# TK804

Version:
**v1.2.17**

Date:
**05.08.2026**

# Contents

# 1 Introduction

## 1.1 Copyright Notice



## 1.2 Trademarks

Welotec is a registered trademark of Welotec GmbH. Other trademarks mentioned in this manual are the property of their respective companies.

## 1.3 Legal Notice

The information in this document is subject to change without notice and is not a commitment by Welotec GmbH.

It is possible that this user manual contains technical or typographical errors. Corrections are made regularly without being pointed out in new versions.

## 1.4 Technical Support Contact Information

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## 1.5 Description

The Welotec TK804L-450, part of the rugged TK804 industrial router series, delivers highly reliable cellular connectivity across 2G, 3G, and 4G LTE networks. Engineered for demanding environments, it offers exceptional performance and versatile deployment options—including DIN-rail installation—making it ideal for mission-critical applications in industries like automation, smart grids, water management, and remote monitoring.

## 1.6 *Important Safety Notes*:

**This product is not suitable for the following areas of application**

- Areas where radio applications (such as cell phones) are not allowed
- Hospitals and other places where the use of cell phones is not allowed
- Gas stations, fuel depots and places where chemicals are stored
- Chemical plants or other places with explosion hazard
- Metal surfaces that can weaken the radio signal level

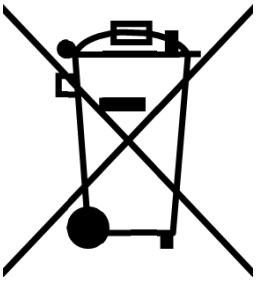
## 1.7 Warning

This is a Class A product. In a domestic environment its use may cause radio interference in which case the user may be required to take adequate measures.

## 1.8 WEEE Notice

The European Directive on Waste Electrical and Electronic Equipment (WEEE), which became effective on February 13, 2003, has led to major changes regarding the reuse and recycling of electrical equipment.

The main objective of this directive is to prevent waste from electrical and electronic equipment and to promote reuse, recycling and other forms of recovery. The WEEE logo on the product or packaging indicates that the product must not be disposed of with other household waste. You are responsible for disposing of all discarded electrical and electronic equipment at appropriate collection points. Separate collection and sensible recycling of your electronic waste helps to use natural resources more sparingly. In addition, proper recycling of waste electrical and electronic equipment ensures human health and environmental protection.



[redacted]

For more information on disposal, recycling, and collection points for waste electrical and electronic equipment, contact your local municipal authority, waste disposal companies, the distributor, or the manufacturer of the equipment.

# 2 Regulatory Compliances

## 2.1 Complies with the following EU directives

| No | Short Name |
|---|---|
| 2014/35/EU | Low Voltage Directive (LVD) |
| 2014/53/EU | Radio Equipment Directive (RED) |
| 2014/30/EU | Electromagnetic Compatibility (EMC) |
| 2011/65/EU | Restriction of the use of certain hazardous substances in electrical and electronic equipment Directive (RoHS2) |
| 2015/863/EU | Amendment to Annex II in Directive 2011/65/EU regards the list of restricted substances (RoHS3) |

# 2.2 References of standards applied

| Standard | Reference | Issue |
|---|---|---|
| EN 18031-1 | Common security requirements for radio equipment - Part 1: Internet connected radio equipment | 2024 |
| EN 55032 | Electromagnetic compatibility of multimedia equipment - Emission Requirements | 2015+A11:2020+A1:2020 |
| EN 55035 | Electromagnetic compatibility of multimedia equipment - Immunity requirements | 2017+A11:2020 |
| EN 301 489-1 | ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility | V2.2.3 |
| EN 301 489-52 | ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication User Equipment (UE) radio and ancillary equipment; Harmonised Standard for ElectroMagnetic Compatibility | V1.2.1 |
| EN 301 511 | Global System for Mobile communications (GSM); Harmonised EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC) | V12.5.1 |
| EN 301 908-1 | IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements Release 15 | V15.2.1 |
| EN 301 908-13 | IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE) | V13.2.1 |
| ETSI TS 151 010-1 | Digital cellular telecommunications system (Phase 2+) (GSM); Mobile Station (MS) conformance specification; Part 1: Conformance specification | V12.8.0 |
| ETSI TS 136 521-1 | LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Conformance testing | V16.9.0 |
| EN IEC 62311 | Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz) | 2020 |
| EN IEC 62368-1 | Safety requirements: Audio/video, information and communication technology | 2020+A11:2020 |

# 3 Safety Instructions

Please read these instructions carefully and retain them for future reference.

1. Disconnect this equipment from the power outlet before cleaning. Do not use liquid or sprayed detergent for cleaning. Use a moist cloth or sheet.
2. Keep this equipment away from humidity.
3. Ensure the power cord is positioned to prevent tripping hazards and do not place anything on top of it.
4. Pay attention to all cautions and warnings on the equipment.
5. If the equipment is not used for an extended period, disconnect it from the main power to avoid damage from transient over-voltage.
6. **Prolonged usage with less than 9V may damage the PSU or destroy the mainboard.**
7. Never pour any liquid into openings as this could cause fire or electrical shock.
8. Have the equipment checked by service personnel if:
    - The power cord or plug is damaged.
    - Liquid has penetrated the equipment.
    - The equipment has been exposed to moisture in a condensation environment.
    - The equipment does not function properly, or you cannot get it to work by following the user manual.
    - The equipment has been dropped and damaged.
9. Do not leave this equipment in an unconditioned environment, with storage temperatures below -40 degrees or above 85 degrees Celsius for extended periods, as this may damage the equipment.
10. Unplug the power cord when performing any service or adding optional kits.
11. Lithium Battery Caution:
    - Risk of explosion if the battery is replaced incorrectly. Replace only with the original or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
    - Do not remove the cover, and ensure no user-serviceable components are inside. Take the unit to a service center for service and repair.

# 4 Quick Start Guide

Guide to installation and comissioning of the TK804 series. Please ensure that all package contents are present upon delivery. If you need a SIM card, contact your local network operator.

## 4.1 Package Contents

Each TK804L-450 is supplied in a box with standard accessories. Optional accessories can also be ordered. Check the contents of the box. If something is missing, contact Welotec.

### 4.1.1 Components Router

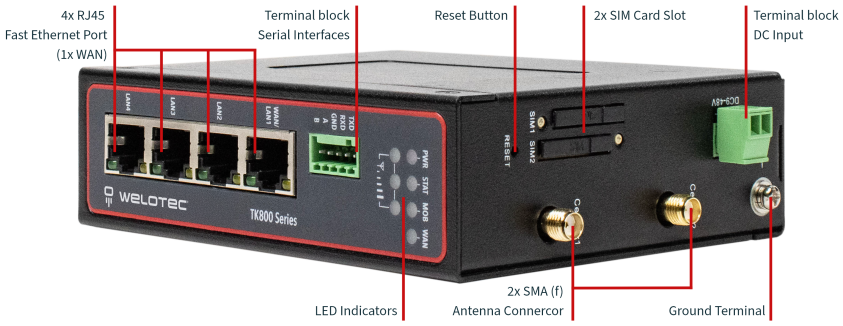
| Product | Amount | Description |
|---|---|---|
| TK804L-450 | 1 | TK804 series industrial router |
| Terminal block | 1 | Terminal block, 2-pin (m) |
| Terminals Serial and I/O | 1 | Terminal block, 5-pin (EX0 / EXW variants only) |

### 4.1.2 Components Set

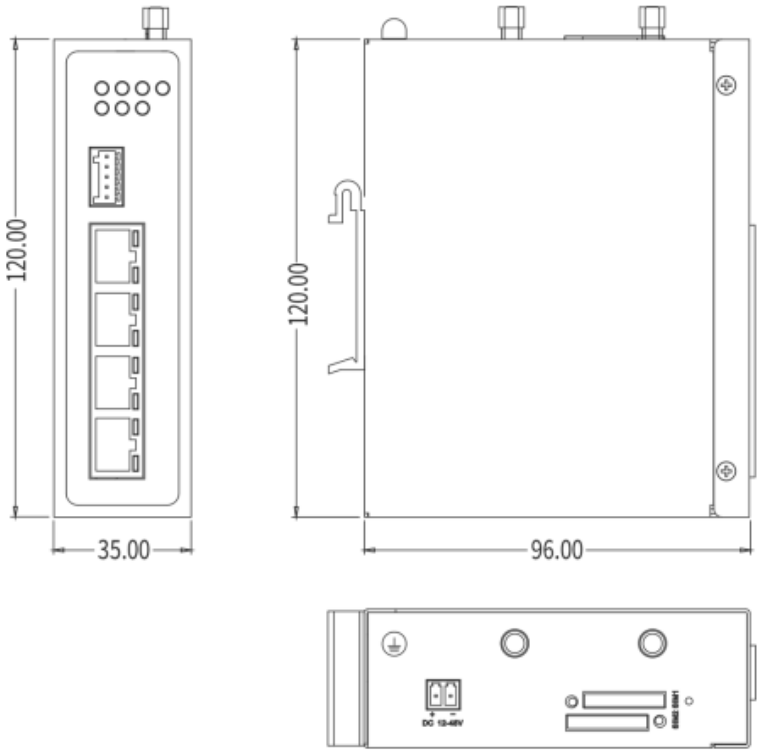
| Product | Amount | Description |
|---|---|---|
| TK804L-450 | 1 | TK804 series industrial router |
| Terminal block | 1 | Terminal block, 2-pin (m) |
| Network cable | 1 | 1,5 m |
| Antenna | 2 (4) | 3G/4G Antenna Wi-fi Antenna (EXW variant only) |
| Power supply unit | 1 | 230 V AC to 12 V DC |
| Terminals Serial and I/O | 1 | Terminal block, 9-pin (EX0 / EXW variants only) |

## 4.2 Information and Control Panel

## 4.2.1 Control Panel




## 4.2.2 Dimension Drawings



# 4.3 Installation Guide

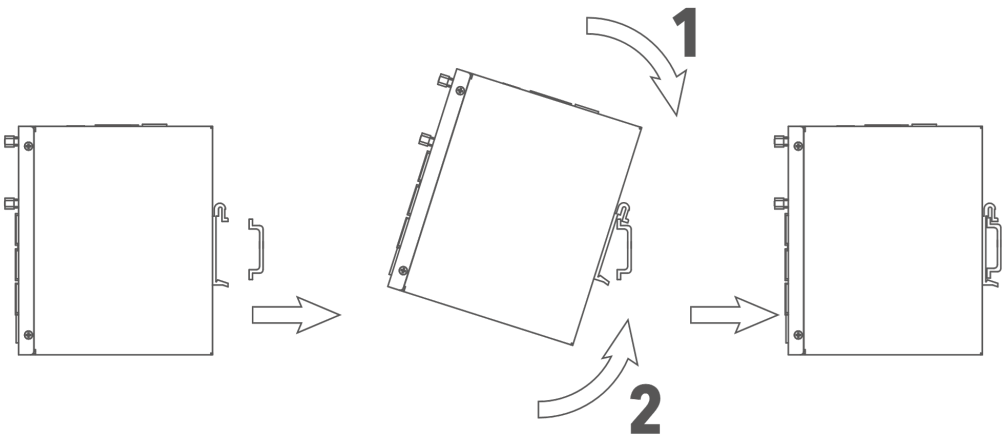
## 4.3.1 Preparations

Prepare the power supply (9 - 36 V DC). Make sure that the device can operate under the specified environmental conditions (working temperature range -25 - +70 °C, humidity: 5 – 95 % relative humidity). The device should not be exposed to direct sunlight and should be installed away from heat sources and environments with strong electromagnetic interference. The router can be mounted on a DIN rail (top-hat rail) or used at a workstation.

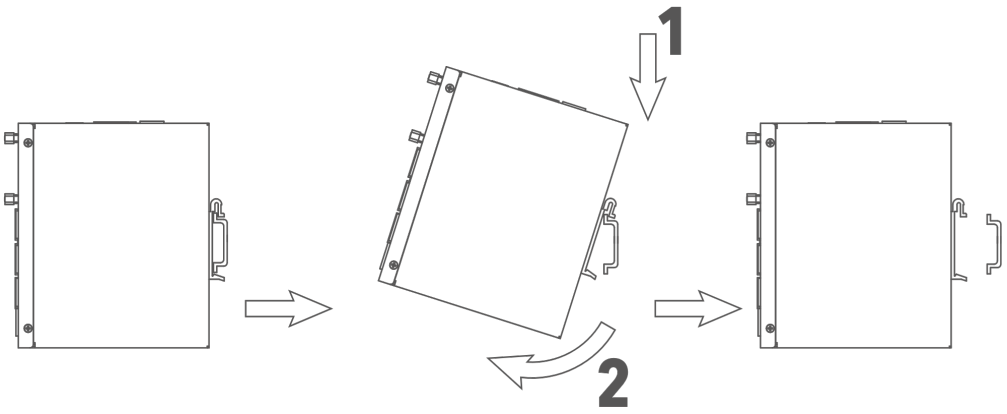
## 4.3.2 Mounting the Device

DIN rail:

Select a position with sufficient space on the DIN rail. Then place the upper part of the DIN rail mount on the DIN rail. Subsequently, press the lower side of the DIN rail mount down until the device is locked in place. This picture serves as an illustration:




For demounting press the device from top to bottom and then pull the lower side of the device from the DIN rail (see figure).



# 4.4 Installing the SIM Card

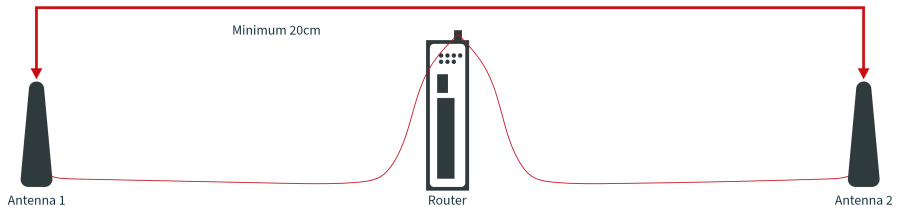
The TK804L-450 supports dual SIM. To insert the cards, press the yellow “Eject” button with a small screwdriver on the top of the device, for example. The respective SIM card slot is pushed out. If the TK804L-450 is not operated in dual SIM mode, use the SIM card slot “SIM1”.

Then insert the SIM card. The SIM card slot is not hot-pluggable. The router must be restarted after inserting the SIM card.


# 4.5 Antennas Installation

Plug the antennas onto the SMA connectors and turn the external attachment on the antenna cable until the connection is tight.

For optimal performance, place the antennas at least 20 cm apart.




# 4.6 Installation of the Power Supply

Remove the terminal block from the top of the router. Loosen the corresponding screws on the terminal block and route the wires to the corresponding terminals. The terminals are marked accordingly on the top of the router. Tighten the screws and then reinsert the connector block into the router. To ground the device, use the grounding screw on the device.

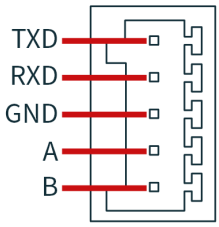
To prevent interference due to electromagnetic influence, the housing of the router must be grounded via the grounding screw.

# 4.7 Cable Connections

Connect the router to your PC via a network cable (RJ45).

# 4.8 Connection of the Serial Interfaces and I/O's

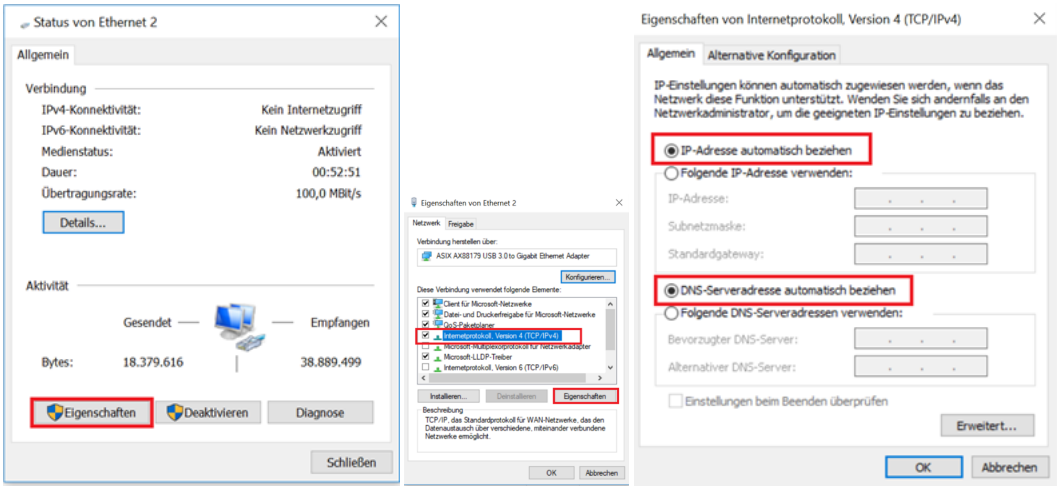
For the connection of the serial interfaces and the I/O's you will find a terminal block on the front of the device. The individual contacts for this are labeled on the front of the device. Connect the lines according to these labels. The "IN" contact here represents the digital input, while the output is labeled "Relay". "COM" represents the ground. This is a potential-free contact, i.e. what you put in at the IN contact comes out again at the relay contact, provided the contact is closed. Switching can be done via SMS and via the web interface. At 230 VAC the contact can be loaded with 2 Ampere. During installation, please remove the connection block from the device and connect the individual wires to the corresponding terminals. Then plug the connection block back onto the device.




# 4.9 Startup of the Router

## 4.9.1 Automatic Configuration (DHCP)

Configure the PC so that it works as a DHCP client (obtain IP address automatically). Connect the PC with a network cable to one of the ethernet interfaces. The PC is then assigned an IP address, standard gateway and DNS server by the router. The following figure shows the configuration process via DHCP on a PC with the Windows 10 operating system. The settings can be accessed via the Network and Sharing Center in Windows 10.




After configuring the IP address of the PC and connecting to the router, open a web browser.

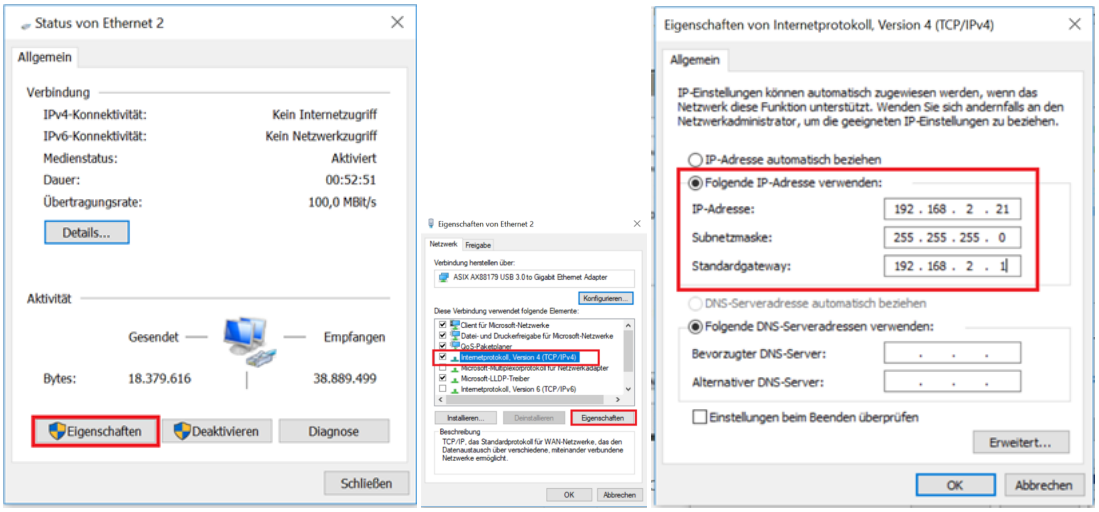
Then enter "**http://192.168.2.1**" in the address line of your browser (e.g. Google Chrome). After confirming with the "Enter" key, a pop-up appears as the login page of the router. Enter the username and password (note: username

and password printed on the device label) and confirm with “Enter”. Now you will be redirected to the configuration web page. Now configure the router according to your requirements.

To check if you are connected to the Internet, select ***Network > Cellular > Status*** from the navigation panel. Here you can see the data of the cellular unit in the router. Alternatively, simply open a web page in your browser.

## 4.9.2 Manual Configuration

Configure your PC so that it is in the same subnet as the router (192.168.2.1). The subnet mask must be 255.255.255.0. The following image shows the process of configuring the IP address on a PC with the Windows 10 operating system.




After configuring the IP address of the PC and connecting to the router, open a web browser.

Then enter “**http://192.168.2.1**” in the address line of your browser (e.g. Google Chrome). After confirming with the “Enter” key, a pop-up appears as the login page of the router. Enter the username and password (note: username and password printed on the device label) and confirm with “Enter”. Now you will be redirected to the configuration web page. Now configure the router according to your requirements.

To check if you are connected to the Internet, select ***Network > Cellular > Status*** from the navigation panel. Here you can see the data of the cellular unit in the router. Alternatively, simply open a web page in your browser.

# 4.10 LED-Indicator Guide for TK804L-450

| Power | Status | Mobile | Wide Area Network | Description |
|---|---|---|---|---|
| (Red) | (Green) | (Green) | (Green) | |
| Off | Off | Off | Off | Turned off |
| On | Off | Off | Off | System error |
| On | On | Off | Off | The module or SIM card is not recognized |
| On | On | Flashing | Flashing | Dial up |
| On | On | On | On | Dial up successful |
| On | Flashing | On | On | System upgrade |
| On | Flashing->On | On | On | Reset |

### 4.10.1 Signal Strength

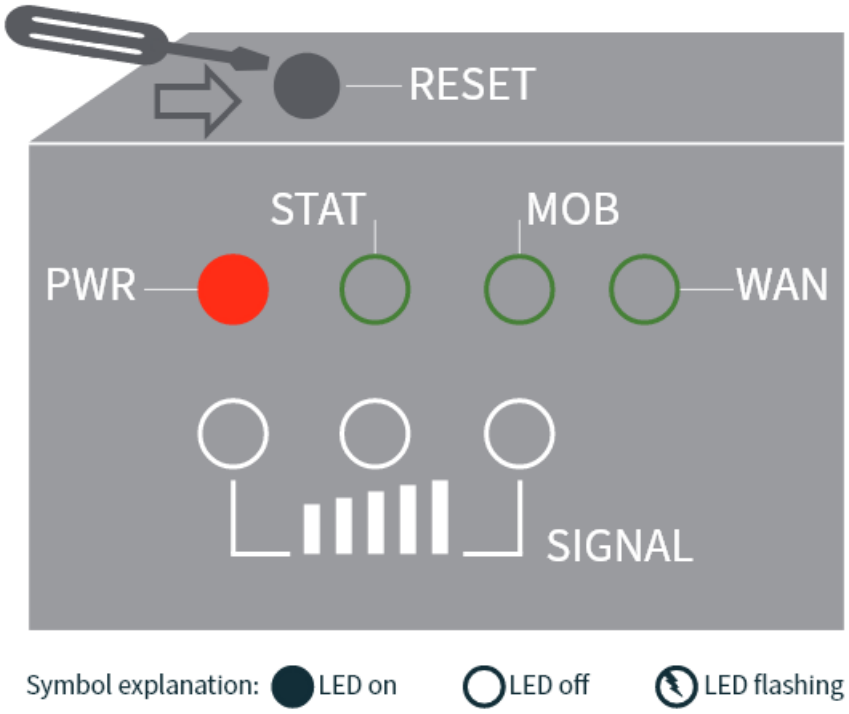
| Signal Level | Description |
|---|---|
| **1–9** | Poor reception – The router cannot function properly. Please check the antenna connection and network coverage. |
| **10–19** | Normal reception – The router is working properly. |
| **20–31** | Perfect reception – Optimal signal strength. |

## 4.11 Factory Reset

### 4.11.1 Hardware Method

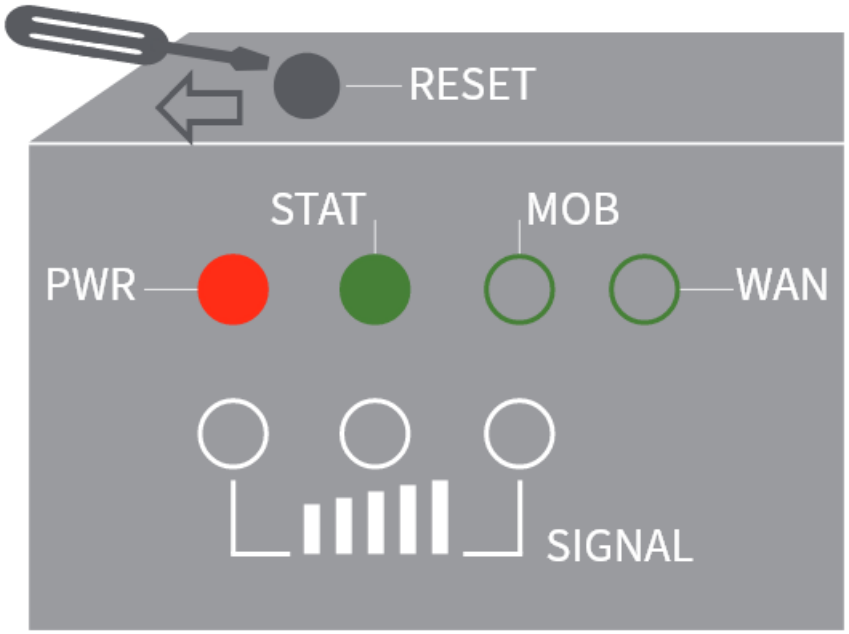
1. Turn on the TK804L-450 Router and wait 30 Seconds, then press and hold the Reset button until the STAT LED is steady on.

1.



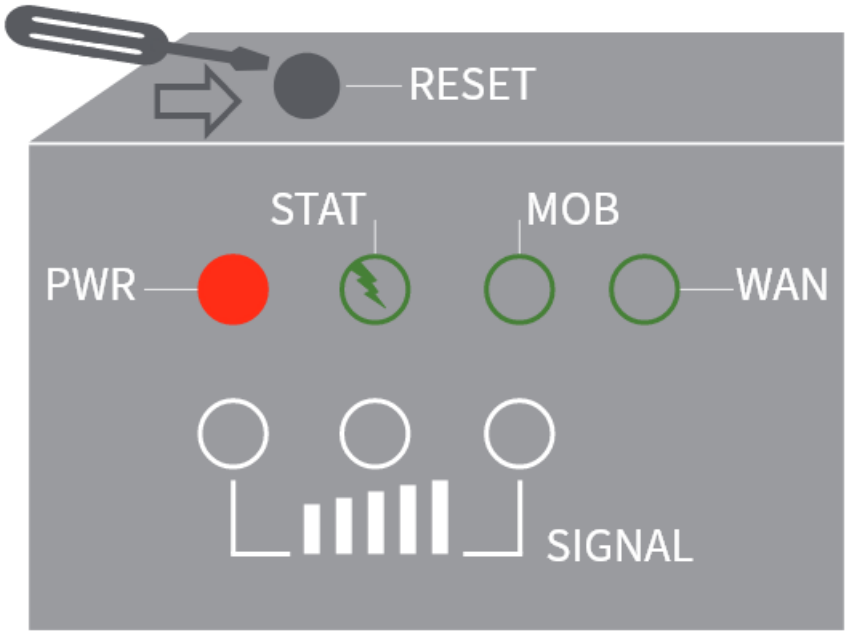

2. When the STAT LED is steady, wait for 2 seconds and Release the Reset button, the STAT LED will go off.

2.



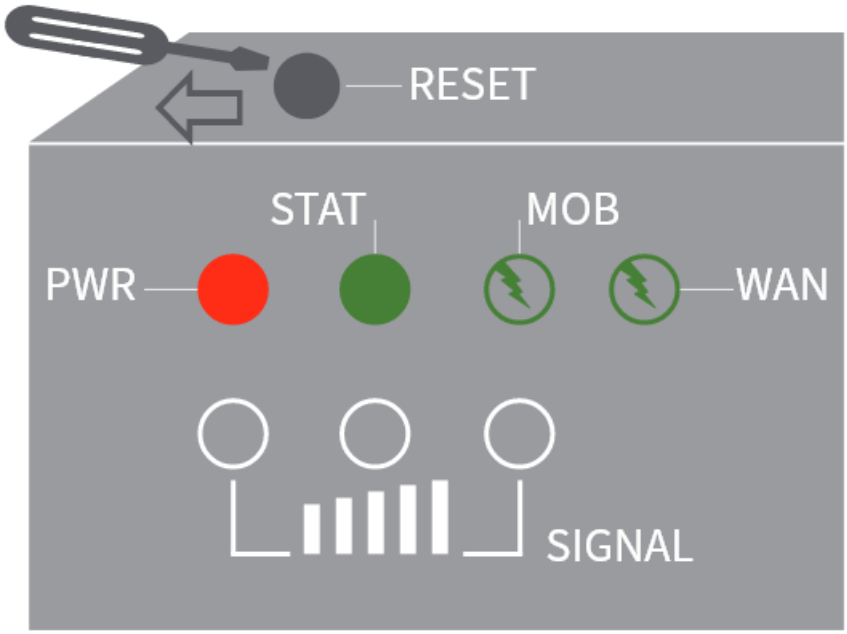

3. After the STAT LED goes off, press the Reset button again, the STAT LED will blink.

3.




4. Release the Reset button then the device will restore to default settings

4.

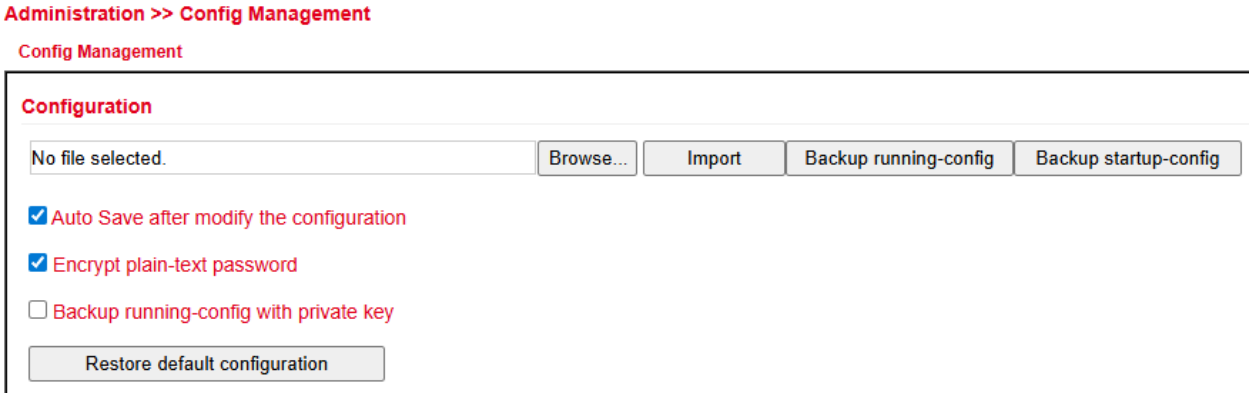


| Factory default settings | |
|---|---|
| IP: | 192.168.2.1 |
| Netmask: | 255.255.255.0 |
| Username: | adm |
| Password: | [see below] |
| Serial parameter: | 115200-N-8-1 |

TK804 routers shipped with firmware version V1.2.13 or higher have a device-specific password for the “adm” user. You can find this password on the device label. Routers shipped with an older firmware version use the combination “adm” / “123456”.

### 4.11.2 Web Method

1) Go to the ***Config Management*** submenu via the ***Administration*** menu:



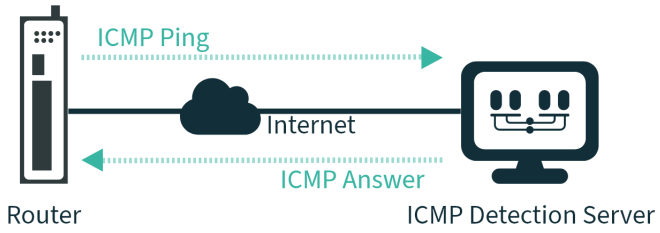

2) Click ***Restore Default Configuration*** to reset the router to its default settings.
After a few seconds you will receive the following message. The router has now been successfully reset.

3) After clicking ***reboot*** the router reboots to factory defaults.

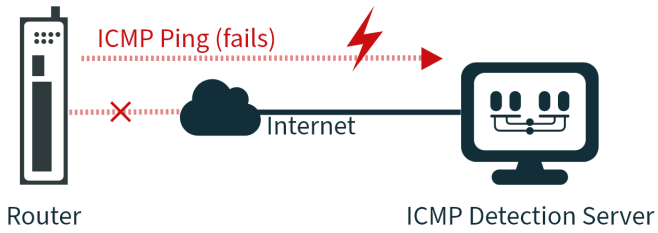
## 4.12 Watchdog

### 4.12.1 Self Monitoring of the Router

Internet connection active

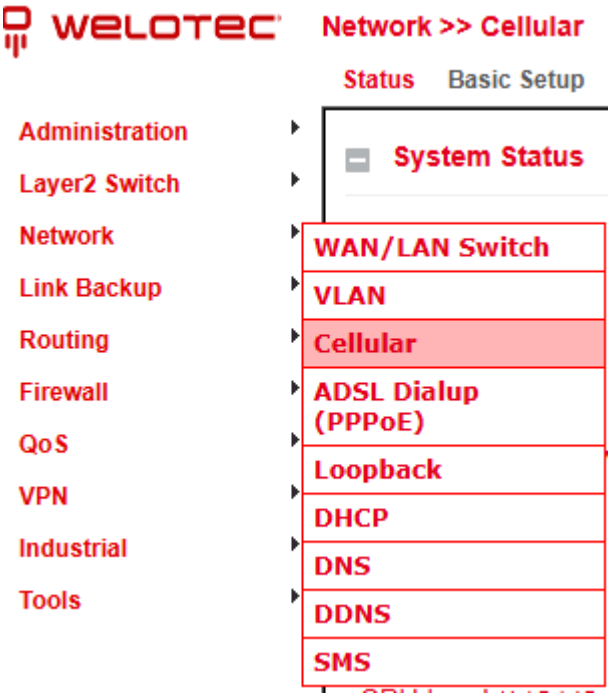



Watchdog active

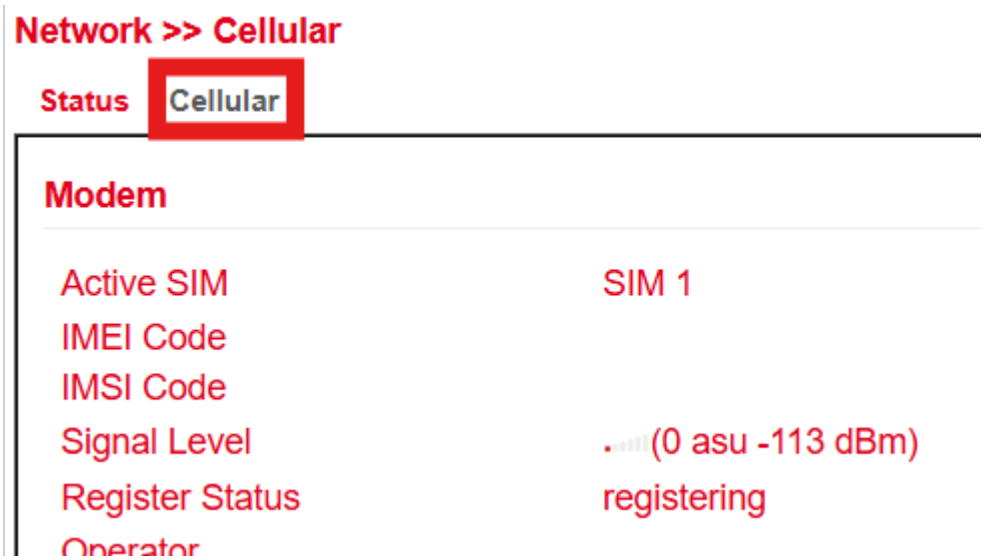



The watchdog monitors the router with regard to the Internet connection. The router itself checks whether there is an Internet connection as required. For this purpose, it sends ICMP packets to an individually defined server (ICMP detection server). If this query fails, the router first automatically restarts the dial-up, then the modem, and if necessary the entire system. The watchdog ensures a reliable Internet connection in the mobile network. This ensures that the router is almost always available.

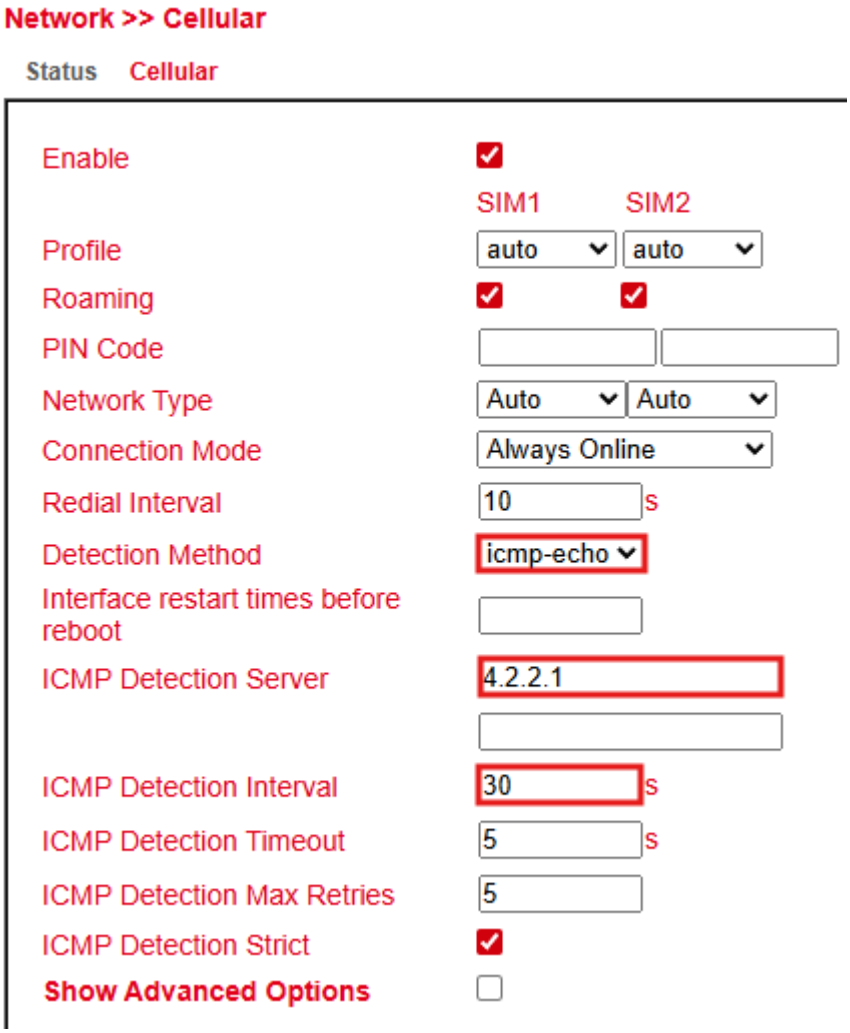
1) Go via the menu item ***Network*** to the submenu item ***Cellular***.




2) Select the ***Cellular*** tab




3) Now enter a suitable ***ICMP Detection Server*** in the corresponding field and change the ***ICMP Detection Interval***.




**Note**: The registered ICMP detection server should have a very high accessibility. A server from Google is no longer suitable for this, since the ICMP requests are blocked there.

# 4.13 Port Mapping / Port Forwarding

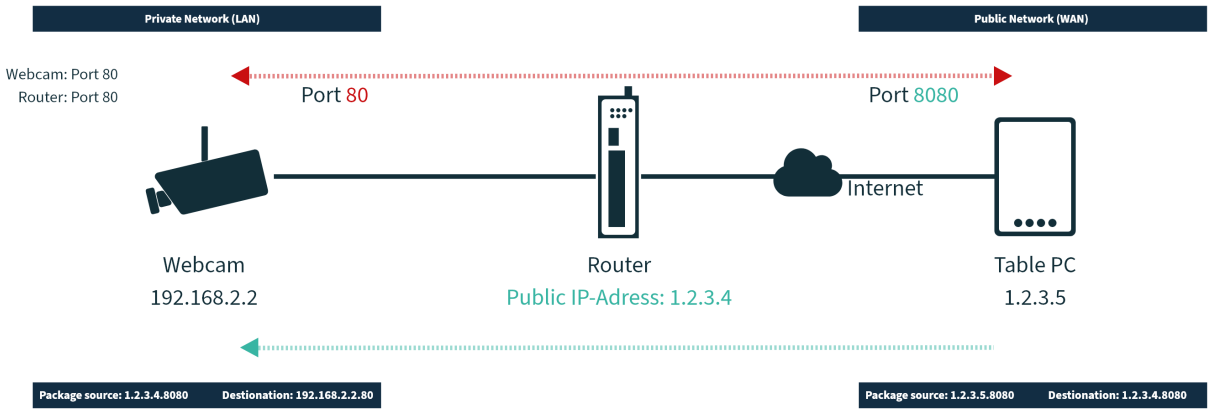
## 4.13.1 Access to Connected Devices via the Internet

To access devices connected to the Welotec router via the Internet, port mapping or port forwarding can be used. This is configured in the TK804L-450 router via NAT rules.

 Port mapping requires a public IP address in the mobile network (Public IP). If necessary, ask your mobile network provider or service provider about this!

The instructions refer to all TK804L-450 routers with firmware ***Version 1.2.15*** or higher.

The following image illustrates the application example (http uses TCP port 80 by default):




***Explanation:***

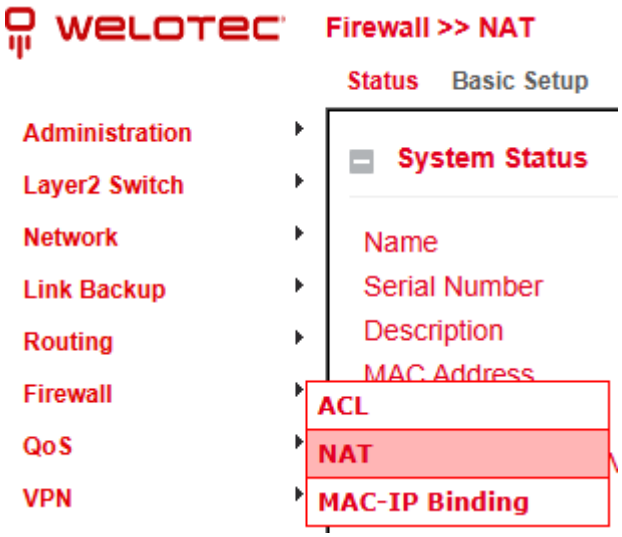
| Welotec Router | |
|---|---|
| LAN IP address: | 192.168.2.1 |
| Subnet mask: | 255.255.255.0 |

| IP camera | |
|---|---|
| LAN IP-Adresse: | 192.168.2.2 |
| Subnet mask: | 255.255.255.0 |
| Standard Gateway | 192.168.1.1 |

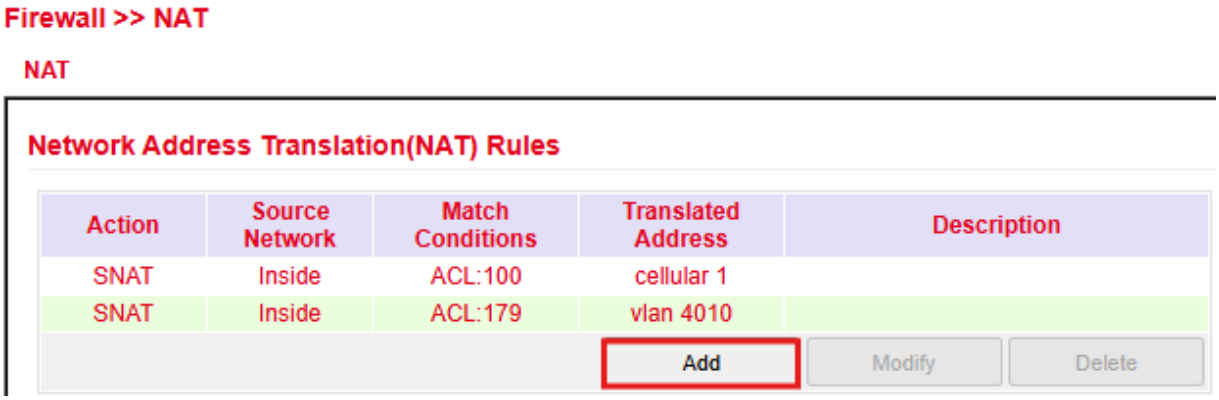
The IP camera has an interface that can be reached with a browser via **http://192.168.2.2** (note: http protocol has TCP port 80).

## 4.13.2 Port Mapping Guide

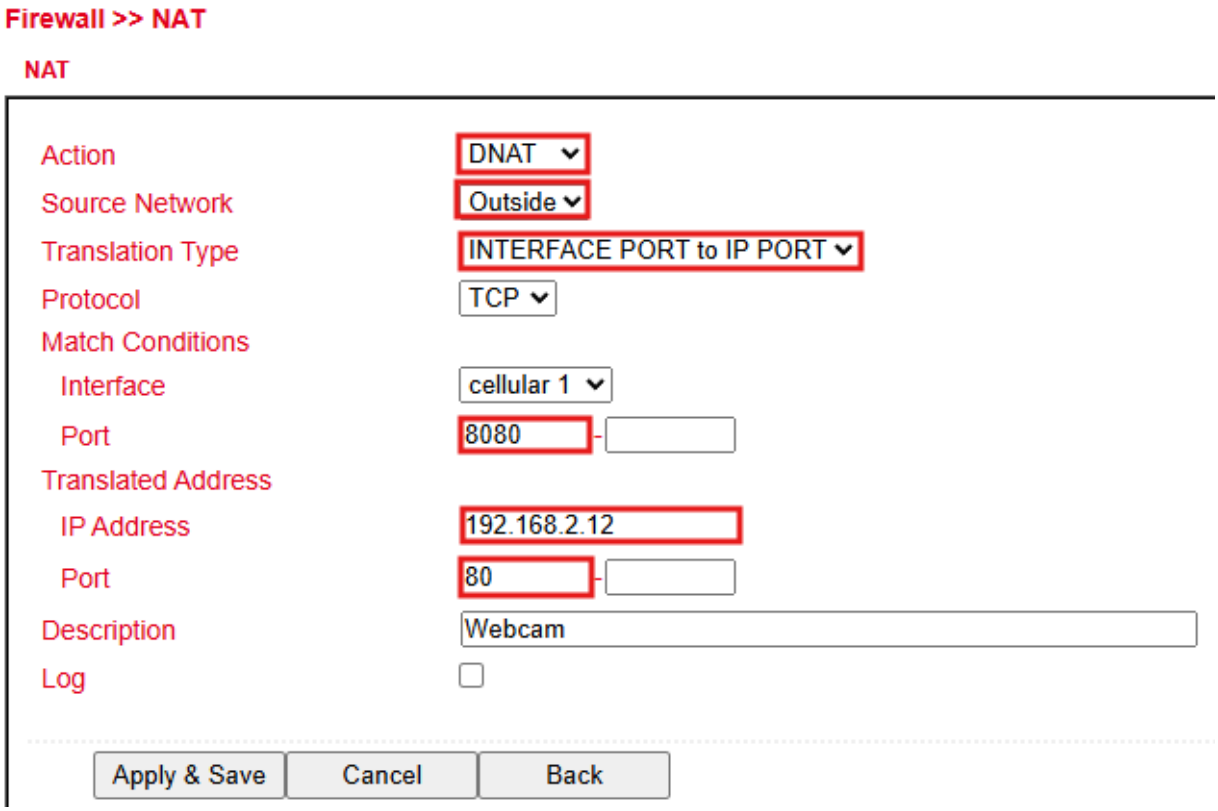
1. Go to `Firewall > NAT`



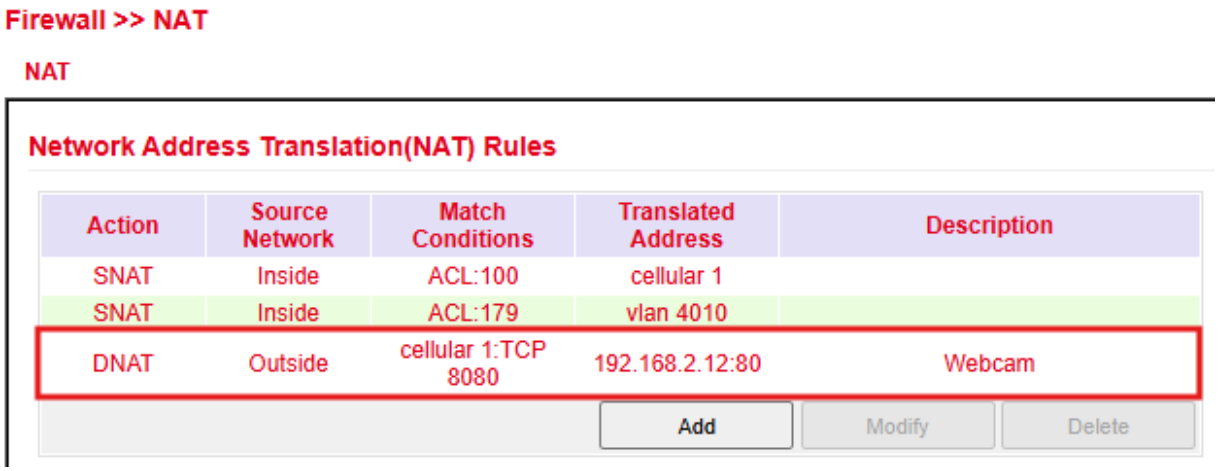

2. Click **Add** to create a new NAT rule




3. Enter rule details (as shown)




4. The rule appears in the list




**Checklist for functionality:**

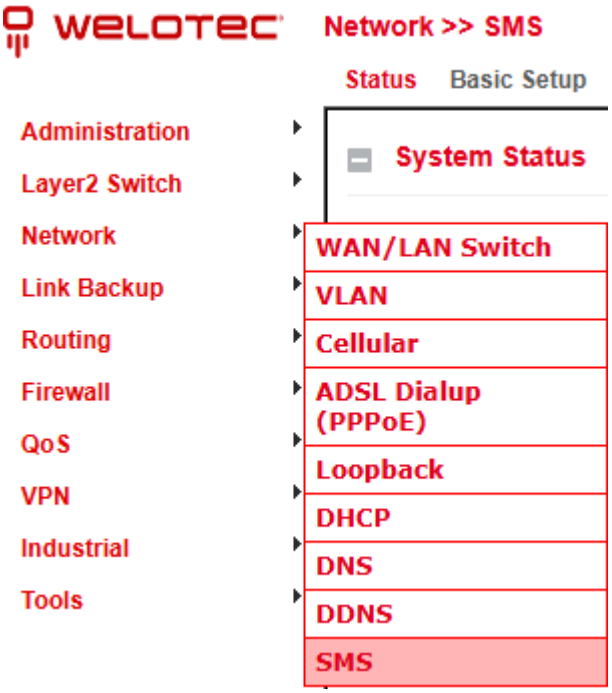
- Correct IP set on the device?
- Responds to `ping`?
- Web interface reachable?
- Gateway set to `192.168.2.1`?

# 4.14 SMS Functions

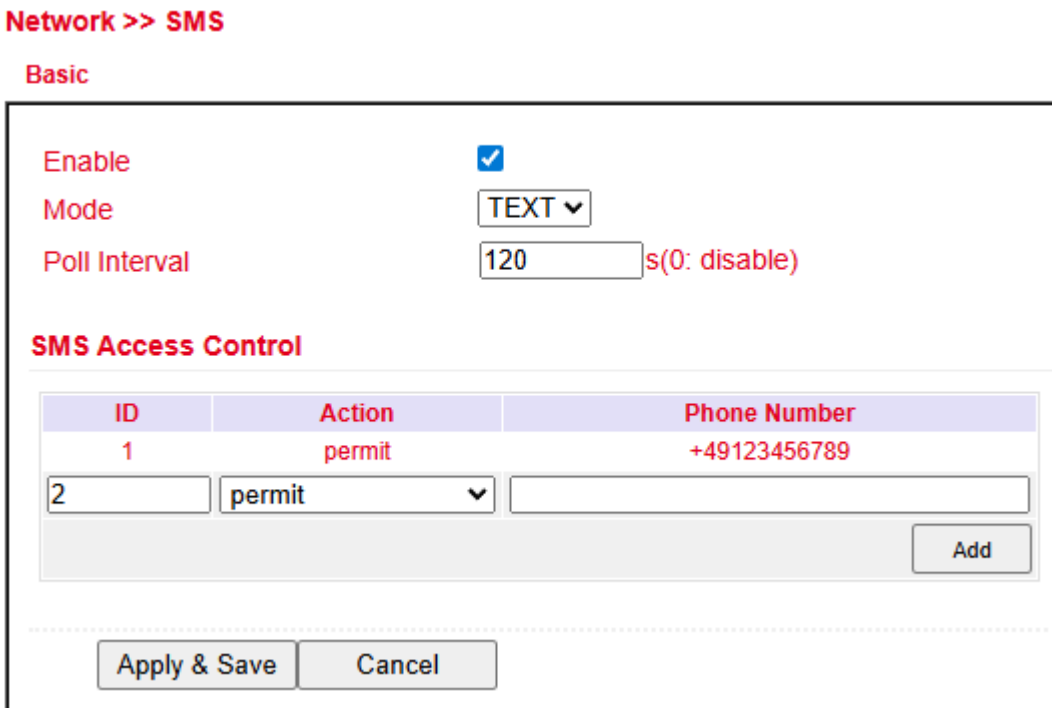
The TK804L-450 can be reached by SMS from the outside and reacts to various commands sent by SMS. One has the possibility to query the status of the device, to start / stop the dial-up or to restart the device.

## 4.14.1 Status Request / Restart

1) Go via the menu item ***Network*** to the submenu item ***SMS**




2) Click the ***Enable*** checkbox to turn on the function



3) Enter in the table ***SMS Access Control*** the phone numbers (**format +49, no 0049 or 49!**), which are allowed to send SMS to the router. Enter "***permit***" as action.

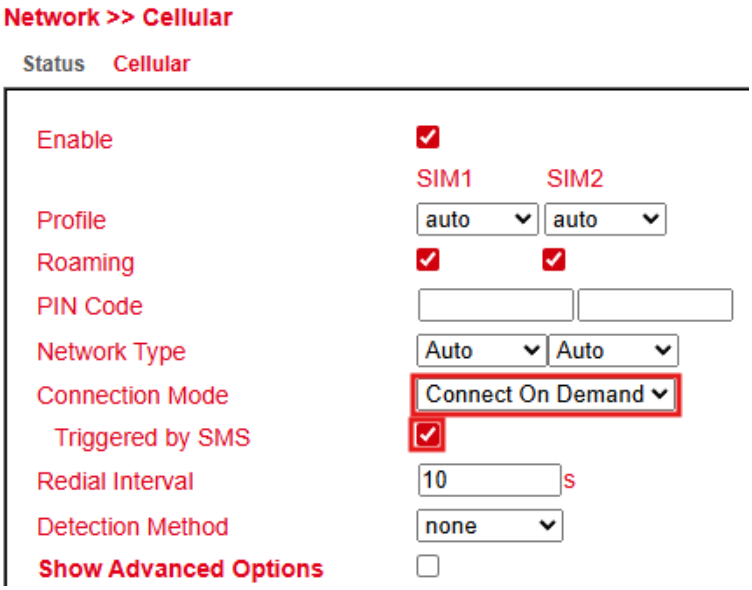
If now an SMS with the content ***show*** is sent to the mobile phone number of the router, the router sends its current status as response

## 4.14.2 Connecting or Disconnecting from the Internet

After successful configuration, you can also control the router's Internet connection via SMS. However, this requires the router to be set to "Connect On Demand"!

1) Go to the submenu item ***cellular*** via the menu item ***network***.

2) Now select the ***cellular*** tab

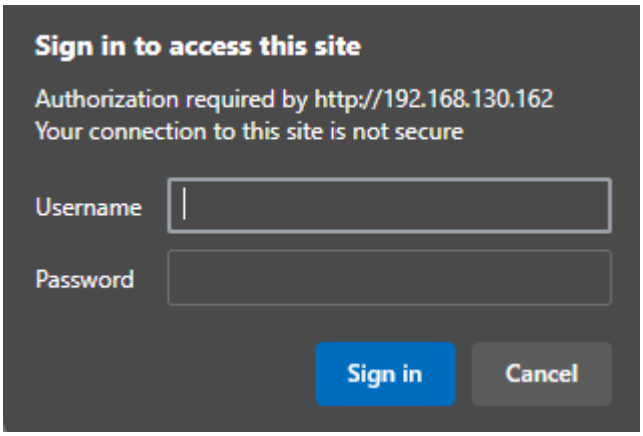



3) Under ***Connection Mode***, select the ***Connect on Demand*** mode and activate the ***Triggered by SMS*** field.

# 5 Web Configuration

## 5.1 Accessing the Web Interface

The **TK804 series routers** have a built-in web server for configuration.
Open `http://192.168.2.1` in your browser.
Enter the user name and password (default values printed on the label) and confirm with **Login**.

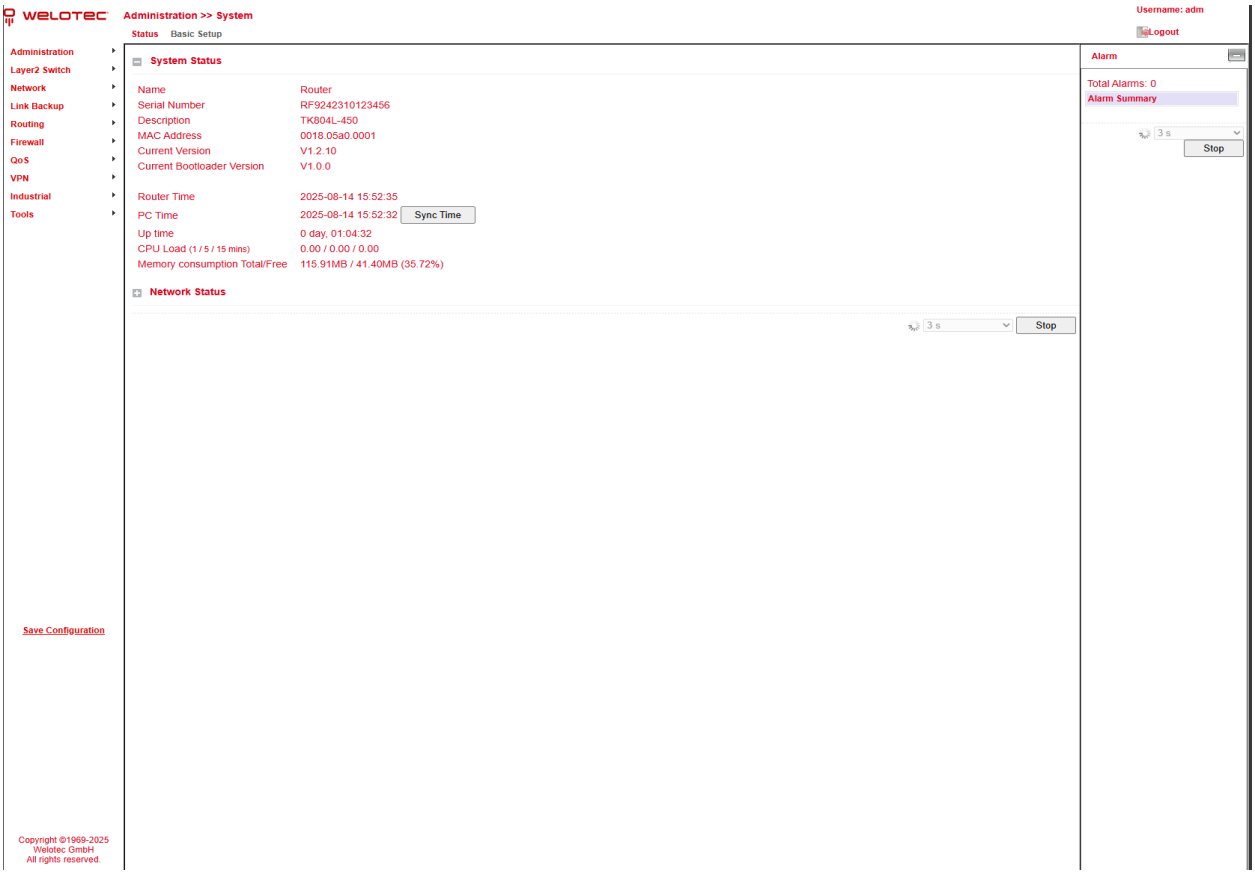



For security reasons, the password should be changed after the first login.
Choose a password with **at least 10 characters**, including:

- uppercase and lowercase letters
- numbers
- special characters

The router allows parallel access for up to **four users** via the web interface.
However, simultaneous configuration by multiple users should be avoided.

After successful login, the **router web interface** appears:



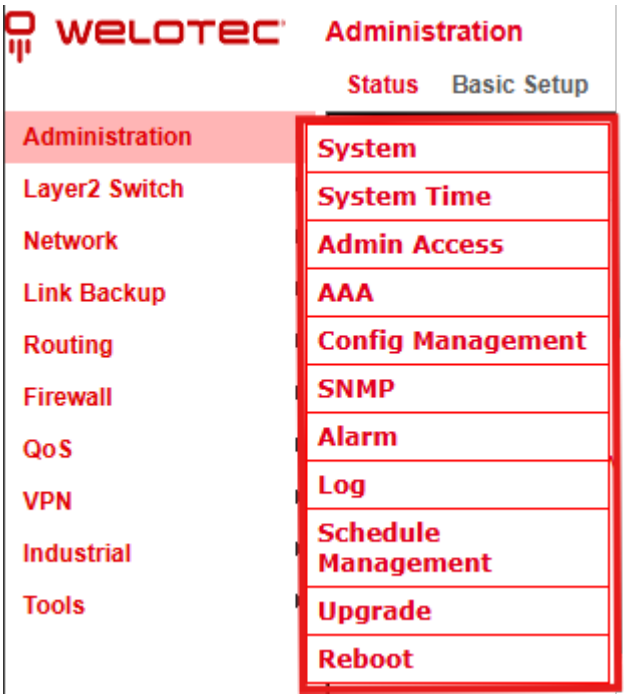

The web interface of the TK804L-450 is divided into **four areas**:

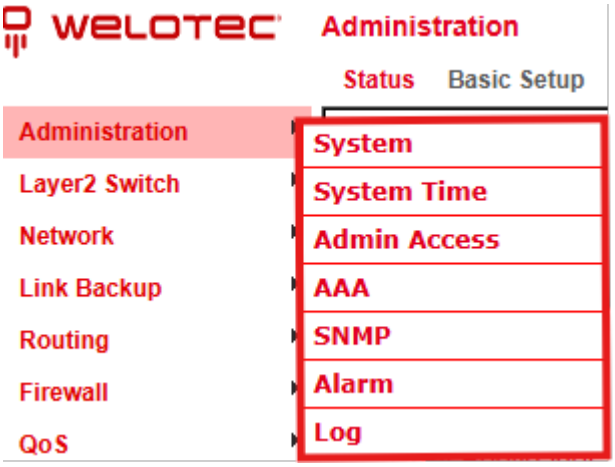
1. **Main navigation** (left) – e.g., Administration, Network.
2. **Detail navigation** (top) – e.g., *Status (active)*, *Basic Setup*.
3. **Main content area** (center) – shows status and configuration options.
4. **Alarm area** (right) – shows active alarms.

# 5.2 Administration

On the left side you will find the menu item **Administration**.
Clicking it with the mouse opens a submenu.
This area contains the **status overview** and **administration settings** for the router.

 With **restricted user rights** (not administrator), some menu items are missing.
Restricted users cannot configure the router, the **Apply & Save** option is unavailable, and several configuration options are hidden.



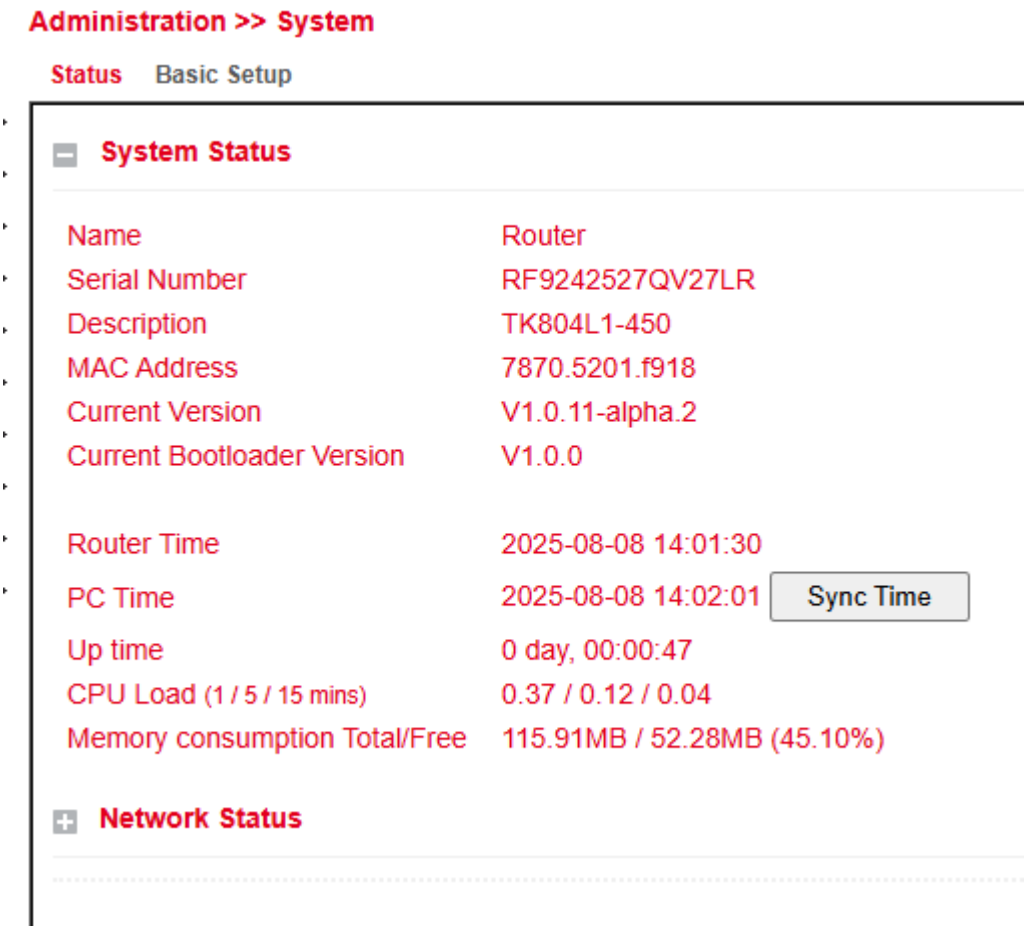




## 5.2.1 System

### Status

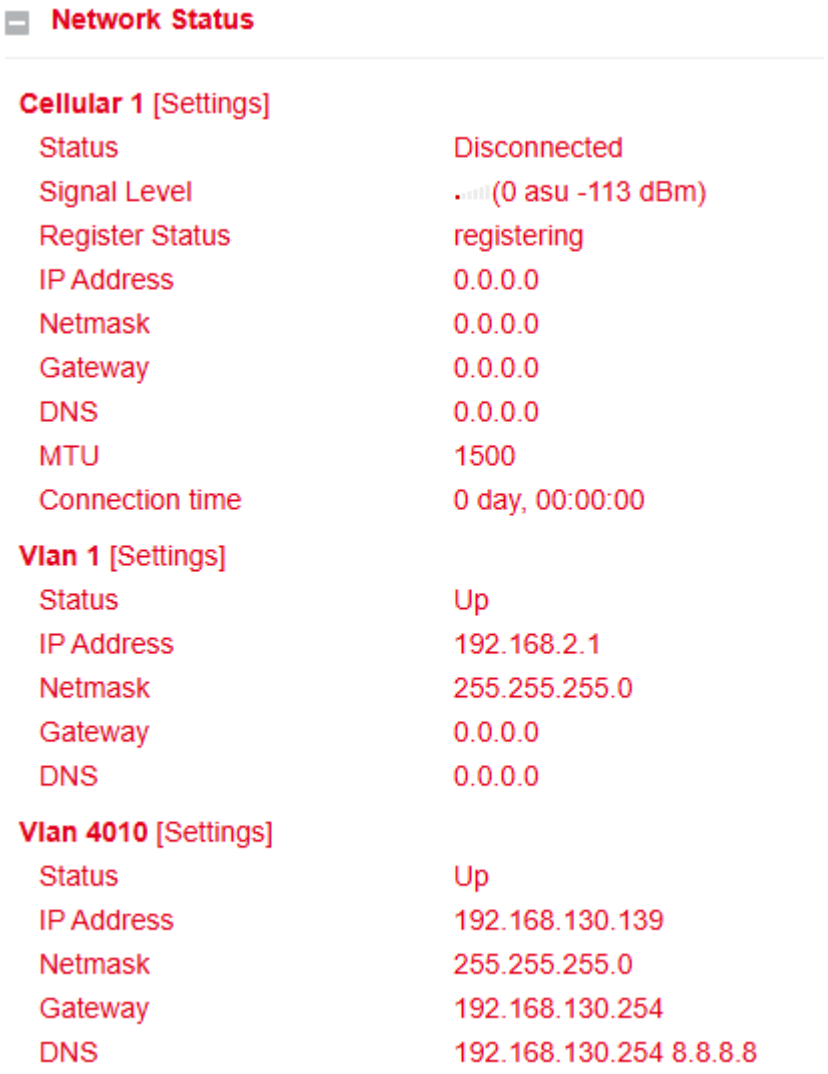
Under **Administration > System > Status** you will find the most important **status information** of the router at a glance.

- With the **Sync Time** button, the router time can be synchronized with the time of the connected PC.




- Below the system status, you will find the **Network Status** section.
  By clicking on the gray [+] symbol, details of the individual network interfaces will expand.
  Here you can see all relevant information about each interface.

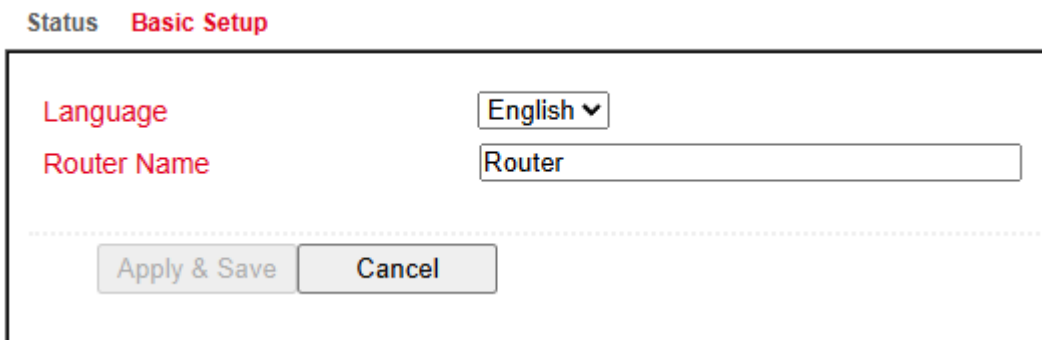
 By clicking on [**Settings**] next to an interface (e.g., *Cellular 1*), you can directly access its configuration page.




## Basic Setup

Under **Administration > System > Basic Setup** you can configure:

- **Language** – currently only *English* is supported.
- **Router name** – choose a meaningful, unique name for easier identification.



## 5.2.2 System Time

To ensure correct coordination between the TK804L-450 router and other devices, the **system time** must be consistent across all components.

Under **Administration > System Time** you can configure:

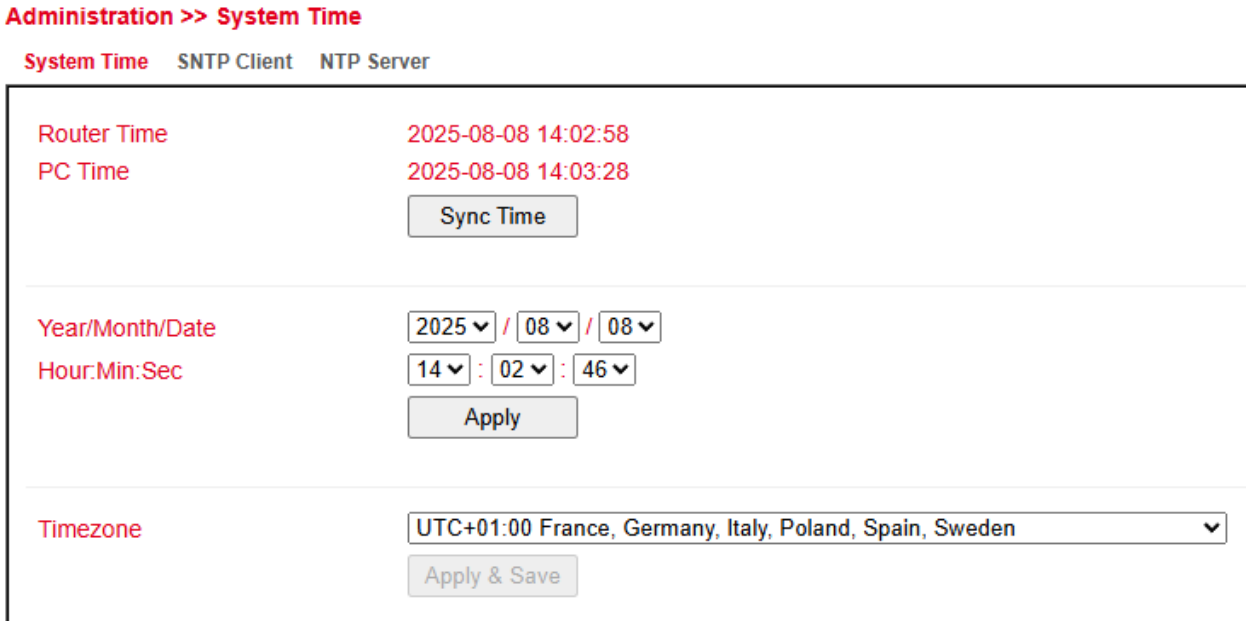
- **Manual time setting**
- **Automatic synchronization** via a time server using the **Simple Network Time Protocol (SNTP)**
- **NTP server function** – allows connected devices to obtain the current time from the router

### System Time Configuration

Under **Administration > System Time** you will find an overview and local settings for the system time of the router.

- With **Sync Time**, the router time can be synchronized with the time of the connected PC.
- Time and date can also be set **manually**.
- Under **Timezone**, the current time zone can be selected.

```
The default is **UTC+1** (Germany, Austria, Switzerland).
```

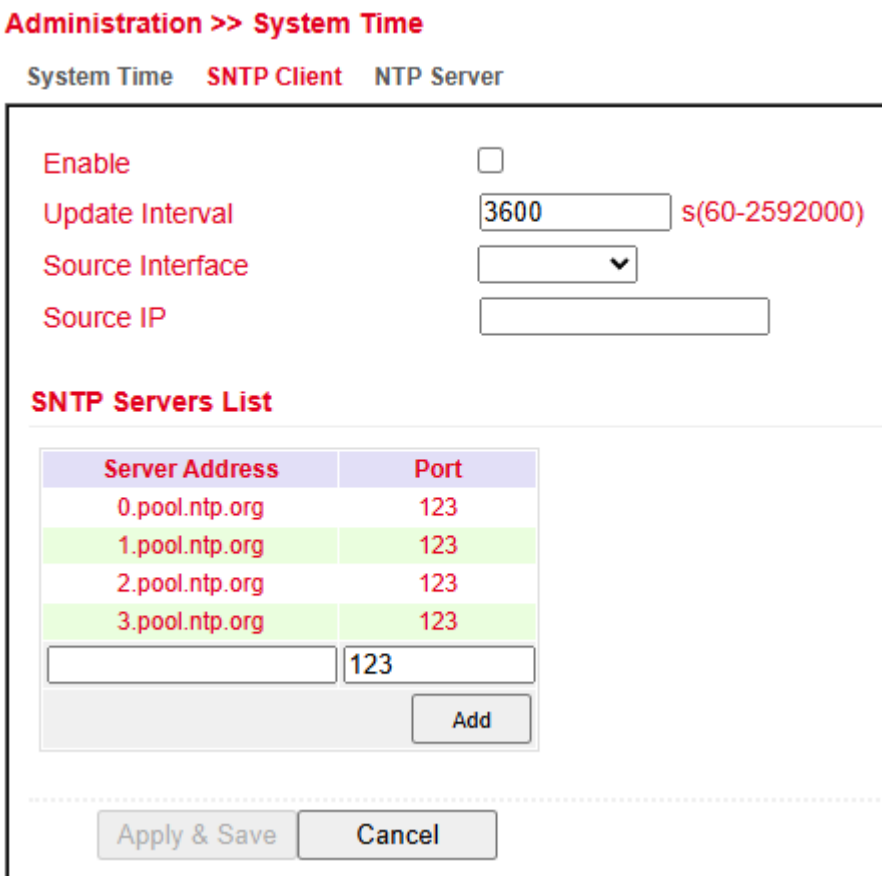



### SNTP Client

**SNTP (Simple Network Time Protocol)** is used to synchronize the clocks of network devices.
It provides mechanisms to synchronize time across a subnet, a network, or the Internet.

- Typical accuracy: **1–50 ms**, depending on the synchronization source and routers.
- Goal: Ensure that all devices in a network share the same clock, so distributed applications run consistently.

Under **Administration > System Time > SNTP Client** you can configure the router to update its time from a **public or private time server**.




Before setting up an SNTP client:

- Verify that the selected **SNTP server is reachable**.
- If using a **domain name**, ensure that the DNS server is configured correctly for name resolution.

You can configure either a **Source Interface** or a **Source IP**.

After a successful update, the following entry will appear under **Administration > Log**:

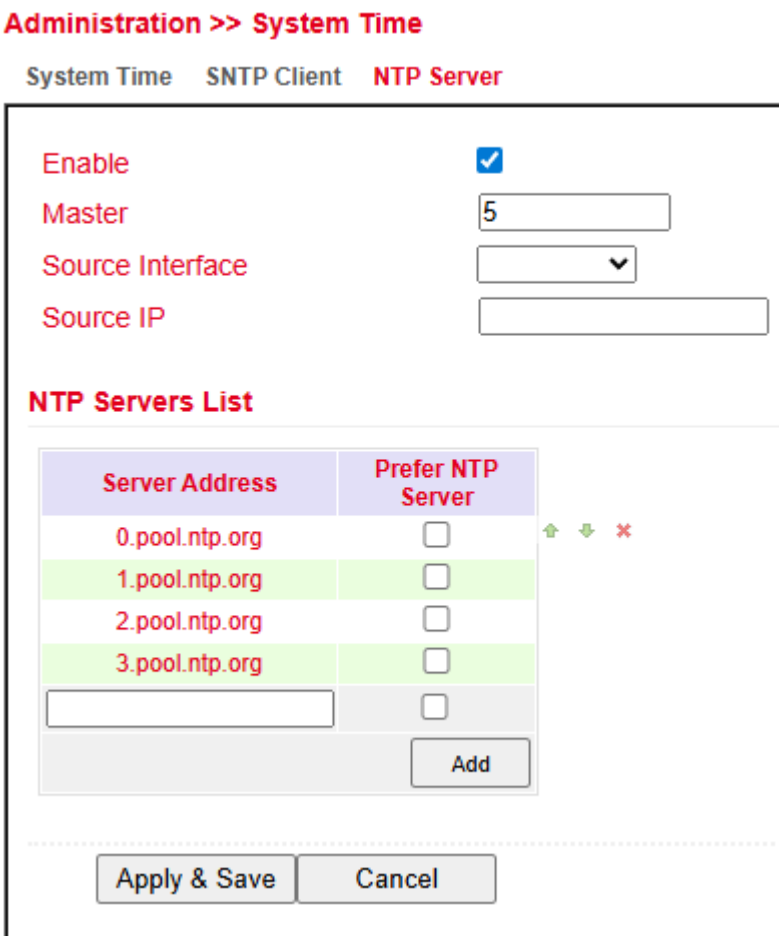
| | | |
|---|---|---|
| Info | Jan 25 09:08:09 | Router sntpc[851]: time updated: Fri, 25 Jan 2019 09:08:09 +0100 [+1s] |
| Info | Jan 25 09:09:09 | Router sntpc[851]: time updated: Fri, 25 Jan 2019 09:09:09 +0100 [-1s] |

## NTP Server

The settings for the time server are located under **Administration > System Time > NTP Server**.
In this mode, the TK804L-450 can act as a **time server** for connected devices.

- **Master (Stratum):** Defines the accuracy level of the server.
  - Range: **2–15**
  - Lower values indicate proximity to a highly accurate time source (e.g., atomic or radio clock).
- **Source Interface:** Specifies the interface from which devices can request NTP.
- **Source IP:** Alternative option for providing NTP service.

**Important:**
NTP **server** and NTP **client** operate independently.
This means both require their own NTP service from the Internet.
To configure this, enter the address under **Server Address** (multiple entries possible).




## 5.2.3 Admin Access

### Management Services

Under **Administration > Management Services** you can configure access to the router via:

- **HTTP / HTTPS** – web interface
- **Telnet / SSH** – Command Line Interface (CLI)

HTTP

**HTTP (Hypertext Transfer Protocol)** is used for unencrypted access to the router's web interface.

HTTPS

**HTTPS (Hypertext Transfer Protocol Secure)** uses **SSL/TLS encryption** to secure HTTP communication.

Telnet

**Telnet** allows access to the router's **Command Line Interface (CLI)**.
 Since Telnet is unencrypted, it is recommended to use **SSH** instead.

SSH

**SSH (Secure Shell)** provides encrypted CLI access to the router, comparable to Telnet but secure.

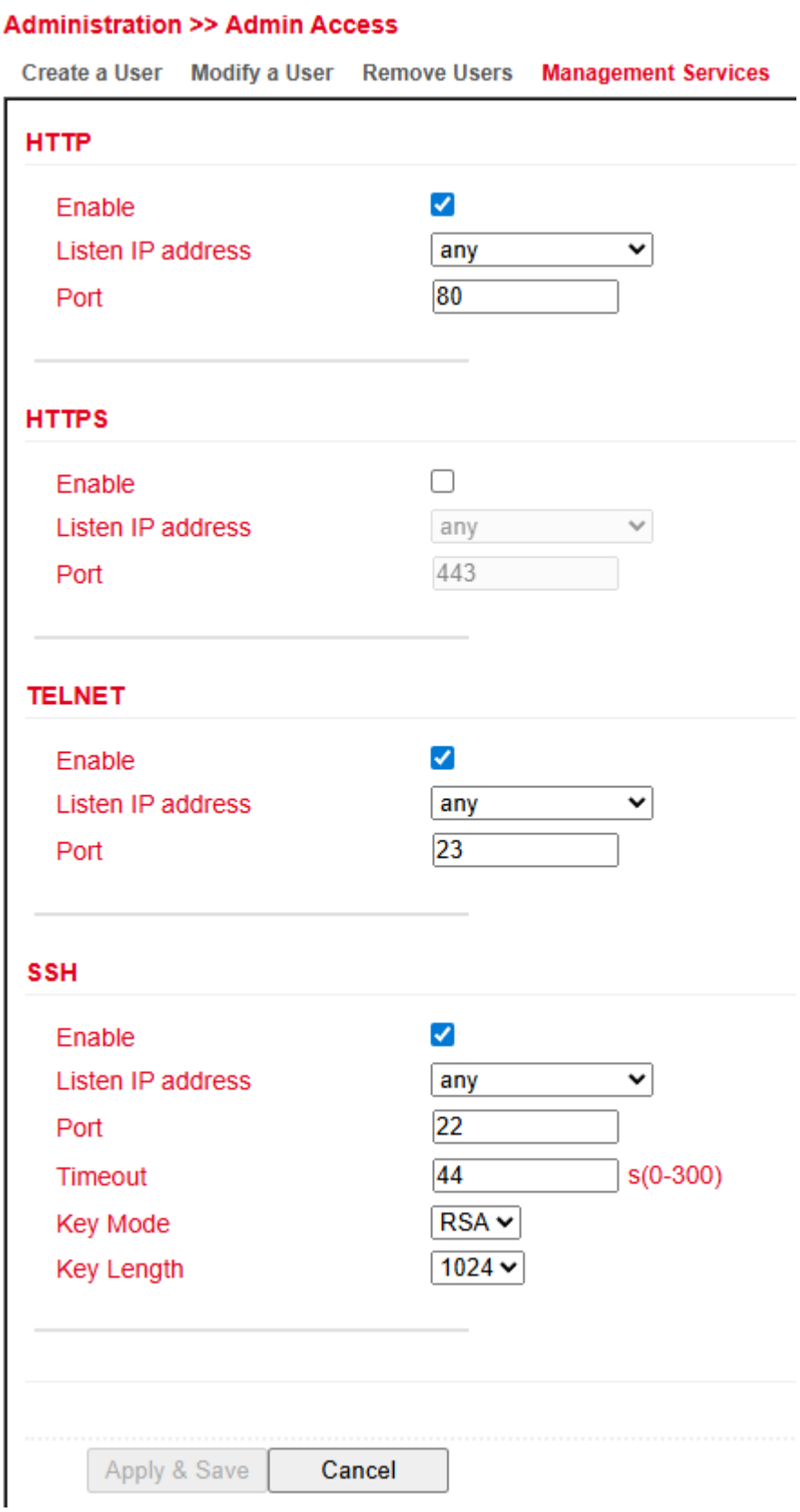
Configuration Options

For each service (HTTP, HTTPS, Telnet, SSH) you can configure:

- **Enable / Disable** the service
- **Port** – select the TCP port for the service
- **ACL Enable** – activate access control:
  - **Source Range** and **IP Wildcard** define which IP addresses or ranges may access the router
- **SSH-specific options**:
  - **Timeout** – inactive sessions are automatically closed after this period
  - **Key Mode / Key Length** – define encryption standard and key size

**Other Parameters**

- **Web login timeout** – defines how long a web session remains active without input.
  - After the timeout expires, the user is logged out automatically.


Administration >> Admin Access
Create a User
Modify a User
Remove Users
Management Services
HTTP
Enable
Listen IP address
any
Port
80
HTTPS
Enable
Listen IP address
any
Port
443
TELNET
Enable
Listen IP address
any
Port
23
SSH
Enable
Listen IP address
any
Port
22
Timeout
44
s(0-300)
Key Mode
RSA
Key Length
1024
Apply & Save
Cancel

# User Management

Under **Administration > User Management** you can configure the users that have access to the router.
The router distinguishes between **Administrator** and **Standard User**:

- **Administrator (adm)** – created by the system, full rights
- **Standard User** – created by the administrator, limited rights (monitoring only)

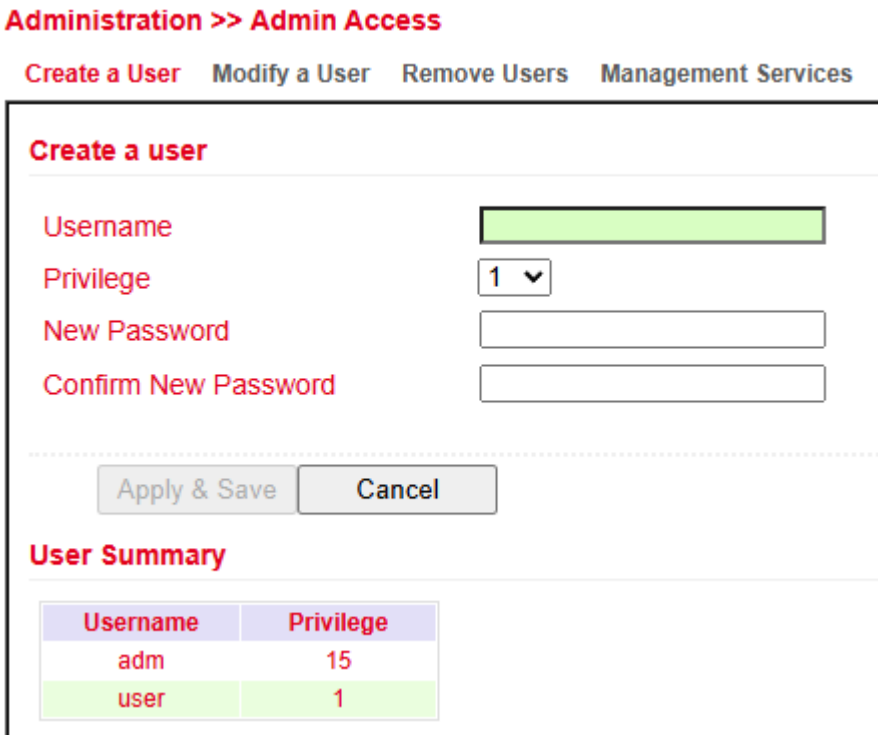
Create a User

Under **Administration > User Management > Create a User** you can create additional users.

Required fields:

- **Username**
- **Password**
- **Permission (Privilege):**
  - **1–14** → standard users (*read-only*)
  - **15** → administrators (*full access*)

Under **User Summary** you will find a list of all users and their assigned privileges.

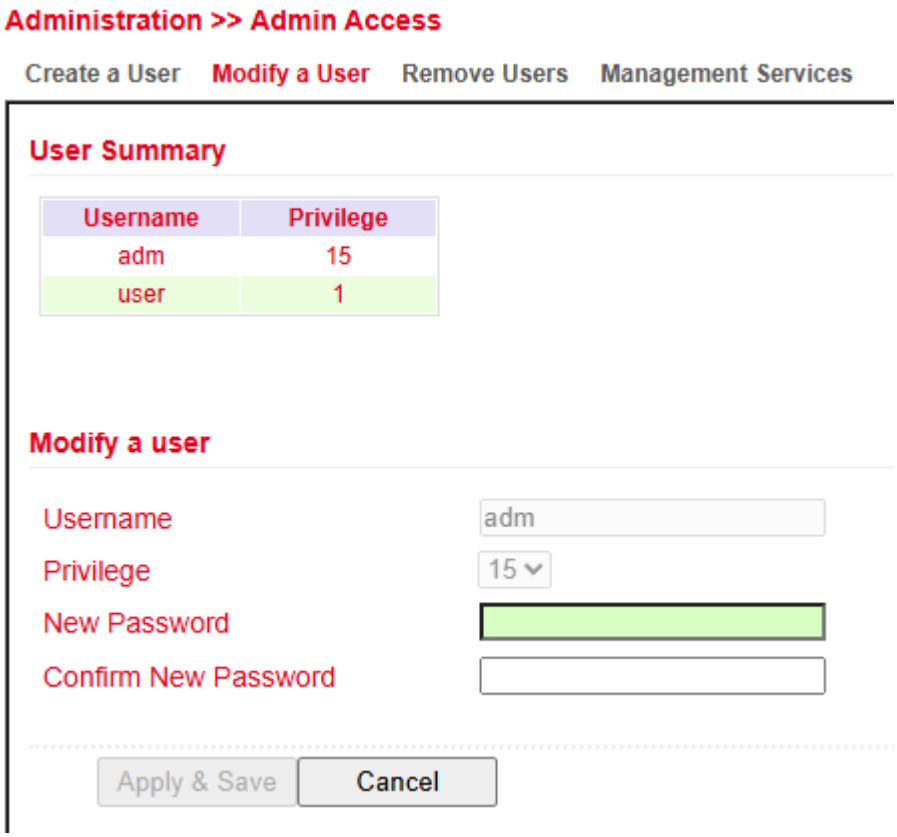



**Password policy:**
Use at least **8 characters**, including uppercase/lowercase letters, numbers, and special characters.
The username **root** is reserved for the operating system.

Modify a User

To change user settings, go to **Administration > User Management > Modify a User**. Here you can update **permissions** and **passwords**.

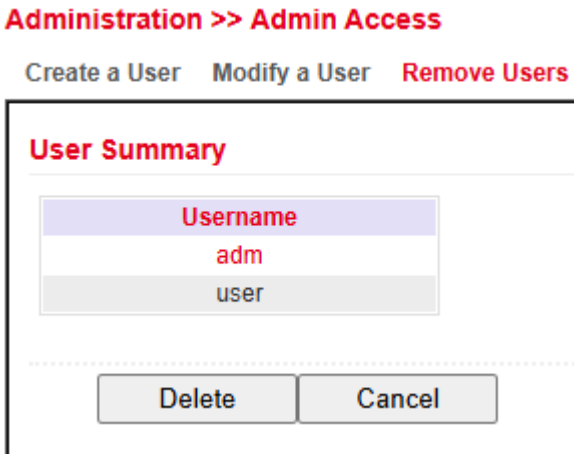
In **User Summary**, select a user and edit them under **Modify a User**.




Remove Users

Under **Administration > User Management > Remove Users** you can delete accounts.

1. Select the user in **User Summary**.
2. Click **Delete** to remove the account.



## 5.2.4 AAA

**AAA (Authentication, Authorization, Accounting)** is a framework for managing network access:

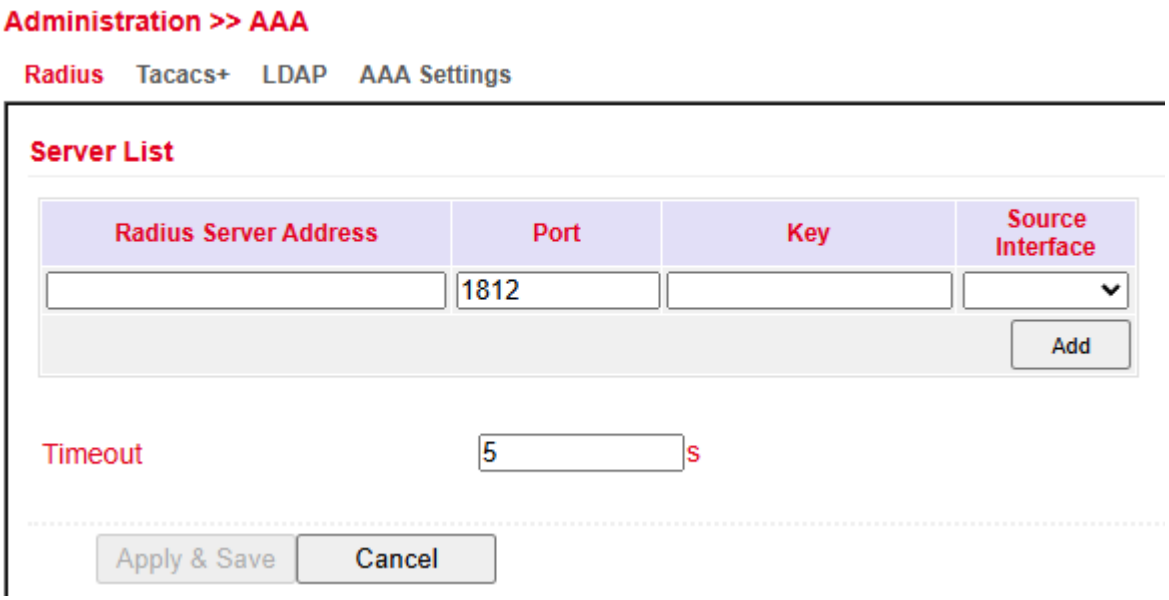
- **Authentication** → controls whether a user may access the device or network
- **Authorization** → defines which services or resources the user may access
- **Accounting** → logs all access events and resource usage

Notes:

- Not all AAA services must be enabled; one or two can be used as needed.
- AAA typically follows a **client–server architecture**.
- The **TK804L-450** acts as an **AAA client** and supports:
  - **RADIUS**
  - **TACACS+**
  - **LDAP**

### RADIUS

**RADIUS (Remote Authentication Dial-In User Service)** is a client–server protocol used for **authentication, authorization, and accounting**.

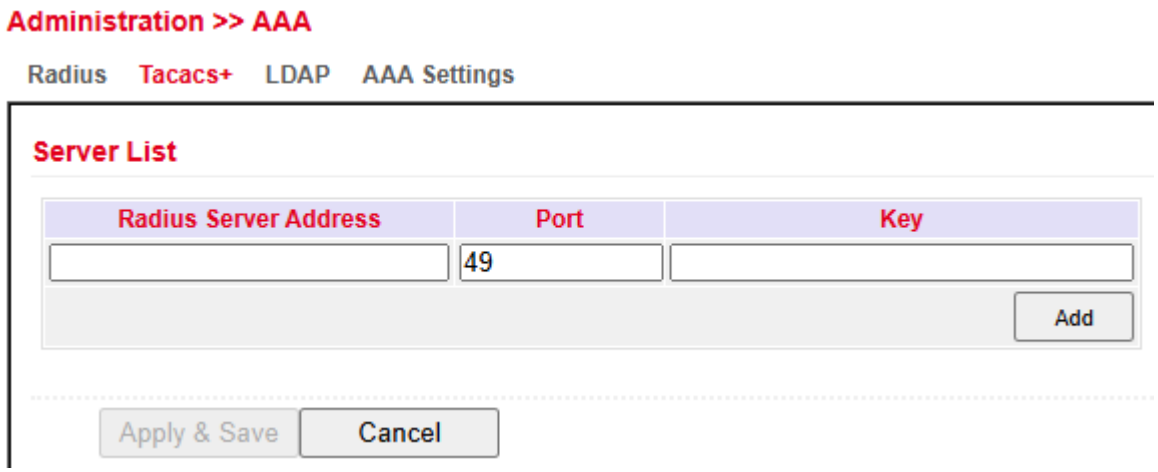



You can configure:

- **FQDN or IP address** of the RADIUS server
- **Port**
- **Shared Key**
- **Source Interface**

## TACACS+

**TACACS+ (Terminal Access Controller Access Control System)** is a client–server protocol used for **authentication, authorization, and accounting**.
It provides communication between **AAA servers** and a **Network Access Server (NAS)**.

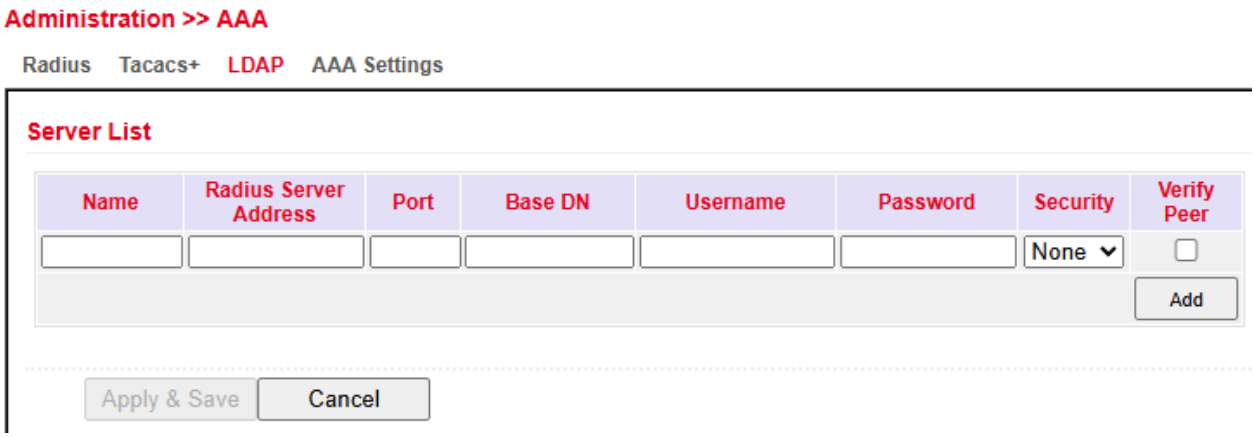



You can configure:

- **Server Address**
- **Port**
- **Shared Key**

## LDAP

**LDAP (Lightweight Directory Access Protocol)** is a protocol based on the client–server model, suitable for querying and modifying information from **directory services**.

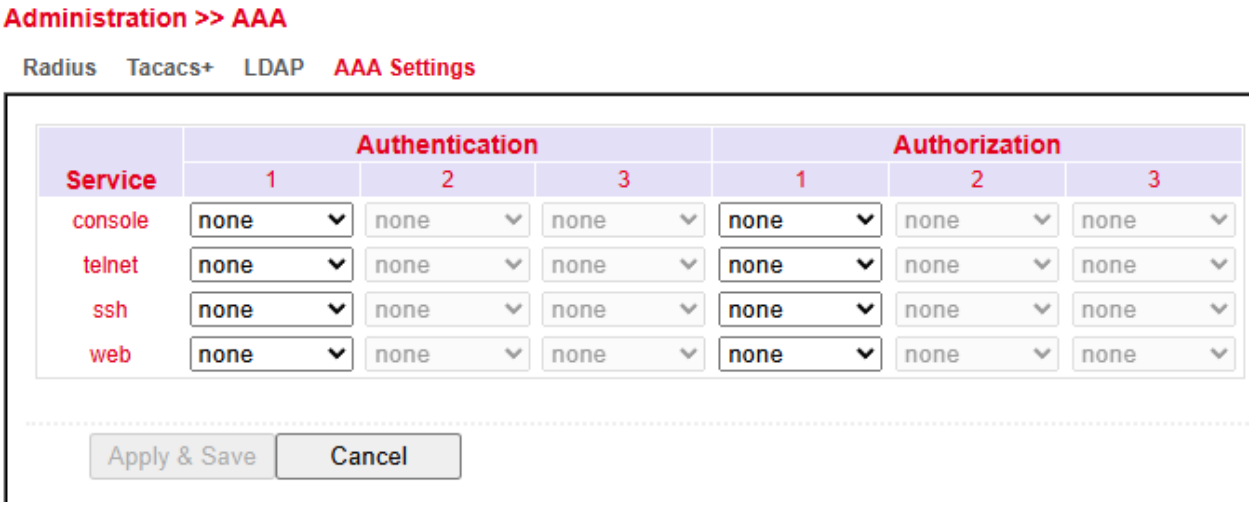



Enter the required connection details for your LDAP server here.

## AAA Settings

The AAA Settings page lets administrators configure Authentication and Authorization for different management services: ***Console, Telnet, SSH, and Web***.

- ***Authentication:*** Verifies user identity. Up to three methods (e.g., Local, RADIUS, TACACS+, LDAP) can be set in order of preference.
- ***Authorization:*** Controls user permissions after authentication. Also supports up to three methods.
- None means no AAA is applied.
- ***Apply & Save*** stores the changes; Cancel discards them.




# 5.2.5 Config Management

Under **Administration > Config Management** you can:

- Save the current configuration
- Import an existing configuration
- Reset the router to factory defaults

## Importing an Existing Configuration

1. Click **Browse…** and select a configuration file.
2. Click **Import** to upload it.
3. After successful import, restart the router to activate the configuration.

## Saving an Existing Configuration

- **Backup running-config** → saves the current configuration including unconfirmed changes.
- **Backup startup-config** → saves the configuration without unconfirmed changes.

## Automatic Saving

If **Auto Save after modify the configuration** is checked:

- All changes are applied immediately and persist after reboot.

If not checked:

- Changes will be lost after reboot unless saved manually via **Save Configuration** (bottom left navigation).

## Reset to Factory Defaults

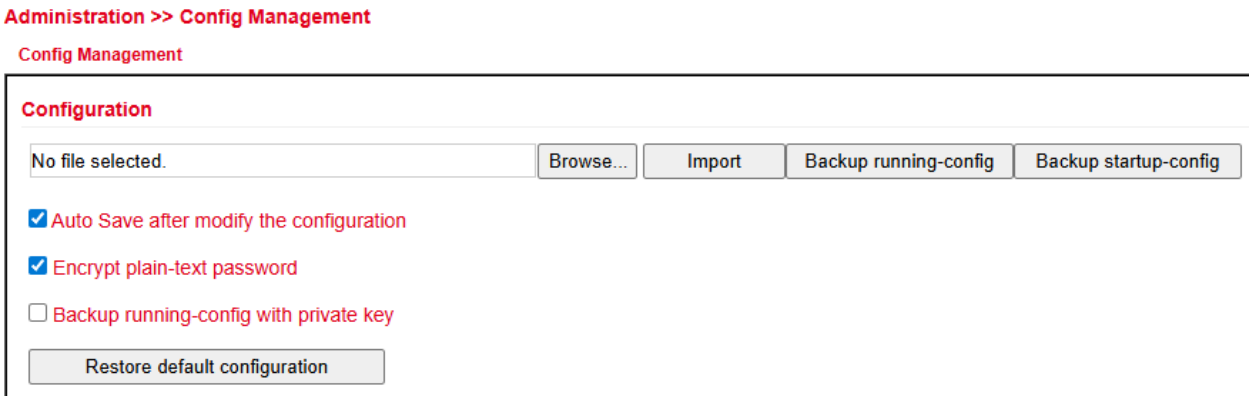
Click **Restore default configuration** to reset the router to its default settings.

## Encrypt Passwords in the Configuration File

Enable **Encrypt plain-text password** to prevent passwords from being displayed in clear text.

## Back Up Running-Config with Private Key

Enable **Backup running-config with private key** to include imported private keys from certificate management in the backup.




# 5.2.6 SNMP

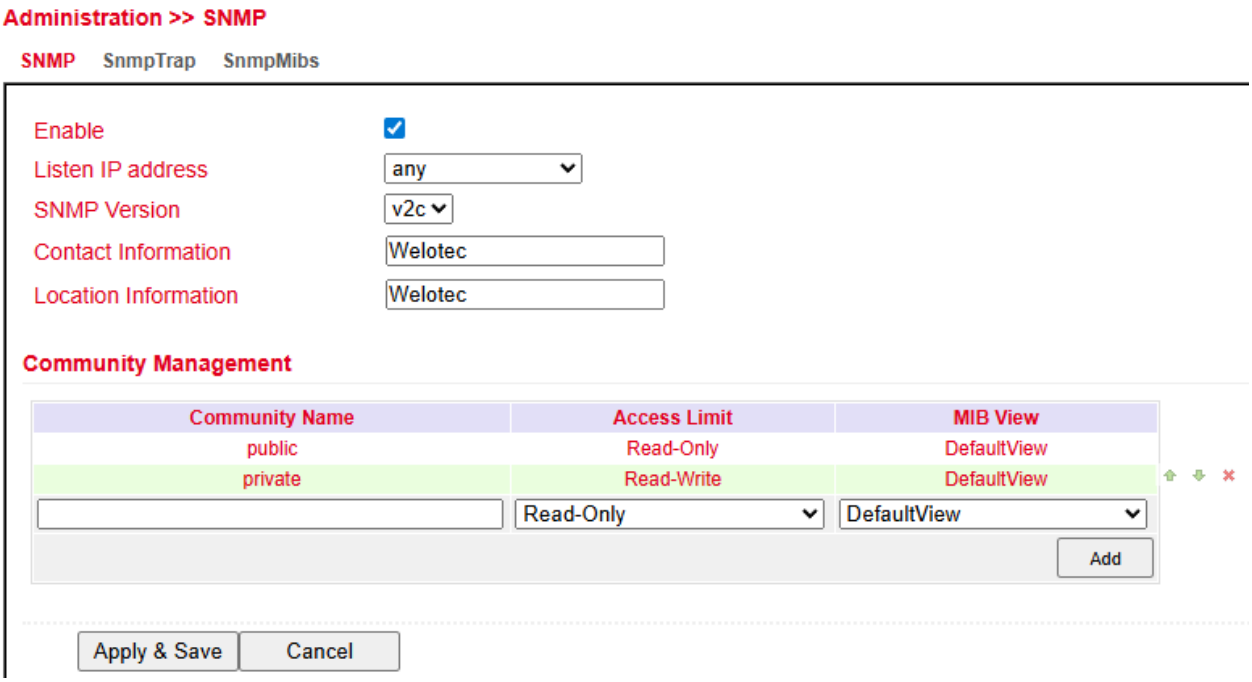
**SNMP (Simple Network Management Protocol)** is an IETF-standard protocol used to **monitor and control network elements** such as routers, servers, switches, printers, and computers from a central station.

- SNMP defines the structure of the data packets and the communication flow.
- It was designed so that any network-capable device can be integrated into monitoring.
- Communication occurs between **monitored devices (agents)** and the **monitoring station (manager)**.

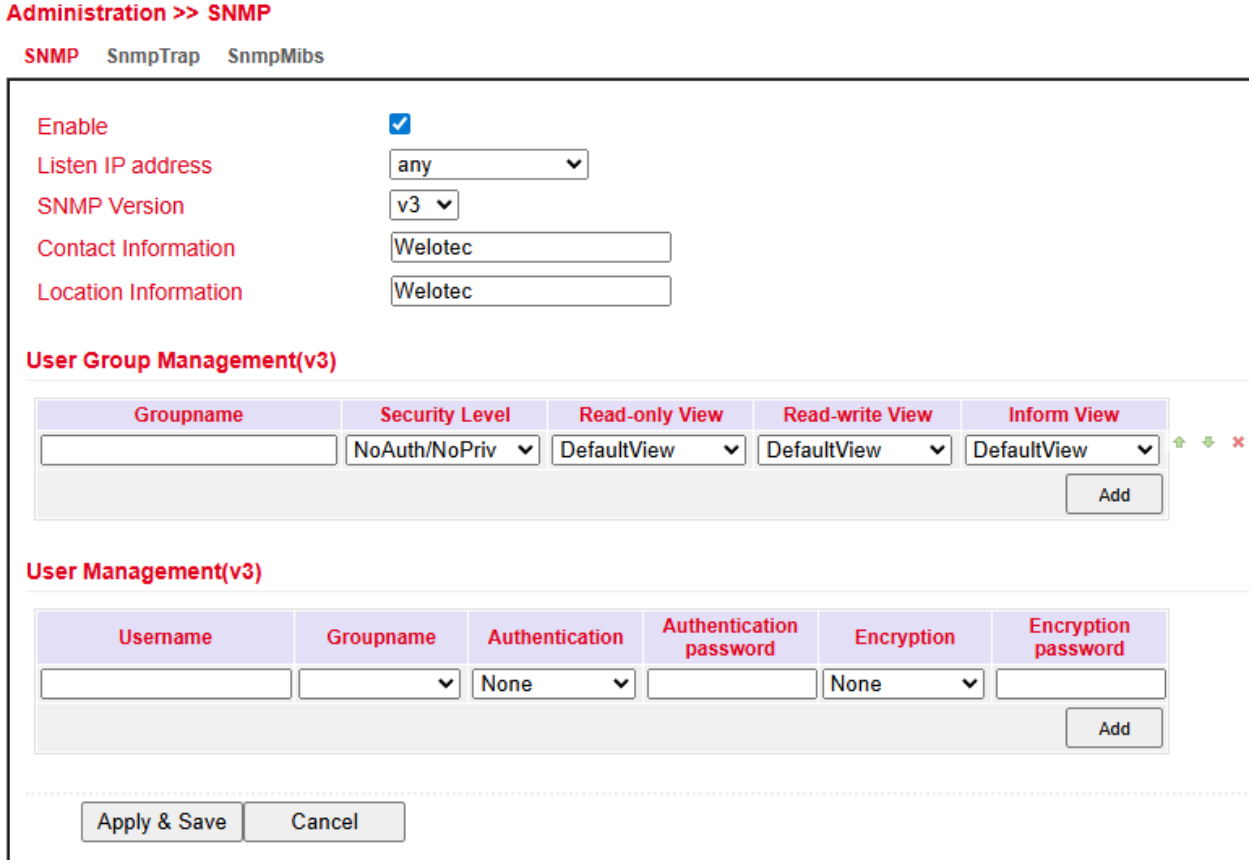
## SNMP Configuration

The TK804L-450 supports **SNMP v1, v2c, and v3**.

- **SNMPv1 / v2c**: use a **community name** for authentication with *read-only* or *read-write* rights.
  The IP address for the SNMP service can be selected under **Listen IP address**.




- **SNMPv3**: uses **username/password authentication** and provides **group management**.
  This allows individual users to be authorized more precisely compared to v1/v2.




Supported in SNMPv3:

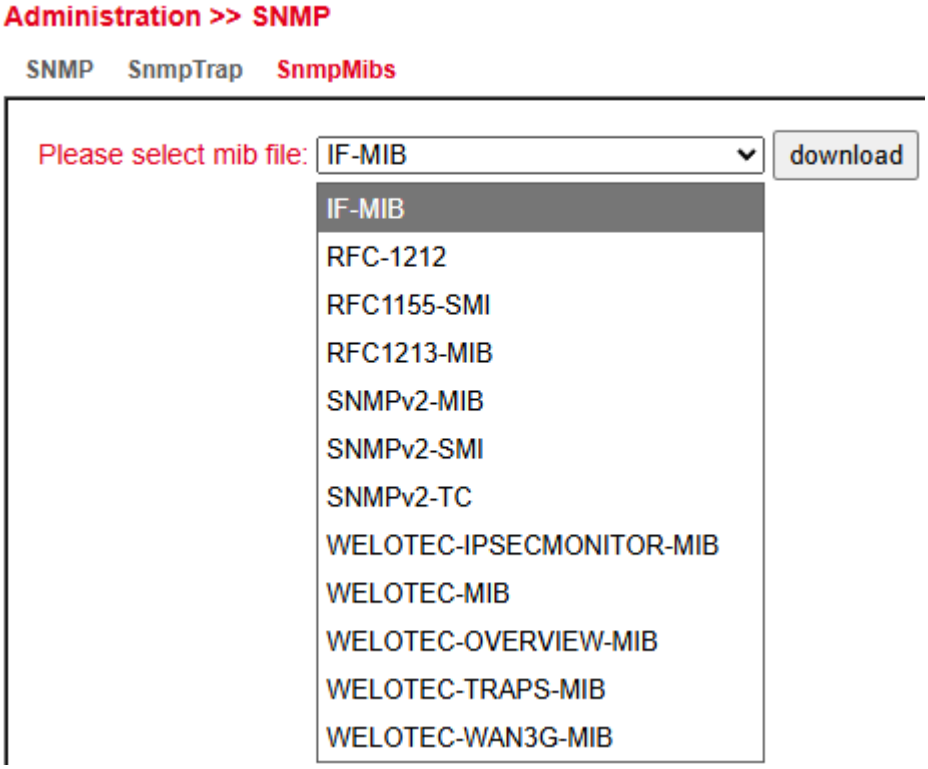
- **Authentication** → SHA or MD5
- **Encryption** → AES or DES

## SNMP Trap

An **SNMP Trap server** can be configured.
This allows the router to actively send SNMP messages to the management server instead of waiting for requests.

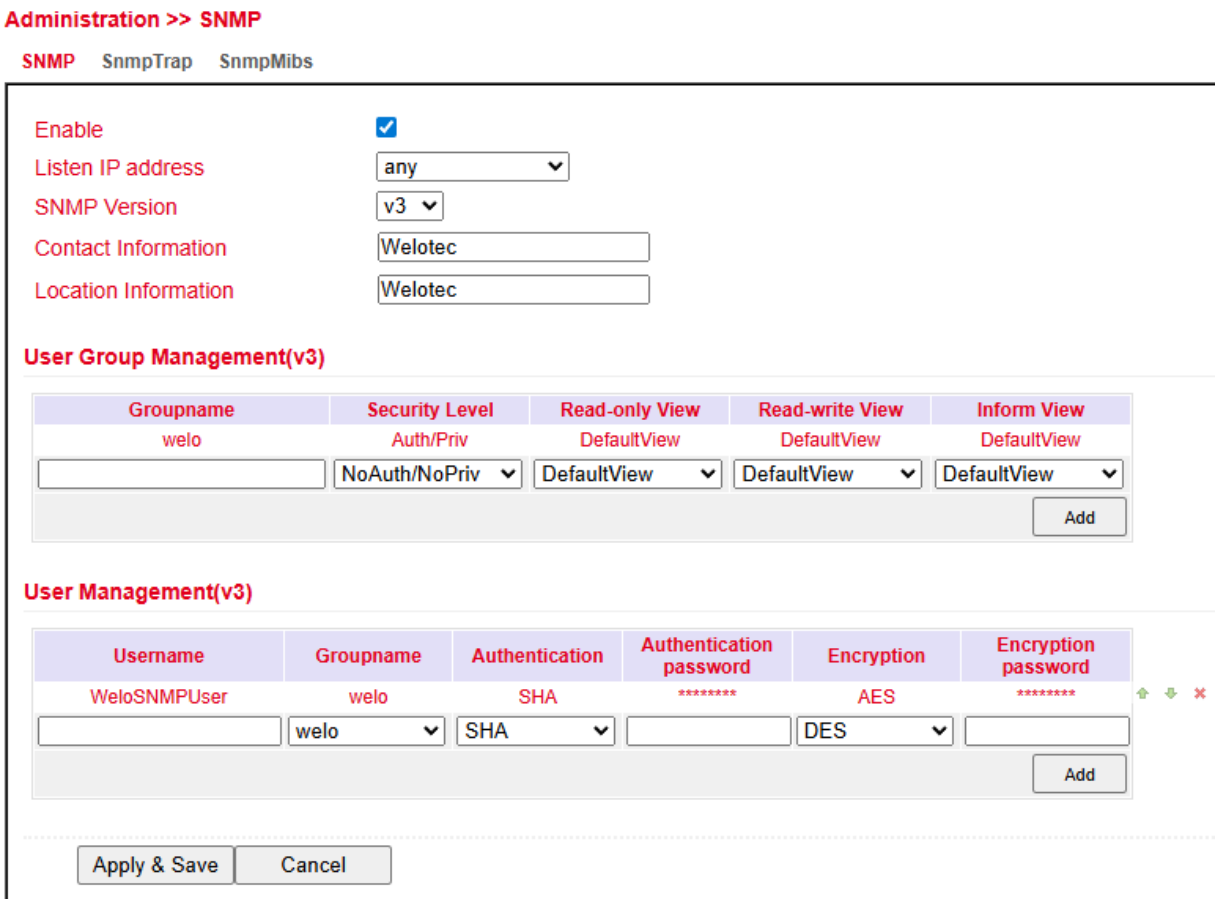

## SNMP MIBs

The **SNMP MIB files** for monitoring the router can be downloaded and used for evaluations.
Select the desired MIB file and click the **Download** button.



# Reading SNMP MIBs with SNMPWALK

1. **Configure SNMP** on the router:




2. **Run SNMPWALK** on a Linux computer, for example:

```
snmpwalk -v3 -u WeloSNMPUser -l AuthPriv -a SHA -A 123456789 \
         -x AES -X 123456789 10.255.229.10

snmpwalk -v3 -u WeloSNMPUser -l AuthPriv -a SHA -A 123456789 \
         -x AES -X 123456789 udp6:[2a02:d20:8:c01::1]
```

3. **Download MIBs from TK804L-450**

4. **Install MIBs locally**

```
mkdir -p ~/.snmp/mibs
cp Downloads/WELOTEC* ~/.snmp/mibs/


 Available MIBs:

 -   WELOTEC-PORTSETTING-MIB
 -   WELOTEC-SERIAL-PORT-MIB
 -   WELOTEC-SYSTEM-MAN-MIB
 -   WELOTEC-WAN3G-MIB
```

5. **Start SNMPWALK using the MIBs**

```
snmpwalk  -m +WELOTEC-MIB -v3 -u WeloSNMPUser -l AuthPriv \
          -a SHA -A 123456789 -x AES -X 123456789 192.168.2.1 WELOTEC


Example Output

WELOTEC-MIB::ihOverview.1.0 = STRING: "TK804L-450"
WELOTEC-MIB::ihOverview.2.0 = STRING: "RF9151408241109"
WELOTEC-MIB::ihOverview.3.0 = STRING: "2011.09.r7903"
WELOTEC-MIB::ihOverview.4.0 = STRING: "1.0.0.r9919"
WELOTEC-MIB::ihWan3g.1.1.1.0 = INTEGER: 3
```

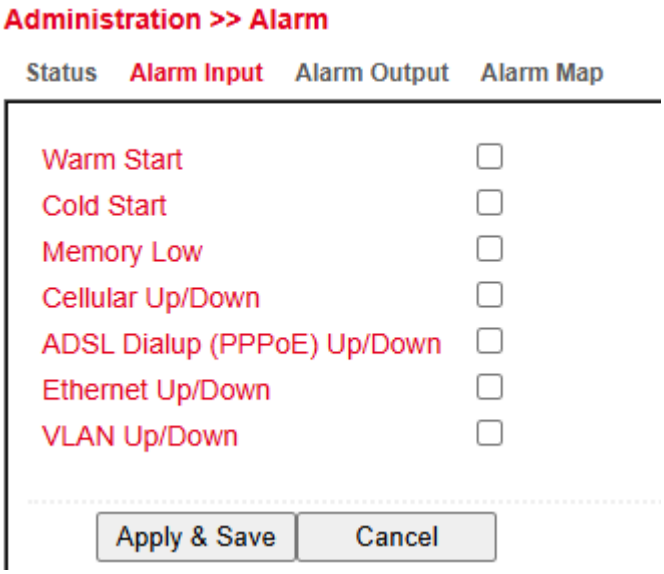
# 5.2.7 Alarm

## Status

The **Alarm Status** page shows an overview of all triggered alarms.

## Alarm Input

In the **Alarm Input** menu, you can define which alarm messages the router should output.
By setting or removing checkmarks, each alarm can be enabled or disabled.

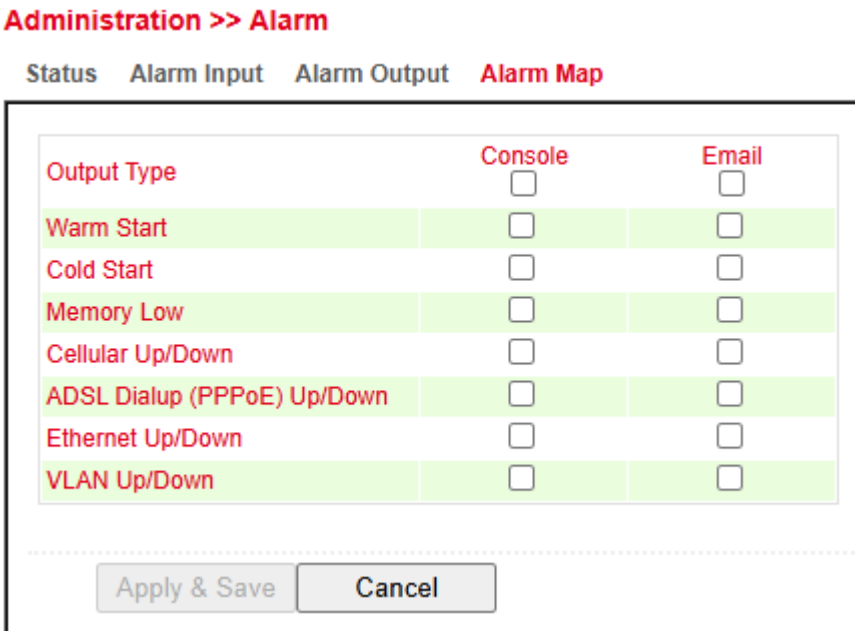



**Available alarm messages:**

| Parameter | Description |
|---|---|
| Warm Start | Warm restart/reboot of the router |
| Cold Start | Cold start = booting the router after power-off |
| Memory Low | Low memory condition |
| Cellular Up/Down | Mobile connection (GPRS/UMTS/LTE) connected or disconnected |
| ADSL Dialup (PPPoE) Up/Down | ADSL dialup connected or disconnected |
| Ethernet Up/Down | Ethernet interface connected or disconnected |
| VLAN Up/Down | VLAN connection established or disconnected |

## Alarm Map

In the **Alarm Map** you can define whether alerts are displayed in the web interface.
Enable or disable the feature by checking the box.




# 5.2.8 Log

The **Log** menu displays the current router messages.
It contains information about:

- Network status
- Operational status
- Configuration changes
- ISP connection
- IPSec / OpenVPN status
- And more

**Administration >> Log**

Log System Log

View recent 20 Lines

| Level | Time | Content |
|---|---|---|
| | | Too many logs, old logs are not displayed. Please download log file to check more logs! |
| info | Aug 8 14:25:56 | redial[1116]: got an attached device |
| info | Aug 8 14:25:56 | redial[1116]: device /dev/ttyUSB1 is ready |
| warning | Aug 8 12:25:56 | kernel: [ 1511.774727] cdc_ether: disagrees about version of symbol module_layout |
| warning | Aug 8 12:25:56 | kernel: [ 1511.775182] cdc_ether: disagrees about version of symbol module_layout |
| info | Aug 8 14:25:58 | redial[1116]: send to modem (4): AT^M |
| info | Aug 8 14:25:58 | redial[1116]: modem response (9): AT^M^M OK^M |
| info | Aug 8 14:25:58 | redial[1116]: send to modem (6): ATE0^M |
| info | Aug 8 14:25:58 | redial[1116]: modem response (11): ATE0^M^M OK^M |
| info | Aug 8 14:25:58 | redial[1116]: detecting modem nat (1/1)... |
| info | Aug 8 14:25:58 | redial[1116]: send to modem (15): AT+QCFG="nat"^M |
| info | Aug 8 14:25:58 | redial[1116]: modem response (24): ^M +QCFG: "nat",1^M ^M OK^M |
| info | Aug 8 14:25:58 | redial[1116]: detecting modem imei (1/3)... |
| info | Aug 8 14:25:58 | redial[1116]: send to modem (8): AT+GSN^M |
| info | Aug 8 14:25:58 | redial[1116]: modem response (25): ^M 867232070004990^M ^M OK^M |
| info | Aug 8 14:25:58 | redial[1116]: detecting modem sim card (1/5)... |
| info | Aug 8 14:25:58 | redial[1116]: send to modem (10): AT+CPIN?^M |
| info | Aug 8 14:25:58 | redial[1116]: modem response (18): ^M +CME ERROR: 10^M |
| info | Aug 8 14:26:08 | redial[1116]: detecting modem sim card (2/5)... |
| info | Aug 8 14:26:08 | redial[1116]: send to modem (10): AT+CPIN?^M |
| info | Aug 8 14:26:08 | redial[1116]: modem response (18): ^M +CME ERROR: 10^M |

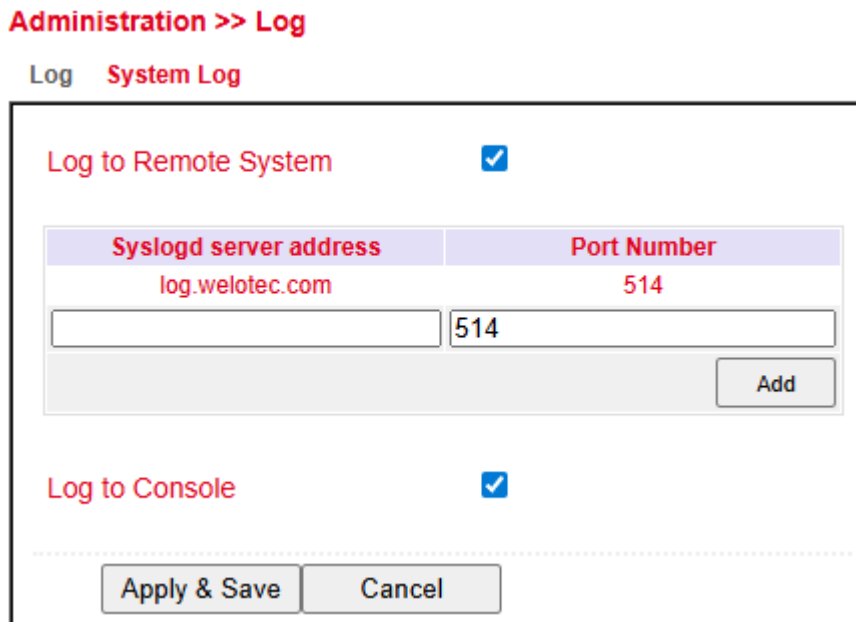
Clear Log | Download Log File | Download Diagnose Data
Clear History Log | Download History Log

**Available options in the log section:**

| Option | Description |
|---|---|
| Clear Log | Delete displayed log entries |
| Download Log File | Download current log file |
| Download Diagnose Data | Download diagnostic data file |
| Clear History Log | Delete log history |
| Download History Log | Download log history |

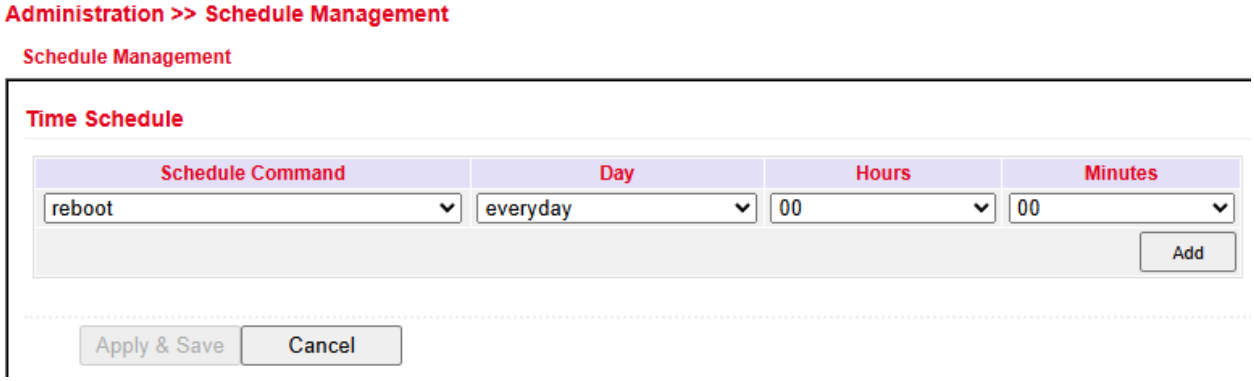
## System Log

In **System Log** you can specify a **syslog server** to which router logs are sent over the network.




- **Syslog server address** → Enter the host name (FQDN) or IP address of the syslog server.
- **Port** → Default is **514** (standard syslog port).

# 5.2.9 Schedule Management




# 5.2.10 Upgrade

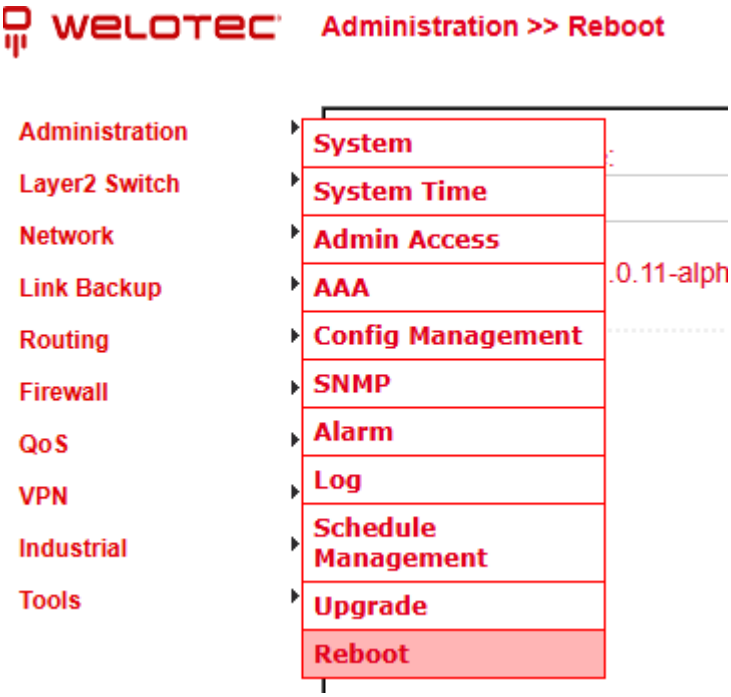
Firmware updates can be performed in the **Upgrade** menu.
Firmware updates may include **new features** or **bug fixes**.

- The currently installed firmware is displayed under **Select the file to use**.
- Click **Browse** and select the firmware file (`.bin` or `.pkg`) previously downloaded.
- Click **Upgrade** to install the firmware.

**Note:**
If the installed version is significantly older, the **bootloader** and the **I/O board** may need to be updated separately. For details, please contact support.

## 5.2.11 Reboot

The router can be restarted via **Reboot**.




- Click **OK** to confirm the reboot.

- Always **save the configuration before restarting**. Otherwise, unsaved changes will be lost.

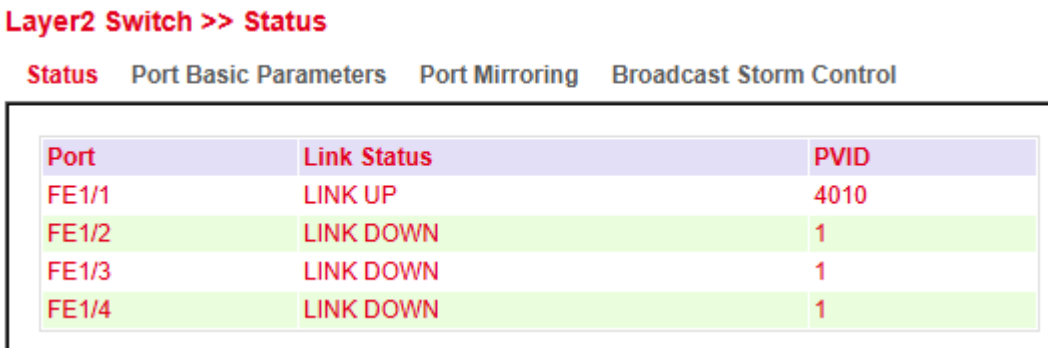
# 5.3 Layer2 Switch

## 5.3.1 Status

The **Status** section shows the **link status** and **VLAN assignment (PVID)** for each physical switch port.

- **Link Status** → Displays if a port is *active (LINK UP)* or *inactive (LINK DOWN)*
- **PVID (Port VLAN ID)** → Indicates the VLAN assigned to untagged traffic on the port

This helps to quickly identify active connections and verify VLAN configuration.

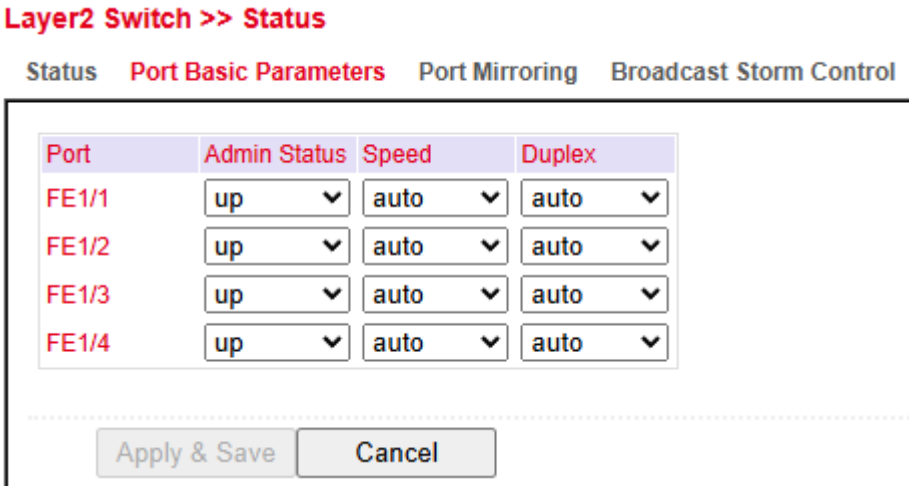



## Port Basic Parameters

In **Port Basic Parameters**, you can configure each port with:

- **Admin Status** → Enable/disable the port (up or down)
- **Speed** → Auto-negotiation or fixed speed
- **Duplex** → Auto, Full, or Half duplex

These settings allow performance optimization and device compatibility management.

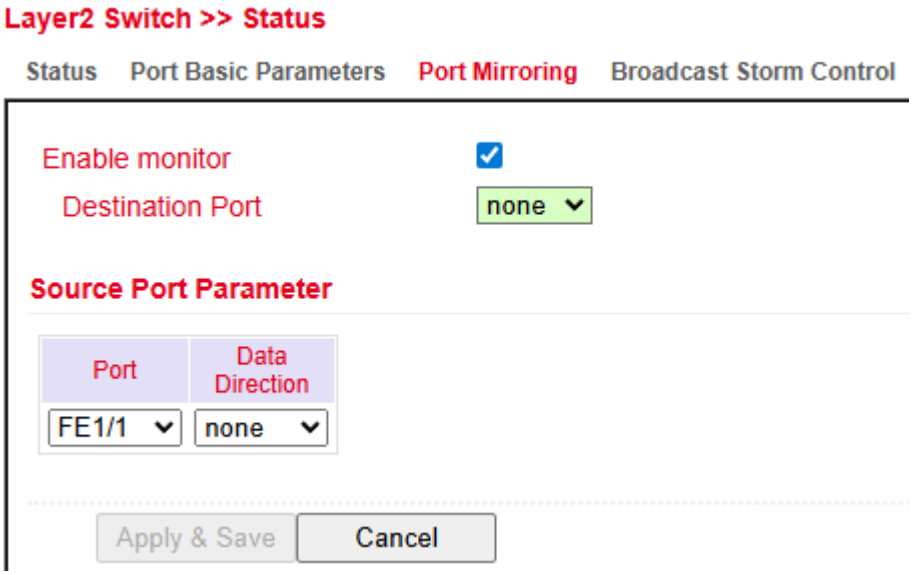


## Port Mirroring

**Port Mirroring** allows monitoring of network traffic by copying packets from one or more source ports to a destination port.

- **Enable Monitor** → Activates mirroring
- **Destination Port** → Port to which mirrored traffic is sent (e.g., analysis tool)
- **Source Port Parameters**:
  - **Port** → The monitored port
  - **Data Direction** → Ingress, Egress, or Both

This feature is used for **diagnostics**, **intrusion detection**, or **performance analysis**.

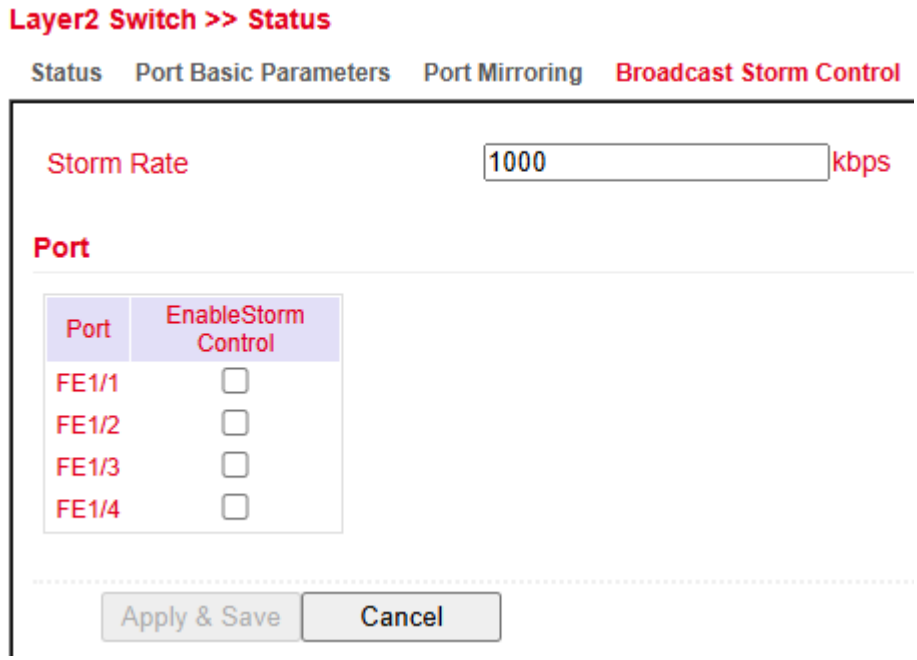



## Broadcast Storm Control

The **Broadcast Storm Control** feature allows administrators to limit the rate of broadcast traffic per port to prevent network flooding.

- **Storm Rate** → Sets the maximum allowed broadcast traffic rate (in kbps).
- **Enable Storm Control** → Can be enabled individually for each port.

Activating this feature on selected ports helps maintain network stability during broadcast storms caused by misconfigured devices or loops.



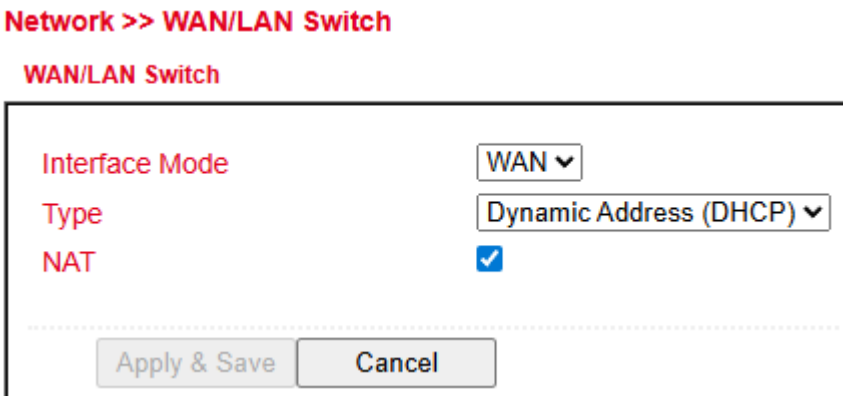

# 5.4 Network

## 5.4.1 WAN/LAN Switch

The **WAN/LAN Switch** section defines the role and addressing behavior of the network interface.

- **Interface Mode** → Select whether the interface operates as **WAN** or **LAN**.
- **Type** → Defines the IP configuration mode:
  - **Dynamic Address (DHCP)** → Automatically obtains IP settings from a DHCP server.
  - **Static Address** → Manual configuration (not shown in image but typically supported).
- **NAT (Network Address Translation)** → When enabled, private IP addresses are translated to a public IP for Internet access.

This configuration is essential for defining how the device integrates into the network and whether it routes traffic between private and public networks.



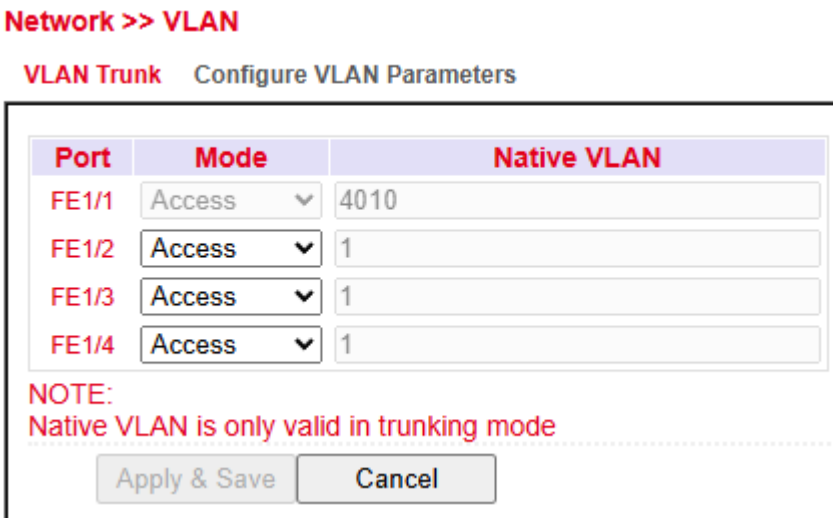
# 5.4.2 VLAN

## VLAN Trunk

The **VLAN Trunk** configuration assigns VLAN modes and native VLANs to individual ports.

- **Port** → The physical Ethernet interface.
- **Mode** →
  - **Access** → Port belongs to a single VLAN.
  - **Trunk** → Port carries traffic for multiple VLANs (not shown in image but typically supported).
- **Native VLAN** → Only valid when the port is in *Trunk* mode; defines the VLAN for untagged traffic.

**Note:** Native VLAN settings apply only when the port operates in **Trunk mode**.
This setting is critical for managing VLAN tags on networks with VLAN-aware devices.




## Configure VLAN Parameters

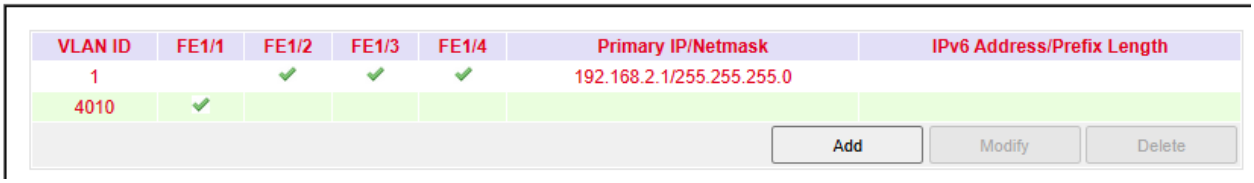
In this section you can define VLAN IDs, assign them to ports, and configure IP addressing for VLAN interfaces.

- **VLAN ID** → Identifier for the VLAN (e.g., 1, 4010).
- **Port Membership** → Assigns ports to the VLAN.
- **Primary IP / Netmask** → Layer3 IP configuration for management or routing.
- **IPv6 Address / Prefix Length** → Optional IPv6 configuration (empty in example).

**Available Actions:**

- **Add** → Create a new VLAN.
- **Modify** → Change VLAN settings.
- **Delete** → Remove an existing VLAN.

This configuration is essential for **network segmentation**, **traffic isolation**, and improving **security and performance**.



| VLAN ID | FE1/1 | FE1/2 | FE1/3 | FE1/4 | Primary IP/Netmask | IPv6 Address/Prefix Length |
|---|---|---|---|---|---|---|
| 1 | | ✔ | ✔ | ✔ | 192.168.2.1/255.255.255.0 | |
| 4010 | ✔ | | | | | |

Add  Modify  Delete

## 5.4.3 Cellular

The **Cellular** interface provides mobile communication access.
With an inserted SIM card, the router can connect to the Internet via **GPRS, EDGE, UMTS, or LTE**, depending on the model.

### Status

Under **Status** you find an overview of the current connection state (**Connected** / **Disconnected**).

- **Network Type** → shown in the Status tab
- **IP Address** → shown in the Network section
- **Modem area** → shows signal level, RSRP, and RSRQ

## Network >> Cellular

**Status** Cellular

### Modem

| | |
|---|---|
| Active SIM | SIM 1 |
| IMEI Code | |
| IMSI Code | |
| Signal Level | (0 asu -113 dBm) |
| Register Status | registering |
| Operator | |
| Network Type | |
| LAC | |
| Cell ID | |

### Network

| | |
|---|---|
| Interface | cellular 1 |
| Status | Disconnected |
| IP Address | 0.0.0.0 |
| Netmask | 0.0.0.0 |
| Gateway | 0.0.0.0 |
| DNS | 0.0.0.0 |
| MTU | 1500 |
| IPv6 Address | |
| Delegated Prefix | :/128 |
| Connection time | 0 day, 00:00:00 |

| | |
|---|---|
| Interface | cellular 2 |
| Status | Disconnected |
| IP Address | 0.0.0.0 |
| Netmask | 0.0.0.0 |
| Gateway | 0.0.0.0 |
| DNS | 0.0.0.0 |
| MTU | 1500 |
| IPv6 Address | |
| Delegated Prefix | :/128 |
| Connection time | 0 day, 00:00:00 |

Connect Disconnect

In some cases, the router may not receive a valid DNS server from the provider.
Check the DNS entry:

- If empty → no DNS assigned
- If unusual (e.g., `10.74.210.210` → Telekom internal DNS), adjust settings accordingly.

RSRP (Reference Signal Received Power)

RSRP is one of the most important indicators for assessing LTE reception quality.
It is measured directly by the device and used to determine the strongest cell.

| RSRP (dBm) | Grade | Comment |
|---|---|---|
| -50 to -65 | 1 (very good) | Excellent reception – perfect |
| -65 to -80 | 2 (good) | Good reception – sufficient |
| -80 to -95 | 3 (satisfactory) | Stable, but not optimal |
| -95 to -105 | 4 (sufficient) | Acceptable, but speed restrictions / occasional drops possible |
| -110 to -125 | 5 (poor) | Very poor – connection barely possible |
| -125 to -140 | 6 (insufficient) | Extremely poor – likely no connection |

RSRQ (Reference Signal Received Quality)

RSRQ is a calculated ratio based on **RSRP** and **RSSI**, and is crucial for evaluating LTE quality.
Together with RSRP, it helps optimize antenna alignment for stationary use.

| RSRQ (dB) | Grade | Comment |
|---|---|---|
| -3 | 1 (very good) | Optimal, no interference |
| -4 … -5 | 2 (good) | Minor interference, no impact |
| -6 … -8 | 3 (satisfactory) | Noticeable influence, but still stable |
| -9 … -11 | 4 (sufficient) | Significant interference, connection affected |
| -12 … -15 | 5 (poor) | Heavy interference, unstable connection |
| -16 … -20 | 6 (insufficient) | Severe interference, no usable connection |

Many providers assign **private IP addresses** that are not directly routable from the Internet.
A successful or failed ping does **not** always indicate Internet reachability.

## Cellular Configuration

Under **Network > Cellular > Cellular** you can configure mobile network access.

**Network >> Cellular**

Status Cellular

Enable ☑

| | SIM1 | SIM2 |
|---|---|---|
| Profile | 4 | 4 |
| Roaming | ☑ | ☑ |
| PIN Code | | |
| Network Type | Auto | Auto |
| Connection Mode | Always Online | |
| Redial Interval | 10 s | |
| Detection Method | none | |

**Show Advanced Options** ☐

**Profile**

| Index | Network Type | APN | Access Number | PDP Type | Auth Method | Username | Password |
|---|---|---|---|---|---|---|---|
| 1 | GSM | 450connect.net | *99***1# | IPv4 | Auto | | |
| 2 | GSM | eon-pdn6crm.450connect.de | *99***1# | IPv6 | Auto | eon | ****** |
| 3 | GSM | eon-pdn6crp.450connect.de | *99***1# | IPv6 | Auto | eon | ****** |
| 4 | GSM | eonplcp2 | *99***1# | IPv6 | Auto | eon | ****** |
| | GSM | | *99***1# | IPv4v6 | Auto | | |

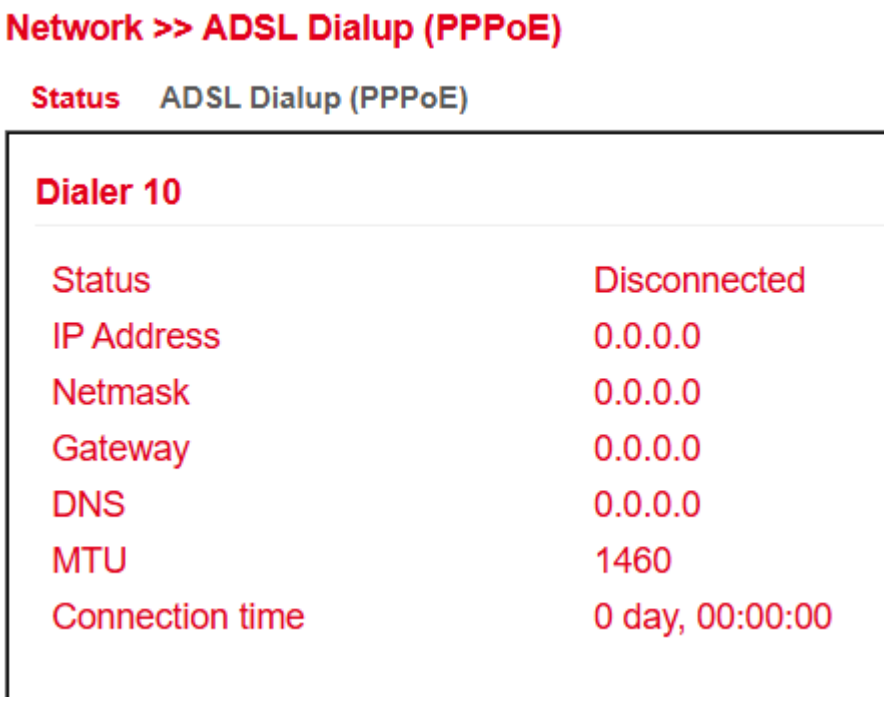
Add

Apply & Save Cancel

| Parameter | Description | Default |
|---|---|---|
| Enable | Enable or disable the cellular interface | Enabled |
| Profile | APN profile for SIM 1 and SIM 2 | Auto / Auto |
| Roaming | Enable or disable roaming. ☒ Depends on provider – roaming may occur despite being disabled. | Enabled / Enabled |
| PIN Code | SIM card PIN. ☒ Enter before inserting SIM card. | Blank / Blank |
| Network Type | Auto / 2G (GPRS, EDGE) / 3G (UMTS, HSDPA, HSUPA, HSPA+) / 4G (LTE) | Auto |
| Connection Mode | Always online or on-demand connection | Always Online |
| Redial Interval | Interval for redialing | 10 seconds |
| Detection Method | How to check Internet connectivity (e.g., ICMP ping, DNS, HTTP) | ICMP (Ping) |
| Show Advanced Options | Displays additional settings when enabled | Disabled |

# 5.4.4 ADSL Dialup (PPPoE)

## Status




The **TK804L-450 routers** do **not** have a built-in ADSL modem.
For ADSL dial-up, connect an **external ADSL modem** to the WAN port.
 Ensure the DSL modem supports **modern IP technologies** for proper operation.

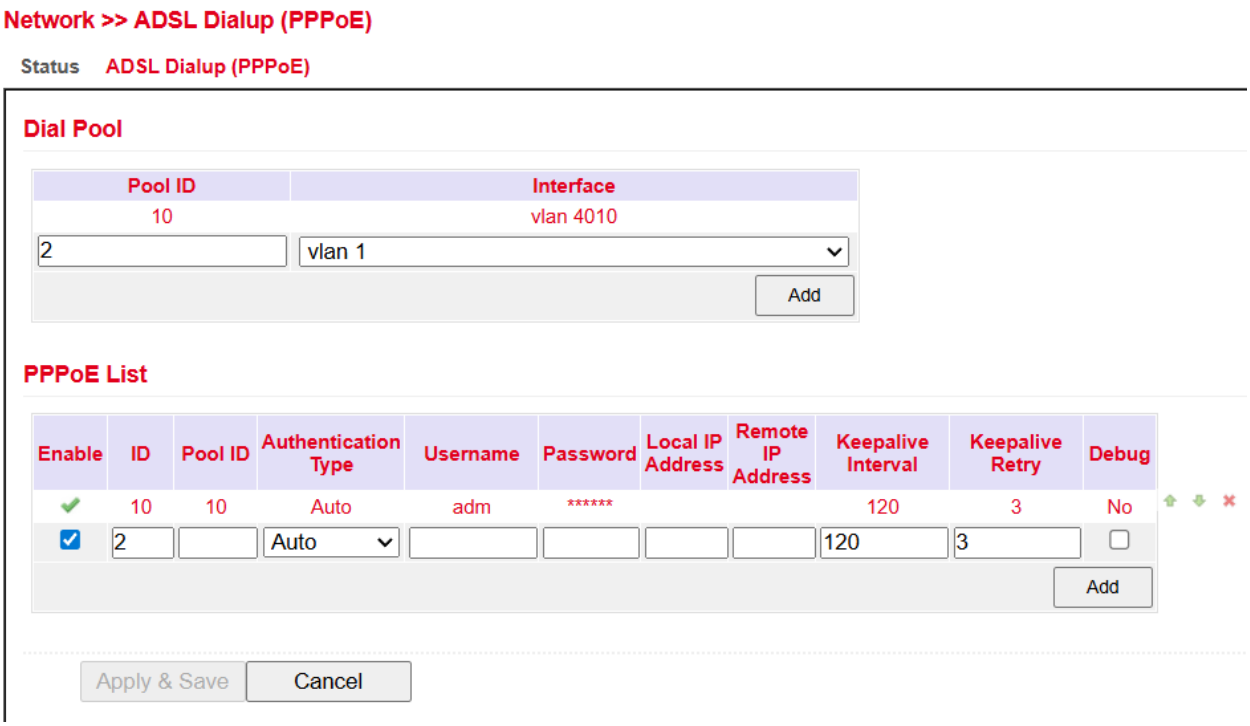
## ADSL Dialup (PPPoE)

Here you can configure **DSL dial-in via PPPoE**.
The TK804L-450 does **not** have an integrated DSL modem, so an **external modem** is required.

The DSL modem should meet the following criteria:

- VDSL2 / ADSL2 Ethernet modem
- Annex A / B / M / J compatible
- PPPoE bridge operation
- IPv4 and IPv6 compatible
- DSL standards:
  - ANSI T1.413 Issue 2
  - ITU G.992.1 A/B (G.dmt)
  - ITU G.992.2 (G.lite)
  - ITU G.992.3 (VDSL2)
  - ITU G.992.4 (G.HS)
  - ITU G.992.5 (ADSL2+)

 Ensure the modem is connected to the router before configuration.
The DSL modem should be attached to **FE 0/1** or a defined **VLAN port**.




Dial Pool

The **Pool ID** defines the interface used for PPPoE dial-up.

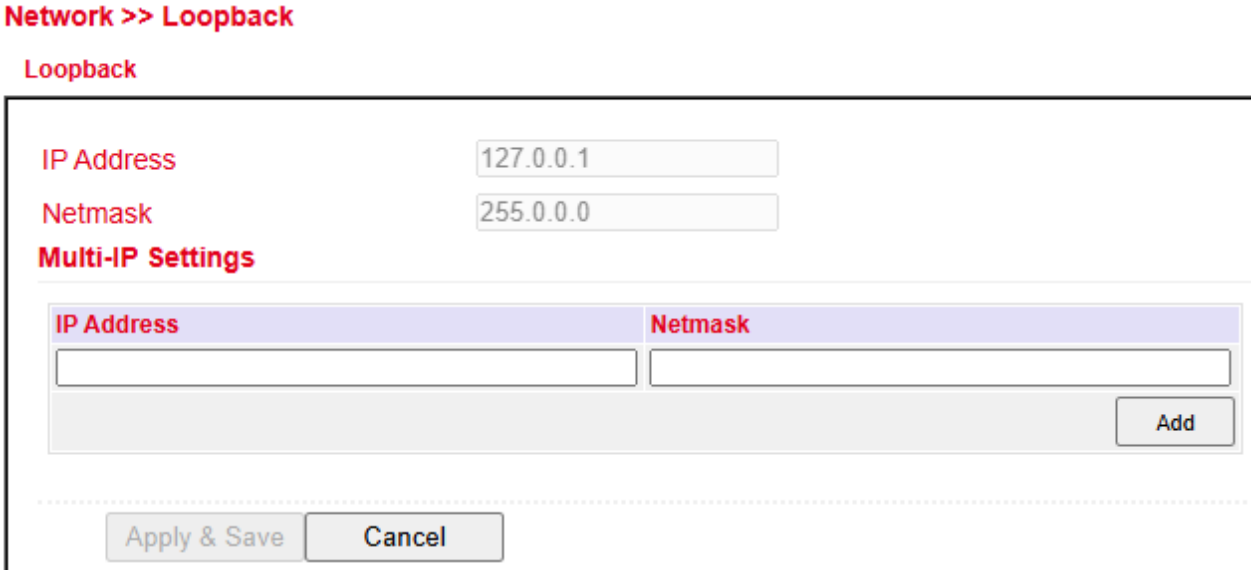
PPPoE List

| Parameter | Description |
|---|---|
| Enable | Enable or disable the PPPoE entry |
| ID | Unique identifier for the entry |
| Pool ID | Pool ID created under *Dial Pool* for the interface used for the connection |
| Authentication Type | Auto, PAP, CHAP (usually set to Auto) |
| Username | Username provided by your ISP |
| Password | Password provided by your ISP |
| Local IP Address | Local IP address |
| Remote IP Address | IP address of the remote device (modem) |
| Keepalive Interval | Time interval for connection checks |
| Keepalive Retry | Number of retries if a connection check fails |
| Debug | Enables detailed logging |

# 5.4.5 Loopback

## Loopback Configuration

Under **Network > Loopback** you can configure additional loopback IP addresses.
 The default address `127.0.0.1` cannot be modified.

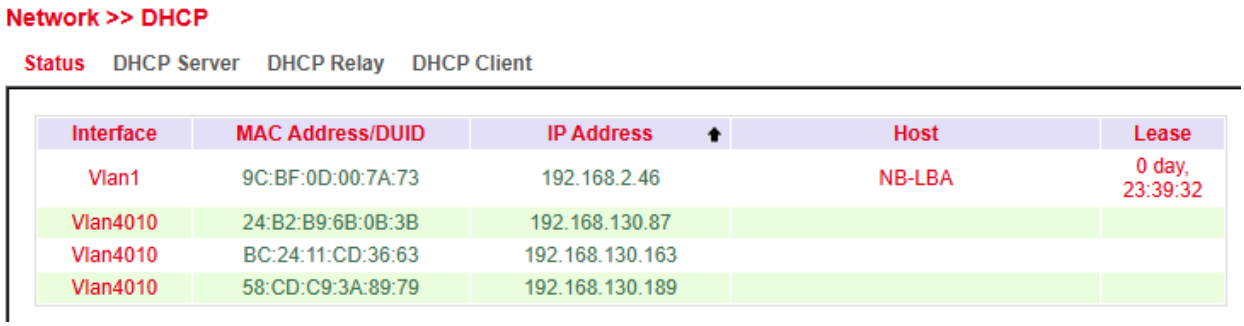



# 5.4.6 DHCP

**Dynamic Host Configuration Protocol (DHCP)** automatically assigns network configuration to clients.

## Status

Under **Services > DHCP > Status** you can view which clients are currently connected to the router and on which interface.

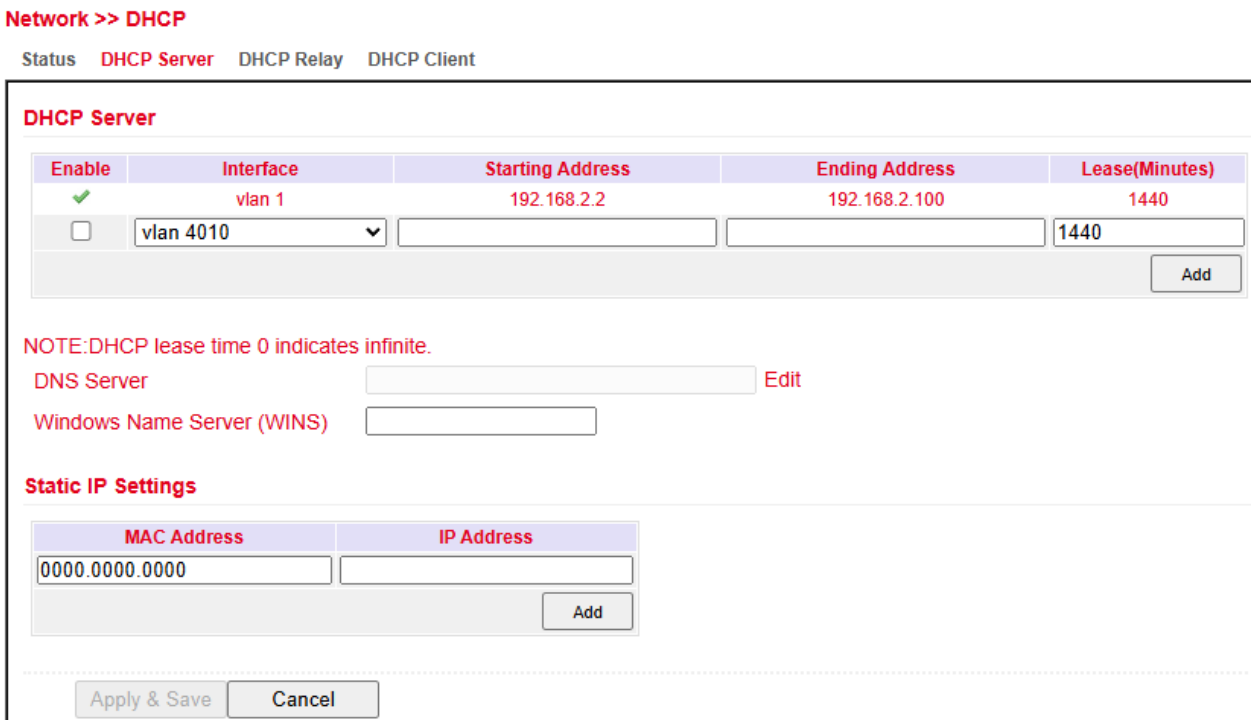



## DHCP Server

Under **Services > DHCP > DHCP Server** you can configure the DHCP server:

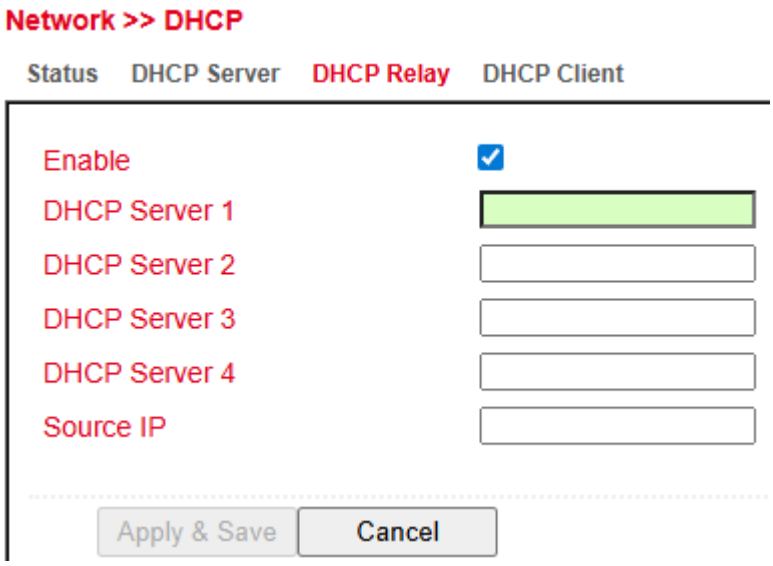
- Select the interface
- Define start and end IP address
- Configure lease time

With **Static IP Settings**, an IP address can be permanently assigned to a specific **MAC address**.



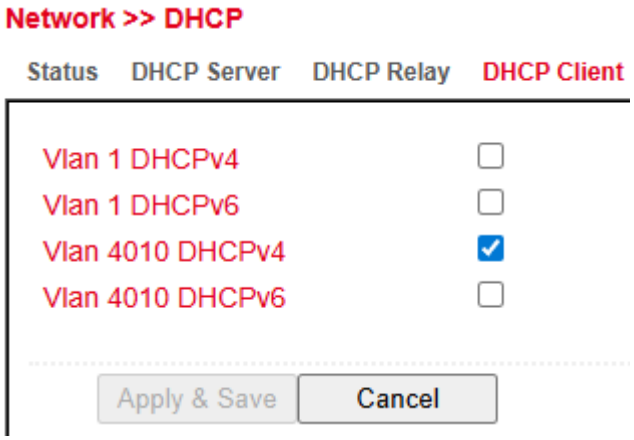

## DHCP Relay

Under **Services > DHCP > DHCP Relay** you can specify **remote DHCP servers**, which then provide IP management for connected networks.
Enable this feature with the **Enable** checkbox.



## DHCP Client

Under **Services > DHCP > DHCP Client**, the router itself can obtain an IP address from a DHCP server. Select the interface to be configured via DHCP (varies by router model).




# 5.4.7 DNS

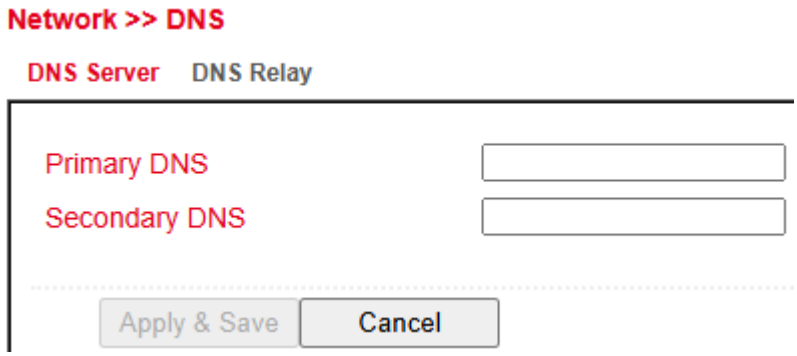
**Domain Name System (DNS)** is one of the most important services in IP networks. Its main purpose is **name resolution**:

- A client queries a domain name (e.g., `welotec.com`).
- DNS resolves the domain to the corresponding IP address (e.g., `192.168.2.1`).
- The IP address allows the client to reach the correct server.

This works similar to a **telephone directory**, where a name is resolved into a number.

## DNS Server

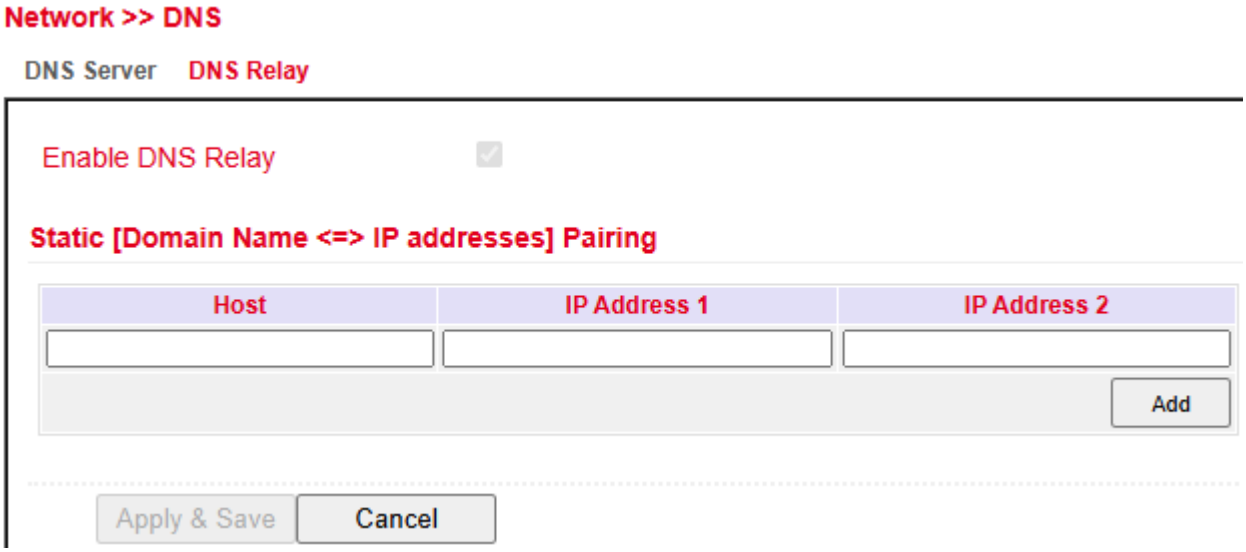
Under **Services > DNS > DNS Server** you can configure up to **two DNS servers**. These apply to all interfaces unless a different DNS server is assigned via DHCP.



## DNS Relay

Under **Services > DNS > DNS Relay** you can add manual DNS resolutions.

- Click **Add** to create an entry.
- Click **Apply & Save** to confirm changes.




## DDNS (Dynamic DNS)

**Dynamic DNS (DDNS)** updates domain entries automatically after a public IP address changes.
This ensures the device is always reachable under the same domain name, even if the public IP changes.

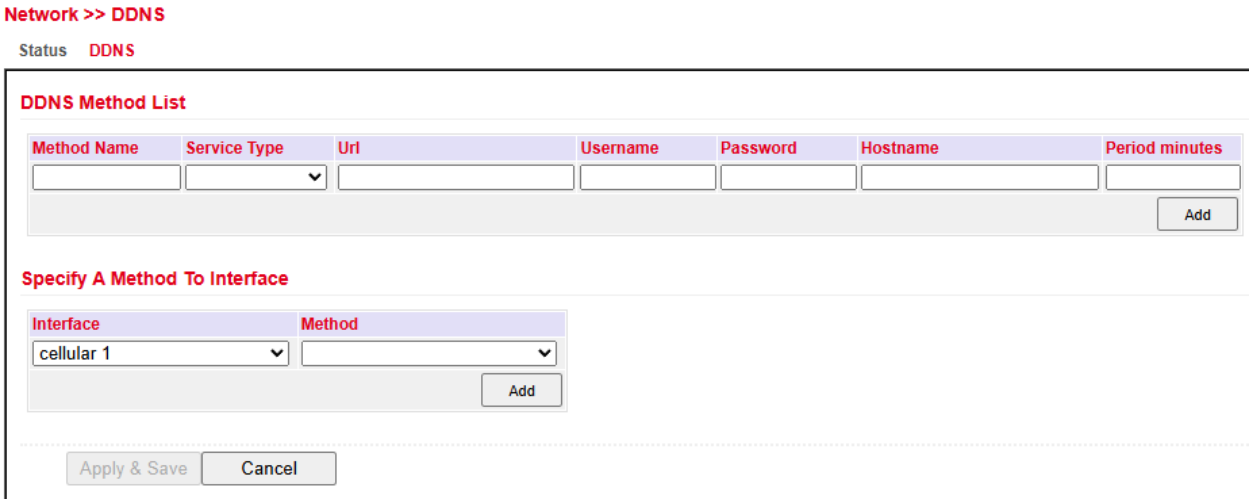
```
Example providers: DynDNS, NoIP
```

DDNS Status

Under **Services > DDNS > Status**, the currently active DDNS services are displayed.

DDNS Configuration

Under **Services > DDNS > DDNS** you can configure a new service.
 A DDNS service must first be created in **DDNS Method List**, then assigned to an interface under **Specify A Method To Interface**.




**DDNS Method List**

| Param-eter | Description |
|---|---|
| Method Name | Freely selectable name for the service |
| Service Type | Predefined DDNS services available. Use **Custom** if not listed |
| URL | Required only for **Custom** type. Full service URL including username and password. Example (NoIP):`https://username:password@dynupdate.no-ip.com/nic/update?hostname=welotec.ddns.net&myip=@IP` |
| User-name | Username for the DDNS provider |
| Pass-word | Password for the DDNS provider |
| Host-name | Domain name used |
| Period (min-utes) | Update interval, range **1–999999 minutes** |

**Assign Method to Interface**

| Parameter | Description |
|---|---|
| Interface | Router interface whose IP should be updated via DDNS |
| Method | DDNS service created under *DDNS Method List* |

 **Note:** You need an account with a DDNS provider (may be chargeable). Configure this account before use.

# 5.4.8 SMS

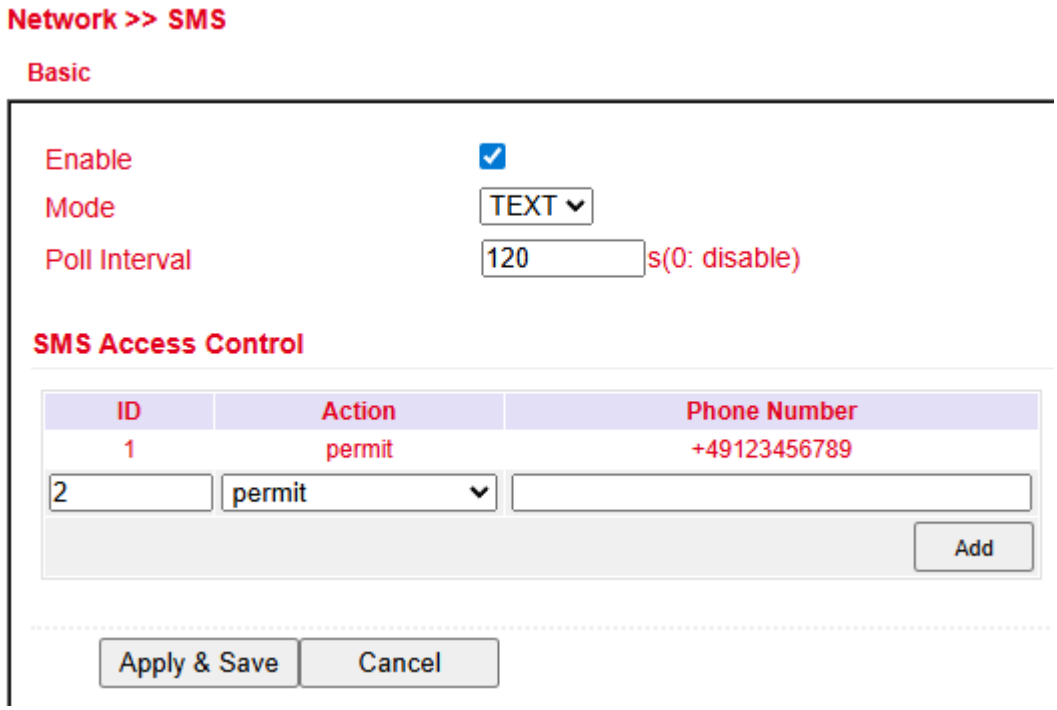
## Introduction

The TK804L-450 can be controlled via **SMS commands**.
Supported actions include:

- Querying device status
- Starting/stopping dial-up
- Restarting the router

## Status Query / Restart

1. Open the **Services > SMS** menu.
2. Check **Enable** to activate the feature.




3. In **SMS Access Control**, enter phone numbers allowed to send SMS commands.
    - Format: 4917123456789 (no 0049 or +49)
    - Action: **permit**

Example:
Send SMS with text `show` → router replies with its current status.

# 5.5 Link Backup

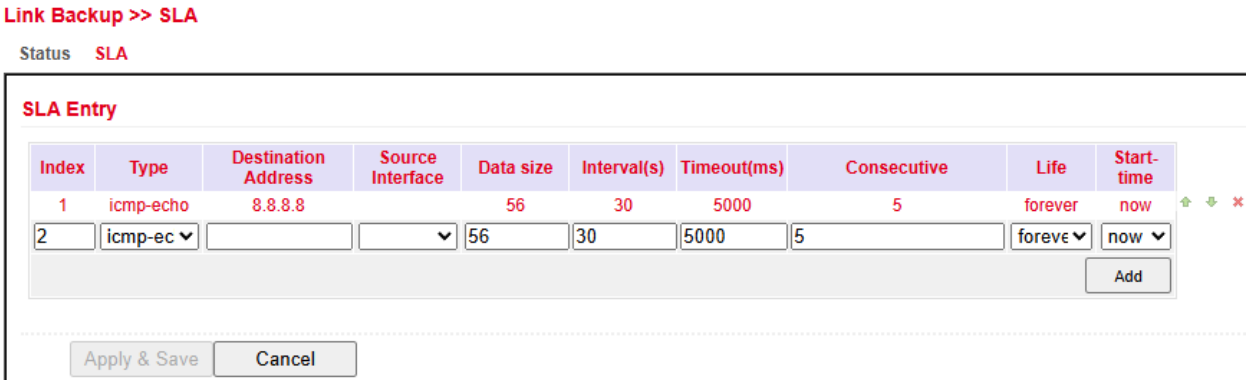
The TK804L-450 supports **dual Internet connectivity** (wired + cellular) to increase availability.

- The router regularly checks the **primary Internet connection**.
- On failure, it switches automatically to the **secondary (cellular) connection**.
- Once the primary connection is restored, the router switches back automatically.

**Prerequisite:** Cellular Internet access must be configured.
The router is preconfigured for **T-Mobile SIM cards**, so normally no additional steps are required.

## 5.5.1 SLA

**SLA Monitoring** checks the availability of peers within the network using ping tests.
Defined destinations are continuously pinged, and the line state is shown as **up** or **down**.

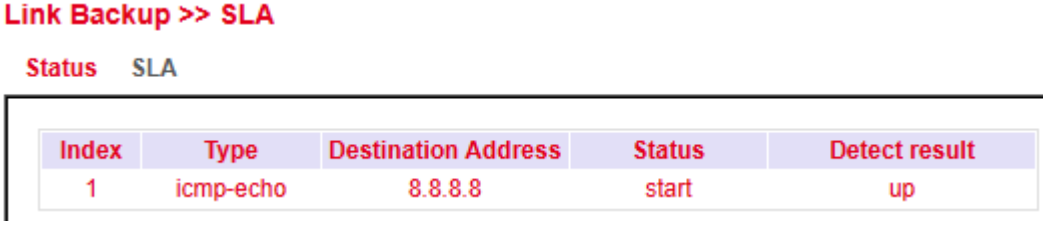


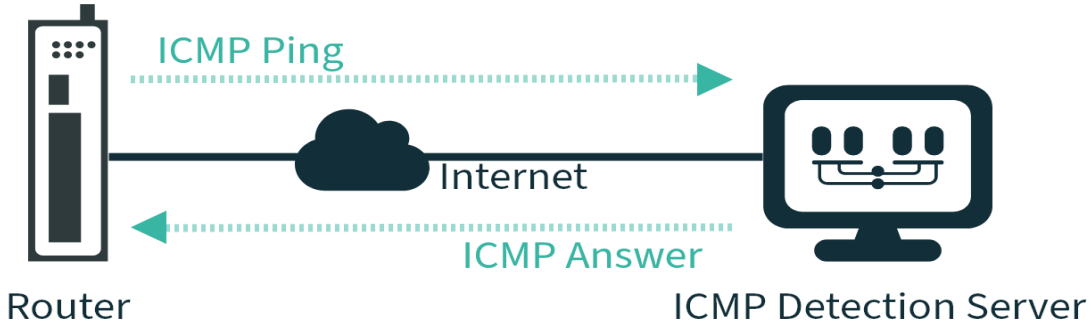

Configure SLA under **Link Backup > SLA > SLA**.

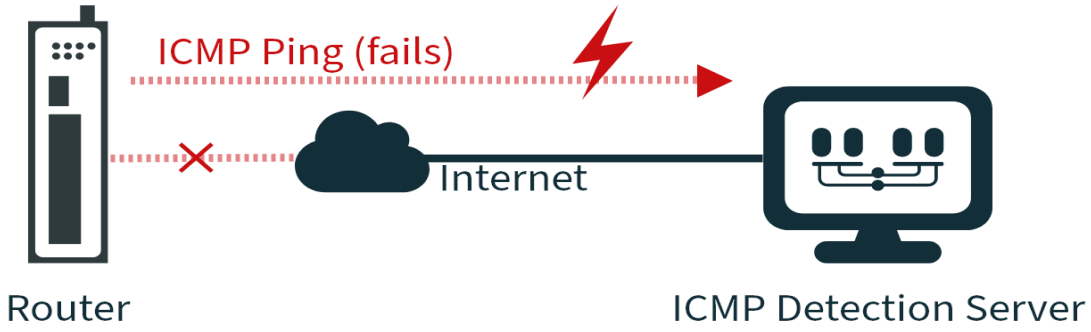
| Parameter | Description |
|---|---|
| Index | Freely selectable, used to identify the entry |
| Type | `icmp-echo` → simple ping to check connectivity |
| Destination Address | Address to be pinged (should be highly available, e.g., Google DNS `8.8.8.8`) |
| Data size | Packet size of a ping (default: 56 bytes) |
| Interval (s) | Interval in seconds between pings |
| Timeout (ms) | Timeout for each ping |
| Consecutive | Number of retries if a ping fails |
| Life | `forever` → pings are executed continuously |
| Start-time | `now` → check starts immediately |

### Status

SLA status shows whether the ping is successful (**Detect result up**) or unsuccessful (**Detect result down**).

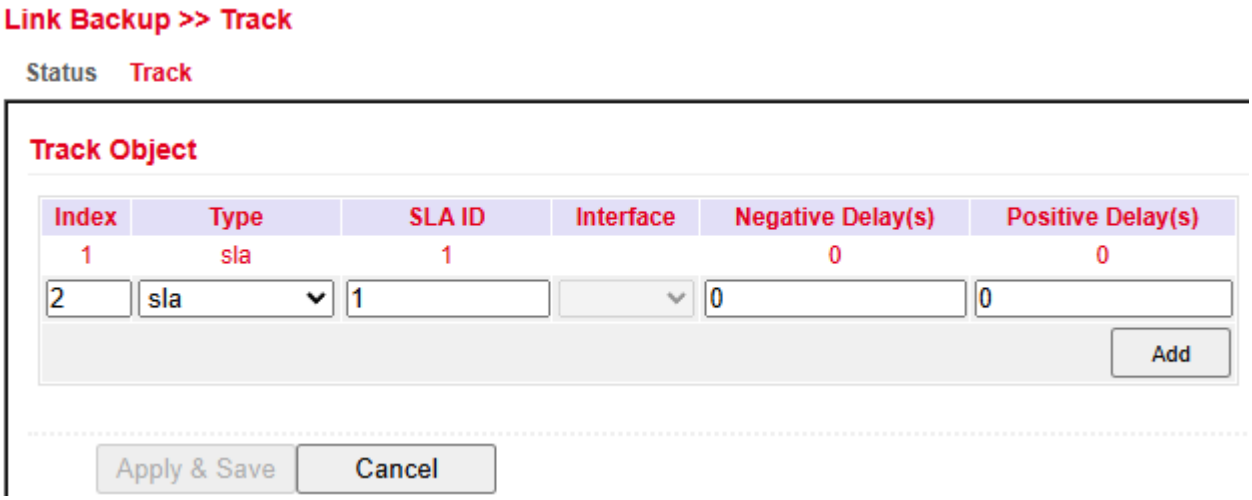





## 5.5.2 Track

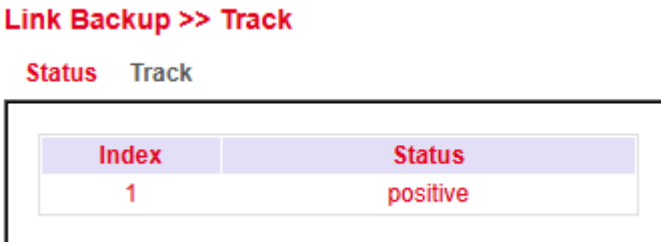
Configure a **Track object** under **Link Backup > Track > Track**.



| Parameter | Description |
|---|---|
| Index | Freely selectable, identifies the entry |
| Type | `SLA` or `interface` |
| SLA ID | SLA index previously created |
| Interface | Not used when type = SLA |
| Negative Delay (s) | Delay before switching to backup if the main connection fails |
| Positive Delay (s) | Delay before switching back to the main connection once available |

### Status

The Track status indicates whether the monitored connection is up.
Check status under **Link Backup > Track > Status**.

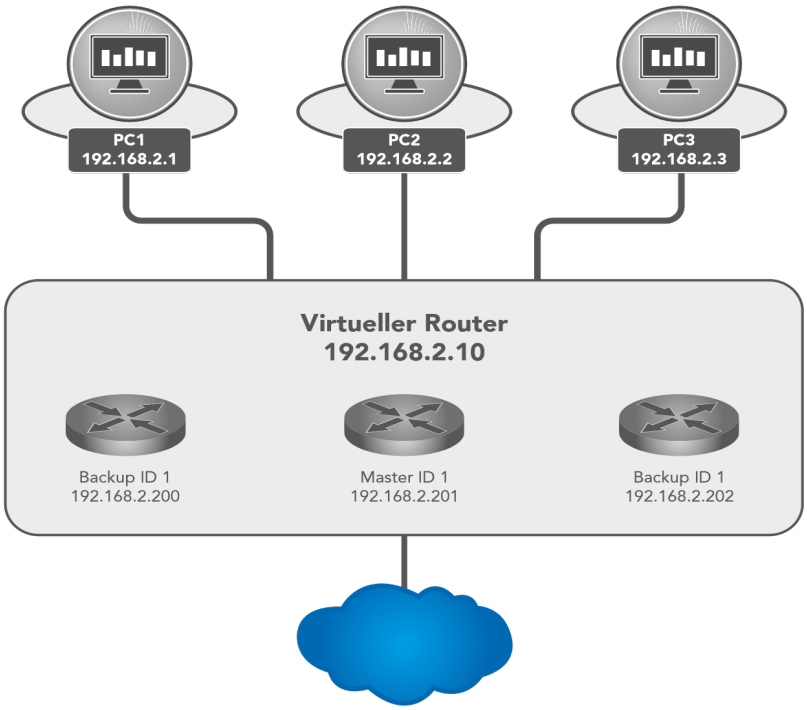



## 5.5.3 VRRP

In IP networks, all clients rely on a common **gateway**. If this gateway fails, communication to external networks (e.g., the Internet) is interrupted.

**VRRP (Virtual Router Redundancy Protocol)** solves this by allowing multiple routers to act as one **virtual router**:

- One router is the **master** (active gateway).
- Others remain in **backup** mode.
- If the master fails, a backup automatically takes over.




**Link Backup >> VRRP**

Status VRRP

| Enable | Virtual Route ID | Interface | Virtual IP | Priority | Advertisement Interval(s) | Preemption Mode | Track ID |
|---|---|---|---|---|---|---|---|
| ✔ | 1 | vlan 1 | 192.168.2.10 | 240 | 1 | ✔ | 1 |
| ☑ | | vlan 1 | | | 1 | ☑ | |

Add

Apply & Save Cancel

| Parameter | Description |
|---|---|
| Enable | Enable/disable VRRP |
| Virtual Router ID | Group ID – must match across all routers in the VRRP group |
| Interface | LAN interface used |
| Virtual IP | Shared virtual router IP, must match across all routers in the group |
| Priority | 0–254 → higher value = higher priority (highest becomes master) |
| Advertisement Interval(s) | Interval in seconds for VRRP hello messages |
| Preemption Mode | If enabled, a router with higher priority takes over as master automatically |
| Track ID | Track object used to monitor connection health |

## Status

**Link Backup >> VRRP**

Status VRRP

| Virtual Route ID | Interface | VRRP Status | Priority | Track Status |
|---|---|---|---|---|
| 1 | vlan 1 | Master | 240 | positive |

| Parameter | Description |
|---|---|
| Virtual Router ID | Router group identifier |
| Interface | LAN interface |
| VRRP Status | Current role → master or backup |
| Priority | Priority of the router |
| Track Status | Connection check result |

# 5.5.4 Interface Backup

**Interface Backup** allows automatic failover between interfaces:
If the main interface fails, traffic switches to a backup interface.

Configure under **Link Backup > Interface Backup > Interface Backup**.

**Link Backup >> Interface Backup**

Status Interface Backup

| Main Interface | Backup Interface | Startup Delay | Up Delay | Down Delay | Track id |
|---|---|---|---|---|---|
| vlan 1 | cellular 1 | 60 | 0 | 0 | |
| cellular 1 | cellular 1 | 60 | 0 | 0 | |

Add

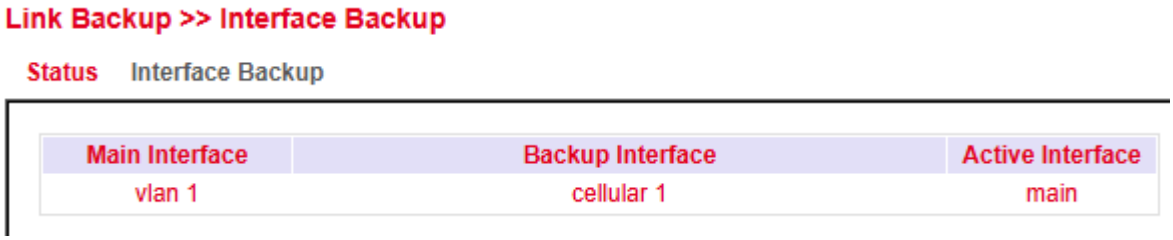
Apply & Save Cancel

| Parameter | Description |
|---|---|
| Main Interface | Defines the main (primary) interface |
| Backup Interface | Defines the backup interface |
| Startup Delay | Delay in seconds after system startup before monitoring begins |
| Up Delay | Delay before switching back to the main interface |
| Down Delay | Delay before switching to backup interface |
| Track ID | Track index linked to a previously created Track entry |

### Status

The status page shows:

- Which interfaces are configured as main/backup
- Which interface is currently active

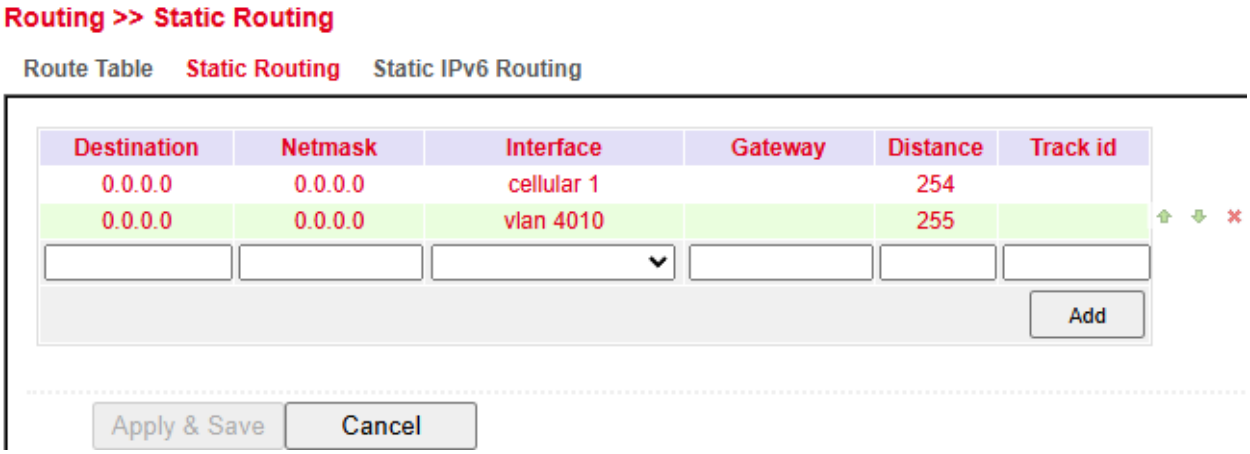



# 5.6 Routing

**Routing** determines how data packets are transported between networks.
Routers use routing tables to select the best path.
On the Internet, multiple paths may exist, but data is reassembled correctly at the destination.

## 5.6.1 Static Routing

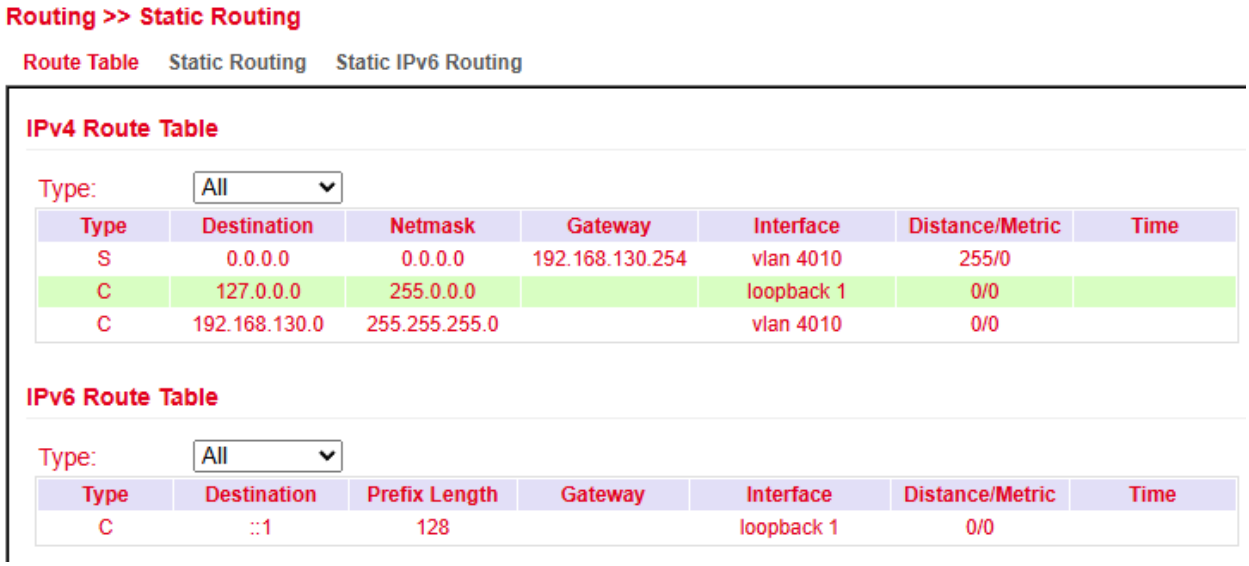
**Static Routing** defines fixed routes to specific networks or hosts.
Configure under **Routing > Static Routing > Static Routing**.




| Parameter | Description |
|---|---|
| Destination | Destination host, subnet, or network. Default route = `0.0.0.0` |
| Netmask | Subnet mask used with destination. Example: host = `255.255.255.255`, default route = `0.0.0.0` |
| Interface | Network interface for the route (e.g., `cellular1`, `fastethernet0/1`, `VLAN1`, `bridge1`) |
| Gateway | Next-hop IP address |
| Distance | Priority/metric for the route – lower values take precedence if multiple routes exist |
| Track ID | Optional link to a Track object for monitoring |

# Route Table

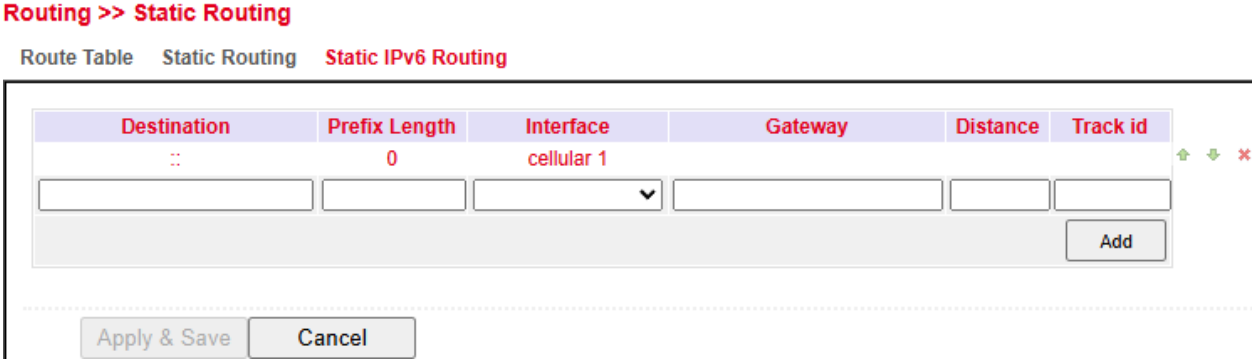
The routing table can be viewed under:
**Routing > Static Routing > Routing Table** and
**Routing > Dynamic Routing > Routing Table**




| Parameter | Description |
|---|---|
| Type | C = Connected (added automatically if interface has IP)S = Static (entered manually)R = RIP (dynamic, via RIP)O = OSPF (dynamic, via OSPF) |
| Destination | Destination host, subnet, network, or default route (0.0.0.0). |
| Netmask | Used with destination to define route scope. Example:- Host route = 255.255.255.255- Default route = 0.0.0.0. |
| Gateway | Next-hop IP address. |
| Interface | Interface used for the route (e.g., cellular1, loopback1, fastethernet0/1, VLAN1). |
| Distance/Metric | Route priority. Lower = higher priority. If multiple routes exist, the one with the lowest metric is preferred. |
| Time | Duration the route has been active. |

# Static IPv6 Routing

Static IPv6 routes can be defined to direct traffic through specific network paths.
This is essential in **multi-interface** or **segmented** networks.



| Parameter | Description |
|---|---|
| Field | Destination IPv6 network or host address. |
| Prefix Length | Subnet size (e.g., 64 for a /64 subnet). |
| Interface | Outgoing interface (e.g., `cellular1`). |
| Gateway | Next-hop IPv6 address. |
| Distance | Administrative distance (lower = preferred). |
| Track ID | (Optional) ID for route tracking / failover. |

**Actions:**

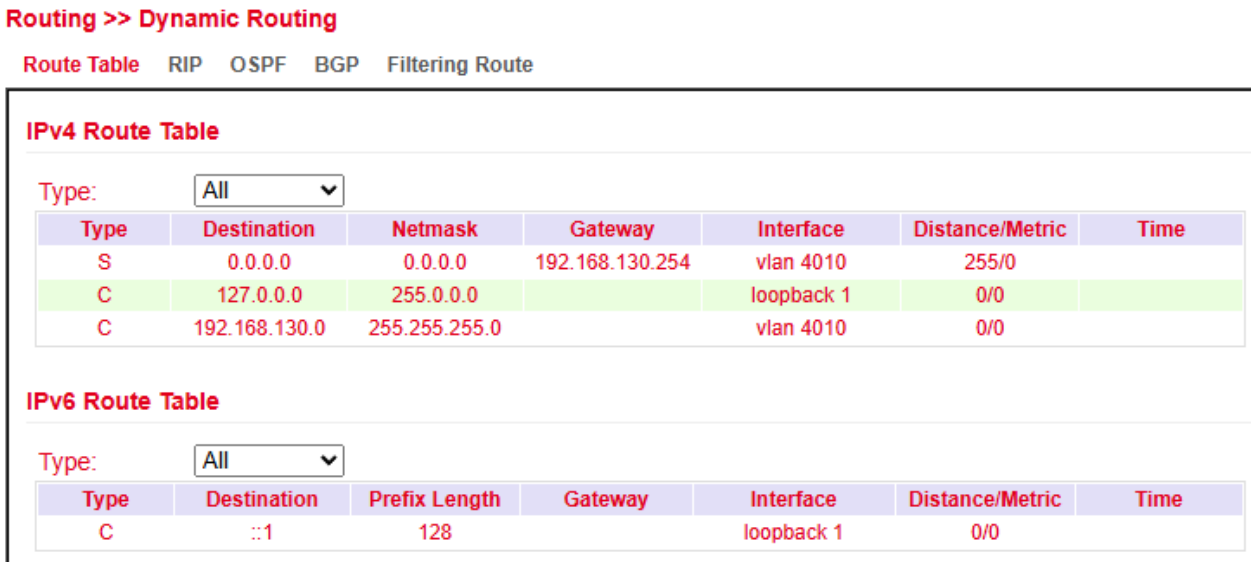
- **Add** → Create new static IPv6 route.
- **Apply & Save** → Save changes.
- **Cancel** → Discard changes.

## 5.6.2 Dynamic Routing

Dynamic routing allows routes to be learned automatically by routing protocols.
Unlike static routing, paths are updated **dynamically during operation**.

### Route Table

Viewable under:
**Routing > Dynamic Routing > Routing Table**

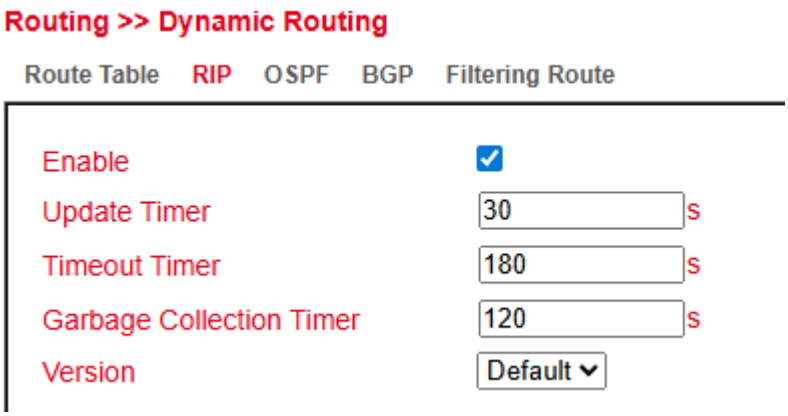


# RIP

**RIP (Routing Information Protocol)** uses a **distance vector algorithm** to share routes.

- Each router advertises known routes to its neighbors.
- The best route is chosen based on hop count (max. 15 hops).

Configure under: **Routing > Dynamic Routing > RIP**



**Routing >> Dynamic Routing**

Route Table | RIP | OSPF | BGP | Filtering Route

**Show Advanced Options** ☑

Default-Information Originate ☐

Default Metric 1

Redistribute Connected ☐

Redistribute Static ☐

Redistribute OSPF ☐

**Distance/Metric Management**

| Distance | IP Address | Netmask | ACL Name |
|---|---|---|---|
| 120 | | | |
| | | | |

Add

| Metric | Policy In/Out | Interface | ACL Name |
|---|---|---|---|
| | | | |

Add

**Filter Policy**

| Policy Type | Policy Name | Policy In/Out | Interface |
|---|---|---|---|
| | | | |

Add

Filter Out(Permit Default-route Interface) ☐

**Passive Interface**

| Passive Interface |
|---|
| |

Add

**Interface**

| Interface | Send Version | Receive Version | Split-Horizon & Poisoned-Reserve | Authentication Mode | Key Text |
|---|---|---|---|---|---|
| | Default | Default | | | |

Add

**Neighbor**

| IP Address |
|---|
| |

Add

**Network**

| IP Address | Netmask |
|---|---|
| | |

Add

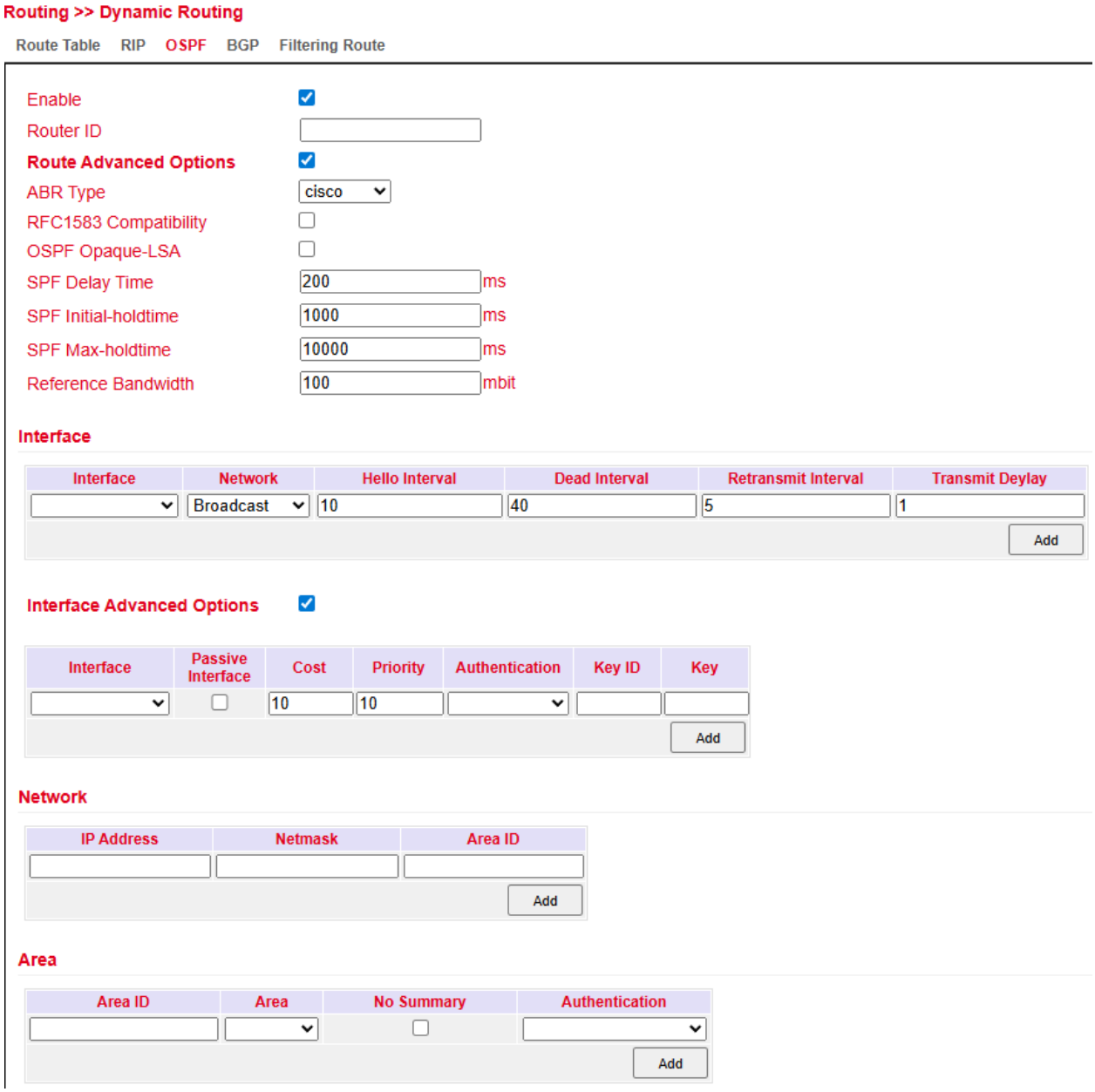
Apply & Save | Cancel

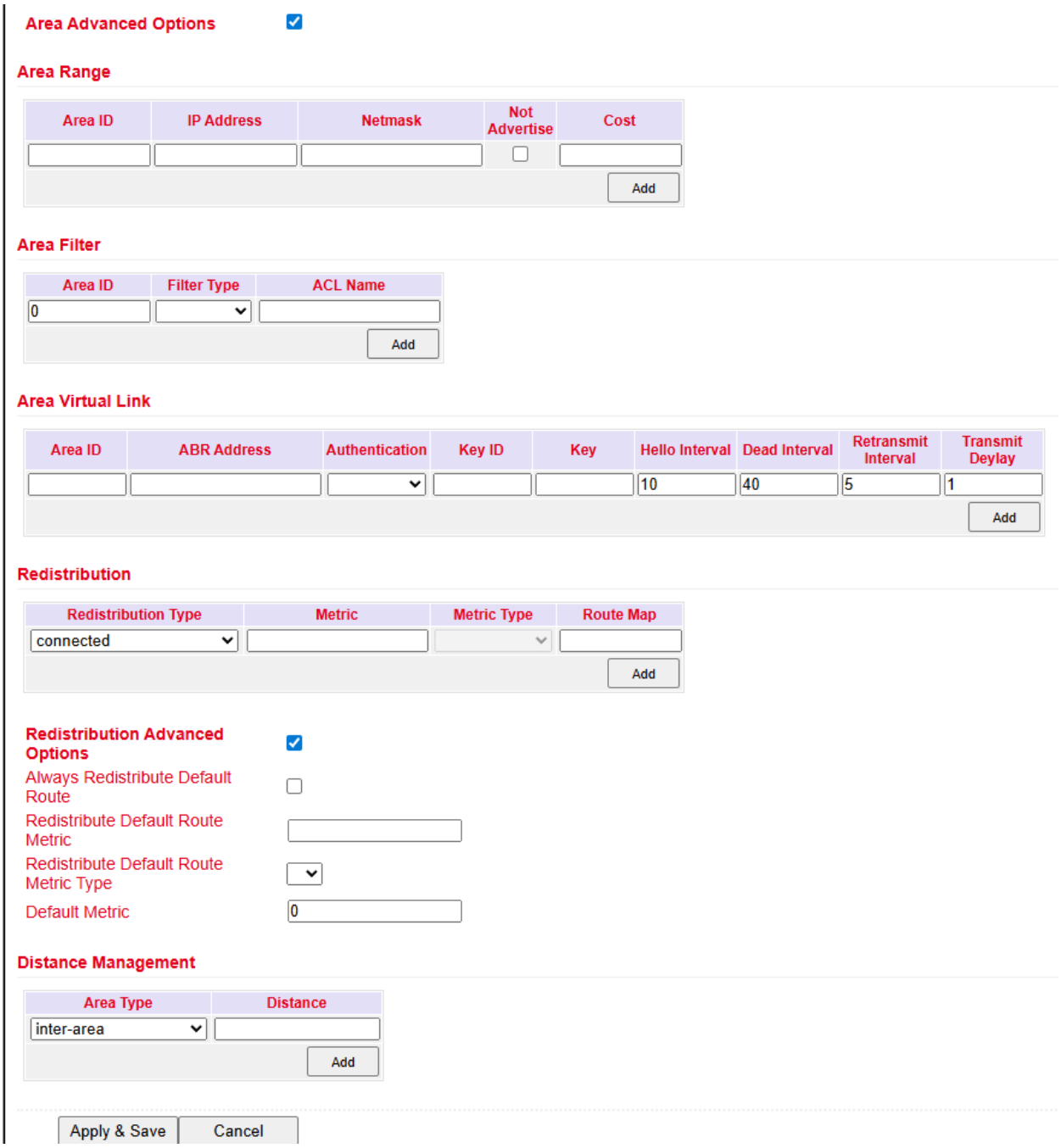
# OSPF

**OSPF (Open Shortest Path First)** uses a **link-state algorithm**.

- Supports hierarchical networks.
- Allows multiple equal-cost paths simultaneously.
- Reacts quickly to topology changes and uses bandwidth efficiently.

Configure under: **Routing > Dynamic Routing > OSPF**



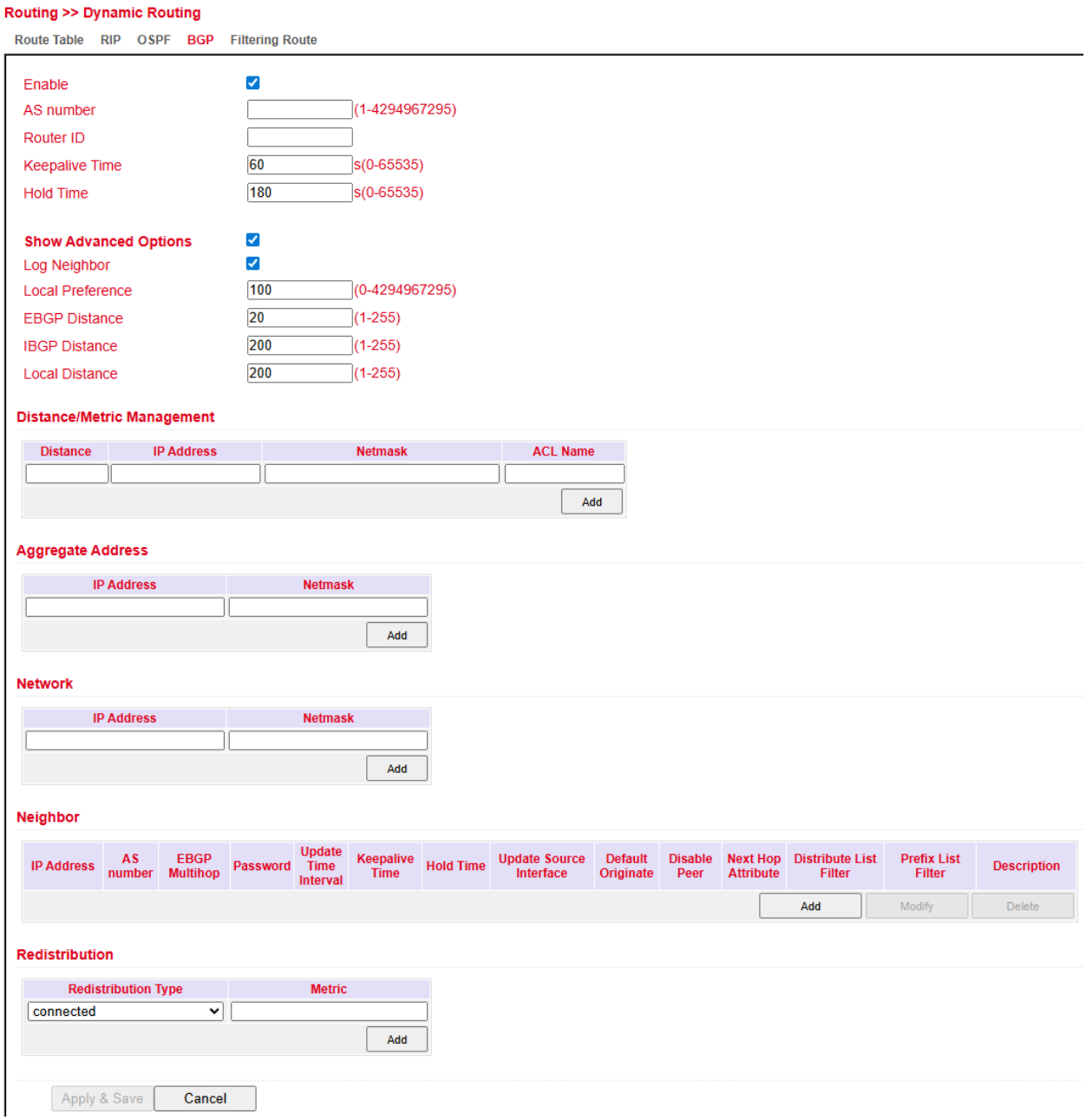



# BGP

**BGP (Border Gateway Protocol)** is the **Internet's main routing protocol**.

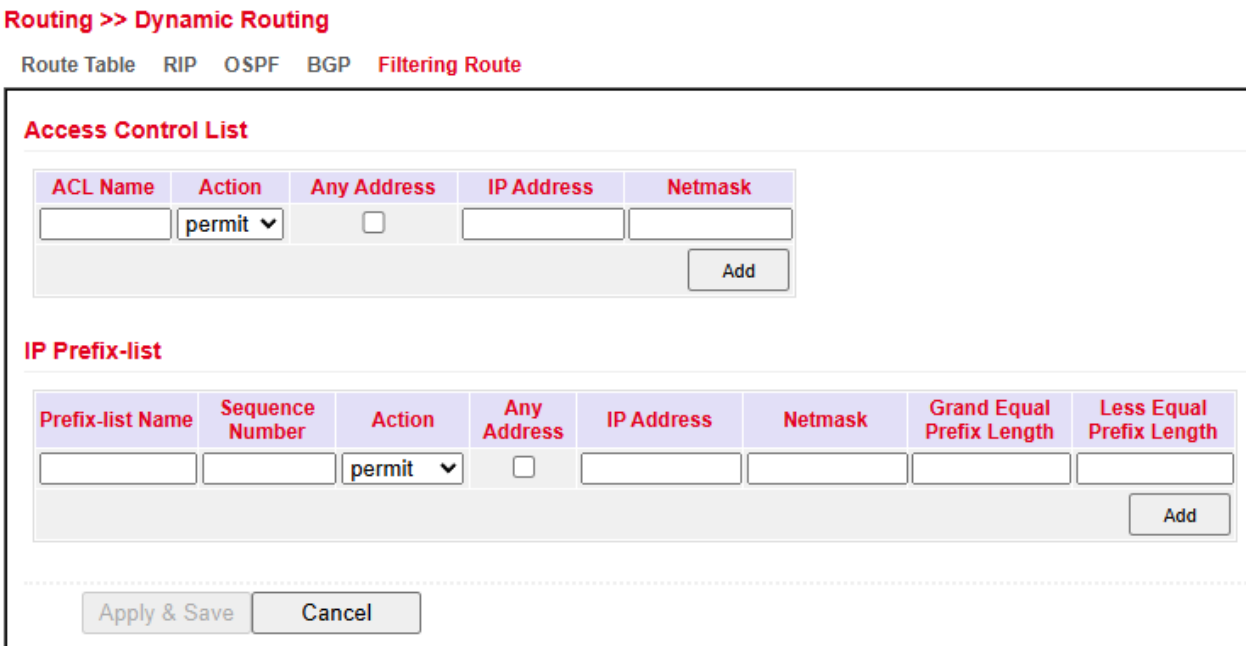
- Connects **autonomous systems (AS)**, typically Internet Service Providers.
- Uses **path vector routing**.
- Routing decisions often consider **business policies** in addition to technical metrics.

Configure under: **Routing > Dynamic Routing > BGP**




# Filtering Route

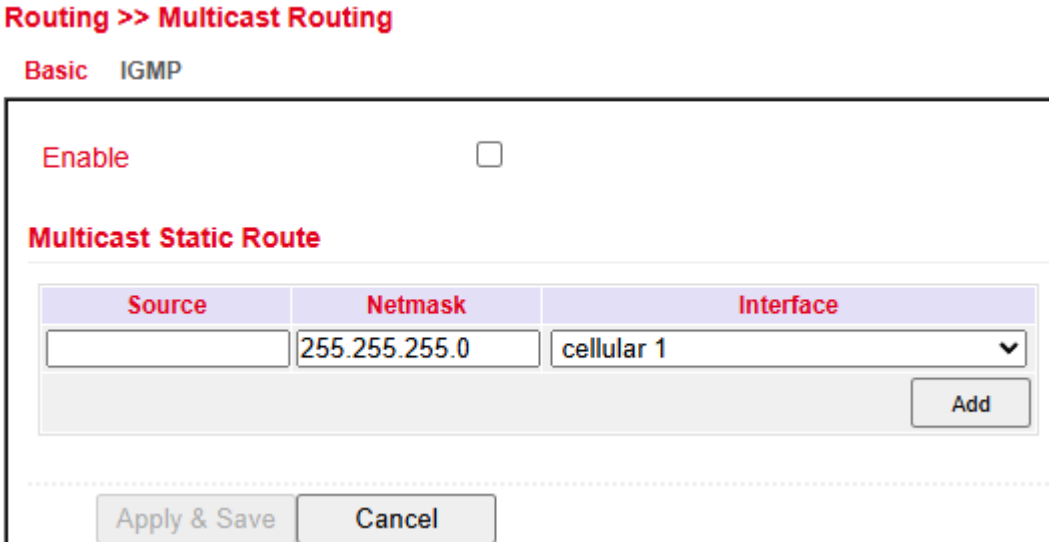
Under **Routing > Dynamic Routing > Filtering Route** you can configure routing filters.
Filters define which routes are advertised or accepted.




## 5.6.3 Multicast Routing

### Basic

Configure under: **Routing > Multicast Routing > Basic**

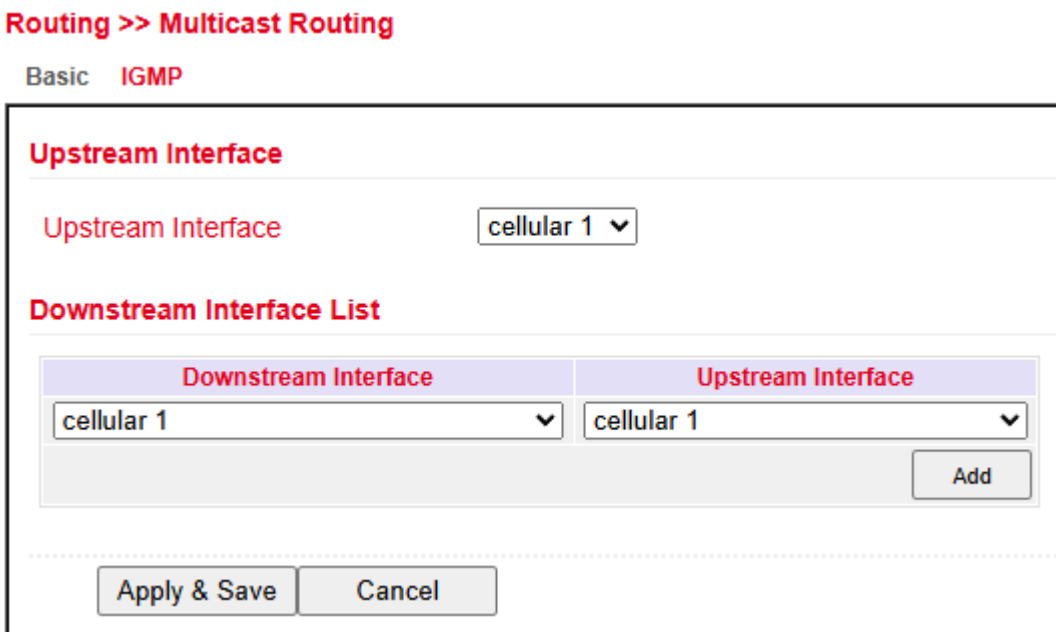



### IGMP

**IGMP (Internet Group Management Protocol)** configuration:

- **Upstream Interface** → Select the interface distributing the multicast.
- **Downstream Interface List** → Select downstream interfaces for multicast traffic.

Interfaces vary depending on the router model.

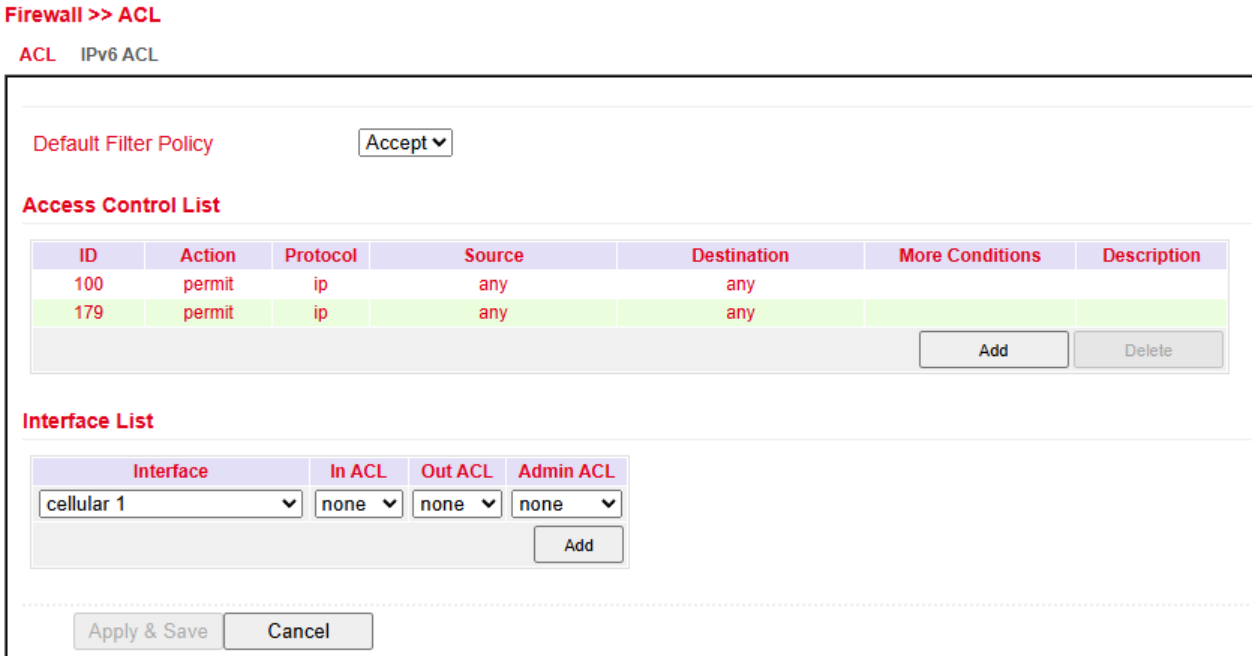



# 5.7 Firewall

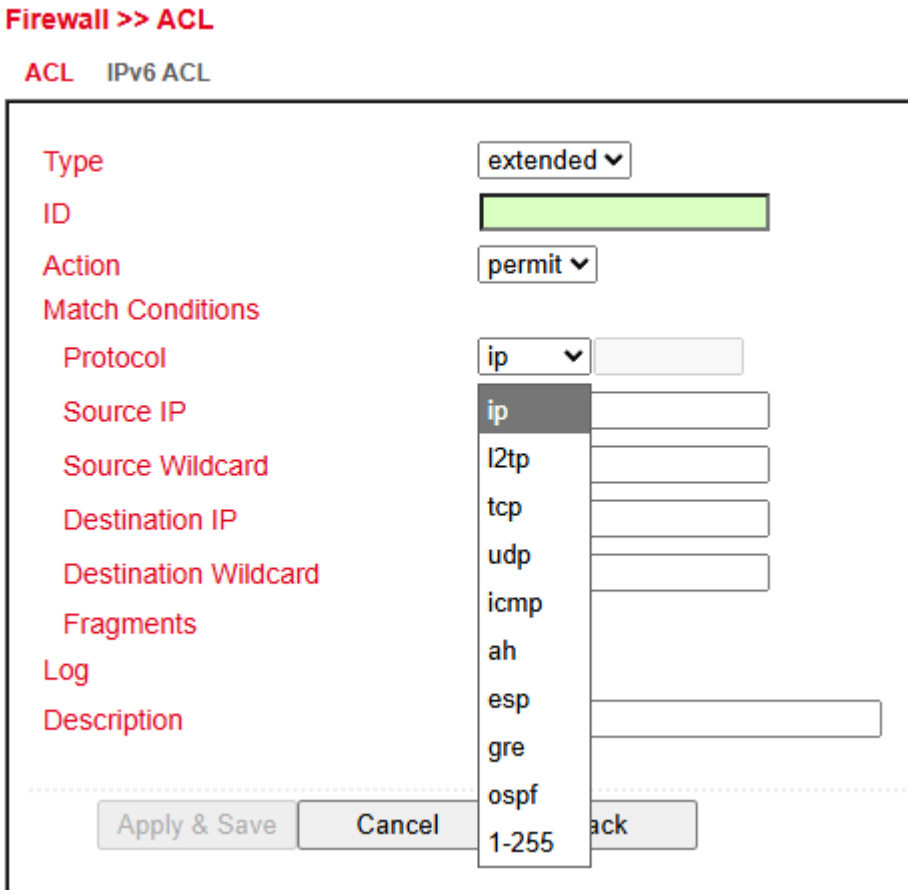
## 5.7.1 ACL

The **Access Control List (ACL)** controls usage and administration by defining which computers or networks can access the router or networks behind it.
ACL rules analyze and manage **incoming and outgoing data packets** according to defined rules.

- Rules can be based on **source/destination IP addresses**, **TCP/UDP port numbers**, and more.
- Two types of ACL are supported:
  - **Standard ACL** → Allow/deny communication from/to a network.
  - **Extended ACL** → More granular options (e.g., restrict HTTP, FTP, Telnet).



- Overview of existing ACL rules.
- Click **Add** to create a new ACL.



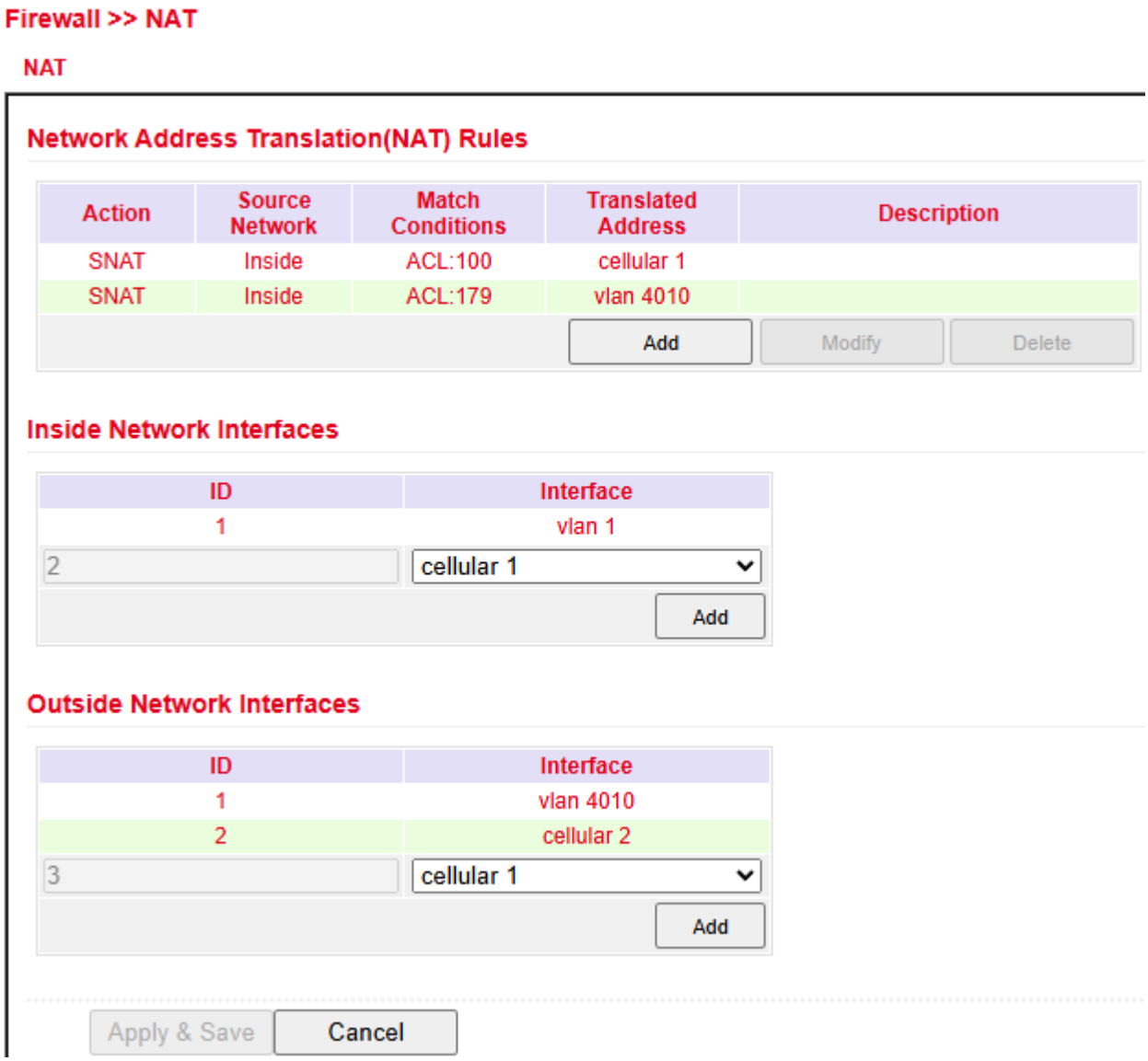

**ACL Parameters**

| Parameter | Description |
|---|---|
| Type | `standard` or `extended` |
| ID | Default: 100 (preconfigured). Additional IDs can be freely assigned. |
| Action | `Permit` or `Deny` |
| Protocol | Protocol(s) to match |
| Source IP | Source IP address or network (e.g., `192.168.2.0`) |
| Source Wildcard | Wildcard of source subnet mask (e.g., `255.255.255.0` → `0.0.0.255`) |
| Destination IP | Destination IP address or network (e.g., `172.16.0.0`) |
| Destination Wildcard | Wildcard of destination subnet mask (e.g., `255.255.0.0` → `0.0.255.255`) |
| Description | Optional text description |

# 5.7.2 NAT

## Network Address Translation (NAT)

NAT modifies address information in data packets to connect different networks.
It is configured under **Firewall > NAT**.




## NAT Types

| Type | Action |
|---|---|
| SNAT | Rewrites the source IP address (LAN → WAN) |
| DNAT | Rewrites the destination IP address (WAN → LAN) |
| 1:1 NAT | Maps one IP address to another (one-to-one translation) |

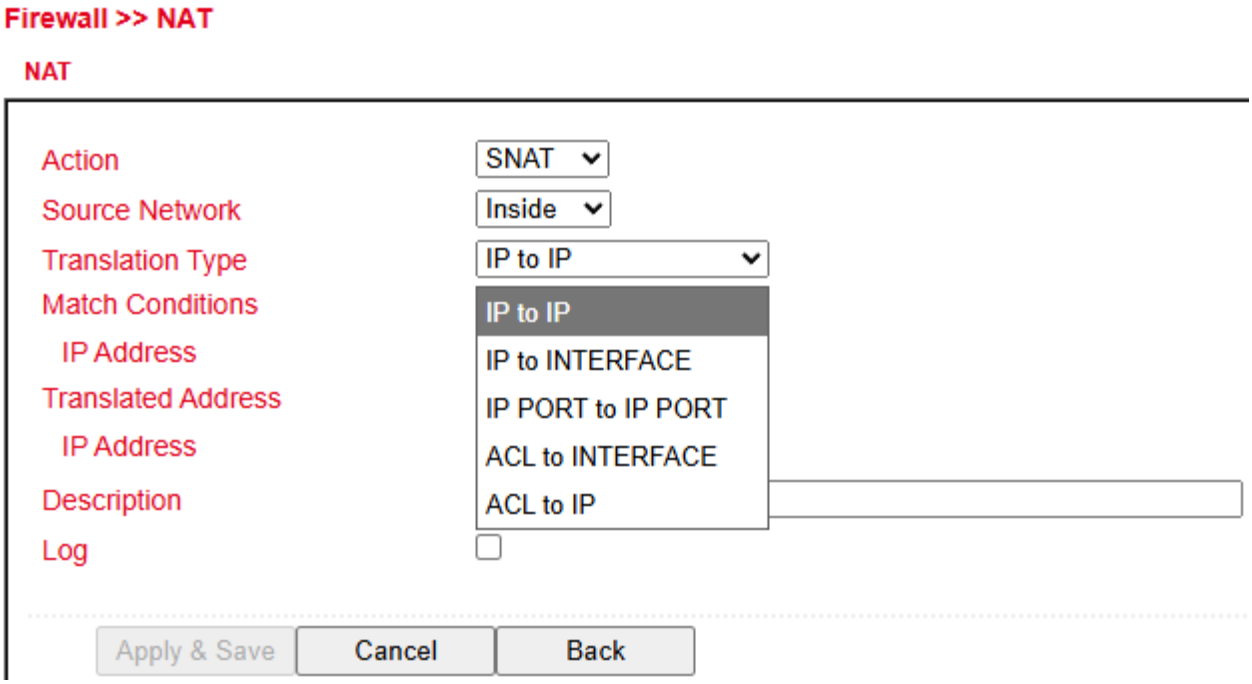
**Inside/Outside Interfaces**

- **Inside** = LAN interface

- **Outside** = WAN interface

**Translation Types**

| Type | Description |
|---|---|
| IP to IP | Translate one IP to another |
| IP to Interface | Translate IP to an interface's address |
| IP Port to IP Port | Translate IP:Port combination to another |
| ACL to Interface | Translate address according to ACL into an interface address |
| ACL to IP | Translate address according to ACL into another IP |

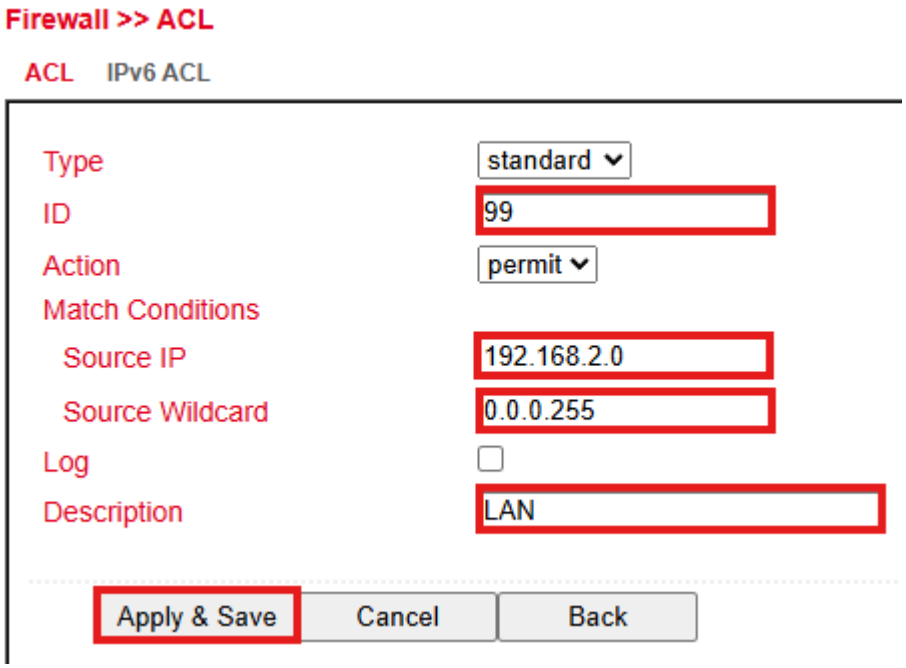



Example: Case 1 – SNAT (Router as Internet Gateway)

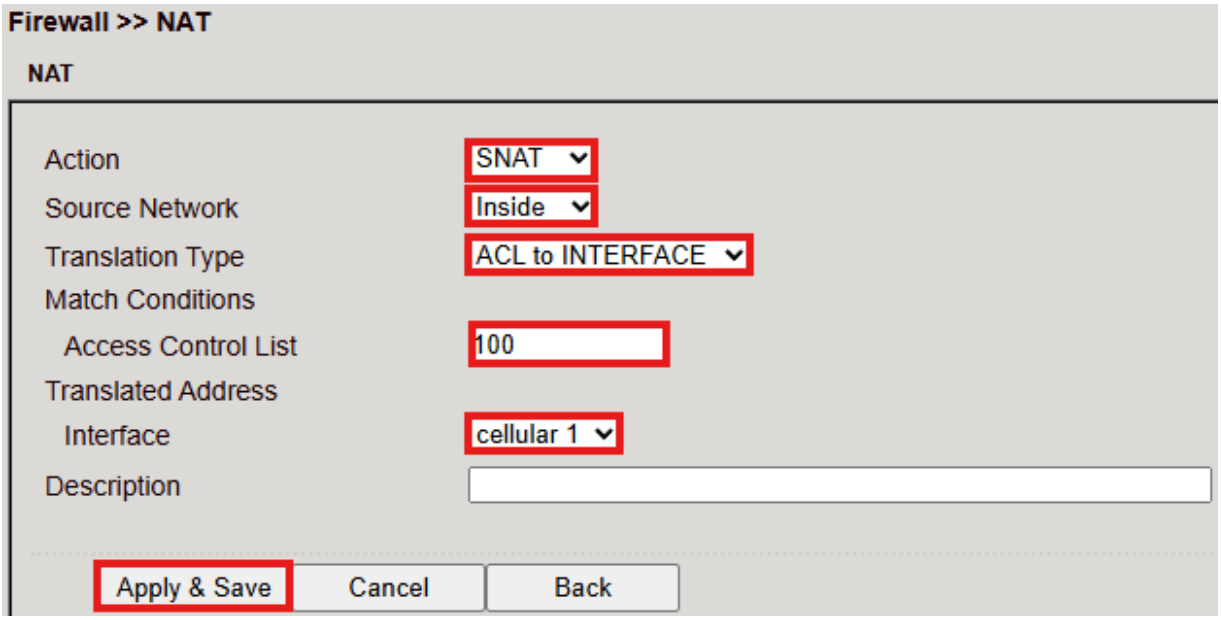
The TK804L-450 translates **private LAN IPs** into a **public IP** for Internet access.
 This is the **default factory setting**.

**Steps:**

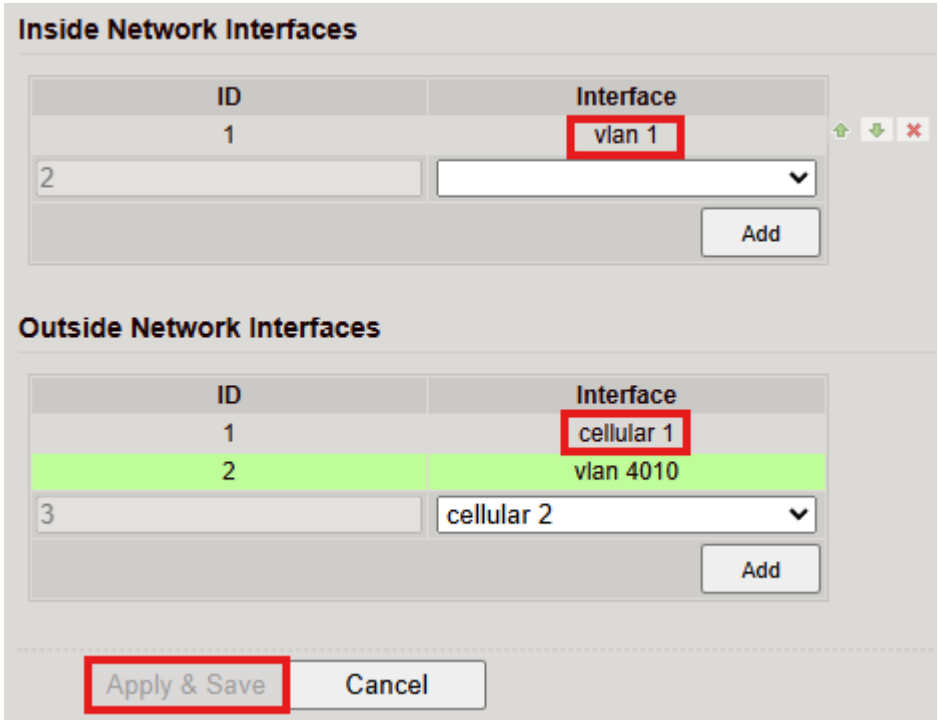
1. Create an **ACL rule** under **Firewall > ACL**:
   - Assign an **ID**.
   - Enter **source IP/network** and **wildcard mask**.



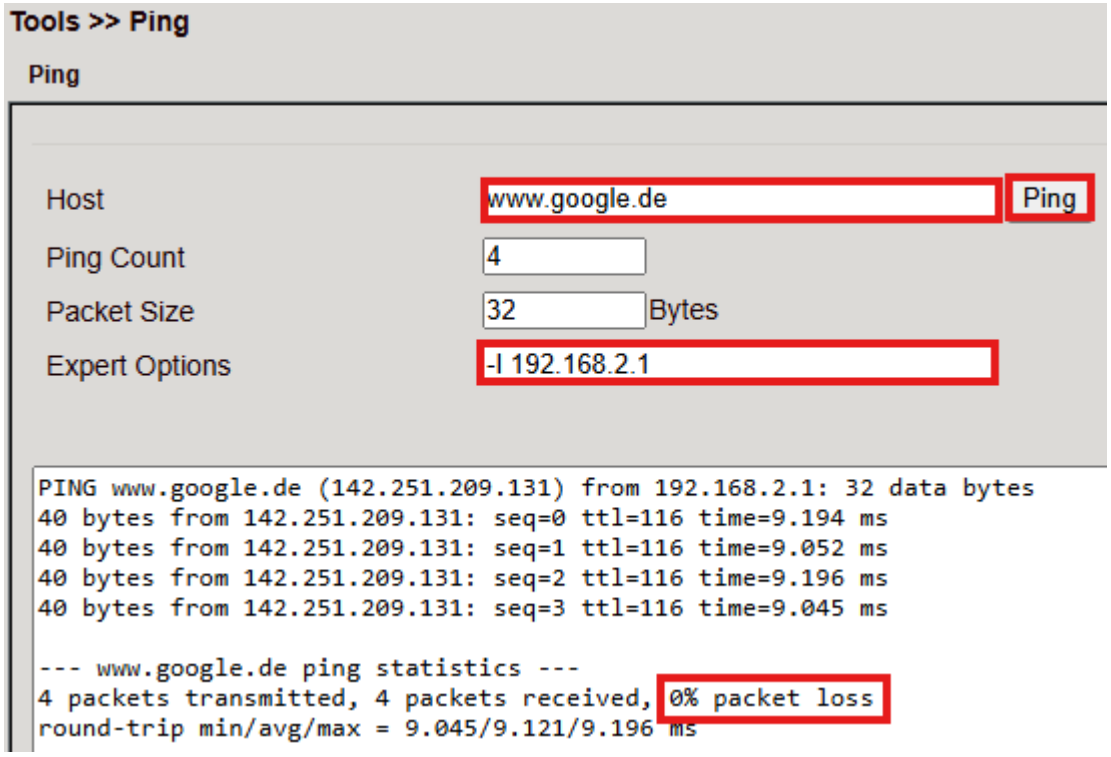

2. Configure the **SNAT rule**.




3. Define the **Inside (LAN)** and **Outside (WAN)** interfaces.




4. Test access with **Ping** under **Tools > Ping**.
    - Use the **Expert option**: `-I 192.168.2.1` (capital i) to ensure ping originates from LAN interface.



Example: Case 2 – DNAT (Port Mapping / Port Forwarding)

**DNAT** (also known as Port Mapping/Forwarding) is used to make internal services (e.g., web servers) accessible from the Internet.
Configuration steps follow the same pattern:

1. Define ACL (optional, depending on policy).
2. Configure **DNAT rule** with desired port mapping.
3. Assign interfaces.

Requirements

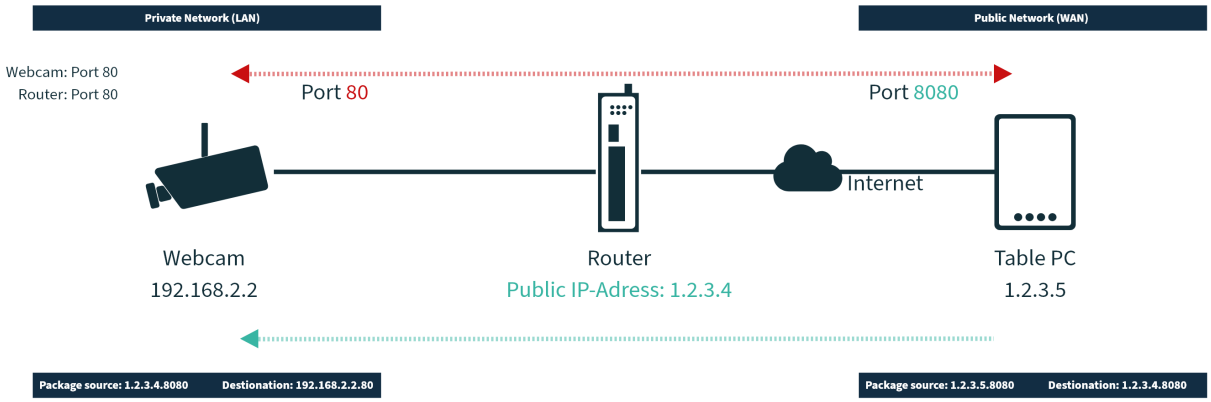
- Public IP address in the mobile network (or also for wired Internet connections).
  *(Note: Many mobile operators offer business tariffs with public IPs, e.g. T-Mobile IP VPN or Vodafone CDA. Some providers also supply public IPs via standard SIM cards.)*

Port Mapping Notes

To configure port mapping you need:

- **IP address** of the target device
- **Port** to be redirected (e.g., HTTP/80)

Example: Welotec




| Parameter | Value |
|---|---|
| LAN IP (Router) | 192.168.2.1 |
| Subnet Mask | 255.255.255.0 |
| LAN IP (Webcam) | 192.168.2.2 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.2.1 |

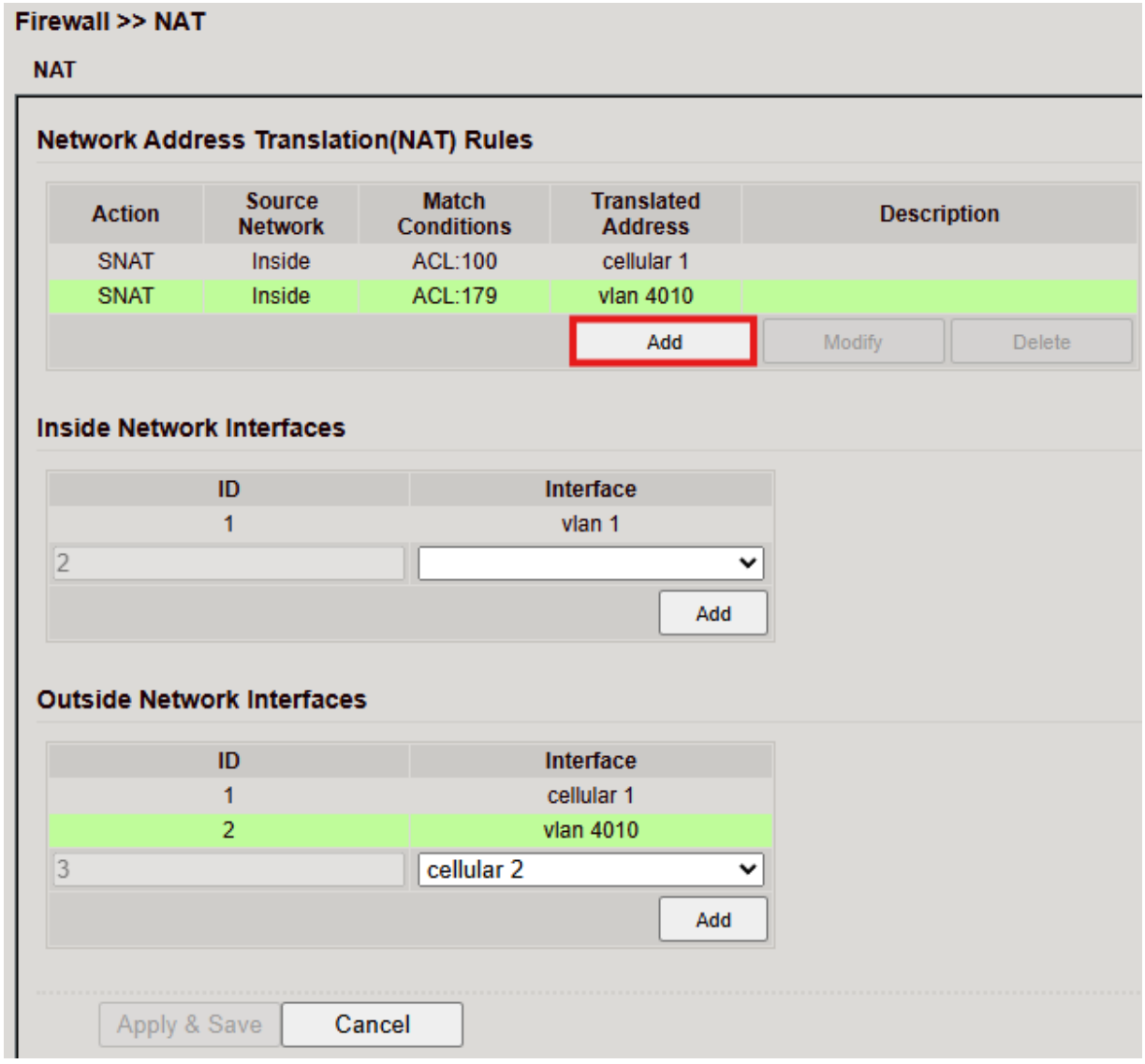
The webcam is reachable via:
**http://192.168.2.2** (TCP Port 80).

**Checklist before setup:**

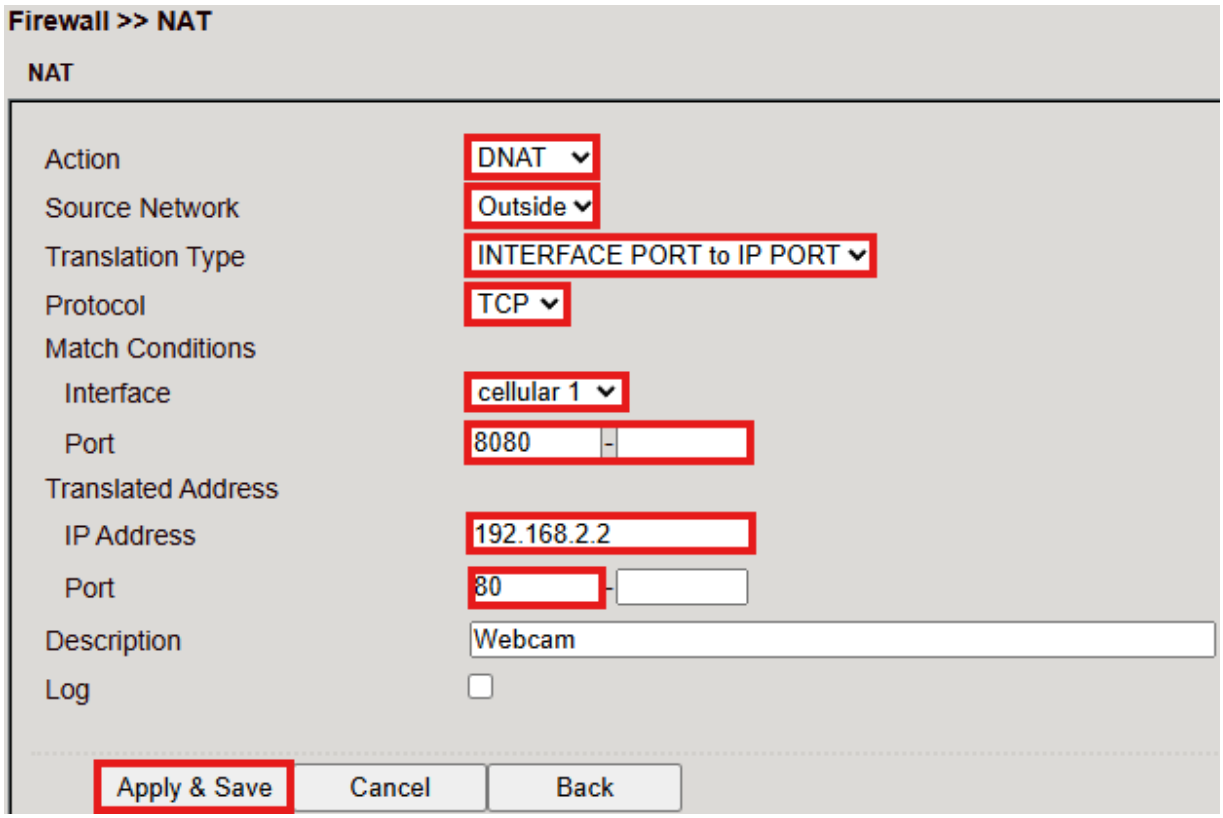
- Does the camera have IP `192.168.2.2`?
- Does it respond to `ping 192.168.2.2`?
- Is the web interface accessible via `http://192.168.2.2`?
- Is the router (`192.168.2.1`) set as default gateway?

Configuration

1. Open **Firewall > NAT**.
2. Click **Add** to create a new NAT rule.



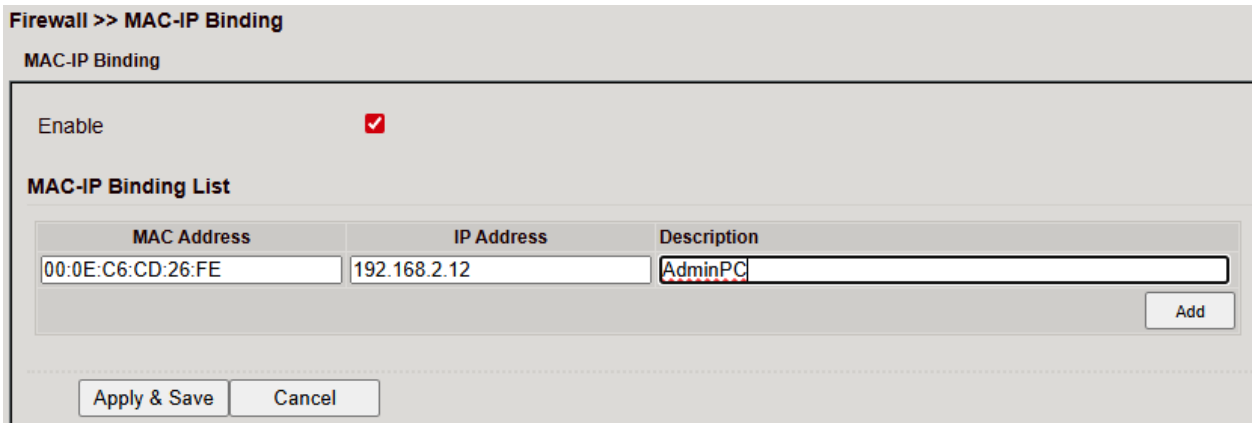

3. Enter the required data (example shown below).




4. The device is now accessible via the router's **public IP + mapped port**.


## 5.7.3 MAC-IP Binding

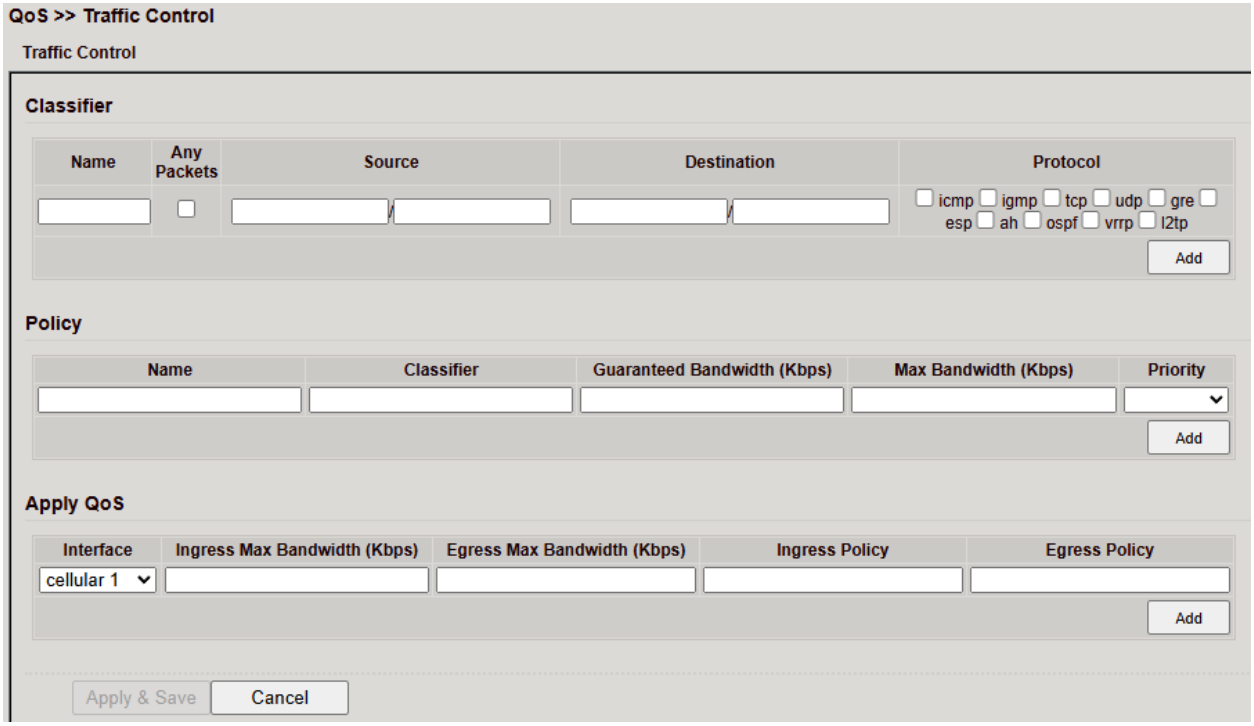
Located under **Firewall > MAC-IP Binding**.
This feature ensures that devices can only access the router if their **MAC and IP address match**.




| Parameter | Description |
|---|---|
| MAC Address | Enter in format `XX:XX:XX:XX:XX:XX`, e.g. `00:FF:4E:85:F1:B5` |
| IP Address | IP address assigned to the device, e.g. `192.168.2.150` |
| Description | Optional description text |

# 5.7.4 QoS – Traffic Control

The **Traffic Control** page allows configuration of QoS rules to prioritize traffic.




## Classifier

Define criteria for traffic matching:

- **Name** → Identifier
- **Source/Destination** → IP or range
- **Protocol** → TCP, UDP, ICMP

Click **Add** to save the classifier.

## Policy

Assign bandwidth rules to a classifier:

- **Guaranteed Bandwidth** → Minimum rate (Kbps)
- **Max Bandwidth** → Maximum rate (Kbps)
- **Priority** → Importance of traffic

Click **Add** to apply the policy.

## Apply QoS

Assign policies to interfaces:

- **Interface** → e.g., Cellular 1
- **Ingress/Egress Bandwidth** → Max allowed rates
- **Ingress/Egress Policy** → Selected policy

Click **Add**, then **Apply & Save**.

# 5.8 VPN

**VPN (Virtual Private Network)** connects devices securely to remote networks.
Example: Remote employees accessing the company LAN from home.

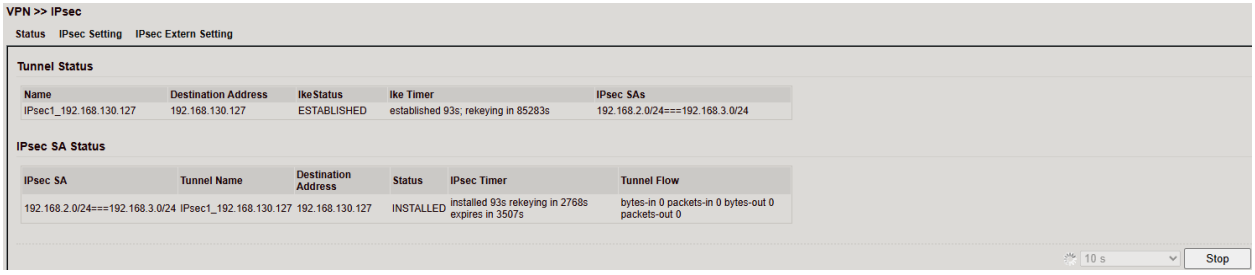
## 5.8.1 IPsec

**IPsec (Internet Protocol Security)** is a protocol suite that secures communication at the network level by providing:

- Integrity
- Authentication
- Confidentiality
- Anti-replay protection

## Status

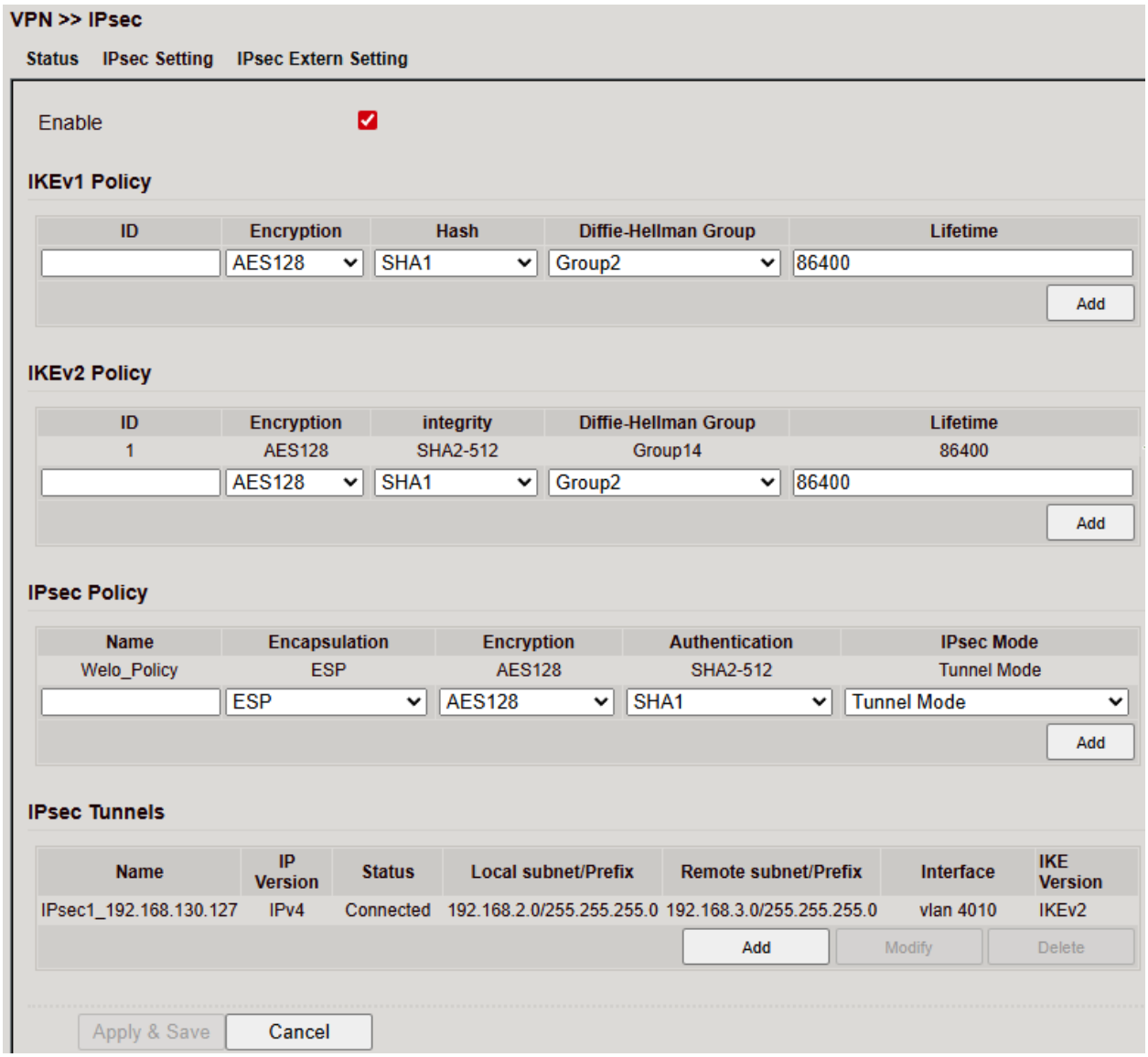
If the tunnel is established, status shows active connection(s).




## IPsec Setting

Configure under **VPN > IPsec > IPsec Setting**.
Steps:

1. Create **IKE policy** (v1 or v2).
2. Create **IPsec policy**.
3. Save via **Apply & Save**.
4. Create the actual **IPsec tunnel**.




IKEv1 Policy

| Parameter | Description |
|---|---|
| ID | Unique identifier (integer) |
| Encryption | Selected encryption method |
| Hash | Hash algorithm |
| Diffie-Hellman Group | DH group for key exchange |
| Lifetime | Validity period before renegotiation |

IKEv2 Policy

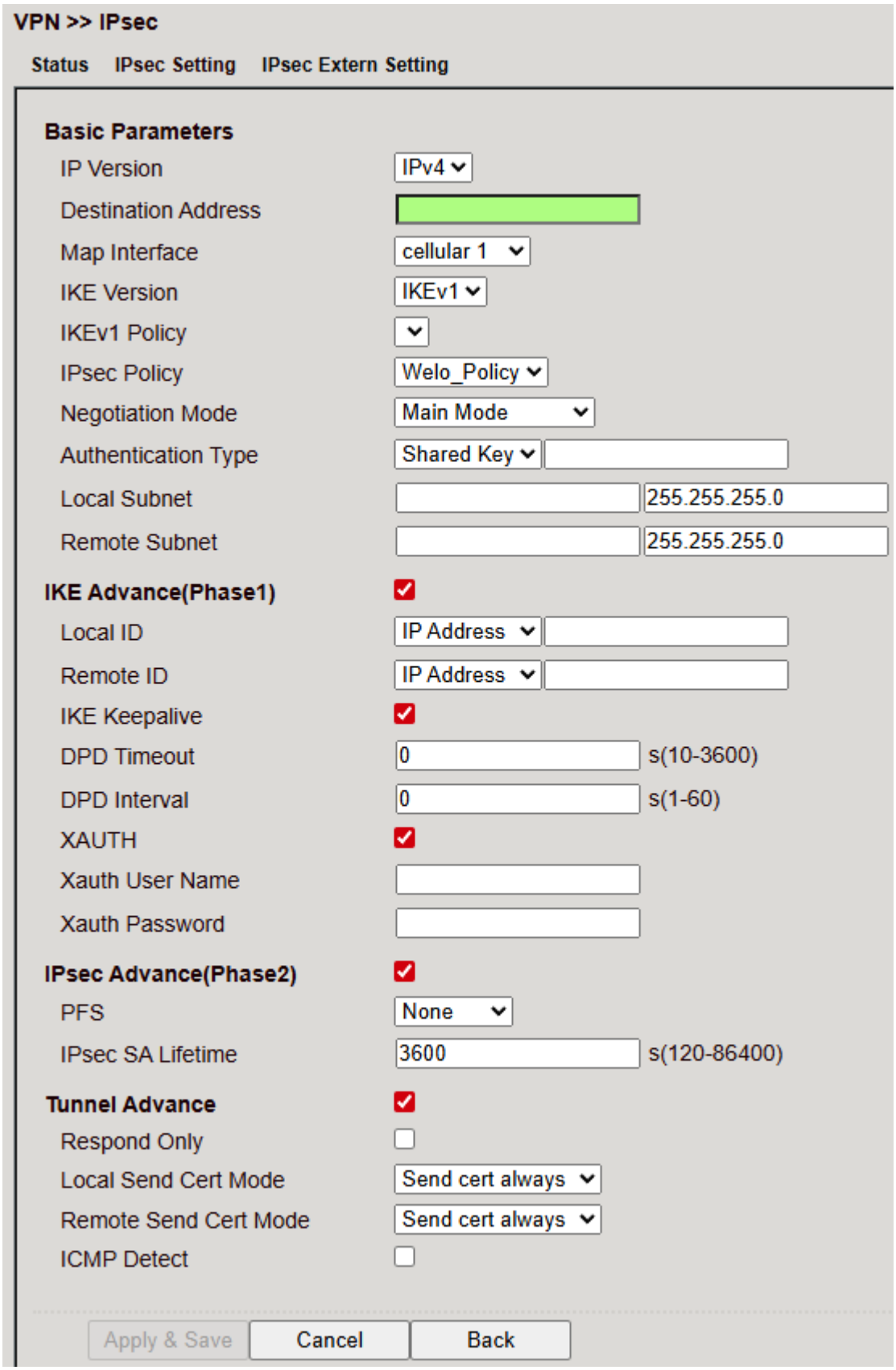
| Parameter | Description |
|---|---|
| ID | Unique identifier (integer) |
| Encryption | Selected encryption method |
| Hash | Hash algorithm |
| Diffie-Hellman Group | DH group for key exchange |
| Lifetime | Validity period before renegotiation |

IPsec Policy

| Parameter | Description |
|---|---|
| Name | Identifier for the policy |
| Encapsulation | ESP or AH |
| Encryption | Encryption method |
| Authentication | Hash algorithm |
| IPsec Mode | Tunnel or Transport mode |

IPsec Tunnel

Create tunnel under **VPN > IPsec > IPsec Setting > IPsec Tunnels**.
 Requires existing IKE (v1/v2) and IPsec policy.


VPN >> IPsec
Status
IPsec Setting
IPsec Extern Setting
Basic Parameters
IP Version
IPv4
Destination Address
Map Interface
cellular 1
IKE Version
IKEv1
IKEv1 Policy
IPsec Policy
Welo_Policy
Negotiation Mode
Main Mode
Authentication Type
Shared Key
Local Subnet
255.255.255.0
Remote Subnet
255.255.255.0
IKE Advance(Phase1)
Local ID
IP Address
Remote ID
IP Address
IKE Keepalive
DPD Timeout
0
s(10-3600)
DPD Interval
0
s(1-60)
XAUTH
Xauth User Name
Xauth Password
IPsec Advance(Phase2)
PFS
None
IPsec SA Lifetime
3600
s(120-86400)
Tunnel Advance
Respond Only
Local Send Cert Mode
Send cert always
Remote Send Cert Mode
Send cert always
ICMP Detect
Apply & Save
Cancel
Back

Basic Parameters

| Parameter | Description |
|---|---|
| Destination Address | Remote peer IP |
| Map Interface | Local interface used |
| IKE Version | IKEv1 or IKEv2 |
| IKEv1 Policy | ID of the previously created IKEv1 policy |
| IPsec Policy | Name of the IPsec policy |
| Negotiation Mode | Main Mode or Aggressive Mode |
| Authentication Type | Shared Key or Certificate |
| Local Subnet | Local LAN subnet |
| Remote Subnet | Remote LAN subnet |

IKE Advanced (Phase 1)

| Parameter | Description |
|---|---|
| Local ID | IP Address, FQDN or User FQDN |
| Remote ID | IP Address, FQDN or User FQDN |
| IKE Keepalive | Enable/disable IKE Keepalive |
| DPD Timeout | Timeout for a Dead Peer Detection packet |
| DPD Interval | Interval of DPD packets |
| XAUTH | Enable/disable Extended Authentication |
| XAUTH Username | Username for XAUTH |
| XAUTH Password | Password for XAUTH |

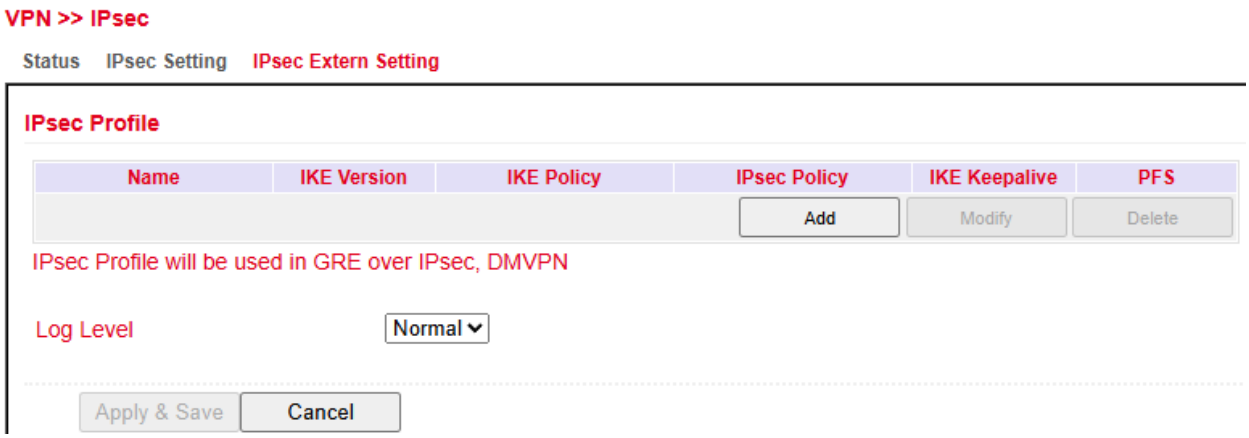
IPsec Advanced (Phase 2)

| Parameter | Description |
|---|---|
| PFS | Perfect Forward Secrecy group |
| IPsec SA Lifetime | Validity period of Security Association before renewal |
| IPsec SA Idletime | Time before inactive SAs are deleted (prior to global lifetime) |

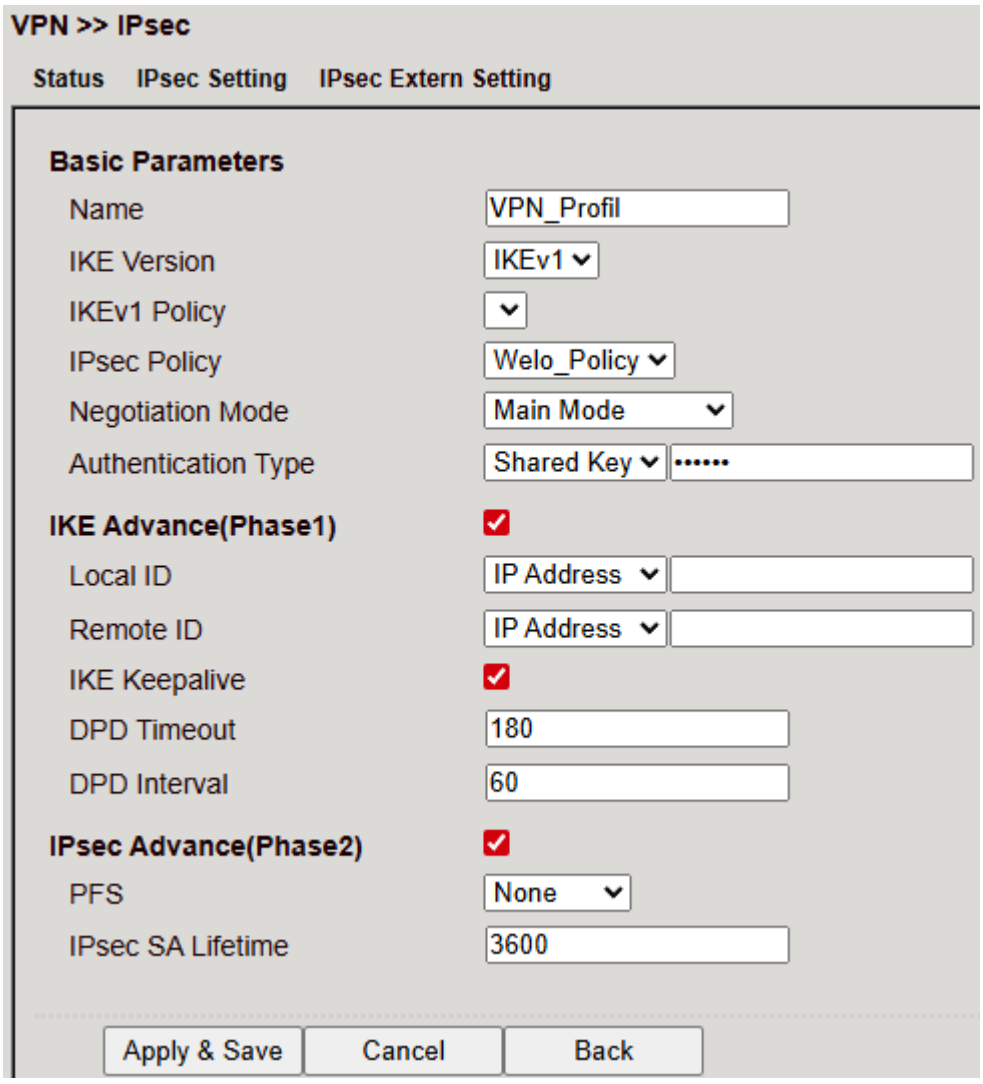
**Tunnel Advanced Parameters**

| Parameter | Description |
|---|---|
| Tunnel Start Mode | Default = Automatic |
| Local Send Cert Mode | Defines when to send the certificate |
| Remote Send Cert Mode | Defines when the peer must send its certificate |
| ICMP Detect | Enable/disable ICMP watchdog |
| ICMP Detection Server | Server used to test tunnel reachability (reachable only via tunnel) |
| ICMP Detection Local IP | Local router interface IP |
| ICMP Detection Interval | Interval for ICMP tests |
| ICMP Detection Timeout | Timeout for ICMP responses |
| ICMP Detection Max Retries | Maximum retries after failed ICMP pings |

## IPsec External Setting




Profiles are required for **GRE over IPsec**. Create a profile with **Add**.




| Parameter | Description |
|---|---|
| Name | Unique profile name |
| IKE Version | IKEv1 or IKEv2 |
| IKEv1 Policy | ID of the IKEv1 policy |
| IPsec Policy | Name of the IPsec policy |
| Negotiation Mode | Main or Aggressive |
| Authentication | Shared Key or Certificate |

IKE Advanced (Phase 1)

| Parameter | Description |
|---|---|
| Local ID | IP Address, FQDN, or User FQDN |
| Remote ID | IP Address, FQDN, or User FQDN |
| IKE Keepalive | Enable/disable Keepalive |
| DPD Timeout | Timeout for DPD packet |
| DPD Interval | Interval for DPD packets |

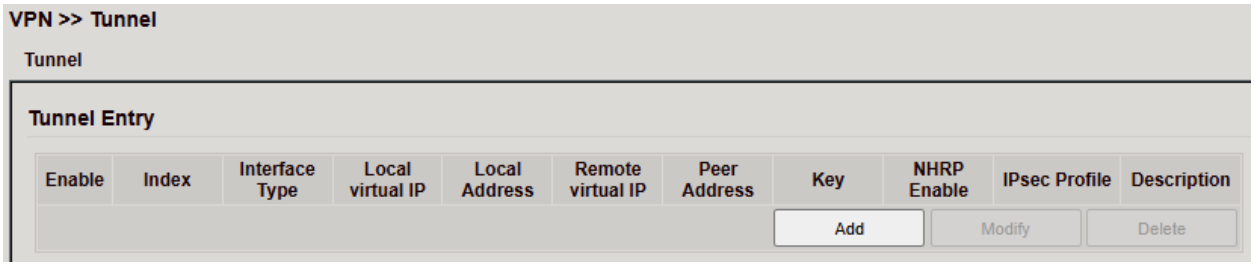
IPsec Advanced (Phase 2)

| Parameter | Description |
|---|---|
| PFS | Perfect Forward Secrecy group |
| IPsec SA Lifetime | Validity period before SA is recreated |
| Fail Times to Restart Interface | Failed attempts before restarting interface |
| Fail Times to Reboot | Failed attempts before router reboot |

## 5.8.2 Tunnel

VPN tunnels enable secure communication between networks or devices.

### Tunnel Entry

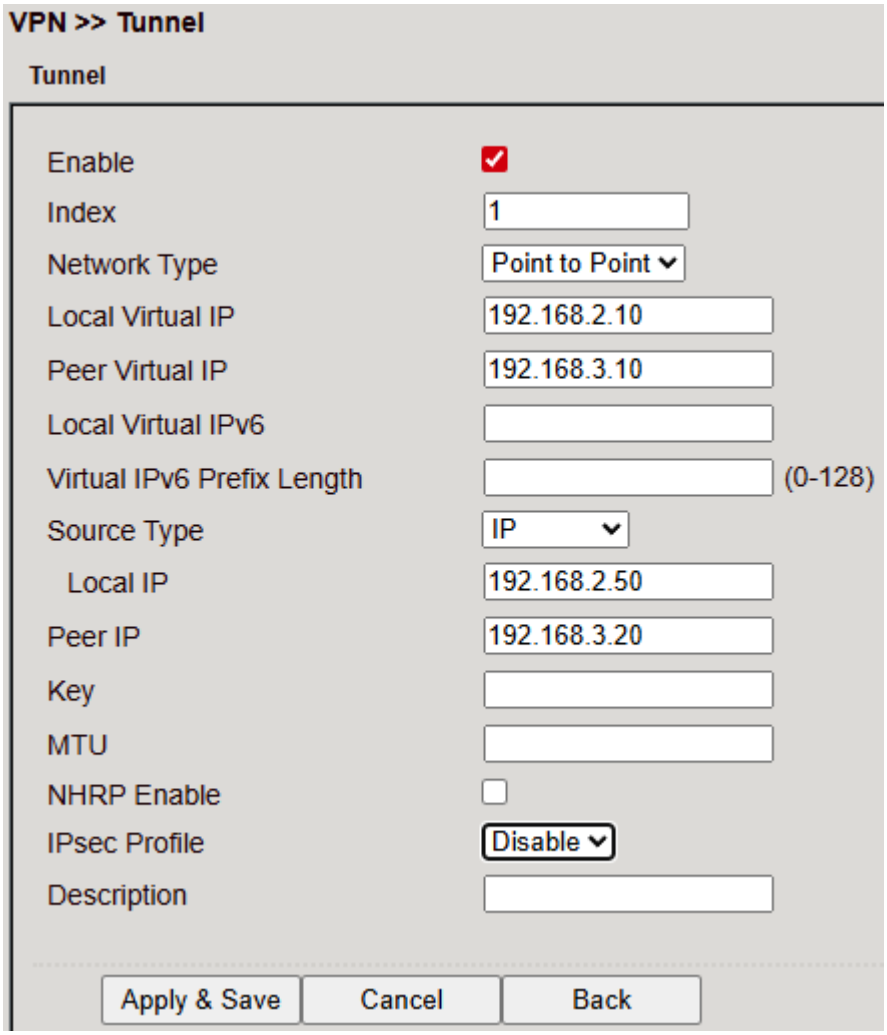



Overview table shows:

- Interface Type
- Local/Remote Virtual IP
- Peer Address
- IPsec Profile
- Description

Use **Add** to create, or **Modify**/**Delete** to manage.

# Tunnel Configuration




Options when adding/editing:

- **Enable** – Activate tunnel
- **Index** – Unique identifier
- **Network Type** – e.g. Point-to-Point
- **Local/Peer Virtual IP** – Virtual tunnel endpoints
- **Local/Peer IP** – Physical endpoints
- **Key** – Shared key if required
- **MTU** – Max transmission unit
- **NHRP Enable** – Enable Next Hop Resolution Protocol
- **IPsec Profile** – Select encryption/auth profile
- **Description** – Optional

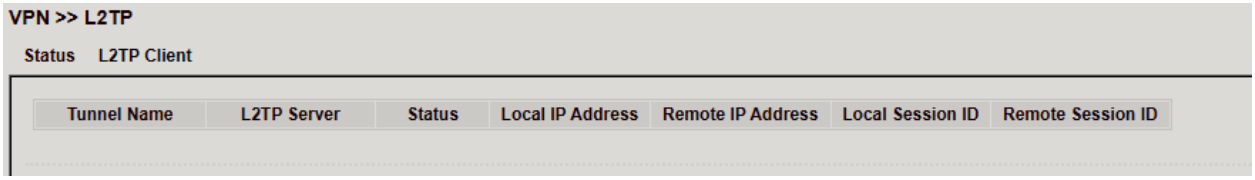
Click **Apply & Save** to activate.

## 5.8.3 L2TP

**L2TP (Layer 2 Tunneling Protocol)** combines **PPTP** and **L2F**.

- Provides tunneling, but **no encryption** → must be paired with IPsec.
- Often used for single-user connections (road warrior).

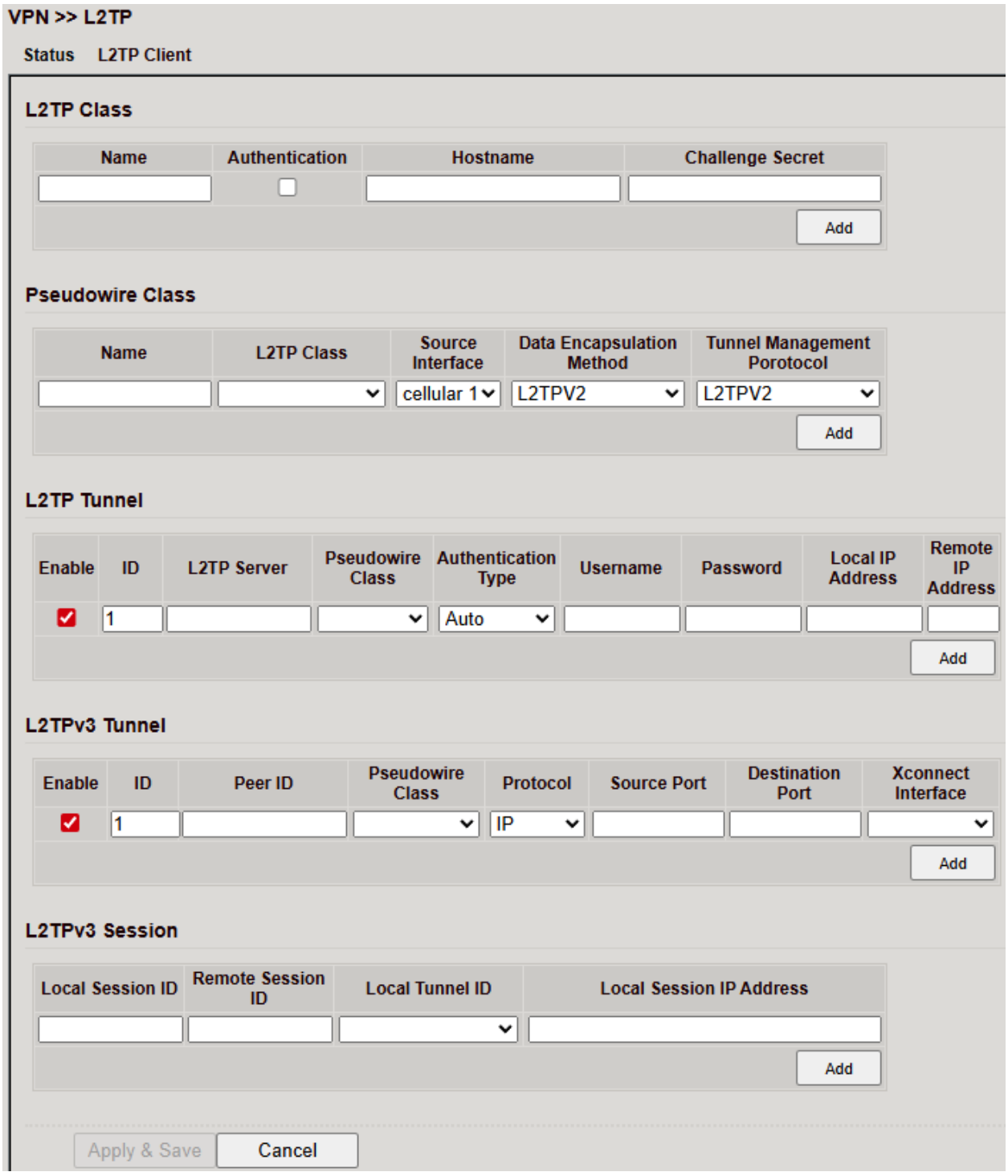
### L2TP Status




### L2TP Client

Configure under **VPN > L2TP > L2TP Client**.

- Add entries via **Add**
- Save with **Apply & Save**


VPN >> L2TP
Status
L2TP Client
L2TP Class
Name
Authentication
Hostname
Challenge Secret
Add
Pseudowire Class
Name
L2TP Class
Source Interface
Data Encapsulation Method
Tunnel Management Porotocol
cellular 1
L2TPV2
L2TPV2
Add
L2TP Tunnel
Enable
ID
L2TP Server
Pseudowire Class
Authentication Type
Username
Password
Local IP Address
Remote IP Address
1
Auto
Add
L2TPv3 Tunnel
Enable
ID
Peer ID
Pseudowire Class
Protocol
Source Port
Destination Port
Xconnect Interface
1
IP
Add
L2TPv3 Session
Local Session ID
Remote Session ID
Local Tunnel ID
Local Session IP Address
Add
Apply & Save
Cancel

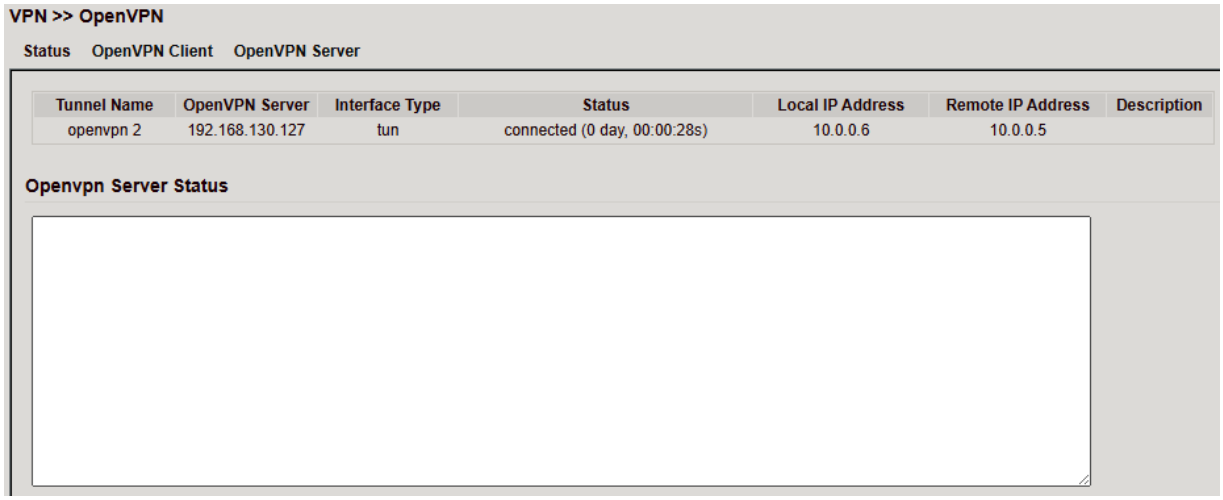
# 5.8.4 OpenVPN

**OpenVPN** is open-source VPN software using **TLS/SSL** encryption.

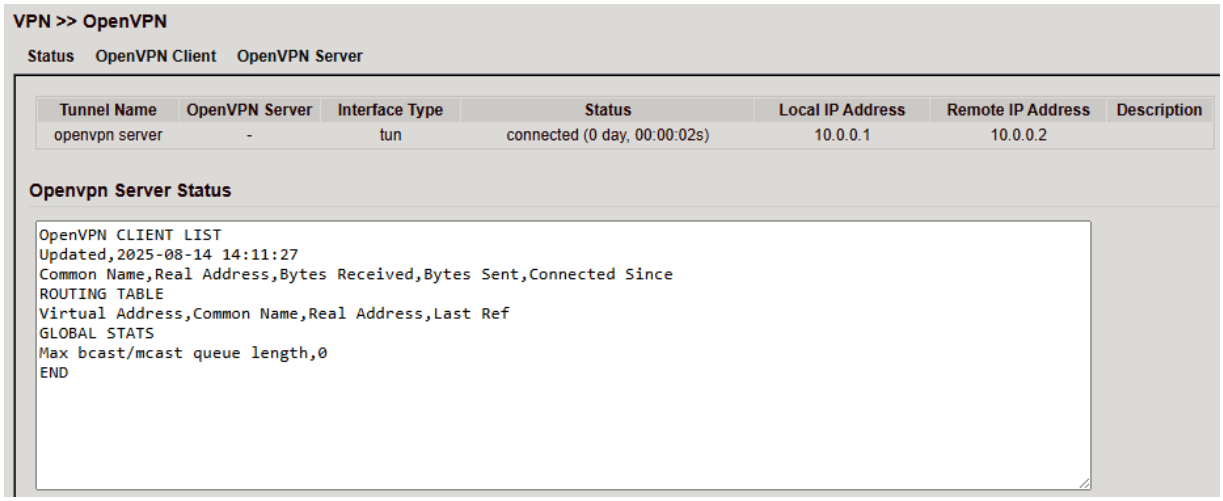
- Transport: UDP or TCP
- Encryption via **OpenSSL**

## OpenVPN Status

- **Client Status**

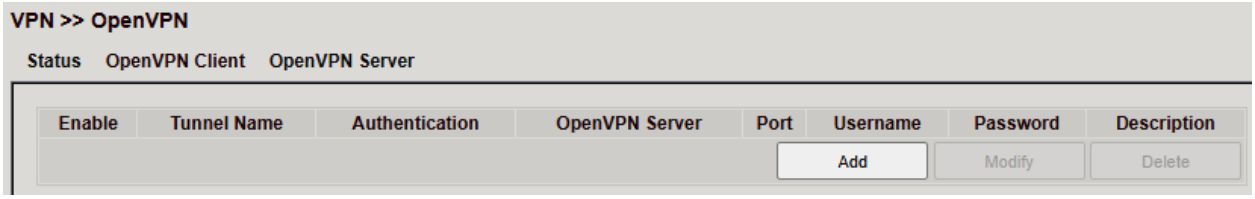


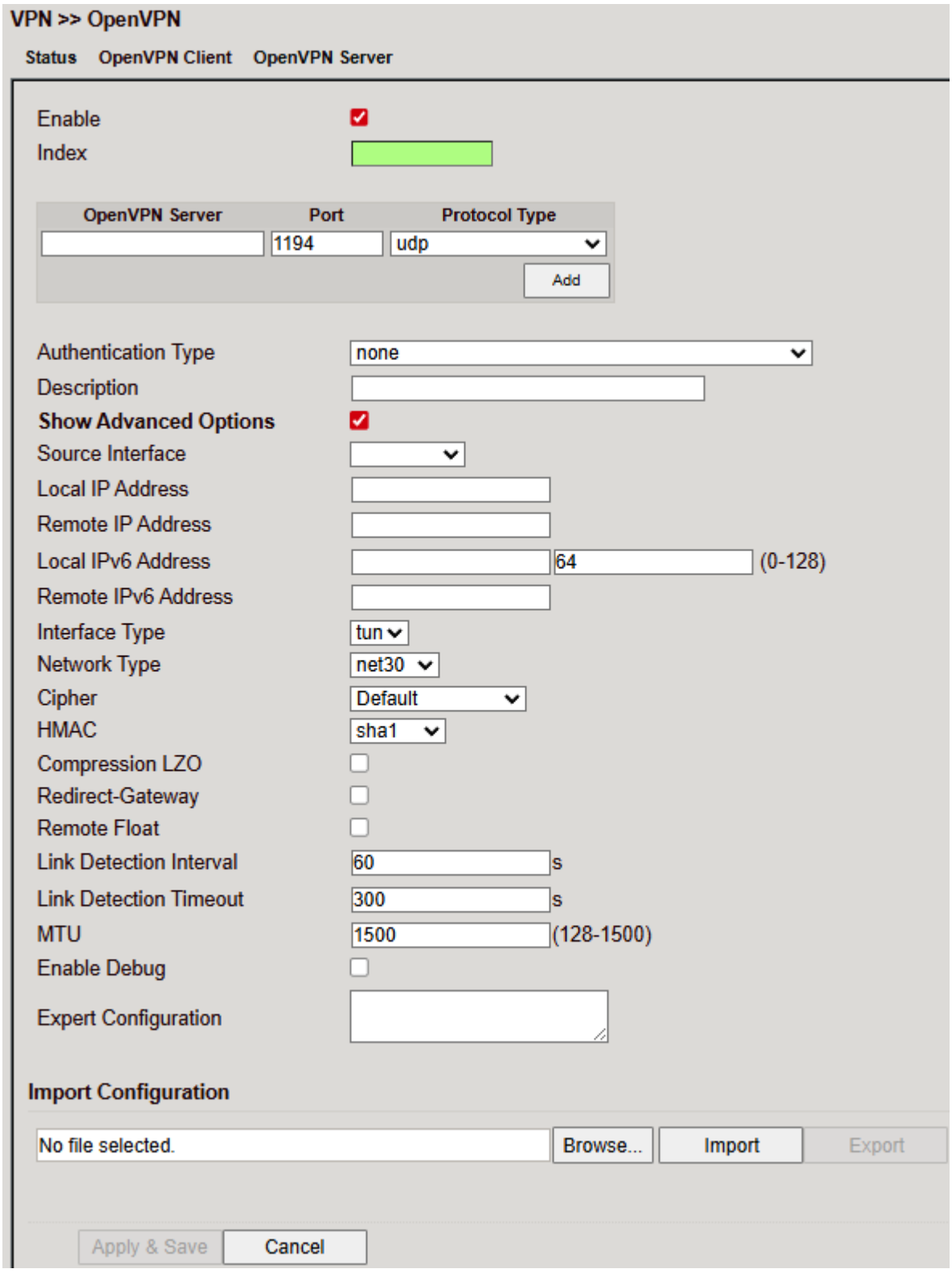

- **Server Status**




## OpenVPN Client

Configure under **VPN > OpenVPN > OpenVPN Client**.
Create a new tunnel with **Add**.




VPN >> OpenVPN
Status
OpenVPN Client
OpenVPN Server
Enable
Index
OpenVPN Server
Port
Protocol Type
1194
udp
Add
Authentication Type
none
Description
Show Advanced Options
Source Interface
Local IP Address
Remote IP Address
Local IPv6 Address
64
(0-128)
Remote IPv6 Address
Interface Type
tun
Network Type
net30
Cipher
Default
HMAC
sha1
Compression LZO
Redirect-Gateway
Remote Float
Link Detection Interval
60
s
Link Detection Timeout
300
s
MTU
1500
(128-1500)
Enable Debug
Expert Configuration
Import Configuration
No file selected.
Browse...
Import
Export
Apply & Save
Cancel

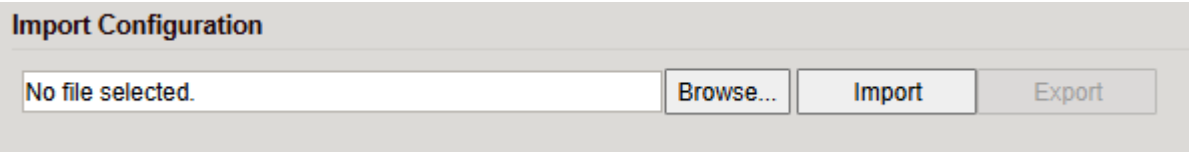
**Parameters:**

| Parameter | Description |
|---|---|
| Enable | Enable/disable tunnel |
| Index | Identifier for tunnel |
| OpenVPN Server | IP/FQDN of OpenVPN server |
| Authentication Type | Method (recommended: `x509-cert`) |
| Username | Username |
| Password | Password |
| Description | Optional description |

Show Advanced Options

| Parameter | Description |
|---|---|
| Source Interface | Interface used for tunnel |
| Interface Type | `tun` (recommended) or `tap` |
| Cipher | Encryption method |
| HMAC | Signs TLS handshake packets (default: SHA1) |
| Compression LZO | Enable/disable data compression |
| Redirect-Gateway | Route all traffic via tunnel |
| Remote Float | Accept packets even if server IP changes (useful for dynamic IP servers) |
| Link Detection Interval | Interval for connection checks |
| Link Detection Timeout | Timeout for connection checks |
| MTU | Maximum packet size |
| TCPMSS | Maximum size for TCP packets |
| Fragment | Maximum packet size for UDP |
| Enable Debug | Enable/disable debug mode |
| Expert Configuration | Raw OpenVPN options not available via GUI |

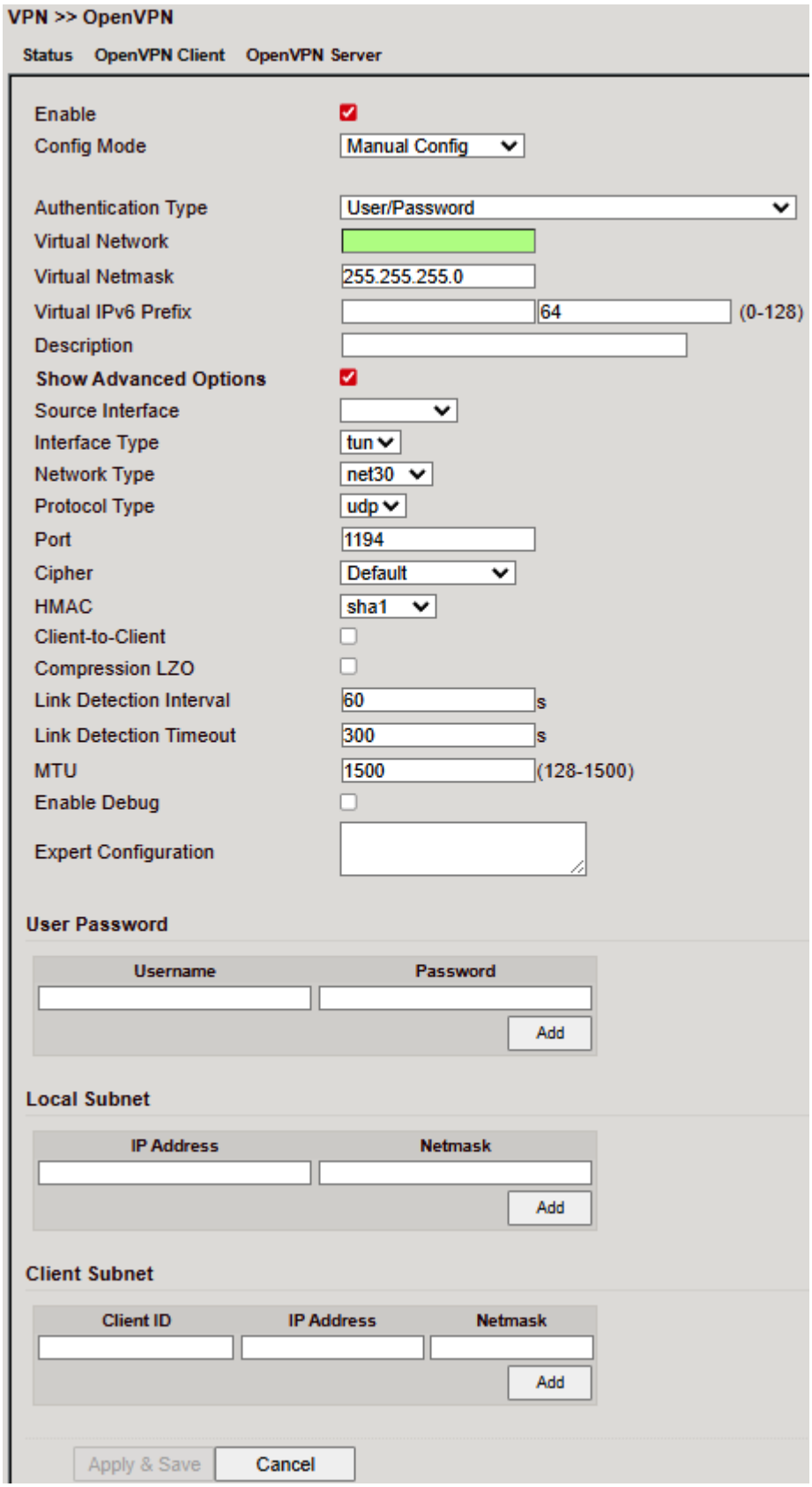
 The client **always needs the server's CA certificate**.




You can **import/export** OpenVPN configurations (`.ovpn` files).
 Avoid spaces in filenames.

## 5.8.5 OpenVPN Server

Configure under **VPN > OpenVPN > OpenVPN Server**.
 A **public IP** is required.


VPN >> OpenVPN
Status
OpenVPN Client
OpenVPN Server
Enable
Config Mode
Manual Config
Authentication Type
User/Password
Virtual Network
Virtual Netmask
255.255.255.0
Virtual IPv6 Prefix
64
(0-128)
Description
Show Advanced Options
Source Interface
Interface Type
tun
Network Type
net30
Protocol Type
udp
Port
1194
Cipher
Default
HMAC
sha1
Client-to-Client
Compression LZO
Link Detection Interval
60
s
Link Detection Timeout
300
s
MTU
1500
(128-1500)
Enable Debug
Expert Configuration
User Password
Username
Password
Add
Local Subnet
IP Address
Netmask
Add
Client Subnet
Client ID
IP Address
Netmask
Add
Apply & Save
Cancel

**Parameters:**

| Parameter | Description |
|---|---|
| Enable | Enable/disable OpenVPN server |
| Config Mode | Manual configuration or import of an existing config |
| Authentication Type | Authentication method |
| Virtual Network | Virtual subnet for VPN clients |
| Virtual Netmask | Subnet mask for the VPN network |
| Description | Optional description |

## Advanced Options

| Parameter | Description |
|---|---|
| Source Interface | Interface over which the OpenVPN tunnel is established |
| Interface Type | `tun` or `tap` (recommended: `tun`) |
| Network Type | Connection type (recommended: `net30`) |
| Protocol Type | UDP or TCP |
| Port | Port on which the OpenVPN server listens |
| Cipher | Encryption method |
| HMAC | Hash-based Message Authentication Code |
| Client-to-Client | Enable/disable communication between clients |
| Compression LZO | Enable/disable compression |
| Link Detection Interval | Interval for tunnel connection checks |
| Link Detection Timeout | Timeout for tunnel connection check packets |
| MTU | Maximum packet size |
| TCPMSS | Maximum size for TCP packets |
| Fragment | Maximum packet size for UDP packets |
| Enable Debug | Enable/disable debug mode |
| Expert Configuration | Enter custom OpenVPN options not available via web interface |

User Password

Clients can be added here. Each client logs in with a **username** and **password**.

Local Subnet

Defines which **local subnets** of the router are accessible for clients.

Client Subnet

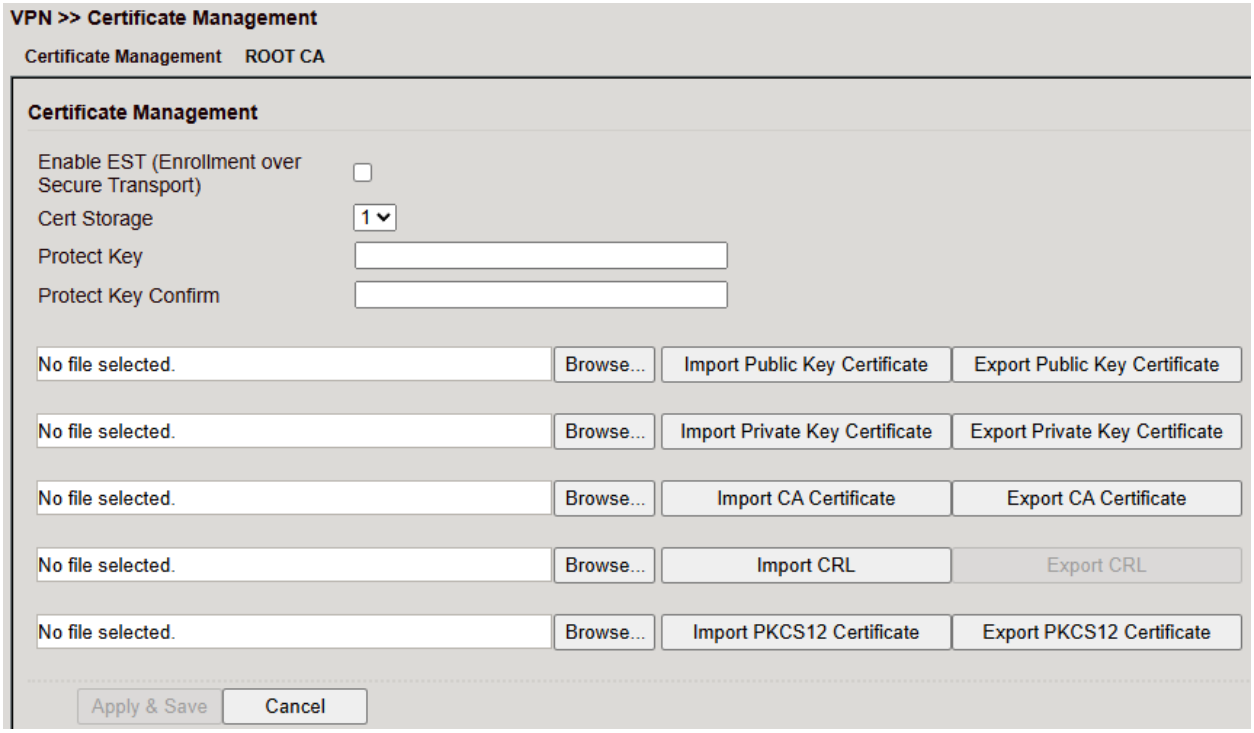
Defines which **client subnets** are accessible from the server.

- **Client ID** = Username (for User/Password auth) or CN (for certificate auth).

 The OpenVPN server **requires a CA certificate, public key and private key** (uploaded under *VPN* > *Certificate Management*).
If these are missing, the server will not start.

## 5.8.6 Certificate Management

Used to store certificates for IPsec and OpenVPN (unless using PSK).




1. Click **Browse**, select the certificate file and **Import**.
2. Use **Export** to verify upload (file size > 0 bytes).
   - If upload fails, try another browser/PC.
3. If importing a **PKCS12** set with password → enter password in **Protect Key** + **Protect Key Confirm**.
4. Click **Apply & Save**.

| Parameter | Description |
|---|---|
| Enable SCEP | Enable Simple Certificate Enrollment Protocol for auto-rollout |
| Protect Key / Confirm | Password for password-protected certificates |
| Revocation | Enable certificate revocation list (CRL) |
| Import Public Key Certificate | Upload public key certificate |
| Import Private Key Certificate | Upload private key certificate |
| Import CA Certificate | Upload Certificate Authority certificate |
| Import CRL | Upload Certificate Revocation List |
| Import PKCS12 Certificate | Upload PKCS12 certificate set |

# 5.9 Industrial

Features:

- Digital input
- Relay output
- RS-232 interface
- RS-485 interface

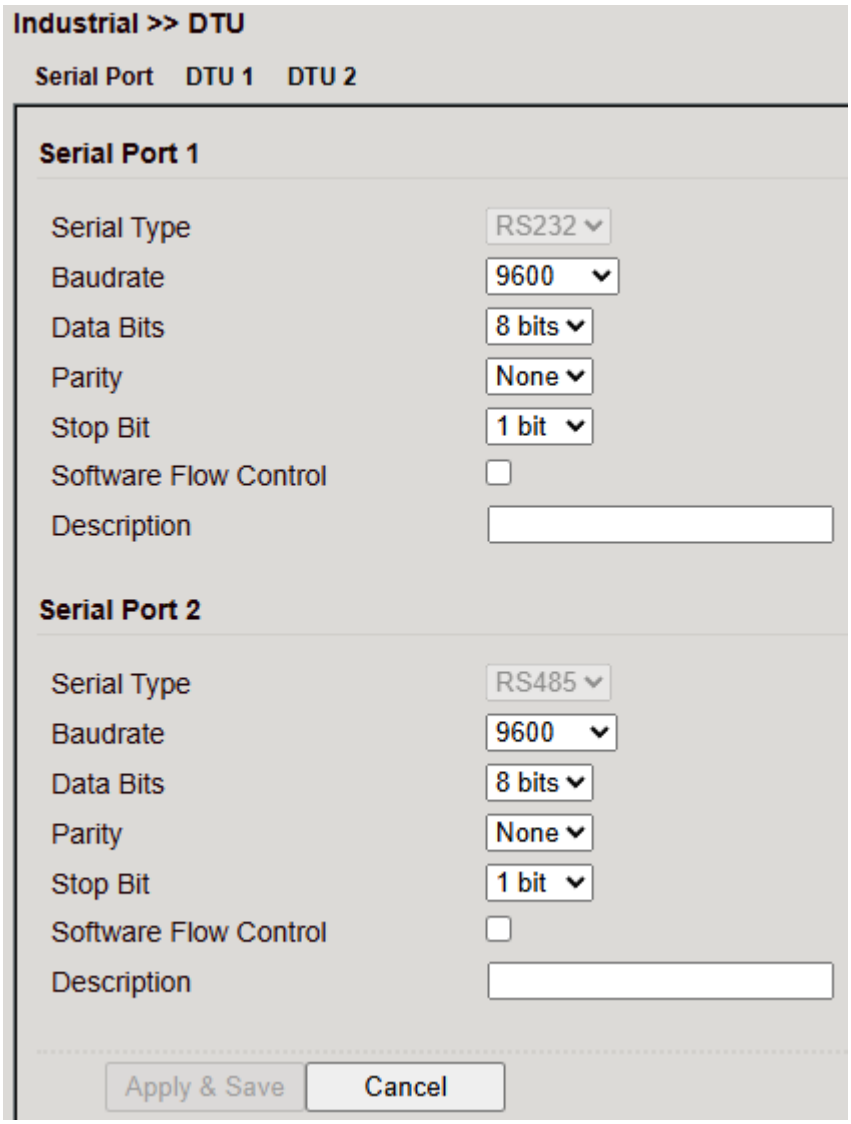
## 5.9.1 DTU (Data Terminal Unit)

Connects serial devices (RS-232, RS-485).
Configuration consists of two parts:

1. **Serial Port** properties (RS-232 / RS-485).
2. **DTU Protocol Parameters**.

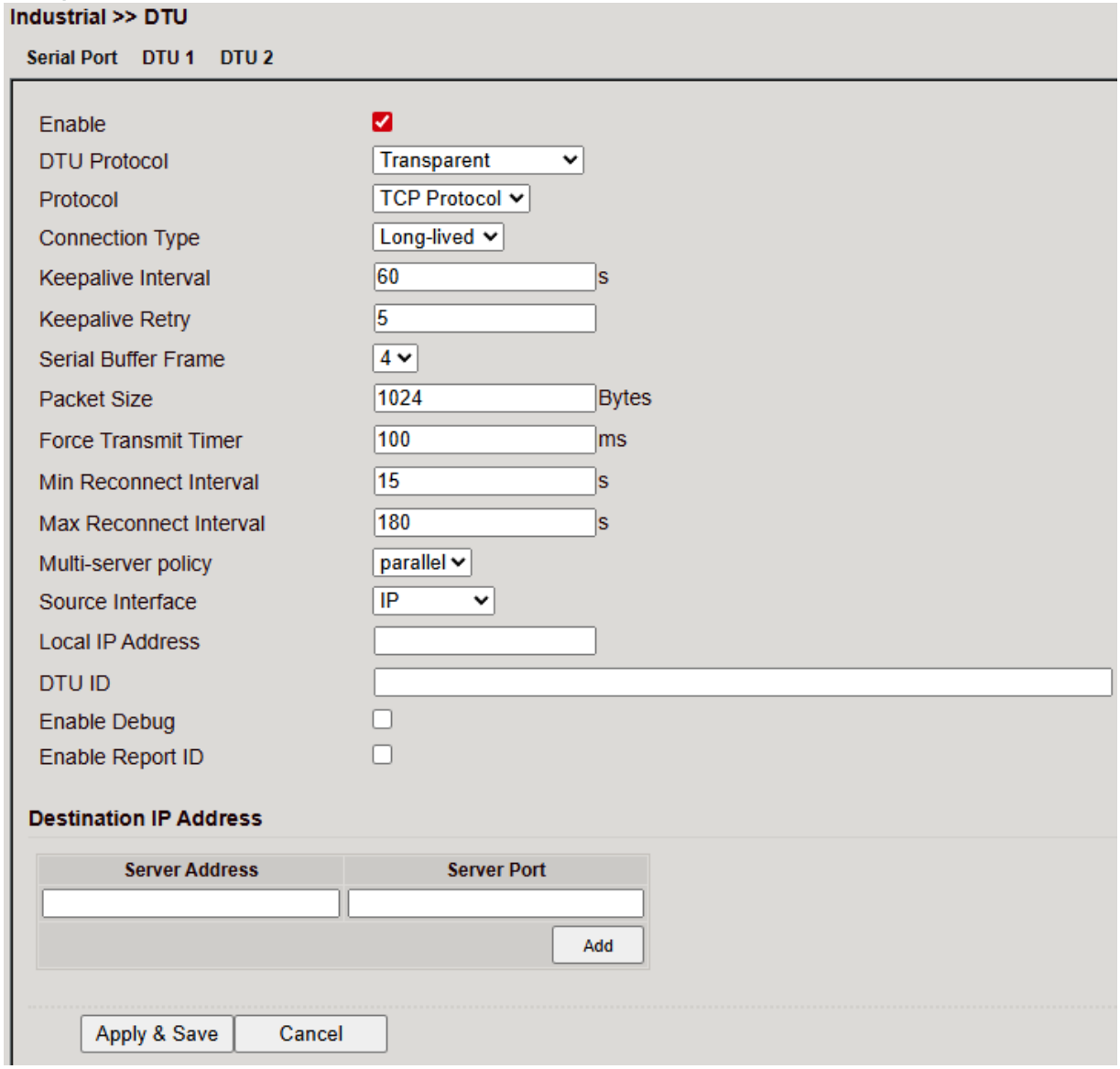
### Serial Port

Configure serial ports `1 (RS232)` and `2 (RS485)`.

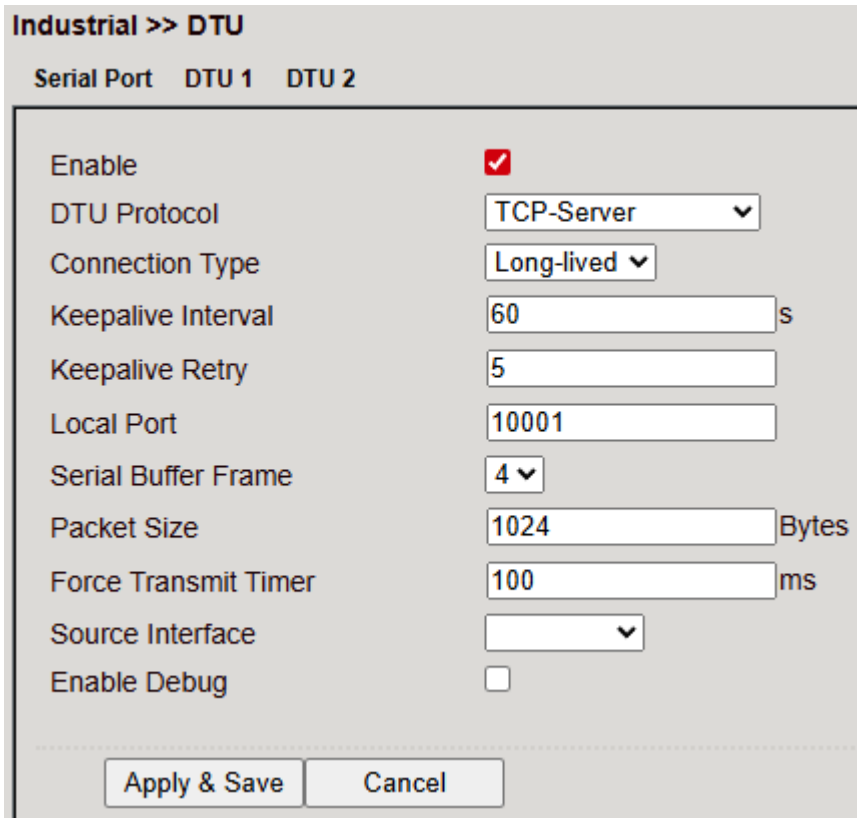

Industrial >> DTU
Serial Port
DTU 1
DTU 2
Serial Port 1
Serial Type
RS232
Baudrate
9600
Data Bits
8 bits
Parity
None
Stop Bit
1 bit
Software Flow Control
Description
Serial Port 2
Serial Type
RS485
Baudrate
9600
Data Bits
8 bits
Parity
None
Stop Bit
1 bit
Software Flow Control
Description
Apply & Save
Cancel

# DTU Protocols

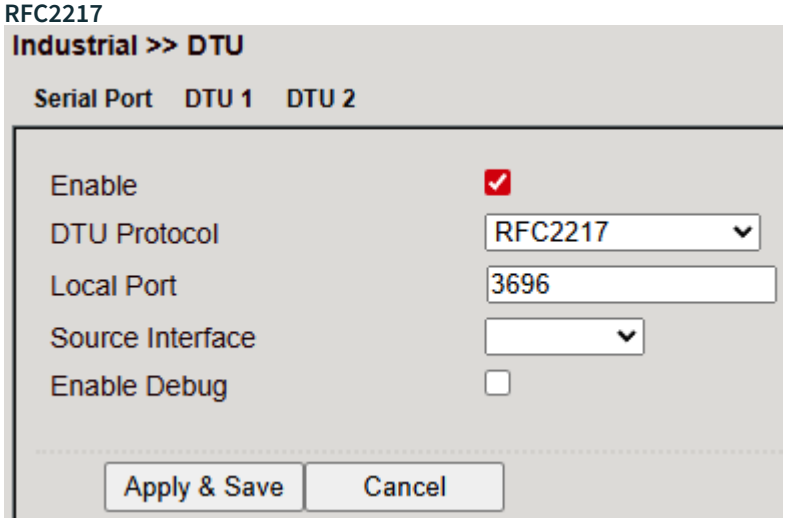
- **Transparent Mode**



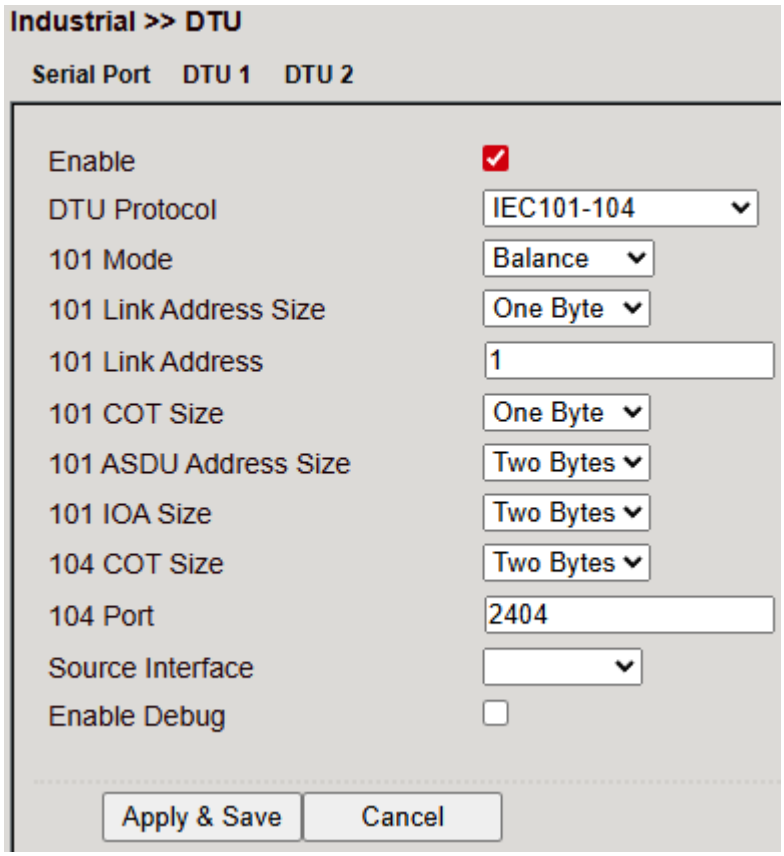

- **TCP Server**



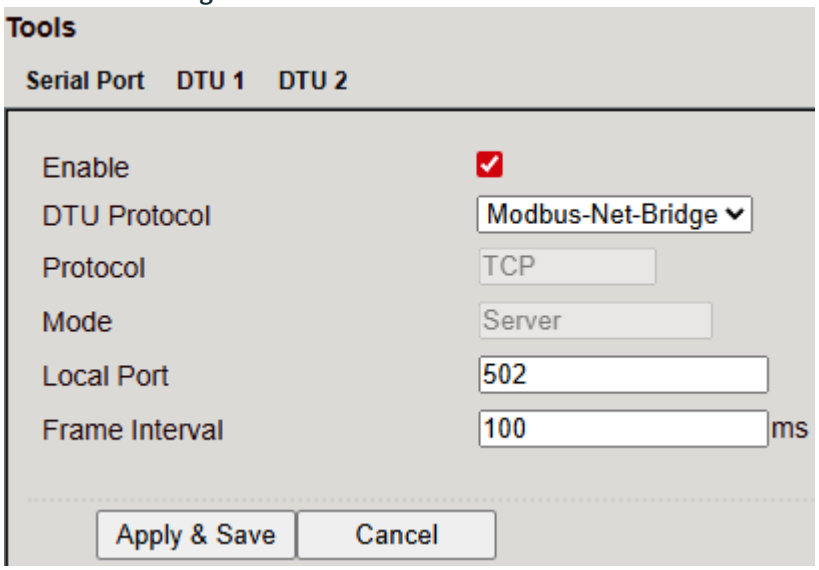

- **RFC2217**



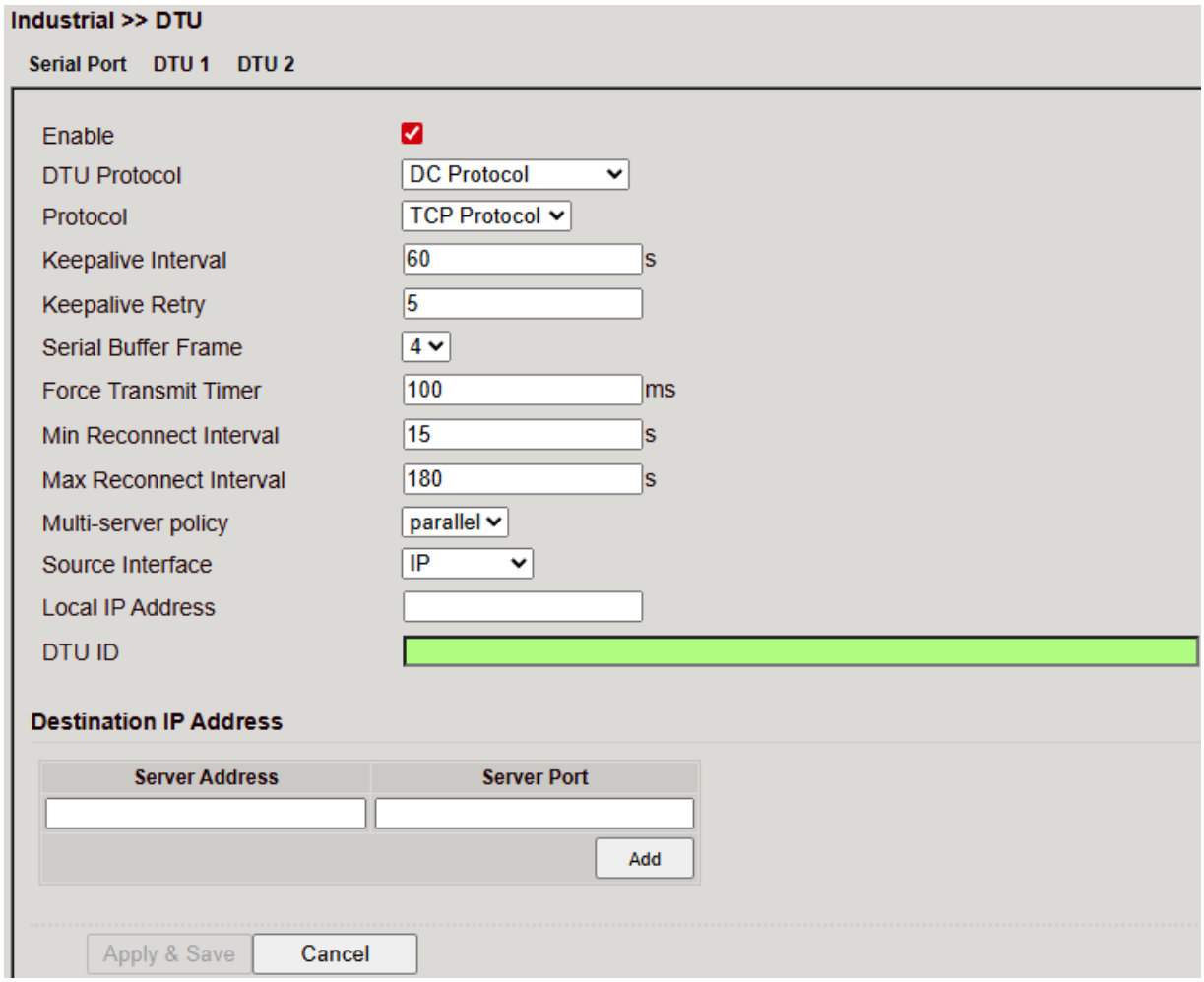

- **IEC60870-5-101/104**




- **Modbus-Net-Bridge**




- **DC Protocol**

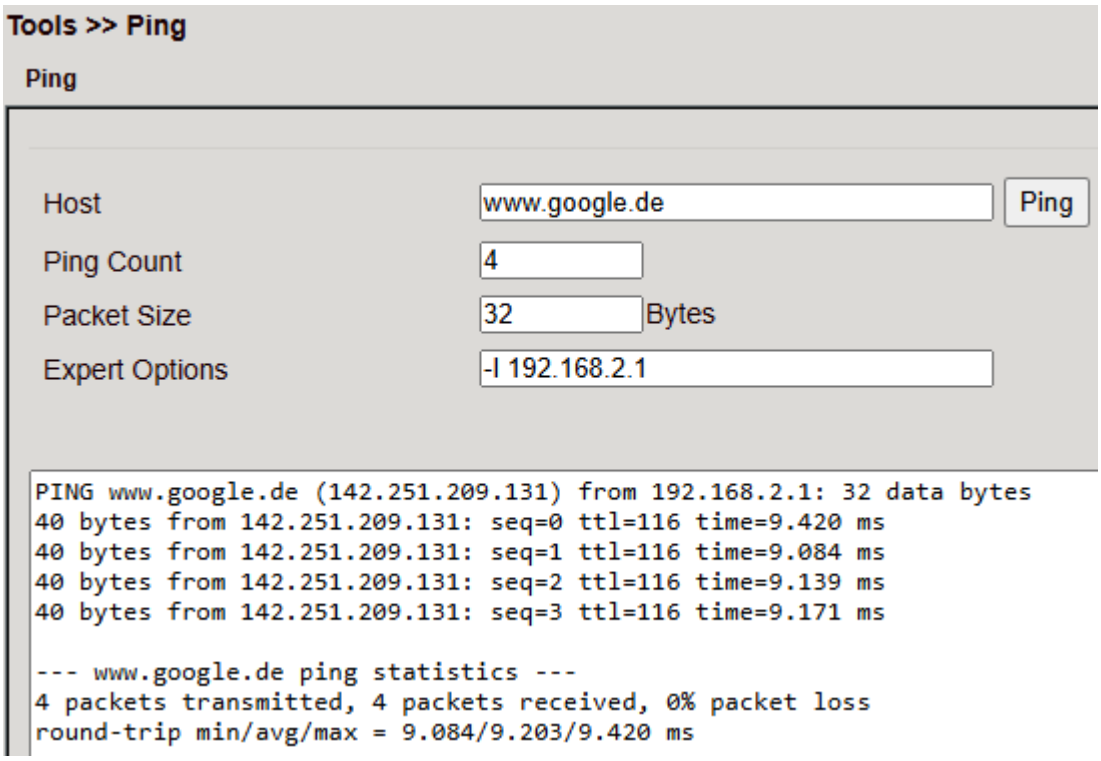



# 5.10 Tools

Utilities for diagnostics and network tests.

## 5.10.1 Ping

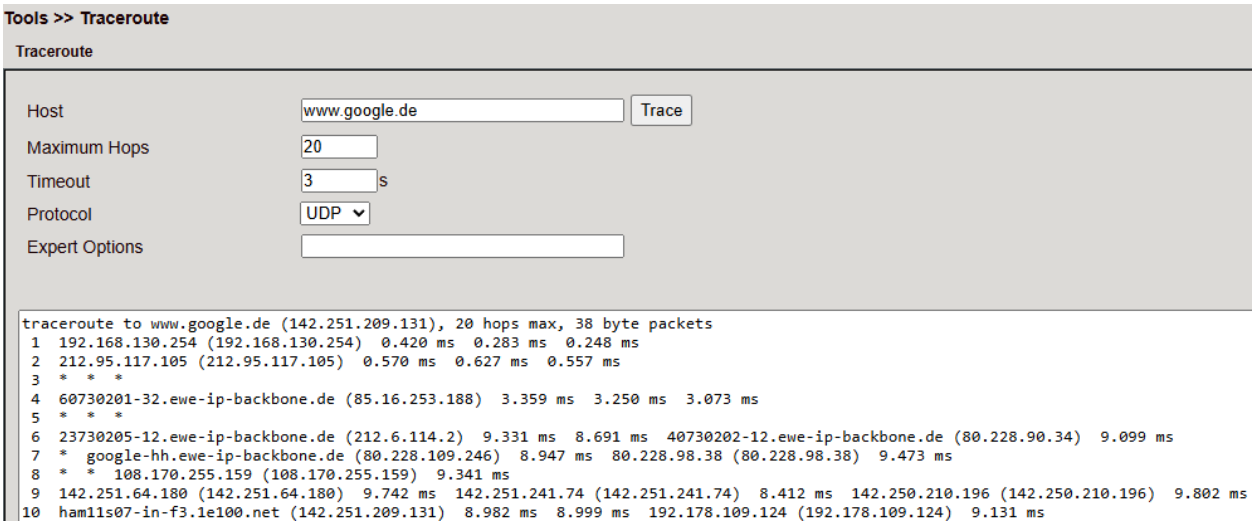
Send ICMP echo requests.




| Parameter | Description |
|---|---|
| Host | Destination IP/hostname |
| Ping Count | Number of pings (1–50, default: 4) |
| Packet Size | Packet size (default: 32 bytes) |
| Expert Options | Additional advanced settings |

## 5.10.2 Traceroute

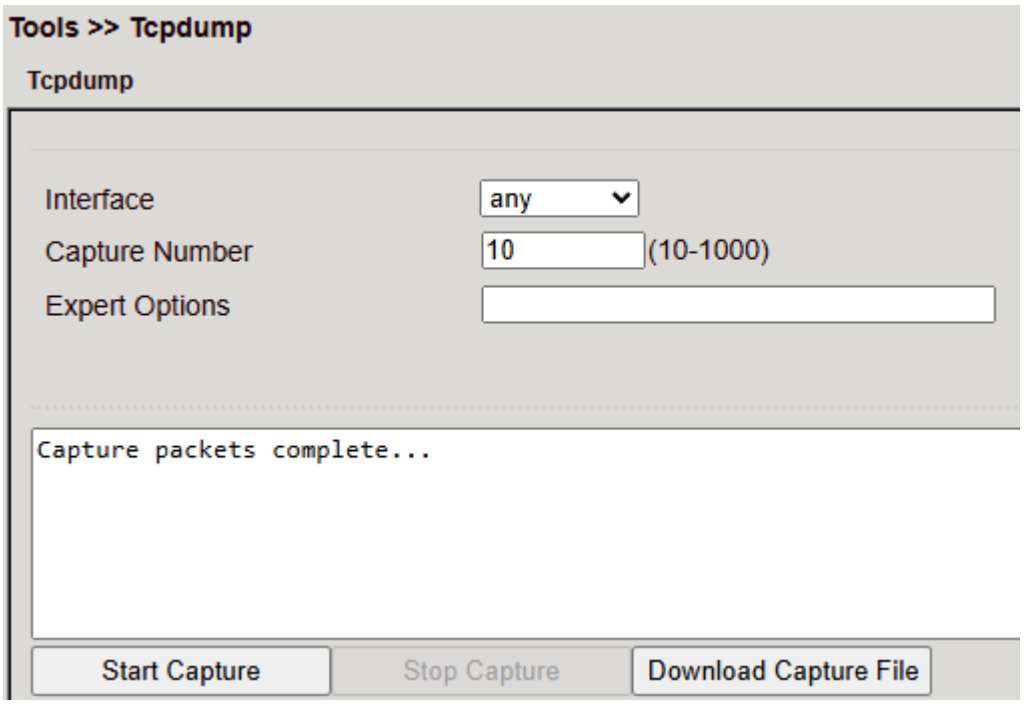
Displays routing path to a host.



| Parameter | Description |
|---|---|
| Host | Destination IP/hostname |
| Maximum Hops | Hop limit (2–40, default: 20) |
| Timeout | Timeout per hop (2–10s) |
| Protocol | ICMP or UDP (default: UDP) |
| Expert Options | Advanced options |

## 5.10.3 Tcpdump

Packet sniffer for TCP/UDP analysis.




| Parameter | Description |
|---|---|
| Interface | Interface to capture |
| Capture Number | Number of packets (default: 10) |
| Expert Options | Advanced options |
| Start Capture | Begin packet capture |
| Stop Capture | Stop packet capture |
| Download Capture File | Save capture as `.pcap` (analyze with Wireshark) |

# 5.11 CLI Commands

The router can also be managed via **CLI (Command Line Interface)** using **SSH** or **Telnet**.

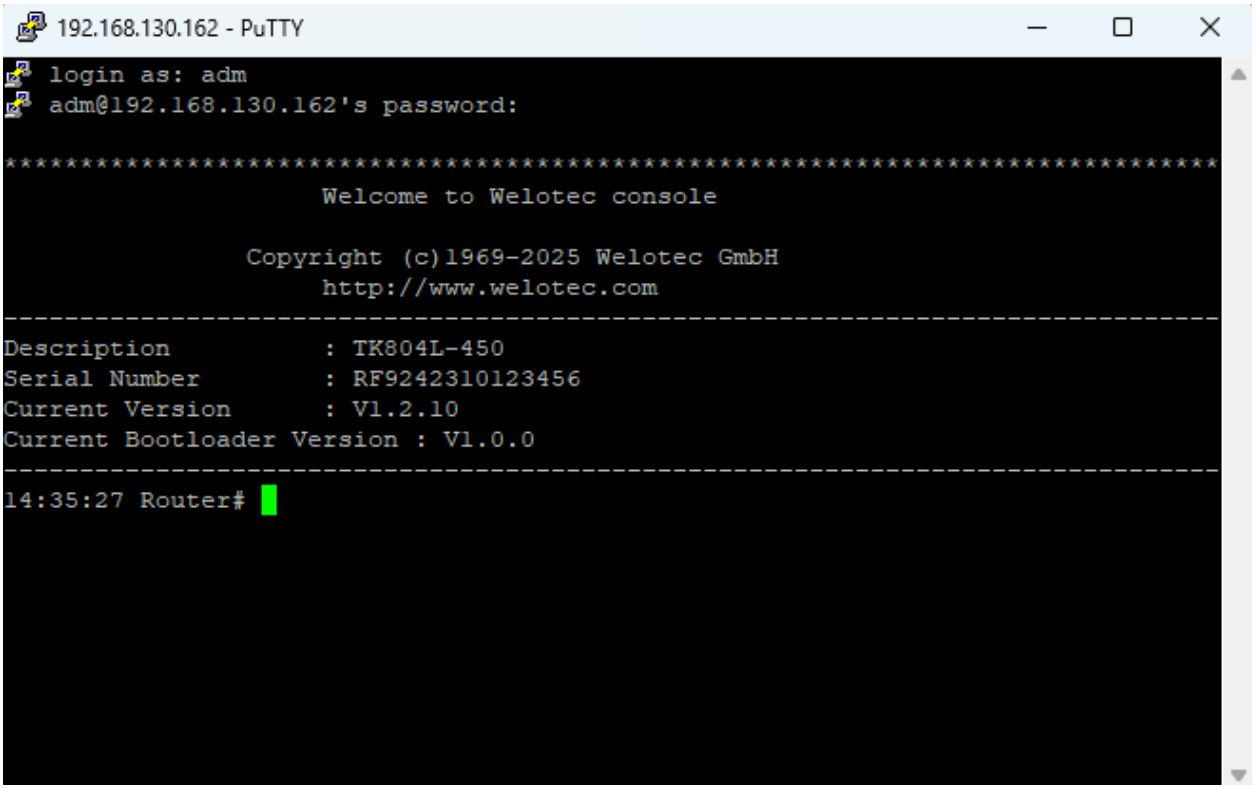
- Enable under **Administration > Management Services**.
- Use a terminal client such as **PuTTY**.

## 5.11.1 Connection

1. Enable SSH/Telnet in the router (**Apply & Save**).
2. Start PuTTY, enter router IP, select SSH/Telnet.
3. Connect.

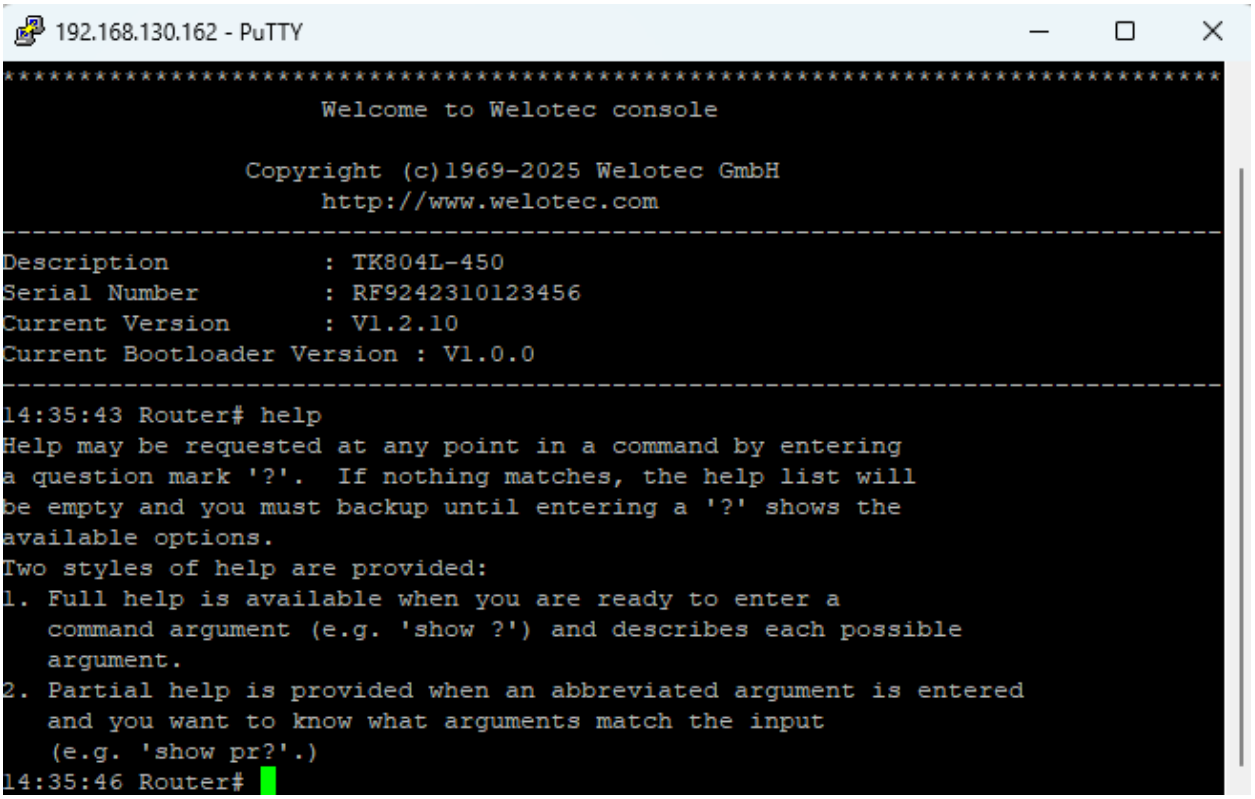

Default login:

- User: `adm`
- TK804 routers shipped with firmware version V1.2.13 or higher have a device-specific password for the “adm” user. You can find this password on the device label. Routers shipped with an older firmware version use the combination “adm” / “123456”.




## 5.11.2 Help Command

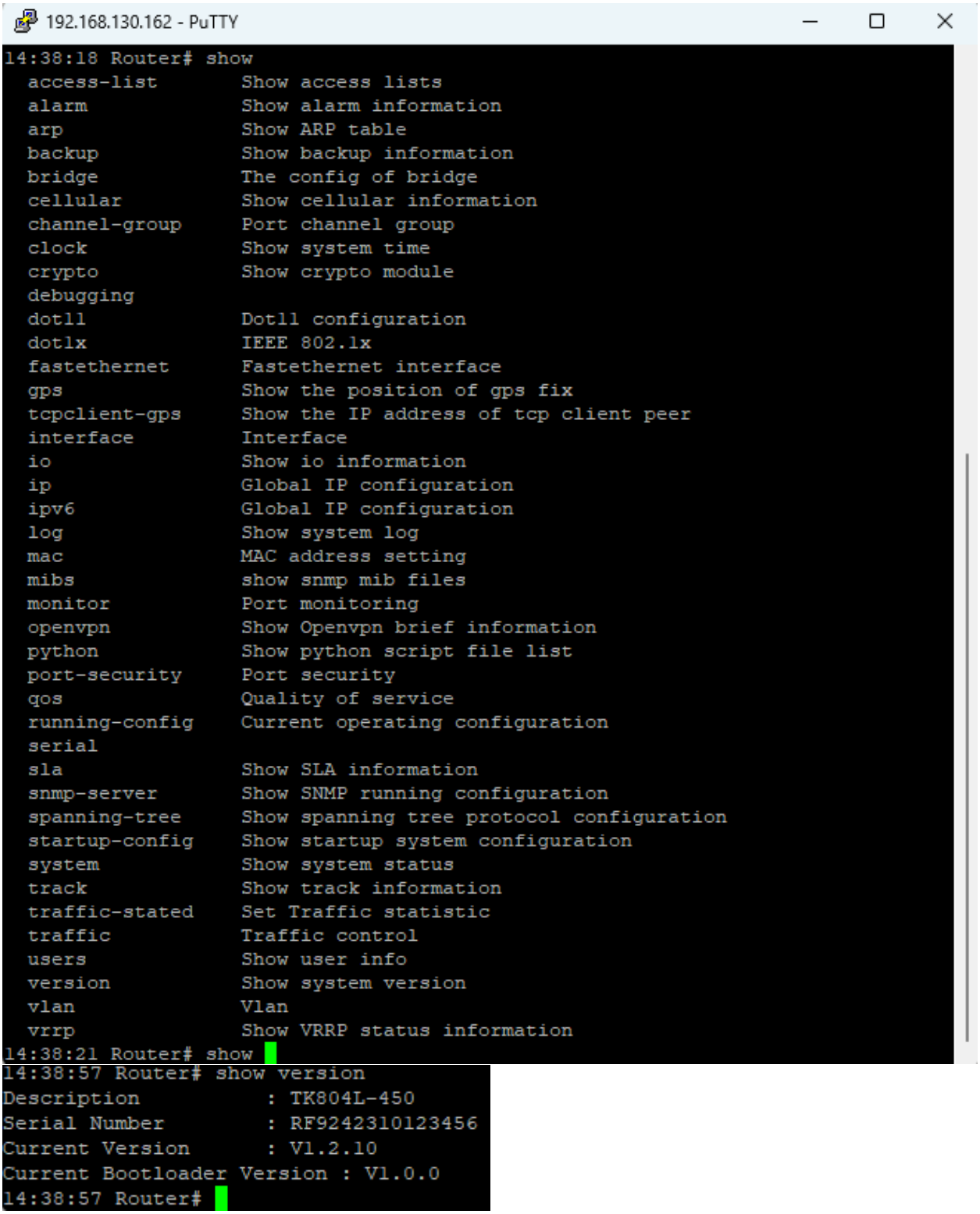
- `help` → Shows help usage
- ? → Context-sensitive help at any point



## 5.11.3 Show Command

Displays router parameters/config.

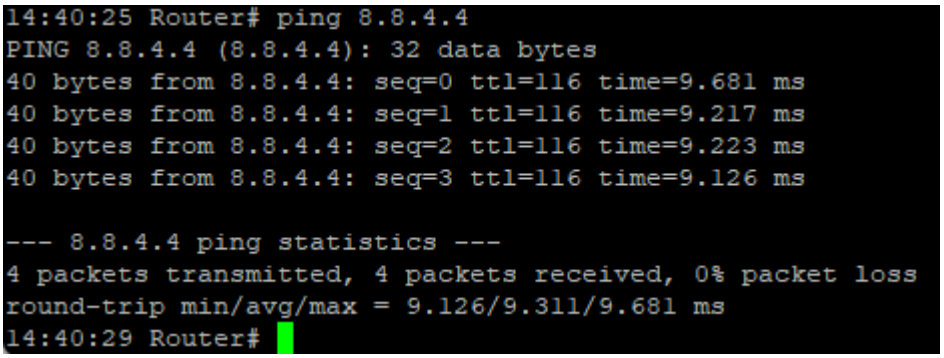
Example:
`show version` → Device info, serial no., firmware, bootloader.



## 5.11.4 Ping Command

Check Internet connectivity.

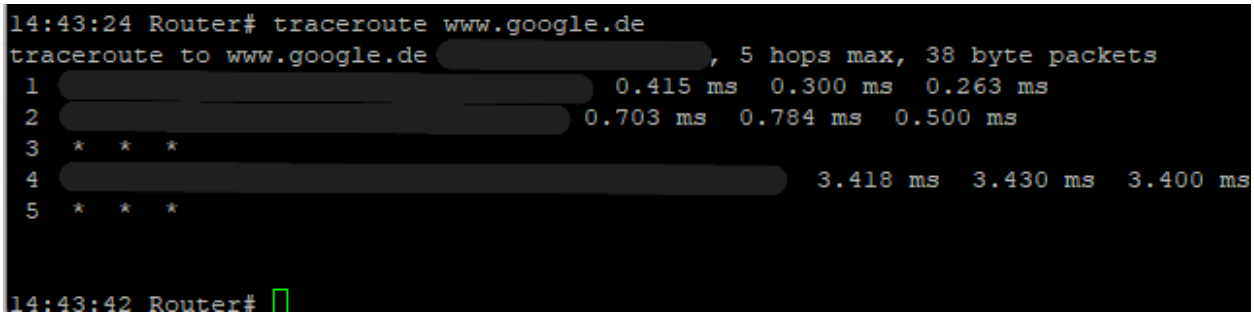
ping <hostname/IP>




## 5.11.5 Traceroute Command

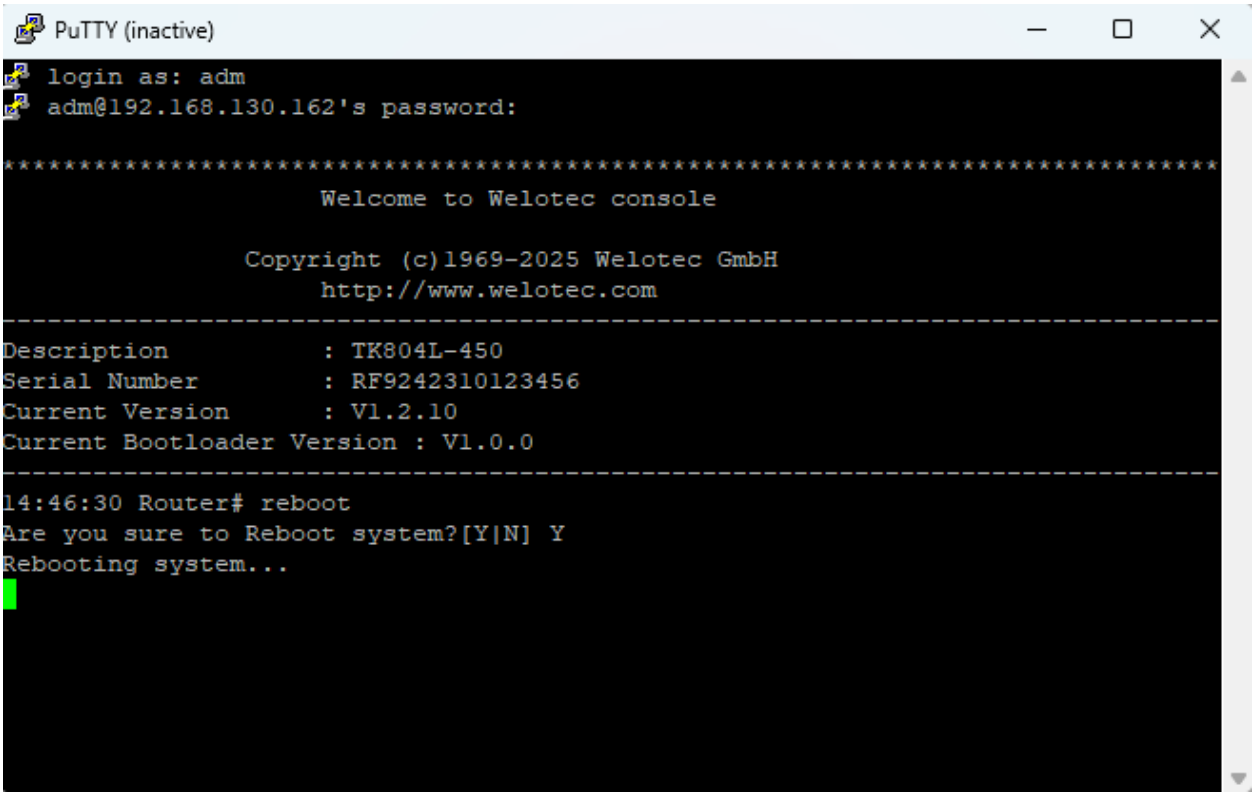
Test the active routing path to a destination.

traceroute <hostname/IP>



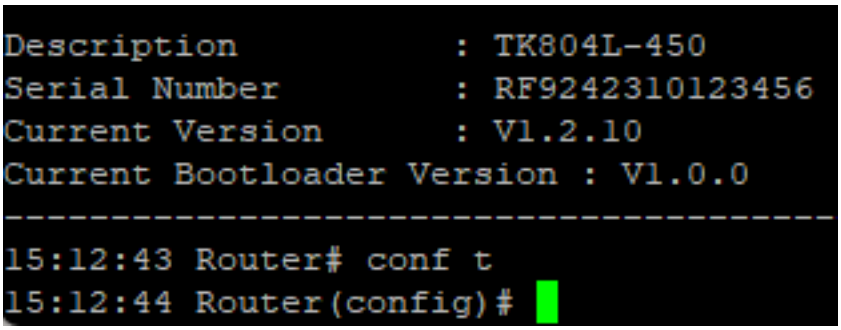

## 5.11.6 Reboot Command

To restart the router, you can use the reboot command. Enter it in the CLI and the router will be restarted.




## 5.11.7 Configuration Command

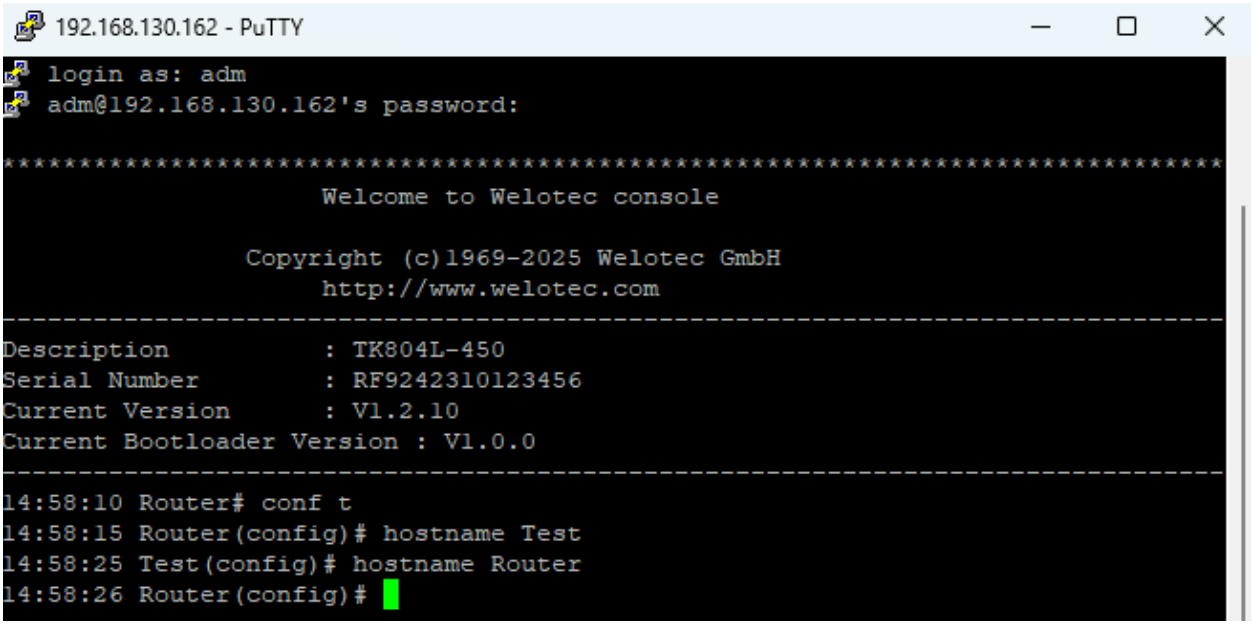
In the superuser view, the router can use the configure command to switch the configuration view for management. A configure command can support no and default, where no indicates setting the abort of a parameter and default indicates restoring the default setting of a parameter. The configure terminal (or conf t for short) command switches the system to configuration mode. In this setting the router can be configured. To exit the configuration mode use the exit command. All entered commands must be terminated with the wr command so that the changes are applied to the router.




### Hostname Command

In **configuration mode**, you can change the router name using **hostname** .
This sets the router's name to the value you specify.

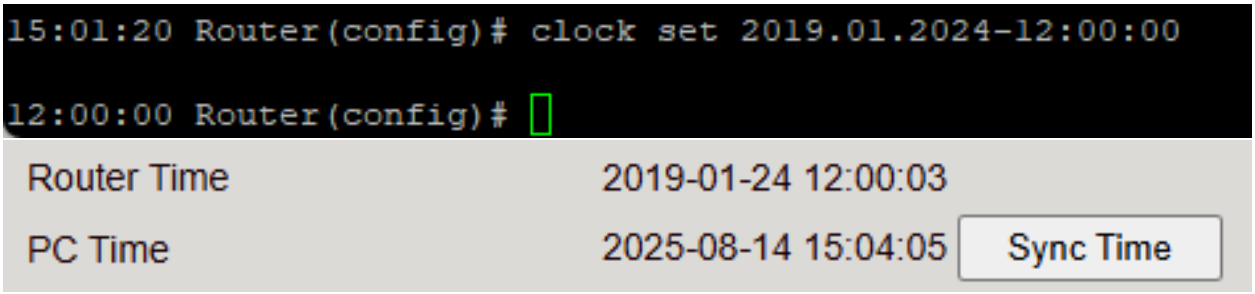
To reset the router name back to the factory default, use **default hostname**.




## Clock Set Command

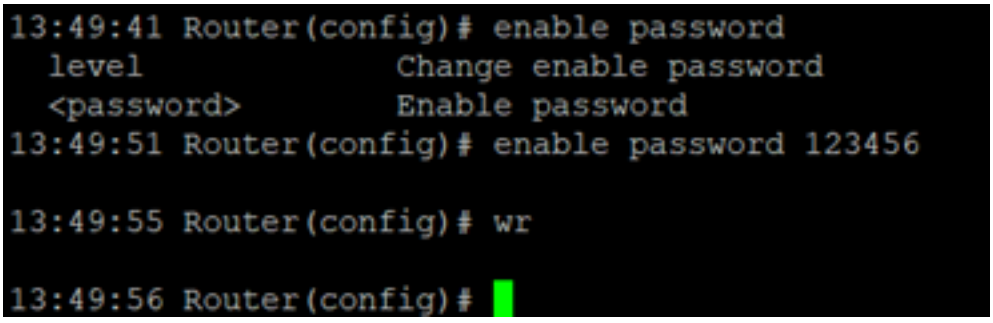
You can configure the system date and time of the router using the **clock set** command.
The required format is: **YYYY.MM.DD-HH:MM:SS**

Example: **clock set 2019.01.24-12:00:00**




## Enable Password Command

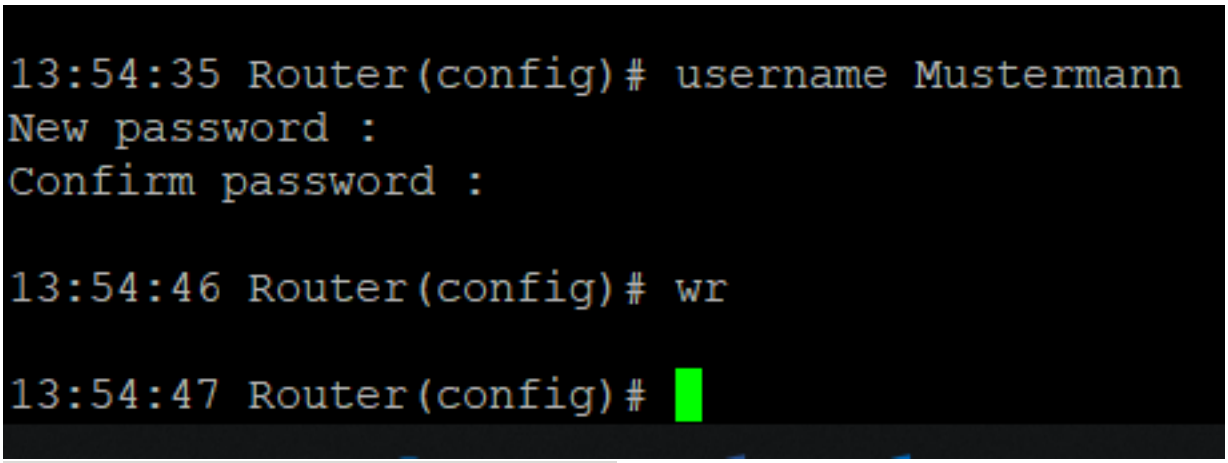
The password of the superuser (**adm**) can be changed at any time via the CLI.
Use the command: **enable password**

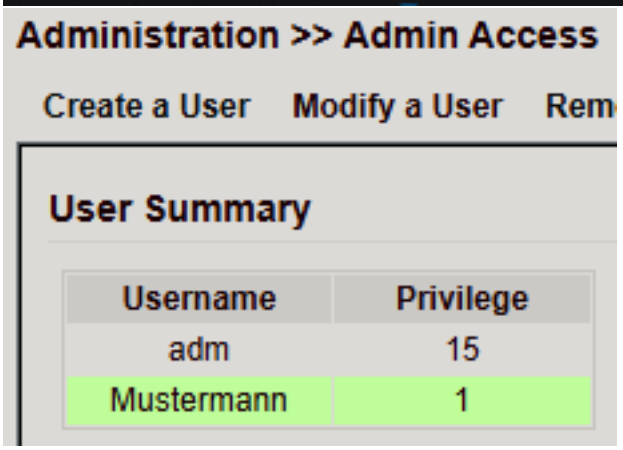


## Username Command

The **username** command allows you to create new users for router access.
Syntax: **username**

When creating the user, you will be prompted to set a password.
 New users created this way are always standard users (not administrators).



# 6 Technical Specifications

## 6.1 Device Properties

| Property | Value |
|---|---|
| Housing material | Metal |
| Ingress Protection | IP30 |
| Dimensions (W x H x D) | 35 x 127 x 108 mm |
| Weight | 457 g |
| Operating voltage | 9 - 36 V DC |
| Mounting | DIN rail |
| Approval | CE compliant |

## 6.2 Environmental Conditions

| Property | Value |
|---|---|
| Operating temperature range | -25 to + 70 °C |
| Storage temperature range | -40 to +85 °C |
| Air humidity | 5 - 95 %, non condensing |
| Concussions | IEC 60068-2-27 |
| Free fall | IEC 60068-2-32 |
| Vibration | IEC 60068-2-6 |
| EMC | EN 61000-4, Level 3 |

# 7 Frequency bands by region

## 7.1 Radio frequencies LTE Europe

| Frequency | Frequency Range Downlink (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| B1 | 2110 – 2170 | 1920 – 1980 | 200 | TK804L-450 |
| B3 | 1805 – 1880 | 1710 – 1785 | 200 | TK804L-450 |
| B5 | 869 – 894 | 824 – 849 | 200 | TK804L-450 |
| B7 | 2620 – 2690 | 2500 – 2570 | 200 | TK804L-450 |
| B8 | 925 – 960 | 880 – 915 | 200 | TK804L-450 |
| B20 | 791 – 821 | 832 – 862 | 200 | TK804L-450 |
| B28 | 758 – 788 | 703 – 733 | 200 | TK804L-450 |
| B31 | 462.5 – 467.5 | 452.5 – 457.5 | 200 | TK804L-450 |

## 7.2 Radio frequencies GSM Europe

| Frequency | Frequency Range Downlink (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| GSM 900 | 925 – 960 | 880 – 915 | 2000 | TK804L-450 |
| GSM 1800 | 1805 – 1880 | 1710 – 1785 | 1000 | TK804L-450 |

## 7.3 Radio frequencies LTE USA/Canada

| Frequency | Frequency Range Downlink (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| B5 | 869 – 894 | 824 – 849 | 200 | TK804L-450 |
| B28 | 758 – 788 | 703 – 733 | 200 | TK804L-450 |
| B72 | 663 – 698 | 617 – 652 | 200 | TK804L-450 |

## 7.4 Radio frequencies GSM USA/Canada

| Frequency | Frequency Range Downlink (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| GSM 900 | 925 – 960 | 880 – 915 | 2000 | TK804L-450 |
| GSM 1800 | 1805 – 1880 | 1710 – 1785 | 1000 | TK804L-450 |

## 7.5 Radio frequencies LTE Asia

| Frequency | Frequency Range Downlink (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| B1 | 2110 – 2170 | 1920 – 1980 | 200 | TK804L-450 |
| B3 | 1805 – 1880 | 1710 – 1785 | 200 | TK804L-450 |
| B5 | 869 – 894 | 824 – 849 | 200 | TK804L-450 |
| B8 | 925 – 960 | 880 – 915 | 200 | TK804L-450 |
| B28 | 758 – 788 | 703 – 733 | 200 | TK804L-450 |
| B31 | 462.5 – 467.5 | 452.5 – 457.5 | 200 | TK804L-450 |

## 7.6 Radio frequencies GSM Asia

| Frequency | Frequency Range Downlink (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| GSM 900 | 925 – 960 | 880 – 915 | 2000 | TK804L-450 |
| GSM 1800 | 1805 – 1880 | 1710 – 1785 | 1000 | TK804L-450 |

# 7.7 Radio frequencies LTE Global

| Frequency Band | Frequency Range Down-link (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| B1 | 2110 – 2170 | 1920 – 1980 | 200 | TK804L-450 |
| B3 | 1805 – 1880 | 1710 – 1785 | 200 | TK804L-450 |
| B5 | 869 – 894 | 824 – 849 | 200 | TK804L-450 |
| B7 | 2620 – 2690 | 2500 – 2570 | 200 | TK804L-450 |
| B8 | 925 – 960 | 880 – 915 | 200 | TK804L-450 |
| B20 | 791 – 821 | 832 – 862 | 200 | TK804L-450 |
| B28 | 758 – 788 | 703 – 733 | 200 | TK804L-450 |
| B31 | 462.5 – 467.5 | 452.5 – 457.5 | 200 | TK804L-450 |
| B72 | 663 – 698 | 617 – 652 | 200 | TK804L-450 |

# 7.8 Radio frequencies GSM Global

| Frequency Band | Frequency Range Down-link (MHz) | Frequency Range Uplink (MHz) | Max. Transmit Power (mW) | Router |
|---|---|---|---|---|
| GSM 900 | 925 – 960 | 880 – 915 | 2000 | TK804L-450 |
| GSM 1800 | 1805 – 1880 | 1710 – 1785 | 1000 | TK804L-450 |

# 8 FAQ: IPsec

## 8.1 Preface

IPsec is an extension of the Internet Protocol (IP) with encryption and authentication mechanisms. This gives the Internet Protocol the ability to transport IP packets over public and insecure networks in a cryptographically secured manner. IPsec was developed by the Internet Engineering Task Force (IETF) as an integral part of IPv6. Because the Internet Protocol version 4 originally had no security mechanisms, IPsec was subsequently specified for IPv4.

### 8.1.1 *Components of IPsec-VPNs*

- Interoperability
- Cryptographic protection of transmitted data
- Access Control
- Data Integrity
- Authentication of the sender (user authentication)
- Encryption
- Key authentication
- Administration of keys (key management)

Behind these components are processes that, when combined, provide reliable security for data transmission over public networks. VPN security solutions with high security requirements therefore generally rely on IPsec.

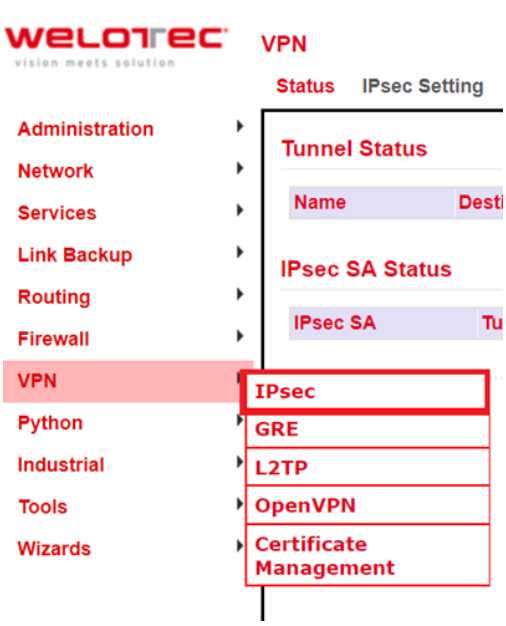
### 8.1.2 *Deployment scenarios*

- Subnet-to-Subnet-VPN
- Host-to-Subnet-VPN
- Host-to-Host-VPN

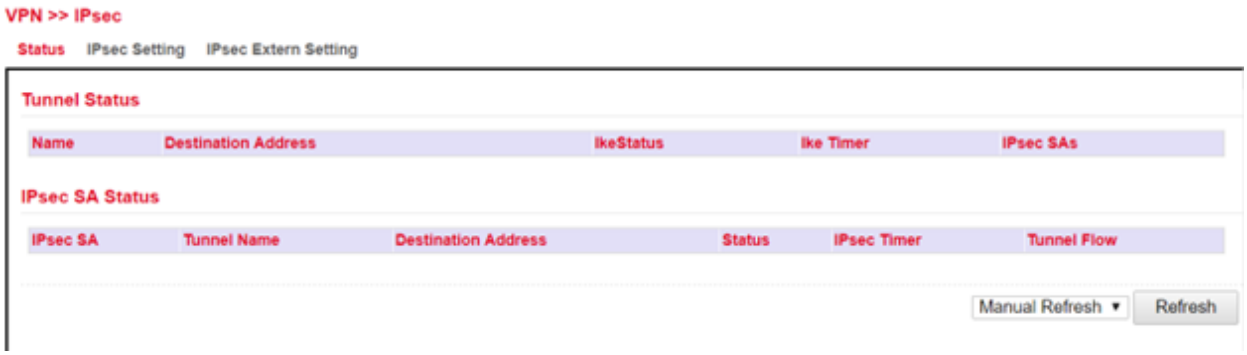
In principle, IPsec is suitable for gateway-to-gateway scenarios. In other words, the connection between networks via a third insecure network.

## 8.2 IPsec

By clicking ***VPN > IPsec***, you can initially view the status of your IPsec tunnel, if you have already created one.

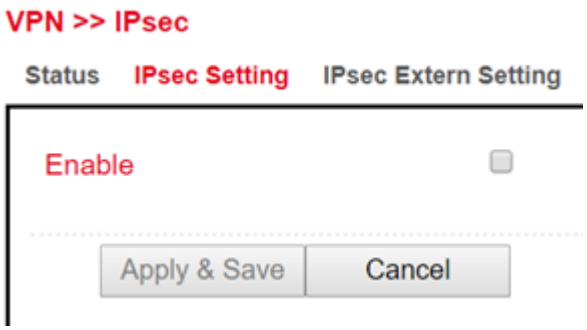



Here the options *"IPsec Setting"* and *"IPsec Extern Setting"* are available.

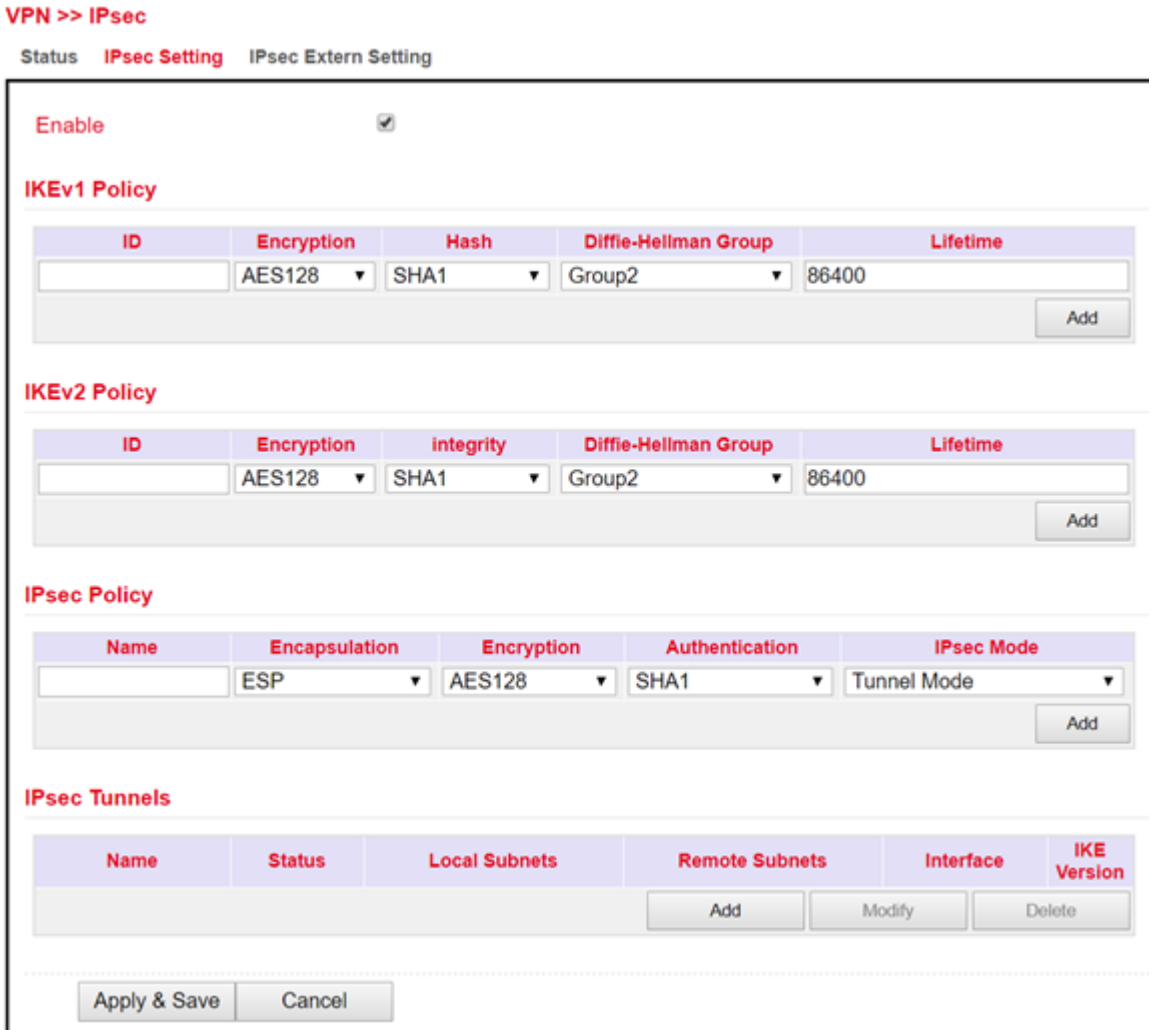



To create a new IPsec tunnel, proceed as follows:

1. Click on **"IPsec Setting"**




2. Click on **"Enable"**



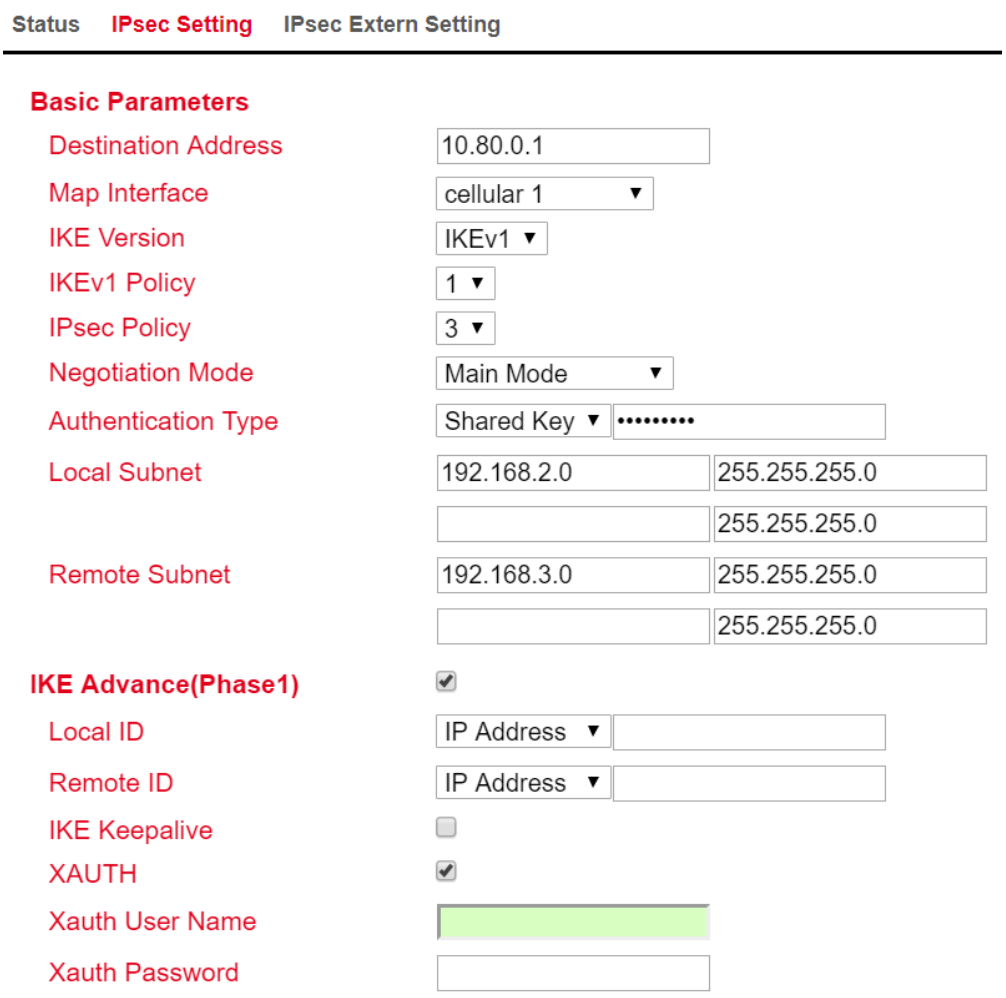

Now you can start with the configuration. Proceed as follows:

1. *IKEv1 and IKEv2 Policy:*
   - To confirm your settings, press the **"Add"** button.
   - ID is used to identify the policy in the tunnel configuration and can be selected freely. The input field is an integer field.
   - Encryption contains a selection list of encryption methods, e.g. AES256.
   - Hash contains the hash algorithm, e.g. SHA1 or SHA2-256.
   - Diffie-Hellman Group offers the possibility to choose the key strength during the key exchange process. The higher the group, the higher the encryption, e.g. Group2 = 1024 Bit.
   - Lifetime is the period of validity of the IKE before it is renegotiated.
2. *IPsec Policy:*
   - The name is used to identify the policy in the tunnel configuration and can be freely chosen.
   - Encapsulating Security Payload (***ESP***) provides authentication, integrity and confidentiality of IP packets within IPsec. In contrast to Authentication Header (***AH***), the user data is transmitted in encrypted form. While AH can "only ensure the integrity and authenticity" of data, ESP increases data security depending on the encryption algorithm chosen. That is why ESP is usually used instead of AH. ESP ensures the confidentiality of the communication. The packets are encrypted. In addition, an integrity protection protects against manipulation. Choose the appropriate protocol for **"Encapsulation"**.

- Enter the encryption in the corresponding field. The **Advanced Encryption Standard** (**AES**) is the successor encryption standard to **DES** (Data Encryption System). **3DES** with 128 bits is still considered secure but is significantly slower than AES because of the triple encryption. AES supports 128, 192 and 256 bit long keys.
- ***Authentication*** is used for authentication and can be selected with MD5, SHA1 und SHA2.
- In addition to the choice between AH and ESP, you have the option of sending the packets over the network in transport or tunnel mode. In transport mode, the original IP header, i.e. IP address plus IP options, will still be used. In tunnel mode, IPsec encapsulates the entire packet including the IP header and writes a new IP header in front of it. The original IP address is no longer visible. Only when decrypting on the opposite side, the IP address together with the rest of the packet becomes visible again. Set the appropriate mode here.

3. *IPsec Tunnels:*

   To create the IPsec tunnel, first click the **"Add"** button




- *Basic Parameters*

  1. The **"Destination Address"** is the IP address of the tunnel remote station. Enter the corresponding IP address here.
  2. For **"Map Interface"**, please enter the interface via which the connection is to be established.
  3. Under **"IKE Version"**, select the version you created under IKEv1 or IKEv2. Depending on the defaults, the values in the list box will be applied.
  4. The name of the IPsec policy created previously appears in the **"IPsec Policy"** field.

5. Under **“Negotiation Mode”** you can choose between two options when negotiating the IPsec tunnel. In *Main Mode*, the initiator (the one who wants to establish the connection) and the responder negotiate an ISAKMP-SA with each other. This negotiation happens in several steps. In *Aggressive Mode*, all but three of the above steps are combined, and the hash values of the pre-shared keys are transmitted in clear text. However, there may be a reason for using this mode if the initiator’s address is not known to the responder in advance, and both sides want to use pre-shared keys for authentication. Aggressive Mode should be used with caution, however, because in practice strong keys are often not used for reasons of convenience.
6. Select the type of authentication for ***“Authentication Type”***. You have two options here. Either via Shared Key, the common key for authentication (to be entered in the following field) or via Certificate, i.e. via existing certificates, which then have to be imported via **“VPN > Certificate Management”**.
7. Enter the subnet of the router under **“Local Subnet”**. In the first field enter the IP address and in the second the subnet mask. You can create up to four entries.
8. Under **“Remote Subnet”** you can then enter the subnet of the remote station. Here, you also have the option of creating up to four entries.

- *IKE Advance (Phase 1)*

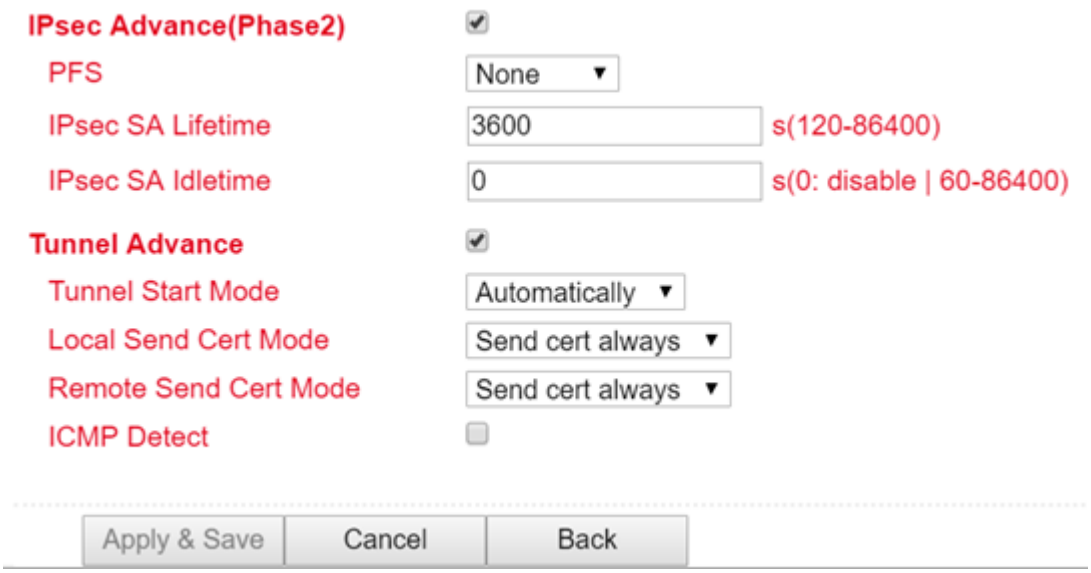
  After activation, the following options are available:

  1. Via the **“Local ID”** you have the option to select different entries from the list box and then enter the corresponding data in the following field, e.g. IP Address and then enter the desired IP address in the following field.
  2. In the **“Remote ID”** field, you then enter the data for the remote station.
  3. **“IKE Keepalive”** you can switch on or off to maintain the IKE phase one.
  4. You can use the XAUTH protocol for the VPN remote terminal separately by activating this function for XAUTH. You can then specify or use a corresponding username (Xauth User Name) and password (Xauth Password).

- *IPsec Advance (Phase 2)*

  After activation, the following options are available:

  1. **Perfect Forward Secrecy (PFS)** is a characteristic of certain key exchange protocols in cryptography. These use previously exchanged long-term keys to arrange a new secret session key for each session that needs to be encrypted. Perfect Forward Secrecy does not have a log so that the session keys used cannot be reconstructed from the long-term secret keys after the session is closed. This means that a recorded encrypted communication cannot be subsequently decrypted even if the long-term key is known. Here you can choose between several groups that work with Diffie Hellman keys. For example, Group 1 has an encryption of 768 bits, Group2 has 1024 bits and Group 5 uses 1536 bit, etc.
  2. You can enter the validity period of the SA (Security Association) under **“IPsec SA Lifetime”**. A Security Association groups IP packets together based on an SPI (Security Parameter Index), the IP destination address and the Security Protocol Identifier. An SA is only valid for ONE direction at a time, so there are always two SAs in use.
  3. With **“IPsec SA Idletime”** you specify whether SAs associated with inactive peers can be deleted before the global lifetime has expired. The 0 means that the function is disabled.




- *Tunnel Advance*

  After activation, the following options are available:

  1. For **"Tunnel Start Mode"**, set how the tunnel should start. The default setting is always automatic.
  2. In the **"Local Send Cert Mode"** field, you specify when a certificate should be sent for the local area. The default setting is that the certificate should always be sent (Send cert always).
  3. With **"Remote Send Cert Mode"** you define when a certificate should be sent for the remote site. The default setting is that the certificate should always be sent (Send cert always).

  image

  4. With **"ICMP Detect"** you can activate or deactivate the ICMP Watchdog function.
  5. For **"ICMP Detection Server"**, specify the address of a server that can only be reached through the tunnel.
  6. Under **"ICMP Detection Local IP"**, enter the router interface IP of the local subnet.
  7. Under **"ICMP Detection Interval"**, specify the interval at which the ICMP packet is to be sent.
  8. **"ICMP Detection Timeout"** is the timer after which the ICMP packet is discarded. Enter a value here between 1 and 60 sec.
  9. **"ICMP Detection Max Retries"** are the maximum attempts after a failed ICMP ping, which you can enter here.

## 8.2.1 IPsec Status

If the IPsec tunnel(s) have been successfully established, then you will see the following in the status overview.

# 9 OSS Clearings

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**Busybox**

V1.26.2

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V1.7.5

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written by Jerome Etienne jetienne@arobas.net

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zlib.h – interface of the 'zlib' general purpose compression library version 1.2.11, January 15th, 2017

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