

CP316

Timers and Counters

Terry Sturtevant

Wilfrid Laurier University

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Timers and Counters

Timers and Counters

timers vs. counters

Timers and Counters

timers vs. counters

→ Section 8.3.1

Timers and Counters

timers vs. counters

→ Section 8.3.1

→ Sections 10.x - 14.x

Timers and Counters

timers vs. counters

→ Section 8.3.1

→ Sections 10.x - 14.x

size (i.e. number of bits)

Timers and Counters

timers vs. counters

→ Section 8.3.1

→ Sections 10.x - 14.x

size (i.e. number of bits)

prescaler

Timers and Counters

timers vs. counters

→ Section 8.3.1

→ Sections 10.x - 14.x

size (i.e. number of bits)

prescaler

start/stop

Timers and Counters

timers vs. counters

→ Section 8.3.1

→ Sections 10.x - 14.x

size (i.e. number of bits)

prescaler

start/stop

interrupt flag

Timer0

Timer0

counter?

Timer0

counter?

size?

Timer0

counter?

size?

16 bit timers; high/low byte order

Timer0

counter?

size?

16 bit timers; high/low byte order

prescaler?

Timer0

counter?

size?

16 bit timers; high/low byte order

prescaler?

→ Section 8.3.1

Timer0

counter?

size?

16 bit timers; high/low byte order

prescaler?

→ Section 8.3.1

→ Section 10

Timer0

counter?

size?

16 bit timers; high/low byte order

prescaler?

→ Section 8.3.1

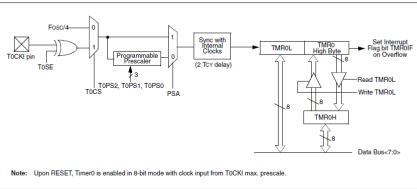
→ Section 10

QwikFlash connections

Timer 0

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Note: Upon RESET, Timer0 is enabled in 8-bit mode with clock input from T0CKI max. prescale

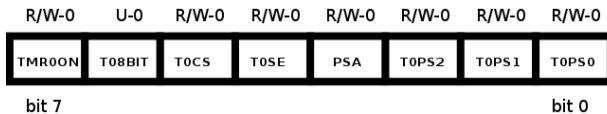


Timer 0

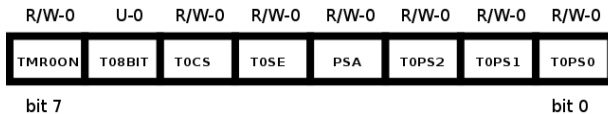
[illegible]

T0CON

T0CON



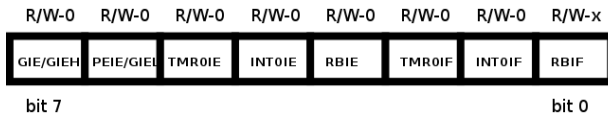
T0CON



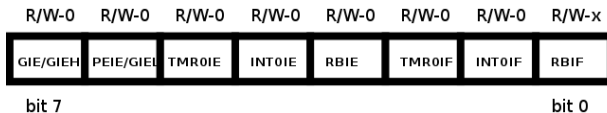
Bits in T0CON register

INTCON

INTCON



INTCON



Bits in INTCON register

Timer1

Timer1

size?

Timer1

size?

counter?

Timer1

size?

counter?

output options?

Timer1

size?

counter?

output options?

prescaler?

Timer1

size?

counter?

output options?

prescaler?

→ Section 8.3.2

Timer1

size?

counter?

output options?

prescaler?

→ Section 8.3.2

→ Section 11

Timer1

size?

counter?

output options?

prescaler?

→ Section 8.3.2

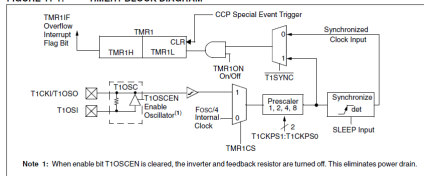
→ Section 11

QwikFlash connections

Timer 1

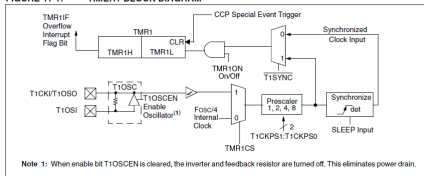
Timer 1

FIGURE 11-1: TIMER1 BLOCK DIAGRAM



Timer 1

FIGURE 11-1: TIMER1 BLOCK DIAGRAM

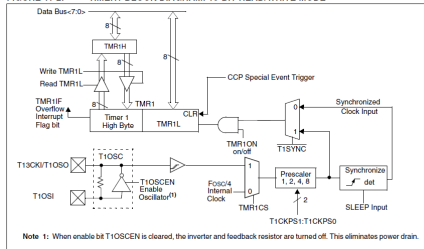


Timer 1

Timer 1- 16 bit

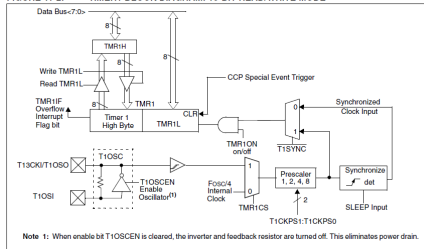
Timer 1- 16 bit

FIGURE 11-2: TIMER1 BLOCK DIAGRAM: 16-BIT READ/WRITE MODE



Timer 1- 16 bit

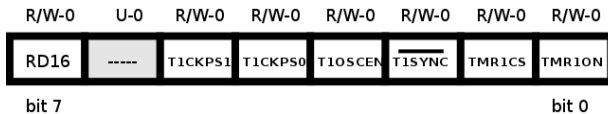
FIGURE 11-2: TIMER1 BLOCK DIAGRAM: 16-BIT READ/WRITE MODE



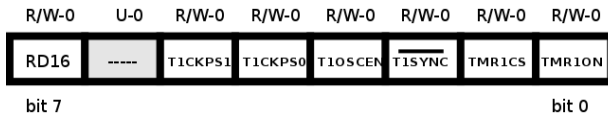
Timer 1 - 16 bit

T1CON

T1CON



T1CON



Bits in T1CON register

Timer2

Timer2

size?

Timer2

size?

counter?

Timer2

size?

counter?

output options?

Timer2

size?

counter?

output options?

prescaler?

Timer2

size?

counter?

output options?

prescaler?

→ Section 8.3.3

Timer2

size?

counter?

output options?

prescaler?

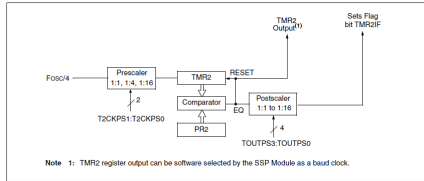
→ Section 8.3.3

→ Section 12

Timer 2

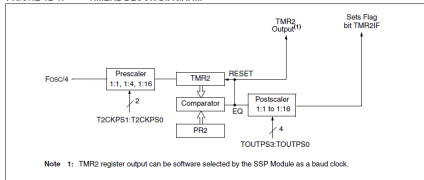
Timer 2

FIGURE 12-1: TIMER2 BLOCK DIAGRAM



Timer 2

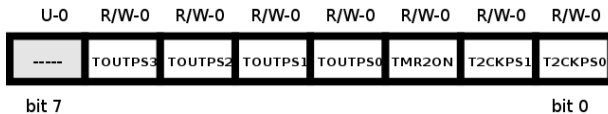
FIGURE 12-1: TIMER2 BLOCK DIAGRAM



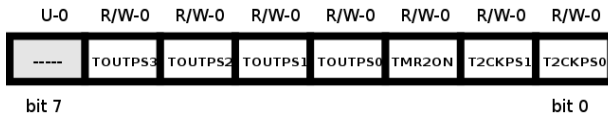
Timer 2

T2CON

T2CON



T2CON



Bits in T2CON register

Timer3

Timer3

size?

Timer3

size?

counter?

Timer3

size?

counter?

output options?

Timer3

size?

counter?

output options?

prescaler?

Timer3

size?

counter?

output options?

prescaler?

→ Section 8.3.4

Timer3

size?

counter?

output options?

prescaler?

→ Section 8.3.4

→ Section 13

Timer3

size?

counter?

output options?

prescaler?

→ Section 8.3.4

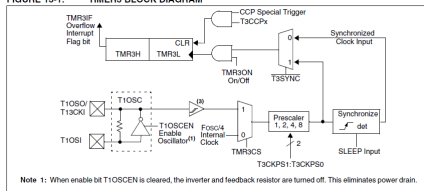
→ Section 13

QwikFlash connections

Timer 3

Timer 3

FIGURE 13-1: TIMER3 BLOCK DIAGRAM



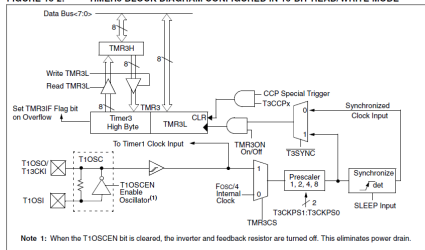
Timer 3

Note 1: When enable bit T1OSCEN is cleared, the inverter and feedback resistor are turned off. This eliminates power drain.

Timer 3- 16 bit

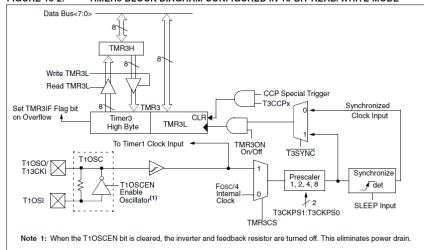
Timer 3- 16 bit

FIGURE 13-2: TIMER3 BLOCK DIAGRAM CONFIGURED IN 16-BIT READ/WRITE MODE



Timer 3- 16 bit

FIGURE 13-2: TIMER3 BLOCK DIAGRAM CONFIGURED IN 16-BIT READ/WRITE MODE



Timer 3 - 16 bit

T3CON

T3CON



T3CON



Bits in T3CON register

Capture/Compare/PWM modules

Capture/Compare/PWM modules

CCP1 and CCP2 modules

Capture/Compare/PWM modules

CCP1 and CCP2 modules

→ Section 8.4

Capture/Compare/PWM modules

CCP1 and CCP2 modules

→ Section 8.4

→ Section 14.1 - 14.2

Capture/Compare/PWM modules

CCP1 and CCP2 modules

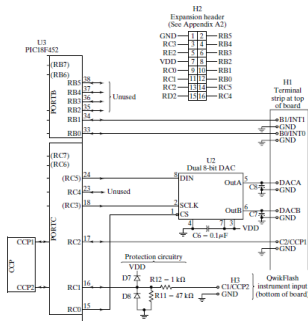
→ Section 8.4

→ Section 14.1 - 14.2

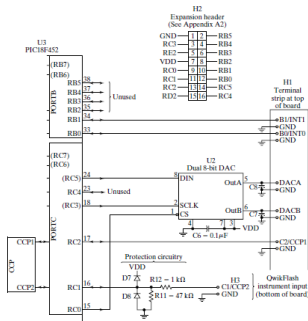
interrupt flags

CCP connections on QwikFlash board

CCP connections on QwikFlash board

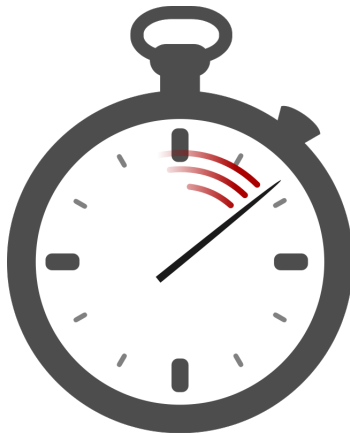


Note all 3 headers

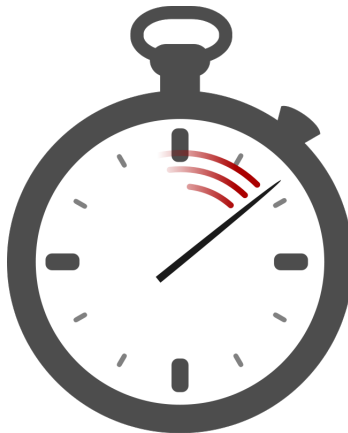


Capture

Capture



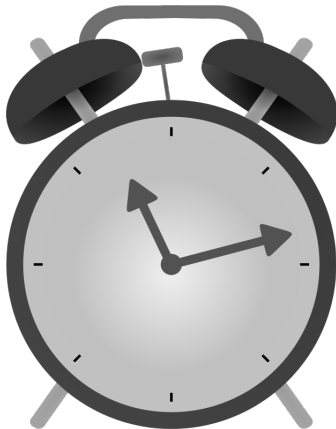
Capture



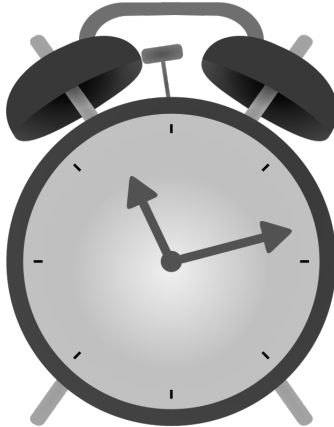
Get time when event happens

Compare

Compare



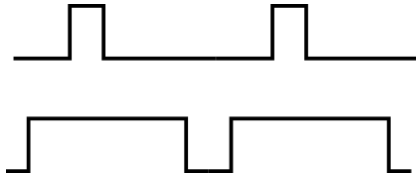
Compare



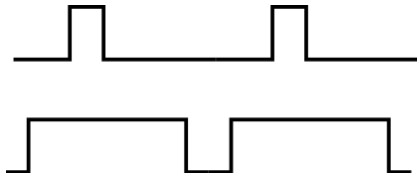
At preset time, trigger event

PWM

PWM



PWM



Programmable pulse generator

capture

capture

→ Section 8.5

capture

→ Section 8.5

→ Section 14.3

capture

→ Section 8.5

→ Section 14.3

compare

capture

→ Section 8.5

→ Section 14.3

compare

→ Section 8.6

capture

→ Section 8.5

→ Section 14.3

compare

→ Section 8.6

→ Section 14.4

capture

→ Section 8.5

→ Section 14.3

compare

→ Section 8.6

→ Section 14.4

PWM

capture

→ Section 8.5

→ Section 14.3

compare

→ Section 8.6

→ Section 14.4

PWM

→ Section 8.7

capture

→ Section 8.5

→ Section 14.3

compare

→ Section 8.6

→ Section 14.4

PWM

→ Section 8.7

→ Section 14.5

capture

→ Section 8.5

→ Section 14.3

compare

→ Section 8.6

→ Section 14.4

PWM

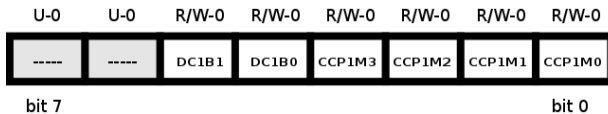
→ Section 8.7

→ Section 14.5

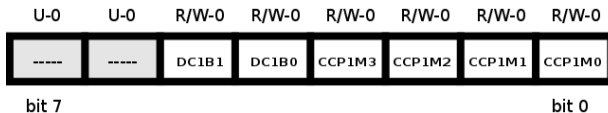
QwikFlash connections

CCP1CON

CCP1CON



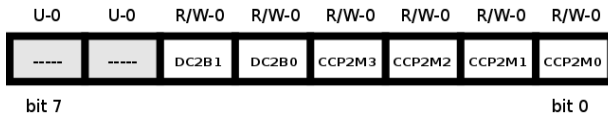
CCP1CON



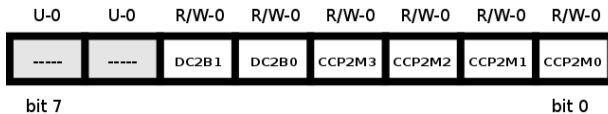
Bits in CCP1CON register

CCP2CON

CCP2CON



CCP2CON



Bits in CCP2CON register