

LabVIEW for Moku:Lab

Getting started guide

Moku:Lab's LabVIEW API is designed to allow for integration of Moku:Lab with existing experimental control systems, as well as a tool for operating Moku:Lab without the need for an iPad.



Table of Contents

| | |
|---|----------|
| Currently supported instruments | 2 |
| Installation | 3 |
| Getting started..... | 4 |
| Full App VI's | 5 |
| Example VI's | 6 |
| Method VI's | 7 |
| Connecting Moku:Lab with your computer | 7 |
| WiFi (hub) | 7 |
| WiFi (direct) | 7 |
| Ethernet (hub) | 7 |

Currently supported instruments

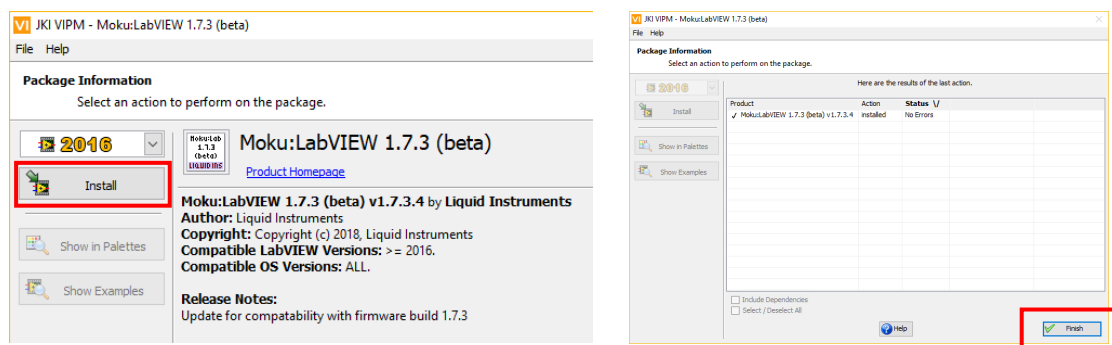
1. Arbitrary Waveform Generator
2. Data Logger
3. Frequency Response Analyzer
4. Lock-In Amplifier
5. Oscilloscope
6. Phasemeter
7. Spectrum Analyser
8. Waveform Generator
9. Laser Lock Box
10. PID Controller

Installation

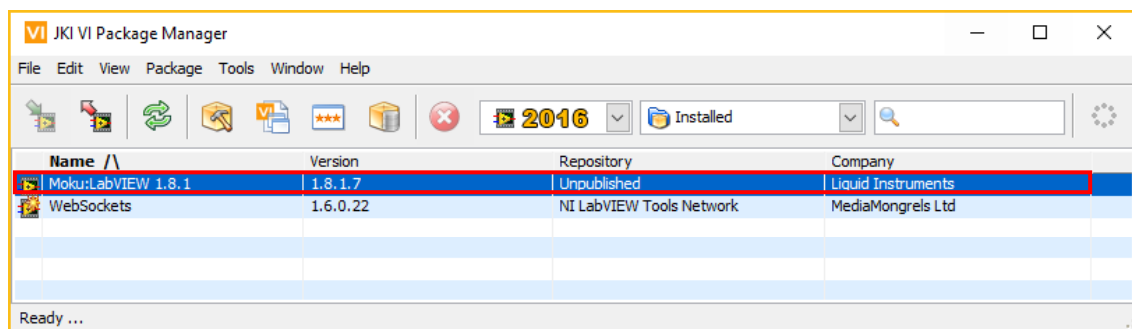


If you already have a previous version of the Moku:Lab LabVIEW API installed, please uninstall it before proceeding. You can uninstall the package from the VI package manager by selecting *Uninstall Package*.

1. Install the **VI Packet Manager** from <https://vipm.jki.net/get>.
2. Download the **Moku:Lab LabVIEW package** from the Liquid Instruments website at <https://www.liquidinstruments.com/labview/>.
3. Install the Moku:Lab LabVIEW Package. Run the downloaded file, and select “install”.

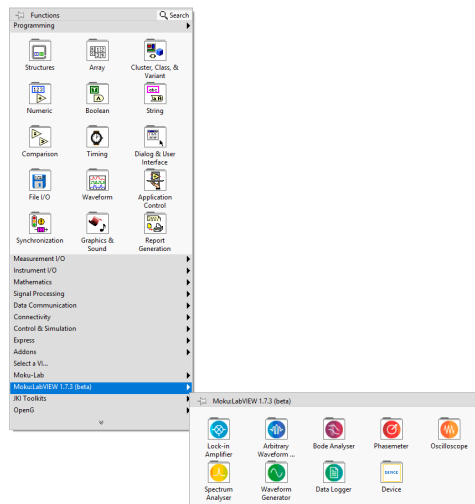


4. The package will install through the VI packet manager. Once complete, you should be able to see the package listed under “installed” in VI Package Manager.

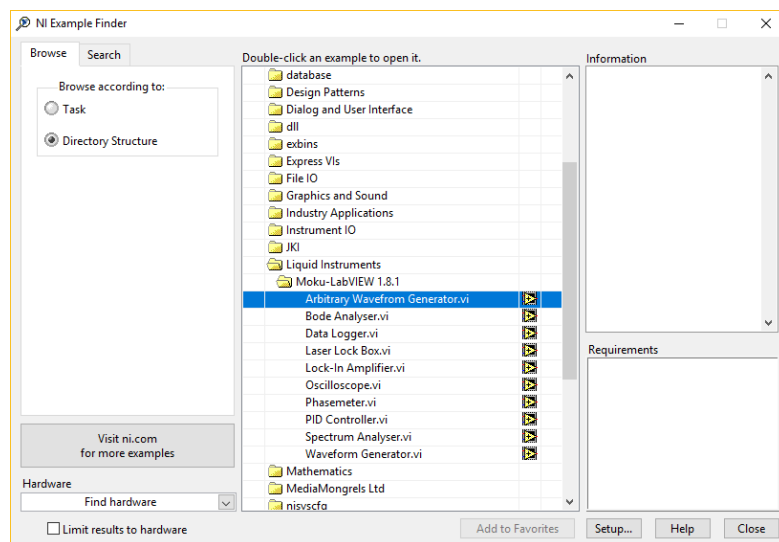


Getting started

The package is arranged into 3 sections: Full App VI's, Example VI's and Methods. All relevant material for the Moku:Lab LabVIEW package can be found under the **Moku:LabVIEW palette** within LabVIEW. To access the palette, right-click when on the back panel of a VI and navigate to the Moku:LabVIEW palette.

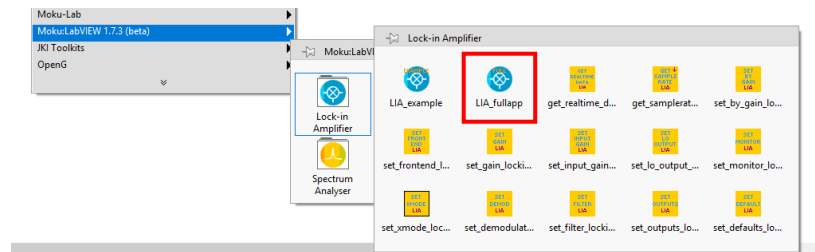


More example files are also available through the NI Example Finder. Switch to the directory structure view, then look for the Moku:Lab LabVIEW API files.

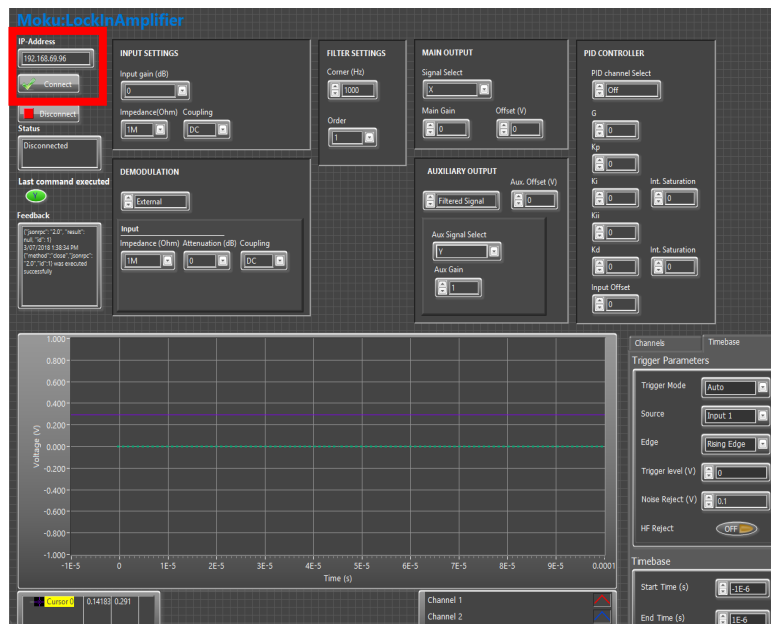


Full App VI's

This is the best place to start. These VI's offer the same functionality as the iPad app in an intuitive user interface. Let's open the Lock-In Amplifier full app. Hover over the Lock-In Amplifier instrument within the Moku:LabVIEW package and **select the LIA_Fullapp VI**.



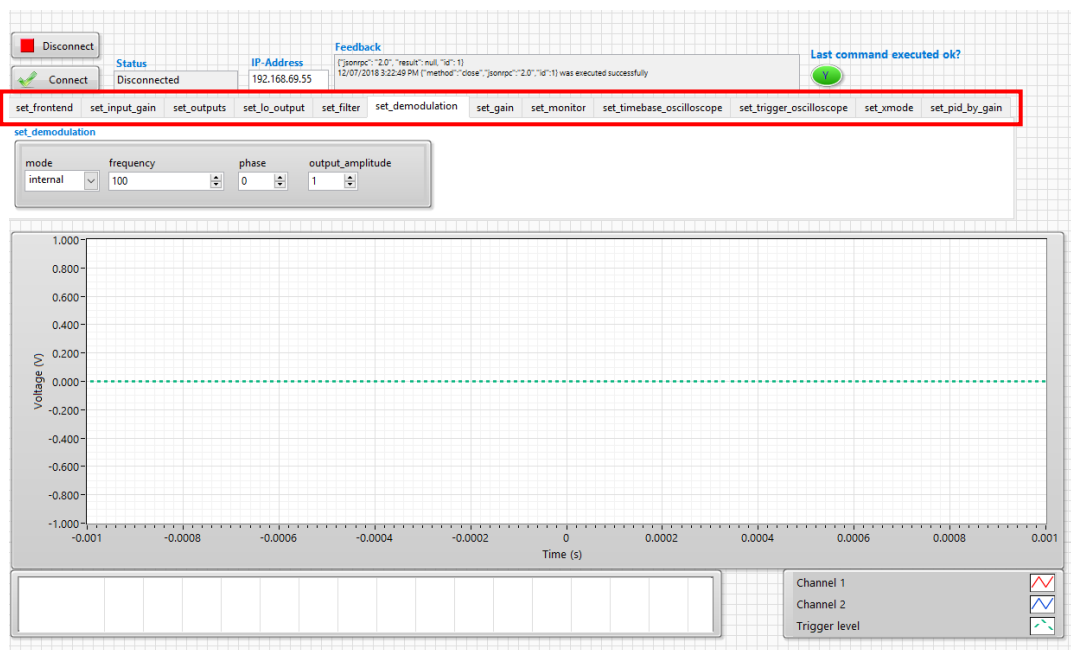
This will open the LIA_fullapp VI in a new window. Enter the IP address of your target Moku:Lab into the **IP-Address** field, and then run the VI. Once the VI is running, you will need to **press Connect** to initiate a connection with your Moku:Lab and deploy the instrument.



Example VI's

The Moku:Lab LabVIEW API is **based upon PyMoku**. The example VI's for each instrument are designed to break out this dependence into individual methods, which allows for greater flexibility in how the Moku:Lab can be integrated into existing control systems in comparison to the full app version. For full Pymoku documentation, refer to the ReadTheDocs documentation at <https://pymoku.readthedocs.io/en/master/>.

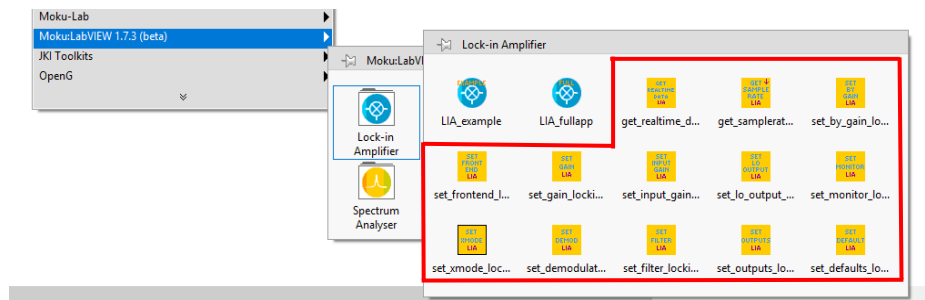
To access the example VI's, hover over the desired instrument and select the _example VI (refer to the full app section for more information). Enter the IP address of your Moku:Lab, start the VI and press "connect".



Each individual method is controlled via an individual tab within the Example VI. These correlate directly to the methods of PyMoku. For full Pymoku documentation, refer to the ReadTheDocs documentation at <https://pymoku.readthedocs.io/en/master/>.

Method VI's

These are the individual functions from within PyMoku that make up the full app and example VI's. They take an input cluster, and convert that cluster into a JSON string packaged with the method name and other parameters. The JSON string is then sent to the Moku:Lab via an RPC server. You won't typically need to interact with these subVI's unless you are creating a completely customised integration with Moku:Lab.



Connecting Moku:Lab with your computer

You can connect to your Moku:Lab over WiFi or Ethernet.

WiFi (hub)

Connect your computer to the same WiFi network that your Moku:Lab is connected too. You'll need to get the local IP address of your Moku:Lab in order to connect to it using LabVIEW. We recommend using the Bonjour Browser which can be downloaded from:

<http://www.tildesoft.com/>

WiFi (direct)

If your Moku:Lab is operating as a hotspot, you can connect your computer directly to its WiFi network. The IP address of your Moku:Lab will by default be 192.168.73.1

Ethernet (hub)

You can connect your computer via Ethernet directly to the router that your Moku:Lab is attached to. You'll need to get the local IP address of your Moku:Lab in order to connect to it using LabVIEW. We recommend using the Bonjour Browser which can be downloaded from:

<http://www.tildesoft.com/>