

Supplementary documentation

Liquiline CM44x, Liquiline CM44Rx, Liquiline CM44P, Liquiline System CA80xx, Liquistation CSFxx

Service information for web browser connection

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1. Introduction

1.1. Scope

This document describes the web browser connection to the Endress+Hauser analysis transmitter of the 4-wire Liquiline Platform, including the models Liquiline CM44x(R), Liquiline CM44P, Liquiline Systems CA80xx and Liquistation CSFxx.

This document mentions subsequently the Liquiline CM44x transmitter, but all information applies to the other models of the Liquiline 4-wire platform accordingly.

1.2. Purpose

This description is designed to complement the device's operating instructions and installation guidelines by providing help for establishing and troubleshooting a connection with a web browser to the Ethernet web server of the device.

1.3. Who should use this document?

Any user, who wants to use the web server of a Liquiline field device.

1.4. Abbreviations and definitions

n. A.: Not applicable

NaN: Not a number (an IEEE-754 floating point value representing no number, 7F A0 00 00_h)

ENP: Electronic nameplate

1.5. References

Additional information is contained in the following Operating Instructions:

BA00444CEN	Liquiline CM44x, Universal four-wire multichannel controller
BA01225CEN	Liquiline CM44xR, Universal four-wire multichannel controller for DIN rail
BA00443CEN	Liquistation CSF48, Automatic sampler for liquid media
BA01240CEN	Liquiline System CA80xx, Colorimetric analyzer
BA01570CDE	Liquiline CM44P

2. Device identification

Manufacturer name:	Endress+Hauser
Model name:	Liquiline CM44x(R) Liquiline CM44x(R) Liquiline CM44P Liquistation CSFxx Liquiline System CA80xx
Physical layers supported:	Ethernet
Physical device category:	Transmitter, DC isolated bus device

The nameplate is located on the right side of the housing and indicates the model name, order codes, serial number and software version.

3. Product overview

Liquiline is a multichannel multi parameter liquid analysis transmitter in field housing or for DIN rail mounting. Different plug and play sensors with Memosens technology can be connected. Liquistation is a multichannel multi parameter stationary liquid sampler. Liquiline System is a wet chemical analyzer platform for various parameters.



4. System design for fieldbus communication

The Liquiline device is an assembly of modules, which are connected to a backplane residing inside a casing. Up to 8 sensors can be connected to the measuring device. For using PROFIBUS, EtherNet/IP or Modbus communication a "485" or an "ETH"-module must be present with appropriate licensing.

The 485 module has a RS485 port to connect it to a PROFIBUS DP or a Modbus RS485 Network. An additional Ethernet port is used to connect the device to a TCP/IP network. The ETH module has only the Ethernet port and no RS485 port. The Ethernet interface supports the following services:

Service/Protocol	Function	TCP-Port
ICMP	"Ping", used to check reachability of a device in a network	7
DHCP	Network configuration, Setting of IP address by DHCP server	546
HTTP	Access to the web server of the measuring device	80
Modbus TCP	Access to process and diagnostics data of the measuring device	502
EtherNet/IP	Access to process and diagnostics data of the measuring device	44818

At any time one of the following fieldbus protocols can be active:

- PROFIBUS PA (RS485) / PROFIBUS DP
- Modbus RS485 (RTU/ASCII)
- Modbus TCP
- EtherNet/IP
- PROFINET

It is possible to switch the active fieldbus protocol by entering the appropriate activation code. The last entered activation code defines the active fieldbus protocol.

For the Ethernet connection to the web server no activation code is needed.

4.1. Power up

On power up, the device must initialize itself, which takes up to 2 minutes. During this period, the device will not respond to any communication.

About 10 to 30 seconds after the measurement view appears on the display Liquiline is ready to communicate, no matter if there are errors present or not.

4.2. Non-volatile memory

The device configuration parameters are saved into a flash memory. New data is written to this memory by a special flash handler. It takes approximately 5 seconds after the execution of the write command that the data will be saved. Data consistency is always ensured.

5. Using the web server

5.1. Configuration of the device

All settings can be done at the display of the device or remotely via the service interface or by using the web server.

- For using the service interface: connect the Commubox FXA291 and use the software FieldCare.
- For using the web server: connect an Ethernet cable and use a web browser on the laptop.

5.2. Exporting the logbooks

The logbooks can be exported via the Web server and saved to a PC. Open a Web browser and enter one of the following URLs to get to an overview page.

http://<IP address>/logbooks_csv.fhtml This file format can be read with any text editor or can be imported into Microsoft Excel, for instance. Separator: ";"

http://<IP address>/logbooks_fdm.fhtml This data format can be imported into the Endress+Hauser Field Data Manager Software.
<http://www.endress.com/MS20>

5.3. Direct URLs of the logbooks

*.csv	*.dat
http://<IP address>/Calibration_logbook.csv	http://<IP address>/Calibration_logbook.dat
http://<IP address>/Diagnostic_logbook.csv	http://<IP address>/Diagnostic_logbook.dat
http://<IP address>/Configuration_logbook.csv	http://<IP address>/Configuration_logbook.dat
http://<IP address>/HW_version_logbook.csv	http://<IP address>/HW_version_logbook.dat
http://<IP address>/Version_logbook.csv	http://<IP address>/Version_logbook.dat
http://<IP address>/Data0_logbook.csv	http://<IP address>/Data0_logbook.dat
http://<IP address>/Data1_logbook.csv	http://<IP address>/Data1_logbook.dat
http://<IP address>/Data2_logbook.csv	http://<IP address>/Data2_logbook.dat
http://<IP address>/Data3_logbook.csv	http://<IP address>/Data3_logbook.dat
http://<IP address>/Data4_logbook.csv	http://<IP address>/Data4_logbook.dat
http://<IP address>/Data5_logbook.csv	http://<IP address>/Data5_logbook.dat
http://<IP address>/Data6_logbook.csv	http://<IP address>/Data6_logbook.dat
http://<IP address>/Data7_logbook.csv	http://<IP address>/Data7_logbook.dat

The *.dat format can be used for data import into the Endress+Hauser Field Data Manager Software.

5.4. Exporting Heartbeat Verification Report

The last Heartbeat Verification Report can be downloaded from:

<http://<IP-Adresse>/heartbeat.fhtml>



- [Logbooks \(FDM\)](#)
- [Logbooks \(CSV\)](#)
- [Heartbeat](#)

6. Diagnostics

The main purpose of diagnostics is to provide exact information about a failure condition, its location and accurate remedy information.

Liquiline supplies different sources of diagnostic information:

- Local operation/web server interface
 - Access to Diagnostics list
 - Access to Logbooks
- LEDs at the 485 / ETH module
- Remote Diagnostics response telegram
- Remote Diagnostics parameters

For detail information of the diagnostic message refer to the product documentation.

6.1. LEDs

The following LEDs area located at the 485 / ETH module.

The LEDs indicate the following status of the device:

LED	Name	State	Description
PWR	Power	off	The module is not powered
		green	The module is ready
BF	Bus Failure	off	
		red, red flashing	Fieldbus error, no communication
SF	System Failure	off	
		red	Status signal of the device accord. NE107 is F (Failure)
COM	Communication	yellow	Modbus request received (LED stays active for 1 second)
T	Termination	off	The bus termination is OFF
		yellow	The bus termination is ON

7. Web server / Ethernet interface

The 485 / ETH module comes with an integrated Ethernet interface which can be used in addition to the fieldbus interface. The usage of the Ethernet interface does not reduce the performance of the fieldbus communication.

Note:

On the other hand, the fieldbus communication may delay the web server operation.

7.1. Hardware connection

7.1.1. Cables

For temporary connections to the web server for service tasks normal patch cables (CAT5 or better) are usually sufficient.

For the permanent connection and integration into an automation system we recommend the usage of PROFINET Cable Type A.

7.1.2. Grounding and Shielding

Correct grounding and shielding must be ensured. This is required to guarantee electromagnetic compatibility (EMC).

For Ethernet installations the guidelines for PROFINET should be considered while planning the installation. These installation guidelines are available for free download at the following website:

<http://www.profibus.com/downloads/>

7.2. Network settings

7.2.1. Default Network settings

DHCP	On
IP address	0.0.0.0
Netmask	255.255.255.0
Gateway	0.0.0.0
MAC address	Display or 485/ETH module side label

7.2.2. Changing the Network settings

The IP address of the measuring device can be changed by the following options:

- Software addressing using local display
- DHCP using a DHCP server

7.2.3. Software addressing

If the DHCP client function is disabled, the IP address is set in the "Ethernet settings" menu:
Menu/Setup/General settings/Extended setup/Ethernet/Settings
Change the settings of IP address and netmask to the appropriate values.

Menu/... setup/Ethernet/Settings		OK	Menu/... setup/Ethernet/Settings		OK
Webserver	On		Webserver	On	
DHCP	Off		DHCP	Off	
IP-Address	192.168.1.212		IP-Address	192.168.1.212	
Netmask	255.255.255.0		Netmask	255.255.255.0	
Gateway	0.0.0.0		Gateway	0.0.0.0	
MAC-Address	00:00:00:00:00:00		MAC-Address	00:00:00:00:00:00	
MODBUS TCP Port	502		MODBUS TCP Port	502	
Webserver TCP Port	80		Webserver TCP Port	80	
ESC			SAVE		

Optional: Specify the IP address of the gateway which connects the measuring device to the Internet.

Menu/... setup/Ethernet/Settings		OK
Webserver	On	
DHCP	Off	
IP-Address	192.168.1.212	
Netmask	255.255.255.0	
Gateway	0.0.0.0	
MAC-Address	00:00:00:00:00:00	
MODBUS TCP Port	502	
Webserver TCP Port	80	
ESC		SAVE

7.2.4. DHCP

If a DHCP server is used within the TCP/IP network, the IP address, gateway and subnet mask are set automatically when the DHCP client function is enabled. The MAC address of the measuring device is used for identification purposes.

The DHCP client function is enabled when the measuring device is delivered. The DHCP client function can be disabled in the "Ethernet settings" menu.

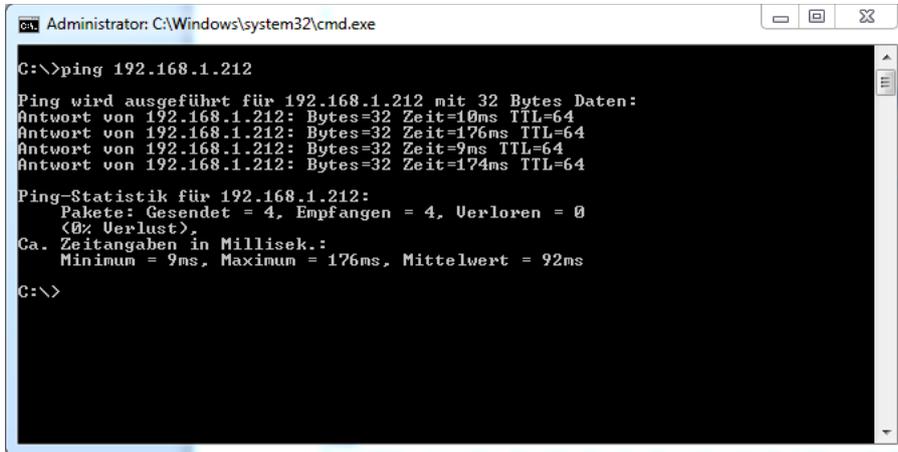
Menu/Setup/General settings/Extended setup/Ethernet/Settings:

Menu/... setup/Ethernet/Settings		OK
Webserver	On	
DHCP	Off	
IP-Address	192.168.1.212	
Netmask	255.255.255.0	
Gateway	0.0.0.0	
MAC-Address	00:00:00:00:00:00	
MODBUS TCP Port	502	
Webserver TCP Port	80	
ESC		SAVE

7.2.5. Checking the Network connection

The device has the ICMP protocol implemented. The “ping” command can be used to check whether the measuring device is reachable through the network.

Example Windows 7:



```

Administrator: C:\Windows\system32\cmd.exe
C:\>ping 192.168.1.212

Ping wird ausgeführt für 192.168.1.212 mit 32 Bytes Daten:
Antwort von 192.168.1.212: Bytes=32 Zeit=10ms TTL=64
Antwort von 192.168.1.212: Bytes=32 Zeit=176ms TTL=64
Antwort von 192.168.1.212: Bytes=32 Zeit=9ms TTL=64
Antwort von 192.168.1.212: Bytes=32 Zeit=174ms TTL=64

Ping-Statistik für 192.168.1.212:
    Pakete: Gesendet = 4, Empfangen = 4, Verloren = 0
    (0% Verlust),
    Ca. Zeitangaben in Millisek.:
    Minimum = 9ms, Maximum = 176ms, Mittelwert = 92ms

C:\>
  
```

7.2.6. Service Switch (FW-Version 1.05.00 and newer)

The service switch is located on the module as part of the 10-digit DIL switch. While this switch is in position “On”, the following network settings are active:

IP-Address = 192.168.1.212
 Netmask = 255.255.255.0
 Gateway = 0.0.0.0

When returning the switch to “Off”, the original network settings are restored.

7.2.7. Web server

The web server is accessible through TCP port 80.

The web server can be reached using any standard web browser.

The default login for the web server is

User: admin
 Password: admin

Note:

To establish a connection, the option for using the proxy server for LAN must be disabled in the settings of the web browser.

Note:

JavaScript must be enabled.

Note:

Up- and Download of the device configuration will be supported later. Please use the SD card interface to backup or restore the device parameterization.

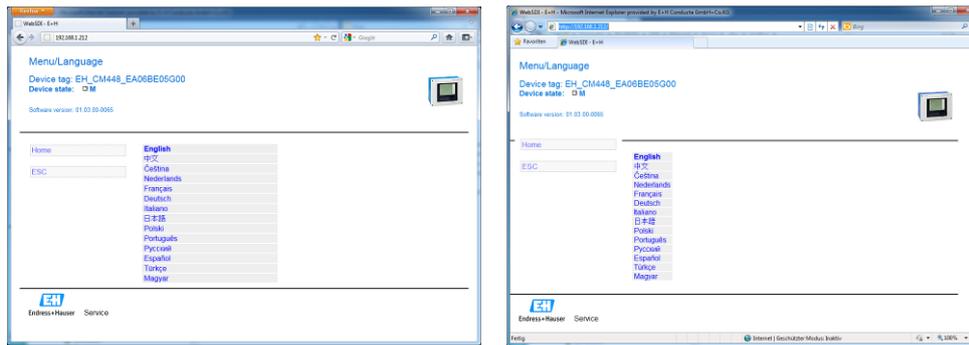
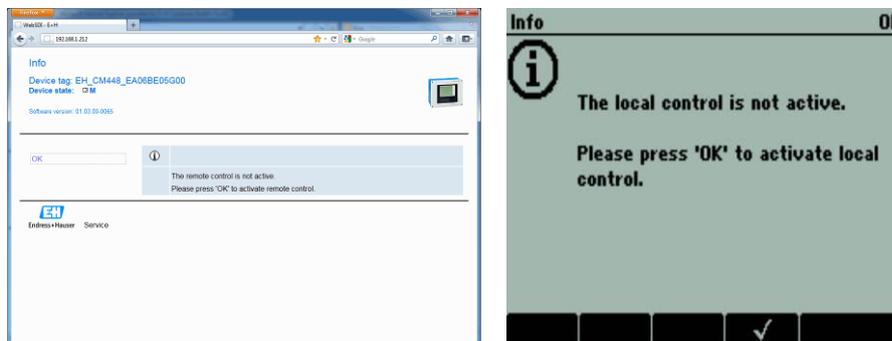


Figure 1 Firefox® (left), Internet Explorer® (right)

At any time one user can work with the operation interface of the measuring device. If a user is connected to the web server of the measuring device, any other network users and the local user are blocked to interact with the measuring device. The following screen is displayed to these users:



Any blocked user may take control of the operation interface at any time and will block other users by doing so.

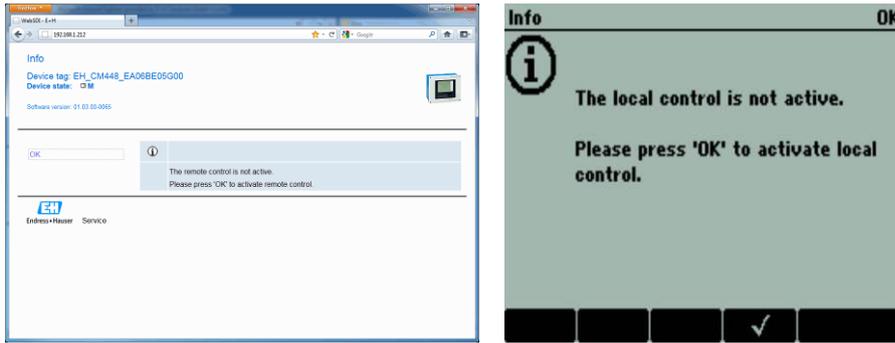
Supported URL of the web server:

URL	Function
192.168.1.212	Online Parameterization
192.168.1.212/logbooks_csv.fhtml	Logbooks in csv-Format to import into e.g. Microsoft Excel
192.168.1.212/logbooks_fdm.fhtml	Logbooks in binary dat-Format for import into the software Endress+Hauser Field Data Manager (FDM)

7.2.8. Access rights

If you see the message 'The remote control is not active' it means that you have an Ethernet connection, but a local operator has the control.

At any time one user can work with the operation interface of the measuring device. If a user is connected to the web server of the measuring device, any other network users and the local user are blocked to interact with the measuring device. The following screen is displayed to these users:



Any blocked user may take control of the operation interface at any time and will block other users by doing so.

8. Configuring the laptop for web browser access

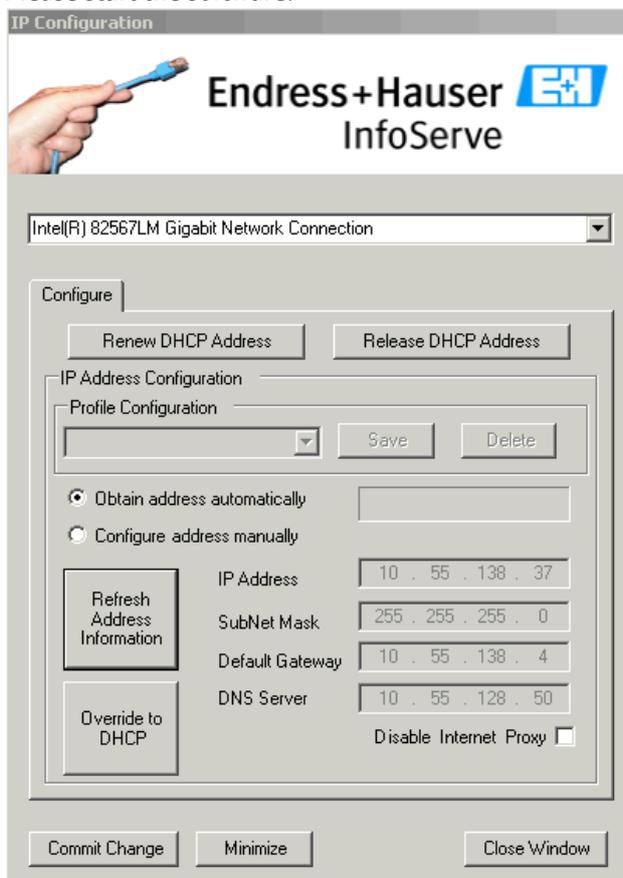
The connection of a web browser to a Liquiline 4 wire device is only possible when the Liquiline has the 485 / ETH module installed.

To connect a laptop to the Liquiline, the IP settings of laptop and Liquiline must match. This comprises the IP addresses and the web browser settings.

8.1. Configuring IP settings with 'IP Configuration' software of Endress+Hauser InfoServe

If the user has no admin rights to change the IP settings of his laptop he can use the software 'IP Configuration' of Endress+Hauser InfoServe. This software must be installed by the administrator.

Please start the software.



In normal operation the laptop receives automatically an IP address by a DHCP server. Please select 'Configure address manually' to deactivate the DHCP client.

Configure the IP address of the laptop accordingly to the Liquiline. The IP address consists of four bytes. It may be adapted to the customers IP network. In this case ask the local IT administrator for a free usable IP address.

The default address of Liquiline is **192.168.1.212**

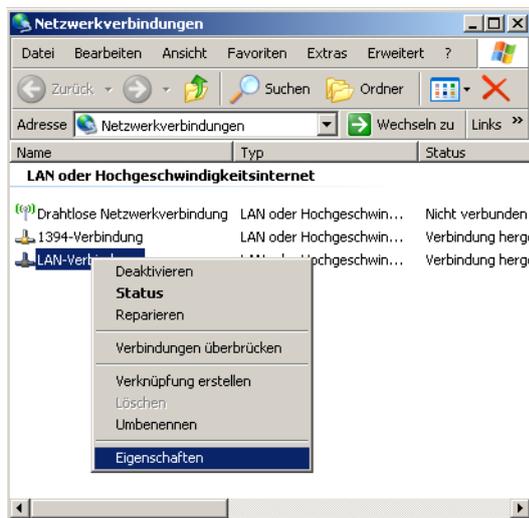
To read the current IP address of the Liquiline see the menu
Menu/Setup/General settings/Extended setup/Ethernet/Settings:

Menu/... setup/Ethernet/Settings		OK
Webserver	On	
DHCP	Off	
IP-Address	192.168.1.212	
Netmask	255.255.255.0	
Gateway	0.0.0.0	
MAC-Address	00:00:00:00:00:00	
MODBUS TCP Port	502	
Webserver TCP Port	80	
<div style="display: flex; justify-content: space-between; width: 100%;"> ESC SAVE </div>		

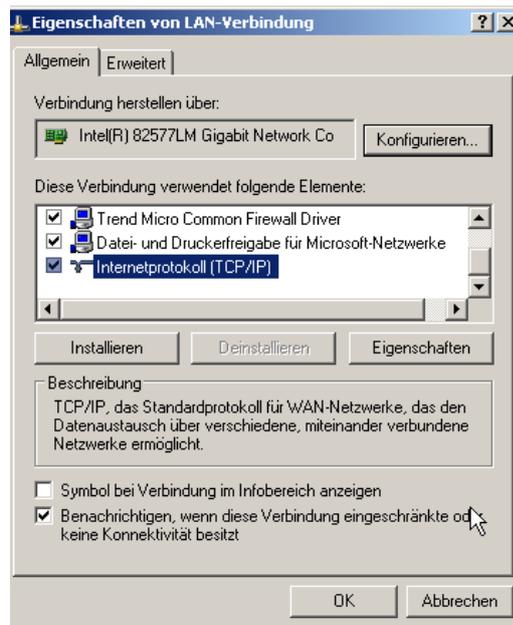
The laptop must be in the same subnet, meaning that the left three bytes must be identical, and the last byte must be different. E.g. in case of the default setting of Liquiline the laptop can be configured to **192.168.1.1**

8.2. Configuring IP settings in Windows

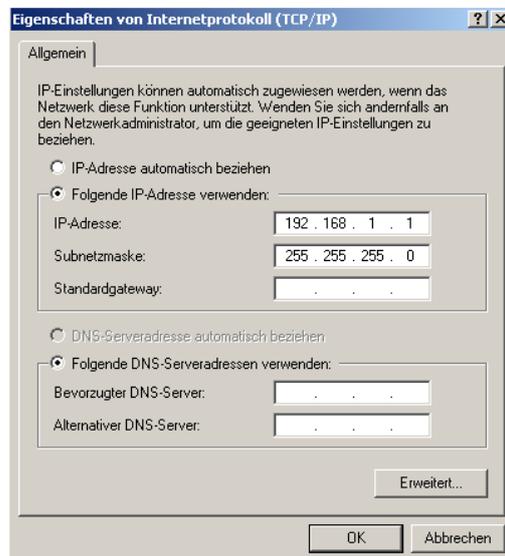
If the user has admin rights of the laptop the IP address can be changed under Windows as follows:
Start → Settings → Network → Network settings



Select LAN connections and right click on properties:



Select Internet protocol (TCP/IP) and click properties:



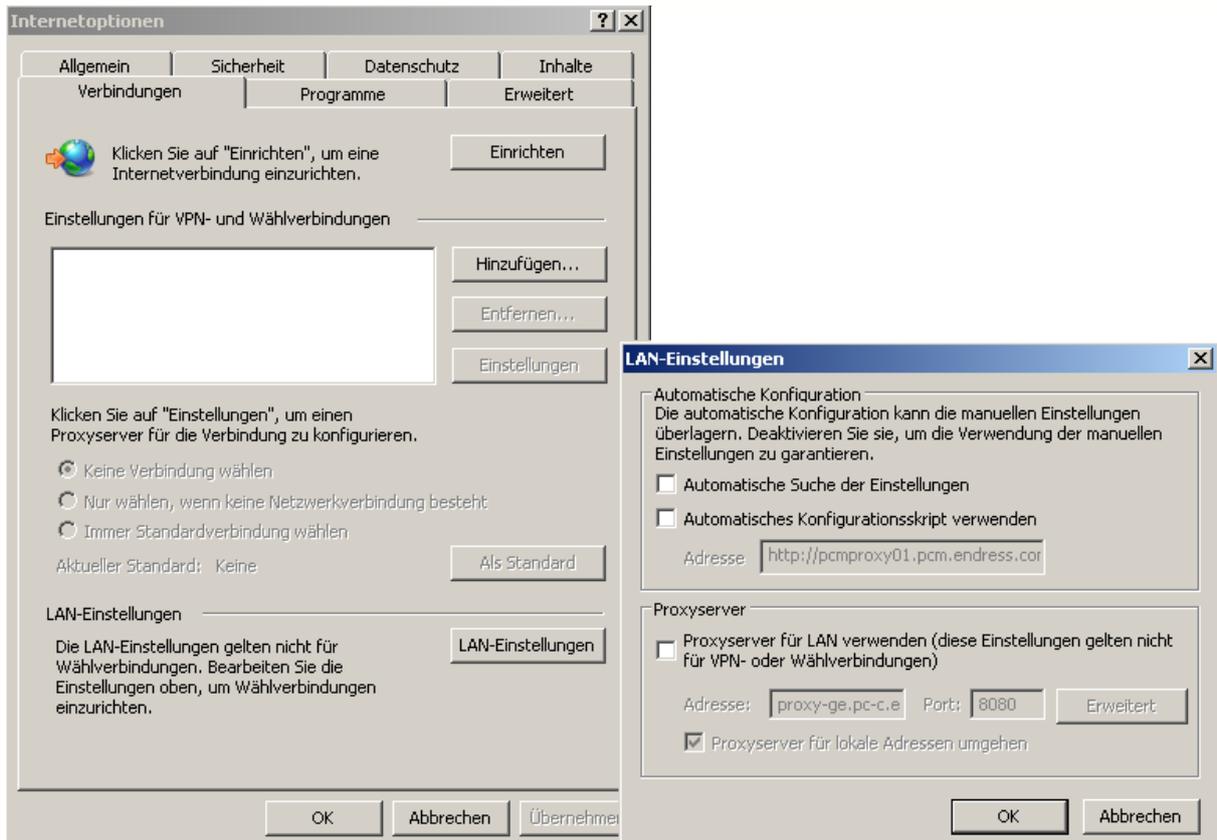
Select 'use following IP address' and enter the desired IP address.

The subnet mask must match the Netmask as configured in the Liquiline (default: 255.255.255.0). Click OK to close all windows.

Open the properties settings of your web browser and deselect any Internet proxy server and configuration scripts:

E.g. Microsoft Internet Explorer:

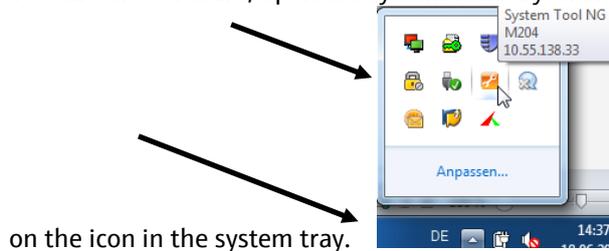
Extras → Internet options → Connections → LAN settings



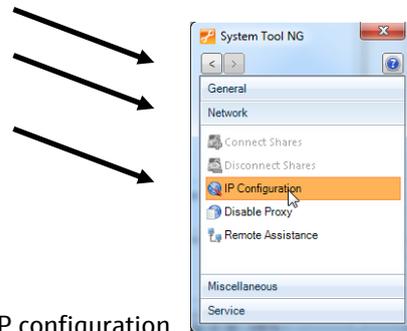
8.3. Configuring IP settings in Windows 7 with 'SystemTool NG' software of E+H InfoServe

With Windows 7 the user can change the IP settings of his laptop without admin rights. He can use the software 'System Tool NG' of Endress+Hauser InfoServe. This software must be installed by the administrator.

To start the software, open the system icons by click on the triangle and select the software by right-click

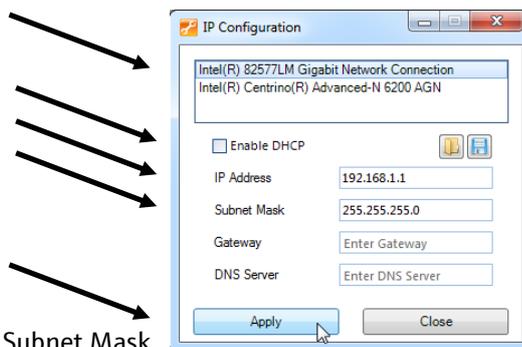


on the icon in the system tray.



Select the task 'Network' in the tab 'General' and click on IP configuration.

Select the Ethernet network connection (not the WLAN adapter or an installed modem),
deselect 'Enable DHCP' and



enter the desired IP Address and Subnet Mask.

Press Apply to active the settings.

This configuration window must be left open while working with the new IP settings.

After finishing your work press 'Close'. A dialog window will appear informing, that DHCP will be activated again.

9. Trouble shooting for web server communication

9.1. No connection to the Liquiline with the web browser

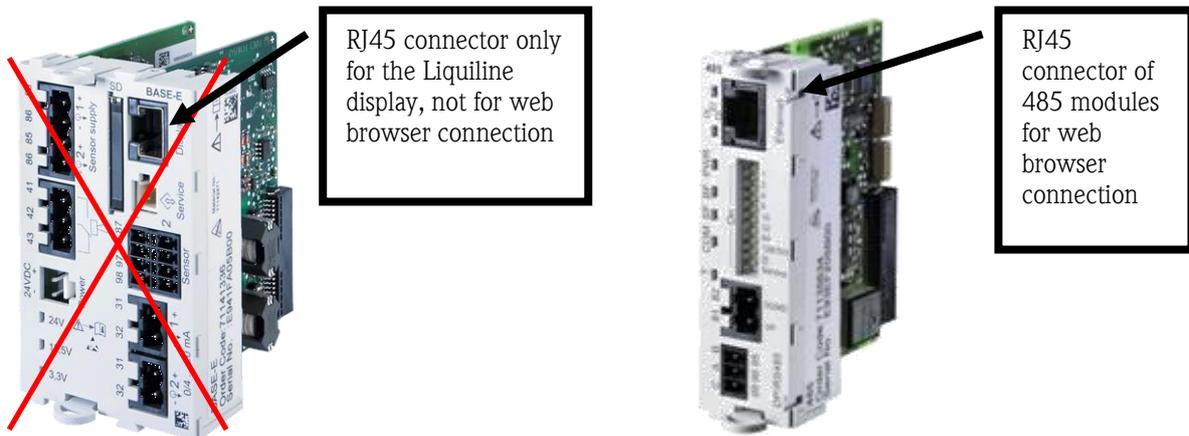
9.1.1. Hardware

1. Check if one of the modules 485 or ETH is installed and running. The label is on the upper left corner. Check if the power LED of the module is on (PWR = green). If the LED is not lit check that the module is pushed properly into the slot and connects to the backplane. Replace the module with another one to check for hardware damages.

2. Check the Ethernet cable for damages. A cross-over cable is not needed.

3. Check for the right RJ45 connector. The laptop must be connected by an Ethernet cable to the RJ45 connector of the 485 / ETH module.

Keep in mind that the RJ45 connector of the BASE module is only for the Liquiline display, not for an Ethernet connection. The RJ45 connector of the 485/ETH module must be used.



9.1.2. Liquiline settings

Check at the display if the Liquiline Ethernet settings are correct:
Menu/Setup/General settings/Extended setup/Ethernet/Settings:

Menu/... setup/Ethernet/Settings	OK
Webserver	On
DHCP	Off
IP-Address	192.168.1.212
Netmask	255.255.255.0
Gateway	0.0.0.0
MAC-Address	00:00:00:00:00:00
MODBUS TCP Port	502
Webserver TCP Port	80
ESC	SAVE

1. The web server must be On.

2. DHCP must be Off when connected directly with the laptop to the Liquiline. When connected via a switch and a DHCP server the DHCP client can be On.

3. Check the IP address. The left three numbers must be equal to those of the laptop, the right number must be different.

4. Check the laptop IP address under Windows:

Start → run → type 'cmd' → type 'ipconfig' in the command window.

9.1.3. Laptop settings

1. Check the DHCP settings.

2. DHCP must be Off when connected directly with the laptop to the Liquiline. When connected via a switch and a DHCP server the DHCP function can be On.

See chapter above how to change the settings.

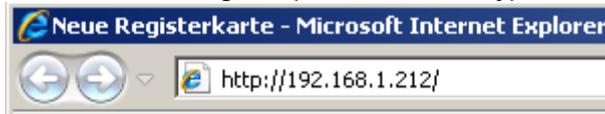
3. Check the web browser settings for proxy server settings.

When connected in the same network with the Liquiline no proxy server or configuration script is needed.

See chapter above how to change the settings.

Note: JavaScript must be enabled.

4. Check that the right Liquiline address is typed in the web browser URL:



Compare the address to the Liquiline settings:

Menu/Setup/General settings/Extended setup/Ethernet/Settings:

Menu/... setup/Ethernet/Settings	OK
Webserver	On
DHCP	Off
IP-Address	192.168.1.212
Netmask	255.255.255.0
Gateway	0.0.0.0
MAC-Address	00:00:00:00:00:00
MODBUS TCP Port	502
Webserver TCP Port	80
ESC	SAVE

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