M2M Router PRO®

User Manual

v1.9

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Intelligence in machine-to-machine communication

Document specifications

This document was completed for the **M2M Router PRO®** device and contains the detailed description of the device configuration which is necessary for the proper operation of the device.

When ordering, you can choose from 3G, 4G LTE and LTE 450 module versions with further optional additional boards (as DUAL SIM, WiFi, RS232/RS485, etc.) to the router. All of the listed settings are similar for the modem versions.

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Table of contents

1. Starting up the Router

1.1 Cable connection

1. **Mount** a 2G/3G or two LTE **SMA antenna** – according to the module type - to one of the **Antenna** titled SMA-M interfaces (in case of LTE module all the two antenna must be mounted).
2. If there is a WiFi module presented, then connect a WiFi antenna to the **WiFi** titled **antenna** connector.

3. **Insert an activated data SIM card** to the SIM holder, placed the chip-side up and the cutted edge towards to inside and push until it sleeves.
4. **Connect UTP cable to the RJ45 port** (**Ethernet** titled), the other side of the cable must be **plugged to the PC** or a current network device.

5. **The DHCP service is turned off for the router Ethernet interface**, by default. Therefore, **you have to configure an IP address for you PC, manually.**

> Add for. e.g. the 192.168.127.10 IP address to your computer's Ethernet interface for connecting to the router.
> (If you have the WiFi onboard version of the router, then you can configure your router on WiFi (DHCP activated).

1.2 First starting of the router

1. **Plug** the **12V DC power adapter** chord **to the POWER** interface, then **plug the adapter to the 230V** electrical network.

2. The **router** has a **pre-installed system** (contains uploaded firmware and system software). By plugging the power adapter to the 230V AC socket, the router begins to work, whereas its **LED signals** are showing the **current activity** during the operation.

3. When the router is booting, the upper **ST LED** will be flashing once per seconds with green light, which means that the system is loading the system. The system starting then takes about 2 minutes while it will be ready for usage.

4. When the **ST LED** will not flashing anymore (but the other LEDs are active), then the system is ready for operating. Then the **ST LED** will blink once in every 10 seconds. The router is available on the web user interface and operating well. Then the router is available on the web user interface and operating well.

5. In case of availability of the **WiFi** (if WiFi module is presented in the device) then the lower **WiFi LED** lighting continuously by green light. This assigns that the WiFi/Access Point is available for the connecting clients – for accessing the public Internet.

6. The mobile network availability is signed by the middle **Cell LED**. When the SIM card network registration was successfully performed by the modem, the middle LED lights continuously by green.

7. **As soon as you can, configure the internet settings of the wireless module (SIM and APN) for connecting to the 3G/4G/LTE network – in other case the router will be restarting in every 10 minutes!**
8. If you notice any failure or unusual LED flashing, then go to the **Troubleshooting** chapter.

In **case of restart** or manual restarting of the router, **all the three LEDs** will lighting for 1 second with red colour, then will be blank for a couple of seconds. Then the boot sequence repeats from the point nr. 3 as it is written here above.

1.3 Web user interface & Login

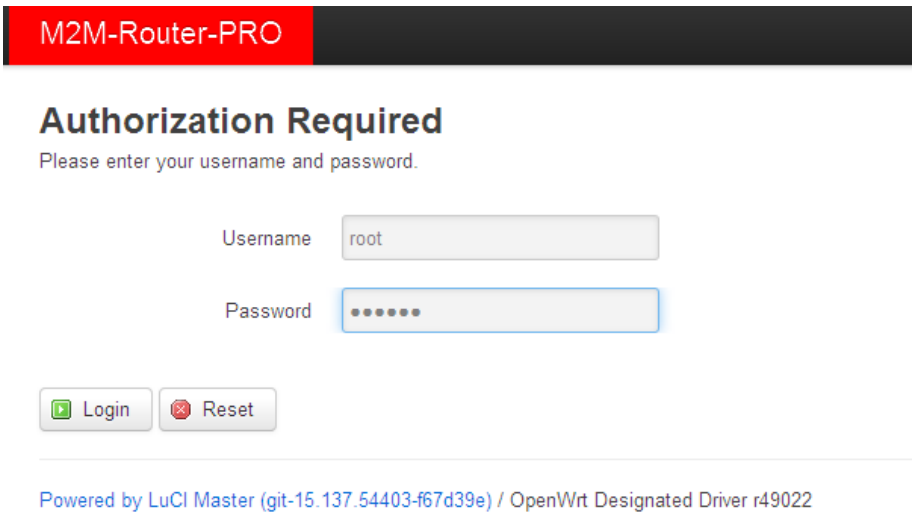
1. Then now you can connect to the **router's local web interface (LuCi) through the Ethernet** interface – on its default address.

> ***Attention!***
> *For accessing the web user interface we offer the Mozilla Firefox web.*

Default web user interface (LuCi) address is: https://192.168.127.1:8888

The login data are the following:

- **Username**: ***root***
- **Password**: ***wmrpwd***
- then push to the **Login** button.

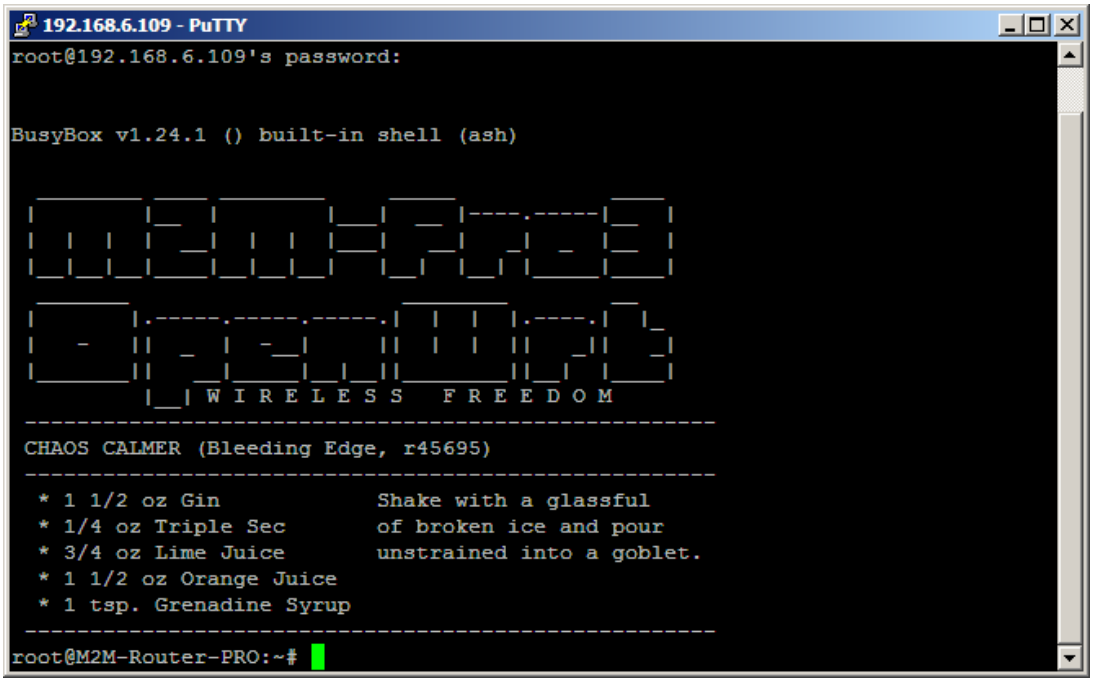


2. **Allow the accessing of the router default IP address in your browser** by pushing to the **Special** button, then **allow the safety exclusion** into the pop-up window.

> ***Attention!***
> *When connecting to the public network, it is recommended to change the login password!*
> *The ethernet IP address can be modified after login from the OpenWrt.*

1.4 Accessing the router on ssh connection

The router can be accessed through an ssh connection, when it is available on its IP address – by a terminal utility (e.g. *putty*) – at **192.168.127.1:22** (Login: ***root***, Password: ***wmrpwd***).

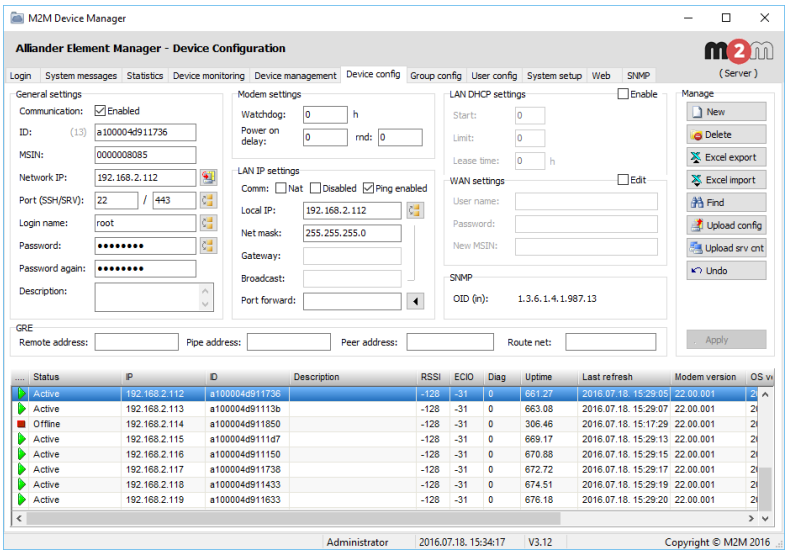


1.5 Acessing the router remotely by M2M Device Manager software

By optional, you you can use the central remote device management application (M2M Device Manager) for your router devices. Which provides continuous monitoring of the operation, remote configuration and remote firmware updates.

The server application assures the opportunity to manage even thousands or routers and listening the network connections.

It is available through license constructions, please advise our sales.

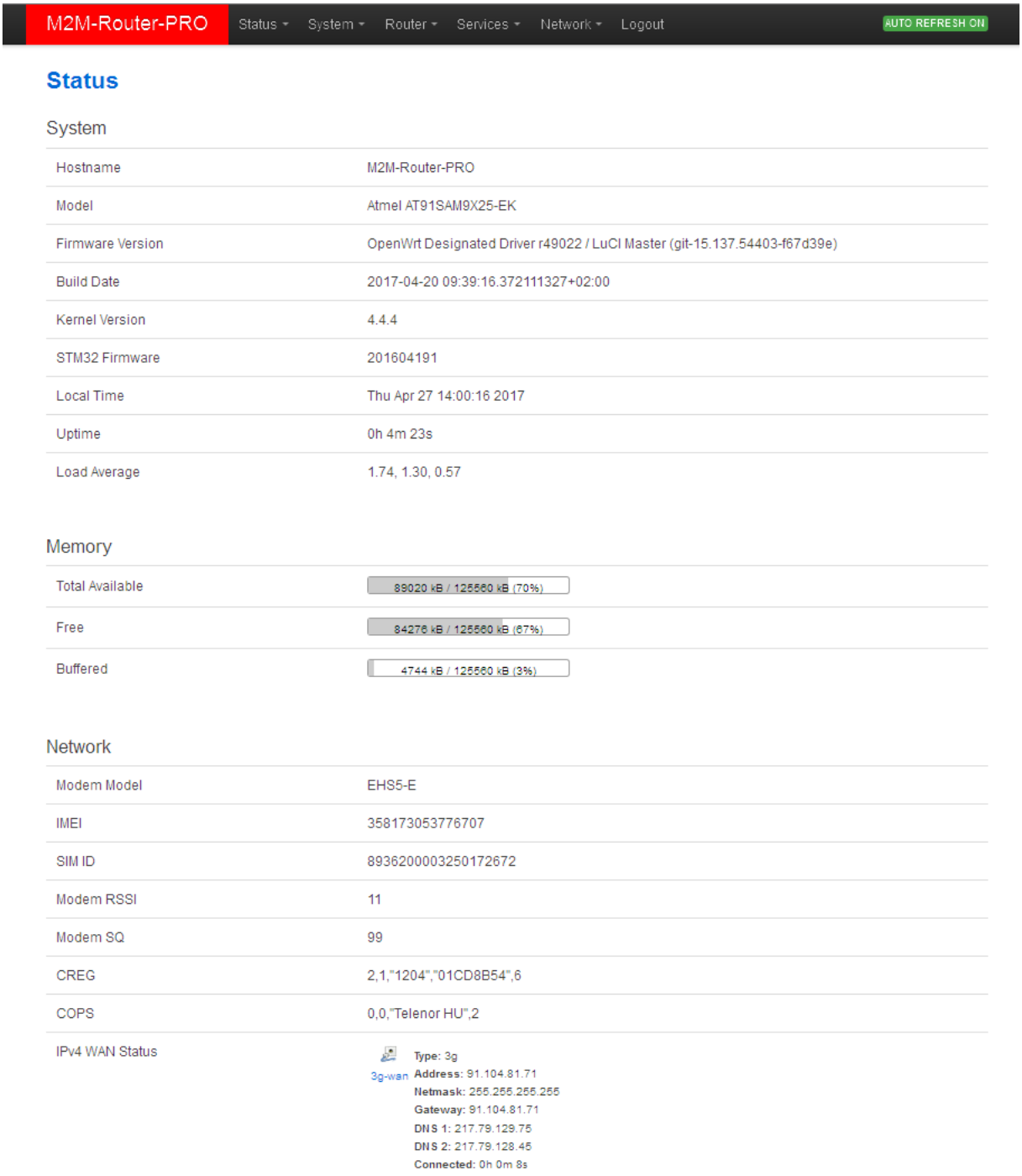


M2M Device Manager website: http://www.m2mserver.com/en/product/ m2m-device-manager/

2. Router configuration on the OpenWrt user interface

2.1 Dashboard (Main page)

After the login to the web interface, the startup screen appears with the current status of the router.



Check the *Build Date* (OpenWrt) statuts that it is 2017-04-20 or newer and the *STM32 Firmware* version.

At the **Network** part you can check the **Modem model**, modem identifier (**IMEI**), the SIM identifier ICC (**SIM ID**), the **Modem RSSI** (mobile network signal strength), the **Modem SQ** (signal quality CSQ) values, and the **SIM-card logon data** (*AT+COPS?*), with the **IPv4 WAN status** of the network (as connection Type, IP address).

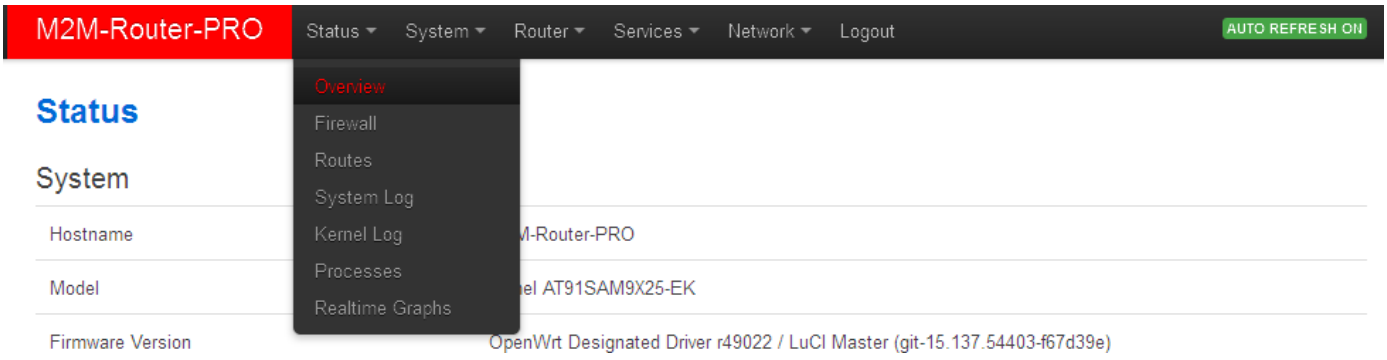
2.2 Menu

By the menu you can access the following features:

- **Status** – Status data, operation logs, operation monitoring
- **System** – System settings, administration, software and fw-refresh, backup/restrore of the configuration settings
- **Router** – Device Manager settings, Modem and Logging parameters, Ping an IP address, Daily restart, Factory settings
- **Services** – DynDNS (dinamic DNS) settings, Ser2net configuration (RS232/RS485)
- **Network** – network interface settings, WiFi settings, DHCP, DNS, Route rules, diagnostics, firewall

2.3 Status menu

- In the **Status** you can check the current status (**Overview**) ,
- activities of the router (**Processes**),
- monitoring the realtime operation at the **Realtime Graphs,**
- check the system messages and event log (**System Log** and **Kernel Log**),
- at the **Firewall** item, you can see the firewall events and information,
- at the **Routes** item the valid/active route settings.

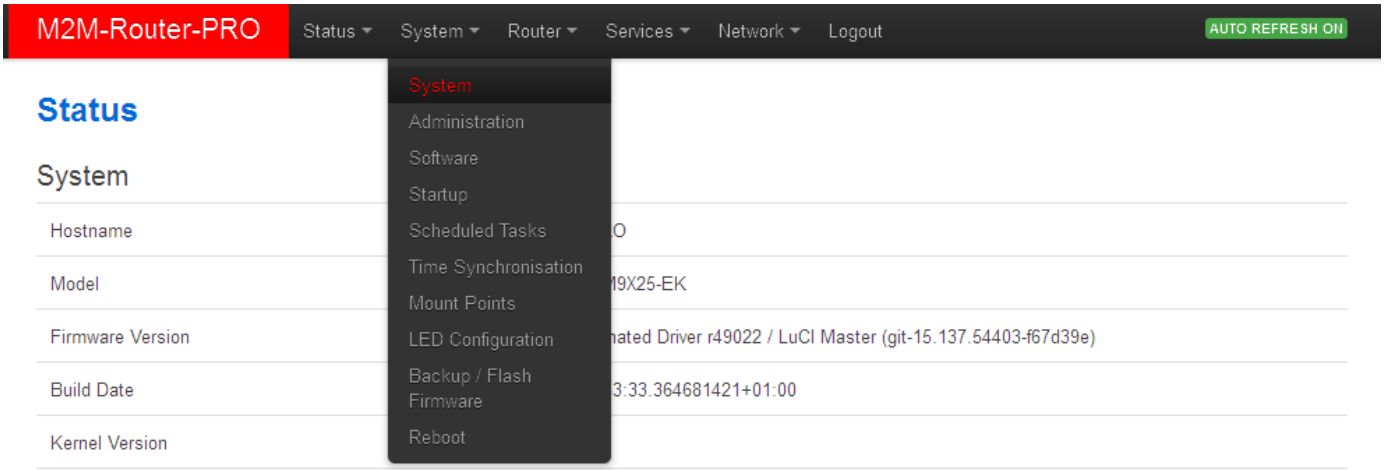


2.4 System menu

You can found several system settings in the **System** and **Administration** menu items.

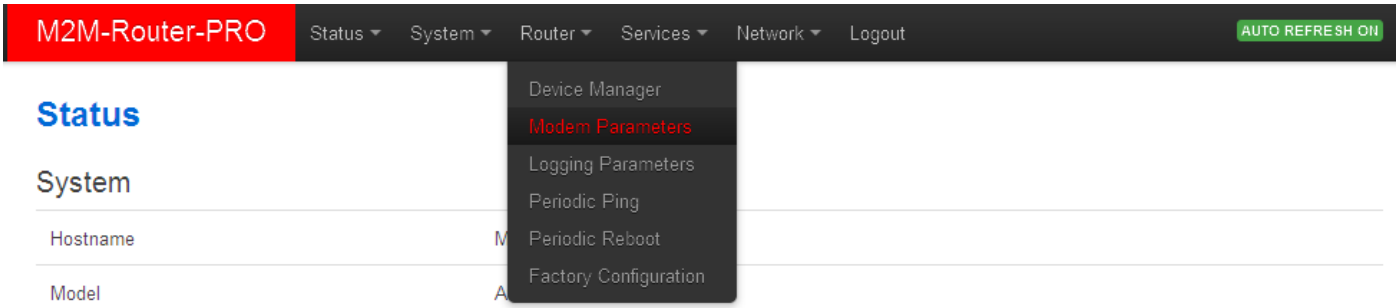
- Installation of further **Software** (3rd party tools, applications for the Linux distribution.
- You can define the **Startup** applicatons – resident programs during the operation and th **Scheduled Tasks.**
- Setup the NTP server for **Time Synchronisation**.

- The **Mount Points** are showing the available (mounted) shares and drives.
- The **LED Configuration** is also configurable.
- You also can **Backup / Flash firmware** updates even **Reboot**ing the router device.



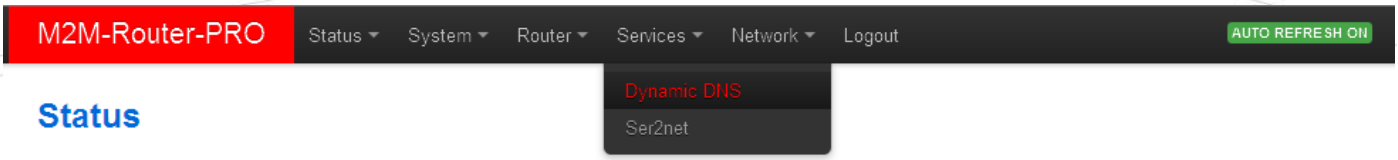
2.5 Router menu

- You can define the remote monitoring software connection settings of the az M2M **Device Manager**.
- Then at the **Modem parameters** (define special parameters for the connection).
- Define the **Logging parameters.**
- At the **Periodic Ping** you can configure the cyclic heartbeat ping interval settings – as a network checking method feature.
- The daily router reboot can be allowed at the **Periodic Reboot** menu item.
- The backup of the factory settings is possible at the **Factory Configuration** (saves to a file).



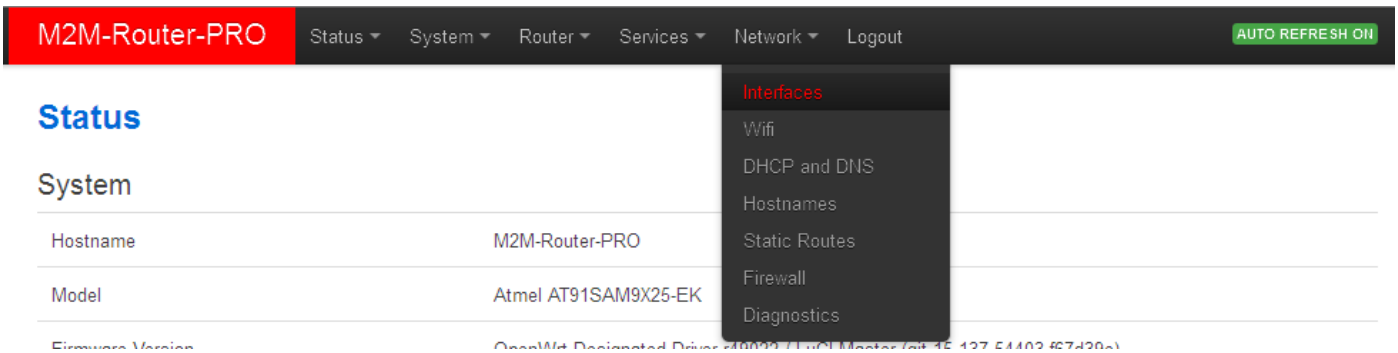
2.6 Services menu

- Here you can define the **DynDNS** (dynamic DNS) service settings
- Also the RS232/RS485 port communication settings (**Ser2net**).



2.7 Network menu

- Here you can configure the settings of each network **Interfaces**
- You can check the WiFi connected devices at the **WiFi** item.
- You can modify the **DHCP** and **DNS** settings.
- or define the router network device name at the **Hostname.**
- The **Static route** paths can be also defined.
- The **Firewall** rules can be declared here as the following submenu items: Port forward, IP router, NAT settings.
- At the **Diagnostics** item, you can test the network operation and connection health by the ping an IP address for the interfaces.



3. Network configuration of the router

3.1 Interface settings

The list of the available network interfacescan be found at the **Interfaces / Interface Overview** menu item.

The **LAN** interface meaning the Ethernet port connection (***eth0***), the **WAN** interface is the public wireless Internet connection (as ***3g-wan, in case of LTE: eth1***) – which means the 3G, 4G, LTE 450 module by physically.

In case of **WiFi** the proper related interface is also available.

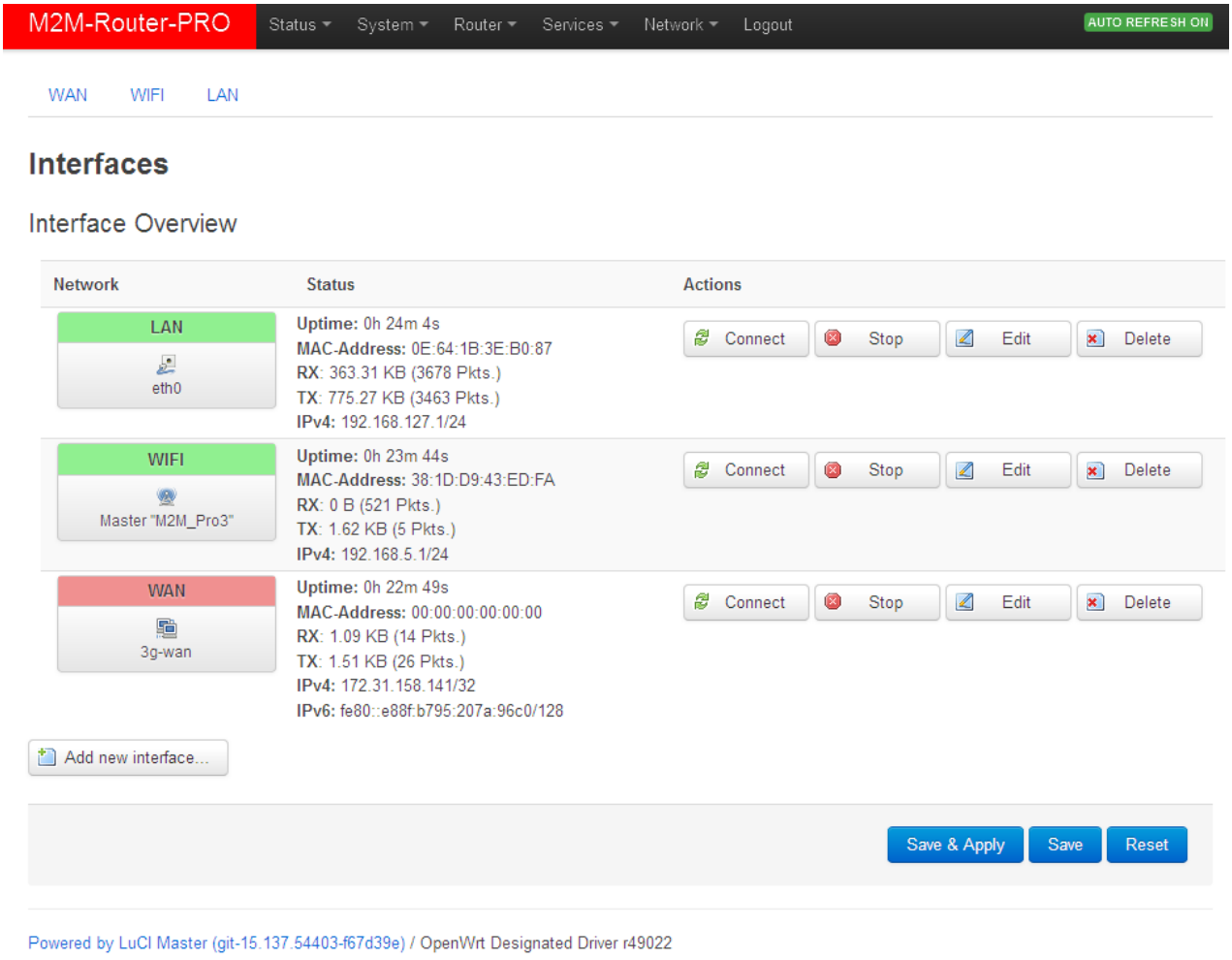
Modifying the interface settings

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

button.

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

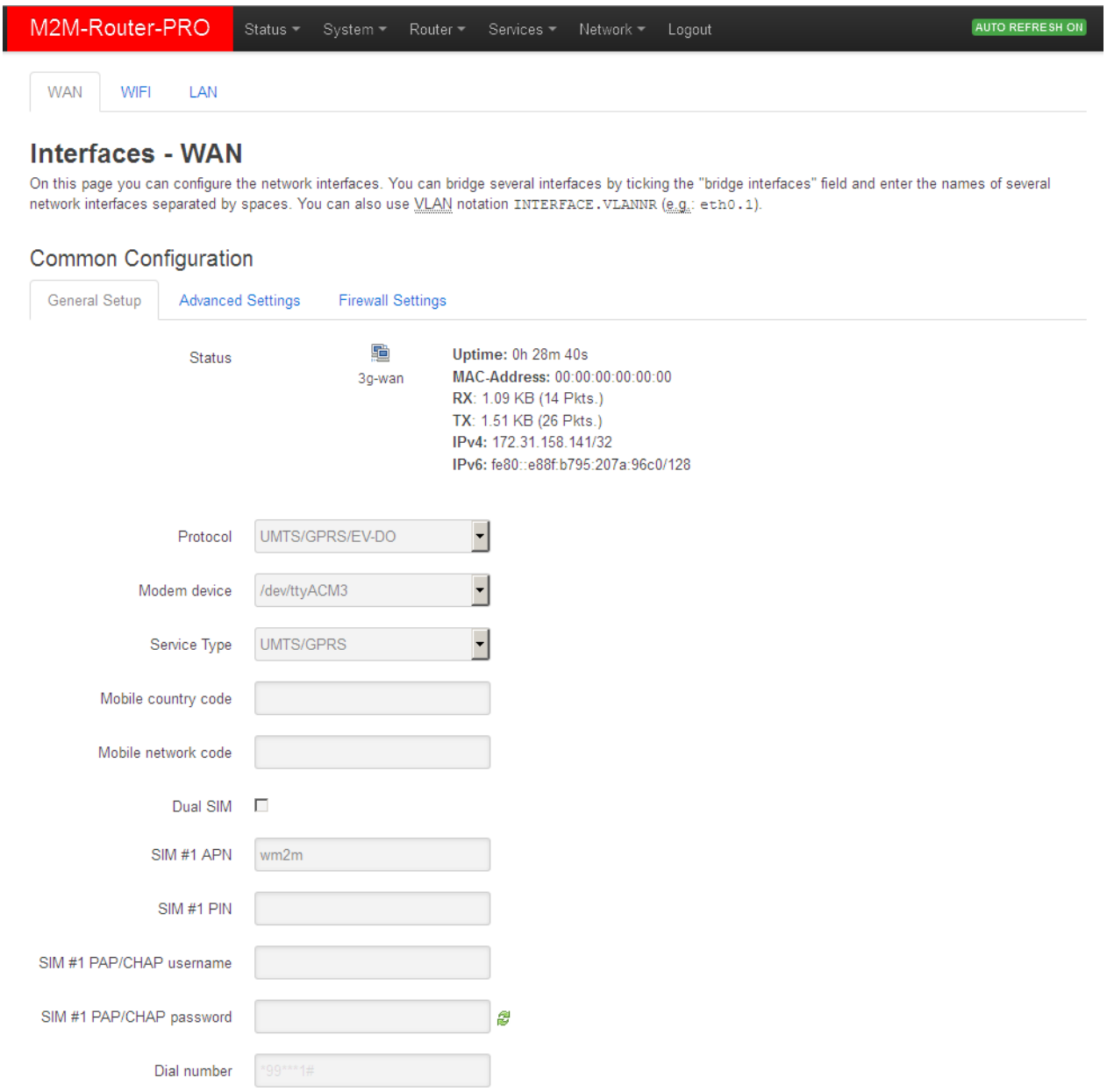
button reconnects the related interface connection.



At the upper **WAN, WIFI, LAN** titles you will found further settings related to the chosen interfaces.

3.2 Mobile internet settings (3G/4G/LTE450 modem)

Open the **WAN** item from the upper selection. Then at the **General Setup** tab you can see the current status of the interface and the transmitted data amount.



Configure the module to the wireless internet and for the 3G/4G/LTE network connection (by the modem type and network behaviour) here for the **WAN** interface.

For configuring end enabling the **roaming** settings – in **case of international or country border usage** – you may need to setup the **Mobile country code** and **Mobile network code** parameters – even if you are attempted to use only a prefered mobile network.

The international country codes can be found here: http://mcc-mnc.com

Ask your mobile operator about the available international settings.

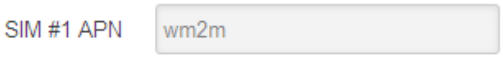
You can define the **SIM #1 APN** account name, and the **SIM #1 PIN** code if it is necessary for the connection.

> ***Attention!***
> *The available APN settings will be assured by the SIM card provider mobile operator or your mobile internet service provider.*

Here you will found some examples for the APN settings.

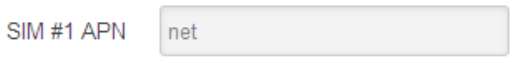
M2M APN (enclosed)

APN name: wm2m



Public Internet APN (opened)

APN name: net



The LTE 450 communication needs special network and an LTE capable SIM-card for the succesful connection!

Automatic mode

When you not set any value for the APN, the router will connect by the SIM-card automatically to the next available network's available APN**.**

Authentication

The **PAP/CHAP username** and **PAP/CHAP password** settings can be also configured here – if it is required for the connection.

When you are attempted to use a DUAL-SIM version router

This can be used well as an alternative – or spare - network path, when the operation can be granted with better change instead of the field coverage (adding further mobile operator service).

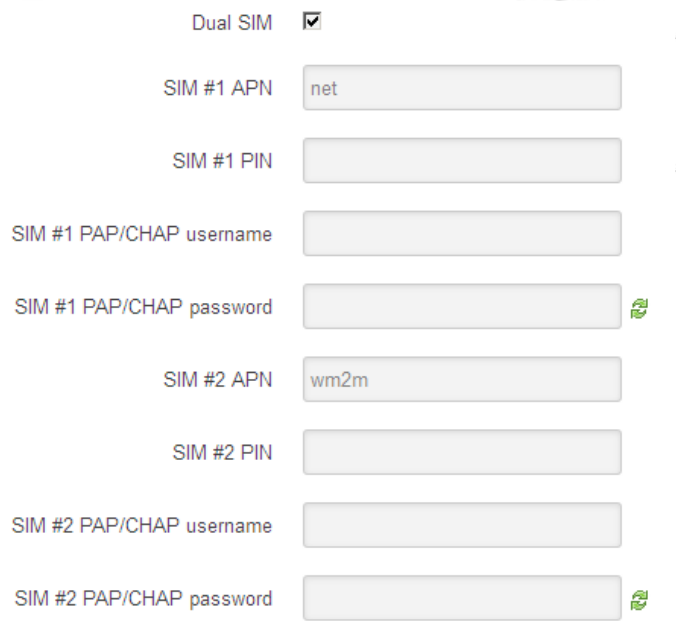
Check in the **Dual SIM** option and define the **SIM #2** APN and PIN code parameter over the **SIM #1**.

Fom the Dual-SIM handling…

The nr. #1 SIM can be accessed by externally of the router, the SIM #2 is located inside the router.

The switching between the SIMs is automatic. It will switch to the next, when with the current SIM it cannot register to the network, or it is hanging or not operating.

The switching between the SIM cards is possible in turned of modem status. It takes about 1.5-2 minutes while the new SIM card will be registered to the mobile network.



The SIM switching can be occured by the following possible events **in case of every modem types**:

- Optional ping does not work (Periodic ping)
- Wrong SIM PIN code
- RSSI low value (99 or 0)
- No available PPP connection (timeout)

There is no SIM switch recovery, the switching is continuous. When none of the SIM cards were registered to the network, then it will continuously switching the SIM cards.

Click to the **Save & Apply** button for saving the settings, while the devices attempts then connecting to the mobile network.

> ***Attention!***
> *After doing the SIM, APN settings, and saving the settings, the router and the modem will not be automatically restarted futhermore!*

Only in case of using the LTE450 modem:

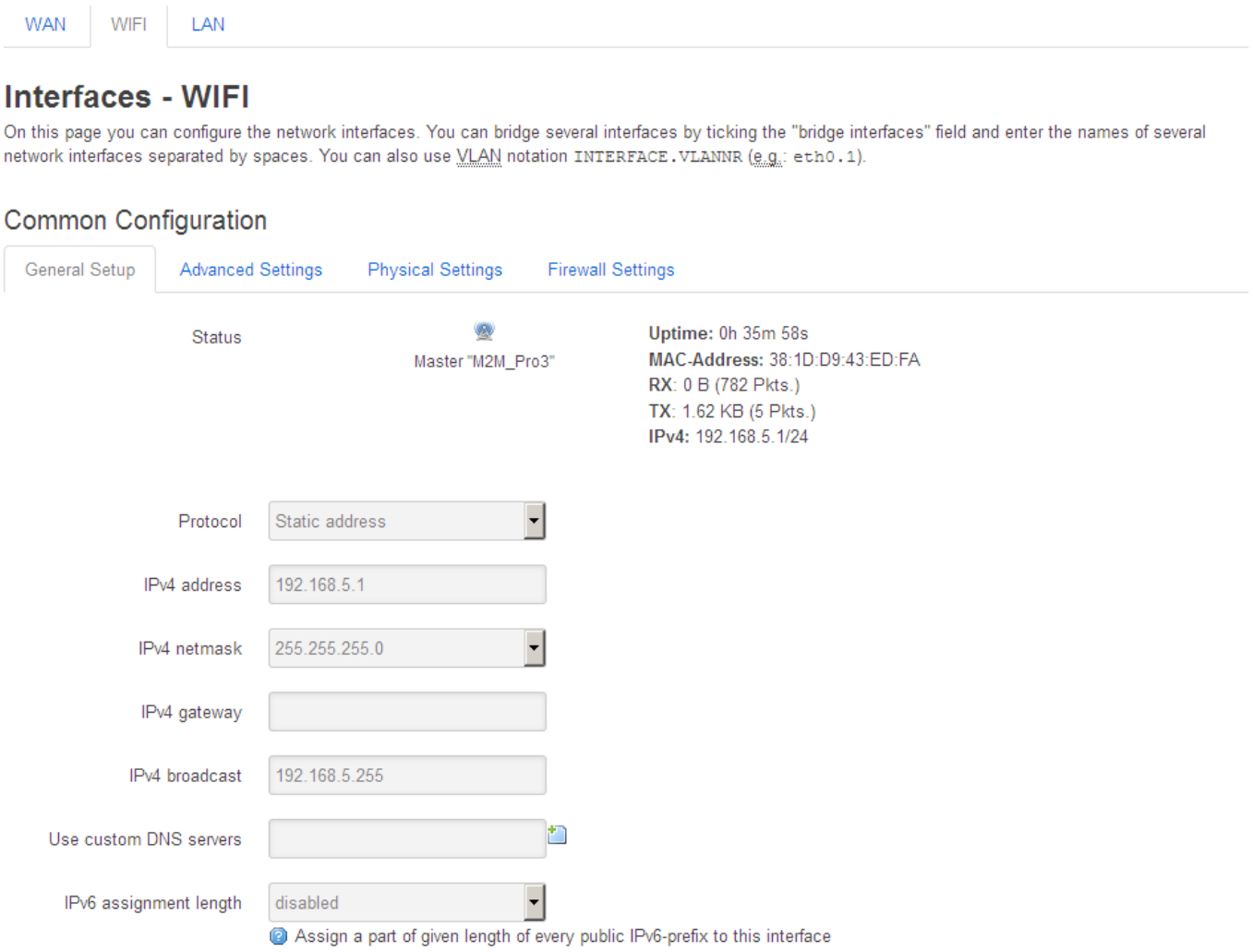
- After the SIM switching, the modem cannot registered for more than 2 minutes
- After 1 minute of the registration it still does net gets WAN IP address to the **eth1** interface (still will be 10.0.0.10)

3.3 WiFi settings (in case of WiFi presence)

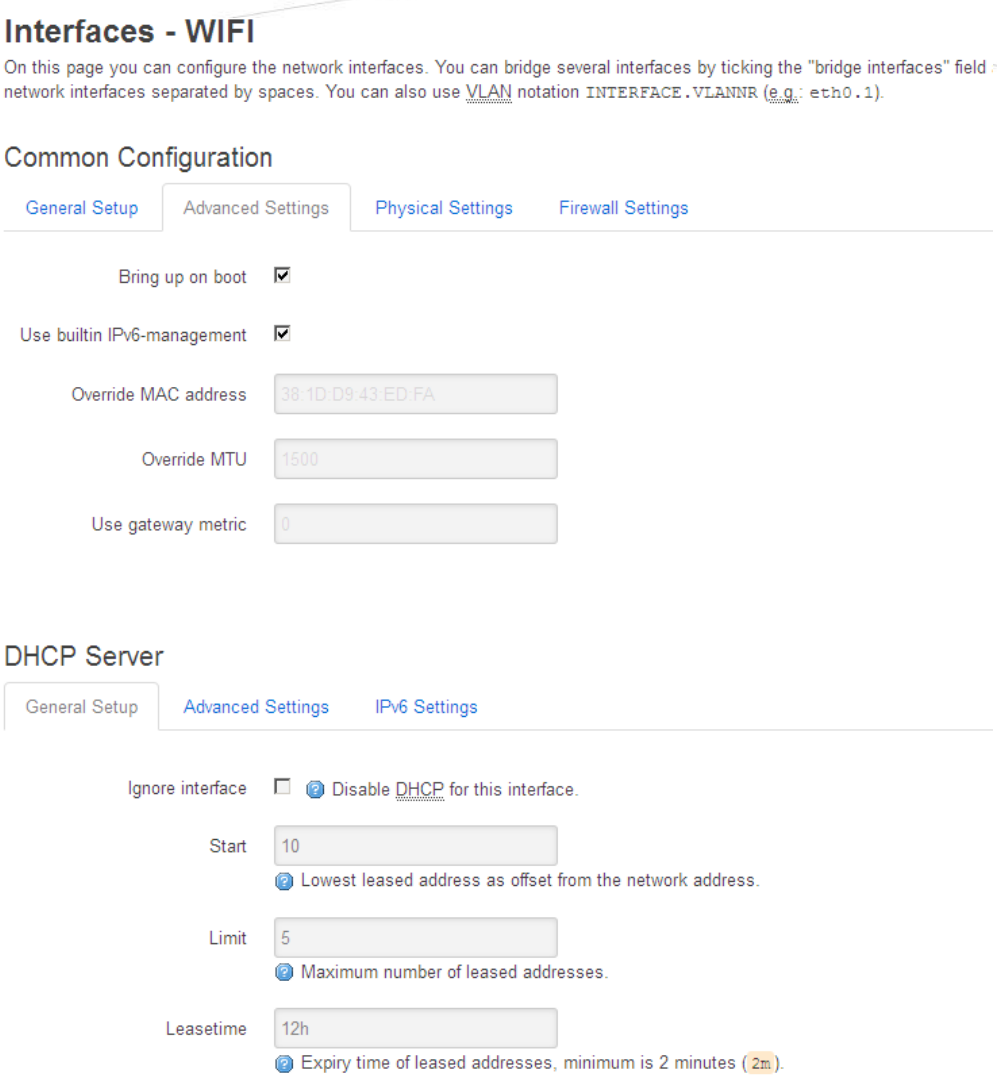
Choose the **WiFi** option from the menu, then at the **General Setup** tab you can define a different IP address range for the **IPv4 address**.

The WiFi feature is optional for the router. In case of presense of the module, the default **WiFi** mode is the *Access Point*, which means that the connecting clients on the WiFi can be using the wireless internet connection of the router. The WiFi module interface is bridged to the ethernet by default.

The **default WiFi password** for the ***M2M_Pro3*** SSID is: ***M2MPro_123***

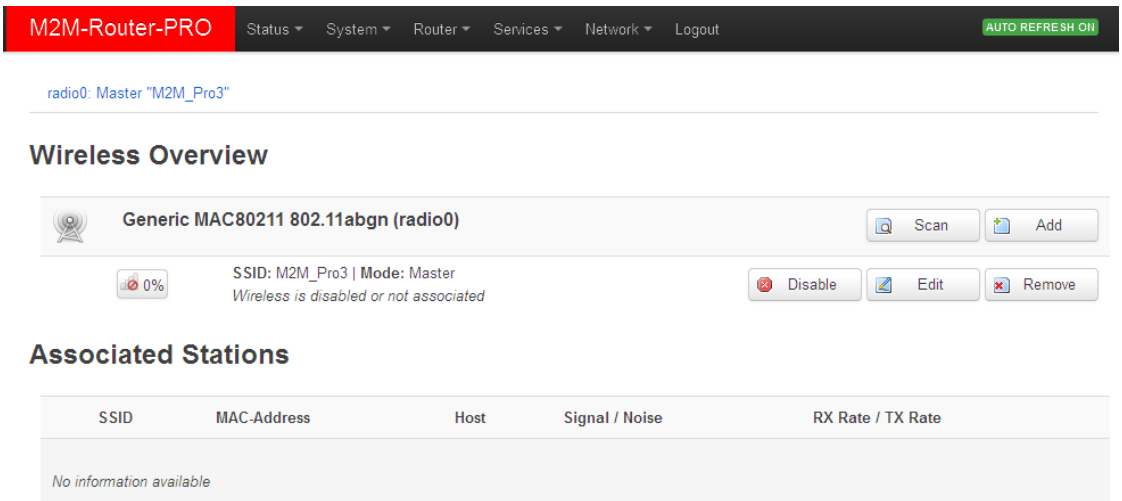


At the **Advanced Settings** tab, in the **DHCP Server** part, check the **Start** IP address and the number of the max. connectable WiFi clients (**Limit**). The router will assure IP addresses from **Start** IP address up to the **Limit** for the connecting clients. The IP address will be automatically provided for clients on the WiFi network.



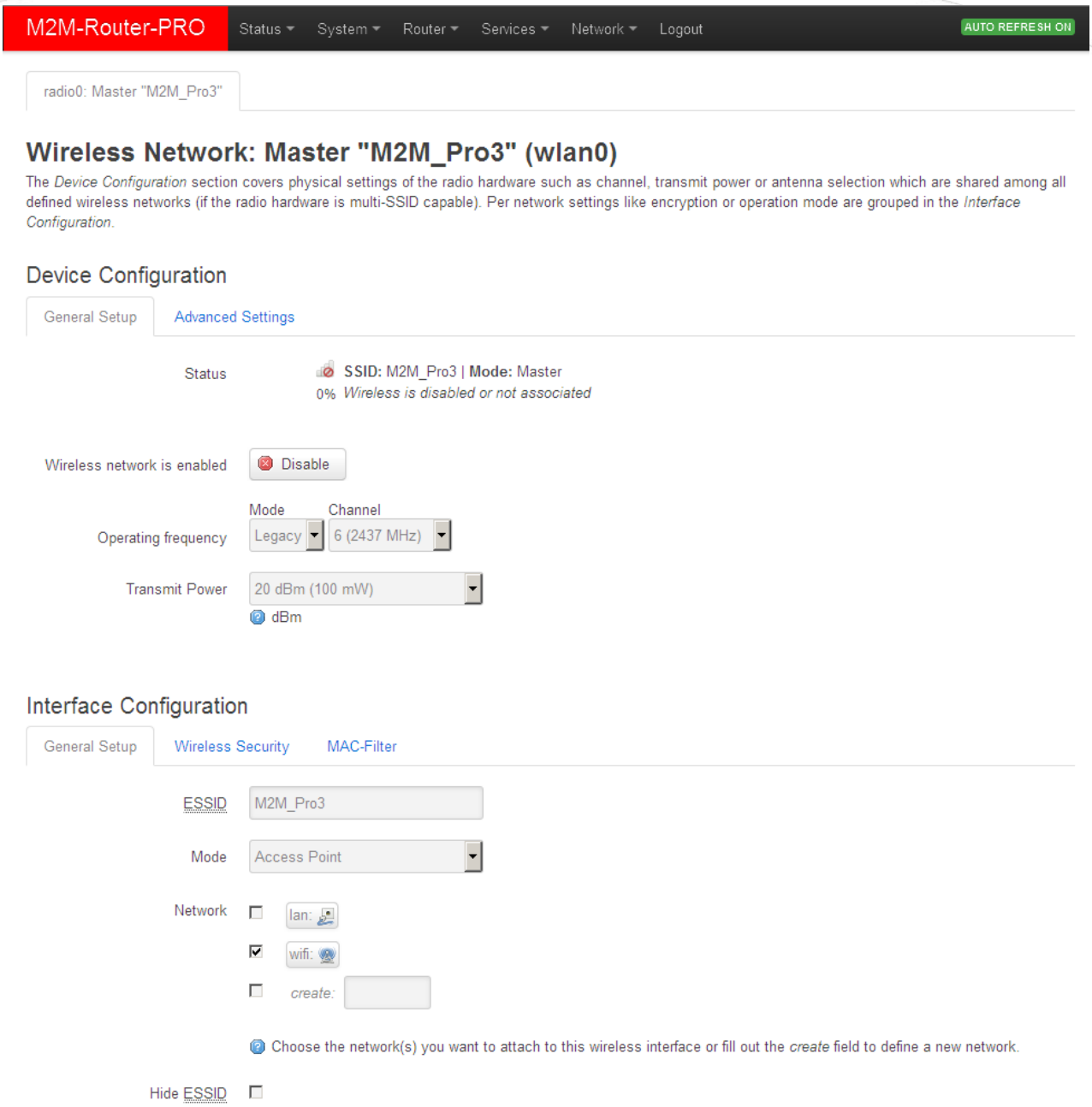
On the top of the screen, the **Bring up on boot** feature must be active (which initializes the 3G module when the router is booting), and the **Use default gateway** also must be active.

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



The connecting WiFi clients can be listed at the **Network** menu **/ WiFi** menu item - at the **Associated Clients** part.

You can define or modify further the current **WiFi settings** by the Edit button.

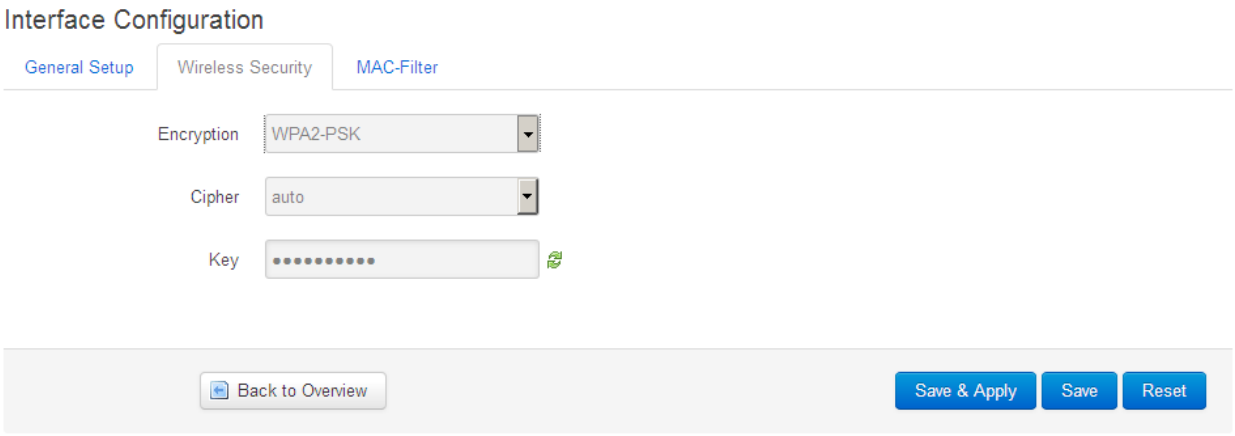


The **Wireless Network** (WiFi interface) settings can be seen at the **Interface** part. The **ESSID** is the name of the SSID point (will be listed for the clients under this name). Therefore the wireless devices can easy to discover and found it, and connect to the router by using the WiFi password.

> ***Attention!***
>
> *The reconfiguration of the **SSID** is highly recommended, which can be initiated by the* Edit *button.*

At the **Mode** defines the WiFi operation mode as it can be *Access Point* or *Client*. In Client mode, the router can connect to other router.

If it is necessary to change the encryption method/level or WiFi password, you can make it at the **Wireless Security** tab, at **Encryption** field – where you can change to an another. By default the encryption os WPA2-PSK.
At the **Key** field you can change the WiFi connection password.



3.4 Ethernet (LAN) settings

For the LAN interface, at the **LAN** menu item at the **General Setup** tab you can define an own IP range (**IPv4 address**), with the related **IPv4 netmask** (subnet mask).

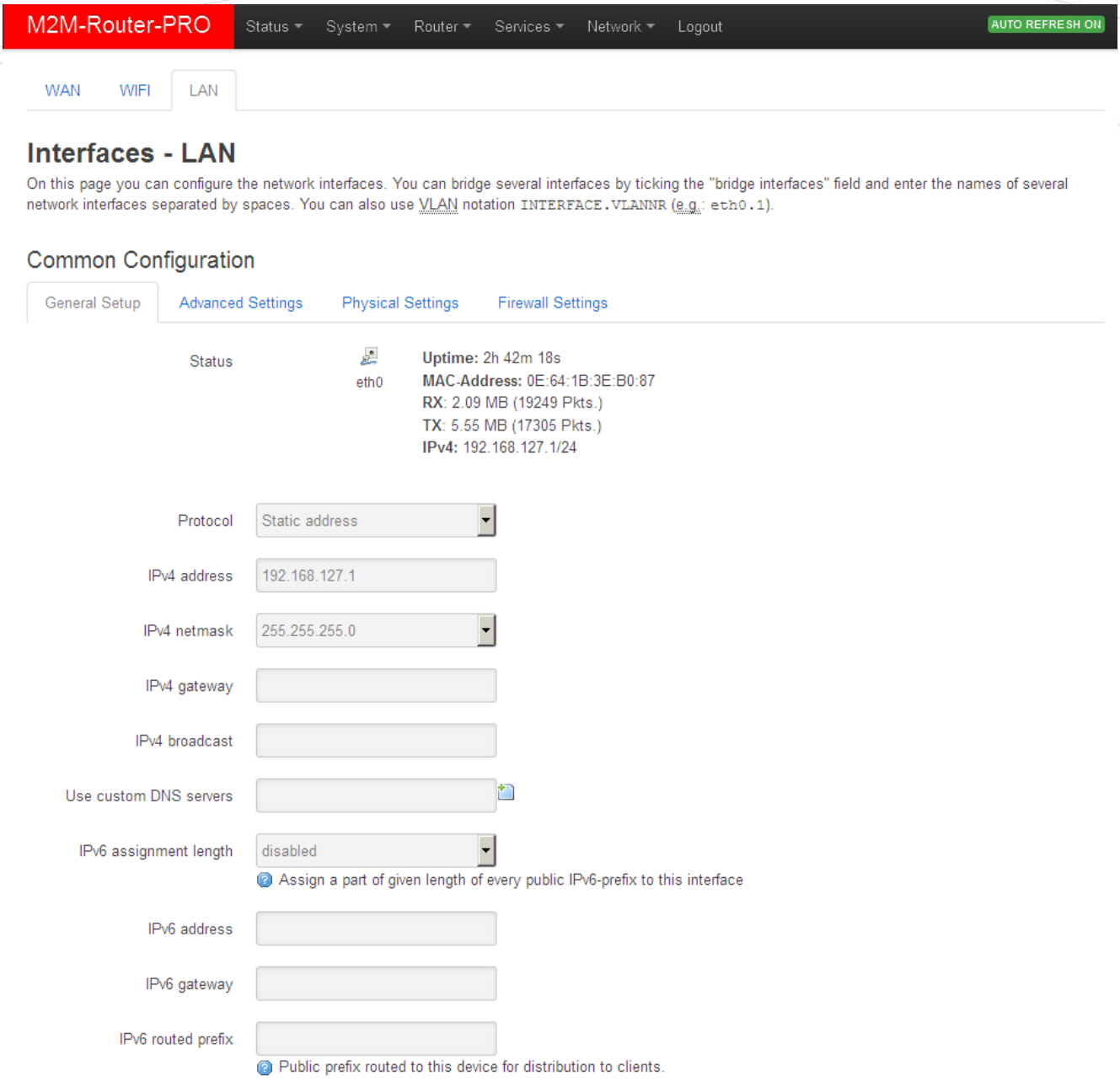
The detailed **LAN** interface settings can be performed by the **Network Interfaces** menu item at the **LAN** interface 

button.

Change the default 192.168.127.1 router **IPv4 address** to a different (own) IP address, regarding the current subnet.

Check the **IPv4 netmask** to be proper for the selected and required network class which you are attempted to use.

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



Important!

The DHCP service is turned off for the router Ethernet interface, by default. Therefore, you have to configure an IP address for you PC, manually.

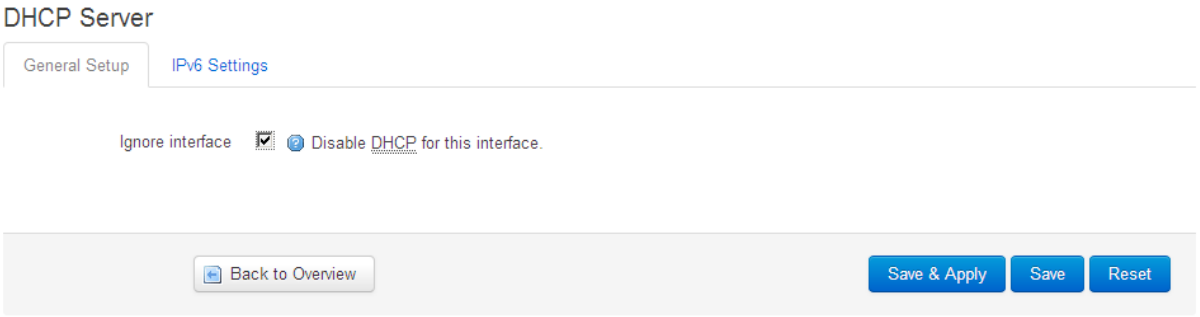
If you are not attempted to use a fixed IP address for the router, and if you want to use DHCP given IP by a different network device, then modify the **IPv4 address** to the connecting gateway – or other network device - IP address, and choose the*Static address* at the **Protocol,** the *DHCP client* setting, and push the Switch protocol button. **Then the DHCP client will be activated for ethernet interface.**

Push the **Save & Apply** button for performing the changes.

3.5 DHCP, DNS settings

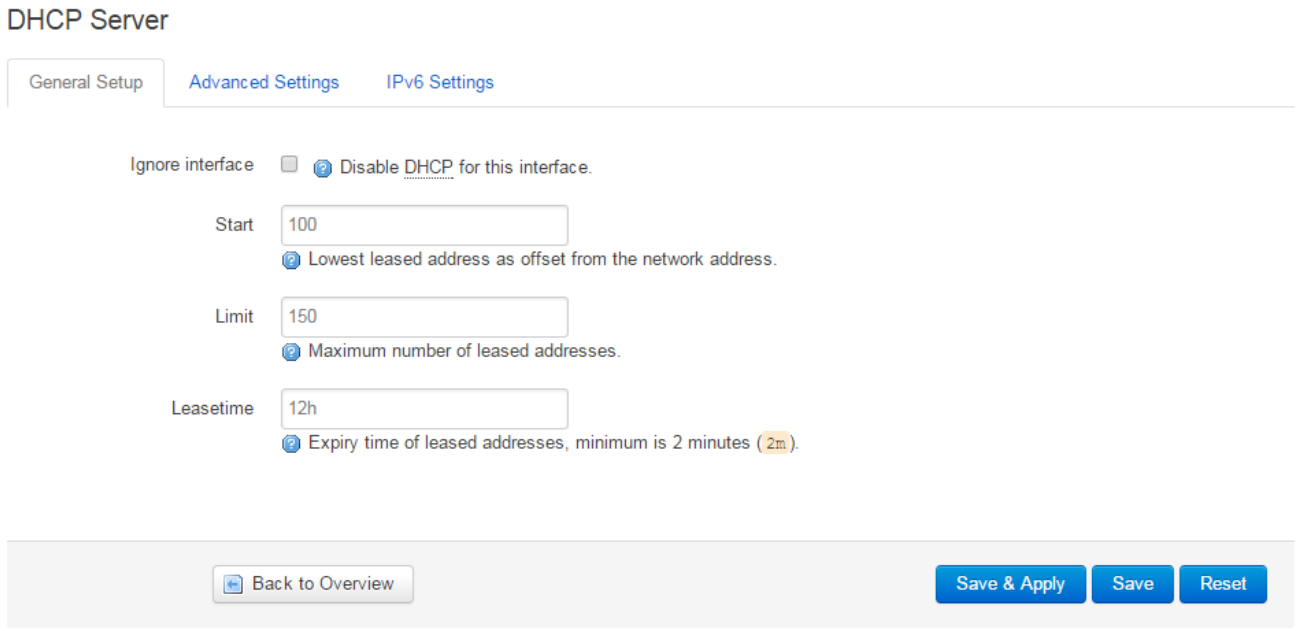
The DHCP service allows the automatic IP address providing for the connecting devices in the current IP segment by the router.

The DHCP settings can be found at the **Network** menu, **DHCP and DNS** item.



> ***Important!***
> *The DHCP service is disabled by the factory default configuration. First, you have to enable the DHCP service for the usage and performing the further DHCP settings!*

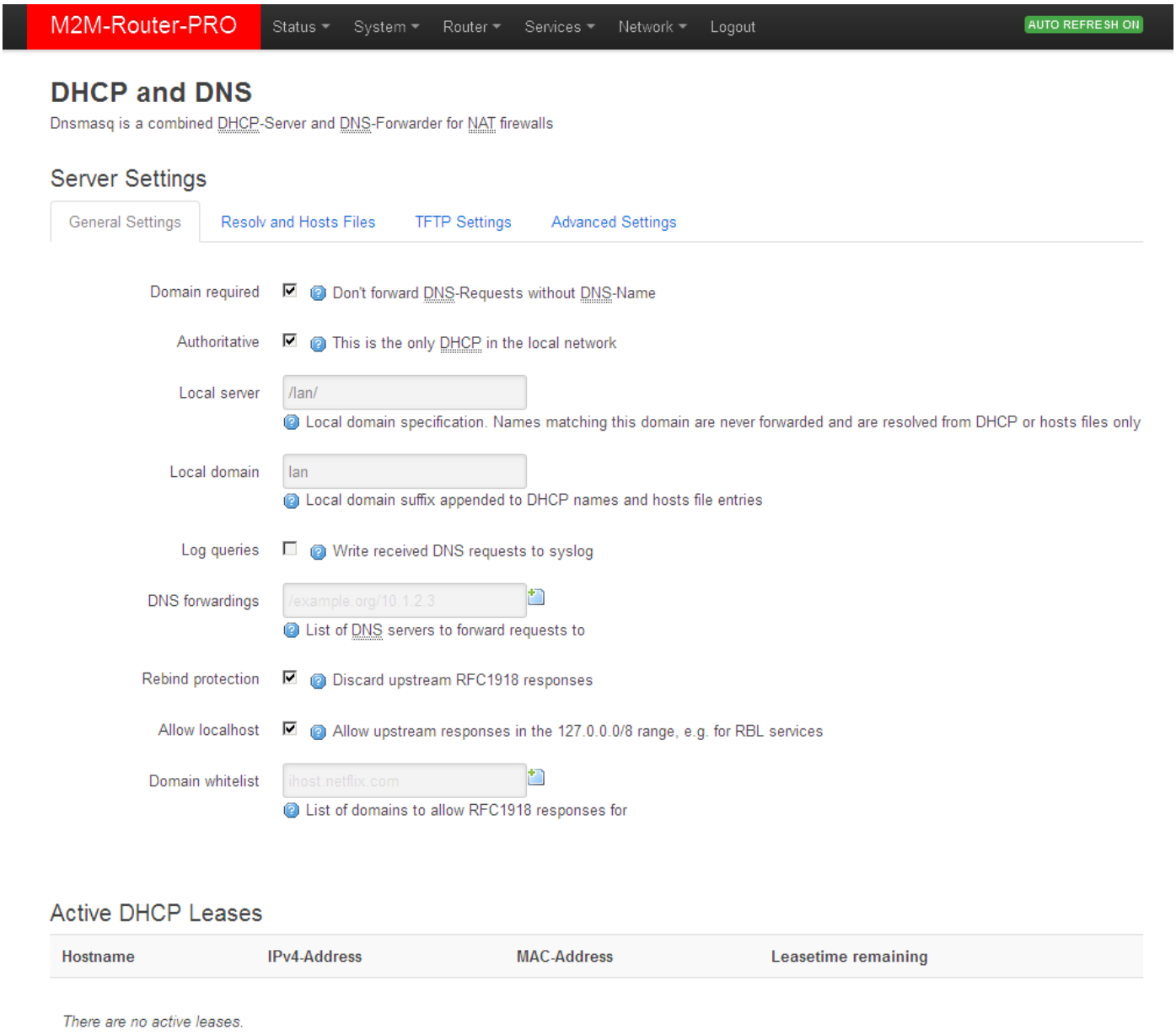
If you attempted to enable the DHCP service, uncheck the *Disable DHCP for this interface* option. Then the related parameter settings will be visible with their default settings.



The **Start** field means the starting IP addres in the subnet for the connecting devces (by default 192.168.x…). You can **Limit** how many IP addresses will be provided. The router will be providing addresses for the connecting devices in the 192.168.x subnet within the *Start* and between the *Start+Limit* address range (especially important for WiFi).

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

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



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

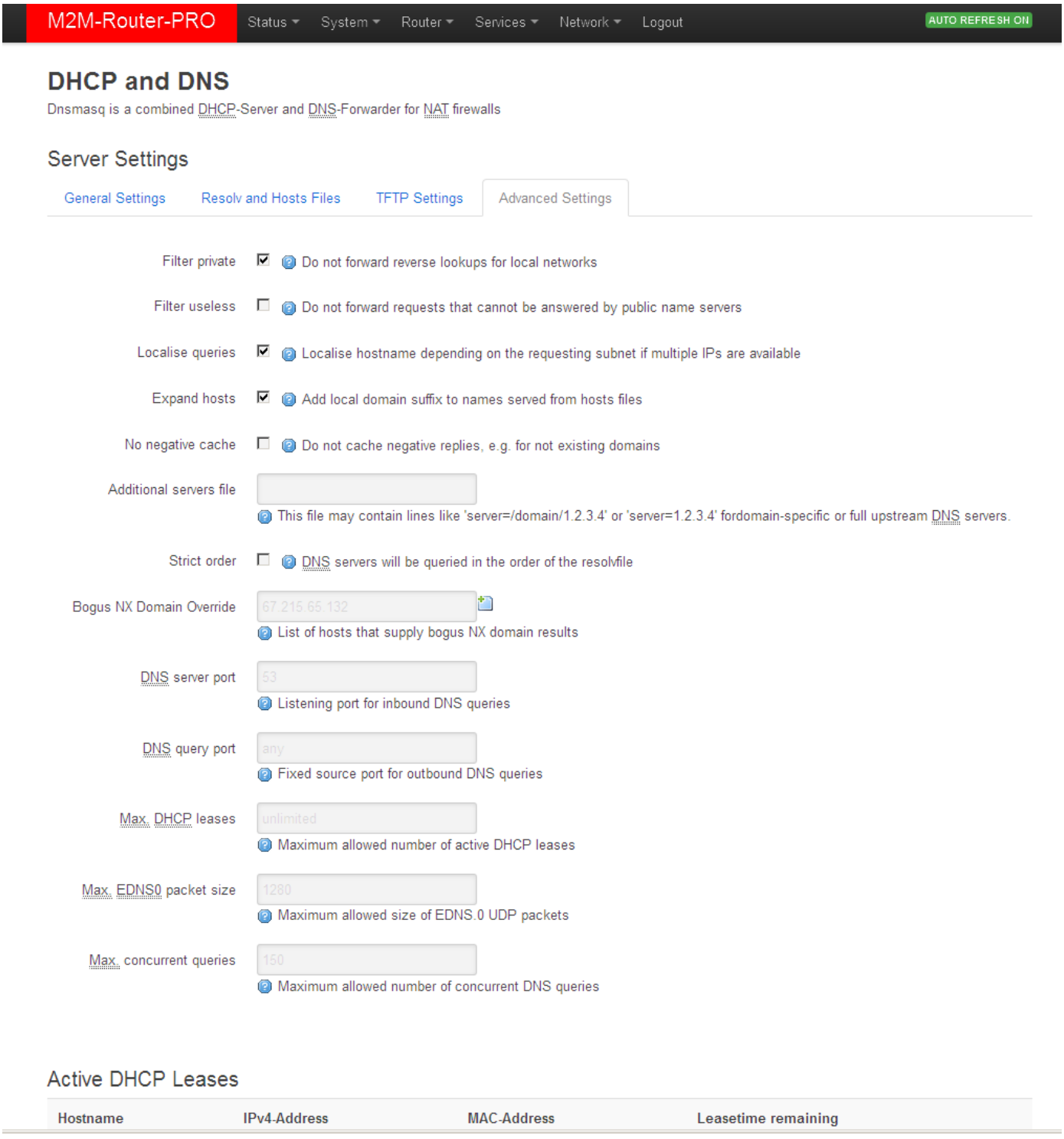
In the **Static Leases** part you can Add devices to always provide the same dedicated IP address by the router. This can be required by adding values to the **Hostname**, the **MAC-Address** and the **IPv4-Address**.

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

3.6 DNS settings

You can configure the DNS service from the **Network** / **DHCP and DNS** menu, with chossing the **Advanced Settings** tab.

At the **DNS server port** field you can define the port for the DNS service (by default its port number is 53).



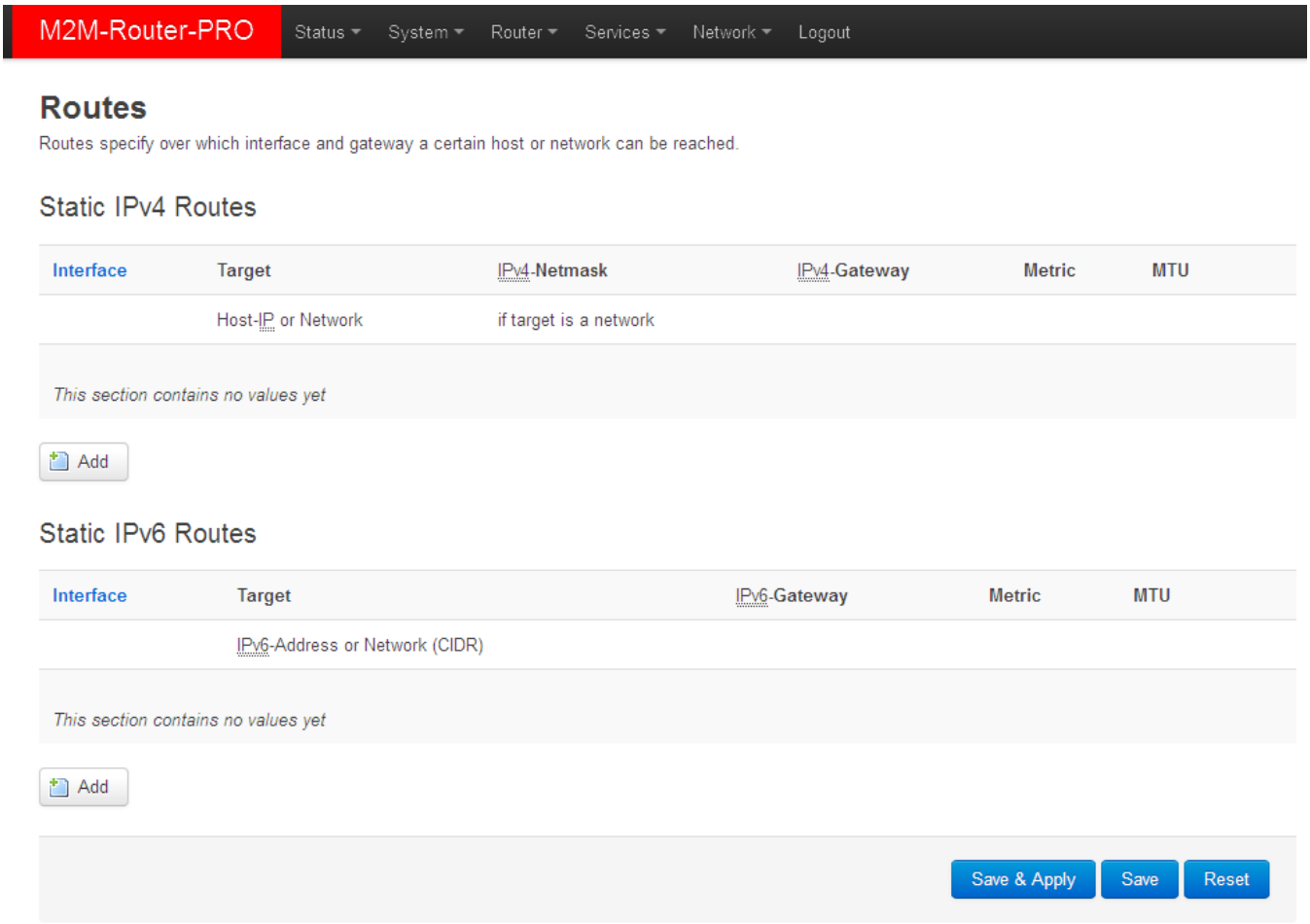
When you have modified the settings, save them by the **Save & Apply** button.

3.7 Defining the route rules

In the **Network** menu, **Static routes** item you can define the rules for the current routing.

You can define a new one by the Add button.

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



Save & Apply your settings here.

3.8 Firewall settings

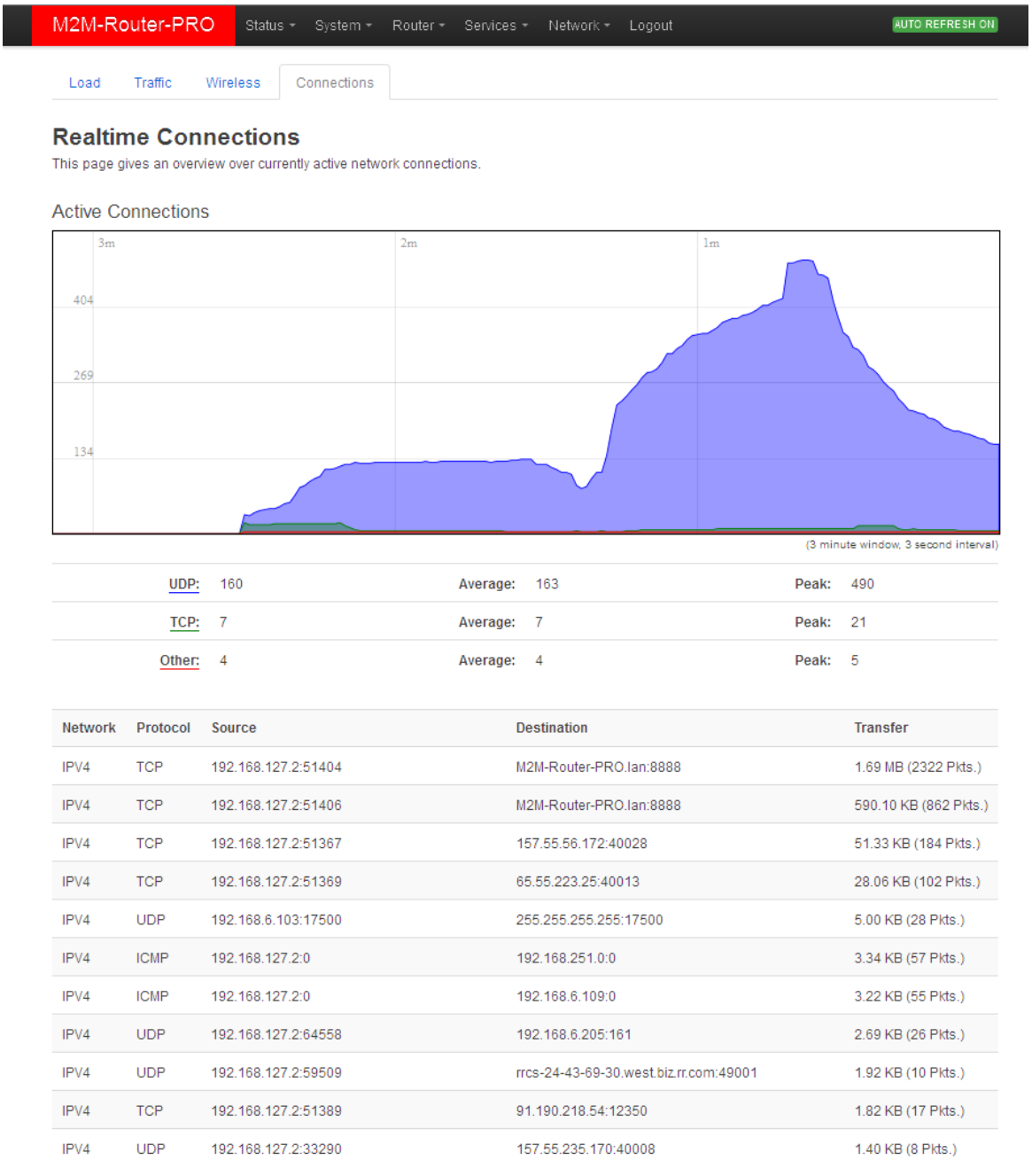
By default, the firewall is active, but it allows all communication. It can be necessary to limit the traffic.

On the public internet the 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 unnecessarly decrease the available data package amount of the SIM card in the router).

> ***Important!***
> *It is offered to check the network traffic on the router. Check the connections, the active communication channels (port number, incoming IP) and listen the incoming activities and for sure the output traffic! These all you can check in the* ***Status*** *menu,* ***Realtime Graphs*** *item at the* ***Connections*** *tab – where these can be listed.*

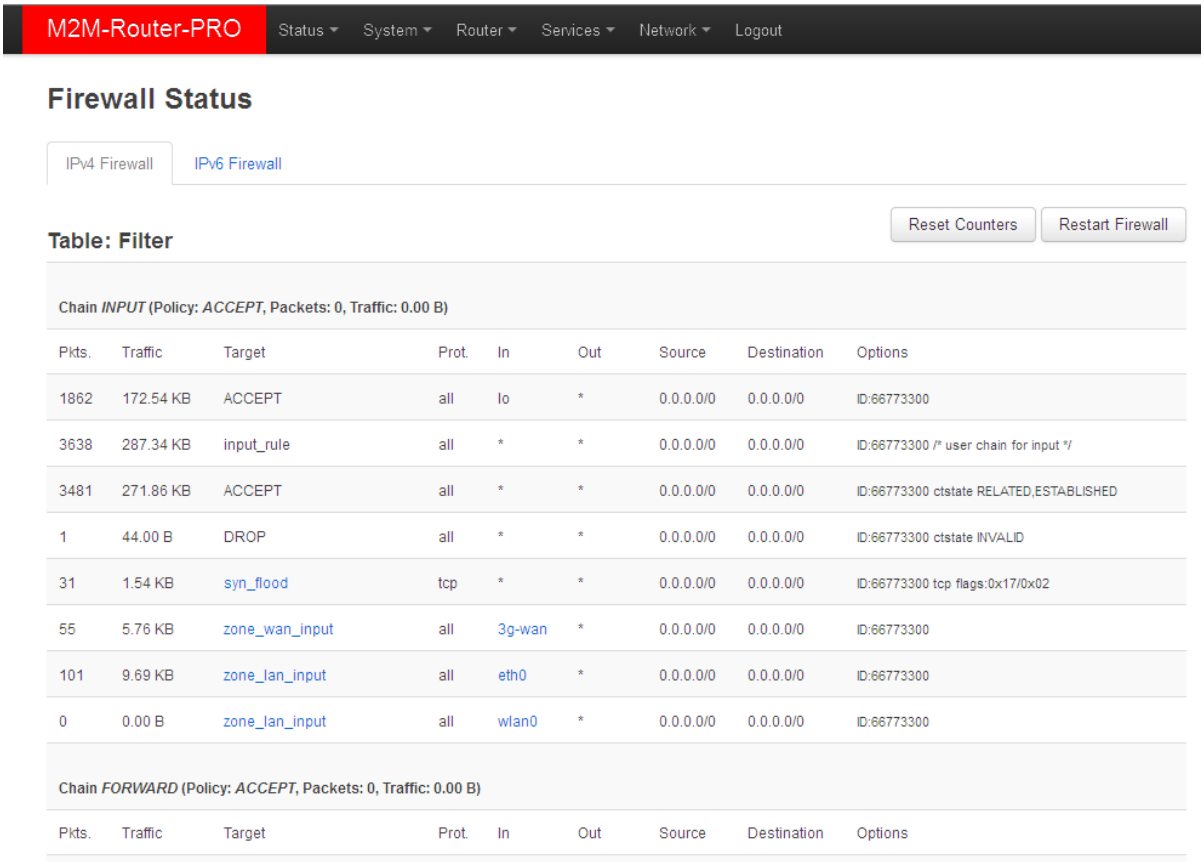
If will you identify communication from an unwanted IP/port, then you have to disable or limit the occured port or IP-segment at the firewall setting rules to deny this traffic.



Network	Protocol	Source	Destination	Transfer
IPV4	TCP	192.168.127.2:51404	M2M-Router-PRO.lan:8888	1.69 MB (2322 Pkts.)
IPV4	TCP	192.168.127.2:51406	M2M-Router-PRO.lan:8888	590.10 KB (862 Pkts.)
IPV4	TCP	192.168.127.2:51367	157.55.56.172:40028	51.33 KB (184 Pkts.)
IPV4	TCP	192.168.127.2:51369	65.55.223.25:40013	28.06 KB (102 Pkts.)
IPV4	UDP	192.168.6.103:17500	255.255.255.255:17500	5.00 KB (28 Pkts.)
IPV4	ICMP	192.168.127.2:0	192.168.251.0:0	3.34 KB (57 Pkts.)
IPV4	ICMP	192.168.127.2:0	192.168.6.109:0	3.22 KB (55 Pkts.)
IPV4	UDP	192.168.127.2:64558	192.168.6.205:161	2.69 KB (26 Pkts.)
IPV4	UDP	192.168.127.2:59509	rrcs-24-43-69-30.west.biz.rr.com:49001	1.92 KB (10 Pkts.)
IPV4	TCP	192.168.127.2:51389	91.190.218.54:12350	1.82 KB (17 Pkts.)
IPV4	UDP	192.168.127.2:33290	157.55.235.170:40008	1.40 KB (8 Pkts.)

In the **Status** menu, **Firewall** item you can check the firewall statistic. The **INPUT** means the incoming, the **OUTPUT** the outgoing/transmitted and the **FORWARD** means the forwarded communication/traffic hereby.

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



Another method for limitation is disabling all ports, to open / then enable only the necessary communication ports, IP-segments or allowing exact IPs.

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

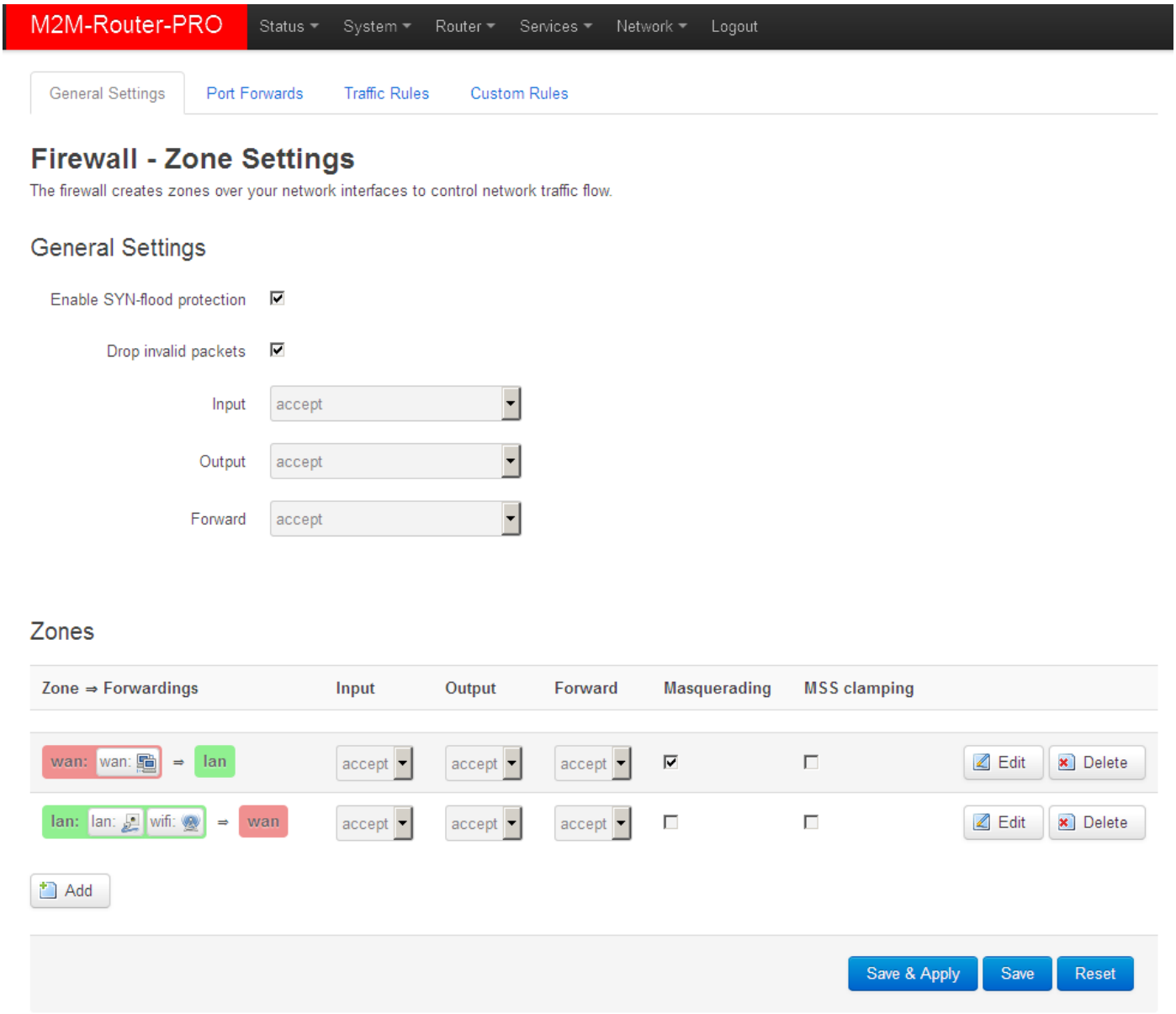
For first, the communication rules are listed here with the directions and operation of the communication rules.

Here, you can see and modify the general rules of 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.

At the **Zones** part you can Add a new rule to the current ones. You also can Delete or Edit an existed rule.

When you are attmepted to add a new firewall rule, it must be performed very carefully, because you can disable or tilt ports communication which are used by the router or some network services by general (e.g. Port nr. 67 is necessary for the DHCP service and 80 port for the, etc).



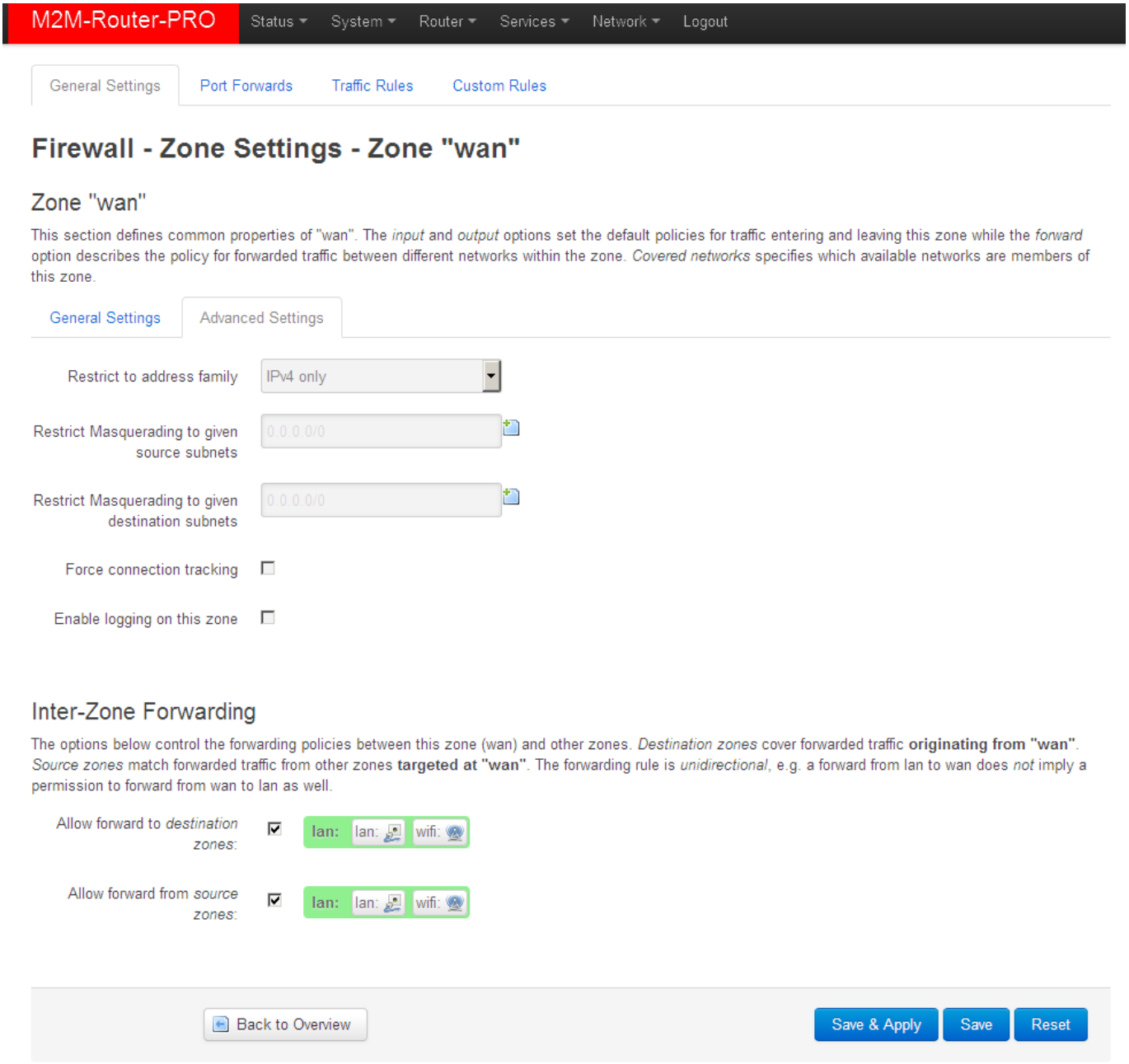
When you have modified the settings, save them by the **Save & Apply** button.

At the **Advanced Settings** tab you can limit the incoming, outgoing, and forwarded traffic for each subnets. When you have modified the settings, save them by the **Save & Apply** button.

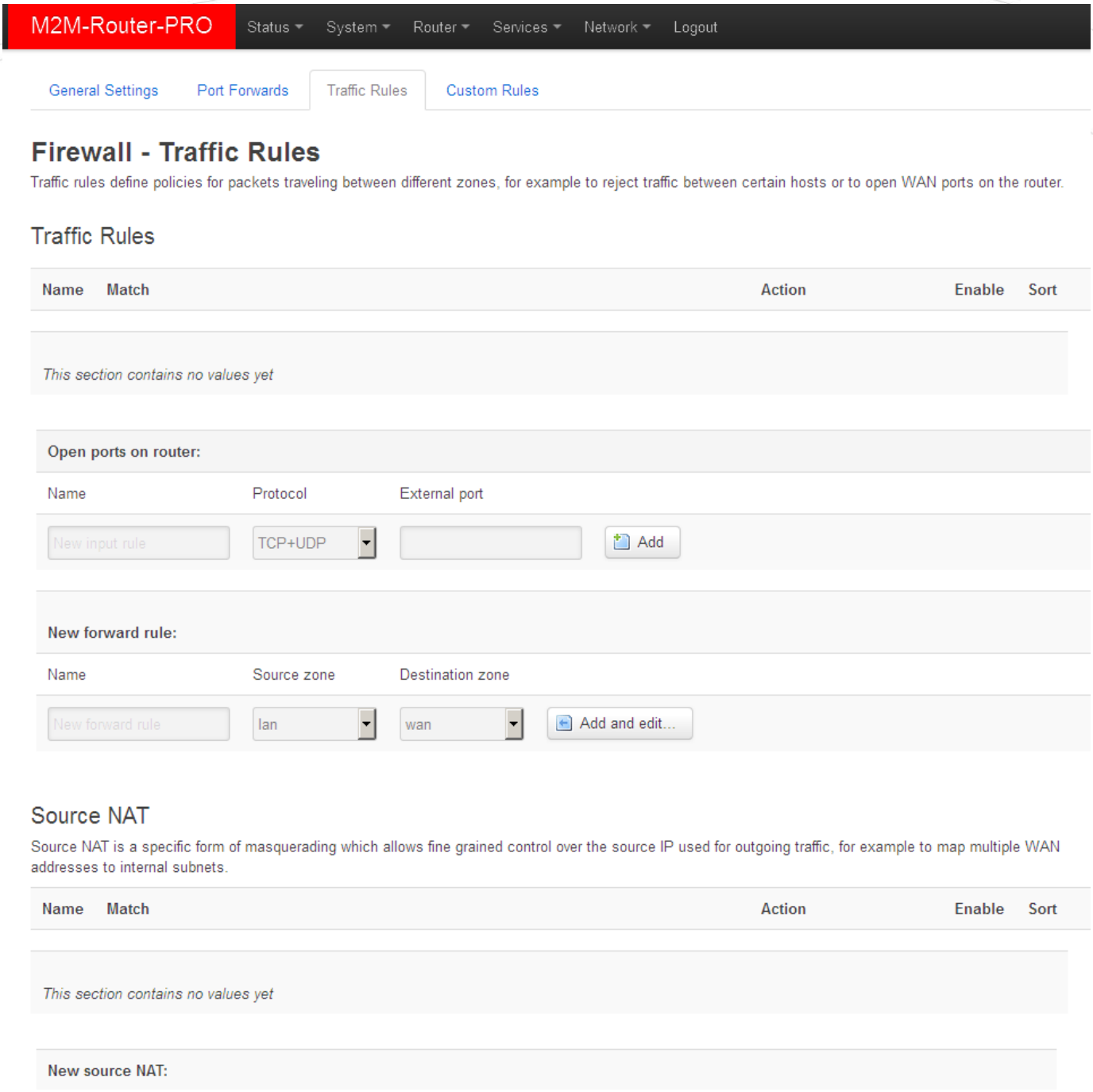
The firewall can be configured by default to allow or tilt the communication – according to the chosen settings.

The firewall is not protecting the router against external network attacks or intrusions if you will just enable the firewall feature.

For a massive safety, further port-level filtering or interface traffic limits or **Traffic Rules** settings are necessary to define!



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



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

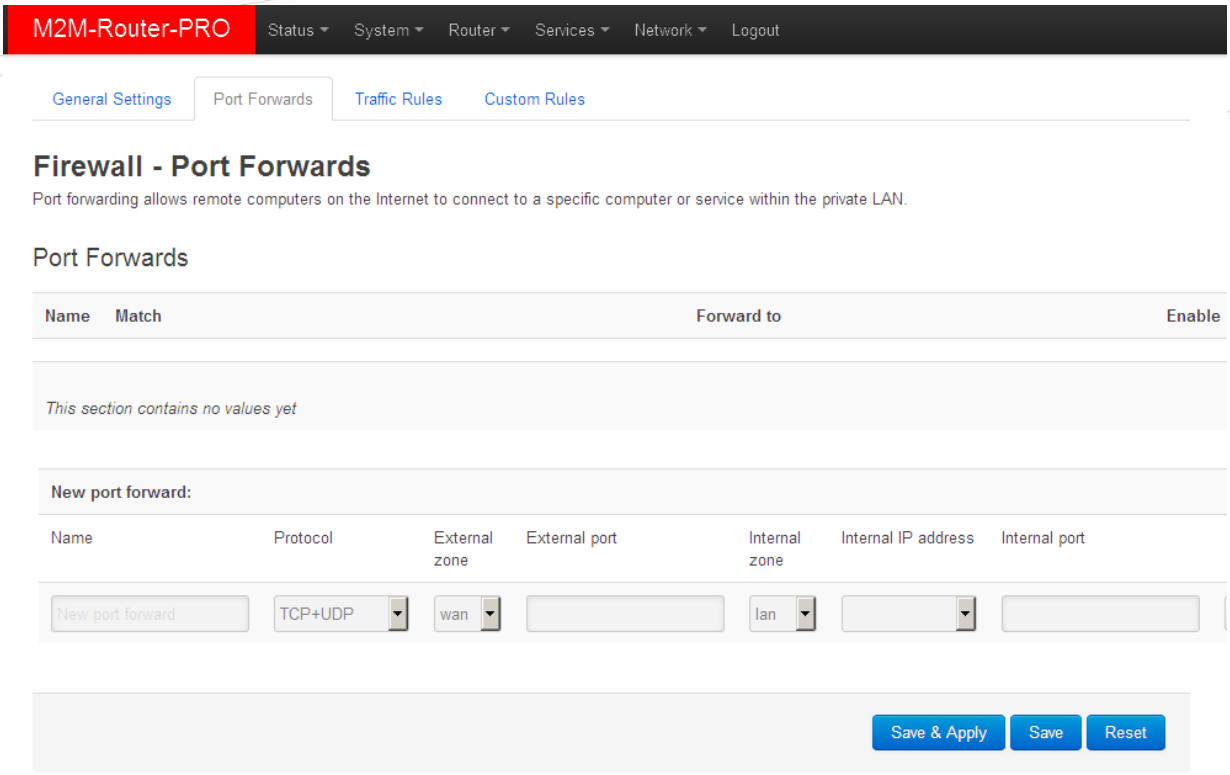
3.9 Port Forward settings

Here in the **Network** menu, at the **Firewall** item, **Port Forwards** tab you can setup, that which port forwarding rules should be valid. Here you can add the necessary ports and IP adresses.

You can add a new rule by the 

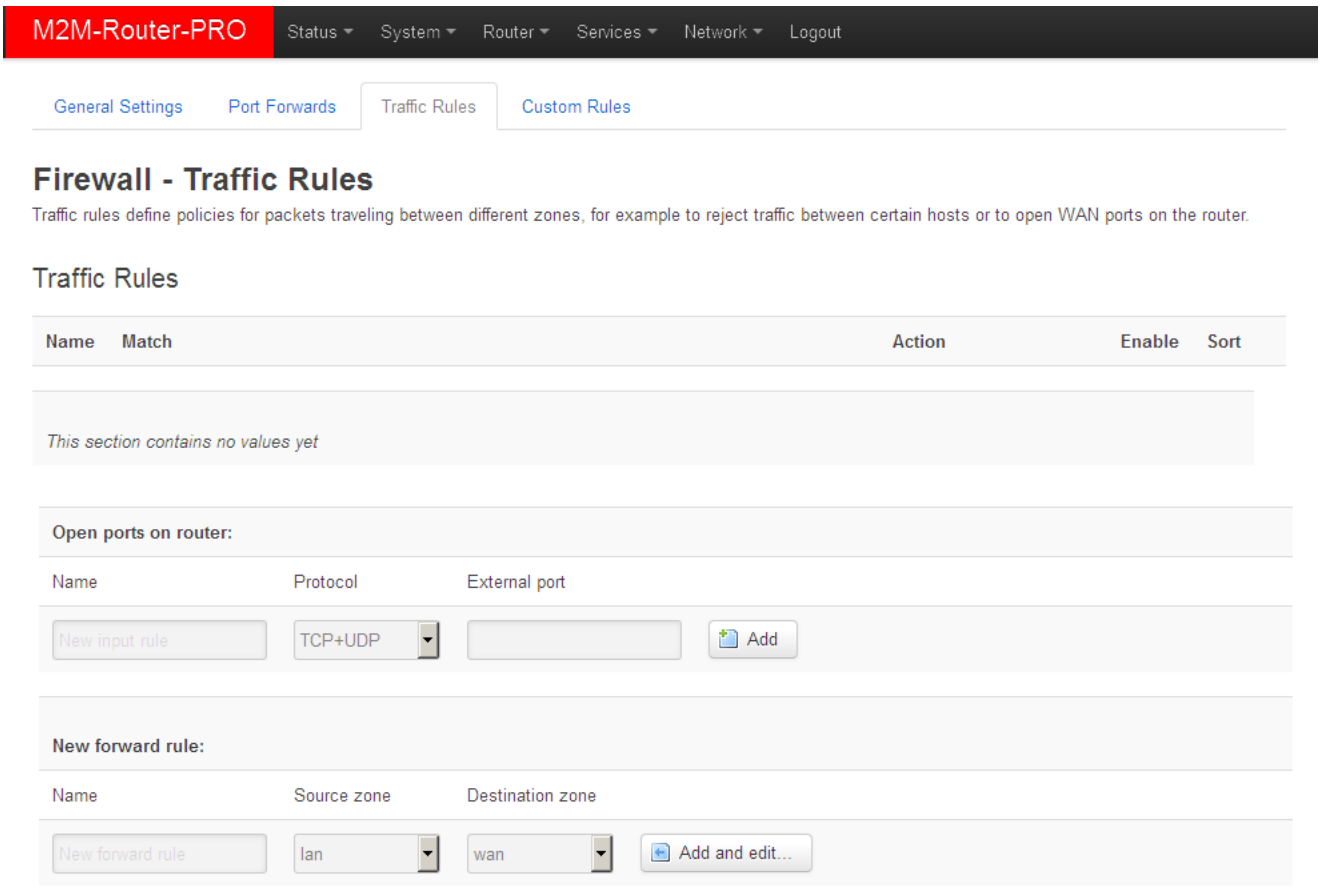
button.

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



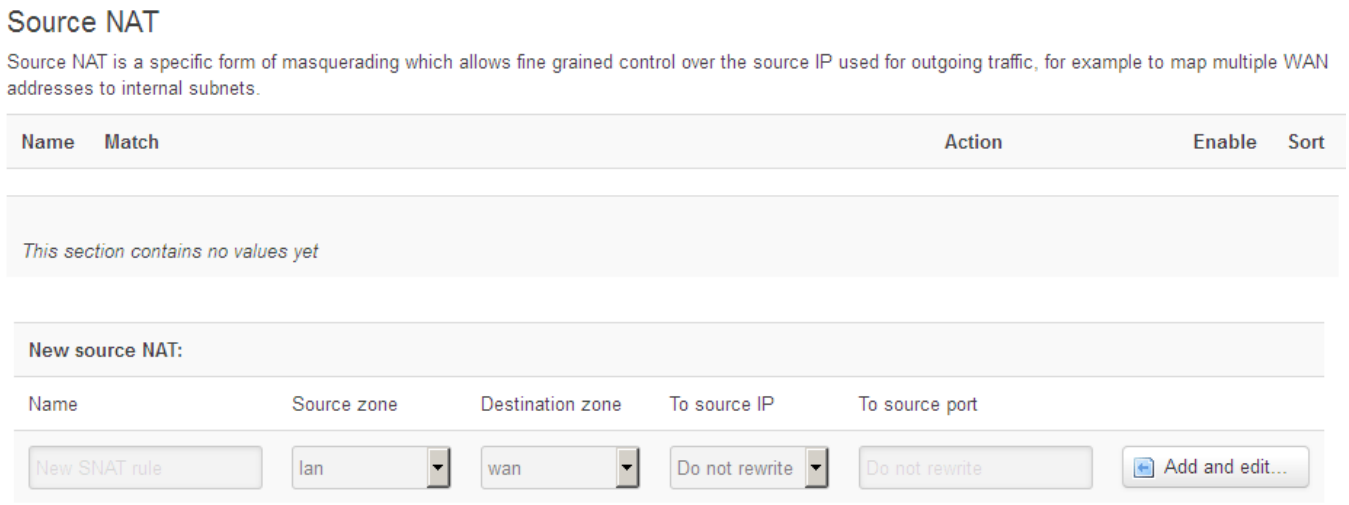
3.10 IP routing, NAT settings

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. Here you can open ports (e.g. for TCP) for the packages, or define new forwarding rule for interfaces (**New forward rule**).
When you modified the settings, save them by the **Save & Apply** button.

The **Source NAT** settings can be performed for each protocol (tcp, udp), that the router 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.



These rules must always be defined, not disallowing the general communication and must consider that the router must be further available on the network. It is easy to enclose the router from the network or disabling the remote access. Please, be careful when configure these settings.

Important!
Always check the used standard ports by the network services and allow these (e.g. FTP: port 21, SSH/Telnet: port 22, web: port 80, general network traffic on windows: 443, etc.).

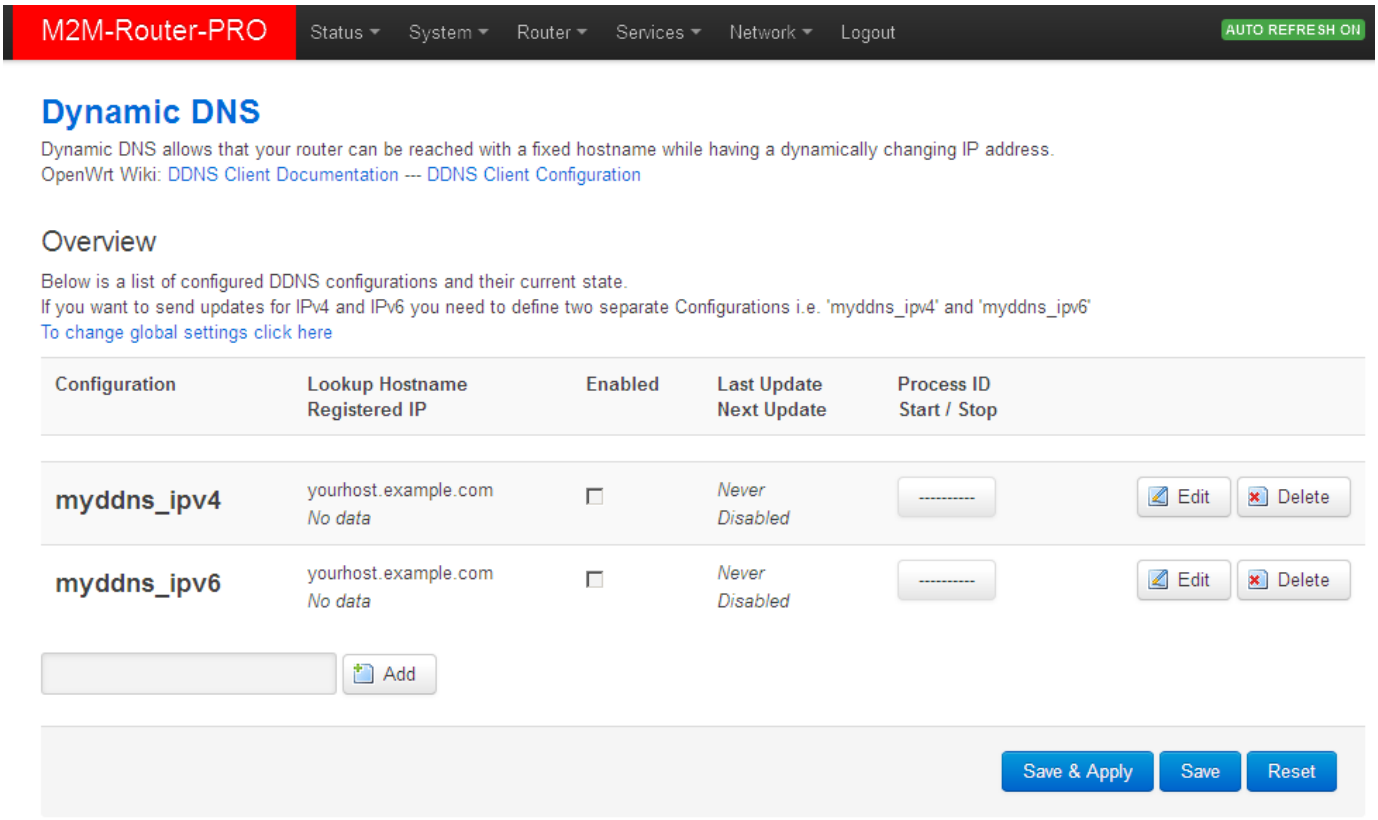
The proper port filtering, routes are minimizing the communication, what could be important by safety reasons, and could decrease the open threads and risks of safety leaks. Always limit the access of services, and decrease the amount of the througput communication on the network by rules to provide the operation of the necessary services, ports.

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

3.10 Dynamic DNS settings

In the **Services / Dynamic DNS** menu you can allow the DDNS service providing and the IP address of the DDNS.

New settings can be Add by the button or the current can be Edit -ed.



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

4. Special settings

4.1 M2M Device Manager settings

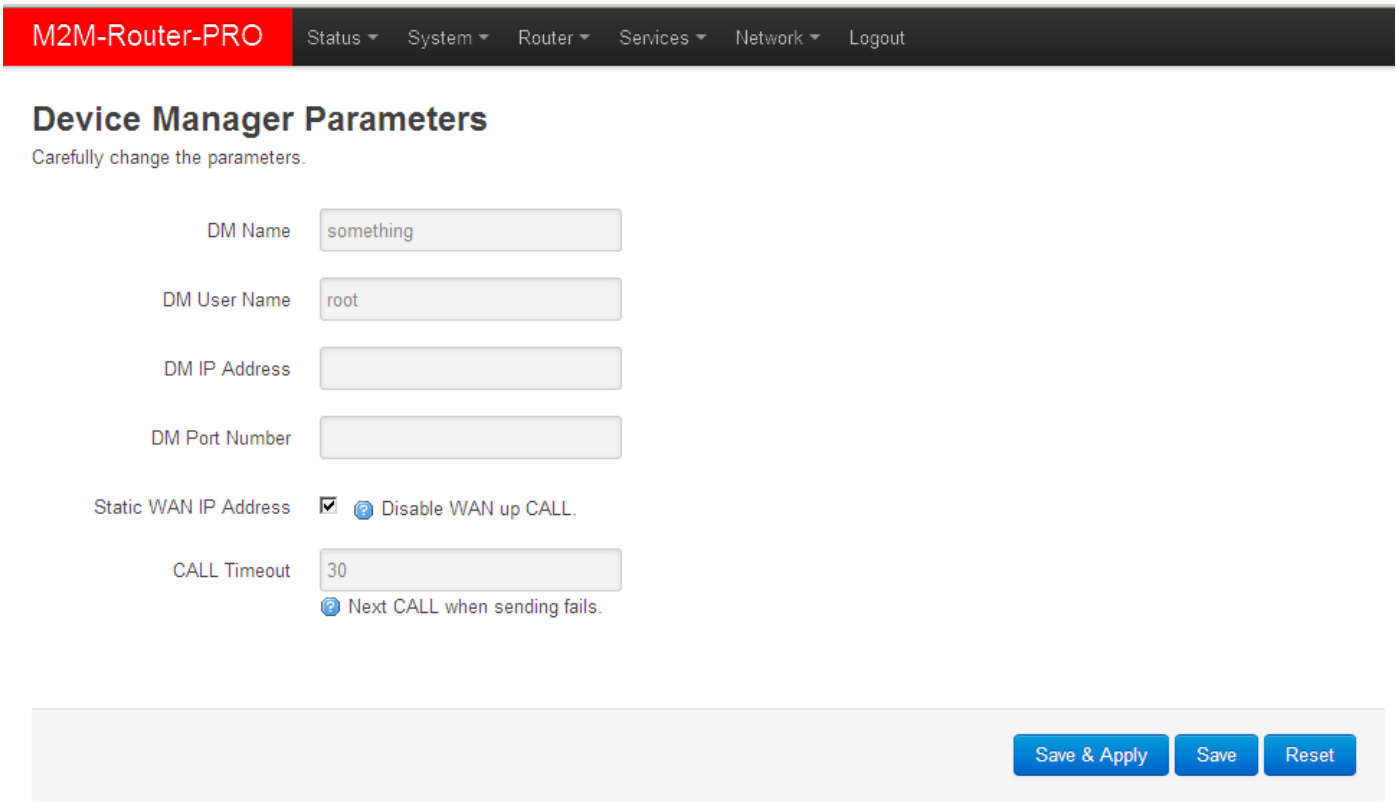
The further router parameters can be easily and remotely configured by the az *M2M Device Manager®* server application. It is also capable of performing remote monitoring and firmware updates.

The necessary Device Manager settings can be defined in the **Router / Device Manager** menu.

The main importants are the **DM IP Address**, the **DM Port Number** and **DM User Name**.

The **DM port number** is **443** by default.

These must be also configured in the Device Manager and the router must access the IP address of the M2M Device Manager. You can check it by performing a ping.

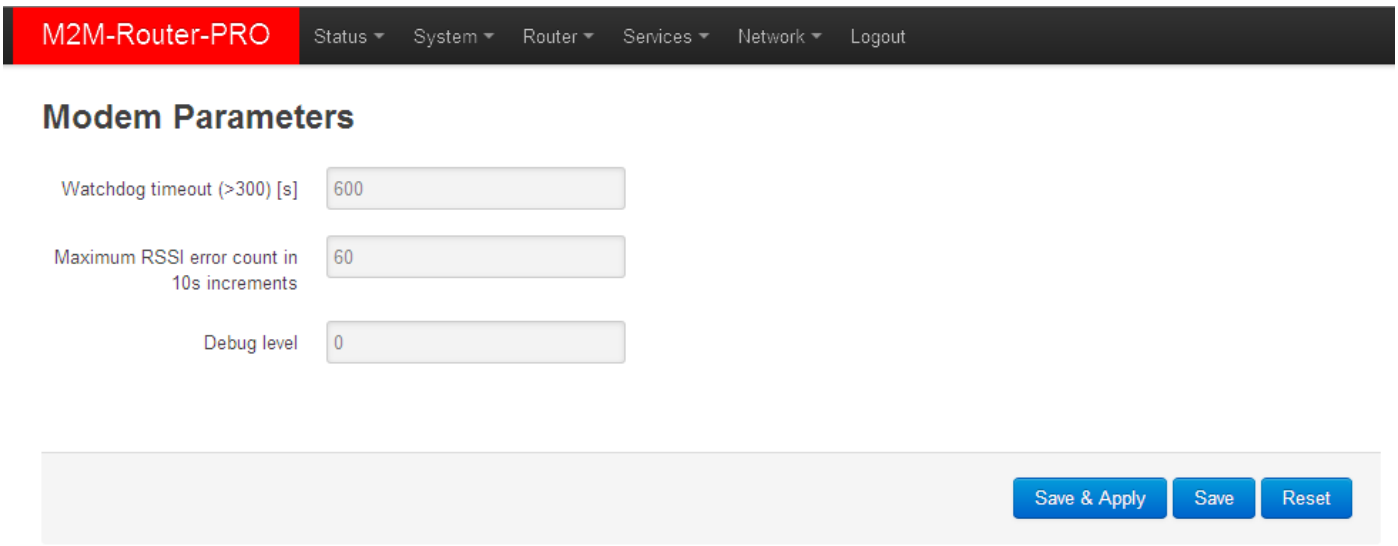


When you modified the settings, save them by the **Save & Apply** button.

4.2 Monitoring the modem

At the **Router / Modem Parameters** menu you can define some special operation monitoring and listener parameters for the modem. The **Watchdog timeout** can be declared as a modem restarting time interval trigger in case of mobile network unaccessibility.

The **Max. RSSI error count** means the possible max. error in case of continuous signal strength troubles. If it is permanently low or not available, the modem will be restarted as it is defined accorfing the **Watchdog timeout** parameter.



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

4.3 Ping an IP address

Open the **Network** menu, **Diagnostics** item. Here you can check the availability of an IP address, that is it accessible or can be pinged (**Ping**), is there a naming service provided, is there a response between two points (**Nslookup**), furthermire the path of the communication (**Traceroute**).

Important!

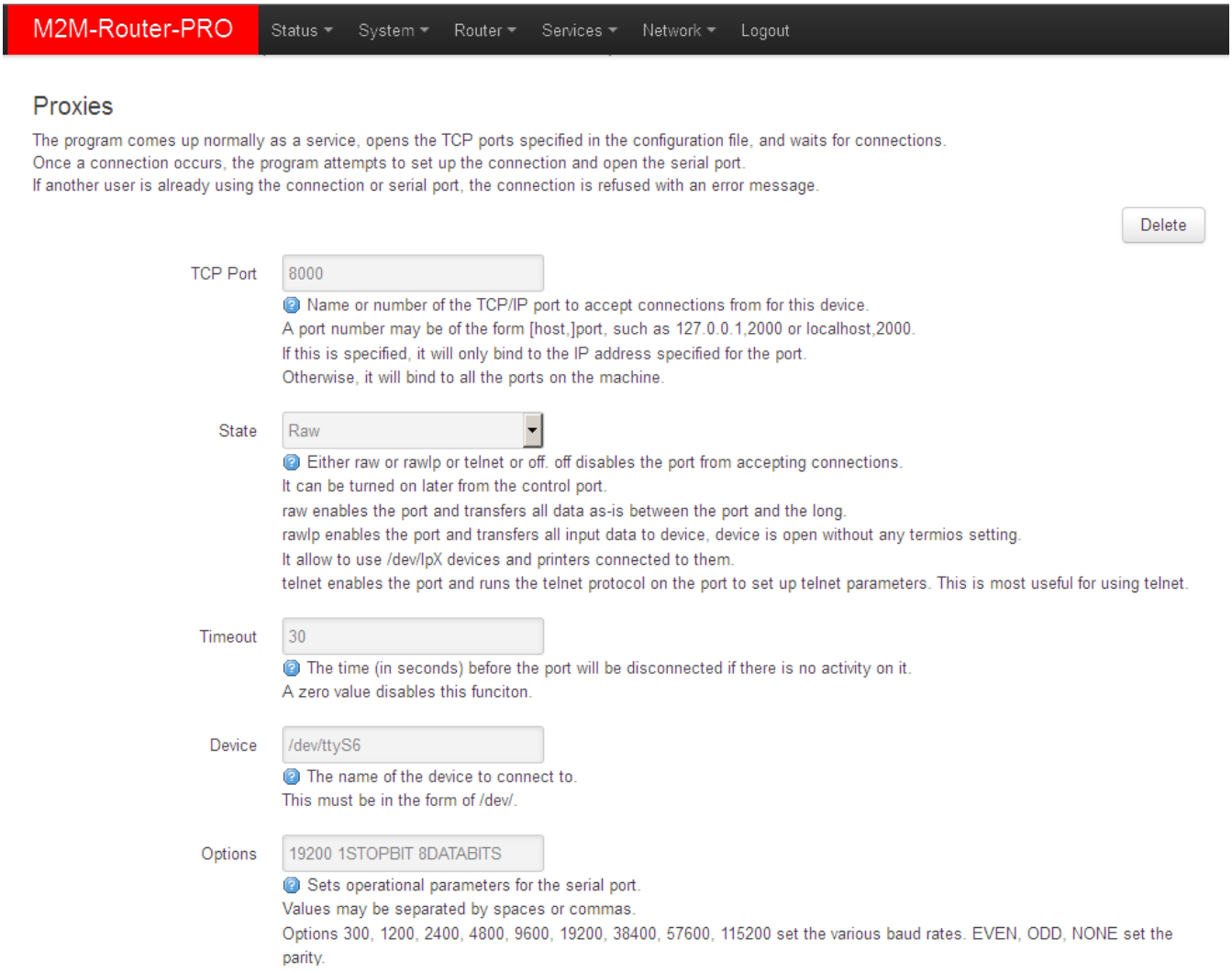
Check only IP addresses, which are available to access from the current IP segment and APN zone for sure (e.g. from an enclosed APN zone the router will not access the public internet, and from the public internet it will not access the enclosed M2M APN zone).

Important!

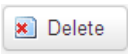
In case of M2M APN the 192.168.1.250 address can be accessed, it is possible to ping the address for checking the 3G network connection.

4.4 RS485/RS232 parameters

In case of present of the serial port and RS485 port expansion, at the **Services** / **Ser2net** menu you can define the elements of the protocol conversion, such as receiving the incoming communication in the proper format and the transparent forwarding.



At the bottom, you can 

or 

a new setting.

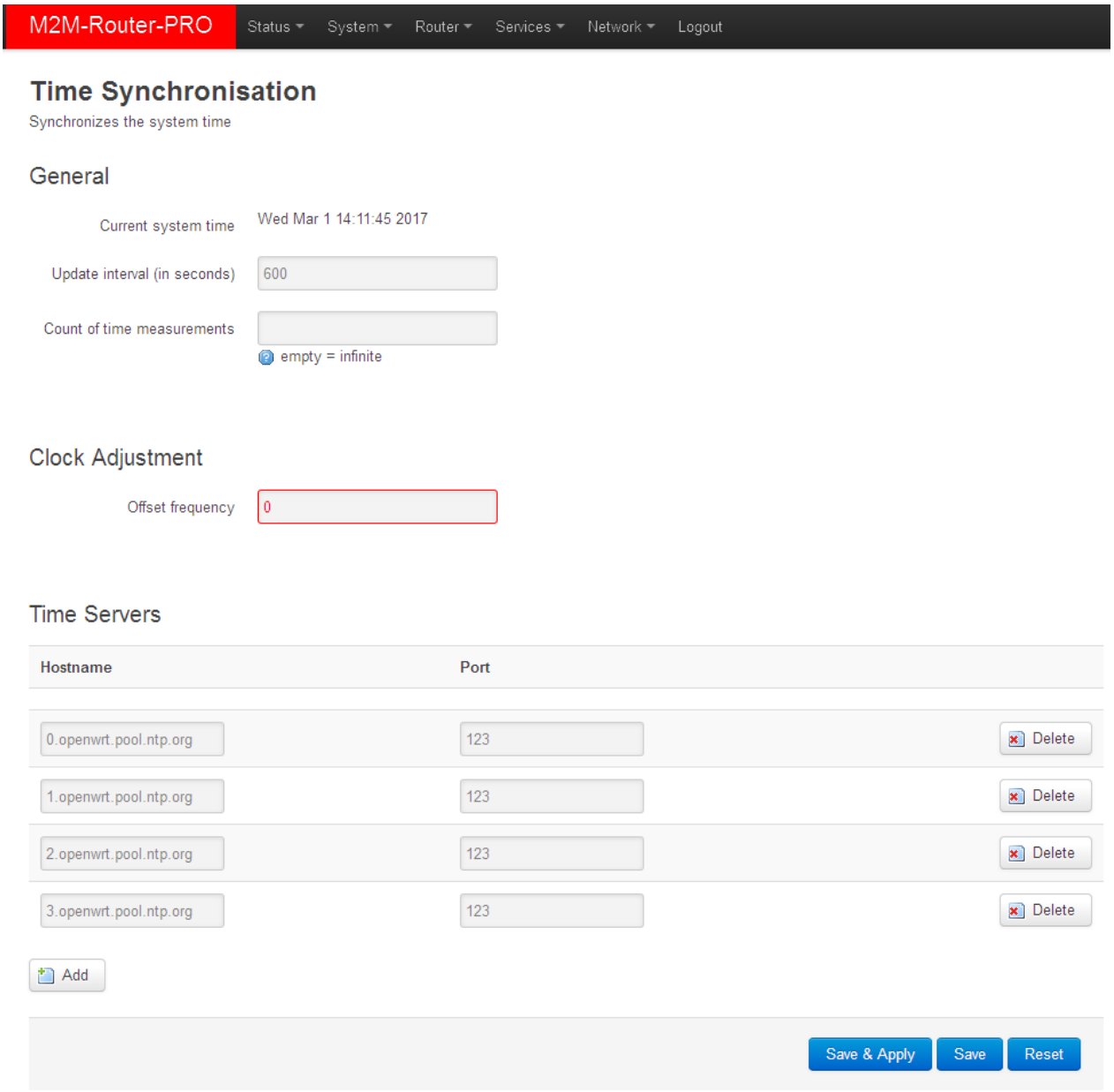
When you modified the settings, save them by the **Save & Apply** button.

4.5 Network Time Service (NTP)

Open the **System** menu, **Time Synchronisation** item.

You can add hereby the refresh interval at the **Update interval (in seconds)**.

You can define the time synch at the **Clock Adjustment**.



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

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

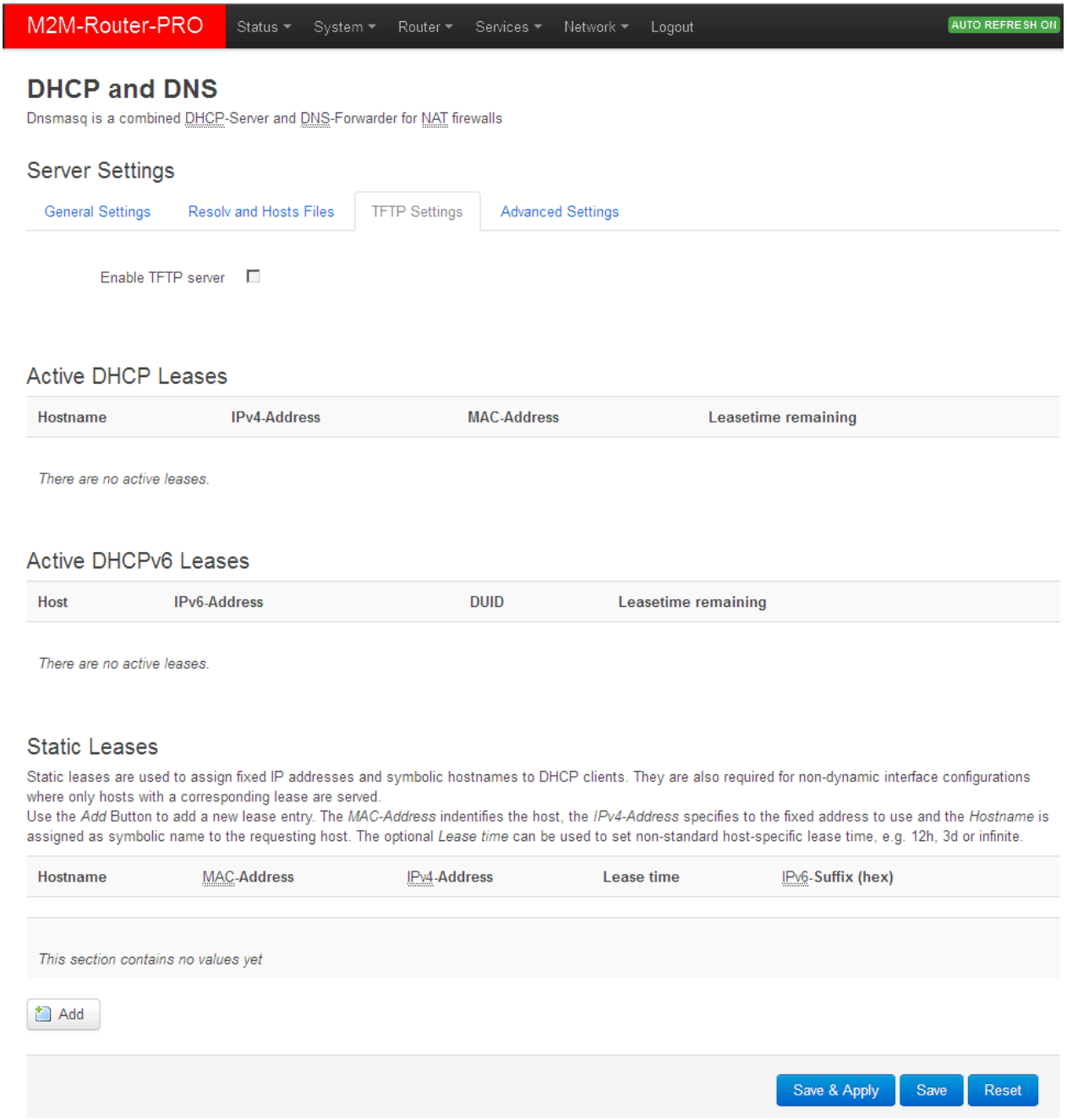
4.6 Identifiying names connecting machines

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

Here you can register those machines, network devices which are using the router connection - for an easier identification. You can add logical names to the IP addresses which you can see as listed at the status overview. When you modified the settings, save them by the **Save & Apply** button.

4.7 TFTP service settings

Open the **Network** menu, **DHCP and DNS** item, **TFTP settings** tab to allow the TFTP service **(Enable TFTP server)**, and the related further parameters.



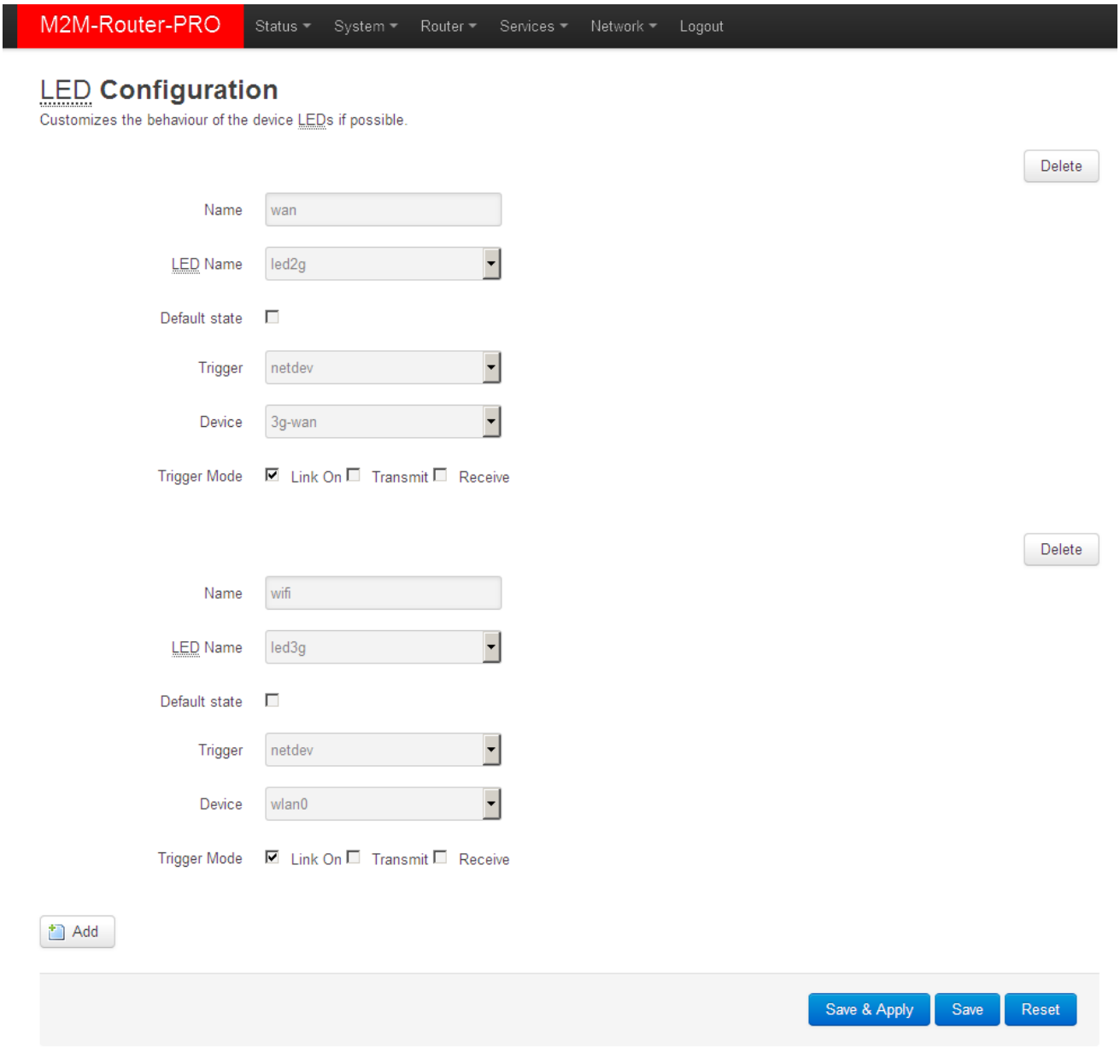
4.8 LED configuration

Open the **System** menu, **LED Configuration** item. Here you can define the LED operation rules for the main important events.

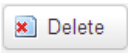
By the **Name** field you can identify a rule, at the **LED Name** filed, where you can choose the LED light according to the following:

- *leg2g* – LED2 green light
- *led1r* – LED1 red light
- *led3g* – LED3 green light
- *led2r* – LED2 red light
- *led3r* – LED3 red light

Only the free – not used - LED statuses will be visible and listed here.



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

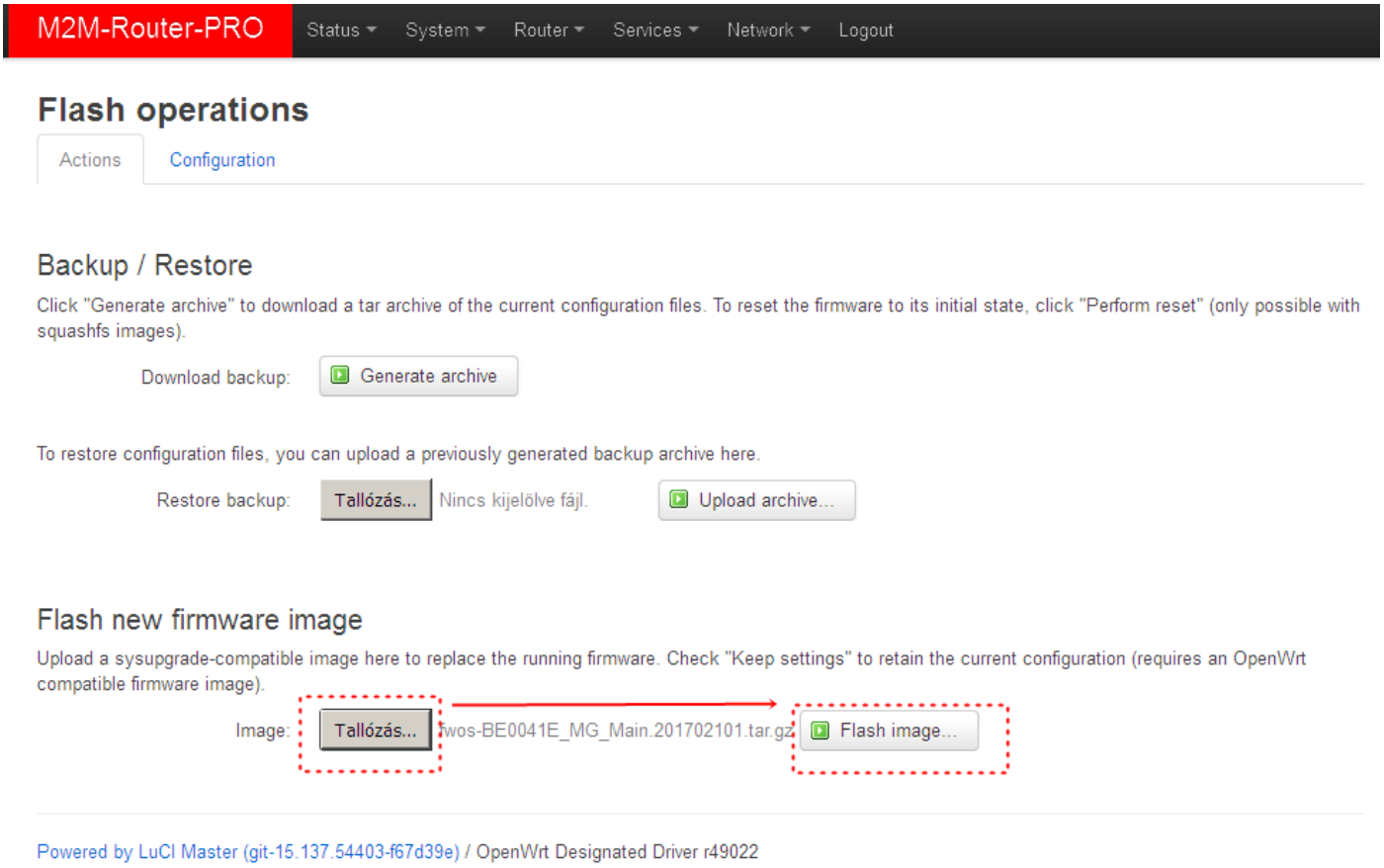
You can  or  a LED setting.

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

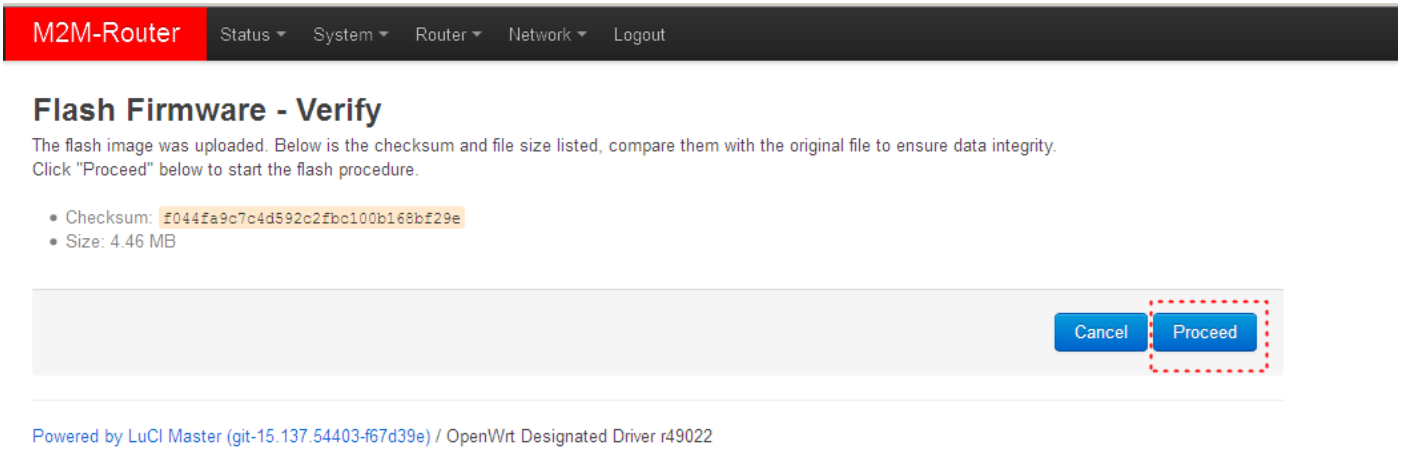
5. Software refresh and router maintenance

5.1 Firmware refresh

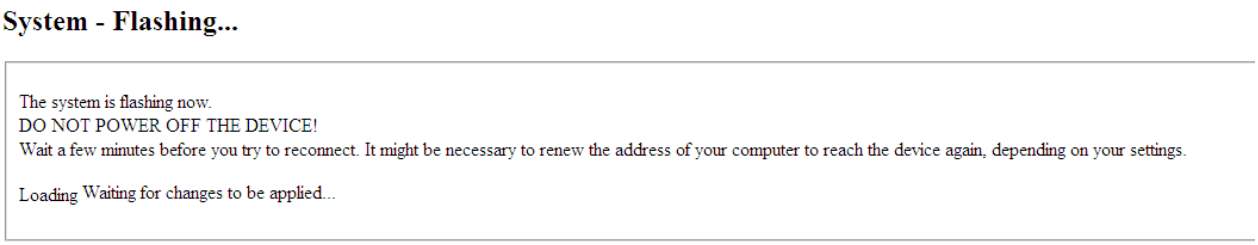
1. Open the **System** menu, **Backup / Flash firmware** item.
2. Browse the ***fwos-***…. compressed file then push to the **Flash image** button.



3. A new window will appear where the file will be checked. When it is okay, the system refreshment is possible by the **Proceed** button.



4. Then the next message appears on the screen in the browser. Then the refresh method has started, while the **LED2** and **LED3** is continuously lidghting by red.



5. Later the **LED2** wil blandk and only the **LED3** lighting with red.

6. At the end of the installation – the LEDs are not lighting further – the system restarting twice while **all the three LEDs** are continuously **lighting** with green, then the OpenWrt system will be loaded as it was described before.

> ***Important!***
> *This flashing… window will not closed automatically, and the browser cannot sense the availability of the OpenWrt site. Then, close the windows after the refresh and open a new with the default URL in your browser.*

7. When the middle **Cell LED** is lighting continuously in green. Login to main page again, and check the updated software version!

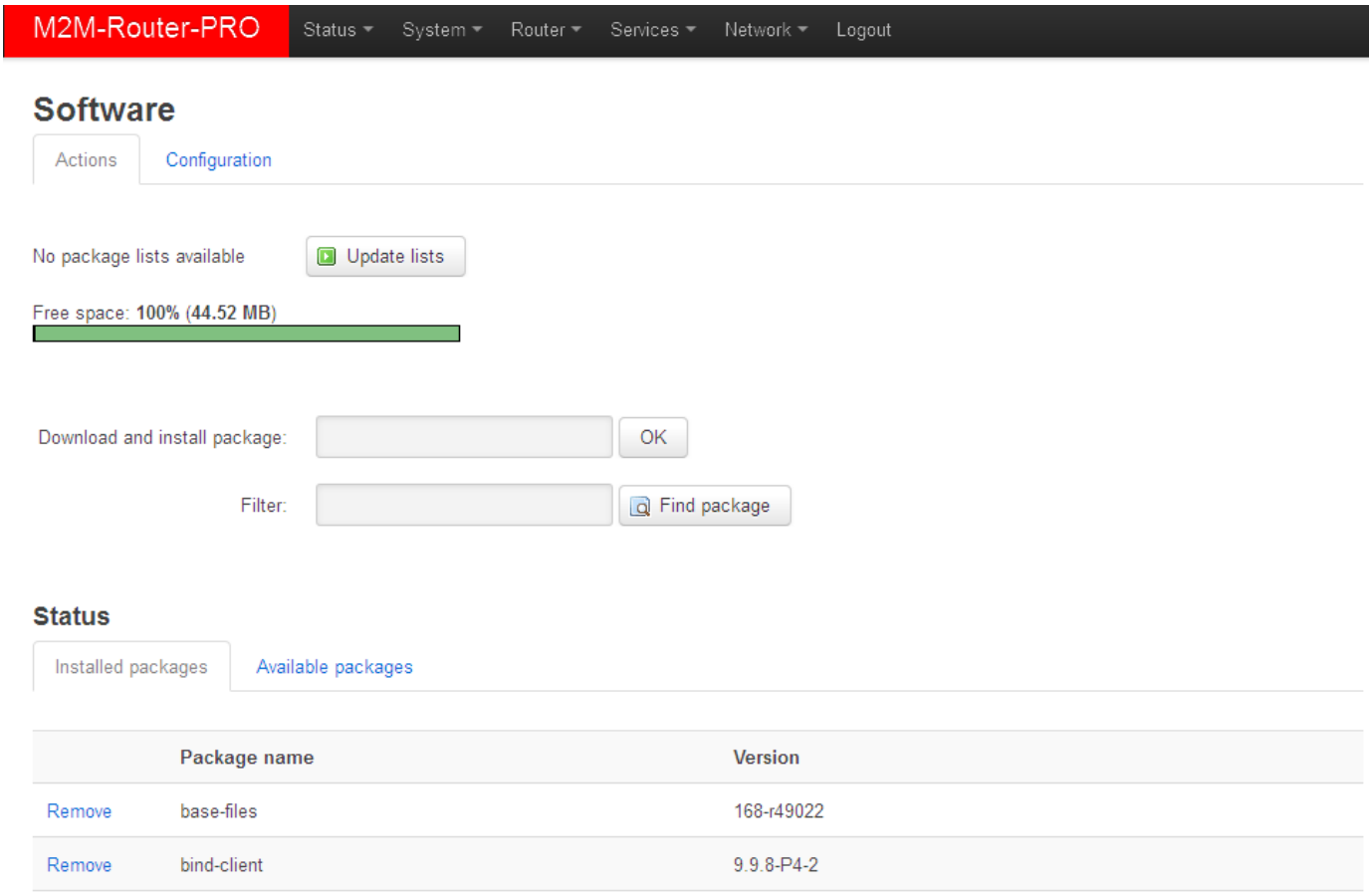
5.2 Installing applications

Open the **System** / **Software** menu.

> ***Important!***
> *This feature is available when the public internet can be accessed by the SIM card, APN zone.*

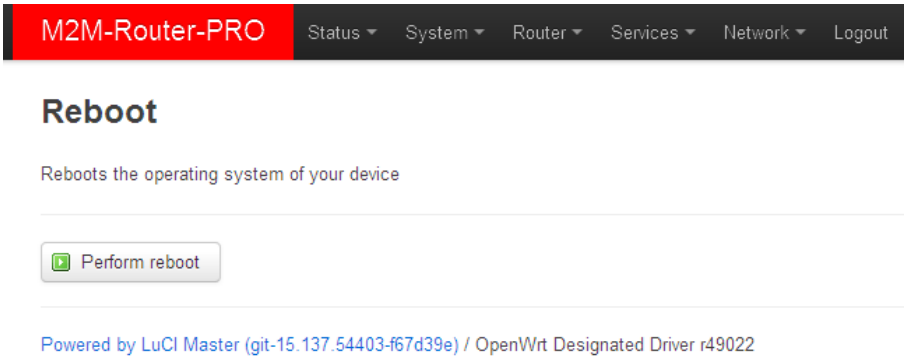
You can refresh the catalog of the available applications by the **Update lists** button.

When it was successful, fill the name of the application you are attempted to install at the **Download and install package** field (e.g. MC – Midnight Commander esetében), and push to the **OK** button for the installation – regarding the upcoming hints on the screen.
The installed packages of the router are listed lower at the **Status** part.



5.3 Restarting the router

Choose the **System** / **Reboot** item and push upon the **Perform reboot** button. Then the router will be restarted as it was described before (**the 3 LEDs lighting shortly** by red colour for a second, and the **St. LED** flashing assigns the booting process, then the router will be operating as normal, and will be connected to the internet according the configuration settings.



5.4 Reset

When the router is not reacting or it was not possible to configure properly, push int he **Reset** titled low-case button for 10 seconds – by a sharp and thin object. Then the router will be restarted by the factory configuration, whereas the LED lights will assign it. After a few minutes, the router will be available and accessible on its default address.

> ***Important!***
> *Configure the router on its web user interface!*

5.5 Password change

Open the **System / Administration** menu.

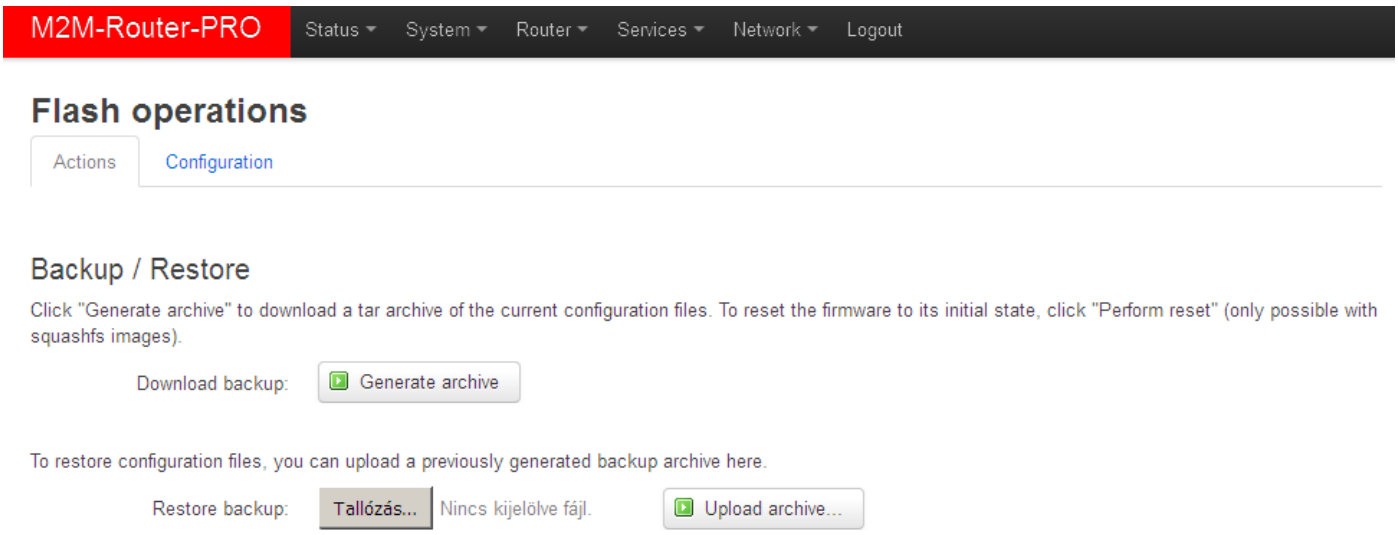
At the **Router password** you can fill the new **Password** and again to the **Confirm password** fields. Now, you will be able to login with this new password.

(Remember: the default account name is *root*, the default password is *wmrpwd).*

5.6 Backup and restore of settings

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

At the **Backup / Restore** part and **Download backup** feature push the Generate archive button for saving the settings into a file.



The **Restore backup** is possible to reload – a previously saved configuration – when you will be able to browse and load from your computer to the router memory by pushing the 

button.

5.7 Handling the memory cards

The router is able to handle the connected and mounted uSD cards, USB memory sticks. But these are only possible to access from the Linux command line (ssh connection).

The partitions and memory areas are listed when you will attempted to choose the **System** / **Mount Points** menu. At the **Mount Points** part will be listed the automatically connected and mounted devices. These will be attached under the /mnt.

6. Troubleshooting

LED activities

Can you see a LED signal activity?

It is not sure that after 2 minutes of LED inactivity it must mean a failure. It is possible that the router is currently under restart progress or it has just booting. Wait 2-3 minutes, then check the LEDs. If the **LED1..LED2..LED3** are not blinking or light then the device hasn't got its power supply or the device has damaged, or it has a malfunction.

In case of LED blinking after restart

After cca. 2 minutes of the the router starting, the **LED1** start to blinking by green (once in every second). Then after cca. 2 minutes the **LED1** will flashing further once in every 10 seconds.

Then the **LED3** starts to blinking in green. The router tries to connect to the mobile network (autenticates and logging to the APN zone and will be initiating the network connection).

(In case of 4G version, the after connecting the **LED3** will not lighting – the LED is inactive).

The device is communicating on the network and will send a couple of minutes later proper *RSSI* values and life signals. During the operation, the **LED1** will blinks once in every 10 seconds. This means the normal operation of the router.

Power supply

Check that the router that it has its power source through its microfit connector (**POWER**). If it does not, then reconnect the power cable. When it has its power source the LED signals will sign it. In this case please wait for 2-3 minutes, while the router will register to the network then check the life signals. When the power source will be added, all then the **LED1** (green) will lighting for 2 minutes, then after that only blinks once in every 10 seconds. The router is booting and just started. When it is ready to operate, login and check the life signals.

Cable connection

Check or connect the RJ45 UTP cable to the **ETHERNET** port. When the router is operating, the **Ethernet** port LEDs must sign the network activities.

Continuous restarting…

When the modem is not available or cannot be connected to the network, then the router will be restarted in every 2 minutes!

When the ppp/wan connection is not configured properly or the modem was not perperly confugzred, the router will be restarted in every 10 minutes.

Antenna

Check or connect proper SMA fit antenna to the **Antenna** connector and mount it to the interface. The router must send and assure proper RSSI signal value and life signals after 2-3 minutes of the starting.

In case of using WiFi, use WiFi antenna!

SIM-card is not detected

Turn off the router – **POWER** plug disconnection. Check that a SIM card was inserted to the **SIM** holder in the proper position and orientation. Push the SIM card back and ask you Mobile Operator that the SIM card is active or not. Let's start the router again and check it, please.

SIM/APN failure

It means a SIM or APN failure, if the **Cell. LED** will not lighting for minutes. If the device is not registering to the network, then the modem was not initiated properly, and the router will restart itself after 10 minutes.

This could caused by a not proper APN setting (you can configure it on the local web user interface).

Connection to the router, checking the connection

Configure the **Ethernet interface** IP address on your PC where you can access it (**Control panel / Network / Network Adapter / Adapter settings**). Ping the router IP address.

When the router will not started…

Follow the hints of the Installation manual.

Cannot access the router on ssh or on the LuCi web interface

The DHCP service is turned off for the router Ethernet interface, by default. Therefore, you have to configure an IP address for you PC, manually. Add fog e.g. 192.168.127.10 IP address to your computer's Ethernet interface for connecting to the router.
(If you have the WiFi onboard version of the router, then you can configure your router on WiFi (DHCP activated).
For accessing the web user interface we offer the Mozilla Firefox web.

Default web user interface (LuCi) address is: https://192.168.127.1:8888

- **Username**: ***root***
- **Password**: ***wmrpwd***
- then push to the **Login** button.

Allow the accessing of the router default IP address in your browser by pushing to the Special button, then allow the safety exclusion into the pop-up window.

7. Support availability

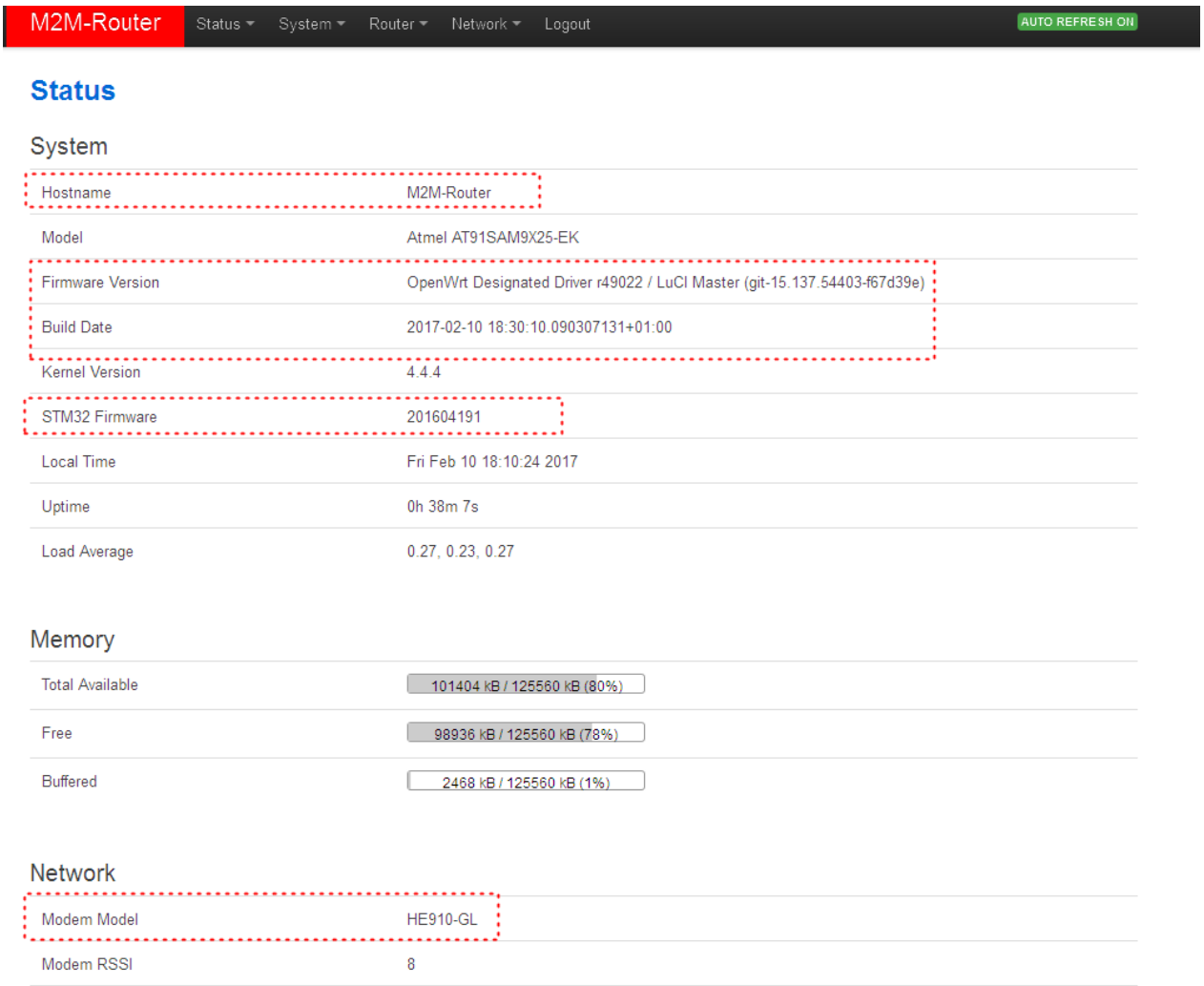
If you have any questions concerning the use of the device, contact us at the following address:

E-mail: support@m2mserver.com

Telephone: +36203331111

7.1 Contact the support line

For the proper identification of the router you should use the sticker on the device, which contains important information for the call center.
Attach the OpenWrt related important information – marked - of modem identifiers to the problem ticket, which will help resolving the problem! Thank you!



7.2 Product support

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

The documentation and software released for this product can be accessed via the following link:
http://www.m2mserver.com/en/support/

Online product support can be required here:
http://www.m2mserver.com/en/support/

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