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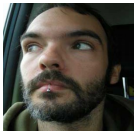
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mega 2560 PWM frequency (<https://forum.arduino.cc/index.php?topic=72092.msg539486#msg539486>)

Hi,
does anybody knows how to change the PWM frequency on Mega 2560?
I found some related topics but they all concern Arduino diecimila or Arduino mega 1280;
No one of them seems to explain what to do when
arduino is 2560, and as far as I understand, the registers to change are different (the code
working on 10000 does not work on 2560).

Unfortunately I'm not an expert and is very difficult for me to understand the code acting
on registers.

Till now I just understood that arduino 2560 uses 5 different timers:

timer 0 for pin 13 and 4

timer 1 for pin 12 and 11

timer 2 for pin 10 and 9

timer 3 for pin 5 and 3 and 2

timer 4 for pin 8 and 7 and 6

All timers generate a PWM frequency on 500 hertz, while timer 0 generates a pwm
frequency of 1000 hertz.

I need on all pins a frequency > 1000 hertz!!!!

thanks in advance!

Valerio

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timer 0 (controls pin 13, 4);

timer 1 (controls pin 12, 11);

timer 2 (controls pin 10, 9);

timer 3 (controls pin 8, 7);

timer 4 (controls pin 8, 7, 6);

 **[SOLVED] mega 2560 PWM frequency** (<https://forum.arduino.cc/index.php?topic=72092.msg541587#msg541587>)

Sep 14, 2011 06:49 pm (<https://forum.arduino.cc/index.php?topic=72092.msg541587#msg541587>)

#1

Hi guys! After some day, I finally managed to change the PWM frequency of all PWM pins of my Arduino Mega 2560.

All the explanations are fundamentally here:

<http://usethearduino.blogspot.com/2008/11/changing-pwm-frequency-on-arduino.html>

In this brief article the author explains very clearly how to change some values in Arduino Decimila registers, in order to enhance the PWM frequency.

Here I simply modified a little bit the author's code to make it match with Arduino 2560.

2) the PWM default frequency is 490 Hz for all pins, with the exception of pin 13 and 4, whose frequency is 980 Hz (I checked with an oscilloscope).

3) In order to change frequency on pin 'A', we have to change some value in the timer (or register), controlling pin 'A'. This is the list of timers in Arduino Mega 2560:

timer 0 (controls pin 13, 4);

timer 1 (controls pin 12, 11);

timer 2 (controls pin 10, 9);

timer 3 (controls pin 8, 7);

timer 4 (controls pin 8, 7, 6);

As you can see, a given timer controls more than one pin (every change about a timer will affect all pins depending on it!).

4) You can access a timer simply changing in your code (typically in the setup()), the value of variable TCCRnB, where 'n' is the number of register. So, if we want to change the PWM frequency of pins 10 and 9, we will have to act on TCCR2B.

5) The TCCRnB is a 8 bit number. The first three bits (from right to left!) are called CS02, CS01, CS00, and they are the bits we have to change.

Those bits in fact represent an integer number (from 0 to 7) called 'prescaler', that Arduino uses to generate the frequency for PWM.

6) First of all, we have to clear these three bits, i.e they must be all set to 0:

```
int myEraser = 7; // this is 111 in binary and is used as an eraser
```

```
TCCR2B &= ~myEraser; // this operation (AND plus NOT), set the three bits in TCCR2B to 0
```

7) now that CS02, CS01, CS00 are clear, we write on them a new value:

`int myPrescaler = 3; // this could be a number in [1, 6]. In this case, 3 corresponds in binary to 011.
TCCR2B |= myPrescaler; //this operation (OR), replaces the last three bits in TCCR2B with our new value 011`

🤖 now we have a new PWM frequency on pin 9 and 10!

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Products I registered those values on all PWM pins, changing the value of prescaler (the only exception are pins 13 and 14, see later):

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```
prescaler = 1 ---> PWM frequency is 31000 Hz
prescaler = 2 ---> PWM frequency is 4000 Hz
prescaler = 3 ---> PWM frequency is 490 Hz (default value)
prescaler = 4 ---> PWM frequency is 120 Hz
```

Forum (<http://forum.arduino.cc>)

(prescalers equal to 0 or 7 are useless).

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Those prescaler values are good for all timers (TCCR1B, TCCR2B, TCCR3B, TCCR4B) except for timer 0 (TCCR0B). In this case the values are:

Blog (<https://blog.arduino.cc>)

```
prescaler = 1 ---> PWM frequency is 62000 Hz
prescaler = 2 ---> PWM frequency is 7800 Hz
prescaler = 3 ---> PWM frequency is 980 Hz (default value)
prescaler = 4 ---> PWM frequency is 250 Hz
prescaler = 5 ---> PWM frequency is 60 Hz
prescaler = 6 ---> PWM frequency is <20 Hz
```

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Note that timer 0 is the one on which rely all time functions in Arduino: i.e., if you change this timer, function like delay() or millis() will continue to work but at a different timescale (quicker or slower!!!)

Ok, I hope it will help!
Cheers, Valerio

ars
(<https://forum.arduino.cc/index.php?action=profile;u=32979>)

Re: mega 2560 PWM frequency (<https://forum.arduino.cc/index.php?topic=72092.msg710647#msg710647>)
Mar 02, 2012, 05:48 am (<https://forum.arduino.cc/index.php?topic=72092.msg710647#msg710647>)

What should I do if i want a frequency of 250 or 300Hz on pins 3 and 5??



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Absorbing knowledge! Will give it back :)
 www.Nickson.me
 (http://nickson.me)



Re: mega 2560 PWM frequency (https://forum.arduino.cc/index.php?topic=72092.msg1219633#msg1219633)

Apr 28, 2013, 03:30 pm (https://forum.arduino.cc/index.php?topic=72092.msg1219633#msg1219633)

#3

@valerio_sperati

Wow! Thanks!

http://playground.arduino.cc/Main/TimerPWMCheatsheet

is very similar but that article seems to be only for ATmega328p or so. Definitely not for Arduino Mega. Mega's timer selections are different to the UNO.

Re: mega 2560 PWM frequency (https://forum.arduino.cc/index.php?topic=72092.msg1436168#msg1436168)



Re: mega 2560 PWM frequency (https://forum.arduino.cc/index.php?topic=72092.msg1436168#msg1436168)

spiralciric
(<https://forum.arduino.cc/index.php?action=profile;u=209628>)

Oct 21, 2013, 12:16 am (<https://forum.arduino.cc/index.php?topic=72092.msg1436168#msg1436168>)

#4

What is with pins 44, 45, and 46, in specs for MEGA 2560 it is said that they can be used for PWM?

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korra
(<https://forum.arduino.cc/index.php?action=profile;u=309538>)



Re: mega 2560 PWM frequency (<https://forum.arduino.cc/index.php?topic=72092.msg2017316#msg2017316>)

Dec 27, 2014, 01:16 am (<https://forum.arduino.cc/index.php?topic=72092.msg2017316#msg2017316>)

#5

Thanks Valerio!!! I can confirm your post.

Thanks you so much,

Corrado 🙄

64CURLP(<https://forum.arduino.cc/index.php?topic=72092.msg2017316#msg2017316>)



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ArduEhsan
(<https://forum.arduino.cc/index.php?>

Re: mega 2560 PWM frequency (<https://forum.arduino.cc/index.php?topic=72092.msg2091669#msg2091669>)

Feb 14, 2015, 11:48 am (<https://forum.arduino.cc/index.php?topic=72092.msg2091669#msg2091669>)

#6

action=profile;u=230917)

good explanations ... thanks! 😊



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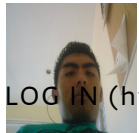
action=profile;u=2635

65) (https://blog.arduino.cc/)

Re: mega 2560 PWM frequency (https://forum.arduino.cc/index.php?topic=72092.msg2111541#msg2111541)

Feb 25, 2015, 04:45 pm (https://forum.arduino.cc/index.php?topic=72092.msg2111541#msg2111541)

#7



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achala

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67)

Re: mega 2560 PWM frequency (https://forum.arduino.cc/index.php?topic=72092.msg2180960#msg2180960)

Apr 10, 2015, 02:53 pm (https://forum.arduino.cc/index.php?topic=72092.msg2180960#msg2180960)

#8

thank you so much.. 😊



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(<https://forum.arduino.cc/index.php?topic=72092.msg2429124#msg2429124>)
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 action=profile;u=414851)

topic=72092.msg2429124#msg2429124)

Oct 09, 2015, 09:34 am (<https://forum.arduino.cc/index.php?topic=72092.msg2429124#msg2429124>)

#9

Hi guys,

Defalut Frequcy of timer 1,2,3 and 4 is 490 HZ. what do i have to do for getting 1KHZ

frequncy on every timer.

Blog (<https://blog.arduino.cc>)



Thanks..

([https://forum.arduino.cc/index.php?LOG IN \(https://id.arduino.cc/auth/login/?action=profile;u=414851\);u=414851](https://forum.arduino.cc/index.php?LOG IN (https://id.arduino.cc/auth/login/?action=profile;u=414851);u=414851))

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7f22baee33021f029b134d63751d)

751d)

masterx
 (<https://forum.arduino.cc/index.php?action=profile;u=455055>)



Re: mega 2560 PWM frequency (<https://forum.arduino.cc/index.php?topic=72092.msg2598336#msg2598336>)

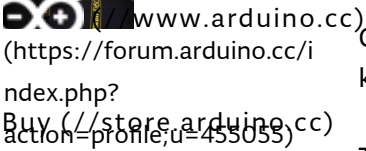
Feb 04, 2016, 12:12 pm (<https://forum.arduino.cc/index.php?topic=72092.msg2598336#msg2598336>) Last Edit:

#10


Feb 04, 2016, 12:31 pm by masterx

Hi,

this is great, it works! I would like to run 1 MHz piezo transducer to produce fog nebulizer.

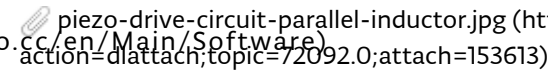


Check attached image to see how I was trying to do this. I can hear buzzer at 4000-8000 kHz, but in contact with water it does not produce any mist or vibration.

 <https://forum.arduino.cc/index.php?board=100.0;en/Main/Software>
action=dlattach;topic=72092.0;attach=153613)

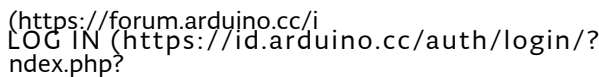
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gakgoelazig
(<https://forum.arduino.cc/index.php?action=profile;u=582546>)

#11

Ok, my question is about Arduino Uno, but I believe it is relevant to the topic:
changing the PWM frequency on Timer 2 can I make the Virtual Wire library working on timer 2?

#12

I want to change arduino pwm frequency in MATLAB SIMULINK, how to do this,



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(<https://forum.arduino.cc/index.php?action=profile;u=686144>)

topic=72092.msg3176716#msg3176716)

Mar 15, 2017, 12:25 pm (<https://forum.arduino.cc/index.php?topic=72092.msg3176716#msg3176716>)

#13

Hi,



Blog (<https://blog.arduino.cc>) I am new to mega2560. We are using TMC429 motor controller and i need to give 16Mhz clock. Kindly advice how to or which pin i can use to provide clock from Mega2560 to TMC429.

(https://forum.arduino.cc/index.php?LOG_IN=https://id.arduino.cc/auth/login/?action=profile;u=686144)

Thanks in advance

SECURITY(<https://forum.arduino.cc/index.php?topic=72092.msg3176716#msg3176716>)



Naveen

Newbie

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id=686144;eabeb320ea=1b1b7f22baee33021f029b134d63751d)

b7f22baee33021f029b134d63751d)

3751d)

jdale18
 (<https://forum.arduino.cc/index.php?action=profile;u=674734>)

Re: mega 2560 PWM frequency (<https://forum.arduino.cc/index.php?topic=72092.msg3211480#msg3211480>)

Apr 08, 2017, 05:07 am (<https://forum.arduino.cc/index.php?topic=72092.msg3211480#msg3211480>)

#14

Just wanted to say thank you to valerio_sperati for doing all the hard work and laying out the info on what timers control which pins and what prescalers relate to which frequency. I plagiarized(stole) your info and used it in my magnetic stirrer project. I gave you credit in



my project. I was able to change my PWM frequency to be slower when my DC pm motor is very slow and this showed a great improvement in motor response.

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