

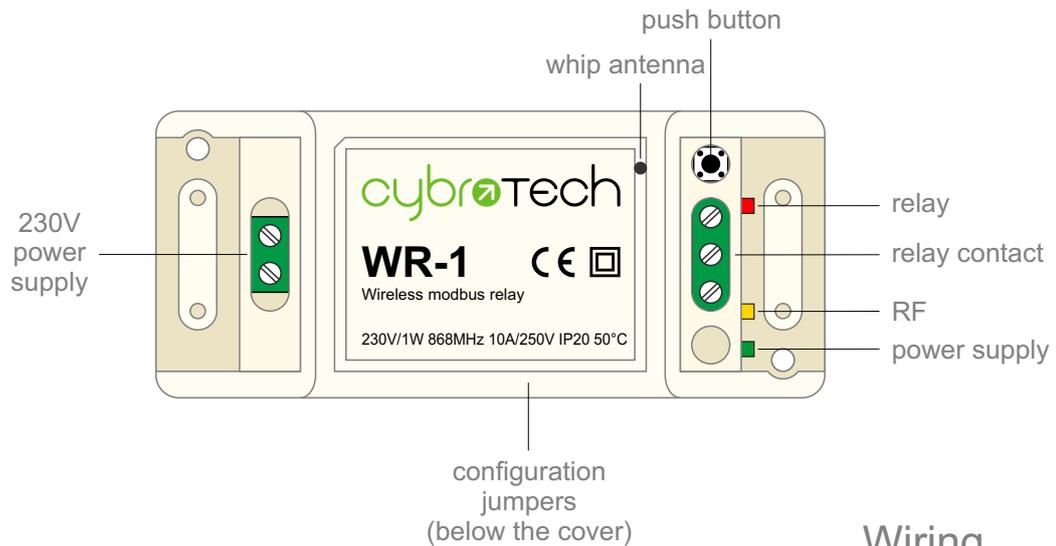
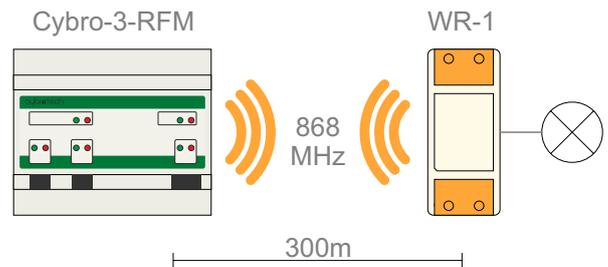
# WR-1

Wireless modbus relay

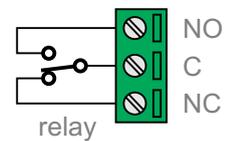


## Features

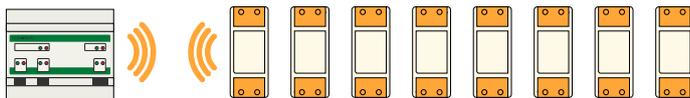
- remote controlled relay
- act as modbus RTU slave
- very long range, no hopping
- up to 8 relays per network
- protected private connection
- multiple addressable groups



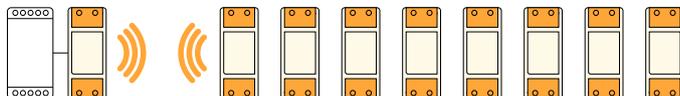
## Wiring



## Examples



Cybro-3-RFM, acting as modbus master, connected to 8 wireless relays (200..207).



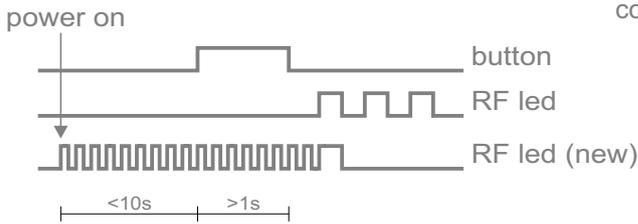
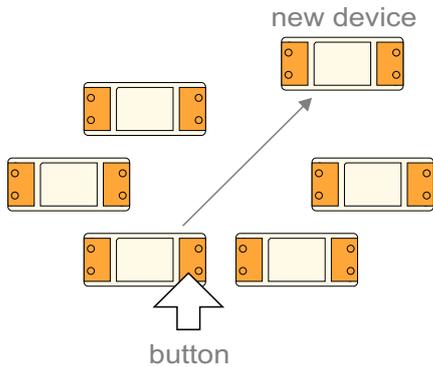
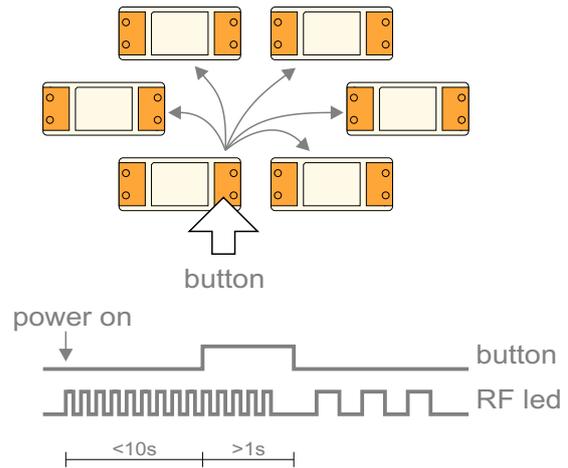
Any modbus master, connected to 8 relays using WM-1 device as wireless adapter.

# 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.



## 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.

## Relay on/off

- press the button shortly

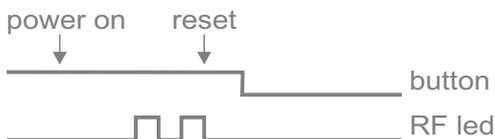
With each press of the button, the relay will switch on/off. Other devices are not affected.



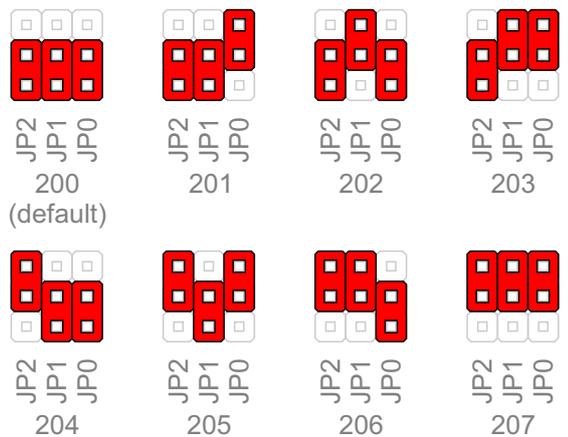
## Factory reset

- hold the button and turn device on

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



## Modbus address setting

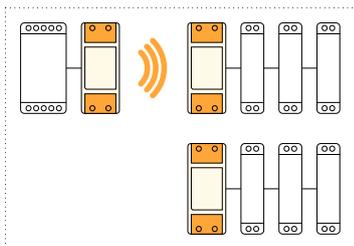


Change is applied right away, no reset needed.

## Message example

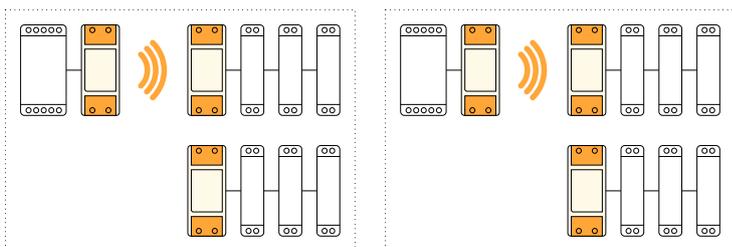
Relay on: C8 05 00 00 FF 00 9D A3  
Relay off: C8 05 00 00 00 00 DC 53

## Secure group



By default (factory reset), all devices can talk to each other. Any device in range may listen or interfere with the communication. To protect your data and ensure privacy, create a secure group. Once created, no other device can listen your data.

## Multiple groups



When system has two or more separate Modbus lines, they should be configured as separate groups. Each group has a single master, and one or more slaves.

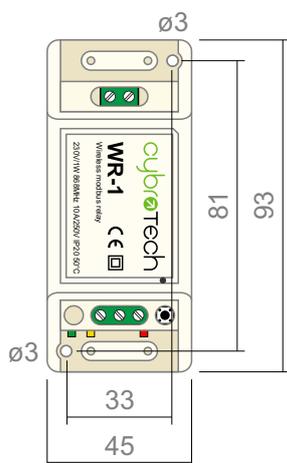
Groups can't talk to each other, but they do share the same bandwidth. Two masters may start transmitting at the same time, causing a collision. To reduce number of missed messages, keep the traffic low.

## 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 use low 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

### Modbus

Address range	200..207
Relay mapping	coil 1 (start address 00h)
Data bits & parity	8n1
Supported functions	01 - read coils 05 - write single coil 15 - write multiple coils

### Relay output

Nominal rating (resistive)	10A 250Vac (NO), 3A 250Vac (NC) 5A 30Vdc (NO), 3A 30Vdc (NC)
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### Radio

Frequency band	ISM 868MHz (EU)
Subband	L 866.8MHz, 25mW, 1% utility
Modulation	FSK 38.4kbps, 80kHz 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	5ms from tx start to relay on
Output power	25mW
Operating range	3..300m with optical visibility

### General

Power supply	230V, 50..60Hz, 1W
Terminals	0.25..1.5mm <sup>2</sup>
Operating conditions	-20..+50°C, 0..85% rh nc
Storage temperature	-40..+85°C
Dimensions	93x45x27mm, 86mm antenna
Weight	100g
Degree of protection	IP20
Standards	EN60730-1, EN300-220, ERC-REC-70-03-h1.2