



**Machine To Cloud
Solutions**

Wireless Modbus Solution



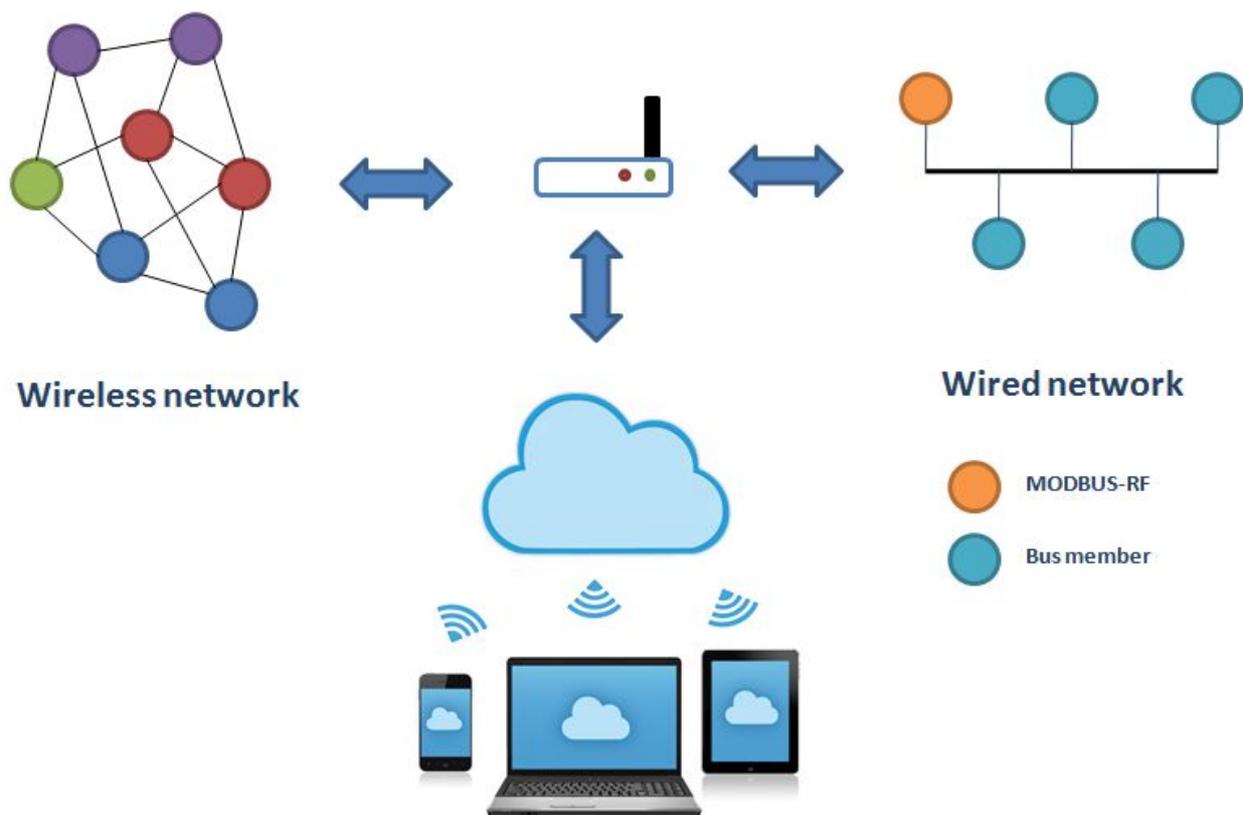
Datasheet
Ref. modbus-rf
Rev. 1.0

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The purpose of the Wireless Modbus device is to create a wireless link between a wired Modbus network and some others areas of the work area. It allows to create a global wireless solution in environments where both wired and wireless networks work together.

In the image below the relevant elements of this solution are shown. The MODBUS_RF element within the wired network turns it into a wireless system, what is connected with the cloud over a gateway. Both wireless and wired network can be monitored from anywhere by using a smartphone or tablet.

The cloud service also allows the user to record data in a database for future data analysis.



Features

- Both Half-Duplex and Full-Duplex mode supported
- DIN rail enclosure
- Screw type connectors
- External power needed
- SMA type antenna connector
- 5 LED interface
- 2 digital output/input pins

Specifications

Absolute Maximum Ratings⁽¹⁾

		MIN	MAX	UNIT
Input Voltage	PB1	-0.3	4	V
	PB2	-0.3	4	
	V _{DD}	4	30	
	A	-8	13	
	B	-8	13	
	Y	-8	13	
	Z	-8	13	
I/O current	PB1		0.05	A
	PB2		0.05	
	A		0.25	
	B		0.25	
	Y		0.25	
	Z		0.25	

⁽¹⁾Stress beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, the product is not intend to work beyond those conditions. Exposure to “Absolute Maximum Ratings” conditions for extended periods may affect device reliability.

Handling Ratings

		MIN	MAX	UNIT
Storage Conditions	T _{STG}	-20	50	°C
	H _{STG}	10	80	%RH
Operation Conditions	T _O	0	50	°C
	H _O	30	80	%RH

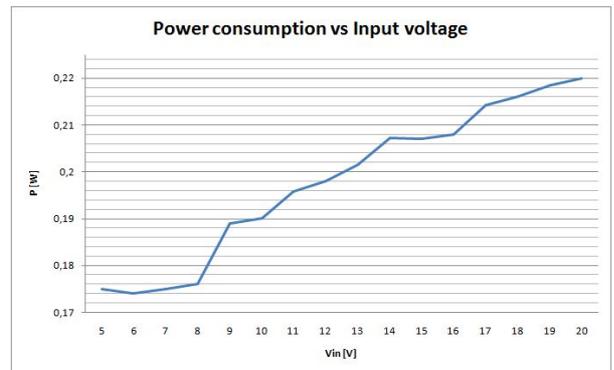
Mechanical Data

		UNIT
Material	PC [polycarbonate]	
Color	White	
Width	36	mm
Height	90	mm
Depth	58	mm
Mounting Type	35mm DIN Rail/Flat surface	
Protection Class IP	IP20	
Display Version	5 LED	

Electrical Characteristics

The electrical ratings specified in this section apply to all specifications in this document, unless otherwise noted. $T_A = 25^\circ\text{C}$, $V_{DD} = 12\text{V}$.

		MIN	TYP	MAX	UNIT
Input Voltage	V_{DD}	5	12	24	V
	PB1	0	3.3	3.6	
	PB2	0	3.3	3.6	
Supply Current	I_{DD}		0.016	0.02 ⁽¹⁾	A



⁽¹⁾When RF is working

RF Characteristics

	MIN	TYP	MAX	UNIT
Transfer Rate		60		Kbs
Operating Frequency	868	⁽¹⁾	915	MHz
Power		0	14	dBm

⁽¹⁾Operating frequency depends on the region. Different operating frequency can be set via firmware to meet specific requirements

RS485 Characteristics

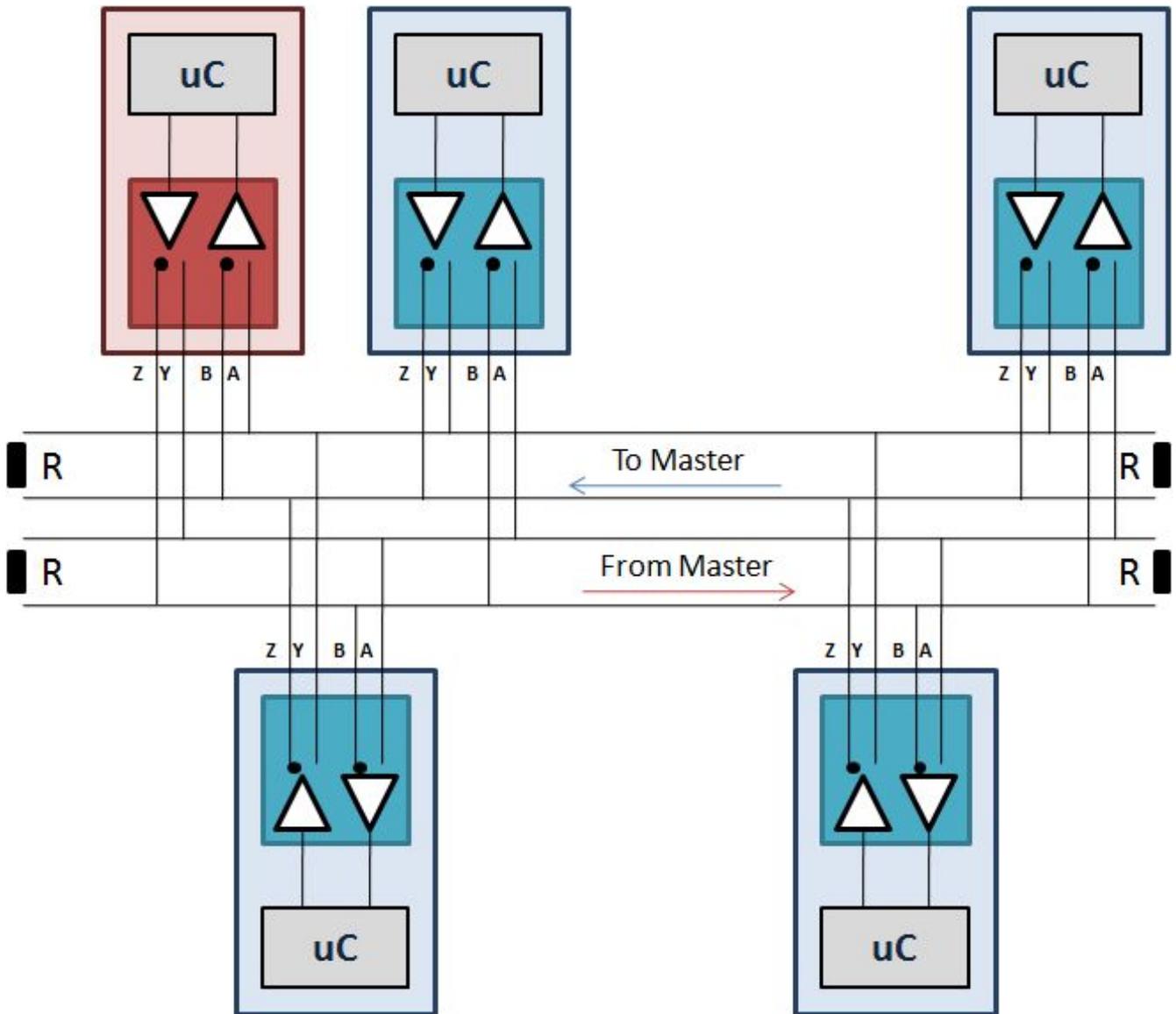
	MIN	TYP	MAX	UNIT
A, B, Z, Y Voltage	-7		12	V
Data rate ⁽¹⁾			10	Mbps
Cable length ⁽²⁾			1220[4000]	dBm

⁽¹⁾At 12m

⁽²⁾At 100 Kbps

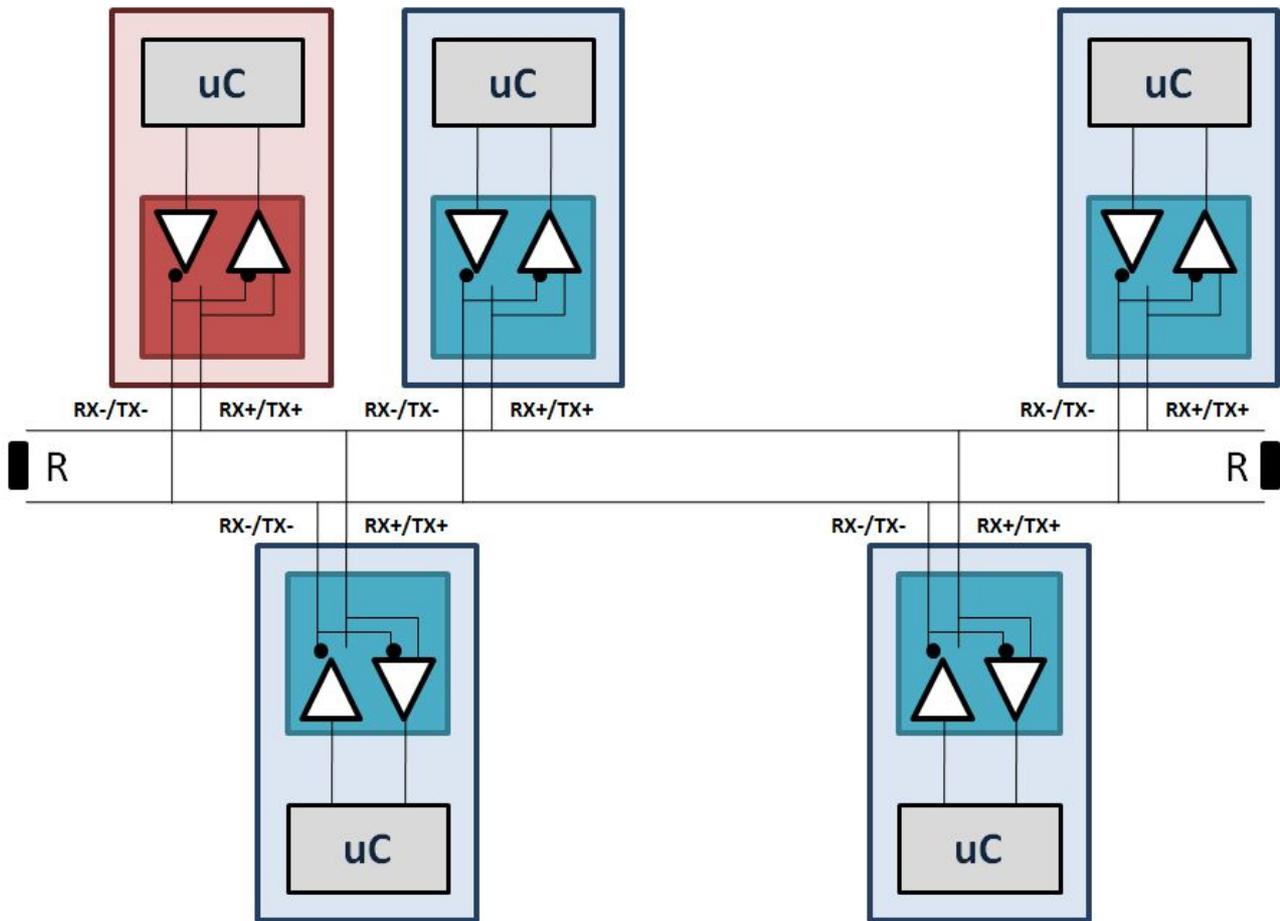
Connection Scheme

Full-Duplex Configuration



Connection Scheme

Half-Duplex Configuration



In half-duplex mode, connect the inverting and non inverting pin of the device with the inverting and non inverting pin of the bus, respectively.

RX-/TX- → inverting pin
 RX+/TX+ → non inverting pin

Installation

RS485 pins must be connected as shown in the previous images. Power pins must be connected according with recommended conditions in Electrical Characteristics.

System Pin Out



LED Display

LED diodes are included with the purpose of telling the user what is happening inside the device. LED behaviour is defined as follows

- All LED will blink once after reset.
- LED0 will blink once after an error while sending a RF message
- LED1 will blink once after a correct Modbus register reading.
- LED2 will blink once after a correct RF package sent.
- LED3 is always ON. It indicates whether or not the system is powered.
- LED4 will blink once when a RF package is received.

This allows the user to quickly check the source of a communication problem. However, application software shows more detailed information about the error.

Output Pins

The system contains two digital output pins controllable via radio. Please check the user manual for more information about the software interface.

Interface

The interface is used to read or write the Modbus registers.

It can be access by typing 192.168.1.107 into your web browser.

After that it is going to appear the following picture where you should type:

User name (Usuario): admin

Password (Contraseña): M2Cadmin



Figure 1.

Once you have access, you are going to be in start menu (Inicio), where you are able to write in a single register.

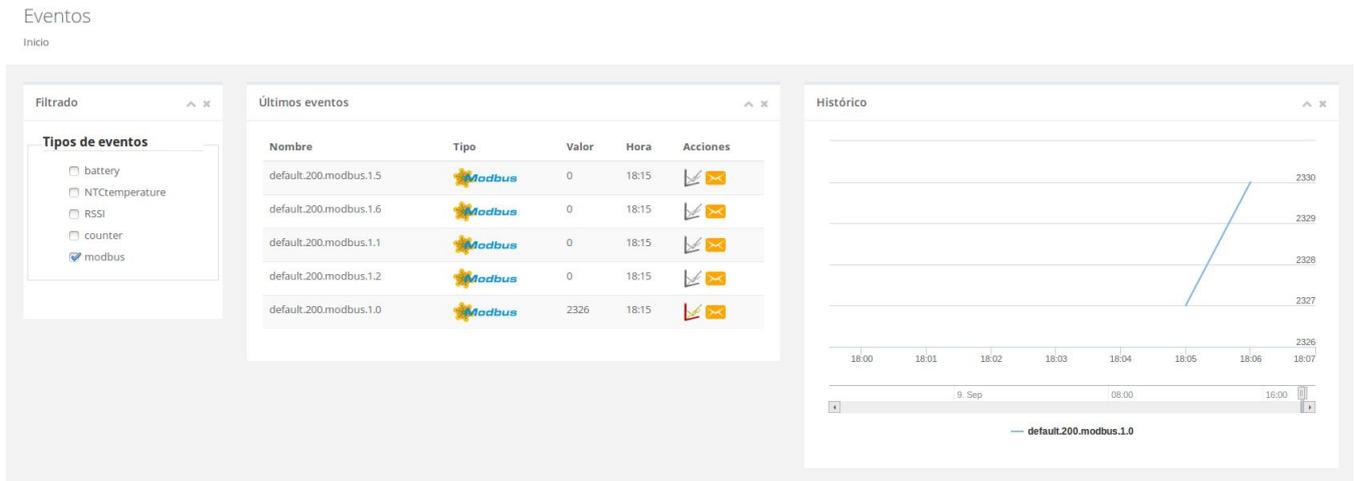


Figure 2.

In the picture at the right you can select different types of events (Tipo de eventos), in your case you have to select modbus as shown in the picture.

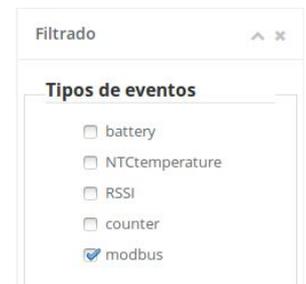


Figure 3.

After that it is going to appear the following image:

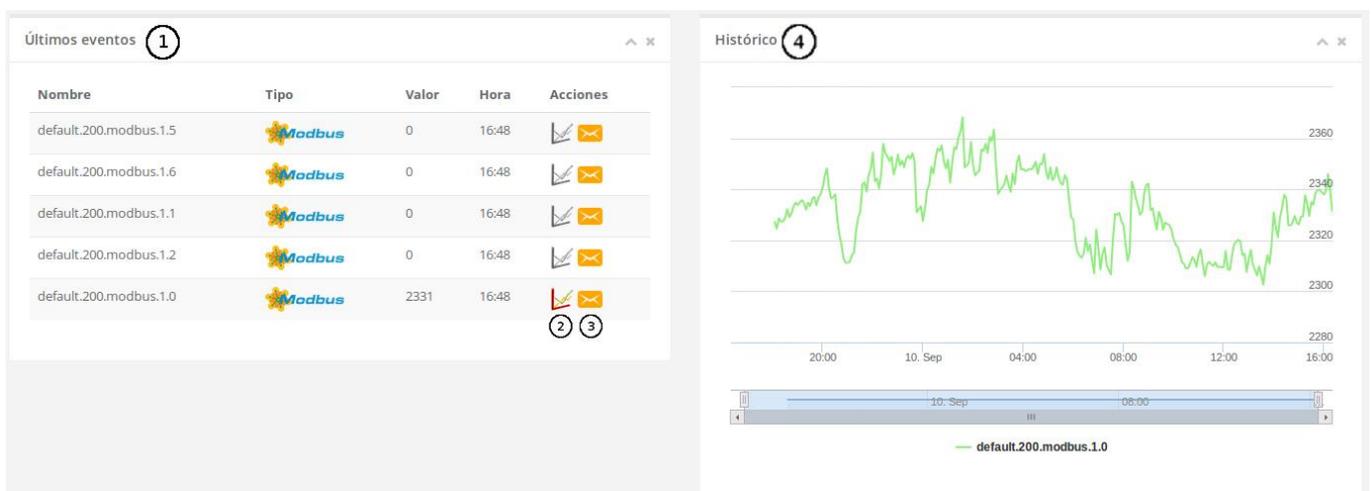


Figure 4.

In the Figure 4. You can see different sections.

1. It is shown last events (últimos eventos). Where is possible to see the name and characteristics of the Modbus, view a graph or assign a new value to the Modbus.

It is possible to see the characteristic in the name:



Figure 5.

1. Radio's address
2. Modbus address that is sent the message
3. Modbus register that is sent the message.

2. If you click on it , it is possible to show the graph in 4.
3. The envelope symbol allows you to send a message to the Modbus register indicated
4. Graph (Histórico). It is possible to show the graph of the different Modbus registers.

If you want to configure the wireless ModBus you have to click in Configuración -> Wireless ModBus (Figure X.)

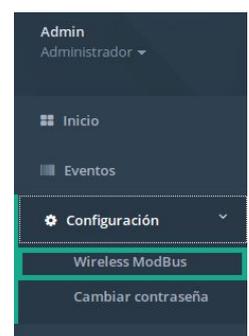


Figure 6.

In the Figure 7. You can set up the wireless Modbus for a continuous reading configuration or single reading configuration, among other options.

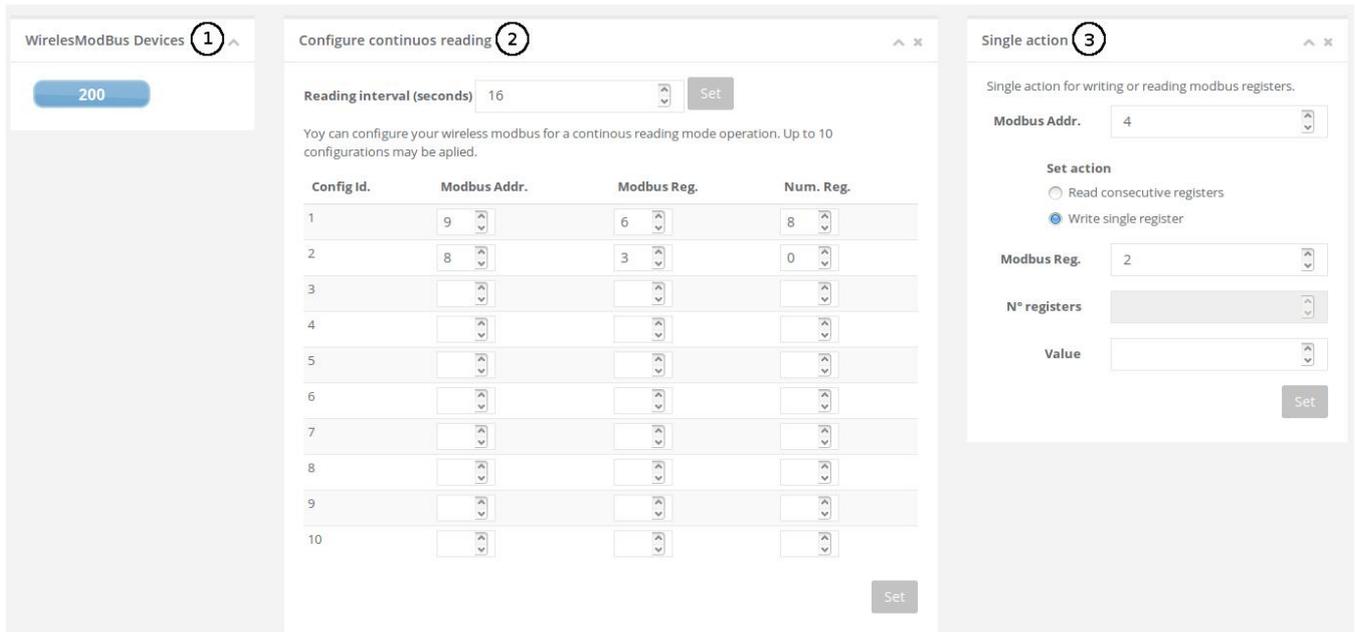


Figure 7.

1. You can select the Wireless Modbus Devices
2. It is possible to configure a continuous reading.
 First of all, you can set reading interval in seconds. The table below lists your wireless modbus for continuous reading, you are allow to select the Modbus address, Modbus register and the number of registers that you want to read.
 ** If you write a zero in number of Register you will delete the configuration of that line.
 ** The maximum number of configurations is 10.
3. This allows you to read or write Modbus registers. First you select the Modbus address, and then you can select if you want to read consecutive register or write single register. If you chose the first option you have to select the Modbus register and number of registers to read, else you have to choose the Modbus register and the value that you want to send.



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