

Installation Instructions: Centellax LabVIEW Drivers and Graphical User Interfaces (GUIs)

William Sitch
Centellax, Inc.
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Abstract

This paper details the installation instructions for Centellax LabVIEW instrument drivers and LabVIEW Graphical User Interfaces (GUIs) on computers with or without National Instrument's LabVIEW software installed. This paper will demonstrate examples from the PPG12500, a 12.5Gb/s Programmable Pattern Generator.

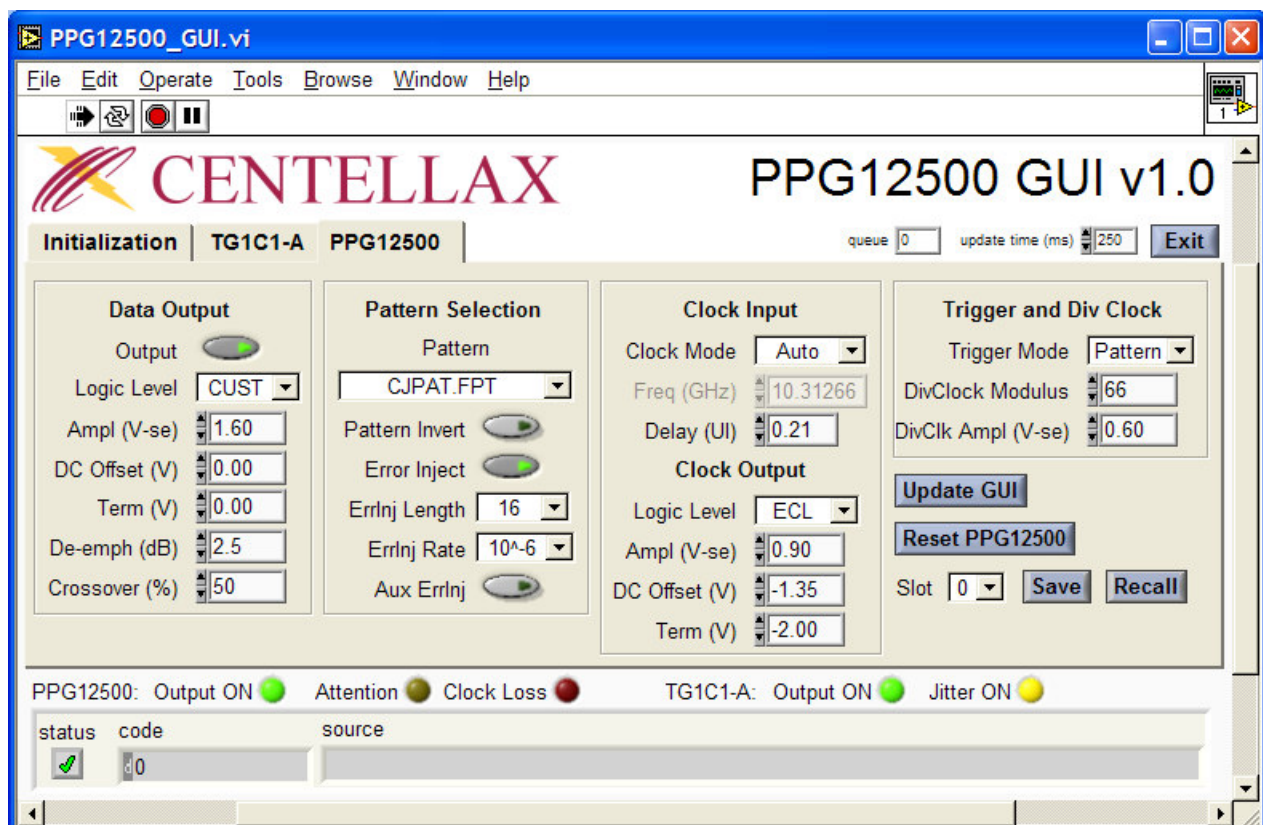


Figure 1 – PPG12500 LabVIEW GUI

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Centellax LabVIEW Drivers and GUIs

Centellax offers a full suite of LabVIEW instrument drivers and GUIs designed for remote instrument control. The drivers and GUIs are available as a free download from the Centellax website. Source code for both drivers and GUIs are available. Compiled GUI executables are available for computers without National Instrument's LabVIEW software installed.

Centellax LabVIEW drivers and GUIs use a low-level VISA interface to communicate with instruments over GPIB and/or USB interfaces. This means the same driver or GUI software can be used with an instrument connected to the computer with either a GPIB cable or a USB cable.

What is an instrument driver?

An instrument driver is a software program that can be used to control a programmable instrument, like a PRBS generator, BER tester, oscilloscope, switch matrix, or a simple DC power supply. The software program is comprised of individual routines that control a particular function of the instrument, like configuring options, writing data, reading data, and triggering the instrument.

Instrument drivers simplify instrument control and reduce test development time by providing an easier method to interface with the instrument. If you wanted to integrate a Centellax instrument into your pre-existing test system, or if you wanted to build a new test system, you should use the Centellax instrument driver when you write software to communicate with the instrument.

The Centellax LabVIEW instrument drivers have a simple user interface that allows single-function control of an instrument. It can be useful for debugging an instrument; the user interface for the Centellax PPG12500 is shown below in Figure 2.

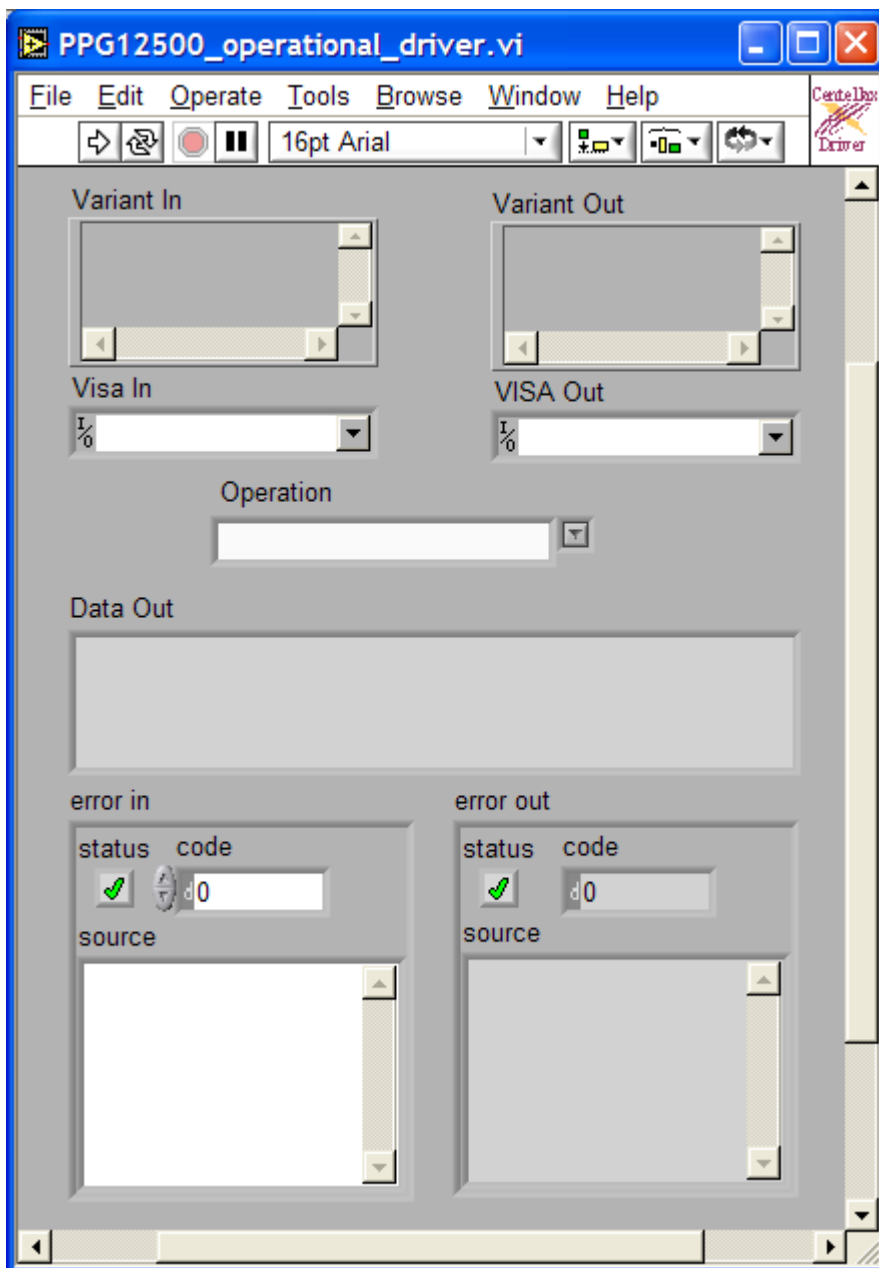


Figure 2 – PPG12500 instrument driver interface

What is a GUI?

A Graphical User Interface (GUI) is exactly what the words describe: a graphical method of interfacing with an instrument. Centellax LabVIEW GUIs allow complete remote control of Centellax instruments, and are written to use the Centellax LabVIEW instrument drivers.

The GUI is written separately from the driver to provide modular options for test development. If you want to develop your own GUI, or integrate a Centellax instrument into a larger test system, simply use the Centellax LabVIEW instrument driver in your own software.

The Centellax LabVIEW GUIs are suitable for lab use. They are not intended to be used for automated instrument control – for example in a final production test environment – but the LabVIEW code contained within the GUI could certainly be modified for that purpose.

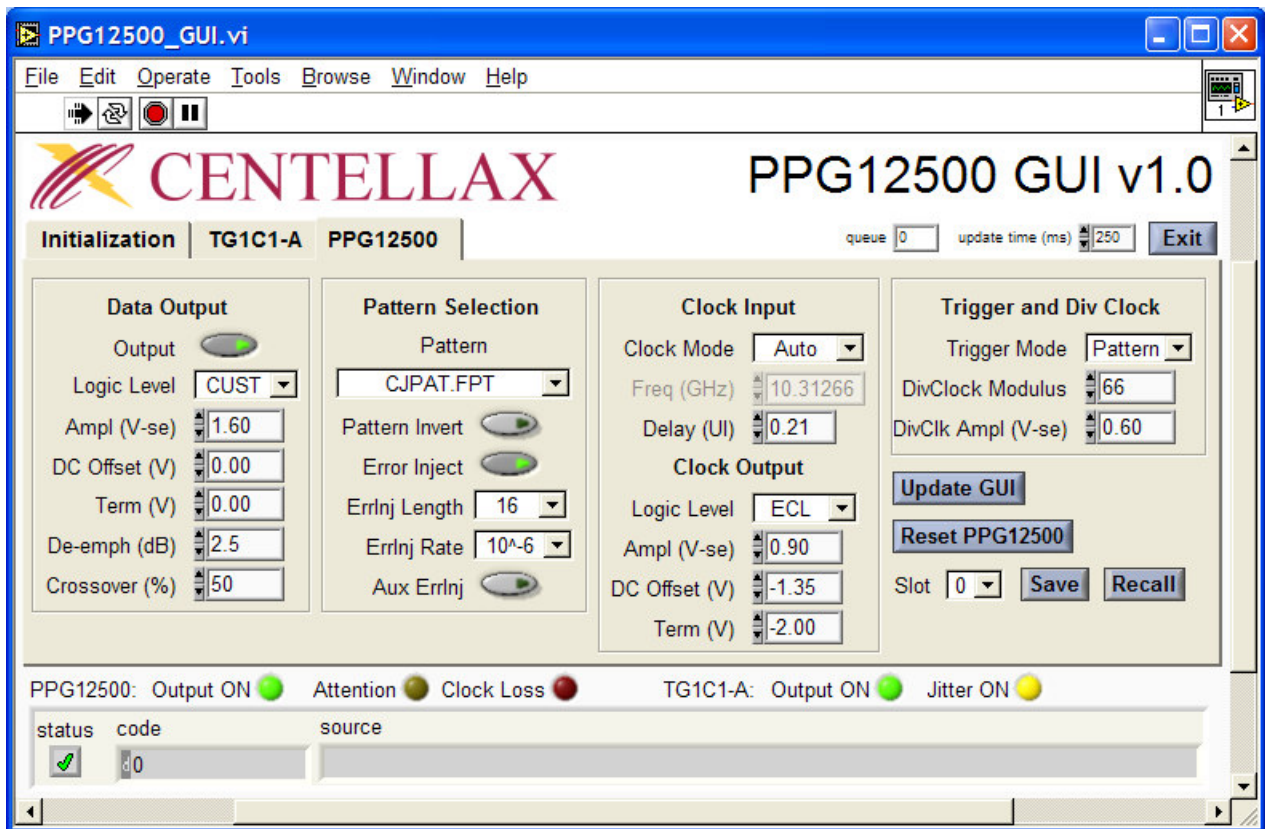


Figure 3 – PPG12500 LabVIEW GUI

If you do not need to edit or change the functionality of the Centellax LabVIEW GUI, you can install a pre-compiled version of the code. Centellax provides compiled executables for the Windows operating system; installation instructions are provided below.

What is LabVIEW?

LabVIEW is a graphical programming language developed by National Instruments. It enables rapid software development of measurement, test, and control systems using

graphical icons and wires that resemble a flowchart. LabVIEW code can be interpreted or compiled for Windows, Mac, Linux, and real-time operating systems (like mobile phones).

To edit, change, or create a LabVIEW program you will need a copy of the LabVIEW software. Contact National Instruments for more information. The LabVIEW source code for Centellax instrument drivers and GUIs is freely available, an example of which is shown below in Figure 4.

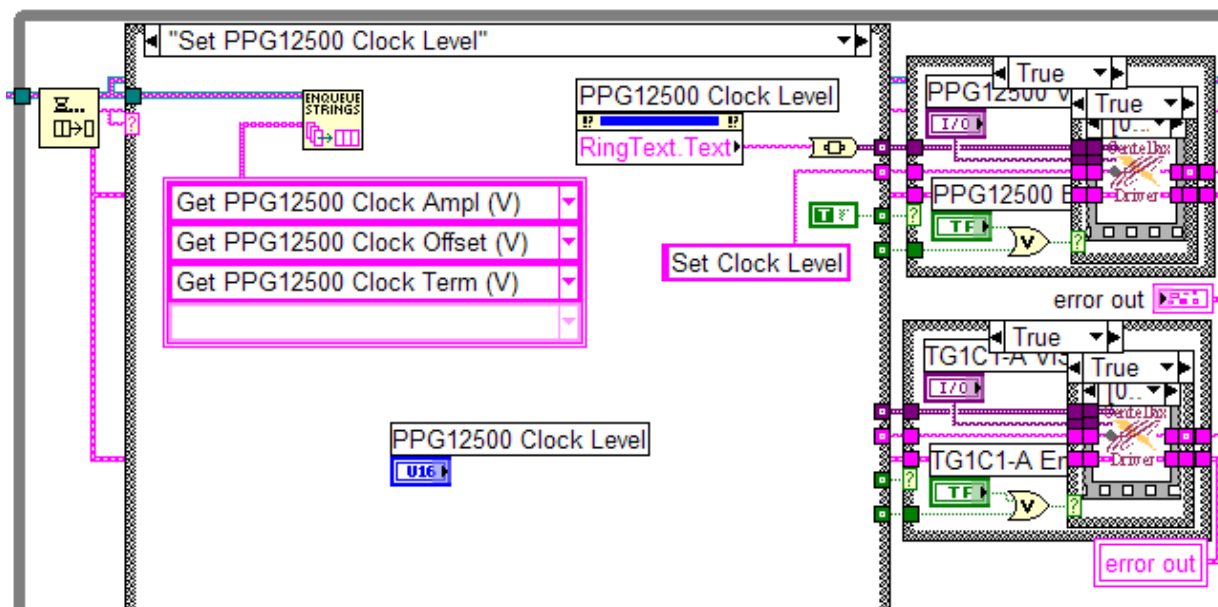


Figure 4 – PPG12500 LabVIEW GUI code example

What is VISA?

Centellax LabVIEW drivers and GUIs all use low-level Virtual Instrument Software Architecture (VISA) libraries for communicating with devices over GPIB, USB, and a variety of other buses. This allows us to write one version of LabVIEW code that can talk to our instruments over either GPIB or USB, which is nice.

From the National Instruments (NI) webpage (<http://www.ni.com/visa/>):

“VISA provides the programming interface between the hardware and development environments such as LabVIEW, LabWindows/CVI, and Measurement Studio for Microsoft Visual Studio. NI-VISA is the National Instruments implementation of the VISA I/O standard.

NI-VISA includes software libraries, interactive utilities such as [NI Spy](#) and the

[VISA Interactive Control](#), and configuration programs through Measurement and Automation Explorer for all your development needs. NI-VISA is standard across the National Instruments product line. With NI-VISA, you can feel confident that your software development will not become obsolete as your instrumentation interface hardware needs evolve into the future.”

National Instruments (NI) provides the VISA libraries free of charge. You are eligible for a ‘free’ deployment license when you download the VISA libraries for use with an application written using NI software.

Installation Instructions for Pre-compiled Executables

For many test applications it may be advantageous to use a pre-compiled executable instead of the LabVIEW GUI source code. One specific reason is if you do not already own a copy of National Instrument’s LabVIEW software!

Centellax offers pre-compiled Windows executables of LabVIEW GUIs for all GPIB- and USB-enabled instruments. You can download these programs and run them just like any other program on your computer.

However, because you do not have the full LabVIEW development kit installed, there are two additional programs that must be installed first. These programs provide libraries and other resources for the pre-compiled executable GUIs.

Step 1: Installing a VISA library for low-level hardware I/O

Centellax LabVIEW drivers and GUIs all use the low-level Virtual Instrument Software Architecture (VISA) libraries for communicating with devices over GPIB, USB, and a variety of other buses.

National Instruments, who provide the LabVIEW software, also sell hardware devices for connecting USB ports to GPIB ports (GPIB-USB-HS), PCI cards that connect to GPIB ports (PCI-GPIB) or ethernet-enabled GPIB host controllers (GPIB-ENET/100). If you are using a NI product to connect your computer to your instrument, use the NI VISA library.

If you use hardware from a different vendor for connecting your computer to the instrument you want to control, you may wish to consider looking for alternative VISA libraries designed for your specific hardware. NI’s VISA libraries may still work.

For a simple USB cable connection from your computer to the instrument, you can use

the NI 488.2 VISA libraries. The following instructions are specific to the NI-488.2 VISA libraries.

1.1 Download and un-zip the software package

You can download the NI VISA libraries directly from the NI webpage. Find and download the latest version of the NI VISA 488.2 software. Make sure you download the version designed for your operating system and in your native language.

Alternatively, Centellax hosts a mirror of version 2.5 (from September 2008). This version works just fine and is hosted on our website, the filename is ni488225.exe, and it is linked from each product page. The file is 259MB and takes a while to download.

After downloading, run the self-extracting file. You may be presented with a security warning message. If you feel it is prudent to continue, unzip the contents into a directory. This is temporary and you can delete it later.

1.2 Install the NI-488.2 software and select appropriate features

Proceed with the software installation when presented with a menu. There is no need to read the documentation. Because you will be using the software with an application written in NI LabVIEW, you do not need an additional license.

The installation will next display a feature selection window, shown below in Figure 5.

Check to ensure you are installing the following features:

- GPIB Analyzer
- Application Support -> LabVIEW Support
- NI-VISA -> Run Time Support -> GPIB
- NI-VISA -> Run Time Support -> Serial
- NI-VISA -> Run Time Support -> USB
- NI-VISA -> Run Time Support -> COM Support
- NI-VISA -> Run Time Support -> (all others, can't hurt)
- NI-VISA -> Configuration Support -> VISA Configuration
- NI Measurement & Automation Explorer
- NI Spy

You may wish to install other features as well, just make sure you get the important ones listed above. Continue through the license agreement and summary screens and install the software.

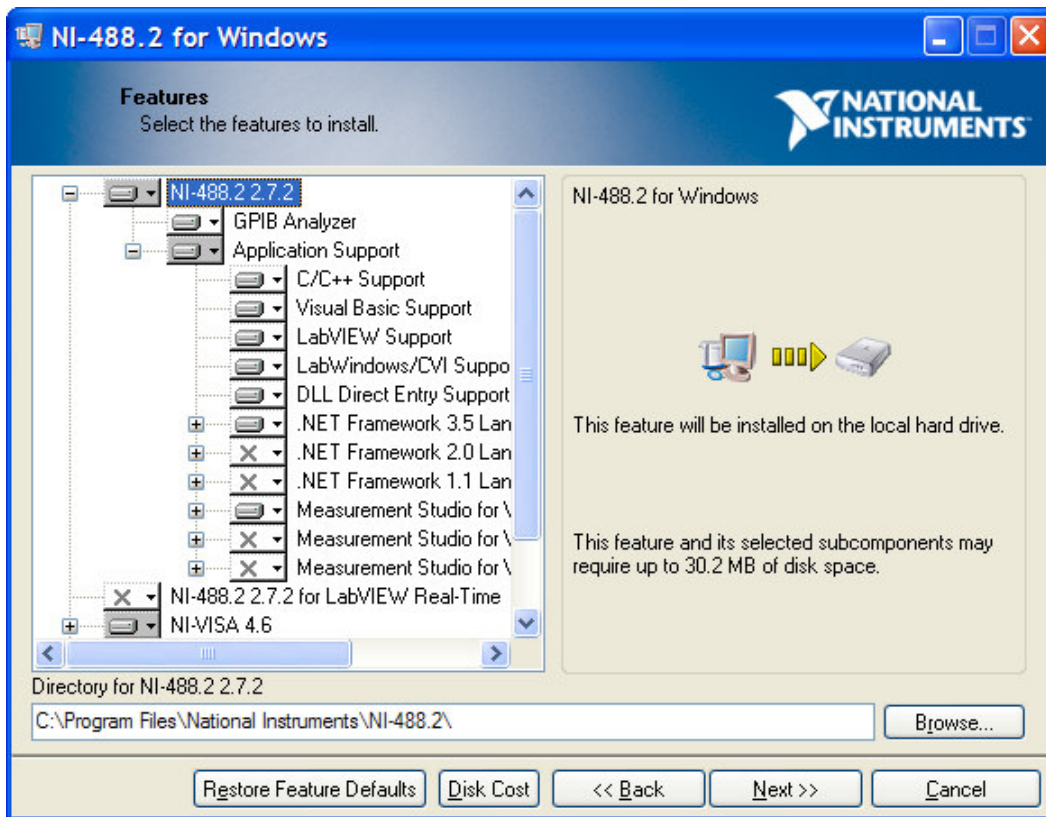


Figure 5 – NI-488.2 software installation, feature selection screen

After the installation is complete, which will take a long time, you will probably be prompted to reboot. You can if you want, but there's no need to before finishing the rest of the installation detailed below.

Step 2: Installing the NI LabVIEW Run-Time Engine

Centellax pre-compiled LabVIEW driver and GUI executables require a run-time engine specific to the version of NI LabVIEW that was used to build the executable.

2.1 Download and un-zip the software package

You can download the NI run-time engine directly from the NI webpage. Make sure you download the version designed for the LabVIEW driver you are planning on using.

Alternatively, Centellax hosts a mirror of the appropriate NI run-time engines. These engines are hosted on our website, linked from each product page. The files are approximately 15MB.

After downloading, run the self-extracting file. You may be presented with a security warning message. If you feel it is prudent to continue, unzip the contents into a directory. This is temporary and you can delete it later.

2.2 Install the run-time engine software

The software install is straightforward and requires no additional instructions.

2.3 Reboot!

If you didn't earlier, reboot your computer.

Step 3: Installing the Centellax pre-compiled executable

This is the easy part. Find the Centellax instrument GUI you want to run, download it. Stick it in a directory somewhere. Run it. That's it.

Installation Instructions for LabVIEW Code

If you already use National Instrument's LabVIEW software and if you want the flexibility of changing the Centellax instrument GUI to suit your particular taste or application, then you should install the code.

Centellax offers LabVIEW instrument driver and instrument GUIs for all GPIB- and USB-enabled instruments. You can download this code from the Centellax website and use it with your locally-installed LabVIEW software.

Step 1: Installing the Centellax LabVIEW driver and GUI code

Centellax LabVIEW instrument driver and instrument GUIs require a version of NI LabVIEW equal or later than the version used to author the code. Most Centellax LabVIEW drivers are written in LabVIEW 6.1, which was released in the Stone Age, so you should have no compatibility problems. LabVIEW is very backwards compatible.

1.1 Download and un-zip the LabVIEW code

Search the Centellax website for the LabVIEW driver and GUI for the instrument you want to control. Download the ZIP file archive of VI files. Unzip the archive into a directory where you keep your LabVIEW code. You can delete the archive file now.

1.2 Install the LabVIEW code

Read the specific installation instructions included with each LabVIEW driver and GUI package.

1.3 Use the LabVIEW code

Double-click the xxx_GUI.vi or xxx_operational_driver.vi, or open these VI files from within LabVIEW. Follow on-screen directions or refer to the usage instructions included with each LabVIEW driver and GUI package.

Troubleshooting

If you run into problems, or if you have any questions not answered in this document, please don't hesitate to contact a Centellax application engineer.

Phone: +1.707.568.5900

Email: support@centellax.com

Online: http://www.centellax.com/contact/apps_engr.php

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