# Aim

This document details how to configure the EleksLaser A3-pro in order to control it via python.

Sources of information include the following:

1. <https://cadduino.wordpress.com/2013/11/18/testing-grbl-in-arduino-board-without-the-motors/>
2. <https://github.com/jandelgado/eleksmaker_a3>
3. <https://github.com/grbl/grbl/wiki/Configuring-Grbl-v0.9>

# Glossary of terms

|  |  |
| --- | --- |
| Term | Description |
| ELEKSROM | Software made by Eleksmaker to upload firmware to their board |
| ELEKSCAM | Software made by Eleksmaker to control their board |
| MCU | Microcontroller unit |
| EleksLaser A3-pro | Name of the 2D robot apparatus |
| G-code | Programming language used to control the board |
| Grbl | G-code parser that runs on an Arduino |

# Introduction

The Elekslaser A3-pro uses an Arduino Nano board as the MCU (microcontroller unit) with an ATMega328p processor.

There are multiple ways to control the EleksLaser board, a GUI based approach and a command line approach are listed below.

NOTE: Ensure that the board is plugged in and the button is pressed down.

# Manufacturer software

The manufacturer software consists of loading the ELEKSROM firmware via the ELEKSROM application and then using the ELEKSCAM software to control the device.

In the GUI for the ELEKSCAM we must click the “install driver” button.

Once the driver is installed the motors can be driven by the software.

# Grbl and Arduino

This approach allows us to control the board by sending commands down the COM serial port. To set this up we perform the following:

1. Download Arduino IDE
2. Go to <https://github.com/gnea/grbl/releases> and download the latest release source code.
3. Unzip the grbl folder and place it in the libraries folder of the installed Arduino software.
4. Rename the folder to GRBL.
5. Open up Arduino IDE and select File 🡪 Examples 🡪 Grbl, select GrblToArduino
6. Click Tools 🡪 Board, select Arduino Nano
7. Click Tools 🡪 Processor, select the old ATMega328p bootloader.
8. Close the Arduino and then install the GrblController 3.5.1 software
9. Click connect and then press some arrows. NOTE: Ensure that the button on the Board is pushed down!

## Limit switches

The setup as provided by Eleksmaker does not include limit switches, as a result the device cannot calibrate exactly where it is. This needs to be wired up manually.

## Grbl

Almost every interaction with Grbl is performed by sending a string of characters followed by enter. Grbl will then process the string and execute it accordingly, it will then reply back with a response to tell us how it went.

Every G-code block sent to Grbl and Grbl system commands will respond with how it went. There are a bunch of responses.

## G-code

The table below contains some basic G-code commands that are commonly used.

System commands are different from regular commands, they start with a $ sign.

|  |  |
| --- | --- |
| Command | Description |
| $ | Help command |
| $$ | View grbl parameters |
| $H | Runs the homing cycle (brings the device back to a predefined place) |
| $X | Kill alarm lock (sometimes the device can get into alarm lock state) |
| ? | Current status |

All grbl parameters (viewable by $$ command) are persistent between shutdowns.