

Getting Started with uArm v1.1

Before assembling the uArm, you should first install the Arduino Integrated Development Environment (Arduino IDE) software on your computer for programming and uploading code to your uArm Uduino board. It is best to program your uArm Uduino (Arduino Uno compatible) board BEFORE powering on your uArm for the first time!

1. Download the Arduino Software (Arduino IDE)

Get the latest version from the Arduino website located here:

<http://arduino.cc/en/Main/Software>

If using Windows, there is a convenient Windows Installer program that you may download. Alternatively, you may manually install using the ZIP file. For Mac OS X and Linux, download the appropriate ZIP file and unzip the downloaded files into an appropriate folder. Make sure to preserve the folder structure of the ZIP file! You can double-click the un-zipped folder to open it and see that there should be a few files and sub-folders.

2. Install the FTDI Drivers

The UFactory supplied Uduino is an UNO compatible Arduino board. There is an Integrated Circuit (IC) chip on the board for converting USB signals to the needed serial UART signals used by the microprocessor. This chip is the FT232RL from a company called FTDI. You will first need to install the FTDI Drivers before you can program the Uduino board.

You can see more details about how to install the FTDI Drivers from Sparkfun [at](https://learn.sparkfun.com/tutorials/how-to-install-ftdi-drivers/all):

<https://learn.sparkfun.com/tutorials/how-to-install-ftdi-drivers/all>

Follow the instructions and install the FTDI Drivers.

3. Install the uArm Control Library

Download the latest uArm control library software from our website here:

<http://www.ufactory.cc/downloads.html>

Follow the instructions on the Arduino website to import the library into the Arduino IDE :

<http://arduino.cc/en/Guide/Libraries>

4. Connect the Uduino Board

Connect the Uduino board to your computer using the USB cable supplied with your kit and without connecting the 5 volt power cable.

5. Open the RemoteControl Example Sketch

Programs that you import to the Arduino IDE are called “sketches”. Open the Arduino IDE on your computer and go to the RemoteControl example sketch: **File > Examples > UF_uArm > RemoteControl** (or **File > Sketchbook > Libraries > UF_uArm > RemoteControl**).

6. Select your Board

From the Arduino IDE, Click on **Tools > Board > Arduino Uno** to select the “Arduino UNO” board at the top of the list as the target for uploading.

7. Select your Serial Port

Select the serial device of the Uduino board from the **Tools > Serial Port** menu. This is likely to be COM3 or higher (COM1 and COM2 are usually reserved for hardware serial ports). To check which port, you can disconnect your USB cable from the board and reopen the menu; the entry that disappears should be the Uduino board. Reconnect the USB cable and select that serial port from the list.

8. Upload the Sketch

Now, simply click the “**Upload**” button in the IDE (on the left of the menu bar, the button with an arrow pointing to the right). Wait a few seconds – you should see the RX and TX LEDs on the board flashing. If the upload is successful, the message "Done uploading." will appear in the status bar. The code remains in the Uduino, even with power off. There is no need to re-load the code each time you use your uArm.

9. Assemble uArm

If your uArm did not come completely assembled, you should now fully assemble it before you attempt to power it on. Follow the uArm Assembly Instructions to assemble your uArm:

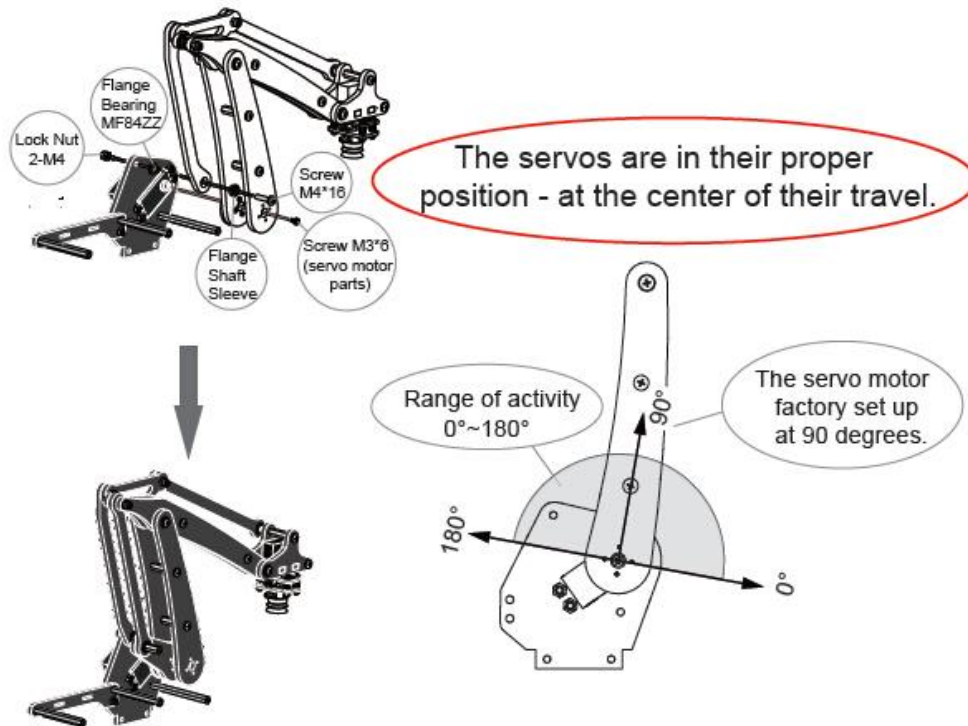
http://www.ufactory.cc/downloads/documents/uArm_Assembly_Instructions_v1.0.1.pdf

Very Important Note: Make sure that you assemble the servos into their right positions according to step 34 & step 35 in "uArm Assembly Instructions".

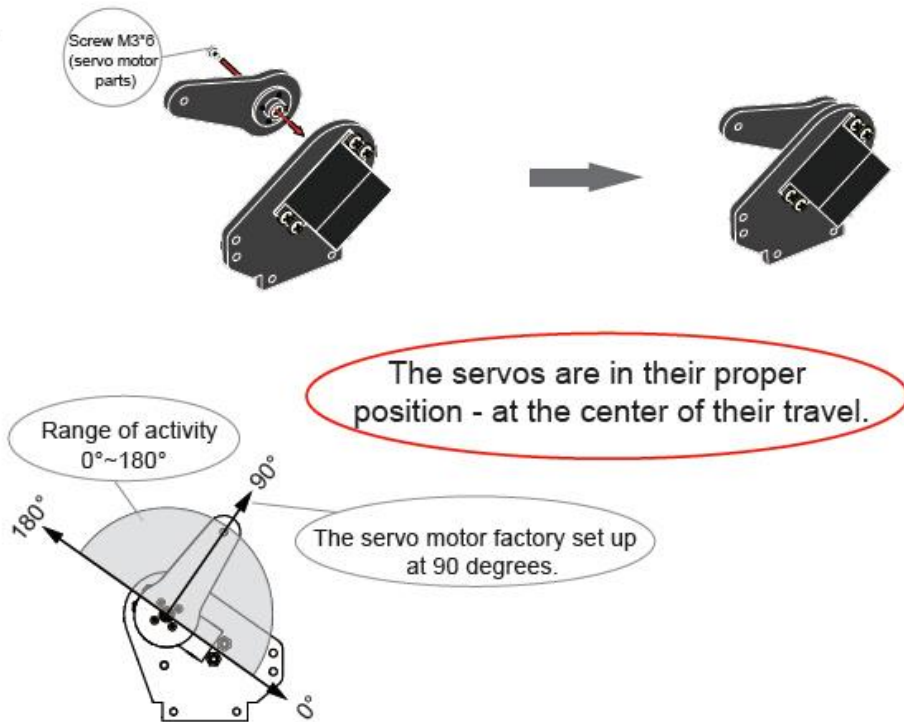
Here is a helpful video for showing how to properly align the arms for attaching to the servos:

<https://www.youtube.com/watch?v=bXz4X5YStHU>

34.



35.



10. Calibration

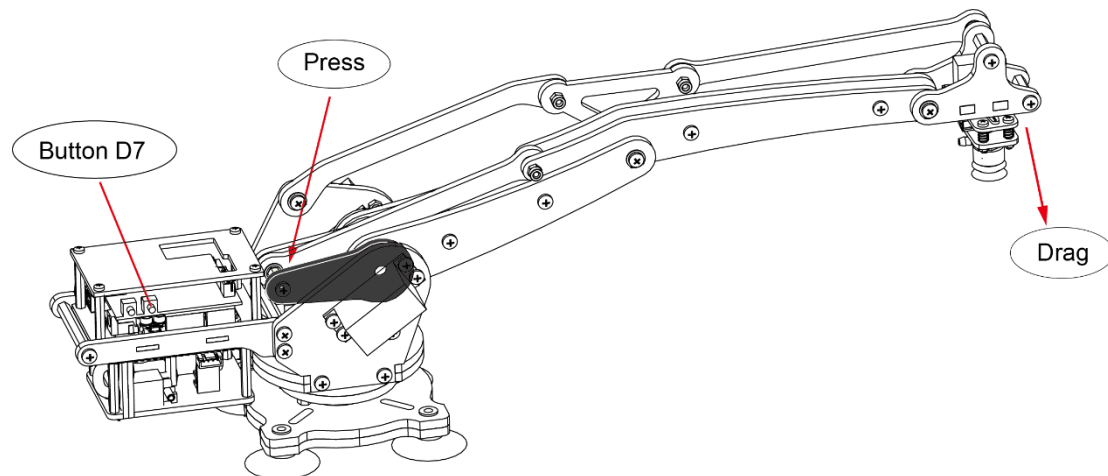
You will need to calibrate your uArm after you assemble it and power it on for the first time. **Make sure that you have uploaded the RemoteControl example sketch (code) to Uduino before attempting to do calibration.**

Connect the power supply to the uArm shield board (NOT directly to the Uduino board). If you haven't already done a calibration (such as the first time you power the uArm), you should hear three short "beeps" and the uArm shoulder servos will be "free" (not engaged). However, the base rotation and hand servos - as well as pump controls - will be working. If you hear a continuous tone, then the Uduino is not programmed properly. Remove power and check that steps 1-8 were followed correctly.

Please watch the following video to see how to do a proper Calibration:
<https://www.youtube.com/watch?v=X46RiD8BOyE>

To calibrate the uArm, press **Button D7** for 3 seconds. After two beeps, you should be able to easily move the arm forward, backward, up, and down.

Press the **B10 and B11** parts of the uArm **to their furthest extent**, and then press and pull the end-effector and extend it to its maximum position.



Press **Button D7** once and move your hand out of the way. The uArm will finish its Calibration and go back to its zero position.

Note: After calibrating correctly, make sure all the servos are reaching their **correct** "home" positions, and are not "locked" (refuse to move). You can push on the arm to test, if the servos are not locked in position you will be able to move the arm. If a servo is locked (stuck) it will soon overheat and may be damaged. Disconnect the power cord immediately! Watch for smoke and the smell of hot insulation!

11.Run Your uArm with the Mouse Control for Windows

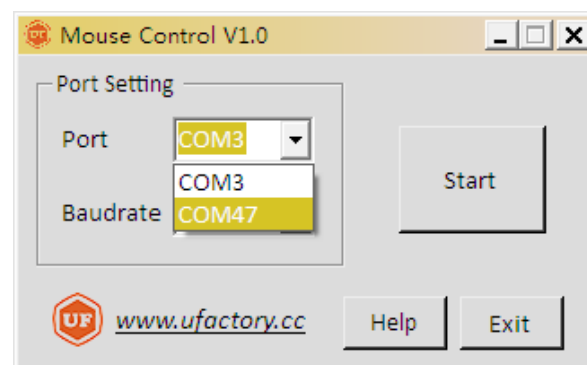
After a successful calibration, you can run your uArm by using our Mouse Control for Windows application. And, of course, you can also write your own application directly by using the Arduino IDE with the uArm library.

Download the Mouse Control application for Windows here:

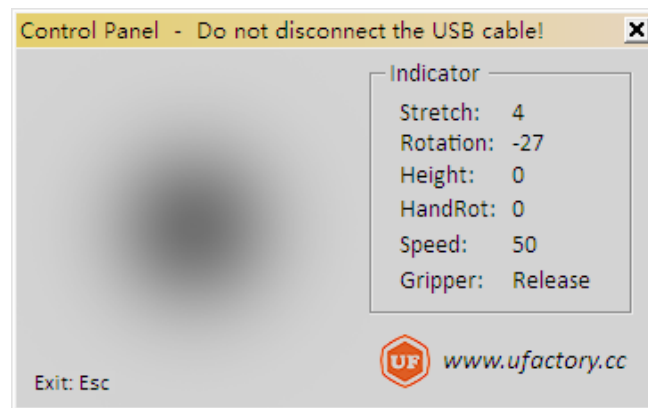
http://www.ufactory.cc/downloads/applications/MouseControl_V1.0.5.exe

Connect the Uduino board to your computer using the USB cable. Connect the power supply to the uArm shield. (NOTE: Do not connect the power supply directly to the Uduino board).

Open MouseControl.exe to start the application. Choose the serial port of the Uduino.



Click “Start” button to control the uArm with a mouse.



Note: If the uArm doesn't work (all the blue LEDs turn off after clicking the “Start” button), press the Uduino reset button (located on the Arduino board just to the left of the USB port when looking at the back of the uArm). The board will reset and the uArm will be able to communicate with the MouseControl software.

The following are the mouse mappings for controlling the uArm:

Mouse Action	uArm Action
Move Mouse Around	Moves uArm Around
Scroll Mouse Wheel	uArm moves Up and Down
Click Left Button once	Grips (suction on)
Double Click Left Button	Releases (suction off)
Hold Right Button, and Scroll Mouse Wheel	Rotates End-effector

Please be careful, and make sure you have attached the servos in their correct positions according to step 34 & step 35 in "uArm Assembly Instructions". And also make sure you have done the Calibration step properly. If the servos get hot, turn off the power immediately! If you still have any questions or run into any problems during the Getting Started period, please send us an email at feedback@ufactory.cc , and we will try our best to help you. And if you also want to purchase new servos or other spare parts. You can send us an email at sales@ufactory.cc , all these parts will be available soon on our online store here: <http://store.ufactory.cc/>