akribis

DATA SHEET

W-Modbus-PRO

Produal

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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 for both the DIN rail and the wall mounted version of the W-Modbus product. All relevant personnel must acquaint themselves with these instructions before installation. Warranty is voided if the product is not handled accordingly with the outlined instructions. Any damage to the product or parts due to improper handling will void the warranty. Do not use the product if damaged. For additional W-Modbus documentation scan the QR-code or visit 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 ineligible or is missing.

FCC ID: XRSTIMOMWAN201 (Wall mount)
XRSTIMOMWAN301 (DIN rail)
IC ID: 8879A-TIMOMWAN201 (Wall mount)
8879A-TIMOMWAN301 (DIN rail)

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

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 24 V isolation transformer, this must be done in accordance with IEC 61558-1.

TECHNICAL DATA

Casing	**Wall mount**	**DIN rail**
Power supply AC:	24 VAC ±10%	24 VAC ±10%
Power supply DC:	24 VDC ± 15%	12–24 VDC ± 15%
Max. power consumption:	2.5 W	2.5 W
24 V output max. power:	10 W	N/A
Auto resettable fuse:	Yes	Yes
Solid cable rating, connector:	0.14 - 0.5 mm^2	0.2 - 1.5 mm^2
Stranded cable rating, connector:	0.2 - 0.5 mm^2	0.2 - 1.5 mm^2
Conductor sizes (AWG):	24 - 20	24 - 16
Range per hop (Line-of-sight):	500 m	700 m
Range per hop (Indoor with walls):	50 - 70 m	50 - 70 m
IP class:	40	X0
Dimensions (W x H x D):	86.0 x 86.0 x 25.5	36.5 x 93.0 x 58.7
Weight:	95 g	87 g

Casing	**Wall mount/DIN rail**
Power source restriction:	Only to be powered by a UL listed LPS power supply of max 15 W
Ambient operating temperature:	-20 to +55°C
Ambient storage temperature:	-30 to +80°C
Relative humidity:	10 - 95% non-condensing
Material:	ABS UL94-V0
Color:	White
Frequency band:	2.45 GHz, ISM band (2400-2483 MHz)
Baud rate:	9600, 19200, 38400, 76800 bps
Number of Nodes:	100 Nodes in one wireless network
Max. number of hops:	8 hops in the meshing network

INSTALLATION

Install the W-Modbus unit next to the device it should be connected to.

1. Confirm that the W-Modbus unit has no visible damage.
2. 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.
3. Connect the power supply and the Modbus device to the W-Modbus unit, as shown to the right. For a wall mounted unit, use the rear and/or top knockouts for cable entry.
4. All W-Modbus units are factory set for Node operation, without the need for additional configuration. If mixing serial configuration in the system, adjust the dip switches accordingly.
5. Check that the W-Modbus unit and its wiring are securely mounted (if the unit is powered this will be indicated by the LEDs).
6. Wall mount: Secure the front plate to the mounted back plate.

The device is now ready for commissioning.
W-Modbus is an end device with internal termination resistor.

W-Modbus by LumenRadio

Scan for additional information

www.lumenradio.com

THE PACKAGING CONTAINS

1 x W-Modbus wall mount or
1 x W-Modbus wall mount PRO or
1 x W-Modbus DIN rail or
1 x W-Modbus DIN rail PRO
and 1 x Instruction leaflet

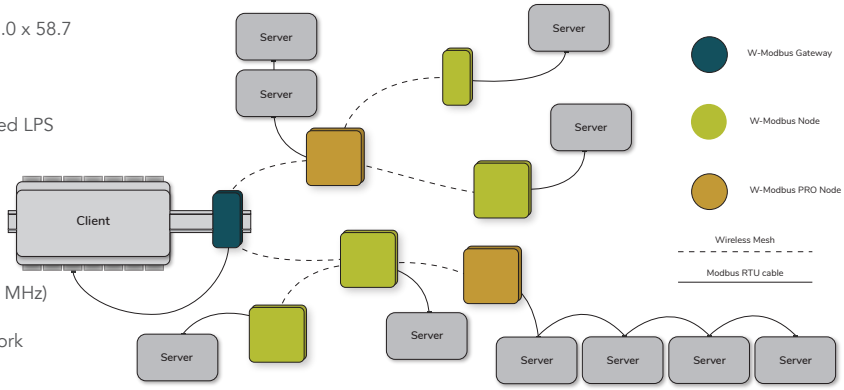
MANUFACTURER

LumenRadio AB
Johan Willins gata 6
416 64 Gothenburg
Sweden

SYSTEM OVERVIEW

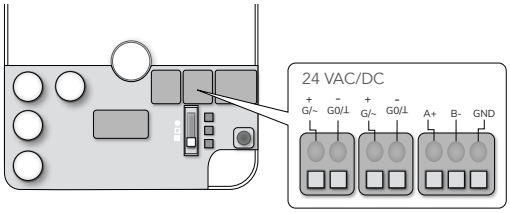
The W-Modbus comes in three different versions; wall mount, wall mount PRO and DIN rail. A W-Modbus network consists of a single W-Modbus Gateway connected to the Modbus client using an RS485 cable. It can be up to 100 W-Modbus Nodes in one network, each of them connected to one Modbus server over RS485, or in the PRO case, up to four Modbus servers on one wall mount PRO. Every device can act as either a Gateway or a Node, selectable by the 3 pole switch - see Commissioning section.

Each W-Modbus Node will scan to find the connected Modbus servers' Modbus addresses. The scanning is done by querying every Modbus address, hence the process may take up to 2 minutes. In this case, the W-Modbus Node will indicate red on the data LED – see System mode and status.



POWER AND RS485 CONNECTION

The W-Modbus uses a half-wave rectified circuit. It should not share a transformer with a full wave rectified VAC source. The W-Modbus wall mount units have 24 VAC/VDC power in/out connection and connection for Modbus RTU communication via RS485. The W-Modbus DIN rail units have an 12-24 VDC or 24 VAC connector at the top of the product next to the external antenna and an RS485 connector at the bottom.



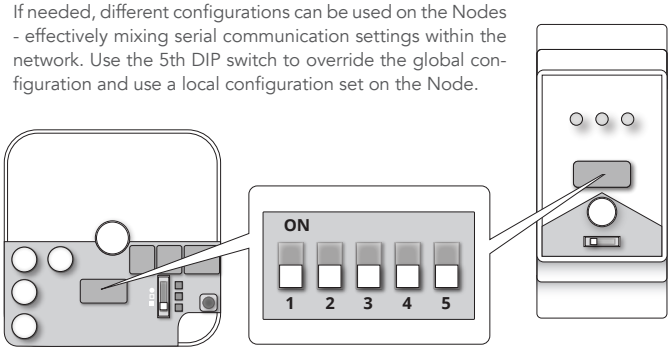
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BAUD RATE, PARITY AND STOP BIT

Set the baud rate, parity and stop bit configuration on the DIP switches to match the configuration of the connected Modbus device. The possible combinations can be found in the table to the right.

The configuration on the W-Modbus Gateway is global and will be synced to all connected W-Modbus Nodes, meaning the W-Modbus Gateway is the only device that needs to be configured as long as the same configuration is used in the entire network.

If needed, different configurations can be used on the Nodes - effectively mixing serial communication settings within the network. Use the 5th DIP switch to override the global configuration and use a local configuration set on the Node.



	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	-
Use local serial configuration set on Node					ON
Use Gateway serial configuration on Node					OFF

COMMISSIONING

All W-Modbus devices will come from factory uncommissioned in Node mode. If the same configuration is used in the entire system, the W-Modbus Gateway is the only device that needs to be configured, the Nodes will automatically be configured when connecting to the Gateway. Mount and power up each device before starting with step 1 below.

1. Start by selecting which device to use as the W-Modbus Gateway and position the 3 pole switch in the middle position. This unit will reboot into Gateway Commissioning mode. The device will indicate the mode by a green flow of LEDs. In this step also adjust the DIP switch to the correct baud rate, parity and stop bit(s).
2. All powered W-Modbus Nodes within range will now connect to the Gateway. This process takes a few minutes. Nodes further away will connect to a closer W-Modbus Node if the Gateway is out of reach. When a Node is connected it will be indicated be a synchronous green blink on all three LEDs.
3. Check that all Nodes installed are indicating connection, and then set the 3 pole switch to the bottom position on the W-Modbus Gateway. Now the entire network will reboot into the secure mode with all three LEDs blinking yellow in sync on all the connected servers. From now on the LEDs will indicate status in accordance with the system mode and status section.

TIP: It is possible to add a new node to an existing system. Just mount and power up the device as usual, then redo the commissioning starting from step 1 for the new Node.

TIP: To speed up the connection process, set the device intended to be Gateway in Commissioning mode before mounting the nodes. In that way they will connect as soon as they are powered, and the waiting time in step 2 above is reduced.

PUSH BUTTON		
Push	Turn ON LEDs	Turns OFF automatically after 30 min
Double push	Rescan for connected Modbus server (only Node)	
Hold 5 s	Turn LEDs to Always ON	Release when mid LED indicates magenta Flashes green twice when activated and flashes red two times when disabled
Hold 10 s	Uncommissioning	Release when mid LED indicates blue
Hold 15 s	Shows firmware version by blinking the three LEDs	Release when mid LED indicates cyan
Hold 20 s	Flash device for Firmware upgrade	Release when mid LED indicates red

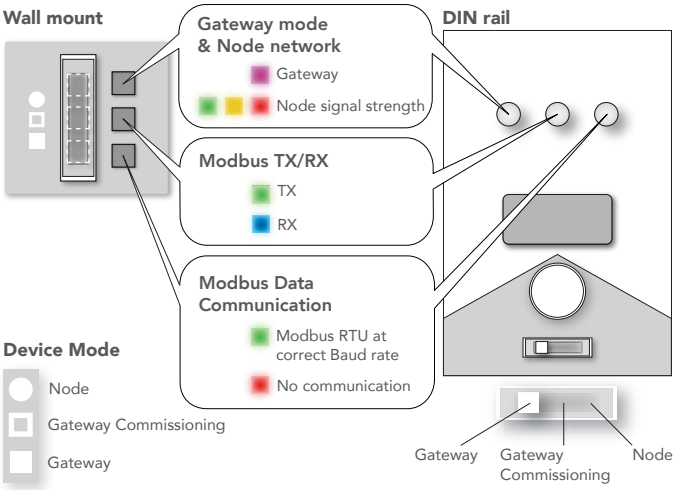
W-MODBUS APP

Download the W-Modbus app on App Store or Google Play, or scan the QR-code on the frontpage of the manual.

Activate Bluetooth on the LumenRadio W-Modbus device by pressing the button three times. The device will confirm by flashing the mid LED blue twice. Bluetooth will be active for 1 min.

SYSTEM MODE AND STATUS

Node signal strength indicates the Nodes mesh network performance. A green LED means that the Node has strong signal to it's parent Node in the mesh network. A yellow LED indicates that you have a normal mesh network performance, no need to change position or add an additional Node. If your Node indicates red it means it has difficulties getting the signal to the next Node in the network but it is still working. It is recommended to either change position or add an additional Node to the network. The Node will blink yellow if it has lost the network and searches for it.



TROUBLESHOOTING

The LEDs suddenly go out.
The LEDs turn off after 30 minutes, press the button once to turn on for another 30 minutes. If you hold the button for five seconds the LEDs will always be on.

Does the unit have power?/How do I see that the unit is powered?
Press the button, if the LEDs are not switched on, check the power.

Is the unit connected to the network?
Check the Mode/Network LED. A steady green, yellow or red mean that a Node is connected. A Node with a flowing blue light is not connected to the network. Refer to the commission section to ensure that the unit indicates connection before switching the Gateway into Secure mode. If the flowing blue light persist the unit is out of range from the network.

My Modbus communication is not working.
If the Data LED indicates no communication (red LED) check if the RS485 cable is correctly installed and make sure the baud rate, stop bit and parity settings are correct. If all is correct and Modbus data is being transmitted, you should see green (TX) and blue (RX) LED flashes on the TX/RX LED. The data LED will also be steady green.

For more information, FAQ and the latest version of the W-Modbus manual visit www.lumenradio.com or scan the QR code.

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