

# CP316

## Timers and Counters

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# Timers and Counters

# Timers and Counters

timers vs. counters

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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?

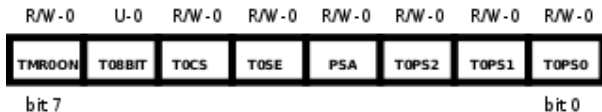
→ Section 8.3.1

→ **Section 10**

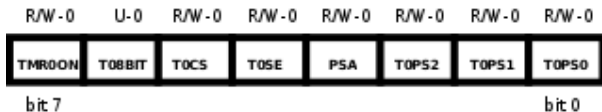
QwikFlash connections

# T0CON

# T0CON



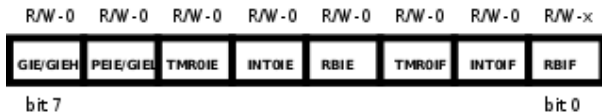
# T0CON



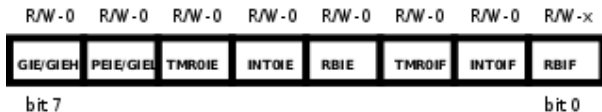
Bits in T0CON register

# 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

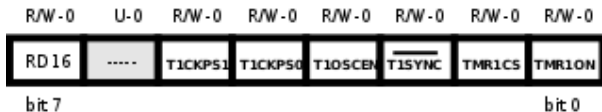
→ **Section 11**

QwikFlash connections

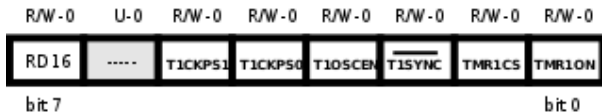
# T1CON



# 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?

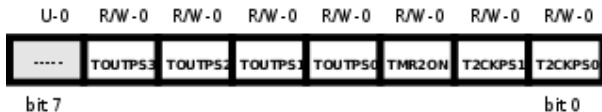
prescaler?

→ Section 8.3.3

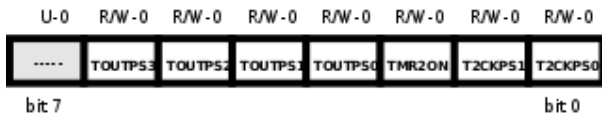
→ **Section 12**

# 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?

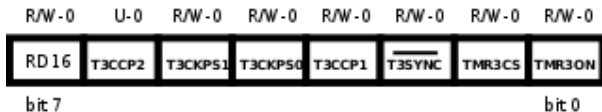
→ Section 8.3.4

→ **Section 13**

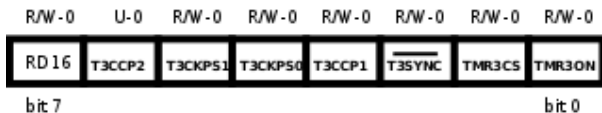
QwikFlash connections

# 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

# Capture

# Capture



# Capture

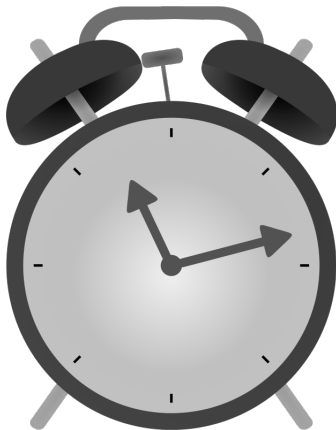


Get time when event happens

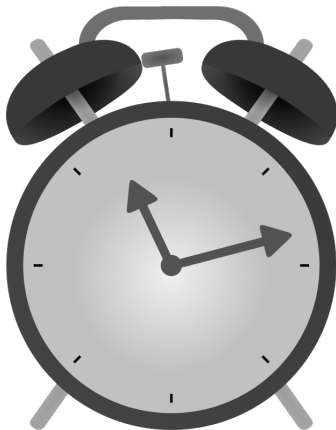
# Compare



# Compare



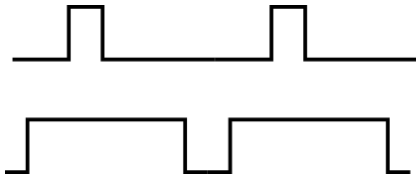
# Compare



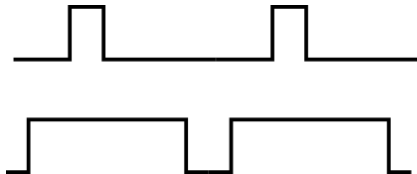
At preset time, trigger event

# 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