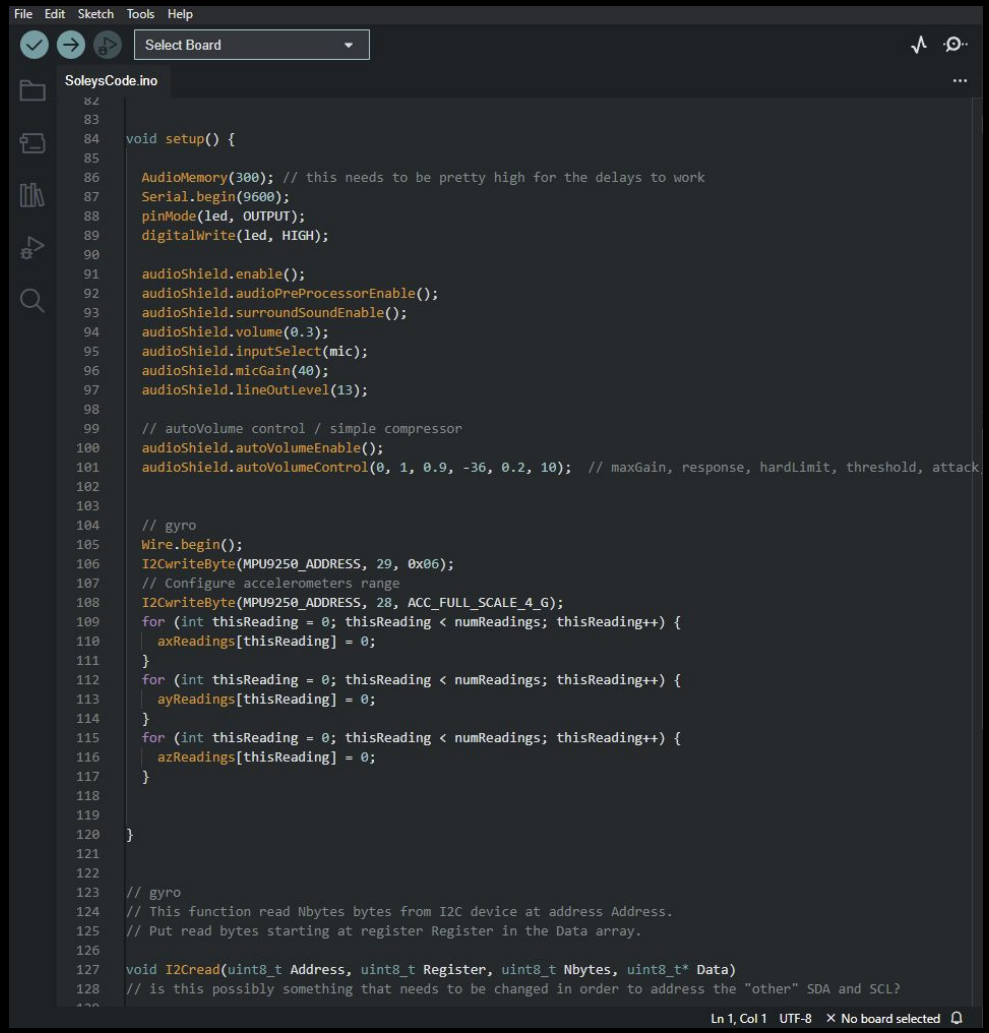
# Teensy les 1

# Teensy workflow


- Gecompileerde code vanuit Arduino IDE
- Seriële communicatie van en naar Teensy

# Arduino IDE

- Software schrijven
- Software compileren
- Gecompileerde software uploaden
- Seriële communicatie met micro-controller



# Arduino IDE

**Javascript:**

- Draait in browser in Runtime
- `;` wordt vergeven
- Datatype is fluide (altijd `let`)
- `console.log("hoi")`

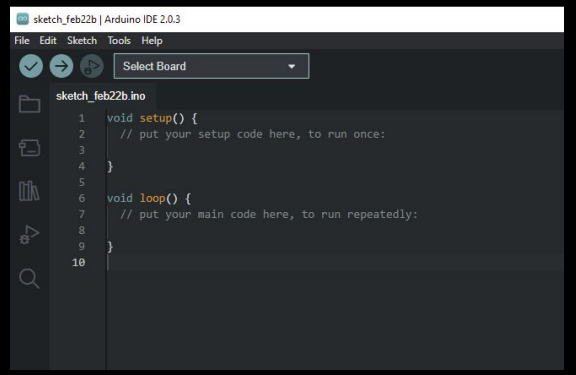
**Arduino (C):**

- Draait gecompileerd op micro-controller
- `;` wordt niet vergeven
- Datatype staat vast (van te voren aangeven welk type)
- `Serial.begin(9600);`
  in `setup()` en later:
  `Serial.println("hoi");`

# Datatypes in Arduino

| Type | Bereik | Voorbeeld declaratie |
|---|---|---|
| **int** | -32768 tot 32767 | `int numLEDs = 5;` |
| **float** | -3.4028235E+38 tot 3.4028235E+38 | `float maxHumanBodyTemp = 37.2;` |
| **boolean** | true \|\| false | `bool ledIsOn = false;` |
| **byte** | 0 tot 255 | `byte redChannel = 0;` |

# Arduino IDE

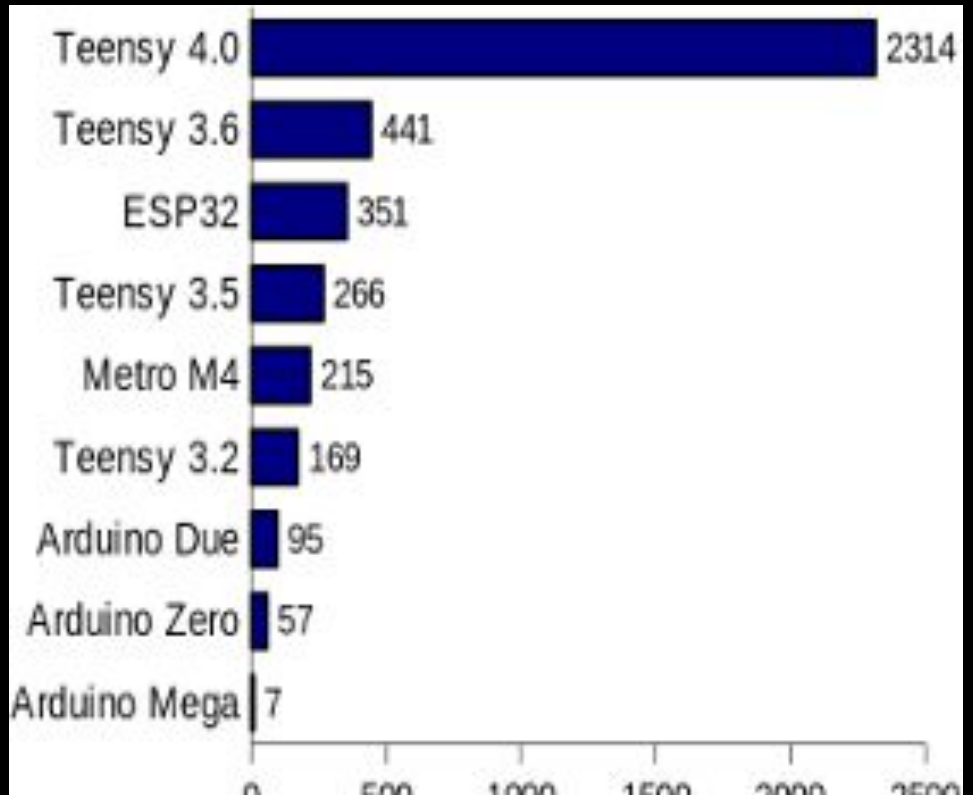



**In Javascript/p5**

```
function setup()
function draw()
```

**In Arduino C**

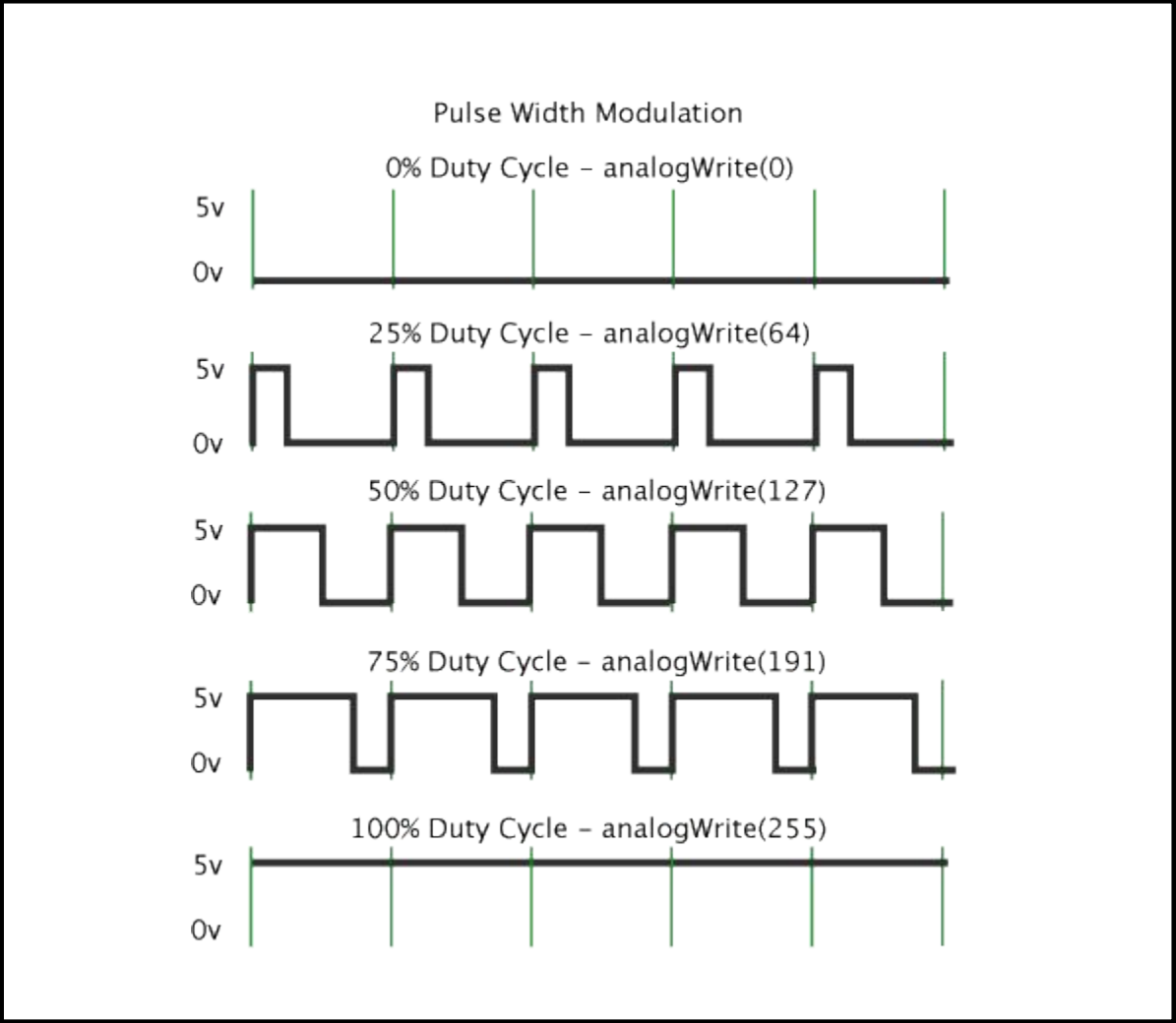
```
void setup()
void loop()
```



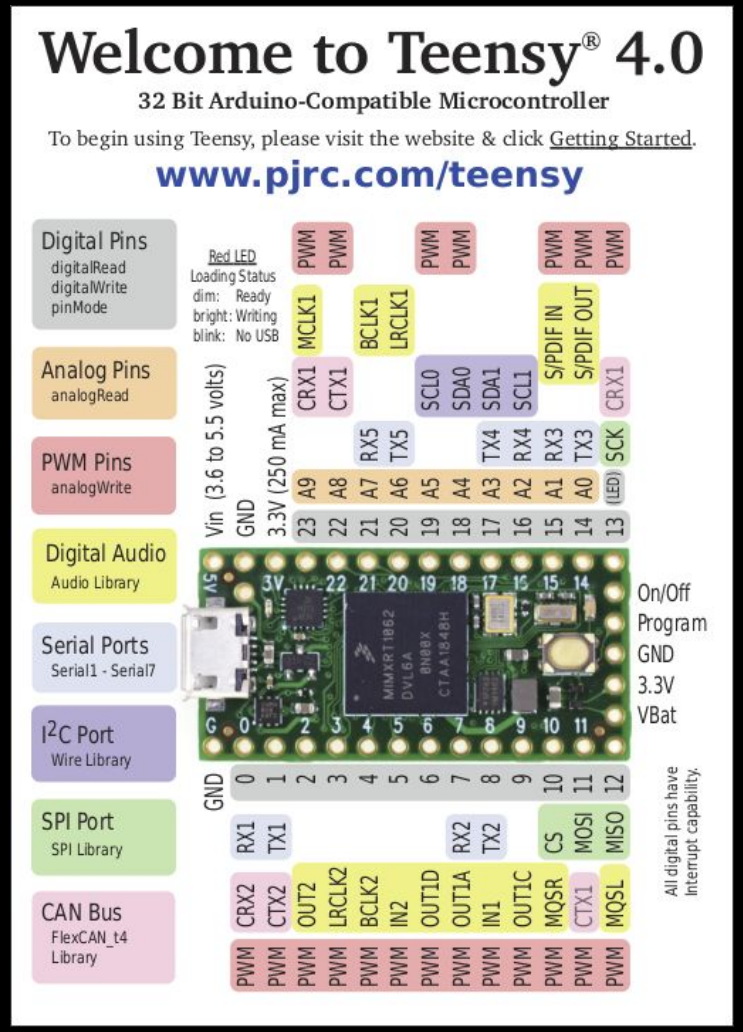
# Arduino basisfuncties

| functie | werking |
| --- | --- |
| **pinMode(pin, modus)** | Stelt de werking van een fysieke pin in op `INPUT`, `INPUT_PULLUP` of `OUTPUT` |
| **digitalWrite(pin, state)** | Zet spanning op een pin `LOW` of `HIGH` (0v of 3.3v (5v op Arduino)) |
| **digitalRead(pin)** | Leest spanning op pin (`HIGH` of `LOW` / 1 of 0) |
| **analogRead(pin)** | Leest voltage op pin (waarde tussen 0 en 1023 / 0v en 3.3v) |
| **analogWrite(pin, byte)** | Zet variabel voltage op pin d.m.v. PWM |
| **delay(ms)** | Zet gehele microcontroller op pauze voor x-aantal milliseconden |

# Arduino analogWrite()



# Pinout lezen



# Arduino IDE Seriële communicatie

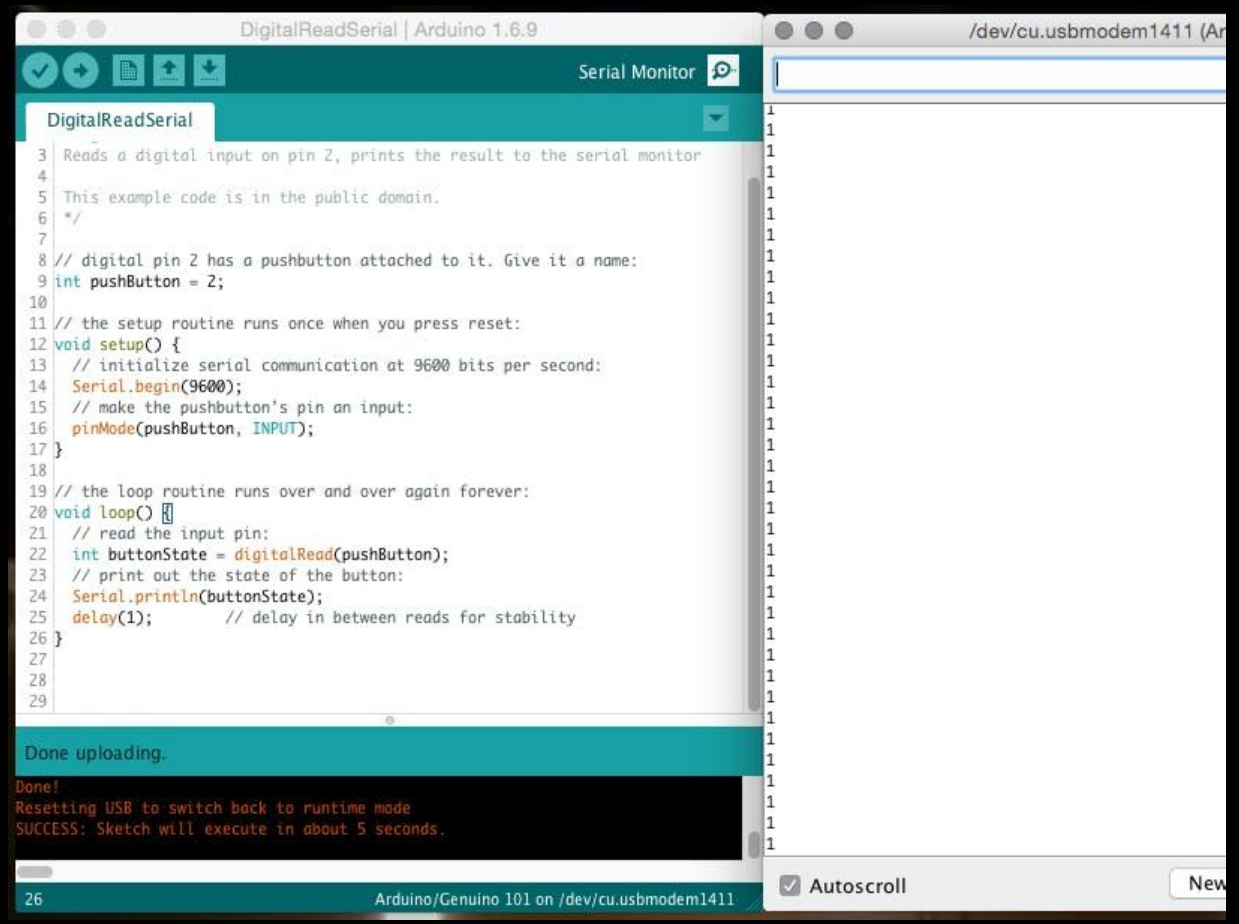
In void setup()

```
Serial.begin(9600);
```

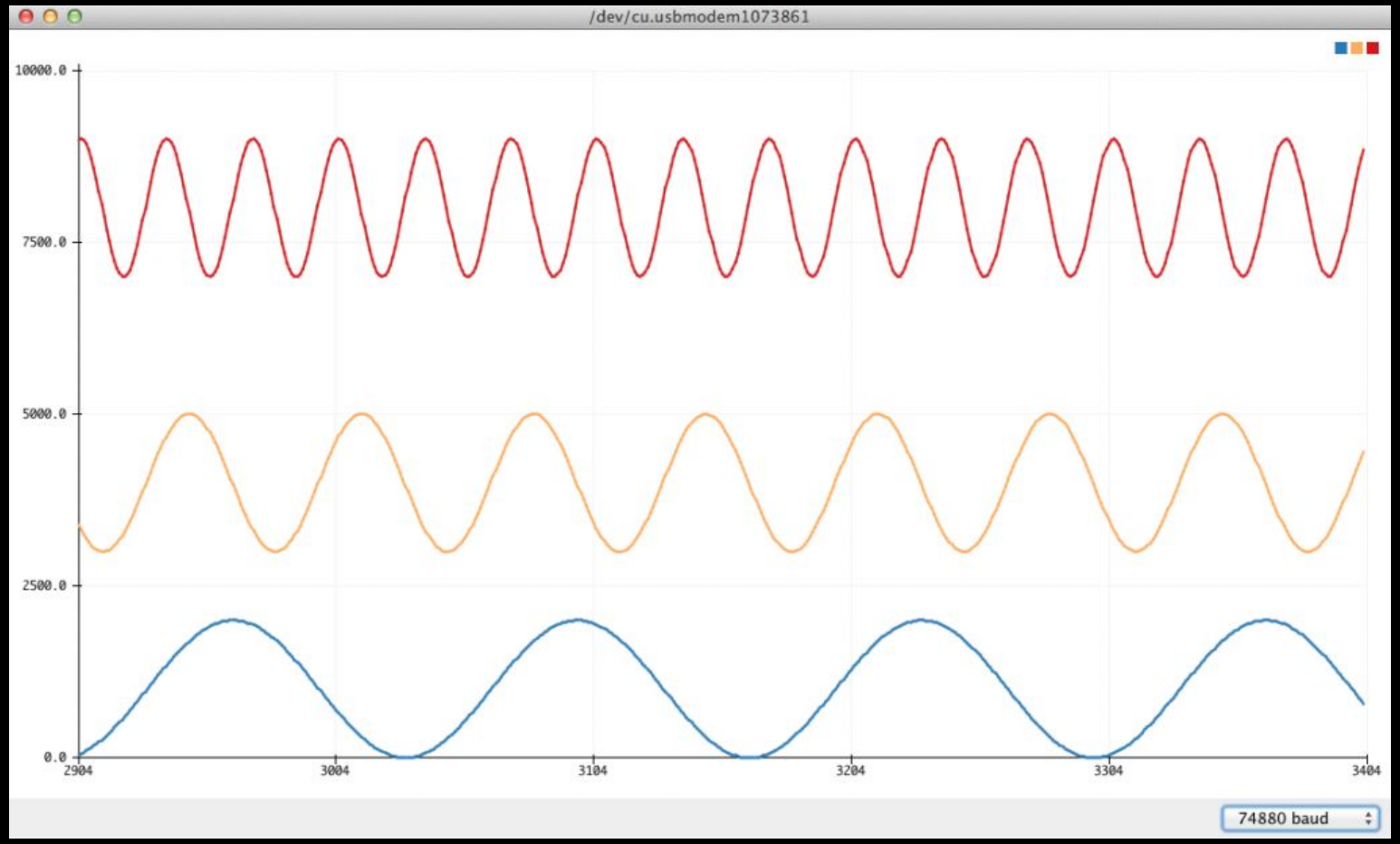
Daarna in bijv. loop()

```
Serial.println(“hoi”);
Serial.println(analogRead(4));
Serial.println(“Value of potmeter on pin ” +  String(potPin) + “ is now ” + String(analogRead(potPin)));
```

# Arduino IDE Seriële monitor



# Arduino IDE Seriële plotter



# Arduino installeren (½)

## Downloads

### Arduino IDE 2.0.3

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.

For more details, please refer to the **Arduino IDE 2.0 documentation**.

Nightly builds with the latest bugfixes are available through the section below.

SOURCE CODE

The Arduino IDE 2.0 is open source and its source code is hosted on **GitHub**.

**DOWNLOAD OPTIONS**

**Windows** Win 10 and newer, 64 bits
**Windows** MSI installer
**Windows** ZIP file

**Linux** AppImage 64 bits (X86-64)
**Linux** ZIP file 64 bits (X86-64)

**macOS** Intel, 10.14: "Mojave" or newer, 64 bits
**macOS** Apple Silicon, 11: "Big Sur" or newer, 64 bits

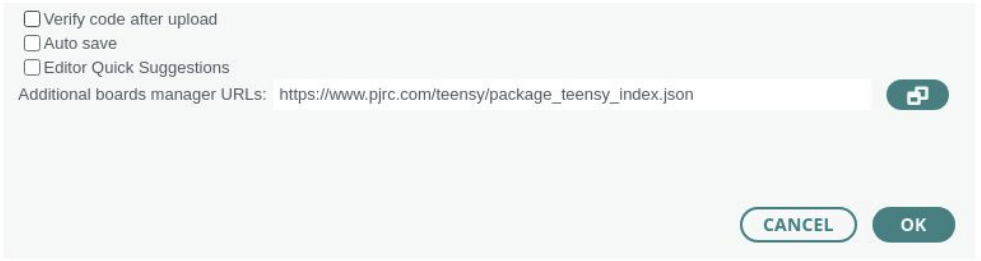
Release Notes

# Teensyduino installeren (2/2)

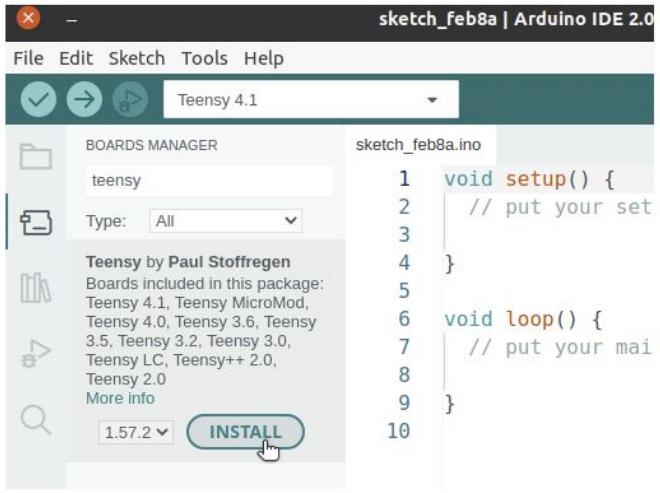
## Arduino 2.0.x Software Development

To install Teensy on Arduino IDE 2.0, click File > Preferences. In "Additional boards manager URLs", copy this link:

```
https://www.pjrc.com/teensy/package_teensy_index.json
```




In the main Arduino window, open Boards Manager by clicking the left-side board icon, search for "teensy", and click "Install".



# Demonstratie