

FIGURE 1 structure of wireless sensor network

The sensor system comprises a base station (WL-BASE), sensors that act as routers and are connected to the mains, and battery-operated wireless sensors (WL-TEMP-RH). In the event of failure, a damaged sensor can be replaced without changing the register list. This makes the installation of the replacement sensor quicker and easier.

The mesh structure of the wireless network improves network reliability. The signal has multiple routes, from which the system automatically selects the strongest. The larger the number of routers in the coverage area, the more routing options the signal has. One wireless base station can monitor data from up to 100 sensors.

Base station connections:

- Direct connection to base station with browser. (over the Internet/locally)
- Ounet connection directly from the base station. (over the Internet)
- local Modbus RTU connection.

(Connections can be utilised simultaneously)

Encryption:

All wireless communication is encrypted. Encryption and authentication uses AES CCM + 128 bit key.

Initial engineering in network construction:

- Building structures are crucial in network engineering. Metal structures weaken the signal, which is also the case for lift wells, electrical power centres, fire doors, etc.
- Old concrete buildings are easier in regard to networks than buildings constructed in the 2010s, where the amount of steel in the structures is higher. Newer buildings require more routers than old ones.
- From the base station, the network should be built by first finding a suitable "backbone" for the network and applying the operating voltage to the sensors, so that they will act as routing elements in the network. See FIGURE 1.
- Once the network is operational in this regard, battery-operated sensors are placed as part of the network.
- The positioning of room sensors must take into account that the sensor should never be exposed to direct sunlight. It must also be ensured that no other external sources of heat affect the sensor, such as refrigerators, television sets, ventilation windows, water radiators, etc.
- It is often the easiest way to place the base station to the same space with the automation substation (heat distribution room, AHU room), but due to the weak 3G signal the optimal location can also be in the other parts of the building. Centrally selected location for the base station can improve the functionality of the sensor network, because more sensors can be directly connected to the base station without routers.
- It is able to select external antenna to the base station which improves reception of the sensor network when needed to achieve better signal levels.
- The base station requires a separate housing, e.g. K118 which also includes the needed power supply. (must be applied when certain IP protection class is needed)

General description

The wireless Ouman sensor system enables a quick and easy reading of precise room temperature data in a building without the laborious laying of cables and drilling of walls. Base station (WL-BASE) calculates automatically average room temperature based on values which are collected from selected sensors. The calculated value can be used when controlling of heating. The base station can be connected as Modbus slave to different SCADA systems or as Modbus master to OUMAN unit controllers S203, C203, H23 EH-203 or A203.

Installation

Base station

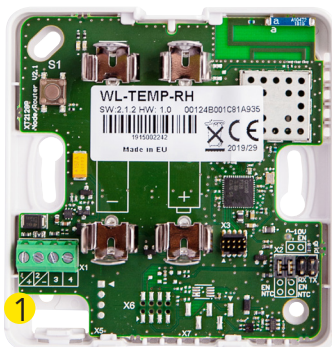


The base station is mounted to a wall or to the centre with a DIN bar. In the centre installation, the base station requires an external antenna. The base station must be installed indoors (0°C...+50°C).

The base station can be connected to Ounet, or independently to the Internet, in which case, measurement data can be inspected from outside the property through a remote connection. If the property already has an Internet connection, you can use it. If there is no Internet connection ready, we recommend you use the 3G connection provided by Ouman.

The base station can also be directly connected to the computer in the local internal network, and as part of the rest of the automation system through the modbus RTU route.

Temperature and humidity sensor:



Rooms sensors can be mounted to the wall with screws or adhesive tape. Please note that the sensor is installed so that the black terminal strips are in the bottom left corner **1**.

Place the room sensor at a height of about 150 cm in a location where it measures the average temperature of the room. Do not install the room sensor in a location where direct sunlight or another source of heat may distort the measurement result.

The room sensor must be installed indoors (0°C ... +50°C). External temperature measuring, digital input, transmitter measurement (0...10V) or leak detector (0-100%) can be connected to the sensor by using the room sensor's AUX connection (see page 5).

PLEASE NOTE: When connected to an external power source (5 VDC), the room sensor is a routing room sensor, but when equipped with AA batteries, it acts as a room sensor. The room sensor will automatically recognise the power source.

Commissioning the wireless network through the Internet connection

Base station



1. First install the base station.

2. Connect the antenna (or the extra antenna with an extension cord) to the antenna connection of the base station. **Do not detach or attach the antenna when the base station is live!**

3. Connect the Ethernet cable between the base station's RJ45 connector and the Internet connection (router/3G modem).

4. Switch on the operating voltage. The voltage is connected to the terminal strip \sim and ground to the adjacent \perp connector.

5. Wait for the LINK light to remain green. This may take a couple of minutes.

6. When the LINK light remains, the base station has successfully been connected to the Ouman ACCESS network.

7. If you have a QR reader, read the QR code of the base station label. In other case, enter the label's website address or IP-address received from device DHCP in your Web browser. Locally, in an internal network you can use `ouman.local` instead of `ouman.net`.

8. Perform base station login. The password is indicated in the label on the side of the base station. Username = service. Upon your first login, the system proposes that the password be changed. This can be set, for example, the object name. The name can also be changed in the settings.

9. We recommend that you do that. If you do not change the password, the password will remain (each base station has a unique password). The changed password can be restored to the original only by restoring the base station's factory settings (see p.14, HW reset). In addition, you can specify a user password in the base station; the user password only entitles you to view measurement data. Username = user, password = Wireless.

10. Switch on installation mode in the user interface. The RF status of the base station is green (see p. 6 Web UI Figure 2, Section 4.)

11. It takes about one minute for the installation mode to be activated. After that, the mode will remain active for 90 minutes, unless you interrupt it in the user interface (you can adjust the default time in the base station settings).

12. Go to "sensor commissioning" (p. 4).



Commissioning the wireless base station without the Web browser interface



1. Connect the antenna (or the extra antenna with an extension cord) to the antenna connection of the base station. **Do not detach or attach the antenna when the base station is live!**

2. Switch on the operating voltage. The voltage is connected to the terminal strip \sim and ground to the adjacent \perp connector.

3. Press the base station's installation mode button.

4. Check that the RF-Status light of the base station is on. When the light is green, the commissioning mode is active.

5. Go to "sensor commissioning" (p. 4).

Base station signal light legend

INIT / ERR

● Red light is on

Upon start-up, the light will be red for about 30 seconds. If the indicator light does not go out, contact your dealer.

● Blinking red light

The power supply voltage is too low. The device shuts down and attempts to restart again.

● Blinking green light

The light is green and blinking when the base station is active.

LINK

● Yellow light on

The light is on when the connections are in order (both the Internet connection and the ACCESS connection are operational)

●●●●● The light is almost continuously on, but is off at times.

Internet connection is operational, but there is no ACCESS connection

●●●●● The light is off most of the time, but blinks at times.

LAN connection is operational, but there is no Internet and ACCESS connection.

No light



No LAN connection.

If the LINK LED is not blinking or is not on at all, check that the LAN cable is properly connected to the base station and router. The signal lights of the base station's Ethernet connector are on if the network cable is physically in order and connected.

● Green light on

The light is green upon start-up and will go out when the device is ready to use.

RF STATUS

● Green light on

The base station is in installation mode

● Blinking green light

The base station is in normal mode

The base station interfaces:

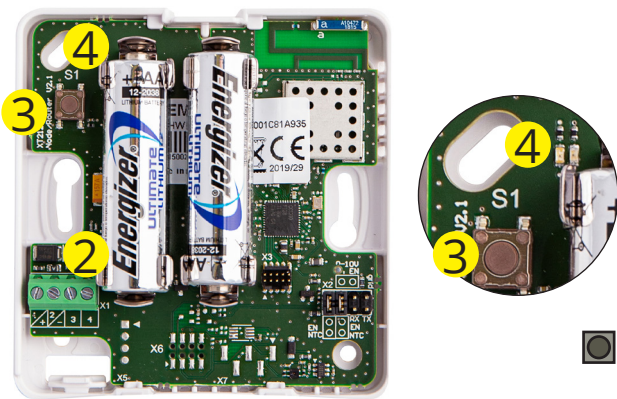
- Modbus RTU Slave
- Modbus TCP slave
- Modbus RTU Master (Unit controller support)**

***) The controller writes the calculated average to the adjustable register.



- \sim Operating voltage
- \perp Operating voltage ground
- \perp 0-10V output ground
- Y 0-10V output
- \perp Bus ground
- B RS-485 bus (unisolated)
- A RS-485 bus (unisolated)

Commissioning the sensors



1. Commission the base station before commissioning the sensors (see pp. 2–3).
2. Open the room sensor's cover and install the batteries or switch on the operating voltage if you intend to make the sensor a routing sensor. The sensor should be first take into use in fixed operating voltage to identify itself as a routed sensor. After this the batteries can be added.

Routing is somewhat slower using batteries, and it must also be remembered that batteries will not last very long if electricity supply is cut off for several days. (Battery consumption depends on the number of sensors being routed).

- 3. If neither LED is blinking rapidly, briefly press the sensor installation button (or insert the batteries).
- ■ 4. Green and red LEDs are blinking rapidly alternately when the connection is being analysed. After the analysis, the LEDs show the status of the connection. The LEDs will blink/light up depending on situation.

Situation 1: The sensor is connecting to the network

- ■ ■ ■ A rapidly blinking green light (blinks 5 times) The sensor receives confirmation from the base station. The connection is in order.
- ■ 3s The green and red light are on for 3 seconds and are then switched off. Connection to either router or base station, but failed to connect. Try again to connect the sensor to the network (press the installation button).
- ■ ■ Slowly blinking red light (blinks 3 times) The sensor is not in the coverage area of the router or base station or the deployment mode is not on. (The sensor has not been connected to any network).

Situation 2: Sensor is already connected to the network

- 3s The red light on (for a minimum of 3 seconds) and is then switched off The sensor received confirmation from the base station. The connection is in order.
- ■ 3s The green and red lights are on for 3 seconds and are switched off after that. The connection to one router is in order but the connection to the base station is not. (There was no acknowledgment from the base station)
- 3s The red light is on (for 3 seconds). The sensor is not in the coverage area of the router or base station. (The sensor is connected to a network but there is no connection.)
- The green and red lights are off **The sensor is in normal mode and in operating condition**
- 2s The green light is on (for 2 seconds). The sensor is receiving new settings from the base station.

Situation 3: The sensor has lost connection

- ■ ■ ■ The red light blinks once. The sensor is trying to send data but is not in the coverage area.
- ■ ■ ■ The red light blinks every 10 seconds. The sensor has lost connection to the network max. 3 minutes earlier.
- ■ ■ ■ The red light blinks every 30 seconds. The sensor has lost connection to the network max. 3-15 minutes earlier.
- ■ ■ ■ The red light blinks every 15 minutes. The sensor has lost connection to the network more than 15 minutes earlier.

Instruction: if the sensor has lost connection:

- 5s **Removing the sensor from the network**

If the network is not found, move closer to the base station or the already installed routing sensor

You can remove the sensor from the network by keeping the installation button pressed down for five seconds. (You also need to separately remove the sensor from the user interface). (see p. 6)

Pay extra attention to the reception of the routing sensors, because they are the "backbone" of the network (see FIGURE 1, p. 1).

The RSSI figure indicates signal strength

Good	... -85dBm
Medium:	-85 ... -95dBm
Poor:	-95dBm ...

Room sensor battery replacement

The Web UI shows the remaining battery life of each wireless sensor. If life is less than 10%, the figure is red, and there is a red exclamation mark in the right upper corner of the user interface.

Sensor configuration

If the base station is connected more than 10 sensor, the simultaneous high-speed sensor sampling interval slows down the configuration significantly. By pressing the OK button on the user interface you will change sensor sampling interval 2 min (see p.7 Web UI figure 4)

Option

WL-ROUTER POWER, 5VDC

External power supply for WL-TEMP-RH sensor. If you connect an external power supply to the sensor, the sensor become a routing sensor.

Connection: Black -, white +

WL-BATTERY-AA-LIT

The delivery includes 10 pieces of 1.5V.

Energizer L91 Ultimate Lithium 3100 mAh batteries

1. When the sensor has found the network, it will automatically appear last in the user interface list (or in place of a sensor removed from the list).

2. You can edit the default name (SensorX) of the added sensor to match the location. Example: Room 101 (see p. 6 Web UI, Figure 2)

3. In the sensor route table, you can see how the added sensor is connected to the network (see p. 7 Web UI, Figure 3). Please note: The sensor will automatically find its route by the best reception. **You cannot change the route manually.**

4. Set the failed response alert limit and updating interval for the base station on a sensor-specific basis. (see p. 5 Web UI, Figure 1)

5. Likewise, the calculation interval of the permanence value. (see p. 5 Web UI, Figure 1). Stability value can be calculated for temperature values.

Instructions: You can define joint maximum and minimum limits for all base station sensors. (Default 20°C and 24°C) Example: if the calculation interval is 10 h and temperature is 2h of the timeline over the maximum limit or under the minimum limit □ The permanence value is 80% for the calculated time.

AUX connection of wireless room sensor

In the wireless sensor or routing sensor, it is possible to connect an external temperature measurement, digital input, status data, 0–10 VDC transmitter measurement or water leak detector by using the AUX connection.

AUX connection in temperature measurement

Connect temperature measurement in terminal strips 3 and 4 ²

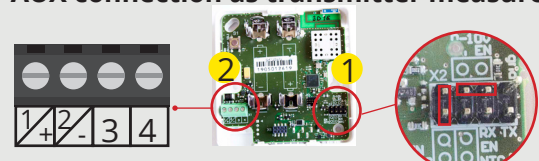
AUX connection as digital input

Connect the digital input in terminal strips 3 and 4 ²

AUX connection as transmitter measurement

1. Remove the battery-side short-circuit (jumper) and turn the other short-circuit from upright to two middle pins in horizontal position on sensor circuit board. ¹

2. Connect the transmitter measurement to terminal strips 3 and 4 (power source's ground ⊥) ²



AUX connection as water leak detector

AUX connectors can be fitted with a fabric-bound water leakage tape that gives a moisture value of 0-100%

AUX connection settings from WEB UI:

Web UI, Figure 1

Select the type of AUX input in the dropdown menu.

Setting the stability interval for the sensor's permanence value (see p. 5).

You can name the input as you like. The name will appear in the AUX connection tooltip in the Web UI.

Reception alarm will be indicated with a red exclamation mark in the right upper corner of the Web UI. The exclamation point can also explain the low battery in any device. Clicking on the exclamation mark, displaying all active alarms.

Usually, you do not need to adjust other settings.

You can also enter the installation mode through the Web interface by clicking this icon.

To exit the installation mode, click the icon. Or, if you do not do that, an automatic exit will take place after 90 minutes.

Gateway

Any sensor low signal	Any sensor battery low	Over 50% of batteries under 30%	Temperature avg	Lowest temperature	Highest temperature
No	No	No	23.5	23.3	23.6

Click the icon with three dots, and the function menu will open.

Devices (2 connected)

#	Location name	Type	MAC	Temp (°C)	Temp stability	Humidity (%)	Whip Temp	Whip Humidity	Signal (dBm)	Battery (%)	Status	Last seen
100				26	23.1	28	Good -21	100	OK	14 m 1 s ago		
100				26	23	28	Good -28	100	OK	12 m 9 s ago		

Select visible columns

Columns

Select all

Number

Location

Type

MAC

Temperature

Temperature stability

Humidity

CO2

CO2 stability

Aux

Signal

Battery

Status

Last seen

Barometer

VOC

Difference pressure

Whip temperature

Whip humidity

Click the icon and select which columns will be displayed.

#	Location name	Type
1	H 2.0 router	Rc
2	TP 1.2 Sensor2	Er de
3	TP 1.3	Er de
4	H 2.1 Sensor4	Er de
5	H 2.2	Er

Humidity (%)	Aux	Signal (dBm)	Battery (%)	Status	Last seen
10	-	Good -25	-	OK	2 m
11	-	Good -24	93	OK	
9	-	Good	96	OK	

Select "Edit location" to rename the sensor location.

Settings

Copy values

Edit location

Change position

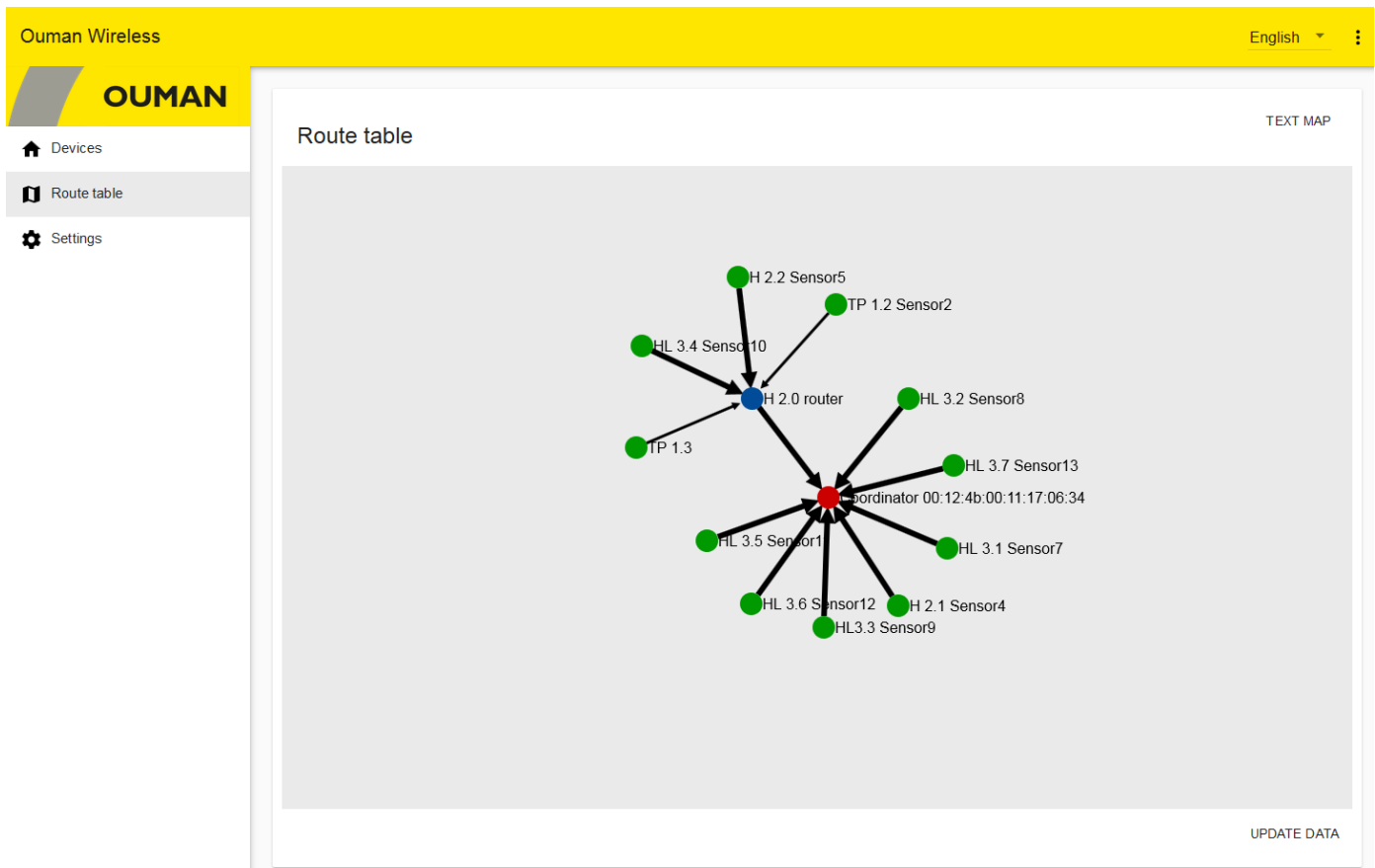
Delete

Enter a new, unique name for the sensor location.

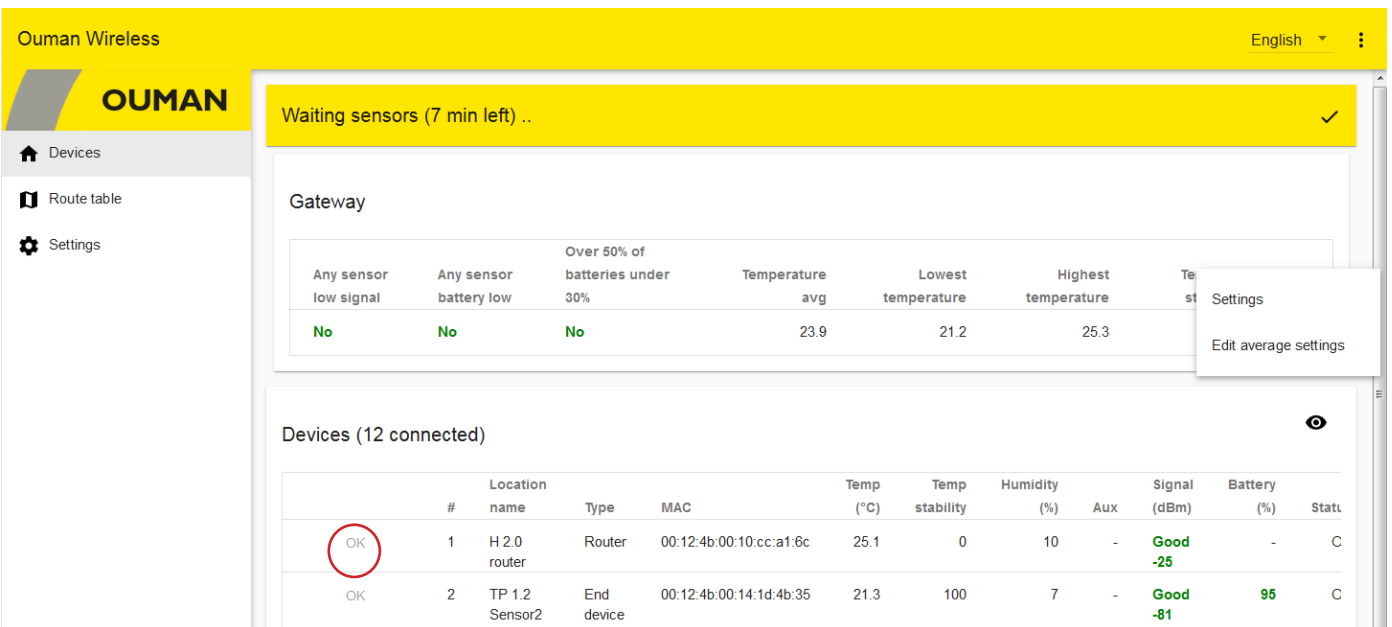
Apartment 101

CANCEL CHANGE LOCATION

#	Location name	Type	MAC	Temp (°C)	Temp stability	Aux	Signal (dBm)	Battery (%)	Status	Last seen
1	Sensor 1.1	End device	000D6F000A64B13A	26.1	0	-	Good -31	48	OK	9 m 42 s ago
3	Sensor 1.3	Router	000D6F000A64B06A	27.2	0	-	Good -76	100	OK	12 m 51 s ago



Base station configuration

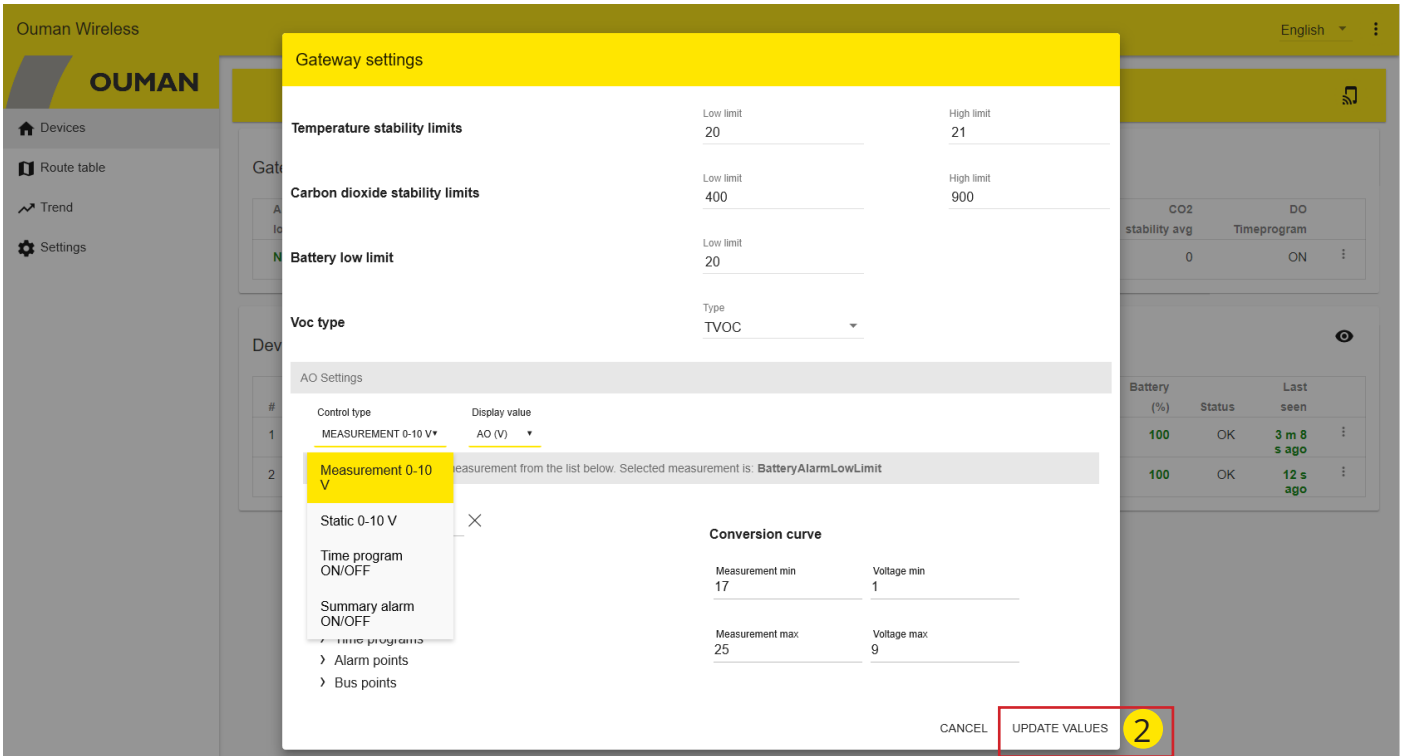
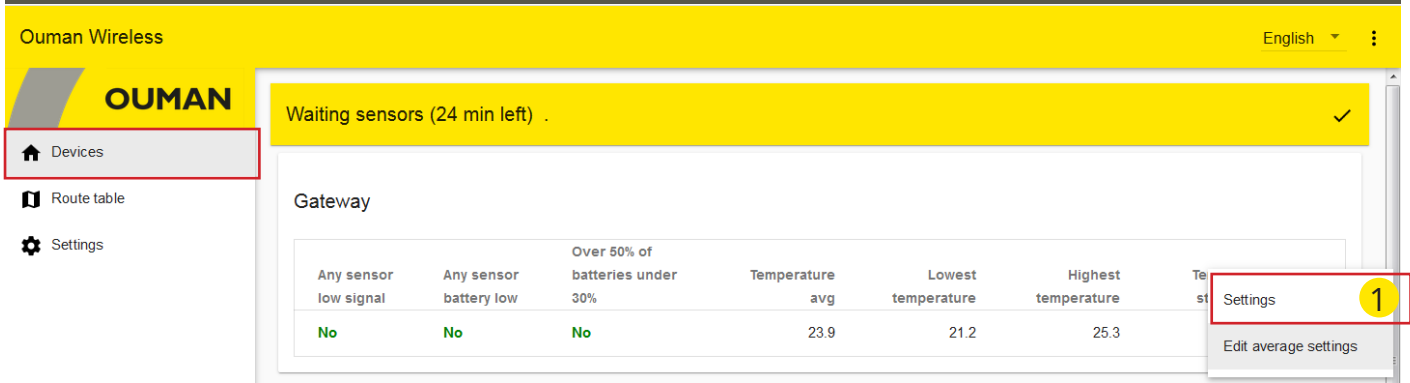


OK button: In the installation mode, the sensor sampling interval is 5 seconds by default. With this fast 5 s sampling interval, there may be a slow down of communication or even a complete break in data transmission if there are 10 or more sensors in the “join mode”. When you press “OK”, the sensor’s sampling interval will change to two minutes, which will accelerate the device.

If you do not change the sampling interval in the install mode, it will automatically change to 15 minutes when you exit the install mode. The minimum sampling interval is one minute.

The device has a setting of “Update interval to gateway” (sampling interval). The sensor checks whether the setpoint is changed, whenever the sensor sends the measurement data to the base station.

Base station sensor settings

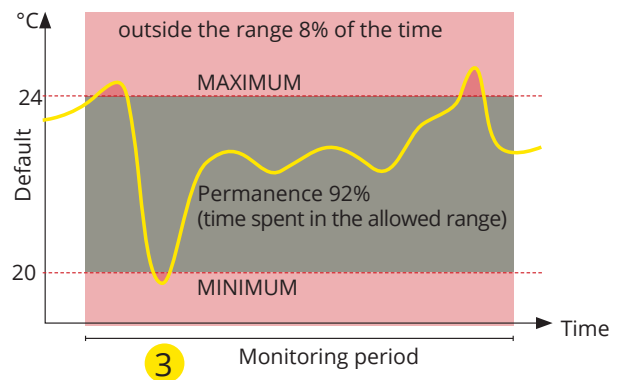


Temperature stability

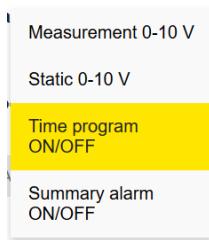
In addition to displaying measurements, the base station calculates averages of selected measurements and filter error readings. For quick review, the value of stability is calculated for all temperatures/CO2 content to reflect how well the temperature /CO2 content has remained within the set limits.

VOC-type

You can choose whether to display the VOC as a TVOC value or CO2eq value.

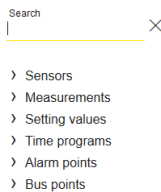


AO settings of Base Station



AO output can be controlled by 0-10V measurement, constant value, ON / OFF timer or ON / OFF sum alarm.

Measurement 0-10V



Select a measurement from the list for control. You can use the search function to search for a measurement.

Display value

Select whether the analog output is displayed as a measurement, as a percentage or as a voltage (V).

Measurement min and Voltage min

The conversion curve gives the minimum value of the measurement and the corresponding voltage. The voltage setting range is 0 ... 9.9 V.

Measurement max and Voltage max

The conversion curve gives the maximum value of the measurement and the corresponding voltage. The voltage setting range is 0 ... 9.9 V. Voltage is determined linearly between minimum and maximum.

Static 0-10V

Static 0-10V

The constant (static) value setting area is 0...10.0V.

Time program ON/OFF

Week program

Voltage OFF

Set the voltage at which the control is OFF. Setting range is 0 ... 10 V.

Voltage ON

Set the voltage at which the control is ON. Setting range is 0 ...



Set the days, time and status (value) for the control.

Select **ADD NEW** to make a new control. Set the time when the control goes back to normal mode. The time schedule is displayed on the graphical display.

Finally, select 'Update values'.



Exception calendar

The time program that differ from the normal weekly schedule will be done with the exception calendar.

Set the date and time at which the desired control starts. You can select from the following:

- one of the following modes: "on," "off" or "automatic"
- one day schedule from the weekly schedule (Monday - Sunday)
- a special day from a special day program (SD1 - SD7) or
- one of the following modes: "on," "off" or "automatic"

If you select a specific day of a week, it means that that day program is used during the set time period. You can also make special day programs (SD) in Ounet and take them into use in the exception calendar.

Select "Add New". Set the time to return to the normal weekly program. Set the mode to "Auto".

Summary alarm ON/OFF

Voltage OFF Voltage ON

The output is set to sum alarm. Enter voltage for OFF and ON. Setting range 0 ... 10.0.

Average calculation settings

Devices-> Gateway -> ⋮ -> Edit average settings

Ouman Wireless English

OUMAN

Waiting sensors (24 min left) ✓

Gateway

Any sensor low signal	Any sensor battery low	Over 50% of batteries under 30%	Temperature avg	Lowest temperature	Highest temperature	Temperature Settings
No	No	No	23.9	21.2	25.3	Edit average settings 1

Temperature average calculation settings

GENERAL SETTINGS | **SENSOR SELECTION**

Sensors used in avg calculations

Select all

- H 2.0 router
- TP 1.2 Sensor2
- TP 1.3
- H 2.1 Sensor4
- H 2.2 Sensor5
- HL 3.1 Sensor7
- HL 3.2 Sensor8
- HL3.3 Sensor9
- HL 3.4 Sensor10
- HL 3.5 Sensor11
- HL 3.6 Sensor12
- HL 3.7 Sensor13

CLOSE SAVE CHANGES

Average calculation settings

Avg calculation time span Time span (h) 0

Average calculation time window. Value 0 means, time window is not used.

Avg calculation method Method Normal 2

Method used in measurements average calculations.

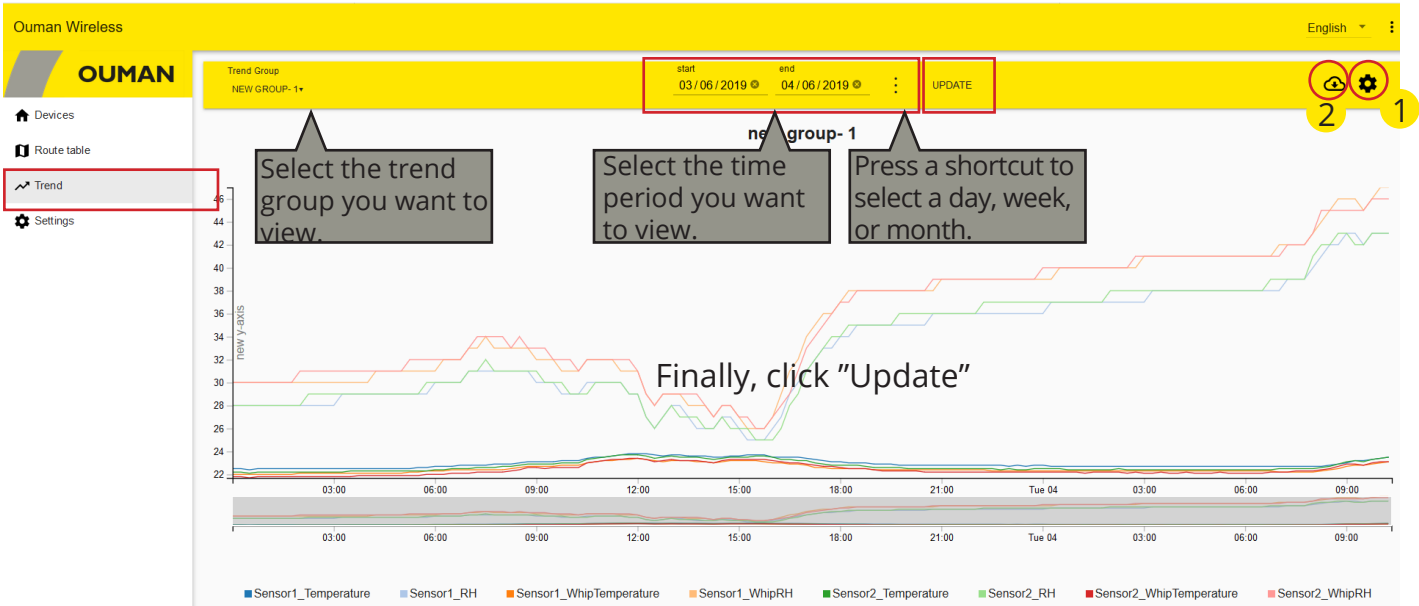
- Normal
- Min-max limited
- Pick out mode
- Min-max and pick out combination

CLOSE 3 SAVE CHANGES

Gateway: General settings	
Avg calculation time span	The calculation can be performed as sliding for a specific period. If the value is 0, the value is an "online" value.
Avg calculation method	
Normal	Will calculate the average of all sensors included in the calculation.
Min - max limited	In the calculation, this function removes measurements not in the minimum and maximum range
Pick out mode	This function removes the selected number of measurements from the calculation. Example: The two lowest temperatures and the highest temperature.
Min - max and pick out combination	The program will first perform the selection and then the limiting process.

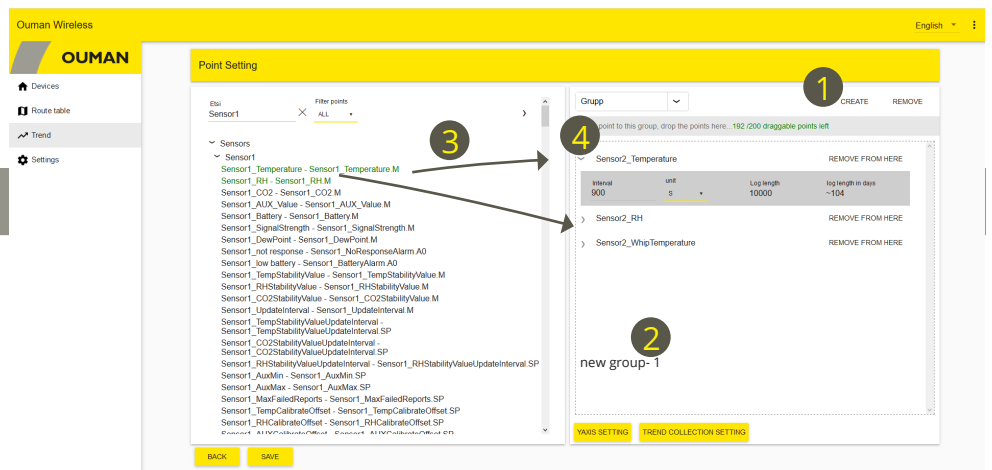
If any sensor drops out of the network, it will not be taken into account in the average calculation.

Trend



1 Point settings

- Etsi, Search
- Filter points
- New group



3. Drag the desired points to the selected group.
 4. Press the arrow > to set the desired recording interval for the dots. (see figure)

Remove

You can remove the selected trend group

Y axis settings

You can select the type line or the graph. You can scale the y-axis by entering the minimum and maximum values for the axis.

Trend collection setting

The display shows all trend collection points and the trend group to which the point belongs. You can stop the trend collection.

Stop collection

First, remove the point from the trend group. You can then select the point the trend collection of which you want to stop. Select "Stop Collection" and "Save".

Save

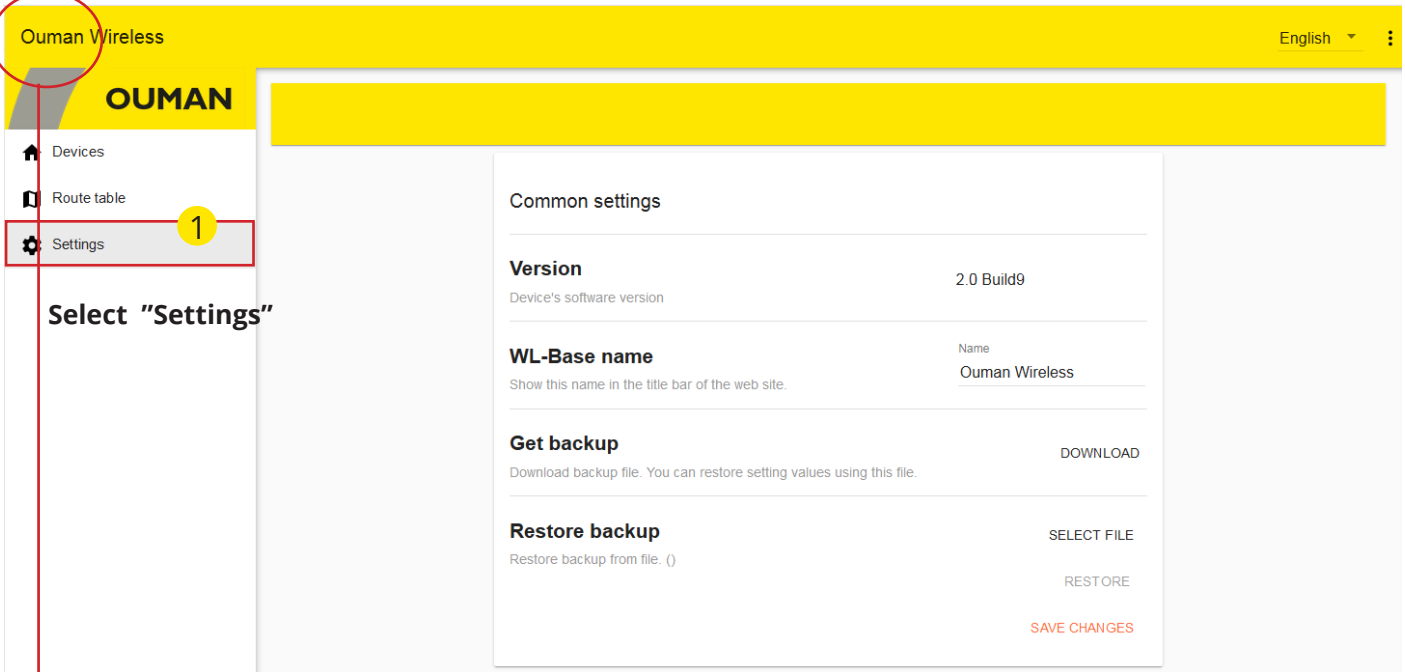
Remember always to save if you make changes to the settings.

2

You can save group trend points as csv files or open files using a spreadsheet program.

Base station configuration

Web UI Figure7



Gateway: Common settings

Version

Shows the software version of the device.

WL-Base name


The name that is displayed on the web page title bar. Enter to the name to the name field and click "Save settings".

Get backup

When a wireless system is created, download a backup. If the base station fails and you need to replace a new base station, the configuration is easier, when you can restore the backup.

Click **Download**: The device creates a copy in which there are saved the device names paired to sensor MAC-code and also other settings of base station

Restore backup:

Returns the names and settings, but every sensor has again to be taken into use to the new base station. First the sensors are removed from the old network (press 5 s the sensor button ) and then added them to the new network pressing shortly. Finally, select "Save Changes".

Gateway settings

Clear sensor network

Click the CLEAR to remove all the installed sensors from network.

Restore default values

Click the RESTORE to restore all other factory settings to the base station, except for the password. Installed sensors are also removed. If you want to take to use the factory-generated password that appears on the label of the device, do the HW reset (see page 14).

Reboot

Click the REBOOT to reboot the gateway



Display update button

Network settings

DHCP	Selectable: On / Off
Access address	Access IP address.
IP address	Local IP address.
Gateway address	
Subnet mask	
Name server address	
Save changes	

If DHCP is turned on, the base station automatically retrieves the network settings when the machine is connected to the network and turned on.

Things to consider when using Access:

- 10.10.128.0/17 and 10.11.0.0/16 are reserved for "Access 2 devices" (Ouflex A)
- 10.20.0.0/16 is reserved for "Access 3 devices" (Ouflex A XL, M-LINK and WL-Base).
- These addresses cannot be used in the local area network.
- The possible routing 10.10.0.0/16 also disturbs "Access 2" connections.

Modbus RTU settings

RTU type	Selectable Master or Slave
Device selection	Preselect master device. When Ouman unit controller is selected as a device, average value is set as a register value of "H1 (H2) Room temperature via bus". You must select from the controller H1 (H2) Room temp.from bus in use.
Baud rate	Baud rate (speed) of the bus. All devices in the same bus must have same baud rate. Default baud rate is 9600, but it can be changed.
Data bits	Amount of the databits of bus. All devices in the same bus must have same Data bits setting.
Parity	Parity of the bus. All devices in the same bus and this field must have same parity.
Stop bits	All participants must have the same setting. Amount of the stop bits of the bus. All devices in the same bus must have same stop bit setting.
Modbus address	Give individual address
Save changes	If you do the changes to the Modbus RTU settings, you have to select "save changes".

Modbus TCP/IP settings

Enabled	Modbus TCP/IP -communication is allowed when mode is enabled (On).
Modbus TCP/IP port	
Sockets	Server load can be limited by changing that setting. The setting defines maximum amount of the allowed connections at once from different IP addresses to the server.
Save changes	If you do the changes to the Modbus TCP/IP settings, you have to select "save changes".

SNMP settings

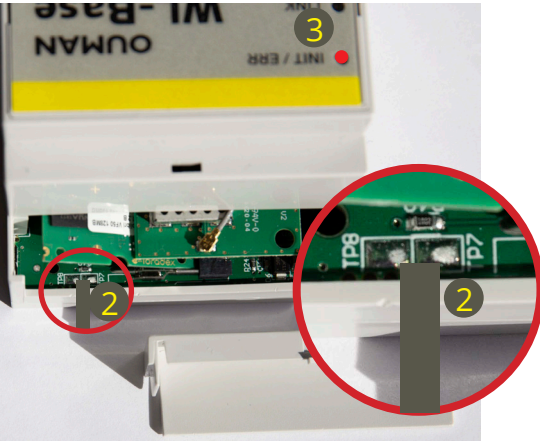
Enabled	On/Off selection enable/disable SNMP function.
IP address	IP-address of the target server where the message will be sent. Default address is Ounet IP address 10.1.1.23.
Save changes	If you do the changes to the SNMP settings, you have to select "save changes".

Downloading templates, version information, and password change

The screenshot shows the OUMAN Wireless TT2 web interface. A yellow callout box highlights a three-dot menu icon in the top right corner. A dropdown menu is open, listing several options: 'Download modbus CSV file', 'Download Ounet template', 'Download Ouflex RTU template', 'Download Ouflex TCP template', 'Version info', and 'Change password'. The interface also shows a 'Gateway' status section with 'Any sensor low signal' set to 'No', and a 'Devices (10 connected)' table with columns for #, Location name, Type, MAC, Temp (°C), Temp stability, Humidity (%), CO2, CO2 stability, Voc, Difference Pressure, Signal (dBm), and Battery (%).

Room temperature Modbus registers	Address index	Address Format	Register Type	R/W
EH-203				
H1 Room temperature	257	S16	Holding	R/W
H2 Room temperature	258	S16	Holding	R/W
C203				
H1 Room temperature to the version 3.0	581	S32	Holding	R/W
H2 Room temperature to the version 3.0	515	S32	Holding	R/W
H1 Room temperature version 3.0.10 forward	380	S16	Holding	R/W
H2 Room temperature version 3.0.10 forward	377	S16	Holding	R/W
S203				
H1 Room temperature version 2.0.0	870	U16	Holding	R/W
H2 Room temperature version 2.0.0	637	U16	Holding	R/W
H1 Room temperature version versions 2.1.0 - 2.1.6	581	S32	Holding	R/W
H2 Room temperature version versions 2.1.0 - 2.1.6	515	S32	Holding	R/W
H1 Room temperature version 3.0.10 forward	255	S16	Holding	R/W
H2 Room temperature version 3.0.10 forward	253	S16	Holding	R/W
H23, HW 1.0 and 2.0				
H1 Room temperature	258	S32	Holding	R/W
H2 Room temperature	260	S32	Holding	R/W
A203				
H1 Room temperature	392	S16	Holding	R/W
H2 Room temperature	390	S16	Holding	R/W

HW reset function



The HW reset is currently implementing the following operations:

- Restores default application files (Modbus registers, default values of objects etc.)
- Removes log files (trends, alarms, 6lbr logs, etc.)
- Restores login information. (The password is indicated in the label on the side of the base station.)
- Restores IP settings (DHCP ON)
- Removes all sensors

The activate HW reset functionality:

1. Remove the protective cover at the top of the base station.
2. Connect the TP7 pad to the TP8 pad with for example a screwdriver and hold connection around 1 second when WL-Base is powered ON.
3. WL-Base indicates HW reset by setting INIT / ERR LED to red. LED will light red until device has been restarted.

Warranty terms

Warranty 2 years

The seller provides a 24-month warranty for the quality of the materials and workmanship of all delivered goods. The warranty period begins on the date of purchase. In the event that material or workmanship defects are detected and the goods are sent, without delay or no later than by the end of the warranty period, back to the seller, the seller agrees to address the defect at their own discretion either by repairing the damaged goods or by delivering a new, defect-free goods, free of charge, to the buyer.

The buyer is responsible for the costs resulting from delivering the goods to the seller for warranty repairs, while the seller is responsible for the costs resulting from returning the goods to the buyer.

The warranty shall not cover damages resulting from accidents, lightning, floods or other natural events, normal wear and tear, inappropriate, negligent or unusual use of the goods, overloading, incorrect maintenance, or reconstruction, alteration and installation work which is not carried out by the seller (or their authorised representative).

The buyer shall be responsible for selecting material of equipment susceptible to corrosion, unless other agreements are signed. In the event that the seller alters the structure of their equipment, they shall not be obligated to make similar changes to previously procured equipment. The validity of the warranty requires that the buyer has fulfilled their contractual obligations related to the delivery.

The seller shall provide a new warranty for goods replaced or repaired under the original warranty. However, the new warranty shall only be valid until the expiration of the warranty period of the original goods. For any repairs not covered by the warranty shall be subject to a 3-month maintenance warranty covering the material and workmanship.

Optional



WL-BASE POWER:

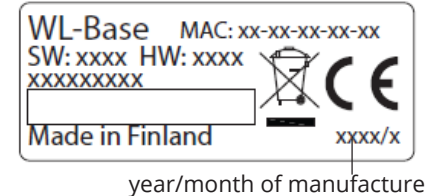
External power source to the WL-BASE base station 24 VDC

Connection: Red \sim
Black \perp

WL-BASE Base station	
Case	ABS plastic
Operating temperature	0°C...+50°C
Protection class	IP20
Measurement interval in installation mode	10 seconds
Measurement interval in normal mode	can be adjusted (1–240 min).
Dimensions	90 x 70 x 59 mm
Installation	Mounted to DIN bar
Operating voltage	24 VAC / 5.5 VA or 20...30 VDC / 3W If the voltage is 10-20 VDC, the AO output does not work properly.
Power consumption in use	12 VDC 160mA 24VDC 85mA 24 VAC 210mA
Network size	up to 100 sensors
Data transfer connections: RS-485 bus (A and B)	Unisolated, supported protocols Modbus-RTU
Approvals	
- EMC Interference tolerance	EN 61000-6-1:2007, ETSI EN 301 489-1 V1.9.2
- EMC Interference emissions	EN 61000-6-3:2007/A1:2011, ETSI EN 301 489-1 V1
- EMC-directive	2014/30/EU
- Low voltage directive	2014/35/EU
Warranty	2 years
Product	Base station for wireless sensor system
Manufacturer	Ouman Oy Linnunrata 14, FI-90440 Kempele FINLAND tel. 0424 840 1 www.ouman.fi
Product name	WL-Base
Models	WL-Base
Version	see product label
Valid	2023/04



Product label on the device:



WL-Base includes open source software using the following licenses:

AFL, AGPLv3 with OpenSSL exception, BSD-2c, BSD-3c, BSD-4c, Curl license, Eclipse Public License, Flex license, GPL, GPLv2, GPLv3, Info-ZIP license, LGPLv2.1, LGPLv3.0, MIT, MIT with advertising clause, NTP license, OpenSSL License, pkgconf license, The "Artistic License", zlib license.

The open source software in this product is distributed in the hope that it will be useful, but without any warranty, without even the implied warranty of merchantability or fitness for a particular purpose, see the applicable licenses for more details.

Base station

- Access function that enables logging on the internal Web server over the Internet
- Built-in Web server to facilitate installation
- Short measurement interval in installation mode
- Ethernet, Modbus TCP/IP
- RS-485, Modbus RTU slave/ master
 - Support unit controllers A203, C203, S203, H23, EH-203.
 - When WL-Base is a Modbus RTU Master device, it calculates an average of the room temperature and writes the calculated value to the unit controller via bus measurement.
- The maximum number of direct connections to the base station is 80 pieces. The signal can pass through the routing sensor, reducing the need for direct contacts.

NOTE! Base station should not be connected to the public internet without firewall! That is, for example, a fixed IP address that is visible from outside network. Typically 3G-modem, adsl/wdsl/cable modem operates firewall functionality, wherein the separate accessory is usually not required but the situation need to make sure the network administrator.