

Useful functions and parameters to be used

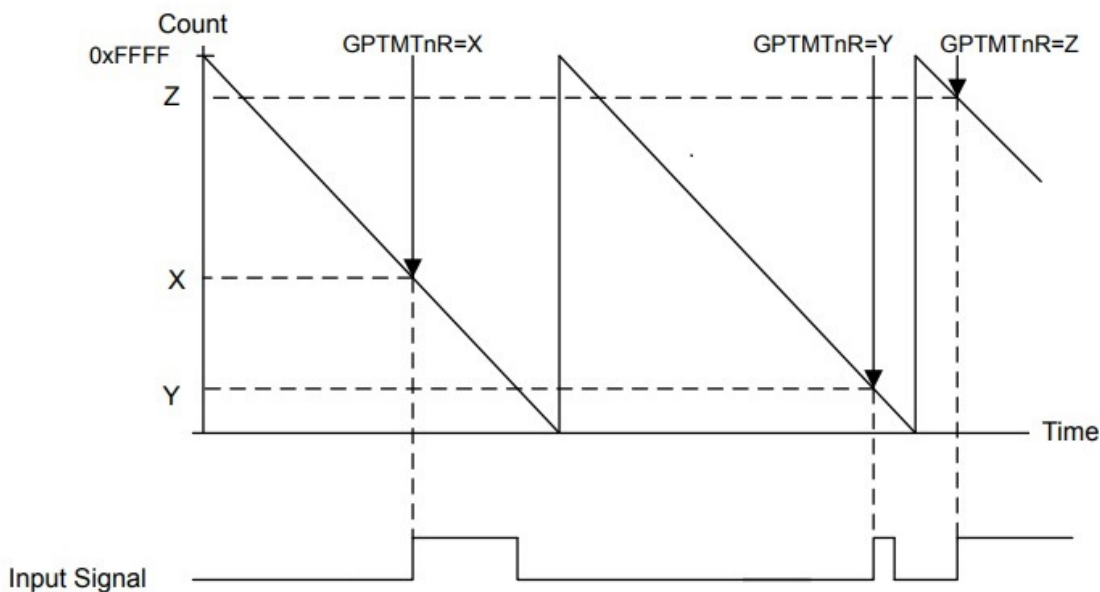
Timer configuration to detect rising and falling edge (*Input Edge-Time Mode*)

Syntax and configuration

TivaWare Peripheral Driver Library, section 29.2.2.6. [\[1\]](#)

```
void TimerControlEvent(uint32_t ui32Base, uint32_t ui32Timer, uint32_t ui32Event);
```

- **ui32Base** is the base address of the timer module.
- **ui32Timer** specifies the timer(s) to be adjusted; must be one of **TIMER_A**, **TIMER_B**, or **TIMER_BOTH**.*.
- **ui32Event** specifies the type of event; must be one of **TIMER_EVENT_POS_EDGE**, **TIMER_EVENT_NEG_EDGE***, or **TIMER_EVENT_BOTH_EDGES**.



Possible ports to be used

CCP pins can be found in the table 13-1 - Available CCP Pins, page 956 [\[2\]](#)

Timer	Up/Down Counter	Even CCP Pin	Odd CCP Pin
16/32-Bit Timer 0	Timer A	T0CCP0	-
	Timer B	-	T0CCP1
16/32-Bit Timer 1	Timer A	T1CCP0	-
	Timer B	-	T1CCP1
16/32-Bit Timer 2	Timer A	T2CCP0	-
	Timer B	-	T2CCP1
16/32-Bit Timer 3	Timer A	T3CCP0	-
	Timer B	-	T3CCP1
16/32-Bit Timer 4	Timer A	T4CCP0	-
	Timer B	-	T4CCP1
16/32-Bit Timer 5	Timer A	T5CCP0	-
	Timer B	-	T5CCP1
16/32-Bit Timer 6	Timer A	T6CCP0	-
	Timer B	-	T6CCP1
16/32-Bit Timer 7	Timer A	T7CCP0	-
	Timer B	-	T7CCP1

Justification

TM4C1294NCPDT Datasheet, section 13.4.4. [\[2\]](#)

The operation mode that we are going to use for GPTM is the Input Edge-Count Mode, because it can be configurable to count time between two external events, being rising edge, falling edge or both. In this mode, "timer is configured as a 24-bit up- or down-counter including the optional prescaler with the upper timer value stored in the GPTMnPR register and the lower bits in the PGTMnILR register.

Timer configuration to interrupt after a given amount of time

Syntax and configuration

TivaWare Peripheral Driver Library, section 28.2.2.8. [\[1\]](#)

```
void SysTickPeriodSet(uint32_t ui32Period);
```

- **ui32Period** is the number of clock ticks in each period of the SysTick counter and must be between 1 and 16, 777, 216, inclusive.

Note: Calling this function does not cause the SysTick counter to reload immediately. If an immediate reload is required, the NVIC_ST_CURRENT register must be written. Any write to this register clears the SysTick counter to 0 and causes a reload with the ui32Period supplied here on the next clock after SysTick is enabled.

Justification

Other tools

Registers

- GPTM Configuration
- GPTM Timer Mode
- GPTM Control
- GPTM Timer n Prescale Register

- GPTM Timer n Interval Load
- GPTM Interrupt Mask
- GPTM Control
- GPTM Interrupt Clear
- GPTM Timer n

APIs

The main API that we are going to use is the TimerAPI, because "The timer API provides a set of functions for using the timer module. Functions are provided to configure and control the timer, modify timer/counter values, and manage timer interrupt handling."

We are also going to use the SysTic API, because it provides a periodic interrupt and it is simple to use for timing purposes.

References

- [1] [TivaWare Peripheral Driver Library](#)
- [2] [TM4C1294NCPDT Datasheet](#)