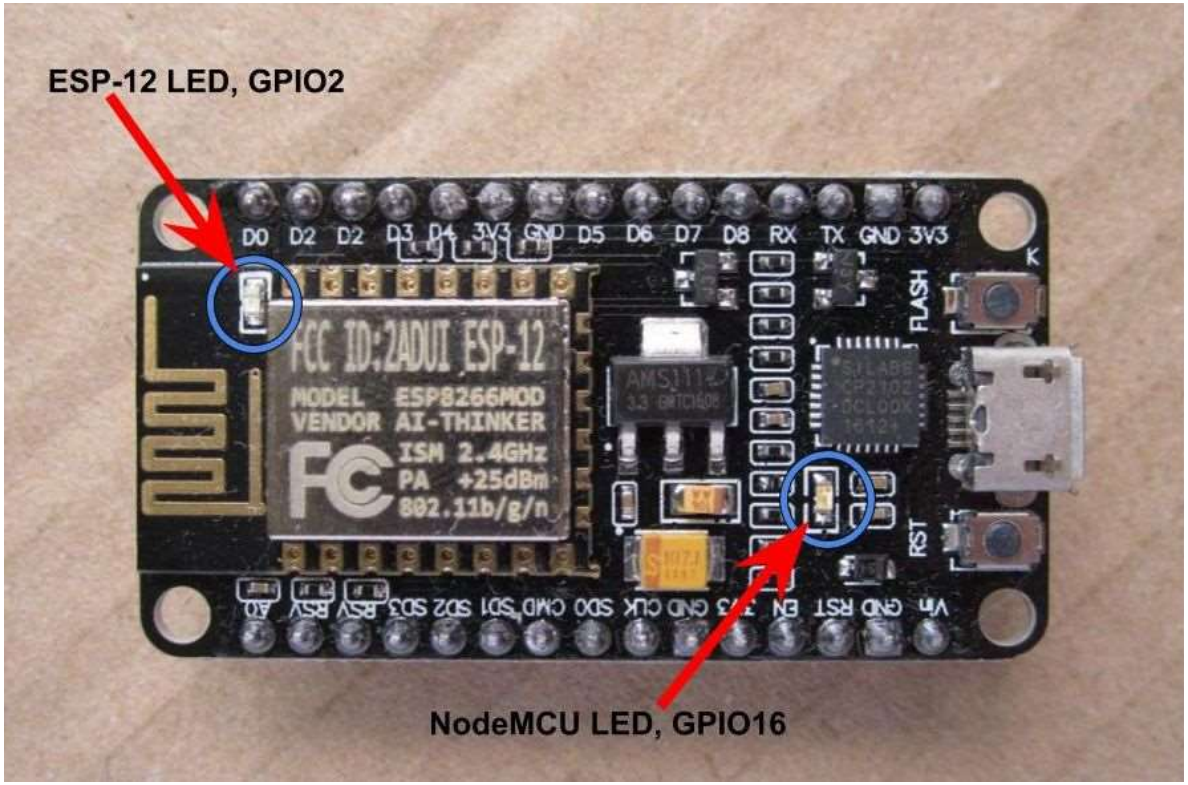
Onboard LEDs? NodeMCU's got two!

Jul 9, 2017

1 minute read

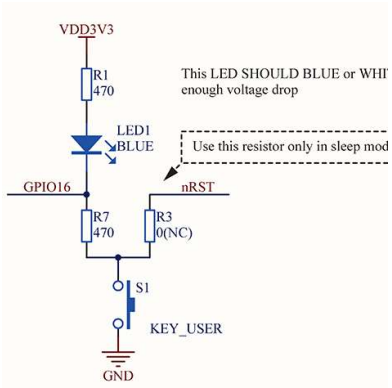
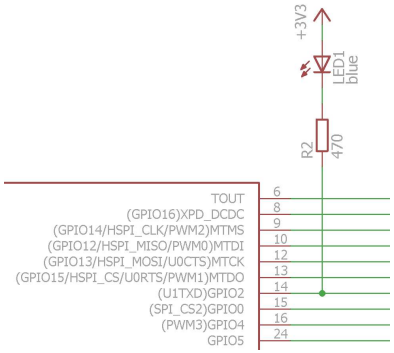
Blinking a LED is the “Hello, world” of embedded programming and most development board have an integrated LED. This makes it easier to run a basic piece of code, without having to hookup any external components.

The NodeMCU ESP8266 board has two of those LEDs! One on the NodeMCU PCB and another on the ESP-12 module’s PCB:



Comparison Table

	NodeMCU LED	ESP-12 LED
Color	Blue	Blue
SMD Footprint	0603	0603
Pin	GPIO16	GPIO2
Pin Functions	USER, WAKE	U1TXD

	NodeMCU LED	ESP-12 LED
Pin Silkscreen	“D0”	“D4”
Current-limiting Resistor	470 ohm	470 ohm
Sketch Pin Numbers	16, D0, LED_BUILTIN, BUILTIN_LED	2, D4
Schematic		

Notes

Both LEDs operate in “inverted” mode, with regard to the pin levels - when the pin is HIGH, the LED is off; when the pin is LOW, the LED is on. The LED on `GPIO2` flashes during ESP programming, as it is connected to the `U1TXD` pin.

NodeMCU LED Blink

```
void setup() {
  pinMode(LED_BUILTIN, OUTPUT);     // Initialize the LED_BUILTIN pin as a
}

void loop() {
  digitalWrite(LED_BUILTIN, LOW);   // Turn the LED on by making the volta
  delay(1000);                      // Wait for a second
  digitalWrite(LED_BUILTIN, HIGH);  // Turn the LED off by making the volt
  delay(2000);                      // Wait for two seconds
}
```

ESP-12 LED Blink

```
void setup() {
  pinMode(2, OUTPUT);     // Initialize GPIO2 pin as an output
}

void loop() {
  digitalWrite(2, LOW);   // Turn the LED on by making the voltage LOW
  delay(1000);            // Wait for a second
  digitalWrite(2, HIGH);  // Turn the LED off by making the voltage HIGH
  delay(2000);            // Wait for two seconds
}
```

Links

- NodeMCU v.1.0 Schematic
- ESP-12E Schematic
- ESP8266 Blink Sketch

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Name

Simon • 3 years ago

i don't know what i am doing wrong but somehow i cant get the voltage of D0 (pi LED_BUILTIN ist HIGH. My Problem is, that most of the time the board does n connected to WiFi and waits for commands. I do not want the blue LED to glow turn it off with digitalWrite(LED_BUILTIN, HIGH) D0 also turns HIGH. someone any tips?

1 ^ | v • Reply • Share ›

GeertVc ➚ Simon • 2 years ago

That is simply not possible. D0 and LED_BUILTIN are one and the same of the file pins_arduino.h in the directory C:\Users\ <user>\AppData\Local\Arduino15\packages\esp8266\hardware\esp82 (windows10):

```
#define LED_BUILTIN 16

static const uint8_t D0 = 16;
static const uint8_t D1 = 5;
static const uint8_t D2 = 4;
static const uint8_t D3 = 0;
static const uint8_t D4 = 2;
static const uint8_t D5 = 14;
static const uint8_t D6 = 12;
static const uint8_t D7 = 13;
static const uint8_t D8 = 15;
static const uint8_t D9 = 3;
static const uint8_t D10 = 1;
```

You can't have a pin being HIGH and LOW at the same time. Simple as tl

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Dimitar Kovachev Mod ➚ Simon • 3 years ago

That's because `LED_BUILTIN` and `Do` are different ways to refer to and the same physical pin. You can check out the LED pin schematic in the "Comparison Table"

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Fabio Polanco • 6 months ago

When i power my NodeMCU, the "NodeMCU LED" turns on. But contrary to ho the "ESP-12 LED" does not start to flash. My board stopped working?

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Andre • 7 months ago

On my board the LED_BUILTIN is pointing to the ESP-12 LED (D4 pin, GPIO2)

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Andre ➚ Andre • 7 months ago

Actually, it is configurable in the Arduino IDE, Tools menu.

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Nando Kools • 3 years ago

I'm really new to the world of arduino/ programming chips.

Is there a reason why you didn't mix those 2 led's in a single sketch?

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GeertVc ➚ Nando Kools • 2 years ago • edited

There isn't and there shouldn't. Here's the code to control both:

```
// the setup function runs once when you press reset or power the board
void setup() {
```

```
// initialize digital pin LED_BUILTIN as an output.
Serial.begin(115200);
Serial.println();
Serial.println("Running Setup");
Serial.print("LED_BUILTIN = ");
Serial.println(LED_BUILTIN, DEC);
pinMode(D0, OUTPUT);
pinMode(D4, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
digitalWrite(D0, HIGH); // turn the NodeMCU LED off (HIGH is the vol
digitalWrite(D4, HIGH); // turn the ESP-12 LED off (HIGH is the voltag
delay(1000); // wait for a second
digitalWrite(D0, LOW); // turn the NodeMCU LED on by making the vol
digitalWrite(D4, LOW); // turn the ESP-12 LED on by making the voltag
delay(1000); // wait for a second
}
```

I've taken the freedom to use D0 instead of 16 and D4 instead of 2 for the NodeMCU pin assignments and by doing this, your SW is agnostic to pos the future.

Best,

^ | v • Reply • Share ›

Hemanth Kumar • 3 years ago

Ty

^ | v • Reply • Share ›

Theme crafted with <3 by John Otander (@4lpine) available on GitHub.