WM-1

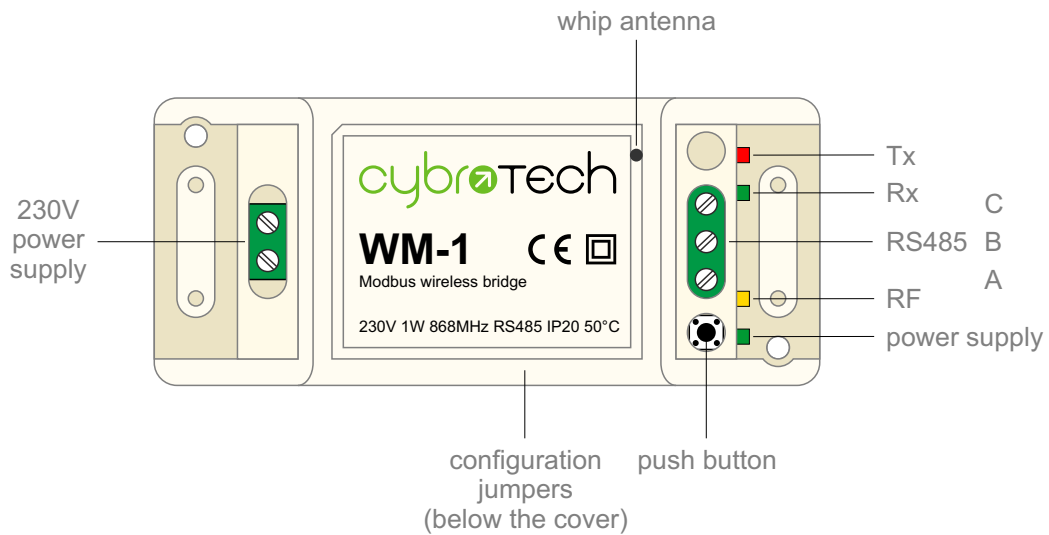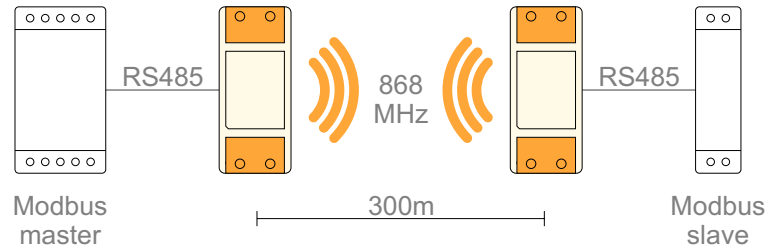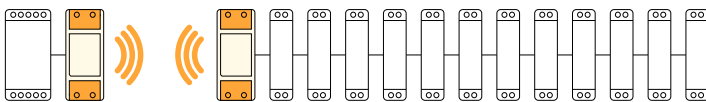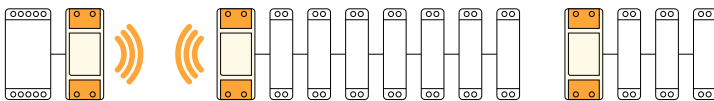## Wireless modbus-to-modbus bridge

Features

- replacement for RS485 wiring
- modbus RTU serial protocol
- wired/wireless combinations
- very long range, no hopping
- protected private connection
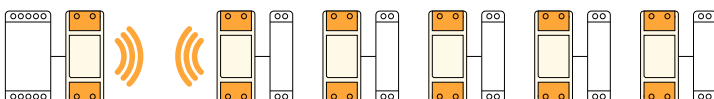- multiple slaves per device
- multiple addressable groups

Examples

Modbus master, connected to 12 slaves using a pair of WM-1 devices.

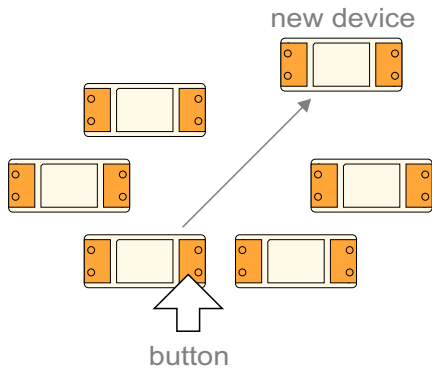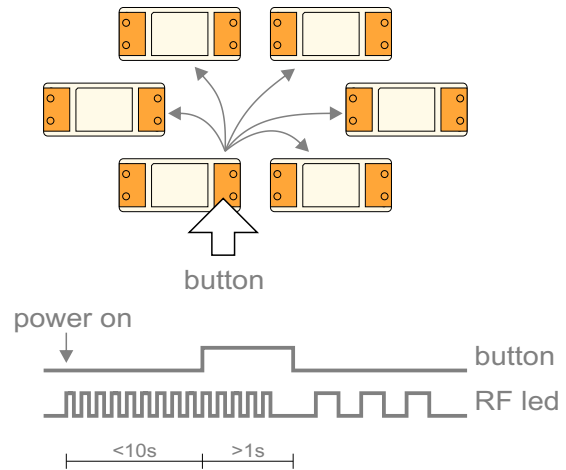Modbus master, connected to 10 slaves, organized in two groups.

Modbus master, connected to 5 slaves, each one has has a local WM-1 device.

Radio configuration

Create a new secure group

• turn on all devices at the same time
• within 10 seconds, while RF led is blinking,
 press and hold button on one of the devices

After a second, the new address is randomly
generated and sent to all devices. RF led will
blink 3 times, to confirm the new address.

button

power on

button

RF led

<10s   >1s

new device

button

power on

button

RF led

RF led (new)

<10s   >1s

Add new device to the group

• turn on new device
• within 10 seconds, press and hold button on one
  of the existing devices

After a second, the existing group address is sent
to the new device. RF led will blink 3 times, to
confirm the address is sent.
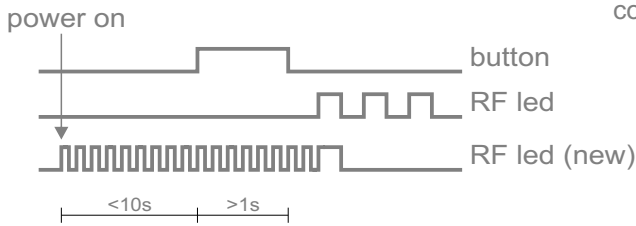
Connection check
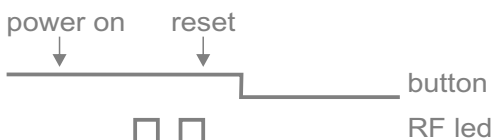
• press the button shortly

RF LED will blink shortly on each connected device.
Serial interface is not affected.

button

RF led

Factory reset

• hold the button and turn device on

RF led will blink twice. Group address is now
reset to default. Other devices are not affected.

power on   reset

button

RF led

Serial configuration

38400   8n2

19200   8e1

9600   7e1   extended

2400   8n1   normal

JP1 JP2   JP3 JP4   JP5

baudrate   bits&parity   timeout
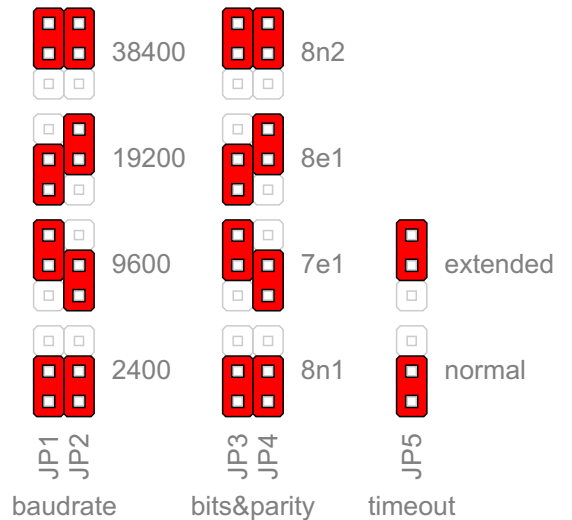
	timeout	
	normal	extended
2400	25ms	200ms
9600	10ms	100ms
19200	5ms	100ms
38400	5ms	100ms

Default jumper position is 2400, 8n1, normal.
Change is applied right away, no reset needed.

Secure group
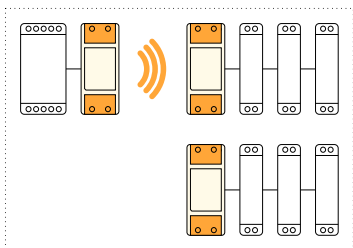
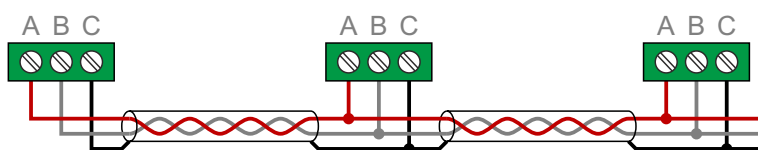
By default, all devices are in the same group, they listen to each other. To separate your devices, for each modbus master create a new secure group. Once the group is created, no other device can listen or interfere with your data.

Groups share the same bandwidth. To avoid collisions, keep the traffic low or synchronize masters so that messages don't overlap.
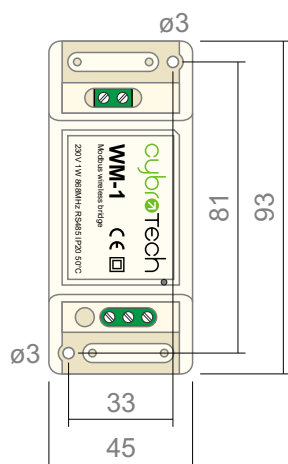
Wiring

Frequency subband

865.0-868.6	868.7-869.2	869.3-869.4	869.4-869.6	869.7-870.0
1%	**0.1%**	**1%**	**10%**	**100%**
25mW	**25mW**	**10mW**	**500mW**	**5mW**

Device uses L subband, which allows 1% utilization and 25mW output power

Mounting

Device should not be installed inside the metal cabinet. Distance from antenna to the nearest object should be at least 10cm.

Technical specifications

Serial

Baudrate	2400, 9600, 19200, 38400
Data bits & parity	8n1, 7e1, 8e1, 8n2
Message size	64 bytes max
Galvanic isolation	4kV RS485 to mains (SELV)
Termination resistor	240 Ohm internal, always on

Radio

Frequency band	ISM 868MHz (EU)
Subband	L 866.8MHz, 1% utilization
Modulation	FSK, 160kHz bandwidth
Listen before talk	yes, delay limited to 20ms
Group address	32-bit, automatically generated
Connection time	10s power-on to network ready
Message delay	5..20ms, depending on size
Output power	25mW
Operating range	300m with optical visibility

General

Power supply	230V, 50..60Hz, 1W
Terminals	0.25..1.5mm2
Operating conditions	-20..+50°C, 0..85% rh nc
Storage temperature	-40..+85°C
Dimensions	93x45x27mm, 86mm antenna
Weight	90g
Degree of protection	IP20
Standards	EN 60730-1, EN 300 220-2, EN 301 489-1, EN 301 489-3

Device is designed for Modbus RTU, but it can be used with any other serial protocol, as long as messages are sent one at a time (half duplex).

CybroTech