Optilnstrument Getting Started

Instruments Remote Communication and Control Software

Version 1.0



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Product Overview

Optilnstrument software graphical user interface (GUI) is designed to communicate and control with different instruments and devices through SCPI commands. Optilnstrument software allows users to connect multiple devices over physical layer or TCP/IP protocol layer.

Optilnstrument enables the automation of testing and characterization of modules and devices using its powerful command sequence builder where a user can build a sequence of commands involving various instruments from different vendors to perform the testing.

Optilnstrument software has a Python script generator which allows users to create an executable Python script for the command sequence which can be used for the automation process. The Python script can be executed independently of Optilnstrument GUI.

Optilnstrument also has a data acquisition feature which allows the user to import graphical waveform data from a device as well as command sequence output results and then export the data in an appropriate format.

GUI Description

The GUI of Instrument is shown below. The following is a description of its icons, fields and toolbar.

Untitled - Optilnstrument				- 0 ×
File Edit View Help	Menu and Tool bar Instrument selection drop-down menu			
Instruments	Current Active Instrument: Exfo LTB8			
🚱 📴 🎼 🖳 TCP/IP address:	🕥 🗙 🚾 🎇 Available Instrum Erfo (TBS 🗸 🗸	▲ Display		→ # ×
Instruments Info		- X -		
E Instruments		A	B C D	E F A
TCPIP0: 172 22 2 5:5025 Exto LTB8	Write VI_SOLLESS	1		
TCPIP0.172.22.2.5.inst0 TCPIP0.172.22.2.	Write Query Write(Read	2 3		
SARLISINSTR ASRLISINSTR		4		
	4 1/0 Settings b	6		
		7		
	EXFO · Inc., LTB-8,990681,1.8.0.203 Display window for waveform	9		
	and data visualization	10		
	Command <u>se</u> quence builder	12		
		13		×
	ζ V	4 Grid Graphs		Þ
	Command Services			
		Since time	rati (0	***
	Status Device Commands	arcep une	Туре	Output
	3			
	4			
	5 Instruments and other settings			
	windows			
	9			
	10			
📖 Instruments	11			
C List Of Command Sequence	13			
SCPI Commands	14			
Documents	16			
Python script	17			
»	10 C			~
	- 0%			CAP NUM SCRL

Menu Bar

The menu bar of OptiInstrument GUI is shown below. It has a standard File, Edit, View and Help dropdown menus for various functions.

File Edit View Help

File

File menu has all relevant functions to enable users to save, open and create new files of sequence commands.



Edit

Edit menu contains functions such as **Undo**, **Copy**, **Paste** and **Cut** of SCPI commands which are typed in the command testing and command sequence windows described below.

Untitled - Optilnstrument					
: File	Edit	View	Help	_	
		Undo	CtrI+Z		
		Cut	CtrI+X		
Instrum		Сору	Ctrl+C		
6		Paste	Ctrl+V		
Instrume	nts				Info
	Instrur	nents			

View

View menu contains functions such as show/hide different windows as well as sequence execution **Status Bar** and instrument **Caption Bar**. The user can also customize these drop-down menus using **Customize...** option under the View menu.

😐 Untitled - (Optilnstrument			
File Edit	View Help			
	Toolbars and Docking Windows	~	Standard	
	✓ Status Bar		Command Sequence	1
List Of Comma	 Caption Bar 		Display	2 <mark>.2.5::</mark>
🚾 🚾 📠	Refresh		Customize	PO::172
List	Info	1		

Status Bar and Caption Bar

The user can enable/disable the **Status Bar** and the **Caption Bar** by selecting or unselecting the relevant bar from the **View** drop-down menu.

The **Status Bar** appears at the bottom of OptiInstrument GUI as shown in the image below. It contains a progress bar on the left side, which shows the execution progress of the sequence of commands.

>> 28 nnv (cv4.) T00	ו ואנה.ראו רא.חרם.נדאדס	Λ	×
0%			CAP NUM SCR

The **Caption Bar** appears at the top of OptiInstrument GUI, just below the menu bar as shown in image below. The **Caption Bar** initially is blank with no text in it. However, when the user

attempts to connect to any instrument, the bar displays "**Searching for available instruments**" as you can see in the image below.

Searching for available instruments							
🔠 🗙 🔟 Available Instruments:	∧	Display					₹ ₽ ×
	1	🛋 🗙					
	Cantion bar		Α	В	С	D	^
Write V	caption bar	1					
Once OptiInstrument software has de	tected and connecte	d to a	n instru	ument(s), it cha	nges th	е

text showing current active instrument's name. When a new instrument is connected, the text displayed in the bar is "Working on it".

Current Active Instrument: TCPIP0::172.	22.2.5::inst0::INSTR			
🔠 🗙 🔟 Available Instruments:	TCPIP0::172.22.2.5::inst0::INSTR ~	^	Display	→ ₽
			I 📫 🖌	

Help

The **Help** drop-down menu contains information on the software build version as well as contact and support details as shown below.



GUI Toolbar



The **Toolbar** shown in the image above appears just below the **Menu** bar and it has several buttons for various application in the GUI.

The button is used for connecting the software to the available device(s)/instrument(s), which are either physically connected or though TCP/IP RAW socket connection. Once the button is pressed, OptiInstrument is automatically connected to all of available device(s)/instrument(s) as it will show up in the Instruments tab.

The button is used for waveform data acquisition. This button allows the user to acquire graphical data after the sequence of commands of an instrument has been executed. Once this button is pressed, the GUI acquires the waveform data and store it in an excel csv spreadsheet as shown in the **Display window**. It also acquires the waveform displayed when the user switches the setting from **Grid** tab to **Graphs** tab.

button allows the user to hide/show the command sequence window.

The **button** allows the user to hide/show the **display** window used to display the acquired data of a waveform in a grid format and in a view mode format.

The button opens the **About OptiInstrument** window, which shows the product build version and Optiwave's contact information as well the technical support details.

Navigation Panes

The

There are different navigation panes in OptiInstrument GUI. The title of the different available panes is shown in the image below. Users can switch between the panes by simply clicking on the relevant tab shown in the image. When a tab is selected the color of its background changes from grey to light blue. The functions of each pane are described below.

Instruments	
List Of Command Sequence	
SCPI Commands	
Documents	
Py Python script	
	» *

Instruments

The **Instruments** pane has the connection control and connection setting parameters. Users establish communication between OptiInstrument software and the instrument(s) using this pane. The pane shows all connected instrument(s) to the GUI in a list format when the **expand sign (+)** on left of the instrument name is clicked as shown in the image below. Less information is displayed when the **minimize sign (-)** is pressed. The **instrument alias** setup as well as the display option of either the **resource name** or **alias name** is also available in this pane.

Instruments						
🚱 🙋 👫 🚆 TCP/IP address:	· · · Port:					
Instruments	Info					
TCPIP instruments						
□	Exfo LTB8					
E-Carl Instrument Info						
Interface Type	TCPIP					
Interface Descript	TCPIP0 (LAN <-> mike-tc-m73)					
Computer Hostna	172.22.2.5					
Port Number	5025					
Dot Notation Add	172.22.2.5					
Resource Manuf	4086					
Resource Name	TCPIP0::172.22.2.5::5025::SOCKET					
Identification *IDN?	EXFO Inc.,LTB-8,990681,1.8.0.203					
User Description	EXFO Inc.,LTB-8,990681,1.8.0.203					
TCPIP0::172.22.2.5::inst0:	TCPIP0::172.22.2.5::inst0::INSTR					
a ASRL instruments						
ASRL1::INSTR	ASRL1::INSTR					
	**					
🛄 Instruments	🛄 Instruments					

List of Command Sequence

This pane lists the sequence of SCPI commands that a user has built previously and had loaded to OptiInstrument GUI or he is currently building as shown in the image below. This pane allows the user to **export**, **import** and **save** the sequence of commands in an XML format. It also allows the user to **edit** the commands as well as the sequence, **modify** and **delete** command(s) from the sequence.

There are different buttons on the top left of the **List of Command Sequence** pane, which allow the user to perform different functionality such as **import**, **export**, and **add** or **close** the command sequence. The description of each button is the following:

- button allows the user to **open** a sequence command saved in an XML file.
- button allows the user to **open** and **add** to an existing sequence or to a sequence the user is currently working on.
- button allows the user to save a sequence of commands as an XML file.
- Button allows the user to clear the existing list of sequences from the pane.

	Info
🔚 List Of Command Sequence	
EFP4_test	
squi *CLS	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
spi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
:LINS2:SOURce:DATA:TELecom:ETHemet:PORT:TRANsceiver CFP4P	TCPIP0::172.22.2.5::5025::SOCKET
sqri :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
:LINS2:SOURce:DATA:TELecom:ETHemet:PORT:TRANsceiver?	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:SOURce:DATA:TELecom:ETHemet:BERT:FRAMing?	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:SOURce:DATA:TELecom:ETHemet:PHY:TYPE?	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:OUTPUT:TELecom:LASer ON	TCPIP0::172.22.2.5::5025::SOCKET
sqri :LINS2:OUTPUT:TELecom:LASer?	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:SOURce:DATA:TELecom:PATTem:TYPE?	TCPIP0::172.22.2.5::5025::SOCKET
sopi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
	TCPIP0::172.22.2.5::5025::SOCKET
spi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
scpi :LINS2:SOURce:DATA:TELecom:ETHemet:STReam:RATE?	TCPIP0::172.22.2.5::5025::SOCKET
scpi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
scpi :LINS2:SOURce:DATA:TELecom:ETHemet:STReam:TX:STATus ON	TCPIP0::172.22.2.5::5025::SOCKET
scpi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET
spi :LINS2:SOURce:DATA:TELecom:ETHemet:STReam:TX:STATus?	TCPIP0::172.22.2.5::5025::SOCKET
spi :LINS2:CONF:WAIT:TIME 5000	TCPIP0::172.22.2.5::5025::SOCKET

SCPI Commands

This pane lists; as a default, the common SCPI commands defined per **IEEE488.2 standard** and make them available in the list of commands for the user. This list has the main commands that are supported by most instruments and devices that support SCPI commands.

The **SCPI Commands** pane allows the user to open XML files that has the SCPI command for various instruments that user may be working with. The list is shown under the common commands. Using the **maximize (+) and the minimize (-) controls** on the left of the command file name, users can expand the list into a more detailed list of commands. Users can keep clicking on the **(+) sign** on the left of each command in the list to expand it into more **detailed (long) form** of

the SCPI command until the full command details are displayed as shown in the image below. Similarly, by clicking the (-) sign the list collapses.

There are several buttons on the top left of the **SCPI Commands** pane, which allow the user to **import**, **export**, **add** to existing list and **delete** command(s) from the pane.

The ^{mage} button allows the user to **import** an XML file containing specific SCPI commands of the instrument.

The 🛅 button allows the user to **open** commands list.

The button allows the user to **delete** command(s) from the opened list of commands, except the common commands list which by default are always open in the tab.

The Button allows the user to **collapse** the expanded command list into a collapsed list for better visualization of open commands.

SCPI Commands	
🖬 🎬 📴 🖓	
SCPI commands list	SCPI command long name
IEEE488.2 Common Commands	
sapi *CLS	*CLS
sqvi *ESE	*ESE
squi *ESE?	*ESE?
sapi *ESR	*ESR
sepi *IDN?	*IDN?
sepi *OPC	*OPC
sepi *OPC?	*OPC?
sepi *SRE	*SRE
sapi *SRE?	*SRE?
sapi *STB?	*STB?
sapi *RST	*RST
sapi *TST?	*TST?
sqni *WAI	*WAI
👳 Cmd88xx cmd tree	
> LINStrument	
CONFig	
DATA	
TELecom	
sepi LOAD	LINStrument:CONFig:DATA:TELecom:LOAD
sepi SAVE	LINStrument:CONFig:DATA:TELecom:SAVE
>	
squi FORMat	LINStrument:CONFig:TIMe:FORMat
WAIT	
ser IIME	LINStrument:CONFig:WAIT:TIME
FETCh	
Instruments	······
List Of Command Sequence	
SCPI Commands	

Documents

This pane allows the user to **open** any type of documents. Once the document is imported, the title of the document will be shown in the pane as illustrated in the image below.

There is a single button on the top left side of the pane. This button allows the user to **import** any kind of documents to Optilnstrument GUI. To open the document, simply **double click** on it. The document opens only if the type of file is supported on the machine hosting Optilnstrument software. For example, if the document is a pdf file, then it will open using Adobe Reader or any other pdf compatible application.

Documents	
<u>Ľ</u>	
Documents	
ug-mxs-9100-hw-rev-b_20190621.pdf	
user_guide_ftbx-2850_englishv1p20.pdf	
<	>
<	>
< The second sec	>
	>
	>

Python Script

This pane is used for Python scripting. When a user executes any command through the command execution window, OptiInstrument creates an executable Python script for that command. The generated script can be executed using command prompt. This pane allows the user to **save**, **modify** and **execute** any Python script as well. This capability allows users to execute features that are not supported by OptiInstrument GUI such as logic control and looping options.

There are various buttons located at the top of the Python Script pane as shown below. Some of them are similar to those of the toolbar.



The *button* allows you to **open** Python script files in OptiInstrument GUI, which can be executed from the GUI. The Python script can also be modified and saved as well.

The 😼 button is used for **saving** the Python script files.

The next three buttons 🐰 🗈 🗈 are for **cut**, **copy** and **paste**, respectively, which are standard for the text editing.

The Control The Co

The ^{a-b} button is used for **placing dots** in white spaces in the script, so the script text is more legible and easier to modify.

The A button is used for **text font** settings. When the user clicks on the button, a dialog box with various font attributes opens up as shown in the image below. Users can change **font type**, **size**, and **colour** of the text. Also, users can change the **foreground** and **background colors** so the text is easily visible and can be differentiated between different segments in the script.

Font and Color Settings	×
Color Text Text Selection Number Keyword Comment String	Font: Courier Size: 10 pt Choose Font Sample
Foreground	AaBbCcXxYyZz
Background	Reset All
 Automatic 	OK Cancel

The 🔀 button is used for **executing** Python scripts. An example of a Python script generated for a sequence of SCPI commands is shown below. This script can be executed using \mathbb{R} button.

Python script							
🚰 🛃 🐇 🖺 🗠 🗠 🗛 🐯							
00 import pyvisa	~						
01 import visa							
02 from visa import constants							
03							
nadef ParameterSettings(inst):							
is inst timeout = 2000							
inst set visa attribute(constants VI ATTR IO PROT_constants VI PROT_NORMAL)							
inst set visa attribute(constants VI ATTR SEND END EN constants VI TRUE)							
inst set wise attribute (constants VI ATTR SUPPRESS END EN constants VI TRUE)							
inst set visa attribute(constants VI ATTR TERMCHAR EN constants VI TRUE)							
inst read termination = Constants. +1_ATTA_TARTA_TARTA_TARTA							
inst inst transfer and the second sec							
inst wirds attribute (constants VI ATTR TOPIC VEEDALIVE constants VI TOUR)							
inst.set_Visa_attribute(constants.vi_ATR_TCFIF_KEFALIVE, CONstants.vi_INCE)							
inst.set_visa_attribute(constants.vi_AITR_ICFIF_WODELAY, Constants.vi_IKOE)							
suer commanuQuery() :							
try :							
m = pyvisa.ResourceManager()							
inst = rm.open_resource("ICPIPU::172.22.2.5::5025::SOCKEI")							
19 ParameterSettings(inst)							
20 print(inst.query('*IDN?'))							
21 Inst close()							
22 except visa.Error as ex:							
23 print("An error occurred: %s" % ex)							
24 print(inst.last_status)							
25 CommandQuery()							
26							
	\sim						
< >							
Instruments							
	_						
List Of Command Sequence							
SCRI Commande							
Documents							
E Python script							

Connecting GUI to Instruments

Users need to follow the steps below to connect Instrument(s) either remotely or physically to OptiInstrument software computer host.

Manual Connection: TCP/IP Supported Instruments

- 1. Make sure that the instrument you are trying to connect to is connected via an ethernet cable or wirelessly to the same network that OptiInstrument software host computer is connected to it via **TCP/IP** protocol.
- 2. Type the instrument/device's **IP Address** and the **port number** in the specified fields for the TCP/IP compatible instrument as shown below.

💊 🙆 👫 쁲 TCP/IP address:			•	Port:
3. Press button to connect to the inst	trumen	t.		
💽 🙋 👫 🕎 TCP/IP address: 🛛				Port:

4. It will take few seconds for the instrument/device to connect and show up in the Instruments tab.

Automatic Connection: Serial, GPIB, USB and TCP/IP Supported

Instruments

- 1. For physically connected instruments, the user does not need to specify the **IP address** and **Port number** of the instrument to allow automatic connection.
- 2. Press the **refresh button** to connect **Serial**, **USB** and **GPIB** bus interface instruments to Optilnstrument software as shown below. There are two refresh buttons, one located above the menu bar and the other one is located in the Instrument's panel. Pressing this button will automatically connect the instruments to the GUI and show them up in the Instruments tab.
- 3. The **refresh button** can also be used to connect to available instruments automatically, which are connected to the same network as the workstation. In this case, it does not matter what type of connection, **physical** or over **TCP/IP**, it detects them and connects to them.

Untitled - Optilnstrument

File Edit View Help								
Instruments								
💽 🙋 👫 🚆 TCP/IP address:	· · · Port:							
Instruments	Info							
⊡								
TCPIP instruments								
TCPIP0::172.22.2.5::5025:	Exfo LTB8							
🖃 💼 Instrument Info								
Interface Type	TCPIP							
Interface Descript	TCPIP0 (LAN <-> mike-tc-m73)							
Computer Hostna	172.22.2.5							
Port Number	5025							
Dot Notation Add	172.22.2.5							
Resource Manuf	4086							
Resource Name	TCPIP0::172.22.2.5::5025::SOCKET							
Identification *IDN?	EXFO Inc.,LTB-8,990681,1.8.0.203							

Setting-up Instrument Alias

Once the instrument is connected to the OptiInstrument GUI, the user can assign an alias name for it. The alias name can be easily recognized and identified for the instrument.

1. Press the **alias** button e shown in the **Instruments** pane to **open** the alias setup dialog box.

Instruments	
💽 🙋 👫 🚆 TCP/IP address:	· · · Port:

- 2. The alias setup dialog box shows all available connected instruments as well as previously saved instruments in the registry. There are three columns in the dialog box, which are the instrument's **Resource name**, **Alias name** and **Description** of it as shown below.
- 3. To assign an alias name for any instrument, highlight the column of **Alias name**, then click the raw beside the instrument of interest to assign an alias name for it.

n Registry	Resource name	Alias name	Description	^	ОК
\checkmark	TCPIP0::172.22.2.1::inst0::INSTR	RIGOL_DS1054Z_Oscilloscope			
\checkmark	TCPIP0::172.22.2.2::inst0::INSTR	RIGOL_DG1022Z_FunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015		Cancel
	TCPIP0::172.22.2.5::5025::SOCKET	Exfo LTB8	EXFO Inc.,LTB-8,990681,1.8.0.203		
	USB0::0x1AB1::0x04CE::DS1ZA201204659::INSTR	RIGOL_DS1054Z_Oscilloscope	RIGOL TECHNOLOGIES, DS1054Z, DS1Z		
	USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR	RIGOL_DG1022Z_FunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015		
	TCPIP0::172.22.2.5::inst0::INSTR	TCPIP0::172.22.2.5::inst0::INSTR	EXFO Inc.,LTB-8,990681,1.00.22		
	ASRL1::INSTR	ASRL1::INSTR			

4. Select the current Alias name and modify it as needed.

n Registry	Resource name	Alias name	Description	^	ОК
\checkmark	TCPIP0::172.22.2.1::inst0::INSTR	RIGOL_DS1054Z_Oscilloscope			
	TCPIP0::172.22.2.2::inst0::INSTR	RIGOL_DG1022Z_FunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015		Cance
	TCPIP0::172.22.2.5::5025::SOCKET	Exfo LTB8	EXFO Inc.,LTB-8,990681,1.8.0.203		
	USB0::0x1AB1::0x04CE::DS1ZA201204659::INSTR	RIGOL_DS1054Z_Oscilloscope	RIGOL TECHNOLOGIES, DS1054Z, DS1Z		
2	USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR	RIGOL DG10227 EunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015		
	TCPIP0::172.22.2.5::inst0::INSTR	Tunable Laser Source	EXFO Inc.,LTB-8,990681,1.00.22		
	ASRL1::INSTR	ASRL1::INSTR			

5. To save the alias name, check the box in the **In Registry** column beside the updated alias name. It is not required to update the alias name in the future when connecting to the same instrument.

In Registry Resource name Alias name Description ✓ TCPIP0::172.22.2.1:inst0::INSTR RIGOL_DS10542_Oscilloscope ✓ TCPIP0::172.22.2.2:inst0::INSTR RIGOL_DG1022Z_FunctionGenerator Rigol Technologies,DG1022Z_DG12A2015 ✓ TCPIP0::172.22.2.5::5025::SOCKET Exfo LTB8 EXFO Inc.,LTB-8,990681,1.8.0.203 ✓ USB0::0x1AB1::0x04CE::DS12A201204659::INSTR RIGOL_DS10542_Oscilloscope RigOL TECHNOLOGIES,DS10542,DS12 ✓ USB0::0x1AB1::0x04CE::DS12A201501452::INSTR RIGOL_DS1052Z_FunctionGenerator Rigol Technologies,DG1022Z,DG12A2015 ✓ USB0::0x1AB1::0x04CE::DS12A201501452::INSTR RIGOL_DC1022Z_FunctionGenerator Rigol Technologies,DG1022Z,DG12A2015 ✓ USB0::0x1AB1::0x04CE::DS12A201501452::INSTR RIGOL_DC1022Z_FunctionGenerator Rigol Technologies,DG1022Z,DG12A2015 ✓ USB0::0x1AB1::0x04CE::DS12A201501452::INSTR Tunable Laser Source EXFO Inc.,LTB-8,990681,1.00.22 ✓ ASRL1::INSTR ASRL1::INSTR	🔲 Alias Setu	qu				2
☑ TCPIP0::172.22.2.1::inst0::INSTR RIGOL_DS1054Z_Oscilloscope ☑ TCPIP0::172.22.2.:inst0::INSTR RIGOL_DG1022Z_FunctionGenerator Rigol Technologies,DG1022Z,DG1ZA2015 ☑ TCPIP0::172.22.2.:iso25::SOCKET Exfo LTB8 EXFO Inc.,LTB-8,990681,18.0.203 ☑ USB0::0x1AB1::0x0642::DS1ZA201204559::INSTR RIGOL_DG1022Z_FunctionGenerator Rigol Technologies,DG1022Z,DG1ZA2015 ☑ USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR RIGOL_DG1022Z_FunctionGenerator Rigol Technologies,DG1022Z,DG1ZA2015 ☑ TCPIP0::172.22.2.5::inst0::INSTR Tunable Laser Source EXFO Inc.,LTB-8,990681,1.00.22 ☑ TCPIP0::172.22.2.5::inst0::INSTR ASRL1::INSTR ASRL1::INSTR	In Registry	Resource name	Alias name	Description	^ C	ж
Image: Constraint of the second se		TCPIP0::172.22.2.1::inst0::INSTR	RIGOL_DS1054Z_Oscilloscope			
Image: Constraint of the second sec	\checkmark	TCPIP0::172.22.2.2::inst0::INSTR	RIGOL_DG1022Z_FunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015	Car	ncel
USB0::0x1AB1::0x04CE::DS1ZA201204659::INSTR RIGOL_DS1054Z_Oscilloscope RIGOL TECHNOLOGIES,DS1054Z,DS1Z USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR RIGOL_DG1022Z_FunctionGenerator Rigol Technologies,DC1022Z,DG1ZA2015 Image: DC1PP0::172.22.5::inst0::INSTR Tunable Laser Source EXFO Inc.,LTB-8,990681,1.00.22 ASRL1::INSTR ASRL1::INSTR ASRL1::INSTR Image: DC1 Inc.,LTB-8,990681,1.00.22 Image: DC1 Inc.,LTB-8,990681,1.00.22 Image: DC1 Inc.,LTB-8,990681,1.00.22 Image: DC		TCPIP0::172.22.2.5::5025::SOCKET	Exfo LTB8	EXFO Inc.,LTB-8,990681,1.8.0.203		
USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR RIGOL_DG1022Z_FunctionGenerator Rigol Technologies,DG1022Z,DG1ZA2015 TCPIP0::172.22.2.5::inst0::INSTR Tunable Laser Source EXFO Inc.,LTB-8,990681,1.00.22 ASRL1::INSTR ASRL1::INSTR ASRL1::INSTR		USB0::0x1AB1::0x04CE::DS1ZA201204659::INSTR	RIGOL_DS1054Z_Oscilloscope	RIGOL TECHNOLOGIES, DS1054Z, DS1Z		
Image: Contract of the second seco	\checkmark	USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR	RIGOL_DG1022Z_FunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015		
ASRL1::INSTR ASRL1::INSTR ASRL1::INSTR		TCPIP0::172.22.2.5::inst0::INSTR	Tunable Laser Source	EXFO Inc.,LTB-8,990681,1.00.22		
Image: Constraint of the second se		ASRL1::INSTR	ASRL1::INSTR			
Image: Section of the section of t						
					~	
					•	

6. Press **OK** to save the changes made as shown below.

Alias Setup

In Registry	Resource name	Alias name	Description	^	ОК
\checkmark	TCPIP0::172.22.2.1::inst0::INSTR	RIGOL_DS1054Z_Oscilloscope			
	TCPIP0::172.22.2.2::inst0::INSTR	RIGOL_DG1022Z_FunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015		Cano
\checkmark	TCPIP0::172.22.2.5::5025::SOCKET	Exfo LTB8	EXFO Inc.,LTB-8,990681,1.8.0.203		
	USB0::0x1AB1::0x04CE::DS1ZA201204659::INSTR	RIGOL_DS1054Z_Oscilloscope	RIGOL TECHNOLOGIES, DS1054Z, DS1Z		
	USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR	RIGOL_DG1022Z_FunctionGenerator	Rigol Technologies, DG1022Z, DG1ZA2015		
2	TCPIP0::172.22.2.5::inst0::INSTR	Tunable Laser Source	EXFO Inc.,LTB-8,990681,1.00.22		
	ASRL1::INSTR	ASRL1::INSTR			
	5				
				~	

 \times

Executing a Single Command in OptiInstrument

A **single** SCPI command can be written and checked in a specific window in OptiInstrument GUI, which allows users to send the individual command to a specific instrument. The command testing window is shown below.

Ð	🗙 🔟 🇞	Available Instruments:	Exfo LTB8	~			^
					Write	[]	
	Write	Query	Write\Read		, mic		ŀ
٩	I/O Setting	32					Þ 🗸
							< >
<							>

Command Test Window

All connected instruments are added to the drop-down menu at the top of the testing window as shown below. This feature allows the user to select the instrument intended for testing a specific command.

	🗈 🗙 🐻 🇞	Available Instruments:	Exfo LTB8	\sim	
l					

The drop-down list of the connected instruments is shown in the image below. The user will select the desired instrument for testing a specific command.

truments:	Exfo LTB8	~	
	Exfo LTB8		
	Tunable Laser Source		
	ASKLIGINSIK		
uery	Write\Read		

There are few buttons present in the top bar of the test window pane. The **plus** button is used for **adding** the command that is tested to the sequence of commands the user is building in the command sequence window. The **plus** button is shown in the image below.

			X 🔤	2	Available Instruments:	Exfo LTB8	~	
--	--	--	-------	---	------------------------	-----------	---	--

The **clear** button shown below is used for clearing any SCPI command typed in the text box of the **command testing window**.



The **id** button is used for sending an identification query to a selected instrument as shown below.



The **Python script generator** button is used for creating a script for the individual SCPI commands tested. The Python script can be executed in the **command prompt** or **Windows PowerShell**.



Instrument TCP/IP Setting

There are various parameters that user can set in OptiInstrument software for the instrument **connection protocol**. The settings can be accessed using the two tabs at the bottom left of the command testing window as shown in the image below. The **I/O tab** allows the user to send a command and receive the response from the instrument, which is displayed in the output box.

The **Settings tab** allows the user to modify the connection settings for the instrument such as **Timeout**, **Termination Methods**, **Packets Methods** and **Buffer Settings** and many more.

Parameter	Value		Ľ
Falanciel	Value		Ľ
Bytes To Read		1024	
Timeout		2000	
I/O Protocol			
I/O Protocol	Normal		
Termination Meth	ods		1
Send End On Writes			
Suppress End On Read			
Enable Termination Character			
Termination Character	Line Feed (\n)	~	
TCP/IP Info	Line Feed (\n)		
Host Name	Carriage Return (\r)		
Address	172.22.2.5		
Port	5025		
Packets Method	s		
No Packet Delay			
Keep Alive Packets			
Buffer Settings			
Write Buffer Size		4096	
Read Buffer Size		4096	

Depending on the type of connection to the instrument, the **Settings tab** will look different as it will have different fields to reflect the type of connection.

Executing a Command

The single command testing window shown below allows the user to send individual commands to an instrument.

🕒 🗙 🔤 🎇 Available I	nstruments: Exfo LTB8	V Construment windo	
*IDN? Write Execution	Query Write\Read s buttons Output window	command type election menu Execution status box	I_SUCCESS
4 I/O Settings	<u> </u>		۵
EXFO · Inc. , LTB-8, 990	681,1.8.0.203		

To test a single command in the **command test window**, use the following steps:

1. Selected from the **drop-down menu** the instrument intended for testing the command as shown below.

ruments:	Exfo LTB8	~	
	Exfo LTB8		
	Tunable Laser Source ASRL1::INSTR		
uerv	Write\Read		

2. Select the **Settings tab** shown below to modify any necessary setting like the termination character, timeout period, buffer settings, etc....

Parameter	Value	
Standart	Value	
Bytes To Read		1024
Timeout		2000
I/O Protocol		
I/O Protocol	Normal	
Termination Met	hods	
Send End On Writes	X	
Suppress End On Read		
Enable Termination Character		
Termination Character	Line Feed (\n)	~
TCP/IP Info	Line Feed (\n)	
Host Name	Carriage Return (V)	
Address	172.22.2.5	
Port	5025	
Packets Metho	ds	
No Packet Delay		
Keep Alive Packets		
Buffer Setting	S	
Write Buffer Size		4096
Read Buffer Size		4096

3. Type a SCPI command in the text field of the command test window. Depending on the type of command, click the relevant execution button to get a proper response from the instrument. There are three execution buttons, Write, Query and Write\Read as shown below. The Write and Query buttons are mostly used for executing commands. However, the Write\Read is another way of executing a Query command as well as Write.



Once the appropriate execution button is pressed, the command is executed. A **VI_SUCCESS** message is displayed in the execution status box beside command type drop-down menu if the execution is successful. If the command is not executed properly, an **error thrown** message by the instrument will display in this box depending on the **type of error**.

Write\Read	Write	~	VI_SUCCESS	
				₽

The response of the instrument to the command is displayed in the **output window** shown below if the command is executed successfully. The successfully executed commands can be used for sequence building as discussed in the next section.

	Write	Query	Write\Read Output Window	Write	
4	/O Settings		₩		Þ
					^
۲.					>

Command Sequence Window

The **Command Sequence** window is used for **creating** and **executing** a sequence of commands. This window has several functions for **creating**, **editing**, **executing** and **saving** a sequence of commands.

Toolbar Buttons

The **toolbar** of the **Command Sequence** window is placed at the top of the window as shown below. The toolbar has many buttons that are used for various functionality in building the sequence of commands.

Comma	and Sequ	ence			🔺 🕆 🗙
) I		🕹 🖬 🗃 📬 🖄 🛎 🗶 🖬 🕲	🗠 😋 🚏 Command Sequence Name:	Sleep tim	e between commands [s]:
	Status	Device	Commands	Туре	Output 🔨
1					
2					
3					
4					
5					
6					
1	+			·•	

1. Execution buttons

The ▶ button is used for executing the entire sequence of commands in the window.

The **b** button is used for executing partial selected commands in the sequence.

2. Up/down buttons

- The 1 button is used for moving commands up in the sequence of commands from their current position.
- The 🖖 button is used for moving commands down in the sequence from their current position.

3. Add/load sequence buttons

- The is button is used for adding a command sequence to an existing list of commands or to load totally new sequence of commands.
- The 📧 button is used for loading a sequence of commands from a list of sequences to the command sequence window.
- The 📑 button is used for updating a sequence of commands that the user is currently working on.

4. Sequence builder buttons

- The E button is used for erasing all existing commands in the command sequence window.
- The ^k button is used for removing empty lines in the command sequence window.
- The X button is used for removing a single command from the list of commands by selecting the row that has the command then click the delete button to remove it from the sequence.

5. Clipboard and action buttons

The 🗎 button is used for copying commands from the sequence.

The is used for pasting commands to the sequence in the window.

The 🖾 button is used for undoing the last action performed by the user.

The 🔛 button is used for redoing the last action done by the user.

6. Python script generator button

The key button is used for creating a Python script for the sequence of commands built using the command sequence builder in the window.

7. Command sequence naming

The tab shown below is used for naming the sequence commands in built in the window. before the user adds to a list of sequences in the list of command sequence window. The user **MUST** specify the name of the sequence before it can be added to the list or before exporting/saving.

Command Sequence Name:

8. Command delay

The **Sleep time (delay time) between commands [s]** shown below is used for setting a specific **delay between commands** when executing the sequence. This time is required for some commands in the sequence to allow successful execution. The delay time applies to all commands. As a result, the user needs to check if it is necessary to set this time and find the proper value of the delay time because it delays the full execution of the sequence.

Sleep time between commands [s]:

Command Sequence Window Functionality

The command sequence window can be undocked off OptiInstrument GUI like any other window in the GUI. This allows the user to flexibly expand or contract the size of the window as desired. To pop-out the window, **double-click** anywhere in the **highlighted area** shown below at the top of the **Command Sequence** window.

Comma	nd Sequ	ence			▲ ± ×
► 0	• II (🗉 👍 🦫 📾 💣 🖉 🖉 🔪 🐚	🛝 🗠 🕾 🎇 🛗 🔹 Command Sequence Name: 🔤 Exfo. Switch wAllSour	rnes S	leep time [s]: 0
	Status	Device	Commands	Туре	Output ^
1	RDY	Exfo LTB8	*CLS	Write	
2	RDY	Exfo LTB8	:LINS1:STAT?	Query	
3	RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query	
4	RDY	Exfo LTB8	:LINS1:SOUR1:POW:WAV?	Query	
5	RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT ON	Write	
6	RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query	
7	RDY	Exfo LTB8	:LINS4:STAT?	Query	
8	RDY	Exfo LTB8	:LINS4:ROUT1:OPEN	Write	
9	RDY	Exfo LTB8	:LINS4:ROUT1:OPEN:STAT?	Query	
10	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN 2	Write	
11	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN?	Query	
12	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN 1	Write	
13	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN?	Query	
14	RDY	Exfo LTB8	:LINS3:STAT?	Query	
15		Eufa I TDO	.I IN \$2.IND.M/AV/ 4240 NBM	14/with	

The window can also be placed or docked wherever in the GUI. This can be achieved by **simultaneously clicking and dragging** the top of the window.

Untitled - Optilnstrument							
File Edit View Help							
S 🛃 🔚 🏗 🕐							
Instruments			Current Active Instrument: Tuna	ble Laser Source			
No address:	/	Port:		Instrumentary and a second second		 Display 	
Instruments	Info			Instruments: Tunable Laser Source		2 X	
Instruments							
TCPIP instruments				Write VI S	SUCCESS	A B	
TCPIP0::172.22.2.5:inst0::INS.	Tunable Laser Sc	ource				2	
ASRL instruments			Write	Query Write\Read		3	
W ASRL1::INSTR	ASRL1::INSTR		4 VO Settings		N.	4	
			4 00 settings			5	
			I THE REAL PROPERTY AND A				
			EXFO-Inc., LTB-8, 99	0681,1.8.0.203	1	8	
	\mathbf{O}						
	Comma	ind Sequ	Jence				
	- E - D		o 🛧 🦆 📾 📽 🗶 🗲	🗙 🐚 🖭 🗠 👯 📑 👘 Command Sequence Name: 🛛 Evfo Sik	itch wallSources	Sleep time [s]: 0	
		Status	Device	Commands	Туре	Output ^	
	1	RDY	Exfo LTB8	*CLS	Write		
	2	RDY	Exfo LTB8	:LINS1:STAT?	Query		
	3	RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query		
	4	RDY	Exfo LTB8	:LINS1:SOUR1:POW:WAV?	Query		
	5	RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT ON	Write		
	6	RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query		
	7	RDY	Exfo LTB8	:LINS4:STAT?	Query		
	8	RDY	Exfo LTB8	:LIN S4:ROUT1:OPEN	Write		
	9	RDY	Exfo LTB8	:LIN S4:ROUT1:OPEN: STAT?	Query		
	10	RDY	Exfo LTB8	:LIN S4:ROUT1: SCAN 2	Write		
	11	RDY	Exfo LTB8	:LIN S4:ROUT1:SCAN?	Query		
	12	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN 1	Write		
Instruments	13	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN?	Query		
Ist Of Command Sequence	14	RDY	Exfo LTB8	:LINS3:STAT?	Query		
cia circoninana sequence	15	RDY	Exfo LTB8	:LIN S3:INP:WAV 1310 NM	Write		
scpi SCPI Commands	16	RDY	Exfo LTB8	:LIN \$3:INP:WAV?	Query		
Por Documents	17	RDY	Exfo LTB8	:LINS3:CONT:MODE ATT	Write		
Documents	18	001/	P. 4. 1 TOA	JINCS, NO. ATT & DD	147-24-	· · · · · ·	
Pier Python script	O-		11			· · · · · · · · · · · · · · · · · · ·	
	~	,	0			"	_
			•		>	4 Grid Graphs	
				Completed 0%			

The window placement assistant appears as shown below allowing the user to place it anywhere in the GUI by dragging the window **the desired arrow**.

Untitled - Optilnstrument									- 0	i ×
File Edit View Help										
🔄 🛃 📃 🌇 🕜										
Instruments			Current Active Instrument: Tunable La	aser Source						
🔂 📴 🥂 🖳 TCP/IP address: 📃 .	Port:		💼 😪 📰 🥦 Available lectre	maate	~	Displa	v			▼ 0 ×
Instruments	Info			Tunable Laser Source		1 12 3	ĸ			
💻 Instrumenta										
TCPIP instruments		_		Write VI_SUCCE	55	1	~			^
ICPIPU: 172.22.2.50n800INS	Tunable Laser Source	·	Wes-	Mitty Band		2			 	
CO ASRL1:INSTR	ASRL1::INSTR		write GD	ny wrechead		3			 	
			4 I/O Settings		Þv	5			 	
			<		>	6			 	
			EXFO. Inc., LTB-8, 990681	1,1.8.0.203	^	7			 	
						9			 	
						10			 	
						11			 	
						12			 	
						14			 	
						15			 	
						16			 	
						17			 	
	Comma	nd Sea	uence			110		×	 	
	- D						lean time Irli		 	
		Plater		Commands			Dutant	-	 	
	1	DOV	Exfect TBR	Commands	Maite	-	Output	—^I	 	
	2	RDV	Exto LTBS	INS1-STAT2	Query				 	
	3	BDY	Exfo LTB8	-LINST-SOURT-POW-STAT?	Query				 	
	4	RDY	Exfo LTB8	:LINS1:SOUR1:POW:WAV?	Query				 	
Instruments	5	RDY	Exfo LTB8	LINS1:SOUR1:POW:STAT ON	Write				 	
misuantens	6	RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query				 	
List Of Command Sequence	7	RDY	Exfo LTB8	:LINS4:STAT?	Query				 	
SCPI Commands	8	RDY	Exfo LTB8	:LINS4:ROUT1:OPEN	Write				 	
-	9	RDY	Exfo LTB8	:LINS4:ROUT1:OPEN:STAT?	Query				 	
Documents	10	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN 2	Write				 	
Python script	11	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN?	Query				 	*
	12	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN 1	Write					>
	13	RDY	Exfo LTB8	:LINS4:ROUT1:SCAN?	Query					Þ
	14	RDY	Exfo LTB8	:LINS3:STAT?	Query				CA	P NUM SCRI

The image below shows the docking of the command sequence window automatically in the selected place.

									-	۳ ×
File Edit View Help										
S 🛃 📃 🏗 🕜										
Instruments	Curre	nt Active Instrument: Tunable I	Laser Source							
No 💽 🕅 🔍 TCP/IP address:						Dirolau				~ 0
Info		Available Inst	ruments: Tunable Laser Source V		^^	crispiay				• •
Instruments						··· •				
TCPIP instruments			Wri	te v1_SUCCESS		1	A B	•	C D	E
ASRL instruments		Wite G	Wite\Read			2				
Ø ASRL1:INSTR ASRL1:INSTR						4				
		1/O Settings			Pv	5				
	(C				,	6				
	E	GFO Inc. , LTB-8, 99068	1,1.8.0.203		^	8				
						9				
						10				
						11				
						12				
						13				
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	100				\vee	16				
	<				>	17				
	A	and familian				4.0				
	Comm	and sequence			▲ û ×	10				
	Comm	II II 4 4 10 10 10 10 10 10 10 10 10 10 10 10 10	·····································	Command Sequence Name:	vfn Switch w	10 19 20				
	> Comm	II Ar A	1 프 또 X 🐚 🖄 🗠 🗠 🎇 👘	Command Sequence Name: F	≠ 0 × ×fo Switch w. Output ^	10 19 20 21				
	1	II A Evice RDY Exfo LTB8	☆ KE K N <td>Command Sequence Name: Fr</td> <td>vfn Switch w. Output</td> <td>10 19 20 21 22</td> <td></td> <td></td> <td></td> <td></td>	Command Sequence Name: Fr	vfn Switch w. Output	10 19 20 21 22				
	1 2	II Device RDY Exfo LTB8 RDY Exfo LTB8	☆ ≦ X 0 10 <td>Command Sequence Name: F Type Write Ouery</td> <td>vfn Switch w. Output ∧</td> <td>10 19 20 21 22 23 24</td> <td></td> <td></td> <td></td> <td></td>	Command Sequence Name: F Type Write Ouery	vfn Switch w. Output ∧	10 19 20 21 22 23 24				
	1 2 3	II Device RDY Exfo LTB8 RDY Exfo LTB8 RDY Exfo LTB8 RDY Exfo LTB8	1월 월 월 월 월 월 월 월 월 월 월 6 (Commands *CLS :LINS1:STAT? :LINS1:SQURI:POW-STAT?	Command Sequence Name: F Type Write Query Ouery	vfn Switch w. Output ^	10 19 20 21 22 23 24 25				
	1 2 3 4	Stat Device RDY Exfo LTB8 RDY Exfo LTB8	Image: Second	Command Sequence Name: Fr	vito Switch w. Output ∧	10 19 20 21 22 23 24 25 26				
	1 2 3 4 5	Stat Device RDY Exfo LTB8	20 E E X 12 20 10 10 10 10 10 10 10 10 10 10 10 10 10	Command Sequence Name: Fr Type Write Query Query Write	vito Switch w. Output ∧	10 19 20 21 22 23 24 25 26 27				
mstruments	Comm 1 2 3 4 5 6	Stat Device ROY Exfo LT88	Commands Commands CLS LINS1:STAT? LINS1:SOURI:POW:STAT? LINS1:SOURI:POW:STAT? LINS1:SOURI:POW:STAT? LINS1:SOURI:POW:STAT?	Command Sequence Name: F Type Write Query Query Query Write Query	vin Switch w.	10 20 21 22 23 24 25 26 27 28 27 28				
instruments	Comm 1 2 3 4 5 6 7	Stat Device RDY Exfo LT58	Commands Commands CLS CLS LINST:SOURI-POW:STAT? LINST:SOURI-POW:STAT? LINST:SOURI-POW:STAT? LINST:SOURI-POW:STAT? LINST:SOURI-POW:STAT? LINST:SOURI-POW:STAT?	Command Sequence Name: Fr Type Query Query Query Write Query Query	← 0 × vfn_Switch_w/ Output ^	10 20 21 22 23 24 25 26 27 28 27 28 29 30				
ee Instruments	Comm 1 2 3 4 5 6 7 8	Stat Device RDY Exfo LT88 RDY Exfo LT88	Commands Commands Cols LINS1:STAT? LINS1:SOUR1:POW:STAT? LINS1:SOUR1:POW:STAT? LINS1:SOUR1:POW:STAT? LINS1:SOUR	Command Sequence Name: Fr Write Query Query Query Write Query Query Query Write		10 20 21 22 23 24 25 26 27 28 27 28 29 30 31				
Instruments	Comm 1 1 2 3 4 5 6 7 8 9	Stat Device ROY Exto LT88 ROY Exto LT88	Commands Commands CLS Commands CLS LINS1:SOUR1:POW:STAT7 LINS1:SOUR1:POW:STAT7 LINS1:SOUR1:POW:STAT7 LINS4:SOUR1:POW:STAT7 LINS4:ROUT1:OPEN LINS4:ROUTI:OPEN LI	Command Sequence Name: Fr Write Query Query Query Write Query Query Write Query Write	← 8 × vfn Switch w Output ∧	10 20 21 22 23 24 25 26 27 28 29 30 31 32				
Instruments The sequence SCPI Command Sequence	Comm 1 1 2 3 4 6 6 7 8 9 10	State Device State Device ROY Exto LT85 ROY Exto LT85	Image: Second	Command Sequence Name: Fri Type Write Query Query Query Write	vax	19 20 21 22 23 24 25 26 277 28 29 30 31 32 33				
Instruments	Comm 1 2 3 4 5 6 7 8 9 9 10 11	State Device State Device ROY Exto LTBS	Commands Commands CLS LINS1:STAT7 LINS1:STAT7 LINS1:SOUR1:POW:STAT7 LINS1:SOUR1:POW:STAT7 LINS1:SOUR1:POW:STAT7 LINS4:STAT7 LINS4:STAT7 LINS4:ROUT1:SPEN LINS4:ROUT1:SPEN LINS4:ROUT1:SPEN LINS4:ROUT1:SCAN 2 LINS4:ROUT1:SCAN 2	Command Sequence Name: Fri Type Query Query Query Query Query Query Query Query Write Query Write Query Write Query	◆ 0 × vfn Switch w Output ∧ Output ∧	10 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34				
Instruments List Of Command Sequence Schoocoments Comments Co	Comm 1 2 3 4 5 6 7 8 9 9 10 11 12	State Device RDY Exto LTB6	Commands Commands CLS LINST:STAT7 LINST:SOURT:POW:STAT7 LINST:SOURT:POW:STAT7 LINST:SOURT:POW:STAT0 LINST:SOURT:POW:STAT7 LINSt:POW:STAT7 LINST:POW:POW:STAT7 LINST:POW:STAT7 LINST:POW:STAT7 LINST:POW:STAT7 L	Command Sequence Name: Fri Write Query Query Write Query Write Query Write Query Write Query Write Query Write	v 0 x vin Switch w Output A	10 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36				
Instruments It is for Command Sequence SCPI Commands Proceedings Python script	Comm 1 1 2 3 4 5 6 7 8 9 10 11 11 12 13	Image Control Control Stati Device Static TBS	Commands Commands CLS LINS1:STAT? LINS1:STAT? LINS1:SOURI-POW:STAT? LINS1:SOURI-POW:STAT? LINS1:SOURI-POW:STAT? LINS1:SOURI-POW:STAT? LINS4:ROUTI-POPEN:STAT? LINS4:ROUTI-SCAN 2 LINS4:ROUTI-SCAN 1 LINS4:ROUTI-SCAN 1 LINS4:ROUTI-SCAN 2	Command Sequence Name: Fri Type Query Query Query Query Write Query Write Query Write Query Write Query Write Query Write Query	• 0 × vin Switch w Output	10 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36				

Creating a Sequence of Commands

Make sure that all instruments are all connected to Optilnstrument GUI. Then follow these steps:

1. Select the desired **instrument** to control or automate from the drop-down menu in the single command execution window.

ruments:	TCPIP0::172.22.2.5::5025::SOCKET ~	
	USB0::0x1AB1::0x04CE::DS1ZA201204659::INSTR USB0::0x1AB1::0x0642::DG1ZA201501452::INSTR TCPIP0::172.22.2.5::5025::SOCKET TCPIP0::172.22.2.5::inst0::INSTR ASRL1::INSTR	Write

2. Type in the desired SCPI command that the user wishes to execute in the selected instrument.

🕒 🗙 🔤 🎇 🛛 Available Instruments:	Exfo LTB8	~	
*IDN? Write Query	Write\Read		Query ~ Write WriteRead Query

3. Before executing the command, make sure that the **TCP/IP settings** for the instrument such as right **termination character**, **timeout period**, **and buffer size** are appropriate.

Parameter	Value	
Standart		
Bytes To Read		1024
Timeout		2000
I/O Protocol		
I/O Protocol	Normal	
Termination Meth	ods	
Send End On Writes		
Suppress End On Read		
Enable Termination Character		
Termination Character	Line Feed (\n)	~
TCP/IP Info	Line Feed (\n)	
Host Name	Carriage Return (\r)	
Address	172.22.2.5	
Port	5025	
Packets Method	s	
No Packet Delay		c
Keep Alive Packets		
Buffer Settings		
Write Buffer Size		4096
Read Buffer Size		4096

4. The user can either test the command before it is added to the sequence or simply add it to the sequence. The type of command must be manually specified from the drop-down menu located beside the command typing box as shown below. The user can add the command to the sequence by simply clicking the **add button** located on the top left of the window as shown in the image below.

(NOTE: if the command is added after it has been executed in the window, the right command type is automatically reflected in the sequence of command)

•	🗙 🔤 🎇 🛛 Available Instruments:	Exfo LTB8	~		^
	*IDN? Write Query d button	Write\Read		Query VI_SUCCESS Write WriteRead Query	

5. After the command is added to the command sequence window, it will appear in the window as shown in the image below.

Command Sequence 🗸 🗸					
🕨 🕨 🕼 📅 🖆 🖉 🌋 🆄 🛍 🛸 🕫 📽 🔭 command Sequence Name: Sleep time between commands (p					
	Status	Device	Commands	Туре	Output
1	RDY	TCPIP0::172.22.2.5::5025::SOCKET	1DN?	Query	
2					
3					
-					
5					
6					
7					
8					
9					
10					

6. Repeat the steps 1 to 5 to add the desired commands to the sequence and build the full sequence of commands as shown below.

Status	Device	Commands	Type	Outpu
RDY	TCPIP0::172.22.2.5::5025::SOCKET	*CLS	Write	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:STAT?	Query	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT?	Query	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:WAV?	Query	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT ON	Write	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:STAT?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:SENS1:POW:WAV 1625 NM	Write	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	*OPC?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:READ:SCAL:POW:DC?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:SENS1:POW:WAV?	Query	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT OFF	Write	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR1:POW:STAT?	Query	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR1:POW:WAV?	Query	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR1:POW:STAT ON	Write	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR1:POW:STAT?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:STAT?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:SENS2:POW:WAV 1310 NM	Write	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	*OPC?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:READ2:SCAL:POW:DC?	Query	
RDY	TCPIP0::172.22.2.6::5025::SOCKET	:LINS0:SENS2:POW:WAV?	Query	
RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR1:POW:STAT OFF	Write	

- 7. The sequence of commands can be modified by moving commands up or down from their current positions, delete any command or commands, removing empty line or lines.
- 8. To set a **sleep time** (delay time) between successive commands, enter the desired value **of seconds** in the box located at the top right corner of the window as shown below.

		▼ Д 3	×
Command Sequence Name:		Sleep time between commands [s]:	I
Commands	Туре	Output	^
	Write		
?	Query		
4:POW:STAT?	Query		

9. To execute the final sequence of commands, click the **Run** button in the toolbar shown below.

Comma	nd Sequ	ience		
► D		🕹 💣 💣 💣 🛎 🛎 🗙 🐚	🗈 🗠 📪 Command Sequence Name:	
	Status	Device	Commands	Туре
1	RDY	TCPIP0::172.22.2.5::5025::SOCKET	*CLS	Write
2	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:STAT?	Query
3	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT?	Query
4	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:WAV?	Query
5		TCDID0~170 00 0 5~5005~500CKET		Write

10. To add a new sequence to the list of the sequence of commands in the window, the user **MUST** first enter the command sequence name, then press **Add** button as shown below. The new sequence will appear and added to the original list of commands.

Comma	and Sequ	ience			
) I		🔸 📑 🖻 👘 🚈 🏹 🐚	🖺 🗠 🗠 🎇 Command Sequence Name:		Sleep t
	Status	Device	Commands	Туре	
1	RDY	TCPIP0::172.22.2.5::5025::SOCKET	*CLS	Write	
2	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:STAT?	Query	
3	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT? Enter Sequence name	Query	
4	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:WAV?	Query	
5	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT ON	Write	
6	RDY	TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:STAT?	Query	

11. The user can **export/save** the sequence of command into an XML file format. To save the sequence, click the **export** button shown below and save it to the desired folder.

List Of Command Sequence	Current Active Instrument: TCPIP0::172.22.2.5::502	25::SOCKET
🖬 🎬 🎑 Export	🔠 🏋 📶 Available Instruments: TCPIPO::	172.22.2.5::5025::SOCKET
List button		
List Of Command Sequence		
i≡ exfo_test4	Writ	te 🗸
	Write Query	Read
	<	
Λ	<	
12	Command Sequence	
L L	🕨 🕨 🚖 🦊 📑 🗃 📸 🚝 🎽	🕻 🗈 🛍 🗠 🗠 🎇
List of command	Statu Device	
sequences	1 RDY TCPIP0::172.22.2.5::5025::SOCKET	*CLS
	2 RDY TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:STAT?
	3 RDY TCPIP0::172.22.2.5::5025::SOCKET	:LINS1:SOUR4:POW:ST

Sequence of Commands Processing

The command sequence window has a toolbar at the top, which allows the user to modify existing sequence or a new sequence being created.

Execute Selected Commands from the Sequence

To execute a select number of commands, first select the required commands by simultaneously pressing **CTRL** on the keyboard and **selecting** the commands as shown below.

mmand Seq	quence			
• IÞ 11	🛛 👍 🕹 📩 🖻 🛎	🗄 🚝 📉 🐁 🗠 🛛 🔁 📸 👘 Command Sequence Name: 🛛 🗜 🖓	Switch As Sleep time [s]: 0	
Statu	Is Device	Commands	Туре	Output
RDY	Exfo LTB8	*CLS	Write	
RDY	Exfo LTB8	:LINS1:STAT?	Query	
RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query	
RDY	Exfo LTB8	:LINS1:SOUR2:POW:WAV?	Query	
RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT ON	Write	
RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query	
RDY	Exfo LTB8	:LINS4:STAT?	Query	
RDY	Exfo LTB8	:LINS4:ROUT1:OPEN	Write	
RDY	Exfo LTB8	:LINS4:ROUT1:OPEN:STAT?	Query	
RDY	Exfo LTB8	:LINS4:ROUT1:SCAN 2	Write	
RDY	Exfo LTB8	:LINS4:ROUT1:SCAN?	Query	
RDY	Exfo LTB8	:LINS4:ROUT1:SCAN 1	Write	
RDY	Exfo LTB8	:LINS4:ROUT1:SCAN?	Query	
RDY	Exfo LTB8	:LINS0:STAT?	Query	
RDY	Exfo LTB8	:LINS0:SENS1:STAR 1480NM	Write	
RDY	Exfo LTB8	:LINS0:SENS1:STAR?	Query	
RDY	Exfo LTB8	:LINS0:SENS1:STOP 1500NM	Write	
RDY	Exfo LTB8	:LINS0:SENS1:STOP?	Query	
RDY	Exfo LTB8	:LINS0:CALC1:DFB:STAT ON	Write	
RDY	Exfo LTB8	:LINS0:CALC1:DFB:STAT?	Query	
RDY	Exfo LTB8	:LINSO:INIT	Write	
RDY	Exfo LTB8	*OPC?	Query	
RDY	Exfo LTB8	*OPC?	Query	
RDY	Exfo LTB8	:LINS0:CALC1:DFB:DATA:CENT:WAV?	Query	
RDY	Exfo LTB8	:LINS0:CALC1:DFB:DATA:CENT:FREQ?	Query	
RDY	Exfo LTB8	:LINS0:CALC1:DFB:DATA:PPOW?	Query	
RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT OFF	Write	
RDY	Exfo LTB8	:LINS1:STAT?	Query	
RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query	
RDY	Exfo LTB8	:LINS1:SOUR1:POW:WAV?	Query	
RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT ON	Write	
RDY	Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query	
RDY	Exfo LTB8	:LINS4:STAT?	Query	
RDY	Exfo LTB8	:LINS4:ROUT1:OPEN	Write	
RDY	Exfo LTB8	LINS4:ROUT1:OPEN:STAT?	Query	
DOV	Exto I TBS	I INSA DOUT I SCAN 2	Meito	

Once commands are selected, click the **Run Selected** button shown below to execute those commands only.

mand Sequence			
	🐚 🗈 🗠 💫 🗃 👘 Command Sequence Name: 🛛 🗛 Switch Os		Sleep time [s]: 0
Run Selected Sequence of Commands.	Commands	Туре	Output
RDY Exfo LTB8	*CLS	Write	
RDY Exfo LTB8	:LINS1:STAT?	Query	
RDY Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query	
RDY Exfo LTB8	:LINS1:SOUR2:POW:WAV?	Query	
RDY Exfo LTB8	:LINS1:SOUR2:POW:STAT ON	Write	
RDY Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query	
RDY Exfo LTB8	:LINS4:STAT?	Query	
RDY Exfo LTB8	:LINS4:ROUT1:OPEN	Write	
RDY Exfo LTB8	:LINS4:ROUT1:OPEN: STAT?	Query	
RDY Exfo LTB8	:LINS4:ROUT1:SCAN 2	Write	
RDY Exfo LTB8	:LINS4:ROUT1:SCAN?	Query	
RDY Exfo LTB8	:LINS4:ROUT1:SCAN 1	Write	
RDY Exfo LTB8	:LINS4:ROUT1:SCAN?	Query	
RDY Exfo LTB8	:LINS0:STAT?	Query	
RDY Exfo LTB8	:LINS0:SENS1:STAR 1480NM	Write	
RDY Exfo LTB8	:LINS0:SENS1:STAR?	Query	
RDY Exfo LTB8	:LINS0:SENS1:STOP 1500NM	Write	
RDY Exfo LTB8	:LINS0:SENS1:STOP?	Query	
RDY Exfo LTB8	:LINS0:CALC1:DFB:STAT ON	Write	
RDY Exfo LTB8	:LINS0:CALC1:DFB:STAT?	Query	
RDY Exfo LTB8	:LIN S0:INIT	Write	
RDY Exfo LTB8	*OPC?	Query	
RDY Exfo LTB8	*OPC?	Query	
RDY Exfo LTB8	:LINS0:CALC1:DFB:DATA:CENT:WAV?	Query	
RDY Exfo LTB8	:LINS0:CALC1:DFB:DATA:CENT:FREQ?	Query	
RDY Exfo LTB8	:LINS0:CALC1:DFB:DATA:PPOW?	Query	
RDY Exfo LTB8	:LINS1:SOUR2:POW:STAT OFF	Write	
RDY Exfo LTB8	:LINS1:STAT?	Query	
RDY Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query	
RDY Exfo LTB8	:LINS1:SOUR1:POW:WAV?	Query	
RDY Exfo LTB8	:LINS1:SOUR1:POW:STAT ON	Write	
RDY Exfo LTB8	:LINS1:SOUR1:POW:STAT?	Query	
RDY Exfo LTB8	:LINS4:STAT?	Query	
RDY Exfo LTB8	:LINS4:ROUT1:OPEN	Write	
RDY Exfo LTB8	LINS4:ROUT1:OPEN: STAT?	Query	
RDY Exfo LTB8	LINSA BOUTISCAN 2	Write	

Moving Commands up/down in a Sequence

Select the desired command from the sequence and click **move up** button as shown in the image below.

Comma	mmand Sequence ×								
► 1		🗅 💽 🦆 📾 📽 📉 🖎 🖬	🖺 🗠 🖓 📸 🔹 Command Sequence Name: 🛛 🖓 Fyfo Switch As		Sleep time [s]: 0				
	Status	s Device	Commands	Туре	Output ^				
1	RDY	Exfo 1 Move Up Sequence of Commands	5. LS	Write					
2	RDY	Exfo LTB8	:LINS1:STAT?	Query					
3	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query					
4	RDY	Exfo LTB8	:LINS1:SOUR2:POW:WAV?	Query					
5	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT ON	Write					
6	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query					
7	RDY	Exfo LTB8	:LINS4:STAT?	Query					
0									

To move the desired command down, select it from the sequence and click **move down** button as shown in the image below.

Comm	nmand Sequence X									
→ I	► II I	o i 👍 👽 🤠 💣 📽 🗡 🐿	🛍 🗠 🖙 🎇 📸 👘 Command Sequence Name: 🛛 🕞 Evifo, Switch, As		Sleep time [s]: 0					
	Status	Banica Maria Davia Saguance et d	Commands	Туре	Output ^					
1	RDY	Exfo LTB8	ommands.	Write						
2	RDY	Exfo LTB8	:LINS1:STAT?	Query						
3	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query						
4	RDY	Exfo LTB8	:LINS1:SOUR2:POW:WAV?	Query						
5	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT ON	Write						
6	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query						

Deleting Command(s) and Removing Empty Lines

To remove a single command from the sequence, select the command and press the **Erase** button.

Comn	mmand Sequence ×							
•		이 👍 🗣 🖬 🗟 🛎 🗶 🎙	n 🗈 🗠 🗠 🎇 📸 👘 Command Sequence Name: 🛛 Fyfon Switch As		Sleep time [s]: 0			
	Status	Device	Commands	Туре	Output ^			
1	RDY	Exfo LTB8	Erase the selection.	Write				
2	RDY	Exfo LTB8	:LINS1:STAT?	Query				
3	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query				
4	RDY	Exfo LTB8	:LINS1:SOUR2:POW:WAV?	Query				
5	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT ON	Write				
6	RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query				
7	RDY	Exfo LTB8	:LINS4:STAT?	Query				

To remove an empty line from the sequence, click the **Remove** button located in the toolbar as shown in the image below.

c	ommar	nd Sequ	ence				×
	► D	11.5) 👍 🦆 🗃 💣 🛎 🔼 🗙 🖻	🗈 🗠 🕾 🎇 Command Sequence Name: 🕞 🖍 Switch As		Sleep time [s]: 0	
		Status	Device X Re	nove empty lines. Commands	Туре	Output	^
1		RDY	Exfo LTB8	*CLS	Write		
2		RDY	Exfo LTB8	:LINS1:STAT?	Query		
3		RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query		
4							
5		RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT ON	Write		
6		RDY	Exfo LTB8	:LINS1:SOUR2:POW:STAT?	Query		

To delete all the commands in the sequence, click the **Erase All** button located in the toolbar as shown in the image below.

Comma	nd Sequ	ience	_				×
+ D	. 11 . 1	ා 👍 🕹 📹 🖻 🛎	🚈 🗙 🗈	🛝 🗠 🕫 🧱 📸 Command Sequence Name: 🛛 🕞 Switch	A C	Sleep time [s]: 0	
	Status	Device	Erase Al	Commands	Туре	Output	^
1	RDY	Exfo LTB8	_	*ČLS	Write		
2	RDY	Exfo LTB8		:LINS1:STAT?	Query		
3	RDY	Exfo LTB8		:LINS1:SOUR2:POW:STAT?	Query		
4							
5	RDY	Exfo LTB8		LINS1:SOUR2:POW:STAT ON	Write		_
6	RDY	Exfo LTB8		:LINS1:SOUR2:POW:STAT?	Query		
7	RDY	Exfo LTB8		LINS4:STAT?	Query		
8	RDY	Exfo LTB8		LINS4:ROUT1:OPEN	Write		
9	RDY	Exfo LTB8		:LINS4:ROUT1:OPEN:STAT?	Query		
10	RDY	Exfo LTB8		LINS4:ROUT1:SCAN 2	Write		
11	RDY	Exfo LTB8		:LIN S4:ROUT1: SCAN?	Query		
12	RDY	Exfo LTB8		LINS4:ROUT1:SCAN 1	Write		
13	RDY	Exfo LTB8		:LIN \$4:ROUT1: SCAN?	Query		
14	RDY	Exfo LTB8		:LINS0:STAT?	Query	1	
15	RDY	Exfo LTB8		LIN S0: SEN S1: STAR 1480NM	Write		
16	RDY	Exfo LTB8		:LIN S0: SEN S1: STAR?	Query		
17	RDY	Exfo LTB8		LINS0: SENS1: STOP 1500NM	Write		

As shown in the image below, all of the commands have been deleted and the command sequence window is empty.

Comma	nd Sequ	ence			×
→ D	- II. C	1 👍 🦆 📩 💣 📕 🚝 🗶 🖬 1	🐁 🗠 🗠 🎇 📷 🦳 Command Sequence Name:		Sleep time [s]: 0
	Status	Device 🗶 Erase All.	Commands	Туре	Output ^
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					

Saving the Results of Executed Sequence of Commands

To save the output results after executing the commands sequence, click the **Export Results** button located in the toolbar at the top of the command sequence window as shown the image below. The results are saved in a .CSV file format.

Co	Command Sequence									
►	• I• I		🛧 🦊 🗃 💣 🚝 🚝 🗙 🐚	🛍 🗠 🖙 🎇 📷 🔹 Command Sequence Name: 📃						
	Sta	atus	Device	Commands						
1										
2										
3										
4										
5										
6										
7		1								

Display Window

Display Window Functions

OptiInstrument GUI allows users to acquire the displayed waveforms in two way: **graphical** and **data values** saved in a .CSV spreadsheet format.

Acquire Waveform and Data

Once the sequence of commands for an instrument that produces waveforms is executed, the waveform is displayed in the **Display Window** in Optilnstrument GUI. The user could acquire the displayed waveform of the instrument as an image and acquire the relevant data in a .CSV spreadsheet form. First, select the relevant instrument from the **Available Instruments** drop-down menu as shown in the image below.



Click the **Display Waveform button** in the GUI toolbar. The instrument produced waveform will be displayed in **Display Window** when selecting the **Graphs** tab as shown below. The waveform data can be displayed in an Excel sheet when the **Grid** tab is selected.

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Saving/Exporting Waveform and Data

There are two buttons located at the top left of the **Display Window.**

The \times button is used for clearing the displayed waveform and data from the **Display Window**.

The 🔤 button is used for saving the acquired waveform data in a .CSV file format.

Waveform Visualization and Manipulation

When displaying a waveform in the **Display Window** after selecting the **Graph** tab, a **menu** with

many display and control options for the graph manipulation can be accessed by selecting the icon that is placed at the top left of the display as shown in the image below. The list of graph manipulation options are shown below.





Display Window Functionality

The display window can be undocked from OptiInstrument GUI and float independently. This feature allows the user to flexibly expand or contract the size of window to fit their requirements. To pop-out the window, **double-click** anywhere in the **highlighted area** at top of the **Display Window** as shown below.



The Display Window will be separated from the GUI and becoming **floating window**. The user can **resize** the window by **grabbing any corner** of the window and dragging it to whatever size as shown below.

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The Display Window can also be placed wherever in the GUI, this can be done by **simultaneously clicking and dragging** the top of the window. The window placement assistant icon will appear to allow the user placing the window anywhere in the GUI by dragging it to the proper arrow as shown below.



The image below shows the Display Window is automatically placed where it was dragged to.

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