
THORLABS

6-Wavelength High-Power LED Source

CHROLIS Software Operation Manual



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Thorlabs GmbH

Warning

Sections marked by this symbol explain dangers that might result in personal injury or death. Always read the associated information carefully before performing the indicated procedure.

Attention

Paragraphs preceded by this symbol explain hazards that could damage the instrument and the connected equipment or may cause loss of data.

Note

This manual also contains "NOTES" and "HINTS" written in this form.

Please read this advice carefully!

1 General Information

The Chrolis software is a graphical user interface for straightforward use of the Chrolis 6-color light source. The Chrolis provides light from six LEDs as continuous wave or as user-defined pulse train sequences.

The software allows the user to set the power value and to define the pulse lengths, pulse timings, and internal and external trigger signals for each LED independently.

2 Requirements

The requirements for the PC intended to be used for remote operation of the Chrolis software are as follows:

Hardware Requirements

CPU:	2.4 GHz or Faster
RAM:	Min. 4 GB
Graphic Card:	Min. 1024 x 768 Pixel Graphic Resolution
Hard Disc:	Min. 1 GB of Available Free Disk Space (32 bit Operating System) Min. 2.3 GB of Available Free Disk Space (64 bit Operating System)
Interface:	Free USB 2.0 Port, USB Cable According the USB 2.0 Specification

Software Requirements

The CHROLIS software is compatible with the following operating systems:

- Windows® 7 (SP1+) (32 bit, 64 bit)
- Windows® 8.1 (32 bit, 64 bit)
- Windows® 10 (32 bit, 64 bit)

3 Download and Installation

The Chrolis software package, including this manual, can be downloaded from the [Thorlabs website](#):

https://www.thorlabs.com/software_pages/viewsoftwarepage.cfm?code=CHROLIS

Note

Do not connect the Chrolis software to the PC during software installation! Exit all running applications on your PC as the installer may require a reboot of your PC during installation! Please make sure that the installation is carried out completely, including the reboot requests.

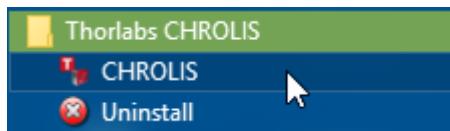
- Save the ZIP file to your computer and unpack the archive.
- Double click the setup.exe to install Shield Wizard.
- Read and accept the End-User License Agreement.
- After installing the Chrolis software, connect the CHROLIS to the PC.

Start Application

Start the Chrolis software from the desktop icon:



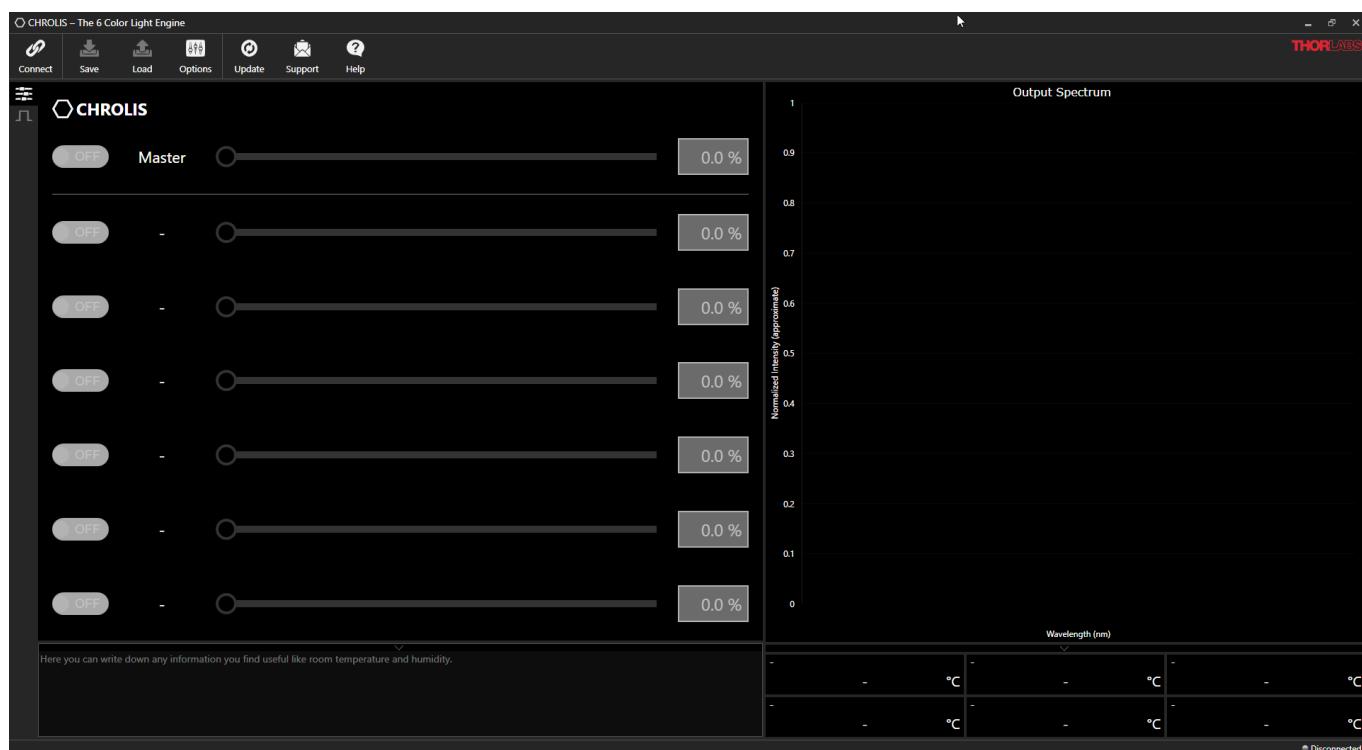
or access the Chrolis software from the START button:



4 Graphical User Interface (GUI)

In this manual, the Chrolis software interface is described based on a set up using a Chrolis with the LEDs of the CHROLIS-C1 configuration, connected to a PC running with OS Windows® 10.

When first starting the software and no Chrolis software device is connected to the PC, the following interface will appear.



Note

The software will recognize an already connected Chrolis device upon starting the software.

Menu Bar

Connect 3

Connect or Disconnect Chrolis devices to the software

Save

Save software settings

Load

Load previously saved software settings

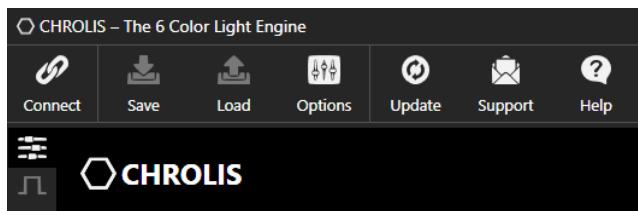
<u>Options</u>	Name LEDs, choose temperature units and change steps (1% or 10%) on the LED slider
Update	Search for new versions of the software. The firmware update button will be functional once there is a first firmware update.
Support	Technical Contact Information
Help	Software Help File

4.1 Connect

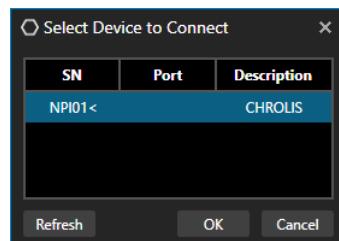
The software will automatically try to connect to the Chrolis 6-Wavelength High-Power LED Source.

In case no device was connected when starting the software, a newly connected Chrolis can be linked to the software.

Use the “Connect” button.



This will open a dialog showing the recognized devices. Select the device and press OK.



Press “Refresh” in order to search for new devices.

Connected devices can be disconnected by using the “Disconnect” button.

4.2 Save / Load

The “Save” button saves all software settings to an XML file. These include all slider settings in the master tab, all pulse settings in the pulse tab as well as the parameters in the Options menu.

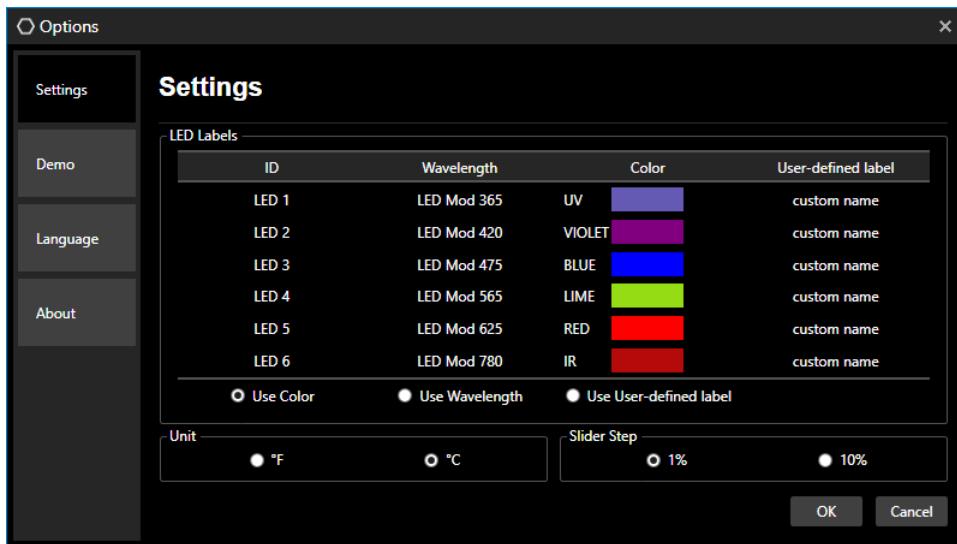
Previously saved settings can be loaded with the “Load” button prior to activating the LEDs.

Note

When settings are loaded while LEDs are switched on, the LEDs will turn off and the settings will be loaded.

4.3 Options

Upon selection of the "Options" button, the following dialog appears:



Settings-Tab:

- LED Labels** Shows basic information for all installed LEDs. For each LED it is possible to insert a custom name in the “User-defined label” column.
- Use ...** Define which label is used to name the LED in the master GUI.
- Unit** Switch between the temperature units for the displayed measured CHROLIS temperature.
- Slider Step** Change the step of the LED power slider between 1 % and 10%.

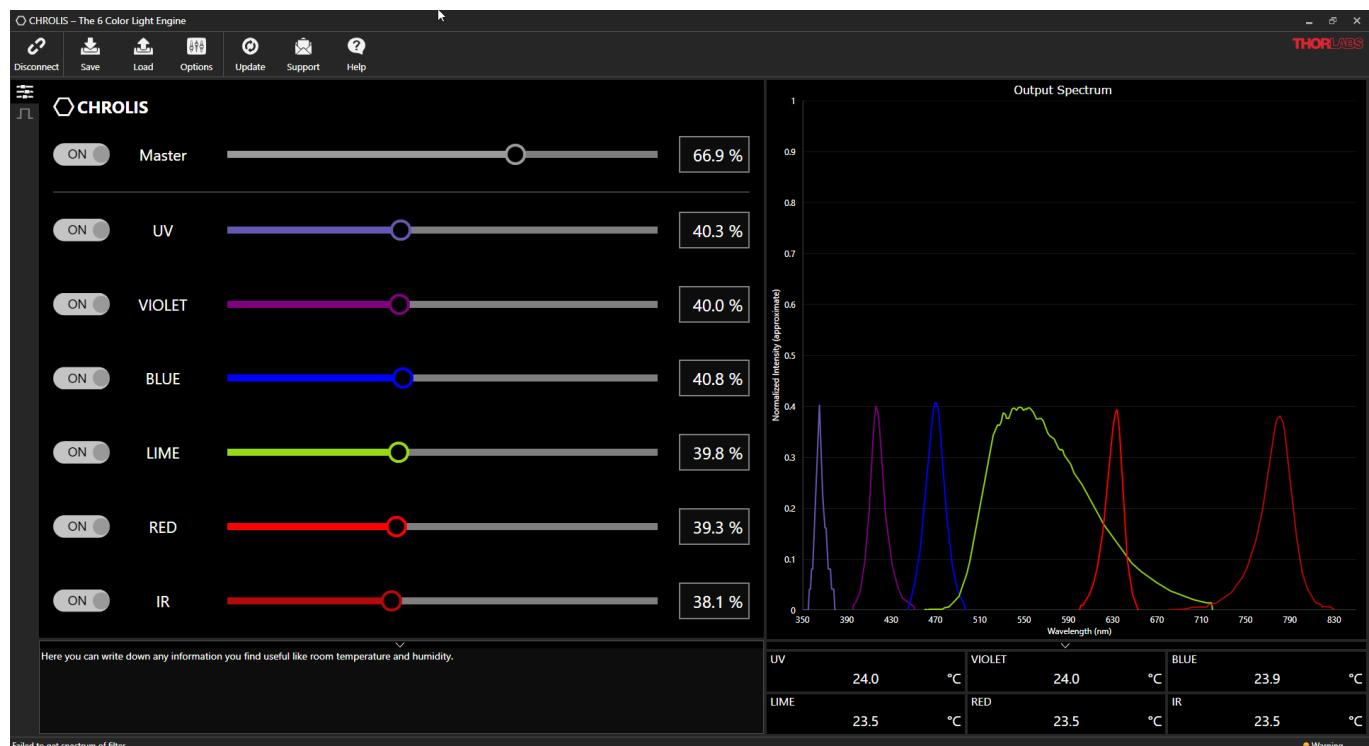
Demo-Tab: Pressing “Run Demo” will run a selection of on-off sequences and color combinations. The demo can be terminated by pressing “Stop Demo”.

Language: Select English or Chinese for the GUI language.

About: The software version number is displayed.

4.4 Master Tab CW

Click  in the top left corner to switch to the Master Tab to control the LEDs in CW mode.



Activate an LED of choice and adjust the power in % with the respective slider on the left side.

To power on the desired LEDs, proceed with the following sequence:

- Set the intensity of each LED using the slider or enter the value in the corresponding field
- Switch on the desired LEDs
- Switch on the Master switch

Note

Master settings: The LEDs will only be powered when the Master switch is turned on.

The Master slider will change the intensity of all LEDs simultaneously while keeping the ratio constant.

LED Spectra

The plot on the right side shows the spectra of the activated LEDs. The height of each spectrum will change according to the set intensity. All spectra are normalized to 1 when the intensity is set to 100%.

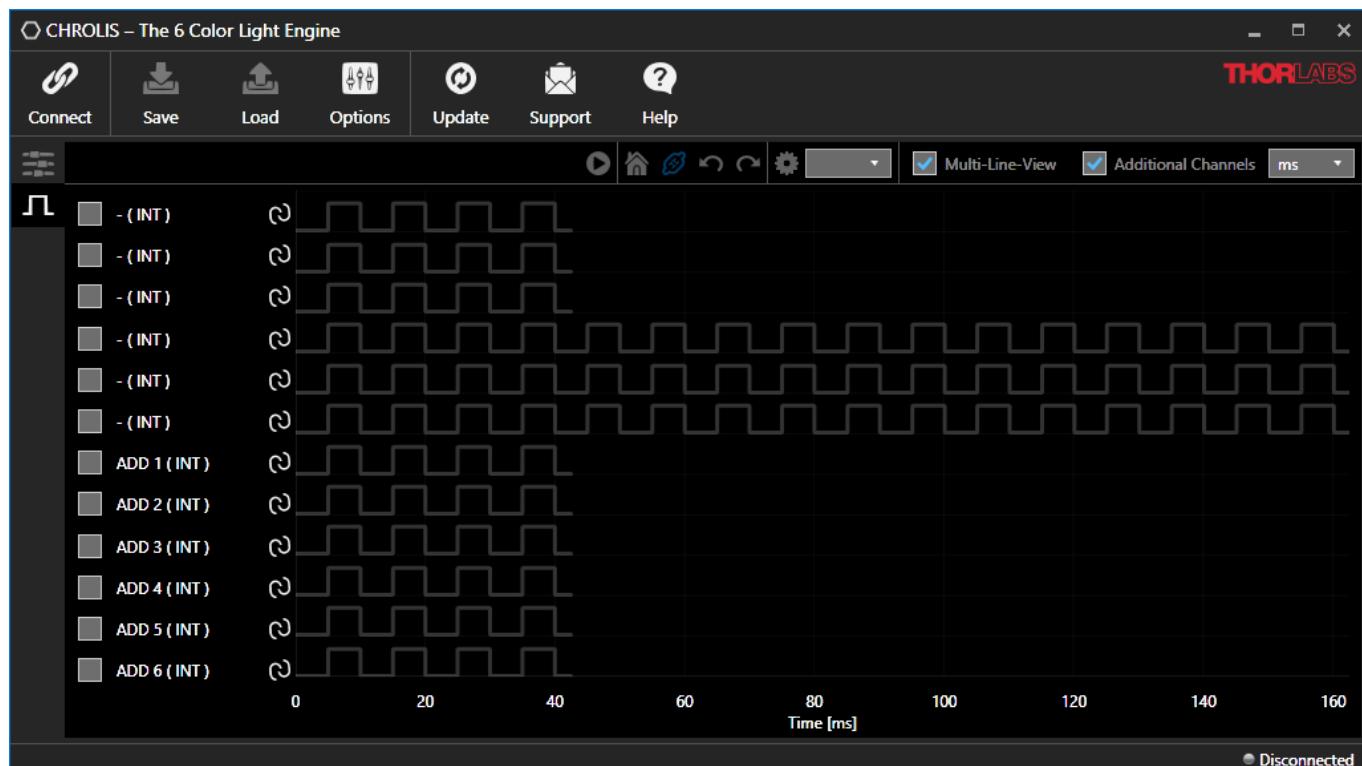
LED Temperature

The table below the plots shows the temperatures of each LED as measured inside the Chrolis. In case the temperature of one LED is too high, all LEDs will be switched off.

4.5 Master Tab Pulsed Mode

Clicking  on the top left corner switches to the pulse mode. This allows for pulsing the individual LEDs and also configuring the behavior of 6 additional input/output channels.

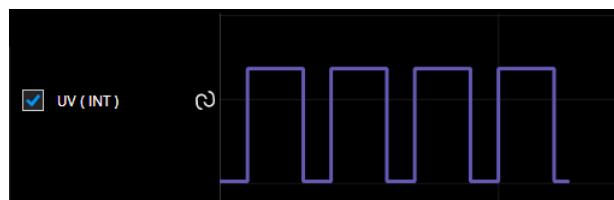
Connect the Chrolis breakout box (BBC1) to the Chrolis device and a pulse generating device or a receiving device in order to pulse the LEDs with external signals or to use the additional input/output channels.



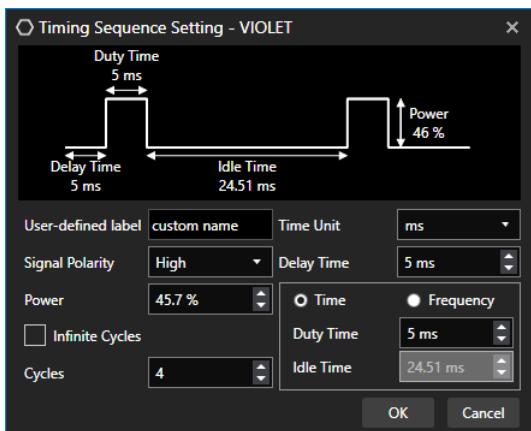
4.5.1 Internal Pulse Generation

To pulse the LEDs with an internally generated signal follow these steps:

- Mark the check box next to the desired LEDs.
- Set the signal to “INT” to choose internal pulse generation.

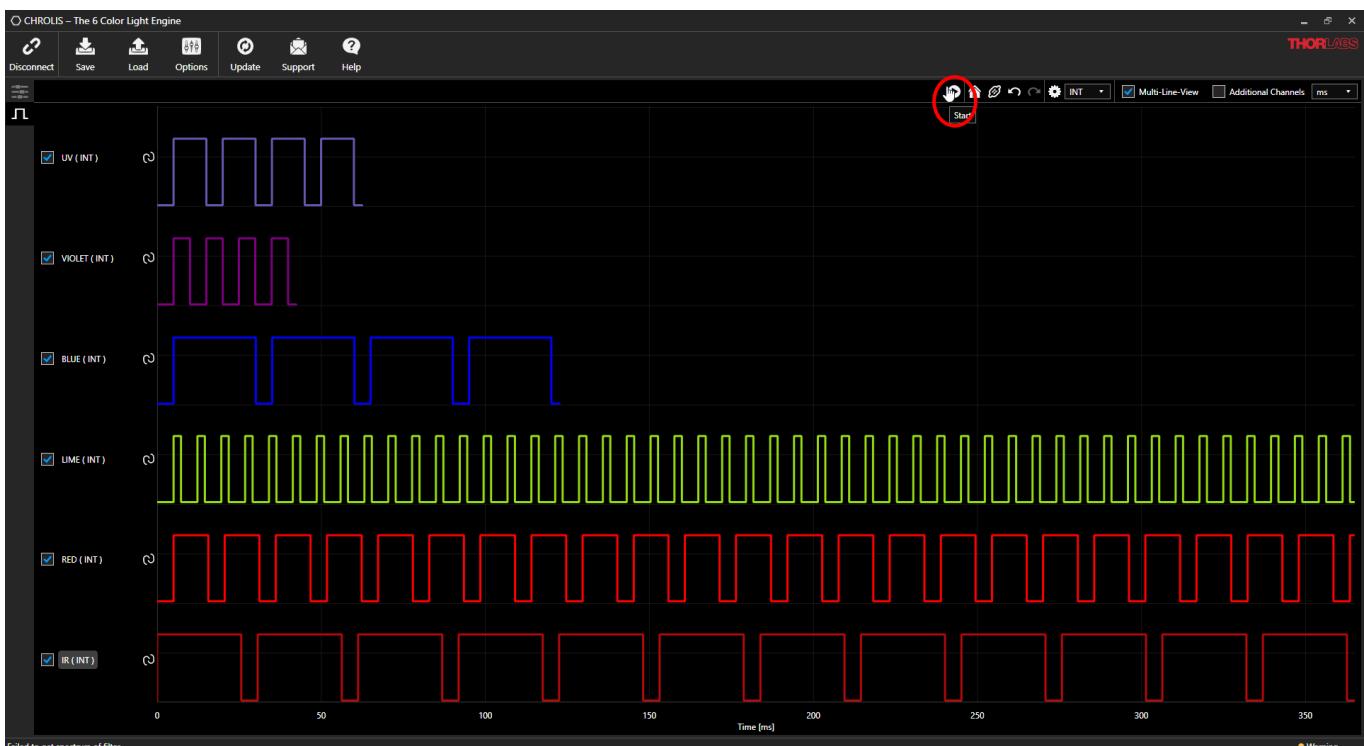


- Double click on the LED name or click the gear button on the top right menu **INT**. This will open the following window:



Use this window to define the following parameters:

- User-defined label** as also described [above](#).
- Time Unit**: User can switch between “ μ s”, “ms”, “s” and “min”.
- Signal Polarity**: Can be used to define whether the LED is active upon “high” or “low” level
- Delay Time**: User defined delay before the pulse starts.
- Power**: Defines the intensity of the LED when active.
- Duty Time/Frequency**: On-time of the LED when set to “Time”; frequency of the pulses when set to “Frequency”.
- Idle Time/Duty Cycle**: Off-time when set to "Time"; Fraction of one period where the signal is active when set to "Frequency".
- Cycles**: Number of pulse cycles that will be generated; check “Infinite Cycles” for continuous pulse generation.
- After the pulses for all LEDs are set, start the pulse generation by clicking on the top right menu, circled below.



4.5.2 External Pulse Generation

The LEDs can also be triggered from other external devices that generate a TTL signal. First, the CHROLIS [Breakout Box BBC1](#) (available separately) needs to be connected to the Chrolis via a DSub25 cable. The input signal generator has to be physically connected to the BNC Breakout Box via one of the BNC connectors marked LED 1 to LED 6.

To use external signals the software has to be configured in the following way:

- Mark the check box next to the desired LEDs.
- Set the signal to “EXT” to enable external triggering by selecting EXT in the top right menu bar next to the gear icon.
- Double click on the LED name or click  to specify setting.
- Specify the desired “Signal Polarity”; Choosing “high” will activate the LED when the external signal is “high” and vice versa.
- Use “Power” to specify the desired intensity of the LED.
- Click  to activate external triggering.

Note

As the signal comes from an external device the parameters in “Delay Time” and the values in the “Time/Frequency” tab have no effects on the signal. They may be adjusted by the user so that the displayed pulse train resembles the external signal.

4.6 Additional Channels

When the Chrolis breakout box BBC1 is connected, the user can configure up to 6 additional channels marked “AUX 1” through “AUX 6”. Each channel can be configured as either an input or an output. These channels can, for example, be used to generate trigger signals for other devices like cameras. In addition, they may also be used to start the internal pulse generation for a specific LED.

4.6.1 Additional Channels as INPUT

To use an AUX channel as input to send additional signal to the measurement, follow these steps:

- Mark the check box next to the desired channel.
- Set the signal to “Input”.
- Double click on the channel name or click .
- Create the desired link to other channels
- Click  to activate external triggering.

Note

As the signal comes from an external device, editing the channel settings (Signal Polarity, Power, Time/Frequency, ...) has no effects on the signal. They may be adjusted by the user so that the displayed pulse train resembles the external signal.

4.6.2 Additional Channels as OUTPUT

To use the channel as output proceed in the following way:

- Mark the check box next to the desired channel.
- Set the signal to "Output".
- Double click on the channel name or click .
- Specify the desired [pulse parameters](#)  6.
- Start the pulse generation by clicking .

4.7 Linking Channels

The CHROLIS software allows for creating links in between channels. The starting point of the link is required to be of external nature: either channels LED 1 to LED 6 when set to "EXT", or channels AUX 1 to AUX 6 when set to "Input". The endpoint of the signal has to be the first edge of an internal/output signal, i.e. either LED 1 to LED 6 when set to "INT" or AUX 1 to AUX 6 when set to "Output". This can, for example, be used to start LED pulses with a certain delay after receiving a trigger pulse. To link two channels follow these steps:

- Left-click on the rising or falling edge of an external/input signal.
- Keep pressing the mouse button and drag the mouse to the first edge of an internal/output signal. A dotted line with an arrow symbol will show up when two signals can be linked.
- Release the mouse button to link the signals. A dialog appears to specify an additional delay between the linked signals.
- To unlink two signals, click  next to the channel name.

5 Write Your Own Application

In order to write your own application, a specific instrument driver and tools for use in different programming environments are required. The driver and tools are included in the installer package and cannot be found as separate files in the installation package.

In this section the location of drivers and files, required for programming in different environments, are given for installation under Windows® 8.1 and Windows® 10 (32 and 64 bit).

In order to fully support 64 bit LabView version, the installation offers an installer:

- for Windows 8.1 (32/64 bit) and Windows 10 (32/64 bit): Install "CHROLIS_Vxxx_Setup.exe"

The 32 bit VXIpnP driver works with both 32 and 64 bit operating systems, while the 64 bit driver requires a 64 bit operating system.

Note

Chrolis software software and drivers contain 32 bit and 64 bit applications.

In 32 bit systems, only the 32 bit components are installed to

`C:\Program Files\...`

In 64 bit systems the 64 bit components are being installed to

`C:\Program Files\...`

while 32 bit components can be found at

`C:\Program Files (x86)\...`

In the table below you will find a summary of what files you need for particular programming environments.

Programming environment	Necessary files
C, C++	*.h (header file) *.lib (static library for linking) *.dll (dynamic library)
CVI	*.fp (function panel) *.h (header file) *.lib (static library for linking) *.dll (dynamic library)
C#	.net wrapper dll *.Interop.dll (.net wrapper assembly)
LabView	*.fp (function panel) *.llb VXIlpnp Instrument Driver Beside that, LabVIEW driver vi's are provided with the *.llb container file

In the next sections the location of above files is described in detail.

5.1 32 bit Operating System

Note

According to the VPP6 (Rev6.1) Standard the installation of the 32 bit VXIpnnp driver includes both the WINNT and GWINNT frameworks.

VXIpnnp Instrument driver:

```
C:\Program Files\IVI Foundation\VISA\WinNT\Bin\TL6WL_32.dll
C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\bin\TL6WL_32.dll
```

Note

This instrument driver is required for all development environments!

Header file

```
C:\Program Files\IVI Foundation\VISA\WinNT\Include\TL6WL.h
```

or

```
C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\incl\TL6WL.h
```

Static Library

```
C:\Program Files\IVI Foundation\VISA\WinNT\lib\msc\TL6WL_32.lib
```

```
C:\Program Files\IVI Foundation\VISA\WinNT\Lib_x64\msc\TL6WL_64.lib
```

or

```
C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\msvc\TL6WL_32.lib
```

```
C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\msvc64\TL6WL_64.lib
```

Function Panel

```
C:\Program Files\IVI Foundation\VISA\WinNT\TL6WL\TL6WL.fp
```

or

```
C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\CVI\TL6WL.fp
```

Online Help for VXIpnnp Instrument driver:

```
C:\Program Files\IVI Foundation\VISA\WinNT\TL6WL\Manual\TL6WL.html
```

or

```
C:\Program Files\Thorlabs\CHROLIS\Drivers\Manual\TL6WL.html
```

NI LabVIEW driver

The LabVIEW Driver is a 32 bit driver and compatible with 32bit NI-LabVIEW versions 8.5 and higher only.

```
C:\Program Files\National Instruments\LabVIEW xxxx\instr.lib\TL6WL\...
...TL6WL.llb
```

(LabVIEW container file with driver vi's and an example. "LabVIEW xxxx" stands for actual LabVIEW installation folder.)

.net wrapper dll

```
C:\Program Files\Microsoft.NET\Primary Interop Assemblies\...
...Thorlabs.TL6WL_32.Interop.dll
```

Chrolis software

...Thorlabs.TL6WL_64.Interop.dll

or

C:\Program Files\IVI Foundation\VISA\VisaCom\...

...Primary Interop Assemblies\Thorlabs.TL6WL_32.Interop.dll

.net wrapper dll - NuGet Package

C:\Users\Public\Documents\Thorlabs\NuGet\...

...Thorlabs.TL6WL_32.Interop.x.x.x.x.nupkg

...Thorlabs.TL6WL_64.Interop.x.x.x.x.nupkg

("x.x.x.x" stands for the driver version)

Example for C++

Solution file:

C:\Program Files\IVI Foundation\VISA\WinNT\TL6WL\Examples\C\...

...CHROLIS_CSample.sln

Project file:

C:\Program Files\IVI Foundation\VISA\WinNT\TL6WL\Examples\C\...

...CHROLIS_CSample\CHROLIS_CSample.vcxproj

Source file:

C:\Program Files\IVI Foundation\VISA\WinNT\TL6WL\Examples\C\...

...CHROLIS_CSample\CHROLIS_CSample.cpp

Example for C#

Project file:

C:\Program Files\IVI Foundation\visa\WinNT\TL6WL\Samples\...

...MS.NET_CS\Thorlabs.TL6WL_32.Sample.csproj

Example for LabView

C:\Program Files\National Instruments\LabVIEW xxxx\Instr.lib\TL6WL\...

...TL6WL.llb

(LabVIEW container file with driver vi's and an example. "LabVIEW xxxx" stands for actual LabVIEW installation folder.)

5.2 64 bit Operating System

Note

According to the VPP6 (Rev6.1) Standard the installation of the 64 bit VXIpnP driver includes the WINNT, WIN64, GWINNT and GWIN64 frameworks. That means, that the 64 bit driver includes the 32 bit driver as well.

In case of a 64 bit operating system, 64bit drivers and applications are installed to

"C:\Program Files"

while the 32 bit files - to

"C:\Program Files (x86)"

Below are listed both installation locations, so far applicable.

VXIpnP Instrument driver:

C:\Program Files (x86)\IVI Foundation\VISA\WinNT\Bin\TL6WL_32.dll

C:\Program Files\IVI Foundation\VISA\Win64\Bin\TL6WL_64.dll

or

C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\bin\TL6WL_32.dll

C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\bin\TL6WL_64.dll

Note

This instrument driver is required for all development environments!

Header file

C:\Program Files\IVI Foundation\VISA\Win64\Include\TL6WL.h

or

C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\incl\TL6WL.h

Static Library

C:\Program Files (x86)\IVIFoundation\VISA\WinNT\lib\msc\...
...TL6WL_32.lib

C:\Program Files\IVI Foundation\VISA\Win64\Lib_x64\msc\TL6WL_64.lib

or

C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\msvc\TL6WL_32.lib

C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\msvc64\TL6WL_64.lib

Function Panel

C:\ Program Files\IVI Foundation\VISA\Win64\TL6WL\TL6WL.fp

or

C:\Program Files\Thorlabs\CHROLIS\Drivers\Instr\CVI\TL6WL.fp

Online Help for VXIpnP Instrument driver:

C:\Program Files\IVI Foundation\VISA\Win64\TL6WL\Manual\TL6WL.html

or

C:\Program Files\Thorlabs\CHROLIS\Drivers\Manual\TL6WL.html

NI LabVIEW driver

The LabVIEW Driver supports 32bit and 64bit NI-LabVIEW version 2009 and higher.

C:\Program Files\National Instruments\LabVIEW xxxx\Instr.lib\TL6WL\...
...TL6WL.llb

(LabVIEW container file with driver vi's and an example. "LabVIEW xxxx" stands for actual LabVIEW installation folder.)

.net wrapper dll

```
C:\Program Files (x86)\Microsoft .NET\Primary Interop Assemblies\...
...Thorlabs.TL6WL_32.Interop.dll
...Thorlabs.TL6WL_64.Interop.dll
C:\Program Files\IVI Foundation\VISA\VisaCom64\...
...Primary Interop Assemblies\Thorlabs.TL6WL_64.Interop.dll
```

.net wrapper dll - NuGet Package

```
C:\Users\Public\Documents\Thorlabs\NuGet\...
...Thorlabs.TL6WL_32.Interop.x.x.x.x.nupkg
...Thorlabs.TL6WL_64.Interop.x.x.x.x.nupkg
("x.x.x.x" stands for the driver version)
```

Example for LabView

```
C:\Program Files\National Instruments\LabVIEW xxxx\Instr.lib\TL6WL\...
...TL6WL.llb
```

(LabVIEW container file with driver vi's and an example. "LabVIEW xxxx" stands for actual LabVIEW installation folder.)

6 Appendix

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6.3 Thorlabs Worldwide Contacts

For technical support or sales inquiries, please visit us at www.thorlabs.com/contact for our most up-to-date contact information.



USA, Canada, and South America

Thorlabs, Inc.
sales@thorlabs.com
techsupport@thorlabs.com

Europe

Thorlabs GmbH
europe@thorlabs.com

France

Thorlabs SAS
sales.fr@thorlabs.com

Japan

Thorlabs Japan, Inc.
sales@thorlabs.jp

UK and Ireland

Thorlabs Ltd.
sales.uk@thorlabs.com
techsupport.uk@thorlabs.com

Scandinavia

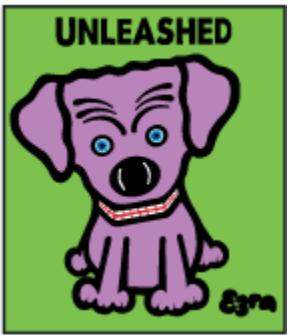
Thorlabs Sweden AB
scandinavia@thorlabs.com

Brazil

Thorlabs Vendas de Fotônicos Ltda.
brasil@thorlabs.com

China

Thorlabs China
chinasales@thorlabs.com



THORLABS
www.thorlabs.com