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Last Revision: 2020/09/07

Last Build: 2021/12/08

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analogWrite()

[Analog I/O]

Description

Writes an analog value ([PWM wave](#)) to a pin. Can be used to light a LED at varying brightnesses or drive a motor at various speeds. After a call to `analogWrite()`, the pin will generate a steady rectangular wave of specified duty cycle until the next call to `analogWrite()` (or a call to `digitalRead()` or `digitalWrite()`) on the same pin.

BOARD	PWM PINS	PWM FREQUENCY
Uno, Nano, Mini	3, 5, 6, 9, 10, 11	490 Hz (pins 5 and 6: 980 Hz)
Mega	2 - 13, 44 - 46	490 Hz (pins 4 and 13: 980 Hz)
Leonardo, Micro, Yún	3, 5, 6, 9, 10, 11, 13	490 Hz (pins 3 and 11: 980 Hz)
Uno WiFi Rev2, Nano Every	3, 5, 6, 9, 10	976 Hz
MKR boards *	0 - 8, 10, A3, A4	732 Hz
MKR1000 WiFi *	0 - 8, 10, 11, A3, A4	732 Hz
Zero *	3 - 13, A0, A1	732 Hz
Nano 33 IoT *	2, 3, 5, 6, 9 - 12, A2, A3, A5	732 Hz
Nano 33 BLE/BLE Sense	1 - 13, A0 - A7	500 Hz
Due **	2-13	1000 Hz
101	3, 5, 6, 9	pins 3 and 9: 490 Hz, pins 5 and 6: 980 Hz

* In addition to PWM capabilities on the pins noted above, the MKR, Nano 33 IoT, and Zero boards have 1 analog output when using `analogWrite()` on the DAC0 (A0) pin.

** In addition to PWM capabilities on the pins noted above, the Due has true analog output when using `analogWrite()` on pins DAC0 and DAC1.

You do not need to call `pinMode()` to set the pin as an output before calling `analogWrite()`.

The `analogWrite` function has nothing to do with the analog pins or the `analogRead` function.

Syntax

```
analogWrite(pin, value)
```

Parameters

pin: the Arduino pin to write to. Allowed data types: `int`.

value: the duty cycle: between 0 (always off) and 255 (always on). Allowed data types: `int`.

Returns

Help

Sets the output to the LED proportional to the value read from the potentiometer.

```
int ledPin = 9;      // LED connected to digital pin 9
int analogPin = 3;   // potentiometer connected to analog pin 3
int val = 0;         // variable to store the read value

void setup() {
  pinMode(ledPin, OUTPUT); // sets the pin as output
}

void loop() {
  val = analogRead(analogPin); // read the input pin
  analogWrite(ledPin, val / 4); // analogRead values go from 0 to 1023, analogWrite values from 0 to 255
}
```

Notes and Warnings

The PWM outputs generated on pins 5 and 6 will have higher-than-expected duty cycles. This is because interactions with the `millis()` and `delay()` functions, which share the same internal timer used to generate those PWM outputs. This will be noticed mostly on low duty-cycle settings (e.g. 0 - 10) and may result in a value of 0 not fully turning off the output on pins 5 and 6.

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