

Budget 3D Scanner Operation Procedures and Documentation

Written by Toby Chui 2/2/2019, Corresponding Firmware: scanner_firmware_2.2

Introduction

This is a build for a low budget 3D scanner with ToF Sensor and Arduino UNO powered by dual 2.8V 200 steps per rev (1.8 degree) stepper motor driven with dual stepper motors. The driving methods and operating procedures is listed below.

Operating Procedures

1. Stick the object that you want to scan onto the platform with double sided tape
2. Plug in the USB cable for the Arduino Serial output to your PC
3. Start serial monitor / Python – Serial capture software
4. Power on the devices. The light blue LED should light up inside the enclosure
5. Run “G95”, wait for the scanner to reach its top position
6. Run “G97” when you place your hand in front of the scanner at a position $> 6\text{cm}$ and $< 20\text{cm}$. Check if the sensor return any value that is larger than 0. If not, continue step 7; otherwise go to step 8
7. Move around the “Sensor Power” wire. Press the restart button on the Arduino and repeat step 5
8. Run “G28”, wait for the sensor head reaching the bottom. If the motor is still running get stuck at the bottom, make sure the sensor wire is not blocking the contact between the head block and the micro switch below.
9. Now, it is ready to start scanning. Enter “G93” to start scanning. Scanning return value with format (h,r,d) where h is height in steps, r is rotation in steps, d is distance in mm.
10. Wait for the scanning process finish.
11. Power off the device after use to prevent heat accumulation in stepper driver

All Supported G-Code command

G28 → Sensor Home (Default)

G93 → Start Scanning

G94 → Calibration (Please put the calibration board in the center position of the scanner platform before using this command)

G95 → Sensor Home (Top), Moving the sensor to the top value preset)

G96 → Platform Check (Perform a full rotation as speed 60rpm)

G97 → Sensor Read (Get the current value from sensor)

DEFAULT → reply with “[info] Echo: <your command here>”