

OPTICS MOTOR

User Manual



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Contents

1	Introduction	3
2	Installation	3
2.1	Configuration file	3
3	Optics motor UI	4

1 Introduction

OPTICS MOTOR is a software used to control the two stepper motors coupled to a mirror mount and used for laser alignment. It was developed in the Ultrafast Chemical Dynamics group at Radboud University in Nijmegen by Daniel Horke and Ana Caballo, based on the design from [1].

2 Installation

The program can be run directly after downloading the GitHub repository. The executable can be find in `\optics_motor_labview\Builds`.

However, before running the configuration file has to be set correctly (see 2.1).

2.1 Configuration file

A default example of the configuration file (`optics_config.xml`) is located in `\optics_motor_labview\Files\VI`s, but a copy is also generated in `\optics_motor_labview\Files\SubVI`s\Config. Make sure you modify both when needed. If a configuration file is not found when running the program, a new one will be generated.

The following parameters have to be modified:

- VISA. It specifies the COM port to which the Arduino board is connected. The auxiliary executable FINDVISA can be used to see the current connections available. If the Arduino board is not found (because it is not connected to the USB port of the computer for example), then the program will give an error. It will then display a message explaining that the connection was not successful and the front panel will be automatically closed.
- Motor numbers. This is an array containing two numbers that determine the index (from 1 to 10) of the motors that are being used. See Figure 1.

```
1  <?xml version='1.0' standalone='yes' ?>
2  <LVData xmlns="http://www.ni.com/LVData">
3  <Version>21.0</Version>
4  <Cluster>
5  <Name>Optics config IN</Name>
6  <NumElts>2</NumElts>
7  <Refnum>
8  <Name>VISA</Name>
9  <RefKind>VISA</RefKind>
10 <Val>COM3</Val>
11 </Refnum>
12 <Array>
13 <Name>Motor numbers</Name>
14 <Dimsize>2</Dimsize>
15 <I32>
16 <Name>Numeric</Name>
17 <Val>7</Val>
18 </I32>
```

```

19 <I32>
20 <Name>Numeric</Name>
21 <Val>8</Val>
22 </I32>
23 </Array>
24 </Cluster>
25 </LVData>

```

Listing 1: Optics configuration example. COM port used and TIP and TILT motor numbers can be typed in lines 10, 17 and 21 respectively.

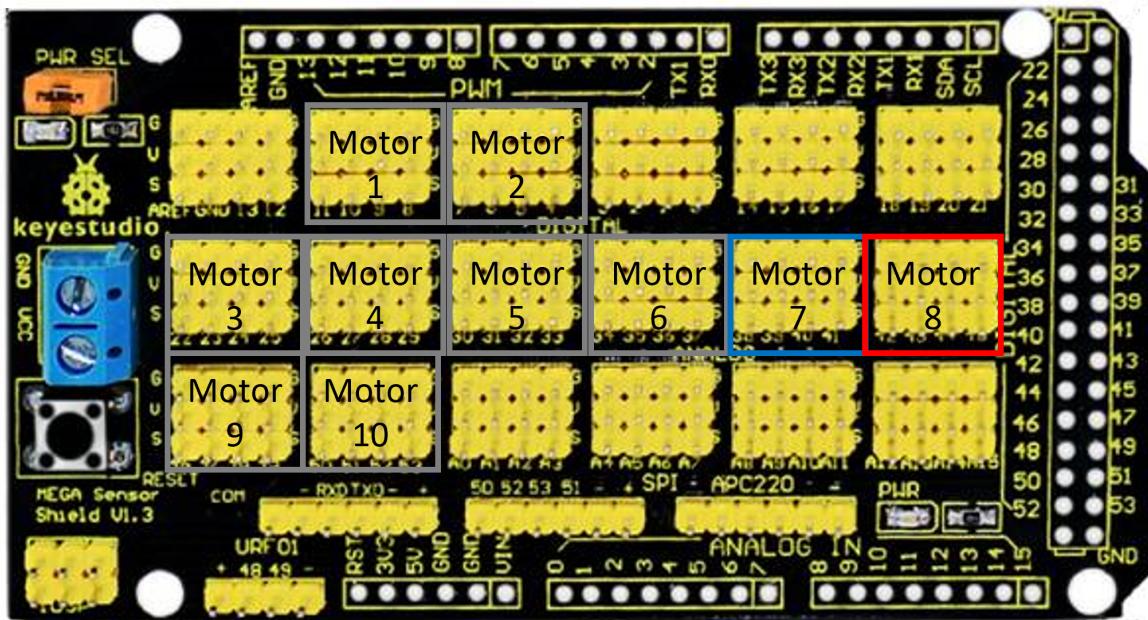


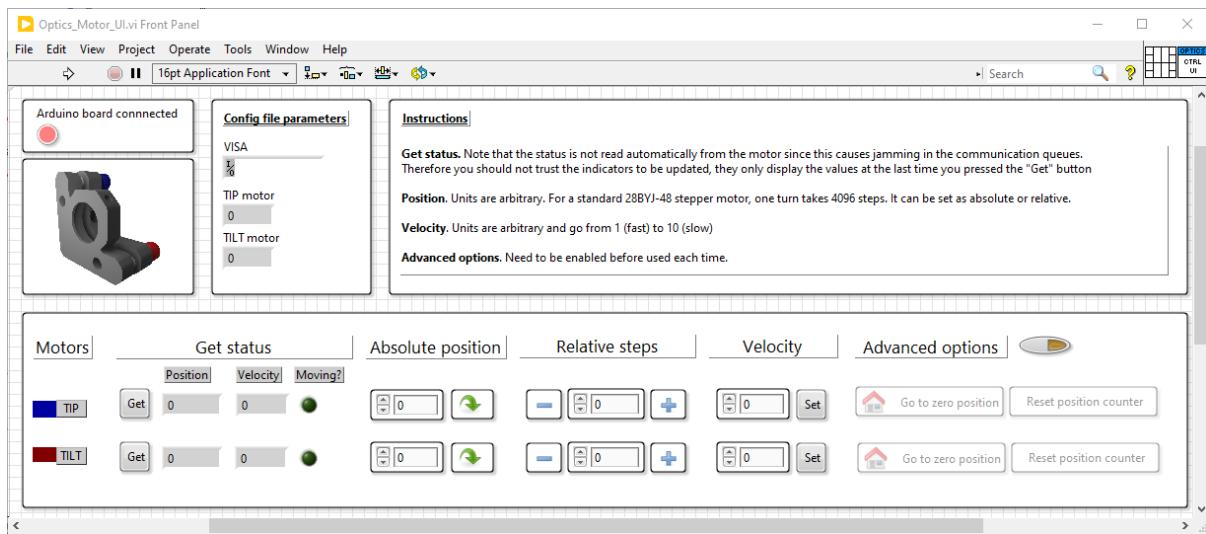
Figure 1: Arduino Mega sensor shield. The groups that correspond to each motor 1-10 are indicated in grey. The example connections used in the default configuration file are indicated in blue (tip) and red (tilt). Figure adapted from [2].

3 Optics motor UI

The optics motor UI is the main window. As the name implies, it is used to control the motors coupled to the optomechanics.

The *Config file parameters* box shows the values read from the configuration file, but just as an indicator, they cannot be modified within the GUI (you have to do so in the raw configuration file).

Once the *Arduino board connected* LED turns green, the lower panel containing all motor controls can be used. A brief description of the controls is written under the *Instructions* panel. For safety, more advanced options that could be accidentally selected have to be enabled via the corresponding button before they are used every time.



References

- [1] L. J. Salazar-Serrano et al. How to automate a kinematic mount using a 3d printed arduino-based system. *Inventions*, 3(2):39, 2018.
- [2] Keyestudio Wiki. https://wiki.keyestudio.com/Ks0006_MEGA_Sensor_Shield_V1, 2021. [Online; accessed 18-July-2023].