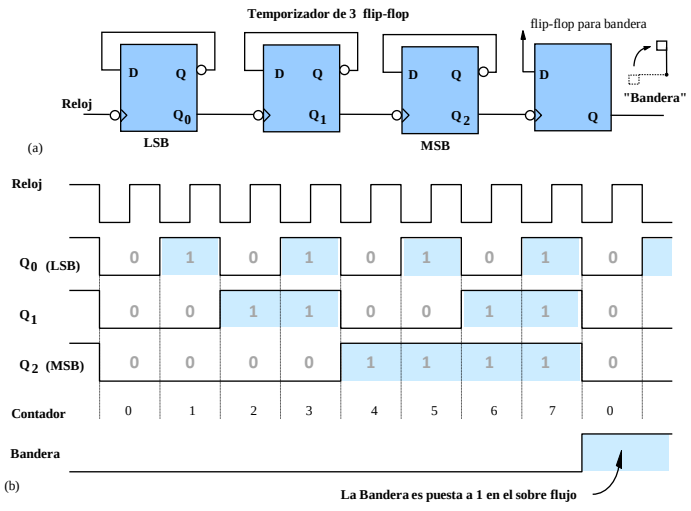
Microcontroladores

Timer0 (AVR)

Temporizador/Contador:



Timer0/Counter0 (8 bits):

- Dos unidades de Output Compare independientes
- Auto-carga (clear timer on compare match)
- Pre-escalador de 10-bits
- Contador de Eventos Externos
- PWM con periodo variable
- Generador de Frecuencia
- Tres fuentes de Interrupción (TOV0, OCF0A y OCF0B)

Diagrama de bloques de Timer0/Counter0:

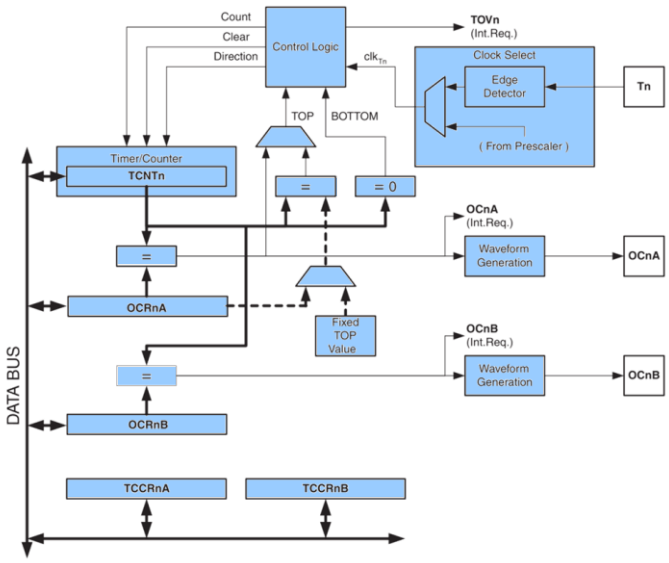


Diagrama de bloques de Timer0/Counter0:

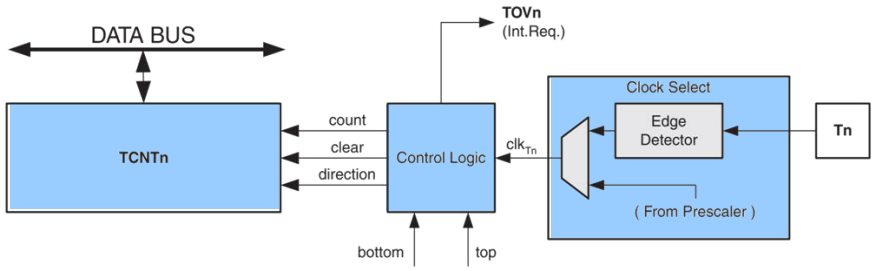


Diagrama de la unidad de comparación:

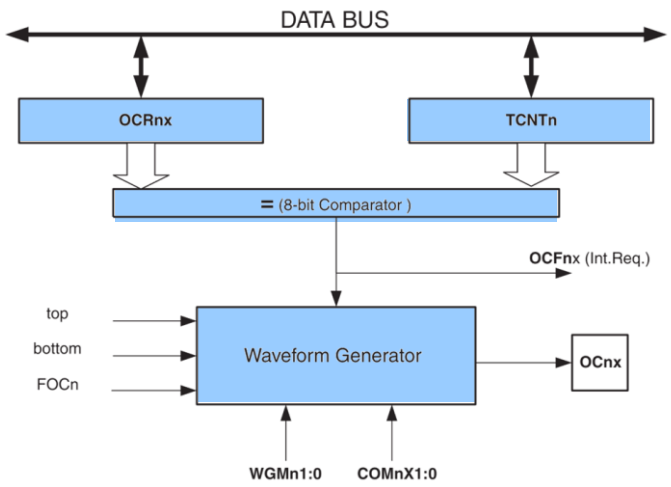


Diagrama de bloques de la salida de unidad de comparación:

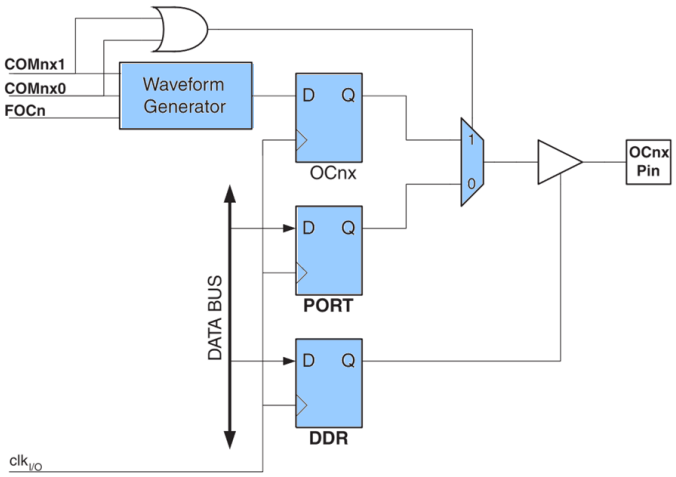


Diagrama de Tiempo (sin pre-escalador)

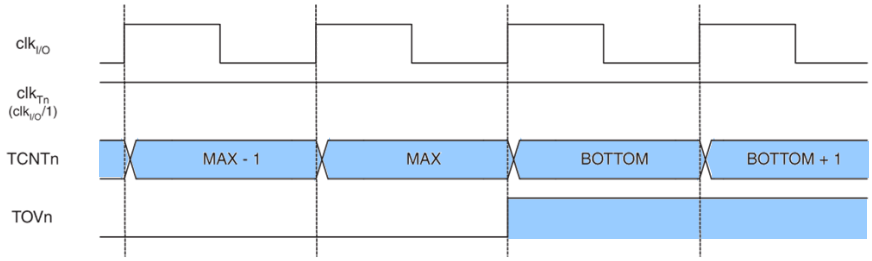


Diagrama de Tiempo (con pre-escalador de 8)
Activación de la bandera TOV

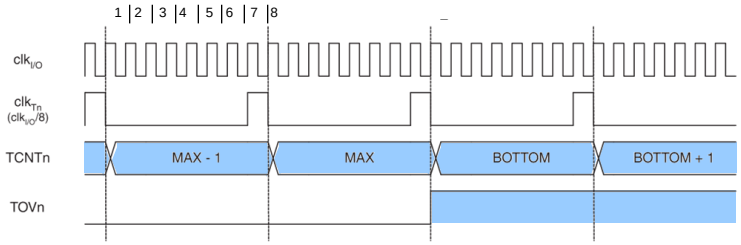


Diagrama de Tiempo (con pre-escalador de 8)
Activación de la bandera OCF

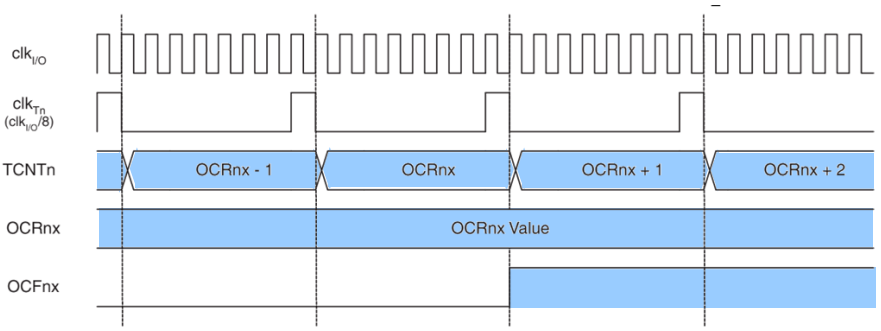
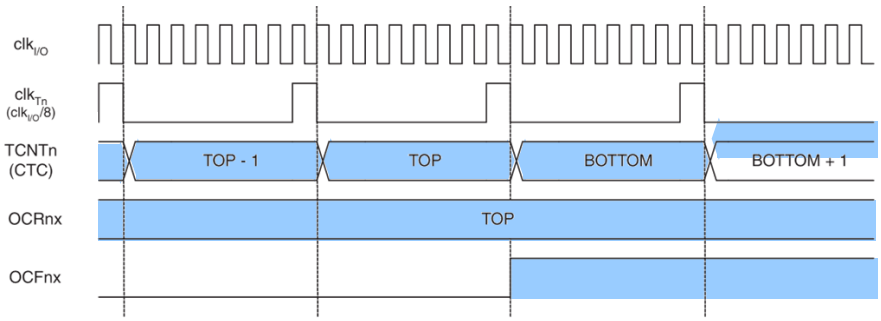


Diagrama de Tiempo (con pre-escalador de 8)
Funcionalidad de CTC (Clear Timer on Compare Match mode)



Registros

TCCR0A

Bit	7	6	5	4	3	2	1	0
0x24 (0x44)	COM0A1	COM0A0	COM0B1	COM0B0	–	–	WGM01	WGM00
Read/Write	R/W	R/W	R/W	R/W	R	R	R/W	R/W
Initial Value	0	0	0	0	0	0	0	0

- **Bits 7:6 – COM0A1:0: Compare Match Output A Mode**
- **Bits 5:4 – COM0B1:0: Compare Match Output B Mode**
- **Bits 1:0 – WGM01:0: Waveform Generation Mode**

Table 14-8. Waveform Generation Mode Bit Description

Mode	WGM2	WGM1	WGM0	Timer/Counter Mode of Operation	TOP	Update of OCRx at	TOV Flag Set on[1][2]
0	0	0	0	Normal	0xFF	Immediate	MAX
1	0	0	1	PWM, Phase Correct	0xFF	TOP	BOTTOM
2	0	1	0	CTC	OCRA	Immediate	MAX
3	0	1	1	Fast PWM	0xFF	BOTTOM	MAX
4	1	0	0	Reserved	–	–	–
5	1	0	1	PWM, Phase Correct	OCRA	TOP	BOTTOM
6	1	1	0	Reserved	–	–	–
7	1	1	1	Fast PWM	OCRA	BOTTOM	TOP

Registros

TCCR0B

Bit	7	6	5	4	3	2	1	0
0x25 (0x45)	FOC0A	FOC0B	–	–	WGM02	CS02	CS01	CS00
Read/Write	W	W	R	R	R/W	R/W	R/W	R/W
Initial Value	0	0	0	0	0	0	0	0

- **Bit 7 – FOC0A: Force Output Compare A**
- **Bit 6 – FOC0B: Force Output Compare B**
- **Bit 3 – WGM02: Waveform Generation Mode**
- **Bits 2:0 – CS02:0: Clock Select**

CS02	CS01	CS00	Description
0	0	0	No clock source (Timer/Counter stopped)
0	0	1	$clk_{I/O}$/(No prescaling)
0	1	0	$clk_{I/O}$/8 (From prescaler)
0	1	1	$clk_{I/O}$/64 (From prescaler)
1	0	0	$clk_{I/O}$/256 (From prescaler)
1	0	1	$clk_{I/O}$/1024 (From prescaler)
1	1	0	External clock source on T0 pin. Clock on falling edge.
1	1	1	External clock source on T0 pin. Clock on rising edge.

Registros

TCNT0

Bit	7	6	5	4	3	2	1	0
0x26 (0x46)	TCNT0[7:0]							
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Initial Value	0	0	0	0	0	0	0	0

OCR0A

Bit	7	6	5	4	3	2	1	0
0x27 (0x47)	OCR0A[7:0]							
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Initial Value	0	0	0	0	0	0	0	0

OCR0B

Bit	7	6	5	4	3	2	1	0
0x28 (0x48)	OCR0B[7:0]							
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Initial Value	0	0	0	0	0	0	0	0

Registros

TIMSK0

Bit	7	6	5	4	3	2	1	0
(0x6E)	–	–	–	–	–	OCIE0B	OCIE0A	TOIE0
Read/Write	R	R	R	R	R	R/W	R/W	R/W
Initial Value	0	0	0	0	0	0	0	0

TIFR0

Bit	7	6	5	4	3	2	1	0
0x15 (0x35)	–	–	–	–	–	OCF0B	OCF0A	TOV0
Read/Write	R	R	R	R	R	R/W	R/W	R/W
Initial Value	0	0	0	0	0	0	0	0