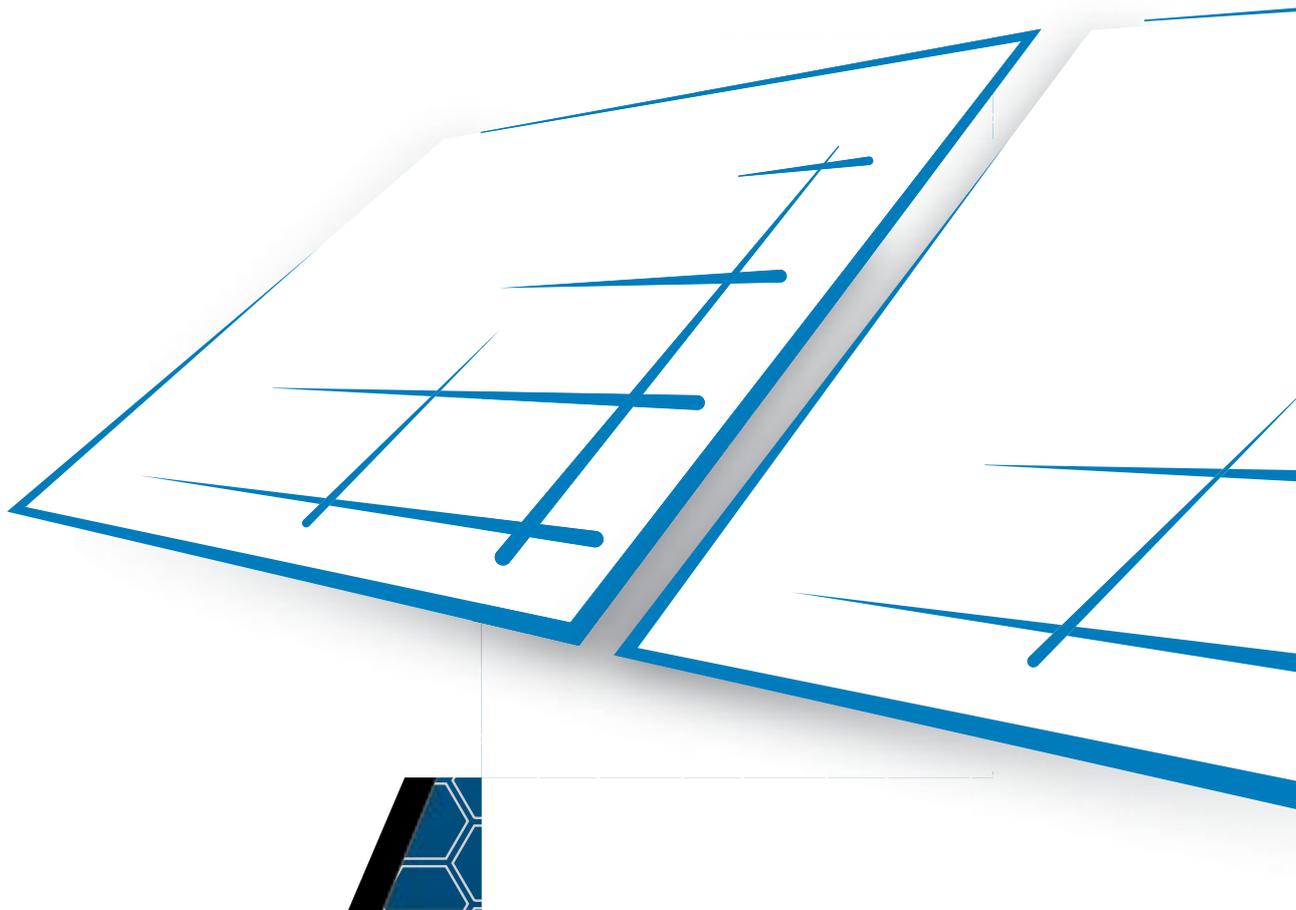


# COMMUNICATION GATEWAY

USER MANUAL



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# User Manual

# 1 Package contents

- Letrika communication gateway
- Power adapter
- Electrical (DC) connector
- WMBus antenna
- WLAN antenna
- Pylon
- Quick install guide

## 1.1 Components

### 1.1.1 Communication gateway units

Next block diagram is showing how each unit of the Letrika communication gateway is connected to the CPU unit which is using embedded Linux 2.6 and have integrated web server.

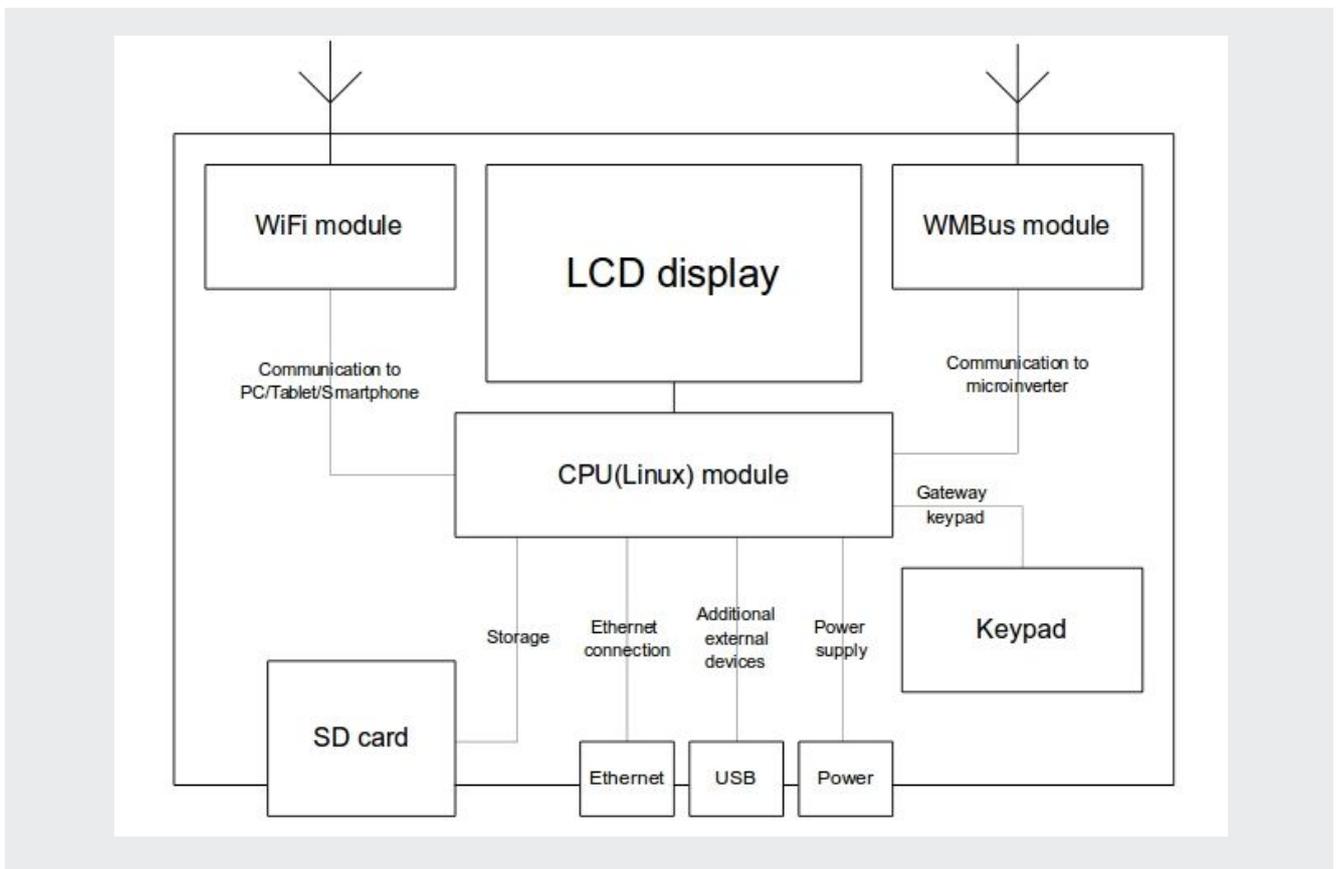


Figure 1: Block diagram

## 1.1.2 Front view

1. **LCD screen:** The user can select (using Menu keys) between different views: Plant info, Communication info, Gateway Info, and Plant settings.
2. **Menu keys:** The user can use keys (Enter, Esc, UP, DOWN) to operate with the Letrika communication gateway menu.
3. **Plant status LED:** When the registration is finished and none of the micro inverters reports an alarms this light will turn green. Otherwise the light will turn red.
4. **Communication gateway status LED:** When the Letrika communication gateway has finished loading and is ready for usage this light will change from orange to green.



Figure 2: Front view

## 1.1.3 Upper view

1. **WMbus antenna connector:** The WMbus antenna should be screwed to this connector.
2. **SD card slot:** Letrika communication gateway is using SD card for storing plant measurements. If the SD card is missing only the current measurements will be stored. The SD card should be inserted in this slot.
3. **WLAN antenna connector:** The WLAN antenna should be screwed to this connector.

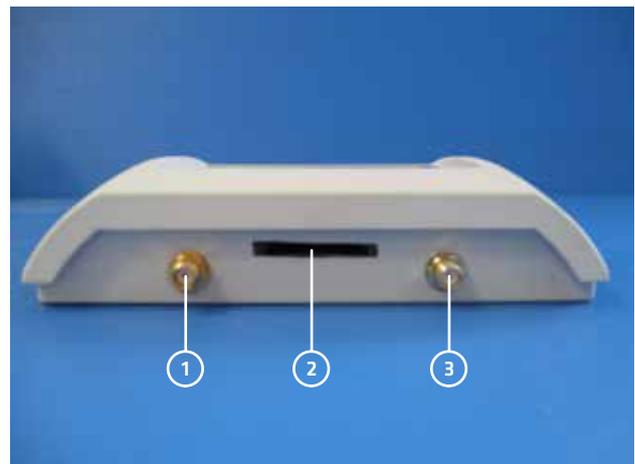


Figure 3: Upper view



Figure 4: Missing SD card



## 1.1.4 Bottom view

- 1. USB port:** By default USB port is not used. It can be used for additional external devices.
- 2. RJ45 Ethernet port:** Ethernet wired network should be connected to this port using ethernet cable.
- 3. Power port:** Connect the included AC power adapter.



Figure 5: Bottom view

## 2 Installation

When installing the Letrika communication gateway be aware that the micro inverter antenna and the Letrika communication gateway antenna must be in the visible range and the distance between each other should not be more than 30m. If this is not possible, please use the antenna extension cable.

### Please follow next steps during the installation of Letrika communication gateway:

#### STEP 1

Attach the pylon to the wall using screws and hole-in anchors.

#### STEP 2

Attach the other part of the pylon to the Letrika communication gateway.

#### STEP 3

Attach the Letrika communication gateway to the wall using the pylon.

#### STEP 4

Screw WMBus and WLAN antennas to the WMBus antenna connector and WLAN antenna connector on the Letrika communication gateway.

#### STEP 5

Insert SD card into SD card slot. Note that SD card is not included in the package.

#### STEP 6

Connect Letrika communication gateway to the power adapter. Letrika communication gateway can be used when the Communication gateway status LED turns green.

#### STEP 7

Remember the network IP that can be found at the Network info menu on the Letrika communication gateway LCD screen (use Menu keys for navigation).

#### STEP 8

Connect your PC/tablet/smart phone to the Wifi/Ethernet network and start your preferred web browser.

#### STEP 9

Insert the network IP from step 7. into the URL bar of your preferred web browser and the Setup wizard should start automatically.

## 3 Setup wizard

First access to the web application will automatically start the setup wizard which consists of two steps that you have to follow.

### 3.1 Gateway settings

Choose the name for your power station and enter it into the field **PLANT NAME**.



Figure 6: Choosing the name for your power station

If you would like to activate username/password protection, mark the field **SECURITY** and enter username and password. You can later easily change your password at the same page.



Figure 7: Activating username/password protection

For additional settings mark the field **ADVANCED SETTINGS**.

- **TIMEZONE:** If Letrika communication gateway is not connected to the internet, manually choose the timezone in which Letrika communication gateway is located from the dropdown menu.
- **HARVEST MEASUREMENT INTERVAL:** From the dropdown menu choose how often the current power measurement and the current energy measurement will be updated. Default value is 1 minute.
- **HARVEST STATUS INTERVAL:** From the dropdown menu choose how often the power station's status will be checked. Default value is 1 minute.
- **EXPORT TYPE:** If you would like to export your power station's measurements choose the export service provider from the dropdown menu. Currently supported export service providers are Sitel and MOIDOM. If you decide to export your measurements to Sitel, enter `www.pomse.si` into the **EXPORT HOST** field and fill the **EXPORT URL** field. Otherwise, if you choose **MOIDOM**, fill the fields **EXPORT HOST**, **EXPORT URL** and **EXPORT MOIDOM ID** with values that were assigned to you by



Figure 8: Advance Letrika communication gateway settings

**MOIDOM.** We encourage you to use the first one and use portal at the <https://www.letrikasol.com> to check the export data.

- **EXPORT INTERVAL:** If you chose one of the export service providers, you can select how often the measurements will be exported to the choosen export service provider. Default value is 5 minutes.

After you have finished with Gateway settings click on the **SAVE AND CONTINUE** button.

## 3.2 Plant settings

If you set all the Gateway settings from the previous paragraph correctly, you will be redirected to the Plant settings and the name of your power station will already be shown at the top of the page.

Firstly define the size of your power station's micro inverter table in the Advanced settings. The size of the table should be defined in a way, that you will later be able to fill the fields of it with micro inverters - each micro inverter at the same position in the micro inverter table as it stands in your power station.

Micro inverters are then registered by filling the fields of the micro inverter table with eight-digit micro inverter ID. For each micro inverter its ID can be found on the label attached to it. We suggest that you take the labels from the micro inverters and paste them in to the micro inverter table which can be found at the end of the Quick install guide included in the package.

Each time after you fill the single field in the micro inverter table with the new micro inverter ID and you move the focus out of the field, the field will be disabled and underneath you will notice a small blue box "registering...". If the micro inverter has been successfully registered, the box will turn green ("registered"). Otherwise, if the registration has not succeed, an alert with an explanation will appear at the top of the page and the field in the micro inverter table will be enabled again, allowing you to correct it.

After the first micro inverter has been successfully registered, its maximal output power will appear in the field **MAXIMAL OUTPUT POWER**. The value in this field will later automatically increase after the registration of each new micro inverter. You can also set maximal output power manually.

The other two settings that you are able to change are **POWER FACTOR** and **PRICE**. The **POWER FACTOR** is the ratio of the real power and the apparent power, while **PRICE** represents the price for 1kWh of energy.

After you have finished with plant settings click on the **SAVE** button and the settings will be applied to all the registered micro inverters.



Figure 9: Registering new micro inverters and setting other plant settings

## 4 Main page

The top of the main page consists of two parts, which are both updated every 60 seconds. The one on the left is showing numerical informations about the quantity of the energy produced by the power station since its installation, about the quantity of the energy produced by the power station in a current day, about the earnings since the power station's installation, and about the quantity of reduced CO<sub>2</sub> emissions since the power station's installation. The income depends on the price setting that the user can change at the Plant settings. The right field contains a chart showing the produced power in a current day. Clicking on the chart with the left mouse

button, changes the shown data from produced power in a current day to the produced energy in a current day. A blue dot is always pointing at the current time at the Letrika communication gateway.

Above the field containing a chart there is an **ON/OFF** button, which can be used when you decide to turn the power station on or off. On its right side there is a **STATUS** light, which is coloured green when the power station is on and coloured grey when power station is off or when at least one of the micro inverters is sending a warning or an alarm.

There are 5 different views to chose among at the Main page.



Figure 10: Overview of the power station

### 4.1 Physical layout

Each micro inverter is represented with a circle at the same position as it stands in your power station. The numbers show the produced energy and current power for each inverter, while the number of lines and their colours show the ratio of micro inverter output power and its status. The higher that the number of lines is, the higher the ratio of micro inverter output power is. If some alarm appears at the micro inverter the lines will be coloured red and an additional box with the explanation of the error will appear. If you click on the circle of working micro inverter, you will be redirected to the page with panel statistics. Otherwise, if you click on the circle of the micro inverter with an alarm you will be redirected to the Alarm history.

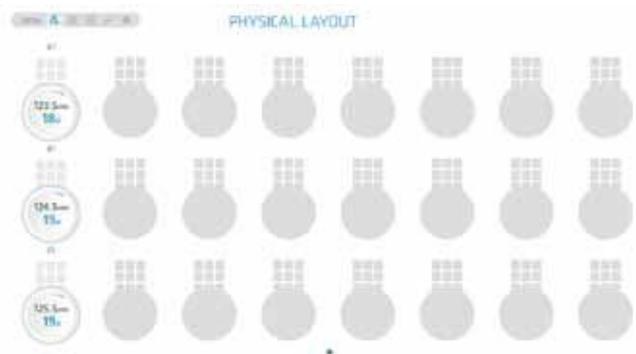


Figure 11: Physical layout



## 4.2 Matrix layout

Micro inverters are arranged by their micro inverter table number (where empty places are left out). The meaning of the numbers, lines, and colours is the same as in the Physical layout.



Figure 12: Matrix layout

## 4.3 Panel statistics

Current status and the last measurements for each micro inverter are gathered in the table. If you click on an alarm ID, you

will be redirected to the Alarm history. The interpretation of the measurements can be found in the next table.

Measurement	Interpretation	Expected values
Panel ID	Panel ID	-
Micro inverter ID	Micro inverter ID	-
Time	Measurement timestamp	-
Status	Status	on
HW ver.	Micro inverter hardware version	-
SW ver.	Micro inverter software version	-
Max Power	Maximal output power of the micro inverter	Depends on user settings
Cos phi	Ratio of the real and apparent power	Depends on user settings
Freq.	Frequency	Approximately 50Hz.
DC-DC t.	Temperature at the DC side of the micro inverter	Depends on the mounting frame heat dissipation
DC-AC t.	Temperature at the AC side of the micro inverter	Depends on the mounting frame heat dissipation
Sec DC volt.	Voltage at the secondary DC side	Approximately 400V
Alarm ID	Alarm ID	0 (For detailed description of alarm ID see the Micro inverter user manual.)

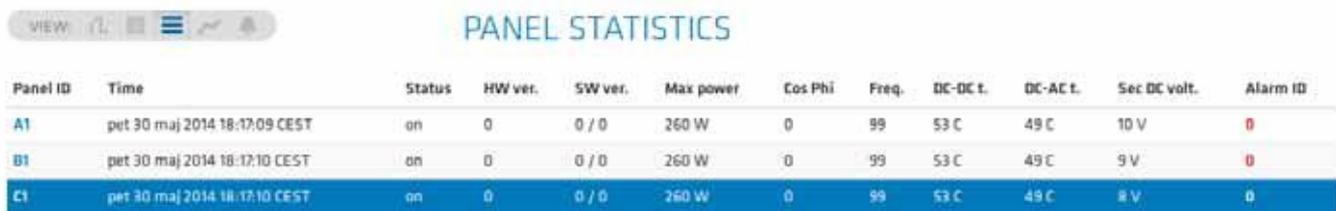


Figure 13: Panel statistics



## 4.4 Charts

All the measurements gathered at your power station can be seen as a chart. You can choose between daily, weekly, and monthly view. The selection between the data gathered at single micro inverter and the sum of data gathered at the power station can also be made. By clicking on arrows on the left and the right side of the shown date, you can also check history data.



Figure 14: Charts

## 4.5 Alarm history

All the alarms are gathered in the table. For every alarm you can see when did it happen, on which micro inverter did it appear, and what kind of error it represents.

## 4.6 Navigation bar

The navigation bar can always be found at the Letrika communication gateway web application. Among other language selection and log out (if you activated username/password protection at the gateway settings) can be made there.



Figure 15: Navigation bar

# 5 Settings

All the setting that were set in the Setup wizard can later be changed at the Settings.

## 5.1 Gateway settings

Basic gateway settings are the same as in the Setup wizard.

## 5.2 Plant settings

Basic plant settings are the same as in the registration wizard. Each new micro inverter should be registered via this page.

## 5.3 Network settings

Here you can set how the gateway will connect to your home network. You can chose between two options: **LAN MODE** (static or DHCP) and **WLAN MODE** (connected to your home **WLAN** or as access point).

If the value for **LAN MODE** is DHCP (as default) the Letrika communication gateway gains **IP**, **MASK**, **GATEWAY**, and **DNS** by itself. All the settings under **LAN MODE** can also be set manually.

The default **CONNECTED IP** for **WLAN MODE** is 192.168.50.1. If the user insert the **CONNECTED IP** for **WLAN MODE** into the URL bar of his preferred web browser the Letrika communication gateway web application should appear. If the **CONNECTED IP** for **WLAN MODE** is changed, it can be found at the LCD screen of the gateway (the same is true for **CONNECTED IP** for **LAN MODE**).

When you are done with changes at any of the settings click on the **SAVE** button. You will be informed if the settings were saved successfully at the top of the page.



Figure 16: Network settings



## 5.4 Plant settings via LCD screen

Plant settings can also be changed via LCD screen on the Letrika communication gateway. Use the menu keys to register new micro inverters.

### Registration of micro inverters via LCD screen

1.	<pre>Plant info Energy: 75.8kWh Power : 672.0W Status: alarms</pre>	The default view on the LCD screen is Plant info.
2.	<pre>Plant settings Press ENTER to enter plant settings menu</pre>	Click on the DOWN key once to move to the Plant settings view.
3.	<pre>New inverter Enter ID: -----</pre>	Click on the Enter key twice to be able to register new micro inverter.
3.*	<pre>Import inverter Enter password: -----</pre>	Click on the Enter key, DOWN key, and Enter key to be able to import micro inverter.
4.	<pre>New inverter Enter ID: 0000009A-----</pre>	Use the Enter key to select the numbers and letters, and the UP and DOWN keys to navigate through the ID when inserting micro inverter ID.
5.	<pre>ID: 0000009A Energy: 4280 Wh Power : 0 W Status: working</pre>	When you have entered micro inverter ID, click on the Enter key and if the registration succeeded "Registered." will be displayed and you will be redirected to the Inverter info view.



## 6 Technical characteristics

Communication to micro inverters	WMbus 868 MHz complies to EN 13757-1 . . . 5, selectable sample rate (Min. 60 s)
Communication to PC, tablet, smartphone	WiFi IEEE 802.11 / 2.4 GHz, Ethernet RJ45
Connectors	RJ45 Ethernet, USB (for additional functions)
Optional	Sending data to cloud by predefined protocol
Operating system	Embedded Linux, Integrated web server
Data storage	SD card (Max. 32 GB)
Basic monitoring and settings	Through LCD display
IP protection	IP 40
Ambient temperature	-20 °C . . . + 55 °C
POWER SUPPLY:	
Input	100 Vac - 240 Vac; 50 Hz - 60 Hz
Output	12 Vdc, 700 mA
Optional	Extension cable for WMbus antenna
Dimensions	150 x 37 x 155 mm
Weight	350 g



# Contacts

Letrika Sol d.d. is a joint venture between Cosylab d.d. and Letrika d.d..

## Headquarters

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