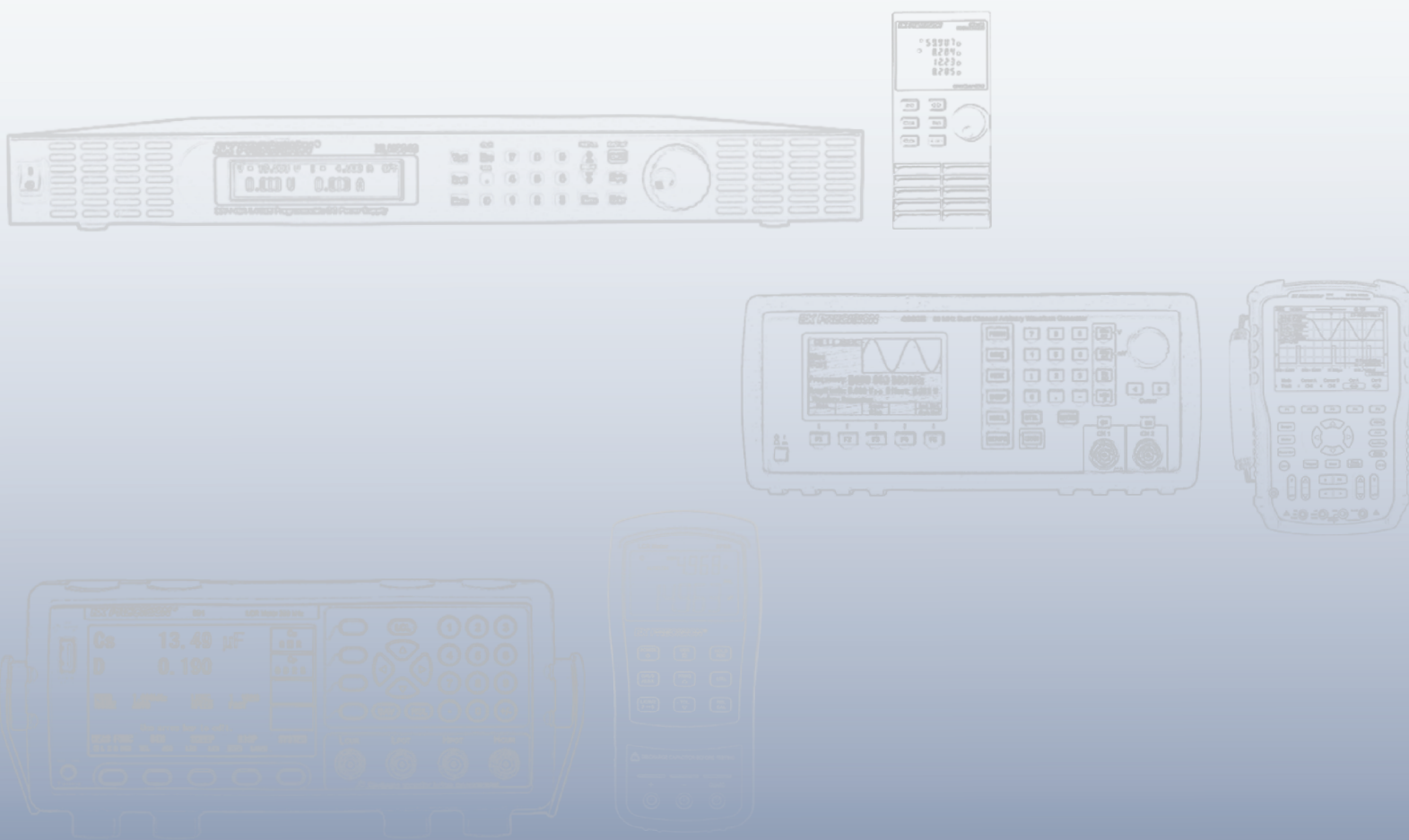


# Application Brief

## 894/895 - Ethernet Connection



# Logging Results of Sweeping Function

## Background

The 894/895 LCR meters take advantage of the Virtual Instrument Software Architecture (VISA) from National Instruments to easily establish remote communication with test and measurement instruments. VISA was created with the purpose of promoting industry wide software compatibility. It provides frameworks and libraries to achieve interoperability among development environments, languages and systems. VISA is a standard for configuring, programming, and troubleshooting instrumentation systems comprising GPIB, VXI, PXI, Serial, Ethernet, and/or USB interfaces. Reducing the time and effort involved in programming different I/O interfaces is one of the great benefits of VISA.

## 894/895 Setup

1. Contact your Network Administrator for how to connect to your network. This will help you determine if you are going to be using a Static or Dynamic IP.
2. These LCR meters do not support generic Socket Connection. VXI interface will have to be used (BK Precision recommends NI VISA).
3. Turn on the LCR meter.
4. Press the System key (located by the arrows).
5. Change the BUS MODE to LAN.
6. In the System Menu, press the LAN SETUP soft key (fig.1).

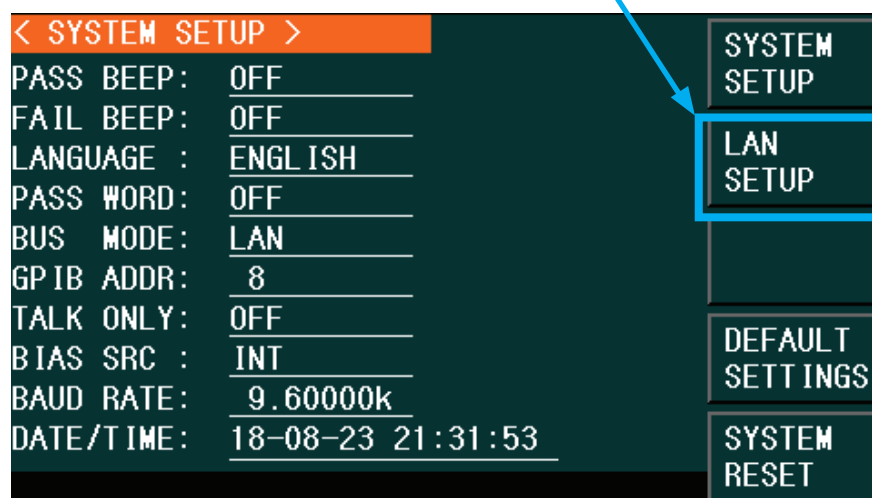


Figure 1

- In the LAN Setup menu (fig. 2), enter the values provided by your Network Administrator

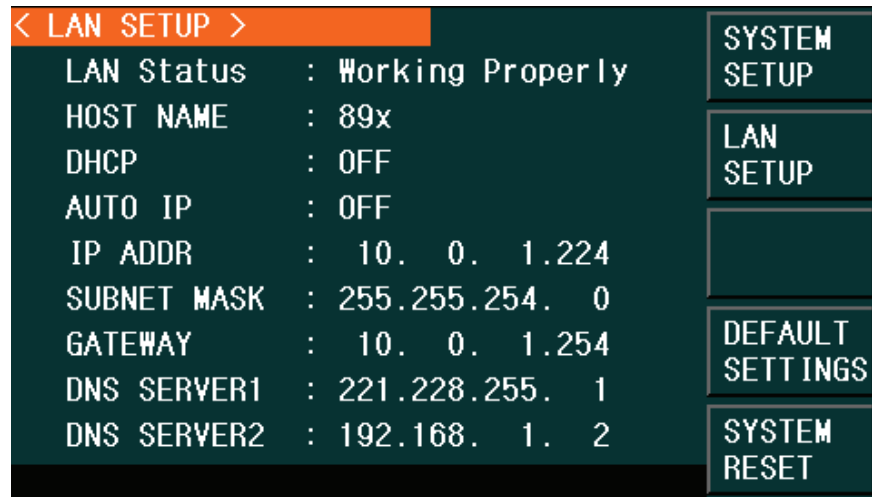


Figure 2

- DHCP is currently not supported. Make sure to DHCP and AUTO IP to off. (fig. 3).

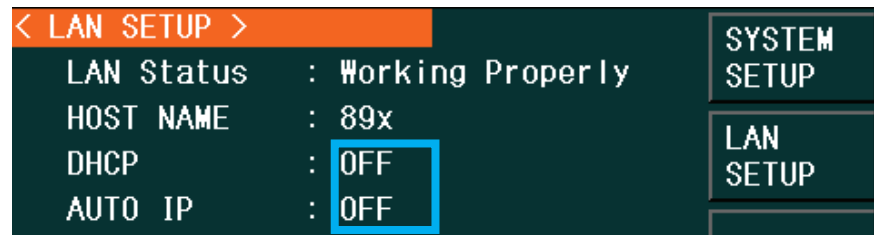


Figure 3

- Press the SYSTEM SETUP softkey to exit the LAN SETUP menu.
- Once in the SYSTEM MENU, press the “LOG” key (fig. 4) to save all the settings changed.
- The meter is now ready to establish remote communication.



Figure 4

## Computer Setup

As it was mentioned at the beginning of this document, the user needs to install NI VISA from ni.com. Find below the direct link to the NI VISA version used for this example, newer versions can be found in this website, too.

<http://www.ni.com/download/ni-visa-17.0/6646/en/>

The user will need to create a new resource for the instrument. This is done through NI MAX. This needs to be done only once, from there on, NI MAX does not need to be open every time a software or interface uses the resource created. However, NI MAX needs to always be installed on that computer.

1. Open NI MAX (NI Measurement & Automation Explorer) installed automatically with NI VISA (fig. 5).
2. Right click on Network Devices.

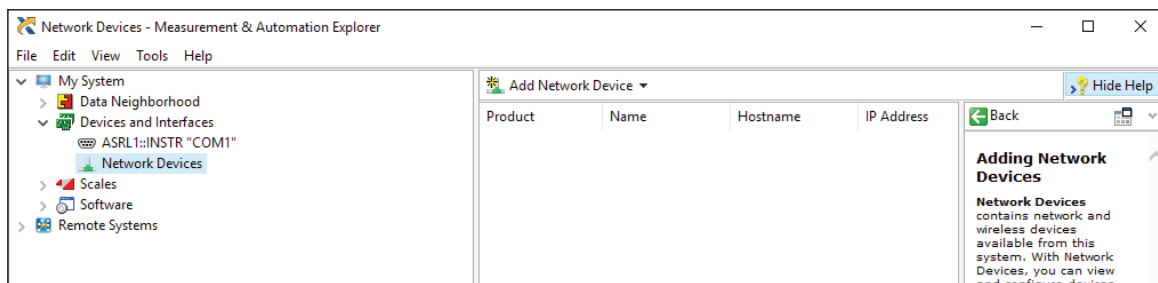


Figure 5

3. Click on the first option "Create New Visa TCP/IP Resource..." (fig. 6).
4. Click on the option "Manual Entry of LAN instrument".

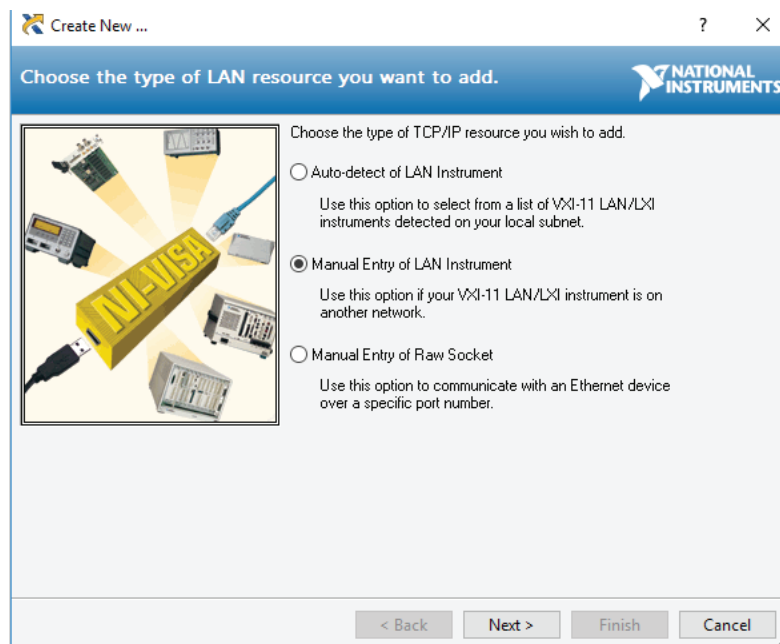
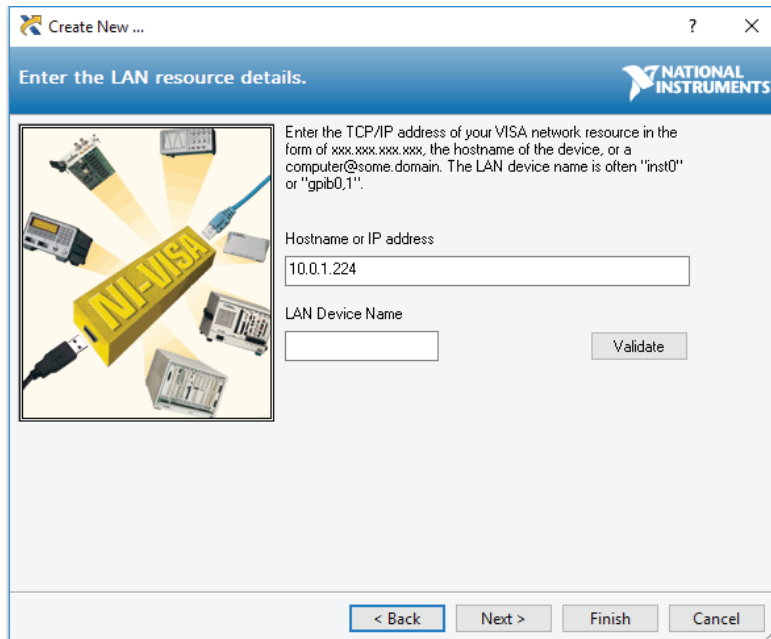


Figure 6

5. Click “Next >” (fig. 6).
6. Type the IP address entered in step 6 of “894/895 Setup Section”. Click on “Next >” (fig. 7).



Enter the LAN resource details.

Enter the TCP/IP address of your VISA network resource in the form of xxx.xxx.xxx.xxx, the hostname of the device, or a computer@some.domain. The LAN device name is often "inst0" or "gpib0,1".

Hostname or IP address  
10.0.1.224

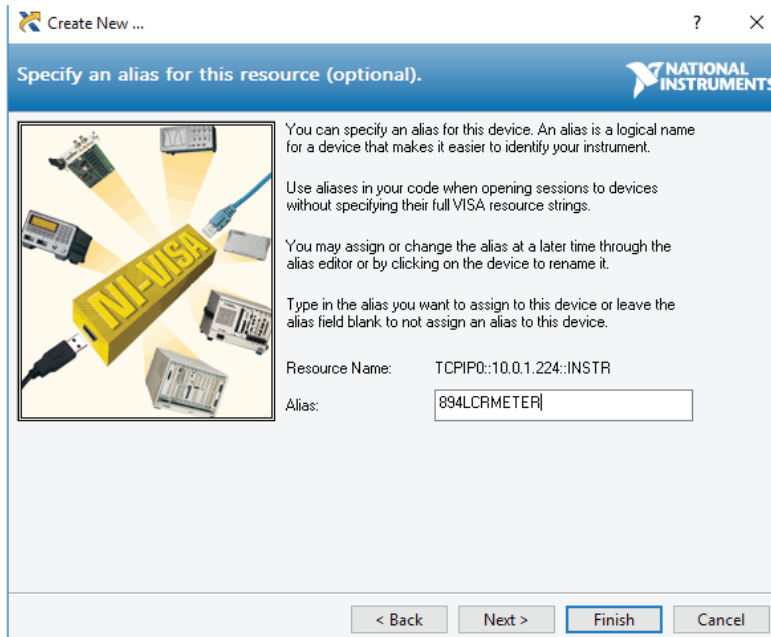
LAN Device Name

Validate

< Back   Next >   Finish   Cancel

Figure 7

7. The user can assign an Alias, if desired. Do not use space in between words. Click on “Finish” (fig. 8).



Specify an alias for this resource (optional).

You can specify an alias for this device. An alias is a logical name for a device that makes it easier to identify your instrument.

Use aliases in your code when opening sessions to devices without specifying their full VISA resource strings.

You may assign or change the alias at a later time through the alias editor or by clicking on the device to rename it.

Type in the alias you want to assign to this device or leave the alias field blank to not assign an alias to this device.

Resource Name: TCPIP0::10.0.1.224::INSTR

Alias: 894LCRMETER

< Back   Next >   Finish   Cancel

Figure 8

8. A new resource has been created for the instrument, and communication has been established.

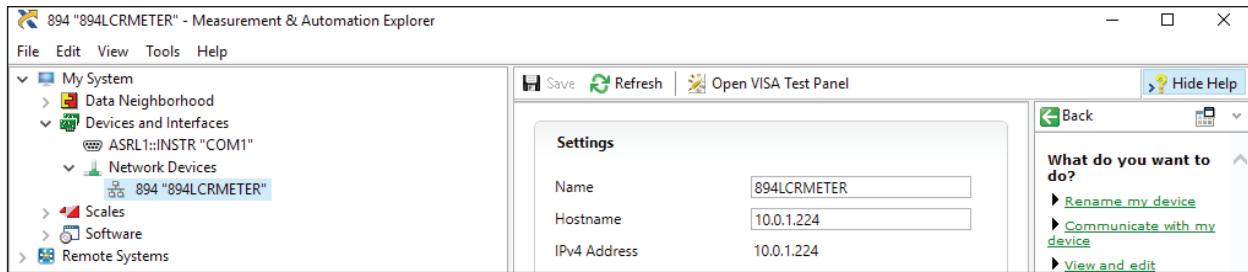


Figure 9

9. Now, the LCR meter can be controlled from the terminal emulator provided by NI MAX. Just click the "Open VISA Test Panel" to open communication (fig. 10).

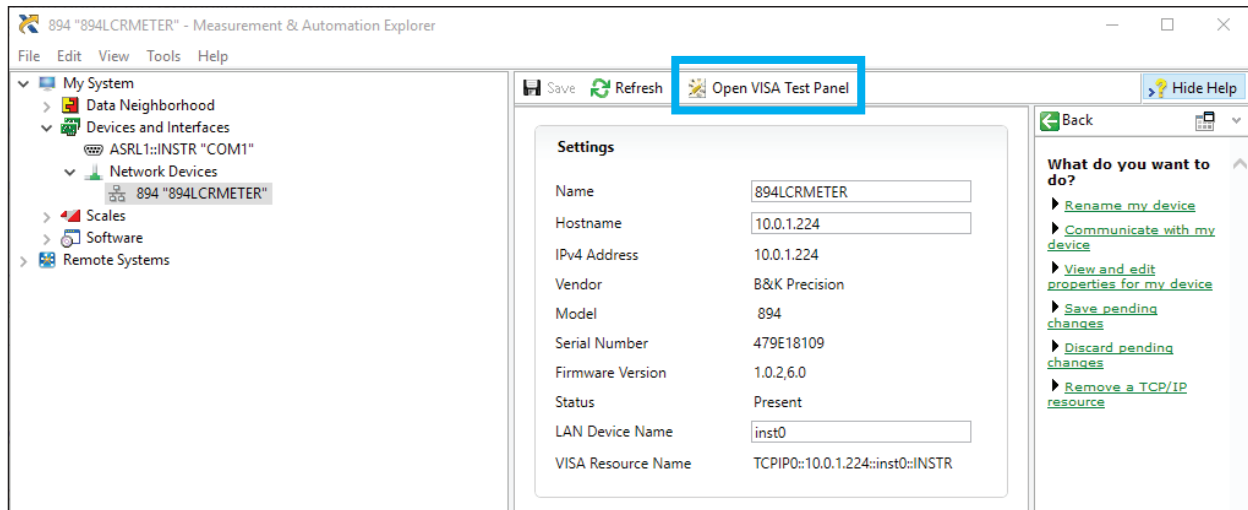


Figure 10

10. Commands are sent and queries can be received from this panel (fig. 11). This panel can be used to test remote connections and troubleshoot because it is able to establish communication with the instrument without the need of any code or software (aside NI VISA).

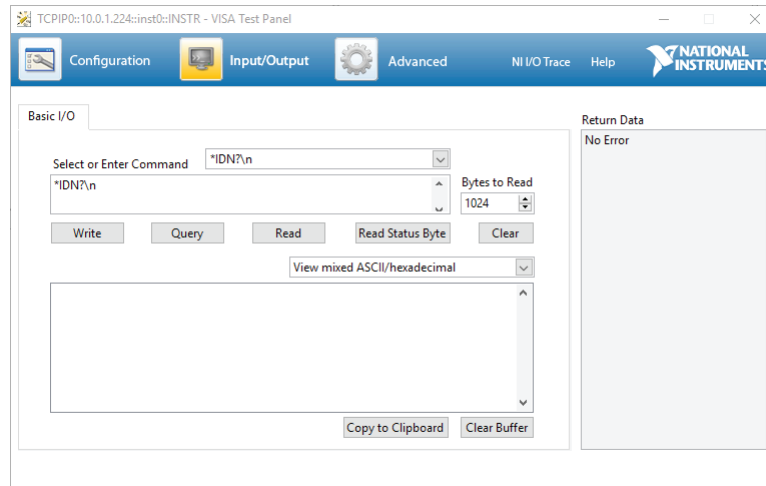


Figure 11

Sample Python Code to Use the Resource Created by NI MAX to Establish an Ethernet Connection. Sample Script (fig. 12) can be found online at:

[https://github.com/bkprecisioncorp/894\\_895\\_Ethernet](https://github.com/bkprecisioncorp/894_895_Ethernet)

```
ethernet trial 895.py - C:/Users/eamezquita/Documents/Current Projects/Technical Sales Training/for external use/ethernet trial 895.py (3.7.0)
File Edit Format Run Options Window Help
import visa

try:
    rm = visa.ResourceManager() #This portion of the code setst the communications. It indexes the resources available.
    li=rm.list_resources()      #Select resource based on number on the left. Press Enter.
    for index in range(len(li)):
        print(str(index)+" - "+li[index])
    choice = input("Which device?: ")
    meter=rm.open_resource(li[int(choice)])
    meter.timeout = 5000

    print(meter.query('*IDN?'))

    #( YOUR CODE HERE)

    print('-----')
    print('close instrument connection')

finally:
    meter.close()
    print('complete')
```

Figure 12