

# uArm

## Learning Mode Instructions v1.0

The Learning mode allows you to “teach” the uArm a sequence of movements by manually moving the arm and recording the movements in the Arduino memory. A new sketch named “Standard” is included in the latest uArm control library software.

**Note:** It would be a good idea to read the [“Getting Started with uArm Instructions”](#) before following these instructions.

### 1. Install the uArm Control Library

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

[http://www.ufactory.cc/downloads/source\\_files/UF\\_uArm\\_libraries\\_beta5.zip](http://www.ufactory.cc/downloads/source_files/UF_uArm_libraries_beta5.zip)

We can also download the library on our github page here:

[https://github.com/UFactory/UF\\_uArm](https://github.com/UFactory/UF_uArm)

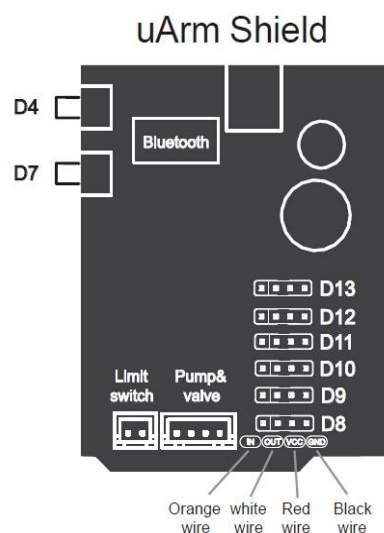
Follow the instructions on the Arduino website to import the library into the Arduino IDE :

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

### 2. Upload the Example Sketch named “Standard”

Upload the “Standard” Example Sketch in the uArm Control Library to your Arduino control board.

### 3. Mode Setting



We have combined 3 modes in this sketch:

(1) The Mouse Control Mode

This is the default mode after you upload the “Standard” sketch and power on. You

can control your uArm by using our Mouse Control Software. ***Make sure you have done the calibration before you run the Mouse Control Software.***

#### (2) The Calibration Mode

After power on, press **Button D7** for 3 seconds. After two beeps, the uArm is in Calibration mode. You can see more details about how to complete the calibration here:

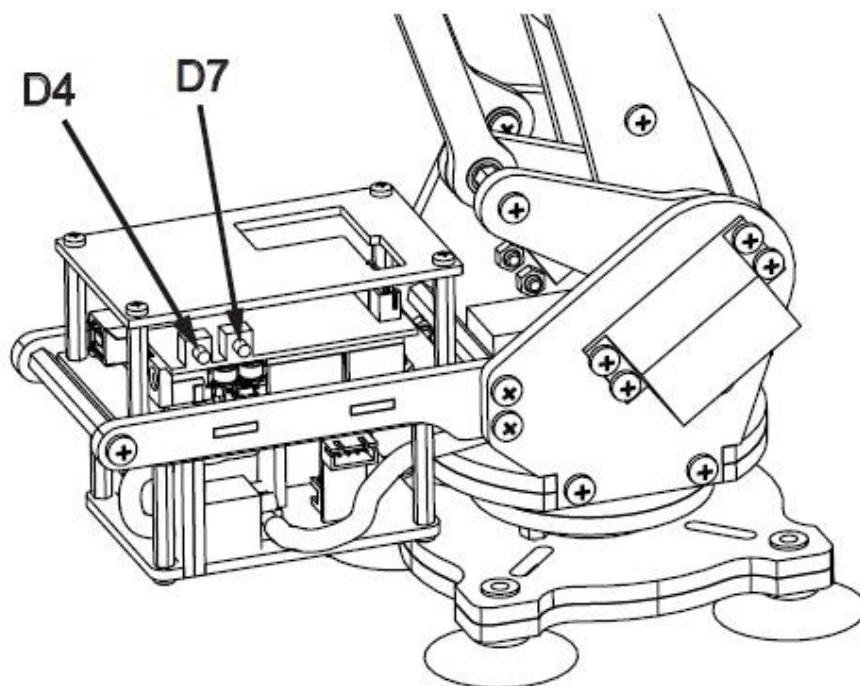
[http://www.ufactory.cc/downloads/documents/Getting\\_Started\\_with\\_uArm\\_v1.1.pdf](http://www.ufactory.cc/downloads/documents/Getting_Started_with_uArm_v1.1.pdf)

#### (3) The Learning Mode

After power on, press **Button D4** once. After two beeps the uArm is in Learning Mode. (To go back to Mouse Control Mode, just press the **reset button** next to the USB connector on the Arduino board.)

### 4. Getting Started with Learning Mode

When the uArm is in Learning Mode:



(1) Press D4 once, after one short beep you should be able to easily move the arm forward, backward, up and down. The uArm is in recording (learning) mode and the Arduino board will record the movements of the uArm.

(2) To turn the suction or gripper on and off during the recording process, press **Button D7**. One short beep indicates the Arduino board has recorded the Suction On (grip) action. To record the Suction Off (release) action, press **Button D7** again. Two

short beeps indicate the Arduino board has recorded the Suction Off action.

(3) To finish the recording, press **Button D4** once. Two short beeps indicate recording has finished.

**Note: The maxim record time is 17 seconds, after 17 seconds you will hear three short beeps, indicating the storage memory is full.**

*[We are planning to store the recorded data directly into the computer by using the USB connection. We will release the new library as soon as we finish it.]*

(4) To replay what you have recorded, press **Button D7** once. After a short beep, the uArm will replay the recorded movements once. If **Button D7** is held down for 1 second there will be a long beep and the uArm will replay the recorded movements over and over until it is stopped.

(5) To stop the repeated replay, press **Button D7** once. To begin the replay again, press **Button D7** again.

(6) The movement data is temporary stored in the RAM of the Arduino board so the recording is lost when the power is turned off. To keep the recording, it can be stored in EEPROM. After making a recording, press **Button D4** for 3 seconds. A long beep will indicate the data has been stored in the EEPROM of the Arduino board. To replay the recorded movements from EEPROM when you next power on, enter Learning Mode and press **Button D7** once.

## 5. Arduino Sampling Rate

In the Arduino code, the maxim recording action for one movement is 340 times, the default recording sample interval is 50ms. So the maxim time is:

$340 \times 50\text{ms} = 17000\text{ms} = 17 \text{ seconds}$

To increase the precision of the movement, change the parameter of the following function in the code:

`uarm.recordingMode(50)`

The default parameter set at 50 means the Arduino board will record the uArm action once every 50ms.

## 6. Demo Video

You can see a demo video for the Learning Mode here:

<https://www.youtube.com/watch?v=tKAtdjVqXco&feature=youtu.be>