

STM32 COURSE



Activar Windows
Ve a Configuración para activar Windows

FEBRUARY 23, 2021

008 Timer PWM Input IC

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SECTION 8

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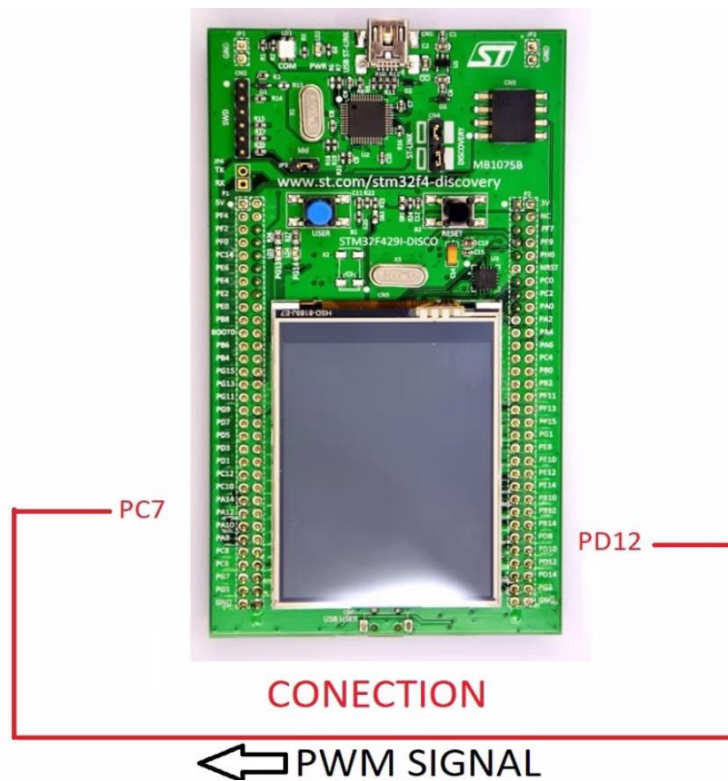
What will we learn?

In this video we will capture a PWM signal generated with another timer in the same microcontroller so that with the appropriate settings we can calculate the frequency and the duty at which said signal is being generated, for this we will only need a small bridge or connection between the GPIOs involved.

"We will use HAL Drivers, which will help us greatly to port and recycle code routines from one processor in one Family to another in another Family."

Key points

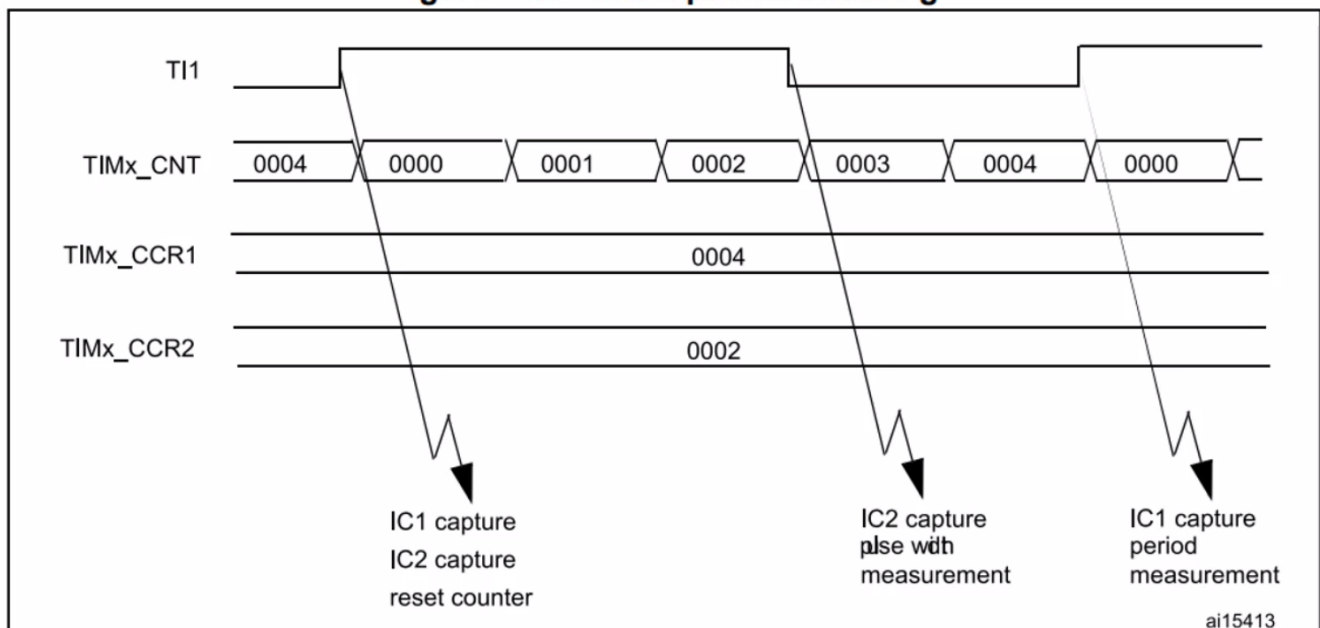
DIAGRAM



The PWM signal will be output (OUTPUT TIMER4) through PD12 and will enter through PC7 (INPUT TIMER3).

CRITERION

Figure 116. PWM input mode timing



We must configure as Reset Mode so that the signal capture sequence is restarted when the Timer3 counter starts counting TIM3-> CNT.

In Trigger Source set TI2FP2 so that the capture is triggered with the positive edge IC2.

Then, as we see in the curve graph, when TIM3-> CNT starts with 0, the capture of both ICs (IC1 and IC2) is triggered at the same time, they are the 2 channels of TIMER3, the one in Direct Mode, that is, through its assigned GPIO and the other in Indirect Mode, that is, it will also receive the same signal that comes in through the other channel.

So when the pulse that we see TI1 descends, we see that IC2 executes the calculation of the pulse width, and when it rises again (New period TIM3-> CNT back to 0) the period of the signal is calculated.

We know that TIMER3 is at 90 MHz because of the datasheet and the configuration, with the formula we can determine the Dutty.

$$\text{Dutty} = (\text{IC1_CNT} * 100) / \text{IC2_CNT};$$

Where IC1_CNT are the counts of pulses in ticks of the Timer in question as well as IC2_CNT.

And the frequency is calculated with:

$$\text{Freq} = (90 \text{ MHz}) / \text{IC2_CNT};$$

INTERRUPTION

We must enable the TIMER3 interrupt to be able to determine the end of a period, it is here when we can calculate and program the necessary functions for estimating the frequency and dutty of the signal..