

Instruction for installation of the Network Adapter for *NANOCOLOR*[®] VIS II and ^{UV}/VIS II

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ATTENTION: This manual is intended for use by IT personnel only.

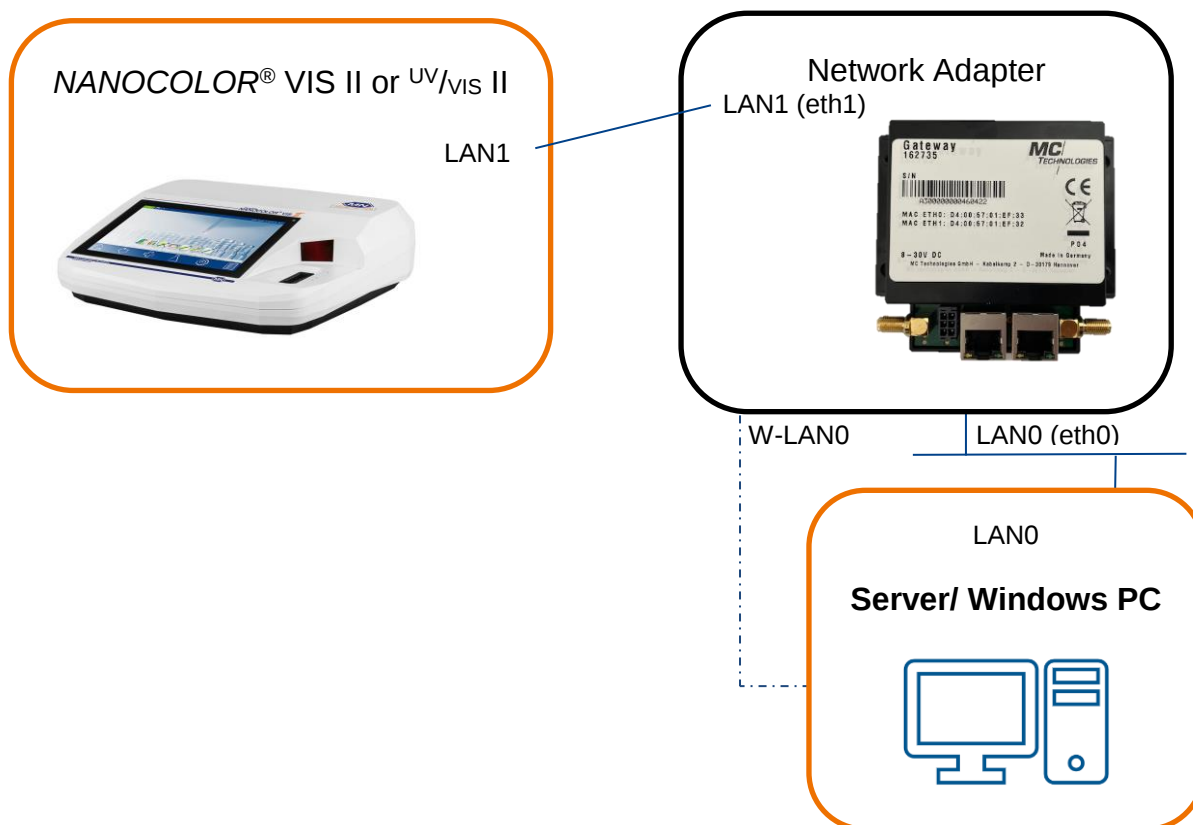
1. Introduction

The Network Adapter from MACHEREY-NAGEL is a device for the stationary use in the laboratory, which is operated in combination with the spectrophotometers *NANOCOLOR® VIS II* and *UV/VIS II*. The product is designed to enable an easy and secure data transfer from the spectrophotometer to a network drive. The Network Adapter supports the state of the art network protocols SMBv2 and SMBv3, whereas the spectrophotometers independent from this product do only support the SMBv1 protocol.

The installation of the system is not a plug and play solution, but requires some IT experience.

2. Connection setup

The *NANOCOLOR® VIS II* or *UV/VIS II* is connected via an ethernet cable (CAT 5E) to the Network Adapter. The Network Adapter is connected via an ethernet cable (CAT 5E) to the network (Switch, Router, PC, Server...). The following scheme shows the final product setup after installation and configuration.



The following information are required from the IT department:

Company network-IP-address static or dynamic from DHCP for Gateway (LAN0/eth0)
 Server IP-address
 SMBv3 Routing directory (exemplary: //Server-IP/Folder_name)
 SMBv3-User: "username"
 SMB3-User Password: "passwd"

<Company network>
 <Server-IP address>
 <network sharing>
 <User Name>
 <User password>

IP-address examples as shown exemplarily in this instruction: (set by default, but can be changed):

Network Adapter: 10.10.240.240/24 (eth0)
 192.168.2.1/24 (eth1)
 Photometer-System: 192.168.2.200
 Server SMBv3 IP address: 10.10.240.151

3. Installation of the Network Adapter

NOTICE

Use only the approved power supply.

NOTICE

If you are not going to use the device for a longer period, take it out of operation and disconnect it from the power supply.

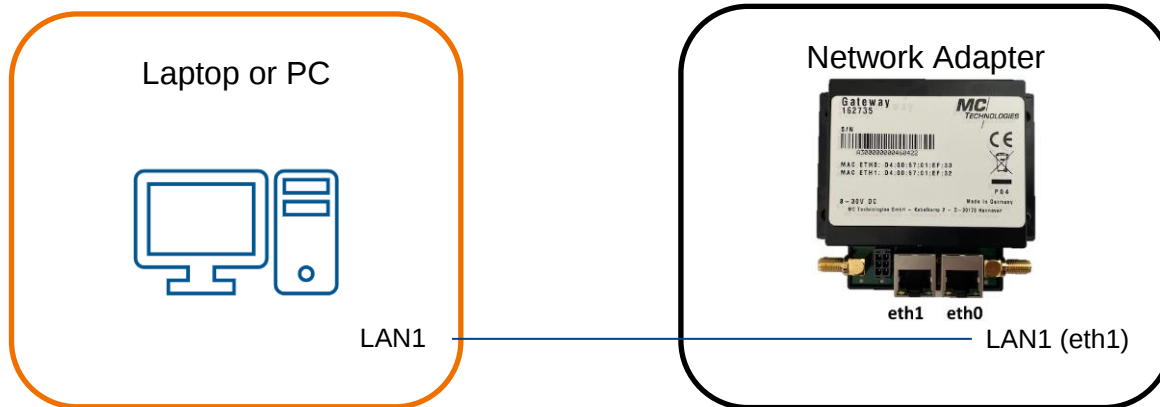
Connect the Network Adapter to the power supply via the connector as indicated in pic. 1. The device will start up and can now be configured as described in chapter 4. Please note that a WiFi antenna can be mounted on the blue marked connector (pic. 1).



Pic. 1: Power supply connection

4. Configuration of the Network Adapter – settings

The following setup is required to run the installation of the Network Adapter:



Required items:

- An Ethernet interface at the computer used for configuration
- An Ethernet cable (CAT5E)
- a Windows PC
- Browser (recommended Google Chrome or Firefox)
- Network Adapter (this product)

For the configuration of the Network Adapter settings connect the instrument directly or via a switch to a configuration PC with an Ethernet cable (CAT5E).

For the connection use interface eth1 (see Pic.2)



Pic.2: Ethernet interfaces

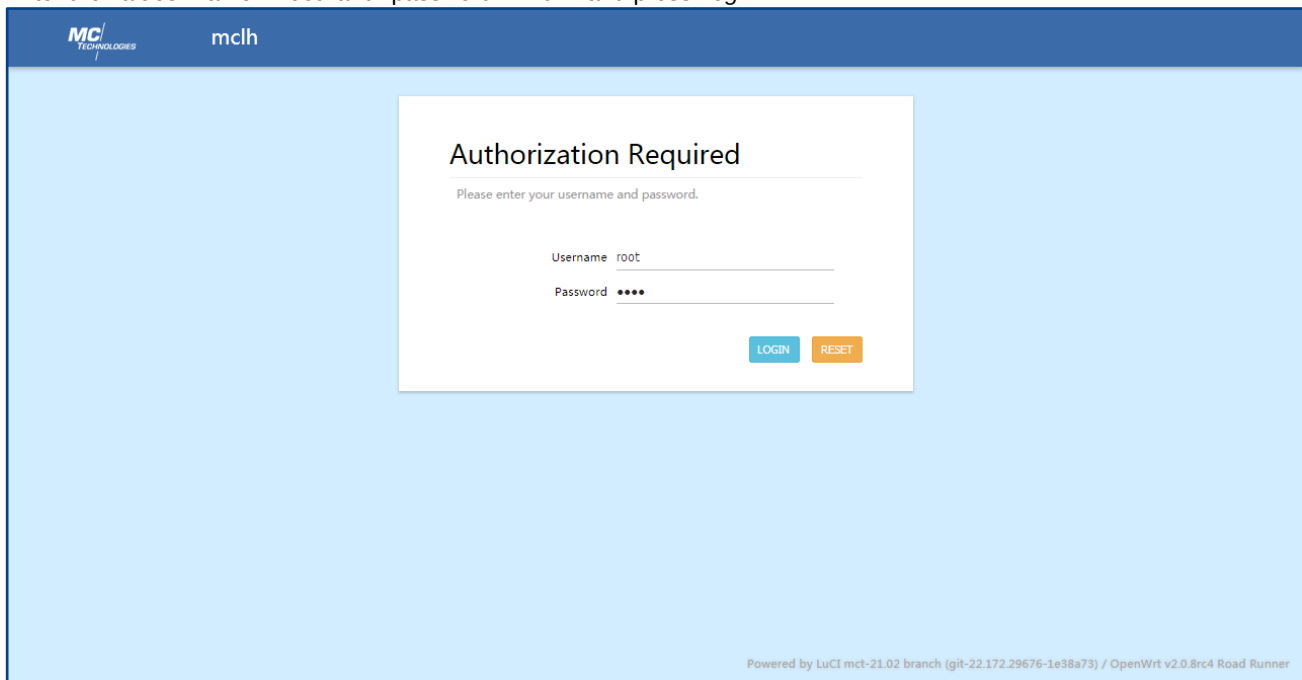
NOTICE

The availability of the Network Adapter in the network can be checked via a ping to the IP address 192.168.2.1. The PC used for the configuration must have an IP address in the range 192.168.2.0/24.

NOTICE

Changing the IP address may be necessary to avoid conflicts between addresses within the setup. Please ask your IT department for support.

Access the Network Adapter with the help of a browser via the path: <http://192.168.2.1>. Enter the values “name = root” and “password = mclh” and press *Login*.



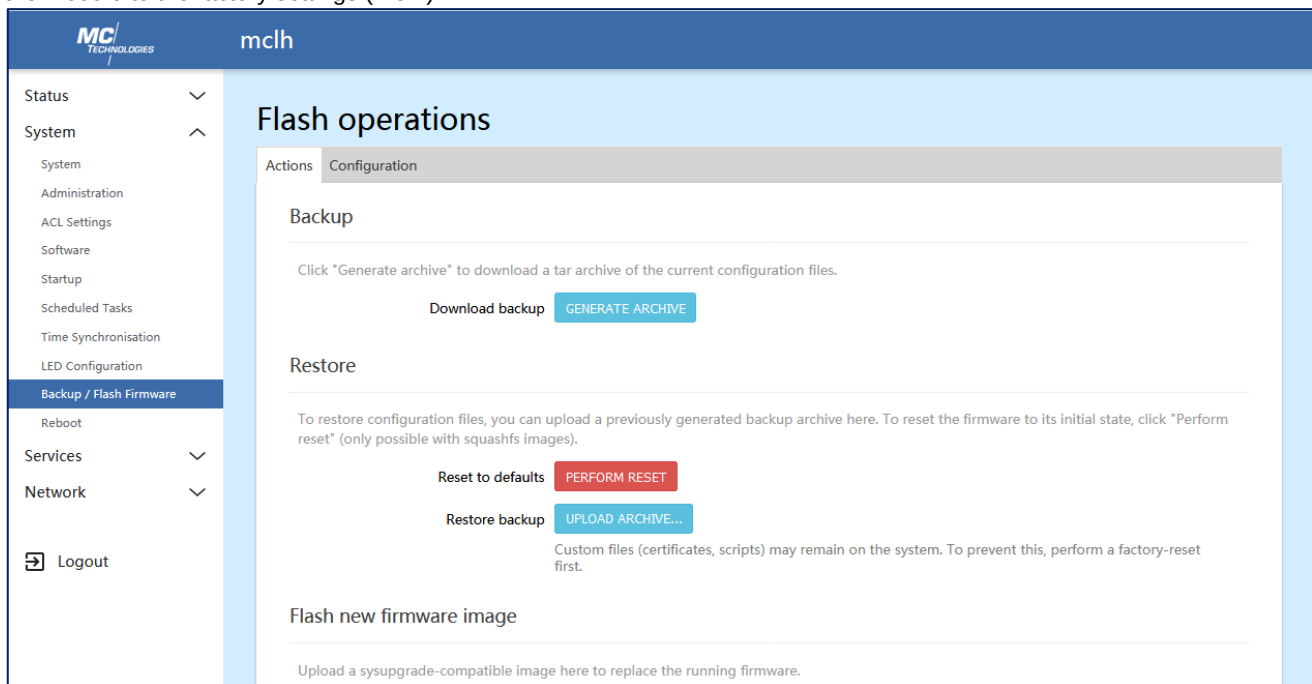
Pic.3: Network Adapter login

4.1 Factory reset

NOTICE

Please note that in case of serious problems or incorrect settings during the setup of the network module, there is always the possibility of a factory reset and starting the process again.

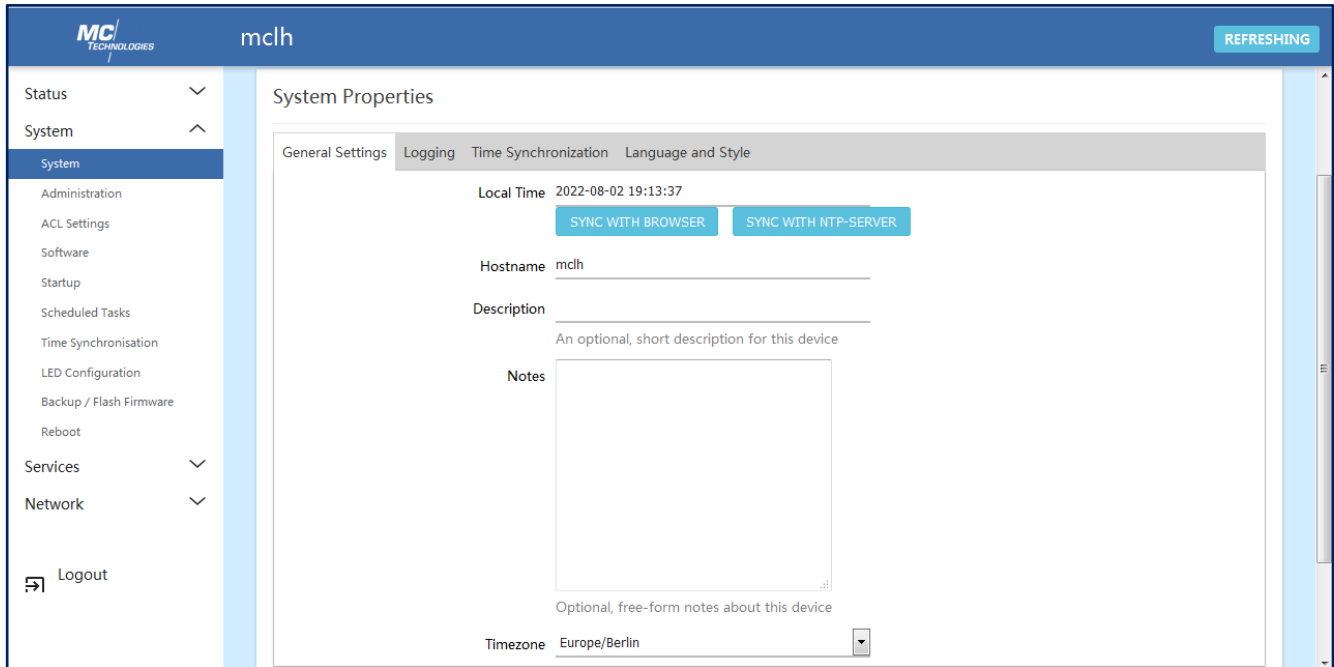
Perform the factory reset by selecting *Backup / Flash Firmware* in the *System* menu item. Choose *Perform Reset* to reset the module to the factory settings (Pic.4).



Pic.4: Factory reset

4.2 Set date and time

To set the time and date of the Network Adapter, switch to the *System* panel on the left side. Choose the entry *System*. Click on *Sync with Browser*. Save the settings by pressing *Save & Apply*.



Pic.5: Setting date and time

The time zone is set to Europe/Berlin by default. The time zone can be changed by choosing a new time zone from the drop down panel *Timezone*.

NOTICE

The clock date and time can also be synchronized with an internal time server. Configure register *Time Synchronization*. Please be aware that the time synchronization is only possible after the full installation and setup of the Network Adapter.

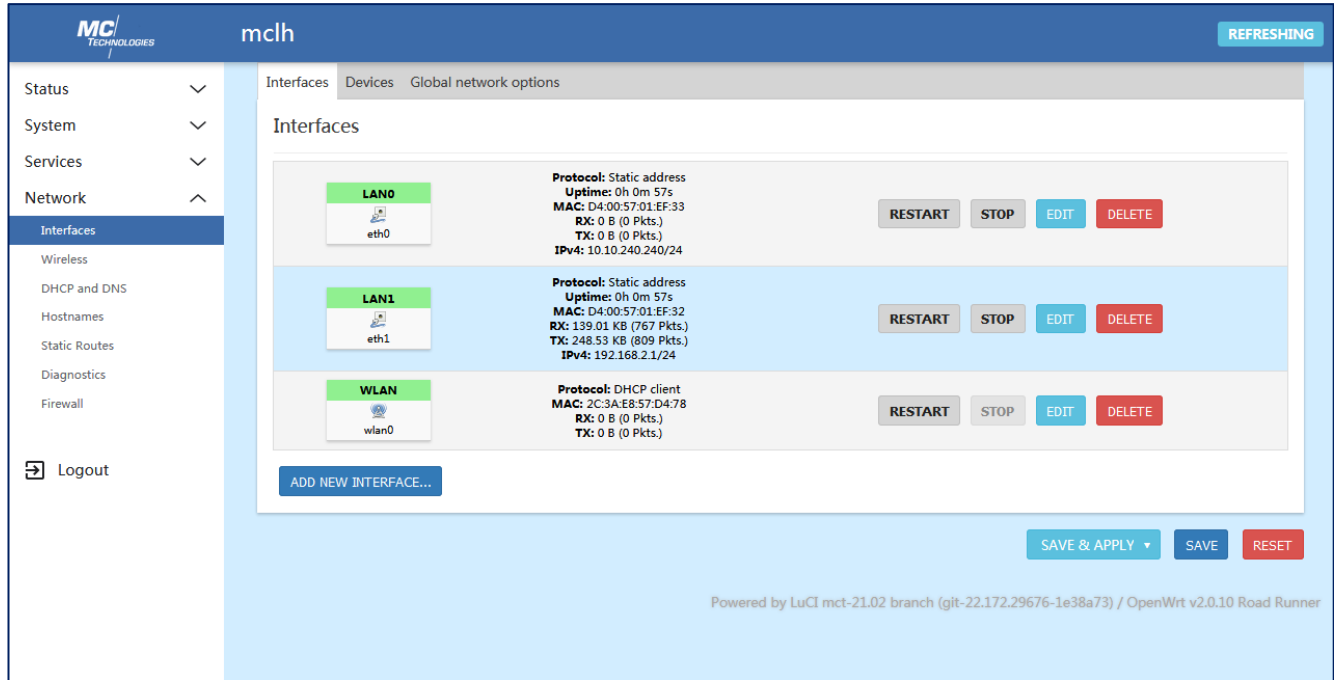
Press *Save & Apply* to save the changes.

NOTICE

The language settings are automatically adopted from the connected computer. However, they can be changed to DE or EN on the *Language and Style* tab of the *System* menu item (Fig. 5).

4.3 Interface settings - overview

To perform or check the interface settings, switch to the *Network/Interfaces* panel on the left side and see the following overview (Pic.5):



The screenshot shows the 'mclh' web interface for network management. The left sidebar contains a menu with 'Status', 'System', 'Services', and 'Network' (expanded). Under 'Network', there are sub-items: 'Interfaces' (selected), 'Wireless', 'DHCP and DNS', 'Hostnames', 'Static Routes', 'Diagnostics', and 'Firewall'. A 'Logout' button is at the bottom of the sidebar. The main content area is titled 'Interfaces' and shows a list of three network interfaces: LAN0 (eth0), LAN1 (eth1), and WLAN (wlan0). Each interface entry displays its protocol, uptime, MAC address, RX/TX statistics, and IPv4 address. Action buttons (RESTART, STOP, EDIT, DELETE) are available for each interface. At the bottom of the interface list is an 'ADD NEW INTERFACE...' button. The bottom right of the main area contains 'SAVE & APPLY', 'SAVE', and 'RESET' buttons. The footer indicates the interface is powered by LuCI mct-21.02 branch (git-22.172.29676-1e38a73) / OpenWrt v2.0.10 Road Runner.

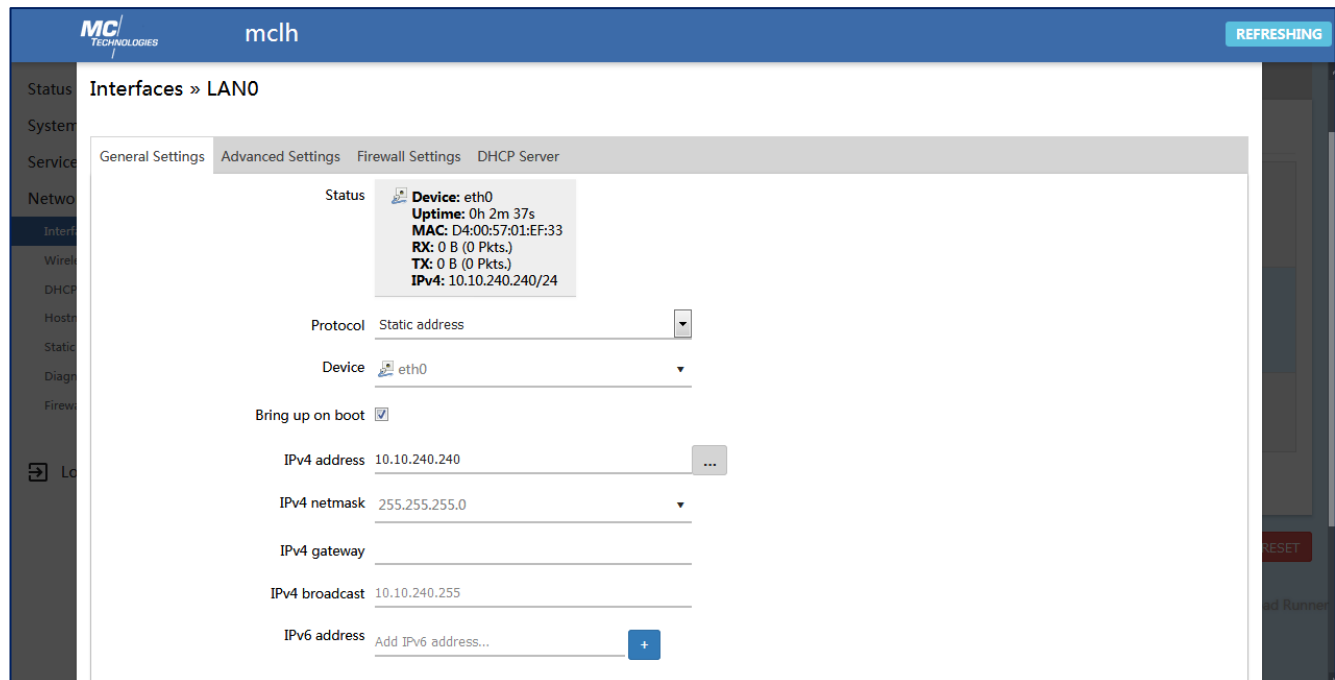
Interface	Protocol	Uptime	MAC	RX	TX	IPv4	Actions
LAN0 (eth0)	Static address	0h 0m 57s	D4:00:57:01:EF:33	0 B (0 Pkts.)	0 B (0 Pkts.)	10.10.240.240/24	RESTART STOP EDIT DELETE
LAN1 (eth1)	Static address	0h 0m 57s	D4:00:57:01:EF:32	139.01 KB (767 Pkts.)	248.53 KB (809 Pkts.)	192.168.2.1/24	RESTART STOP EDIT DELETE
WLAN (wlan0)	DHCP client		2C:3A:E8:57:D4:78	0 B (0 Pkts.)	0 B (0 Pkts.)		RESTART STOP EDIT DELETE

Pic.5: Network Adapter interface overview

4.3.1 Interface settings – LAN0 static mode

To run the Network Adapter in DHCP mode, refer to chapter [4.3.2](#).

To configure the interface settings for the static configuration of IP LAN0 choose *EDIT (LAN0)*. If necessary, change the IP address and netmask to your company's network IP address for the gateway (LAN0/eth0), as shown in the following Pic.6. Save the settings by pressing *Save* and in the next window by pressing *Save & Apply*.

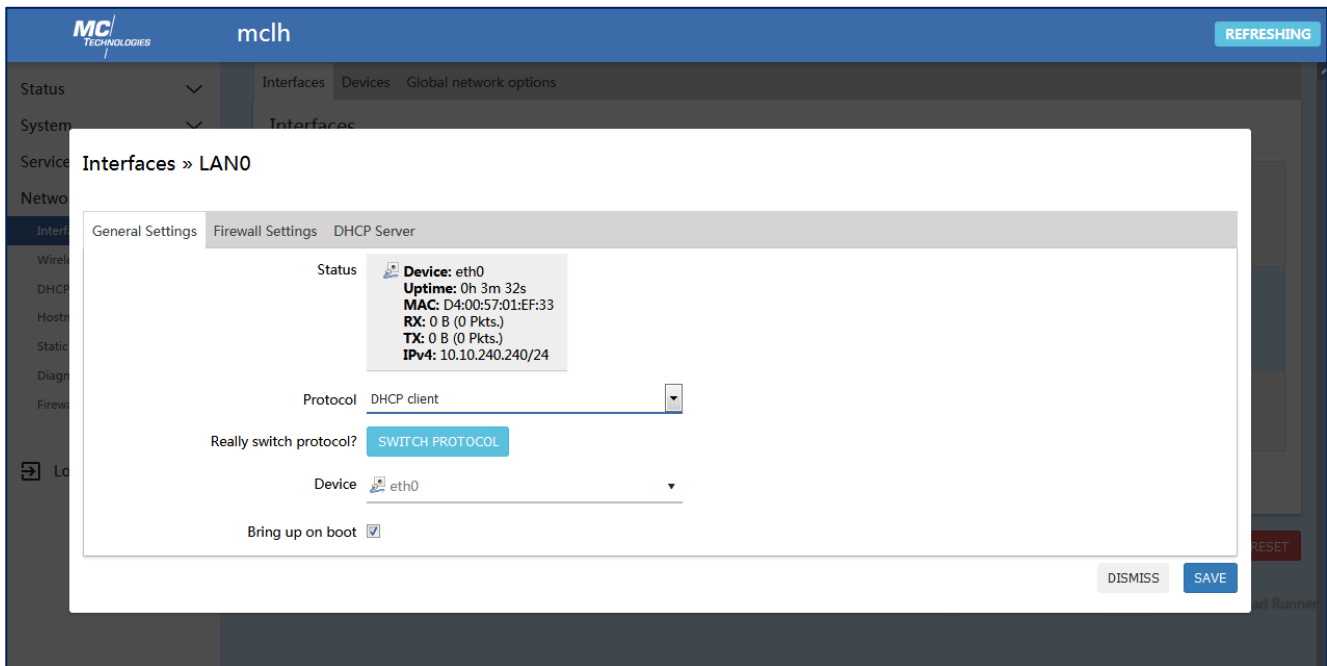


Pic.6: Network Adapter static IP LAN0 settings

If the static configuration is chosen, please proceed with [chapter 4.3.3](#).

4.3.2 Interface settings – LAN0 dynamic mode (as DHCP client)

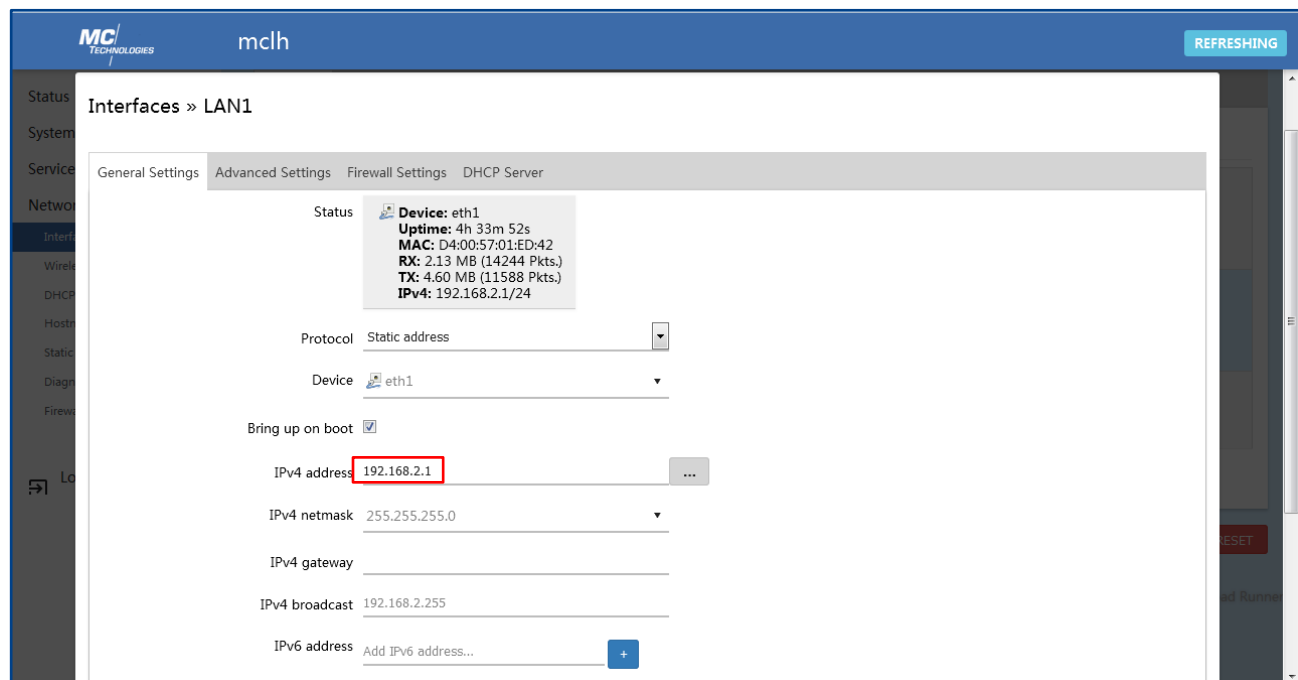
To perform the interface settings of LAN0 in the dynamic configuration via DHCP, choose *EDIT (LAN0)* and delete the existing IP address by clicking on  and  (see Pic.6). Now change the field *Protocol* to *DHCP client* for Network Adapter (LAN0/eth0) as shown in the following Pic.7. Confirm the question *Really switch protocol?* by clicking on . Save the settings by pressing *Save* and in the next window by pressing *Save & Apply*.



Pic.7: Network Adapter dynamic IP LAN0 settings

4.3.3 Interface settings eth1 – LAN1 static mode

For configuration of the LAN1 (eth1) Interface choose *EDIT (LAN1)* in the Interface Overview (see [chapter 4.3](#)) and check the settings depicted in Pic.8:



Pic.8: Network Adapter static IP LAN1 settings

NOTICE

If another IP address than the preset 192.168.2.1/24 is required, the Network Adapter settings as well as the spectrophotometer settings (see chapter [6. Configuration of the NANOCOLOR spectrophotometer](#)) must be changed. A conflict of the IP address with the local user network is indicated by a red IP address. After changing the IP address, you must change the IP address of the PC used for the configuration into the same range. Access the Network Adapter now via the new IP address.

4.4 Network Mount settings

The Network Mount settings are required to determine the locations for the data transfer.

To configure the Network Mount settings, choose *Services* and then *Network Mounts* from the left side panel menu (Pic.9).

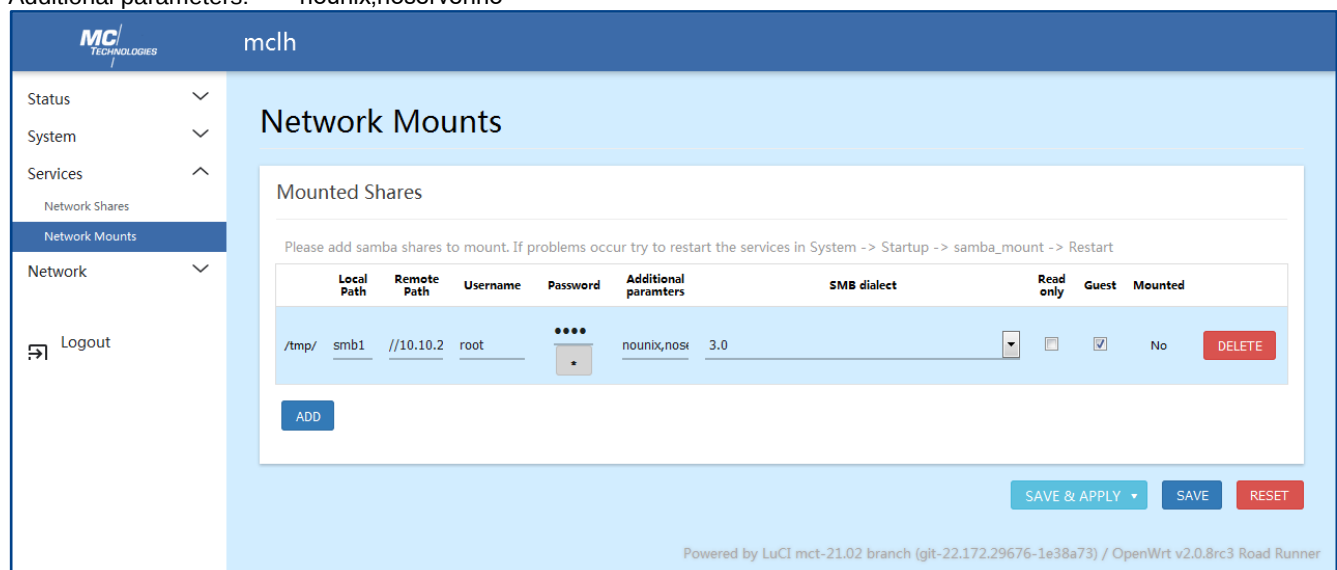
The field settings are as follows:

Remote Path: //Server-IP/Folder_name

(SMBv3) Username: "username"

(SMBv3) Password: "password"

Additional parameters: "nounix,noserverino"



Pic.9: Network Mount Settings

NOTICE

In case of domain networks the username needs to be entered as follows:
username@domain

NOTICE

To avoid mistakes during entering the password you can press the asterisk underneath the password to make the entered characters visible.

NOTICE

Make sure that your connected system is compatible with the selected SMB dialect. Otherwise, please choose the adequate entry.

Pressing **SAVE & APPLY**, will save the changes. The status for the entry *Mounted* will change from *No* to *Yes*, if all information about the host have been entered correctly.

4.4.1 DNS settings

The DNS settings are required if a server name is used for the field *Remote Path* in the *Network Mounts* settings.

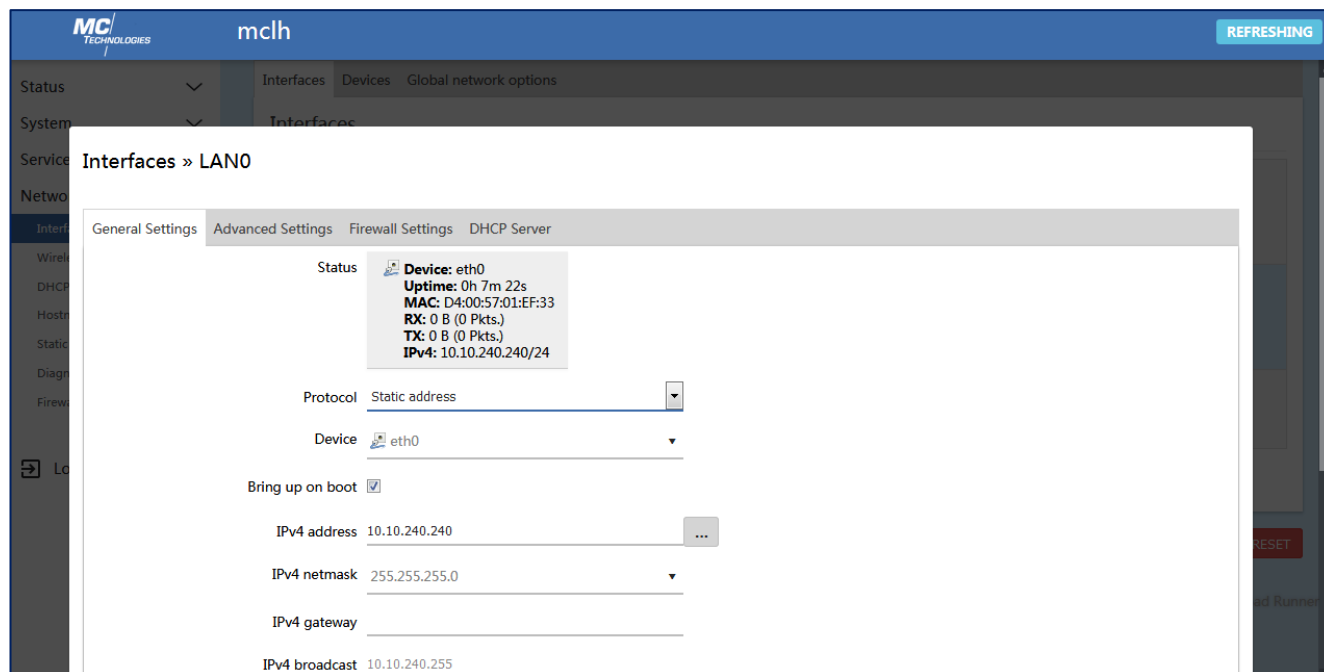
When using dynamic mode (see [chapter 4.3.2](#)), the DHCP-Server will provide the DNS-Server for the LAN-Connection.

In static mode you have to fill in the IP address of the gateway in field *IPv4 gateway* (see Pic.10).

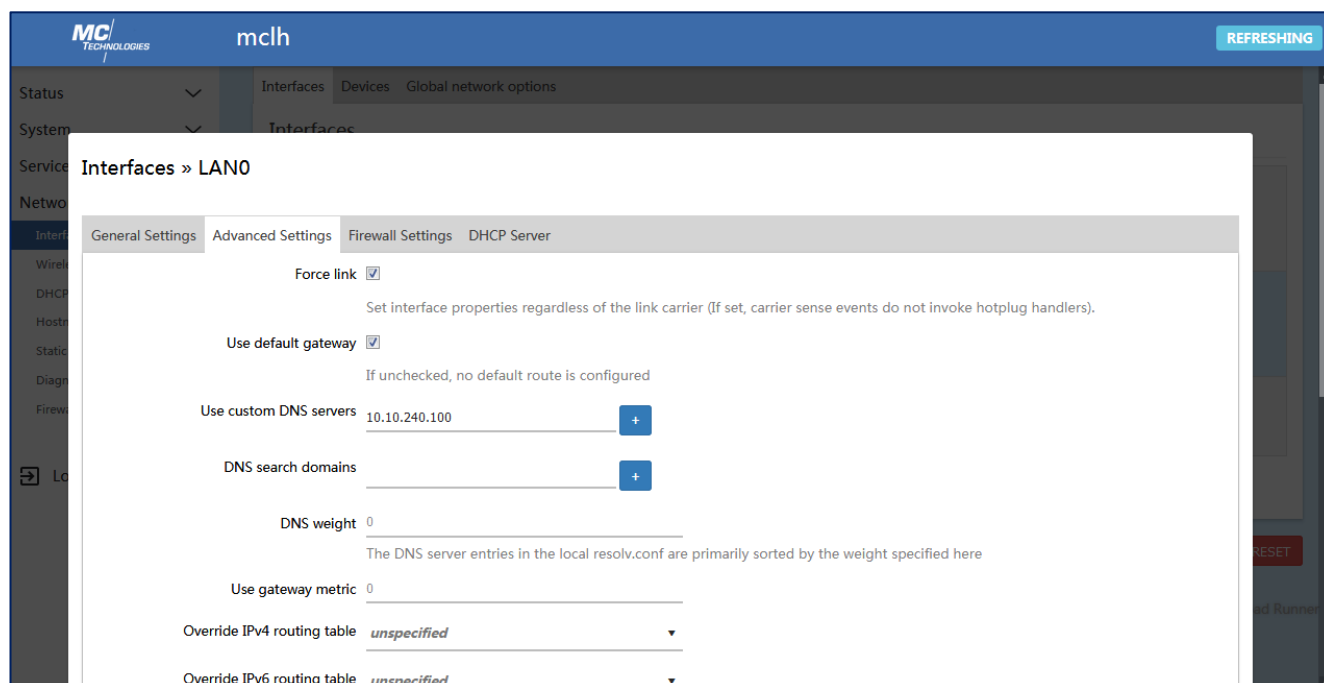
The subnet mask must be entered in the field *IPv4 netmask* and the gateway IP address must be entered in the field *IPv4 gateway*.

Additionally you must enter the IP address of the DNS server in the tab *Advanced settings* in the field *Use custom DNS servers* (see Pic.11).

Save the settings by pressing *Save* and in the next window by pressing *Save & Apply*.



Pic.10: Network Adapter static IP LAN0 DNS General Settings



Pic.11: Network Adapter static IP LAN0 DNS server Advance Settings

5. Configuration of the WiFi module

To perform the WiFi settings go to the tab *Wireless* in the section *Network*. Choose *EDIT* for the *demo_ssid* and configure the WiFi module (Pic.12).

NOTICE

Please note that WiFi antennas are not included

The screenshot shows the 'Wireless Overview' page in the mclh web interface. The left sidebar contains navigation links for Status, System, Services, Network, and Logout. The main content area shows a list of wireless interfaces. The first interface is 'radio0' with a generic MAC address and is not active. The second interface is 'demo_ssid' in client mode, which is disabled. The third interface is 'OpenWrt' in master mode, also disabled. Each interface has a set of control buttons. Below the list is an 'Associated Stations' table, which is currently empty. At the bottom of the page, there are buttons for 'SAVE & APPLY', 'SAVE', and 'RESET'.

Pic.12: Wireless overview

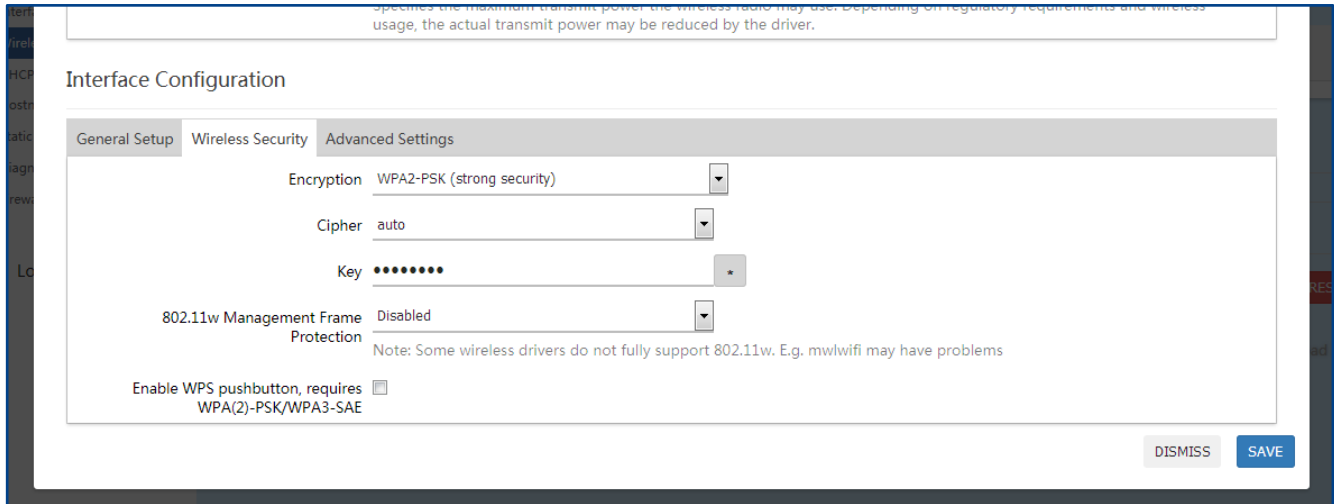
Enter the SSID of the router in the *ESSID* field in the tab *General Setup* (Pic.13).

The screenshot shows the 'WiFi - General Setup' page in the mclh web interface. The page is divided into two main sections: 'Device Configuration' and 'Interface Configuration'. The 'Device Configuration' section includes fields for 'Mode' (set to Client), 'SSID' (demo_ssid), 'BSSID', 'Encryption', 'Channel', 'Tx Power', 'Signal', 'Noise', and 'Bitrate'. The 'Interface Configuration' section includes fields for 'Mode' (set to Client), 'ESSID' (demo_ssid), 'BSSID', and 'Network' (set to WLAN). The page also includes a 'Status' section with a 'DISABLE' button and a 'Maximum transmit power' section with a dropdown menu.

Pic.13: WiFi - General Setup

Configure the field **Key** in the tab *Wireless Security Key* (Pic. 14) and Save the settings by pressing **SAVE**. Confirm the settings in the next window by pressing **SAVE & APPLY**.

The configured WiFi client appears in the list of *Associated Stations* and in the *Wireless Overview* (Pic.15) as well as in the *Interfaces* (Pic.5).



Interface Configuration

General Setup | **Wireless Security** | Advanced Settings

Encryption: WPA2-PSK (strong security)

Cipher: auto

Key: ••••••••

802.11w Management Frame Protection: Disabled

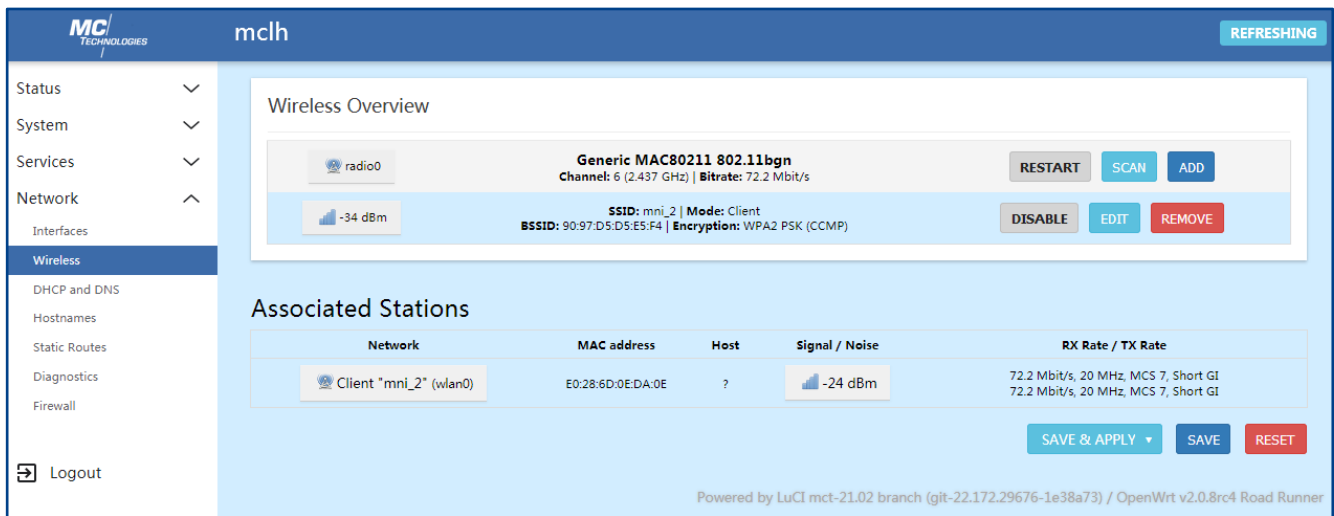
Note: Some wireless drivers do not fully support 802.11w. E.g. mwifi may have problems

Enable WPS pushbutton, requires WPA(2)-PSK/WPA3-SAE ☐

DISMISS SAVE

Pic.14: Wireless Security

Activate the WiFi client by pressing "Enable" in the *Wireless Overview* tab.



MC TECHNOLOGIES mclh REFRESHING

Status System Services Network

Interfaces

Wireless Overview

radio0 Generic MAC80211 802.11bgn Channel: 6 (2.437 GHz) | Bitrate: 72.2 Mbit/s

-34 dBm

SSID: mni_2 | Mode: Client BSSID: 90:97:D5:D5:E5:F4 | Encryption: WPA2 PSK (CCMP)

RESTART SCAN ADD

DISABLE EDIT REMOVE

Associated Stations

Network	MAC address	Host	Signal / Noise	RX Rate / TX Rate
Client "mni_2" (wlan0)	E0:28:6D:0E:DA:0E	?	-24 dBm	72.2 Mbit/s, 20 MHz, MCS 7, Short GI 72.2 Mbit/s, 20 MHz, MCS 7, Short GI

SAVE & APPLY SAVE RESET

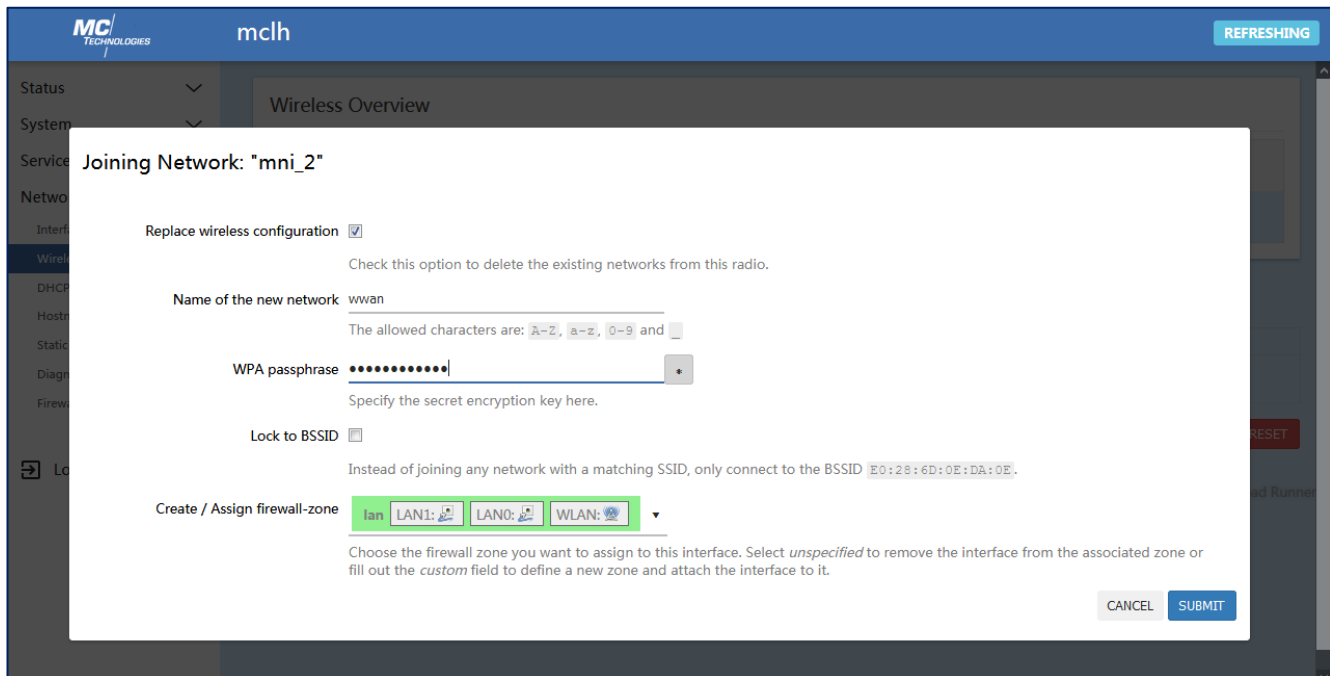
Powered by LuCI mct-21.02 branch (git-22.172.29676-1e38a73) / OpenWrt v2.0.8rc4 Road Runner

Pic.15: Wireless Overview after configuration

Alternatively, the wireless connection can be set up via a network scan:

Press "Scan" in the Wireless Overview tab and chose the desired WiFi network by selecting join.

Enter the password in the Joining Network tab and confirm by pressing *Submit* (Pic.16). Save the WiFi settings by selecting *SAVE & APPLY* in Associated Stations tab (Pic.15).



Pic.16: Joining WiFi after a network scan

6. Configuration of the NANOCOLOR® spectrophotometer

This chapter describes the configuration and connection of the spectrophotometer.

NOTICE

Make sure to perform the installation steps in [chapter 4](#) before starting the photometer configuration. A successful connection to the mount should be given before you proceed with this chapter.

6.1 Network configuration

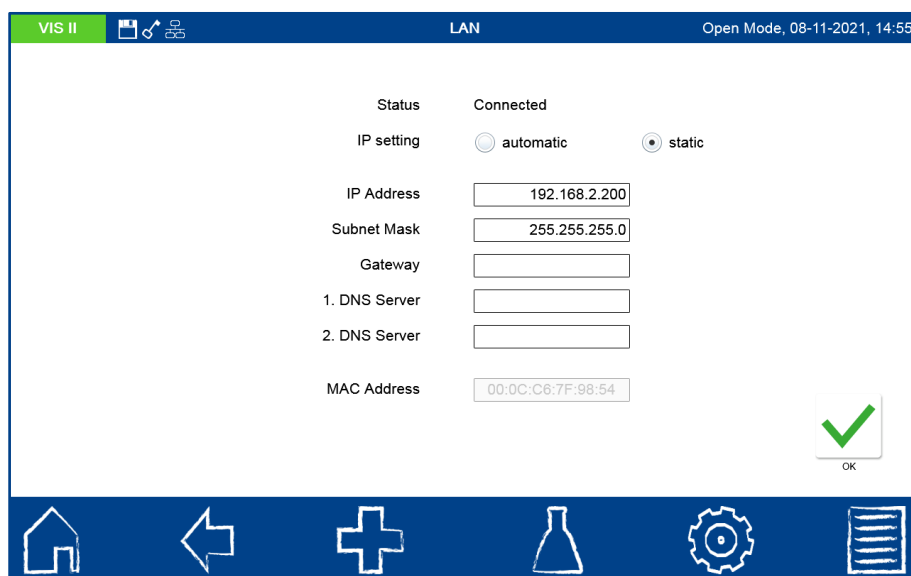
Connect the spectrophotometer to the eth1 interface of the Network Adapter with the help of a LAN cable (CAT 5E).

For the configuration of the NANOCOLOR® VIS II or UV/VIS II, refer to the manual of the instrument.

The menu to enter the IP addresses can be reached via *Main menu* → *Connectivity* → *Network* → *LAN*.

The following settings and conditions are required:

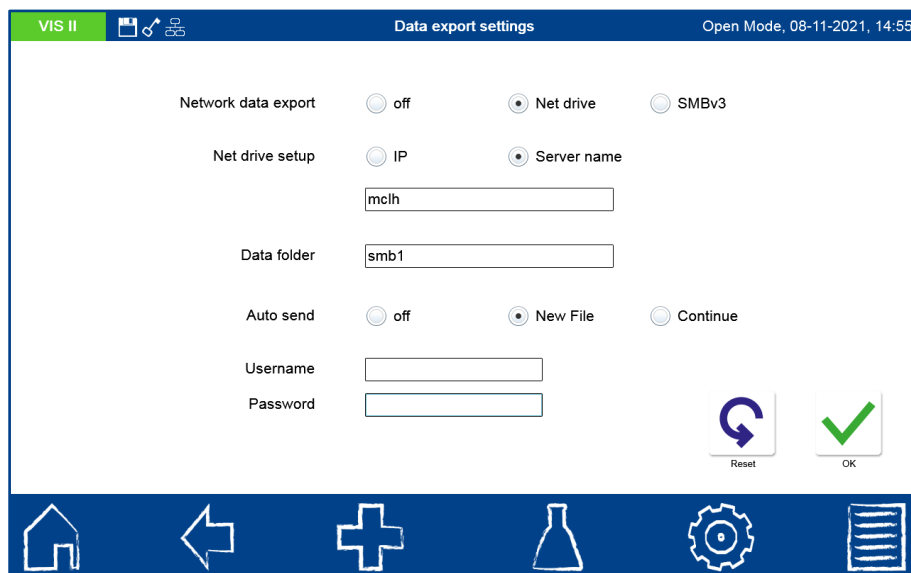
- Software version: ≥ 1.10.1
- Operating system: ≥ 7.0.2864.2
- IP setting: static (the spectrophotometer will perform an automatic restart after confirming the setting)
- IP Address: 192.168.2.200
- Subnet Mask: 255.255.255.0



Pic.17: IP setting in NANOCOLOR® spectrophotometer

To enter the data export settings go the respective menu via *Main menu* → *Data export* → *Network*.

- Network data export: Net Drive
- Net drive setup: server name; value = mclh
- Data folder: smb1
- Auto send: New file / continue
- Username: none
- Password: none



Pic.18: Data export settings NANOCOLOR® spectrophotometer

Before pressing OK, connect the spectrophotometer to the Network Adapter with help of a LAN cable (CAT 5E). The spectrophotometer will check the connection and confirm the successful connection by automatic quit of the *Network* menu.

NOTICE

If another IP address than the preset 192.168.2.200/24 is required, the Network Adapter settings (see [chapter 4](#)) as well as the spectrophotometer settings must be changed.

6.2 ACRON configuration

NOTICE

When using the ACRON export option make sure to perform the settings described in [chapter 6.1](#).

Additionally the username and password for the network drive access (see pic. 14) must be filled with the following credentials:

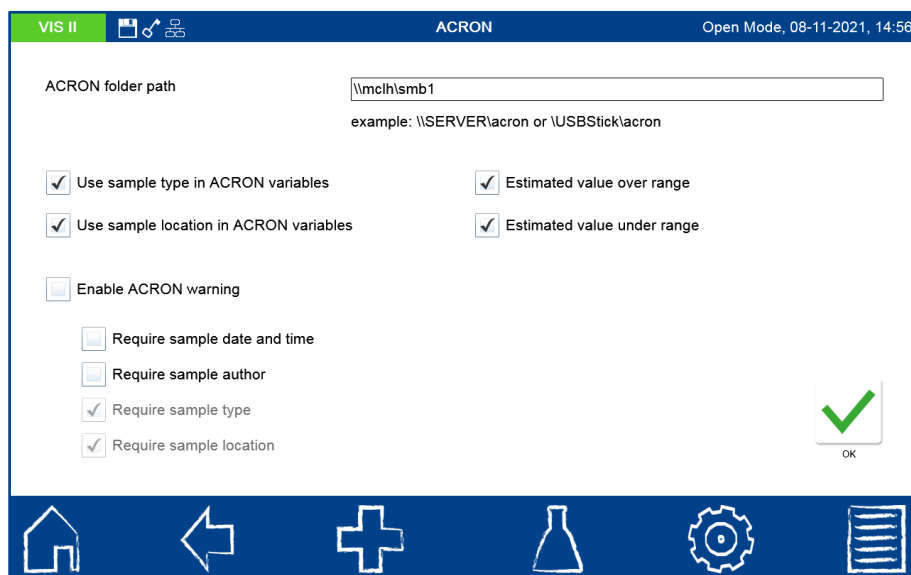
Username = root

Password = mclh

When using the ACRON connection in the spectrophotometer, the settings for the ACRON folder path must be set to "\\mclh\smb1" (see Pic.19).

To enter the data export settings go the respective menu via *Main menu* → *Data export* → *ACRON*.

The ACRON compatible files will now be exported to the host directory.



Pic.19: ACRON folder path settings NANOCOLOR® spectrophotometer

7. Errors, Causes and solutions

Depending on the operating status, different messages can be displayed. The source of the error can be either an operating error or a malfunction of the device.

Network Adapter

Error	Causes	Solutions
Failed ping to Network Adapter.	Wrong interface used for setup.	Check the LAN connection and make sure interface ETH1 is used for connection.
Although the correct login information is used, the login is denied.	Cache Data from previous logins.	Delete the Browser Cache. Restart the Browser.
The Network mount does not change to Yes.	Wrong login Data.	Check user Data. Check password.
	Writing right of the shared folder. Incorrect IP addresses.	Check accessibility of the shared folder by ping.
	SMB version of Server and Network module.	Check and change the SMB version.

Network Adapter error codes

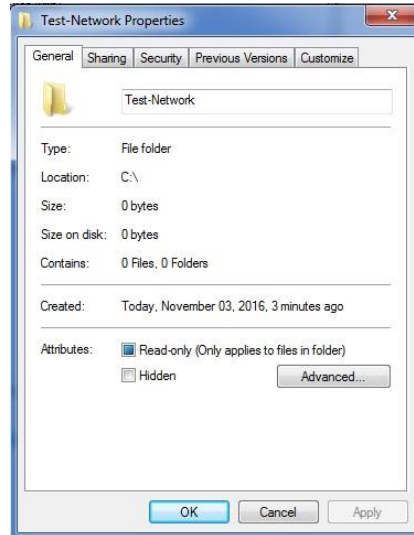
Error	Meaning
IDS_NET_UNKNOWN_ERROR	Unknown Network error
IDS_ENRXP_NET_ERR	Unexpected Network error
IDS_BAD_NETPATH	Network path could not be found
IDS_ACCESS_DENIED	Access Denied
IDS_PATH_NOT_FOUND	Network path could not be found
IDS_BAD_NET_NAME	Network name could not be found
IDS_MISSING_DNS_IP_ADDRESS	No IP address is specified for the DNS server
IDS_MISSING_DNS_QUERY	PC name for IP address is wrong

Spectrophotometer

Error	Causes	Solutions
Unexpected network error.	Device cache contains old IP and authentication settings	Restart the spectrophotometer. Check the IP address and authentication settings.
Network connection error.	Network cable is not connected.	Check the correct network connection.

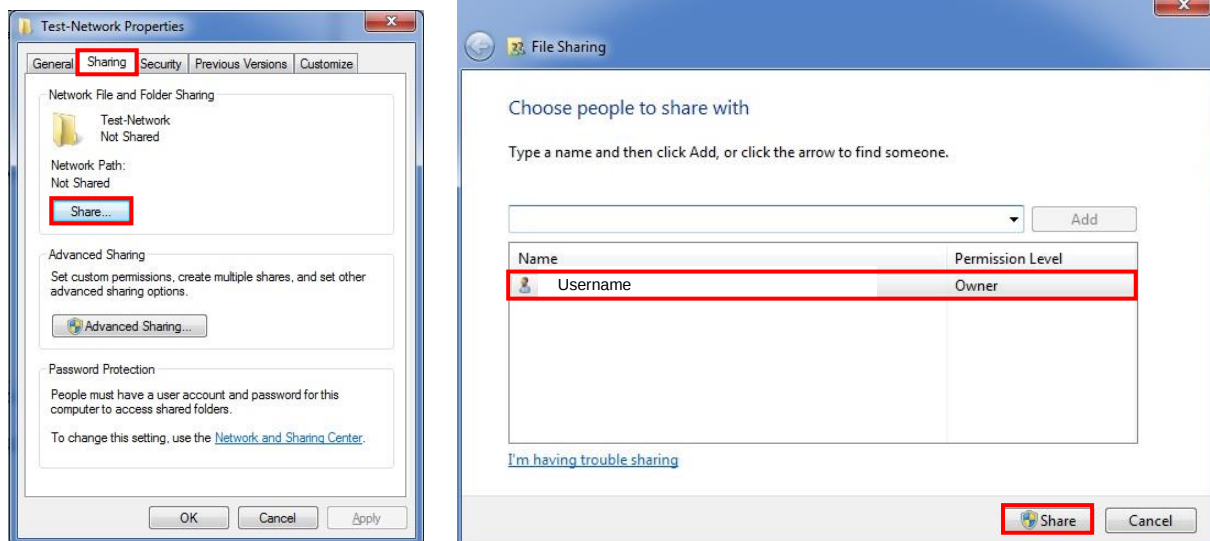
8. Share network drive

Start the Microsoft Windows-Explorer with the keyboard shortcut *Windows + E*.
Click with the right mouse button on the folder (e.g. Test-Network) which you would like to share.
Select *Properties*.



Pic.20: Share folder Properties

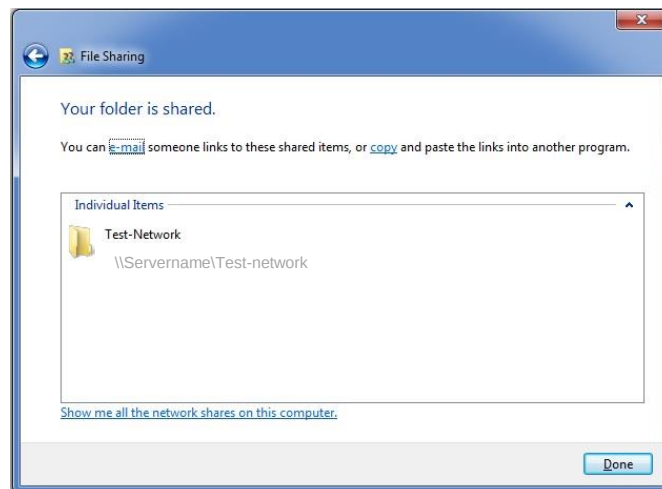
Open the register *Sharing* (see pic.21) and select “*Share...*”



Pic.21: Folder share settings

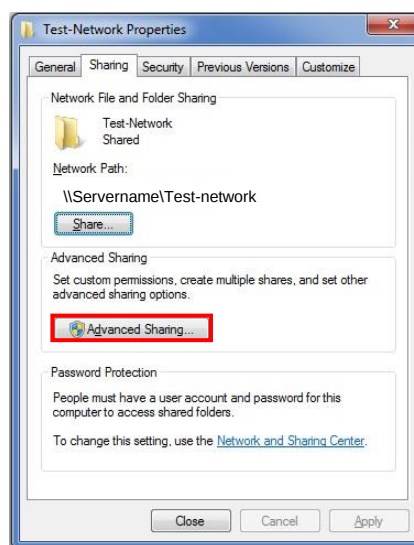
Select the person the folder should be shared with (see Pic.21, right side; Username“).
Confirm with *Share*.

Sharing of the folder is confirmed in a new dialogue (see Pic.22).
Close the window by confirming with *Done*.



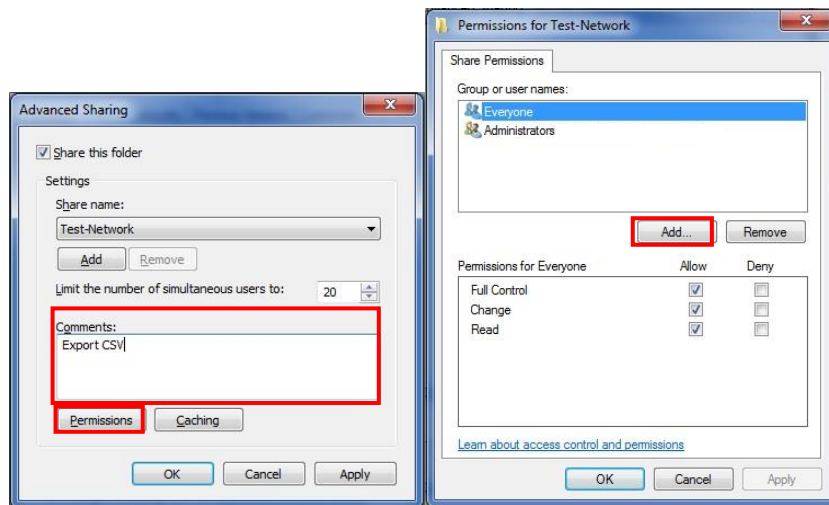
Pic.22: File Sharing

Click on “*Advanced Sharing...*”.



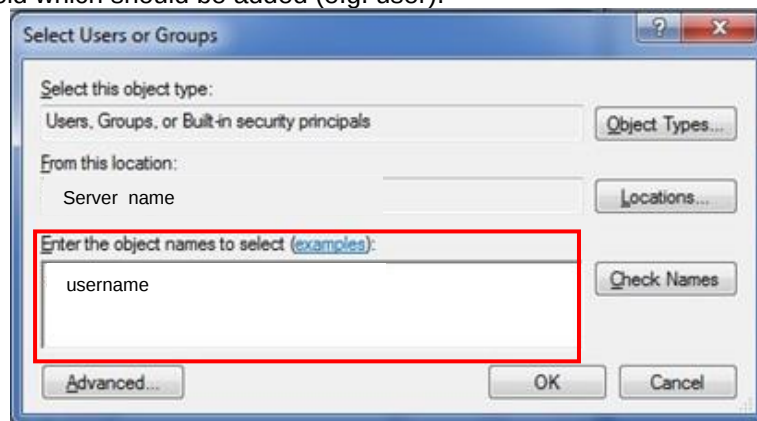
Pic.23: Folder Properties: Advance Sharing

If needed, a comment can be added which describes the use of the folder (e. g. "Export CSV"). Click on *Permissions* followed by *Add* (see pic.24).



Pic.24: Folder share settings: Advanced Sharing

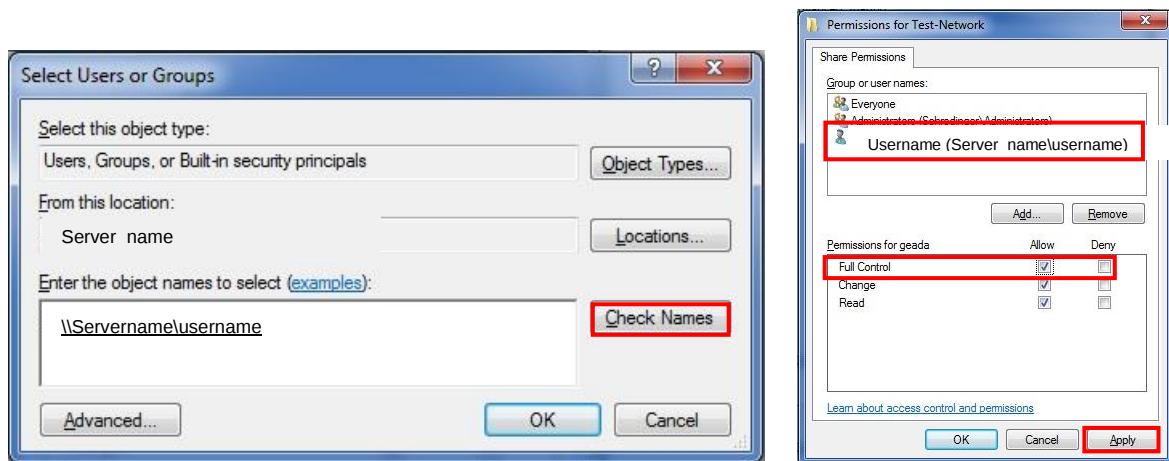
Enter the user to the text field which should be added (e.g. user).



Pic.25: User selection

Click on *Check Names* (see Pic.25).

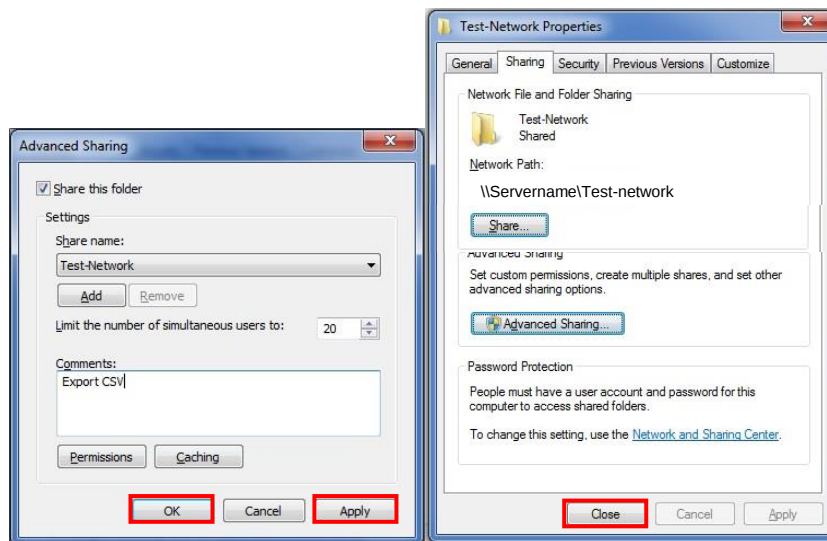
Choose the user from the list and set the correct permissions for the user profile.



Pic.27: Permission settings

Enter a check for the user in the field *Full Control/Allow*.

Confirm with *Apply* and save the settings with *OK*.
Confirm the settings with *Apply* and save your changes with *OK*.



Pic.28: Folder sharing

Click *Close*. The network drive is now successfully shared.

9. Contact

If you have further questions, please do not hesitate to contact us:

Technical support and customer service

Tel.: +49 24 21 969-333

E-Mail: support@mn-net.com

For orders (international)

E-Mail: sales@mn-net.com