M2M Industrial Router® - Quick Installation Guide

INTERFACES
1 – POWER (9-32V DC): Microfit power connector (for 12V DC adapter)
2 – SIM card slot (2FF)
3 – micro-SD slot
4 – micro-USB connector (for configuration)
5 – Reset button hole
6 – Ethernet (RJ45, 10/100 Mbit)
7 – Primary SMA antenna connector (SMA-M, 50 Ohm - MAIN)
9 – Operation LEDs (LED1..LED3, re-configurable)
10 – RS485 connector (3-pins terminal block) – only for the Industrial version
11 – RS232 (DSUB-9) connector – by order
12 – RS485 / Modbus connector – by order

CURRENT & CONSUMPTION / OPERATING CONDITIONS
- 12V DC, 1A power adapter (9-32VDC), microfit 4-pins power connector
- Average current: 160-260mA, 12V DC (according to the chosen cellular module) / Consumption: 1.9 - 3.1W, 12V DC
- Cellular module options: LTE Cat.1 with 2G or 3G/2G „fallback", LTE Cat.M / Cat.NB with LTE450 option or 2G „fallback" option
- SIM slot: mini SIM (type 2FF, push / insert)
- Operating / storage temperature: between -40'C and + 80'C, 0-95% rel. humidity
- Size: 92x85x35 mm, Weight: 170gr.
- IP51 shielded industrial aluminum housing, with adapter for 35mm DIN-rail mounting by a DIN-rail adapter (order option), 3 status LEDs

INSTALLATION STEPS
1. Mount an SMA 50 Ohm antenna onto the **Main** (7) **antenna connectors**.
2. Insert an **activated SIM** card to the **SIM slot** (2) - the SIM chip surface must be look to top and the cutted edge of the SIM must be look to the router – then push the SIM until it will be fixed and closed (you will hear a soft click sound).
   In case of necessary of SIM removal, you have to power off the router and push the SIM a bit, while it will be released and can be removed.
3. **Connect an UTP cable** to the router's Ethernet titled RJ45 port (6). During the configuration the cable's opposite connector must be connected to the PC's Ethernet port. (After the configuration connect it to an external device on RJ45.)
4. You can also configure the router through the **micro-USB** slot* (4) by a **microUSB-USB cable** of the PC connection.
5. Connect the RS485 meter or device to the **RS485** port (10) to receive the data of the external device or meter. (In case of Modbus device, connect to the port nr. 12, for RS232 device connect to the port nr. 11.)
6. Connect the **microfit DC power connector** (1) when the router begins its operation, where the LED lights will be signing and inform you about the current status of the device. **Alternatively**, the DC power voltage input (interface nr. 1) can be provided by **9-24V DC power voltage** source and using our **Microfit cable** (order option).
7. The router is provided with pre-installed system (which contains the router firmware and the OpenWrt® system, which is accessible on the local website of the router).
8. Connect to the router on **Ethernet** and enable access to the router's IP address in your computer's browser (IP address: **192.168.127.x** (x = 2-255)**,** Subnet Mask: 255.255.255.0) - setup in Windows® **Control Panel** / **Network Sharing Center → Change adapter settings** at **Network Connections.**
9. Use the **default website's** URL to **login** as we described before.

ACCESSING THE ROUTER VIA USB CONNECTION
1. Download micro-USB driver and install before using the cable: https://www.m2mserver.com/m2m-downloads/USB_Ethernet_RNDIS_DRIVER.zip
2. Unzip the downloaded file to a directory and install it.
3. Establish the **USB** connection between the PC and the router with a micro-USB cable.
4. Setup the IP address of the USB-Ethernet interface on the PC for the "**USB Ethernet / RNDIS Gadget**" network connection (in Microsoft Windows® check the **Ethernet** settings at the **Control Panel / Network / Network Adapter / Adapter Settings.**
   (for **USB** settings configure this in the **Network Connections**, **USB Ethernet / RNDIS Gadget interface**)
5. Connect to the router on **USB** and enable access to the router's IP address in your computer's browser (IP address: **192.168.10.x** (x = 2-255), Subnet Mask: 255.255.255.0) - setup in Windows® **Control Panel** / **Network and Sharing Center → Change adapter settings** at **Network Connections, USB Ethernet / RNDIS Gadget interface**.)
6.. Use the **default website's** URL to **login** as we described before.

BOOT SEQUENCE
- When starting the device (at power on) – or in case of rebooting – **all the three LEDs** of the router will be **active** for a few seconds.
- Then the **LED1** is **lighting** continously **by green**, which signs that the system is during loading (boot progress).
- The system start requires about 1-2 minutes, while the device loads the necessary modules or the operation and prepares the web user- and configuration interface – the **LED2** will sign it. Then the web interface will be availble for login.
- Configure the device's wireless internet module settings (**SIM** and **APN** data on the router web interface) for the cellular internet connection – otherwise the router will be restarting in ever 10 minutes.
- The modem registration to the cellular network is signed by the **LED3** will be **flashing** after the settings. If it was succesful (to register the SIM card data to the network) then the **LED2** will be **lighting**, which shows that the router can access the cellular network already.
- If you notice an unusual LED sign or other operation misbehaviour symphoms, please read the ***Installation Guide***.

CONNECTING THE ROUTER
1. On the router, the **DHCP service** of the **Ethernet** interface is disabled by default. Therefore, for a connected PC, you should manually configure an IP address at first. To connect to the router, allow the router IP address for the **Ethernet** connector interface in the Windows®'s network settings (**IP address**: **192.168.127.100**, **Subnet mask**: **255.255.255.0**)
2. Open the router's local website in Mozilla® Firefox® browser. The **web user interface** (LuCi) URL on **Ethernet** port is **https://192.168.127.1:8888**
3. In case of **USB connection**, you have to setup the **USB Ethernet / RNDIS Gadget** virtual interface to the following IP: **192.168.10.100**, subnet mask: **255.255.255.0** On the **USB** connection the **URL** is **https://192.168.10.1:8888**
4. At the first time, you have to **accept the security risk** in the Mozilla® browser by choosing the **Advanced** option at the **Potential Security Risk** and choose the **Accept** the **Risk and Continue** option.
5. Then the router's local web interface will be loaded and you can login: **Username**: *root* / **Password**: *wmrpwd* Then push to the **Login** button.
6. Afterall, on the main page (**Status / Overview** menu), check the operation and connection status of the router.

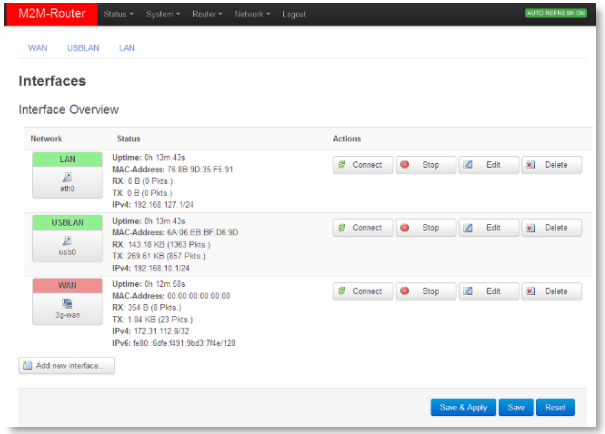
The router can be accessed through SSH connection also, when it is available on its IP address – use the *putty* terminal utility/tool for the connection. Connect to the 192.168.10.1:22 IP address. (**Login**: *root*, **Password**: *wmrpwd*). **Accept** the security risk (RSA token) **encryption key usage warning notice** (visible at first time only).
Then the Linux command line will appear, where you can use standard Uc Linux kernel 4.9 compatible commands and execute scripts on the device. You can also use *UCI command line interface* commands here. Read the ***Installation Manual*** for more info.

CONFIGURE THE ROUTER
1. Configure the cellular network settings: at the **Network / Interfaces** menu. Open the **WAN** interface, **General Setup** tab.
2. At the **Wireless network** field, we offer to use the ***No Change*** option. In case of LTE Cat.1 module use the ***4G/3G/2G*** option (automatic detection mode with 3G/2G „fallback" option).
3. For Cat.M or Cat.NB networks you have to choose a **Select IoT Technology** – according to the used cellular LPWAN network you want *to* use (e.g. ***Cat-M1*** for dedicated LTE Cat.M, or ***NB-IoT*** for dedicated Cat.NB. You can choose a preferred network with sequence at further options here).
4. Setup the **SIM #1 APN** name according to the SIM card info. If you won't set any value for SIM #1 APN, the router will try to connect by the SIM-card automatically to the next available network's APN.
5. Fill the SIM **PIN** code if it is necessary for the connection.
6. If SIM requires a username and password for APN connection, then fill **SIM #1 PAP/CHAP username** and **SIM #1 PAP/CHAP password** fields also.
7. Click to the **Save & Apply** button to save your settings.
8. As you can see, the device is already connected to the mobile internet network and is currently active - **RX** (received data), **TX** (sent data) and **KB** (KBytes) are constantly increasing.
9. During these, the **LED2** indicates the network registration process - if the APN and SIM settings are correct, the LED will be **flashing** by **green**.
10. When the network registration was successful, the **LED2** will be **lighting continuously** by **green**.
11. Data traffic from the **WAN** interface (mobile network) is indicated by a fast **green** flashing of **LED2**.
12. You can find more network settings on the **Advanced Settings** tab if you want to set more.
13. Configure the **Ser2net (RS485)** settings according to the Chapter 5.6 of the ***User Manual*** of the device.

IMPORTANT!
Change the login password before connecting the router to the public cellular network! Open **System** / **Administration** menu. Add the new **Password** and **Confirm password** fields and **Save** your settings. Note that next time you have to use these data for the login!

FURTHER SETTINGS
Ethernet settings
1. Configure the LAN settings in the N**etwork** / **Interface** menu, on the **General Setup** tab.
   Push **Edit** button next to the **LAN** interface enrty.
2. Change the default 192.168.127.1 address and add the new **IPv4 address** with the corresponding **IPv4 netmask** (subnet mask).
3. Save the settings by the **Save & Apply** button.

DHCP, DNS settings
1. In the **Network** / **DHCP and DNS** menu, under the **General Settings** tab, you can configure the **DNS and DHCP settings** – by enabling DHCP service.
2. At the **DHCP**, the **Start** field means the starting IP address and you can **Limit** the IP addresses.
3. If you want to enable the DHCP service, just deselect "**Disable DHCP for this interface**".
4. You can also add devices by the Add button there, at the **Static Leases** part (by defining their **Hostname** and **MAC-Address** and **IPv4-Address**).
5. Save the settings by the **Save & Apply** button.



FIRMWARE UPDATE
Before performing a firmware update, ask our Sales for getting the proper firmware version!
Before upload a new firmware file to the router, save your settings. Open the **System** menu, **Backup / Flash Firmware** menu. At the **Backup / Restore** part, check **Download backup** and push to the ***Generate Archive*** button to save your settings. Save the setting to your computer.

IMPORTANT NOTES
- In case of a performing a restart, all the three **LEDs** will be flashing by **red** for 1 second, then they will be blank for a few seconds.
- Note that for **Narrow Band** (NB-IoT) networks it could be needed to wait 5-15 minutes for the first successfully network registration.
- The **RS485** data speed can be set between 300 and 115,200 baud on the web interface, but the device is able to serve the channel up to 19 200 baud. We recommend that you use the standard 9 600 baud (for general industrial devices) or 2 400 baud (for utility meters) for the better compatibility.
- If the router does not responds or if it was misconfigured: press the **Reset** labeled button with a thin object on the front panel for at least 10 seconds. Then the device will restart with the factory settings. After a few minutes it will be available on its default address. Configure the router on its web interface.

DOCUMENTATION & SUPPORT
M2M Industrial Router https://m2mserver.com/en/product/m2m-industrial-rs485/
M2M Industrial Mbus Router https://m2mserver.com/en/product/m2m-industrial-mbus-router/
In case of product support request, ask our support. Contact opportunities: https://www.m2mserver.com/en/support/

CE

This product is marked with the CE symbol according to the European regulations.
The crossed out wheeled bin symbol means that the product at the end of its life cycle should be disposed of with general household waste within the European Union. Only discard electrical/electronic items in separate collection schemes, which cater for the recovery and recycling of materials contained within. This refers not only to the product, but also to all other accessories marked with the same symbol.