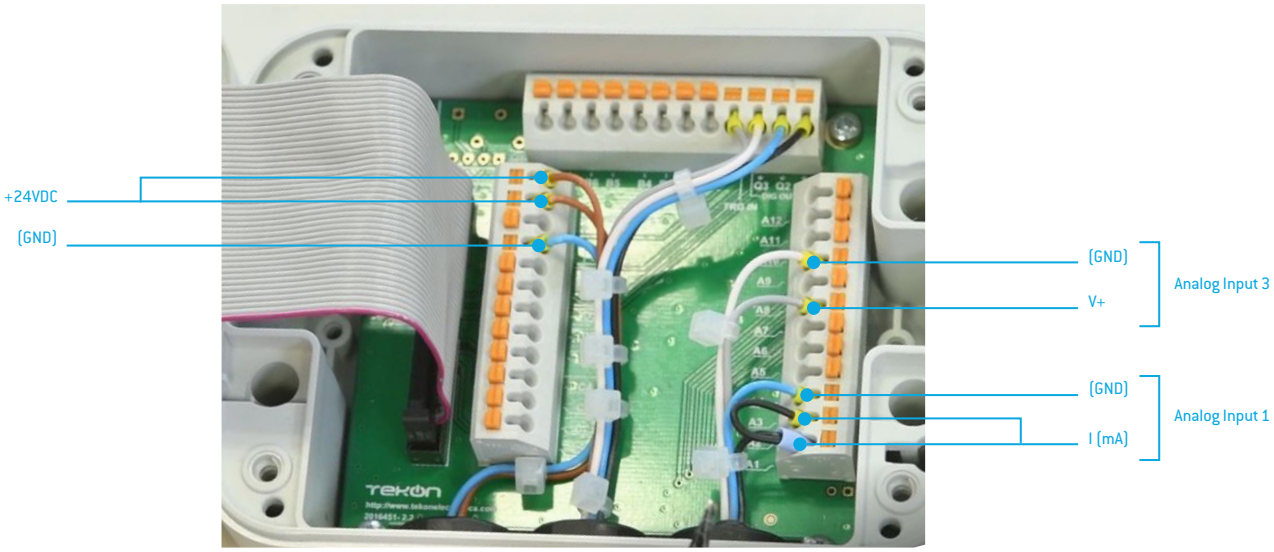
The status string at the bottom of the software window provides feedback on ongoing operations.



05

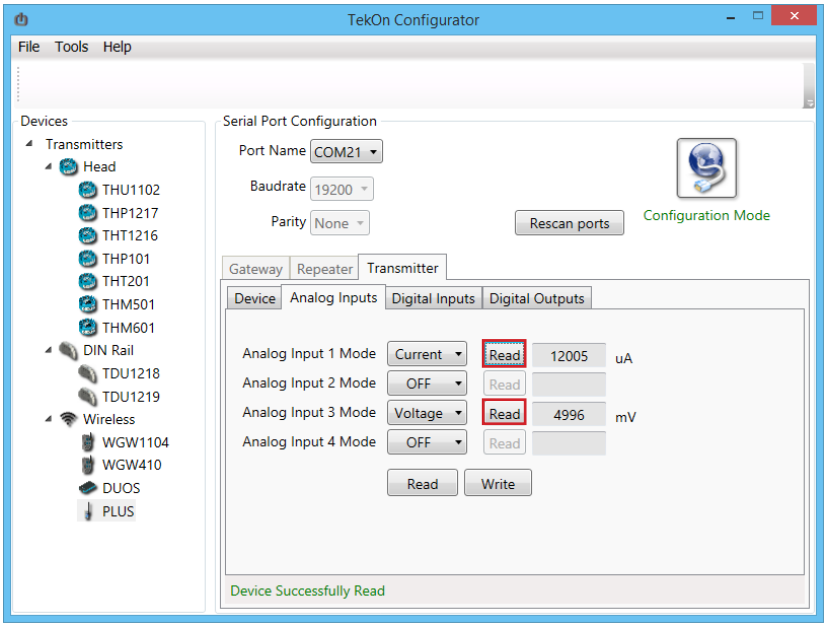
Wiring

Wire the device according to the diagram below.



06

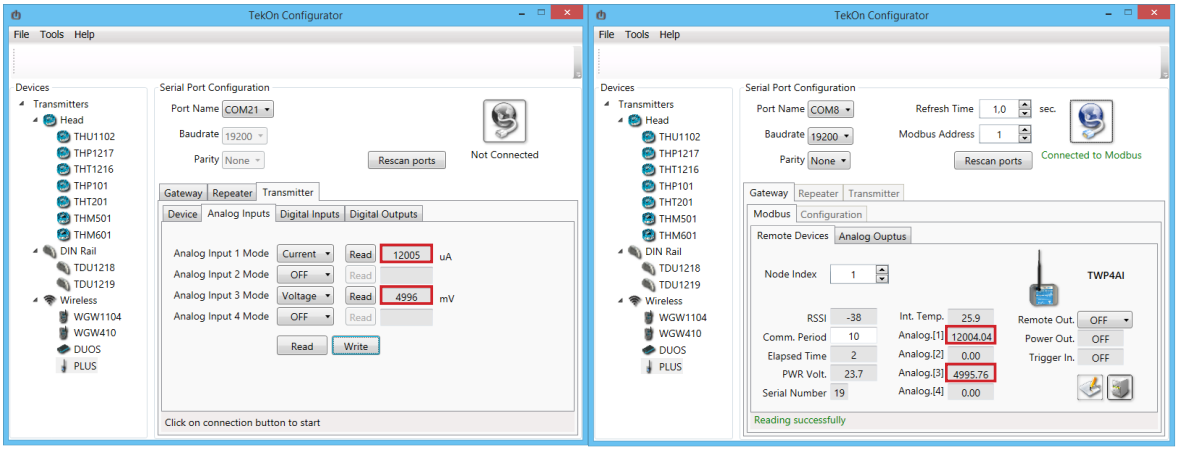
Validate configuration by clicking on *Read* button.



NOTE:
Configuration and Operation validated.
Measured value of current and voltage depend on the setup. In this example 12mA (12000uA) and 5V (5000 mV) are being injected.

07

Exit configuration mode and compare data sent by wireless communication.



step

04

TWP4AI TRANSMITTER DIGITAL INPUT CONFIGURATION

step 04

TWP4AI TRANSMITTER DIGITAL INPUT CONFIGURATION

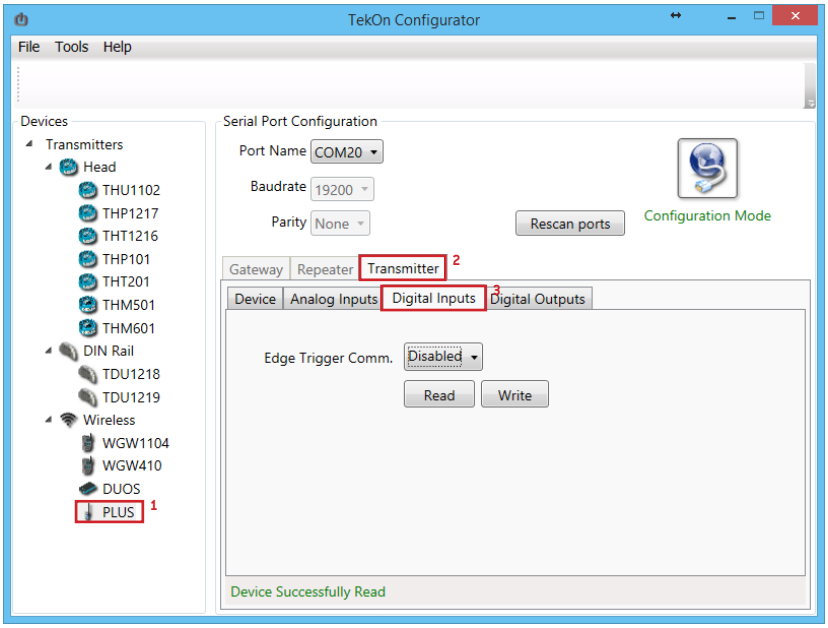
NOTE:
Sink type Digital Input.

01

To enter in *Configuration Mode* follow steps 01 to 05 of TWP4AI PLUS Wireless *Transmitter* Configuration.

02

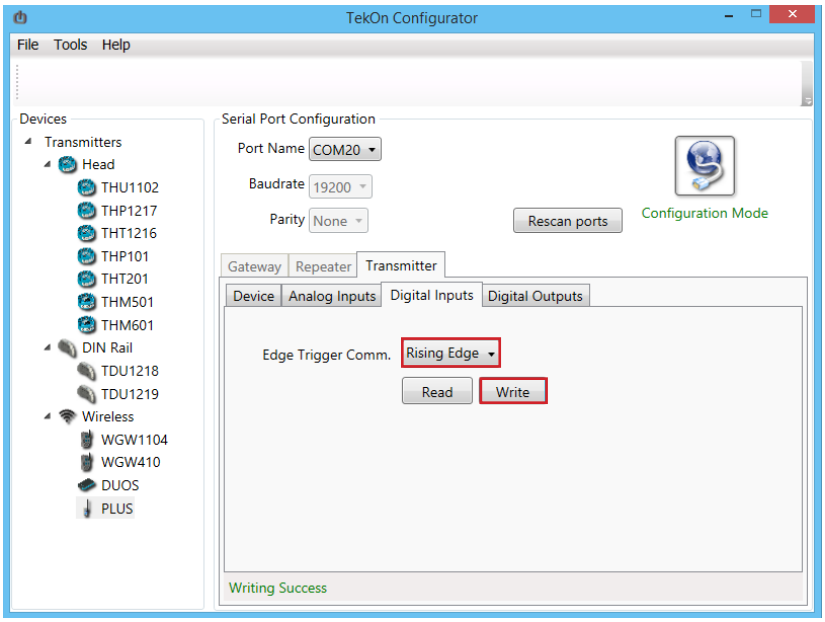
In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Digital Inputs* menu.



step
04 TWP4AI TRANSMITTER DIGITAL INPUT CONFIGURATION

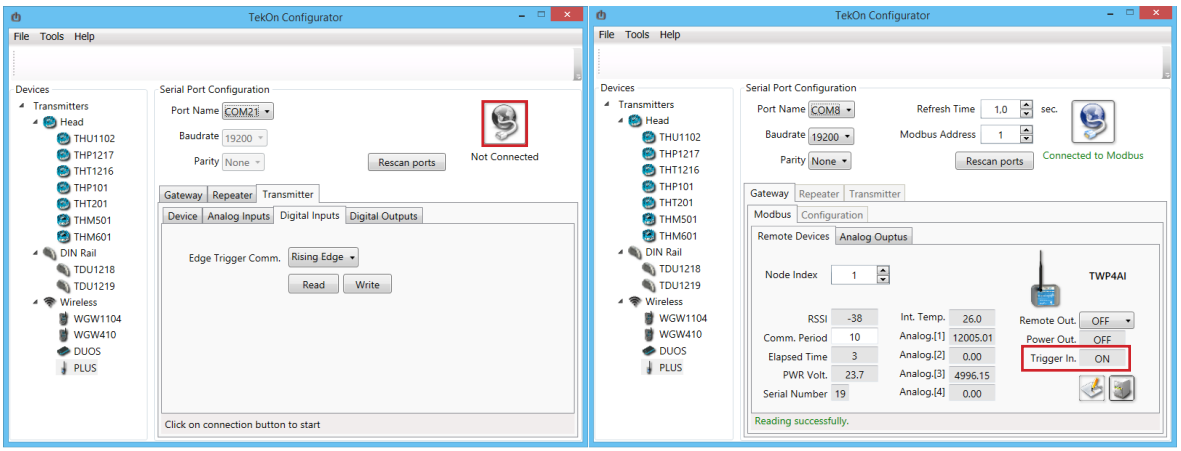
03

Select Operation Mode *Rising Edge* and click on *Write* button.



04

Validate functionality and click on *Disconnect* button.
Wait for the device to connect to the Gateway and observe data in Tekon Configurator window.



step

05

TWP4AI TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

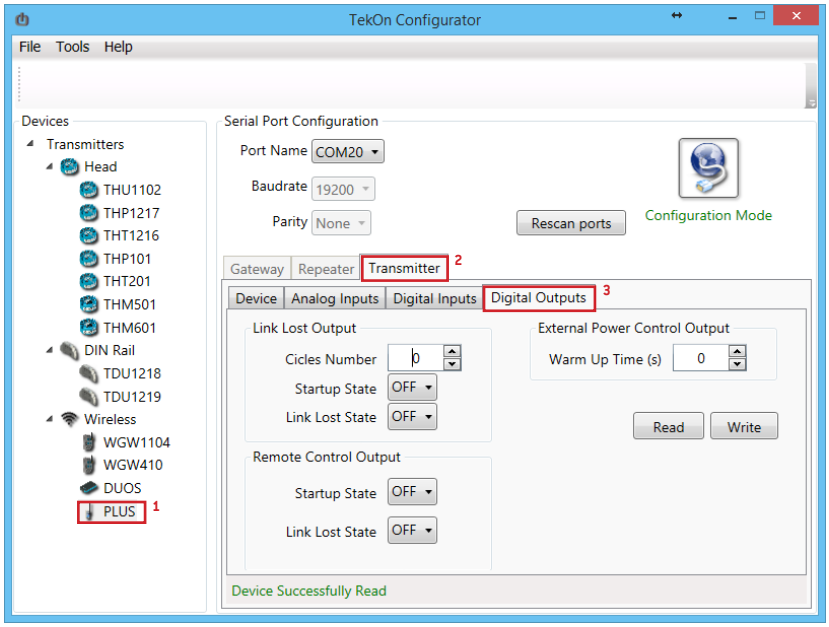
step
05 TWP4AI TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

01

To enter in *Configuration Mode* follow steps 01 to 05 of TWP4AI PLUS Wireless *Transmitter* Configuration.

02

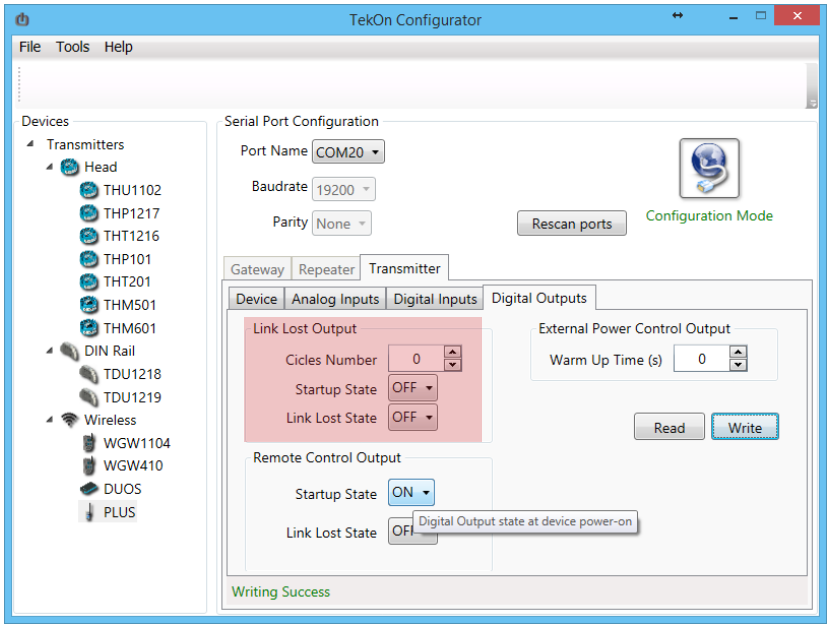
In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Digital Outputs* menu



03

Link Lost Output

Output that outputs wireless connection state of the device.

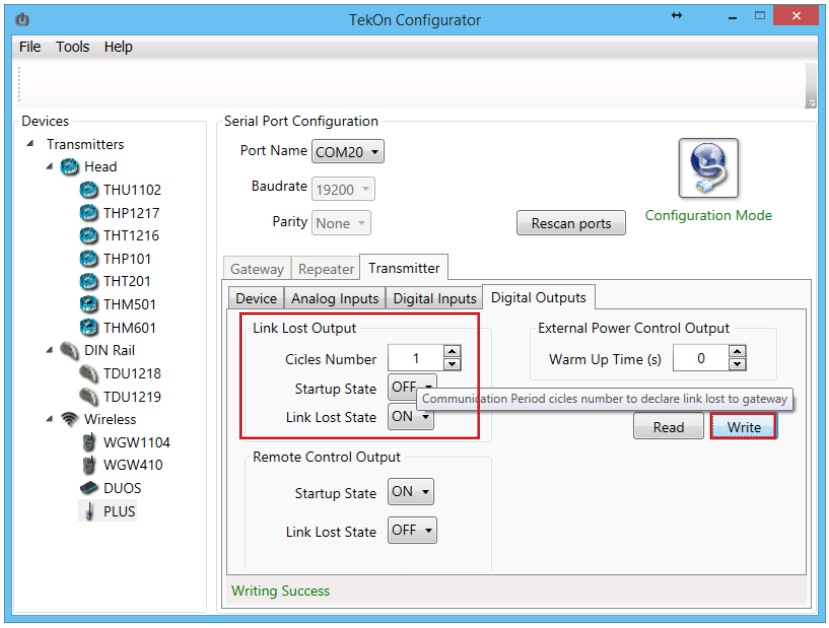


step **05**

TWP4AI TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

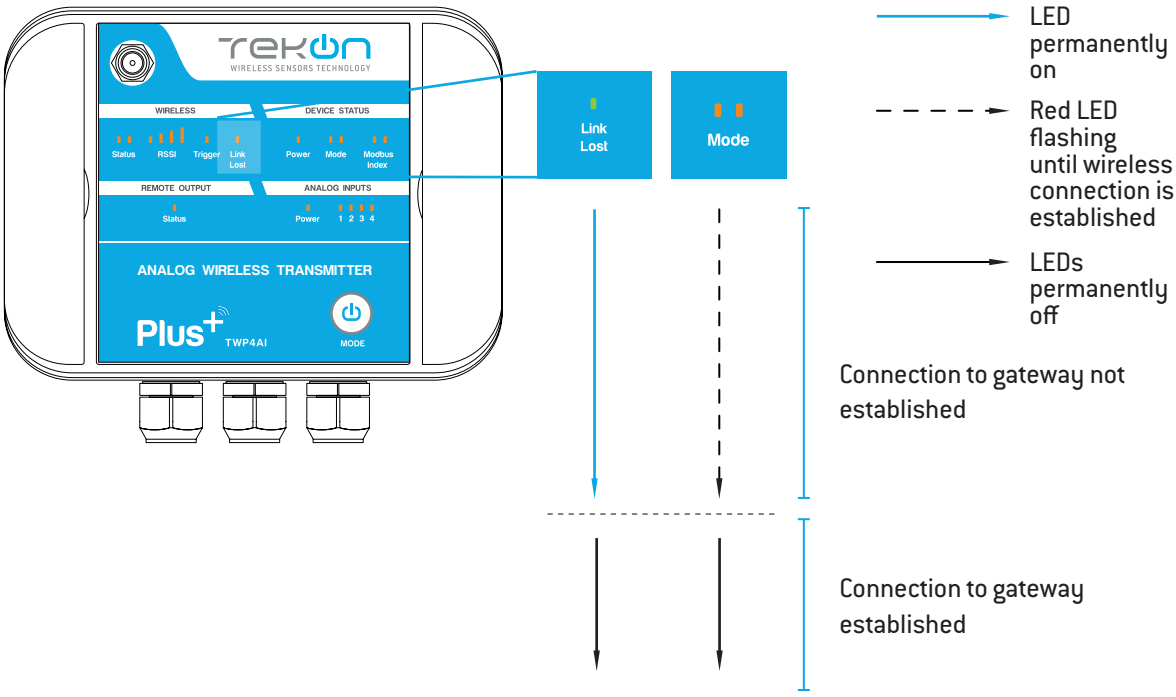
03.1

Select *cycle number*, *start-up state* and *link lost state* and click on *Write* button.



03.2

Exit configuration mode and verify setup by checking LEDs indicators..



step 05

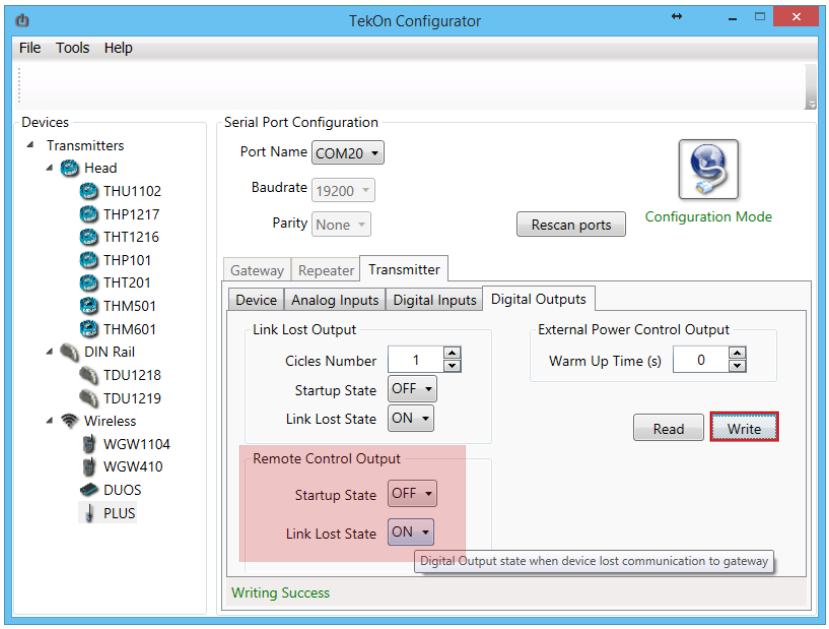
TWP4AI TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

04 Remote Control Output

Digital output remotely controlled by Gateway modbus protocol.

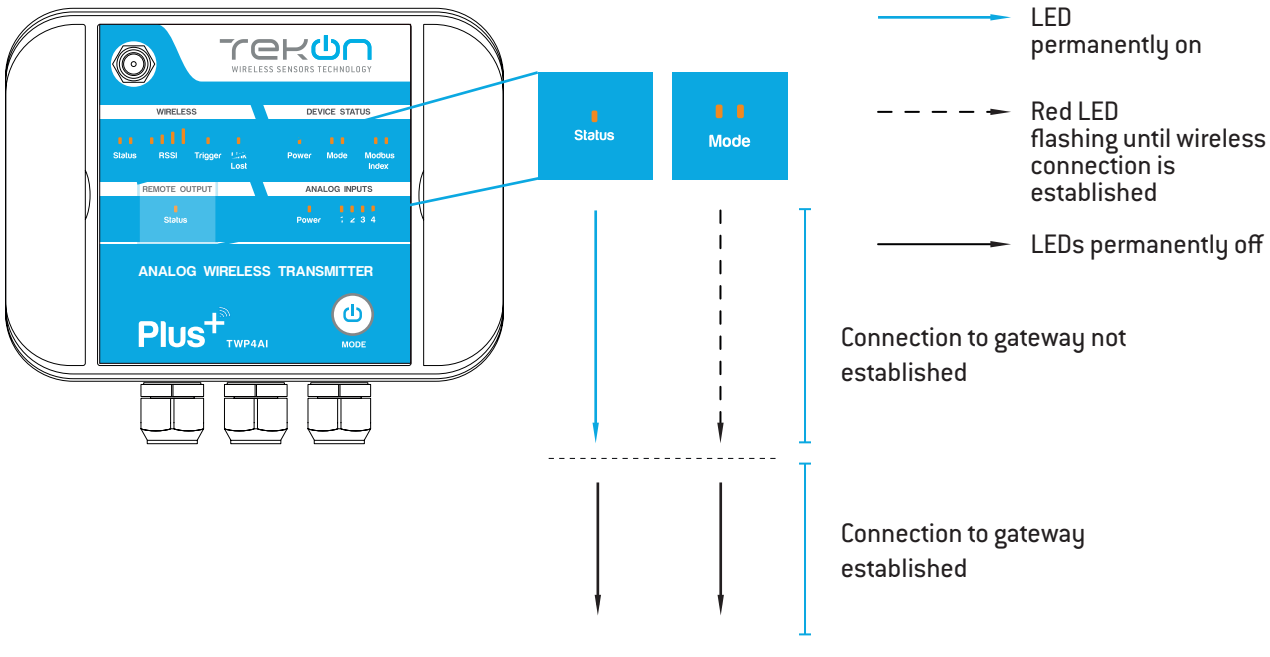
04.1

Define *Start-up state* and *Link lost state.* Click on *Write* button.



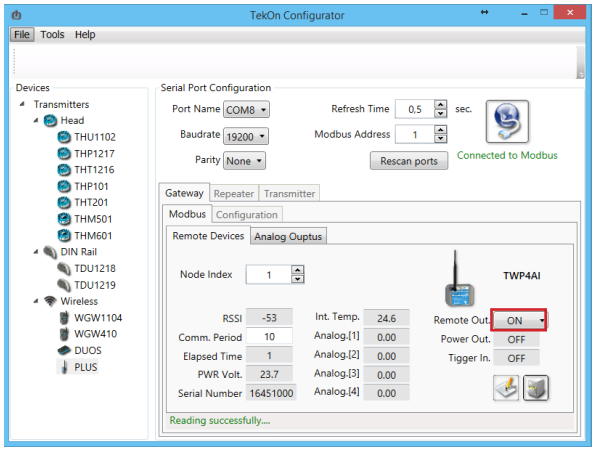
04.2

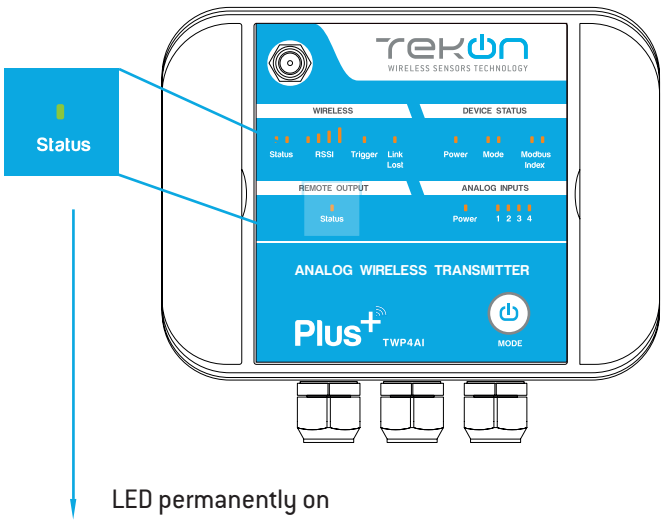
Exit configuration mode and verify setup by checking LEDs indicators.



04.3

Using the Tekon Configurator you can change the State of Remote Output by setting the modbus register on the gateway. The Gateway will send the information in the next time the transmitter performs a communication.





LED permanently on

05

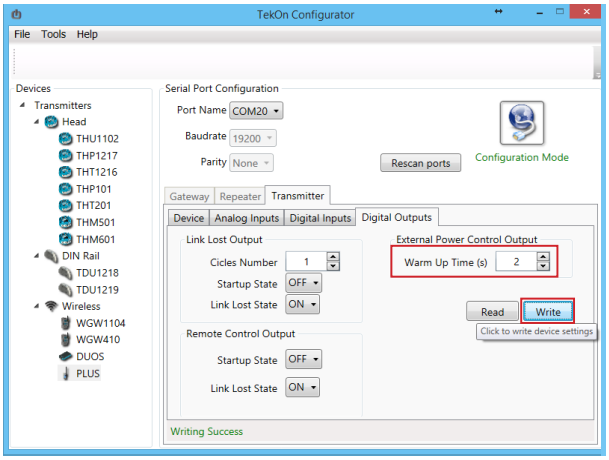
External Power Control Output

Time configurable output to power on an external device before data acquisition and transmission.

step
05 TWP4AI TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

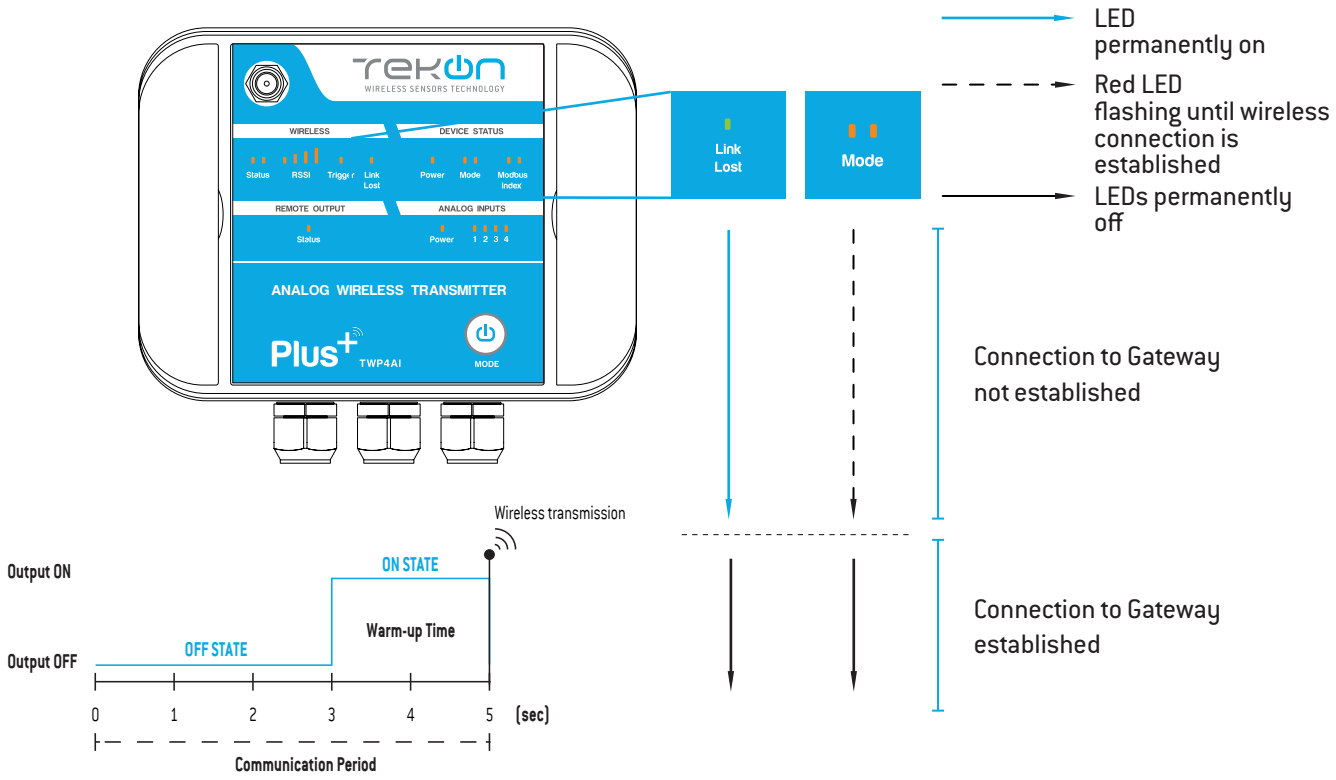
05.1

Define *Warm up time* and click on the *Write* button.



05.2

Exit configuration mode and verify setup by checking LEDs indicators.



NOTE:
Diagram only applies after the transmitter and gateway are connected.

step

06

WGW420 GATEWAY ANALOG OUTPUTS CONFIGURATION

step 06

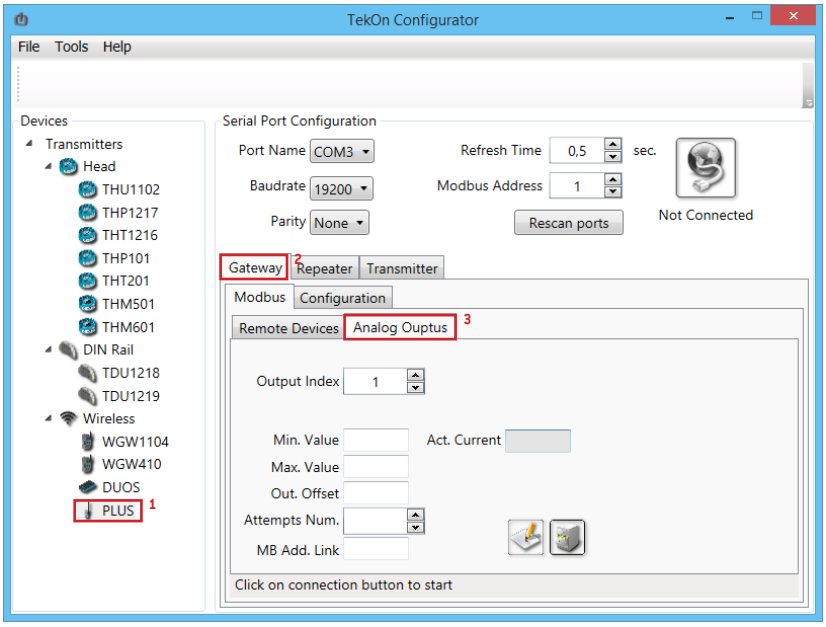
GATEWAY ANALOG OUTPUTS

01

Follow steps 06 and 07 of the PLUS Wireless *Gateway* Configuration.

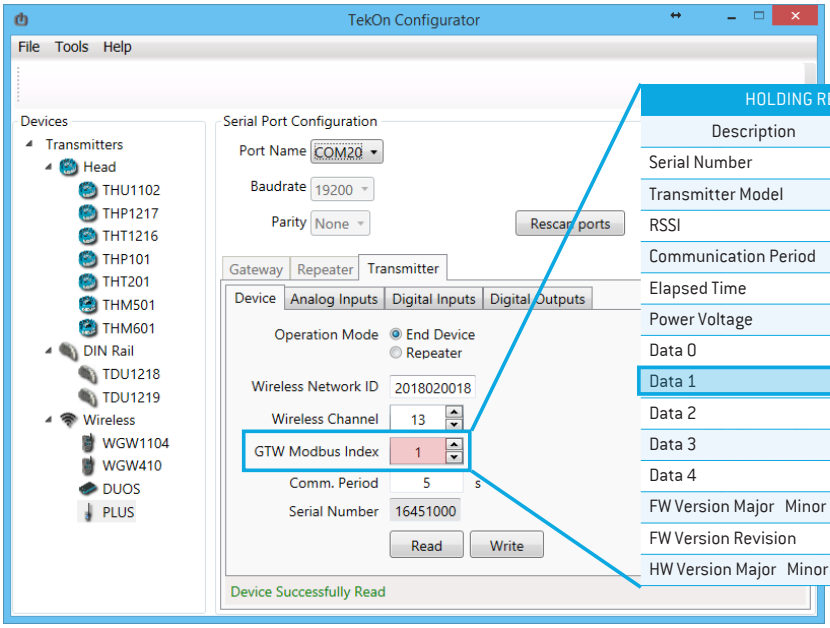
02

In *Tekon Configurator Software* select *PLUS* >> *Gateway* >> *Analog Outputs* menu



03

Considering the transmitter configuration with GTW Modbus Index=1, there is a Gateway Modbus Address Window corresponding to Modbus address window [0-19].



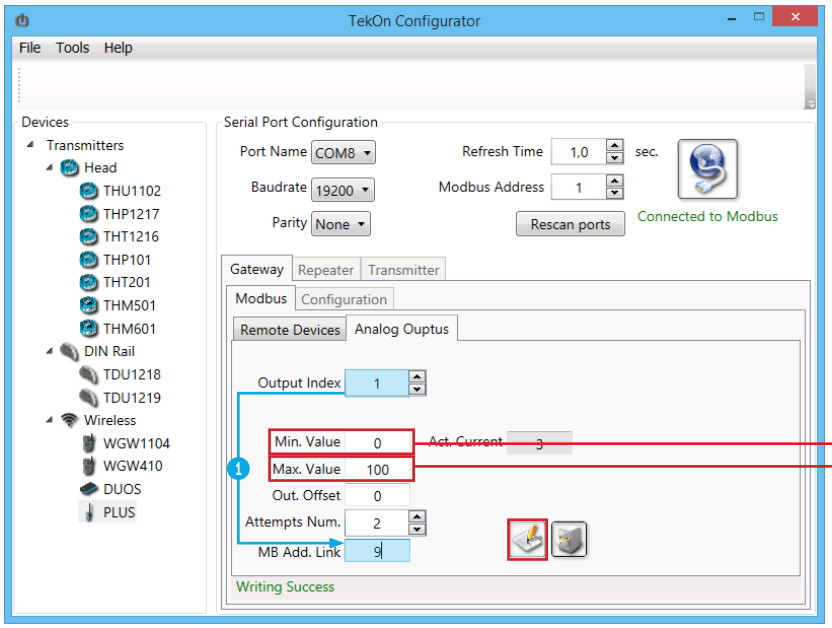
MB Add

HOLDING REGISTERS - TRANSMITTERS DATA		
Description	Address	
Serial Number	(Transmitter Modbus Index-1) x 20+0	0
Transmitter Model	(Transmitter Modbus Index-1)x20+2	
RSSI	(Transmitter Modbus Index-1)x20+3	
Communication Period	(Transmitter Modbus Index-1)x20+4	
Elapsed Time	(Transmitter Modbus Index-1)x20+5	
Power Voltage	(Transmitter Modbus Index-1)x20+6	
Data 0	(Transmitter Modbus Index-1)x20+7	
Data 1	(Transmitter Modbus Index-1)x20+9	9
Data 2	(Transmitter Modbus Index-1)x20+11	
Data 3	(Transmitter Modbus Index-1)x20+13	
Data 4	(Transmitter Modbus Index-1)x20+15	
FW Version Major Minor	(Transmitter Modbus Index-1)x20+17	
FW Version Revision	(Transmitter Modbus Index-1)x20+18	
HW Version Major Minor	(Transmitter Modbus Index-1)x20+19	19

NOTE:
Transmitter analog input 1 data is received and stored at the Gateway Modbus address [9].

04

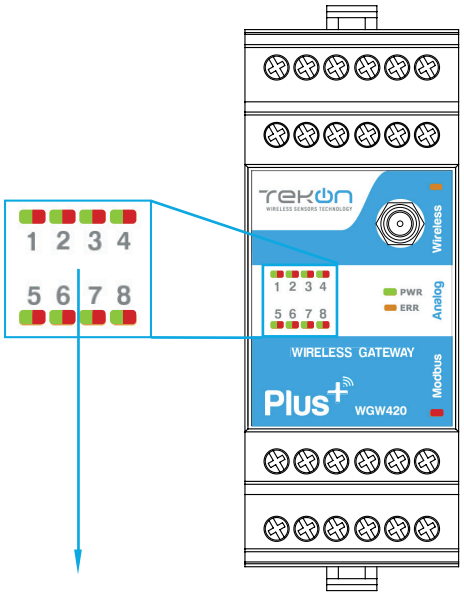
Link *Analog Output Index 1* (Gateway) to *Analog Input 1* (Transmitter) and configure MB Add Link according to the previous step. Set minimum and maximum values and click on *Write*



NOTE:

① Output index 1 is linked to modbus address [9], according to mapping table of step 03.

Modbus address double word (float 32) value is converted into 4..20 mA scale according to minimum and maximum defined values.



1 → Green led permanently on during a closed current loop

2 → Red led permanently on during an open current loop

step

07

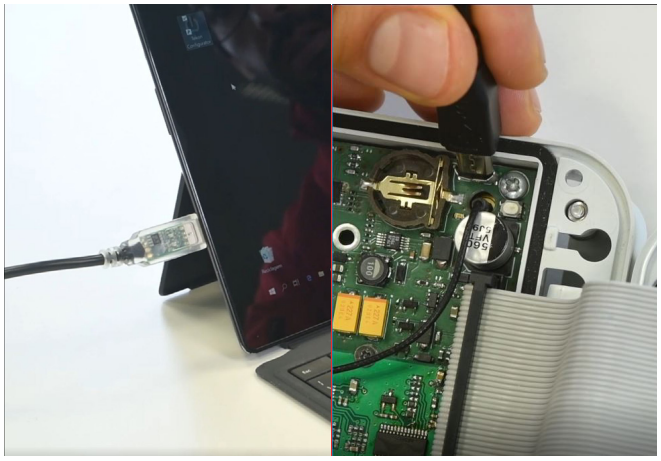
WRP001 PLUS WIRELESS REPEATER CONFIGURATION

step **07**

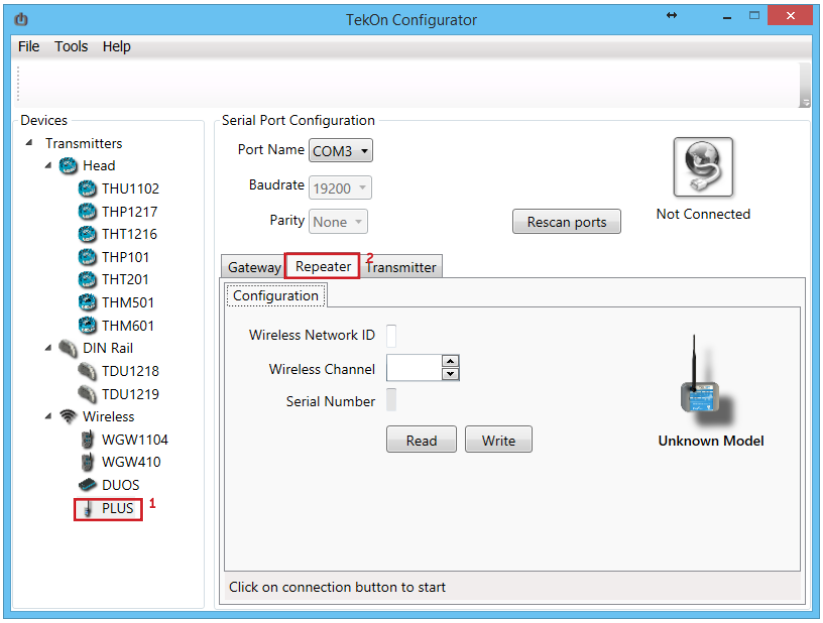
CONNECT AND CONFIGURE THE PLUS WIRELESS REPEATER

01 Loosen the 4 screws of the case and oppen it.

02 Connect a micro USB cable to the computer and then to *WRP001 PLUS Wireless Repeater*.

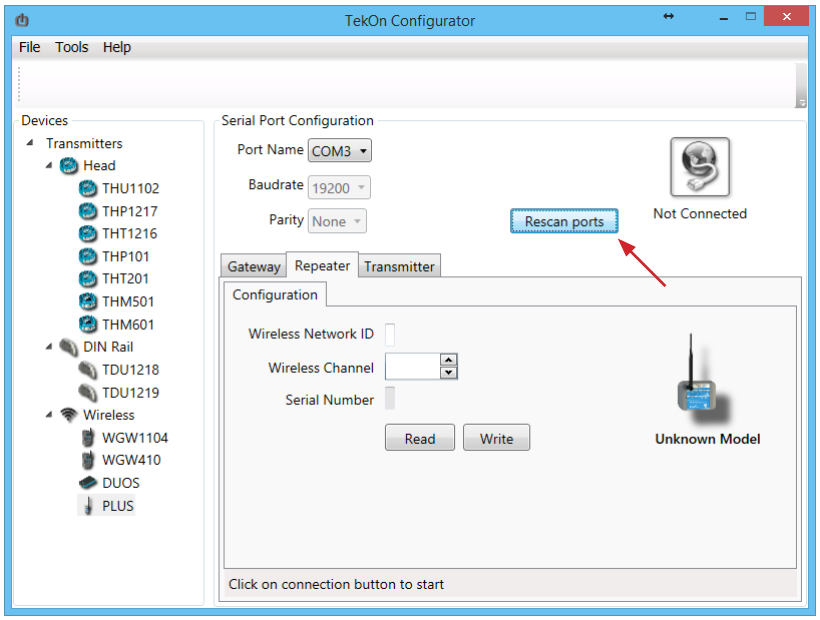


03 Open a new window of *Tekon Configurator Software* and select *PLUS* >> *Repeater* menu.

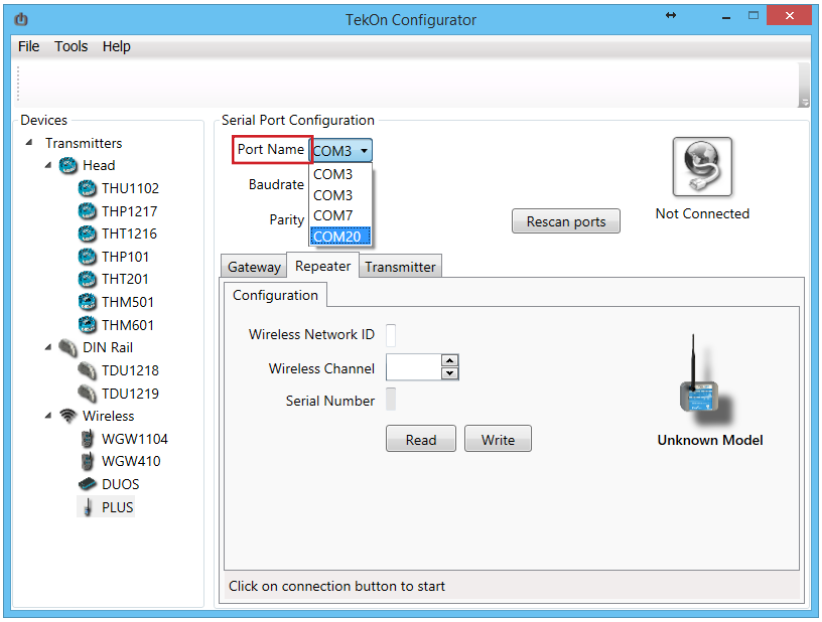


step
07
CONNECT AND CONFIGURE THE PLUS WIRELESS REPEATER

04 Click on *Rescan Ports* button.



05 Select corresponding *Port name*[1].



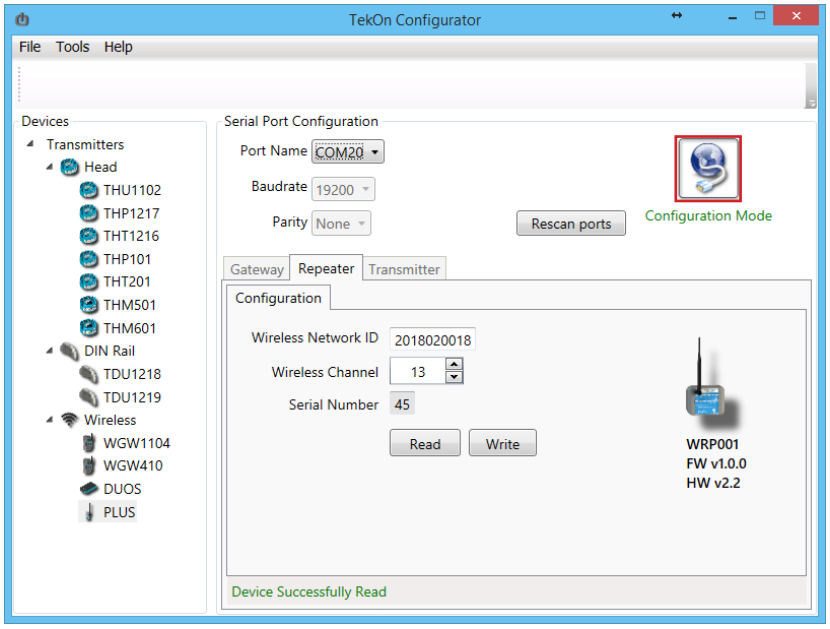
[1] You can check device's serial port name in "Device Manager" on Microsoft® Windows® operating system.

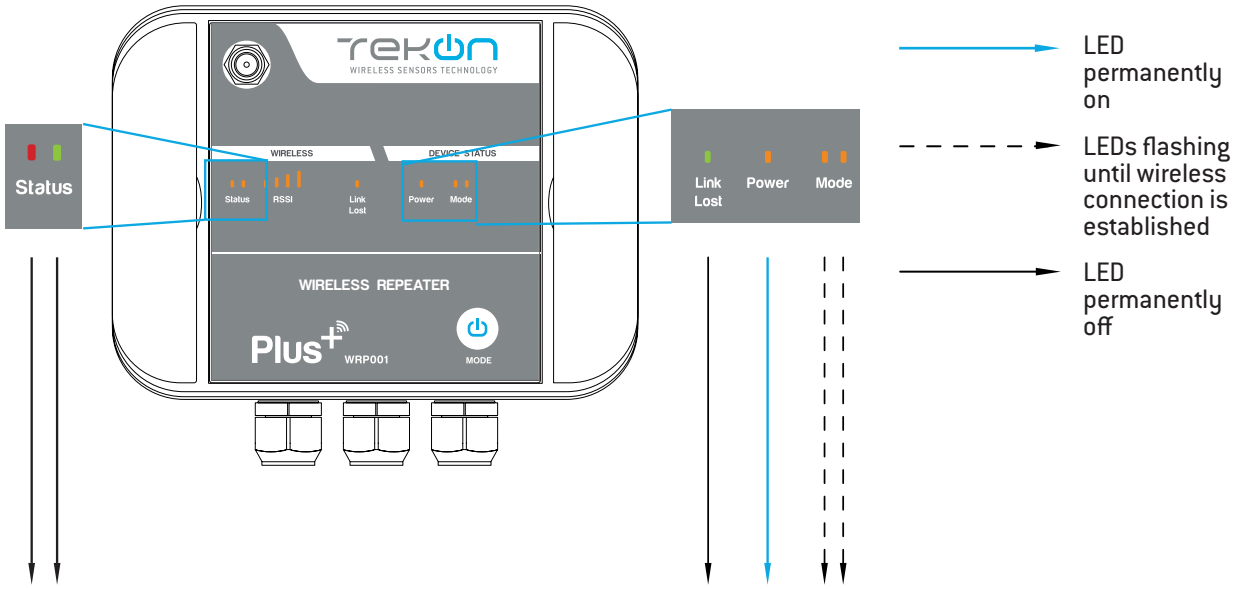
step **07**

CONNECT AND CONFIGURE THE PLUS WIRELESS REPEATER

06

Click on *Configuration Mode* ( ) button.



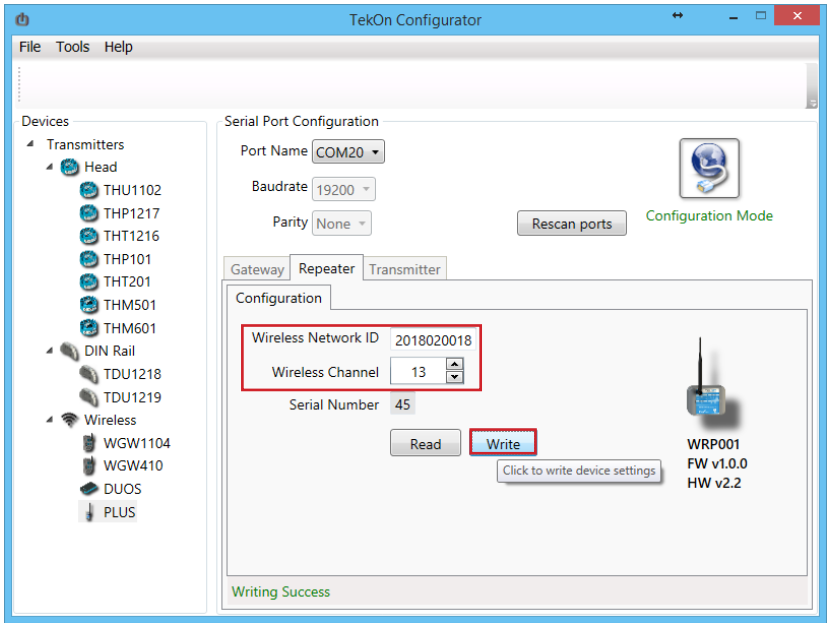


step
07
CONNECT AND CONFIGURE THE PLUS WIRELESS REPEATER

07

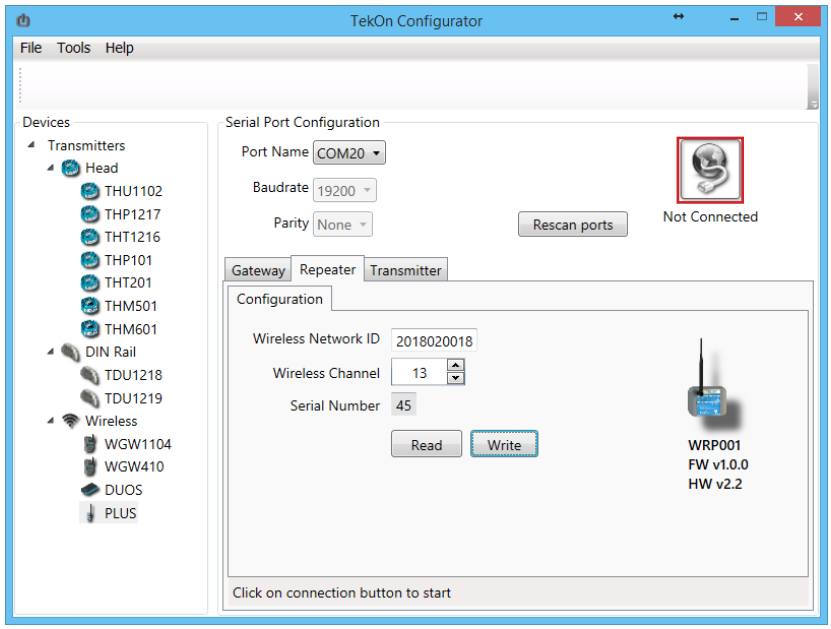
Configure *Wireless Network ID* and *Wireless Channel* previously obtained from *Gateway*.

Click on *Write* button to update *Transmitter* settings.



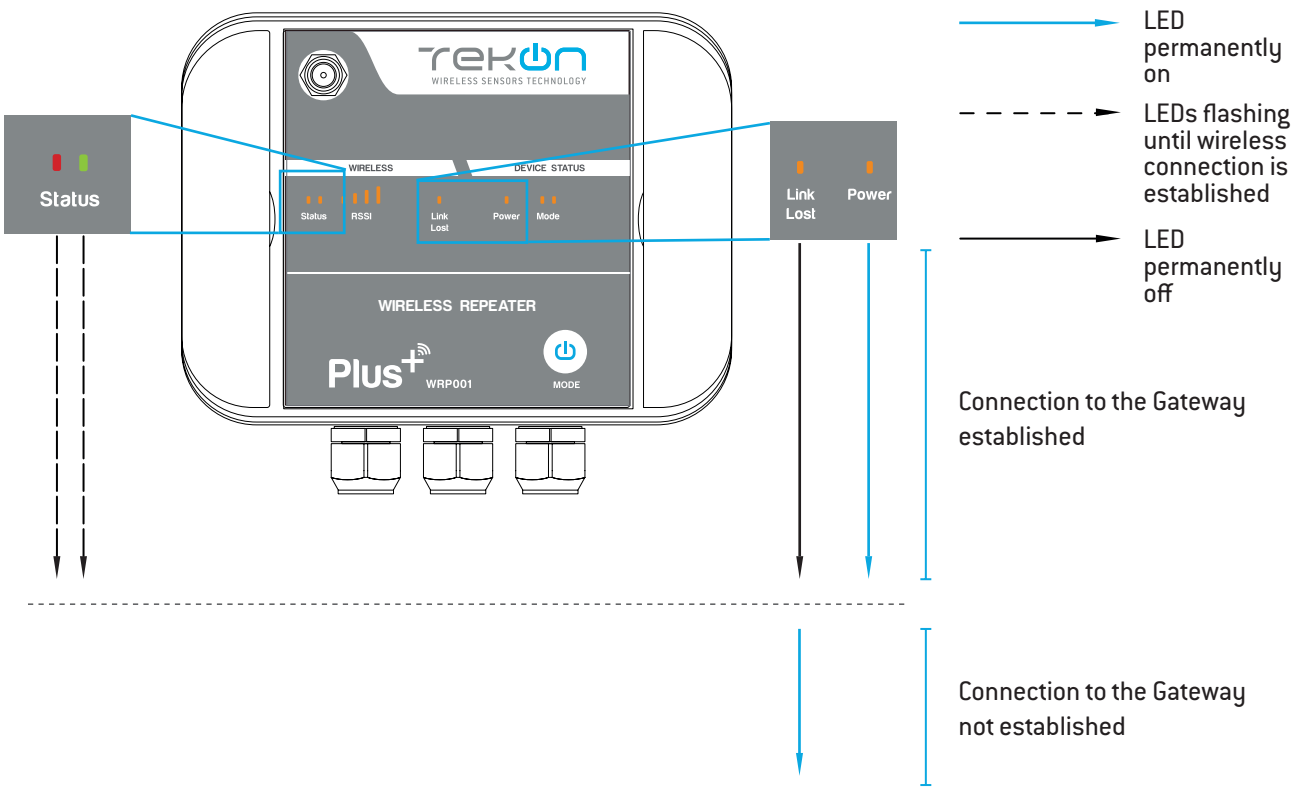
08

Click on *Configuration Mode* ( ) button to exit setup and resume normal operating mode.



step 07

CONNECT AND CONFIGURE THE PLUS WIRELESS REPEATER



step

08

TWPH-1UT PLUS WIRELESS TEMPERATURE TRANSMITTER CONFIGURATION

step **08**

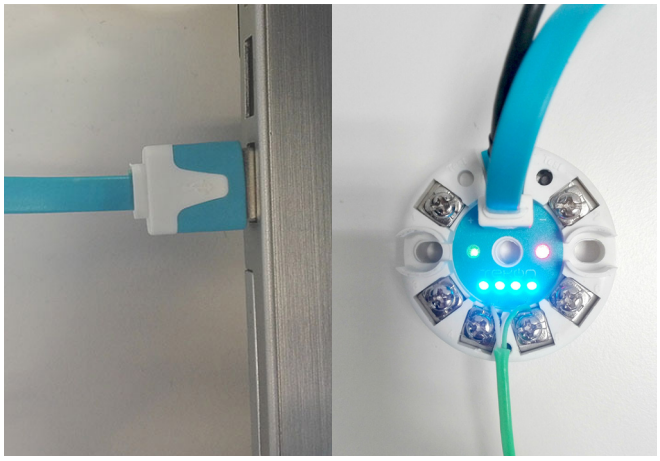
TWPH-1UT PLUS WIRELESS TEMPERATURE TRANSMITTER CONFIGURATION

01

Connect the antenna and sensor connectors to the *TWPH-1UT PLUS Wireless Transmitter*..

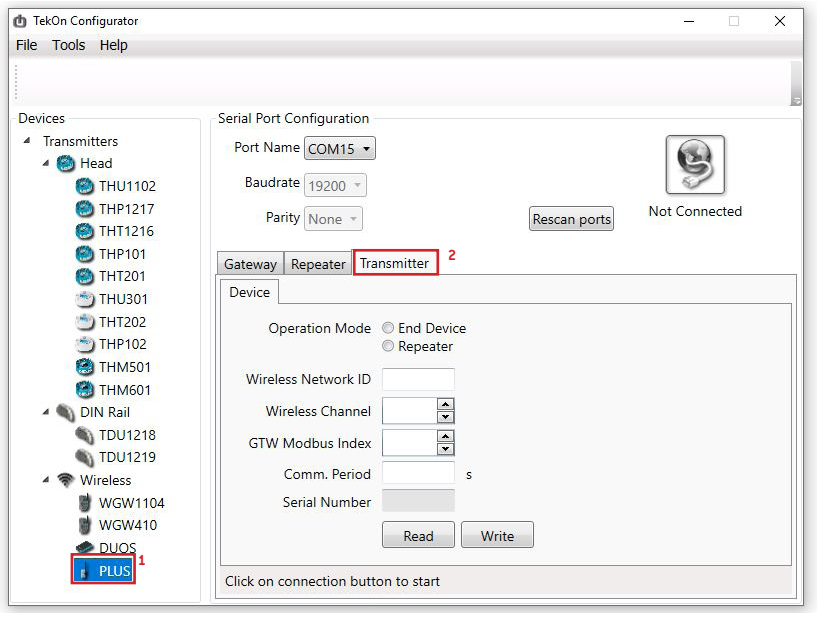
02

Connect the micro USB cable to the computer and then to *TWPH-1UT PLUS Wireless Transmitter*.



03

Open a new window of *Tekon Configurator Software* and select *PLUS* >> *Transmitter* menu.

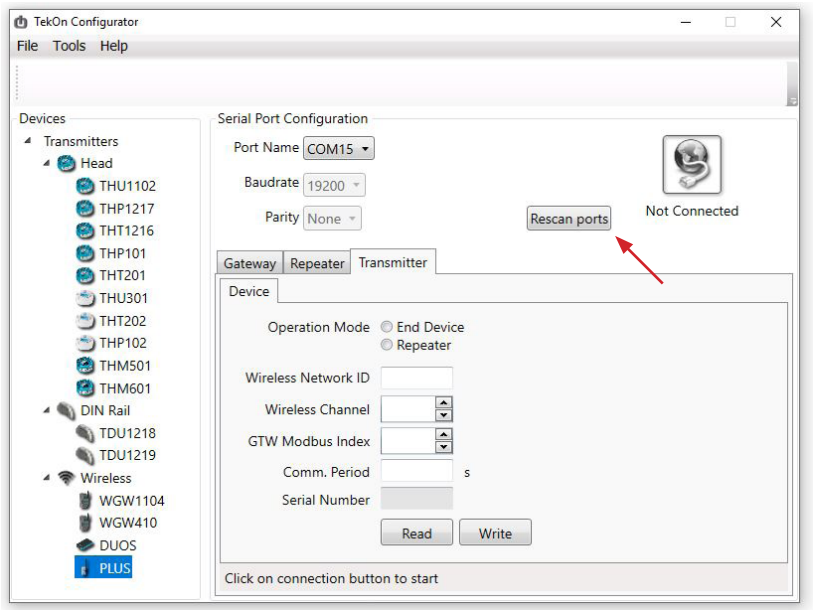


step 08

TWPH-1UT PLUS WIRELESS TEMPERATURE TRANSMITTER CONFIGURATION

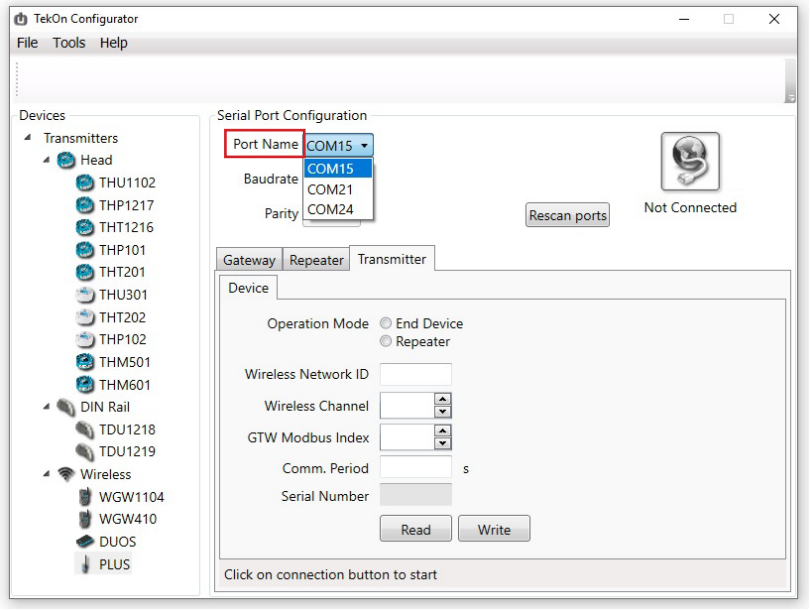
04

Click on *Rescan Ports* button.



05

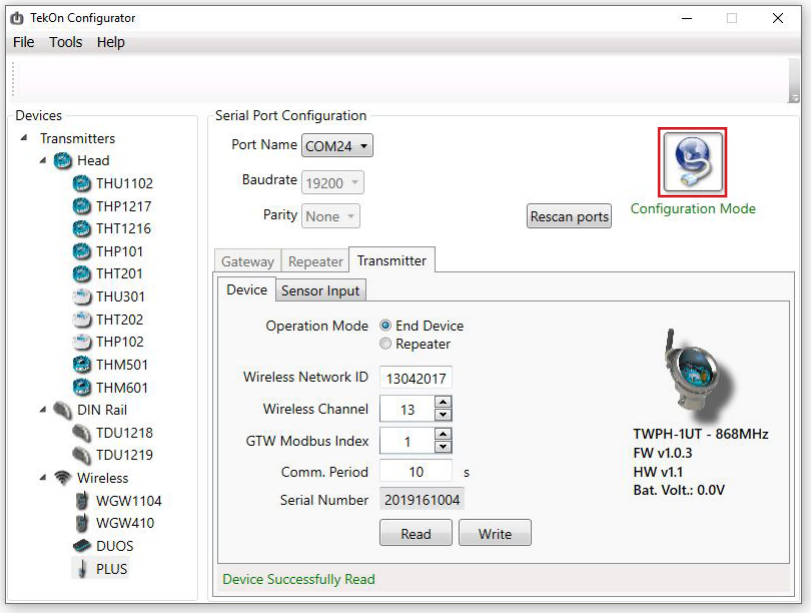
Select corresponding *Port name*[1].



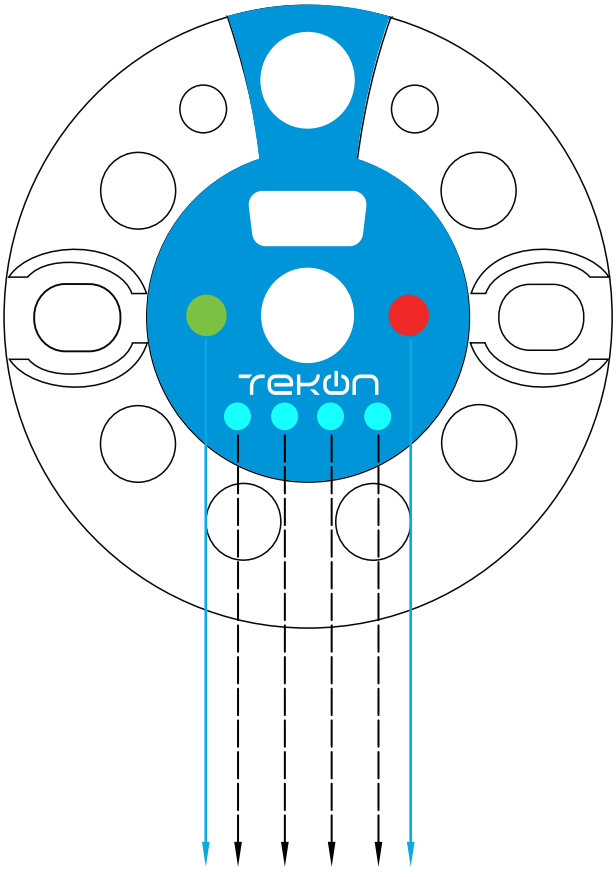
[1] You can check device's serial port name in "Device Manager" on Microsoft® Windows® operating system.

06

Click on *Configuration Mode* ( ) button.



When the *TWPH-1UT Transmitter* is in *Configuration Mode*, all LEDs are active but with different behaviours.



LED permanently on

LED flashing with 1 second interval

step 08

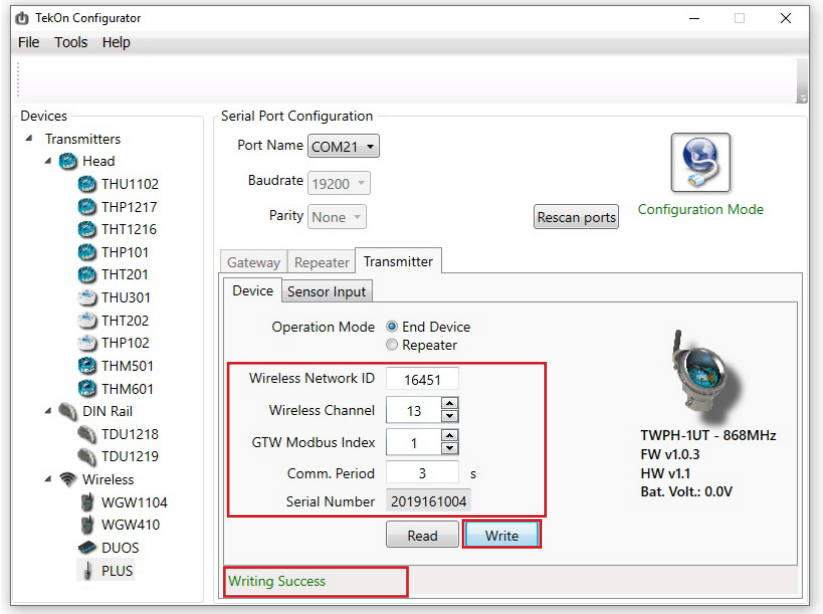
TWPH-1UT PLUS WIRELESS TEMPERATURE TRANSMITTER CONFIGURATION

07

Configure *Wireless Network ID* and *Wireless Channel* previously obtained from *Gateway*.

The wireless connection between both devices is ensured by setting the same *Wireless Network ID* and *Wireless Channel* parameters.
Gateway Modbus Index will define the modbus registers window used to store information sent by the transmitter.
Each transmitter should have a different *Gateway Modbus Index* in order to avoid information override.

Click on *Write* button to update *Transmitter* settings.

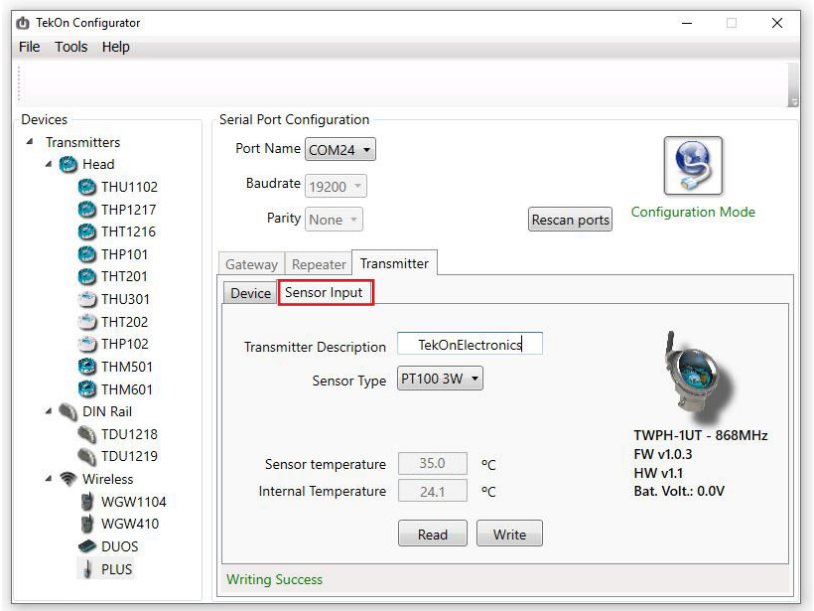


step **08**

TWPH-1UT PLUS WIRELESS TEMPERATURE TRANSMITTER CONFIGURATION

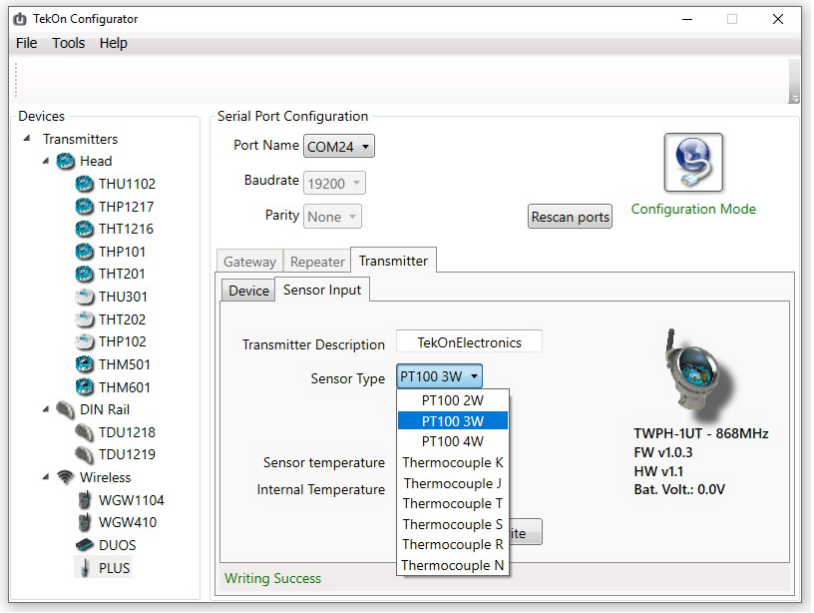
08

Click on *Sensor Input* tab.



09

Select the *Sensor Type* you will use.

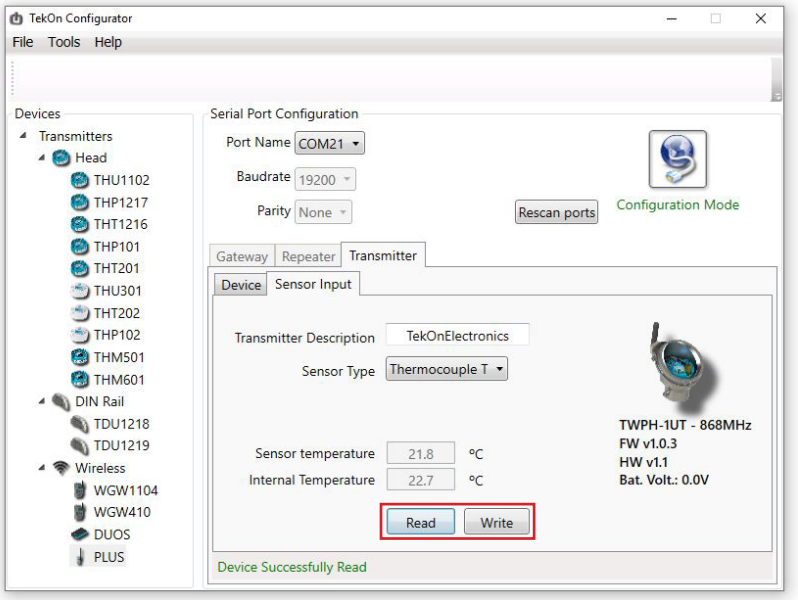


step 08

TWPH-1UT PLUS WIRELESS TEMPERATURE TRANSMITTER CONFIGURATION

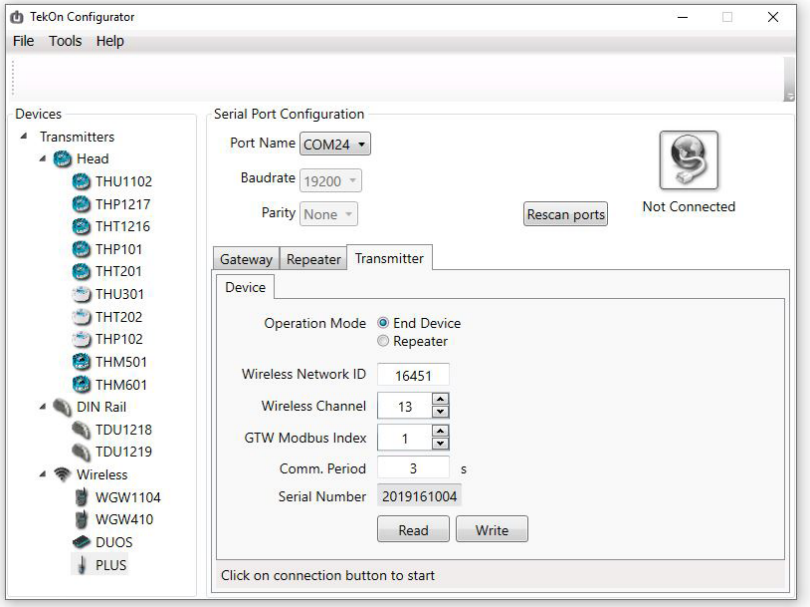
10

Click on *Write* button to update the *Transmitter* settings.
Click on *Read* button to read the sensor and internal temperature.



11

Click on *Configuration Mode* ( ) button to exit from configuration mode to normal operating mode.



After clicking on *Disconnect* button, the device will permanently attempt to connect to a wireless network.
If there is no communication, the red LED flashes slowly until the connection occurs or by 1 minute. When there's a successful connection directly to a wireless network, both status LEDs alternate quickly - during 1 minute if the transmitter is operating as end device or permanently if operating as repeater.

NOTE:
Make sure that the devices are at a distance of at least 3 meters or remove the antenna from the gateway (in case both devices are near each other).

step

09

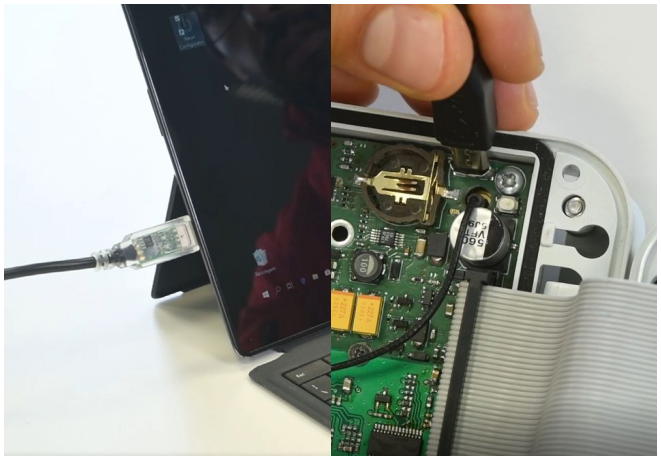
TWP-4AI4DI1UT PLUS WIRELESS TRANSMITTER CONFIGURATION

step **09**

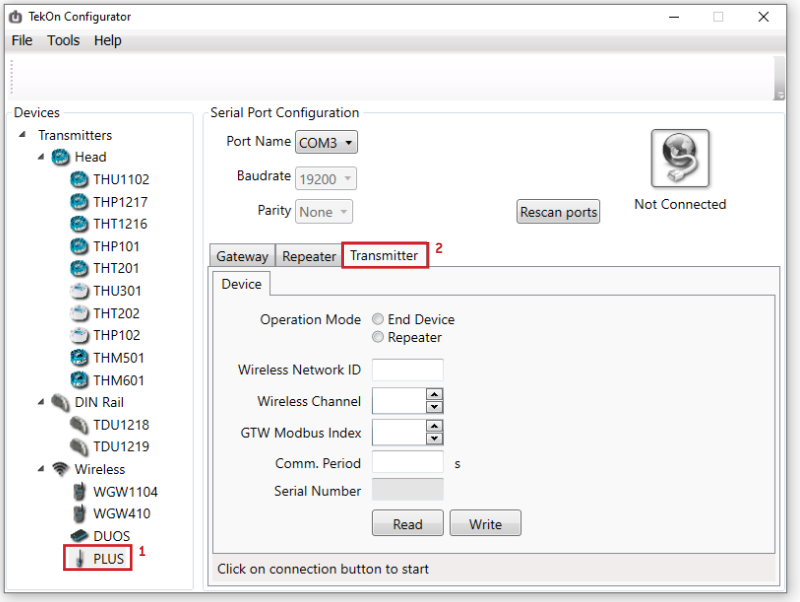
TWP-4AI4DI1UT PLUS WIRELESS TRANSMITTER CONFIGURATION

01 Loosen the 4 screws of the case and open it.

02 Connect a micro USB cable to the computer and then to *TWP-4AI4DI1UT PLUS Wireless Transmitter*.



03 Open a new window of *Tekon Configurator Software* and select *PLUS* >> *Transmitter* menu.

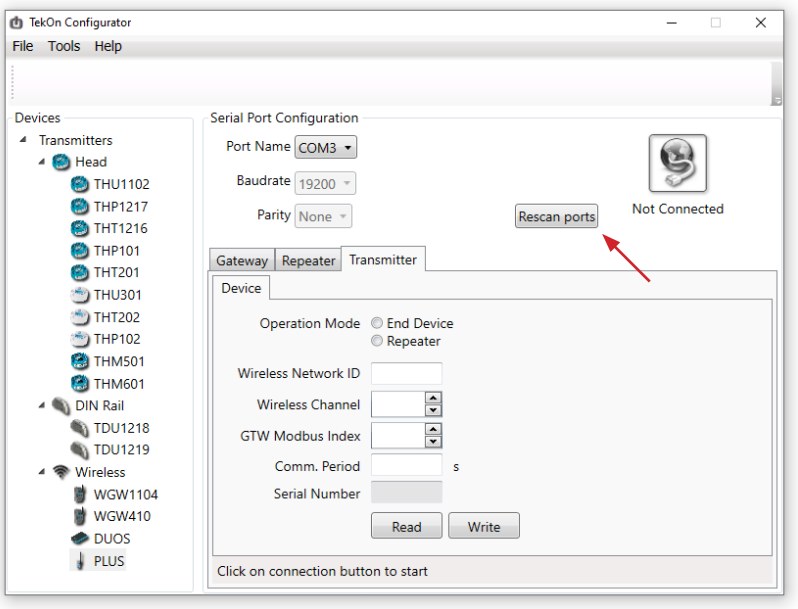


step 09

TWP-4AI4DI1UT PLUS WIRELESS TRANSMITTER CONFIGURATION

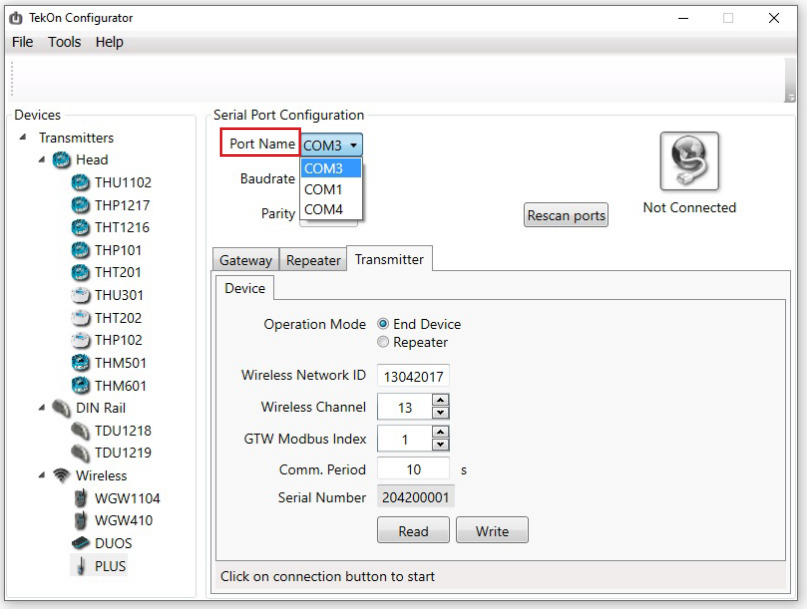
04

Click on *Rescan Ports* button.



05

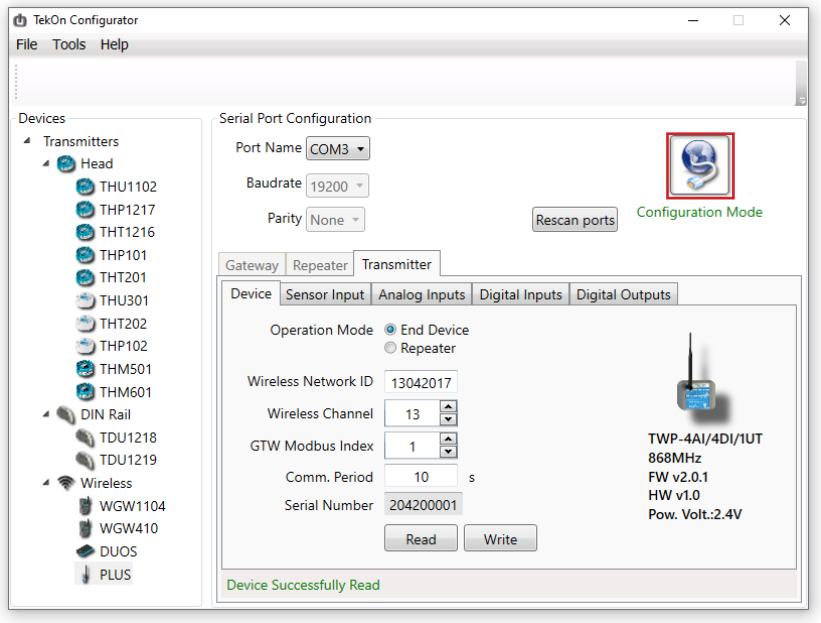
Select corresponding *Port name*[1].

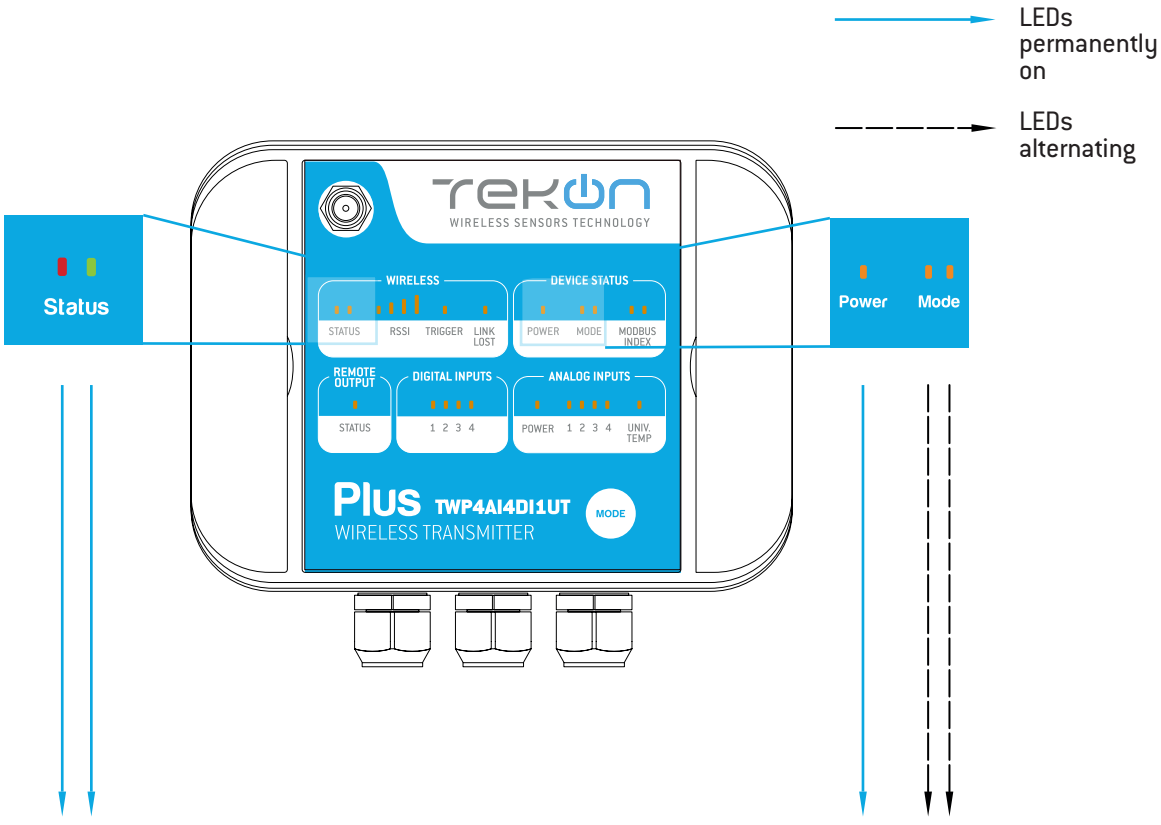


[1] You can check device's serial port name in "Device Manager" on Microsoft® Windows® operating system.

06

Click on *Configuration Mode* ( ) button.





step 09

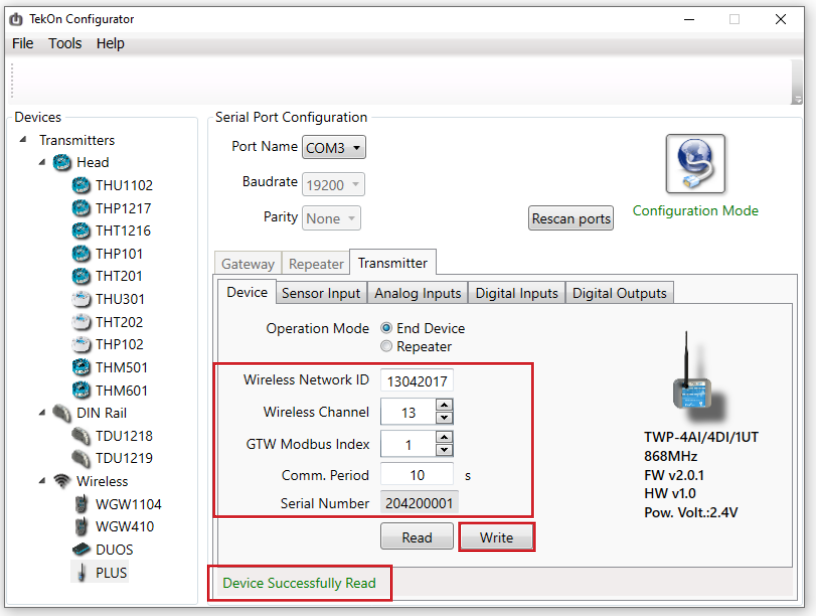
TWP-4AI4DI1UT PLUS WIRELESS TRANSMITTER CONFIGURATION

07

Configure *Wireless Network ID* and *Wireless Channel* previously obtained from *Gateway*.

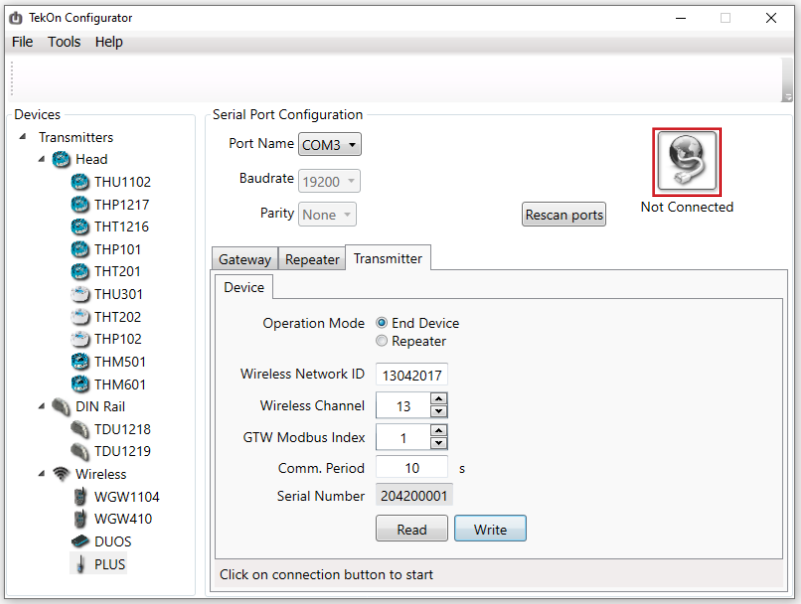
The wireless connection between both devices is ensured by setting the same *Wireless Network ID* and *Wireless Channel* parameters.
Gateway Modbus Index will define the modbus registers window used to store information sent by the transmitter.
Each transmitter should have a different *Gateway Modbus Index* in order to avoid information override.

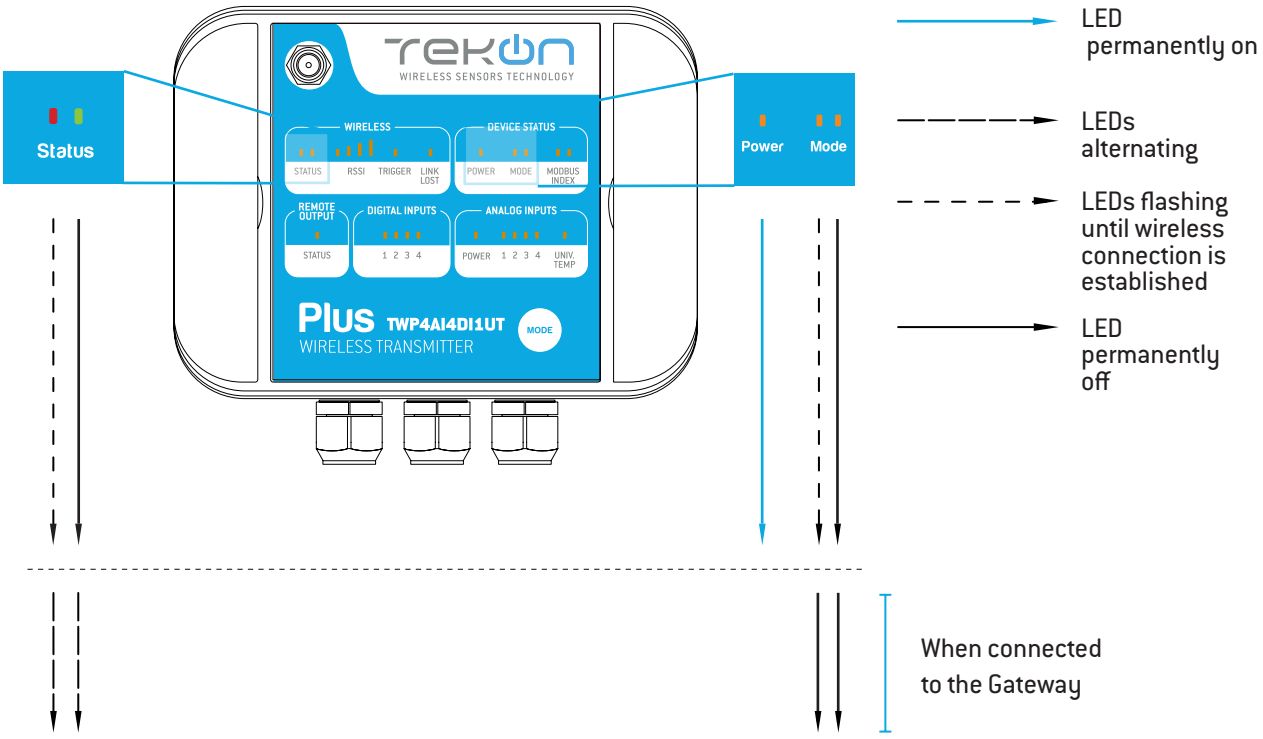
Click on *Write* button to update *Transmitter* settings.



08

Click on *Configuration Mode* ( ) button to exit setup and resume normal operating mode.





step 09

TWP-4AI4DI1UT PLUS WIRELESS TRANSMITTER CONFIGURATION

After clicking on *Disconnect* button, the device will permanently attempt to connect to a wireless network.
If there is no communication, the Status LED flashes slowly and the Mode LED flashes quickly. When there's a successful connection directly to a wireless network, both status LEDs alternate quickly - during 1 minute if the transmitter is operating as end device or permanently if operating as repeater.

NOTE:
Make sure that the devices are at a distance of at least 3 meters or remove the antenna from the gateway (in case both devices are near each other).

step

10

TWP-4AI4DI1UT TRANSMITTER ANALOG INPUT CONFIGURATION

step
10

TWP-4AI4DI1UT TRANSMITTER ANALOG INPUT CONFIGURATION

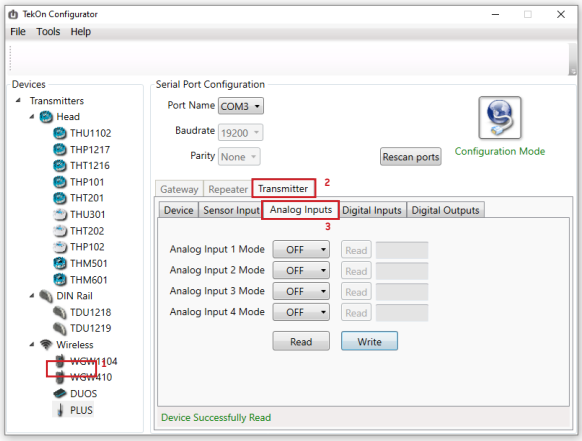
NOTE:
By default, analog inputs are switched OFF for power optimization.
Each analog input can be configured independently, as current input [0..20mA] or voltage input [0..10V]

01

To enter in *Configuration Mode* follow steps 01 to 06 of TWP-4AI4DI1UT PLUS Wireless *Transmitter* Configuration.

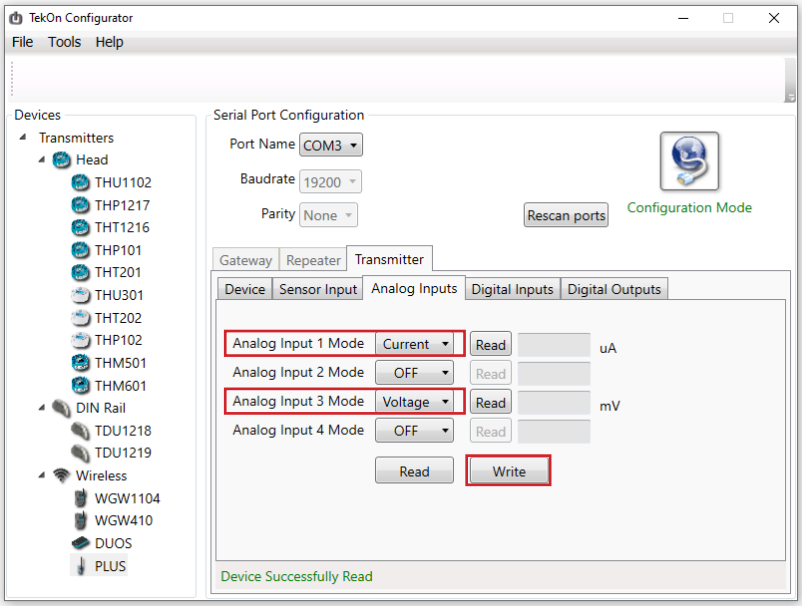
02

In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Analog Inputs* menu



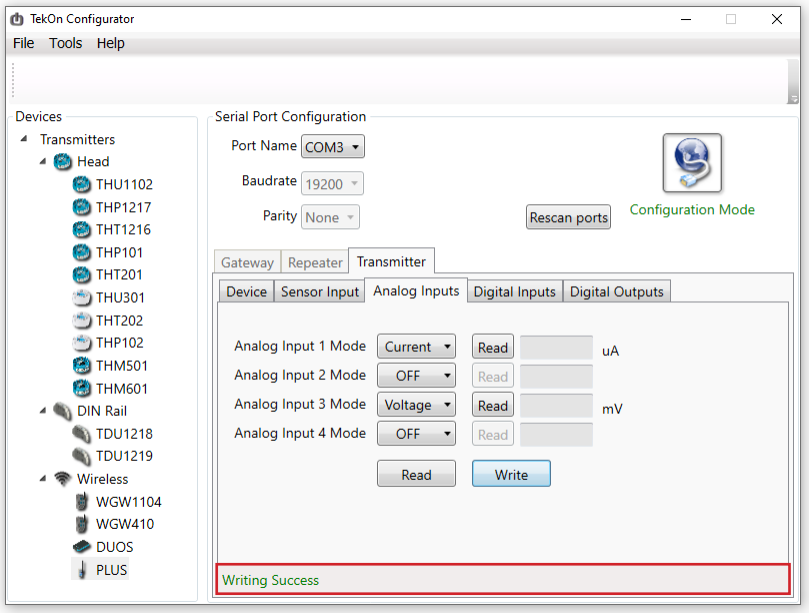
03

Select *Current* option on Analog Input 1 and *Voltage* option on Analog Input 3 operation mode and click *Write*.



04

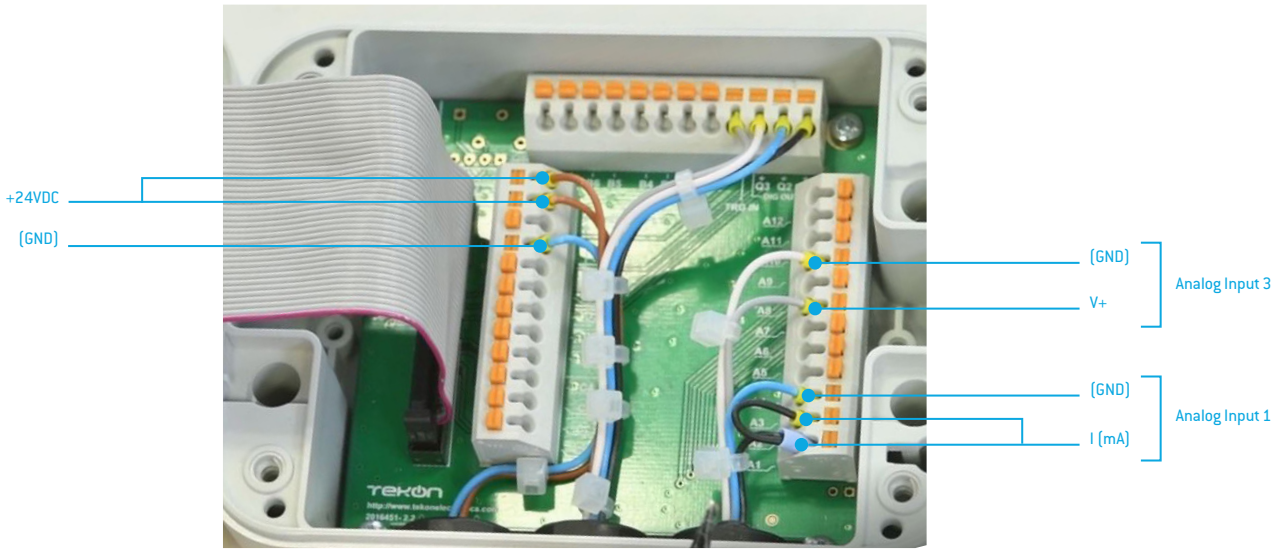
The status string at the bottom of the software window provides feedback on ongoing operations.



05

Wiring

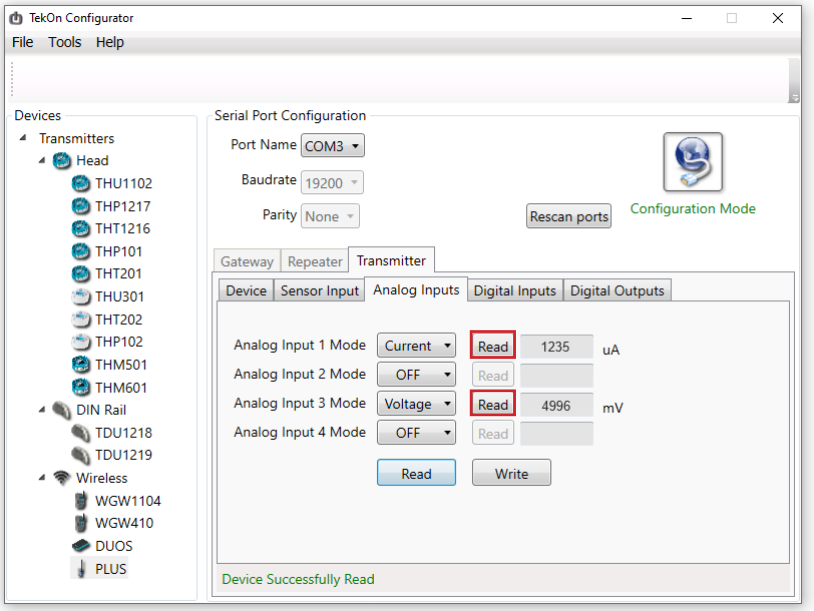
Wire the device according to the diagram below.



step
10
TWP-4AI4DI1UT TRANSMITTER ANALOG INPUT CONFIGURATION

06

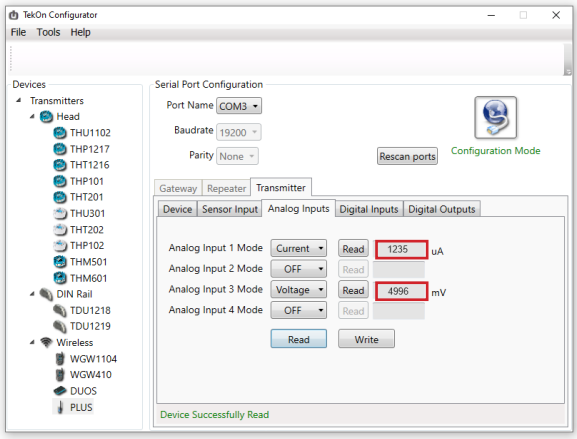
Validate configuration by clicking on *Read* button.

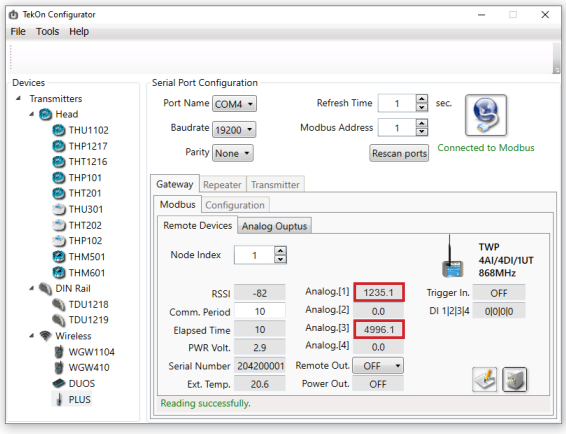


NOTE:
Configuration and Operation validated.
Measured value of current and voltage depend on the setup. In this example 12mA (12000uA) and 5V (5000 mV) are being injected.

07

Exit configuration mode and compare data sent by wireless communication.





step

11

TWP-4AI4DI1UT TRANSMITTER DIGITAL INPUTS CONFIGURATION

step
11

TWP-4AI4DI1UT TRANSMITTER DIGITAL INPUT CONFIGURATION

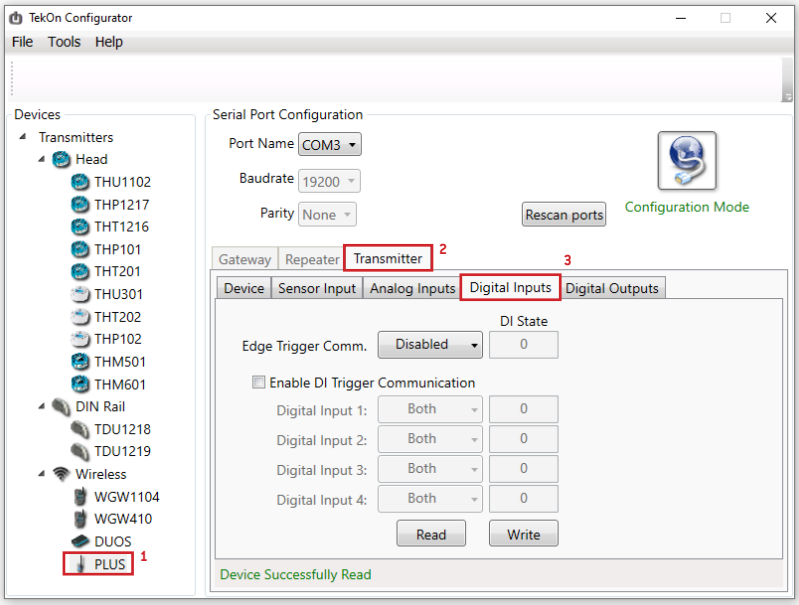
NOTE:
Sink type Digital Input.
Configuration of Digital Input Trigger.

01

To enter in *Configuration Mode* follow steps 01 to 06 of TWP-4AI4DI1UT PLUS Wireless *Transmitter* Configuration

02

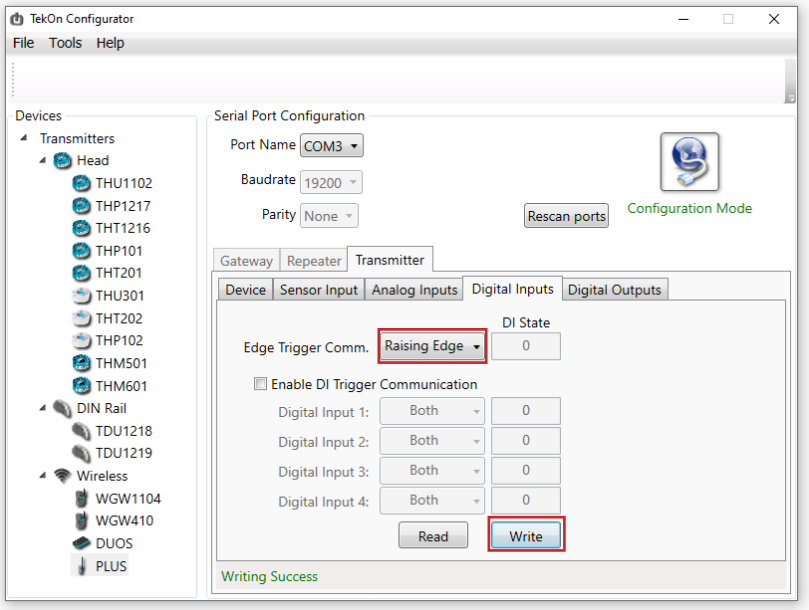
In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Digital Inputs* menu.



TWP-4AI4DI1UT TRANSMITTER DIGITAL INPUT CONFIGURATION

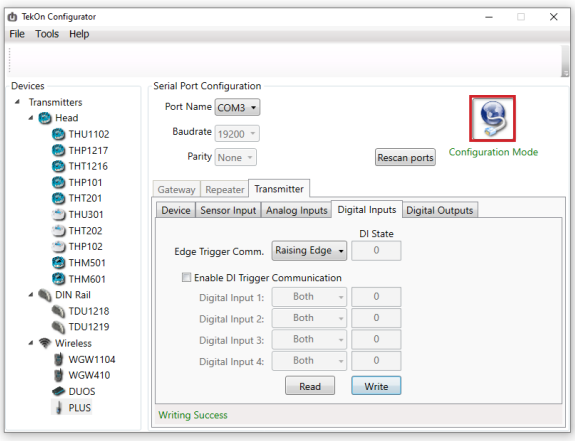
03

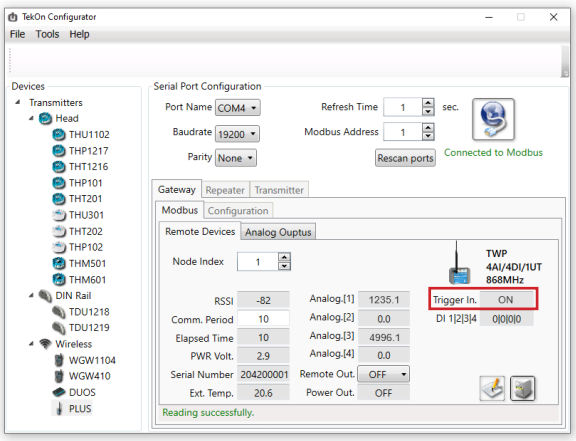
Select Operation Mode *Raising Edge* and click on *Write* button.



04

Validate functionality and click on *Disconnect* button.
Wait for the device to connect to the Gateway and observe data in Tekon Configurator window.





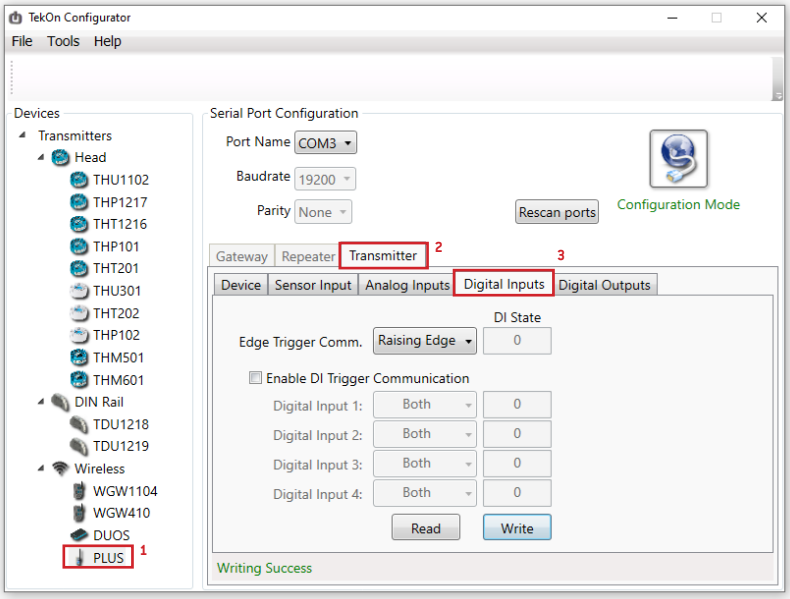
step
11

TWP-4AI4DI1UT TRANSMITTER DIGITAL INPUT CONFIGURATION

NOTE:
Digital Inputs configuration

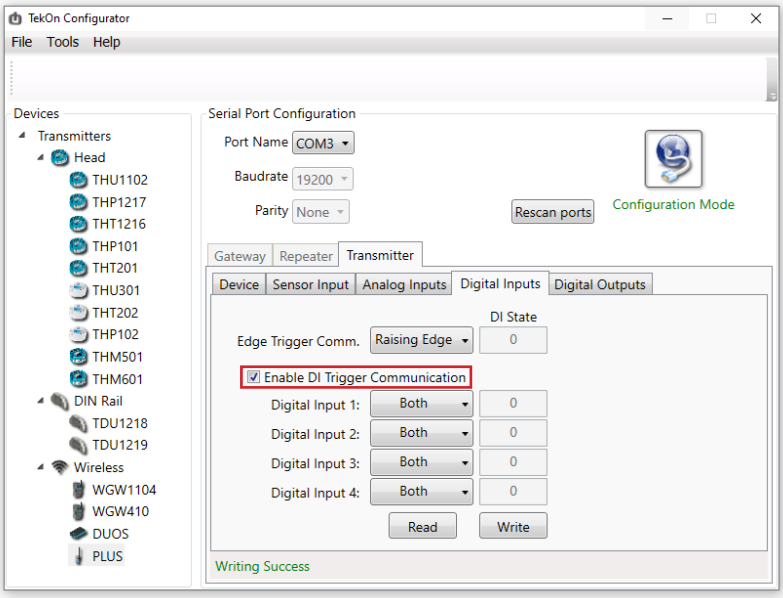
05

In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Digital Inputs* menu.



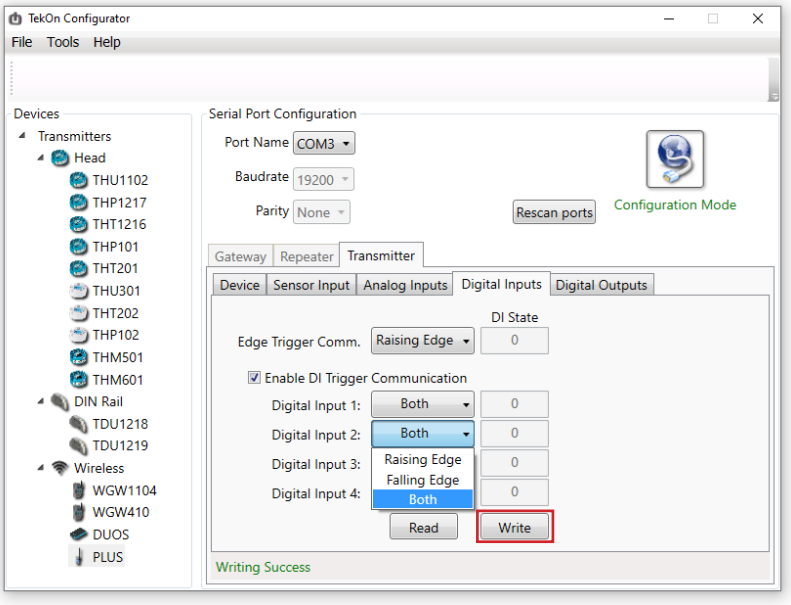
06

Click on the checkbox *Enable DI Trigger Communication* to enable the digital inputs configuration.



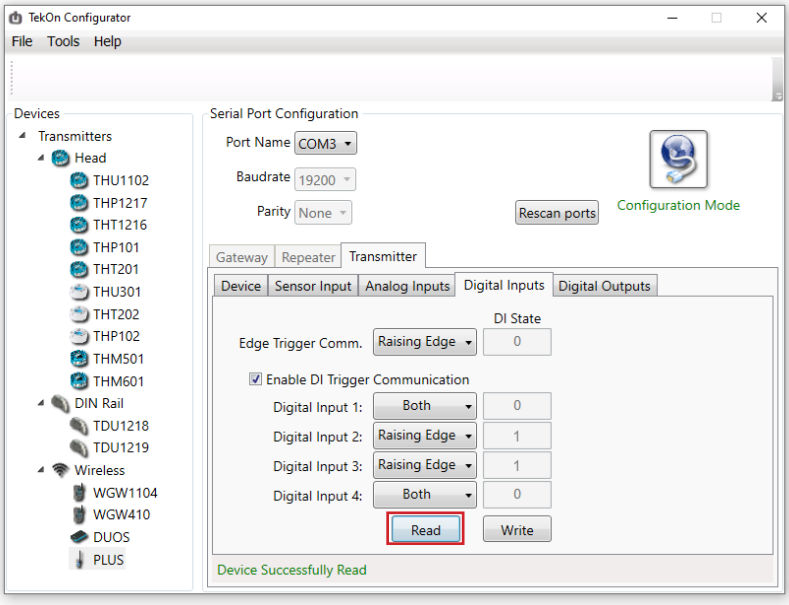
07

Select the *Event Trigger* for each connected digital input and click on *Write* button



08

Change the digital input state and click on *Read* to check the state of the digital inputs.

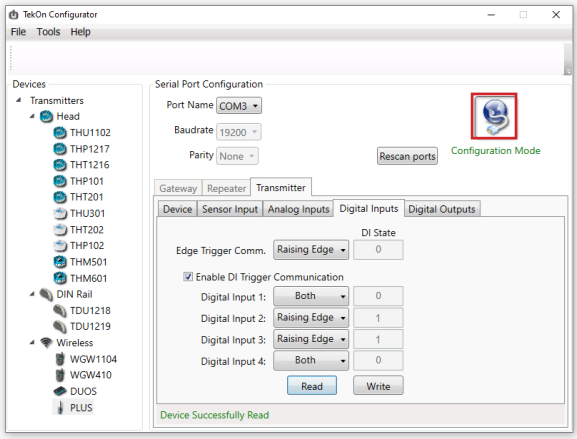


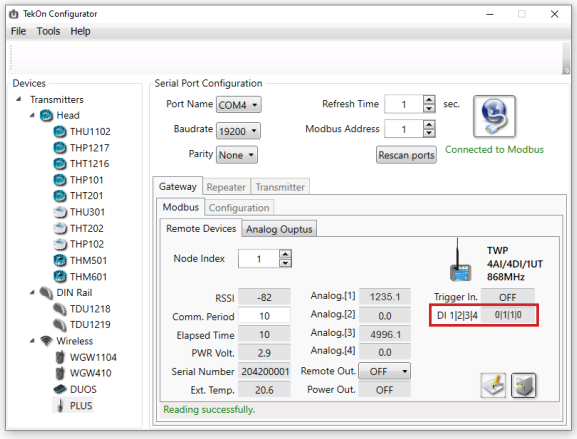
step
11

TWP-4AI4DI1UT TRANSMITTER DIGITAL INPUT CONFIGURATION

09

Validate functionality and click on *Disconnect* button.
Wait for the device to connect to the Gateway and observe data in Tekon Configurator window.
Trigger an event on your digital inputs and observe an earlier communication and the state of each Digital Input.





step

12

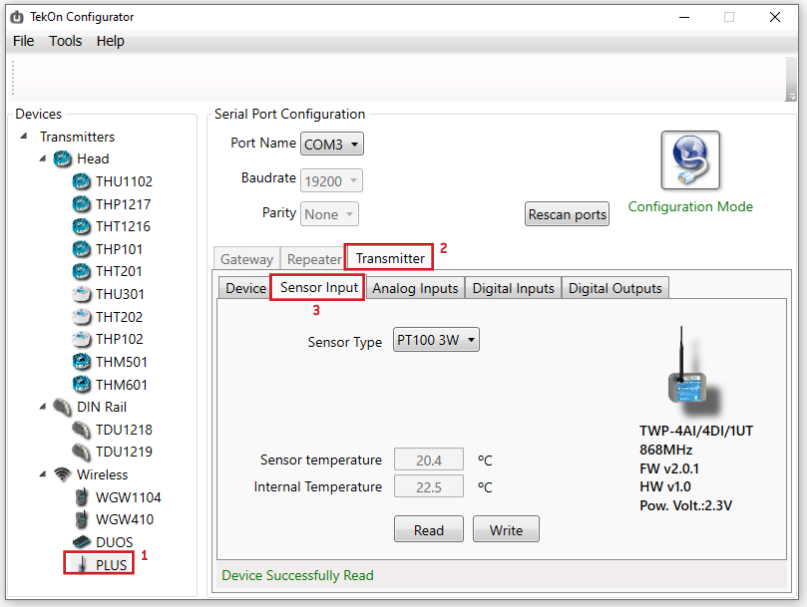
TWP-4AI4DI1UT TRANSM. UNIV. TEMPERATURE INPUT CONFIGURATION

step
12

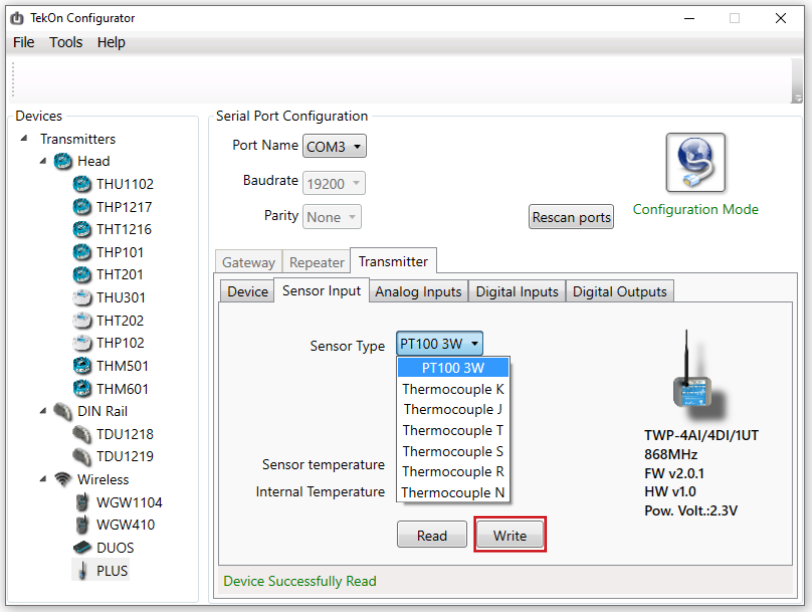
TWP-4AI4DI1UT TRANSMITTER UNIVERSAL TEMPERATURE INPUT CONFIGURATION

01 To enter in *Configuration Mode* follow steps 01 to 06 of TWP-4AI4DI1UT PLUS Wireless *Transmitter* Configuration

02 In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Sensor Input* menu.



03 Select the *Sensor Type* connected to the transmitter universal temperature input and click on *Write* button.

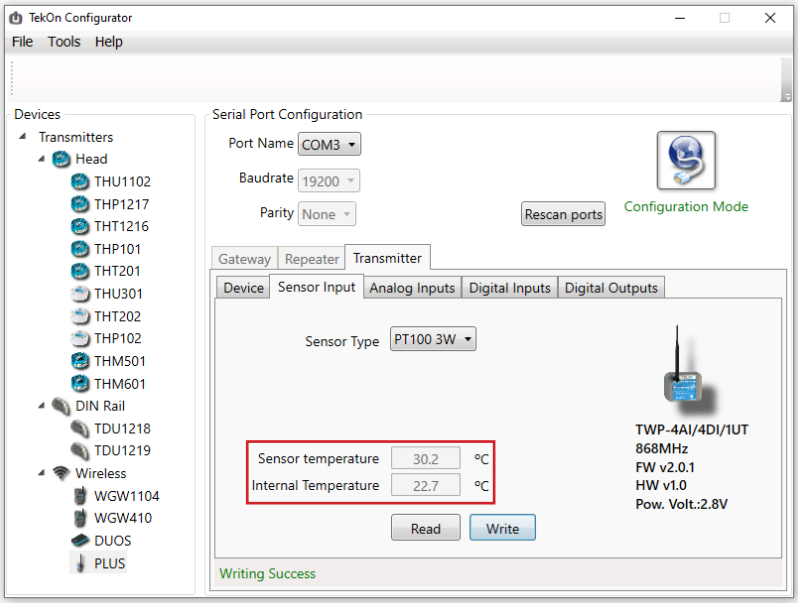


step **12**

TWP-4AI4DI1UT TRANSMITTER UNIVERSAL TEMPERATURE INPUT CONFIGURATION

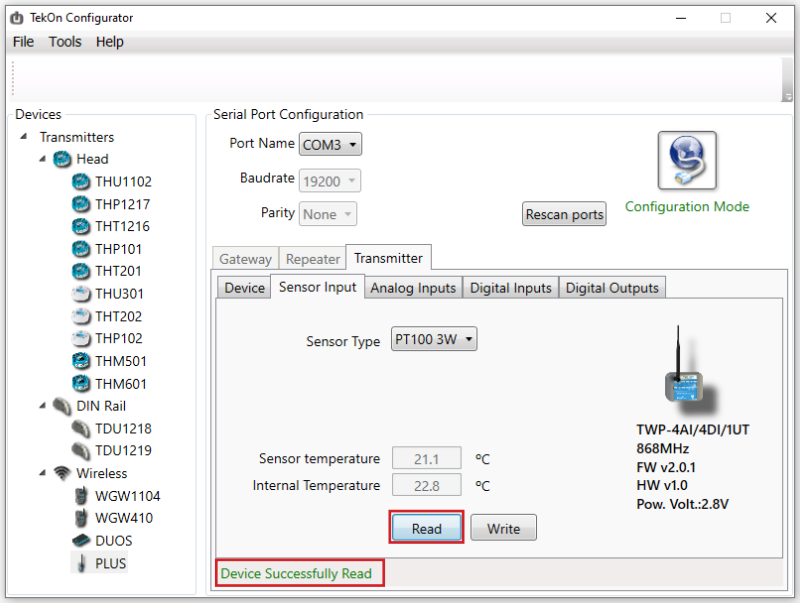
04

You can check the *Sensor Temperature* and *Internal Temperature* from the transmitter.



05

Click on *Read* button to update the temperature readings and wait for the read success message.



NOTE:
If the readed value is "*65535*", please check the presence of temperature probe and its connection.

step

13

TWP-4AI4DI1UT TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

step **13**

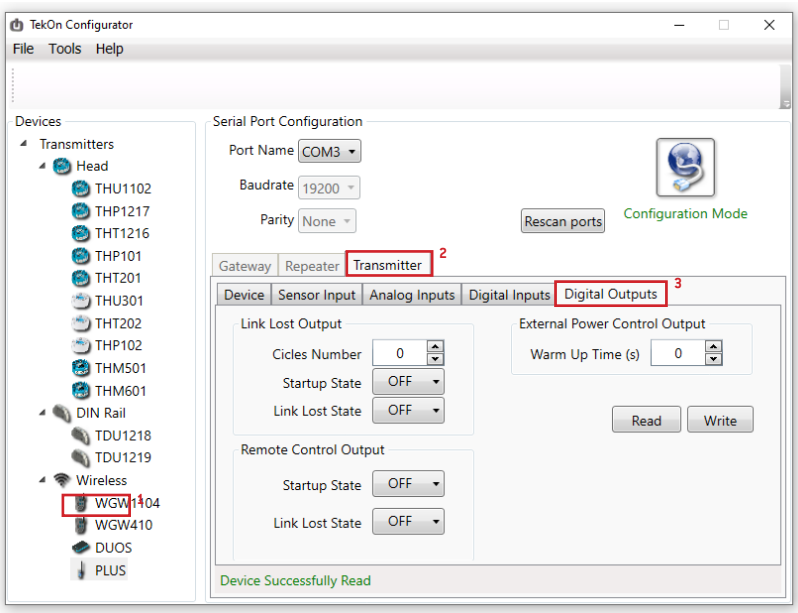
TWP-4AI4DI1UT TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

01

To enter in *Configuration Mode* follow steps 01 to 06 of TWP-4AI4DI1UT PLUS Wireless *Transmitter* Configuration

02

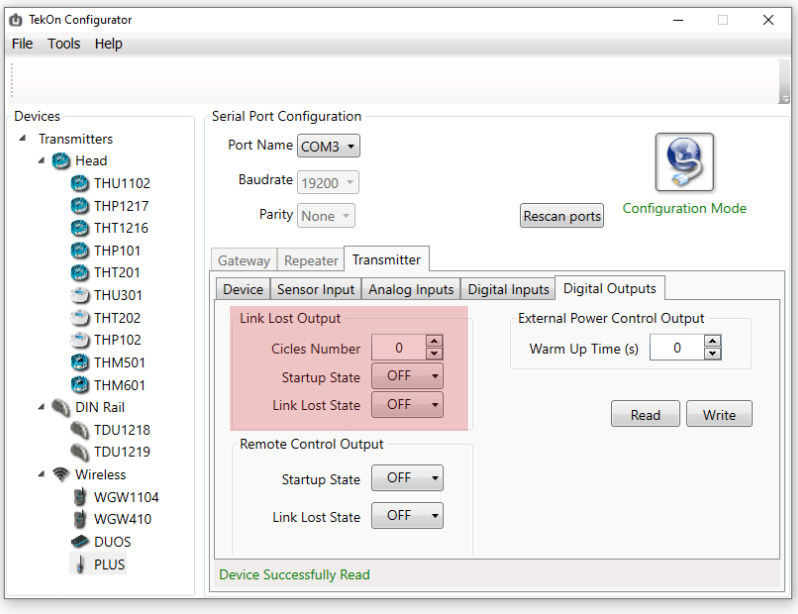
In *Tekon Configurator Software* select *PLUS* >> *Transmitter* >> *Digital Outputs* menu



03

Link Lost Output

Output that outputs wireless connection state of the device.

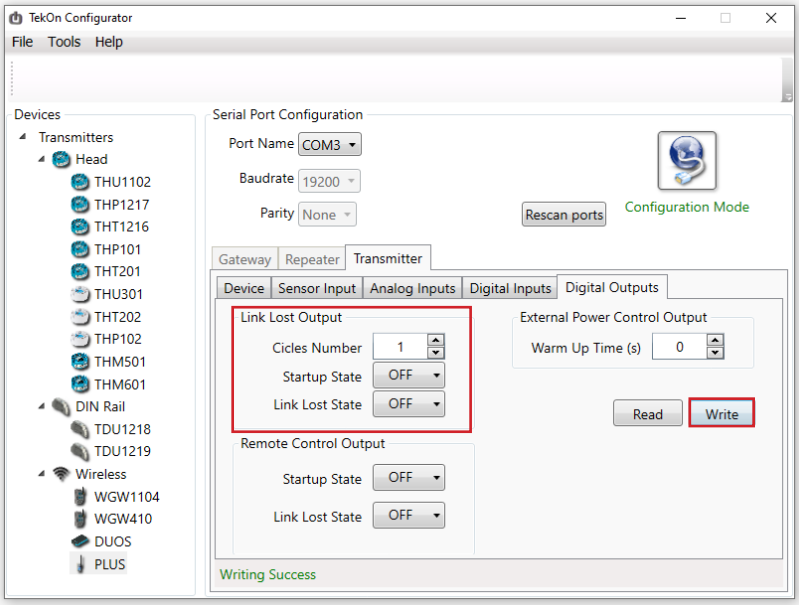


step
13

TWP-4AI4DI1UT TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

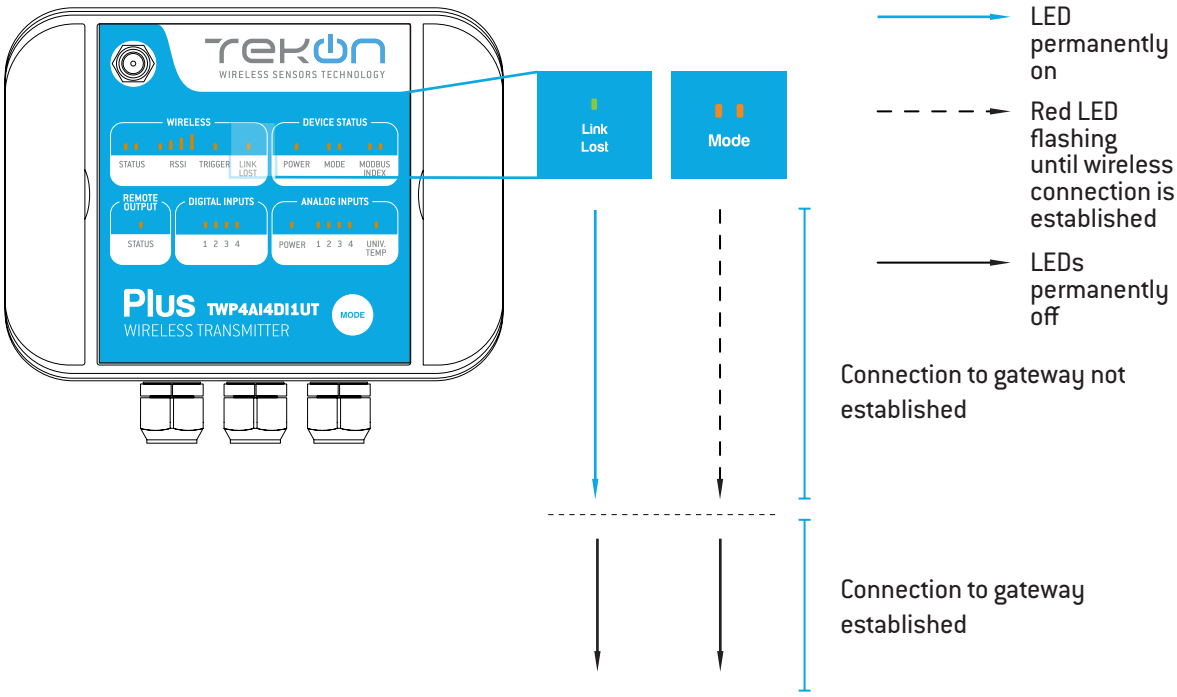
03.1

Select *cycle number*, *start-up state* and *link lost state* and click on *Write* button.



03.2

Exit configuration mode and verify setup by checking LEDs indicators..



TWP-4AI4DI1UT TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

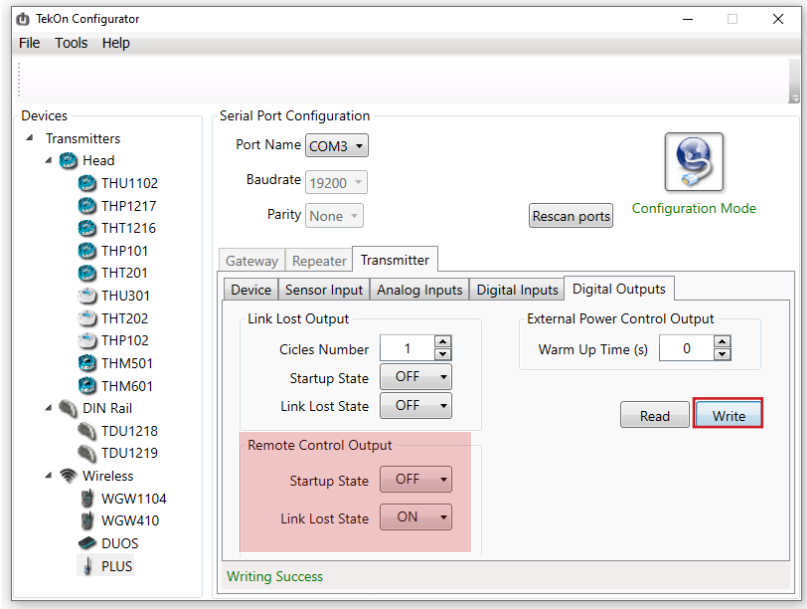
step **13**

04 Remote Control Output

Digital output remotely controlled by Gateway modbus protocol.

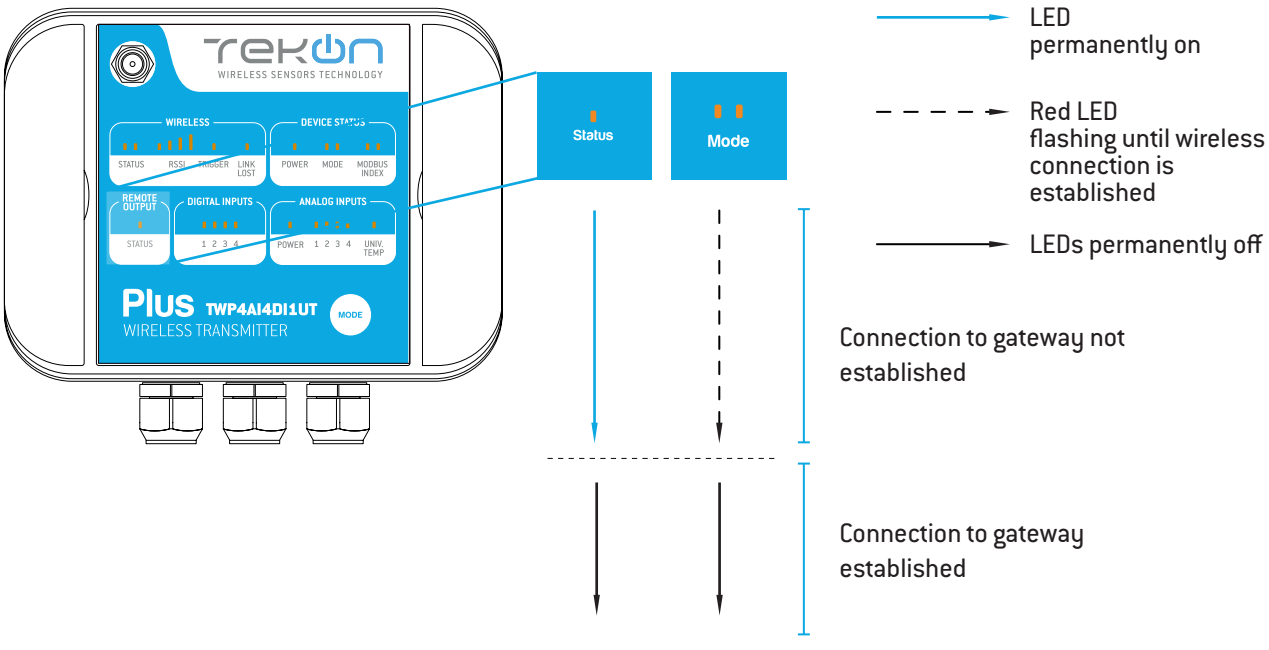
04.1

Define *Start-up state* and *Link lost state.* Click on *Write* button.



04.2

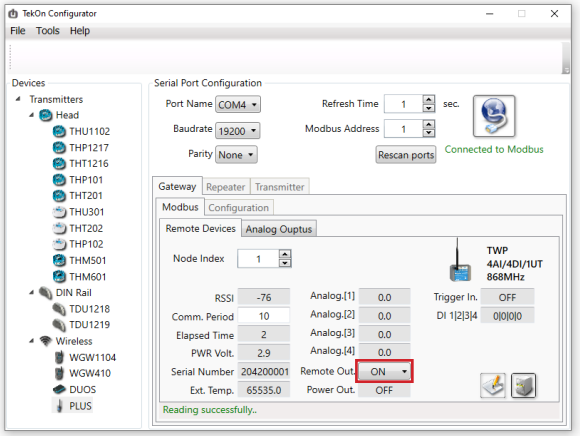
Exit configuration mode and verify setup by checking LEDs indicators.

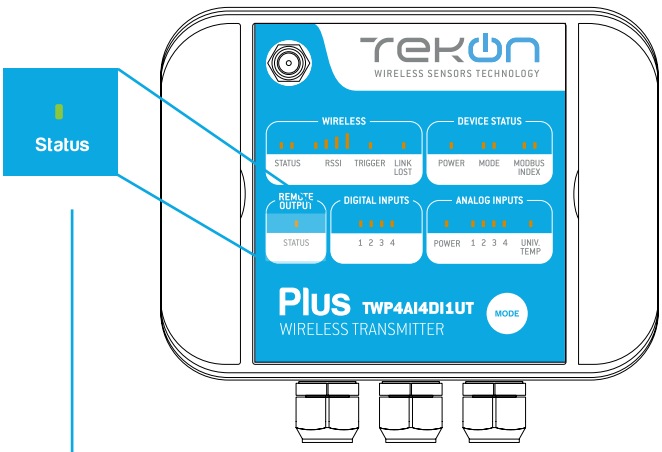


step
13
TWP-4AI4DI1UT TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

04.3

Using the Tekon Configurator you can change the State of Remote Output by setting the modbus register on the gateway. The Gateway will send the information in the next time the transmitter performs a communication.





LED permanently on

05

External Power Control Output

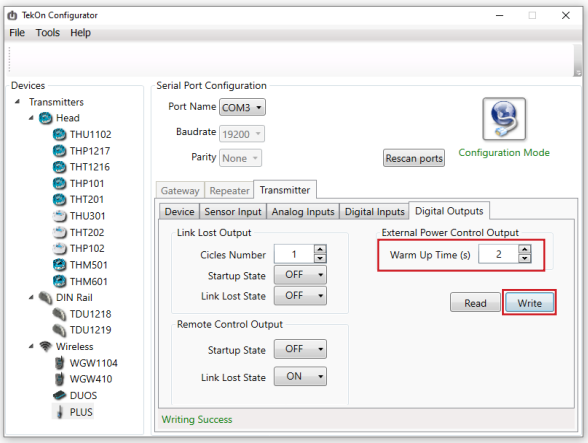
Time configurable output to power on an external device before data acquisition and transmission.

step **13**

TWP-4AI4DI1UT TRANSMITTER DIGITAL OUTPUTS CONFIGURATION

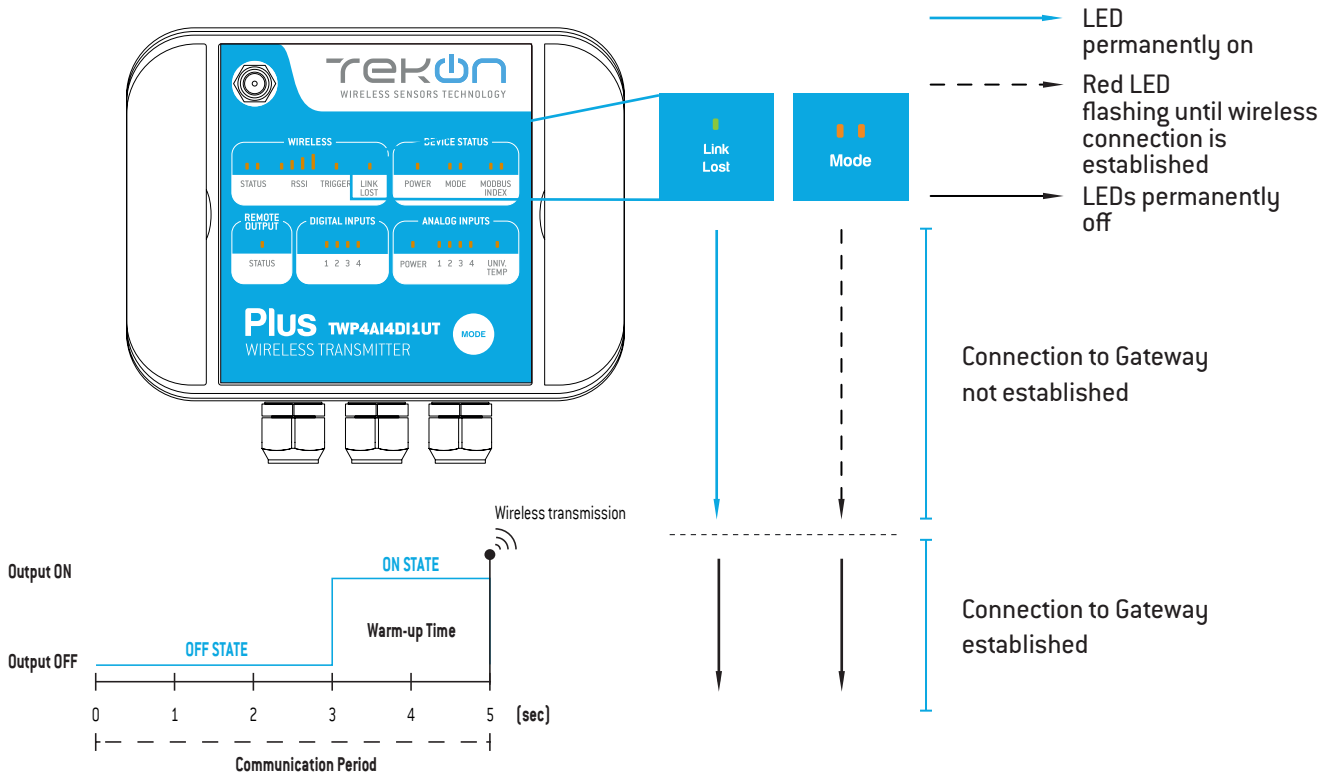
05.1

Define *Warm up time* and click on the *Write* button.



05.2

Exit configuration mode and verify setup by checking LEDs indicators.



NOTE:
Diagram only applies after the transmitter and gateway are connected.

step

14

SITE SURVEY MODE

step **14**

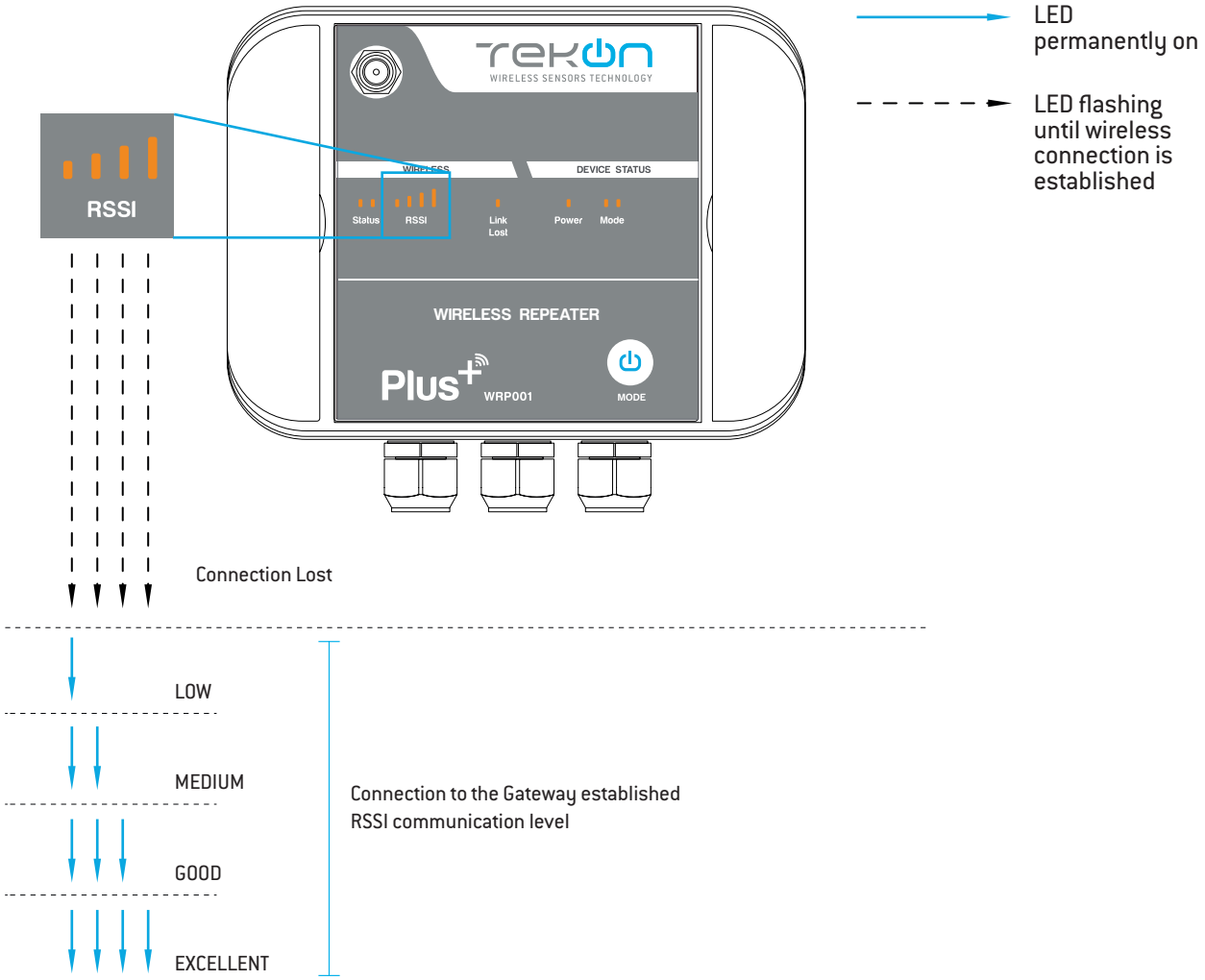
SITE SURVEY MODE

Refers to following devices: *TWP4AI Transmitter*, *TWP-4AI4DI1UT Transmitter*, *WRP001 Repeater* and *TWPH-1UT Transmitter.*
Site survey mode is a tool that allows a quick wireless signal strength evaluation at the site of installation. It doesn't require additional equipment or software.

01

Press and hold Mode (⏻) button untill Status LEDs are permanently on and Mode LEDs flash.

RSSI LEDs indicate the signal strength.



02

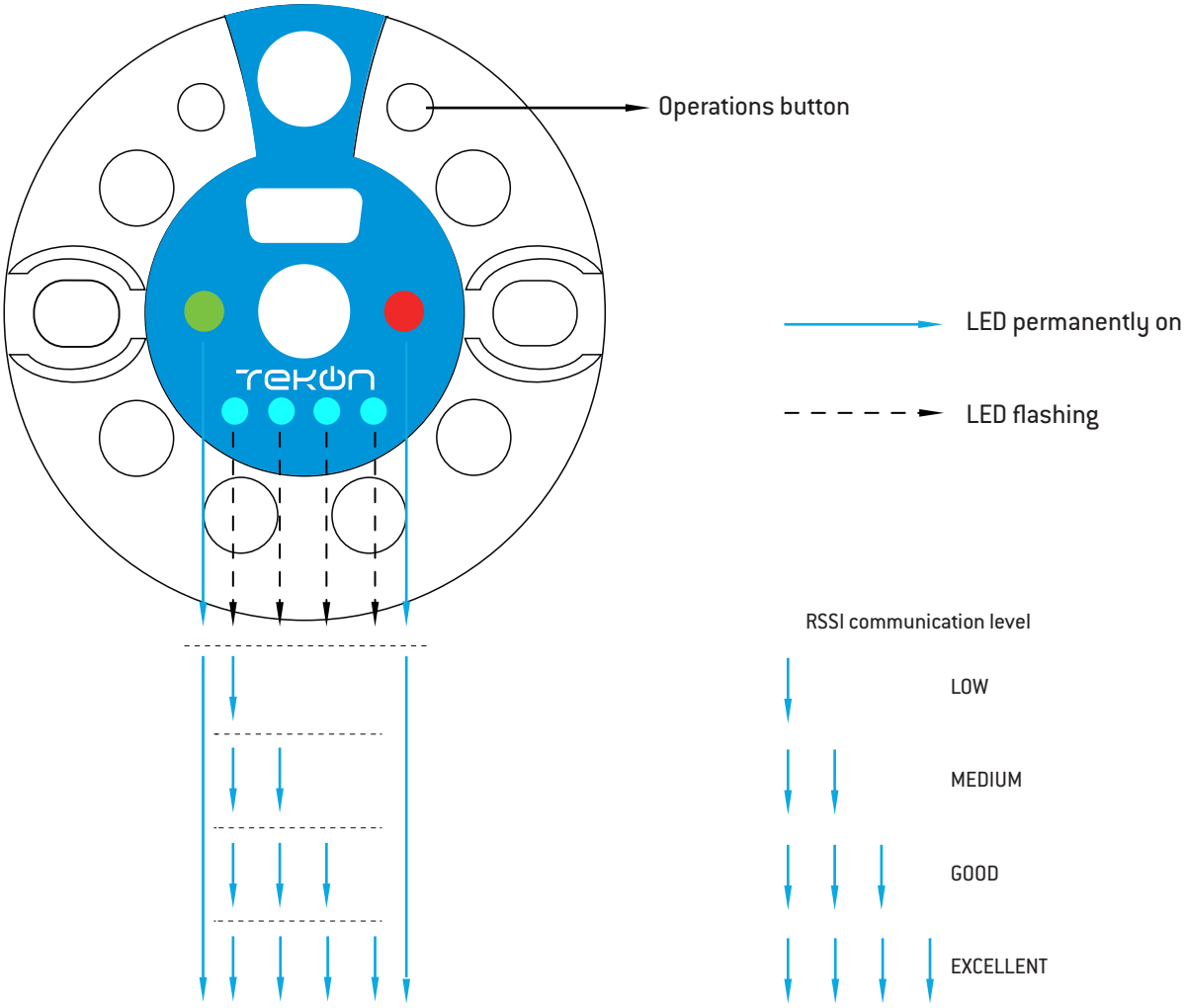
Press and hold Mode (⏻) button untill RSSI LEDs switch off and device resumes normal operation mode.

step
14
SITE SURVEY MODE

03

Press and hold operations button for 3 seconds. Red and green LEDs will stay on.

Blue LEDs indicate the signal strength.



04

Press and hold operations button for 3 seconds to exit Site Survey Mode and activate normal operation mode.

TEKON ELECTRONICS
a brand of Bresimar Automação S.A.

Quinta do Simão
3800-230 Aveiro
PORTUGAL

Sales
P.: +351 234 303 320
M.: +351 933 033 250
E.: sales@tekonelectronics.com

Technical Support
E.: support@tekonelectronics.com

Cofinanciado por:

COMPETE 2020

PORTUGAL 2020

UNIÃO EUROPEIA
Fundo Europeu
de Desenvolvimento Regional