Architecture des ordinateur 2

Cours 8 - Timer

Halim Djerroud <hdd@ai.univ-paris8.fr>

LIASD - Université Paris 8

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Timer

- Éviter les attentes actives

Le Timer 0

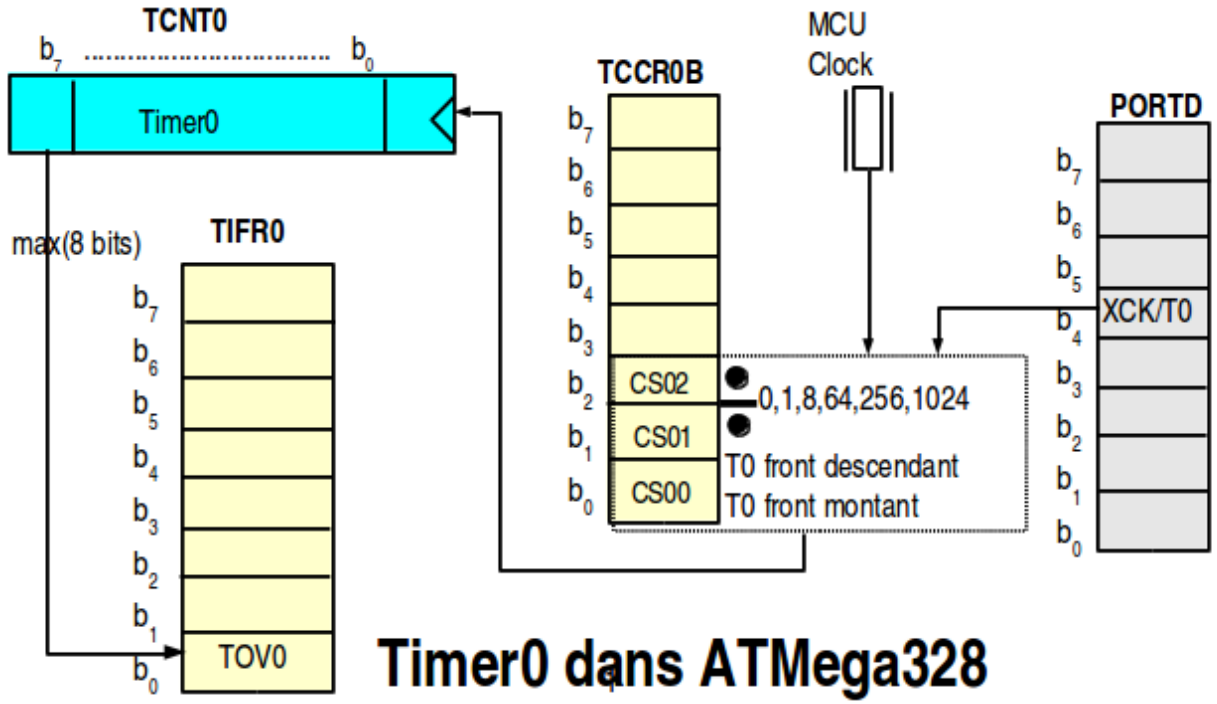

FIGURE – Le Timer 0

Prescaler

Table 19-10. Clock Select Bit Description

CA02	CA01	CS00	Description
0	0	0	No clock source (Timer/Counter stopped).
0	0	1	$clk_{I/O}$/1 (No prescaling)
0	1	0	$clk_{I/O}$/8 (From prescaler)
0	1	1	$clk_{I/O}$/64 (From prescaler)
1	0	0	clkI/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.

If external pin modes are used for the Timer/Counter0, transitions on the T0 pin will clock the counter even if the pin is configured as an output. This feature allows software control of the counting.

FIGURE – Select Bit

Prescaler registre TCCR0

Name: TCCR0B
Offset: 0x45
Reset: 0x00
Property: When addressing as I/O Register: address offset is 0x25

Bit	7	6	5	4	3	2	1	0
	FOC0A	FOC0B			WGM02	CS0[2:0]		
Access	R/W	R/W			R/W	R/W	R/W	R/W
Reset	0	0			0	0	0	0

FIGURE – TTCR0B

- Le registre TCCR0 gère le prescaler à l'aide de trois bits CS02, CS01, CS00

Timer 8bits

Name: TCNT0
Offset: 0x46
Reset: 0x00
Property: When addressing as I/O Register: address offset is 0x26

Bit	7	6	5	4	3	2	1	0
	TCNT0[7:0]							
Access	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Reset	0	0	0	0	0	0	0	0

FIGURE – TCNT0

Timer overflow

Name: TIFR0
Offset: 0x35
Reset: 0x00
Property: When addressing as I/O Register: address offset is 0x15

Bit	7	6	5	4	3	2	1	0
						OCFB	OCFA	TOV
Access						R/W	R/W	R/W
Reset						0	0	0

FIGURE – TIFR0

- Un bit d'un registre TIFR est appelé TOV0 (Timer overflow 0 = débordement du timer 0). Ce bit est automatiquement positionné à 1 lors du débordement du timer 0, c'est-à-dire pour un passage de 0xFF à 0x00.

Blink

```
int main(void){
        TCCR0 = 0x02; // prescaler 8
        TCNT0 = 0x00; //   tmr0
        DDRB |= 0x01; //RB0
        while(1) {
                while ((TIFR & (1<<TOV0)) == 0);
                PORTB ^= 0x01;
                TIFR |= 0x01;
                // TIFR |= (1<<TOV0);
        }
        return 0;
}
```

Le Timer 1

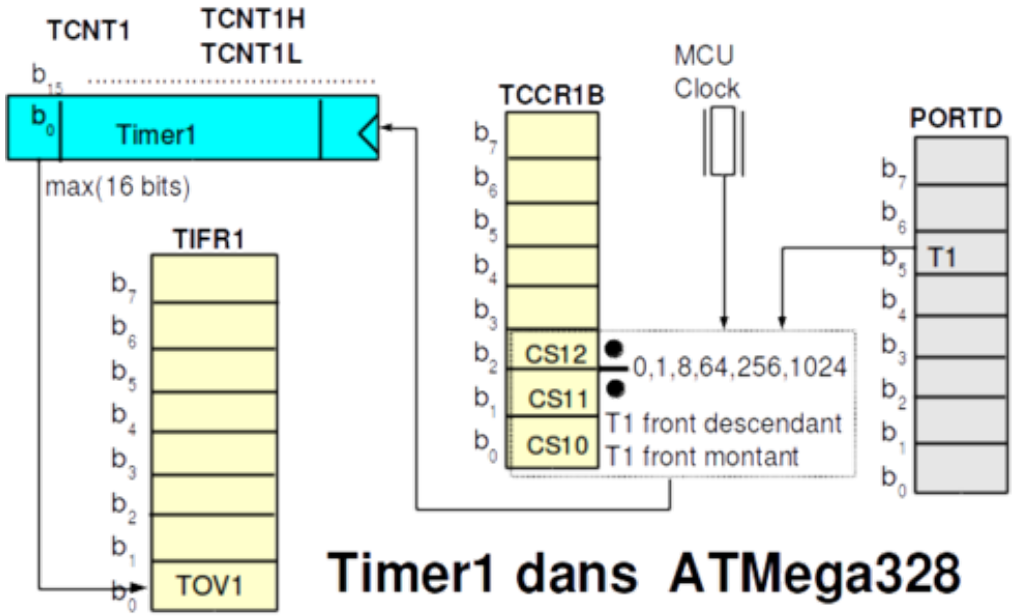

FIGURE – Le Timer 1