Ticker Programming

Last updated 9/27/21

Ticker Programming

- Ticker Operation
  - Nucleo-L476RG has 12 timers
  - It's not clear how many of these can be used in our implementation

  - The Ticker uses ISRs
    - All usual ISR rules apply

  - Ticker runs continuously

Ticker Programming

- Ticker Connections
  - There are no connections enabled in the Mbed system

Ticker Programming

- Ticker Class

Public Member Functions		
template<typename F >		
MBED_FORCEINLINE void	attach (F &&func, float t)	Deprecated
	Attach a function to be called by the Ticker, specifying the interval in seconds. More...	
void	attach (Callback< void()> func, std::chrono::microseconds t)	Use 10us, 10ms, 10s not 10, 10000, ...
	Attach a function to be called by the Ticker, specifying the interval in microseconds. More...	
void	attach_us (Callback< void()> func, us_timestamp_t t)	Deprecated
	Attach a function to be called by the Ticker, specifying the interval in microseconds. More...	
void	detach ()	
	Detach the function. More...	

Ticker Programming

- Constructors - template

Public Member Functions
template<typename F >

```
      // Create Ticker object
      Ticker Tk_1;
```

Ticker Programming

- Member Functions (Methods)

MBED_FORCEINLINE void	attach (F &&func, float t)	Deprecated
	Attach a function to be called by the Ticker, specifying the interval in seconds. More...	
void	attach (Callback< void()> func, std::chrono::microseconds t)	Use 10us, 10ms, 10s not 10, 10000, ...
	Attach a function to be called by the Ticker, specifying the interval in microseconds. More...	
void	attach_us (Callback< void()> func, us_timestamp_t t)	Deprecated
	Attach a function to be called by the Ticker, specifying the interval in microseconds. More...	
void	detach ()	
	Detach the function. More...	

```
// Attach the function to call when the ticker count is reached
Tk_1.attach(&my_tick, 1000us);
```

Ticker Programming

- Simple example
  - Setup a limited number of ticker cycles

```
/////////////////////////////////
//
// ticker_class_ex_1 project
//
// created 6/4/21 by tj
// rev 0
//
/////////////////////////////////
//
// Ticker example file for class
//
// shows basic ticker operation
//
/////////////////////////////////

#include "mbed.h"
#include <stdio.h>

// function prototypes (actually an ISR)
void my_tick(void);

// Global HARDWARE Objects
// Create Ticker object
Ticker Tk_1;
// create an output object for pin D4 to drive with the ticker (ISR)
DigitalOut Out_dig(D4);

int main(void){
    setbuf(stdout, NULL);    // disable buffering

    // splash
    printf("\n\nticker_class_ex_1 - example for EE2905\n");
    printf("Using Mbed OS version %d.%d.%d\n\n",
            MBED_MAJOR_VERSION, MBED_MINOR_VERSION, MBED_PATCH_VERSION);

    // initialize the output
    Out_dig = 0;

    // Attach the function to call when the ticker count is reached
    Tk_1.attach(&my_tick, 1000us);

    // create a limited cycle loop
    while(1){
        wait_us(10000);
        Tk_1.detach();
    }// end while

    return 0;
}// end main
```
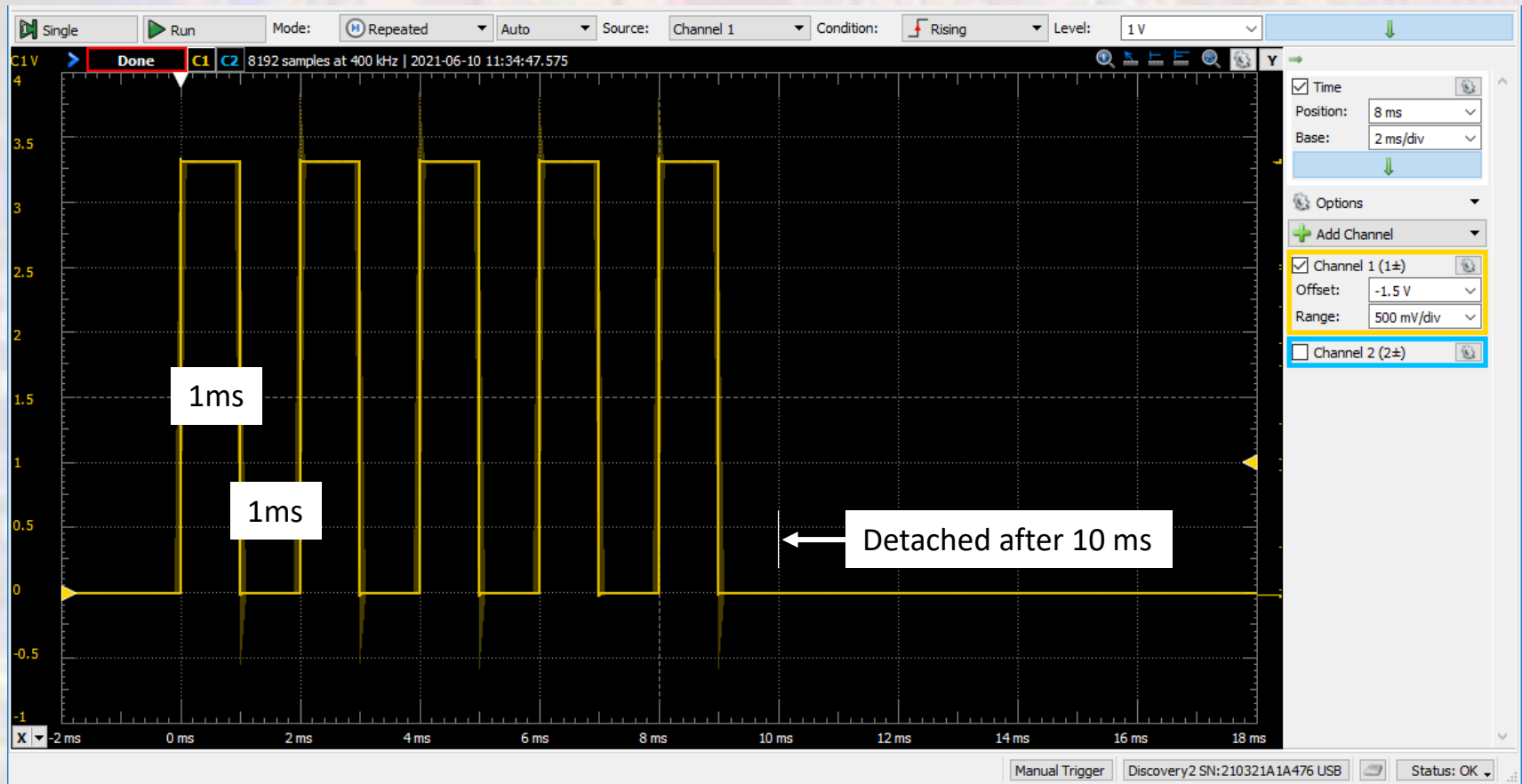
```
void my_tick(void){
    Out_dig = !Out_dig;
}// end my_tick
```

Ticker Programming

- Simple example
  - Setup a limited number of ticker cycles

Ticker Programming

- Limitations summary

  - Minimum measurable timer tick is 1us