M2M Router PRO4®
Installation Guide
v1.50
Document specifications

This document was made for the **M2M Router PRO4®** router device and it contains all relevant installation steps of the device.

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1. Wiring and Preparation
1.1 Description of interfaces

- 0 – Optional (not presented by general) ~110 – 230V AC connector can be supplied (4-pins terminal block, order option), pinout from left-to-right: L, N, -, PE
- 1 – Power supply connector (12..24V DC, 2-pin terminal block), pinout from left-to-right: -/+ 
- 2 – micro SD card slot (for uSD card, for alternative uSD boot or data storage)
- 3 – micro USB connector (PC connection - USB LAN bridge - for configuration, debug)
- 4 – Primary SIM-card slot (2FF-type mini SIM card, push-insert)
- 5 – Secondary SIM-card slot for DUAL SIM option feature (2FF-type mini SIM card, push-insert) – currently the DUAL SIM feature is not supported (under development)
- 6 – Ethernet LAN1 port (IEEE 802.3, 100/10 Mbit FastEthernet, full duplex, bridged, RJ45 connector)
- 7 – Ethernet LAN2 port (IEEE 802.3, 100/10 Mbit FastEthernet, full duplex, bridged, RJ45 connector)
- 8 – Ethernet LAN3 port (IEEE 802.3, 100/10 Mbit FastEthernet, full duplex, bridged, RJ45 connector)
- 9 – Ethernet LAN4 port (IEEE 802.3, 100/10 Mbit FastEthernet, full duplex, bridged, RJ45 connector)
- 10 – RS232/RS485 port (isolated RS232 and isolated RS485, half-duplex data interface, RJ12 connector)

- 11 – Reset button (hole) – has multiple features, see Reset features chapter later

- 12 – ANT Main – Primary antenna connector for 4G LTE, SMA-M, 50 Ohm (obligatory to use)

- 13 – ANT Diversity - Diversity antenna connector 4G LTE, SMA-M, 50 Ohm (recommended to use for 4G LTE)

### 1.2 Safety declaration

The device must be used and operated according to the related user manual.

The installation can be carrying out only by a responsible, instructed and skilled person by the service team, who has enough experience and knowledge about carrying out the wiring and installing a router device.

It’s prohibited to touch or modify the wiring or the installation by the user. It is prohibited to open the device enclosure during its operation or under power connection.

It is also prohibited to remove or modify the device PCB. The router and its parts must not be changed by other items or devices.

Any modification and repairation is not allowed without the permission of the manufacturer. It all causes the loss of product warranty.

**Only a certified expert or the manufacturer is allowed to open the enclosure!**

Caution!

By general the device is using DC mains. 24V DC mains electric shock (12..24V DC) hazard inside the enclosure! DO NOT open the enclosure and DO NOT touch the PCB.

In case of using the optional orderable AC power source, please consider the following. ~110-230V AC 50Hz, electric shock (~110-230V AC) hazard inside the enclosure! DO NOT open the enclosure and DO NOT touch the PCB.

(Consumption: Min. 3W / Average (2G/3G communication): 4W / Advanced (4G LTE communication): 10W / Max: 15W (with expansion and 2nd wireless module)

The IP51 immunity protection will be effective only in case of under normal usage and operation conditions with unharmed hardware conditions by using the device in the provided enclosure/chassis.
Deliberate damage or occing casualty of the device means the loss of product warranty.

To ensure general safety, please follow the following guideline!

■ Keep the chassis area clear and dust-free during and after installation.

■ Keep tools and chassis components away from walk areas.

■ Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.

■ Wear safety glasses when working under conditions that might be hazardous to your eyes.

■ Do not perform any action that creates a hazard to people or makes the equipment unsafe.

Safety with Electricity

Follow this guideline when working on equipment powered by electricity.

■ Read all the warnings in Safety Warnings.

■ Locate the emergency power-off switch for your installation location. If an electrical accident occurs, you can quickly turn off the power.

■ Disconnect all power before:
  − Installing or removing a chassis
  − Working near power supplies

■ Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.

■ Do not work alone if hazardous conditions exist.

■ Never assume that power is disconnected from a circuit. Always check.

■ Never open the enclosure of the router's internal power supply.

■ If an electrical accident occurs, proceed as follows:
  − Use caution; do not become a victim yourself.
– Turn off power to the device.

– If possible, send another person to get medical aid. Otherwise, assess the victim’s condition and then call for help.
– Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

**Preventing Electrostatic Discharge Damage**

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It may occur if electronic printed circuit cards are improperly handled and may cause complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing modules:

■ Ensure that the router chassis is electrically connected to earth ground.

■ Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.

■ If no wrist strap is available, ground yourself by touching a metal part of the chassis.

Caution: For the safety of your equipment, periodically check the resistance value of the antistatic strap. It should be between 1 and 10 megohms (Mohm).

**Warning!**

**IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

**SAVE THESE INSTRUCTIONS**

Warning: Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43
Warning: In order to comply with FCC radio frequency (RF) exposure limits, antennas should be located at a minimum of 7.9 inches (20 cm) or more from the body of all persons. Statement 332

Warning: Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001

Warning: Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

Warning: Read the installation instructions before you connect the system to its power source. Statement 1004

Warning: This product relies on the building’s installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 20A. Statement 1005

Warning: This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

Warning: The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019

Warning: This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

Warning: This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

Warning: Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Warning: Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

Warning: For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection:
10/100 Ethernet. Statement 1044

Warning: To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: Statement 1047

Warning: Installation of the equipment must comply with local and national electrical codes.
Warning: To prevent airflow restriction, allow clearance around the ventilation openings to be at least: 3 inches (7.6 cm). Statement 1076
Warning: Hot surface. Statement 1079

Caution: This industrial router can only be accessed by service personnel or by users who have been instructed about the reasons for the restrictions applied to the location. Access is through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.

Caution: Be aware of the size and weight of the industrial Router when mounting. Ensure that the mounting location has a stable flat surface and can safely support the weight of the device.

1.3 Mounting, fixation

The device enclosure (unit) contains a DIN-Rail fixation due its case, which is to be intended to mount to DIN-35 rail or using a 3-point fixation by screws, or using the hook (in hanging position).

You can also mount the enclosure to wall, place into server rack or similar fixation opportunity. The unit must be mounted inside a cabinet by the listed fixation points, in vertical orientation.

Please note that close metal parts, the cabinet metal material and the industrial conditions as the usage of high rate power or other external gained radio frequency signals can cause radio signal disturbance and could cause weak wireless signal at reception or data transmitting or could cause less effective signal reception, weak wireless fidelity. In any of these, we recommend you to test the wireless signal reception and quality and if it is necessary use external, magnetic mount antenna which is leaded outside of the cabinet and placed onto the cabinet’s surface – to ensure enough reception.

Figure of bottom side of the unit enclosure

- A – Device housing case back plate
- B – Hook for fixation to wall/mount
- C – DIN-rail sleede for fixation
- D – DIN-rail position holder (release/fixate)
- E – Additional hooks for fixation to wall/mount
1.4 Cabling, wiring

1. **Remove the plastic, transparent port protector** (No. 15) part by releasing the two screws (No. 14) from the top of the enclosure and slide up the plastic part, then remove upside.
   Now you can free to connect wires and cables to the ports and interfaces.

2. **Mount a 4G LTE antenna** to the **ANT Main** titled (no. 12) SMA antenna connector and mount an recommended to also using a secondary antenna also and mount to the **ANT Diversity** (no. 13) SMA connector. Twist the antenna to the connector until it is fastened.
You can use 4G LTE wireless antenna with 3-6dB, 9dB or more gained versions. RG174 cable SMA antenna with magnetic mount can be also using for external usage. The **antenna** must be placed and oriented that it should has a some clearance in any direction.

3. **Insert and push** an activated **mini SIM card** to the **SIM 1** titled card holder (No. 4), top SIM holder. Insert by following the hints of SIM card figure for the proper orientation. (The SIM chip-side will be face down and the cutted edge towards to inside and push until it sleeves).

4. If you are using the DUAL SIM feature you need to insert the secondary SIM card into the bottom SIM holder - **SIM 2** titled (No. 5). The secondary SIM card must be oriented like this: the SIM chip face up and the SIM title down.

5. You can use the **microUSB** (No. 3) connector with a **microUSB-to-USB** cable connection as **USB LAN** - instead of the Ethernet connection.

6. Beside / instead of USB connection you can connect an **UTP cable to the LAN1** (No. 6) and/or **LAN2** (No. 7), **LAN3** (No. 8), **LAN4** (No. 9) RJ45 interface Ethernet port.

The other side of the UTP cable must be plugged to your computer or a network device (hub or switch, if you are attempted to use one).

Note, that the Ethernet ports are bridged by default, which means its equal which port you are using.
7. By default, the router has an installed OpenWRT® operating system which is ready to use and configure to your SIM card APN and for your usage requirements.

8. **Plug** the **24V DC power supply to the 12..24V DC** interface (No. 1), then **plug the adapter to the external 24V DC** (12..24V DC) power supply – according the pinout (from left-to-right direction: - / +), to the terminal block part of the power supply and connect to the device, by adding stable 24V DC power.

**Current and power consumption (DC power source / mains)**
- Power supply / Voltage range: 12..24 VDC
- Current: 800mA at 24V DC
- Consumption: 2.5 - 10W

```
In case of presence of ~110-230V AC interface, you can use ~110-230V AC power input source (No. 0 interface) to connect AC supply power for the device.

**Current / power consumption (AC power source) – optional mains input**
- Power supply / Voltage range: ~110-230V AC, 50 Hz
- Current: 0.1A at ~230V AC Consumption: 2.5 - 10W
```

**The following cables are not part of the accessories of the delivered package**

Use the following hints and the recommendation to choose useful cable and type to prepare the necessary connection(s) according to your requirements.

**DC cable:**
The power cord 70 cm type, OMYA 2 x 1 mm^2, voltage Insulation min. 24 V, maintaining colors and ends with the power supply enabling connection to a 24 V DC
Function: 12-24V DC power supply to the router
Pins must be wired for usage: L (+), N (-) (see schematic for pinout)

**AC cable (optional):**
The power cord 70 cm type, OMYA 2 x 1 mm^2, voltage Insulation min. 500 V, maintaining colors and ends with the power supply enabling connection to a 230 V AC
Function: ~110-230V AC power supply to the router
Pins must be wired for usage: L, N, -, PE (see schematic for pinout)

**UTP (Ethernet) cable:**
Cable Type: Cat5e UTP PVC
Connector type: RJ45 Ethernet
Function: RJ45 (LAN) Ethernet connector to external device

**RS232/RS485 cable:**
Type: 2 + 3x LgY 0.75 mm²
Connector type: RJ12
Function: RS232 connector to external device / R485 connector to external device

**microUSB-USB configuration cable:**
Type: micro-USB-USB cable
Connector type: USB 2.0 micro Type B connector
Function: alternative LAN bridge (USB LAN) for configuration – connecting to computer

**Schematic figure of wiring, interfaces, pinout – DC power outfit**

**Schematic: wiring of the AC / DC power source**
1.5 Important notes

- The **DUAL SIM** mode is currently inactive (feature is under development).
- You have to use two **4G LTE antenna** for the stable wireless network operation. You can check the signal reception and wireless availability in the Overview menu.
- The available APN settings will be assured by the SIM card provider mobile operator or your mobile internet service provider. Ask them about **APN**, password, **SIM PIN** and further necessary information for the configuration.
- When configuring the **SIM** or **APN** settings, after the saving the router, it will not restart the modem automatically with the new settings. You need to restart the modem by the **Restart WAN** button in the OpenWrt® menu at **Network / Modem settings**.

1.6 Understanding the LED signals

The router has 16 LEDs to assign the router current status, the communication, connection. These LEDs are located in four groups:

- **Operation status LEDs (Group A)**
  - **PWR** – Power source connected / mains on
  - **ON** – The router has started
  - **SUPERCAPACITOR CHARGE** (in case of exhausted supercapacitor it shows the recharge)

- **Connectivity LEDs (Group B)**
  - **RS232** connection and activity (on the RJ12 connector)
  - **RS485** connection and activity (on the RJ12 connector)
  - **WAN** – wireless network connection and access
  - **USBLAN** connection (on microUSB port)
  - **KERNEL** – for sign possible failures, stand-by mode

- **cellular network signal strength indication LEDs (Group C)**
  - **signal 1 to signal 4**: wireless signal reception (higher is better)

- **LAN (Ethernet) connectivity LEDs (Group D)**
  - **LAN1** port to **LAN4** (by the detected the RJ45 port connection)
The power indication group (group A) and signal level LEDs (group C) are fixed, but the other 9 LEDs (group B and group D) are free to reconfigurable.
2. Installing the router

2.1 The very first startup

The router has a super-capacitor component inside, which can protect the device against the possible short (<5sec) power outages. Therefore this component can be charged and it can be exhausted after an outage or if you store the router for months without connecting power source or using.

In these cases you cannot start the router as usual by adding the DC power supply only, because only the PWR led will be active (lighting by green), but the router won’t start further.

First, you must start the router by the adding the power source and pushing the Reset button (No. 11) for 2 seconds by a sharp object (e.g. by a pen) – while the ON led will be also active (all the two leds are lighting by green colour) – then you can release the Reset button.

Then the router will start immediately and charging the supercapacitor (SUPERCAPACITOR CHARGE led will be also active – by yellow colour).

Next time you don’t need to push the Reset. You can stop it by removing the power source and start it by adding the DC power.
2.2 Normal startup

The router has a pre-installed system (which contains the router firmware and the pre-configured OpenWrt® system).

After adding power source to the router you will just need to configure some necessary and unique settings for your SIM card, network access, and some other required connection parameters.

Please, start the router by the following sequence.

1. Ensure that you have inserted an activated SIM card into SIM 1 holder (No. 4) in the right position. The usage of SIM 1 holder is obligatory to use for wireless communication.

2. Only if you are using DUAL SIM version, insert active SIM card into SIM 2 titled holder also.

3. Ensure that antennas are mounted to the SMA interfaces (No. 12 and 13).

4. After plugging the DC Power source (No. 1), the router begins to perform booting – the LED signals are always showing the current activity during the operation.

   The system start needs about 40-50 seconds while it will be ready for usage, network communication.

5. During the boot, the router begins to operate, whereas its LED signals are showing the current activity during the operation.

**Boot sequence:**

a.) First the LAN1 – LAN4 leds are blinking for half a second, which signs that the power was added. The PWR and ON leds are also active (lighting by green).

b.) Then the RS232 and RS485 LEDs are ligthing for ~10 seconds during the firmware start.
c.) The **RS232, RS485, WAN, USBLAN** leds will be flashing during 30 seconds until boot.

d.) At the end of the boot process, only the **WAN, USBLAN** leds are flashing for 5-10 seconds.

e.) When the connectivity LEDs are not blinking anymore the load of the system has finished.

f.) If the WAN (APN) was not configured, the **SIGNAL LEVEL low LED** is blinking which means the router tries to connect to the wireless network. If it will was configured properly (APN, password and SIM PIN is matching) and the registration was succesful, then the **WAN** led
will be lighting and the current **SIGNAL LEVEL** leds will be also lighting its signal strength value which means connected and you have useful wireless signal reception for the usage and data transmitting.

g.) If you have already connected the **USBLAN** or **LAN1..LAN4** or the **RS232/RS485**, the interface connectivity led will be also active and signing the network connection and data traffic.

When the router has reached the listed point „e.)” then the device is already accessible on its **LAN** and **USBLAN** interfaces, therefore now you can login to the LuCi® web user interface (or connect via SSH).

### 2.3 Local access via Ethernet port (LAN1..LAN4 interfaces)

The router’s default Ethernet IP address is **192.168.1.1**

Add the **192.168.1.x** IPv4 address (where x can be between 2 and 255) to your computer’s Ethernet interface for connecting to the router.
Then you can access the device through the web user interface or by SSH.

For connecting to the router on web interface use the [https://192.168.1.1](https://192.168.1.1) URL.

**Important!**
The DHCP service is turned on for the Ethernet interfaces, by default.
The ETH1..ETH4 interfaces are bridged, therefore its not important which port are you currently using, all network data and TCP/IP packets will be relied.
2.4 Local access via USB LAN (USB connection)

1. Download, unpack and install the USBLAN driver for using the USB connection:
   https://www.m2mserver.com/m2m-downloads/USB_Ethernet_RNDIS_DRIVER.zip

2. After you’ve connected the USB-microUSB cable, you can add the driver in the Windows® / Start / Control Panel / System / Device Manager. Find the Network Cards, extend it and you will found the „USB Ethernet / RNDIS Gadget”. Double click on the entry and choose the Driver tab, and the Refresh button, then browse the uncompressed file’s directory then Install the driver.)

3. Build a connection between the PC and the router with a microUSB-to-USB cable.

4. Configure the USB-Ethernet interface IP address on your PC for the „USB Ethernet/RNDIS Gadget” and setup the next fixed ipv4 address: 192.168.10.10, subnet mask is: 255.255.255.0 – connect these settings.
   (You can ping the device through the USB connection on its IP address.)

5. The USBLAN interface IP address is 192.168.10.1
   For connecting to the router on web interface use the https://192.168.10.1 URL.

2.5 Web user interface and Login

1. The router’s local web user interface (LuCi®) is reachable through the Ethernet or USB interface – on the default addresses.

   **Attention!**
   For accessing the web user interface we recommend to use the Mozilla Firefox® web browser. Other browsers cannot be used.

2. Enter the router default web user interface (LuCi®) URL.

   The Ethernet web interface default URL is: https://192.168.1.1

   The USB web interface default URL is: https://192.168.10.1

3. Use the Mozilla® browser! In your browser window you will get a security risk message. Ignore the security message and choose the Advanced option here.
4. Then click on the **Accept the Risk and Continue** button to access the router webpage.
5. The OpenWRT® system’s LuCi® web interface has loaded into your browser. Now fill the **Username** and **Password** fields and click on the **Login** button for the entry.

**Username**: root  
**Password**: wmrpwdM2M

---

### 2.6 SSH access

The router can be accessed through SSH connection, when it is available on its IP address – by a terminal utility (e.g. the *putty* tool).

Putty is a free tool which can be downloaded from the following URL:

https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

The router can be accessed by SSH on the **192.168.1.1:22** (port nr. 22 for the **Ethernet** interface, **LAN1.. LAN4** ports) or the **192.168.10.1:22** (port nr. 22 for the **USB** interface).

Allow to access the router, ignore the security breach message in your computer in the pop-up window.

**Choose Accept (Yes) at the Putty or other SSH terminal’s Security Alert of the RSA2 key of the router to allow and trust the connection – by security reasons.**

**SSH login data:**

**Login as**: root  
**Password**: wmrpwdM2M
Now you are logged in, at the OpenWrt®’s Linux command line. Here you can maintain and check the device by executing Linux commands or scripts.

The operating system uses the embedded Micro uCLinux, kernel 4.4 version, therefore you can use standard and compatible Linux commands or the **UCI Command line interface** – check command line compatibility before using the commands here.

You can get more information about using the UCI® (commands, syntax, usage and examples) by downloading the UCI® User Manual from the product website: [https://www.m2mserver.com/m2m-downloads/EasyCwmp_Command_Line_Reference.pdf](https://www.m2mserver.com/m2m-downloads/EasyCwmp_Command_Line_Reference.pdf)

### 2.7 Wireless access

**Before using the wireless access** you need to **setup** the SIM card’s current **APN** properties at the OpenWrt® web interface.

You have to configure these settings (SIM and APN) for connecting to the wireless network properly.

1. Choose the **Network / Interfaces** menu, **WAN** interface, **Edit** button.
2. Add the **APN** and **PIN** or **username, password** (if your SIM card using these). Ask your Mobile Operator about the SIM card data.

3. Click on the **Save & Apply** button.
4. Soon the wireless module will be configured regarding the settings. Now the router will try to connect and register the SIM card to the network. The availability of the mobile network is assigned by the **WAN** LED (lighting by green). When it has successfully registered to the given APN, the **WAN** LED will lighting by green and the **SIGNAL LEVEL** will be also signed according to the signal reception (it is lighting by green).

If the module with the SIM card was connected, the module is immediately generating data traffic on the network where the \( Rx/Tx \) values will be continuously growing/changing for the **Interface status** at the **Interfaces / Interface Overview** part for the **WAN** interface. This means that the wireless Internet connection (as **lte-wan**) is already active.

![M2M Router PRO4](image)

### 2.8 LED indication

The default LED signal indication is listed here. The B-C-D group of LEDs can be changed if you need in the OpenWrt® web interface.

<table>
<thead>
<tr>
<th>Description</th>
<th>Colour</th>
<th>Reconfigurable</th>
<th>No light</th>
<th>Flashing</th>
<th>Continuously light</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWR</td>
<td>No / FIXED</td>
<td></td>
<td>No power</td>
<td>N/A</td>
<td>DC Power supply OK</td>
</tr>
<tr>
<td>ON</td>
<td>No / FIXED</td>
<td></td>
<td>Router power supply removed</td>
<td>N/A</td>
<td>Router power supplied / The router has started</td>
</tr>
<tr>
<td>SUPERCAPACITOR CHARGE</td>
<td>No / FIXED</td>
<td></td>
<td>Supercap/Battery is fully charged (no need to charge)</td>
<td>N/A</td>
<td>Supercap/Battery is exhausted and it is currently charging</td>
</tr>
<tr>
<td><strong>Group B</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>RS232</td>
<td>Yes</td>
<td></td>
<td>No</td>
<td>Receive/Transmit data on RS232 serial channel</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Data flow channel on the RS485 port</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----------------------------------</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>RS485</td>
<td>Yes</td>
<td>No</td>
<td>Inactive transmission channel on cellular network, module not configured / not properly configured</td>
<td>Active data transmission on the 4G LTE cellular network</td>
<td></td>
</tr>
<tr>
<td>WAN</td>
<td>Yes</td>
<td>No</td>
<td>No connection to the USB port</td>
<td>Data flow to the USB port</td>
<td></td>
</tr>
<tr>
<td>USBLAN</td>
<td>Yes</td>
<td>No</td>
<td>Connection to the USB port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KERNEL</td>
<td>Yes</td>
<td>No</td>
<td>Error</td>
<td>Error</td>
<td></td>
</tr>
</tbody>
</table>

### Group C

<table>
<thead>
<tr>
<th>SIGNAL LEVEL (四级信号强度)</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celluar network signal strength</td>
<td>4 signal – Signal is above 97dBm (very good reception)</td>
</tr>
<tr>
<td></td>
<td>3 signal – Signal is above 85dBm (average reception)</td>
</tr>
<tr>
<td></td>
<td>2 signal – Signal is above 65dBm (poor reception)</td>
</tr>
<tr>
<td></td>
<td>1 signal – Signal is below 50dBm (weak reception)</td>
</tr>
<tr>
<td></td>
<td>0 signal – No signal (no reception)</td>
</tr>
</tbody>
</table>

### Group D

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Data flow</th>
<th>Connection through ethernet port</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN1</td>
<td>Yes</td>
<td>No</td>
<td>Data flow</td>
<td>Connection through ethernet port1</td>
</tr>
<tr>
<td>LAN2</td>
<td>Yes</td>
<td>No</td>
<td>Data flow</td>
<td>Connection through ethernet port2</td>
</tr>
<tr>
<td>LAN3</td>
<td>Yes</td>
<td>No</td>
<td>Data flow</td>
<td>Connection through ethernet port3</td>
</tr>
<tr>
<td>LAN4</td>
<td>Yes</td>
<td>No</td>
<td>Data flow</td>
<td>Connection through ethernet port4</td>
</tr>
</tbody>
</table>

### 2.9 Power On / Supercap Charging mode

**Normal operation (DC power supply connected)**

The normal usage is assigned, when you are adding power supply to the **12..24V DC** connector. The router’s **PWR** LED will lighting by **green** and then the **ON** LED will also lighting by **green** colour when the system has started.

There should be LED activity on the connected interfaces also (as **USBLAN** or **LAN1..LAN4**). When the wireless network registration was successful and the router is on the 4G network, the **WAN** LED should is also active (lighting by **green**).
No Power supply / Power supply removed / Power line outage
If the DC power supply was removed or in case of a detected electricity / power outage, after min. 5 seconds the router will be disconnecting all interfaces, file systems, uSD card and afterall will be shutdown. This extra operation time is possible due to the internal supercapacitor – which provides safe backup power for short time outages.
During the shutdown process only the ON LED will be lighting by green, but the PWR LED will be blank.
When the shutdown process has been finished, all LEDs will be inactive.

Replug power supply / Stabilizing the power line
In case of providing the DC power source (replugging the power supply) or stabilizing the outage of the power source, the router will getting enough power again and automatically starting.
During these the PWR and ON LEDs will be active (ligthing by green).
Because the supercapacitor was used previously, it needs to be charged - therefore the SUPERCAPACITOR CHARGE led will be also active during the charging process (ligthing by yellow).
2.10 Service features

The router has various service features which can be controlled manually - just for the case – which can be initiated by pushing the Reset button (no. 11).

By any reason, if you need to stop or start the device immediately or you cannot login into the system, you can start or stop it manually here. It is useful when the router was misconfigured or the installation process failed, IP address or the password was loosen.

Here we’ve listed all Service features of the Reset button which can be selected by manually.

<table>
<thead>
<tr>
<th>Push RESET</th>
<th>Legend</th>
<th>LED / signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 sec</td>
<td>START the router (when it was stopped before, AND the device has power source)</td>
<td>the ON led will lighting (green)</td>
</tr>
<tr>
<td>6 sec</td>
<td>Power off / STOP the router (if it was operating)</td>
<td>all LEDs will inactive, only the PWR led is active (green)</td>
</tr>
<tr>
<td>4 sec</td>
<td>SERVICE MODE MENU of the router (if the device is operating) – the menu is active for 1 minute</td>
<td>the KERNEL led will lighting by red, while the service mode is active</td>
</tr>
</tbody>
</table>

The router Service menu has 4 modes (the menu is active for 1 minute only, while you can be select a mode from the menu by pushing the Reset button until 1sec).
The following modes can be selected from the menu, here:

- **MENU ITEM 0** (no short push) – **reboot**
- **MENU ITEM 1** (1x short push) – **restoring the default configuration**
- **MENU ITEM 2** (2x short push) – **restoring the factory configuration**
- **MENU ITEM 3** (3x short push) – **exit from menu**

Then after the selection, the choosed menu item number is flashed by the **KERNEL** led (e.g. flashing twice in case of selecting the **MENU ITEM 2**). Then you need to **confirm** the choosen menu item for executing by a longer **6sec Reset** push.

**Some examples:**

**a.) RESTART the router:**
- The router must be operating
  - Push the **RESET** for **4sec** (entering the service mode) – **KERNEL** led is lighting (**red**)  
  - Push the **RESET** again for **6sec** (selected: mode 0 (**restart**) and confirm your selection)  
  - The router will restarts itself immediately

**b.) Restoring the DEFAULT configuration to the router:**
- The router must be operating
  - Push the **RESET** for **4sec** (entering the service mode) – **KERNEL** led is lighting (**red**)  
  - Push the **RESET** again **once** for **1sec** (selected: mode 1 (**restoring default config**))  
  - **KERNEL** led (red) is flashing **once** per second  
  - Push the **RESET** again for **6sec** (confirm your selection)
- The router will delete the current configuration and restoring the *default configuration* and restarting itself with loaded *default configuration* – if the default config doesn’t exists, it is restoring the *factory config*.

c.) Restoring the FACTORY configuration to the router:
- The router must be operating
- Push the **RESET** for **4sec** (entering the service mode) – **KERNEL** led is lighting 
- Push the **RESET** again **twice** for **1sec** with a short pause (selected mode: 2 *(restoring factory config)*)
- **KERNEL** led (red) is flashing **twice** per second
- Push the **RESET** again for **6sec** (confirm your selection)
- The router will delete the current configuration and restoring the *factory configuration* and restarting itself with the original configuration.
3. Router configuration (main important settings)

**Important!**
The router uploaded by a pre-configured system. Check the configuration, and if the settings are not match with your expectations, please change the configuration settings and save them. The router will be automatically apply your settings.

When you have logged in, at the startup screen (Status/Overview) the web interface can be seen with all relevant information and the current status of the router.

The M2M Software version should be **201909051** or newer. If it has an older version, then refresh the firmware, please.

You can configure the 4G connection and APN/password (for SIM), Ethernet IP address, etc.).

**SIM/APN settings:** In the OpenWrt menu, choose the Network / Interfaces menu, WAN interface, *Edit* button. (You can also use the Network / Modem settings.)

1. Ask your Mobile Operator about the SIM card information.
2. Add the APN and PIN or username, password (if your SIM card using these).
3. Store the wireless network settings by the Save & Apply button.
4. Soon the wireless module will be configured regarding the settings. If the module with the SIM card is operating network traffic Rx/Tx values will be continuously growing/changing at Interface status: **Interfaces / Interface Overview** part, where **WAN** interface means the public wireless Internet connection (as **lte-wan**) – which assigns the physical 4G module.

**Important!**
*In case of network outage, the wireless and wired data and interface connections, sessions will be reconnected as the power source established and the network is reachable.*

**IP settings:**
1. By default the Ethernet IP address is *static*, the default IP address is: 192.168.1.1. If you want to switch the **BR-LAN** interface to *dynamic* (at Protocol field), then the router will waiting for an IP address on the network.
2. If you want to use the local **DHCP server** – to allow to add IP addresses by the router for the connecting external ethernet devices – then the right setting is the **Static Address**, and the **IP address** should be also changed, and you have to uncheck the **DHCP disabled** option for the **BR-LAN** interface to allow the DHCP server.
3. In case of using DHCP, you can define the IP range (**Start**, **Limit**) and you can define **IPv4 netmask** for your network.
4. When changing the **Protocol** field, you need to push the **Switch protocol** button.
   You can find further important settings at the **DHCP and DNS** menu.
   But, first save your settings by the **Save & Apply** button.
   Then the bridged **BR-LAN** interface IP address will be changed according your request due to the new settings.
5. Further detailed settings can be found in the **User Manual** document.
4. Support

4.1 Contact support

If you have any questions concerning the usage of the device, contact us at the following contact:

E-mail: iotsupport@wmsystems.hu  Phone: +36 20 3331111

Online product support can be required here at our website:
https://www.m2mserver.com/en/support/

For the proper identification of your device, use router sticker and its information, which contains important information for the call center.

Due to the support questions, the product identifier is important for resolve your problem. Please, when you are attempting to tell us an incident, please send us the IMEI and SN (serial number) information from the product warranty sticker (located on the front face of the product housing).

The documentation and software release for this product can be accessed via the following link:
https://www.m2mserver.com/en/products/m2m-router-pro-4/

4.2 GNU/Linux license and open source code

The router operating system and OpenWrt®/Luci open source code is available on our website at the product site. The router software is under GNU/Linux licensing.

Product URL: https://www.m2mserver.com/en/products/m2m-router-pro-4/

There at the Downloads tab at the middle on the router website, at the Source Code part you will found the source code of the router software and GNU/Linux license notice.
5. Legal notice

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Warning
Any errors occurring during the program update process may result in failure of the device.