



# Graphical User Interface

Manual

The Pure Photonics Graphical User Interface (GUI) is an utility to communicate with our devices over a serial port. It includes commands to address all standardized registers and also specific commands to access Pure Photonics' specific functionality.

This manual describes the GUI with a focus on the use with Pure Photonics lasers.





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## 2. Software usage

The software can be downloaded from the Pure Photonics website (purephotonics.com) under the support section.

No installation is required. The unzipped directory can be placed at any location.

The software is run by double clicking the 'Pure Photonics GUI.exe' file.

This manual is based on the software version 2024.08.21. This version is written in the Python 3 language and operates with the Windows 11 operating system and earlier versions. This version does not work with a Linux operating system.

In addition, this version works with COM ports with numbers larger than 9 and it can handle both textual com-ports (such as 'com8') and numbered ones (e.g. 8).

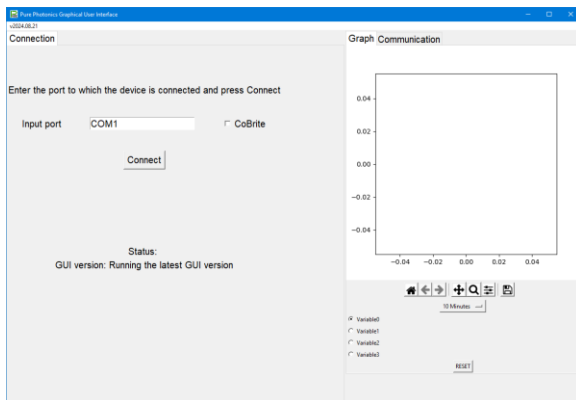
The software has a built in feature to check for updates upon start-up. In case a more recent update is available it will be shown on the connection page. You can also manually check at [https://purephotonics.com/GUI\\_VERSION\\_STATUS](https://purephotonics.com/GUI_VERSION_STATUS) . If a new version is available the user will need to manually download this from <https://purephotonics.com/support/> under 'software' and 'GUI'.

### 3. Connection

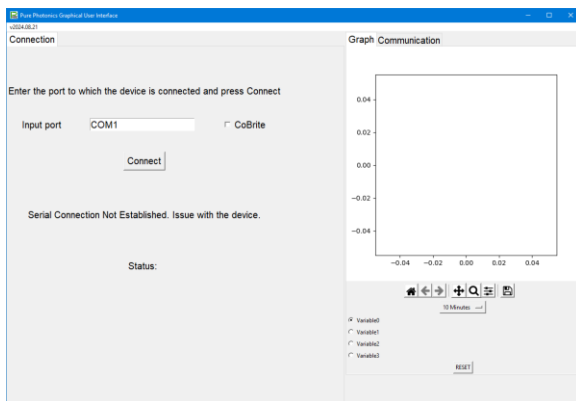
After opening the program it opens up with a **connection** tab and 2 supplemental tabs (**Graph** and **Communication**).

Upon opening, the program will communicate with the Pure Photonics website (purephotonics.com) and will check if the currently used software version is the latest version. The findings are listed under the status-line. In case you are using an older version, you can download the latest version from the website under the Support section (Software, GUI). The downloaded contents can be replaced in the location where the previous version was placed or you can just replace the .exe file.

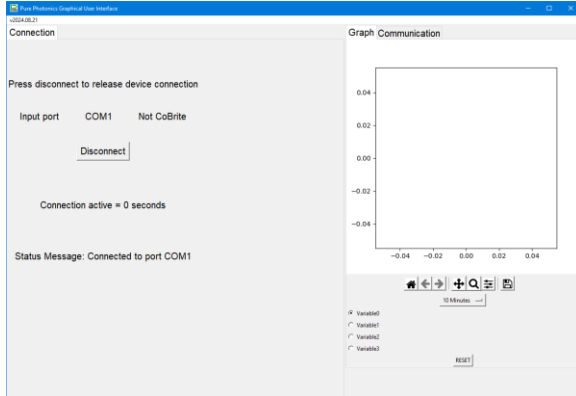
To establish a connection, the serial port of the device needs to be entered. Either as COMxx or just the COM port number (i.e. COM5 and 5 are both valid entries). If you are connecting to a CoBrite product (CoBrite, DX or DX4) then the CoBrite check box needs to be selected.



After pressing *Connect*, the program tries to establish a connection with the product and retrieve relevant information. In case no connection can be made, the program will say so. Causes can be that the product is not powered or that the serial port is already used by a different program.

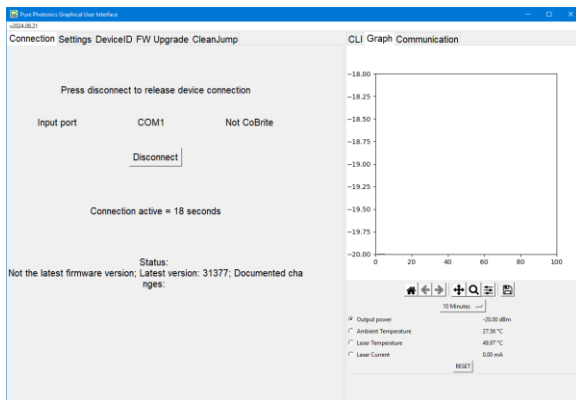


When the serial connection can be established, the session counter will start and the program will communicate with the device. It will download relevant information and check on capabilities and limits of the device. Typically this takes 15 seconds or less. However, in case of an existing clean jump calibration, this may take a bit longer.



After the connection is established and all the data is downloaded, the session counter will start to increment and the graph will start to get populated. The input port conditions are listed on the top.

In case a Pure Photonics device is detected, the firmware version (timestamp) is compared with what is available on the Pure Photonics website. If a newer version is available, this is listed. Note that if you are using a special firmware version, it may not matter that there is a newer version on the web.

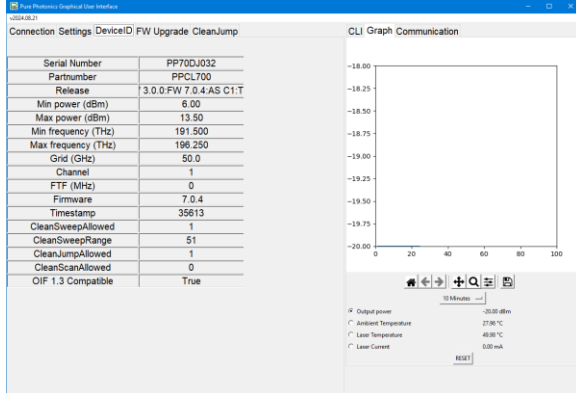


If the connection is not needed anymore the *Disconnect* button can be pressed.

Dependent on the device type that is detected, several other tabs are now accessible.

## 4. Device Information

The basic device information is listed in the **DeviceID** tab. Information on some of the grid features, serial number, partnumber, firmware version and device capabilities are all listed in this table.



The screenshot shows the 'DeviceID' tab in the GUI. On the left, there is a table of device parameters. On the right, there is a 'CLI Graph Communication' window with a plot area and a list of sensor readings.

Connection Settings DeviceID FW Upgrade CleanJump	
Serial Number	PP70DJ032
Partnumber	PPCL700
Release	3.0.0 FW 7.0.4 AS C1.T
Min power (dBm)	6.00
Max power (dBm)	13.50
Min frequency (THz)	191.500
Max frequency (THz)	196.250
Grid (GHz)	50.0
Channel	1
FTF (MHz)	0
Firmware	7.0.4
Timestamp	35613
CleanSweepAllowed	1
CleanSweepRange	51
CleanJumpAllowed	1
CleanScanAllowed	0
OIF 1.3 Compatible	True

**CLI Graph Communication**

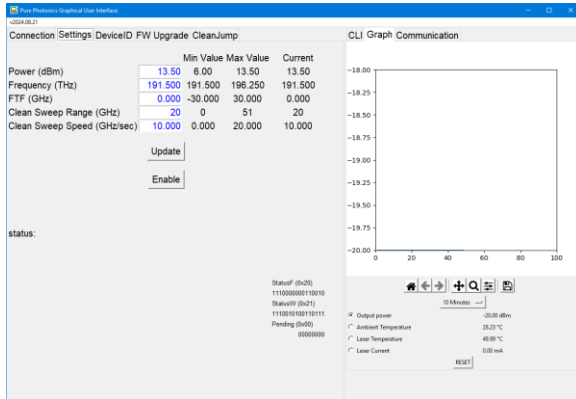
The graph shows a plot area with the y-axis ranging from -20.00 to -18.00 and the x-axis ranging from 0 to 100. Below the graph, there are control buttons and a list of sensor readings:

- Output power: -20.00 dBm
- Ambient Temperature: 27.96 °C
- Laser Temperature: 40.90 °C
- Laser Current: 0.00 mA

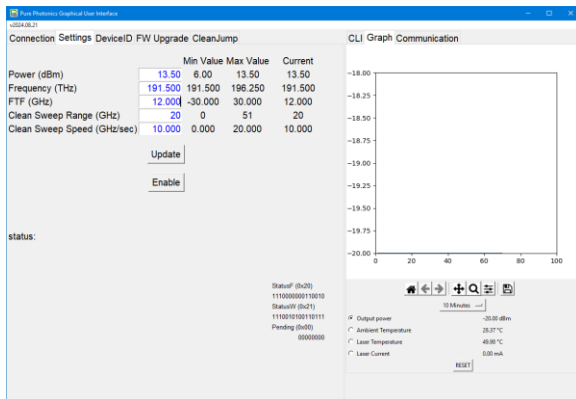
A 'RESET' button is located below the sensor readings.

## 5. Device Setting

In the **Settings** tab the user can control the basic settings for the laser and turn the laser on and off. Dependent on the device that is detected, several lines are show, with the current value and the device capabilities. It also provides an entry box for most of these values where the current setting can be changed. Note that some entries may be removed dependent on the device condition (e.g. power can't be changed when whispermode is enabled).

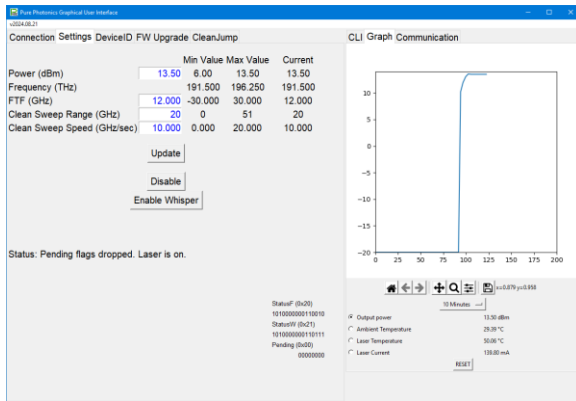
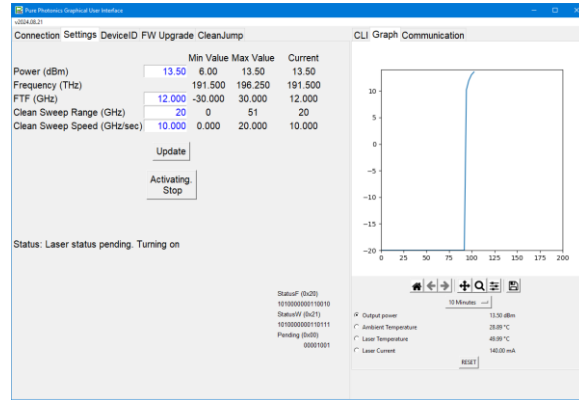
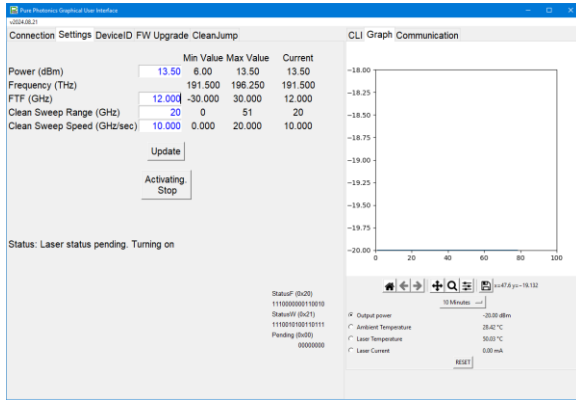


Changing the value in some of the entry boxes and then pressing *Update*, will update the value on the device (as reflected in the 'Current' column).



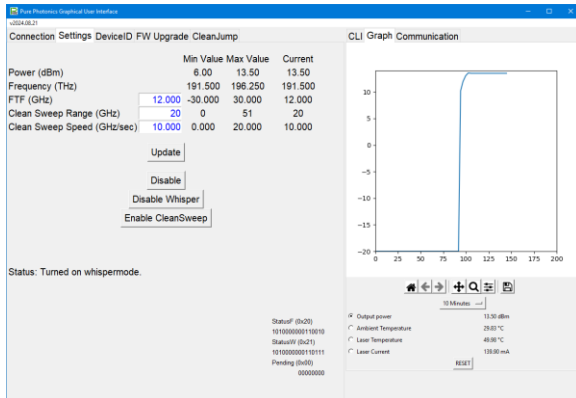
To turn on the laser, press the *Enable* button. While the laser is enabling, a *Stop* button is available. The status line will show that the laser is enabling and the Pending flags in the lower right will show one or more pending flags raised. Once all flags have dropped, the laser will shift to ON state.

The graph on the right will also update and you will see the power increase.

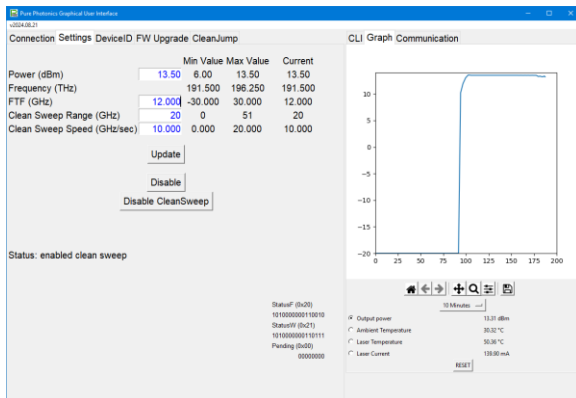




After the laser is on, the *Enable Whisper* button will show for Pure Photonics lasers. Pressing this button will enable the whispermode. Be aware that for the PPCL500 and the PPCL600, the pending flag will drop before the unit is stabilized in the dither mode. Some extra time will need to be added before making this switch. Alternatively the PPCL600/500 product can be configured to use a 'sensor'-type pending flag behavior with a later drop.



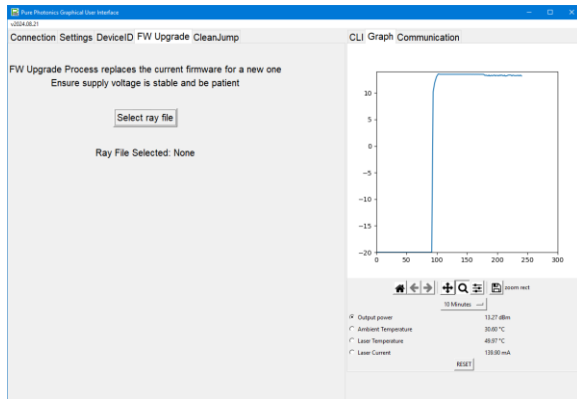
Once the device whispermode is enabled, the *Enable CleanSweep* button will show (only for PPCL700/550). Pressing this will start the Clean Sweep. A *Disable Clean Sweep* button will show to stop the clean sweep.



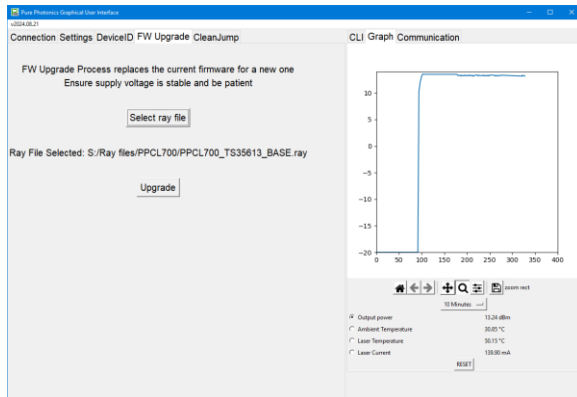
## 6. Firmware upgrade

If a firmware upgrade is needed, the program will set the baudrate of the device higher and will upload the requested firmware (ray file) to the unit. To start the firmware upgrade a valid ray file needs to be made available to the program and the laser needs to be off.

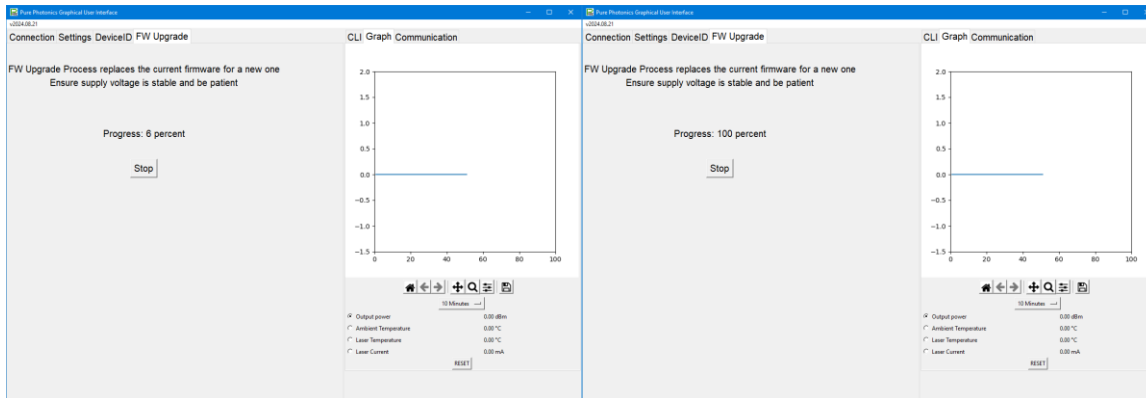
To select a ray file, press the *Select Ray File* button. This will open up a file dialog, looking for a ray file. Select the right ray file and press OK. The file will be loaded to the program and checked for consistency.



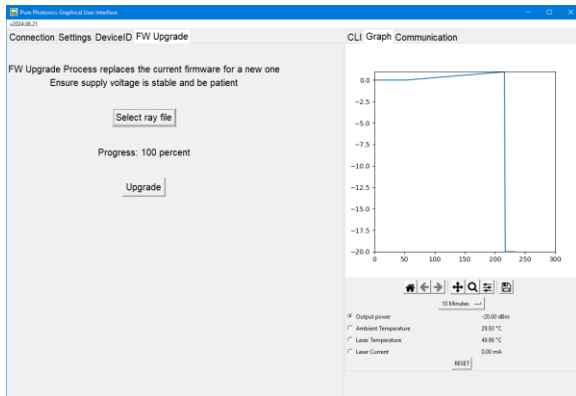
After the file is uploaded the path will be shown in the window. If the device is off, the *Upgrade* button will show. Pressing this button will start the upgrade. This upgrade should take 2-3 minutes, but may take up to 30 minutes for a CoBrite and up to 5-10 minutes for a poorly configured COM port (latency setting must be changed to 1ms).



During the upgrade the program will track the completion rate of the upgrade up to 100%.

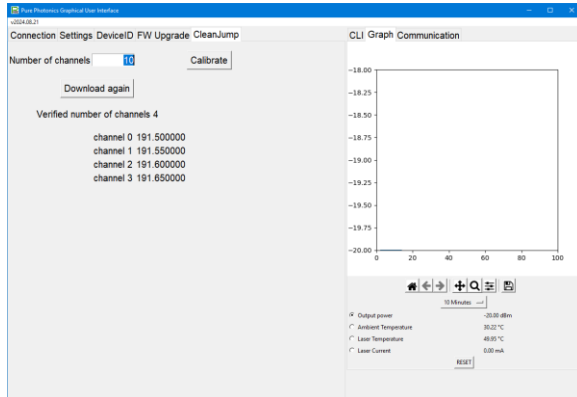


Upon completion the *Stop* button disappears and the *Upgrade* button appears. The graph starts to update itself again. We recommend to power cycle the laser (and the program) after firmware upgrades.

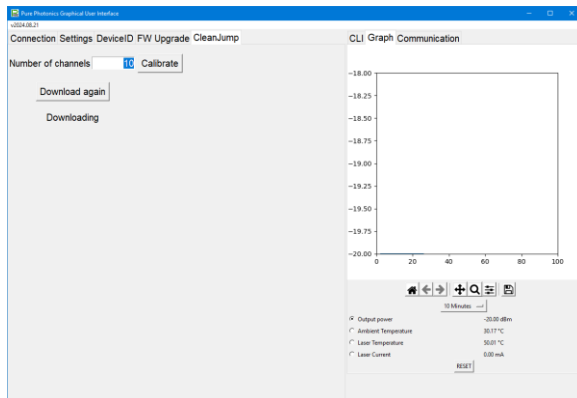


## 7. Clean Jump (PPCL700 only)

The clean jump feature allows the frequency to jump to pre-defined setpoints in whispermode. Upon the connection the device will scan its memory and output all the calibrated setpoints. Those setpoints are listed as channels. If more than 10 channels are found, there will be a pull-down box that allows you to select the first channel # to display.

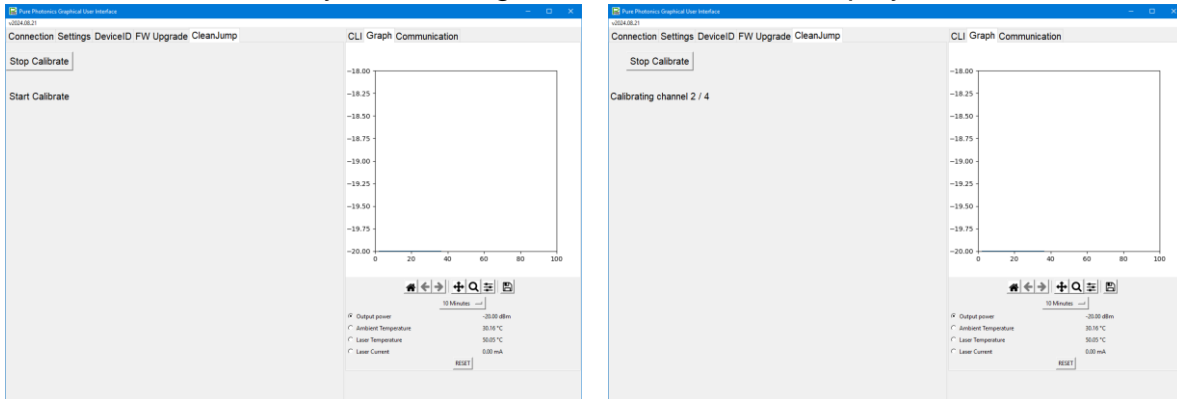


In case you want to download the setpoints again, press the *Download Again* button. The device will now output all the setpoints. During the download the status bar will show downloading. And after completion the found channels will be displayed.

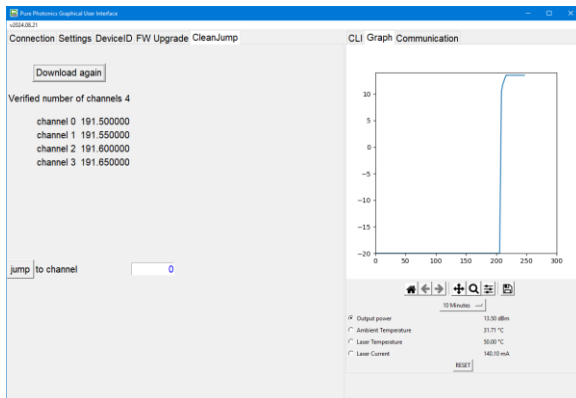


For devices that have no calibration loaded or that need a new calibration, a calibration can be started by pressing the *Calibrate* button. It will then calibrate for the number of channels listed in the entry box. During the calibration it will display at which channel it is

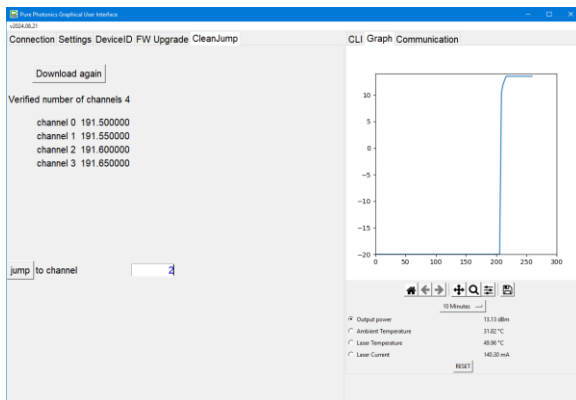
at.



Upon completion the channels are downloaded and displayed.



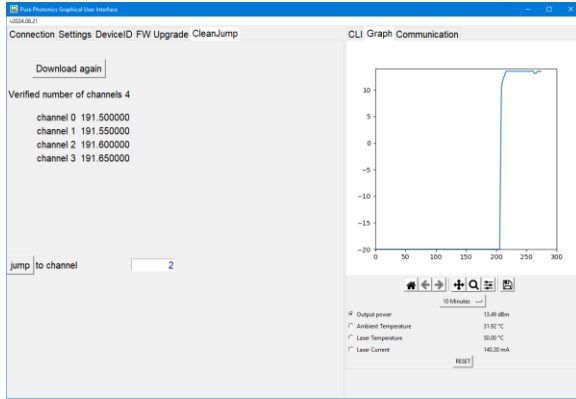
A jump to one of the channels can be initiated by setting the channel in the lower entry box and then pressing the *Jump* button.



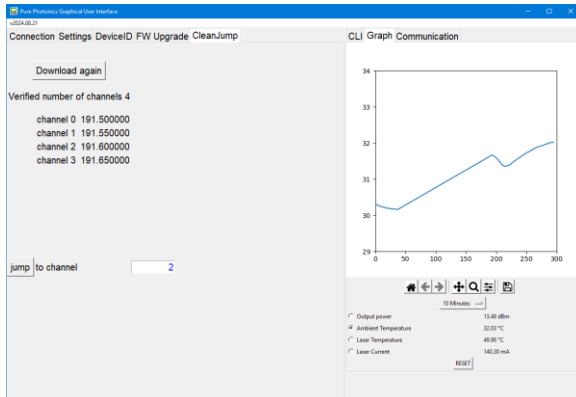
Note that the automatic calibration follows a grid pattern defined by the First Channel Frequency (channel 0) and then each channel offset by the grid parameter. The first channel frequency can be set in the **Settings** tab. The Grid value (in units of 0.1GHz) can be set with the **CLI** tab.

## 8. Graphing of data

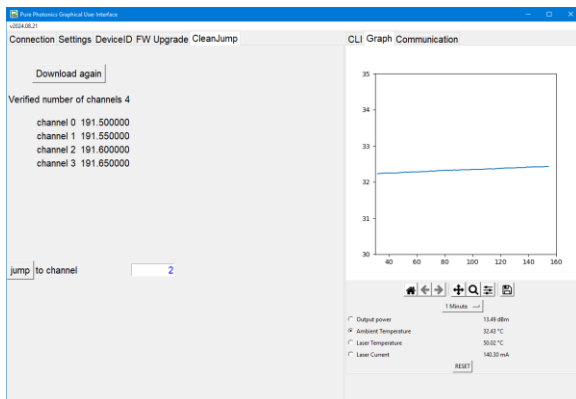
The **Graph** tab plots the data that is being collected. The graphing is independent from the actual data collection which is being stored in logfiles (in the logfiles directory).



By clicking a different radio button, a different variable is being plotted.

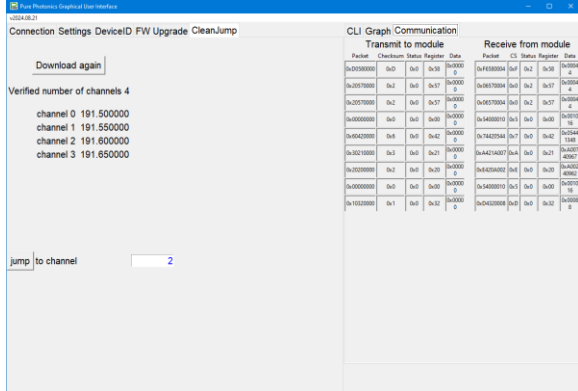


For longer measurements, the timeframe of the display can be selected. This allows to zoom into the data in the time domain. Even though data is discarded for plotting purpose, the full data set remains available for using different timeframes.



## 9. Command packets

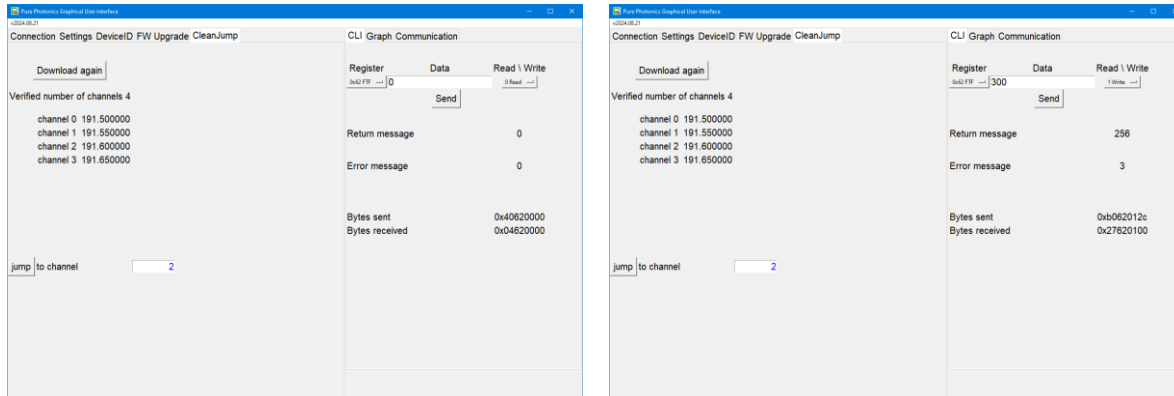
The **Communication** tab provides a snapshot of the last 10 commands sent to and received from the module (taken when the tab is selected). It breaks down each packet of 4 bytes into the relevant components.



## 10. Command Line Interface

The **CLI** tab allows for sending individual commands to the device and monitoring the response. One needs to select the register, the data value to be sent and if this is a read or write operation.

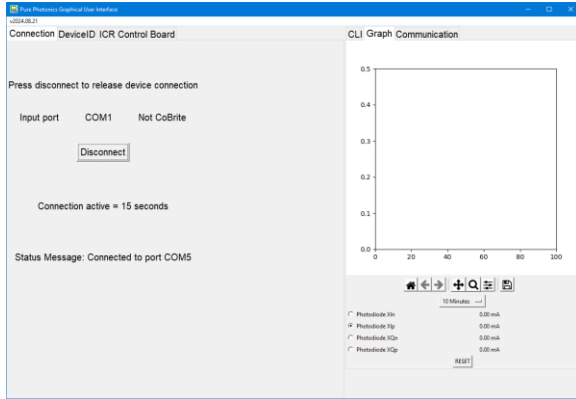
After pressing *Send*, the packet is created, send to the module, a response is received and decoded. The associated data is displayed, including the data-portion of the response, the error code from the response packet (0=no error; 1=pending; 2=AEA; 3=error) and the sent and received packet of 4 bytes.





## 11. Integrated Coherent Modulator Controller

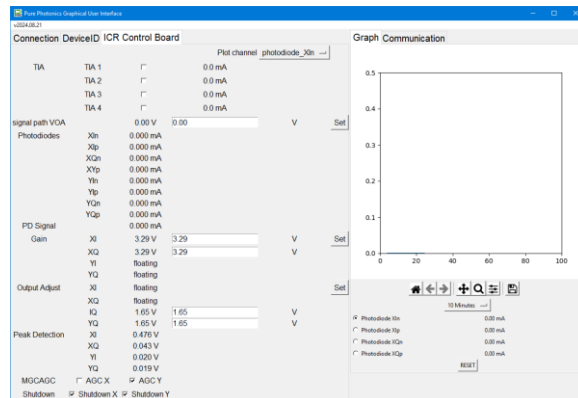
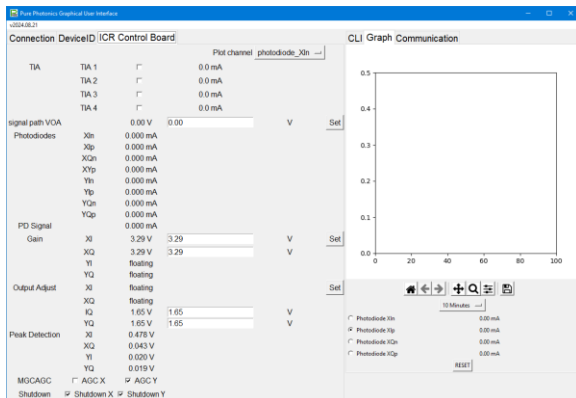
In case the program detects an ICR control board (PPEB075 or PPEB076), a special tab is opened. Only the **Device ID** tab and the **ICR Control Board** tab are opened.



The **ICR Control Board** tab allows the user to control all the functions of that board.

- Enable and disable the TIA supplies by clicking the check boxes. The current is displayed.
- Setting the VOA voltage
- Reading the photodiode currents
- Setting the Manual Gain Control and the Automatic Gain Control and controlling the associated Gain and Output Adjust voltages.
- Getting the peak detection values
- Setting the shutdown toggles

The graph will display the photodiode currents versus time (the control in the upper right is used to select which photodiode is in position 1).



## 12. Analog Array

In case an analog array is detected (PPAAxxx) the **Analog Array** tab is shown.

More information to follow.