

M2M Industrial Router 2 DCU MBUS® – Quick User Guide

INTERFACES

- 1 – POWER (9-32V DC): 4-pin Microfit power connector (for 12V DC adapter)
- 2 – SIM card slot (type 2FF)
- 3 – micro-USB connector (for configuration)
- 4 – Reset button
- 5 – Ethernet (RJ45, 10/100 Mbit)
- 6 – Antenna connector (SMA-M, 50 Ohm)
- 7 – 3 Operation LEDs (reconfigurable)
- 8 – RS485 / Modbus connector (3-pin terminal block), pinout from left to right: GND, A, B
- 9 – Mbus port (2-pin terminal block, for up to 30 Mbus slaves), pinout from left to right: -, +



CELLULAR MODULE TECHNICAL DATA

- Mini SIM card slot (2FF type, push/insert)
- Cellular Module:
 - SIMCOM A7676E – LTE Cat.1 / 450MHz – with 2G „fallback“
 - LTE Cat.1: B1/B3/B8/B20/B31/B72
 - GSM/GPRS/EDGE: 900/1800MHz
 - SIMCOM SIM7070E – LTE Cat.NB / Cat.M, 450MHz – with 2G „fallback“
 - LTE Cat.M: B1/B2/B3/B4/B5/B8/B12/B13/B14/B18/B19/B20/B25/B26/B27/B28/B31/B66/B72/B85
 - LTE Cat.NB: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B28/B31/B66/B85
 - GSM/EGPRS: 850/900/1800/1900MHz

POWER SUPPLY / OPERATION CONDITIONS

- Power connection: 12V DC, 1A (9-32VDC), 4-pin Microfit power input connection
- Consumption: 200mA - 320mA 12VDC / 2.4 – 3.84W @ 12VDC
- Operation: from -40°C to +75°C / Storage: from -40°C to +80°C at 0 to 95 rel. humidity
- Dimensions: 92.5 x 85 x 35 mm / Weight: 175gr. (without antenna, adapter)
- IP51 industrial aluminum casing, mountable to a 35mm DIN rail (by DIN rail adapter – order option) or wall

INSTALLATION STEPS

1. Ensure that the DCU is not under power voltage, or remove power adapter from the **POWER** microfit connector (1). Ensure that all the 3 LEDs (7) are blank.
2. **Mount a proper LTE antenna** to the **Antenna** connector (6).
3. **Insert a SIM card** (activated with APN) into the SIM tray (2) - the SIM chip surface must be look to top and the cutted edge of the SIM must be look to the DCU – then push the SIM until it will be fixed and closed (you will hear a soft click sound).
4. **Connect an UTP cable** to the DCU's **Ethernet** titled RJ45 port (5). During the configuration the cable's opposite connector must be connected to the PC's Ethernet port. (After the configuration connect it to the network- or industrial device's RJ45 port.)
(You can also configure the DCU through the **micro-USB** (3) connection by a microUSB-USB cable of the PC connection. Then install the **USB Ethernet / RNDIS Gadget** driver to your computer by using the following link in your web browser: https://www.m2mserver.com/m2m-downloads/RNDIS_win10.ZIP)
5. Connect the **RS485 device** or Modbus utility meter to the **RS485** port (8) to receive the data of the external device or meter.
6. Connect Mbus devices or utility meters (up to 30 slaves) to the **Mbus** port (9) to receive the data of the external devices or meters. 24-36V DC power provided by the DCU MBUS to the connecting devices for the proper operation.
7. Connect the **power adapter** to the AC plug. Then the device begins its operation, the LED lights will be signing and inform you about the current status of the device.
The system start requires about 1-2 minutes, while the device loads the necessary modules or the operation and prepares the web configuration user interface – the **LED2** will sign it. Then the web interface will be available for login.
8. To connect to the DCU, allow the device IP address for the Ethernet connector interface in your computer's network settings of the Microsoft Windows® system (IP address for Ethernet connection: **192.168.127.x**, Subnet mask: 255.255.255.0) – „x“: from 2 to 255.
(For **USB connection** setup **USB Ethernet / RNDIS Gadget** virtual interface for IP: **192.168.10.x**, subnet mask: 255.255.255.0 – „x“: from 2 up to 255.)

IMPORTANT! Configure the device's wireless internet module settings (SIM and APN data on the DCU web interface) for the cellular internet connection – otherwise the device will be restarting in every 10 minutes.

BOOT SEQUENCE OF THE DEVICE

1. **After a long time off, when powering the device, all 3 LEDs** will be active with **orange** color for a few seconds. The charging of the supercapacitors has began. Normally, **in case of rebooting**, the supercapacitors are already charged, therefore LEDs will be active with **green**.



2. Then the **LED1** is lighting continuously by **green**, which signs that the system is during loading (boot in progress).



3. The system start requires about 1-2 minutes, while the device loads the necessary modules or the operation and prepares the web configuration user interface – the **LED2** will sign it. Then the web interface will be ready to login. If the cellular module was already configured, the **LED3** will be flashing, which means the network registration is in progress.



SOFTWARE SYSTEM

The device has a built-in eMMC chip (4 or 8 GByte storage – by order option) for Secure Boot process / encrypted storage of all customer data. It uses an OTP-enabled memory chip. The DCU comes with a pre-installed OpenWRT® system, which is tailored to the customer's requirements and includes the operating system, software, and a factory default configuration. The device uses a web user interface (LuCI®), and standard Linux-based and UCI commands at the command line.
The product can also be managed with our state-of-the-art Device Manager® platform (order option), providing clients with the ability to perform OTA firmware updates and mass deployments more efficiently.

IMPORTANT! The DHCP service is turned off by default. When enabled, the router assigns IP addresses to connected devices, while the available Ethernet interface addresses use **static** addresses. If you want to assign IP addresses by DHCP, change the protocol value to **DHCP client**. You can do this in **Network / DHCP and DNS settings** menu or in the **Network / Interfaces** menu, at the **LAN** interface, in the **DHCP** section.

CONFIGURATION STEPS

1. Open the local website of the device by an Internet browser on **LAN** (Ethernet): <https://192.168.127.1> or on **USBLAN** connection: <https://192.168.10.1>
 2. Accept the security risk messages in the internet browser by choosing the **Advanced** option at the **Potential Security Risk**, then choose **Accept the Risk and Continue** option. Then the DCU's local web interface will be loaded and you can login. **Username: root Password: wmrpww**
Push to the **Login** button.
 3. The available network interfaces can be found at the **Network / Interfaces** menu. At the **WAN (Protocol: 4g-wan)** interface, at right modify the settings with the **EDIT** button. At the **General Settings** tab setup the module parameters.
 - Fill the **APN** name, then the **PIN** code (if SIM card using it).
 - Configure **PAP/CHAP username** and **password** settings
- IMPORTANT!** For using **LTE Cat.M** or **NB-IoT** cellular networks a compatible **SIM card** is required! Ask your mobile operator for the appropriate **SIM type** and **APN, PIN** and **PAP/CHAP username** info.
4. Click to the **Save** button for saving the settings. Then the device will attempt to connect to the mobile network. Then the **LED3** indicates the network registration process.



5. If the APN and SIM settings are correct, it flashes by **green**. When the network registration is successful, **LED2** is lighting continuously by **green**, which shows that the DCU can access the cellular network already.



OTHER IMPORTANT SETTINGS

- **Change the current login password of the DCU before connecting on public internet** – configure in **System / Administration** menu!
- Open the **Status / Overview** menu and check device status, **Network** connection and cellular network signal at **RSSI / SQ** values.
- Further network settings can be found in **Network / Interfaces** menu in the current Interface settings at **Advanced Settings** tab.
- Configure the Ethernet interface in the **Interfaces / Interface Overview** menu, at the **LAN** tab.
- Configure the **DHCP, DNS services** in the **Network / DHCP and DNS** menu.
- Configure the **Ser2net settings (RS485 / Modbus)** according to the Chapter 9.9 of the **User Manual** of the device.
- Also configure the Modbus, Mbus data collection and PLC register readout in **Services / Data Collection** menu – according to the **User Manual**.
- Save your settings in the **System** menu, **Backup / Flash Firmware** item, then choose the **Backup / Restore, Download backup** part to push the **Generate Archive** button.
- You can refresh the firmware in the **System** menu, **Flash Firmware** item, then choose the **Browse** and **Refresh Firmware** button. **Ask our sales about the latest firmware!**
- If you need **IPSec** or **VPN**, first you have to enable the required services in **Systems / Startup** menu, then configure it according to the **User Manual**.

SSH ACCESS

The device can be also accessed via **SSH** connection also, when it is available on its IP address – use the **putty** terminal program for the connection.

- Connect to the **192.168.10.1222** IP address (**Login: root, password: wmrpww**)
 - **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 U Linux commands and execute scripts on the device.
 - The operating system of the device uses embedded Micro uLinux kernel version 5.10 and interprets UCI Command line interface commands. The UCI® (Unified Configuration Interface) is an OpenWrt® API / utility that allows centralized configuration and management of OpenWrt® system.
- To review the UCI commands from our website: https://m2mserver.com/m2m-downloads/UCI_Command_Line_Reference_v3.pdf

FASTENING THE DEVICE

The product casing can be fastened by ABB00MKL part (order option) to a 35mm DIN-rail.

DOCUMENTATION & SUPPORT

User Manual and latest firmware: <https://m2mserver.com/en/product/m2m-industrial-router-2-dcu-mbus/>
Read our support website for the further contact opportunities please: <https://www.m2mserver.com/en/support/>
In case of product support request, ask our support at the lotsupport@wmsystems.hu email address.

This product is marked with the CE symbol according to the European regulations.

CE 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.

