LAN 1

Power ON/OFF

# Reliable Connectivity

wherever you need it.

**SpeedFi**

# CONTENT

# PCU

## Portable Connectivity Unit



The **PCU** is a portable, battery powered multi-WAN router. It was designed to withstand the most demanding weather conditions to overcome connectivity and power challenges associated with remote and temporary projects. It comes with dual embedded cellular modems, integrated cellular, WiFi, bluetooth and GPS antennas. Depending on the version, the **PCU** can be equipped with one PoE and USB input or four PoE ports. You can connect an additional access point, VoIP phone, security cameras or other equipment. LAN ports can be configured as WAN to provide additional sources of Internet connection. **PCU** allows you to aggregate multiple wireless and wired internet connections to create a faster, reliable, 100% uptime connection.

## KEY FEATURES

**Easy to use**

Press the button, the device will be ready for use after three minutes. You will be informed about it via SMS or e-mail.

**Dual 4G LTE**

Two simultaneously operational LTE modems and dual SIM slots that allows you to use different cellular providers for bandwidth bonding or load balancing helping reach high speeds even in rural or industrial areas.

**Battery Monitor**

Highly advanced battery monitor. Displays voltage, current, consumed amp hours, remaining battery capacity, time remaining, power and temperature.

**Bluetooth App**

Using the mobile app for iOS and Android, you can read and configure the battery parameters.

**S.A.NE**
SIMPLE AGGREGATION OF NETWORKS

Bonded Internet Connectivity

Aggregation of multiple wireless and wired internet connections to create a faster, reliable, 100% uptime connection. You are always online and connected.

2.4 GHz    5 GHz

11ac

2x2 MU-MIMO

802.11b/g/n/ac (WiFi 5)

Wave-2 802.11ac Dual-Band Wi-Fi, can work as an access point or Wi-Fi WAN to provide additional sources of Internet connection.

LiFePO$_4$ Battery

192 or 154 Wh Lithium Iron Phosphate (LiFePO4) battery and charger all built in, allowing it to operate remotely for up to 32 or 24 hours.

**IP66**

IP 66 Waterproof

Designed to work as a closed lid solution, it is entirely dust and waterproof when shut.

**Power over Ethernet**

Power your access point, IP phone or camera. The port can be configured as WAN to power an additional router or modem.

**12V Output**

Optional 12 V output to power additional equipment.

**Sealed connectors**

Environmentally sealed connectors designed to provide secure, robust and watertight connections in heavy duty and harsh environment applications. Water and dust proof when mated with compatible connectors.

**Operating temperature**

45°C

-20°C
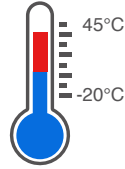
Operates in extreme temps from -20°C to 45°C. The built-in temperature sensor allows you to quickly check the battery temperature.

**8 kg**

**Portability**

The device weighs 8 kilograms. The handle makes it easy to carry.

**Highly impact resistant**

The shell is made of a polypropylene copolymer which has high mechanical strength, stiffness, hardness and has chemical resistance properties.

SpeedFi

# WHAT IS INTERNET BONDING?

Internet bonding is the aggregation of two or more separate Internet connections into one virtual connection, which is more stable, reliable and much faster than any single connection.

It is possible to combine many types of Internet connections, such as fixed-line cable internet, fiber optic connection, 4G LTE, 5G NR, Wi-Fi WAN or even satellite network. Whether it's fiber with a cable, multiple LTE connections, or a combination of all of the above, all internet sources are combined to provide one redundant, higher-bandwidth connection with a single static IP address
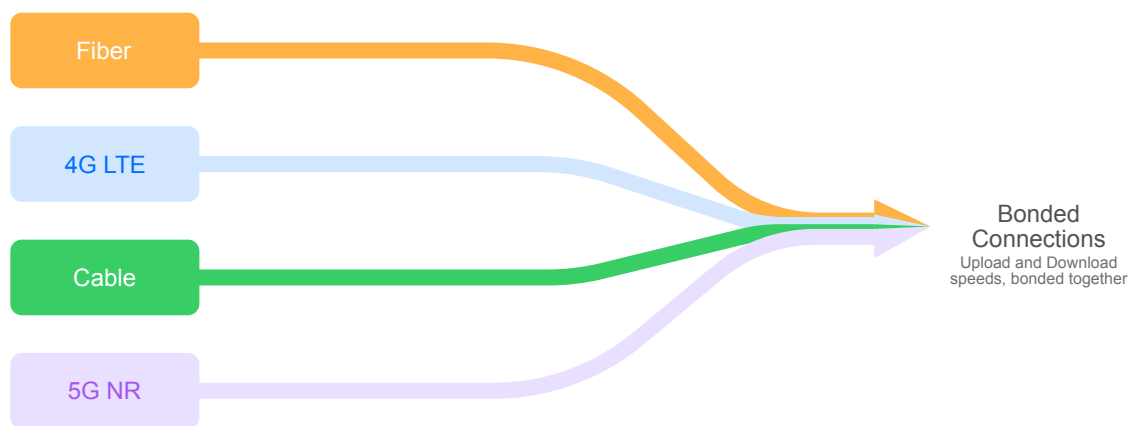


Two of the most common challenges that can be solved with bonded connections:

### Slow Bandwidth Connections

In places with insufficient broadband, multiple 4G, 5G mobile networks and fixed wired connections can be combined to provide adequate bandwidth

Combining different types of Internet connections provide faster download and upload speeds compared to a single connection that ISPs can provide in a given location, so this solution is great for remote locations with poor infrastructure and limited access to high-speed internet.

### Reliability Problems

Internet downtime can be catastrophic. Even short outages can cause voice calls, file transfers, video conferencing or VPN connections to drop. Bonding Internet can provide nearly 100% availability.
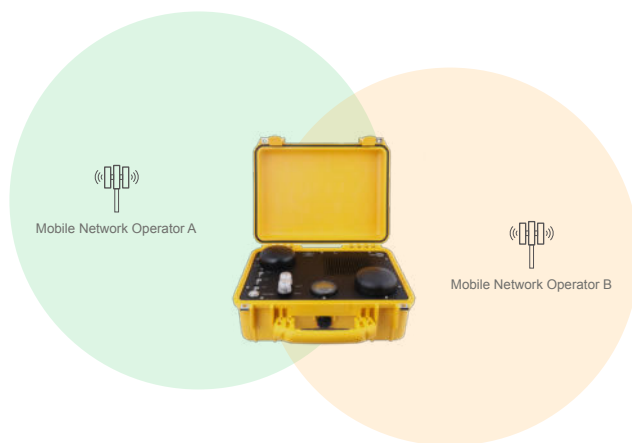
Compared to failover mode and load balancing, in case of failure of one link, switching to the one that remains operational takes place immediately. The process is invisible to the user, as if the network failure never happened. You still have the same IP address, files are still sent, and voice calls and video conferences conducted in Zoom or Teams do not have to reconnect. This is because a bonded connection uses multiple links at the same time.

# PCU – BONDED INTERNET ON THE GO

To provide Internet connection bonding, the Portable Connectivity Unit (PCU) uses Bondix Intelligence S.A.NE technology. This combination allows for reliable connectivity in most remote locations and mission critical applications.

The PCU has two built-in LTE modems that ensure a cellular bonded connection immediately after starting the device. More internet sources can be added later.

Combining two or more cellular connections provides more bandwidth for uploads and downloads. It also improves connection reliability and stability in situations where cellular networks become congested due to heavy traffic or in remote areas where cellular signal strength may be low.

**bondix S.A.NE**
intelligence

**S**imple
**A**ggregation of
**NE**tworks

## BONDING OPTIONS

- **Seamless failover**

  One WAN link is used, all WAN links stay connected.

- **Load balancing with seamless handover**

  All WAN links are used, each one for a different application.

- **Bonding (WAN aggregation)**

  All WAN links are used and their bandwidth is combined.

- **Packet duplication**

  Replicates data packets on two or more WAN links.

Mobile Network Operator A

Mobile Network Operator B

Using connections from different mobile network providers to reduce dependence on a single carrier is known as carrier diversity.

Carrier diversity improves even greater connection resiliency so that if the connection drops, packet loss occurs or the available bandwidth decreases, data is automatically rerouted and transmitted through another cellular connection in the bonded link.

## ADDITIONAL FEATURES

- **S.A.NE Bonding Proxy**

  Secret ingredient. Ensures best-possible performance of your bonded connection.

- **Satellite Mode**

  Allows higher data throughput where WAN link characteristics are vastly different (e.g. satellite and 5G).

- **S.A.NE Latency Smoothing**

  Sends interactive, low-bandwidth streams over the fastest link, while bulk traffic is distributed over all WAN links, for stable latency.

- **Optimal use of available WANs**

  S.A.NE automatically utilizes additional WAN links on peak bandwidth demands, keeping them on stand-by otherwise.

- **WAN Prioritization**

  Allows manual and automated prioritization of WAN links according to latency or cost to ensure most cost-effective use.

## HOW IT WORKS

Bonding happens between the SpeedFi PCU with the S.A.NE client installed (1) and a S.A.NE bonding server (2), hosted either by SpeedFi or by yourself. The client software combines all existing WAN interfaces of any type of WAN medium into a virtual tunnel. In this example, the tunnel is established via WiFi, two different LTE connections, satellite and broadband. This virtual tunnel uses the S.A.NE bonding server as a relay, from which the data is then forwarded to the Internet.
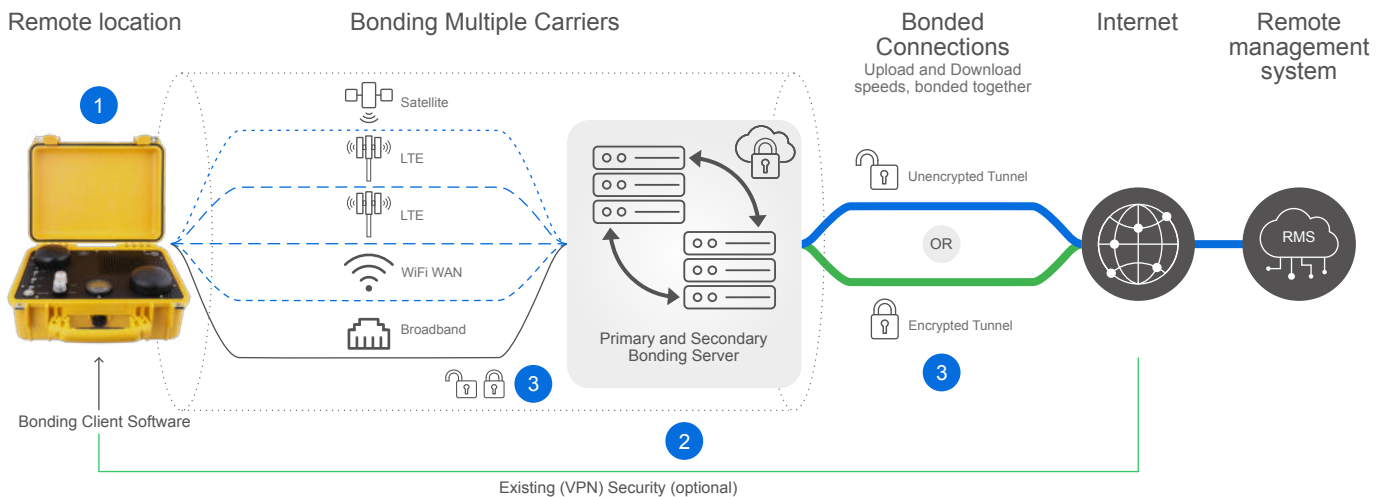


By default, S.A.NE does not encrypt connected tunnels. "Bonding (Encrypted)" features can be enabled: If enabled, activates Wireguard based encryption for S.A.NE tunnels (3). This means that all traffic between client and server is fully encrypted and the S.A.NE server also acts as a VPN endpoint.
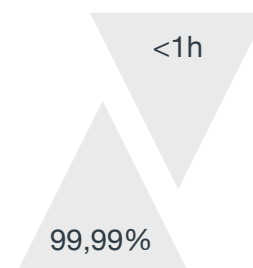
### Reliability Booster

Most providers offer an SLA of 98,5% for their connections, which means they could be out for about 130 hours without compensation.
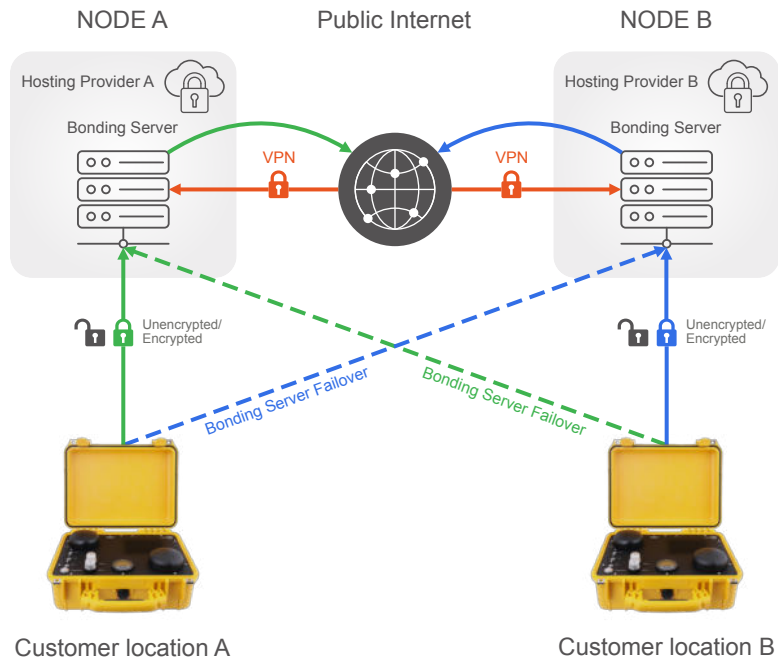


With PCU and S.A.NE, you can increase your connection reliability to 99,6% with only 36 hours outage by aggregating two fixed or wireless WAN links and using two S.A.NE bonding servers for failover.

For mission-critical applications where failure is not an option, you can combine two PCUs with two servers and go even higher up to 99,99% within less than an hour.

## Recommended PCU deployment



NODE A — Public Internet — NODE B

Hosting Provider A
Bonding Server
VPN — VPN
Hosting Provider B
Bonding Server

Unencrypted/Encrypted — Unencrypted/Encrypted

Bonding Server Failover — Bonding Server Failover

Customer location A — Customer location B

## Deployment for mission-critical applications that are resilient in the event of PCU hardware failure



NODE A — Public Internet — NODE B

Hosting Provider A
Bonding Server
VPN — VPN
Hosting Provider B
Bonding Server

Unencrypted/Encrypted — Unencrypted/Encrypted

Bonding Server Failover — Bonding Server Failover

Master — Backup

Remote location

Switch

Access Point

LAN Clients

# USE CASES EXAMPLES



5G/4G Outdoor Gateway

Internet

Access Point

Security Cameras

IP Phone

802.3af/at PoE

IP Radio

5G/4G · LTE · LTE

Bonded Connections
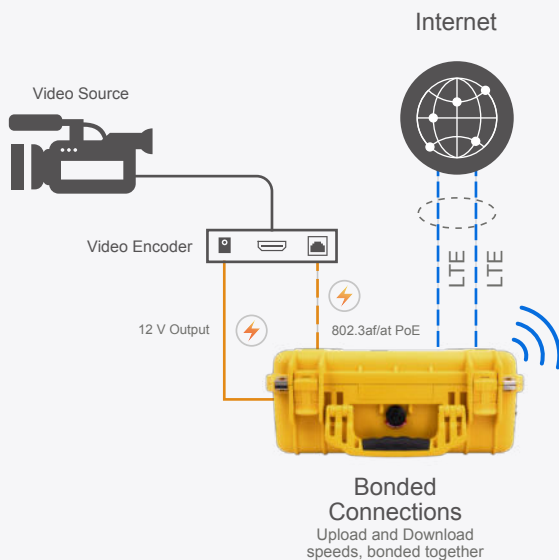Upload and Download speeds, bonded together

## Instant and reliable connectivity for temporary locations

Construction industries often need to operate in remote and temporary locations. Providing safe and reliable internet access is crucial, especially in the early stages of work.

Usually, the time it takes to get a wired internet connection is too long and expensive. PCU provides instant connectivity that is available from day one. By combining the bandwidth of several LTE and 5G connections, you can ensure fast and reliable connectivity no matter where the construction site is located.

Quickly and securely send plans, technical drawings and receive emails or VoIP calls. Connect security cameras or other specialized equipment to the network.



Internet

Video Source

Video Encoder

12 V Output

802.3af/at PoE

LTE · LTE

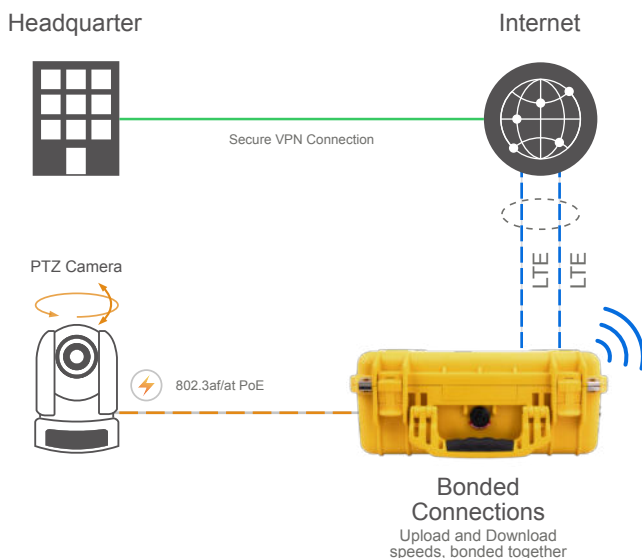Bonded Connections
Upload and Download speeds, bonded together

## Field Live Streaming

Aggregating multiple internet sources is useful in any situation where you need a faster and more reliable internet connection, especially for live streaming or broadcasting.

You cannot rely on the reliability of a single internet connection while transmitting from a remote location, signal coverage may be poor or may be dropping during transmission. Having multiple connections means you don't rely on a single connection source, when one connection fails the transmission will not be interrupted.

Connection bonding is also useful when the cellular network is overloaded, using multiple connections means more bandwidth, which allows for much higher image quality.



Headquarter

Internet

Secure VPN Connection

PTZ Camera

802.3af/at PoE

LTE · LTE

Bonded Connections
Upload and Download speeds, bonded together
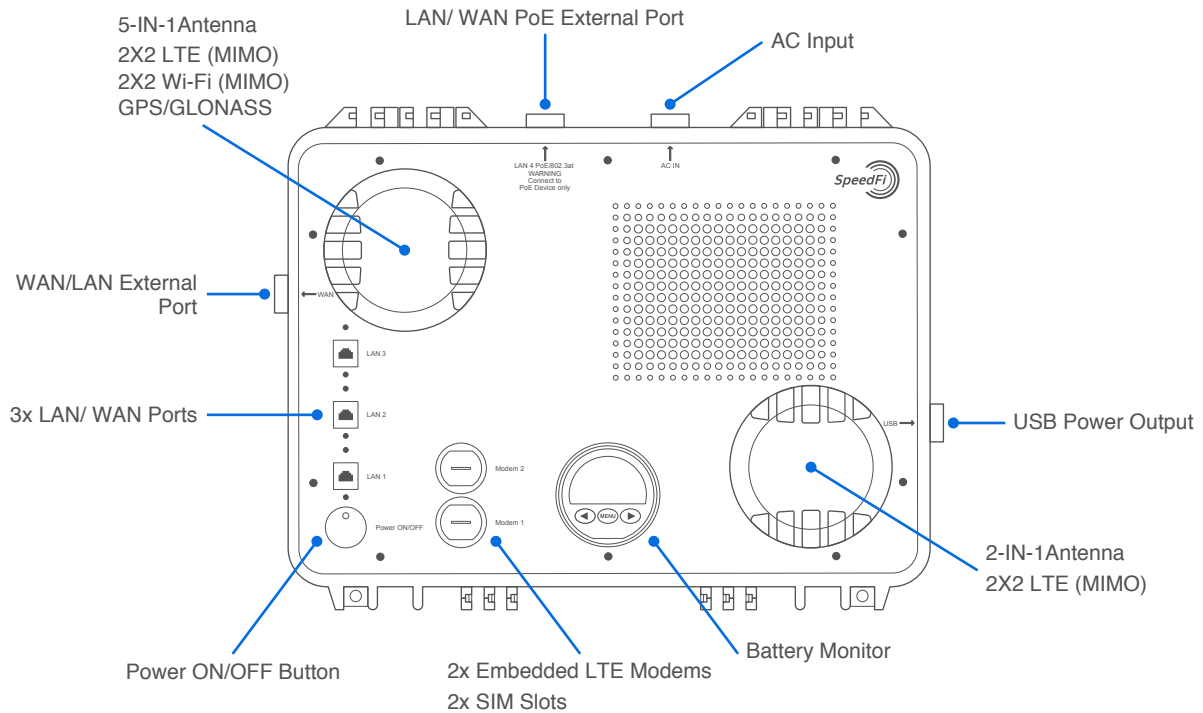
## Video Surveillance in remote locations

PCU is the ideal solution when there is a need for mobile easy-to-set-up video surveillance with remote control capability.

The device is light and compact and suitable for short-term operational requirements in multiple locations. Ease of transport and ease of assembly and disassembly make it perfect for quick response situations. It only takes a few minutes to get an image from any location. Thanks to bandwidth bonding, your connection will be stable and reliable.

It is also possible to connect an additional battery when there is a need for a longer surveillance time.
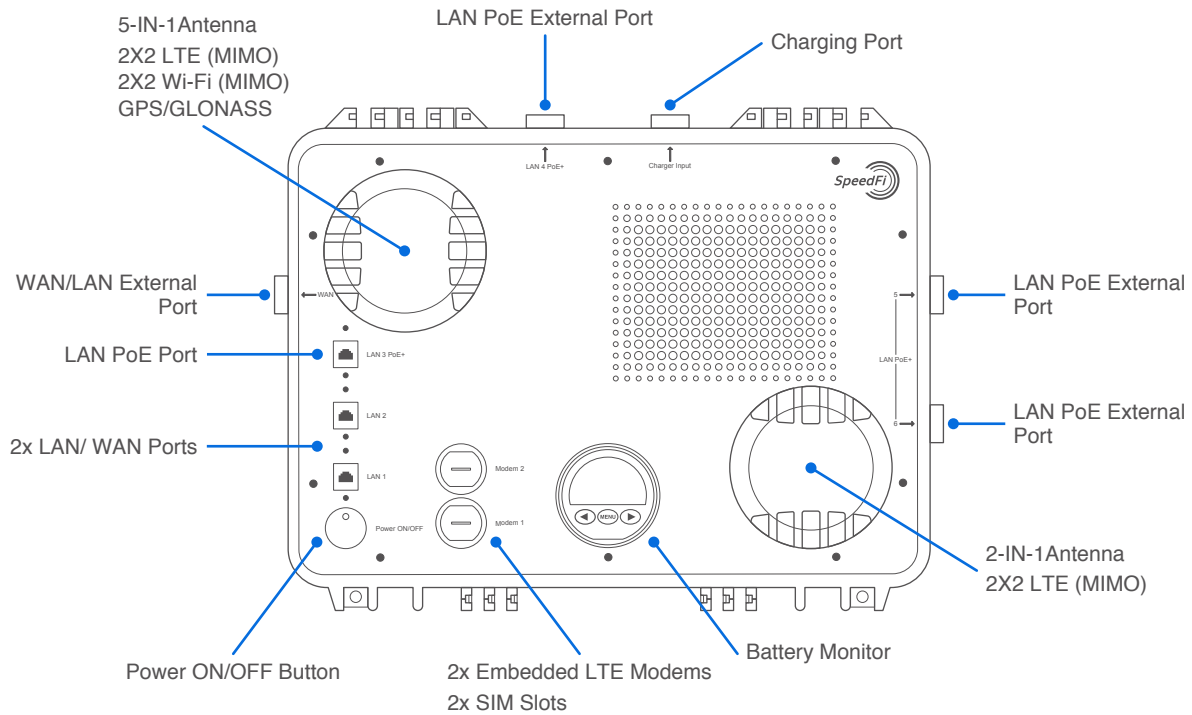
# SPECIFICATION

## Portable Connectivity Unit (PCU-M)



5-IN-1Antenna
2X2 LTE (MIMO)
2X2 Wi-Fi (MIMO)
GPS/GLONASS

LAN/ WAN PoE External Port

AC Input

WAN/LAN External Port

3x LAN/ WAN Ports

USB Power Output

2-IN-1Antenna
2X2 LTE (MIMO)

Power ON/OFF Button

2x Embedded LTE Modems
2x SIM Slots

Battery Monitor

| | | | |
|---|---|---|---|
| **Integrated Cellular** | 2x Embedded LTE-A Modems (CAT-6) | **Power Input** | AC: 100V – 240V |
| **SIM Card Slot** | 2x Full-size (1FF) | **Power Output** | 1x 802.3af/802.3at PoE |
| | | | 1x USB |
| **Ethernet (WAN and/or LAN)** | 5x GE Ports (8P8C) | **Power Consumption** | Idle: <6 W, Max: <24 W (no PoE) |
| **Wi-Fi Interface** | Simultaneous Dual-Band (2.4GHz / 5GHz) | **Dimensions** | 40.9 x 33.1 x 17.5 cm |
| | Wi-Fi 5 2x2 MU-MIMO | **Weight** | 8 kg |
| | Wi-Fi WAN and/or AP | **Operating Temperature** | Charge  0°C ~ +45°C |
| **Antennas** | 4x Cellular Antennas (Embedded) | | Discharge -20°C ~ +45°C |
| | 1x GPS Antenna (Embedded) | **Humidity** | 15% – 95% (non-condensing) |
| | 2x Wi-Fi Antennas (Embedded) | **Warranty** | 1-Year Limited Warranty |
| **USB** | 1x USB2.0 | **Package Content** | PCU |
| **Battery** | 192 or 154 Wh Lithium Iron Phosphate (LiFePO4) 12V battery | | 1x Special Power Cord |
| | | **Certifications** | |
| | | **Colours** | ● ● ● ● ● ● |

# Portable Connectivity Unit (PCU-UM)

5-IN-1Antenna
2X2 LTE (MIMO)
2X2 Wi-Fi (MIMO)
GPS/GLONASS

LAN PoE External Port

Charging Port

WAN/LAN External Port

LAN PoE Port

2x LAN/ WAN Ports

LAN PoE External Port

LAN PoE External Port

2-IN-1Antenna
2X2 LTE (MIMO)

Power ON/OFF Button

2x Embedded LTE Modems
2x SIM Slots

Battery Monitor

| | | | |
|---|---|---|---|
| **Integrated Cellular** | 2x Embedded LTE-A Modems (CAT-6) | **Power Input** | DC: 13.8 – 14.6V |
| | | **Power Output** | 4x 802.3af/802.3at PoE |
| **SIM Card Slot** | 2x Full-size (1FF) | **Power Consumption** | Idle: <6 W, Max: <24 W (no PoE) |
| **Ethernet (WAN and/or LAN)** | 7x GE Ports (8P8C) | | |
| | | **Dimensions** | 40.9 x 33.1 x 17.5 cm |
| **Wi-Fi Interface** | Simultaneous Dual-Band (2.4GHz / 5GHz) | **Weight** | 8 kg |
| | Wi-Fi 5 2x2 MU-MIMO | **Operating Temperature** | Charge  0°C ~ +45°C |
| | Wi-Fi WAN and/or AP | | Discharge -20°C ~ +45°C |
| **Antennas** | 4x Cellular Antennas (Embedded) | **Humidity** | 15% – 95% (non-condensing) |
| | 1x GPS Antenna (Embedded) | **Warranty** | 1-Year Limited Warranty |
| | 2x Wi-Fi Antennas (Embedded) | **Package Content** | PCU |
| | | | 1x Waterproof IP68 Battery Charger |
| **Battery** | 192 or 154 Wh Lithium Iron Phosphate (LiFePO4) 12V battery | **Certifications** | |
| | | **Colours** | ● ● ● ● ● ● |

# ACCESSORIES AND MODIFICATIONS

## Accessories

| | | | |
|---|---|---|---|
| **All versions** | Pre-Wired S/FTP Cat 6a Patch Cord IP68 RJ45 to Shielded RJ45 Cable* | **Version with external charger** | 7A LiFePO4 charger waterproof IP68 |
| | Length 2, 3, 5m | | |
| | Pre-Wired S/FTP Cat 6a Patch Cord IP68 RJ45 to IP68 RJ45 Cable* | OFF-GRID | 2A DC to DC battery charger & maintainer waterproof IP54 |
| | Length 2, 3, 5m | | STD, AGM, GEL and LiFePO4 to LiFePO4 |
| **Version with built-in charger** | Special Power Cord* | OFF-GRID | 5A solar charge controller & battery monitor waterproof IP54 |
| | Length 2, 3, 5m | | Works with 12V polycrystalline or mono-crystalline solar panels, with rated output from 10W to 60W |

\* Other lengths on request

## Modifications

| | | | |
|---|---|---|---|
| **12 V output** | 12 V output to power additional equipment | **Cold weather package*** | Recommended when charging will occur in winter conditions (consistently below 0°C) |
| **Remote control*** | Remotely turning on and off the PCU. This function is useful for saving battery in special situations. | **Reinforced battery compartment** | Increased shock and vibration resistance |
| | Remote reading of battery voltage and temperature inside the device. | | |

\* Coming soon

# PICTURES