# iocafe

open source IoT/IO device communication



## ESP32: 1 MHz clock signal to output pin

## code

```
/* Example: Generate 1 MHz clock signal with
ESP32,  note 24.3.2020/pekka
   ESP32: LEDC peripheral can be used to generate
clock signals between
   40 MHz (half of APB clock) and approximately
0.001 Hz.
   Please check the LEDC chapter in Technical
Reference Manual.

   Example code below.
 */
 include "driver/ledc.h"
 include "driver/periph_ctrl.h"
 void set_1MHz_clock_on_GPIO2(void)
 {
   periph_module_enable(PERIPH_LEDC_MODULE);

   // Set up timer
   ledc_timer_config_t ledc_timer = {
     // We need clock, not PWM so 1 bit is
enough.
     .duty_resolution = LEDC_TIMER_1_BIT,

     // Clock frequency, 1 MHz, high speed
     .freq_hz = 1000000,
     .speed_mode = LEDC_HIGH_SPEED_MODE,
     .timer_num = LEDC_TIMER_0,

     // I think not needed for new esp-idf
software, try uncommenting
     // .clk_cfg = LEDC_USE_APB_CLK
   };
```


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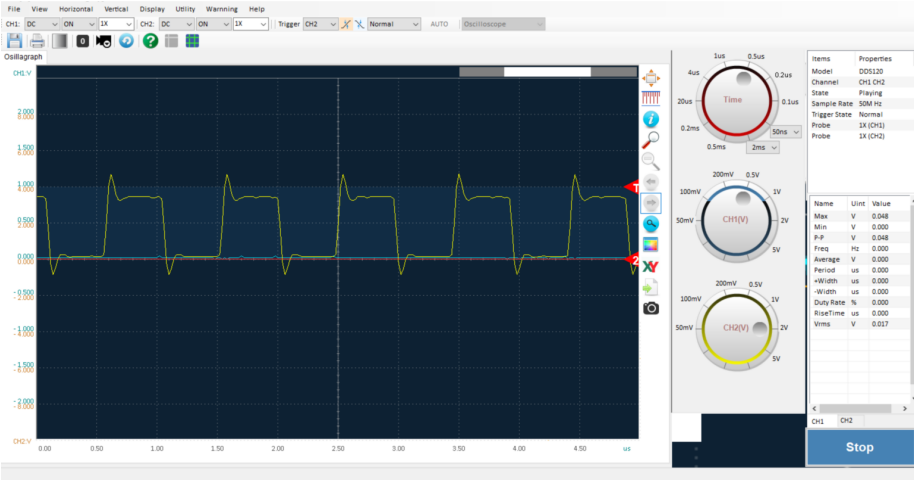
```
    ledc_timer_config(&ledc_timer); // Set up GPIO
PIN

    ledc_channel_config_t channel_config = {
      .channel    = LEDC_CHANNEL_0,
      .duty       = 1,
      .gpio_num   = 2,                        //
GPIO pin
      .speed_mode = LEDC_HIGH_SPEED_MODE,
      .timer_sel  = LEDC_TIMER_0
    };

    ledc_channel_config(&channel_config);
 }
```

## scope




Note about practical ESP32 limits:
– Maximum clock pulse frequency which can be generated by PWM code above should be 40MHz. I didn't test it this high tough.
– Maximum pulse frequency which can be generated by timer interrupt is about 0.5MHz, although I would recommend using 250kHz as design top limit.

pekkalehtikoski March 25, 2020 technical notes

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