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Thank you for downloading MINT.Box!

When we designed this program, we set out to inspire creativity through simplicity and to make large systems painless. We at MINT.Team hope that you find the ability to control systems of servo motors without the need for precise commands and technical knowledge. We promise that it will be fast and intuitive, without sacrificing the functionality. So launch our app, and get started building; we hope it lets you build something special.

Sincerely,

MINT.Team

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Installation and Safety Guide

Installation Requirements

- I. Ubuntu 16.04: Operating System required for running MintPatch.
- II. Python 2.7/pip: Programming Language needed in order to compile and run the library; and pip to install the needed libraries.
- III. ROS Kinetic: Underlying protocol needed for running MINT.Patch. (Note: This provides the needed apt setup in order to install the ROS Library. You will need 3 GB of space in order to install the full desktop application, however provided options are available for machines with smaller storage sizes.)
- IV. U2D2 udev rules: Required for having the correct permissions to communicate with physical device.

Installation Procedure

- I. Download MINT.Patch from the Github repository using either "git" or directly from the website.
- II. Have one terminal run the following command to start up the ROS Kinetic nodes for MINT.Patch: "roscore"
- III. Have another terminal opened in the repository and run the following command to start up the library: "python startup.py"

Safety Guidelines

These safety guidelines are intended to be followed before, during, and after the operation of the motors with the provided software. They are intended to protect not only the

equipment from damage, but as well to protect the operator from any serious injury or death. As well, we are not responsible for any damages to the motor with regards to our program library and/or diagnostic software. Please read the following before operating our software:

- I. Do not stick anything near the motors during operation; and this includes any body parts, pins, or any generally sharp objects.
 - II. Use the correct polarity power supply for the power board supplying the power for the motors.
 - III. Do not leave equipment near children.
 - IV. Do not operate motors outside of temperature limits between 5 - 55 celsius; nor outside of the motors' rated speed and current.
 - V. Do not disassemble motors.
 - VI. Do not apply a massive amount of physical shock to the motors.
 - VII. If any motors emit smoke, or a strange odour, remove the power immediately.
- Do not place any of the equipment near any water and/or flammable liquids.

User Instruction Manual

Following are instructions on operating MINT.Box:

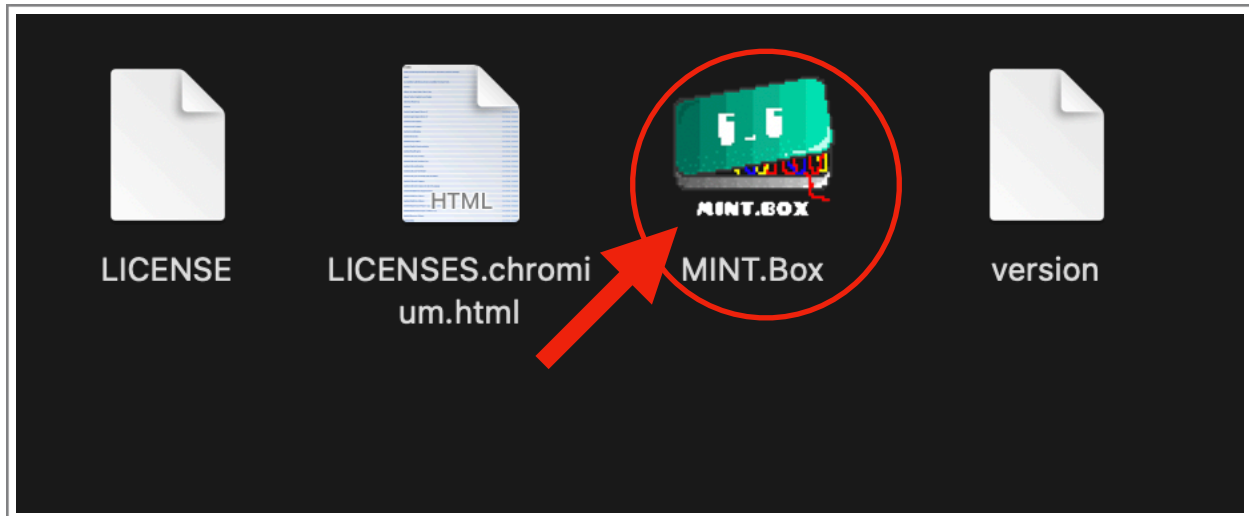


Figure 37.1 - Locating MINT.Box

Navigate to the folder where MINT.Box is installed, and then press the icon to open the software. Reference Fig. 37.1 for an example.

After pressing the icon, MINT.Box will open a separate window. Refer to Fig. 38.1, for a visual example of what that would initially look-like.

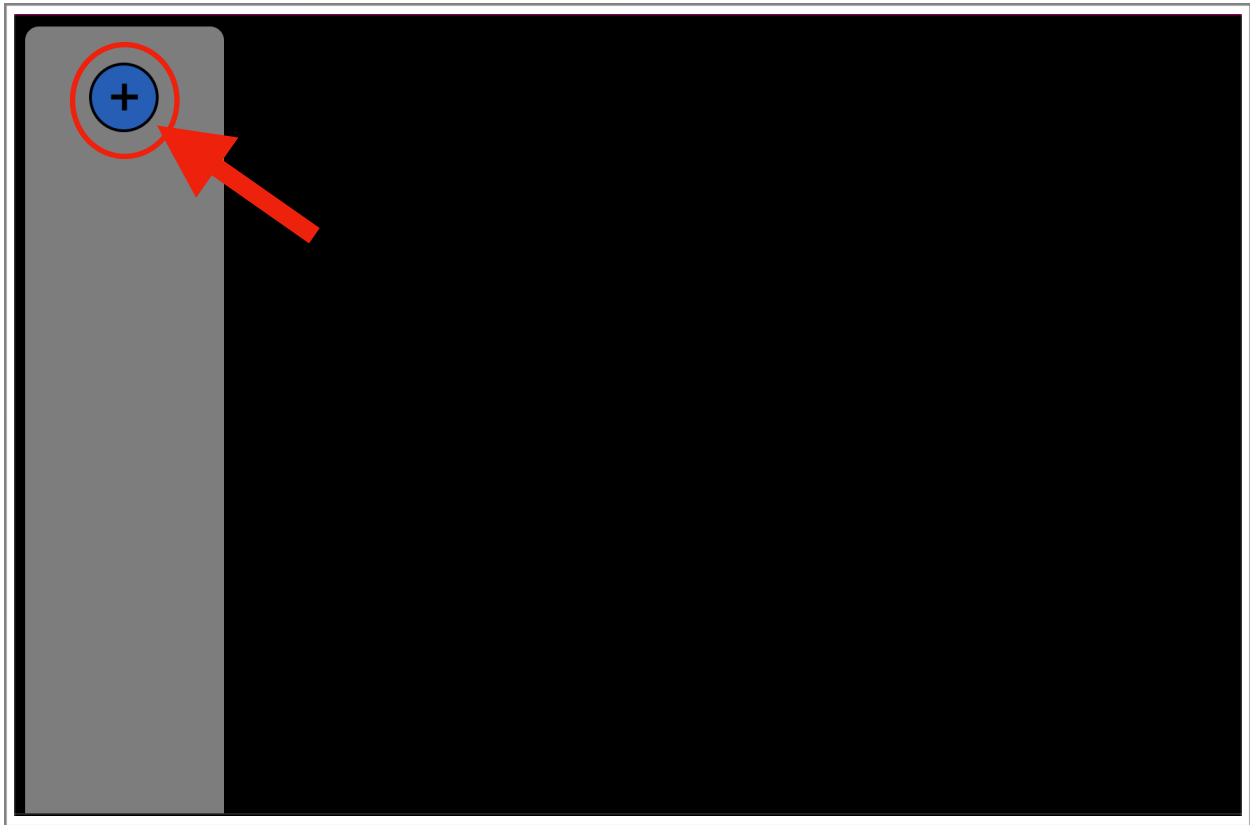


Figure 38.1 - Launching MINT.Box

After MINT.Box opens, press the scan button to load all connected servos into the user interface. Reference Fig. 39.1 for a visual representation.

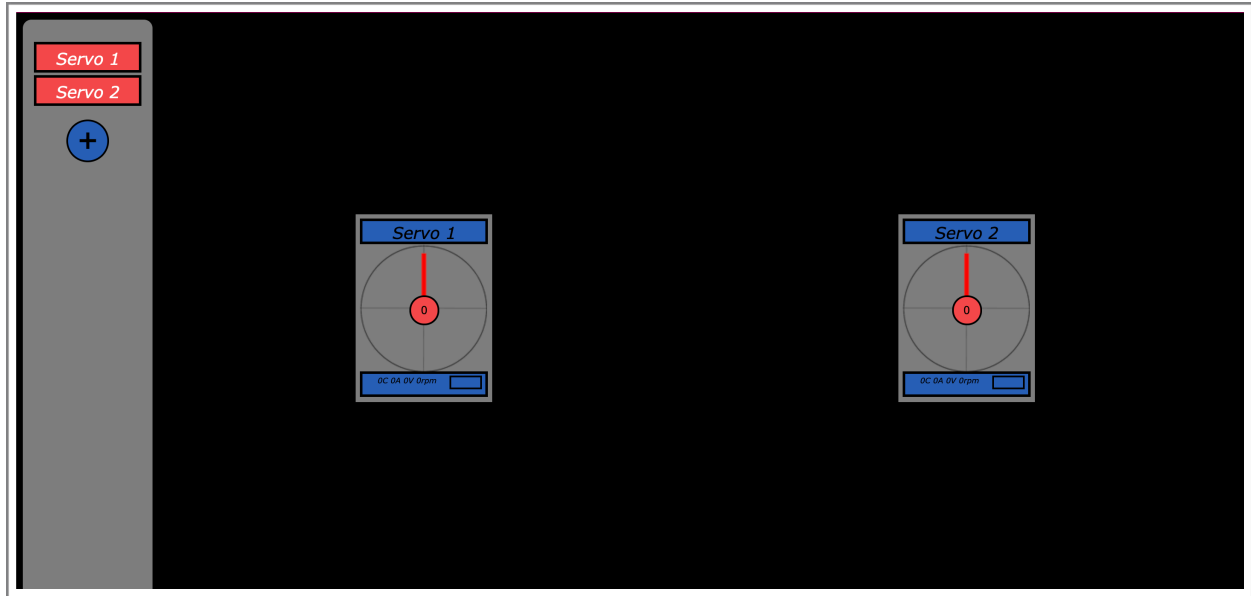


Figure 39.1 - Connecting Servos to MINT.Box

After the servos are connected, they can be moved around freely on the Catalogue on the left and the Canvas in the middle. Each Catalogue-Element and Canvas Element can be dragged using mouse-clicks. To drag, press and hold on the element and then drag the mouse over to the desired position. For reference, observe the new changes in Fig 40.1.

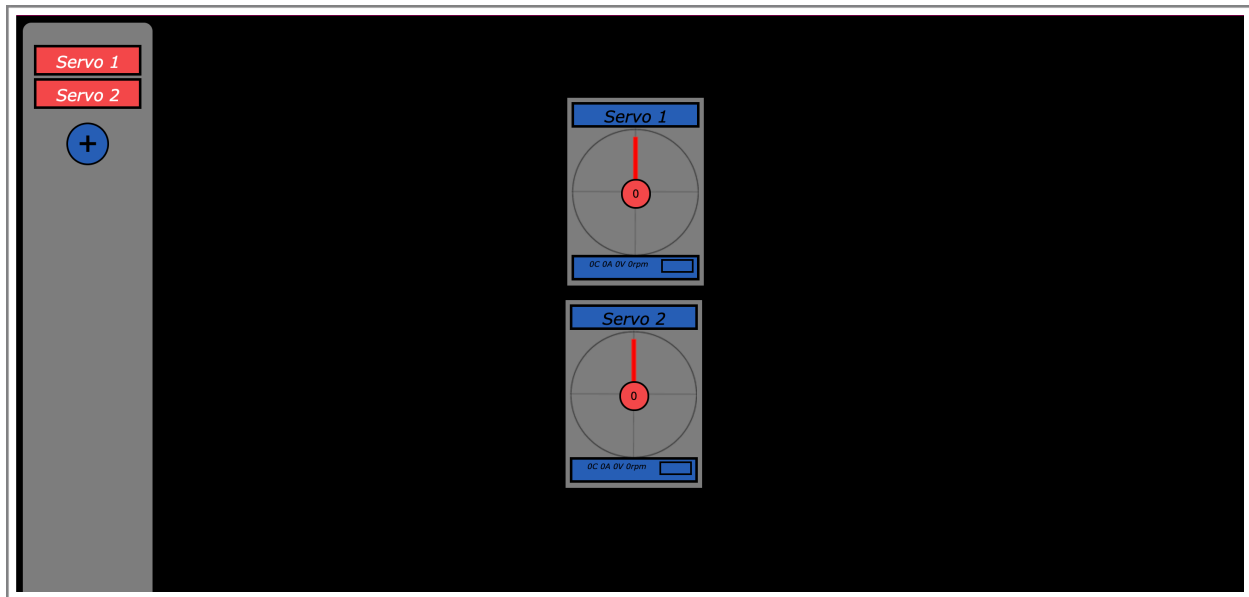


Figure 40.1 - Element Repositioning in MINT.Box

After the servos are connected, they can be moved around freely on the Catalogue on the left and the Canvas in the middle. Each Catalogue-Element and Canvas Element can be dragged using mouse-clicks. To drag, press and hold on the element and then drag the mouse over to the desired position. For reference, observe the new changes in Fig 40.1.

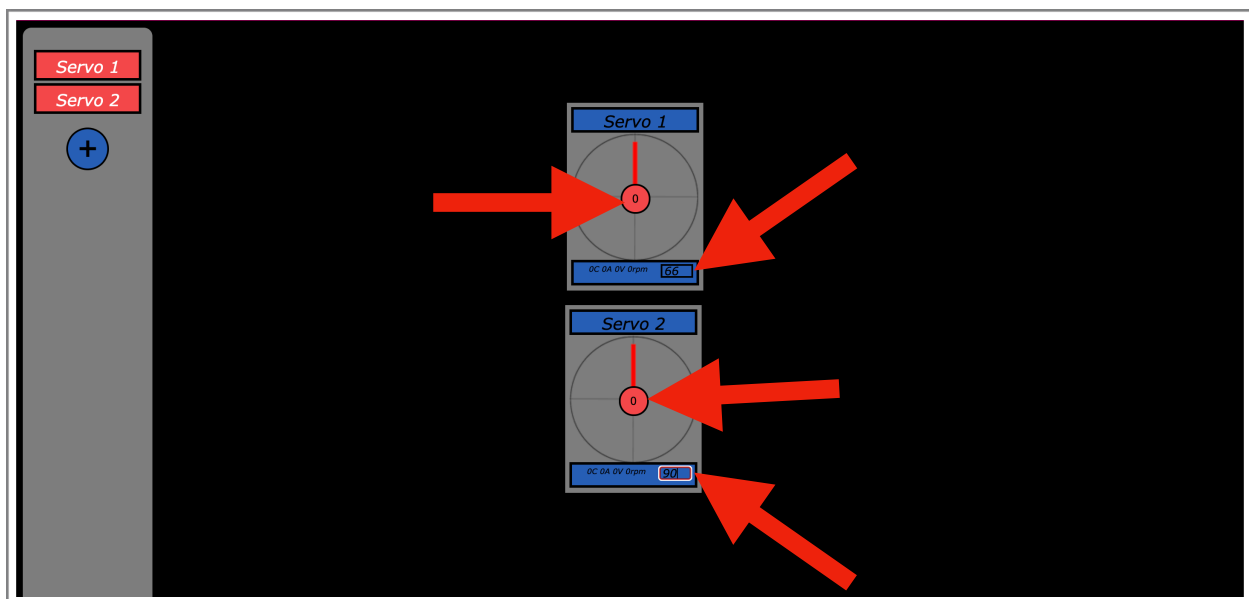


Figure 40.2 - Element Update in MINT.Box

The goal position of the servo can be set and then the activation button can be pressed to manipulate the servos, reference Fig. 40.2. The red colour of button represents the 'off' state of the servos, this will change when the servos are activated.

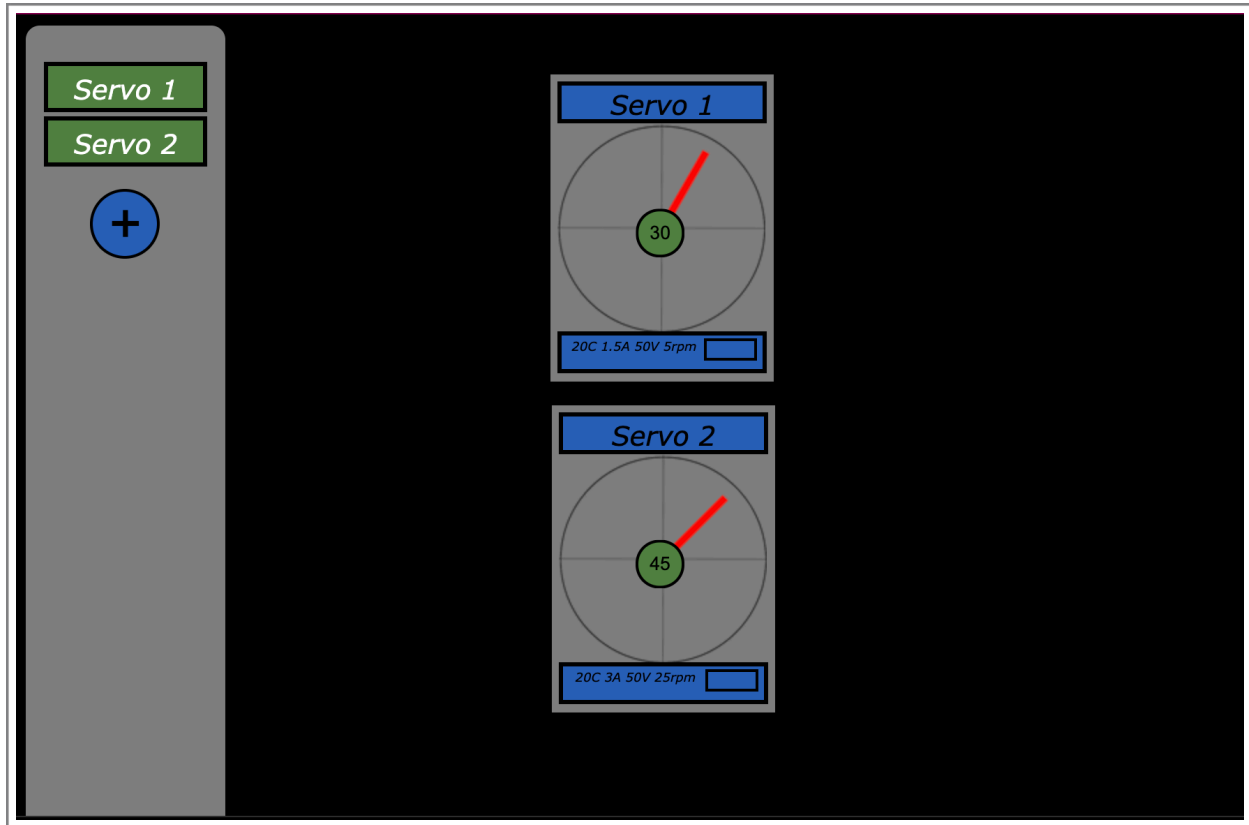


Figure 41.1 - Servo Manipulation

After the activation of the servos, their state changes to 'on' (represented by the green i), and the angle is tracked with changes to the angle-tracker. The speed, temperature, current, and voltage values also change when the servo is activated, this can be referred in Fig. 41.1.

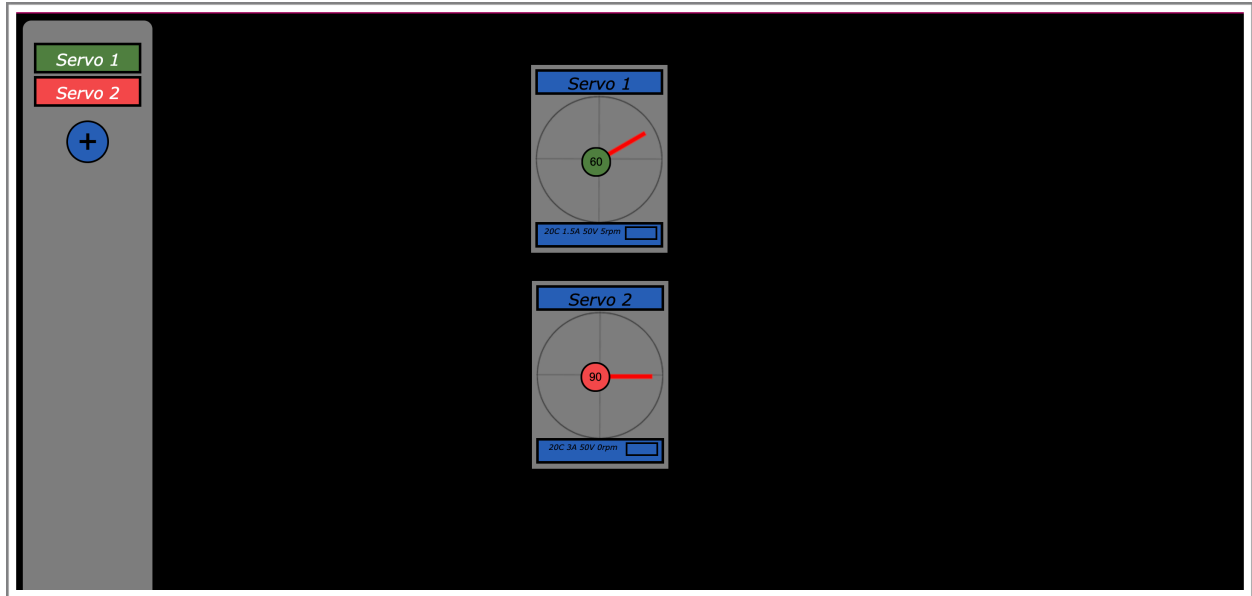


Figure 42.1 - Post-Activation Status

As soon as the servo reaches the goal position, it becomes 'off' again however it keeps track of it's temperature, current, and voltage. Use Fig. 42.1 for reference.

References and Dependencies

- I. concurrently: 6.0.0 (By kimmobrunfeldt, Gustavo Henke)*
- II. dynamixel_sdk: 3.7.31 (By Gilbert, Zerom, Darby Lim, Leon)*
- III. electron: 12.0.2 (By OpenJS Foundation)*
- IV. electron-forge: 5.2.4 (By Mark Lee, Samuel Attard)*
- V. electron-is-dev: 2.0.0 (By Sindre Sorhus)*
- VI. electron-squirrel-startup: 1.0.0 (By mongodb-js)*
- VII. express: 4.17.1 (By Douglas Wilson, James M Snell, Mikeal Rogers)*
- VIII. python-shell: 3.0.0 (By Nicolas Mercier, brucedjones, almenon)*
- IX. react: 17.0.2 (By Facebook)*
- X. react-beautiful-dnd: 13.1.0 (By Alex Reardon, Daniel Del Core)*
- XI. react-draggable: 4.4.3 (By Matt Zabriskie, strml)*
- XII. rospy: 1.12.17 (By Ken Conley, Dirk Thomas, Jacob Perron, Shane Lorentz)*
- XIII. socket.io: 4.0.1 (By rauchg, Damien Arrachequesne)*
- XIV. wait-on: 5.3.0 (By Jeff Barczewski)*