Prerequisites

- <u>NI-VISA</u>
- NI MAX
- PXI VNA software
- LabVIEW

The VISA library is a widely used software input-output interface in the field of test and measurement for controlling devices from a personal computer. It contains a library of functions for programs such as LabVIEW to control the instrument. NI-VISA can be downloaded here: <u>https://www.ni.com/visa/</u>

NI MAX is needed to configure the analyzer and the interface. NI MAX is included with NI-VISA. No additional downloads are necessary.

PXI VNA software is the main VNA application needed to drive the analyzer module. It takes raw measurements from the analyzer module and processes them into complex S-parameters which can be represented in different display formats. The PXI VNA software must always be running when automating the analyzer module via LabVIEW.

LabVIEW is the primary programming environment for the PXI S5090 network analyzer. A licensed version of the software can be downloaded here: <u>http://www.ni.com/en-us/support/downloads/software-products/download.labview.html#305508</u>

Steps to configure LabVIEW for PXI VNA

 To enable remote control of the analyzer, select either HiSLIP server or Socket server in the settings of the VNA application.

<u>HiSLIP</u> System > Misc Setup > Network Remote Control Settings > HiSLIP Port - 4880 (default) > HiSLIP Server -ON

<u>Socket Server</u> System > Misc Setup > Network Remote Control Settings > Socket Port - 5025 (default) > Socket Server – ON

HiSLIP server and Socket server use various network protocols based on the TCP/IP protocol. HiSLIP is a specialized protocol developed for measuring and test equipment. TCP/IP Socket is a general-purpose protocol.



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Launch NI MAX and navigate to 'Devices and Interfaces' tab to see the list of connected instruments.



 Automation of the network analyzer is based on the TCP/IP protocol. Hence, select 'Network Devices' under 'Devices and Interfaces' tab and add the 'Network Device' using 'VISA TCP/ IP Resource'.





 Choose either 'Manual Entry of LAN Instrument' or 'Manual Entry of Raw Socket' to add the VISA resource and click 'Next.'.



5) IP address would be the actual address of the computer running the application if automating remotely, or 127.0.0.1 (or localhost) if automating locally. 'Validate' button can help to verify the connection quickly.

💦 Network Devices - Measurement & Automation Explorer		_		\times
File Edit V 🂦 Create New	?	×		
V 📮 My Sys			💡 Hide H	lelp
✓ 👹 Dev Enter the LAN resource details.	STRUM	ENTS		~
Enter the TCP/IP address of your VISA network resource in th form of xxx. xxx. xxx, the hostname of the device, or a computer@some.domain	9		ork	^
> Remoti			k and	
Hostname or IP address			his	
127.0.1			n view	
Bet Musher			a	
Validate	_		NOLK	
Measurement & Automation Explorer	×		<u>ork</u>	
Successfully opened a VISA session to "TCPIP0::127.0.0.1::5025::SOCKET"	,		dback	
ОК			for t.	
< Back Next > Finish	Cance	:		\sim



Note: Adding an 'Alias' name makes it easier to identify your instrument.

🔀 Create New				?	×
Specify an alias for this resc	ource (optional).			TIONA FRUM	L ENTS
	You can specify an a for a device that mak Use aliases in your co without specifying the You may assign or ch alias editor or by click Type in the alias you alias field blank to not Resource Name: Alias:	ias for this device. An alias is a es it easier to identify your instru- ir full VISA resource strings. ange the alias at a later time the ing on the device to rename it. want to assign to this device or assign an alias to this device. TCPIP0::127.0.0.1::5025::S0 PXIe-S5090	logical name iment. iough the leave the DCKET	3	
	< Back	: Next > Fin	ish	Cance	

Once 'Finish' button is clicked, the VNA software is ready to begin automating.

6) The newly created VISA resource should be displayed under 'Devices and Interfaces'. Using the 'VISA Test Panel', automation commands can be tested. Here is an example of *IDN? query to check the device connection.

💥 TCPIP0::127.0.0.1::5025::SOCKET - VISA Test Panel		-		\times
Configuration Input/Output 🔅 Advanced NI I/O Trace	Help	V	NATIONA NSTRUM	IL ENTS
Basic I/O Select or Enter Command *IDN?\n IDN?\n Bytes to Read 1024 Delta De	Return Data Read Opera No Error	ation		



At this point, the instrument should be ready to be controlled from LabVIEW. Using the VISA VI, you can
initialize the connection. The VISA resource name created using NI MAX should appear in the dropdown

VISA resource name	VISA resource name out
^I ∕ ₈ PXIe-S5090 ▼	1/2
PXIe-S5090	
Refresh	out ID string
Yes 2000	00
No	
Reset? (T: Yes)	
() Yes	
No	
error in (no error)	error out
error in (no error) status code	error out status code
error in (no error) status code	status code
error in (no error) status code	status code
status code	error out status code

Further information on tutorials and examples of LabVIEW programs can be found here:

http://www.ni.com/academic/students/learn-labview/ http://www.ni.com/getting-started/labview-basics/examples

