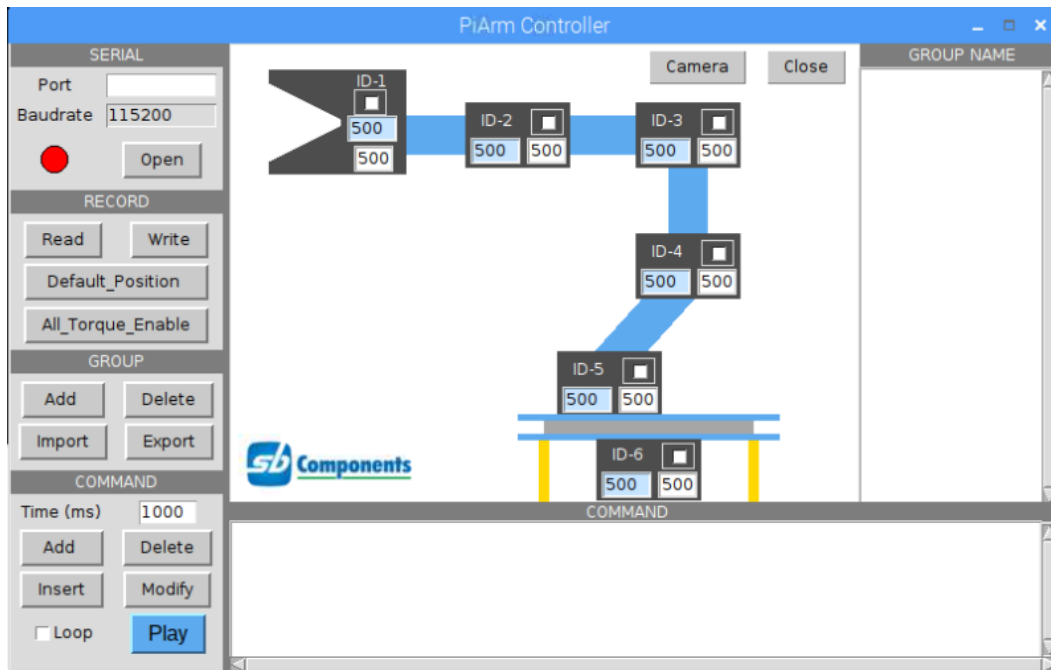# PiArm Servo Controller
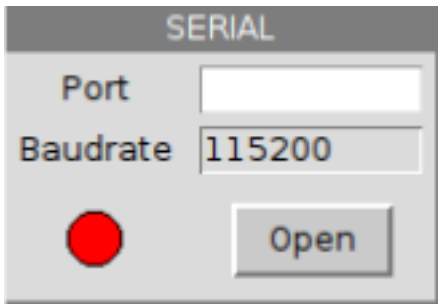# INSTRUCTION MANUAL

PiArm Controller: PiArm controller is used to control the moment of each motor and store command. PiArm provides following controls and functionalities:
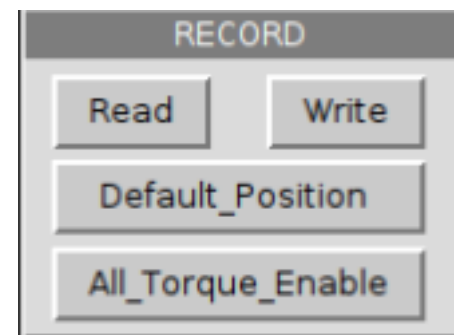
I.   Read the current position of all the servo motors.
II.   Write time and position for all motors and watch the action.
III.   Set motors at default position i.e. '500'.
IV.   Disable or Enable torque for all motors at a time, or use checkbox for individual motor.
V.   Add a group, to record set of commands/actions.
VI.   Import a file to group section, to use previously recorded commands.
VII.   Export a group to a text file at **'./Export Files/'.**
VIII. Select a group, and Add/Insert/Modify commands to group or file.

- **Comm Port :** Enter Comm Port number in the text field. If connected through GPIO, enter **'ttyS0'** ; Else if connected through USB, enter **'ttyUSB0'.**

- **Baudrate :** The required baudrate for Servo motor is '115200 bps', which shall remain constant

- **Open :** Open or Close comm port.

- **Read:** Read current position of motors. The position of each motor will be displayed at controller diagram text boxes.**.**

- **Write :** Write data for position and time in text boxes to PiArm.

- **Default_Position:** Write default position(500) and time(500) for each servo in PiArm.

- **All_Torque_Enable:** Enable or Disable Torque of all motors. Enabling Torque will block manual movements of servo and Disabling will unblock manual movements..
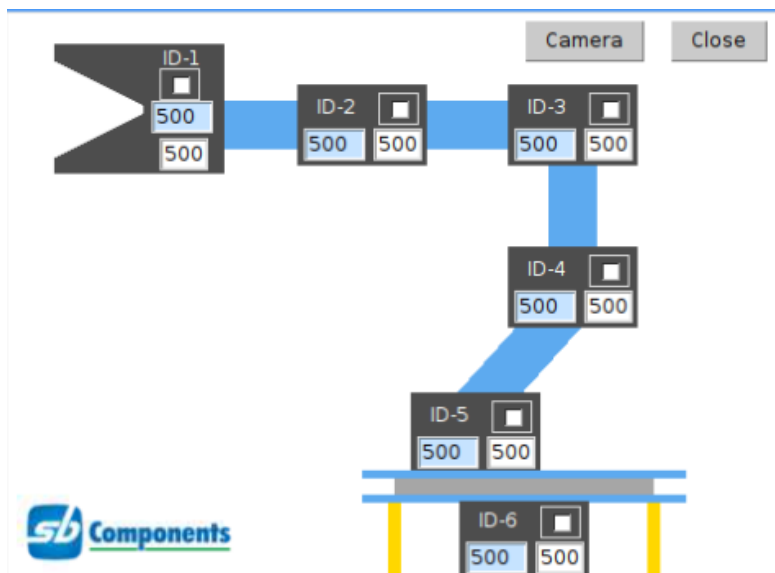
This Diagram read/write Position and Timevalues for each motor in PiArm

- The ID is the servo motor ID.
- The checkbox above each box is to enable/disable the servo motor torque.
- The shaded first textbox is servo motor's position for each individual motor. The range for the position is 0~999.
- The second text box is servo motor's time for each individual motor. The range for time is 0~999.

NOTE :
The changes in the controller will take place only after Read/Write button is pressed..

- **Add:** Add a Group, where all the commands will be stored. When clicked, a window will appear to enter the name of the group.

- **Delete:** Delete a group, from 'Group Name' menu.

- **Import:** This will import a file, and show the name of file in 'Group Name' menu.

- **Export:** The Group will be exported to a '.txt' format file in './Export Files/'.

- **Group Name:** Groups Added or imported will appear here. The actions will be performed on selected group and commands inside that group will appear in the command window.

- **Command:** The command is the set of position and time for all 6 servos and time delay between two commands..

- **Command widget** is used to Add/Modify/Insert commands into a group. The changes will take place in the group selected from Group Name.

- **Time:** Delay to execute current command after previous command. The unit is milliseconds.

- **Add:** Add a command to Group. The position and time at figure 1 are added automatically. You can change the positions of motors manually than read the position with **'Read'** button and Add to set the current position of PiArm to command.Command: The command is the set of position and time for all 6 servos and time delay between two commands..

- **Delete:** Delete a command from command window.

- **Insert:** Insert can be used to insert a command in between two commands

- **Play:** Play button can be used to execute a set of commands. Starts from the selected command in command window and ends after the last command in command window is executed.
- **Loop:** Loop checkbox can be used to repeat a set of command infinitely, until box is unchecked. Applies only after 'Play' button is pressed**.**
- **Modify:** Modify command can be used to enter/change command manually. ID is the servo ID of each motor in PiArm, the value of position and speed can be changed for any command by changing the text box values of Position and Speed.

Modify		
ID	Position	Speed
1	252	500
2	499	500
3	868	500
4	150	500
5	522	500
6	502	500
	Save	Cancel

- **Modify command** can be used only if a command is selected from command window..

COMMAND

ID:1 P150,T500 ID:2 P499,T500 ID:3 P670,T500 ID:4 P321,T500 ID:5 P489,T500 ID:6 P500,T500
ID:1 P252,T500 ID:2 P499,T500 ID:3 P868,T500 ID:4 P150,T500 ID:5 P522,T500 ID:6 P502,T500
ID:1 P500,T500 ID:2 P499,T500 ID:3 P868,T500 ID:4 P150,T500 ID:5 P522,T500 ID:6 P502,T500
ID:1 P500,T500 ID:2 P499,T500 ID:3 P950,T500 ID:4 P400,T500 ID:5 P600,T500 ID:6 P502,T500
ID:1 P500,T500 ID:2 P499,T500 ID:3 P950,T500 ID:4 P400,T500 ID:5 P531,T500 ID:6 P880,T500
ID:1 P560,T500 ID:2 P498,T500 ID:3 P990,T500 ID:4 P500,T500 ID:5 P700,T500 ID:6 P879,T500
ID:1 P184,T500 ID:2 P499,T500 ID:3 P799,T500 ID:4 P219,T500 ID:5 P567,T500 ID:6 P878,T500

- **Camera:** Raspberry Camera can also be used with PiArm. When 'Camera' button is
  pressed a new UI opens.
  In the Camera UI, user can click on 'Photo' to take a picture, or
  Click on **'Video'** button to record a video.
  Pressing the **'Home'** button will open the PiArm controller screen..
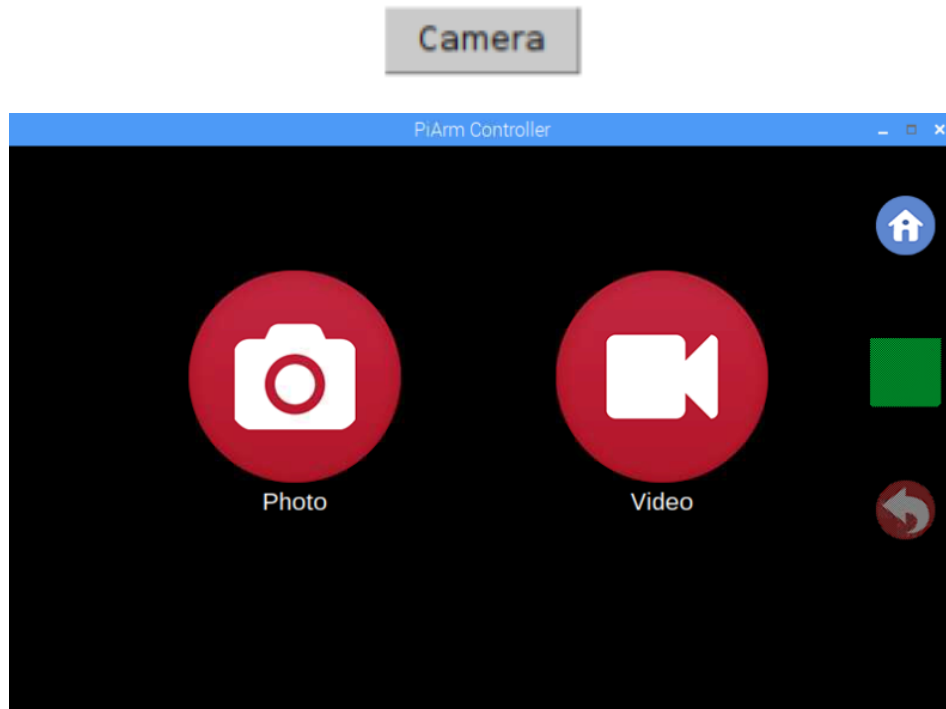
- **Close:** ' Close' button will close the PiArm Controller application.