

SEMJR-100 / SEMJR-101

Submarine Environment Monitor

Software Installation

Overview

The SEMJR environment monitor software application is developed using the Arduino IDE with Teensyduino add-on which provides support for Teensy microprocessors. To load the SEMJR software you must first install Arduino IDE and Teensyduino on your local system. If you run into any problems or simply wish to avoid this part of the project, seek out someone else whom has built a SEMJR and ask them to load the software for you.

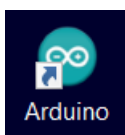
Requirements

You will need a USB cable to connect your computer to a micro-usb connector on the microprocessor. In most cases this will be a USB type A male to micro-usb which can be purchased from most anywhere.

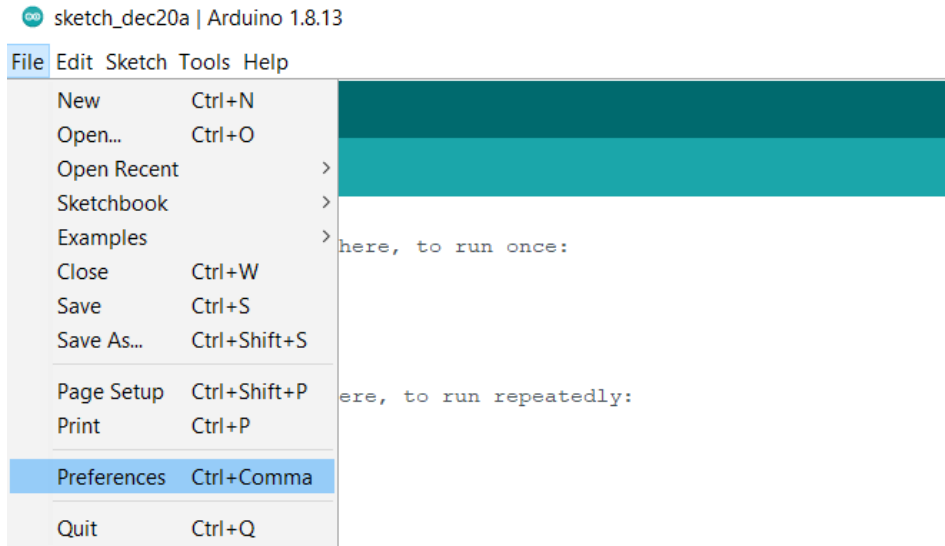


Software Loading Instructions

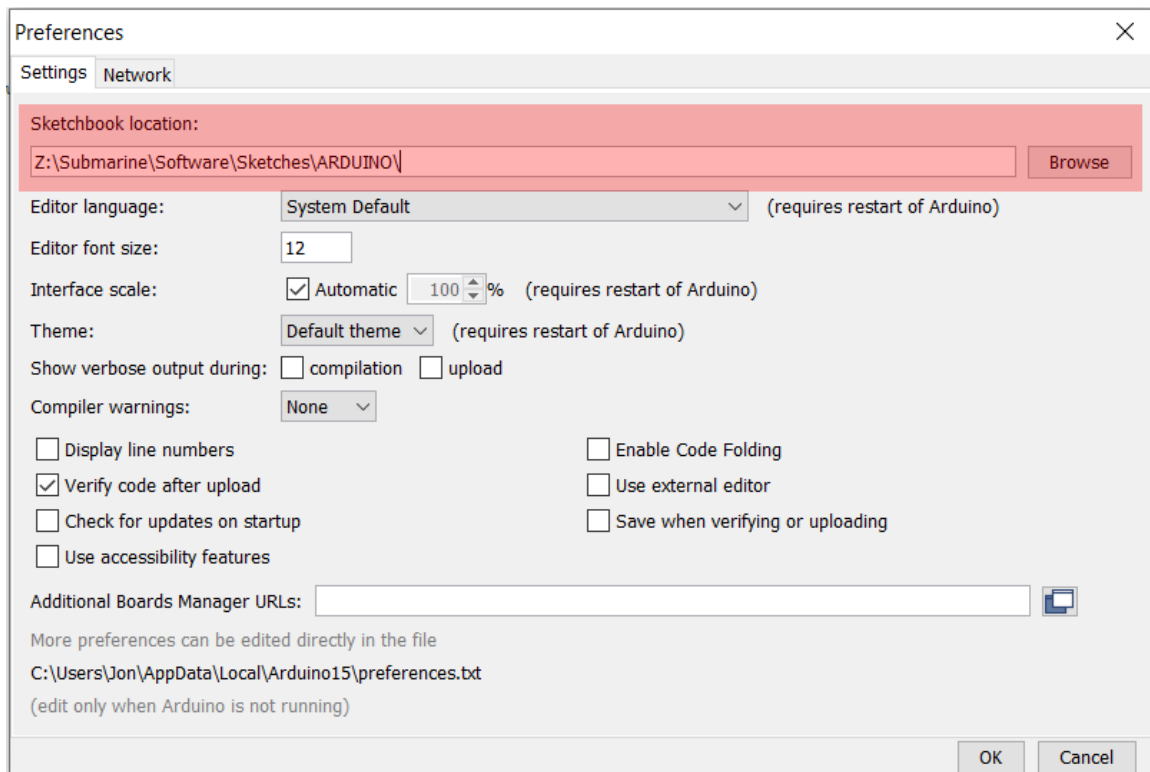
- 1) Download the latest Arduino IDE from <https://www.arduino.cc/en/software/> and install it on your local desktop or laptop computer. Simply accept all defaults as provided during the installation.
- 2) Download the latest Teensyduino add-on software from https://www.pjrc.com/teensy/td_download.html and install it on the same computer. Again, simply accept all defaults as provided during the installation.
- 3) Start the Arduino IDE by clicking on the Arduino desktop icon.



4) Click on File → Preferences



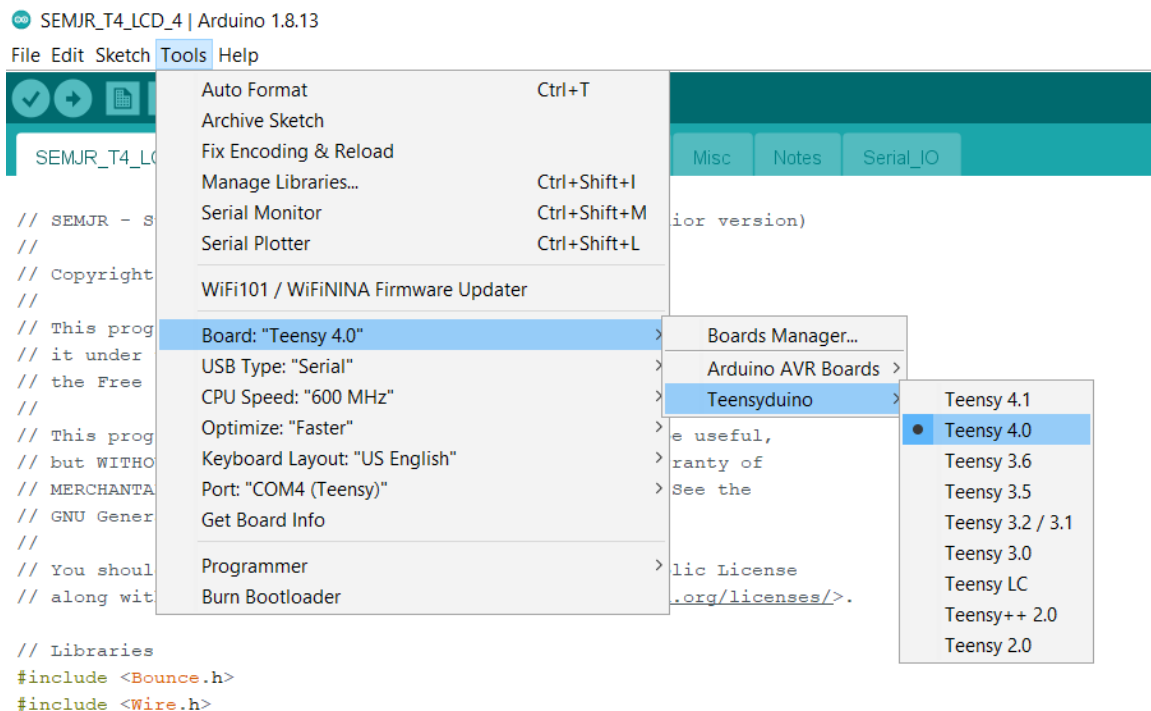
5) Make note of the “Sketchbook location” and write it down. Yours will be different than the one shown in this example.



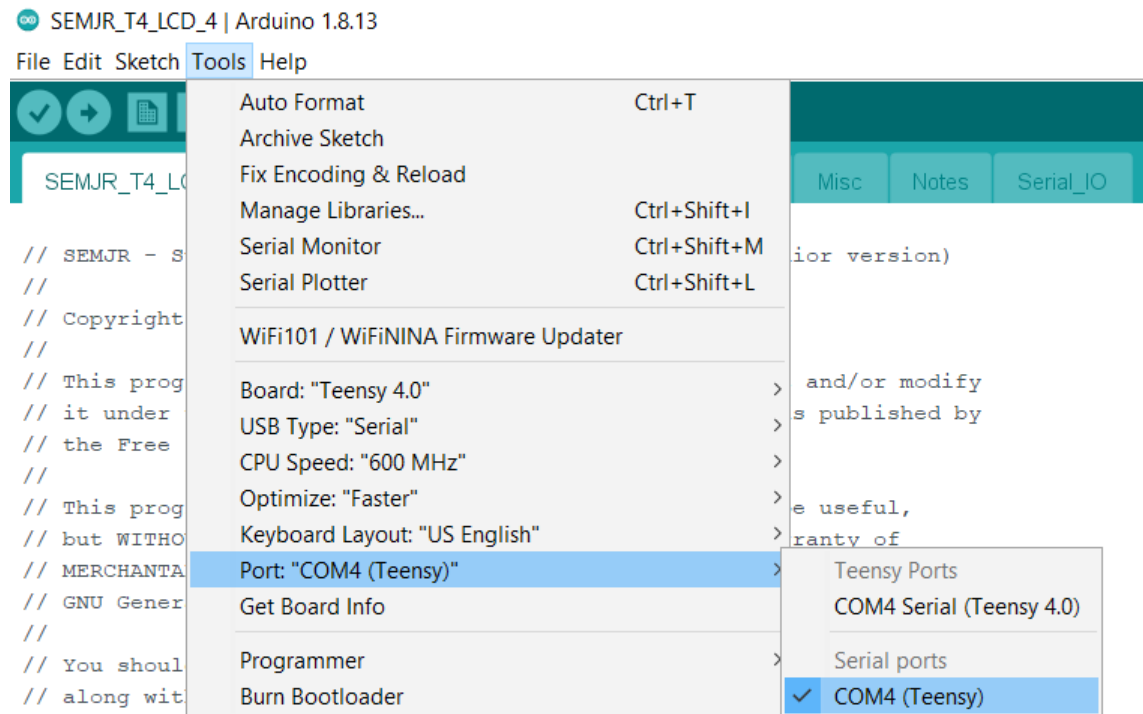
- 6) Close the Arduino IDE application.
- 7) Download and unzip the SEMJR software package from PSUBS.ORG at <http://www.psubs.org/community/projects/SEM1/SEMJR-1.0.zip> into a temporary folder on your local computer. You should see the following files listed.

Name	Type
libraries	File folder
SEMJR_1.0	File folder

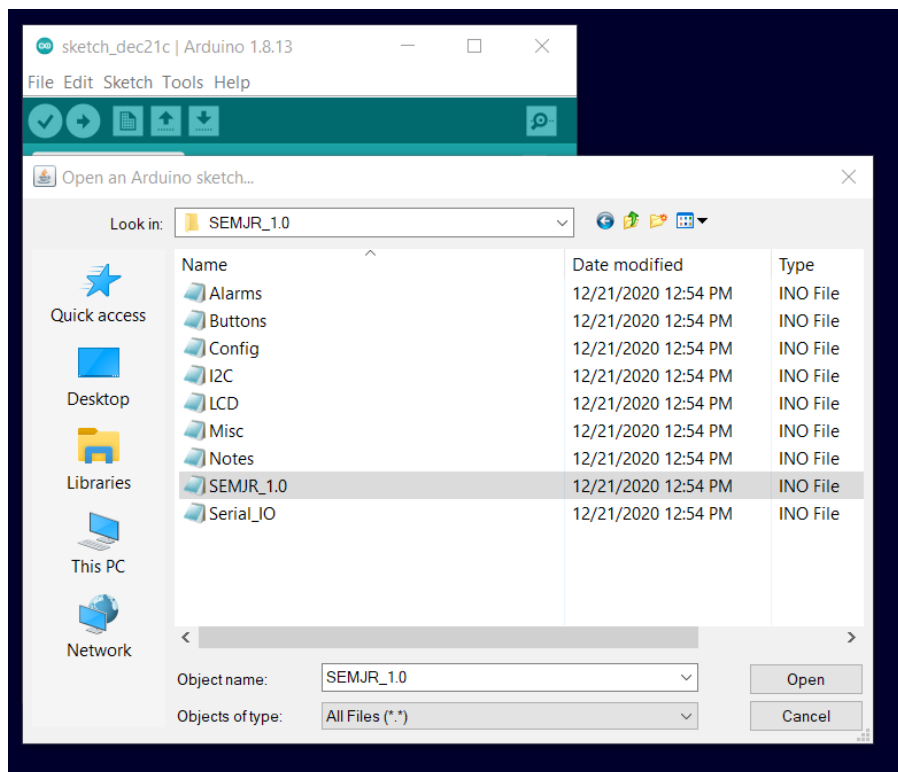
- 8) Perform the following steps to copy the files from the zip collection into the appropriate location on your local computer.
 - a) Open a file explorer on your computer.
 - b) Navigate to the "Sketchbook location" that you wrote down from Step #5 above.
 - c) Copy the contents of the zip file (folders "libraries" and "SEMJR_1.0") from Step #6 above, into the "Sketchbook location" from Step #5 above.
- 9) Connect the Teensy 4.0 microprocessor into your computer using a USB cable. Wait for your computer to indicate that the device has been recognized.
- 10) Re-start the Arduino IDE software (see Step #3 above).
- 11) Go to Tools → Board → Teensyduino, and select "Teensy 4.0".



12) Go to Tools → Port, and select the COM port that your Teensy 4.0 is connected to.



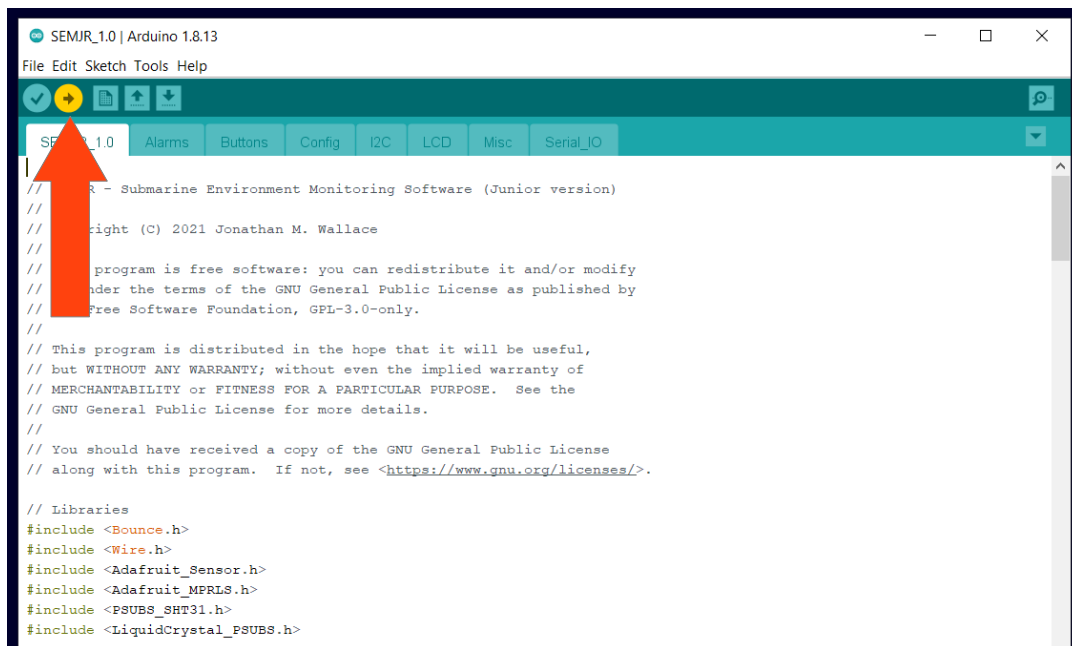
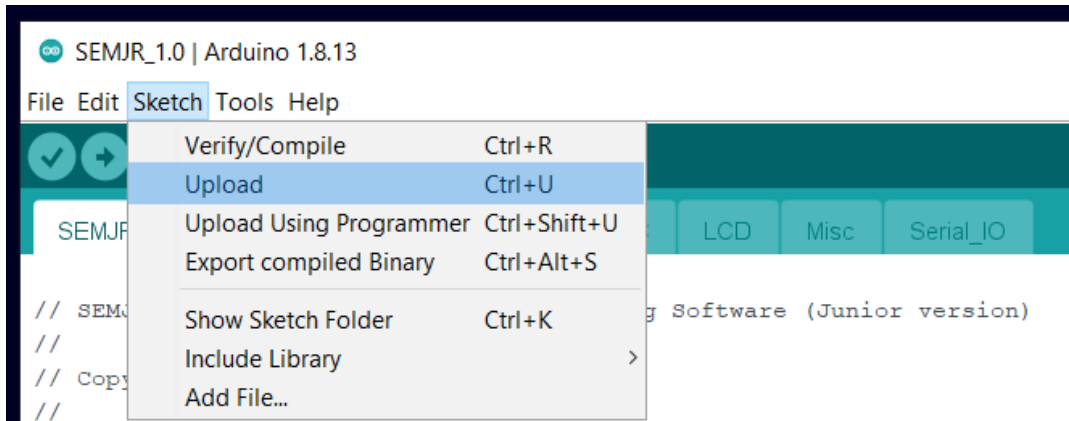
13) Go to File → Open, and select "SEMJR_1.0". Click on the file "SEMJR_1.0.ino" to open the application in the Arduino IDE.



14) Make sure your Teensy 4.0 processor is connected to your local computer via the USB cable.

15) Go to Sketch → Upload, to compile the software and upload it to your Teensy microprocessor.

Alternatively, you can press CTRL+U keys at the same time; OR click the → icon under the Menu bar.



- 16) Check for errors. If the upload was successful you should see a message similar to the following at the bottom of the Arduino IDE window.

```
// Libraries
#include <Bounce.h>
#include <Wire.h>
#include <Adafruit_Sensor.h>
#include <Adafruit_MPRLS.h>
#include <PSUBS_SHT31.h>
#include <LiquidCrystal_PSUBS.h>

// SENSORS
#define OXY 0 // OXYGEN
```

Done uploading.

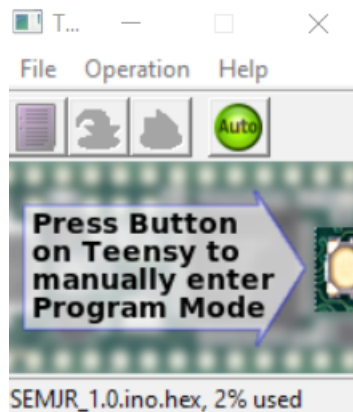
Opening Teensy Loader...

Sketch uses 40992 bytes (2%) of program storage space. Maximum is 2031616 bytes.

Global variables use 45756 bytes (8%) of dynamic memory, leaving 478532 bytes for local variables. Maximum is 524288 bytes

1 Teensy 4.0 on COM4

- 17) Additionally, after a successful upload you should see a graphic such as the following. Click the "X" to close this window.



- 18) Your Teensy 4.0 microprocessor is now loaded with the SEMJR software application. Attach it to the SEMJR-100 or SEMJR-101 system board and connect all other components. Power the system board with 9-18 vdc and check that all components are running and outputting reasonable data.
- 19) If you receive errors when attempting to load the microprocessor, capture the error message that appears at the bottom of the Arduino IDE window and ask for guidance on the PSUBS mailing list.