

Hardware les 1

Teensyduino installeren

- Arduino IDE installeren
- Teensyduino add-on installeren

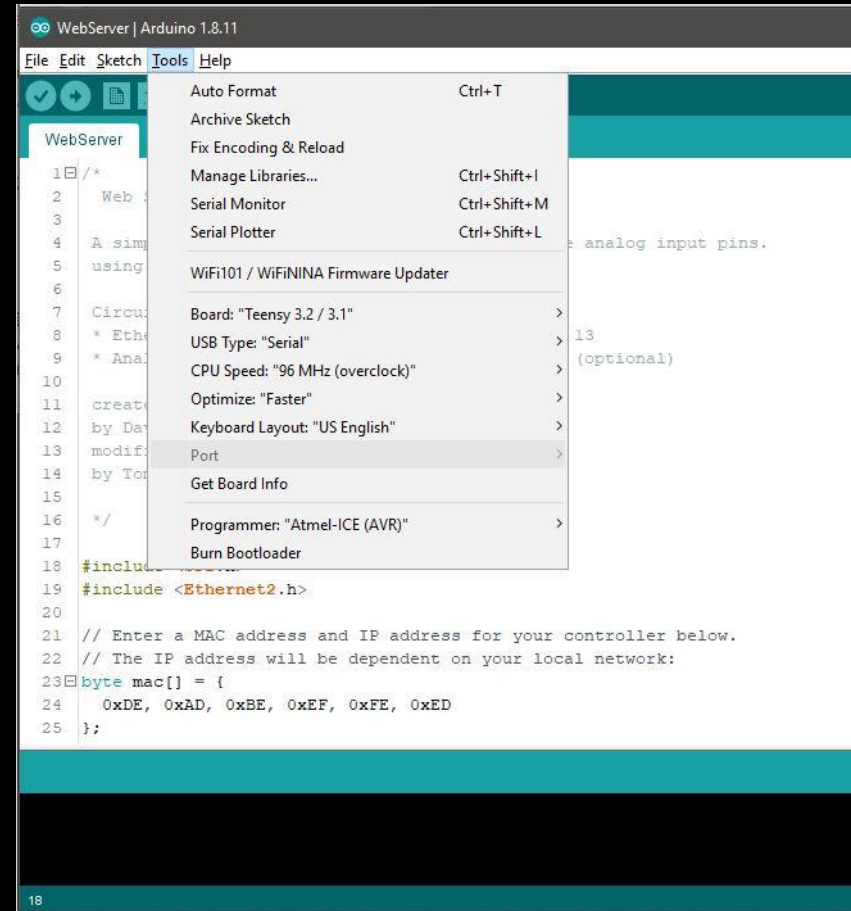
Teensy workflow



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

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 op micro-controller gecompileerd
- ; 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 - 32767	<code>int numLEDs = 5;</code>
float	-3.4028235E+38 - 3.4028235E+38	<code>float maxHumanBodyTemp = 37.2;</code>
boolean	true - false	<code>bool ledIsOn = false;</code>
byte	0 - 255	<code>byte redChannel = 0;</code>

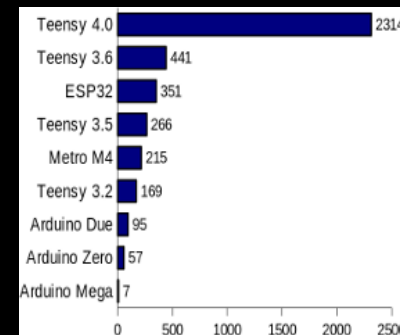
Arduino IDE

In Javascript/p5
function setup()
function draw()

In Arduino C
void setup()
void loop()

```
File Edit Sketch Tools Help
sketch_mar10a
1 void setup() {
2   // put your setup code here, to run once:
3
4 }
5
6 void loop() {
7   // put your main code here, to run repeatedly:
8
9 }
```

Teensy 3.2 / 3.1, Serial, 96 MHz (overclock), Faster, US English on usb: 0/140000/0/2

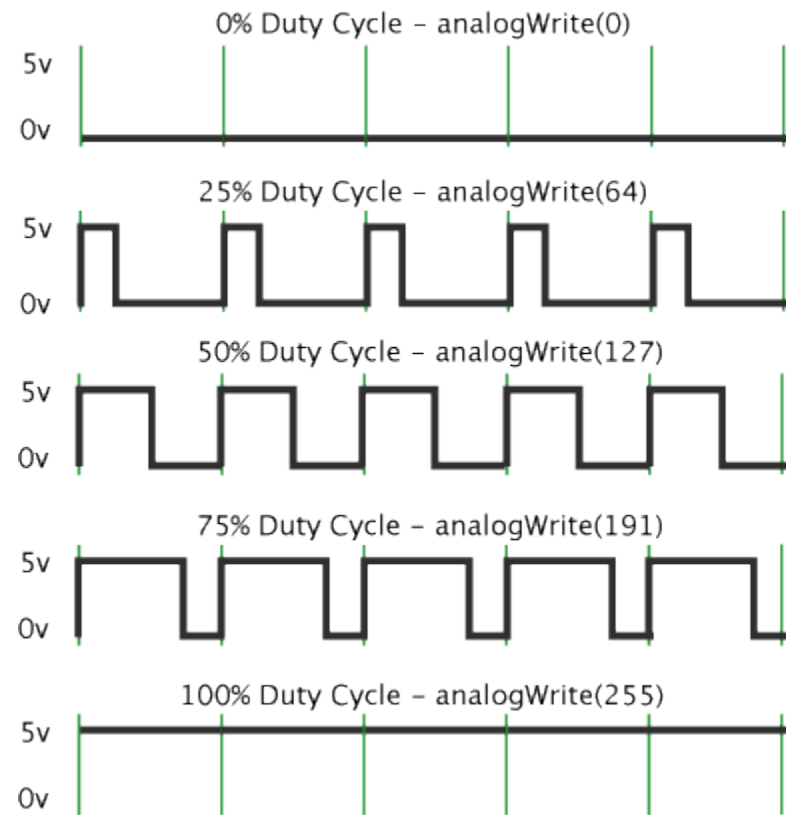


Arduino basis functies

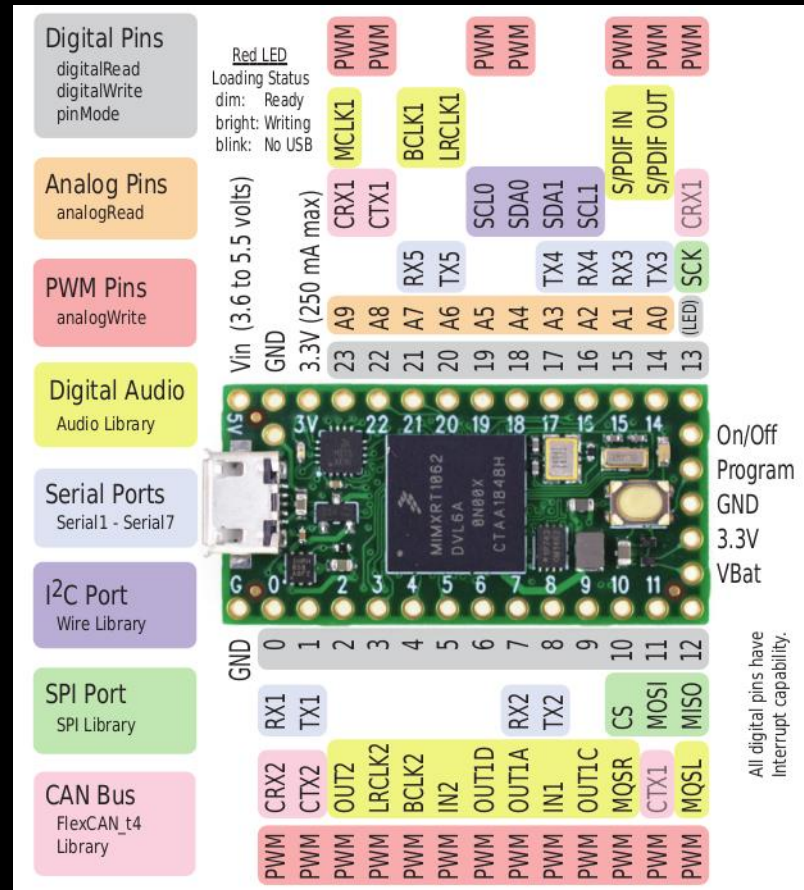
functie	werking
<code>pinMode(pin, modus)</code>	Stelt de werking van een fysieke pin in op INPUT, INPUT_PULLUP of OUTPUT
<code>digitalWrite(pin, state)</code>	Zet stroom op een pin LOW of HIGH (0v of 3.3v (5v op Arduino))
<code>digitalRead(pin)</code>	Leest stroom op pin (HIGH of LOW / 1 of 0)
<code>analogRead(pin)</code>	Leest voltage op pin (waarde tussen 0 en 1023 / 0v en 3.3v)
<code>analogWrite(pin, byte)</code>	Zet variable voltage op pin dmv PWM
<code>delay(ms)</code>	Zet gehele microcontroller op pauze voor x-aantal milliseconden

Arduino analogWrite()

Pulse Width Modulation



Pinout lezen



Arduino IDE Seriële communicatie

In void setup()

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

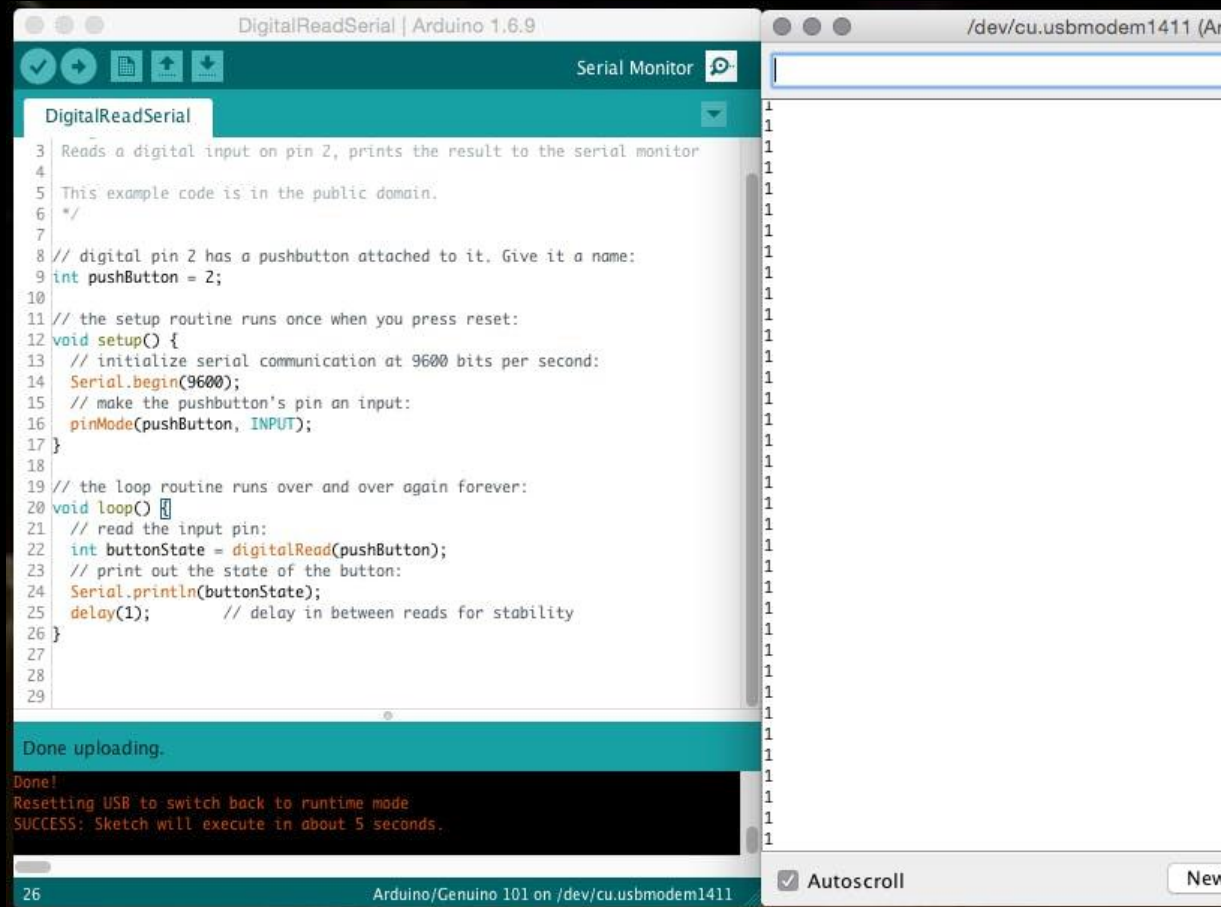
Daarna in bijv. loop()

```
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

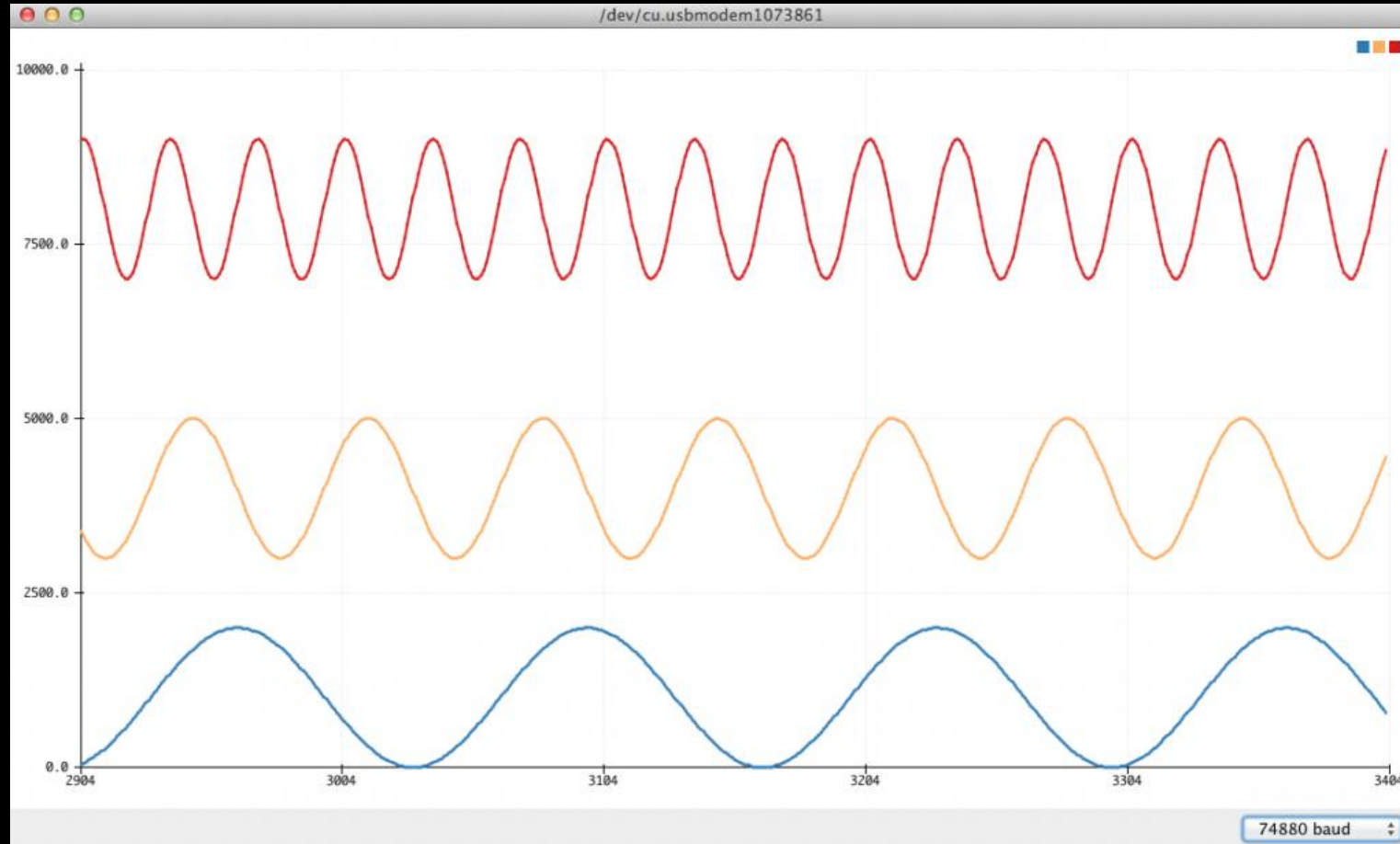


The image shows a screenshot of the Arduino IDE interface. The main window displays a code editor with the following code:

```
3 Reads a digital input on pin 2, prints the result to the serial monitor
4
5 This example code is in the public domain.
6 */
7
8 // digital pin 2 has a pushbutton attached to it. Give it a name:
9 int pushButton = 2;
10
11 // the setup routine runs once when you press reset:
12 void setup() {
13   // initialize serial communication at 9600 bits per second:
14   Serial.begin(9600);
15   // make the pushbutton's pin an input:
16   pinMode(pushButton, INPUT);
17 }
18
19 // the loop routine runs over and over again forever:
20 void loop() {
21   // read the input pin:
22   int buttonState = digitalRead(pushButton);
23   // print out the state of the button:
24   Serial.println(buttonState);
25   delay(1);      // delay in between reads for stability
26 }
27
28
29
```

Below the code editor, a status bar indicates "Done uploading." and "Resetting USB to switch back to runtime mode". A message at the bottom of the IDE says "SUCCESS: Sketch will execute in about 5 seconds." The Serial Monitor window is open on the right, showing a list of lines numbered 1 through 26, with the content of each line currently blank. The Serial Monitor window title is "/dev/cu.usbmodem1411 (Ar". At the bottom of the Serial Monitor window, there is a checkbox for "Autoscroll" which is checked, and a "New" button.

Arduino IDE Seriële plotter



Demonstratie