

APPLICATION AREA

The W-Modbus product transmits Modbus RTU frames wirelessly. It is designed to be used indoors only. If used outdoors, this unit must be installed in a protective enclosure with minimum IP65 rating. The product is intended to be used as a Modbus RTU cable replacement.

GENERAL

This manual applies to all W-Modbus products. All personnel must read these instructions before installation. Improper handling or failure to follow these guidelines will void the warranty. Do not use the product if it is damaged. For more detailed documentation, scan the QR code or visit our website: [www.lumenradio.com](http://www.lumenradio.com)

WARRANTY

The warranty or service agreement will be deemed void if:

- 1. The product is repaired, modified, or changed, unless such repair, modification or change has been approved by LumenRadio AB; or
- 2. The serial number on the product has been made illegible or is missing.

ELECTRICAL SAFETY

Only qualified electricians or service personnel trained by LumenRadio may perform interventions in connection with electrical installation. Always follow local/national rules when performing this type of electrical installation. When connecting a 24V isolation transformer, this must be done in accordance with IEC 61558-1.

POWER AND RS485 CIRCUIT CAUTION

W-Modbus uses a half-wave rectified circuit. It should not share a VAC transformer with a device using full-wave rectified circuit. The same VAC transformer can be used for W-Modbus and other device(s) if:

- 1. The other device(s) are half-wave rectified.
- 2. All power connections must have the same polarity. The "+" terminal of W-Modbus must not be connected to the "-" terminal of another device.

WIRELESS

W-Modbus uses our proprietary wireless technology called MiraMesh which operates on the 2.4GHz range of the ISM band (2402-2480 MHz) at a max output power of 20 dBm. A Modbus network has a limit of 100 wireless nodes, where any node can be a maximum of 8 hops away from the gateway.

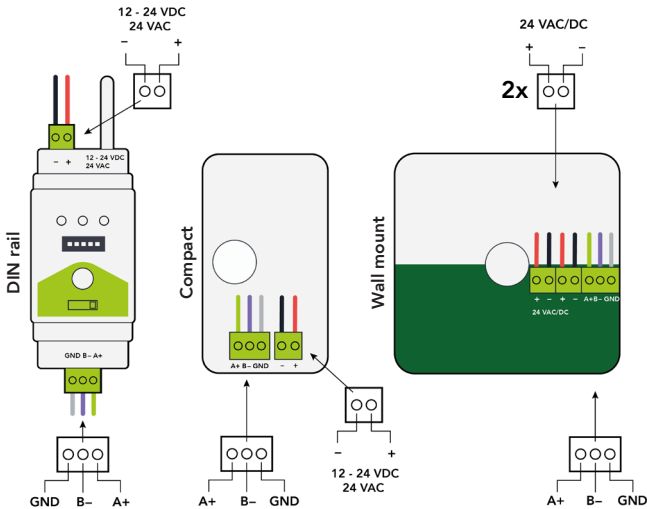
MODBUS

The W-Modbus system supports four different baud rates: 9600, 19200, 38400 and 76800. W-Modbus supports all addresses up to 255, including the reserved range from 248 to 255. If using a non-PRO product, it is possible to connect one Modbus server per wireless node. If using a PRO node it is possible to connect up to 4 Modbus servers. The wireless system introduces a dynamic response latency, typically 250ms per request. Therefore, it is recommended to set a system response timeout of 1000ms.

TECHNICAL DATA

|                                    | DIN rail                                                      | Compact                  | Wall mount                |
|------------------------------------|---------------------------------------------------------------|--------------------------|---------------------------|
|                                    | 840-2120<br>840-2124                                          | 840-2130                 | 840-2110<br>840-2114      |
| POWER                              |                                                               |                          |                           |
| Voltage range AC                   |                                                               | 24VAC ±10%               |                           |
| Voltage range DC                   | 12-24VDC ±10%                                                 | 12-24VDC ±10%            | 24VDC ±10%                |
| Max power consumption              | 2.5W                                                          | 2.5W                     | 2.5W                      |
| Conductor cross section (stranded) | 0.2 - 1.5mm <sup>2</sup>                                      | 0.2 - 1.5mm <sup>2</sup> | 0.2 - 0.5mm <sup>2</sup>  |
| Conductor cross section (solid)    | 0.2 - 1.5mm <sup>2</sup>                                      | 0.2 - 1.5mm <sup>2</sup> | 0.14 - 0.5mm <sup>2</sup> |
| AWG                                | 24 - 16                                                       | 24 - 16                  | 24 - 20                   |
| 24V throughput power               | N/A                                                           | N/A                      | Max 10W                   |
| Power source restriction           | Only to be powered by a UL-listed LPS power supply of max 15W |                          |                           |
| ENVIRONMENT                        |                                                               |                          |                           |
| Ambient operating temperature      | -20 to +55°C                                                  |                          |                           |
| Ambient storage temperature        | -30 to +80°C                                                  |                          |                           |
| Relative humidity                  | 10 - 95% non-condensing                                       |                          |                           |
| MECHANICAL                         |                                                               |                          |                           |
| Dimensions in mm (WxHxD)           | 36x93x59                                                      | 48x85x22                 | 86x86x25                  |
| Weight                             | 87g                                                           | 55g                      | 95g                       |
| Protection level                   | IP20                                                          | IP40                     | IP40                      |

WIRING DIAGRAM



# W-Modbus

**Christian Rott Ingenieurbüro**  
91154 Roth  
+49 (0) 9171 8573512  
[www.en4y.de](http://www.en4y.de)

MANUFACTURER

LumenRadio AB  
Johan Willins gata 6  
416 64 Gothenburg  
Sweden



FCC ID: XRSTIMOWAN201 (wall mount, compact)  
XRSTIMOWAN301 (DIN rail)  
IC ID: 8879A-TIMOWAN201 (wall mount, compact)  
8879A-TIMOWAN301 (DIN rail)



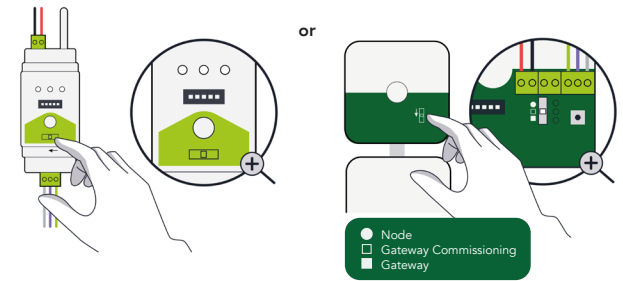
MET: E115504  
UL 62368-1  
CSA C22.2 No 62368-1

WIRING INSTALLATION

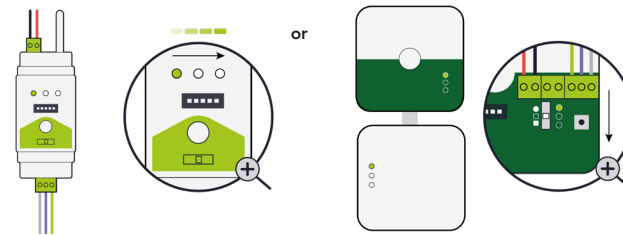
- 1. Confirm that the W-Modbus unit has no visible damage.  
**Wall mount:** The enclosure is wall mounted and fits onto a junction box. Start with mounting the backplate of the enclosure.  
**DIN rail:** The DIN rail has a clip-on mounting. Place it onto the DIN rail.  
**Compact:** The enclosure is wall mounted and fits onto a junction box. Start with mounting the backplate of the enclosure.
- 2. Connect the power supply and the Modbus device to the W-Modbus unit, as shown to the left. For a wall mounted unit, use the rear and/or top knockouts for cable entry.
- 3. All W-Modbus units are factory set for node operation, without the need for additional configuration. If mixing serial configuration in the system, refer to Step 3, according to table 3.1, on the next page.
- 4. Ensure that the W-Modbus unit and its wiring are securely mounted (if the unit is powered this will be indicated by the LEDs).
- 5. Wall mount and Compact: Secure the front case to the mounted back plate.

INSTALLATION GUIDE

1 Choose your **gateway**, either a DIN rail or a wall mount. Power it on (see wiring on previous page). Flip the switch to the "COMM" (or ) Gateway Commissioning position).



2 The lights now sweep green on the **gateway**.



3 Set the RS485 bus settings on the gateway using the dip switches. These settings will automatically be used for all nodes in the network unless they have been manually set to local configuration ON. If auto-baud is set to ON, the baud rate will be automatically discovered.

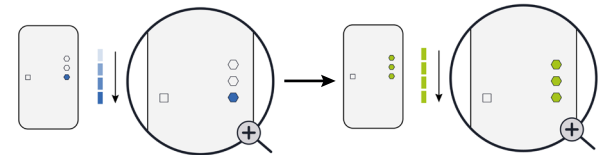


|                                           | 1   | 2   | 3   | 4   | 5   |
|-------------------------------------------|-----|-----|-----|-----|-----|
| 9600 baud                                 | OFF | OFF | -   | -   | -   |
| 19200 baud                                | OFF | ON  | -   | -   | -   |
| 38400 baud                                | ON  | OFF | -   | -   | -   |
| 76800 baud                                | ON  | ON  | -   | -   | -   |
| No parity                                 | -   | -   | OFF | -   | -   |
| Even parity                               | -   | -   | ON  | -   | -   |
| 1 stop bit                                | -   | -   | -   | OFF | -   |
| 2 stop bit                                | -   | -   | -   | ON  | -   |
| Node only: use local serial configuration |     |     |     |     | ON  |
| Use gateway serial configuration on node  |     |     |     |     | OFF |

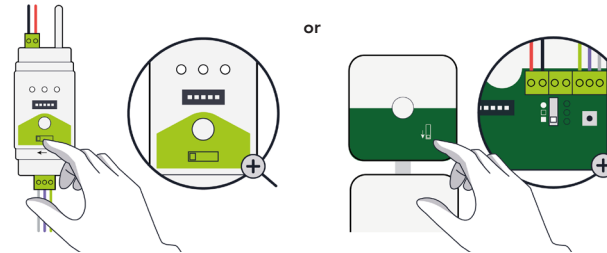
3.1 Dip switch settings

4 Install your W-Modbus node and connect it to your Modbus server device. Serial bus settings are inherited from the gateway unless local configuration is set to ON as described in Step 3.

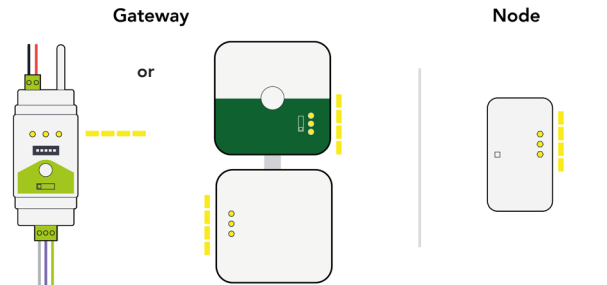
The node has successfully joined the gateway once its LEDs start flashing green. Allow for up to 5 minutes of joining time.



5 Return to the **gateway** and flip the 3-way switch to the "GATEWAY" (or ) Gateway position). This will lock and secure the network.



6 All devices will flash yellow for 10 seconds and reboot. Allow up to 15 minutes for the network to rebuild and stabilize. The Modbus controller can now start communicating with the devices in the wireless network.



7 This is a quick intro to the W-Modbus LED behaviour. For all LED combinations, scan the QR code on the other side for the full manual.

**LED 1** is used to indicate gateway/node and network signal strength on node.  
**LED 2** is used to indicate Modbus bus activity TX/RX.  
**LED 3** is used to indicate valid communicating Modbus device(s) on the local bus

| Mode                                                                           | LED 1<br>MODE/NET | LED 2<br>(TX/RX) | LED 3<br>(RS485 DATA) |
|--------------------------------------------------------------------------------|-------------------|------------------|-----------------------|
| Gateway Commissioning mode 3-state dip "COMM"                                  |                   |                  |                       |
| Gateway secure mode 3-state dip "GATEWAY" and communicating with Modbus device |                   |                  |                       |
| Node scanning for network                                                      |                   |                  |                       |
| Node paired with a network                                                     |                   |                  |                       |
| Node scanning for network with no Modbus device                                |                   |                  |                       |
| Node joined into network and communicating with Modbus device(s)               |                   |                  |                       |

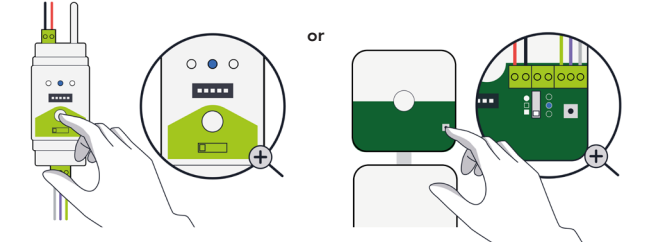
7.1 LED behaviour

\* TX  
RX

| Push button |                                                        |                                                                                                               |
|-------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Push        | Turn ON LEDs                                           | LEDs will be turned OFF automatically after 30 min                                                            |
| Double push | Rescan for connected Modbus server (only in node mode) | The third LED will blink faster to indicate that a scan for Modbus devices is running                         |
| Triple push | Activate concurrent Bluetooth for 3 min for mobile app | Mid LED flashing blue twice                                                                                   |
| Hold 5s     | Turn LEDs to Always ON                                 | Release when mid LED indicates magenta flashes green twice when activated and flashes red twice when disabled |
| Hold 10s    | Uncommission                                           | Release when mid LED indicates blue                                                                           |
| Hold 15s    | Shows firmware version by blinking the three LEDs      | Release when mid LED indicates cyan                                                                           |
| Hold 20s    | Enter Firmware Update Mode                             | Release when mid LED indicates red                                                                            |

7.2 Button behaviour

8 Validate your installation with the mobile app. Activate Bluetooth on the **gateway** by pressing the button **3 times**. The middle LED should flash blue twice. The device will be connectable for 3 minutes.



Download the W-Modbus app at:

