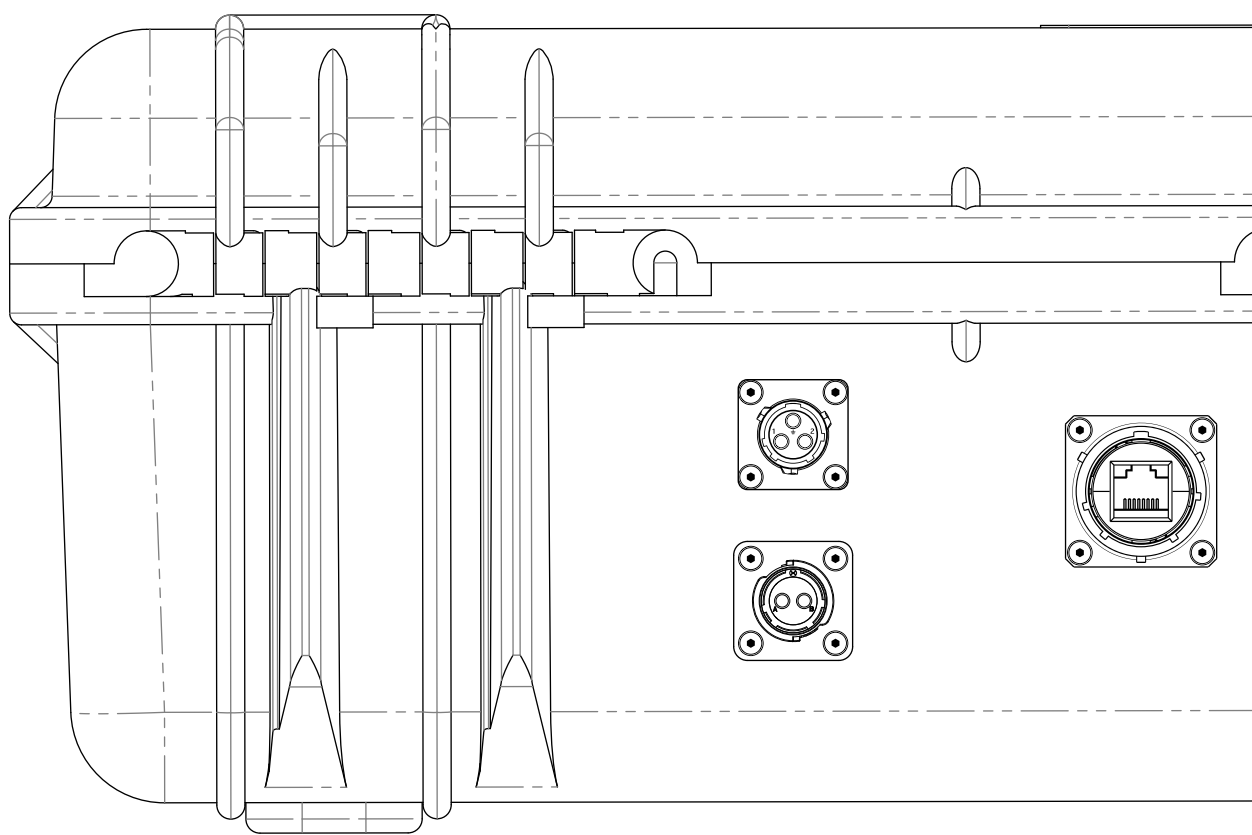


# Portable Connectivity Unit

User Manual

Manufactured by:

**SPEEDFI sp. z o.o.**



**WARNING:**

The recommendations provided in this user manual must be followed, and a copy should be kept near the device in case it is needed in the future.

Improper use of the device may cause heat, smoke, fire, explosion or other injuries.

**FLAMMABLE HAZARD:**

Lithium batteries contain flammable liquid electrolyte that may vent, ignite, and produce sparks when subjected to high temperatures ( $> 150\text{ }^{\circ}\text{C}$  ( $302\text{ }^{\circ}\text{F}$ )), when damaged, or when abused (e.g., mechanical damage or electrical overcharge). They may burn rapidly with a flare-burning effect. Burning cells can ignite other batteries in close proximity.

Vapors or mists from a ruptured battery may cause respiratory irritation.

## CONTENT

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SPEEDFI sp. z o.o. makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice.

# INTRODUCTION

## Product Description

Thank you for choosing the Portable Connectivity Unit (PCU) from SpeedFi. We are confident that you'll get the most out of your new device.

Please unpack your PCU carefully and inspect the contents for completeness and any visible damage. In case of any damage, please inform us immediately.

Your PCU is delivered in a ready-to-use state with approximately 40% charge (+/-5%). However, we strongly recommend that you read through this user manual carefully. If you have any further questions regarding the PCU, please contact SpeedFi or an authorized distributor.

## Contact Details

SPEEDFI sp. z o.o.

Customer Service/ Technical Support  
ul. Michałowicza 12, 43-300 Bielsko-Biała  
Poland

Phone: +48 33 445 70 06

E-Mail: [Info@speedfi.eu](mailto:Info@speedfi.eu)

Website: [speedfi.eu](http://speedfi.eu)

# SAFETY INFORMATION

## Product Description

Before using the Portable Connectivity Unit (PCU), please read and understand the instructions thoroughly, including all cautions and safety notices on the second page of this manual. Adhering to the instructions for proper operation and troubleshooting will reduce the risk of personal injury and/or property damage.

While these instructions do not cover every aspect of operation and troubleshooting, following them will help ensure your safety. If you have any questions or concerns about procedures or safety that are not covered in this manual, do not hesitate to contact SpeedFi or an authorized distributor.

## Operator Responsibility

Handle the PCU system with care by placing protective caps on the external ports and turning it off when not in use.

If you notice any unusual sounds or smells coming from the unit, turn it off immediately and contact SpeedFi or an authorized distributor. Place the unit in a well-ventilated area, away from any flammable materials.



### **WARNING:**

Do not put any objects into the unit's ports.

Keep away from loose metal objects such as tools, screwdrivers, screws, and drill bits, which can cause an electric short circuit.

Never open the unit's top case panel.

Do not disassemble, repair, or modify the product yourself.

Disassembly of this product by individuals without appropriate professional qualifications is strictly prohibited. Failure to comply will result in the loss of all warranties.

Please avoid placing the device in direct sunlight and keep it away from fire and heat sources.

Do not expose to temperatures outside the range of -20°C to 45°C.

To minimize any adverse effects on battery performance it is recommended that the system be kept at room temperature (25°C +/- 5°C). Low or elevated temperatures can result in shortened cell life.

Please use the appropriate adapter when charging the device.

Extended periods without use can cause the battery to degrade.

Please allow the battery to fully charge and discharge at least once every 6 months.

Keep out of the reach of infants and children.

**DANGER:**

Avoid short circuits, very deep discharges and excessive charge or discharge currents.

Explosion and fire hazard. In case of fire, you must use a type D foam or CO2 fire extinguisher.

Any leaked battery material, such as electrolyte or powder on the skin or the eyes, must immediately be flushed with plenty of clean water. Then seek medical assistance. Spillages on clothing should be rinsed out with water.

**Condition of Use**

If system is in abnormal physical condition, do not use.

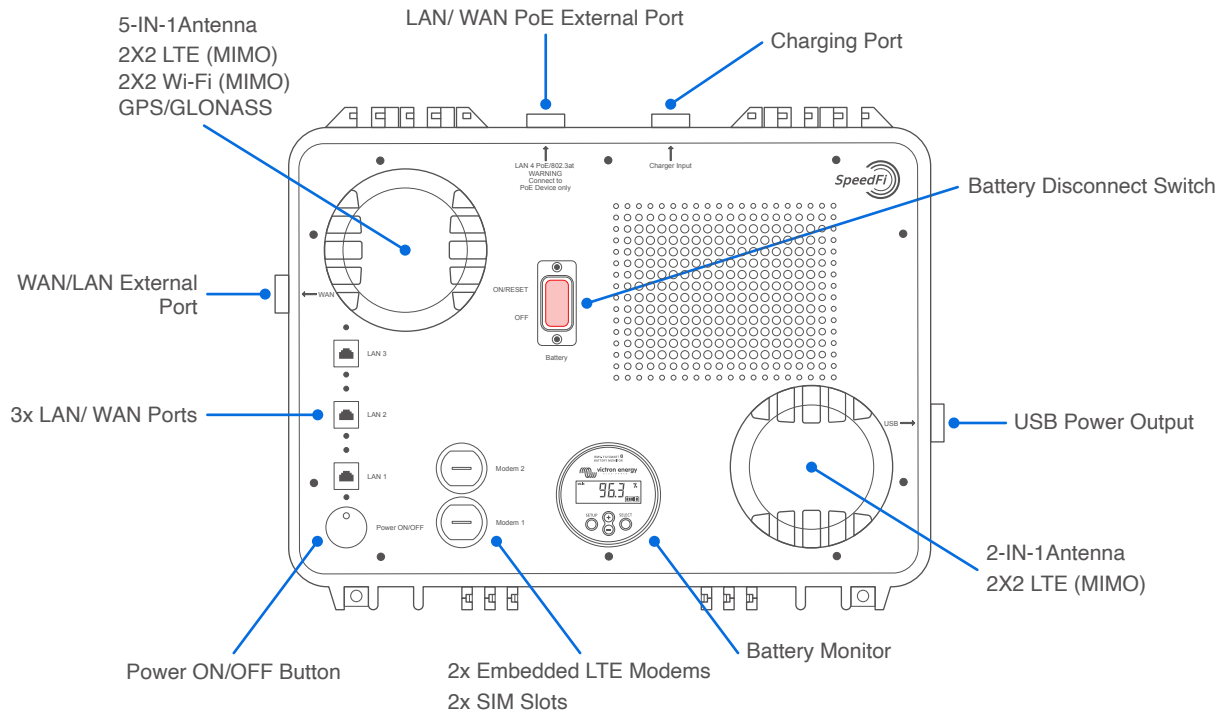
**Critical Errors**

If the Battery Disconnect Switch is pushed on but the state of charge gauge or Battery Monitor backlight remains off, this indicates an error. Please contact SpeedFi technical support immediately.

If you hear or suspect that internal components are loose and rattling inside, please contact SpeedFi technical support.

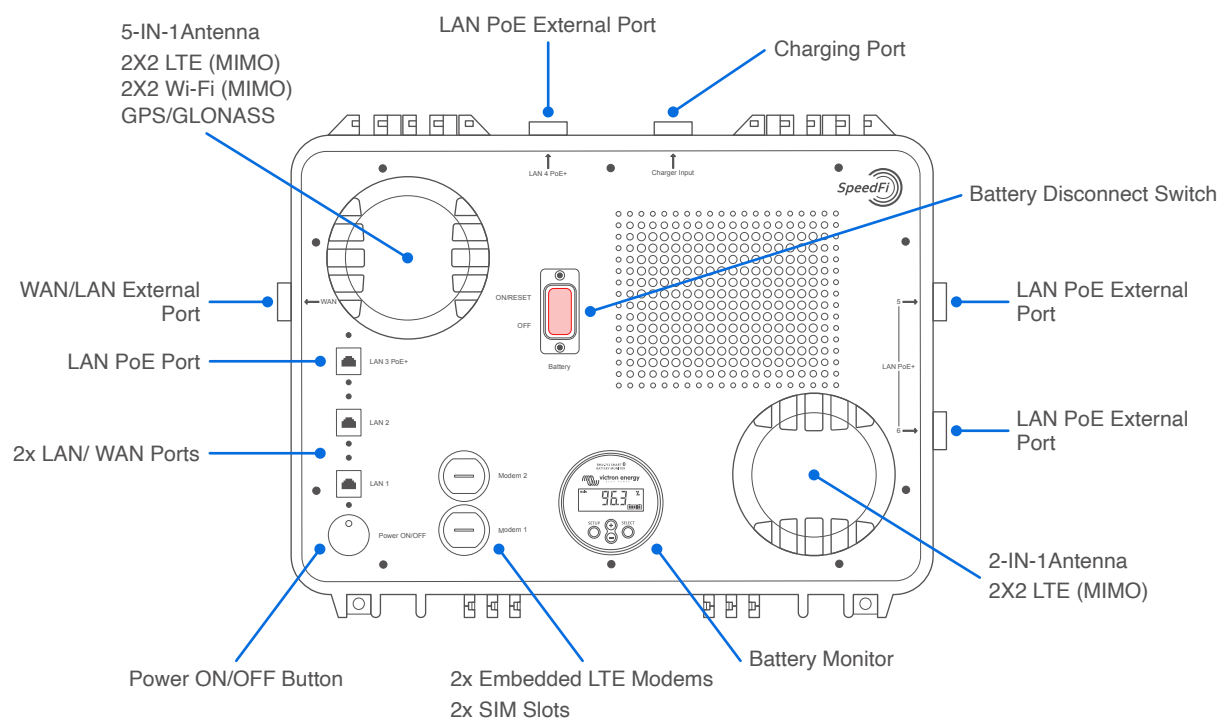
# SPECIFICATION

## Portable Connectivity Unit (PCU-M)



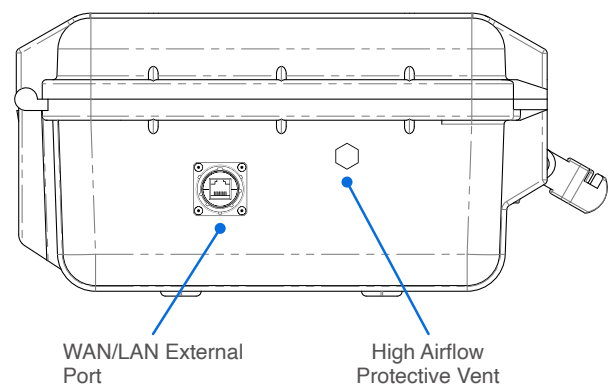
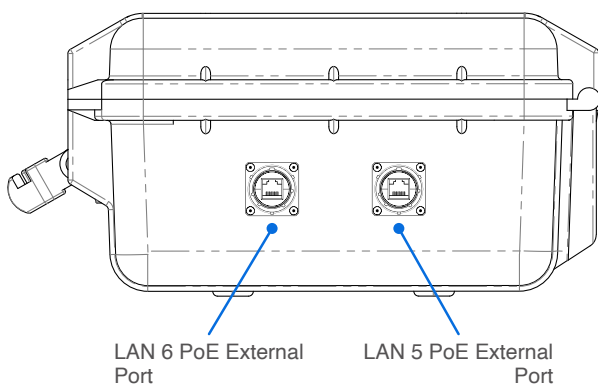
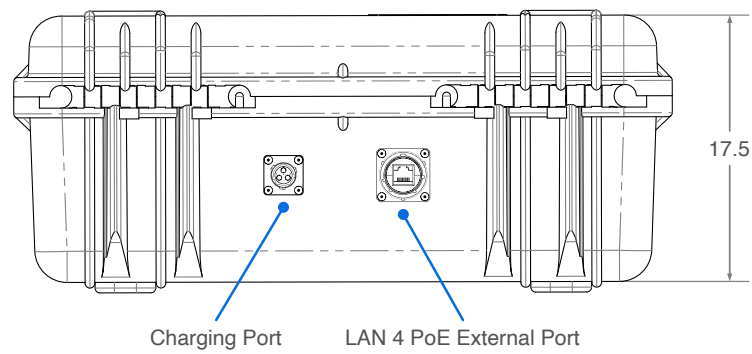
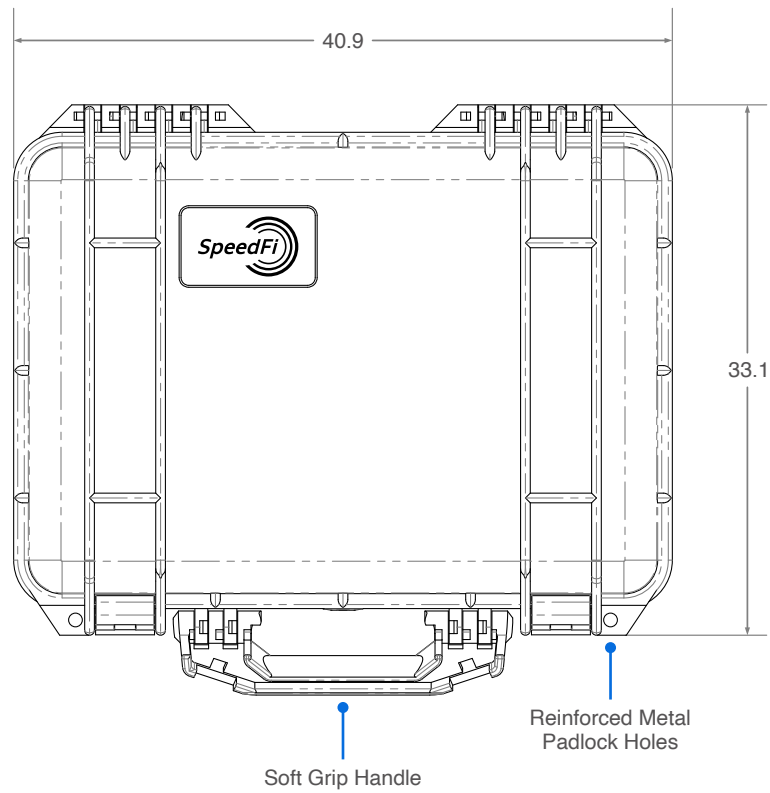
<b>Integrated Cellular</b>	2x Embedded LTE-A Modems (CAT-6)	<b>Power Input</b>	DC: 13.8 – 14.6V
<b>SIM Card Slot</b>	2x Nano-SIM (4FF)	<b>Power Output</b>	1x 802.3af/802.3at PoE 1x USB
<b>Ethernet (WAN and/or LAN)</b>	5x GE Ports (8P8C)	<b>Power Consumption</b>	Idle: <6 W, Max: <24 W (no PoE)
<b>Wi-Fi Interface</b>	Simultaneous Dual-Band (2.4GHz / 5GHz) Wi-Fi 5 2x2 MU-MIMO Wi-Fi WAN and/or AP	<b>Dimensions</b>	40.9 x 33.1 x 17.5 cm
<b>Antennas</b>	4x Cellular Antennas (Embedded) 1x GPS Antenna (Embedded) 2x Wi-Fi Antennas (Embedded)	<b>Weight</b>	8 kg
<b>USB</b>	1x USB2.0	<b>Operating Temperature</b>	Charge 0°C ~ +45°C Discharge -20°C ~ +45°C
<b>Battery</b>	154 Wh Lithium Iron Phosphate (LiFePO4) 12V battery	<b>Humidity</b>	15% – 95% (non-condensing)
		<b>Warranty</b>	1-Year Limited Warranty
		<b>Package Content</b>	PCU Waterproof IP68 Battery Charger
		<b>Certifications</b>	CE, IP65 IP67 pending
		<b>Colours</b>	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>

## Portable Connectivity Unit (PCU-UM)



<b>Integrated Cellular</b>	2x Embedded LTE-A Modems (CAT-6)	<b>Power Input</b>	DC: 13.8 – 14.6V
<b>SIM Card Slot</b>	2x Nano-SIM (4FF)	<b>Power Output</b>	4x 802.3af/802.3at PoE
<b>Ethernet (WAN and/or LAN)</b>	7x GE Ports (8P8C)	<b>Power Consumption</b>	Idle: <6 W, Max: <24 W (no PoE)
<b>Wi-Fi Interface</b>	Simultaneous Dual-Band (2.4GHz / 5GHz) Wi-Fi 5 2x2 MU-MIMO Wi-Fi WAN and/or AP	<b>Dimensions</b>	40.9 x 33.1 x 17.5 cm
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		<b>Colours</b>	

# MECHANICAL DRAWING



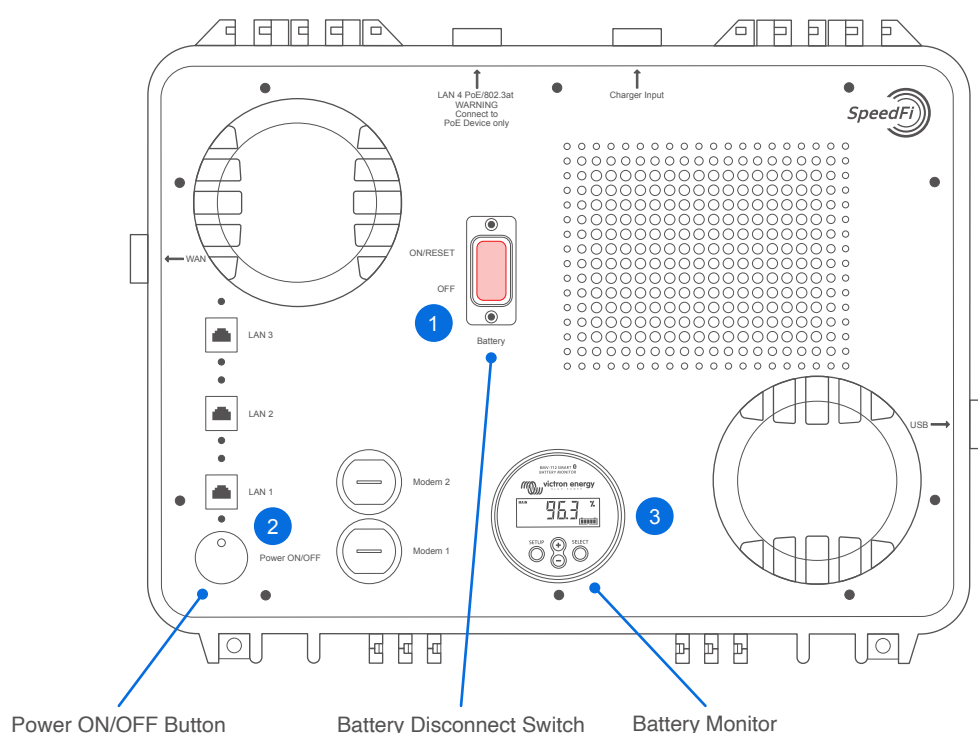
# HOW TO USE THE PCU

## Turning the device on and off

Switch the toggle of the Battery Disconnect Switch to the ON/RESET position (1) to turn on the PCU. The LCD screen of the Battery Monitor (3) will light up, and the battery level indicator will display.

Next, press the Power ON Button (2) to power on the built-in router and additional components such as the PoE switch and/or additional modems. After about 2-3 minutes, the system will be ready for use.

\*image may defer from actual unit based on product version



To turn off the device, follow the steps in reverse order.

## Standby mode

There is no need to use the Battery Disconnect Switch (1) every time to turn off the device; simply use the Power ON/OFF Button (2).

**If the device is not used for more than two or three days, it should always be turned off using the Power ON/OFF Button first (2), and then the Battery Disconnect Switch (1).**

In the ON/RESET position, very little power is consumed but will slowly deplete the battery, which can be especially dangerous if the battery becomes fully depleted.

A monthly self discharge of 5-10% will occur and may damage a unit that has been left stored after being depleted.

Please ensure that the unit is recharged after it has been depleted.

**SpeedFi is not responsible for batteries left depleted and these will not qualify for a warranty replacement.**

SpeedFi recommends always turning off the PCU by toggling the Battery Disconnect Switch (1) to the OFF position when the PCU is not in use for an extended period.

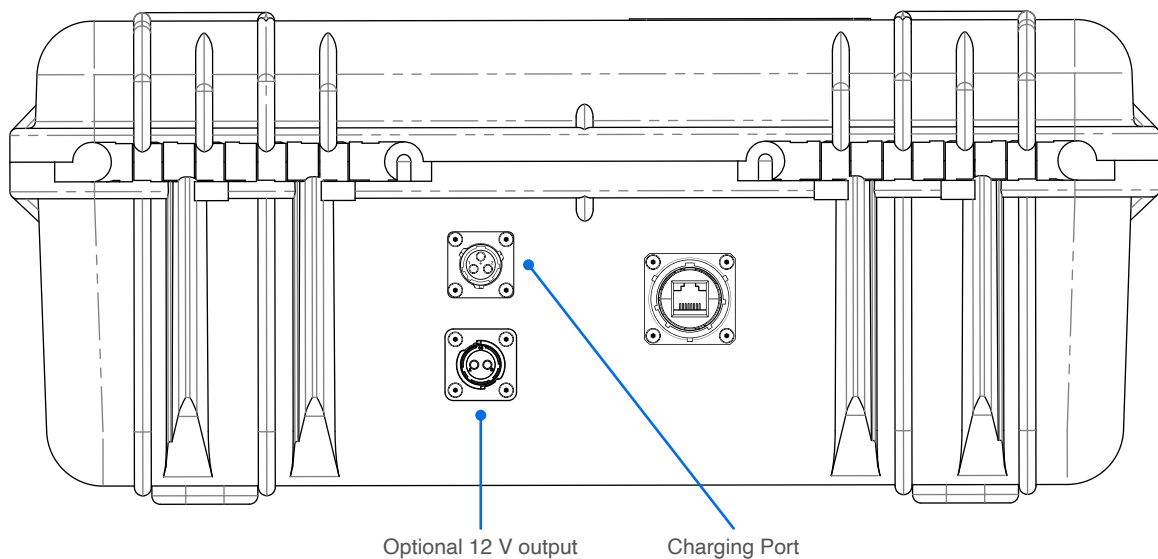
## Charging

**The unit should be charged at least every 3 months.** Please note that the battery monitor may not show any reduction in energy level, depending on the battery monitor's configuration, when the Power ON/OFF button (2) is OFF and the Battery Disconnect Switch (1) is in the ON/RESET position, even though a minor discharge has occurred.

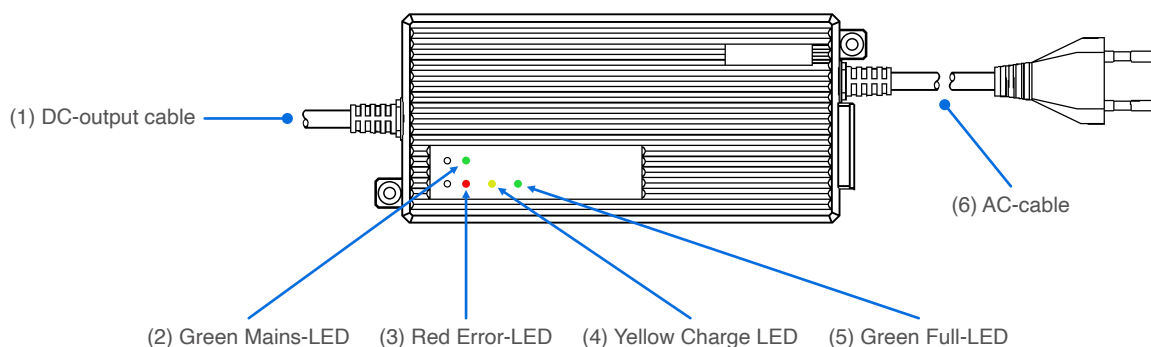
Charge with supplied chargers only.

The battery should be charged under temperature range of 0-40°C however 10-30°C is recommended for optimizing the charging performance.

Fully charged battery will discharge naturally.



\*The charger power connector may vary based on the product version.





## ATTENTION:

Before operating please make sure that the power cable and the charger including the charging cable show no damages and make sure that the mains supply complies with the specification.

- a) Connect the charger to the PCU
- b) Connect the charger to the wall socket

The charging process starts automatically. The display of the battery monitor will show the current flow to the battery. Depending on the battery level, the charger will run through the following four charging phases:

### 1. Charging phase: precharge

This charging step is indicated by **blinking alternately of the Charge-LED (4) and Full-LED (5)**.

**Explanation:** The precharge phase starts automatically at deeply discharged batteries (where the BMS is off). During this phase, the charger use controlled current pulses. That tries to reactivate the BMS and bring the battery in a voltage where it is possible to start the charging process.

### 2. Charging phase: soft start

This charging step is indicated by **constant lighting of the Charge-LED (4)**.

**Explanation:** During the soft start phase the charger reduces charging current, in order to extend battery lifetime.

### 3. Charging phase: constant current

This charging step is indicated by **blinking slowly of the Charge-LED (4)**.

**Explanation:** During the constant current phase, the battery is being charged to ~80% of its capacity.

### 4. Charging phase: constant voltage

This charging step is indicated by **blinking quickly of the Charge-LED (4)**.

**Explanation:** During the constant voltage phase the battery is being charged to its maximum capacity.

If the **Full-LED (5) is constant lighting** the battery has reached the full capacity. Should the battery stays on charger, the automatic restart starts after 7 days or the battery voltage is under 3.4V/cell.

### Disconnect the charger from the battery:

- a) Disconnect the charger from the mains supply
- b) Disconnect the charger from the PCU

### Charging advice:

For increasing the lifetimes of the battery please do not stop a charging process before the battery is fully charged. The charger will automatically stop the charging process

It is safe to leave the PCU plugged into the charger for extended periods of time.

The PCU can be charged whether the Power ON/OFF Button (2) is in the ON or OFF position. However, for energy-saving purposes, we recommend keeping the system in the OFF position while charging.

When the PCU is being charged with the Power ON/OFF Button (2) in the ON position, the discharging current will be subtracted from the charging current, which will be indicated on the Battery Monitor display (3).

## Charger Errors and Troubleshooting

Table 1: General errors:

Error description	Solution
No LED lighting or blinking after connecting mains	Check if charger is connected to mains supply Check function of mains supply
Green Mains LED is on, charger is connected to the PCU and the charging process don't start	Check connection to the PCU Check if battery is damaged or deeply discharged
Error- LED blinking (N x blinking / 2 sec pause)	Please see the table below for error description

Table 2: Error- LED blinking signals:

Blinking signal	Error description
1 x	Battery damaged
2 x	Battery voltage is too high
5 x	Charger temperature is too high as charging

## Discharging

The PCU should discharge within a temperature range of -20°C to 45°C; however, -10°C to 40°C is recommended for better performance.

At low temperature, the battery internal resistance will increase, and will short the discharging time.

Make sure the total power consumption should not exceed PCU max output power (10 Amps), otherwise the internal protection circuit will active and cut off power to protect the battery cells.

Battery Disconnect Switch (1) will automatically toggle to the OFF position.

In such a situation, disconnect the load and switch the Battery Disconnect Switch (1) to the ON/RESET position.

In the event of a short circuit, the Battery Disconnect Switch (1) may not automatically switch to the OFF position after the power is cut off. In this case, switch it to the OFF position manually, and then to the ON/RESET position.

## 12 V output

Before connecting other devices, ensure that the input voltage of the devices you wish to power is compatible with the PCU's output voltage.

Use the original cable: connect one end to the device to be powered and the other end to the PCU's 12 V output port.

The connection will automatically initiate the powering process, and the Battery Monitor display will show the updated battery level as a percentage and the current drawn from the battery.

## Transporting and Shipping

If shipping is required, please ensure to list the PCU with your shipper as hazardous goods and follow all necessary precautions and regulations.

The PCU battery is UN38.3 certified, class UN3481 (lithium-ion battery in equipment).

It is the shipper's responsibility to ensure all paperwork and required packaging are in order. SpeedFi can help guide you through the process.

## Maintenance & Cleaning



### **WARNING:**

SpeedFi does not recommend using a pressure washer to clean the unit as this may damage the internal and void the warranty. Always ensure that the ports caps are closed and the system is OFF when cleaning.

For wiping the components on the panel, as well as the panel itself, use a soft, dry microfiber cloth. To clean the external ports and the casing, you can use a cloth dampened with water.

Always make sure to turn off the unit when not in use for an extended period of time and keep the unit in a charged state.

Please use or store the product in an environment temperature between 20°C to 30°C, away from water, heat, and other metal objects.

For safety, please do not store the product in an environment temperature higher than 45°C or lower than -10°C for a long time.

For safety, please do not store the product in an environment temperature higher than 45°C or lower than -10°C for a long time.

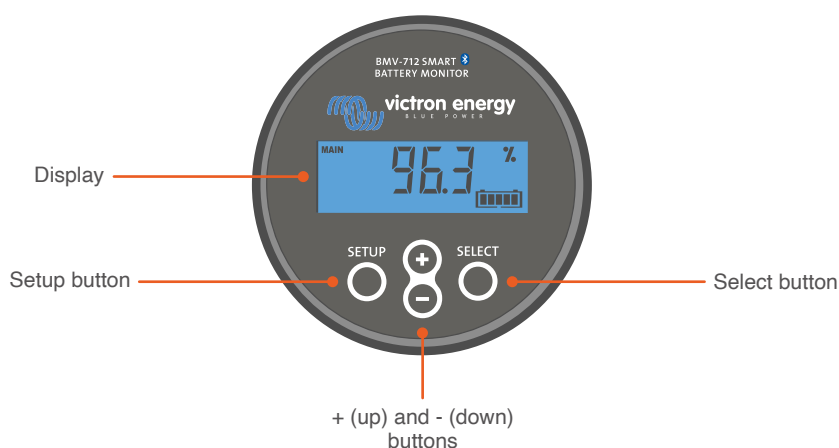
No user maintenance is required. Periodic system checks can be performed by an authorized SpeedFi representative.

## BATTERY MONITOR

The PCU is equipped with a BMV-712 Smart Battery Monitor. It measures battery voltage and current. Based on these measurements, it calculates the battery's state of charge and estimated time remaining. It also keeps track of historical data, such as deepest discharge, average discharge and the number of charge and discharge cycles.

All monitored battery parameters can be viewed, and settings adjusted, using the display and four buttons.

BMV head unit display and buttons.



A connection with the VictronConnect app is possible via Bluetooth. The VictronConnect app can be used to read out all monitored battery parameters or to change settings.

### The VictronConnect app

The VictronConnect app can be used to monitor and configure the battery monitor. Note that configuring the battery monitor using the VictronConnect app is easier than configuring using the battery monitor head unit.

The VictronConnect app is available for the following platforms:

Android, Apple iOS, macOS

The VictronConnect app can be downloaded from app stores or from the VictronConnect product page or scan the below QR code.

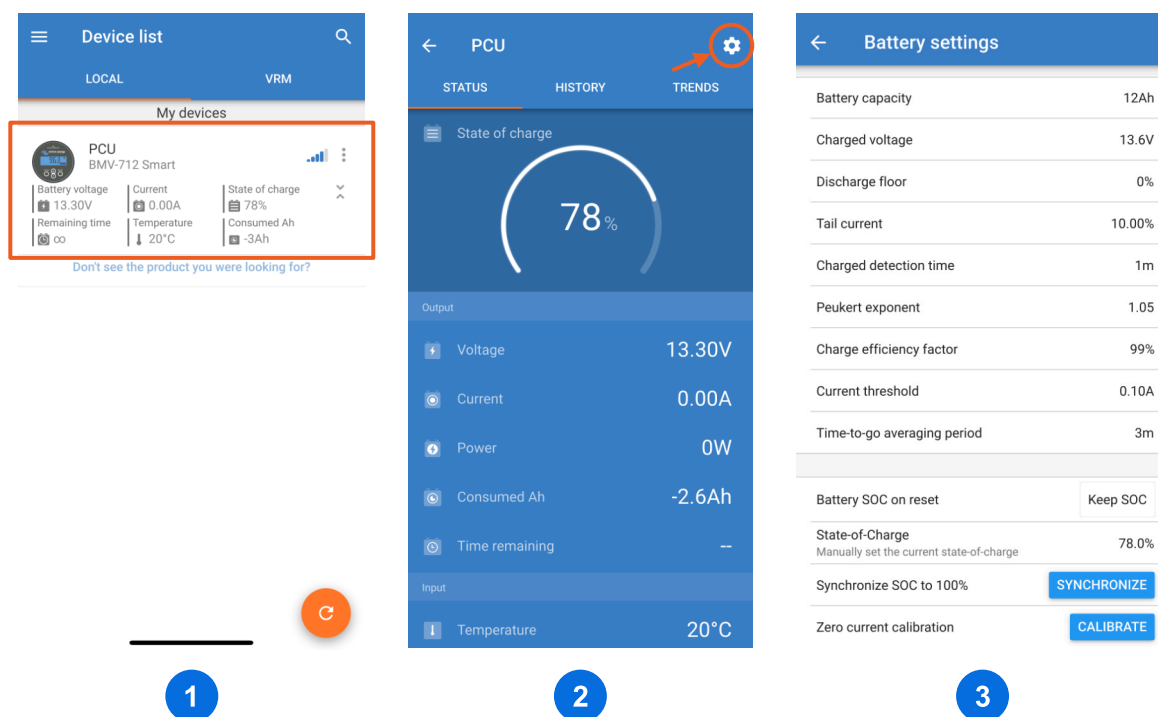


## Programming the PCU Battery Monitor

VictronConnect is available to users of macOS, iOS and Android phones, as well as tablets.

In this guide, we will use an iPhone.

1. Download the VictronConnect app from the App Store.
2. Turn on your phone's Bluetooth and bring it close to the PCU.
3. Select the BMV-712 on the Device List (picture 1).
4. Enter the PIN code provided with the device.
5. Press the gear icon in the top right corner (picture 2).
6. Enter the appropriate values for the supplied charger or solar panel (screen shown on picture 3).
7. Exit from settings, you have completed programming.



**NOTE:** Only one phone can be connected to each device at a time. Be sure to completely disconnect and close the app to log out.

**NOTE:** To change the PIN code from the app, go back to the device list page in the app. Click on the three circles to the right of your device, and select "Reset PIN code".

### PROGRAM SETTINGS FOR: supplied battery charger

- **Battery capacity:** 12Ah
- **Charged voltage:** 13.6V
- **Discharge floor:** 0%
- **Tail current:** 10.00%
- **Charged detection time:** 1m
- **Peukert exponent:** 1.05
- **Charge efficiency factor:** 99%
- **Current threshold:** 0.10A
- **Time-to-go averaging period:** 3m
- **AuxInput:** Temperature
- **Temperature unit:** Celsius or Fahrenheit

### PROGRAM SETTINGS FOR: supplied solar panel

- **Battery capacity:** 12Ah
- **Charged voltage:** 14.2V
- **Discharge floor:** 0%
- **Tail current:** 2.00%
- **Charged detection time:** 3m
- **Peukert exponent:** 1.05
- **Charge efficiency factor:** 99%
- **Current threshold:** 0.10A
- **Time-to-go averaging period:** 3m
- **AuxInput:** Temperature
- **Temperature unit:** Celsius or Fahrenheit

## Synchronizing the PCU Battery Monitor

For a reliable readout, the state of charge displayed by the battery monitor must regularly self-synchronize with the actual state of charge of the battery. This prevents drift in the "State of Charge" value over time. A synchronization will reset the state of charge of the battery to 100%.

### Automatic synchronization

Synchronization is an automatic process and occurs when the battery is fully charged. The battery monitor evaluates several parameters to determine full charge status. It will consider the battery fully charged when the voltage reaches a specific value and the current drops below a certain threshold for a set period.

If the battery monitor does not synchronize automatically (the green LED will light up on the charger, the meter does not indicate 100%, current is not flowing from the charger and the indicator of consumed amp-hours is negative), it is recommended to perform a manual synchronization.

### Manual synchronization

The battery monitor can be synchronized manually if required. This can be done by pressing the "Synchronize" button in the VictronConnect app. Navigate to "settings" and then to "battery settings" (picture 1).

Alternatively, the battery monitor can be synchronized when in normal operating mode by simultaneously pressing and holding the + and – buttons for 3 seconds (picture 2).

←

Battery settings

Battery capacity	12Ah
Charged voltage	13.6V
Discharge floor	0%
Tail current	10.00%
Charged detection time	1m
Peukert exponent	1.05
Charge efficiency factor	99%
Current threshold	0.10A
Time-to-go averaging period	3m

Battery SOC on reset

Keep SOC

State-of-Charge

Manually set the current state-of-charge

78.0%

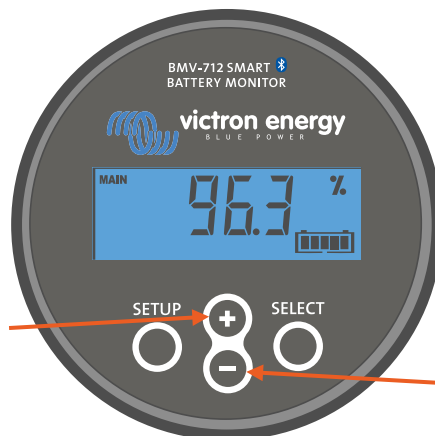
Synchronize SOC to 100%

SYNCHRONIZE

Zero current calibration

CALIBRATE

1



2

## BUILT IN ROUTER

Depending on the version, the PCU can be equipped with routers from three manufacturers:

### Teltonika Networks

### Advantech

### Digi International


All routers used in the PCU are compatible with internet bonding software. To provide internet connection bonding, the Portable Connectivity Unit (PCU) uses Bondix Intelligence S.A.NE technology.

Depending on the ordered version, in addition to this manual, detailed documentation for the specific router model and instructions on how to configure the bonding software will be provided.

The PCU is always delivered with the latest firmware version for the specific router model as well as the modems.

The information with the serial number, router IP, wireless network name, and password will be located under the device's cover.

Example information label located under the device cover

Portable Connectivity Unit	
<b>Model:</b> PCU-UM	<b>Router IP:</b> 192.168.1.1
<b>Serial No.:</b> [REDACTED]	<b>Username:</b> admin
<b>MFC Date:</b> 22.06.2024	<b>Password:</b> [REDACTED]
<b>Extras:</b>	<b>SSID:</b> PCU
<input checked="" type="checkbox"/> 12 V Output	<b>Password:</b> [REDACTED]
<input checked="" type="checkbox"/> Solar Charger	
<input type="checkbox"/> Cold Weather	
<input type="checkbox"/> Reinforced BC	
speedfi.eu	

# WARRANTY

## Manufacturer's Warranty Coverage

All Portable Connectivity Units (PCU) supplied by SPEEDFI sp. z o.o. are tested for reliability and performance before delivery to ensure correct function and condition.

We do not assume any warranty or liability for defects and losses that occur during customer use.

Please refer to this user manual to ensure proper operation and maintenance, which will ultimately prolong the life of the PCU. The warranty does not cover neglect of this manual's instructions.

## Owner's Warranty Responsibility

If the product does not operate as warranted during the applicable warranty period, SPEEDFI sp. z o.o. will, at its option and expense (except for shipping costs), repair the defective product or part, or provide an equivalent product or part to replace the defective item.

All replaced products will become the property of SPEEDFI sp. z o.o.. Replacement products may be new or reconditioned, depending on the condition of the original unit.

**Standard warranty period (unless otherwise contracted) is twelve (12) months.**

**Battery warranty period is set at 24 months or 500 cycles (whichever occurs first) and only covers the battery module.**

The warranty period for this product begins on the date of purchase.

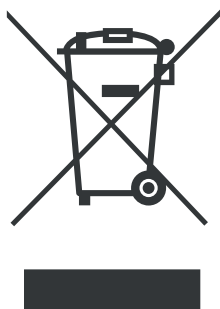
## Exclusions

Warranty does not apply, if

- The warranty period is expired
- The warranty seal is broken or removed
- The product has been modified, opened, or repaired by any unauthorized service center or personnel
- The defect resulted from abuse, improper use not conforming to the product manual instructions, or environmental conditions more severe than those specified in the manual's operating conditions
- The G Shock sticker has been triggered (50G)
- The water tape indicator has been triggered

## Recycling

Please return the product to SPEEDFI sp. z o.o. for safe recycling. If the battery within the system is suspected to be damaged, please recycle it at the nearest electronics recycling facility.



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