



Instruction Manual Autonomous-Prober 2023

Arizona State University - Biodesign and Nano-Electronics, Tempe, USA

Kristófer D. Kristjánsson

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Abstract

This document is an instruction manual for the autonomous-prober. Included in the manual is an overview of the components that make up the backpack, how to operate it, and relevant safety warnings.

1 Device Overview

The autonomous-prober is an autonomous system that can collect current and voltage measurements while also storing data for later retrieval. The auto-prober's operations are simple, and the user should learn how to operate it swiftly and without any problems.

The auto-prober consists of several components:

Nr.	Quantity	Component
1	2	Stepper motor
2	2	Stepper motor driver
3	1	Voltage supply
4	1	Arduino Uno
5	1	Portable computer with windows 11 OS
6	1	Linear operational amplifier PCB board
7	1	National instrument data acquisition
8	2	Coaxial cable

Table 1: This is a list of all components included in the auto-prober , refer to Table 1 for the location of each component.

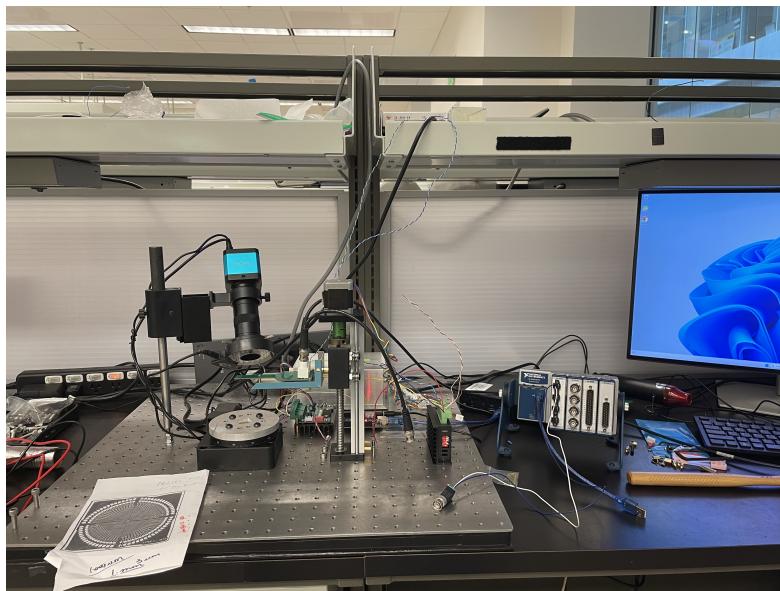


Figure 1: Setup for the system 1.

All components mentioned are easily accessible for modification and repair. Refer to the manual of each component to get the required software and data sheet that goes with it. The PC is the brain of the system and the programmable areas of the computer are easily accessible. The stepper motors can be easily calibrated through the user menu in the program called "main" that can be easily found under the GitHub link later referenced in this document.

All programming code can be found in the following GitHub repository:
<https://github.com/kristofer0907/auto-prober-2023.git>.

2 Operations

1. To turn the auto-prober on, connect the power cable for the voltage supply to a power outlet. Once plugged in you will see lights for the stepper motor drivers. Also make sure the PC is connected to PC if done correctly then the Arduino Uno should display a red LED.
2. Locate the "main.py" file and change lines 63 and 251 to the folder path in which the main.py file is located. This is where all data files will also be saved.
3. Start the python file called "main.py" whether that be through windows terminal or Visual studio code interface.
4. Once run, the PC screen will display an user interface which at first displays 5 separate options. Choose whichever fits your purpose.
5. Simply follow along the user interface for the rest of continued operations.
6. When asked for the analog input/output you can simply type cDAQ1Mod2/ai0 and cDAQ1Mod1/ao0 respectively.

3 Troubleshooting

The auto-prober due to it's design nature, makes troubleshooting as accessible as possible. If you encounter one of the issues listed below, the auto-prober team encourages you to try troubleshooting yourself before seeking technical support. If needed assistance it is possible to send an email to kkristjansson42@gmail.com along with your issue.

There are no lights on the stepper motor/stepper motors won't move

Possible cause/s

The wires on the Arduino Uno have gotten out of place.

Solution

To begin, it is crucial to verify that all wires are securely and correctly connected. The wires for the step motor driver should be as defined in the arduino script,"testing coms004" in the Auto-prober github repository.