


LAN Communication With H&H Devices

The purpose of this application note is to explain the various ways of configuring electrical loads and source-sinks from Höcherl & Hackl for LAN communication.

Safety Instructions

 Read the operating instructions of your device and especially the general safety instructions before starting the operation!

Connection options

You can either connect an H&H device directly (peer-to-peer) to the PC or integrate it into a network (client-server) via an Ethernet switch. The LAN connection (RJ45 socket) of the device has a so-called Auto-MDI-X functionality, which allows the use of crossed (crossover) and uncrossed (patch) cables.

Configuring LAN Interface

The LAN interface can be configured via the menu and by means of SCPI commands.

Series ACL, ERI, PLI, QL, SCL, TRL:

Main menu -> Configuration -> Communication -> LAN

Series PMLA:

Main menu -> Data Interface Settings -> LAN

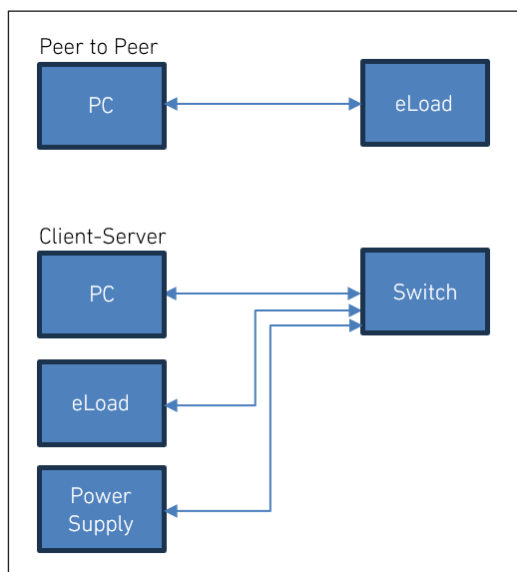
Series PLA:

Main menu -> IFC -> LAN

Further information and the SCPI commands can be found in the user manuals of the corresponding device series.

Peer-to-Peer Connection

If the device is connected directly to a PC, usually no DHCP service is active on the PC and you have to work with a static IP address. To establish a direct connection with a PC, proceed as follows:



1. PC: Determine the IP address of the network card connected to the device, e.g. via the Windows command line: `ipconfig /all`.
2. Device: Navigate to the LAN -> Configuration dialog box in the device menu and deactivate "DHCP".
3. Enter the static IP address in "Static Settings". Make sure that the first three numbers are identical (here in the example: 169.154.16). However, the last number must be different from the IP address of the PC. Acknowledge the changes with OK and restart the device.
4. Test communication with a terminal program, e.g. Load Terminal (see chapter Communication below).

Client-Server Connection

With the client-server connection, all devices in the network are connected via a switch, with or without automatic address assignment by DHCP.

a) DHCP Server available

A DHCP server is responsible for automatic address assignment in a client-server based network. Make sure that the DHCP functionality of the device is enabled. The factory default setting is "DHCP on". You can change the setting in the LAN Configuration dialog box.

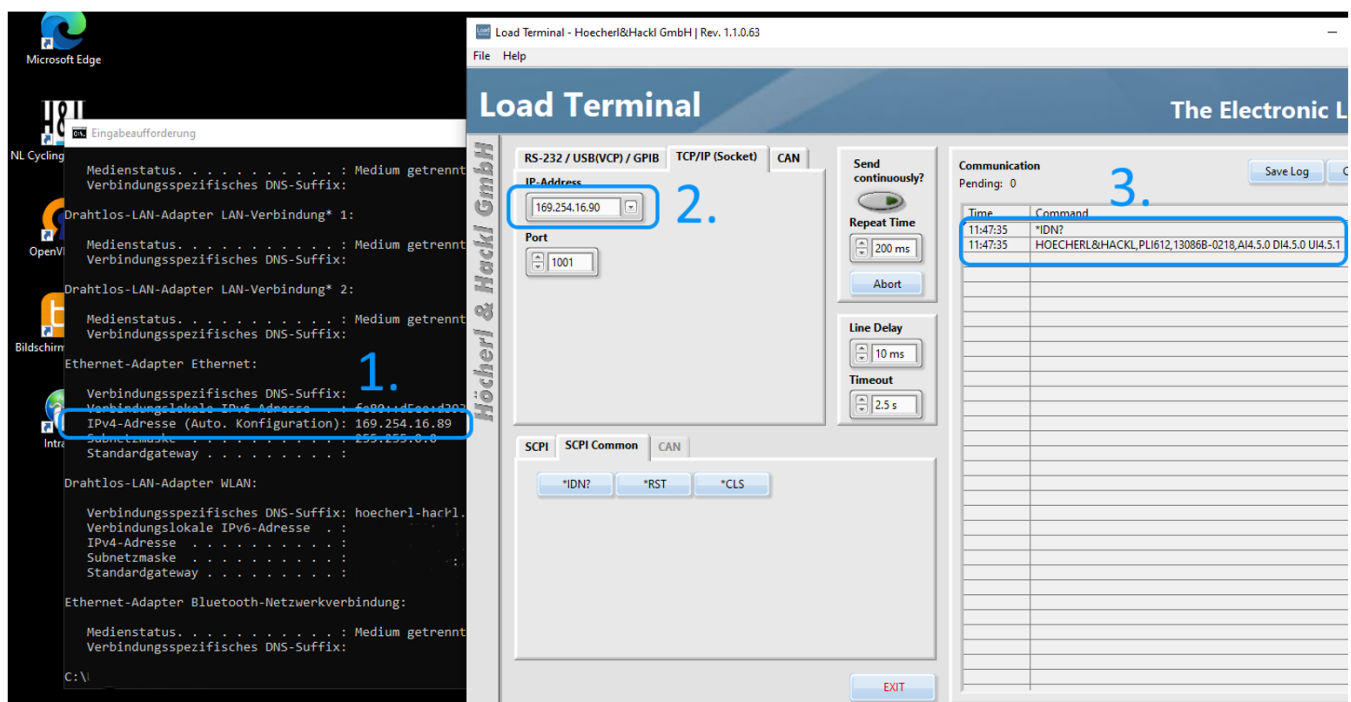
After switching on the device, the IP address is assigned automatically if the DHCP functionality is enabled.

1. Device: Navigate to the LAN -> Configuration dialog box in the device menu and activate "DHCP".
2. Acknowledge the changes with OK and restart the device.
Navigate to the "LAN Status" dialog window to display the current IP address.
3. Test communication with a terminal program, e.g. Load Terminal (see chapter Communication below).

b) No DHCP Server available

If there is no DHCP server in the network, you have to work with static IP addresses.

1. Device: Navigate to the LAN -> Configuration dialog box in the device menu and deactivate "DHCP".
2. Enter the static IP address in "Static Settings". Make sure that the first three numbers are identical to those of your static network. However, the last number must be different.
3. Acknowledge the changes with OK and restart the device.
Test the communication with a terminal program, e.g. Load Terminal.



Configuring and testing IP address

Communication

To communicate with an H&H device via an IP socket, you need the IP address or host name and port of the device.

Via IP Address

The IP address is available in the "LAN Settings" dialog box in the device menu.

Example with terminal program:

The screenshot shows the terminal program interface with the 'TCP/IP (Socket)' tab selected. The 'IP-Address' field is set to '192.168.111.93' and the 'Port' is '1001'. The 'Send continuously?' checkbox is checked, and the 'Repeat Time' is set to '200 ms'. The 'Communication' log shows the following entries:

Time	Command
13:53:56	*IDN?
13:53:56	HOECHERL&HACKL,PLI612,13086B-0218,AI4.5.0 DI4.5.0 UI4.5.1

Via Hostname

If there is a DNS server in the network, you can also address the device via the host name. Especially in networks with automatic address assignment ("DHCP on"), the use of the host name has advantages, since the DHCP server can always reassign the IP addresses depending on its settings. The host name, on the other hand, remains the same and thus the device can always be accessed by the host name.

The host name is available in the "LAN Settings" dialog window in the device menu.

Example with terminal program:

The screenshot shows the terminal program interface with the 'TCP/IP (Socket)' tab selected. The 'IP-Address' field is set to 'PLI-13086' and the 'Port' is '1001'. The 'Send continuously?' checkbox is checked, and the 'Repeat Time' is set to '200 ms'. The 'Communication' log shows the following entries:

Time	Command
13:53:56	*IDN?
13:53:56	HOECHERL&HACKL,PLI612,13086B-0218,AI4.5.0 DI4.5.0 UI4.5.1
13:56:29	*IDN?
13:56:29	HOECHERL&HACKL,PLI612,13086B-0218,AI4.5.0 DI4.5.0 UI4.5.1

Communication with NI Tools

Via VISA Resource Name

If you work with NI tools, e.g. LabVIEW, you can also work with a VISA Resource Name. This has the following structure:

TCPIP0::IP-Address::Port::SOCKET

e.g.: TCPIP0::192.168.111.93::1001::SOCKET

Example with terminal program:

The screenshot shows the terminal program interface with the 'TCP/IP (Socket)' tab selected. The 'VISA resource name' field is set to 'TCPIP0::192.168.111.183::'. The 'Serial Configuration' section shows 'Serial Baud Rate' set to '115200' and 'Flow Control' set to 'RTS/CTS'. The 'Send continuously?' checkbox is checked, and the 'Repeat Time' is set to '200 ms'. The 'Communication' log shows the following entries:

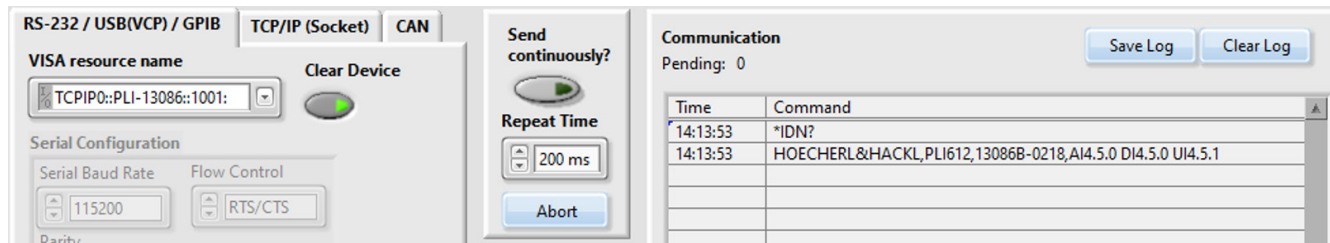
Time	Command
14:11:53	*IDN?
14:11:53	HOECHERL&HACKL,PLI612,13086B-0218,AI4.5.0 DI4.5.0 UI4.5.1

or

TCPIP0::Hostname::Port::SOCKET

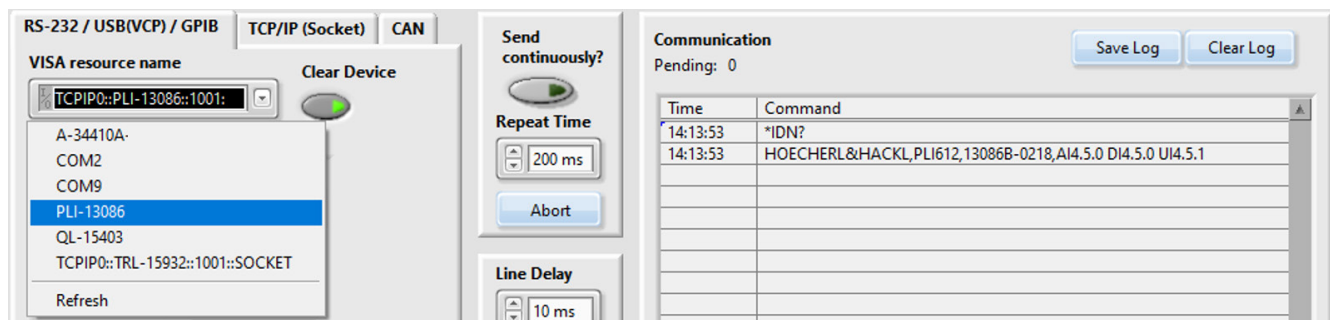
e.g.: TCPIP0::PLI-13086::1001::SOCKET

Example with terminal program:



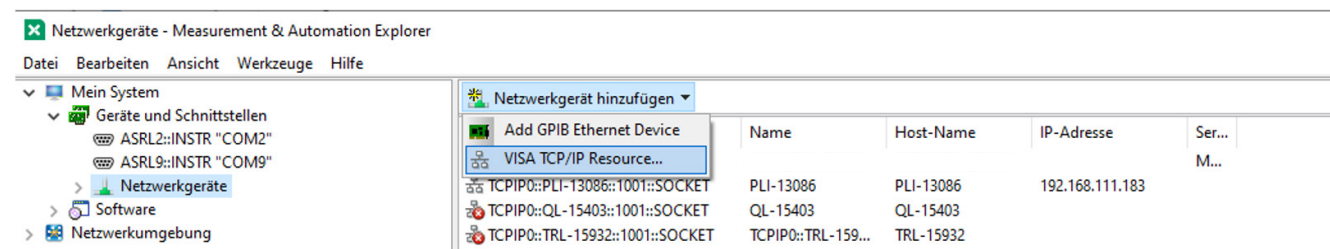
Via NI MAX

Using the "Measurement & Automation Explorer" MAX from National Instruments, you can register the device as a network device. When using NI Tools, the connection to the device is then shown in the "VISA Resource Name" drop-down list.

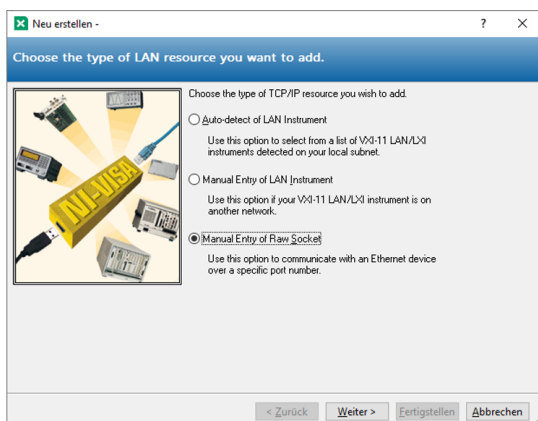


Start NI MAX.

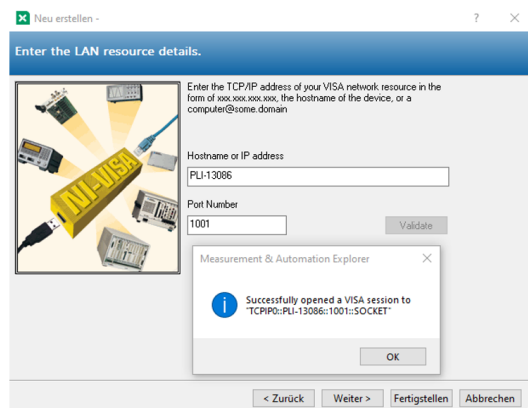
network devices -> add network device -> VISA TCP/IP Resource



Select "Manual Entry of Raw Socket".

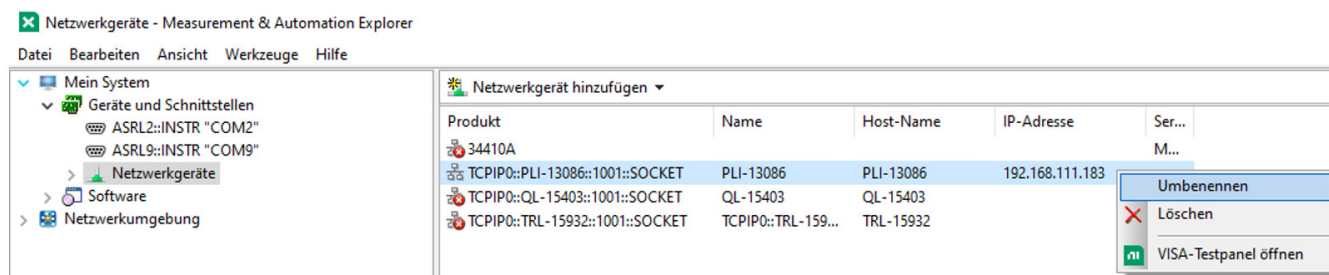


Enter host name or IP address and port. Test connection with "Validate".



Click "Finish".

Optional: Change the name of the network device



The device now appears with the selected name in the selection list with the VISA Resource Names.