

Application Note #19

# 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.
- 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.

- 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.

 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.

- 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.

	🔤 Load Terminal - Hoecherl&Hackl GmbH   Rev. 1.1.0.63	-
Microsoft Edge	File Help	
Microsoft Edge     Microsoft Edge     NLCycling     Medienstatus	Load Terminal - Hoecher/82HackI GmbH   Rev. 1.1.0.63 File Help Load Terminal RS-232 / USB(VCP) / GPIB TCP/IP (Socket) CAN P.Address [169254.16:30] 2. Port [100] 200 ms Abort Line Delay []:00ms Timeout []:00ms Timeout []:00ms Timeout	Communication Pending: 0 11:47:35 HOECHERL&HACKL, PLI612, 130868-0218, AIA.5.0 DIA.5.0 UIA.5.1 11:47:35 HOECHERL&HACKL, PLI612, 130868-0218, AIA.5.0 DIA.5.0 UIA.5.1 11:47:45
Standardgateway : Drahtlos-LAN-Adapter WLAN:	*IDN? *RST *CLS	
Verbindungsspezifisches DNS-Suffix: hoecherl-hackl. Verbindungslokale IPv6-Adresse : IPv4-Adresse Subnetzmaske Standardgateway		
Medienstatus Medium getrennt Verbindungsspezifisches DNS-Suffix:		
C:\\	EXIT	

Configuring and testing IP address

# Höcherl & Hackl The electronic load

## 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:

RS-232 / USB(VCP) / GPIB T	TCP/IP (Socket)	CAN	Send Communication			Save Log	Clear Log			
Port			Repeat Time	Time 13:53:56 13:53:56	Command *IDN? HOECHERL&HAC	KL,PLI612,13	086B-0218,AI4	4.5.0 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 Dhur 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:

RS-232 / USB(VCP) / GPIB	TCP/IP (Socket)	CAN	Send	Communicat	ion Save Log Clear Log	
IP-Address			continuously?	Pending: 0 Time	Command	
Port			200 ms	13:53:56 13:53:56	*IDN? HOECHERL&HACKL,PLI612,13086B-0218,AI4.5.0 DI4.5.0 UI4.5.1	
1001			Abort	13:56:29	*IDN? 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:

RS-232 / USB(VCP) / GPIB	TCP/IP (Socket) CAN	Send	Communicatio	on Save log Clear log
VISA resource name	Clear Device	continuously?	Pending: 0	Save Log
TCPIP0::192.168.111.183:		Repeat Time	Time	Command A
Serial Configuration Serial Baud Rate Flow Co	ontrol	200 ms	14:11:53	HOECHERL&HACKL,PLI612,13086B-0218,AI4.5.0 DI4.5.0 UI4.5.1
(* 115200 (* R	TS/CTS	Abort		



or TCPIP0::Hostname::Port::SOCKET e.g.: TCPIP0::PLI-13086::1001::SOCKET

Example with terminal program:

RS-232 / USB(VCP) / GPIB TCP/IP (Socket) CAN	Send	Communicat	ion	Save Log Clear Log	h
VISA resource name Clear Device	continuously?	Pending: 0			9
Serial Configuration	Repeat Time	Time 14:13:53 14:13:53	Command *IDN? HOECHERL&HACKL,PLI612,13086B-0218,4	44.5.0 DI4.5.0 UI4.5.1	*
Serial Baud Rate Flow Control	Abort				-

#### 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.

RS-232 / USB(VCP) / GPIB TCP/IP (Socke	t) CAN Send	Commur	ication	Save Log Clear Log
VISA resource name Clear D	evice continuously	Pending:	0	Save Log Clear Log
A-34410A	Repeat Time	Time	Command	A
COM2 COM9	200 ms	] 14:13:5	HOECHERL&HACKL,PLI612,13086B-02	18,AI4.5.0 DI4.5.0 UI4.5.1
PLI-13086	Abort			
QL-15403 TCPIP0::TRL-15932::1001::SOCKET		1 🗆		
Refresh	€ 10 ms			

#### Start NI MAX.

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

🔀 Netzwerkgeräte - Measurement & Automation Explorer					
Datei Bearbeiten Ansicht Werkzeuge Hilfe					
V 💭 Mein System	🐔 Netzwerkgerät hinzufügen 🔻				
Gerate und Schnittstellen Gerate und Schnittstellen Gerate und Schnittstellen	Add GPIB Ethernet Device	Name	Host-Name	IP-Adresse	Ser
COM9"	응고 VISA TCP/IP Resource				M
> 🔔 Netzwerkgeräte	击 TCPIP0::PLI-13086::1001::SOCKET	PLI-13086	PLI-13086	192.168.111.183	
> 🔂 Software	TCPIP0::QL-15403::1001::SOCKET	QL-15403	QL-15403		
> 😫 Netzwerkumgebung	TCPIP0::TRL-15932::1001::SOCKET	TCPIP0::TRL-159	TRL-15932		

#### 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

🗙 Netzwerkgeräte - Measurement & Automation Explorer Datei Bearbeiten Ansicht Werkzeuge Hilfe 🗸 🛄 Mein System 🚈 Netzwerkgerät hinzufügen 🔻 ✓ ₩ Geräte und Schnittstellen Host-Name IP-Adresse Produkt BASRL2::INSTR "COM2" Name Ser... COM9" 💑 34410A M... > 🛓 Netzwerkgeräte 윪 TCPIP0::PLI-13086::1001::SOCKET PLI-13086 PLI-13086 192.168.111.183 Umbenennen Software TCPIP0::QL-15403::1001::SOCKET OL-15403 QL-15403 5 Löschen × > 😫 Netzwerkumgebung TCPIP0::TRL-15932::1001::SOCKET TCPIP0::TRL-159... TRL-15932 a VISA-Testpanel öffnen

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

# More applications at www.hoecherl-hackl.com

PAGE 5 of 5