M2M PRO4 MODEM®

User Manual

v0.92

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Document specifications

This document was made for the **M2M PRO4 MODEM®** device and it contains the detailed description of the configuration possibilities for the proper operation of the device.

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Table of contents

1. Device configuration (OpenWrt user interface)

1.1 Web user interface

Important!

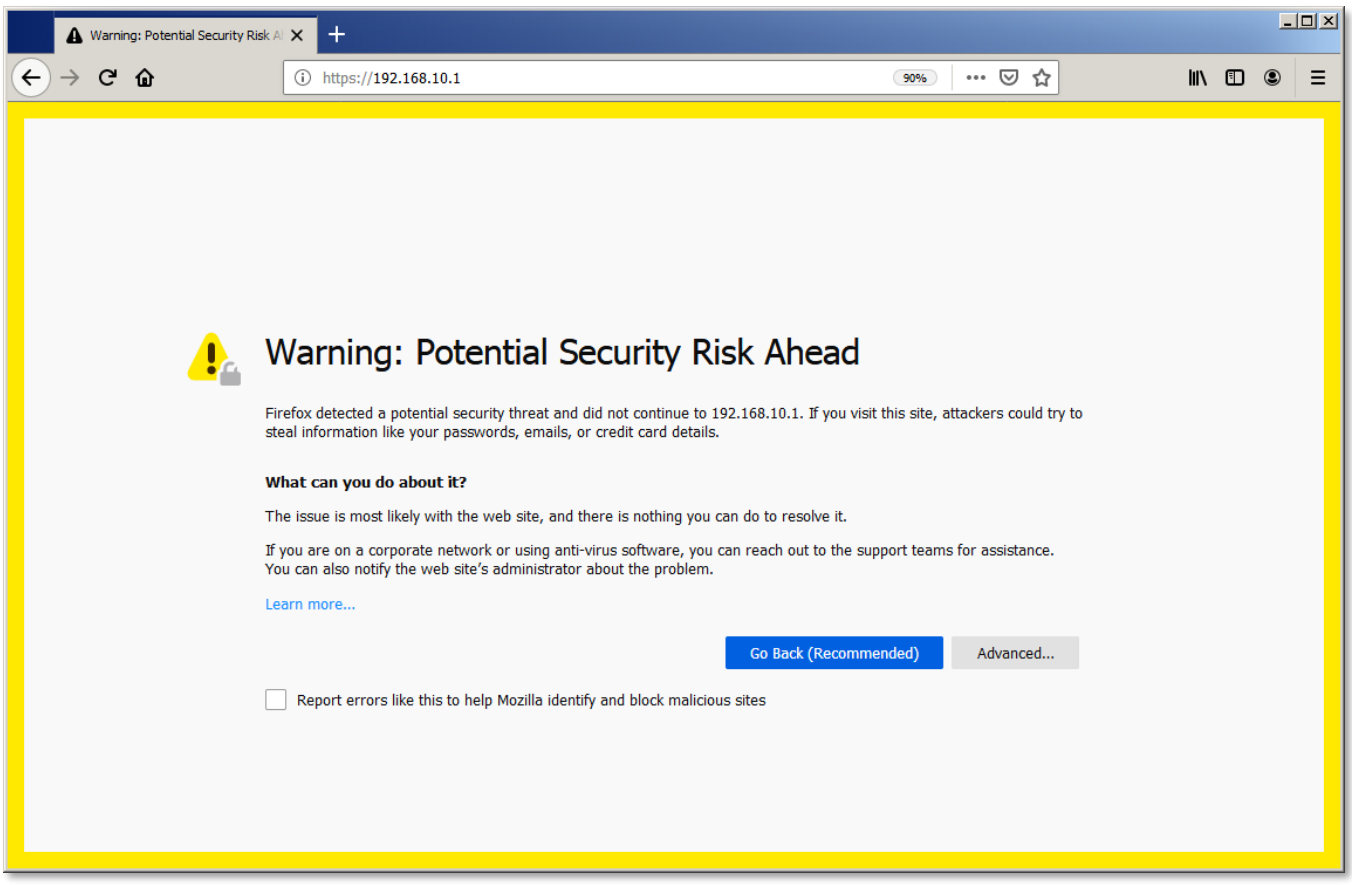
The modem software contains a pre-configured system. Please check the configuration, and if the settings are not match with your expectations, change the configuration settings and save them.

1. The modem's **local web user interface (LuCi®)** is reachable through the **USB** interface – on the device's default addresses.
   For the usage you have to **install the „RNDIS Driver" to your computer**, according to the Installation manual Chapter 2.3.

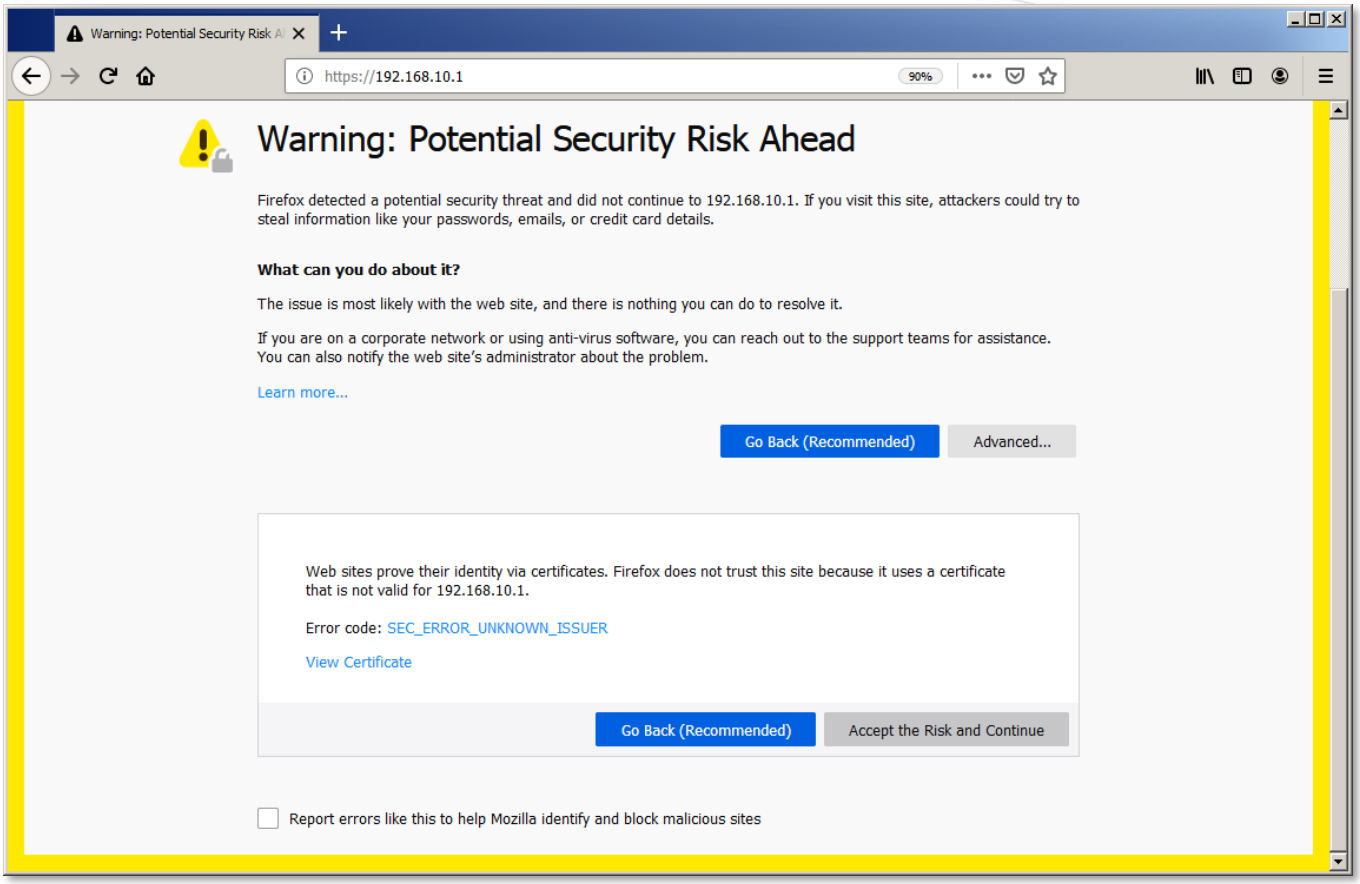
   > ***Attention!***
   > *For accessing the web user interface we recommend to use the Mozilla Firefox® web browser.*

2. Enter the default **web** user interface address of the device on the **micro USB** interface is the following **URL** by default: **https://192.168.10.1**

3. In the Mozilla browser you will get a security risk message, its not important to take care, but choose the **Advanced** option.



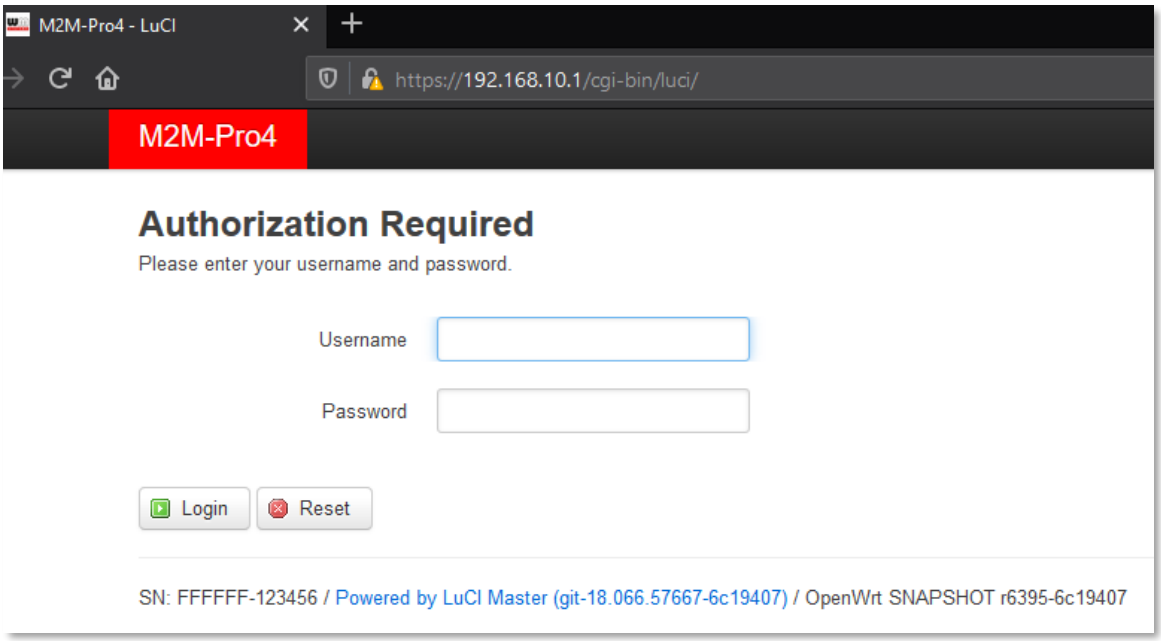
4. Then click on the **Accept the Risk and Continue** button to access the modem's webpage.



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*



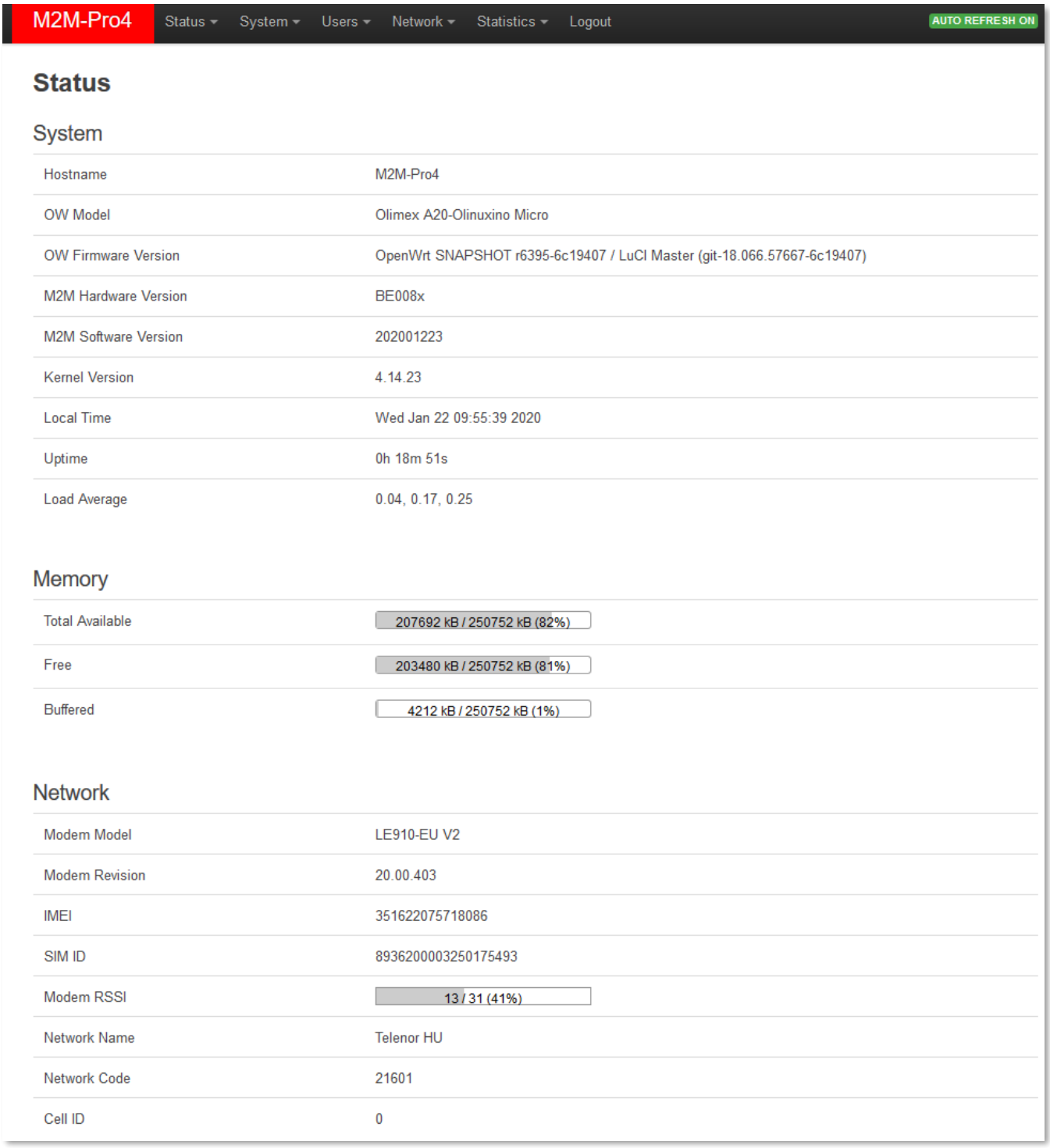
1.2 Dashboard (Main page)

After you have logged to the web interface, a startup screen appears with all relevant information and the current status of the device.

At the **System** part, you can check the installed software build (**M2M Software version**) where it should be ***202002071*** or newer. (If it has an older version, then refresh the firmware, please.)

At the **Local Time** you can check the current time.

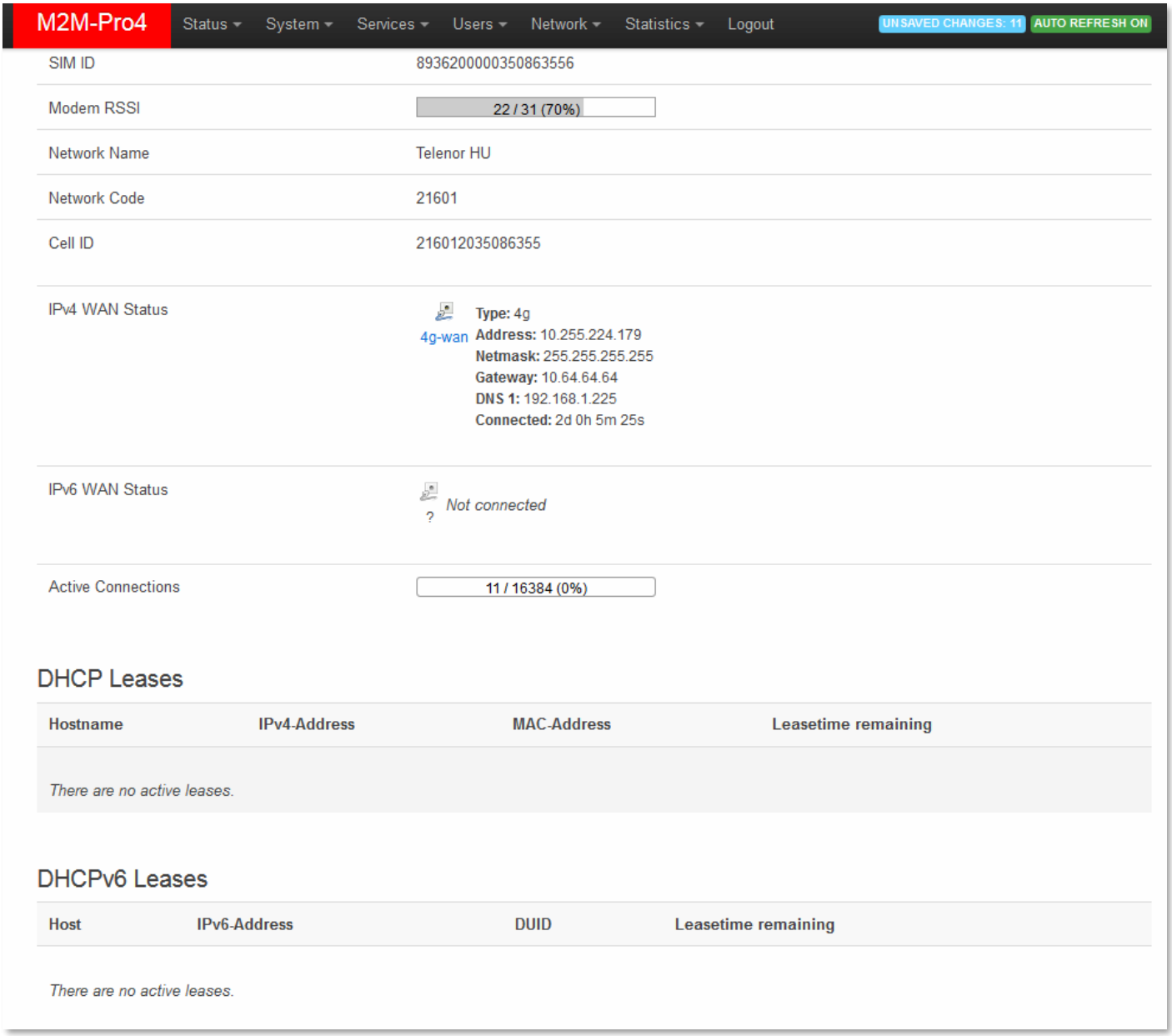
The **Uptime** shows the spent time interval since the last bootup (or reboot).



At the **Network** part, first you can check the wireless modem availability at **IPv4 WAN Status** or **IPv6 WAN Status** part, as the module's **IMEI** identifier and the **SIM ID** identifier of the used SIM card.

The wireless network access' current status and health, properties can be checked at **Modem RSSI** (cellular network signal strength), **Network Name**, **Network Code** and **Cell ID** is getting from the mobile operator.

The modem's wireless network address can be seen at **IPv4 WAN** or IPv6 status. There the **Type** value will show you the connection type as *2G*, *3G* or *4G* LTE.



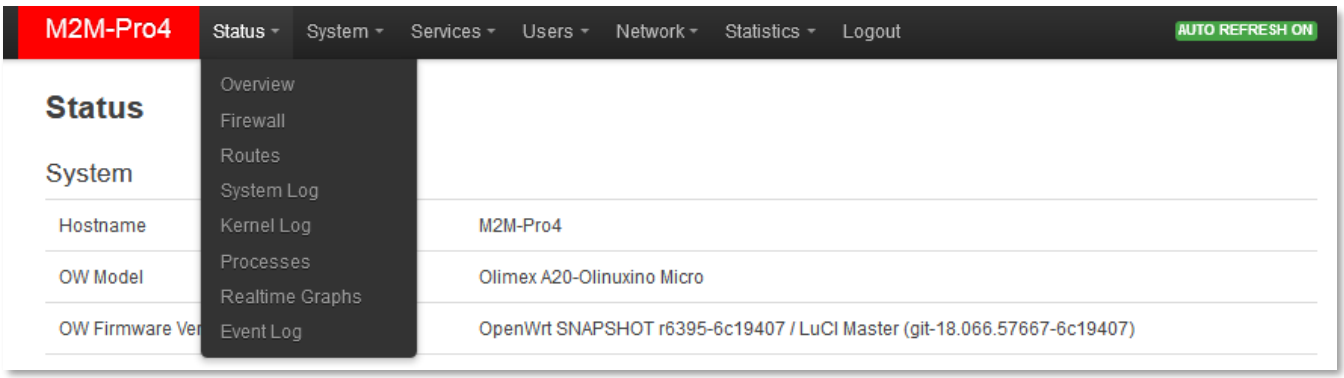
1.3 Menu overview

By the menu you can access the following features:

- **Status** – Status data, operation Logs (system, kernel, event log), Firewall, monitoring the operation (at Processes and Realtime graphs)
- **System** – System settings and administration, software installation (3rd party tools), startup settings and scheduled tasks, time synch, mount points (for Flash memory, file systems), LED configuration, Firmware flashing, Backup/Restore of the configuration settings, Custom commands, Reboot of the system)
- **Services** – RS485 metering data connection settings and configurable readout schedules.
- **Users** – add/delete users, Clone configuration, Periodic ping and reboot of the device
- **Network** – Network interface settings (USB/Wireless module), SIM PIN change, Hostname, Bandwith Diagnostics, Diagnostics, Serial proxy (RS485 settings)
- **Statistics** – System graphs and statistics settings
- **Logout** – Logout and login with a different user

1.4 Status menu

- In the **Status** you can check the current status (**Overview**).

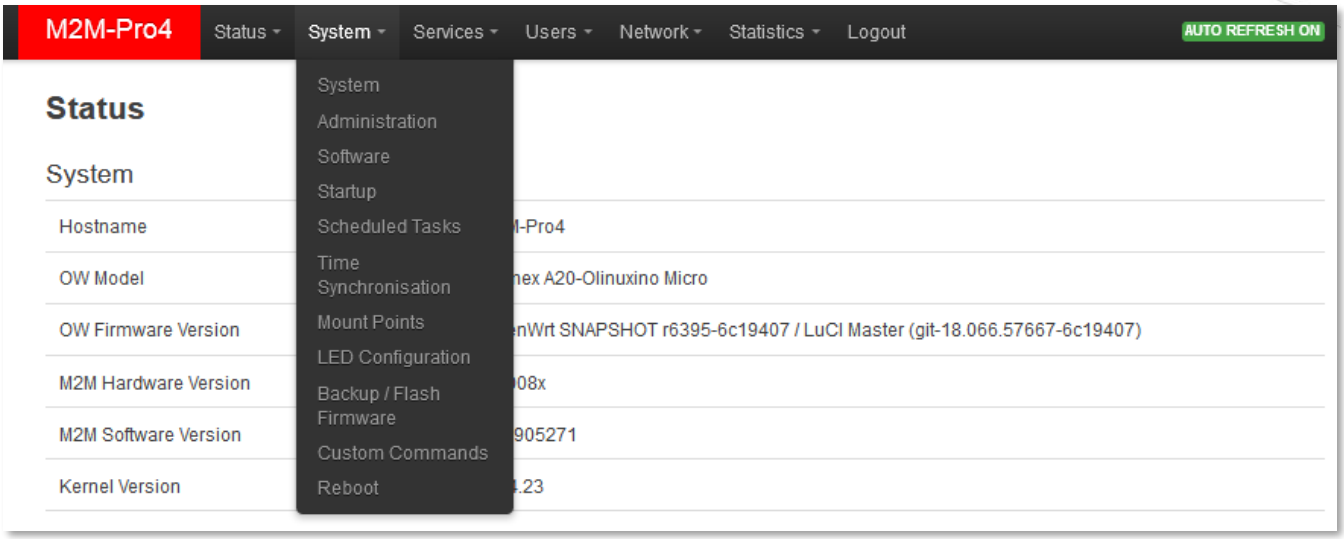


- Check system messages and event log (**System Log**, **Kernel Log**).
- Check the activities of the device (**Processes**).
- You can find monitoring features of the realtime operation at the **Realtime Graphs.**
- You also can check or download the **Event Log** here.

1.5 System menu

- You will found several system settings in the **System** and the **Administration** menu items.
- Installation of further **Software** (3rd party tools, applications for the Linux distribution).
- You can define the **Startup** applicatons.
- Initialization of programs can be configured during the operation and the **Scheduled Tasks**.
- Setup the *NTP server* for **Time Synchronisation.**

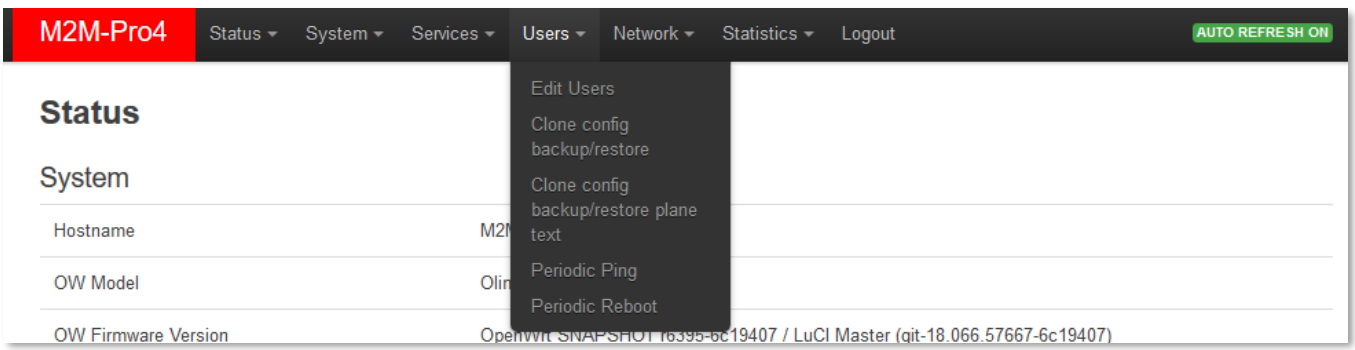
- The **Mount Points** are showing the available (mounted) shares of the Linux file system and flash memory.



- The **LED Configuration** is also configurable for custom needs.
- You also can **Backup** and restore your system configuration, applying **Flash firmware** updates.
- **Custom Commands** for defining some connads to execute.
- **Reboot** menu: for restarting the device.

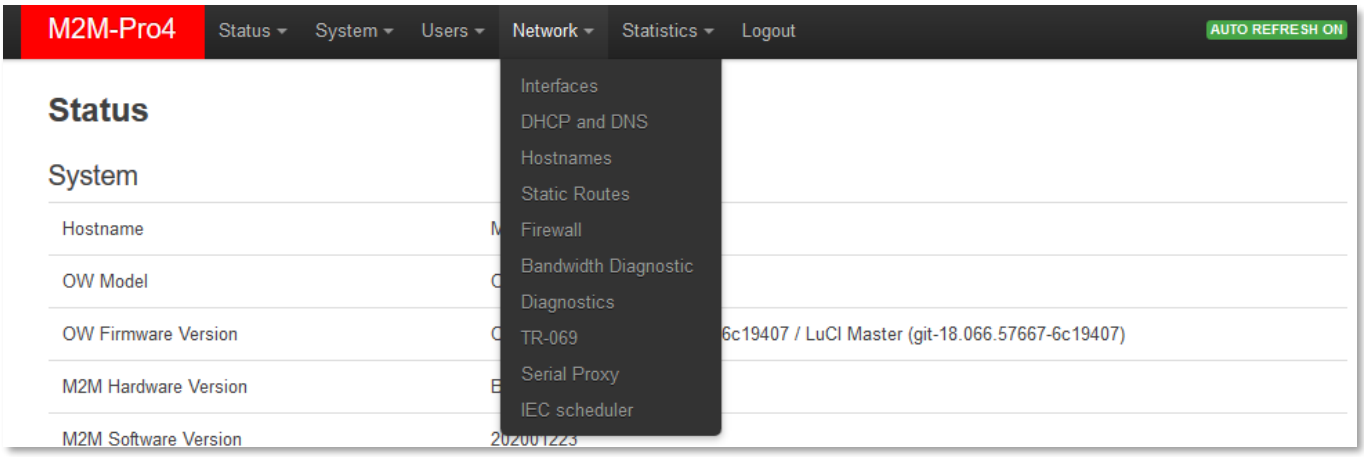
1.6 Users menu

- You can define or modify, delete **Users** for allowing to access the system
- Define **periodic ping** (for QoS check) or **periodic reboot** (for industrial standard or safety reasons).
- **Clone config backup/restore** for easy cloning of the currently saved settings to another device.
- **Clone config backup/restore plane text** – the same feature in uncompressed format.



1.7 Network menu

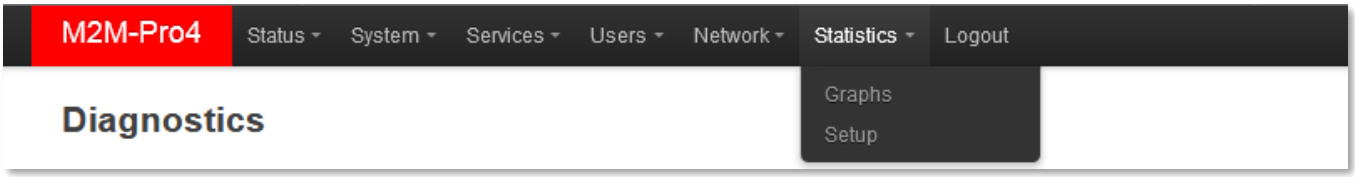
- Here you can configure the settings of each network **Interfaces** (for the wireless module and the USB port)
- You can define the **DHCP and DNS** settings for the wireless LTE module and connection.



- Define **Hostname** for the modem for easier identification of the device on your network.
- At the **Static Routes** are also configurable (IP route settings).
- **Firewall** settings for control and rule the incoming and outgoing, througput communication.
- At the **Bandwith Diagnostics** item, you can configure a diagnostic address for testing the communication health.
- At the **Diagnostics** menu, you can check network access (ping, traceroute, nslookup).
- **TR-069** settings are here for configuring the TR-069 compatible remote management server and its management settings.
- Also you can configure the RS485 port settings at the **Serial Proxy** menu.
- In the **IEC scheduler** menu you can configuration the utility IEC1107 compatible meters' readout setting and the FTP transmission settings (to a remote server).

1.8 Statistics menu

- Check the statistics **Graphs -** you can test the network operation and connection health by the ping an IP address for the interfaces.
- Here you can **Setup** the system **Statistics**



1.9 Logout menu

This menu item will allow you to log out from the OpenWrt® environment in your computer browser.

2. Important notes

- By security reasons, we do recommend to **change the web user inteface login** and **password** as soon as you can.
- The **IPv6 protocol** is disabled for the LAN interfaces by default, change it if you want to use it instead of the IPv4 protocol. Use the **Network** / **Interfaces** menu **USBLAN** interface and the IPv6 relevant fields.
- The DHCP service is active for all interfaces, therefore the device will giving IP addresses for the connected devices, but the protocol which is used, configured for static IP addresses for the ethernet interfaces. If you want to use and distribute IP addresses by DHCP, change its protocol to DHCP client. You can change its settings in the Network / DHCP and DNS settings menu or in the **Network** / **Interfaces** menu, **USBLAN** interface and **DHCP** section.
- The **Firewall** service is active by default (by security reasons), therefore all communication is disabled excluding the used ethernet, DHCP, DNS and WAN channels, web port and the necessary services and ports for normal operation for the modem.
- We recommend you to disable all ports and protocols in the firewall which you are not using actively or which are not necessary to the connection and data transmitting by respecting the ports which are necessary for the general operation. Use to check Status / Firewall menu to check the data throughput and the **Network / Firewall** to configure new roles.
- The **firewall is not protecting the device against external network or DoS attacks**, if you just enable the firewall feature. For a massive and advanced safety, you have to customize the settings by harmonized with you used current network and connection settings.
- We offer to **check the network traffic** on your modem frequently by the **Status / Firewall** menu option to be ensured that all of your connections and active communication channels (port number, incoming IP) are using only the wanted paths and routes and listening the defined incoming activities and consequently occuring the estimated output traffic.
- We offer to **measure your throughput data and network traffic** (by minutes, hours) – use the **Status / Realtime Graphs** or **Statistics / Graphs** and calculate the estimable data transmitting amount according your expectations and the data limits of the used SIM card.
- The modem has 4G wireless transmission capabilities and 2G/3G fallback in case of the unavailability of the 4G network. In this case, the device will operating on the 3G or 2G

network. When the 4G network will be available again, the device will switch back to the 4G network. This feature is configurable for the **WAN** interface of the device.

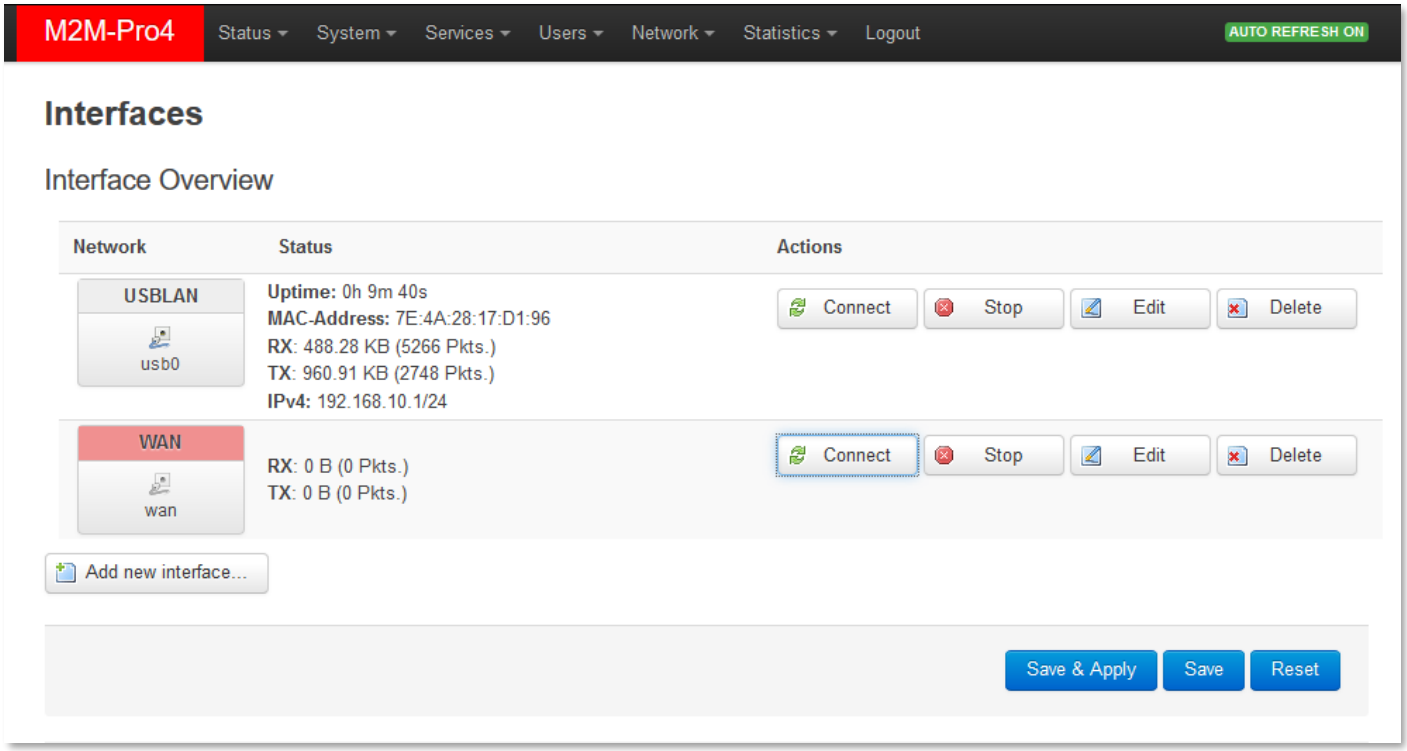
If you need, you can choose dedicated wireless service type or automatic mode (using which is accessible). Therefore you can limit your data transmitting for 2G or 3G instead of the 4G – for example. Use the **Network / Interfaces menu**, **WAN** interface, ***Edit*** button and *Service Type* field.

- 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 #1 APN** or **PIN** settings, after the saving, the modem will not restart its module automatically with the new settings. You need to restart the modem by the **Restart WAN** button in the OpenWrt® menu at **Network / Interface settings**.
- In case of network outage, the wireless network and cable connections, sessions will be reconnected soon, data will be received and transmitted automatically (by the settings) as the power source was estabilished. The **RS485** data will be also able to received soon.
- You can configure **RS485 data speed** rate betweeen 300 baud and 115 200 baud, but please consider that max. 19 200 baud is guaranteed to receive by the device. Note, that we offer to use **2 400 baud** speed rate, which is standard for utility meter's data readout and can be guaranteed that it will work. With higher data speed rates some connected systems can cause loss of characters/data in case of some models, meter types.
- The utility meter readout through the **RS485** port is possible only by using and connecting IEC1107, DLMS compatible (IEC 62056-21, IEC 62056-31 supported) devices.
- You have to configure the RS485 meter connection settings at the **Network/IEC Scheduler** menu item.
- The device has **service modes** by its **Reset** button – for stop, restart and applying the default configuration. You will found further information in the ***Installation Guide***

3. Network configuration

3.1 Interface settings

The list of the available network interfaces can be found at the **Network / Interfaces** menu item.



The **USB-LAN** interface is listed for configuring and using the modem by your PC through the micro USB connection (***usb0*** interface).

The **WAN** interface means the wireless Internet connection (as ***4g-wan***) the physical 4G module.

Modifying the interface settings

At the interfaces, at right you can modify the settings with the 

button.

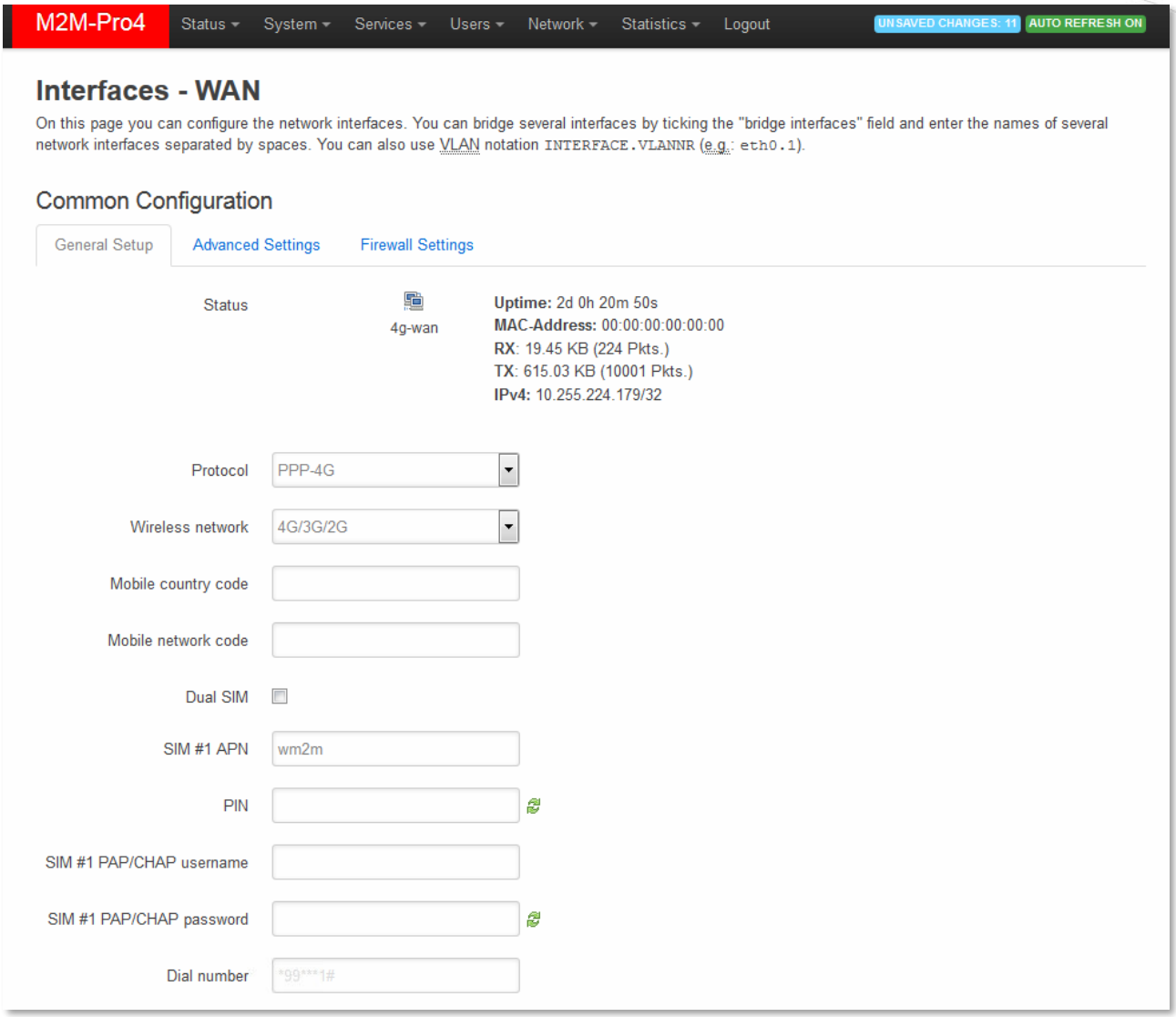
The **Stop** button stops the communication on the current interface, the 

button reconnects the related interface connection.

3.2 Cellular internet settings

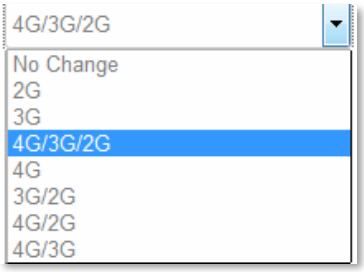
The wireless module / cellular network settings of the modem can be configured at the **Network** menu, **Interfaces** menu item. Open the **WAN** item from the interface list by the ***Edit*** button. (You can also use the **Network / Interfaces** item – if you want to configure only the *APN* settings).

The wireless connection can be operated through the dynamic and static IP address (IPv4) assignment also - which is provided by your mobile operator.



At the **General Setup** tab, you can see the current status of the interface with transmitted data amount.

The device detects the 4G module and configuring. You only have to setup the **APN** you want to use for the **WAN** (*ppp-4g*) interface and the **PIN** code of the SIM (if it is presented).



The ***Wireless Network*** field gives you the opportunity to choose a dedicated communication band or you can leave it on default value: *4G/3G/2G* – which means the *Auto mode*.

This mode could grant the best speed and quality option (for *4G* selection), or the garanteed operation on any network (*fallback* feature for *4G/3G/2G* selection (when the 4G cellular network service is not available the 3G will be used – it 3G is not available, or 2G fallback will be used – when 3G or 4G will be available again, it will switch back to 4G).

If you have to use a dedicated network like 3G, 2G, etc., then choose the required network type, please.

Take consider, that the fallback mode will be inactive in this mode – if you choose the *4G* and it the network will be not available, there will not be provided 3G or 2G fallback (if the choosen network is not available, the device won't get mobile network access). For fallback always choose the Auto mode (4G/3G/2G setting).

Here you can define the **SIM #1 APN** name for the Internet connection, which is necessary to use. **When you will not set any value** for the *APN*, the modem will restart the modem sequentially in every ca. 10 minutes until it is not configured properly.

Here you can define SIM card's **PIN** code if it is necessary for the connection.
Note, that the **PIN** code which is already configured here, it cannot be seen here due to the security rules – the characters are placed by asterix signs. Just modify the PIN if you would like to change.

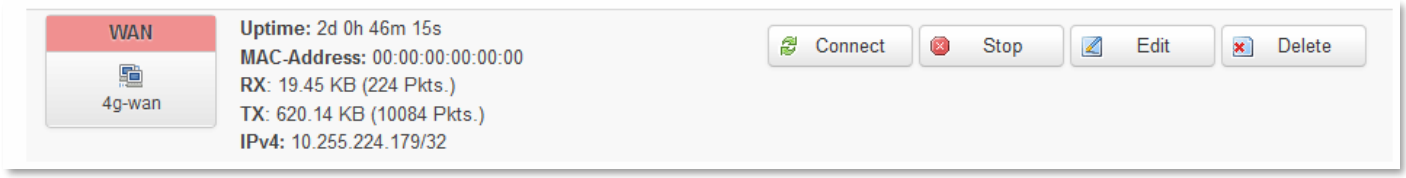
Important!
If you need to change the PIN code, use the Network / SIM PIN Change menu item.

Authentication methods:

- The **SIM #1 PAP/CHAP username** and **SIM #1 PAP/CHAP password** settings can be also configured here – if it is required for the connection.
- If you need dialup connection for using the Internet service at your provider, set the **Dial number** value (format: *99***1#).

Click to the **Save & Apply** button for saving the settings, while the device is restarting the modem with the new settings and will connecting to the cellular network.

Then, you can check the data transmitting at the **Network** / **Interfaces** menu, when check the **WAN** interface status at the **Interfaces** part.



The device is already connected to the cellular network, it has active data traffic and the **RX** (received data), **TX** (transmitted data) at **Packets** and **KB** (KBytes) values are growing.

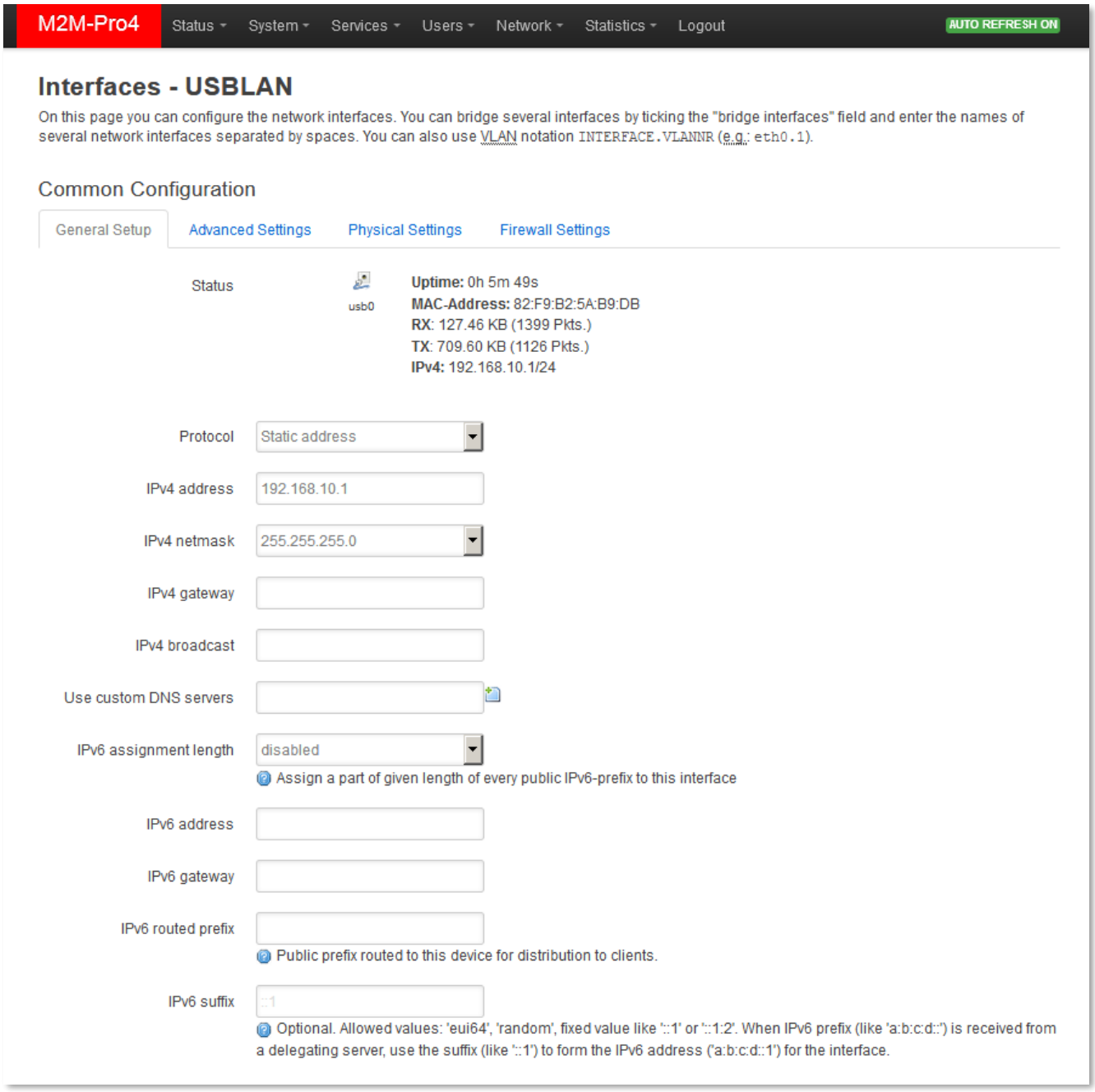
At the **Advanced Settings** tab you will found further settings for the wireless module.

By default we do not offer to change these settings, only if you are special requirements at operating the mobile network communication by the modem (these are the **LCP Echo** settings, the **Bring up on boot** and the **use built-in IPv6 management** parameters mainly).

If you changed the configuration here, click upon **Save & Apply** button for saving the settings. Then the device will reconnecting the module to the mobile network.

3.3 USB settings (micro USB interface)

The modem has USB connection interface, which is provided for configuration purposes (by your USB-connected computer), and supports alternative DC power source.



The **USBLAN** (*usb0*) interface settings for the PC connection can be performed by using the **Network / Interfaces** menu item at the **USBLAN** part, where you need to choose the Edit button. Then choose the **General Setup** tab.

Here you can define **Protocol** (*Static address* or *DHCP client*) for getting IP address from a connected network device.

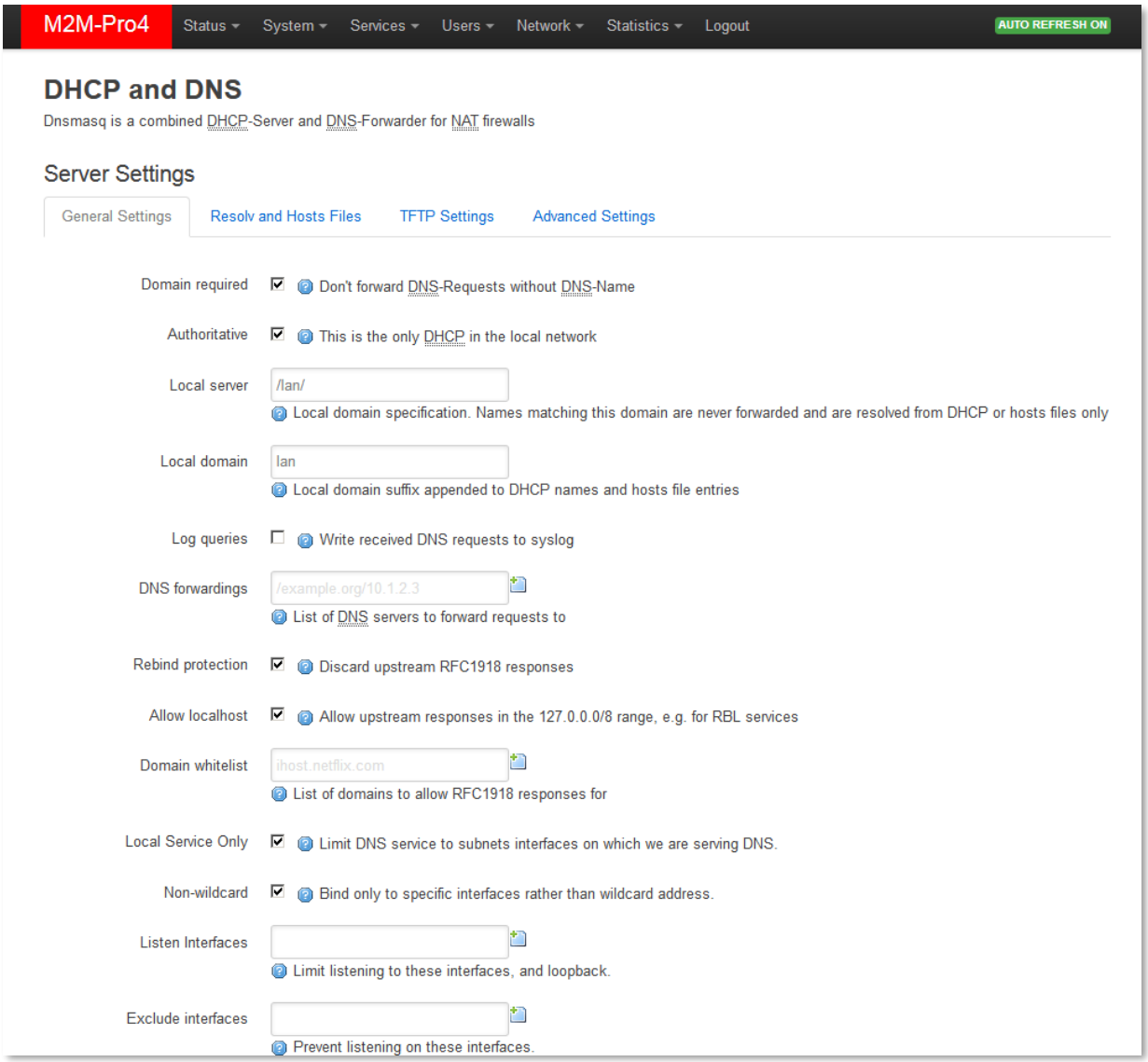
You can define the **IPv4 address** of you *static* connection.

The IPv6 addresses can be also used, but by default the setting of the device it is disabled by the **IPv6 assignment length** (*disabled*). You can allow this and add the IPv6 settings too.

If you have had changed some values here, please click upon the **Save & Apply** button for saving the settings.

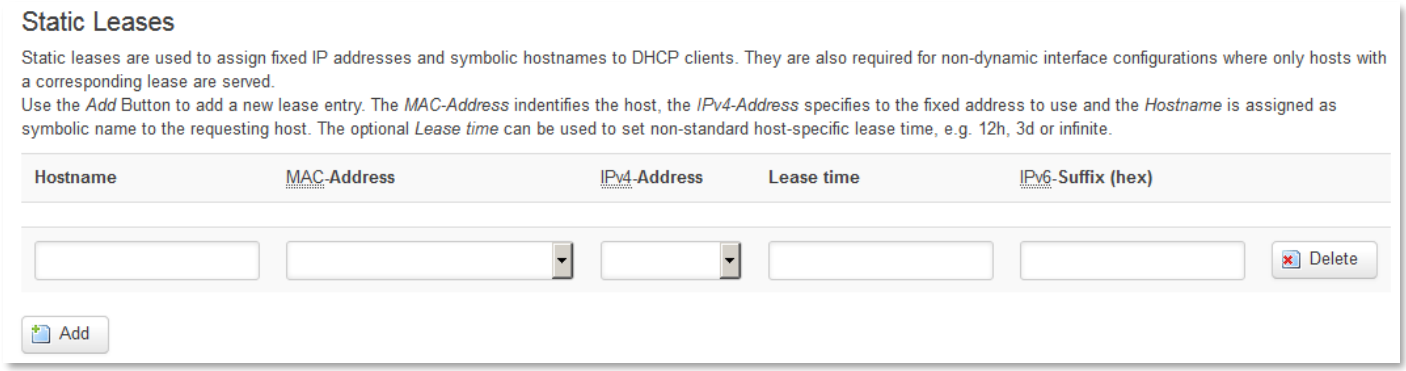
3.4 DHCP and DNS

The DHCP and DNS settings can be achieved at **Network** menu, **DHCP and DNS** item at **General Settings.**



Below, at the **Active DHCP Leases** part you can see the list of the devices, which given their IP addresses from the modem's DHCP service (with the renewal *lease time*).

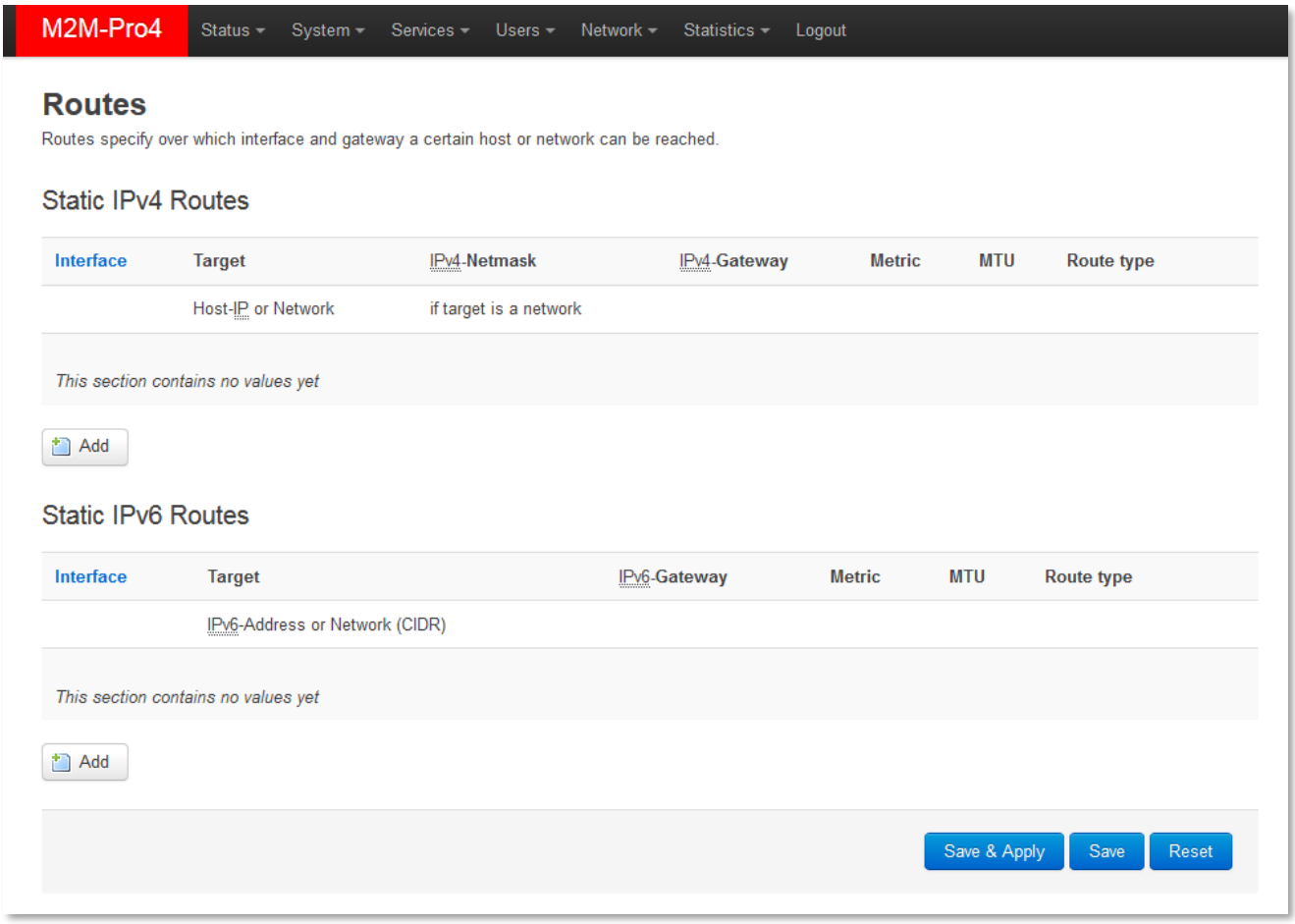
At the **Static Leases** you can add network devices by the Add button to be guaranteed to get the same IP address after every leade time renewal. Define a **Hostname** and the valid **MAC-Address** of the device and the required **IPv4-Address**.



When you have modified the settings, save them by the **Save & Apply** button.

3.5 Defining route rules (Static route)

We offer to check the currently used route rules - ARP routes, and the IPv4 and IPv6 route rules which you can find in the **Status** / **Routes** menu.



Here you can define a new IP route rule, by the  button.

These can be performed by choosing the related interface and adding the **Host-IP or Network** name, the **IPv4-Netmask**, and **IPv4-Gateway**.

To apply the new settings, **Save & Apply** your settings you made here.

3.6 Firewall settings

By default, the firewall service is active, but it allows all communication. It can be necessary to limit the traffic.

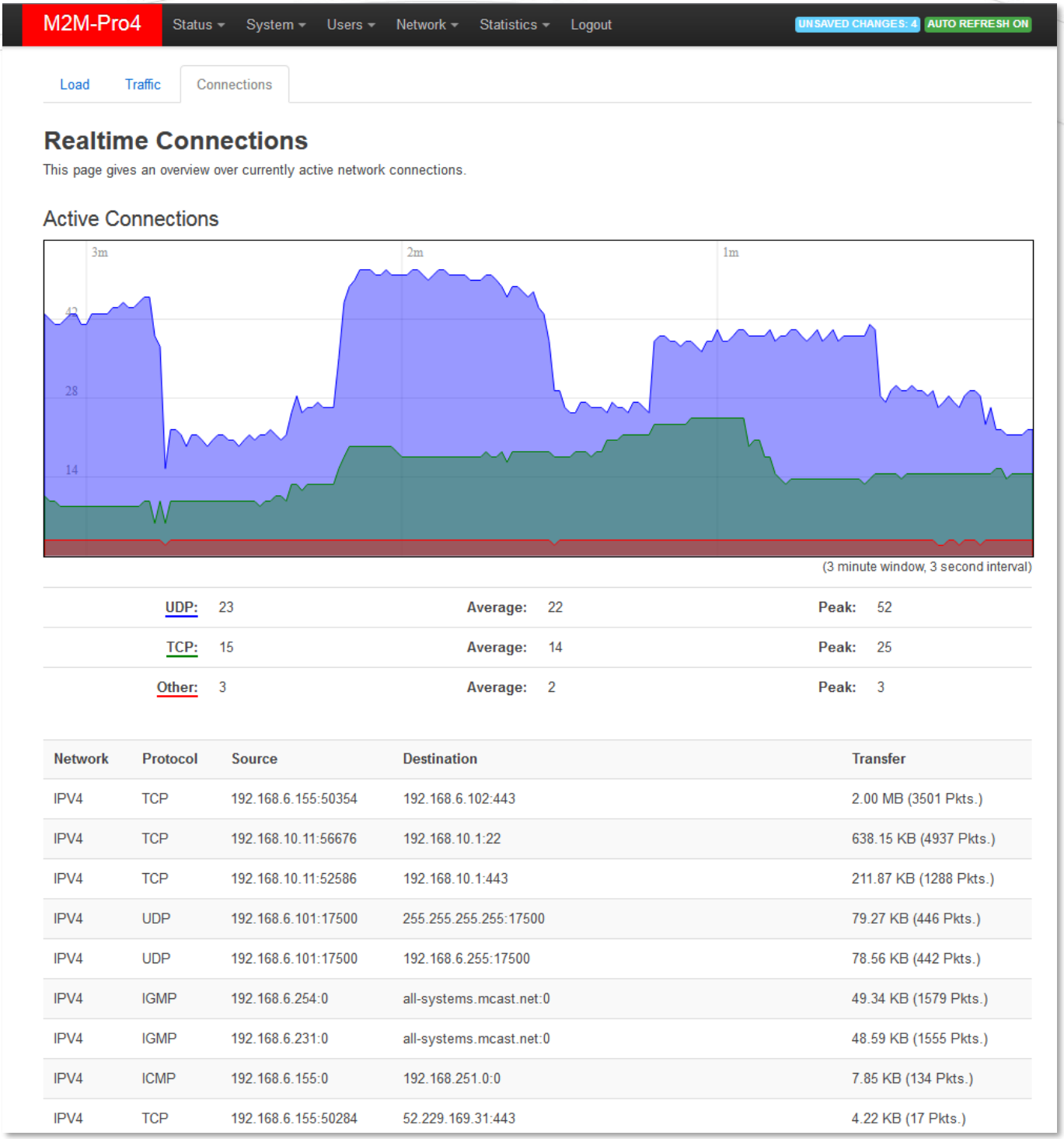
> ***Important!***
> *We offer to check the network traffic on your modem. Check connections and active communication channels (port number, incoming IP) and listen the incoming activities and the output traffic!*

We highly recommend to check the firewall settings and configure the communication to reject the unnecessary boundaries.

On the public Internet, you can have several network attack and getting unwanted communication, internet data collection by applications. These all over the unwanted network activity causes the growing the mobile network traffic and increasing the transmitted amount of data (which is unnecessarily decrease the available data package amount of the SIM card in the modem).

You can check all of these at the **Status** menu**, Realtime Graphs** item at the **Connections** tab – where these can be listed.

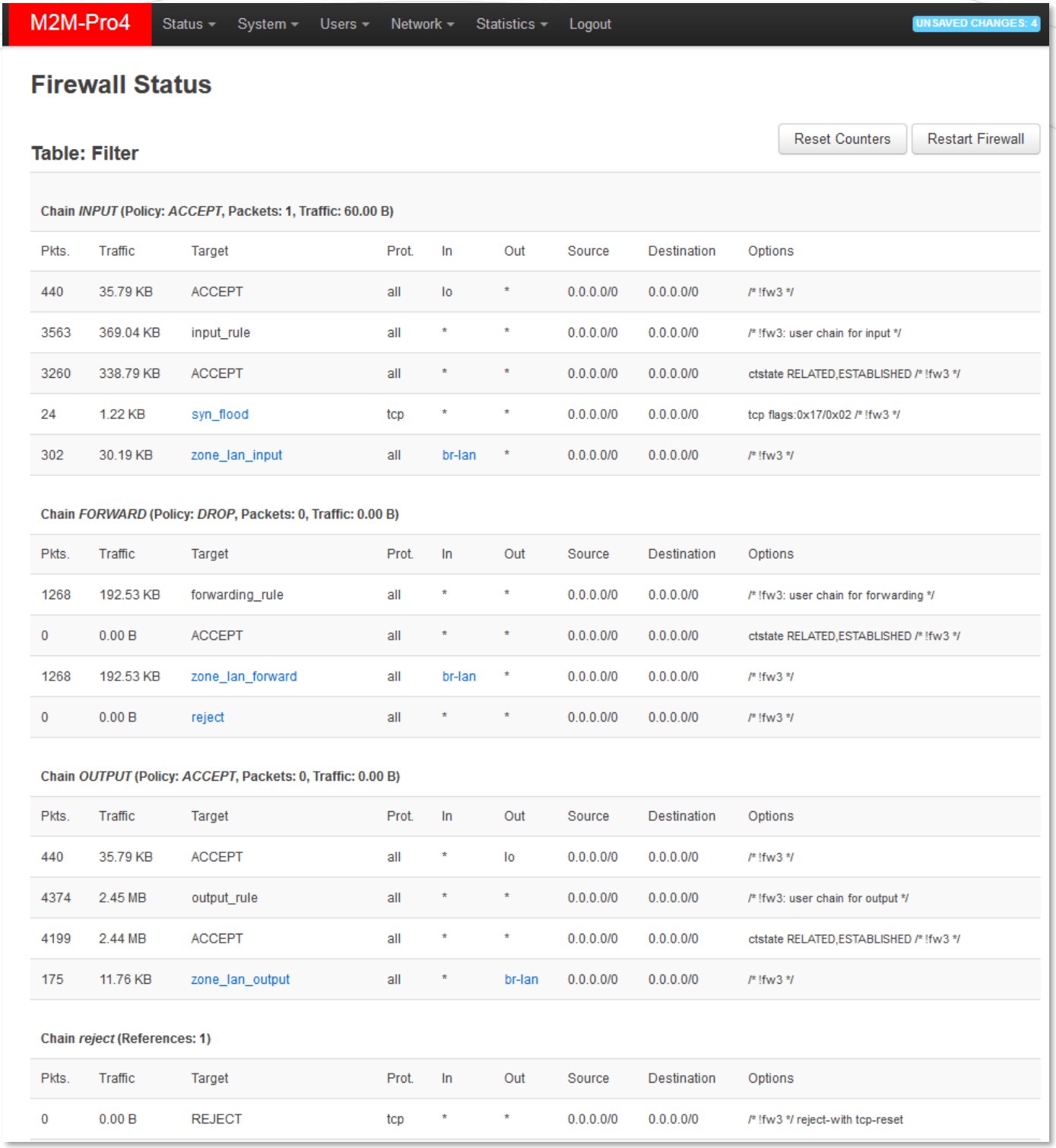
If you'll identify some communication from an unwanted IP/port address/range, then you can disable or limit the affected port or IP-segment at the firewall setting rules to deny/prohibit this traffic by disabling the communication on it.



In the **Status** menu, **Firewall** menu item you can check the actual firewall statistic.

The ***INPUT chain*** means the incoming, the ***OUTPUT chain*** is the outgoing/transmitted and the ***FORWARD chain*** means the forwarded communication/traffic hereby.

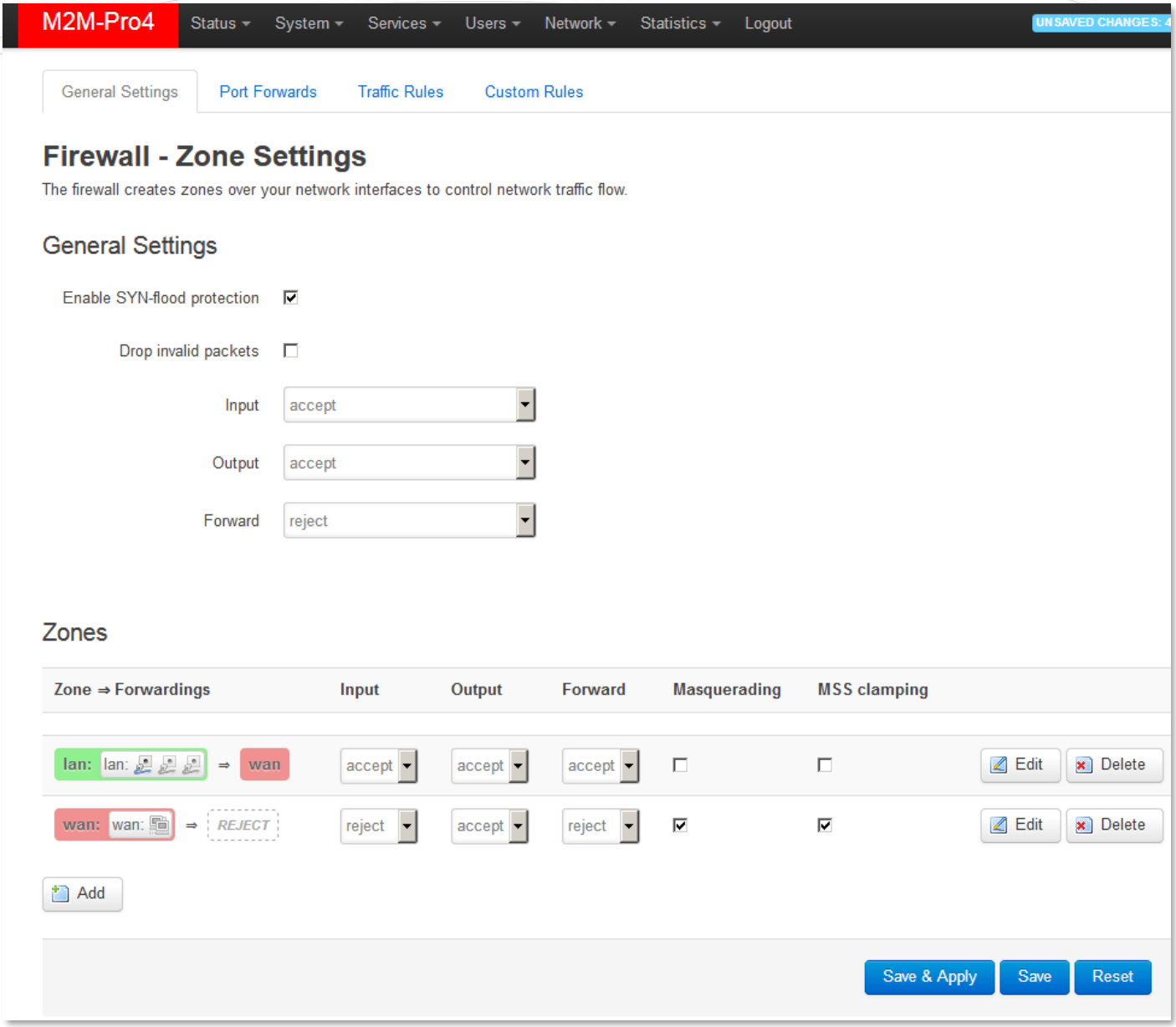
You can also see the **Reject**ed chain here below.



As it can be seen, there are several communicating IP addresses on several ports for the device and subnet.

Another method for limitation is to disable all ports, to open and enable only the necessary and used communication ports, define the used IP address range by allowing exact IPs.

You can modify the firewall settings at the **Network** menu, at the **Firewall** item, **General Settings** tab.

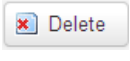


As you can see, the communication rules are listed here by their acceptance (*Accept/Deny/Reject*) with the directions of the communication (*br-lan* to *wan* or other).

Here, you can check or modify these firewall rules for the communication, at the **Input** (incoming), **Output** (outgoing) and **Forward** operations one by one by **accept** it, or **reject**, **drop.**

You can **Delete** the settings or 

modify. Below, at **Zones** part you can 

a new rule to the current ones. You also can 

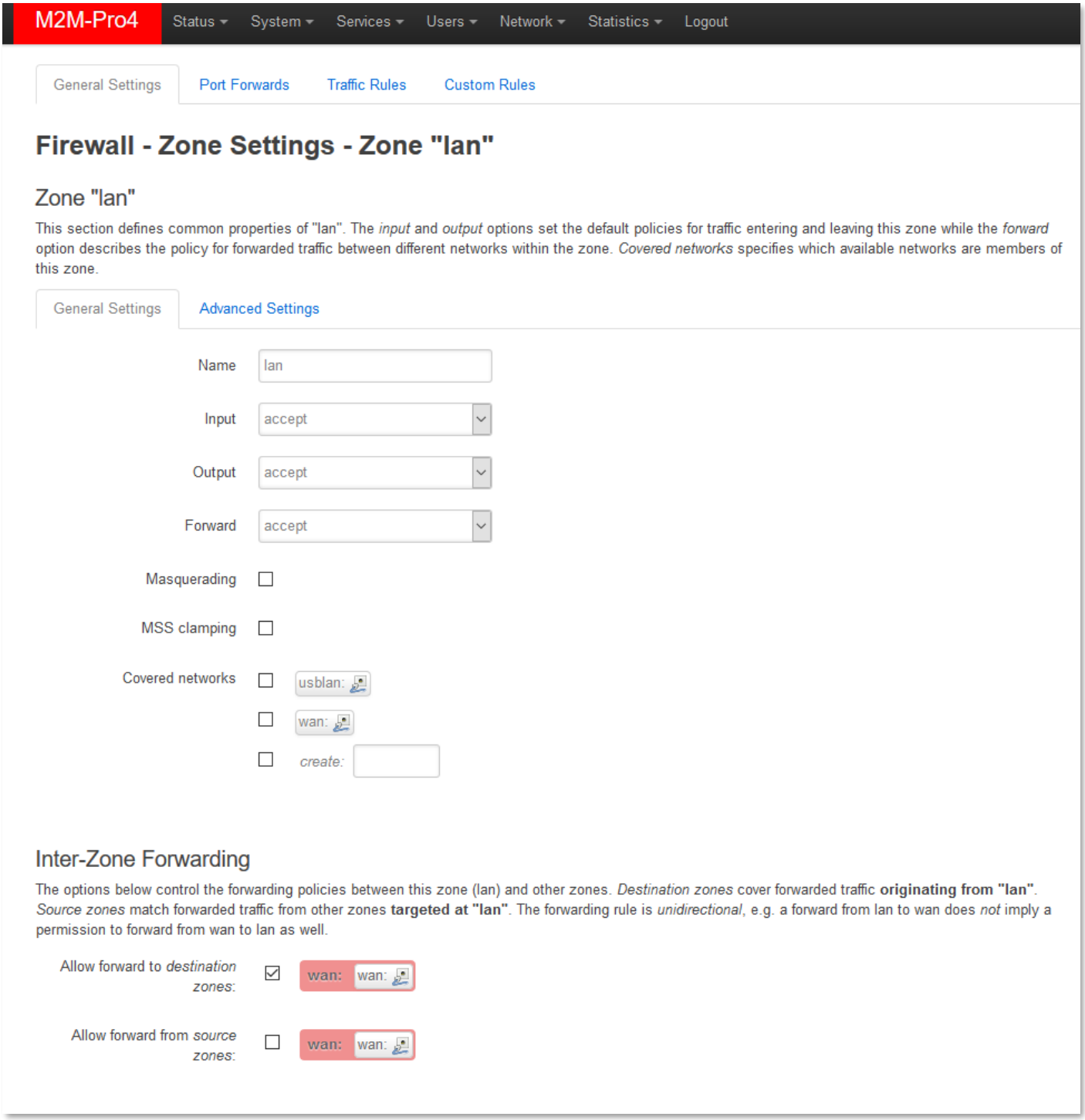
or 

an existed rule. Save modified settings by **Save & Apply** button.

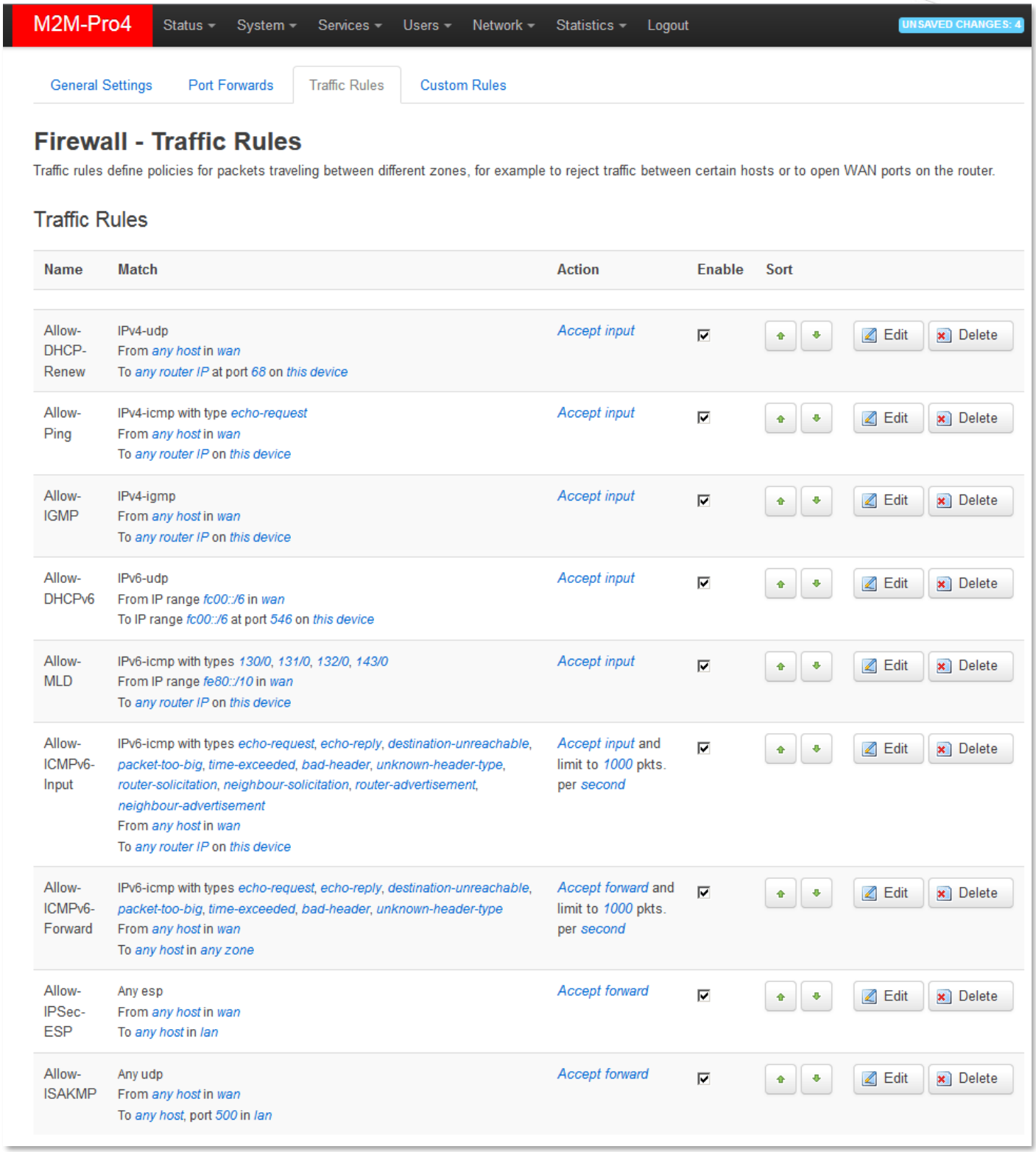
When you'd like to **add new rule to the firewall settings,** it must done **carefully**, because you can disable or tilt some ports out of the communication so easy (which ports can be used by the device (by default) or they are necessary to existing for some network services or could required by

some other running tasks). E.g. Port nr. 67 is used by DHCP service and the DNS which is also using a dedicated port (nr. 53).

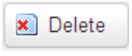
Therefore you can add new port (which you have configured for the relevant service) to the firewall rules by the Add button. Configure the port and save the settings. Don't forget to Delete the old, not relevant rule for the service. For modifying the Firewall settings, choose Edit button.



For the port-level filtering or interface traffic limits or **Traffic Rules** settings are also necessary to define!



Here you can **Enable / Disable** or 

, 

a configured rule.

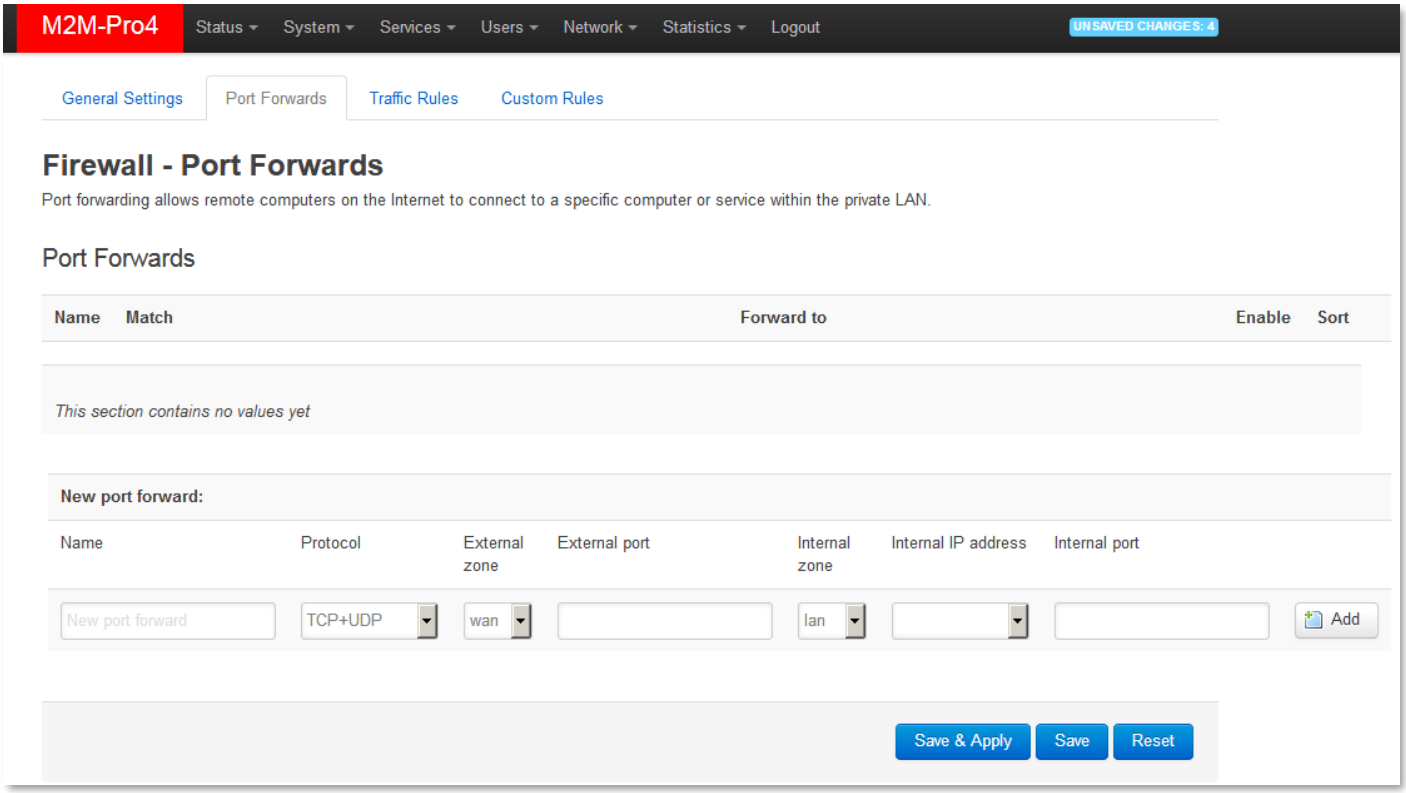
When you have modified the settings, save them by the **Save & Apply** button.

3.7 Port Forward settings

Here in the **Network** menu, at the **Firewall** item, **Port Forwards** tab you can setup the port forwarding rules for the modem.

You can add a new rule by the Add button.

Here you can define a rule with the necessary **Protocols**, interface (**External zone** and **Internal zone**), Ports (**External ports**, **Internal ports**) and the **Internal IP address** values.



When you modified the settings, save them by the **Save & Apply** button.

If you already have a forwarding rule, you can **Enable**/**Disable**, or **Edit**, **Sort** or **Delete** the rule.

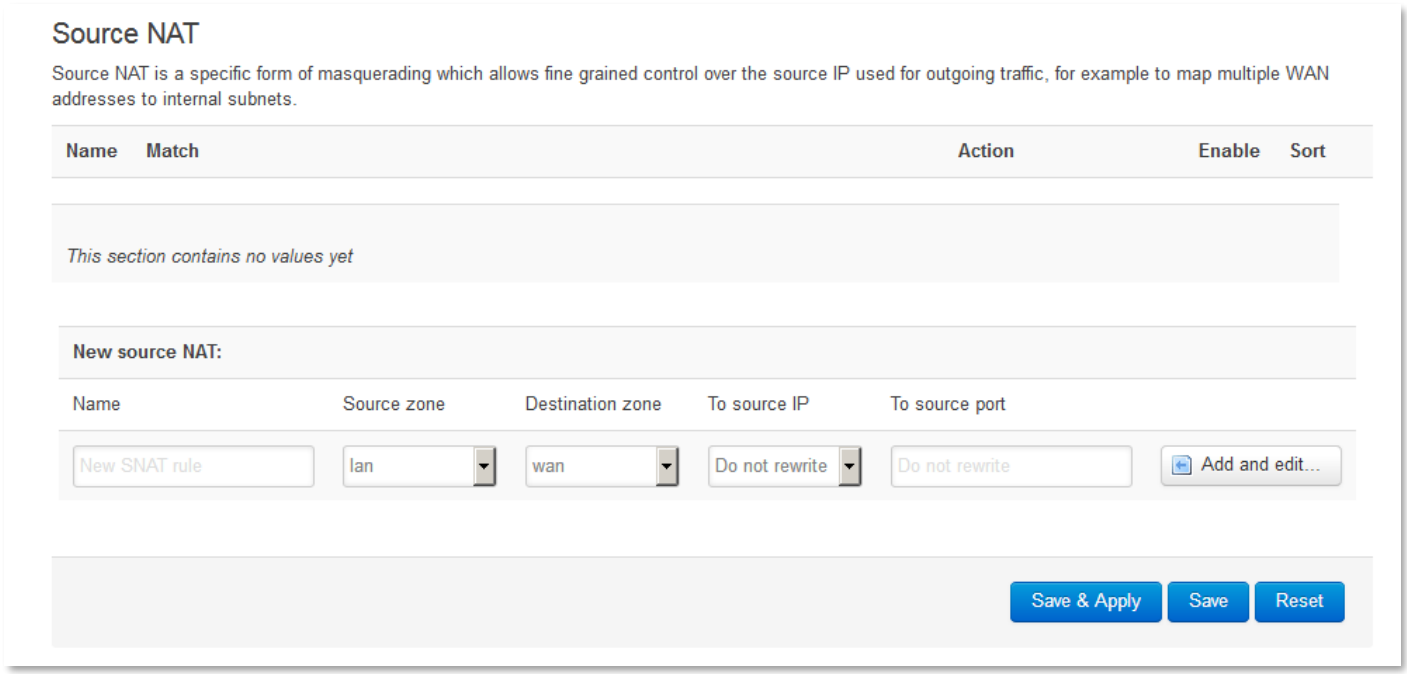
3.8 NAT settings

In the **Network** menu, **Firewall** item, **Traffic Rules** tab you can setup the **Traffic Rules**, and the **Source NAT** settings.

You can add a new rule by the Add button and **Save & Apply** to close the upcoming window.

Here you can open ports (e.g. for TCP) for the packages, or define new forwarding rule for interfaces (**New forward rule**).

The **Source NAT** settings (below) can be performed for each protocol (tcp, udp), that the modem allows the redirection of data –which incoming IP address and port must be redirected to which outgoing IP address and port and must be forwarded the data traffic. You also can define a port range, hereby.



When you modified the settings, save them by the **Save & Apply** button.

These rules must always be defined, not to disallow the general communication.
Take care, because it is easy to enclose the device from the network or disabling the remote access. Please, be careful when configure these settings.

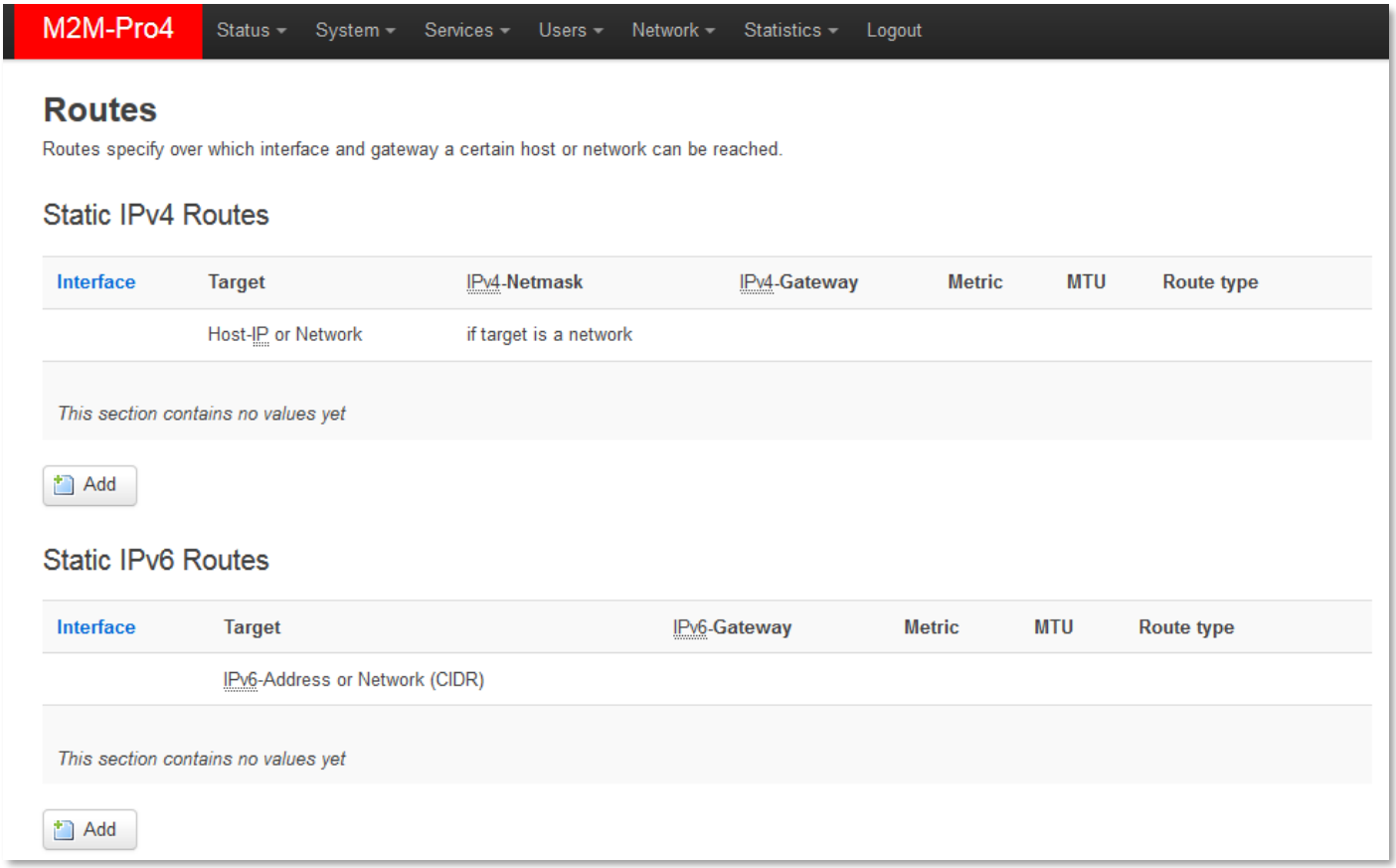
Important!
Always check the standard ports, which are used by the network services and always allow these to operating (e.g. FTP: port 21, SSH/Telnet: port 22, DHCP: port 53, NTP time server: port 123, etc).

The proper port filtering, routes are minimizing the communication, what could be important by safety reasons, and could decrease the open threads and risks of some safety leaks.

Always limit the access of services, and decrease the amount of the throughput communication on the network by these rules to provide the operation only for the necessary services, ports, ip addresses.

When you modified the settings, save them by the **Save & Apply** button.

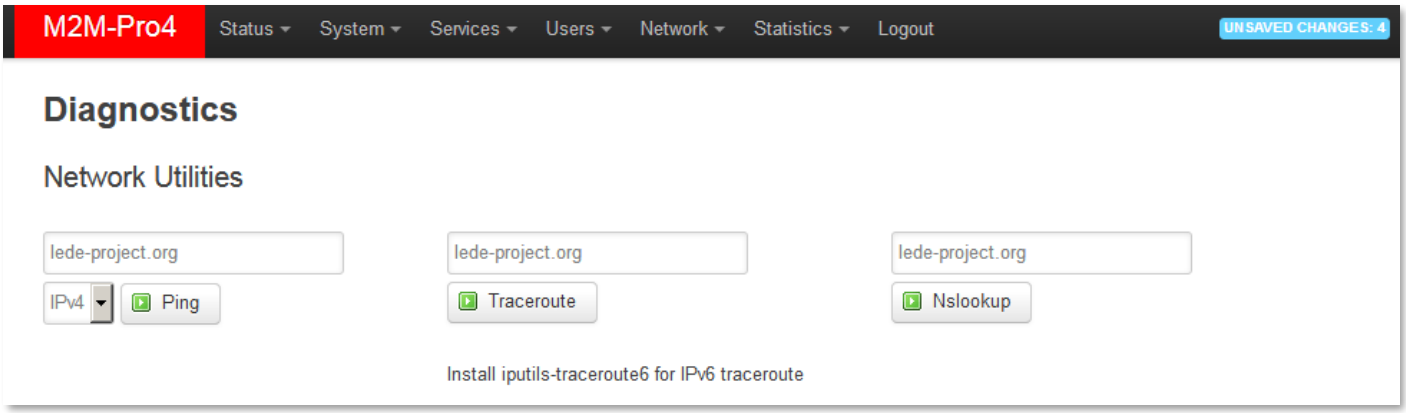
At the **Network** / **Static Routes** menu item you can define a new route.



4. Advanced services

4.1 Ping IP address / checking IP

Open the **Network** menu, **Diagnostics** item.



Here you can check the availability of an IP address, that is it accessible (push Ping button), is there a naming service provided, and is there response between two IPs (push Nslookup button), furthermore you can query the path of the communication (by Traceroute button). Then below you will get the results listed.

Important!

Check that IP addresses, which are accessable from the current IP segment and APN zone for sure (e.g. from an enclosed APN zone the device will not access the public internet, and from the public internet it will not access the enclosed M2M APN zone).

Important!

In case of M2M APN the 192.168.1.250 address can be accessed, it is possible to ping the address for checking the 4G network connection.

```
PING lede-project.org (139.59.209.225): 56 data bytes
64 bytes from 139.59.209.225: seq=0 ttl=54 time=29.080 ms
64 bytes from 139.59.209.225: seq=1 ttl=54 time=28.597 ms
64 bytes from 139.59.209.225: seq=2 ttl=54 time=26.848 ms
64 bytes from 139.59.209.225: seq=3 ttl=54 time=28.095 ms
64 bytes from 139.59.209.225: seq=4 ttl=54 time=27.842 ms

--- lede-project.org ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 26.848/28.092/29.080 ms
```

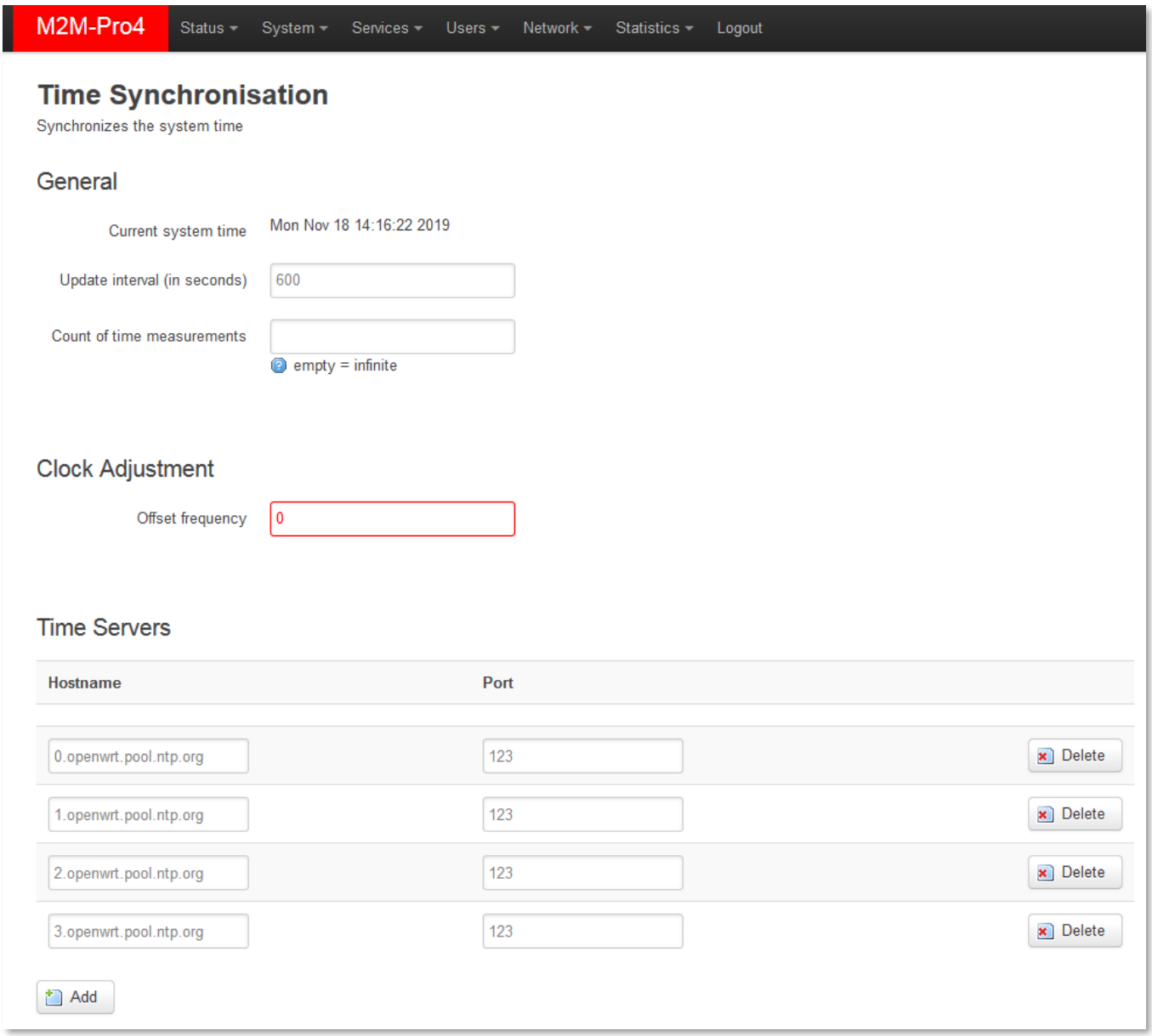
4.2 Network Time Service (NTP)

Important!

This NTP time synchronisation is highly important for data storage of the incoming readout results (metering files) on the modem's memory. Because the device uses file syntax with the current datetime values.

The supercapacitor provides max. 2 days of keeping the date-time values, but the NTP sync is also very important to keep updated time for the device and your data. Therefore we highly recommend you to configure NTP time servers and to test the proper functioning of this feature.

Open the **System** menu / **Time Synchronisation** item. You can add and refresh time interval at the **Update interval (in seconds)**. Then you can define the time synch at the **Clock Adjustment**'s **Offset frequency**.



At the **Time Servers** part you can Add NTP time servers by its **Hostname**, IP-address or server name, and **Port**.

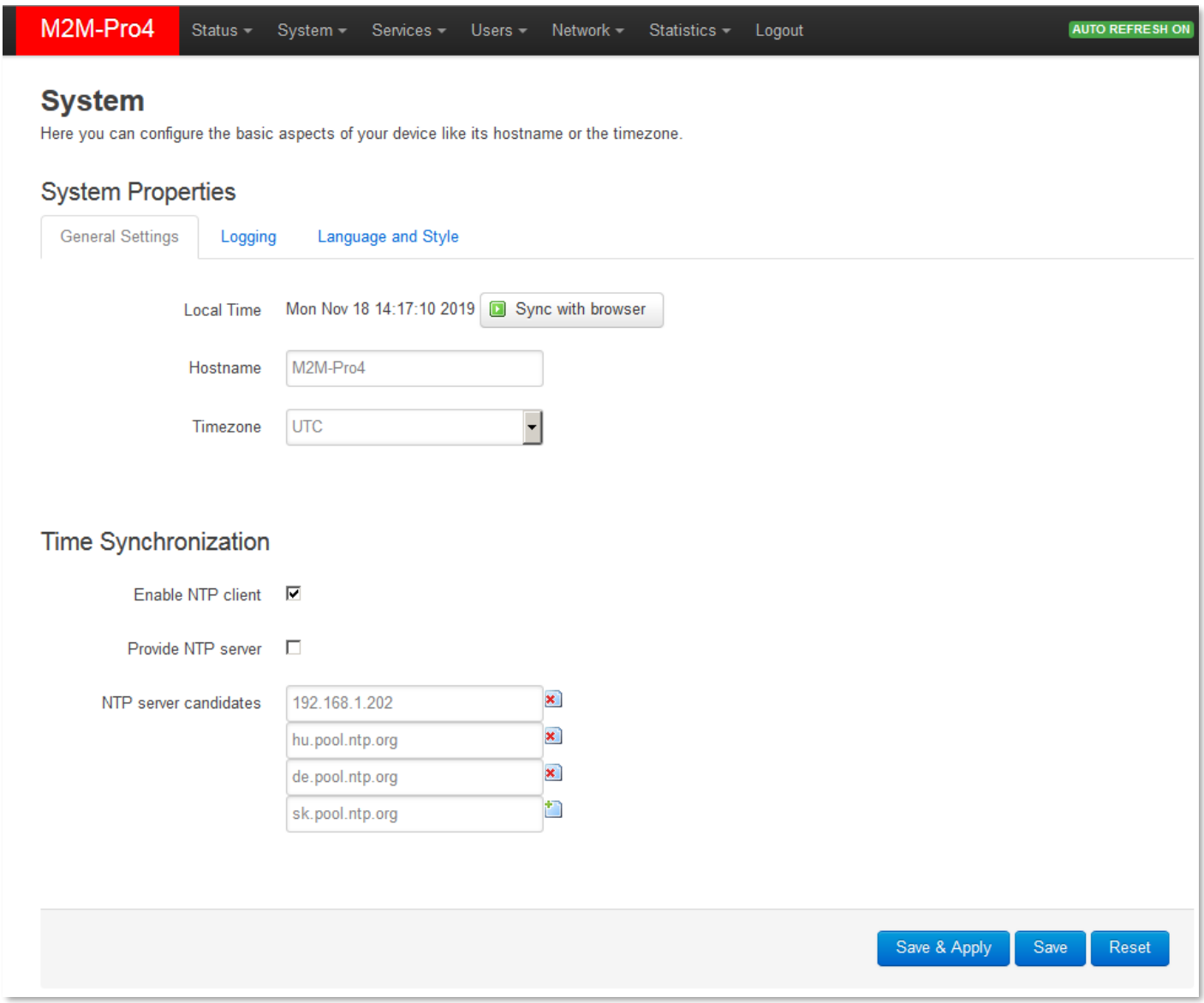
You can Add or Delete a **Time server** entry.

The most NTP time servers are using the UDP Port nr. 123 for time synchronisation. You can find a NTP time servers on the Internet. Note, that the modem must access the public Internet for the NTP time server sync.

Take care of using the IPv4 and IPv6 dependent time servers.

Save the settings by the **Save & Apply** button.

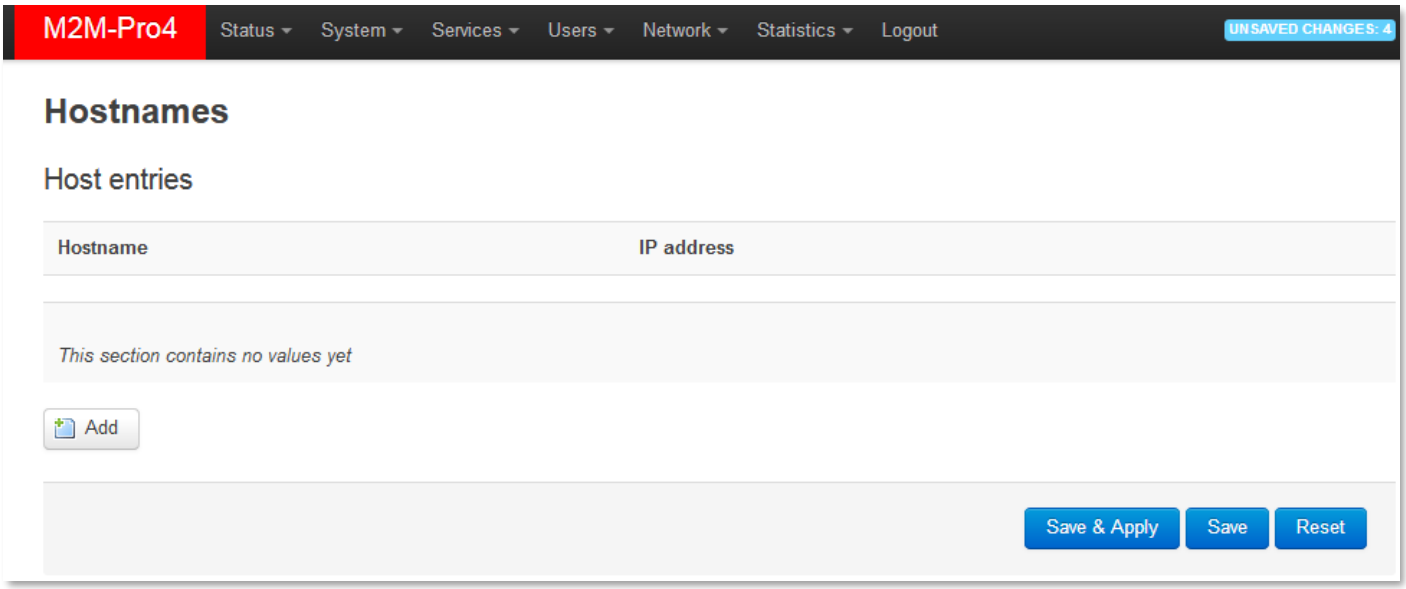
The time zone and synchronization of the system can be achieved in the **System** menu / **System** item. Here you can define the **Timezone** and at the **Time Synchronization** part you can *Enable* or *Disable* the **NTP client** or **Provide NTP server**.



4.3 Identifiying of connecting computers

Open the **Services** menu, **Hostnames** item.

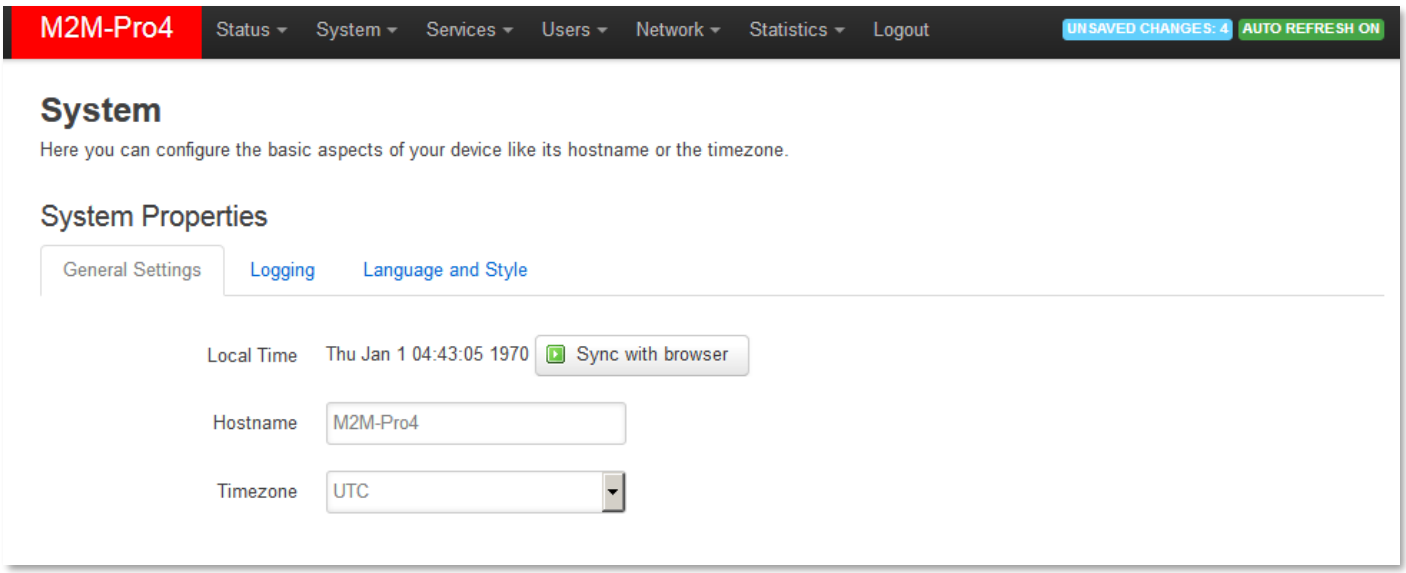
Here you can register those machines, network devices which are using the modem's connection - for an easier identification.



You can  logical names to the IP addresses of the connecting machines, which you can see as listed at the **Status / Overview** menu as external connected clients.

When you have modified the settings, save them by the **Save & Apply** button.

The local hostname for the modem (which name will appear for external devices on the network), it can be changed at the **System** / **System** menu item, where you will find the **General Settings** tab, at the **Hostname** field you can define unique device name – to make it easy to identify the device on the network.



4.4 Serial Proxy (RS485 settings)

Important!

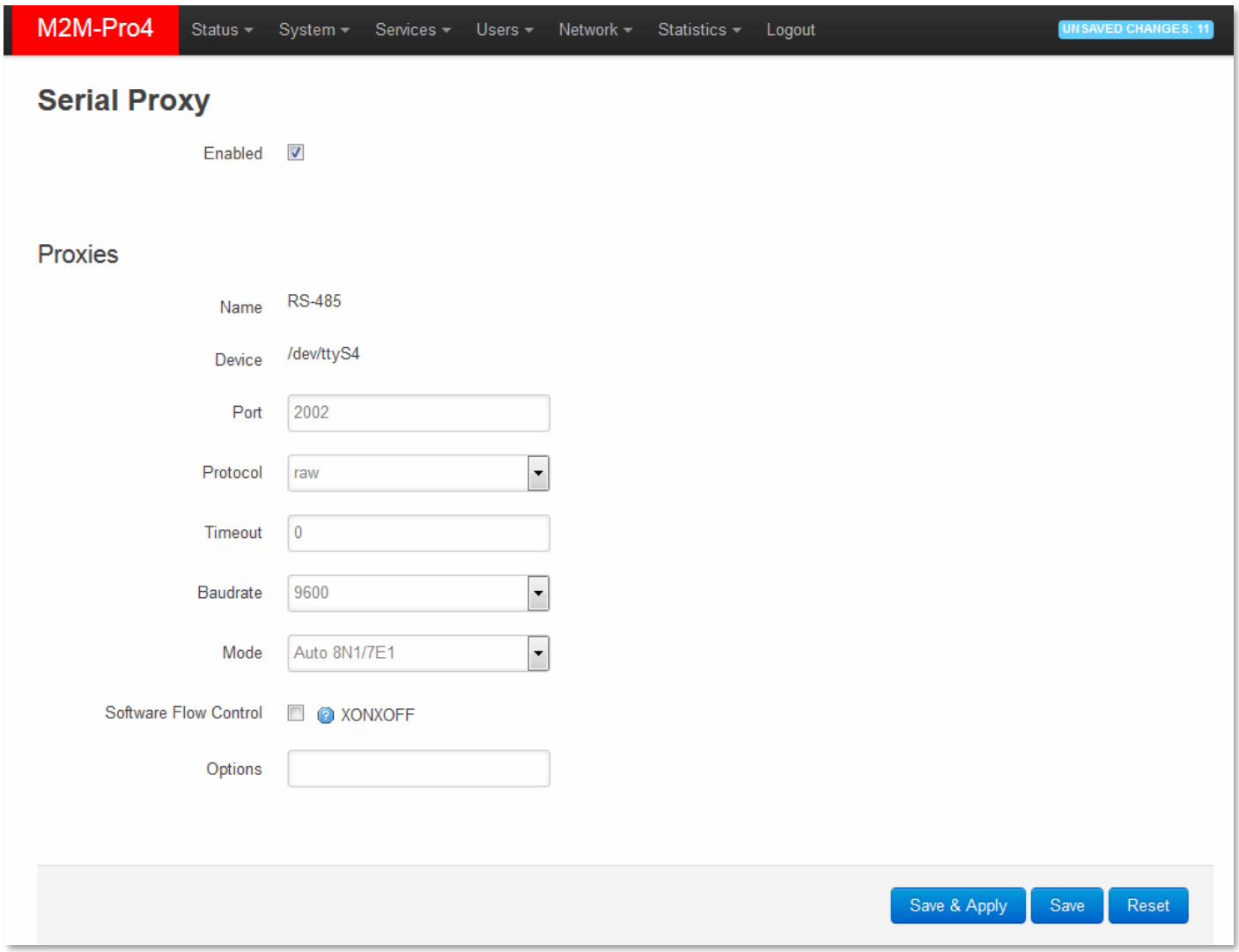
*The utility meters can be connected to the modem via RS485 port, where they can send data to the modem (activity is signed by **RS485 RX** LED) and the modem can also exchange data with the meters (**RS485 TX** led signs it).*

For the proper settings of the RS485 port connection, choose the **Network menu, Serial Proxy** menu item.

Here you can define the protocol conversion parameter settings, such as receiving the incoming communication in the proper format and data exchange.

For first, the **Serial Proxy** must be **Enabled** for using RS485 communication and RS485 cabling must be connected to the external utility meters which you want to get data from or collect data.

Note that the modem supports up to 31 utility meter connection in the same time.



At the **Proxies** part you will found the Port (nr. 2002 by default), which you have to configure to your needs.

There you will find the **Name RS485** and the **Port**, which must be configured.
Choose the right value for the **Protocol** here:

- *off*: no dataflow
- *raw*: full duplexity
- *rawlp:* one-direction communication
- *telnet:* for further usage

We offer to use the ***raw*** option here, because the meters are sending raw text format files to the modem.
The **Timeout** value is 0 by default (without delay), and the **Mode** must be ***Auto 8N1/7E1*** (which means in sequence: *Databits / Parity / Stopbits*).
The **Baudrate** (default is *9600* bps for the RS485).

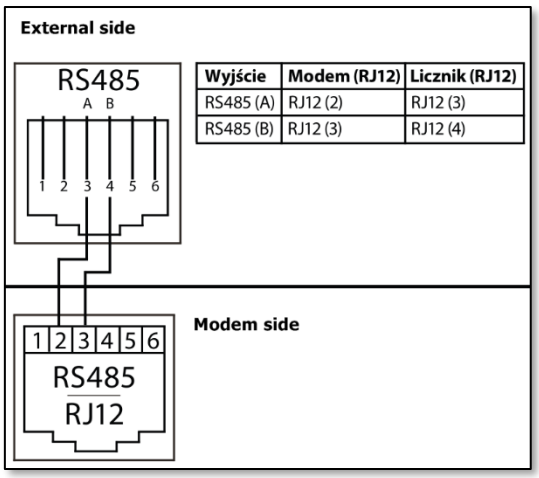
Important!
Note that maximum 19 200 baud speed rate can be used wheather of the configuration options.
But, we offer to use the standard 9600 baud speed for receiving or transmitting data.

If you want, you can use a **Software Flow Control** where you must **Enabled.**

When you modified the settings, save them by the **Save & Apply** button.

4.5 RS485 meter connection

The **RS485** port (RJ12 connector) pinout can be seen here.
Take care on grounding when using the connection with external devices.
You can order from us an RJ12 connection special cable with the matching pinout to interconnect your external devices to the modem.



Wyjście	Modem (RJ12)	Licznik (RJ12)
RS485 (A)	RJ12 (2)	RJ12 (3)
RS485 (B)	RJ12 (3)	RJ12 (4)

Through the RS485 connection, the device is able to handle 1 to 31 utility meter connections at the same time without problem.
Note that you still have to configure the IEC scheduler settings for the meter data exchange!

4.6 The incoming utility meter files

All incoming data of the connected meters will be automatically stored under the **/tmp** directory on the RAM drive.

Important! *Note that, this is a temporary storage pool, where all stored data of the directory will be deleted after rebooting.*

The incoming meter readout files of the meters are stored here in plain text format. The following syntax can be found inside the file:

- Meter type, password
- *Register address N – decimal address and register value N – raw data
- Readout frequency (interval)
- Load Profile request/data
- Event log request/data

**The registers are repeating until the end of the data flow*

The filename syntax contains the date- and time stamp of the successful utility meter readout (YYYYMMDDhhmmss).

Note, that in case of Load Profile and/or Event Log readout, when it was successful, the readout date will be stored. Next time only the differencial data (delta) will be read out (the necessary data only, since the last successful reading).

There is an another opportunity to declare the period of the readout (*date from* and *date until* values can be configured for the meter readout).

<u>The file syntax of the incoming meter files:</u>

Filename: **MeterAddress_TimeStamp_Type.txt**

e.g. *0000009901868575_20200120204241_R.txt*

Where the

- meter address is IEC1107 standard 16 character long.
- type is 1 character long: R, L or E

The RS485 meter readout settings can be achieved for each meter device.

The modem will be automatically transmit further the incoming data at the scheduled time intervals to the configured IP address of a server.
Therefore, we suggest to configure the *ftp* client and make the server-modem connection to upload the stored files from the modem to the distant server IP address, in case of unwanted data loss – regarding the next setting options.

The data transmission FTP settings can be also configured at the **Network / IEC Scheduler** setting part.

The „FTP connection success/failure", „file upload OK" or „file upload wrong" events and messages are logged by the modem, you can check it in the device logs.

There is 1 MBytes of free memory space for storing the incoming meter files (in plain text format), which is sufficient for long interval of readout of several meters without problem.

The stored files after the successful FTP upload will be automatically deleted from the modem's /tmp/ directory.

In case of transparent (on-demand) meter readout of the HES center, the schedule is not started during the on-demand readout.
Therefore we offer to schedule the meter readout during a not-frequented manual readout pediod – e.g. for the night-shift, when the scheduled readout will not meet with the on-demand requests.

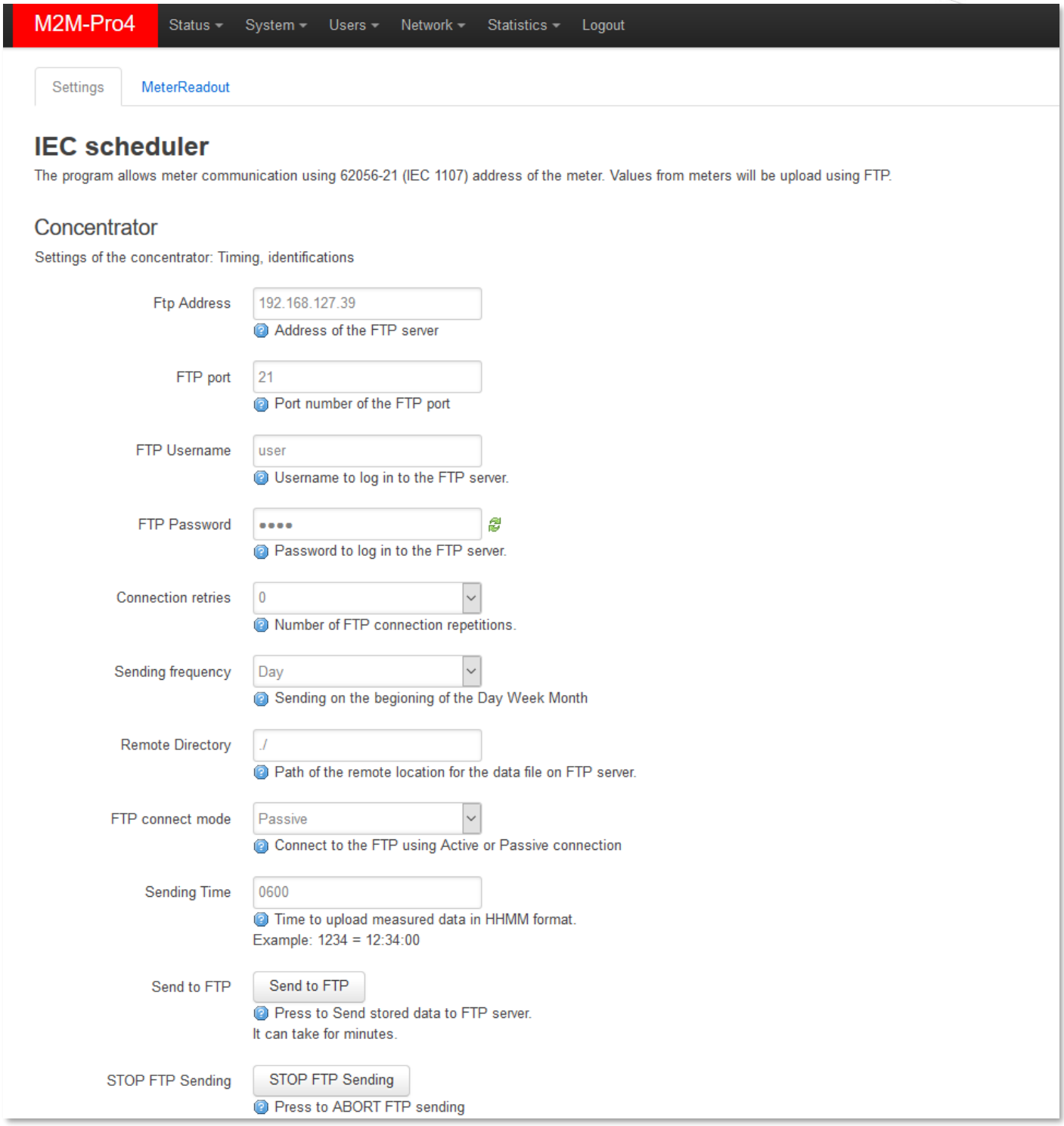
4.7 IEC scheduler

Note that the **Serial Proxy** settings must be ***Enabled*** before the settings of the *IEC Scheduler* configuration and proper operation of the utility meter data exchange – meter readout and FTP sending to a server.

Choose the **Network / IEC scheduler** menu item for the meter data readout schedule settings and the **Settings** tab here.

At the **Concentrator** part, you can configure the **FTP address** for the upload of the plain text files to a remote server's IP address). Configure the **FTP port number** (port 21 is the default).

It is necessary to use **FTP username** and **FTP password** according to the current ftp server's settings which you already made.



The **Connection retries** it is configurable to setup the number of tryings in case of uploading problem or cellular network or inaccessibility of the remote FTP server.

The **Sending frequency** value means the scheduled interval of the utility meter file sending, where you can select the daily (***Day***), weekly (***Week***) or monthly (***Month***).

Examples:

- In case of the ***Week*** schedule setting, the meter(s) will be requested to readout at the *first day of every week.*
- ***Day*** value means a daily once readout

The **Remote Directory** is the target directory location on the remote FTP server. Add the proper path of the file storage, please. (E.g. /ftp/meterdata/)
FTP connect mode can be ***Passive*** or ***Active*** according the ftp server's setting.

For the meter connection, you can declare the **SerialNumber of the device** here for the exact identification of the modem – it is very handly for the server side to identify, where the data came from.

At the **Sending time** you can add the interval of data daily transmission to the FTP server – in *HHmmss* format (hours, minutes, seconds).

The **Send to FTP** button offers the opportunity to make an on-demand data upload to the FTP server – independent of the scheduled interval.

The **STOP FTP Sending** button allows to stop and abort the ftp file transmission to the remote server.

Save the configured settings by the **Save & Apply** button.

4.7 Configuration of the utility meters

Here at the **Network / IEC scheduler** menu item, **MeterReadout** tab you can see the meters which you already have configured. Furthermore, you can **Add**, or **Delete** meters by the buttons or modify the current settings. Note that max. 31 meters can be configured for the modem.

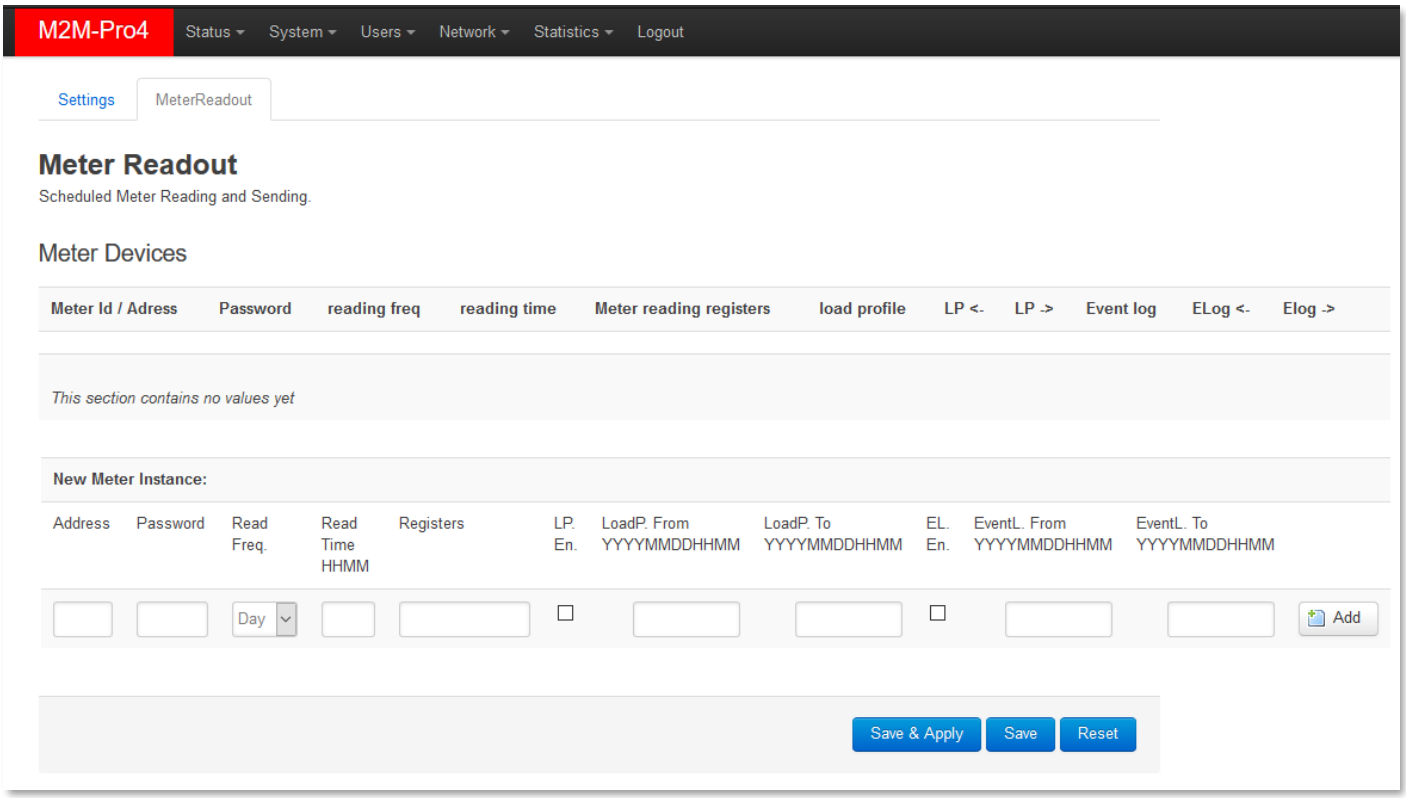
At the **Address** (meter address), **Password** fields, the configuration of the meter access can be achieved.

You can choose a **Readout Frequency** of meters readout here (as daily, weekly, monthly)

- the day of the ***weekly*** readout is always Monday.

- in case of a ***monthly*** readout, the day of event will be the day of the month – which is not configurable.

Furthermore, you can define an exact **Read Time** (in format *HHMM*), where the scheduled readout time (hour and minutes) can be configured exactly.



The **Registers** can be also configured to be read out – according to the meter's possibilities.

The **LP En.** (*Load Profile Enable*) of the meter can be also enabled (by check in the box) to be read out or not.
There is an opportunity to declare a period (**From *YYYYMMDDHHMM*** and **To *YYYYMMDDHHMM*** values) of readout the Load Profile values.

The is also an **EL En.** (*Event Log Enable*) of the meter can be also enabled (by check in the box) to be read out or not.
There is an opportunity to declare a period (**From *YYYYMMDDHHMM*** and **To *YYYYMMDDHHMM*** values) of readout the Event Log events.

Save the settings of the configured meter by the **Save & Apply** button under the new meter's entry. If you need, you can **Add** more meters up to 31 meters.

4.8 TR-069 settings

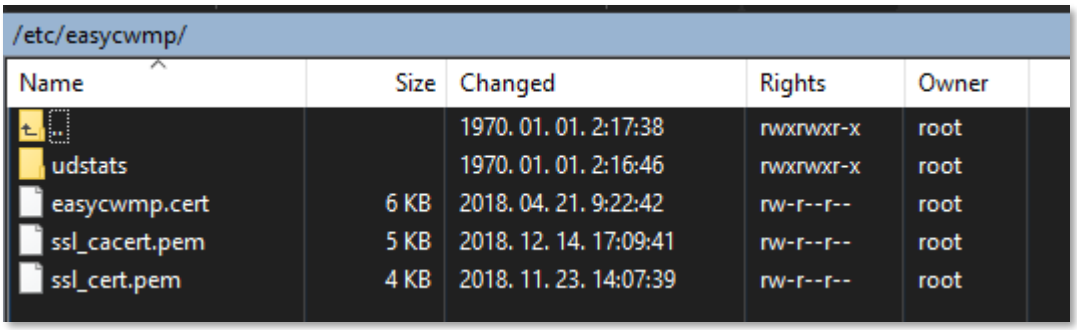
Open the **Network** menu, **TR-069** menu item for configuring the remote management server (ACS) connection settings.

At the **ACS Login** part you can define the server access. At the **ACS URL** you need to define the *http* or secured *https* protocol address (URL) of the remote management server.
The ACS uses the *8080* port as default in settings, but you can use anything else, what is configured at server side.

The **Certificate** is important when you are attempting to use the *https* protocol at the ACS communincation (**ACS URL**).
The **certification** must contain the local path and filename of the certification file with the certification file allocation on the modem (with .cert extension).

Important! *For using the certification file, you have to copy to the path you were given.*

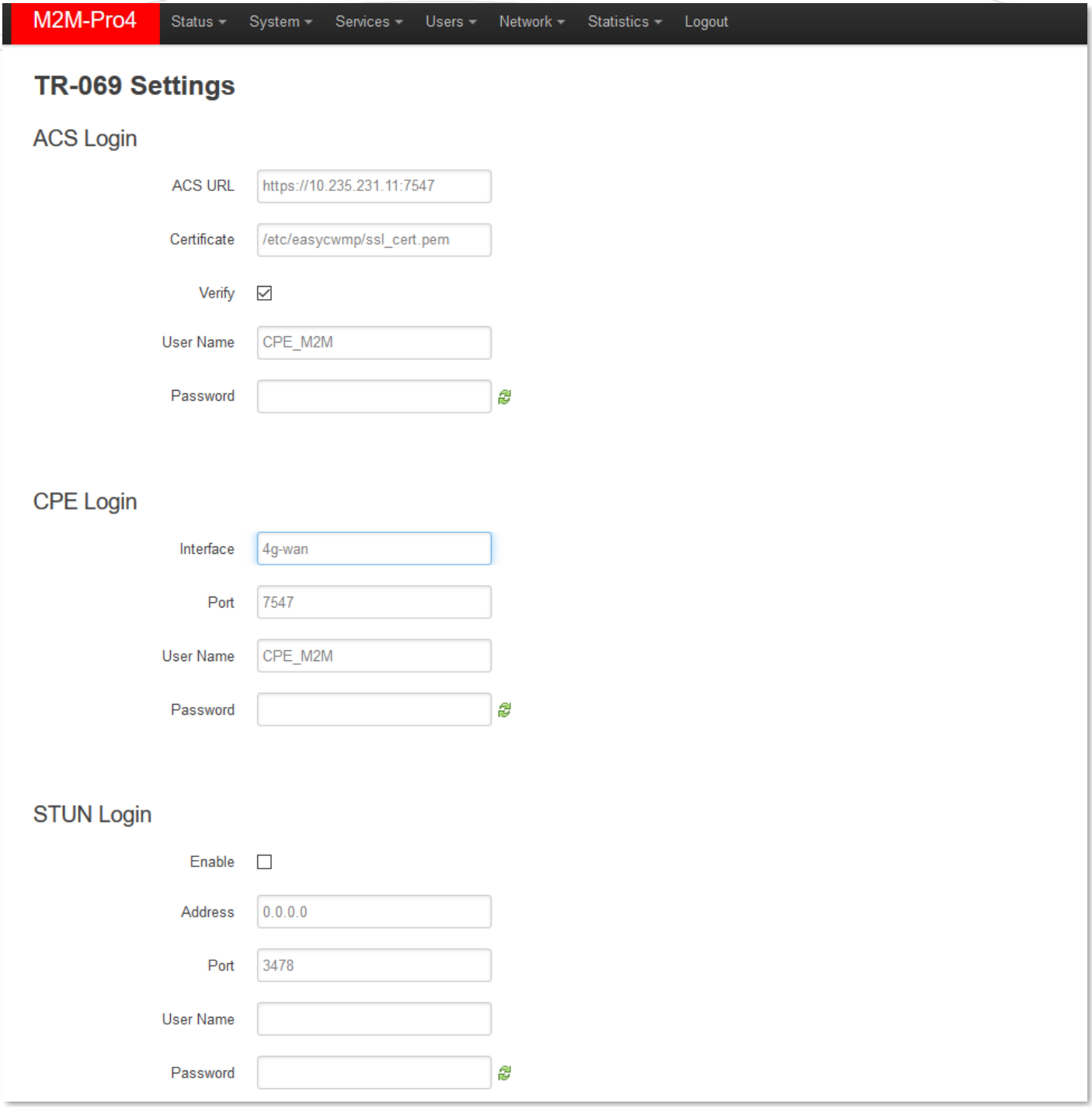
Copy the .cert certification file to the **/etc/easycwmp/** directory to the device. You can use e.g. the **WinSCP** tool for that (***SCP*** protocol, ***port 22***, by defining an ***account*** and ***password*** for the connection).



On the web interface you can enable **Verify** if you are required to use that.
The **User Name** and **Password** are important to define for the access – the same which were gaven at the server side.

The **CPE Login** part server for the definition of the modem-side (local) TR-069 connectivity client settings.
Define the **Interface** which you want to connect to the server, and the **Connection Port**.

The **User Name** and **Password** are important to define for the access.



There you also able to define the optional **STUN Login** settings. *STUN (Simple Traversal of UDP through NATs (Network Address Translation)) server is an implementation of the STUN protocol, which enables the STUN functionality for the TR069 settings.*

Here you can find mode information about STUN: https://www.voip-info.org/vovidaorg-stun-server/

On the web interface, you can **Enable** the service, define its **Address**, **Port** number, **User name** and **Password** for its proper operation.

When you have modified the settings, save them by the **Save & Apply** button.

Note that the TR-069 can be also configured by the *Easycwmp®* daemon, which is also installed to the system and can be started by the *UCI®* command

Check our *„EasyCwmp® Command Line Reference"* documentation and *„UCI® Command Line Interface Reference"* documentation for more information of using the *Easycwmp* with *UCI*.
UCI manual:
https://www.m2mserver.com/m2m-downloads/UCI_Command_Line_Reference_v3.pdf
Easycwmp manual:
https://www.m2mserver.com/m2m-downloads/EasyCwmp_Command_Line_Reference_v3.pdf

4.9 LED configuration

The device has 16 LEDs to assign the modem's current operation and connection status.

The **POWER INDICATION** leds (**group A**) and **SIGNAL STRENGTH** leds (**group C**) are fixed, but the further LEDs are reconfigurable (**CONNECTIVITY** leds and **DATA CONNECTION** leds) in the web user interface.

The programmable LEDs has pre-defined default values (see table below), but can be free to change to other meaning/function. For changing the LED settings, open the **System** menu, **LED Configuration** item. Here you can define the LED rules for the main important events as light/blink each LEDs.

By the **Name** field add a logical name (for identifying the led) and choose a physical led for the setting by the **LED Name** field, then declare the event of operation by the **Trigger** field and the interface at the **Device** (which will be valid for). All useable possibilities are listed on the web UI.

LED operations / signals which can be changed:

Group B				
- (not used, configurable)	- (not used, configurable)	**LED: lg32 (modem)** (by default: **4G-WAN c**onnection)	**LED: lg31 (usb)** (by default: **USB** connection)	**LED: Lr31 (panic)** (by default: **BLAD** (failure/panic))
		Green LED	***Green LED***	***Red LED***
	Group C		**Group D**	
	LED: lg43 (cellular signal strength: ■■■■)	***Green LED***	**LED: lg41** **RS485 TX** (data transmit)	***Green LED*** ***(permanent)***

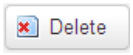
	LED: lg33 (cellular signal strength: ■■■)	***Green LED***	**LED: lg31** **RS485 RX** (data receive)	***Green LED (permanent)***
	LED: lg23 (cellular signal strength: ■■)	***Green LED***	**LED: lg22** - (not used, configurable)	***Green LED (permanent)***
	LED: lg13 (cellular signal strength: ■)	***Green LED***	**LED: lg11** **POMIEC** (read from/write into non-volatile memory)	***Green LED (permanent)***

Here you find the webadmin settings of the LED settings of the device.

The **Trigger** allows to choose an event type of operation. E.g. *netdev* means the network interface connection type, and **Device** identifies the related network interface.

Select a **Trigger** type from list, if additional option required then additional menu will appear.

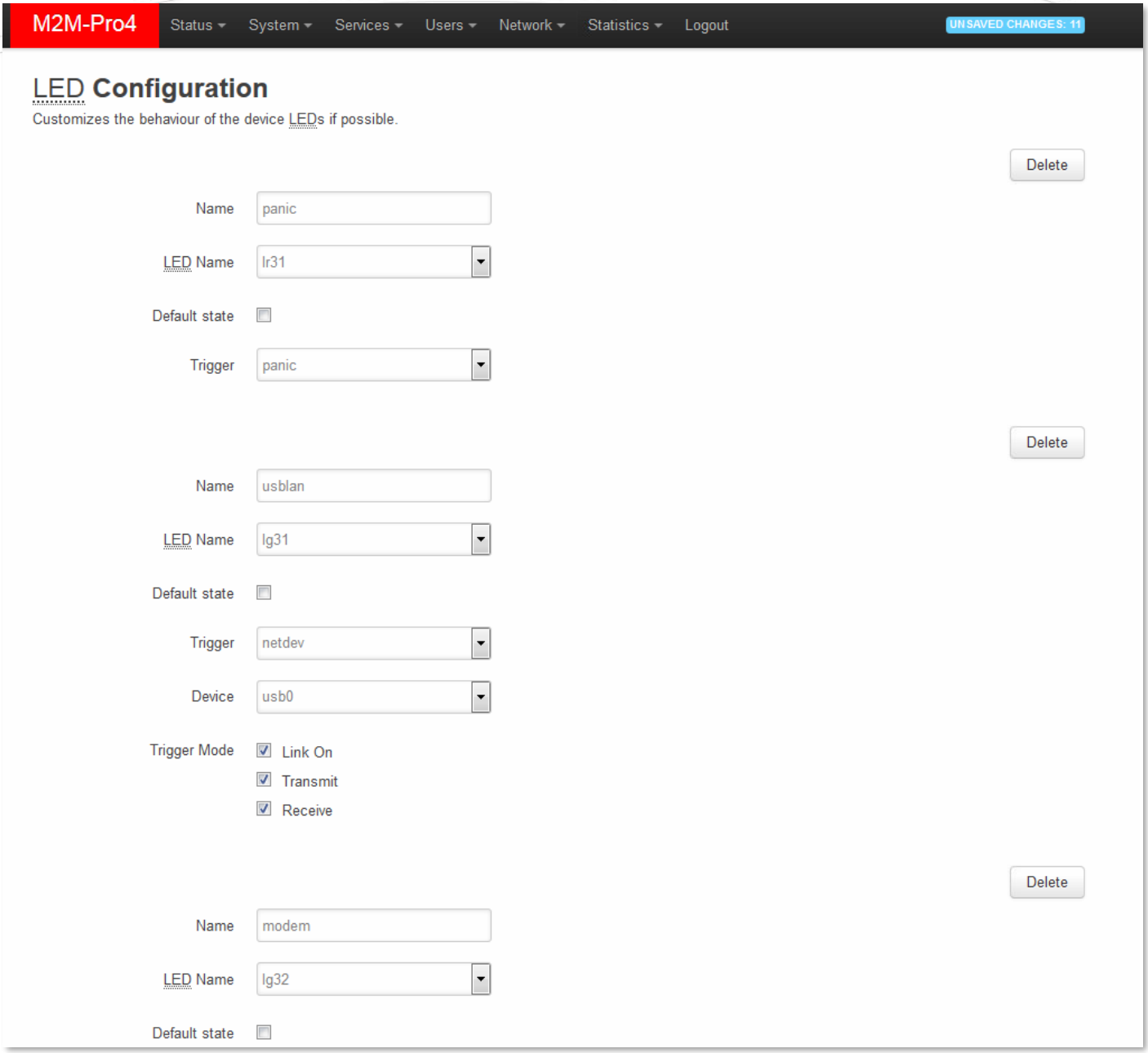
You can 

a LED to define or 

a LED setting from the list.

The **Trigger mode** and the **Link On** can be also defined as the Transmit (Tx) or Receive (Rx) for data flow.

When you have modified the LED settings, save them by the **Save & Apply** button.


M2M-Pro4
Status
System
Services
Users
Network
Statistics
Logout
UNSAVED CHANGES: 11
LED Configuration
Customizes the behaviour of the device LEDs if possible.
Delete
Name
panic
LED Name
lr31
Default state
Trigger
panic
Delete
Name
usblan
LED Name
lg31
Default state
Trigger
netdev
Device
usb0
Trigger Mode
Link On
Transmit
Receive
Delete
Name
modem
LED Name
lg32
Default state

5. Maintenance

5.1 Firmware Flashing

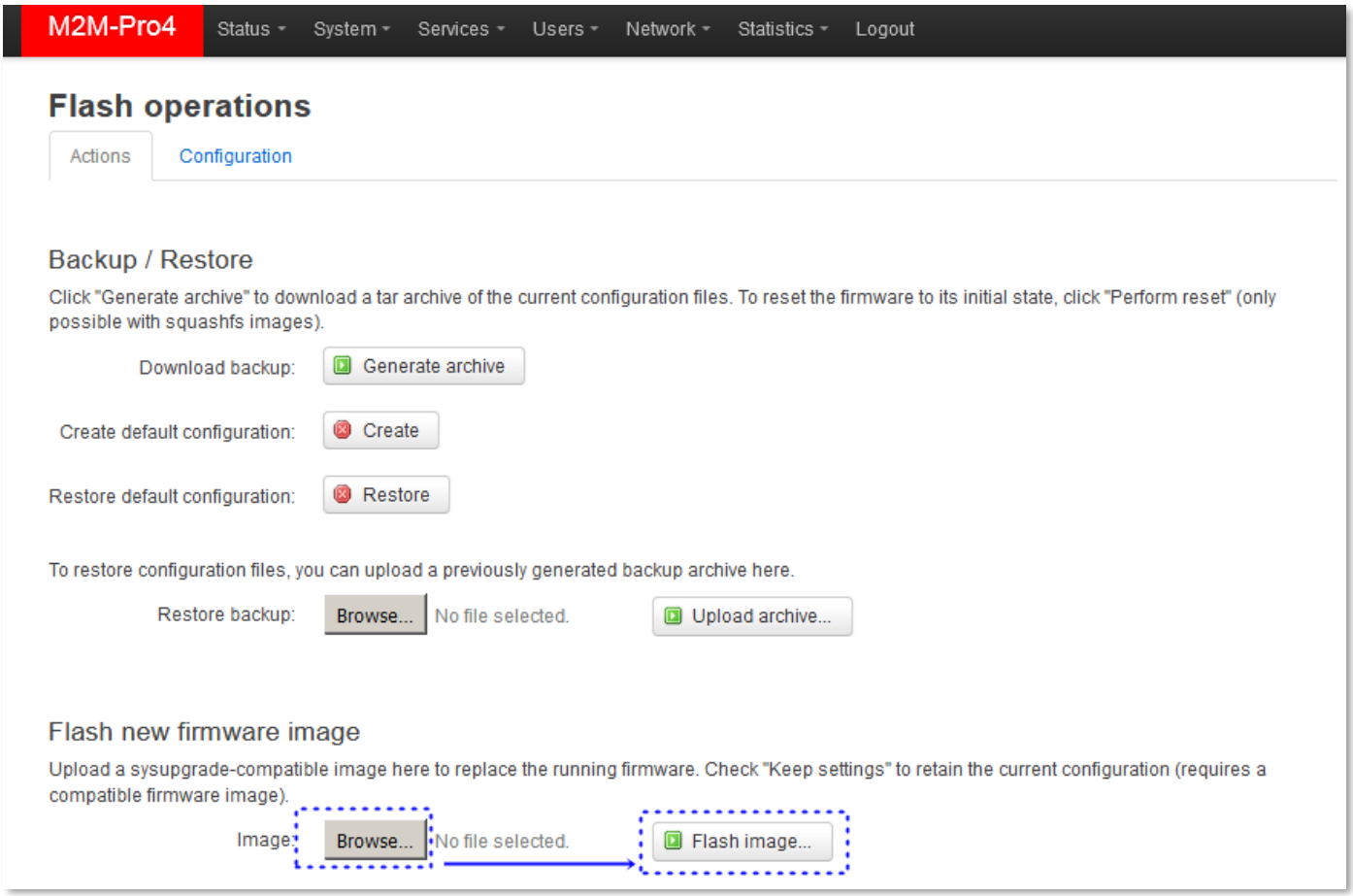
1. Download the latest device firmware from our website by using the following URL in your web browser.

2. Choose the **Downloads** tab at the middle on the website of the device, then look at the **Firmware** part. **Download the file** to your computer from there.

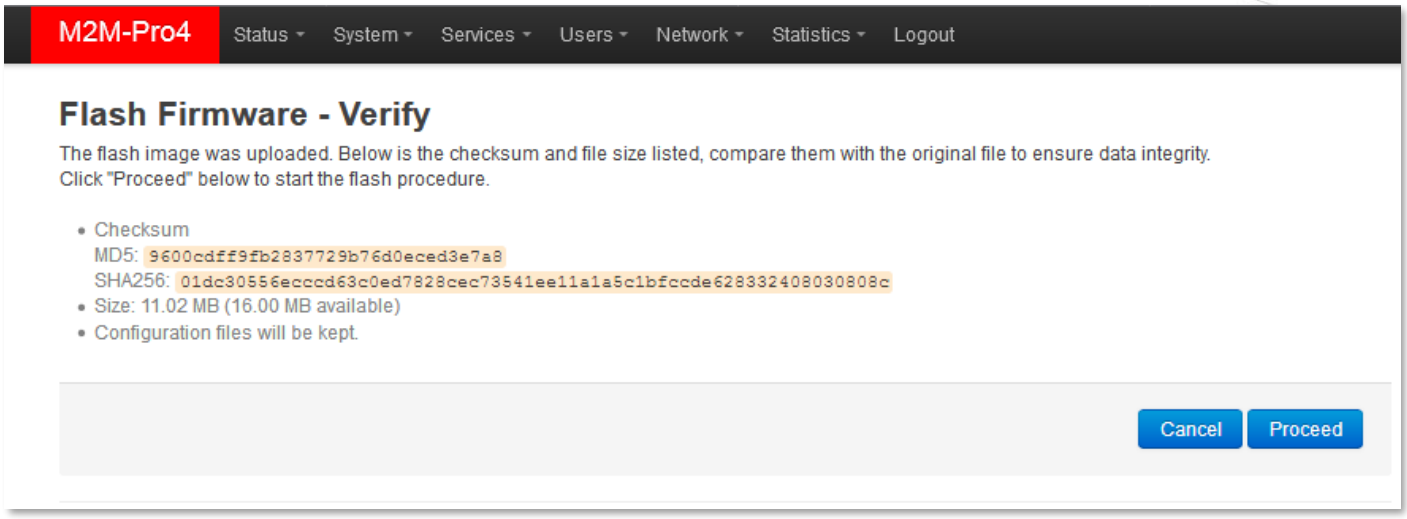
3. Open the **System** menu, **Backup / Flash Firmware** menu item.

4. At first just by safety, **backup your system** before changing the firmware version (see the instructions later)

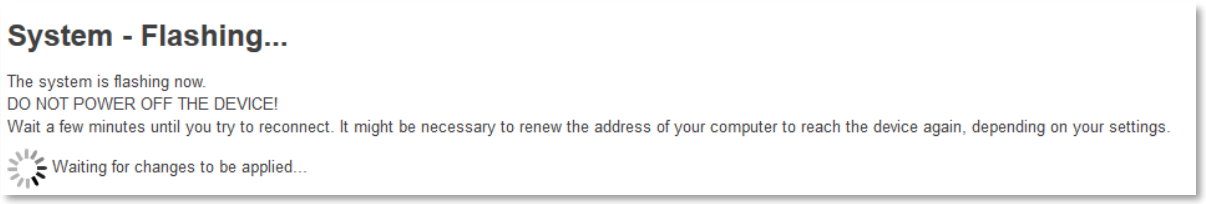
5. Push **Browse** for selecting the compressed and downloaded firmware file (***fwos-....*** file with **.zip** extension) from your computer, then push to the **Flash image** button.



6. After the compressed firmware file upload to the modem, a new window will appear where the uploaded file is checked. Then you can start the system software refresh by the **Proceed** button.



7. Then another message appears on the screen in the browser, that he refresh method has been started.



8. When beginning the firmware installation, the modem LED lights will check the installation progress. During the whole installation **BLAD** LED is continously ligthing until the finish.
   When the installation begins, the **USB** LED is flashing then later ligthing by **green**.

9. Later the **4G-WAN** LED is also flashing by **green** – with the **USB** led.

10. Soon, the *second empty titled* LED will be also flashing together with the previously listed LEDs (**green**).

11. Then as sigining the progress of installation, the *first empty titled* LEDs will also flashing by **green**.

12. When the installation has been completed, the **BLAD** LED will be blank, but all further progress leds in the line will be **green**, which signs that the installation has been over and the device is already rebooted.

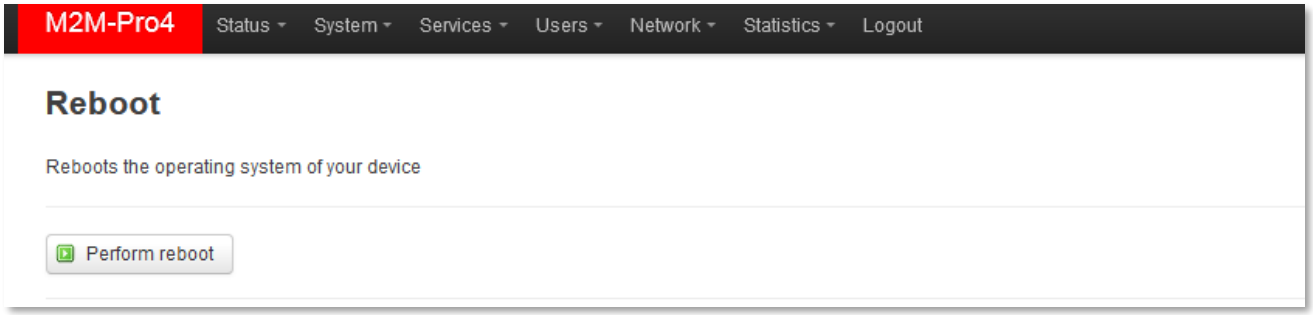
13. The modem will be started as usually. After 40-50 seconds the interface signals (**CONNECTIVITY** leds) will be active (if the **WAN** interface was already configured, then the **4G-WAN** led will be also lighting after successful registration to the wireless network).

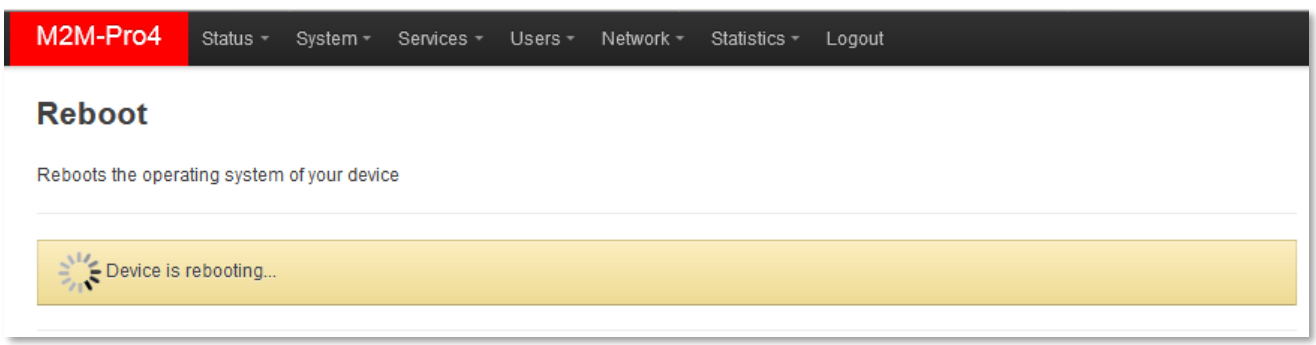
14. When the **CONNECTIVITY** LEDs are active, then your **can login to the modem.**

5.2 Restarting the device

Choose the **System** / **Reboot** menu item. There push the **Perform reboot** button for rebooting the modem.

Then the device will be restarted, where its LED lights will assign. After 40-50 seconds it will be available again and accessible on its default address. You can login again to the web user interface.





5.3 Backup device settings

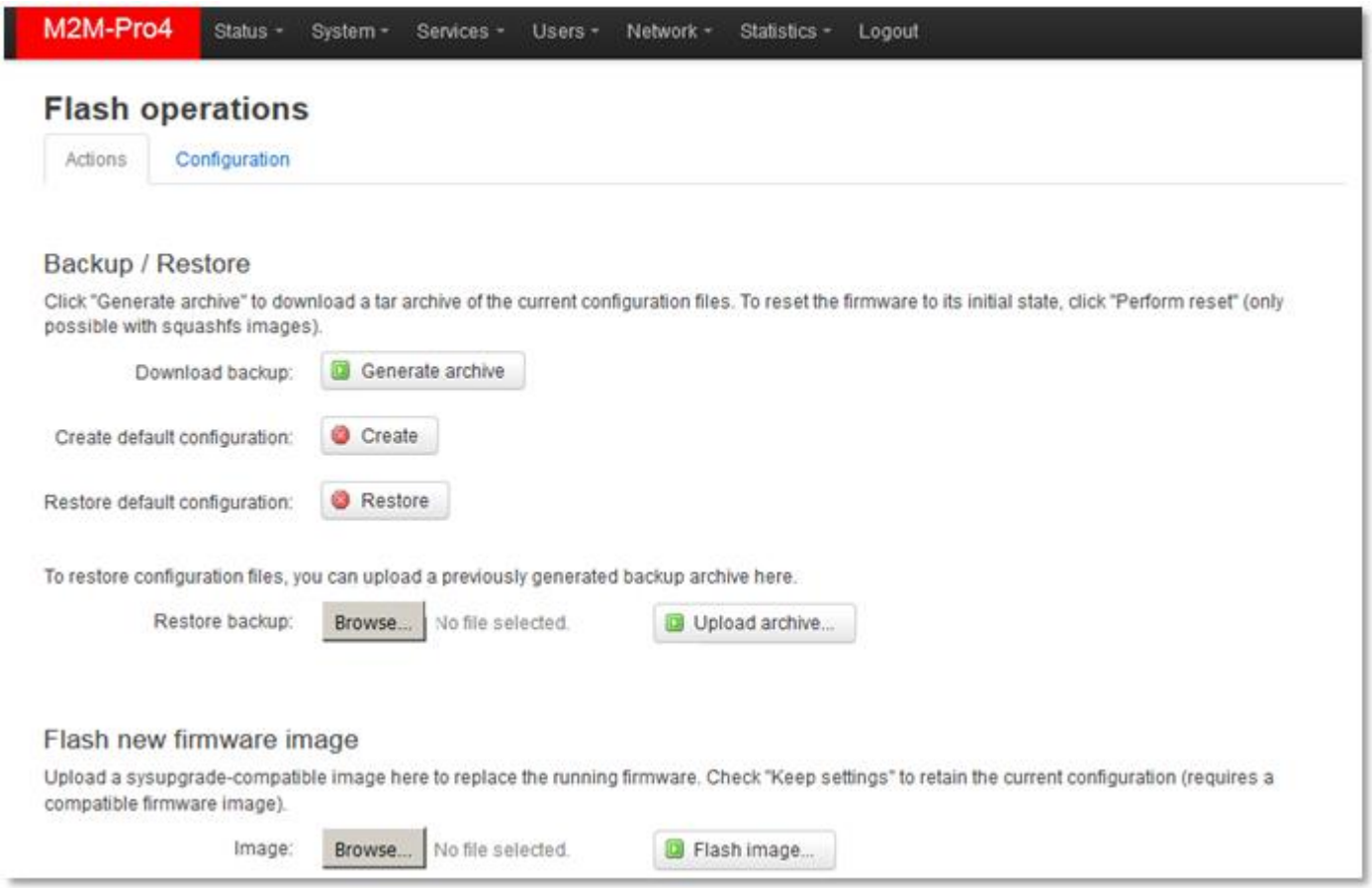
The modem settings are automatically stored by the OpenWrt® system, but there can be other situations when you need to restore the settings to a previously saved settings.

You can save these settings to your computer or restore back to the modem anytime by following the next hints.

Open the **System** menu, **Backup / Flash Firmware** menu.

To backup your system settings into an archive file, choose a the **Backup / Restore** part, the **Download backup** and push the Generate archive button. It is saving current settings to a compressed file to your computer. This is very useful during the first configurations.

A pop-up message will apear to save the archive file to your computer. **Save** the file, please.



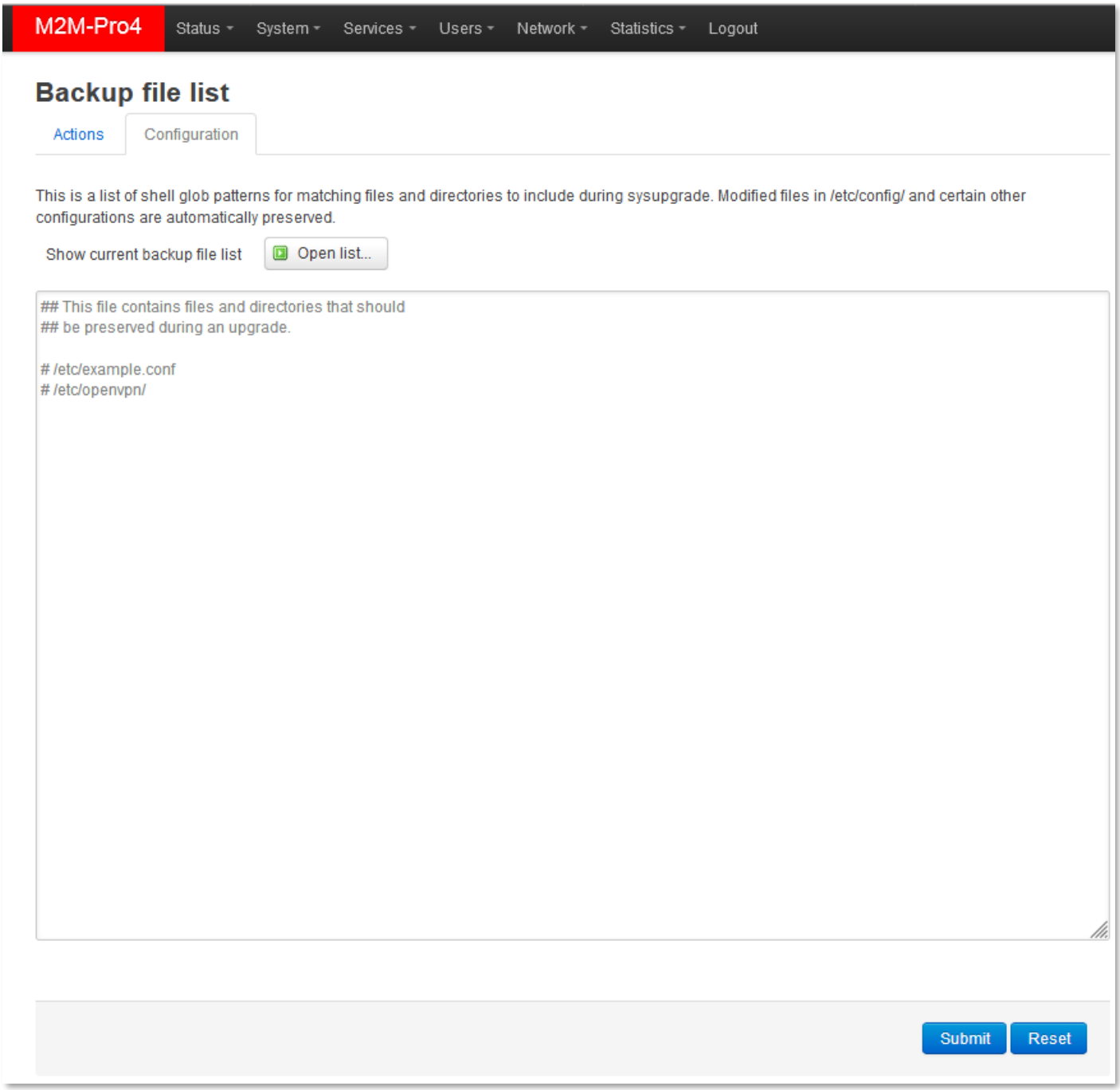
Important!

After the next reboot, the system will starting the system by these stored settings – as the new default configuration.

Note that the modem saves its own settings and components only! If you were installing 3rd party applications or installing and using your own scripts, the system WILL NOT BACKUP these and these

are not part of the compressed backup file! You must save the additional files, scripts and directories manually by your own.

You can include or exclude your files and directories in your backup process by using the **Configuration** tab here. You can edit the list with all necessary directories you need.



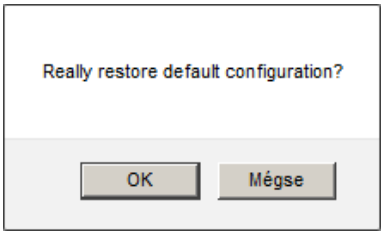
Of course, you need to know the modem device's file system to make it right. Therefore, we offer to check the OpenWrt® system structure, directories by standard Linux-side commands from the CLI.

When you are ready with the modifications, push the **Submit** button for the changes.

At the **Actions** tab, you can **Create default configuration** feature allows you to save the current configuration as a last known good configuration for saving by the Create button.
Then the device will backup the configuration to the device.
A popup window will appear, where you have to push **OK**.

5.4 Restore device settings

You can **Restore default configuration –** your previously saved system configuration archive – as a saved last good know configuration - from your modem.



For this, just push the Restore button if you want to restore a previously saved (factory default) configuration. A popup window will appear, where push **OK** if you want the restore the default configuration. the modem applies your previous backup to the device as a valid configuration and will continue its operation regarding the stored settings.

For making a **complete restore** from your computer (.tar.gz. format) back to the modem, open the **System** menu, **Backup / Flash Firmware** item.

By the **Restore backup** option you can restore a previously saved system configuration archive – which was saved to your computer – back to the modem and apply.

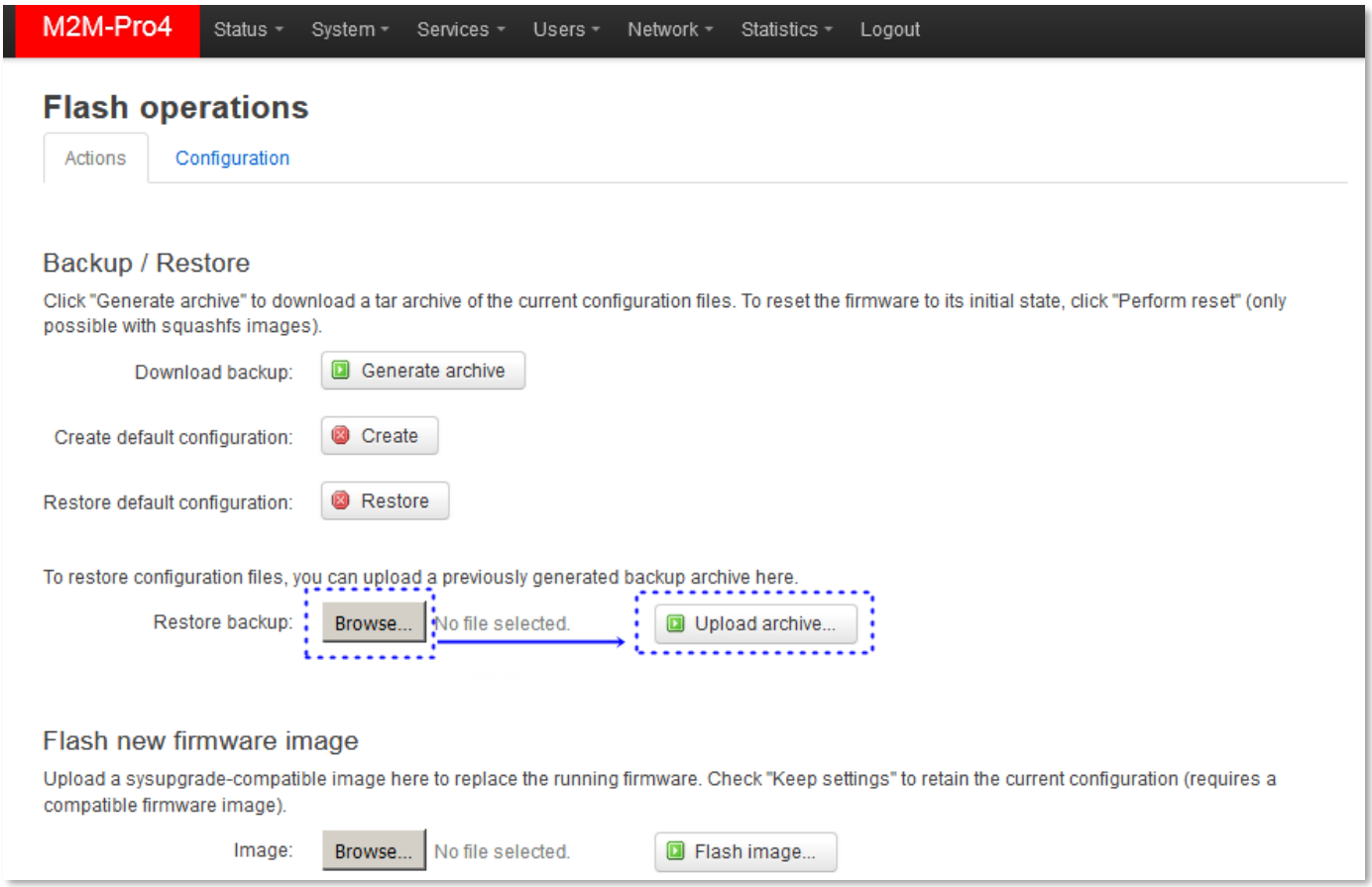
Push the **Browse** button at **Restore backup** part and choose the previously saved archive file (tar.gz extension compressed file) from your computer and then push the Upload archive... button.

Then the system will reload the saved backup the saved archive file content **from your computer to the modem** apply by restoring the system, then afterall the device will restart the system and applying the previously used system.

Important!

Note that your custom saved settings must be loaded seperately – it won't be restored automatically.

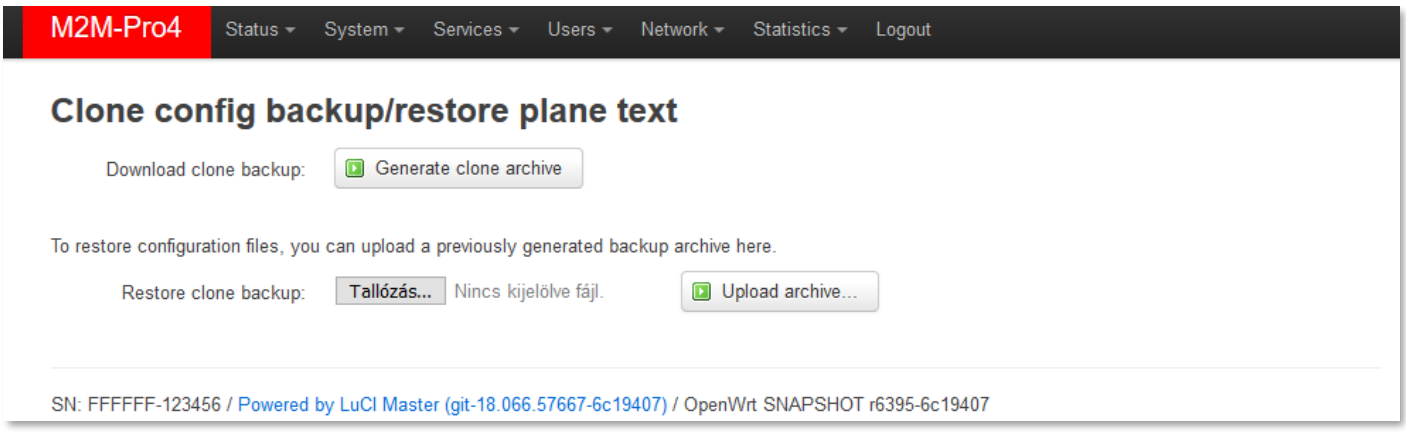
You can also restore the *default configuration* or the *factory configuration* of the device manually by the **Reset** button on the modem device - without using the OpenWrt® web interface. For more information, please check the *Installation Guide*, **Service Features** part.

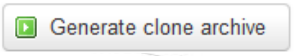


5.5 Clone config backup/restore

The device current configuration settings can saved (backup) and strored into plain text format by the **Users** menu, **Clone config backup / restore plane text** menu item.

You can save these settings to your computer or restore back to the modem anytime by following the next hints.



To backup your system settings into a plain text file, push the 

button.
A pop-up message will apear to save the archive file to your computer. **Save** the file, please.

This is very helpful to move the saved configuration file to your computer and then later restore these settings to a different modem device by the **Browsing...** and then the 

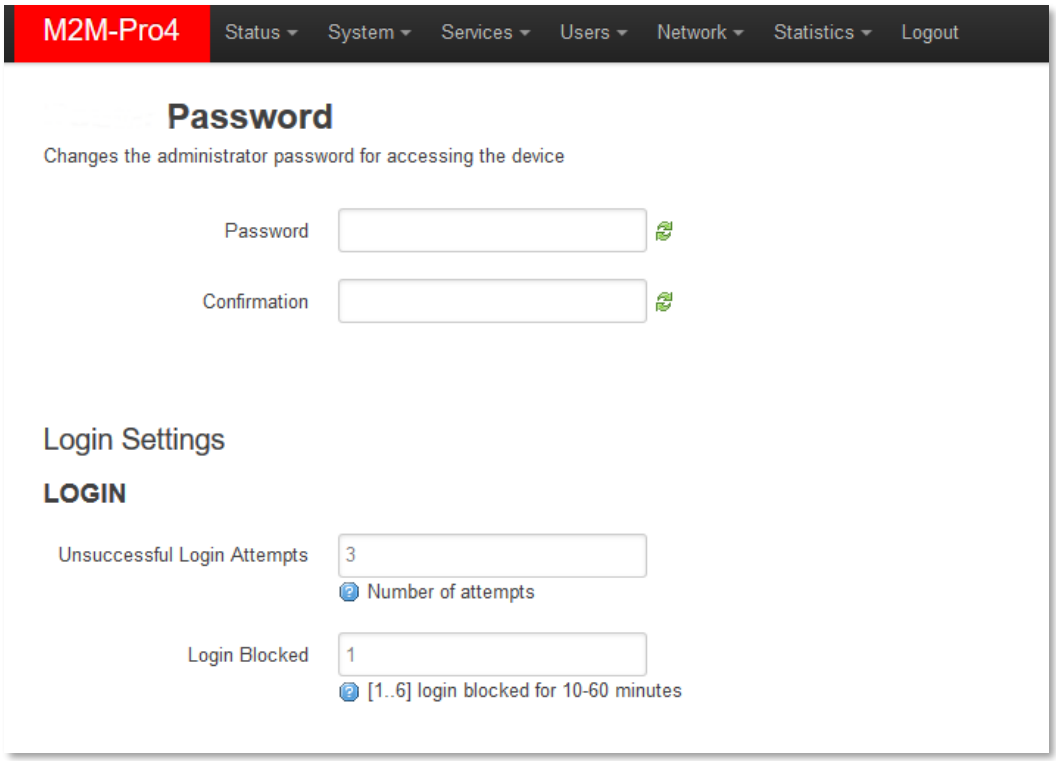
button. There you can save time by this quick configuration method.

6. Administration

6.1 Password change

Open the **System / Administration** menu.

At the **Password** part you can fill the **Password** and and confirm it the at the **Confirmation** field.



IMPORTANT NOTES

- The password must contain min. 8 characters, lowercase and uppercase letters and numbers or special characters are allowed.
- It is obligatory to use passwords by using minimum 3 special characters (upper case, numbers or special characters (e.g. underline)
- The currently used **Password** cannot be seen here due to some security rules – the characters shown as are empty here.
- When you are changing the password, the written characters will be placed by asterix signs.

You are able to limit the numbers the **Unsuccesful Login Attempts** and you can make the **Login Blocked** for a while (in 6 piece of 10 minutes-steps between 1 to 6).

When you have modified the settings, save them by the **Save & Apply** button.

Important! *Now, you can login by the new password.*

6.2 Logging

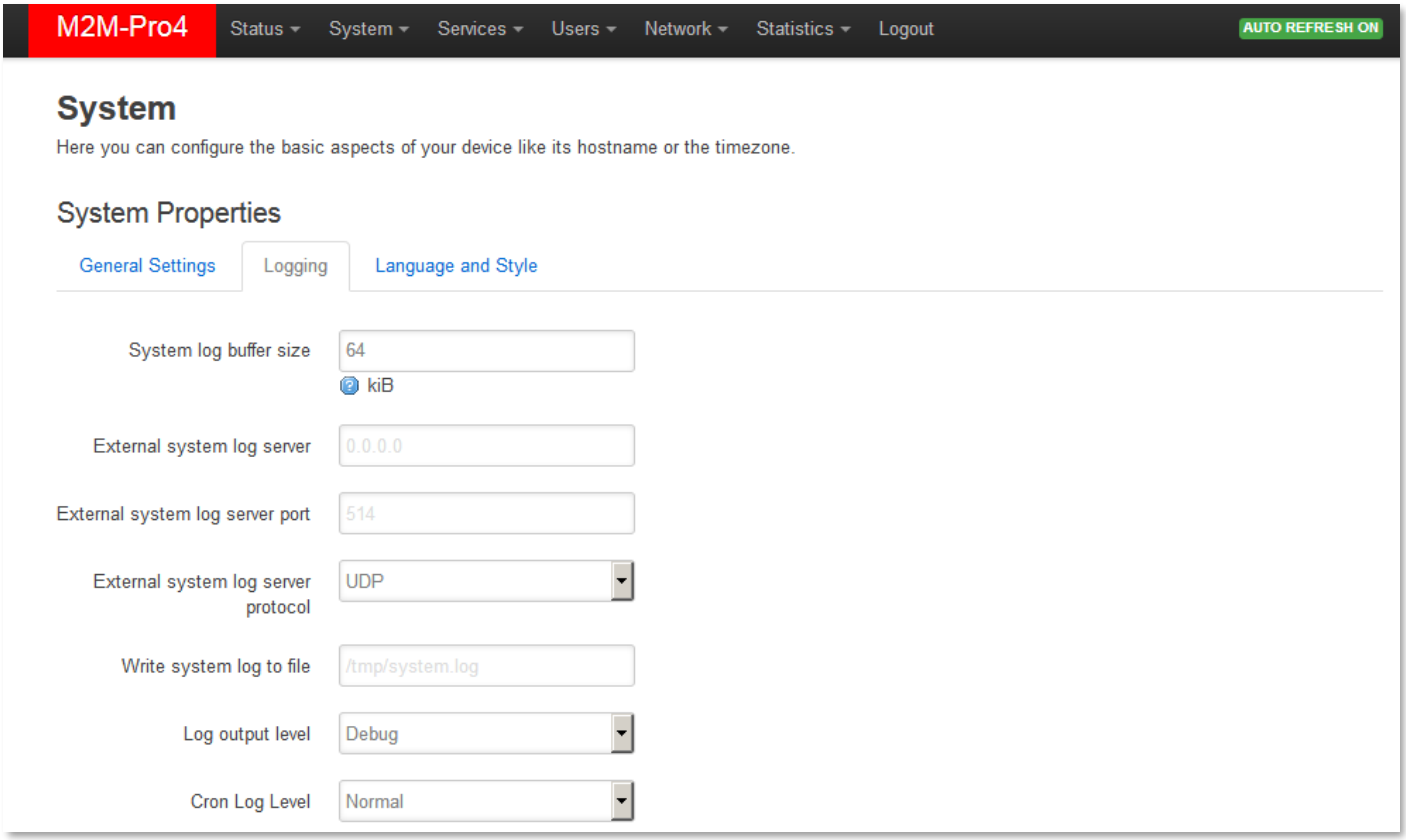
Open the **System / System** menu find the **Logging** tab.

There you can define a log file (**Write system log file**) and the level of logging (**Log output level**).

You also are able to limit the log file size (**System log buffer size**), and you can define an **External system log server** (IP address) and its **port, protocol** for sending the log files for a distant IP address.

The **Log output level** can be also defined for the added log file (**Write system log to a file**) – filename should be added with directory path.

When you have modified the settings, save them by the **Save & Apply** button.

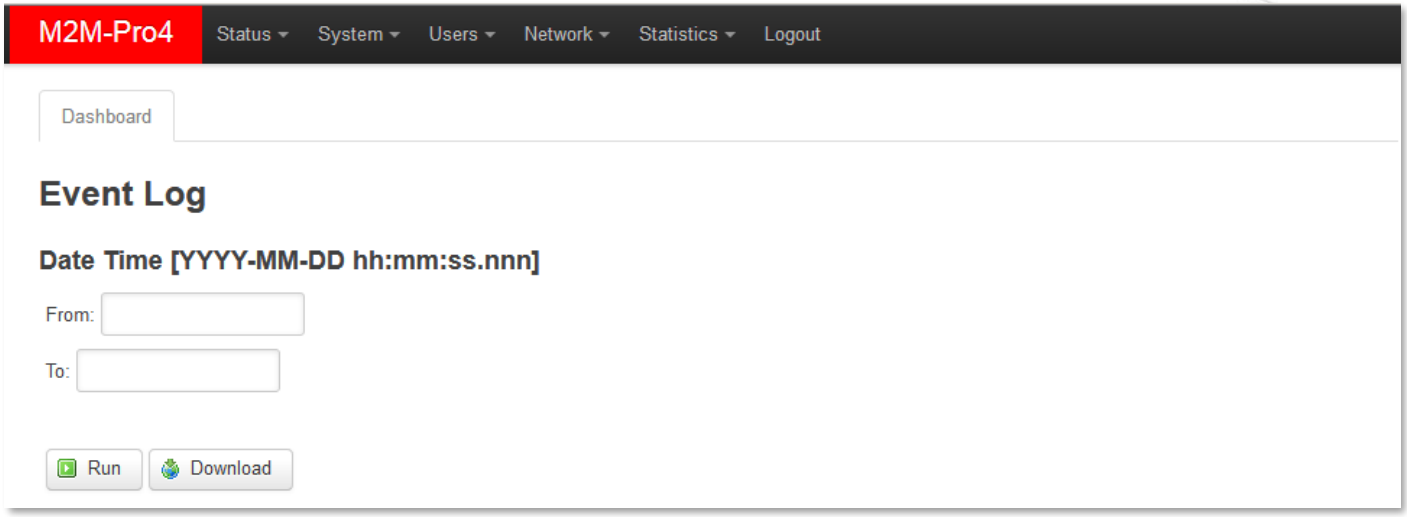


Remember that you can use further log features from the **Status** menu, where the **System log**, the **Kernel Log** helps you to understand what is happening on the modem currently since its last reboot, you also can check the proper operation at these menus.

The **Event Log** menu item will also help you to list (**Run**) or **Download** the recorded events to your computer.

When you are checking the event log, you can define an interval for identifying the events within a period by the **From:** and **To:** parameters. (Use the date (*YYYY-MM-DD*) and time

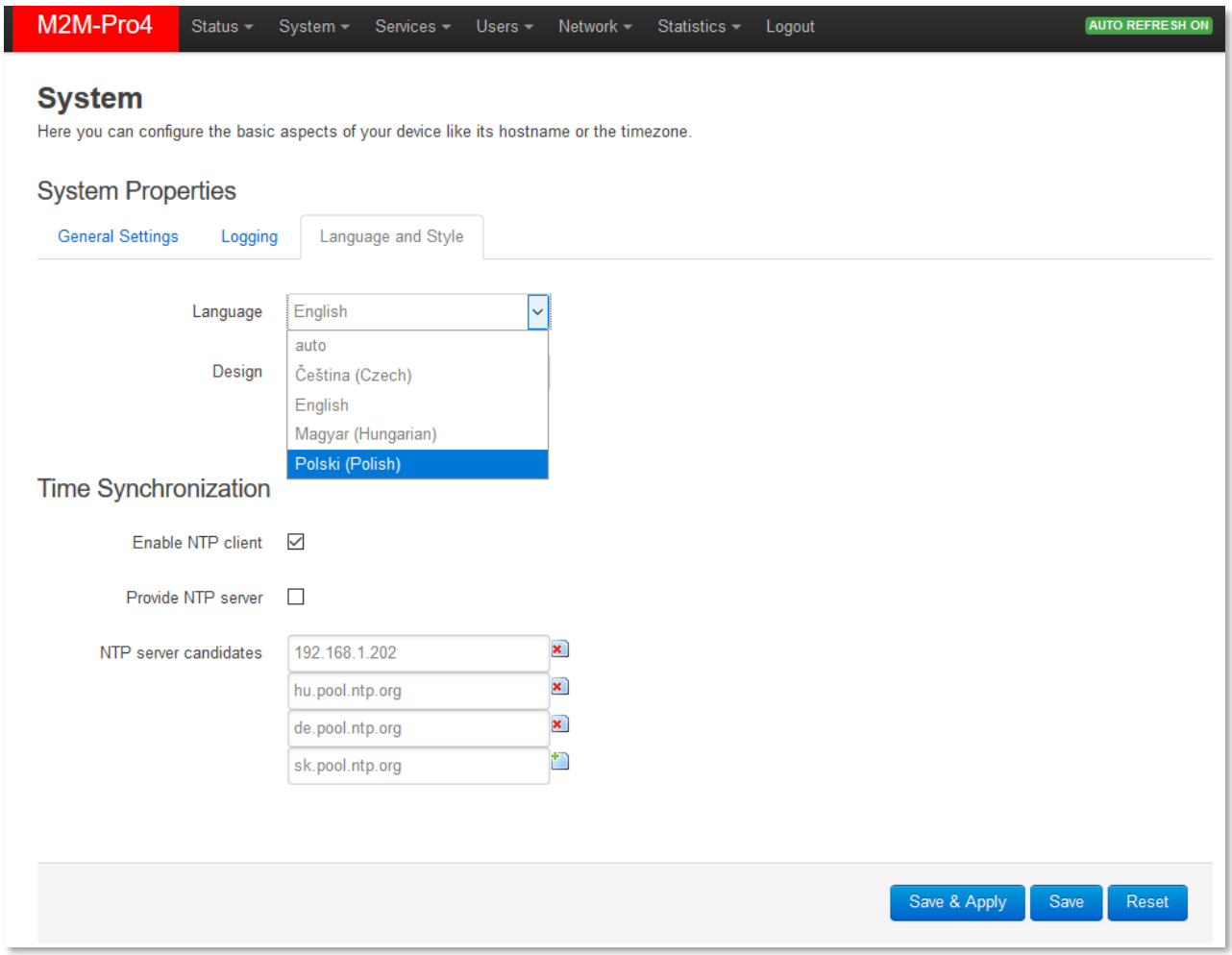
(*hh:mm:ss*) values if you would like to filter the listing.) Sure, it's not obligatory to define the whole datetime format, you can use just years and month or else.



The main important event are logged as the reboot time, FTP connection success/failure, FTP file upload OK or wrong.

6.3 Language settings

Open the **System / System** menu find the **Language and Style** tab.

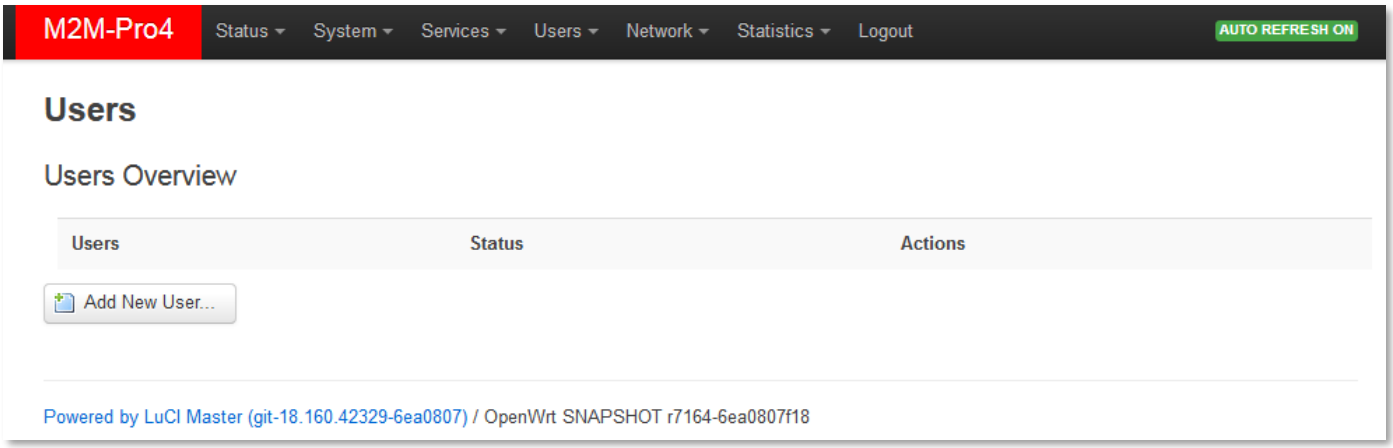


Here you can choose a pre-defined **Language** for the web user interface by selecting an item from the list.

The *Auto* preference means that the OpenWrt® UI language will be configured according to your browser language settings.
Push to the **Save & Apply** button when you have changed the language, then the new language translated texts will appear.

6.4 User management

The device can handle multiply user accounts for accessing the system or the web and limit the permissions, defining roles.
This makes the modem able to providing a multi-user capable environment, which is supporting workgroups and to execute the dedicated tasks for the users (e.g. administrator role, installer, maintanence group, riport maker roles, etc.).
Choose the **Users** menu / **Edit Users** menu item for the user settings.



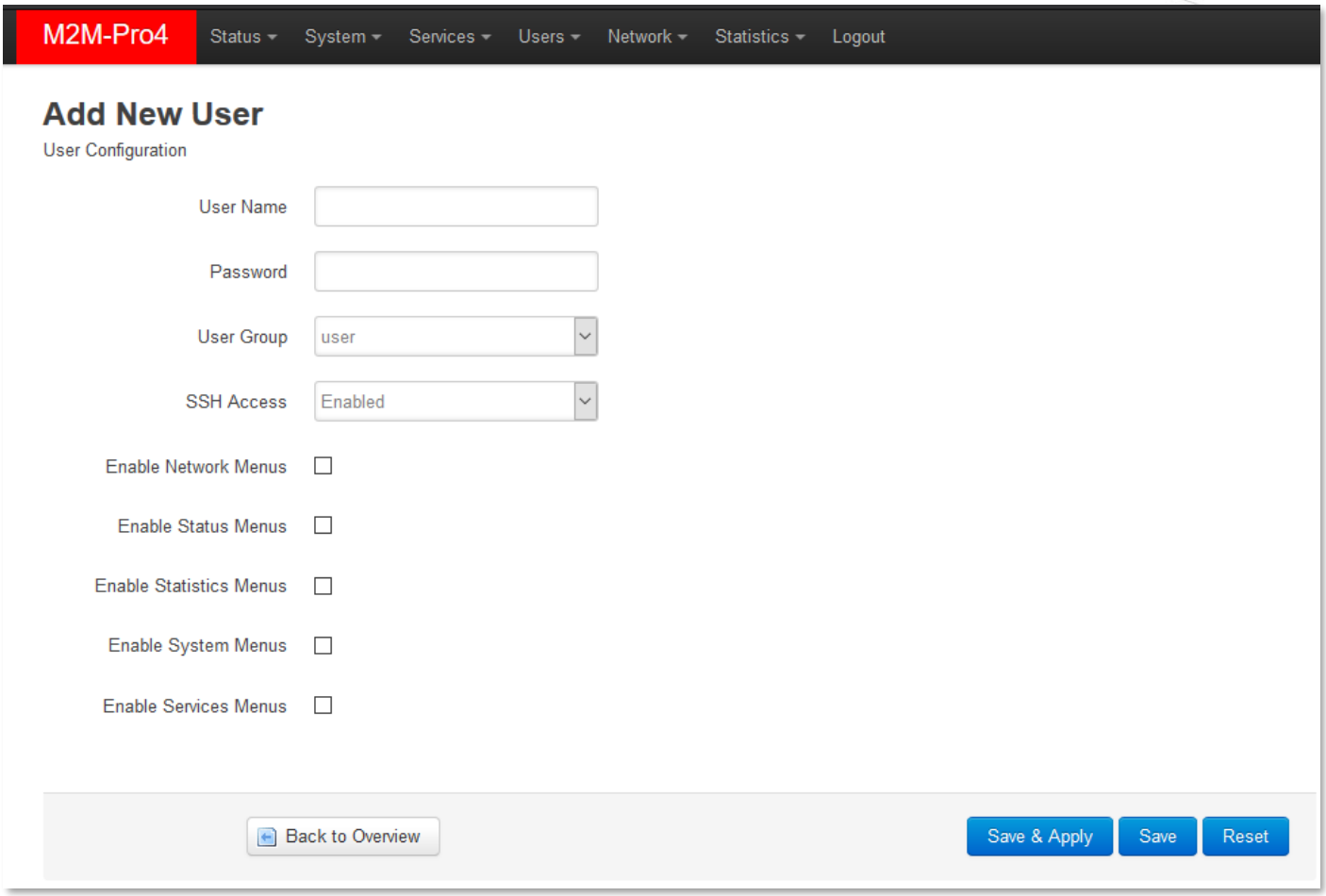
Here you can **Add New User** by its button. Then a new window will appear.

Define **User Name** and select a **User Group** for the permission / entry-level.

Choose the required ***Menu*** items by *enabling* the related checkboxes to provide the required menus for the role of the user account.

Then, the selectable sub-menus will be appearing, where you can grant a more detailed permission for the menu items by selecting the sub-items.

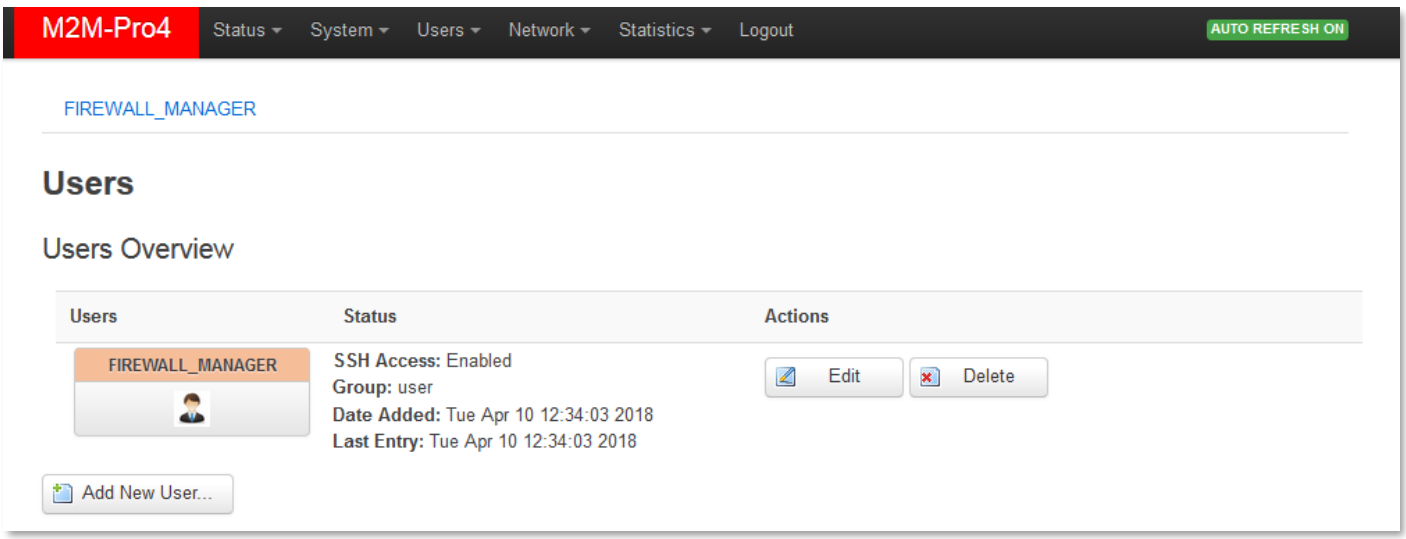
Certainly, only the configured menu items and permissions will be valid for the configured user account.



You can also grant by enabling ***SSH*** access permission to the account.

When you have finished, push to the **Save & Apply** button for saving the new account settings.

Now, as you can see, the new user account is listed. Here you can Edit the settings of the user account or Delete this account from the system.

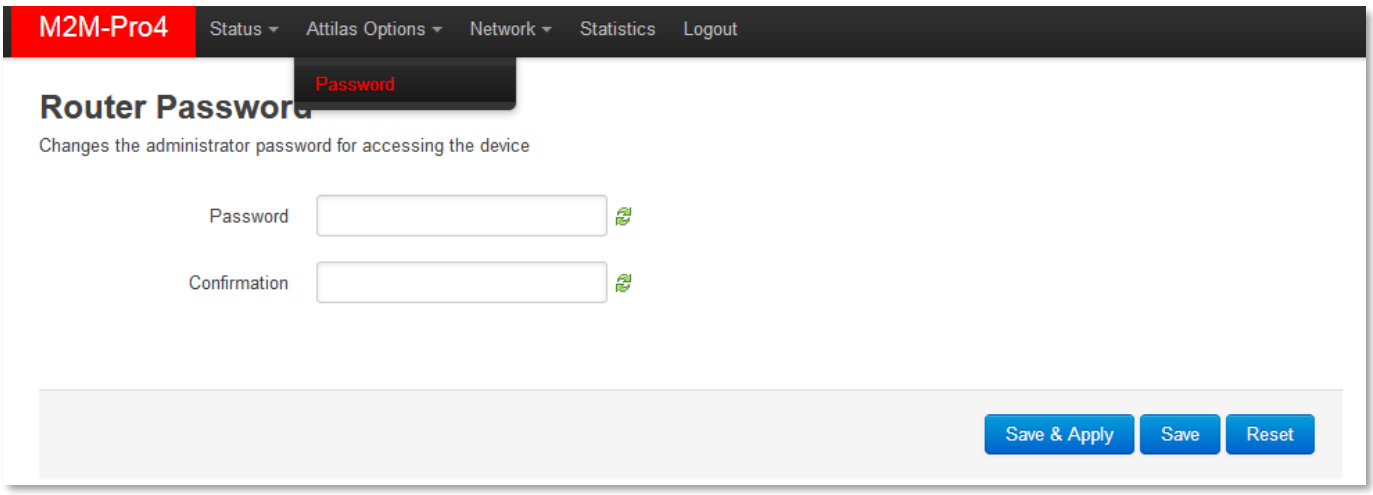


Then, after you will **Logout** from the system, the new user can **Login** with his account and able to access the declared menu items, features by his pre-defined role.

Note that the **default password** for all manually added users is the following: ***wmrpwdM2M***

After, you have will login by the new user login there will be a new menu item, the ***User* Options**, with a **Password** menu item.

There you can change the user **Password** for unique one. **Confirm** and **Save & Apply** your settings.



Important!

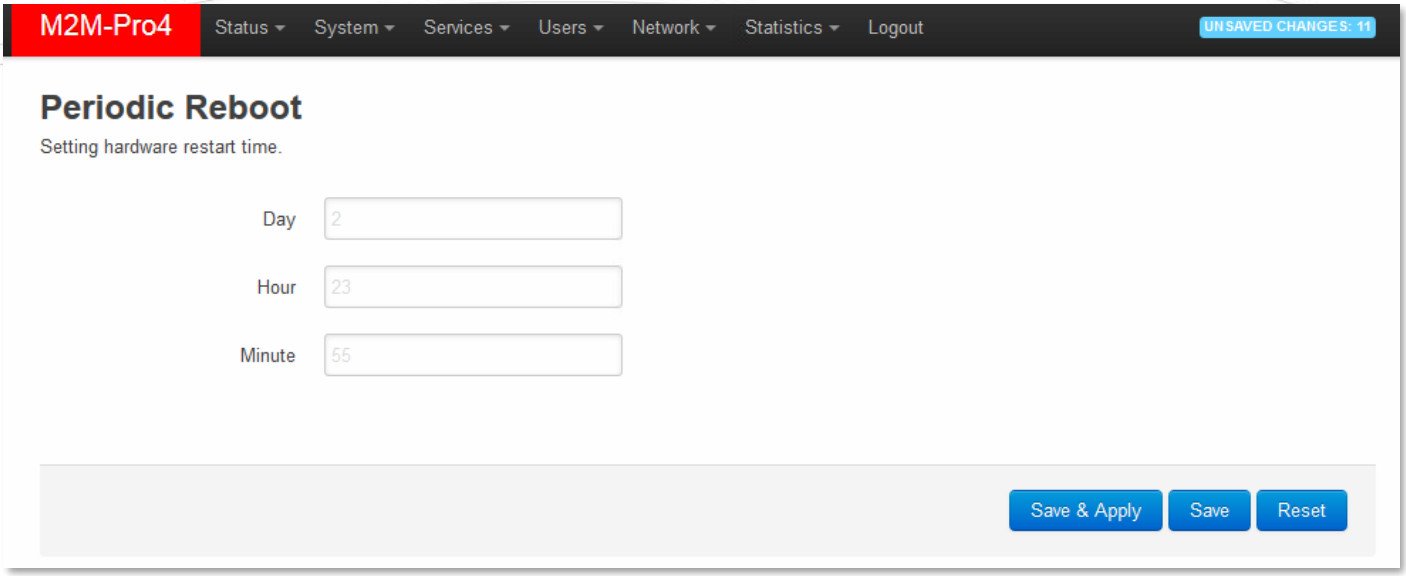
The password must contain min. 8 characters, lowercase and uppercase letters and numbers or special characters are allowed.

It is obligatory to use passwords by using minimum 3 special characters (upper case, numbers or special characters (e.g. numbers)).

*Note, that the current **Password** cannot be seen here due to some security rules – the characters shown as are empty here. When you are changing the password, the written characters will be placed by asterix signs.*

6.5 Periodic ping and Periodic reboot settings

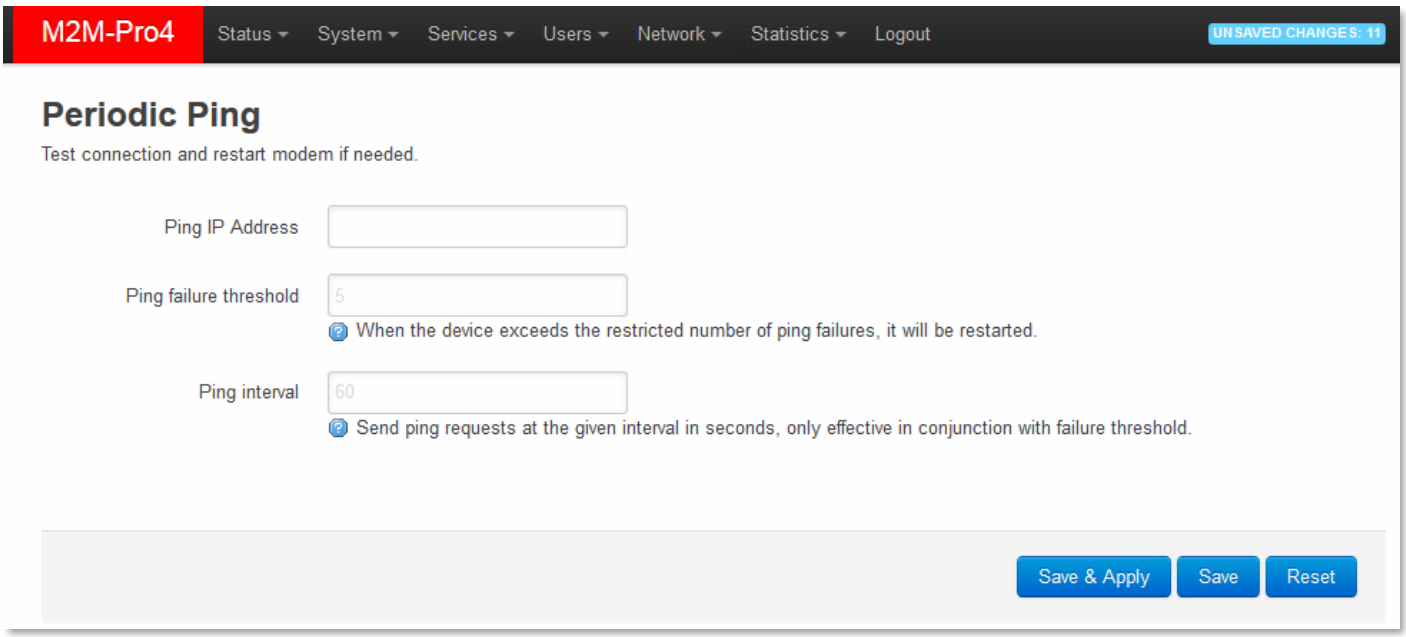
For matching the industrial standard requirements, you can define an time interval for periodic daily restart of the deivce if you want in the **Services** menu / **Periodic Reboot** item.



At the **Day** value, you can define how many days of period will be applied to the modem reboot. E.g. Day=2 means reboot on every second day at the **Hour**/**Minute** defined time.

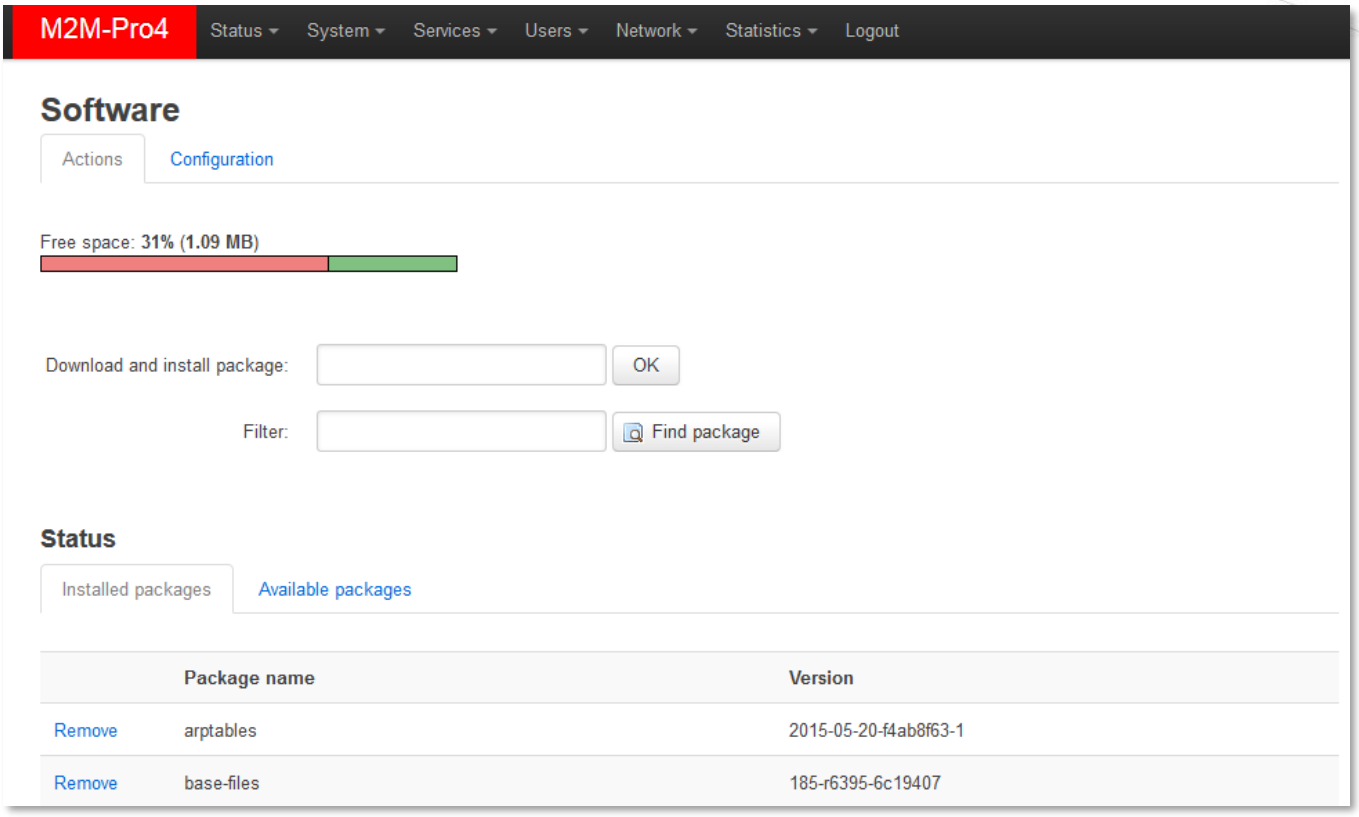
If you want to use periodic ping as checking an IP address or remote server, device as checking its availability by the device if you want to use this service by accessing from the **Services** menu / **Periodic Ping** item.

Save the configured settings by the **Save & Apply** button.



6.6 Installing 3rd party applications

Open the **System** menu / **Software** menu item, find the **Actions** tab.

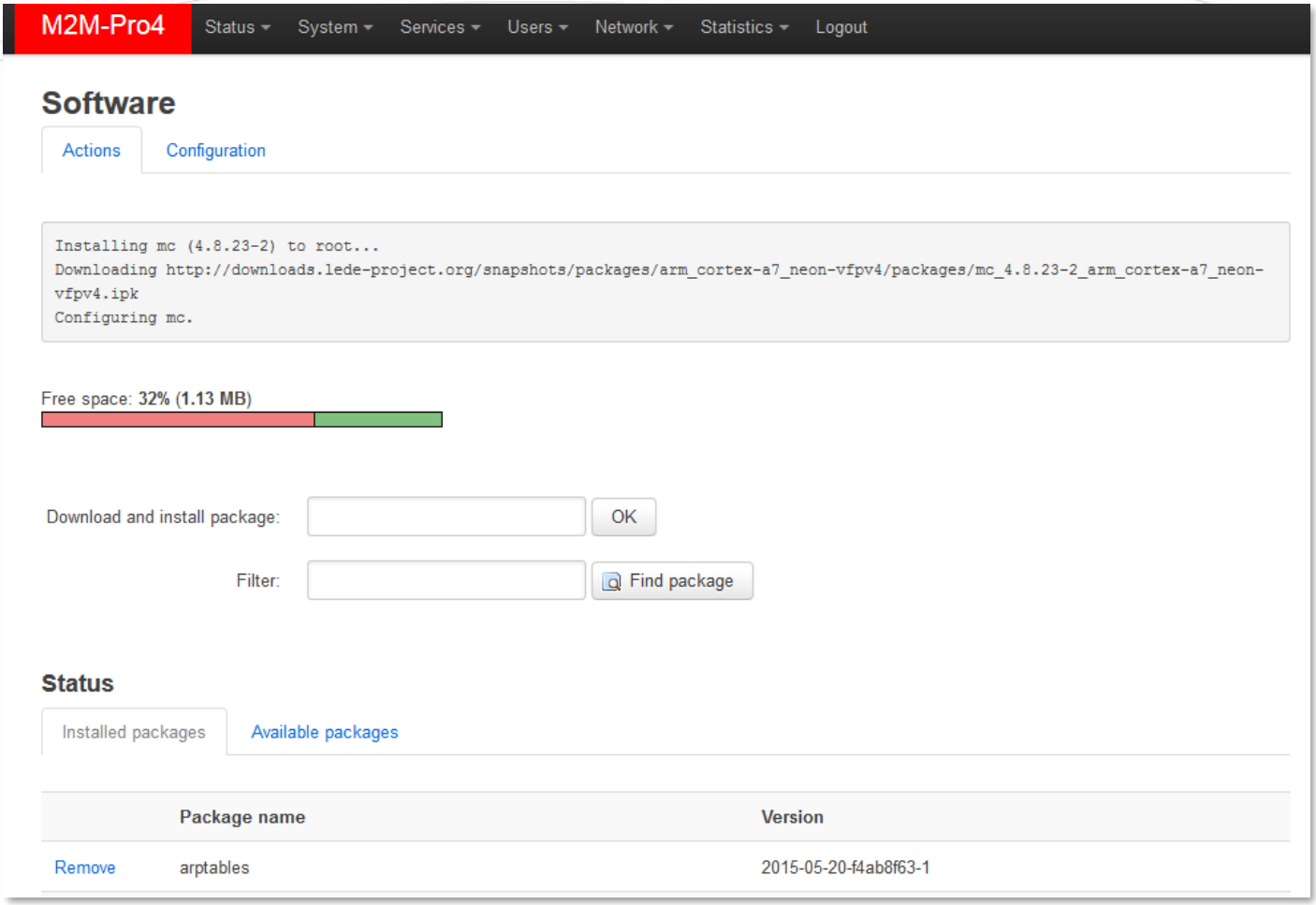


> ***Important!***
> *This feature is available only, when the public Internet is accessable by the SIM card and the used APN.*

Enter the name of the application, which you are attempted to install to the **Download and install package** field (e.g. *MC* – which means the *Midnight Commander* application) if you are exactly sure about the filename.

If you want to select the file, then use the **Filter** field and enter the program name you are searching for.

When choosed the ***Download and install*** option, the software catalog file will be updated from the repository with the list of the available applications.
The installed packages of the modem are listed lower at the **Status** part with its **Version**.



Now you can use the installed Linux application / component which you were installed. Open SSH terminal window to configure your new application or use it. E.g. about our example, enter the „mc" to start the *Midnight Commander* tool which you were installed from the repository.

6.7 Mount points (Flash memory)

The device is handling the connected and mounted file systems of the internal Flash and further partitions.

Choose the **System** menu / **Mount Points** menu item for checking the mounted file systems and partitions.

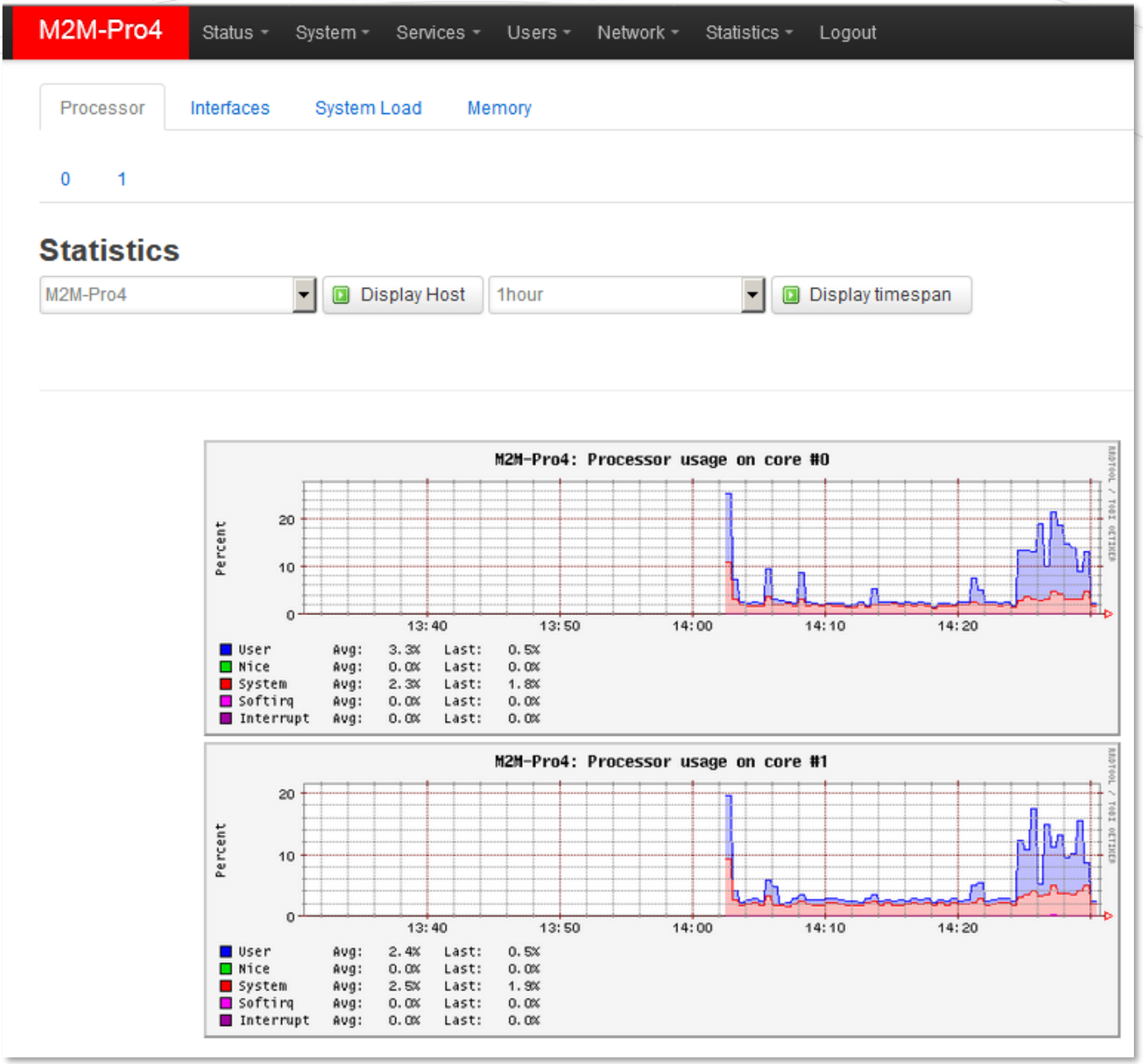
The **Mounted file systems** are listed the connected and mounted devices (such as USB and internal Flash). These file systems will be attached under the */mnt* directory in SSH.

6.8 Statistics

6.8.1 View the statistics reports

In the **Statistics** menu / **Graphs** menu item, you can see the current and archive statistic graphs of the modem's perfomance.

Choose a tab (**Processor**, **Interface**, **System Load**, **Memory**) to check the stored QoS /resource statistics.

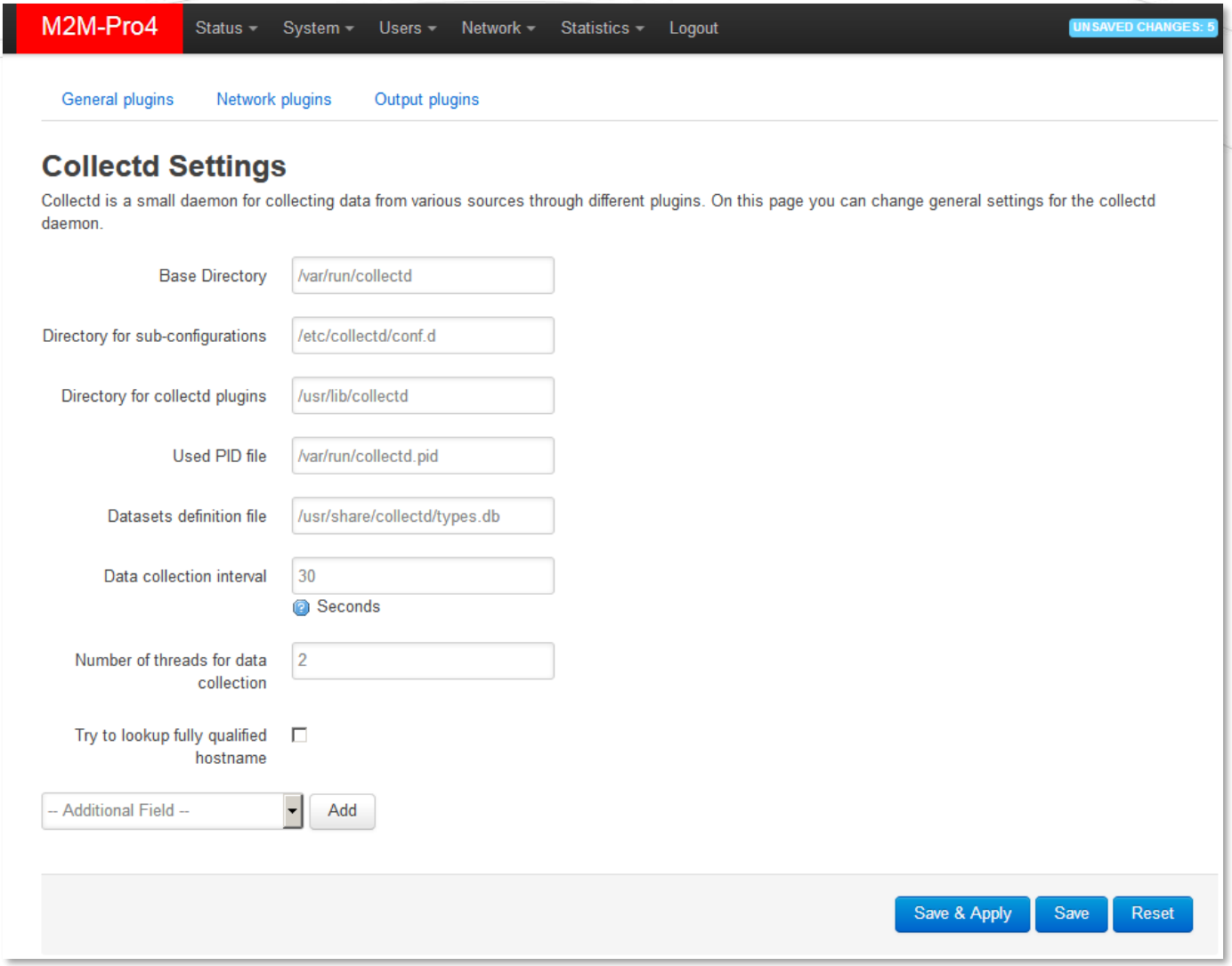


6.8.2 Configuring statistics reports

In the **Statistics** menu / **Setup** menu item, you can configure the current statistic settings for collecting and evaluating modem's performance data and the performance graph settings.

The main screen is the **Collectd Settings**, where you can define the **Data collection interval** and the Linux-side settings.

When you have changed the configuration, push to the **Save & Apply** button.
The changes will be active in the next statistic cycle interval.



There are further tabs in the upper sub menu as **General Plugins**, **Network Plugins**, **Output plugins** where you can enable the collected performance items, interfaces, etc.

For example, to the wireless network statistics settings, let's choose the **Network** tab, and there the **Wireless** tab below.
Then allow the **Enable this plugin** and enable the ***wwan0*** inteface too.
To performing the change of the new settings, you have push to the **Save & Apply** button.

The changes will be active in the next statistic cycle interval.

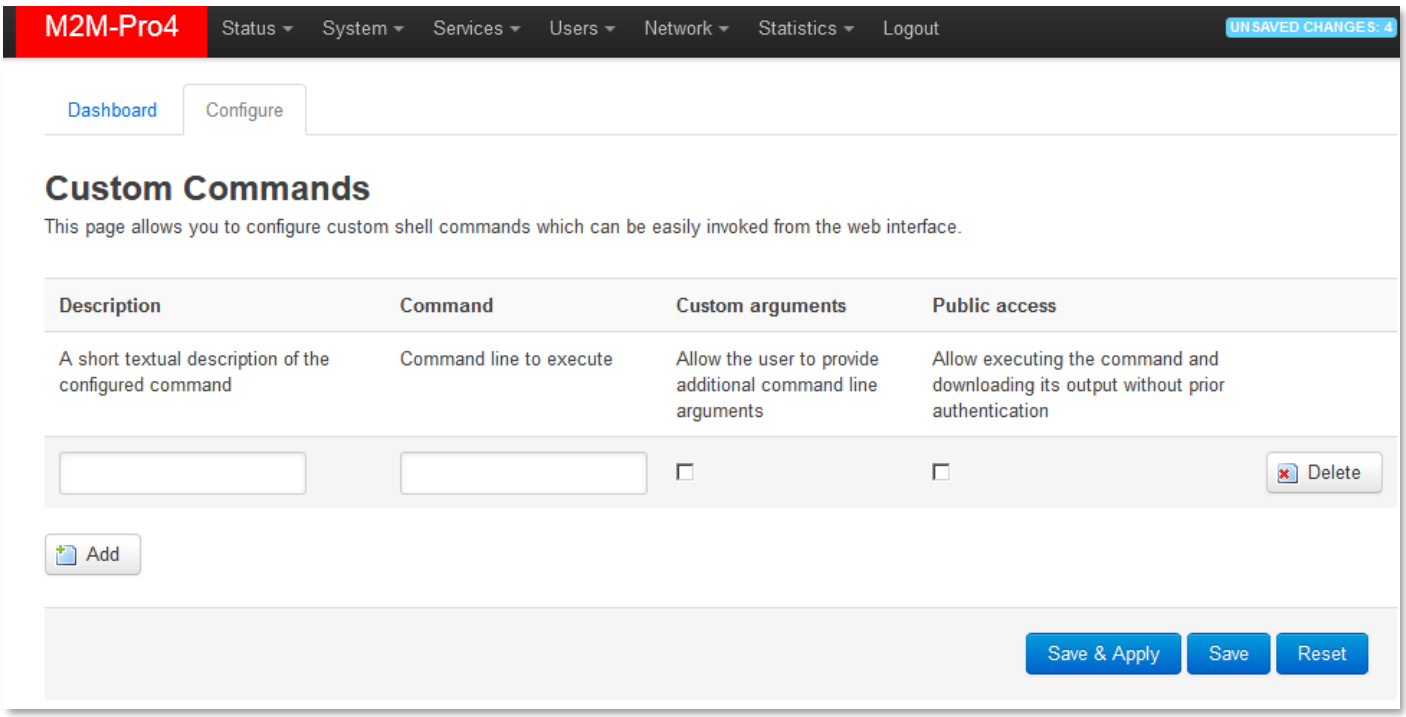
Then wait a couple of minutes and go to the **Statistics** menu / **Graphs** item and check the **Network** tab, where the ***wwan0*** interface will be now listed.

6.9 Custom commands

You can configure and initiate custom Linux commands on the rotuer at the **System** menu, **Custom Commands** menu item.

By the Add button you can define a **Description** for the **Command** and the **Custom arguments** (user can define the further parameters and arguments) and the **Public access** to any user.

This is useful for configuring a list of custom commands as a startup script to your device.



When you have modified the settings, save them by the **Save & Apply** button.

6.10 SSH access

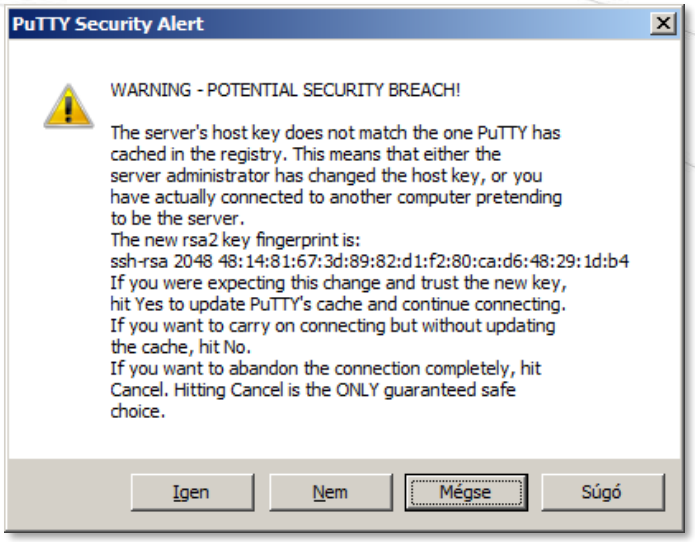
You can access the device remotely according the current settings. Consider, the modem can access devices or data due to the SIM card IP-segment possibilities. The same issue when you are attempted to access the device remotely: your computer must be located in the same IP segment or APN zone as the modem has. (In case of public internet access, there is no limit for that.)

The remote access is possible by SSH and FTP services.

SSH Connection

The modem can be accessed through SSH connection, when it is available on its IP address – by a terminal utility (e.g. *putty*) – at the **192.168.10.1:22** (port nr. 22 - **USB** interface).

Accept (Yes) the Putty or other SSH terminal's Security Alert of the RSA2 key of the device to allow and trust the connection – by security reasons.

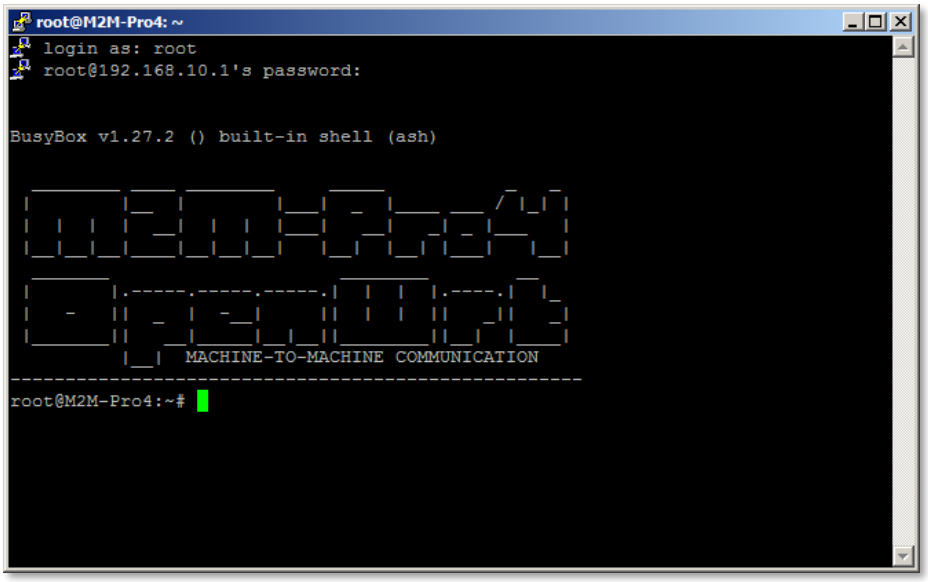


SSH login data:

Login: ***root***

Password: ***wmrpwdM2M***

Now you are logged in, at the OpenWrt®'s command line.



Here you can use Linux commands or using scripts on the device.

6.11 Using the UCI Command Line Interface

The operating system uses the embedded Micro uClinux, kernel 4.4 version, ***UCI Command line interface*** – check command line compatibility before using the commands here.

The **Unified Configuration Interface** (**UCI®**) is an API of OpenWrt® which is also the utility to intend and to centralize the whole configuration of a device running on OpenWrt®.
You can find the UCI command line interface options, setting parameters in the UCI® CLI document.

7. Troubleshooting

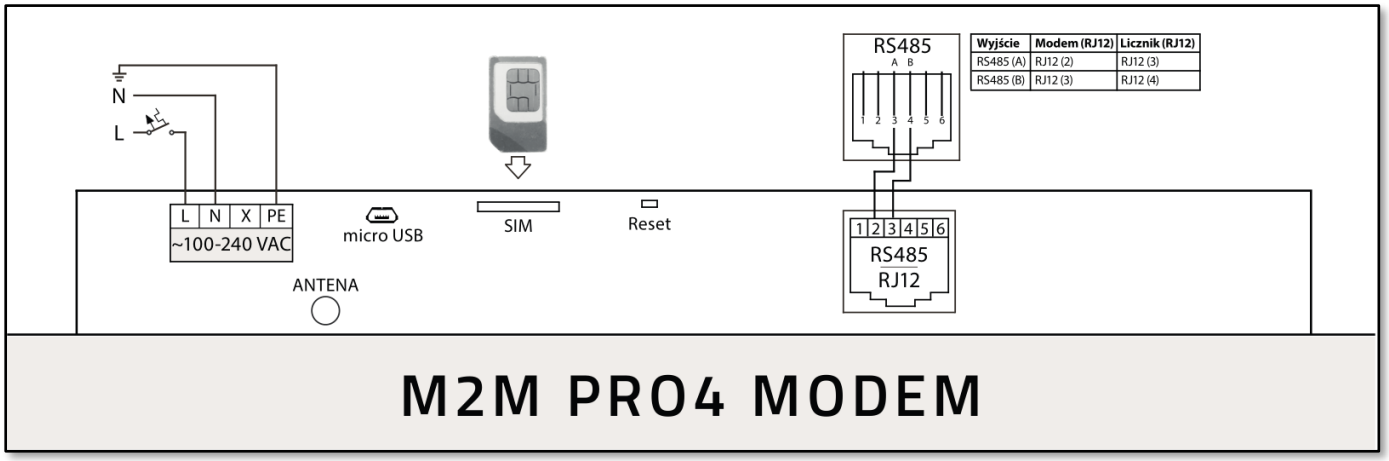
LED signals / LED activity

For understanding the LED activities, please check the Chapter 1.5 and Chapter 6.6.

Power supply

Connect a ~100-240V AC power supply according the hints of the following figure.

Then the modem must be powered on, and the **MOC** (Power) and **WL** (ON) LEDs must be lighting and the device has been started, the boot process begins.



Removing the power supply

When you are removing the AC (or DC) power supply, the **MOC** (Power) LED will be blank and the super-capacitor will activated inside the device, for granting temporary (internal) power supply for the modem. This is possible for 5 seconds now by default settings – technically this can be setup for 30-60 seconds also.

After 5 seconds, all connections will be closed and the file systems will be unmounted until you will adding the power supply again to the modem. Then all connections will be reconnecting and the mounting points will be accessable again.

USB connection

You can access the device on microUSB-to-USB cable, there you need to connect this cable to the ***USBLAN*** interface of the modem. The other side of the USB cable must be connected to a computer. Then the **USB** LED must be lighting when the cable was connected.

RS485 connection

You can make utility meter connection to the modem by connecting RS485 cable to the RJ12 connector (RS485 port) of the modem.

You also need to configure and enable the operation by the **Serial Proxy** menu and the **IEC scheduler** settings (FTP, meter settings) menu.
When data traffic is performed through the cable, the **RS485 Tx** or the **RS485 Rx** LEDs will be blinking during the communication – by signing the data exchange between the modem and the meter(s).

SIM-card is not detected

Turn off the modem by remove the power plug (~100-240V AC) connection.
Check that a SIM card was inserted to the **SIM** holder and the proper orientation of the card. Insert and push the SIM card to the holder. Start the device by reconnecting the AC power to the device. If the problem is still occuring, ask you Mobile Operator about the SIM card is healthness and activation, APN.

SIM/APN failure

Always check the **Status / Overview** menu first at the **SIM ID** field for the current status of the SIM card. In normal case you have to see the SIM identifier there. But, in case of a problem, the SIM error message will be shown, as:

- **No SIM or SIM error –** means: there is no SIM card presented, insert an active SIM card, not inserted properly or the SIM card is wrong. Check the SIM and the insertion again.
- **Not enough RSSI value** – means: connect a proper 4G antenna to the **ANTENA** mount or use a better gained antenna to the device for the better RSSI value (signal strength).
- **No NW registration** – means: APN name for the SIM card is not configured well or the setting is wrong
- **Check RSSI** – antenna is not presented and/or the SIM card is not configured or wrong, Check antenna and SIM again.

During the operation, when the **4G-WAN** LED is not lighting for long, then the device cannot be registered to the wireless network or the modem was not initiated properly. This could also caused by a wrong APN setting.
When the APN setting is not right or the network registration was not made successfully, the **SILA SIGNALU** bottom led blinking.
Please check SIM card insertion and orientation (after power off the modem). Power on the modem. re-configure the APN and SIM settings on its local web user interface.
If the problem is still occuring, ask you Mobile Operator about the SIM card is condition and activation status, correct APN name and configure the modem with the new SIM and SIM info.

Power outage – disconnecting the ports and data connection

In case of power/electricity network outage or maintain, the wireless and RS485 meter data connection and session will be established if it was interrupted throug a way and it was later estabilished, reconnected.

Power outage

In case of an unwanted power outage, 5 seconds after the outage, the device will disconnect all sessions and connections. Then, after the estabilishment of the power source, the device is automatically revert to enable data transmission, builds up the network connections and mounts the data mounting points.

Cannot access the device on SSH / LuCi web interface

You tried a wrong IP address or you cannot connected to the device properly.

Check the IP address, ping the modem.

Reconfigure the IP address on you PC.

For accessing the modem's web user interface we offer the Mozilla Firefox web browser only.

Try to access the modem on its USB interface by your browser: **https://192.168.10.1**

Ensure that the modem uses a SIM card and it's **APN** is already confifured and the **4G-WAN, SILA SIGNALU** leds are active or not.

Default login data:

- **Username**: ***root***
- **Password**: ***wmrpwdM2M***
- Push to the **Login** button to access the web UI.
- Allow the accessing of the device's default IP address in your browser by pushing to the ***Special*** button, then allow the safety exclusion into the pop-up window.

8. 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 device's glued 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-pro4-modem/

GNU/Linux license and open source code

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

Product URL: **https://www.m2mserver.com/en/products/m2m-pro4-modem/**

There at the **Downloads** tab at the middle on the modem's website, at the **Source Code** part you will found the **source code** of the device software and **GNU/Linux license notice**.

9. Legal notice

The pictures in the user guide are only for illustration purposes.
WM Systems LLC. does not confirm or accept responsibility for any mistakes in the information contained in the user guide.
The published information in this document is subject to *change without notice*.
All data contained in the user guide is for information purposes only. For further information, please, contact our colleagues.

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