

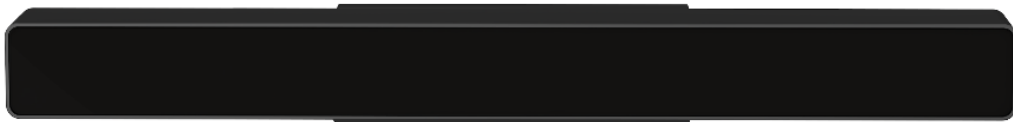


Startup Guide

Lab Streaming Layer (LSL)

v 1.1.15

March 2025



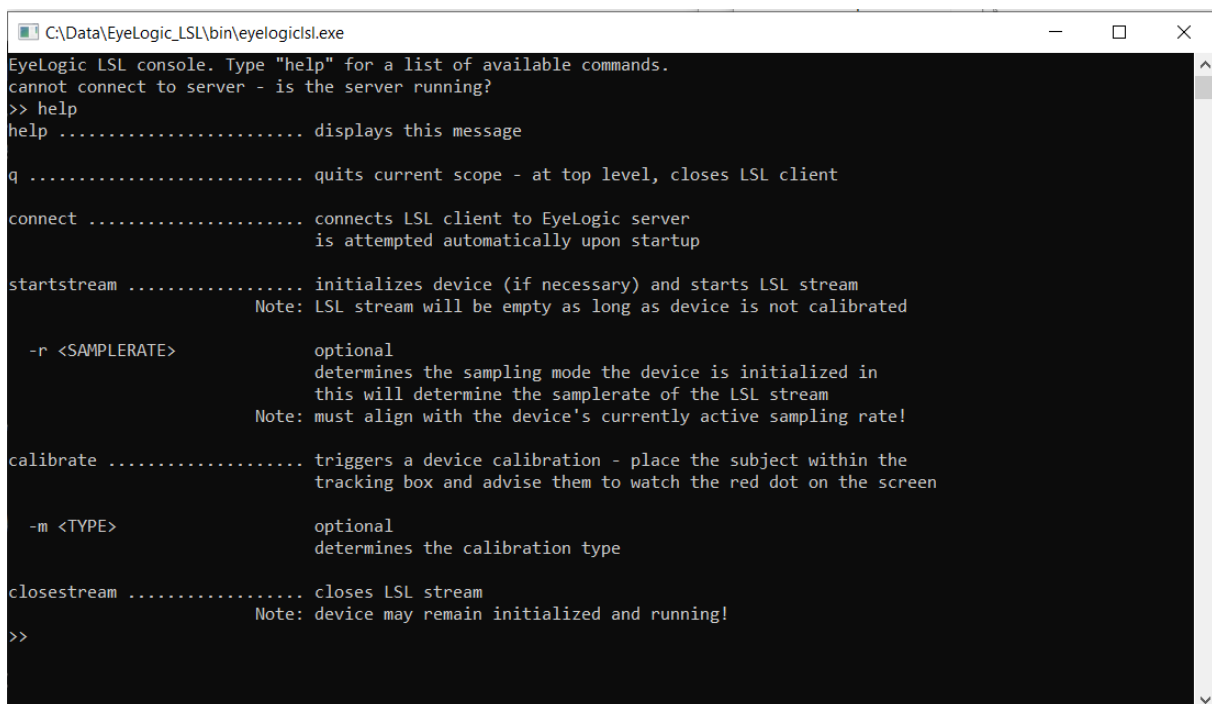
Tutorial

This is a manual on how to use the EyeLogic integration into Lab Streaming Layer (LSL) from the Swartz Center for Computational Neuroscience. LSL allows researchers to synchronize streaming data across devices. The actual EyeLogic-LSL-addon package includes a client which provides an LSL stream containing data from EyeLogic devices. It has a simple command line interface through which you can easily set up the LSL stream.

Start EyeLogic-LSL

To start the EyeLogic-LSL streaming client, just execute `eyelogicls.exe`.

Using EyeLogic-LSL

A screenshot of a Windows command prompt window titled "C:\Data\EyeLogic_LSL\bin\eyelogicls.exe". The window shows the output of the "help" command, listing various LSL client commands and their functions. The text is as follows:

```
EyeLogic LSL console. Type "help" for a list of available commands.
cannot connect to server - is the server running?
>> help
help ..... displays this message

q ..... quits current scope - at top level, closes LSL client

connect ..... connects LSL client to EyeLogic server
               is attempted automatically upon startup

startstream ..... initializes device (if necessary) and starts LSL stream
                  Note: LSL stream will be empty as long as device is not calibrated

    -r <SAMPLERATE>      optional
                        determines the sampling mode the device is initialized in
                        this will determine the samplerate of the LSL stream
                        Note: must align with the device's currently active sampling rate!

calibrate ..... triggers a device calibration - place the subject within the
                  tracking box and advise them to watch the red dot on the screen

    -m <TYPE>           optional
                        determines the calibration type

closestream ..... closes LSL stream
                  Note: device may remain initialized and running!
>>
```

EyeLogic-LSL envelops a short list of commands which can be listed with the `help` command, the output of which is shown in the above figure.

This guide will go through an ideal setup scenario. If you encounter any typical errors along the way the error messages should point you towards fixing your issue.

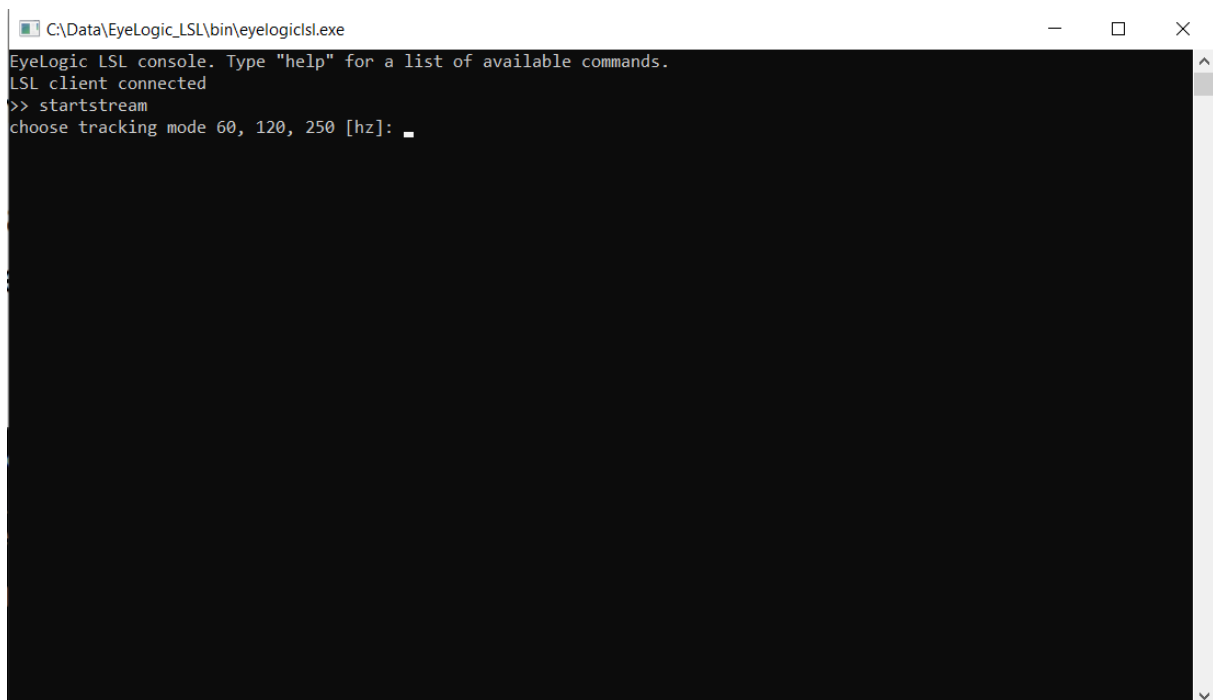
Connect to the EyeLogic Server

Upon opening up EyeLogic-LSL will attempt to connect to your EyeLogic server.¹ However, a running EyeLogic server is not necessary to start EyeLogic-LSL. Whenever you start EyeLogic-LSL before the server or EyeLogic-LSL becomes disconnected for whatever reason, you can connect EyeLogic-LSL with a running EyeLogic server through the `connect` command. Disconnecting the client is possible server-side or by closing EyeLogic-LSL.

Note: In order to initialize a an LSL stream with valid gaze data, it is important that your EyeLogic device is calibrated. Without a calibration your data stream will contain only invalid **Point Of Regard (POR)** data.

Start the LSL Stream

When not being passed a samplerate through the `-r <rate>` option EyeLogic-LSL will list all available rates and prompt you to input a rate of your choice:



```
C:\Data\EyeLogic_LSL\bin\eyelogicls.exe
EyeLogic LSL console. Type "help" for a list of available commands.
LSL client connected
>> startstream
choose tracking mode 60, 120, 250 [hz]:
```

Upon successfully starting the LSL stream you can expect some LSL internal print outs equivalent to those:

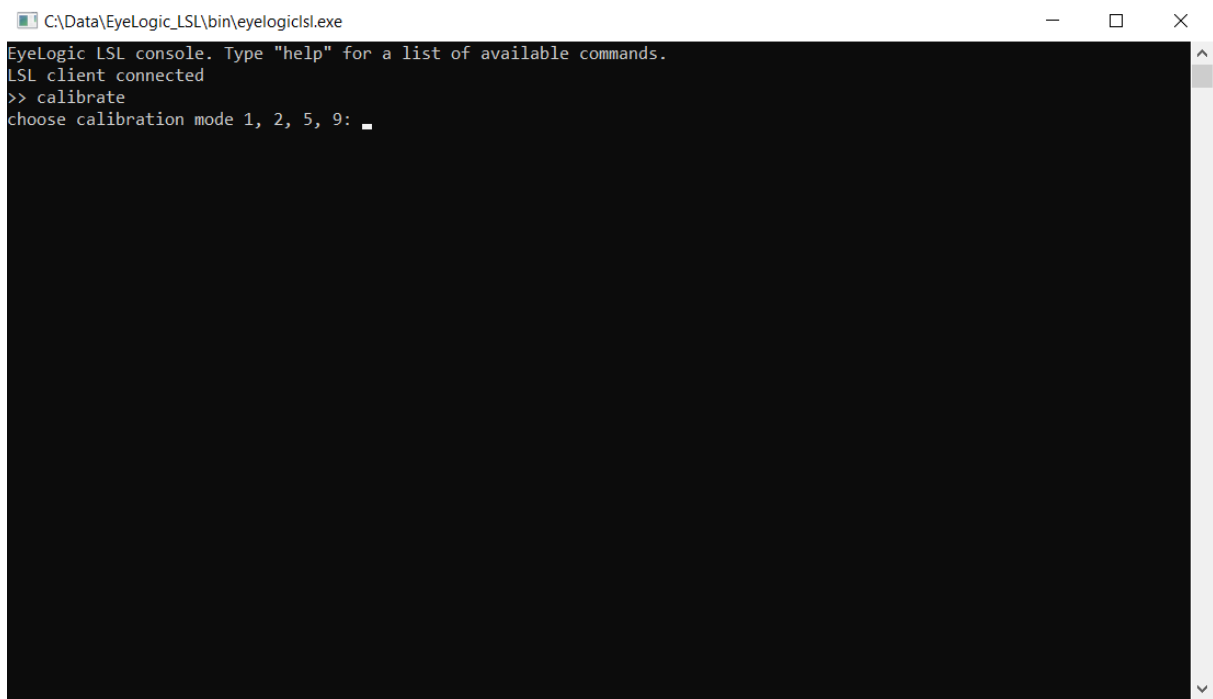
¹The EyeLogic server must be acquired separately. Consult the respective quick start guide on how to get your EyeLogic server running.

```
C:\Data\EyeLogic_LSL\bin\eyelogicls.exe
EyeLogic LSL console. Type "help" for a list of available commands.
LSL client connected
>> startstream
choose tracking mode 60, 120, 250 [hz]: 250
2021-09-02 12:36:41.245 ( 71.150s) [ 50CE26B9]      api_config.cpp:231  INFO| Loaded default config
2021-09-02 12:36:41.246 ( 71.151s) [ 50CE26B9]      common.cpp:64    INFO| git:a0fc2fde92a10f4cb5fccbc555
2228b865f17379/branch:refs/tags/v1.15.0/build:Release/compiler:MSVC-19.0.24245.0/link:SHARED
tracking started - please note:
* sample stream will be (paritally) invalid until device is calibrated
* the previous subject's calibration may still be active
>> _
```

You have now opened your LSL stream, however your device may yet be uncalibrated. Before calibrating the device, it will only deliver invalid POR data (which is marked as "Not-A-Number"/NAN).

Calibrate the Device

Once the client is in streaming mode you may initialize a calibration of your choice through the `calibrate` command. Equivalently to before, when called without `-m <mode>` option, EyeLogic-LSL will list all available calibration modes and prompt you to input your desired calibration mode:

A screenshot of a Windows command prompt window titled "C:\Data\EyeLogic_LSL\bin\eyelogicls.exe". The window has a black background with white text. The text inside the window reads: "EyeLogic LSL console. Type 'help' for a list of available commands.", "LSL client connected", ">> calibrate", and "choose calibration mode 1, 2, 5, 9: " followed by a cursor. The window has standard Windows window controls (minimize, maximize, close) in the top right corner.

```
C:\Data\EyeLogic_LSL\bin\eyelogicls.exe
EyeLogic LSL console. Type "help" for a list of available commands.
LSL client connected
>> calibrate
choose calibration mode 1, 2, 5, 9: _
```

ATTENTION: Due to the vital importance of this fact it must be again stressed, that each calibration is subject-specific. For each new test subject you will need to re-calibrate the device.

About

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