Intelligent DAC Documentation 29 September 2017

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¿What this function does?

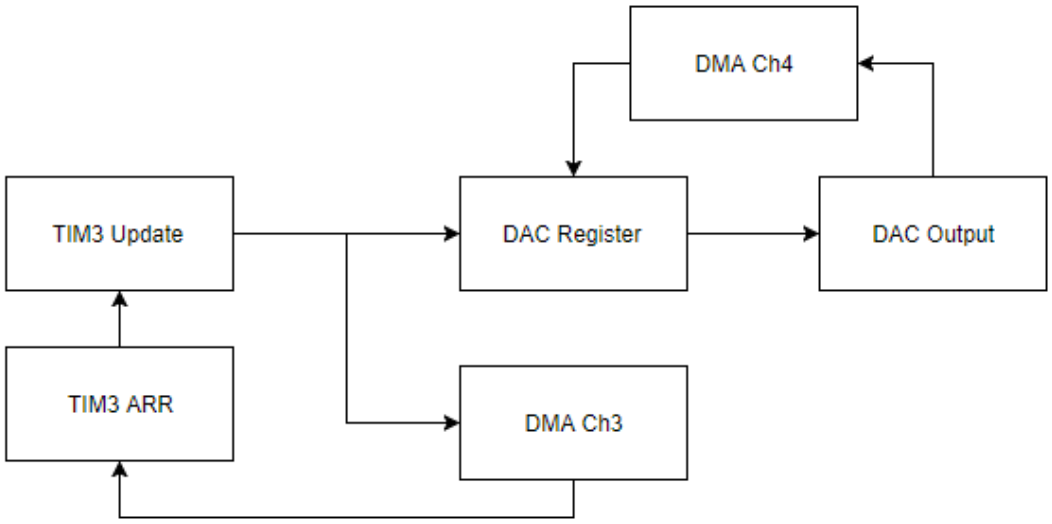
Creates a PWM with the DAC output within two selected levels

¿How?

The function is a modification of the example program to create a sine wave.

First, TIM3 triggers the DAC to output the value charged on the register (DHR12RD), and that action triggers the DMA to charge a new value into the DHR12RD register, creating the square wave.

To achieve PWM, the same TIM3 update triggers the DMA to charge a new value into the Autorreload (TIM3->ARR) register, so update time changes, creating that false PWM hardware that outputs to the DAC.



Advantages

Totally done by Hardware, no MCU time is used. Will take time, yes, but not crash the program when it has to attend lots of interruptions.

Disadvantages

Designed for very specific peripherals use. Only made it work with dual channel DAC output, so no DAC pins free to use.

¿Will it work on my device?

If you're using an STM32F10x family device, it's very probable. If not, it's very problable that it will not work at first. For everyone, you just need this:

- TIM3 unoccupied, or change the Timer configuration, but you need a timer capable of creating an update trigger to both DAC and DMA channels.
- DMA1 channels 3 and 4 unoccupied. But maybe your device has a different connections matrix, so you need to match channels for DAC trigger and another one for the selected Timer update trigger. And maybe your device uses DMA2 or DMA3 peripheral.
- DAC1 Peripheral totally unoccupied, I can't make it work with only one channel.
- Patience
- Remember to use StopDAC, needed to restart, reconfigure, and use the Intelligent DAC later. Do not try to stop it by any other means because there will be errors.

¿Any feature?

I only tested this function with PWM up to 20 Hz, feel free to modify Timer configuration to (try to) make it faster.