LJSwrap

LJ-S Communication Library for Python programming language.

Description

- Works on Windows OS / Linux OS.
- The download file contains two parts:

1. Wrapper I/F (LJSwrap.py)

- Wrapper definition for calling the communication library functions from the Python programming language.
- Import this module to create your Python application.
- The dynamic link library (LJS8_IF.dll or libljscom.so) is built with C++, and cannot be directly called from Python.

This wrapper I/F makes it possible to call library functions from Python.

2. Sample Programs

- sample_ImageAcquisition.py: This sample program demonstrates how to acquire height and luminance images from the LJ-S head. The 2D image display and height profile display are also explained in this sample.
- **sample_HowToCallFunctions.py** : A sample collection of how to call LJSwrap I/F functions.

Installation

Windows

The Microsoft C Runtime Library is required for the DLL (LJS8_IF.dll) to operate.

The installer is in the "runtime" folder inside the downloaded zipfile.

Run vc_redist.x64.exe to install the runtime library.

Linux

(1) Build the library

After unzipping the provided file, open the top level folder.

A shared object file (libliscom.so) will be generated after the following operation.

\$ cd ./PYTHON

\$ make

(2) Select the Reference Library

To select the correct library, edit the file (LJSwrap.py) as follows:

To use on Windows: Set 1 to 'envWindows'.

To use the Linux Library: Set 0 to 'envWindows'.

Function Reference

The communication library functions (LJS8IF_...) can be used via the wrapper I/F as follows:

```
import LJSwrap

# Ethernet open
res = LJSwrap.LJS8IF_EthernetOpen(0, ethernetConfig)
```

- For additional details and reference, refer to the sample program.

 The wrapper behavior is done using the Python standard module "ctypes".
- For details on each function (LJS8IF_...),
 refer to the "LJ-S8000 Series Communication Library Reference Manual".
 This manual can be downloaded from the User Support website.

Sample Program (sample_ImageAcquisition.py)

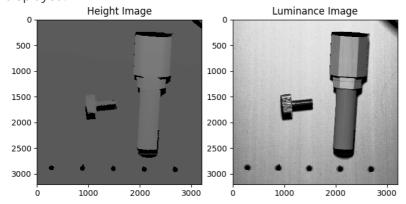
How to run

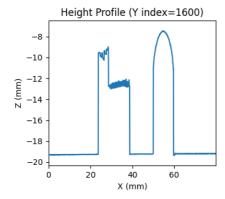
The sample program (sample_ImageAcquisition.py) is in the "PYTHON" folder inside the downloaded zip file. It contains a main routine.

```
$ python3 sample_ImageAcquisition.py
```

This is an example of how to acquire height and luminance image from the LJ-S head using high-speed communication.

After the completion of the image acquisition, the 2D images and height profile will be displayed.





How to obtain real-size image

The parameters in the list below are used to convert a 16-bit image to actual size. When converting the pixel value to the height data (mm), use the following formula.

Note that the value 0 is stored for invalid data.

	Data pitch (in millimeter)		
Model	X pitch*1	Y pitch*1	Z pitch
LJ-S015	0.005	0.005	0.0004
LJ-S025	0.008	0.008	0.001
LJ-S040	0.0125	0.0125	0.0012
LJ-S080	0.025	0.025	0.002
LJ-S160	0.05	0.05	0.0024
LJ-S320	0.1	0.1	0.0046
LJ-S640	0.2	0.2	0.0102

^{(*1):} These values may be different when the data interval has been changed using the "Sub-sampling" or "Interpolate Y line"

How to change operation

The operation can be changed by rewriting a part of the sample program. The source code is highlighted using the comments below.

Specifically, rewrite the following parameters.

- **Device id**: Identifier when using multiple heads.
- IP address, Port number: Network settings of the LJ-S head.
- Interpolate Y lines: Use this parameter to adjust image aspect ratio.
- **Timeout**: Timeout error occurs if the acquiring process exceeds the set value.
- Use external trigger: Set "true" to control trigger timing externally (e.g. terminal input).
- Use image filter: Set "true" to apply filter to image (e.g. "spike noise cut" and "invalid pixel suppression"). Note that this image filter cannot be used in Linux OS.

Sample Program (sample_HowToCallFunctions.py)

How to run

The sample program (sample_HowToCallFunctions.py) is in the "PYTHON" folder inside the downloaded zip file. It contains a main routine.

```
$ python3 sample_HowToCallFunctions.py
```

How to execute each sample code

Some sample code may change the controller settings. To prevent accidental execution, each sample code is initially set to 'False' as shown below. Set to 'True' to execute.

Third Party Software

This library (LJSwrap, LJS8_IF.dll, libljscom.so) itself does not contain any third-party software. Only the sample program is dynamically linked to the third-party software.

The following links refer to the license or copyright associated with the third-party software.

- Python3: ver.3.12.0 (https://docs.python.org/3/license.html)
- matplotlib: ver.3.8.2 (https://matplotlib.org/users/license.html)
- Numpy: ver.1.26.2 (https://numpy.org/doc/stable/license.html)
- Pillow: ver.10.1.0 (https://pillow.readthedocs.io/en/stable/about.html#license)

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