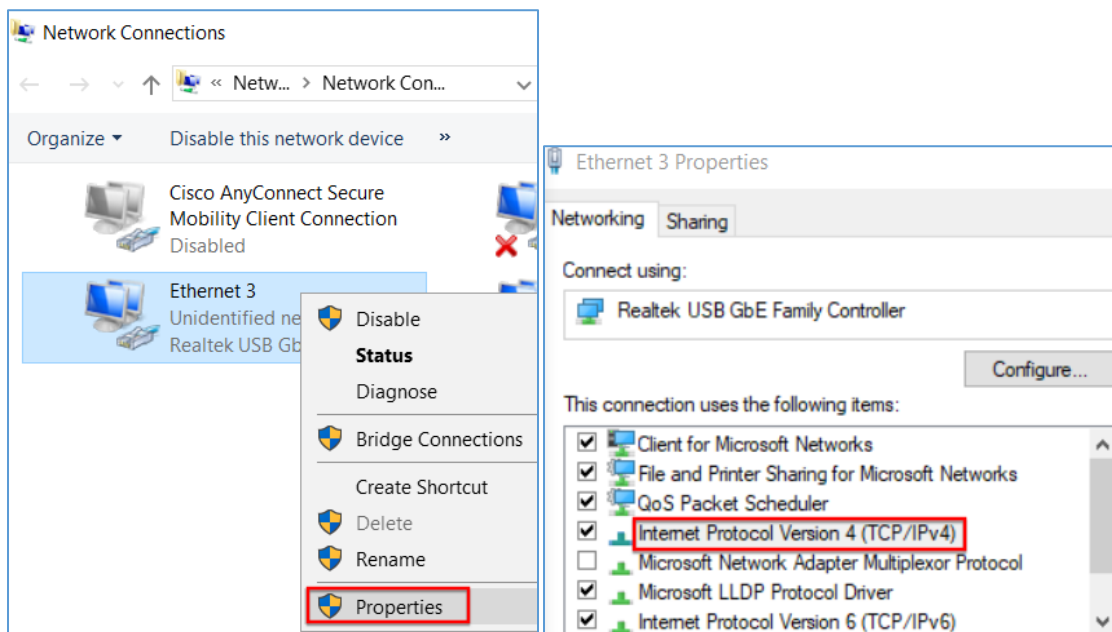
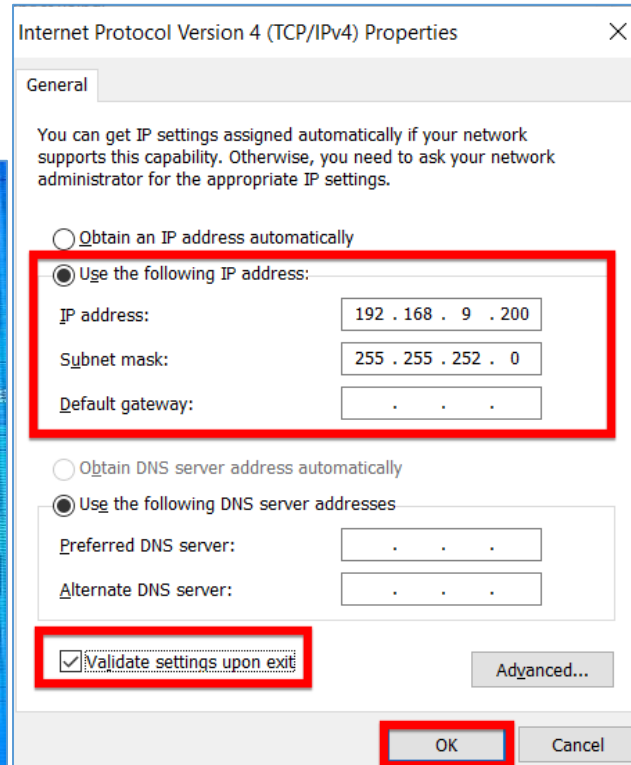
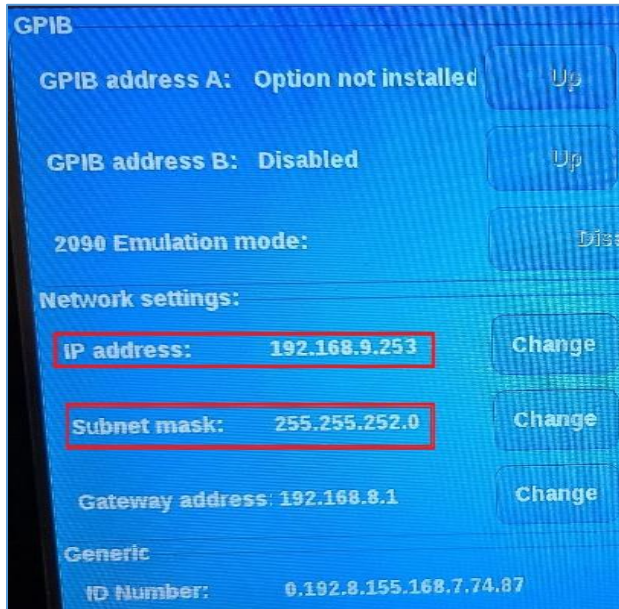


Ethernet Instrument Setup Walkthrough

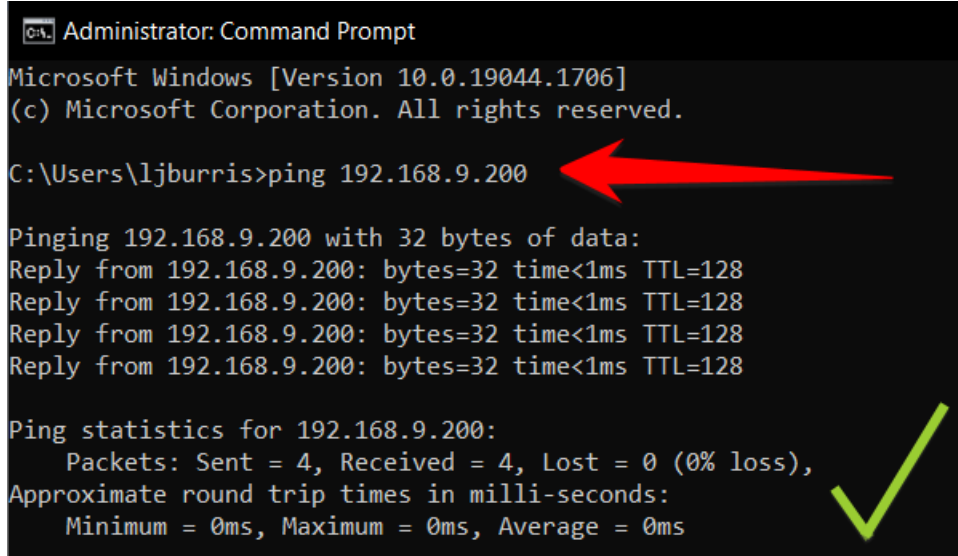
1. Hello everyone, this video explain how to setup an instrument via Ethernet. Using an EMCenter as the example instrument, the walkthrough will explain how to configure the IP address, create a new NI MAX VISA resource, and then how to communicate with the instrument in a TILE! profile.
2. **How to Configure the Ethernet IP address for an instrument**
 - a. The following example shows how to configure the IP address for an EMCenter to communicate with the computer.
 - b. Go to **Control Panel -> Network and Sharing Center -> Change adapter settings**.
 - c. Use the Ethernet cord to connect the EMCenter to the computer, and the new Ethernet connection should appear.
 - d. Right click on the Ethernet connection that appears and select **Properties**, then Double-click **Internet Protocol Version 4**.





- e. Set the **IP address** to be similar to the IP address on the EMCenter Config page, but the last numbers must be different or the connection will not work.
- f. For example if the EMCenter IP address is 192.168.9.**253**, then the computer's Ethernet IP address should reflect that and could be set to 198.168.9.**200**.
- g. Set the **Subnet mask** to be the same as on the EMCenter (255.255.252.0).
- h. Select the **Validate settings upon exit** checkbox and click **OK**.

- i. Open the **Command Prompt** and **ping** the Ethernet IP address to check the connection.



```


Administrator: Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.

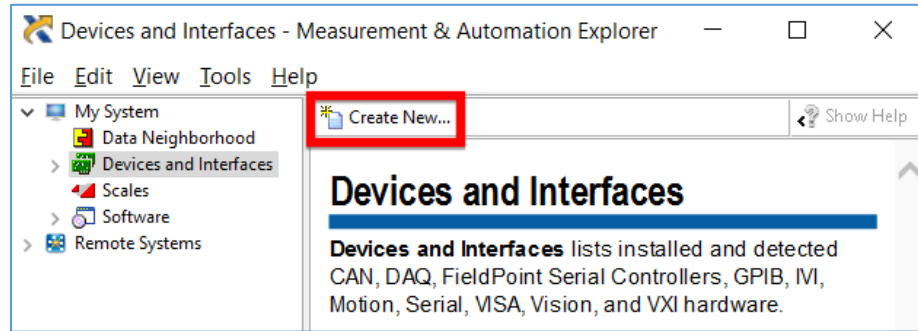
C:\Users\ljburriss>ping 192.168.9.200

Pinging 192.168.9.200 with 32 bytes of data:
Reply from 192.168.9.200: bytes=32 time<1ms TTL=128
Reply from 192.168.9.200: bytes=32 time<1ms TTL=128
Reply from 192.168.9.200: bytes=32 time<1ms TTL=128
Reply from 192.168.9.200: bytes=32 time<1ms TTL=128

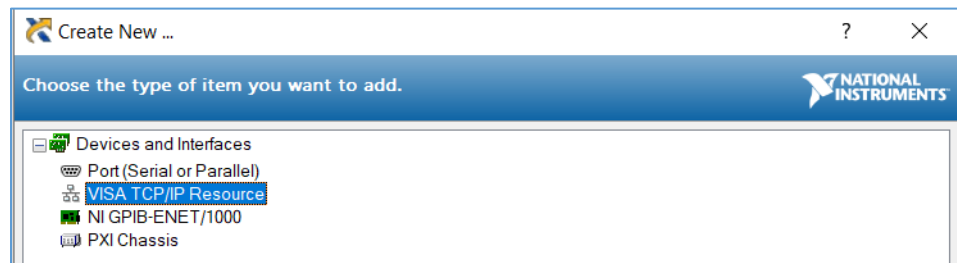
Ping statistics for 192.168.9.200:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
  
```

3. Create new NI MAX VISA resource for TILE

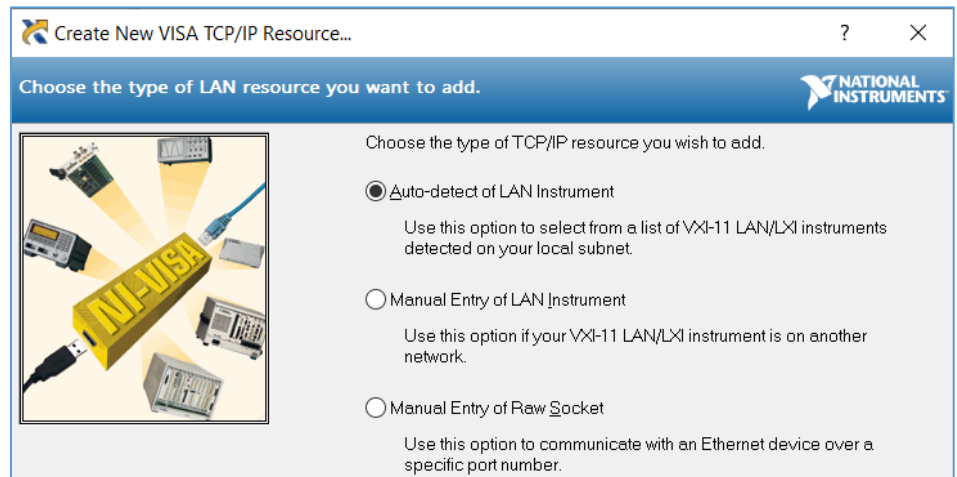
- a. In order to use a network-enabled (LAN) instrument in TILE, the easiest way to access it is to first configure it as a Network Device in NI MAX. Follow these basic instructions to configure the device and refer to NI documentation or your instrument's documentation for the specific requirements of the device.
- b. **NOTE:** Images in this example are taken from NI MAX version 18.5 and TILE version 7.4.3.2. Other versions may appear slightly different, but the general process should be similar.
- c. Run NI MAX (Start Menu->All Programs->National Instruments->NI MAX) 
- d. Select **Devices and Interfaces**, then press the **Create New...** button in the right pane (or right-click on Devices and Interfaces and select Create New...):



- e. Select VISA TCP/IP Resource as the type of item to add:



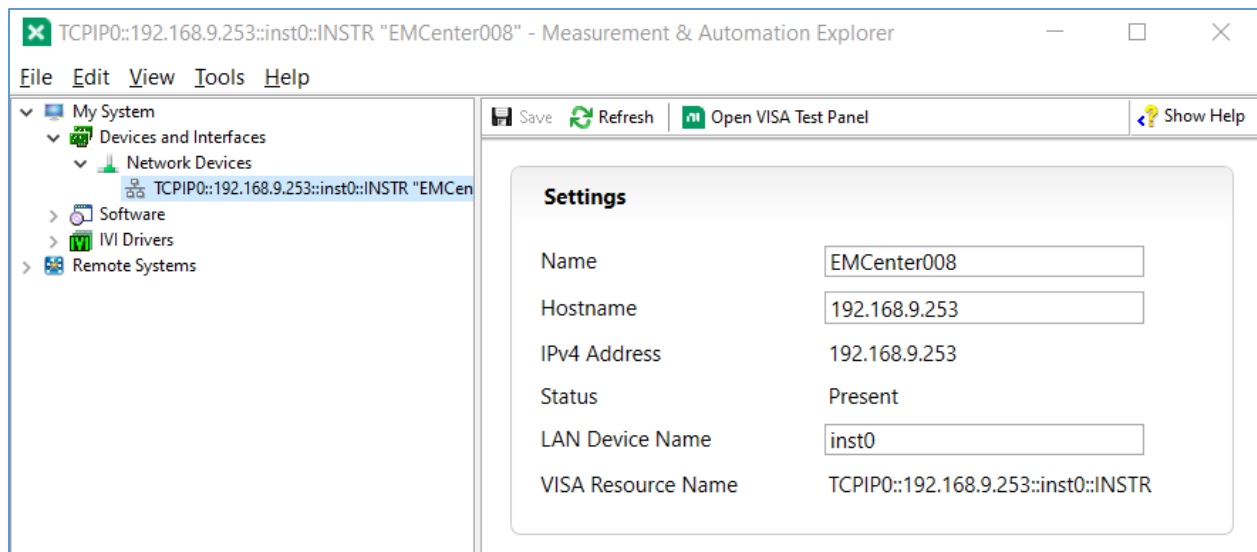
- f. Choose LAN resource:



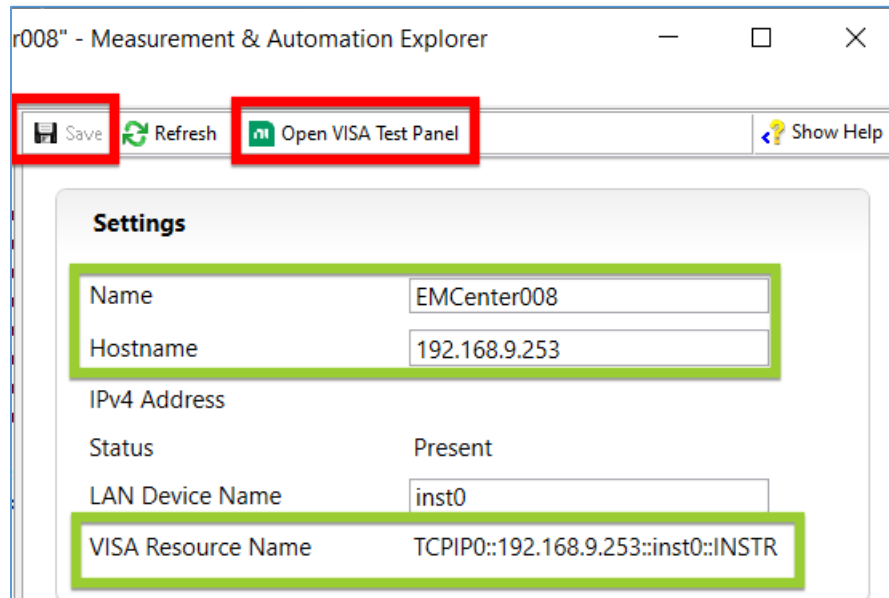
- g. If the device supports the VXI-11 (LXI) protocol, you can auto-detect the instrument if it is active on the local network.
- h. If the device is NOT VXI-11 compliant, is not active on the network and/or does not auto-detect on the system, then you will need to use one of the “Manual Entry” options.
- i. **NOTE:** Refer to your instrument documentation and NI-MAX help for more details on manual configuration of a network device. This may be as

simple as knowing the IP address and/or socket of the instrument you are trying to connect to.

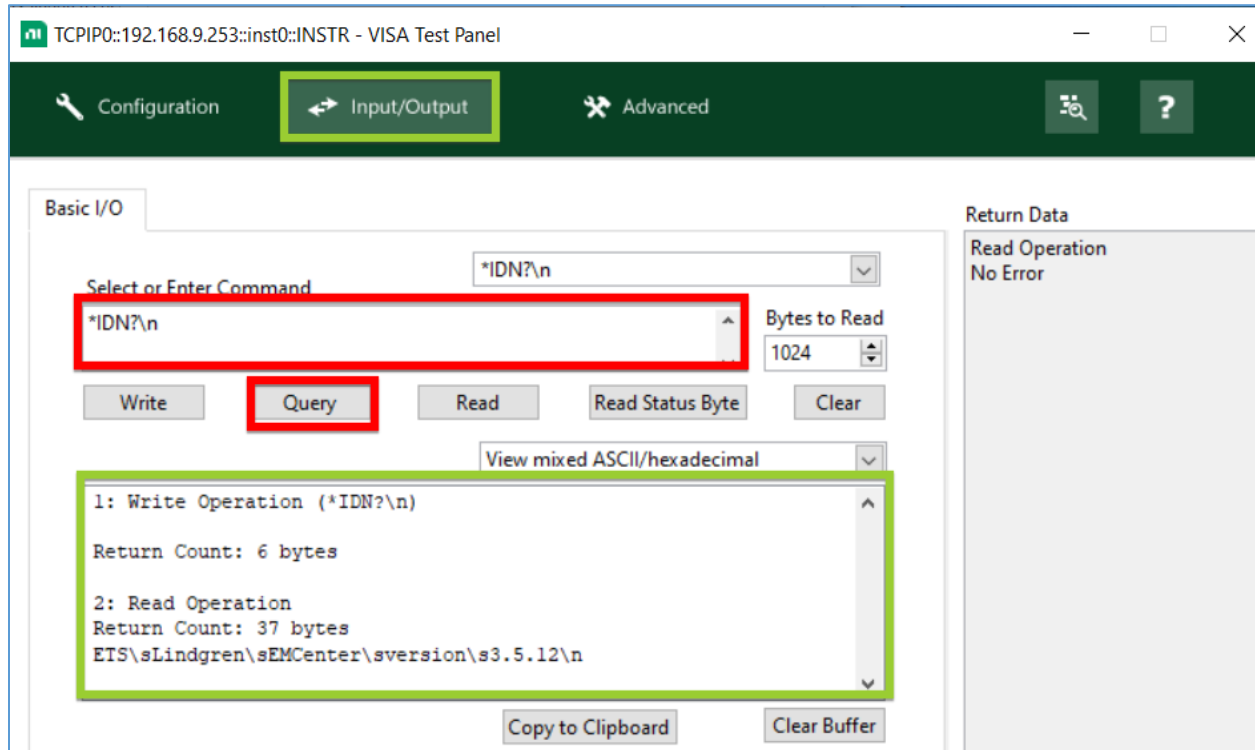
- j. Details of network configuration can be complex and are beyond the scope of this section. Make sure your network-enabled instrument is configured properly and accessible to the computer you are attempting to communicate with via MAX and TILE.
- k. Once your device is properly configured in MAX it will be listed in the Network Devices list, along with the VISA string you will use to communicate with it in TILE:



- l. OPTIONAL, you can create a VISA Alias name for this device that will make it easier to refer to in TILE, such as "EMCenter008".
- m. Make sure to press the Save button after creating a VISA Alias name or making any changes to your device.

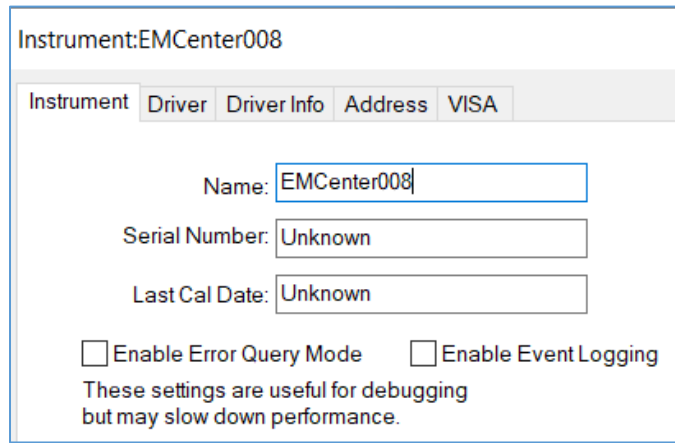


- n. To test your connection select “**Open Visa Test Panel**” above your instrument on the settings page, in the Test Panel, select “**Input/Output**” and **Query** the instrument.



4. Run TILE:

- a. Add a new instrument in the Instrument View and **name** it.



Instrument:EMCenter008

Instrument Driver Driver Info Address VISA

Name:

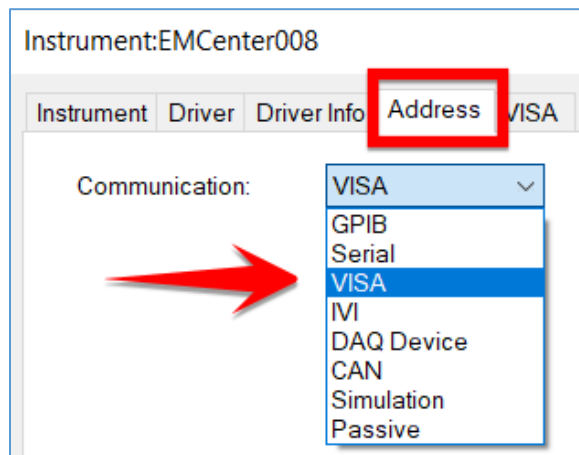
Serial Number:

Last Cal Date:

Enable Error Query Mode Enable Event Logging

These settings are useful for debugging but may slow down performance.

- b. On the Address tab and change the **Address** Communication type to **VISA**:



Instrument:EMCenter008

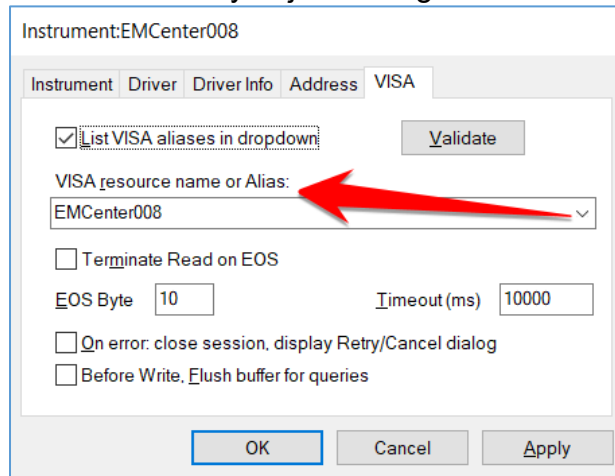
Instrument Driver Driver Info **Address** VISA

Communication:

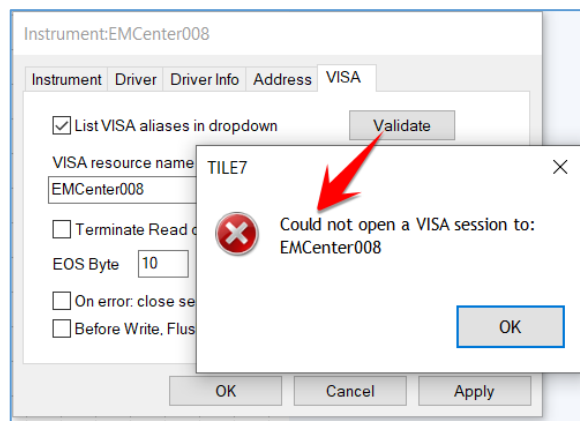
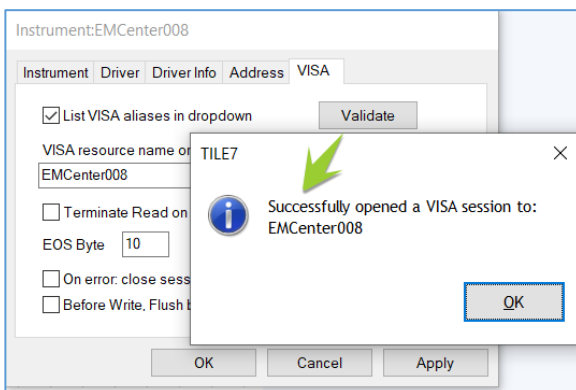
- VISA
- GPIB
- Serial
- VISA
- IVI
- DAQ Device
- CAN
- Simulation
- Passive

A red arrow points to the dropdown menu, and a red box highlights the 'Address' tab.

- c. On the VISA tab, change the “**VISA Resource Name or Alias**” to the network device you just configured in NI MAX ... “*EMCenter008*”.



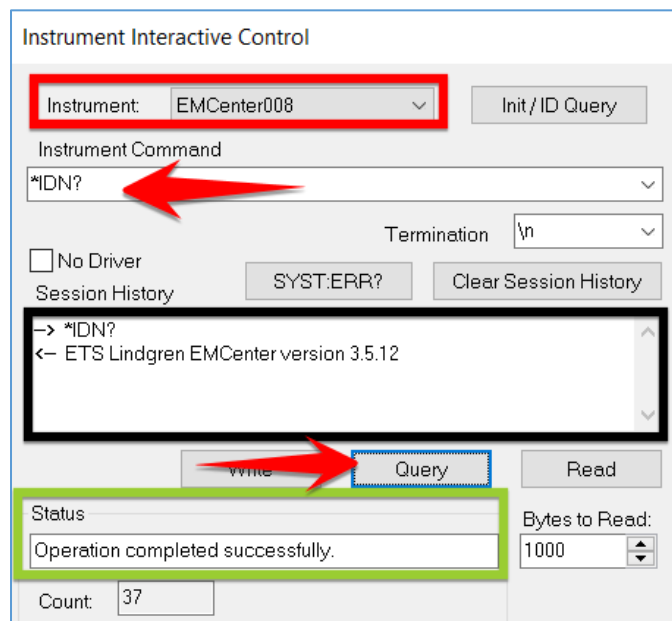
- i. Option 1: Click the drop-down arrow and view a list of all available NI VISA configured instruments on the system.
 - ii. Option 2: Copy/paste a VISA resource name from directly into this box. For example, “*TCP/IP0::192.168.9.253::inst0::INSTR*”.
- d. Once the VISA resource name has been populated, validate the VISA connection to the instrument by pressing the **Validate** button. A popup message will appear indicating **success** or **failure**.
- i. **NOTE:** If an error occurs, it is a good idea to return to MAX to validate the proper configuration of the device. If MAX cannot successfully communicate to the device, then TILE will not be able to either.



- e. **NOTE:** Unlike with GPIB/Serial instruments, TILE will attempt to open VISA sessions (and communicate) to all VISA-configured instruments in a profile immediately upon loading the profile.
 - i. This means that any VISA-configured instruments listed in a profile that are not accessible when the profile is opened will generate warning prompts similar to the one shown above.
 - ii. However, this does not prevent the profile from opening. If the instruments become active after the profile is opened, then they will be accessible by the profile at that time.
- 5. Once the VISA device has been successfully configured, you should be able to communicate to it with any Action or utility in TILE as if it were a standard GPIB or Serial device.
 - a. A useful tool to verify basic device communication is the **Instrument Interactive Control utility**, accessible via the toolbar button showing the hand and wand icon.



- b. Sending the *IDN? command to most instruments will return an ID string and verify basic device communication is functional:



6. Finally, it should be pointed out that TILE can access network-enabled VISA devices without first configuring them in NI MAX. It is only necessary to know the correct VISA resource name that will communicate with the device, and entering that resource name in the TILE VISA resource name input on the instrument's Address tab.
7. There are numerous benefits of using a VISA configuration utility such as MAX, however:
 - a. Instruments are configured and verified independently of TILE.
 - b. Auto-detect feature of MAX may be able to detect and configure available instruments automatically.
 - c. VISA resource names are produced in MAX using only network-specific information such as IP address and socket number. The specific VISA syntax is generated by the utility.
 - d. VISA resource names and aliases created in MAX become automatically available in the TILE VISA resource name dropdown list. Devices that have not been "pre-configured" in MAX will not appear in the dropdown list.
8. Thank you for watching this video.