VPixx Software Tools

Update Guide

Version 3.3

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Overview

This update guide provides installation and usage information relating to the latest VPixx Software Tool release.

For technical questions or product support information, do not hesitate to contact the VPixx support team by phone or by sending an E-mail to support@vpixx.com

By creating your *MyVPixx* account on the VPixx Technologies website, you will have access to additional product documentation, demos, source code examples and the latest firmware and software drivers.

Update(s)

This section lists the updates contained within this release. Some of these updates require some explanation or an installation procedure, in which case the relevant information will be listed under the name of the corresponding update.

- **USB IO Hub Firmware update**
- **New improved Diagnosis tools**
- **NEW PyTPx UI**
- **PyTPx Search Limits**
- **TRACKPixx /mini scaling calibration**
- **New Button, Awake All Devices/Sleep All Devices**
- **New IO Hub demo Widget**
- **New USB IO Hub demo files.**
- **New PROPixx Calibration in PyPixx**
- **PROPixx Hotspot correction Widget**
- **Graphics Card Test**

Bugfix(es)

DATAPixx3 video signal problem on awake of a computer fixed

With the latest firmware revision, the DATAPixx3 will automatically power ON properly when the video signal was previously lost.
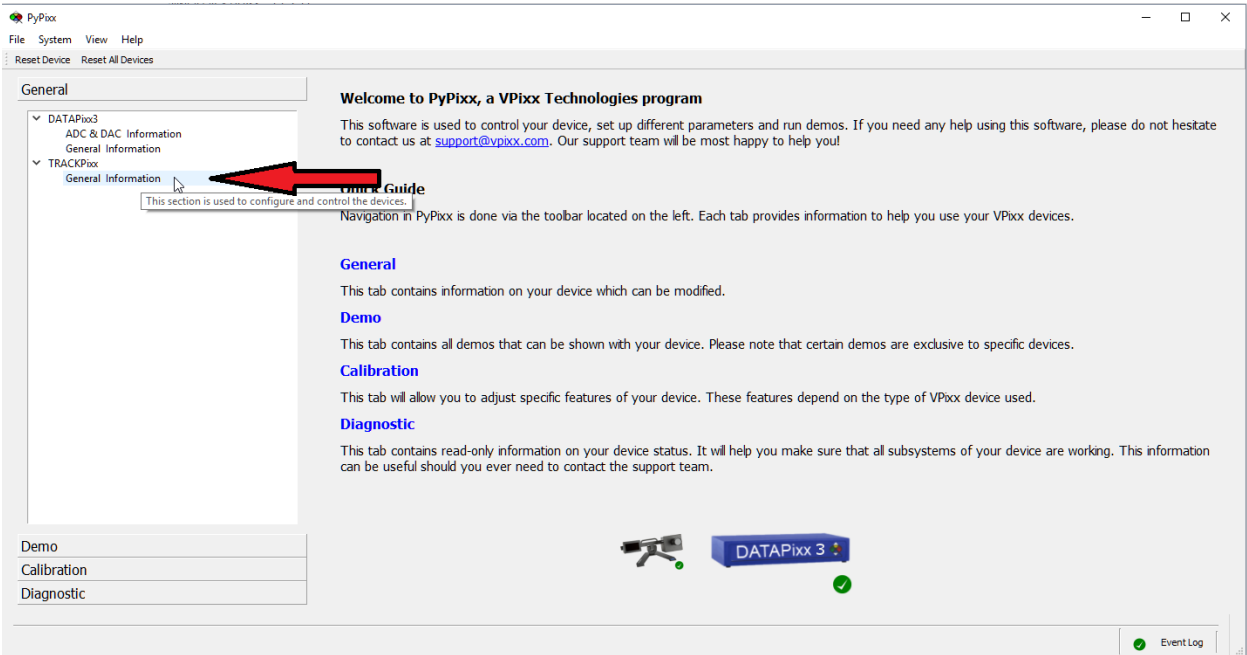
Firmware Update

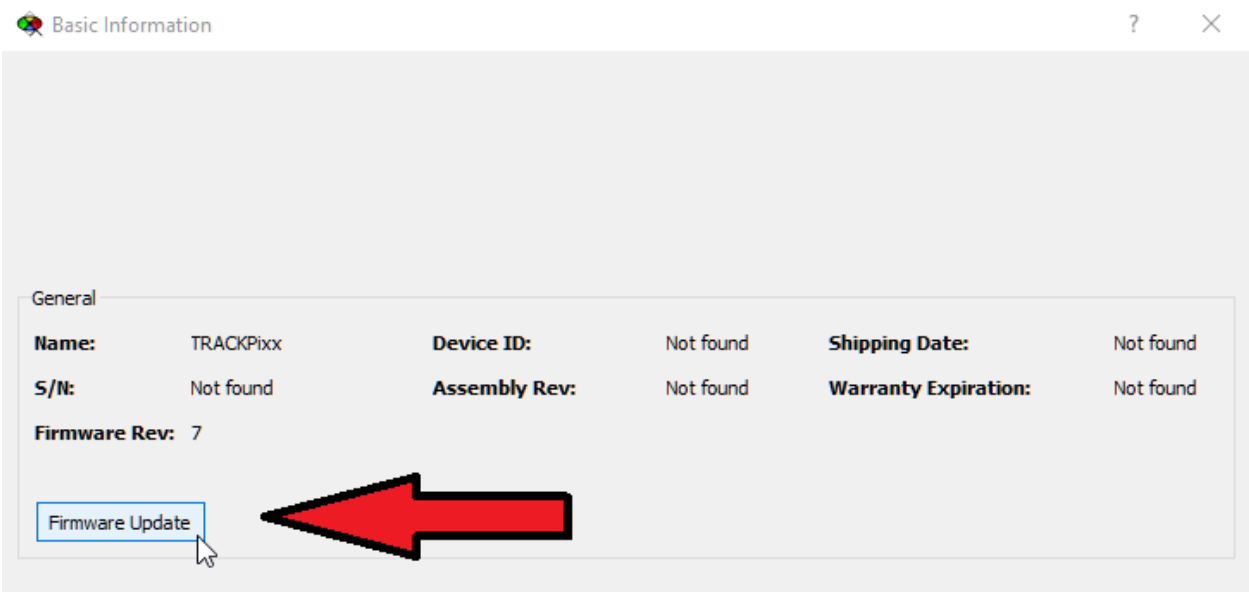To implement the updates contained within this release:

- The TRACKPixx firmware must be updated to **revision 7**
- The DATAPixx3 firmware must be updated to **revision 11**

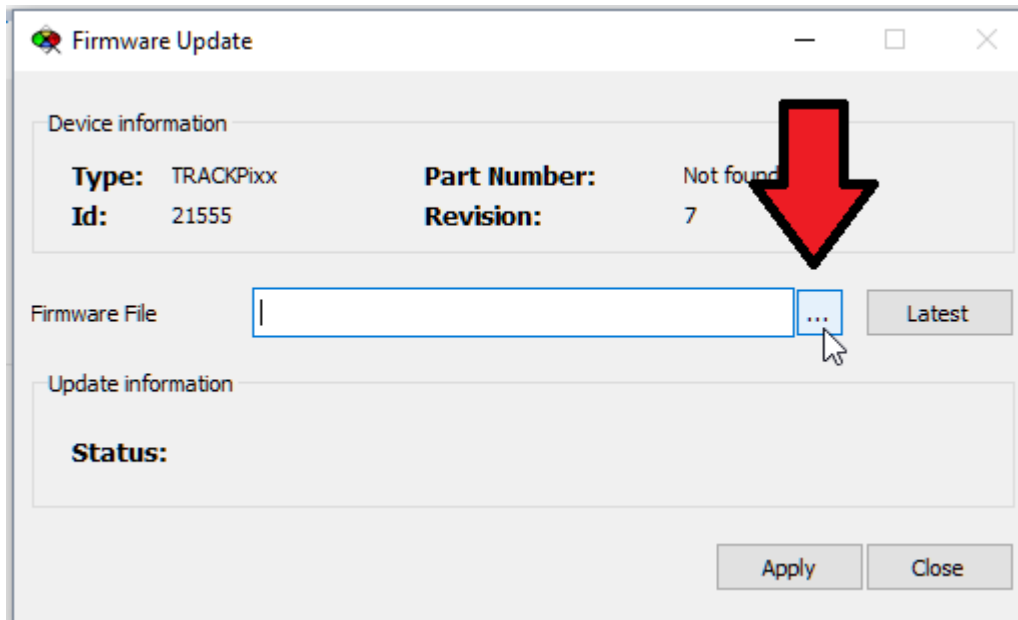To update the firmware, follow this procedure:

1. To update your firmware using PyPixx, click on the **General Information** sub menu for the product to upgrade.
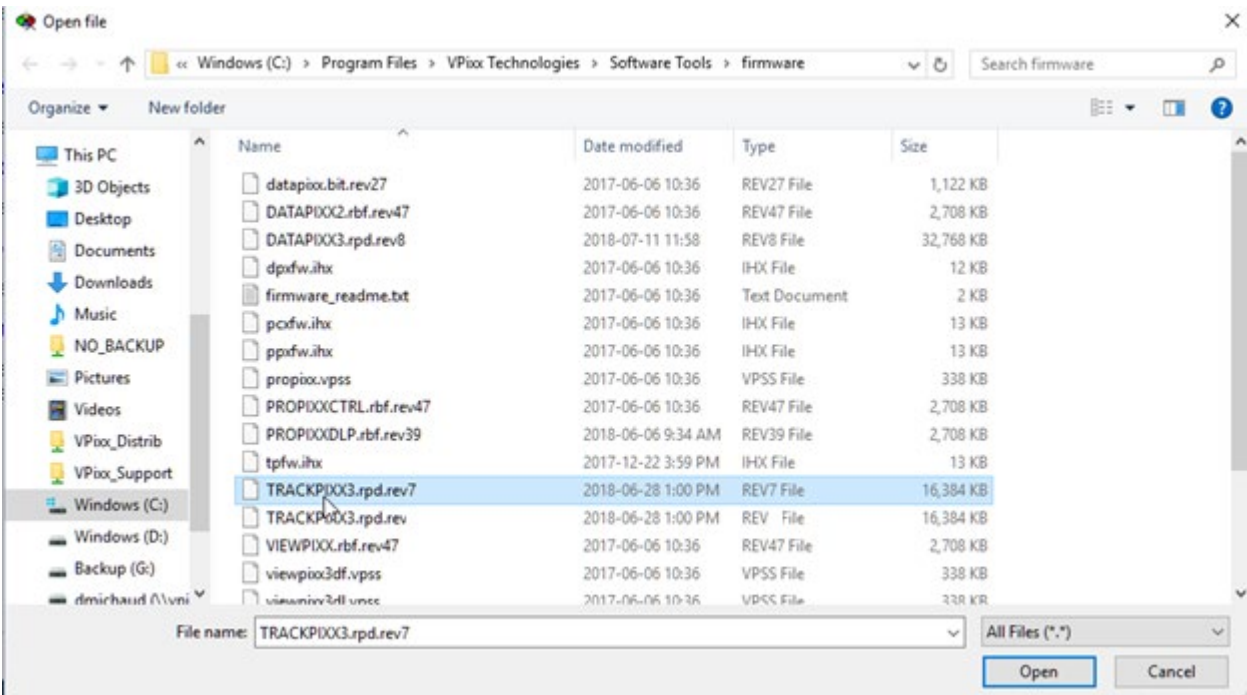

2. Click on the **Firmware Update** button.

3. A new widget will open. Using the (**…**) button, navigate to the firmware file located in *C:\Program Files\VPixx Technologies\Software Tools\firmware* (the default folder), or use the **Latest** button.
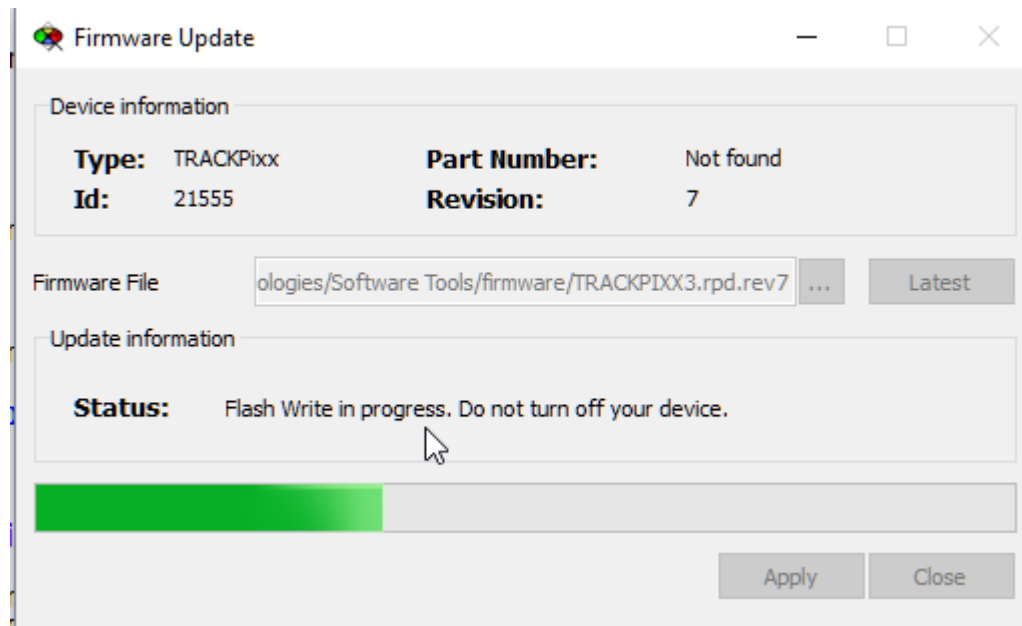

4. Select the firmware for your device (if you select the wrong firmware a warning will be displayed).
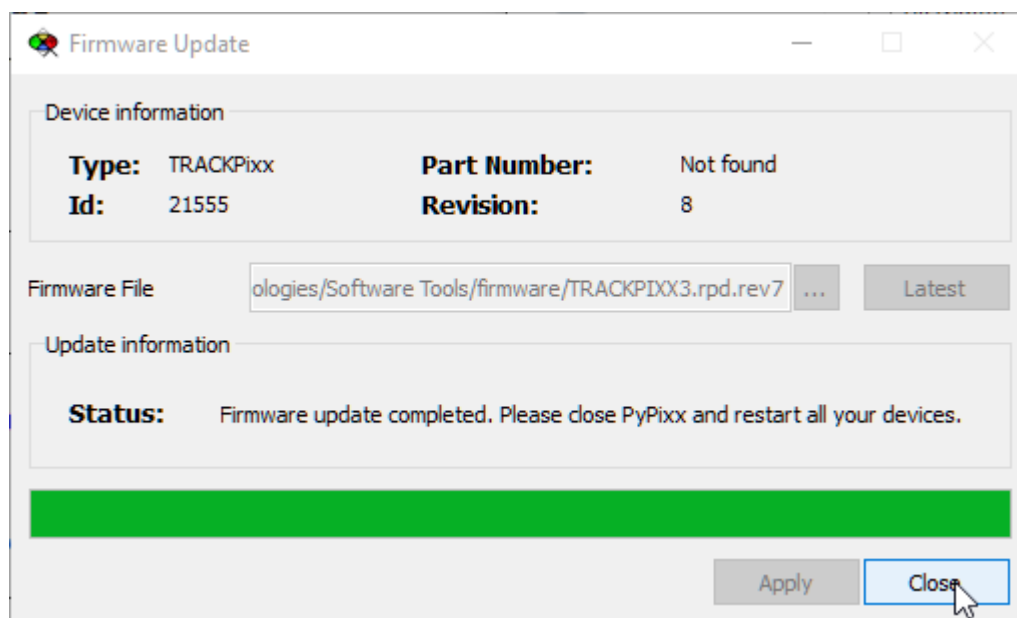

5. Select *Yes* for the warning message informing you that your current firmware will be overwritten.
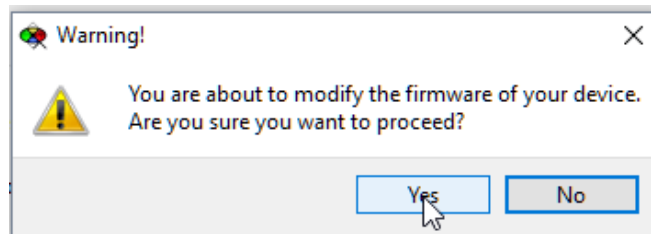
Ensure that you do not turn off any of the devices or close PyPixx during the update.
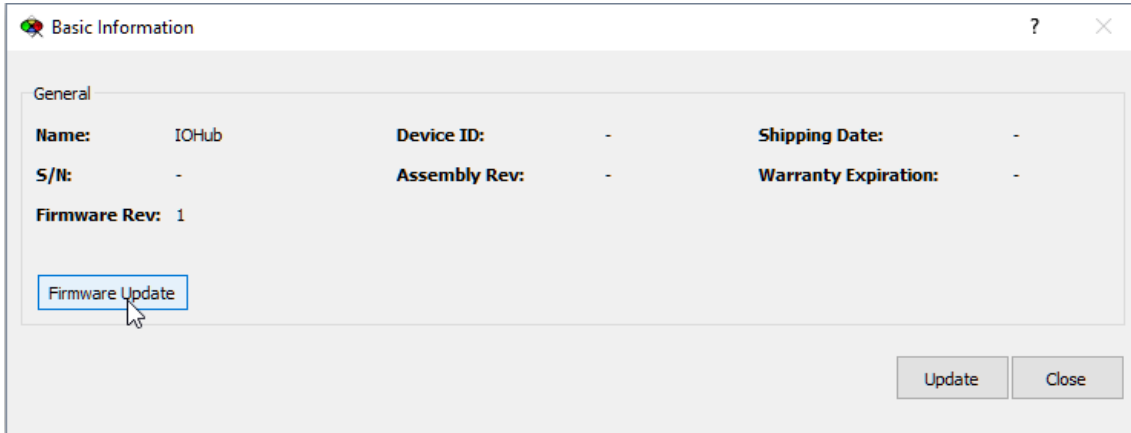

6. After the update is complete, follow the on screen instructions (close PyPixx and restart all your devices).
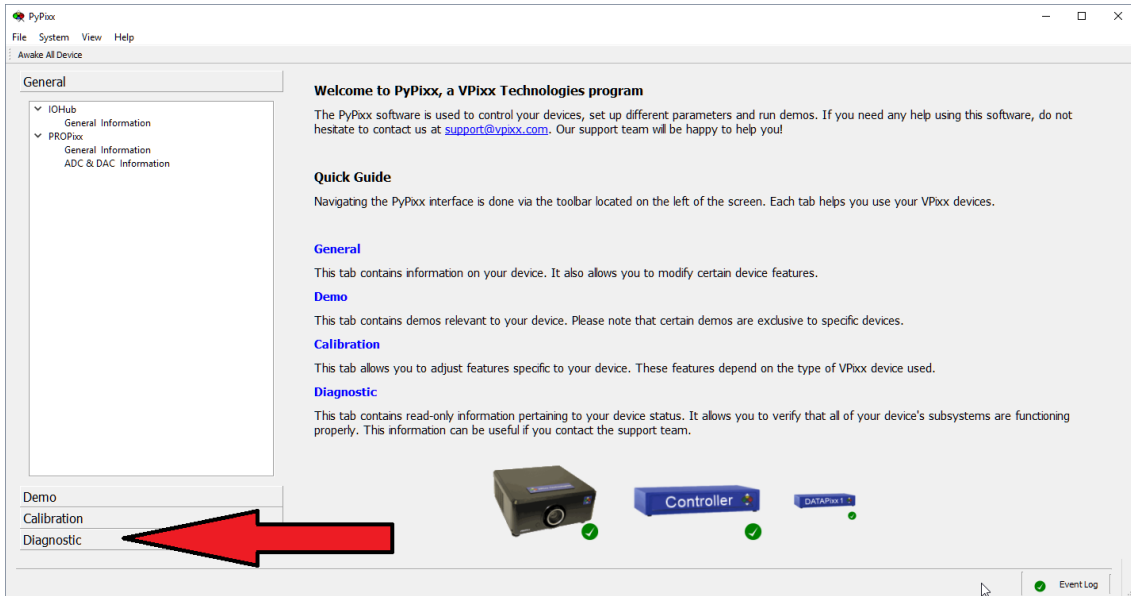
USB I/O Hub Firmware update

PyPixx now supports USB I/O Hub firmware upgrades.

New improved Diagnosis tools

You can find the diagnosis tools (sometimes referred to as test benches) in the *Diagnostic* tab of PyPixx:

You can use this tool to test the subsystems of your device to ensure everything is working. Should you contact us with an issue regarding your hardware, we will generally ask for these tests. To run a specific test, select the device on which the tests are to be run (or select *any* to run the test on all the devices). The user interface is as follows.
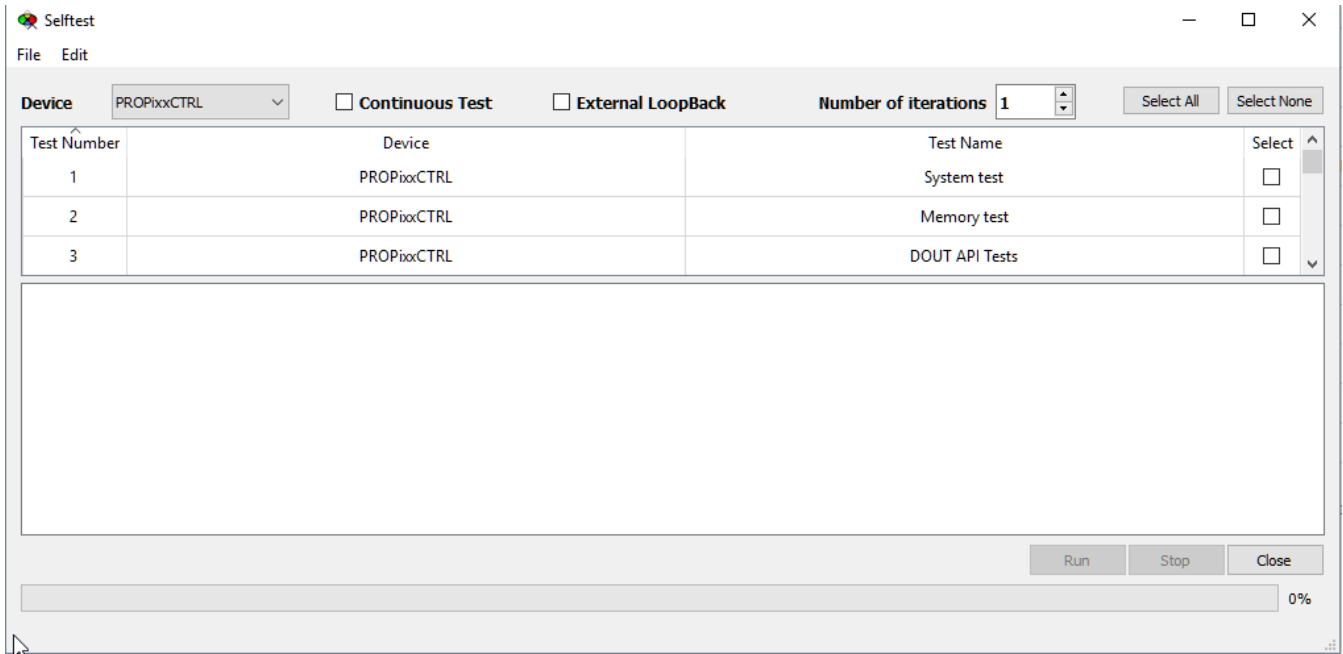
Device: at the top left of the screen, you can select which device to run the test on.

**Continuous Test**: if you check the **Continuous Test** box, you will be able to run a test until it is explicitly stopped.

External Loopback: if you check the **External Loopback** box, the test will assume you plugged in a loopback on the digital or analog IO.

Number of iterations: number of tests to run.

To run one or more tests, simply select the tests you wish to run by checking/unchecking the **Select** check box to the right of the screen. Start the selected tests by clicking on the *Run* button and stop the test(s) by clicking on the *Stop* button at any time. The test results will be printed in the text box in the bottom half of the screen.
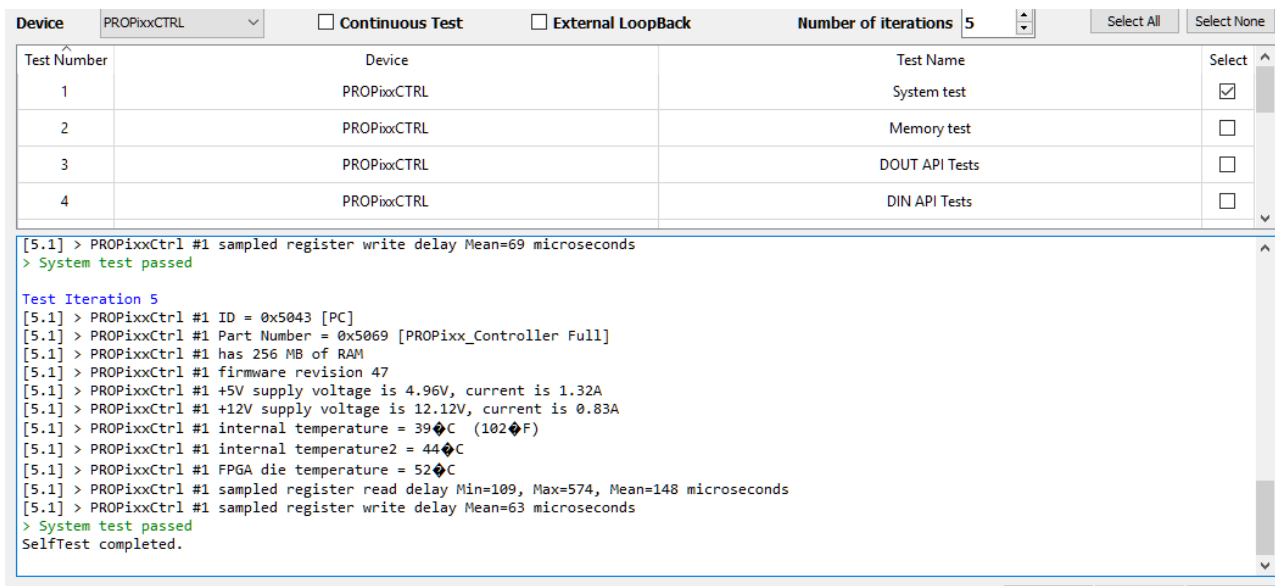
NEW PyTPx UI

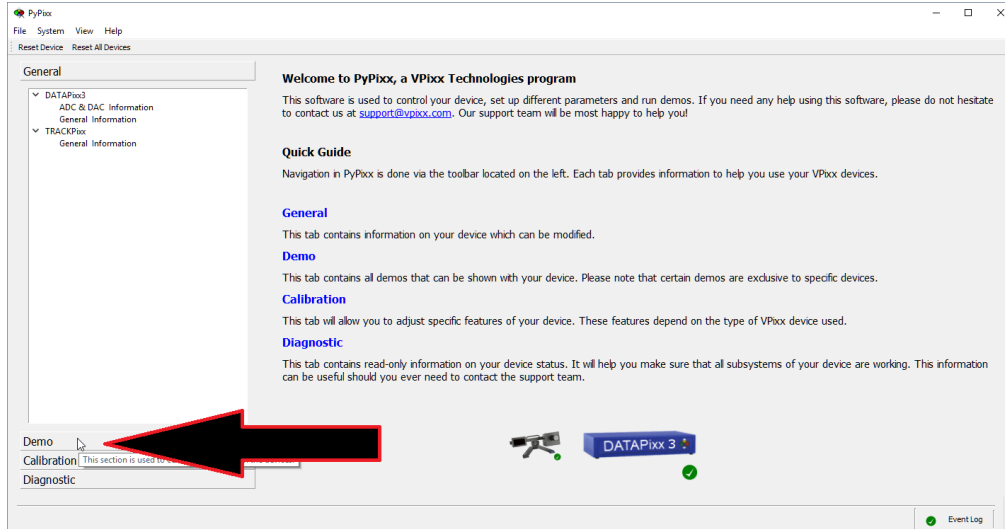From this release onward, to launch PyTPx, follow this procedure:
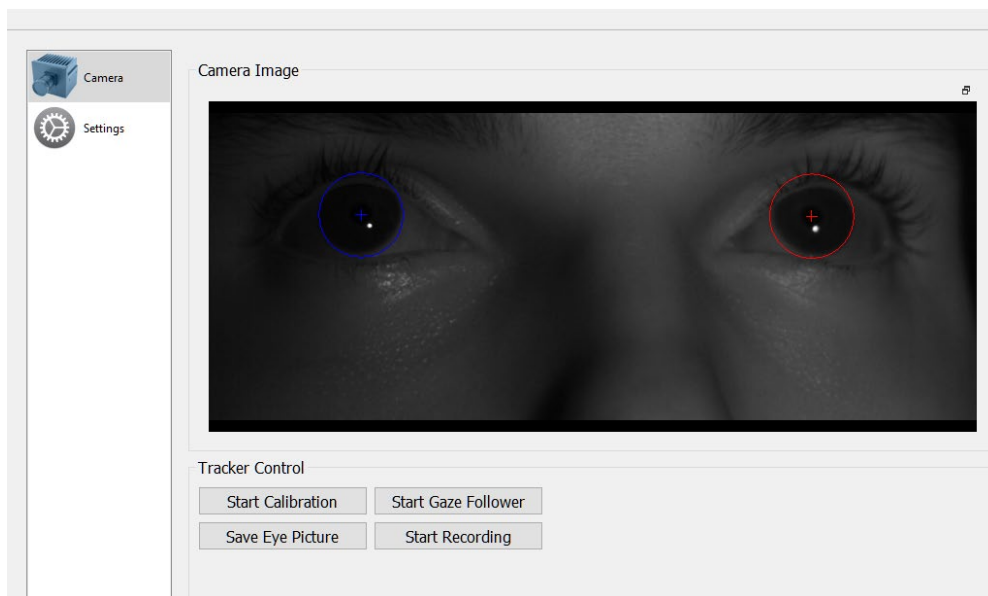
1. Navigate to your desktop to find the shortcut.


2. Click on the *Demo* tab.

3- Click on the *TRACKPixx* item. You can directly see if the tracking is working with the blue and red circles.

TIP: the size of the circle should approximately match the size of the iris. If this is not the case, you will need to adjust the lens type.

In this new UI, you have a *Camera* widget to start a calibration.

4. You can adjust the settings through the *Settings* widget.
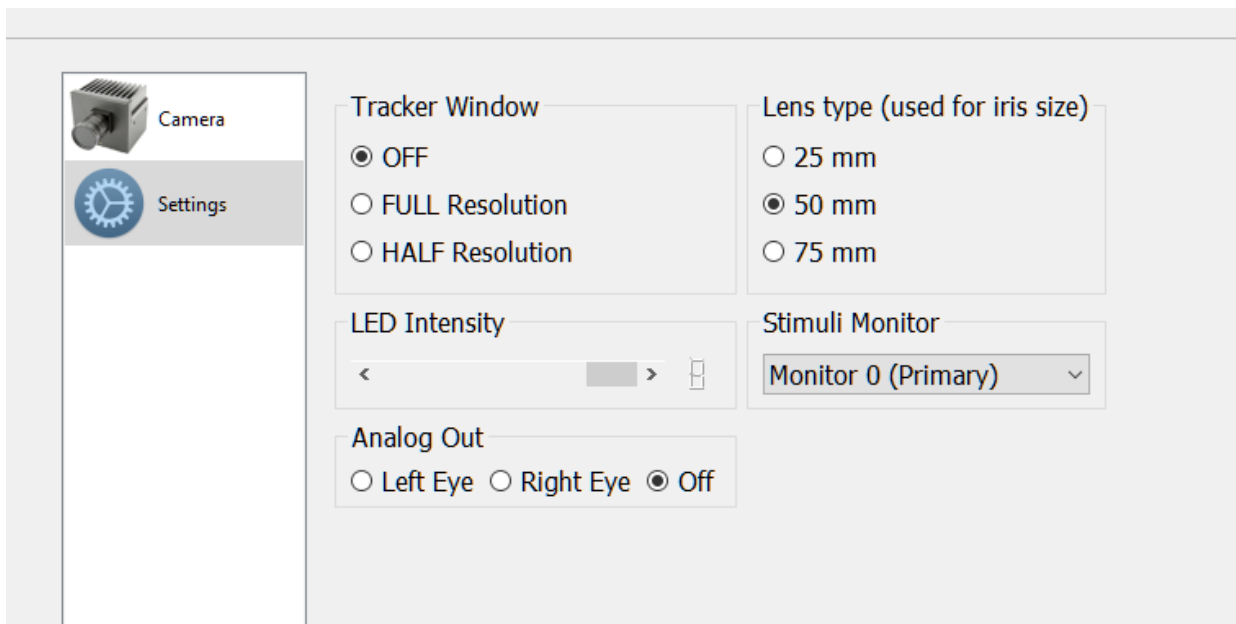
Tracker Window: this sets the presence and size of the overlay Window on the DATAPixx console output (Out 2).

Lens Type: this setting is used to match the correct iris size. It should be the same value as the lens you are using. If the circle in the camera does not fully cover the iris, consider changing this setting for better tracking.

LED Intensity: this is the intensity of the InfraRed Illuminator. In most cases, full power is used, but can be reduced if the focus is difficult for both eyes.

Stimuli Monitor: sets which monitor to use for a calibration (useful for computers having multiple outputs).

Analog Out: if the TRACKPixx is calibrated, you can enable the analog output of the eye tracking position. Refer to the *TRACKPixx Application guide* for more details.

Once your settings are adjusted go back to the *Camera* widget and start a calibration using the ***Start Calibration*** button. Follow the on-screen instructions.
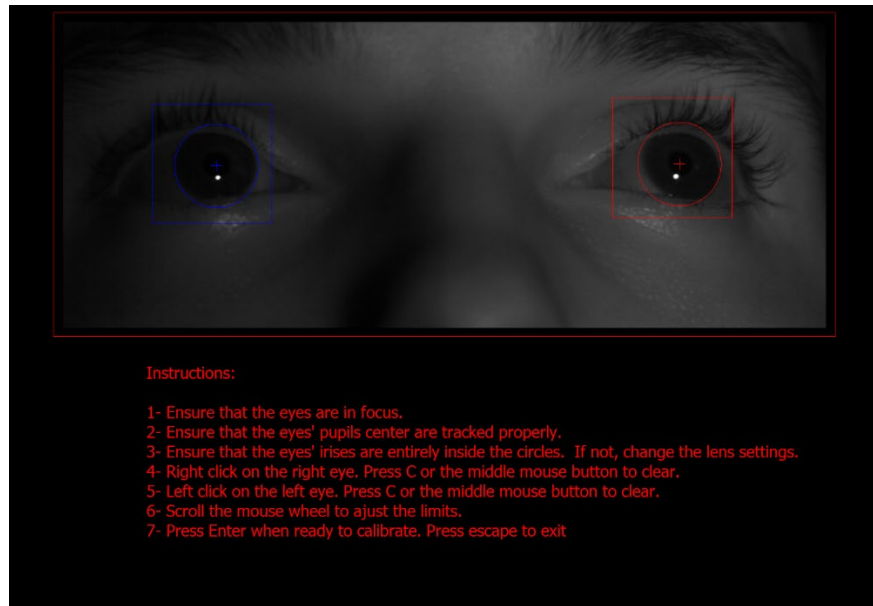
PyTPx Search Limits

Search limits allow you to specify to a TRACKPixx3 system a certain zone in which the eyes will be located. This is useful when the TRACKPixx3 is used in an environment restricting head movement, such as an MRI.

1. Start the calibration with the **Start Calibration** button.
2. Once the script starts, you can simply follow the on-screen instructions but if you are unable to proceed, we list here some possible solutions:
   a. (Optional): set the search limit for the left eye by left-clicking on the left eye. This will place a blue square box around the eye. You can press the middle mouse button or 'C' to clear the search limits. You can see real-time tracking to test the limits.
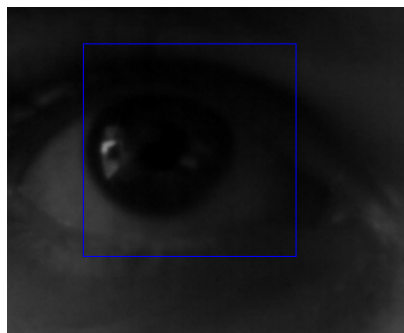

   b. (Optional): set the search limit for the right eye by right-clicking on the right eye. This will place a red square box around the eye.

3. Once both search limits are set, simply press **Enter** to start calibration.

TRACKPixx /mini scaling calibration

In MATLAB, PyPixx and OpenSesame there is now have a scaling factor for the TRACKPixx mini to be able to calibrate screens larger than 22 inches. This will scale both axis with the same argument, for example passing 80% will use 80% of the horizontal and vertical axis, with a remote calibration result looking like this:
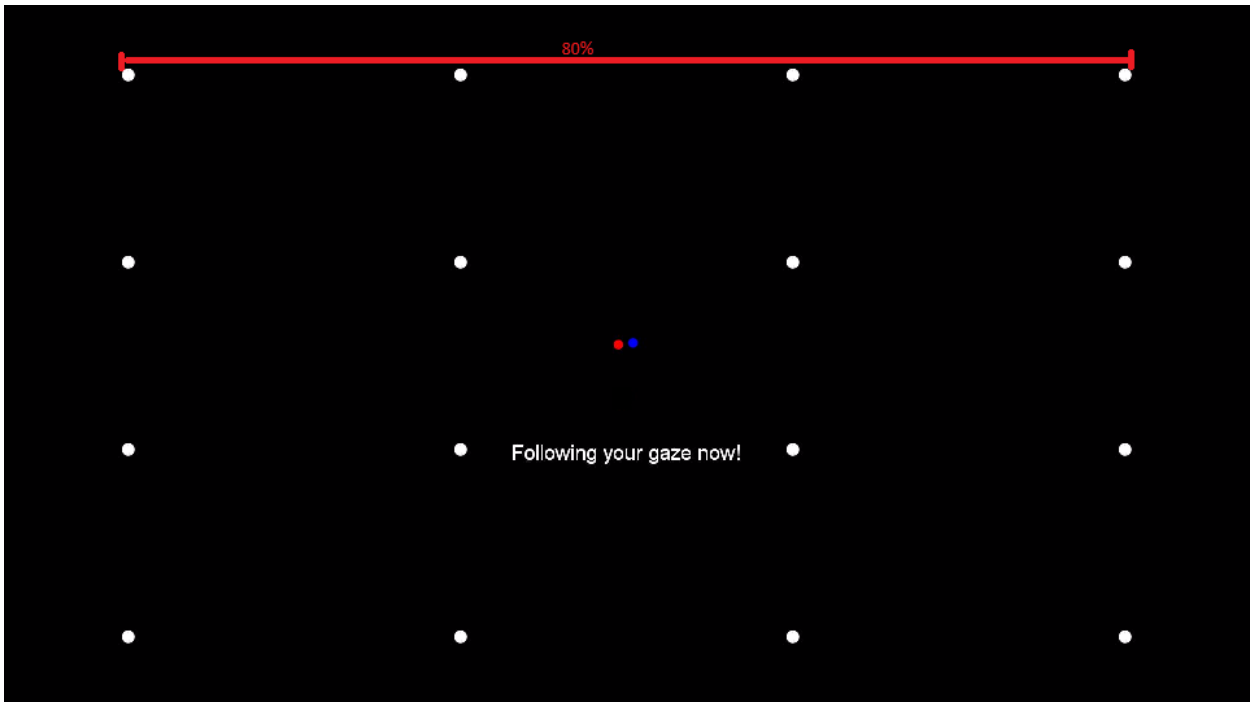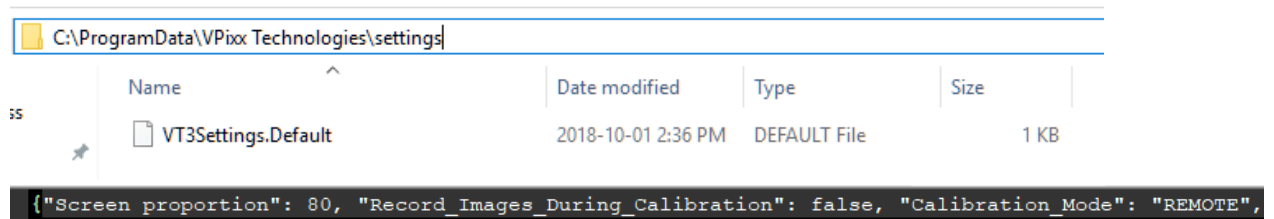

a) MATLAB

In MATLAB, this is simply an argument to the *Initialize* function:

```
Datapixx('Initialize', mode [, screenProportion=80]);
 - "screenProportion" determines the proportion of the screen to calibrate in
```

b) PyPixx – PyTPx demo

In PyTPx, the screen proportion can be set in the setting file. The setting file can be found in:

If the file does not exist, turning on PyTPx should create one with the default option and save your settings.

c) OpenSesame

In the *TRACKPixxMiniDemo.osexp* (which can be found in Documents/VPixx Experiments), you can find the setting to set the screen proportion in the 'Init' section of the demo:
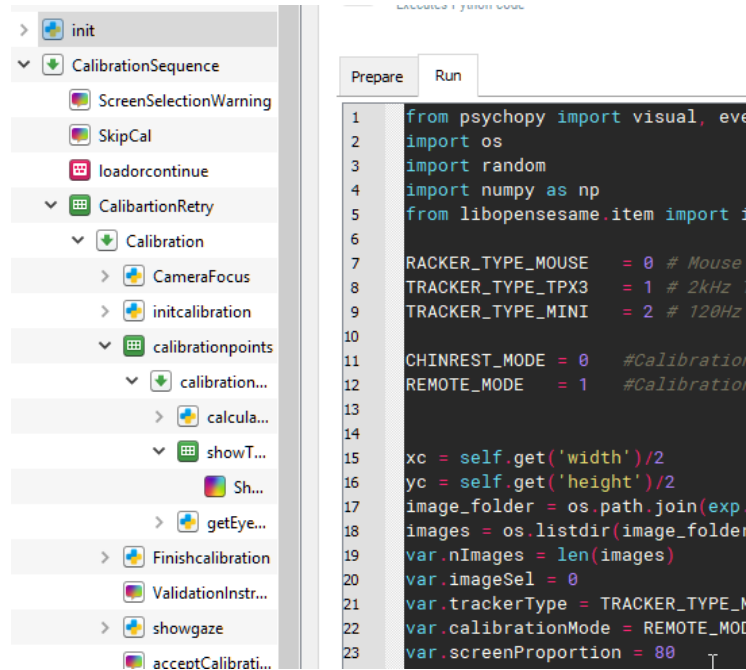

New Button: Awake All Devices/Sleep All Devices

A new button at the top of PyPixx allows you to quickly awaken all devices (PROPixx and/or TRACKPixx) and put them to sleep when you are finished.
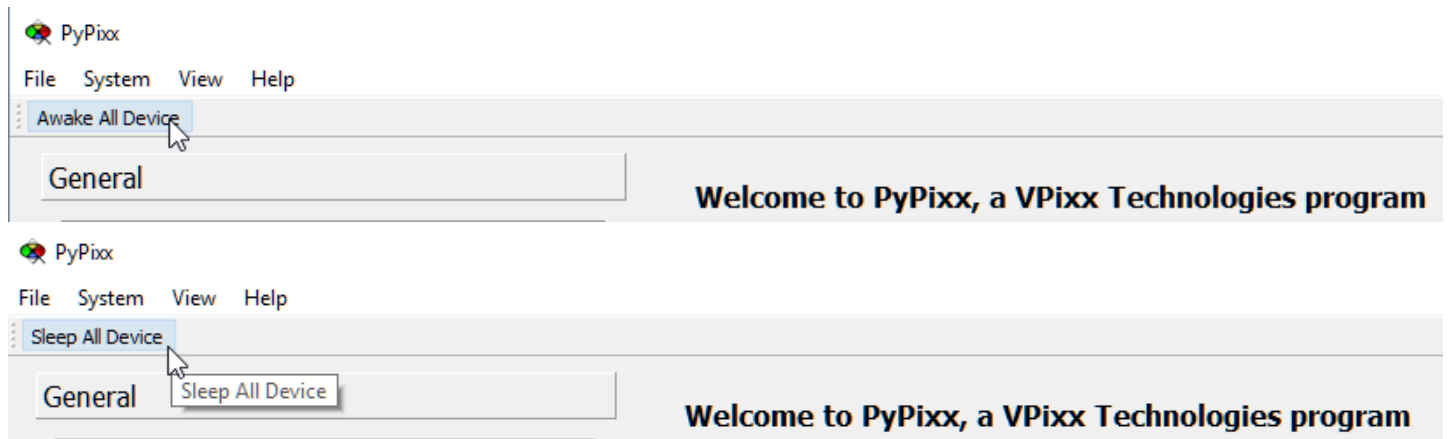
New I/O Hub demo Widget

In PyPixx, if you have a connected I/O Hub and go to the *demo* section, you can find the newest I/O Hub demo. In this demo, you can determine the current time of the device, adjust the LED intensity on the RESPONSEPixx, as well as monitor the responses in real time. When you press a button, the corresponding button will light up.
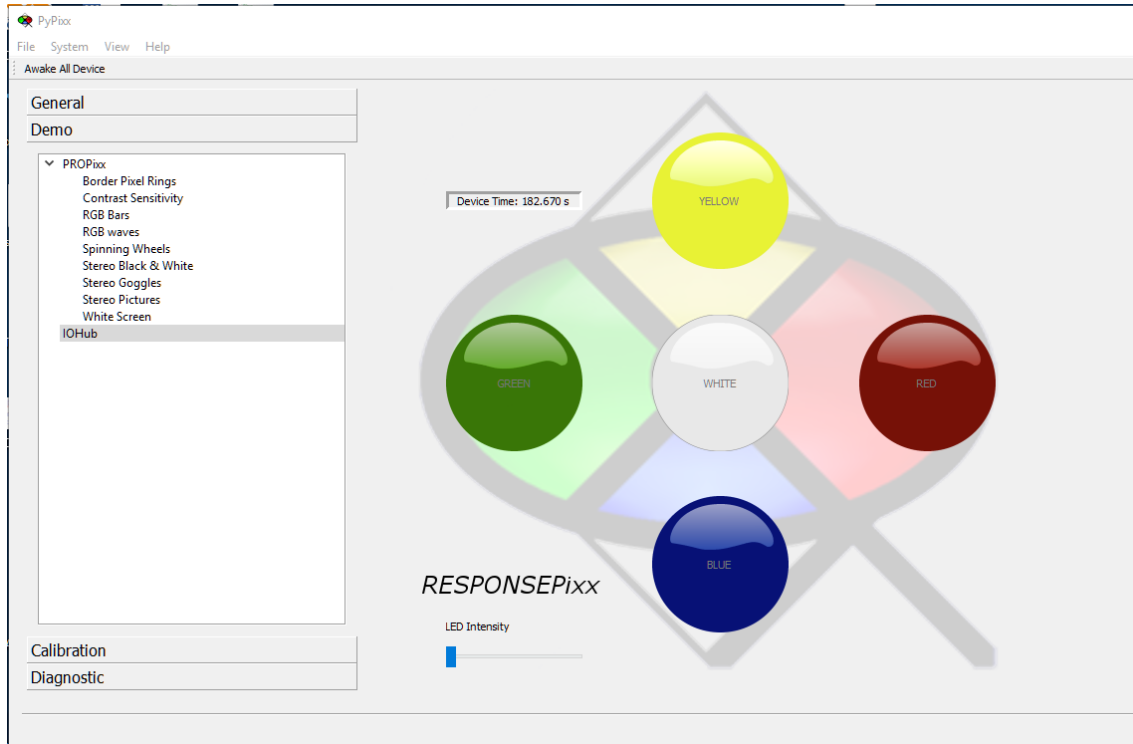
New USB I/O Hub demo files.

During the software tool installation, you can now find demos to use with the USB I/O Hub for pypixxlib (Python), MATLAB, E-Prime and Presentation:
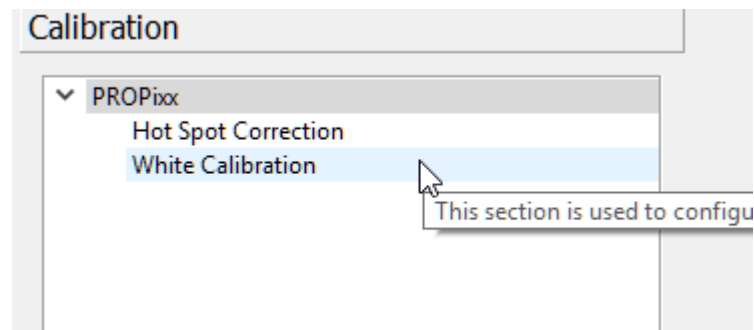
New PROPixx Calibration in PyPixx

To run a PROPixx calibration, you will need an i1 Display and the PROPixx connected to the computer via USB, both devices being powered on.
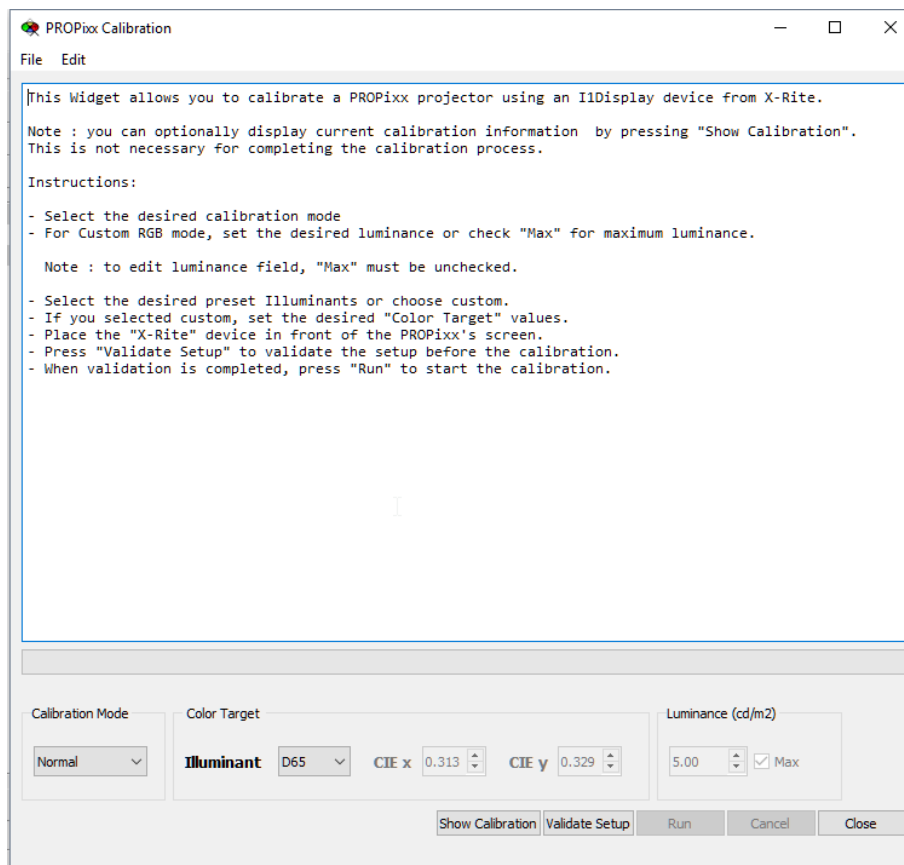
1. Navigate to your desktop to find the shortcut.

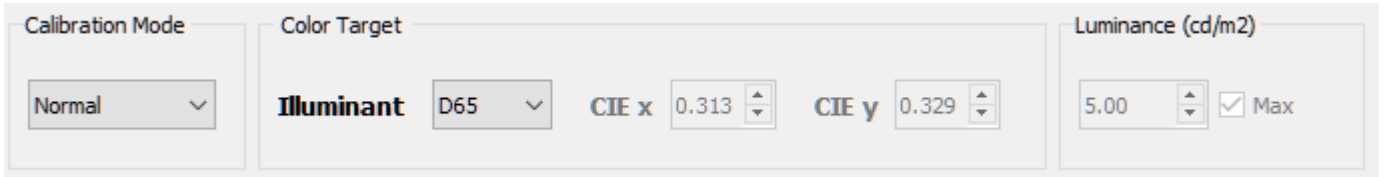2. Click on the *Calibration* tab and then *White Calibration*.

3. In the new Widget, you will get instructions:

To visualize a current calibration's value, use the ***Show Calibration*** button.

4. To start a calibration, first select the mode you want to use. Once the mode is selected, you can choose the other options, such as the illuminant target or custom CIE coordinates.

5. Once the settings are chosen, you can begin the calibration by clicking on the ***Validate Setup*** button. This will compare the black level and the white level to ensure that the PROPixx can be calibrated.
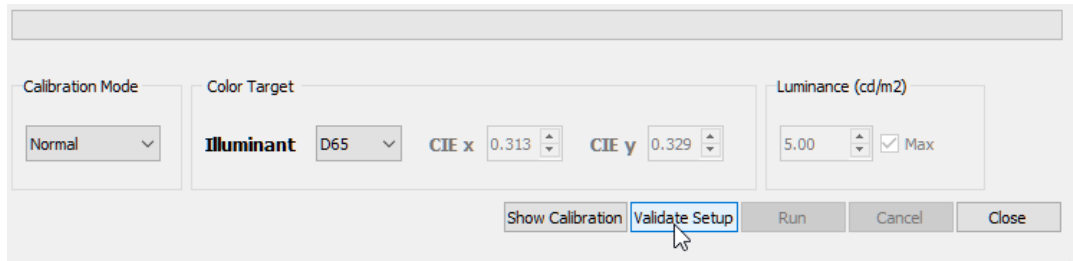
6. Once the setup is validated, click the ***Run*** button to start the calibration procedure, which will take from 10 to 15 minutes to complete.
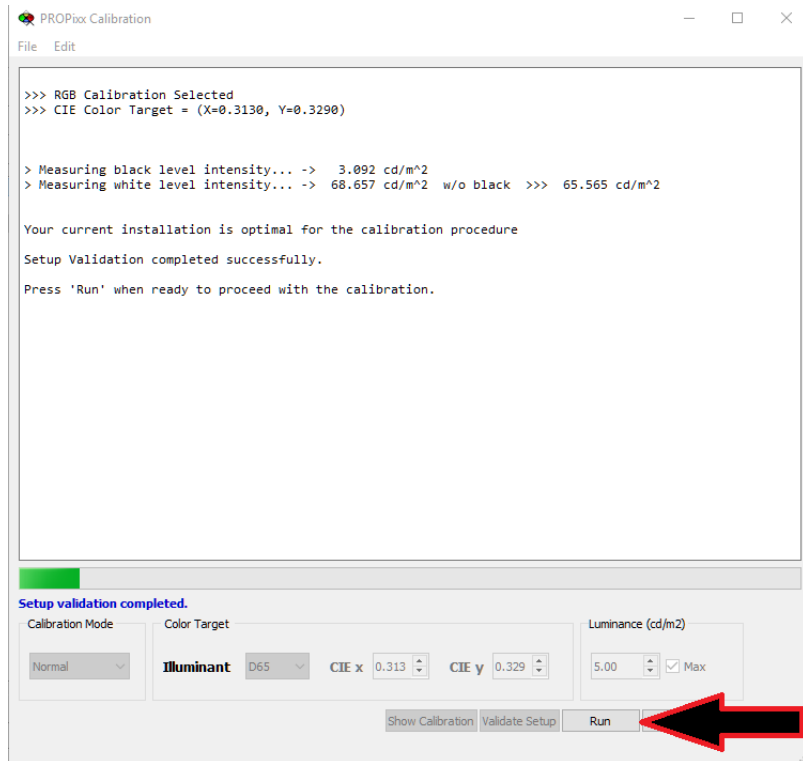
7. Once the calibration is over, it is immediately applied for the appropriate sequencers.

```
Execution Time = 1653.997722s

CIE Target (x,y) = (0.313, 0.329)
LED CURRENT #0      RGB = [0x8200, 0x3097, 0x1DD7] RGB = 42.32A, 15.82A,  9.71A DutyCycle = 0.0%
0.0% 0.0%, TargetL =  58.060 cd/m^2, Error Lxy=[  0.000, 0.0000, 0.0000]

LED CURRENT #1      RGB = [0x2E9E, 0x160F, 0x0D08] RGB = 15.17A,  7.18A,  4.24A DutyCycle = 0.0%
0.0% 0.0%, TargetL =  29.030 cd/m^2, Error Lxy=[  0.013, 0.0001, -0.0001]

LED CURRENT #2      RGB = [0x1424, 0x0C12, 0x0572] RGB =  6.56A,  3.93A,  1.77A DutyCycle = 0.0%
0.0% 0.0%, TargetL =  14.515 cd/m^2, Error Lxy=[ -0.003, 0.0006, 0.0000]

LED CURRENT #3      RGB = [0x07EE, 0x07C7, 0x01C5] RGB =  2.58A,  2.53A,  0.58A DutyCycle = 0.0%
0.0% 0.0%, TargetL =   7.257 cd/m^2, Error Lxy=[  0.070, 0.0068, 0.0027]

LED CURRENT #4      RGB = [0x0055, 0x0049, 0x0049] RGB =  0.11A,  0.09A,  0.09A DutyCycle = 0.0%
0.0% 0.0%, TargetL =   3.629 cd/m^2, Error Lxy=[ -0.133, -0.0327, -0.0212]


>>> Sequencer is now RGB 120Hz
```
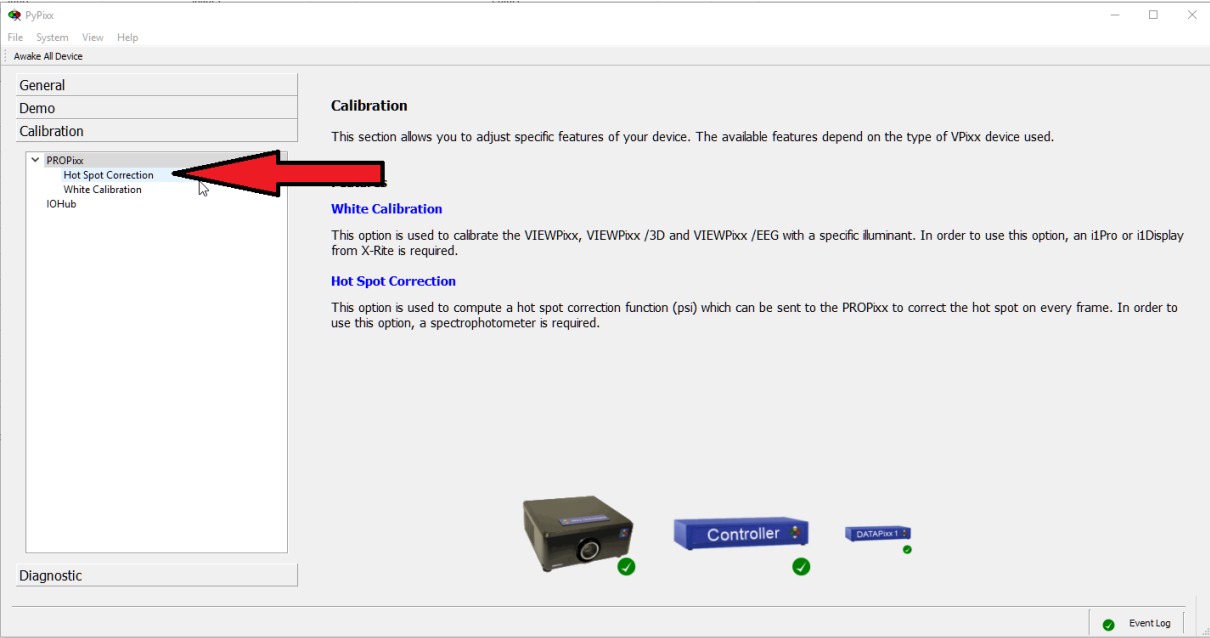
Calibration completed.

Calibration Mode	Color Target					Luminance (cd/m2)	
Normal	**Illuminant**	D65	**CIE x**	0.313	**CIE y**	0.329	5.00 ☑ Max

PROPixx Hot Spot correction Widget

The PROPixx Hot Spot Correction tool can be found in the *Calibration* tab of the PROPixx.


This widget allows you to modify the incoming video to compensate for a hotspot effect from the projection screen. A rear projection screen can sometimes create a 'halo' effect where the center is brighter than the edges of the screen. This can be corrected in real time with our tool and the PROPixx projector, which adds no delay.

To run this demo, you will need an apparatus that can be pointed towards the screen and give you luminance, similar to an I1 Display or photo research equipment. Ensure your equipment is well calibrated.

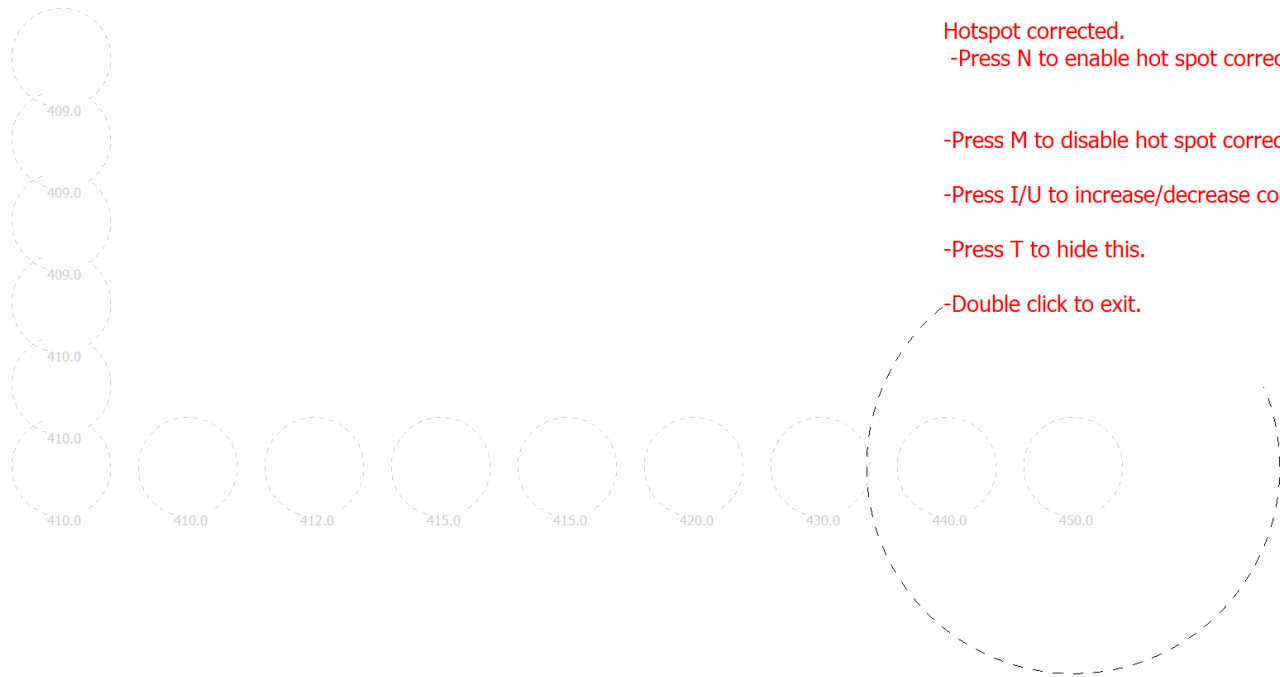Once you start the widget, this screen will be displayed:
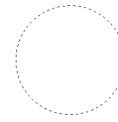
Simply follow the on screen instructions and the required correction for your PROPixx will be calculated. If the application opens on the wrong display, press **'S'** to cycle between the screens.

Summary of the instructions:

1- Move the circle with the keyboard arrows to the location of the hotspot.
2- Once the circle is at the hotspot position, press **Enter** twice to enter the luminance value of the hotspot.
3- Take a luminance measurement of the screen at the new circle position and repeat. If you make a mistake you can go back by pressing the letter **'C'** on your keyboard.
4- Once the calculation is finished, wait a moment and you will see that the hotspot correction has been enabled. You can toggle between *enabled* or *disabled* using the **'M'** and **'N'** buttons (**'M'** disables, **'N'** enables).

Once you are done, double-click the widget to exit.

409.0

409.0

409.0

410.0

410.0

410.0   410.0   412.0   415.0   415.0   420.0   430.0   440.0   450.0

Hotspot corrected.
-Press N to enable hot spot correction.
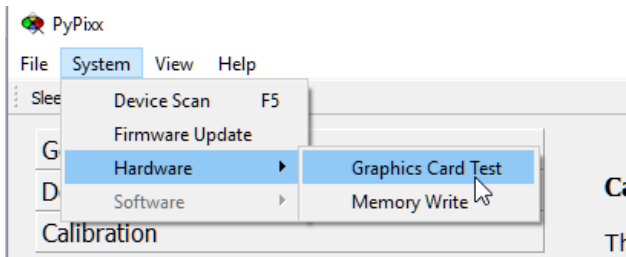
-Press M to disable hot spot correction.

-Press I/U to increase/decrease correction.
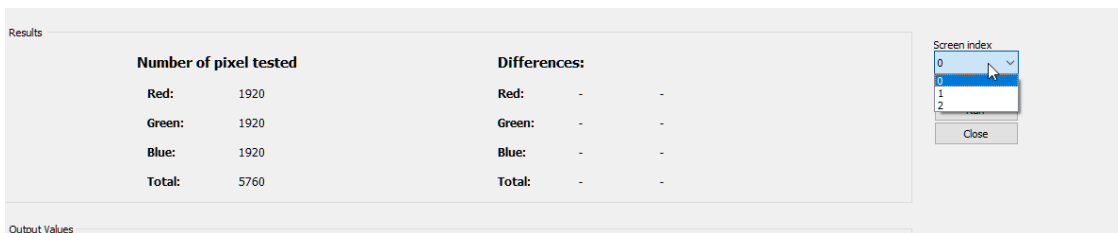
-Press T to hide this.

-Double click to exit.

Graphics Card Test

In the *System* menu, there is now a tool called *Graphics Card Test*:

This tool allows you to verify if your graphics card is dithering the color (sending +/- 1 to the color value, at random). Once you start the widget, simply switch it to the screen that the VPixx device is using:

You can then run the test. If your graphics card has dithering (or if you run it on the wrong screen), you should see that the differences are not zero:

Results

Number of pixel tested		**Differences:**		
Red:	1920	Red:	163171.0	8498.5 %
Green:	1920	Green:	154088.0	8025.4 %
Blue:	1920	Blue:	154856.0	8065.4 %
Total:	5760	Total:	472115.0	24589.3 %

Screen index: 1

Export
Run
Close

In the case of a good graphics card, it will print:

Results

Number of pixel tested		**Differences:**		
Red:	1920	Red:	0.0	0.0 %
Green:	1920	Green:	0.0	0.0 %
Blue:	1920	Blue:	0.0	0.0 %
Total:	5760	Total:	0.0	0.0 %

Screen index: 2

Export
Run
Close

Output Values