

MICROPROCESSADORES E MICROCONTROLADORES



TIMER_A

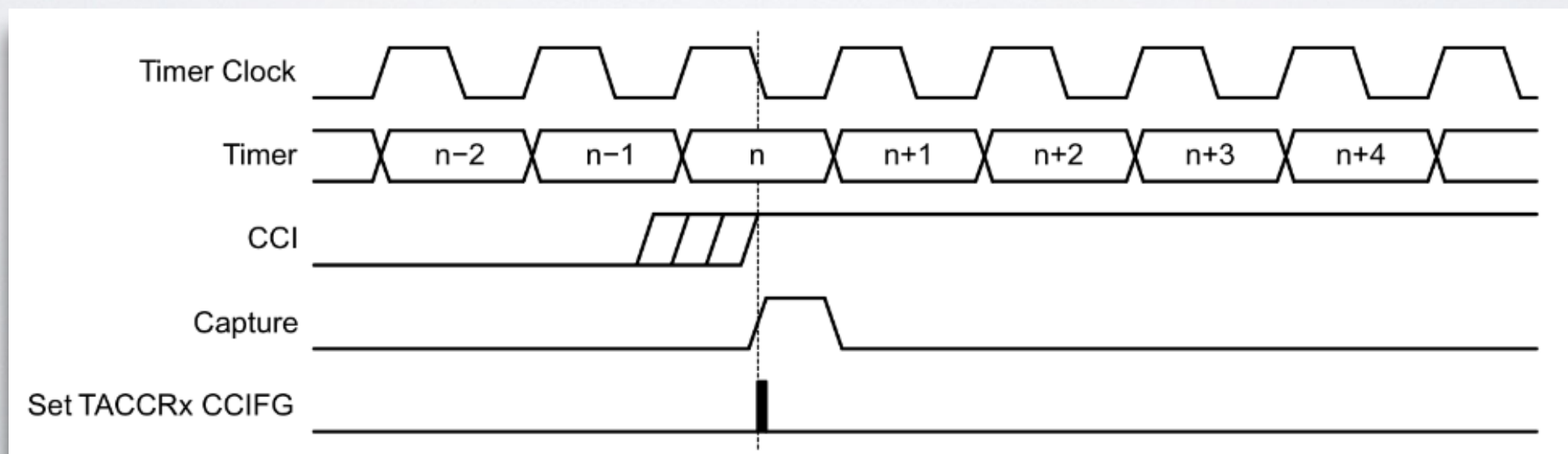
Timer mais completo do MSP430.

Registrador TAR, de 16 bits, é incrementado de acordo com o sinal de clock escolhido.

Quando TAR retorna a 0, a flag TAIFG é setada.

TIMER_A

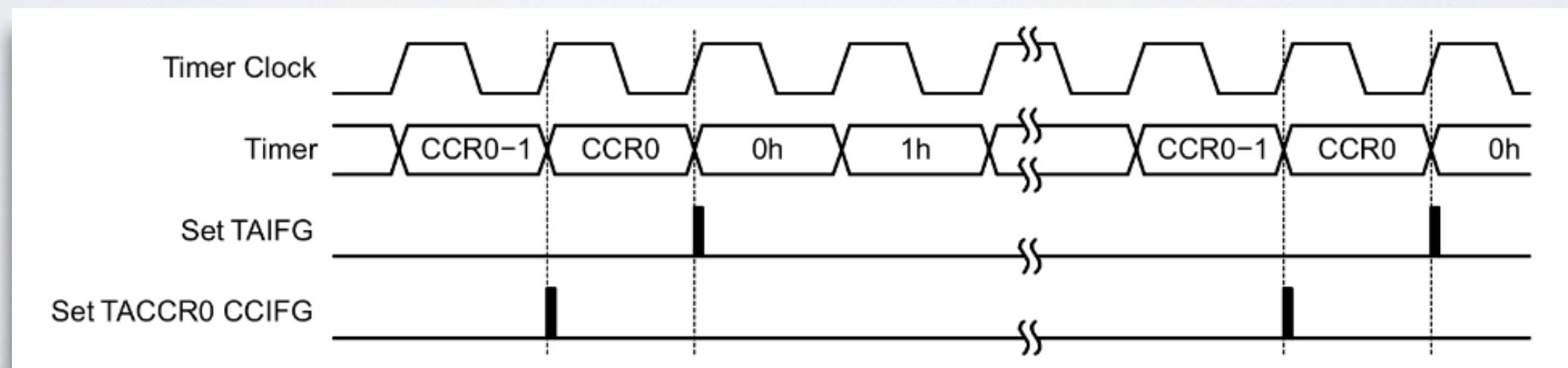
Canais de captura - é possível guardar nos registradores TACCRx o valor de TAR no instante em que muda um sinal de escolha (interno ao MSP430 ou externo). Este evento pode também gerar um interrupção.



TIMER_A

Canais de comparação - é possível mudar o valor de uma saída de escolha (interna ao MSP430 ou externa) quando $TAR = TACCRx$.

Este evento pode também gerar um interrupção.



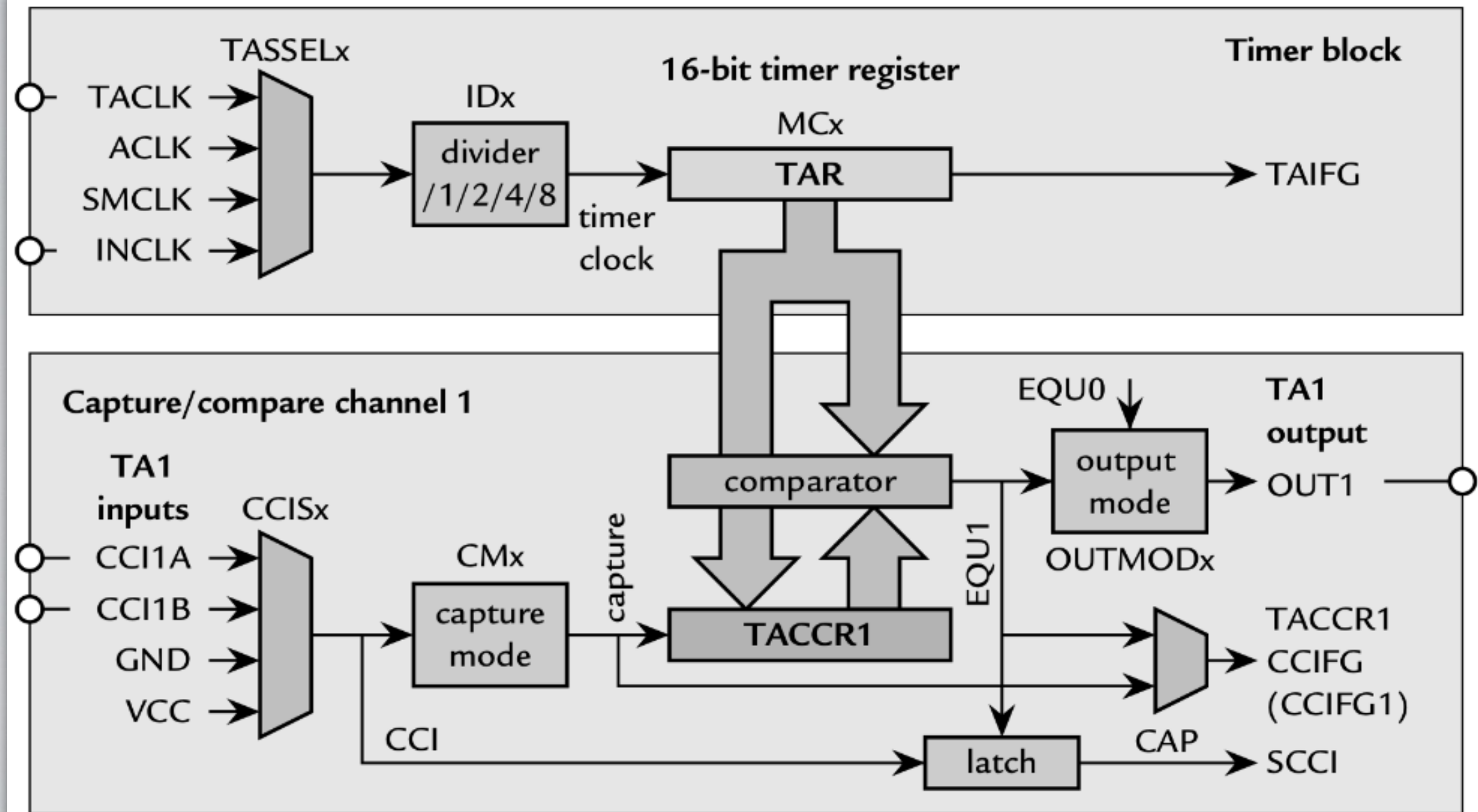
TIMER_A

O número de canais varia de acordo com a família. A maioria tem três canais, 0, 1 e 2. Todos dependem do mesmo registrador, TAR, o que garante o sincronismo entre eles.

TIMER_A

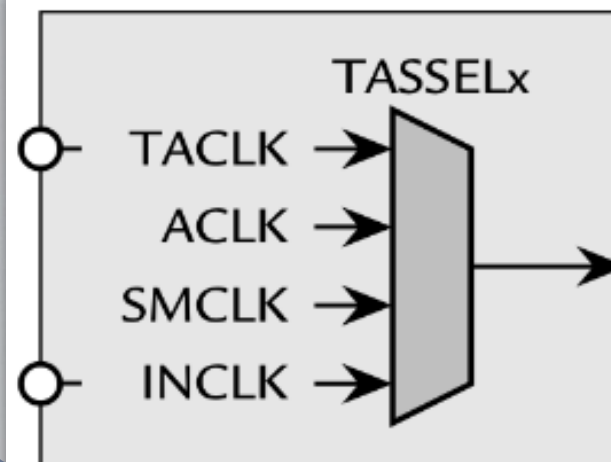
O canal 0 é especial: possui um endereço de interrupção de maior prioridade, e é usado para controlar o modo de funcionamento do Timer_A, de forma geral.

TIMER_A



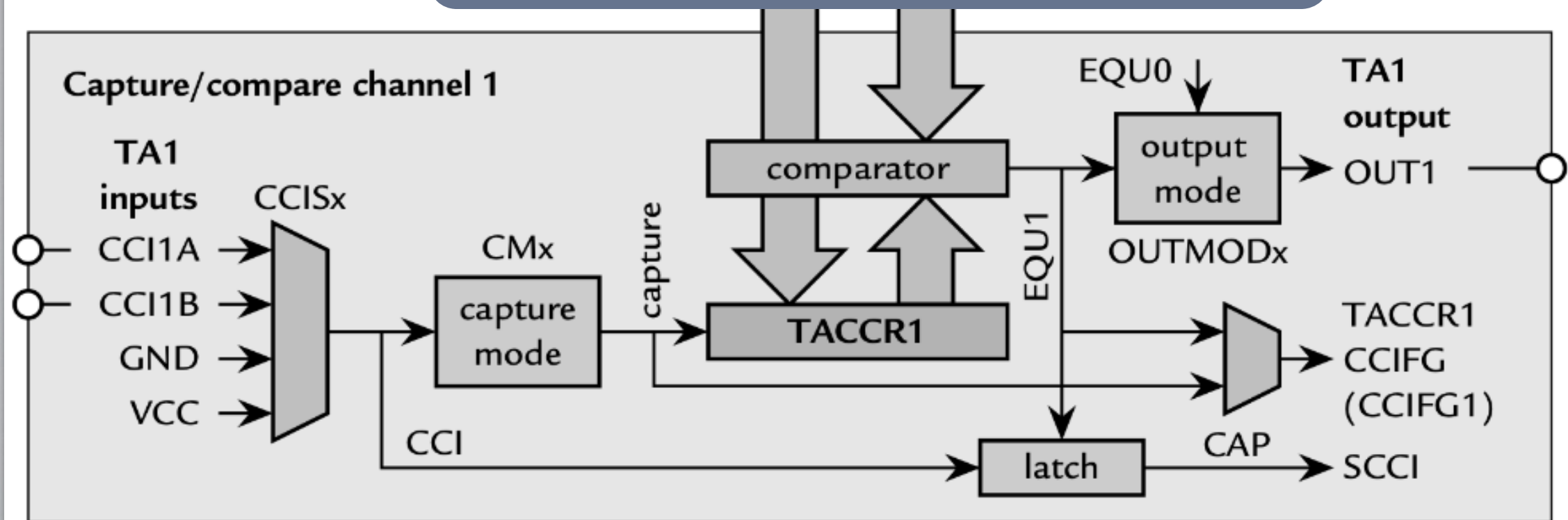
TIMER_A

Sinais de clock disponíveis, escolhidos via bits TASSELx, no registrador TACTL.



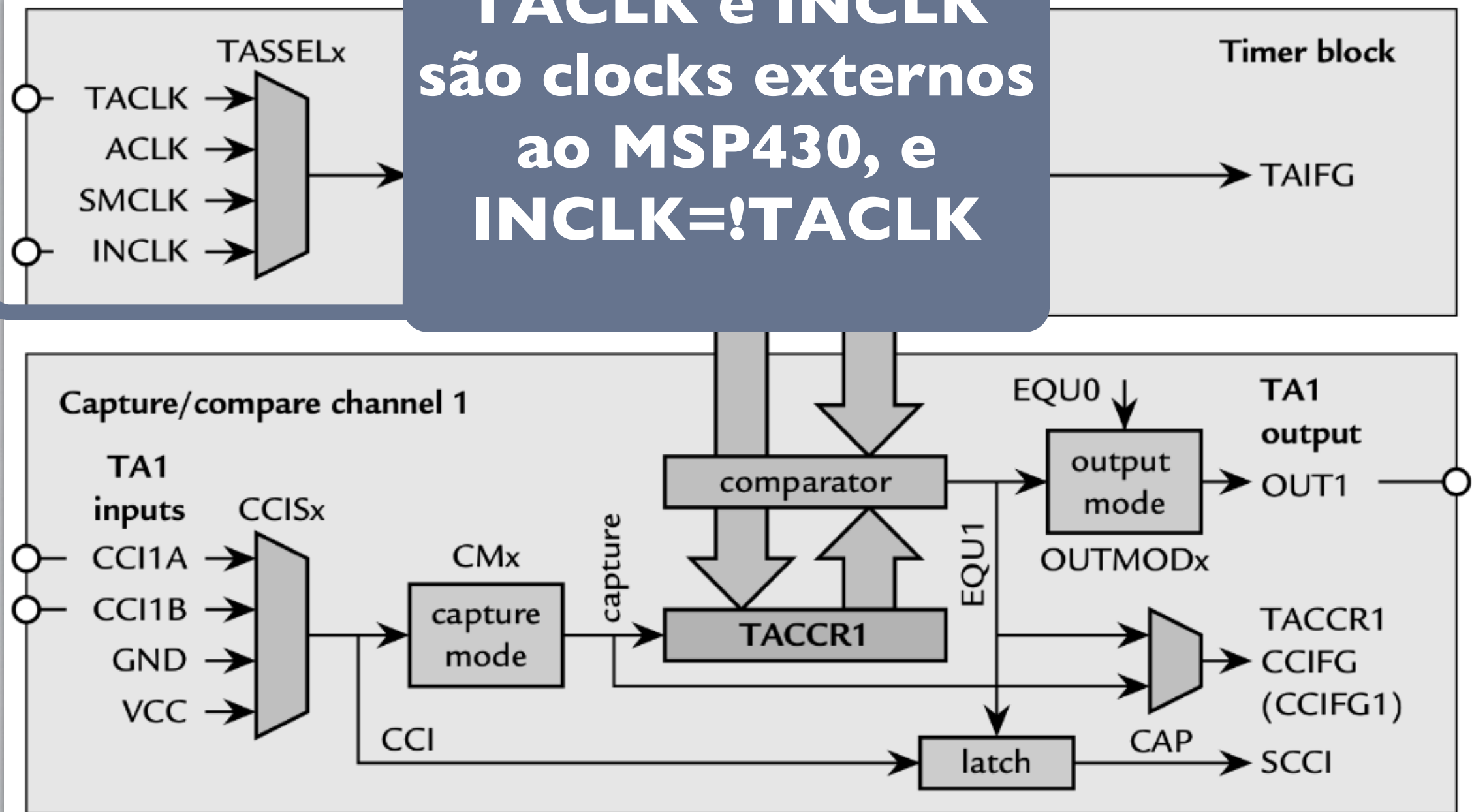
mer block

TAIFG

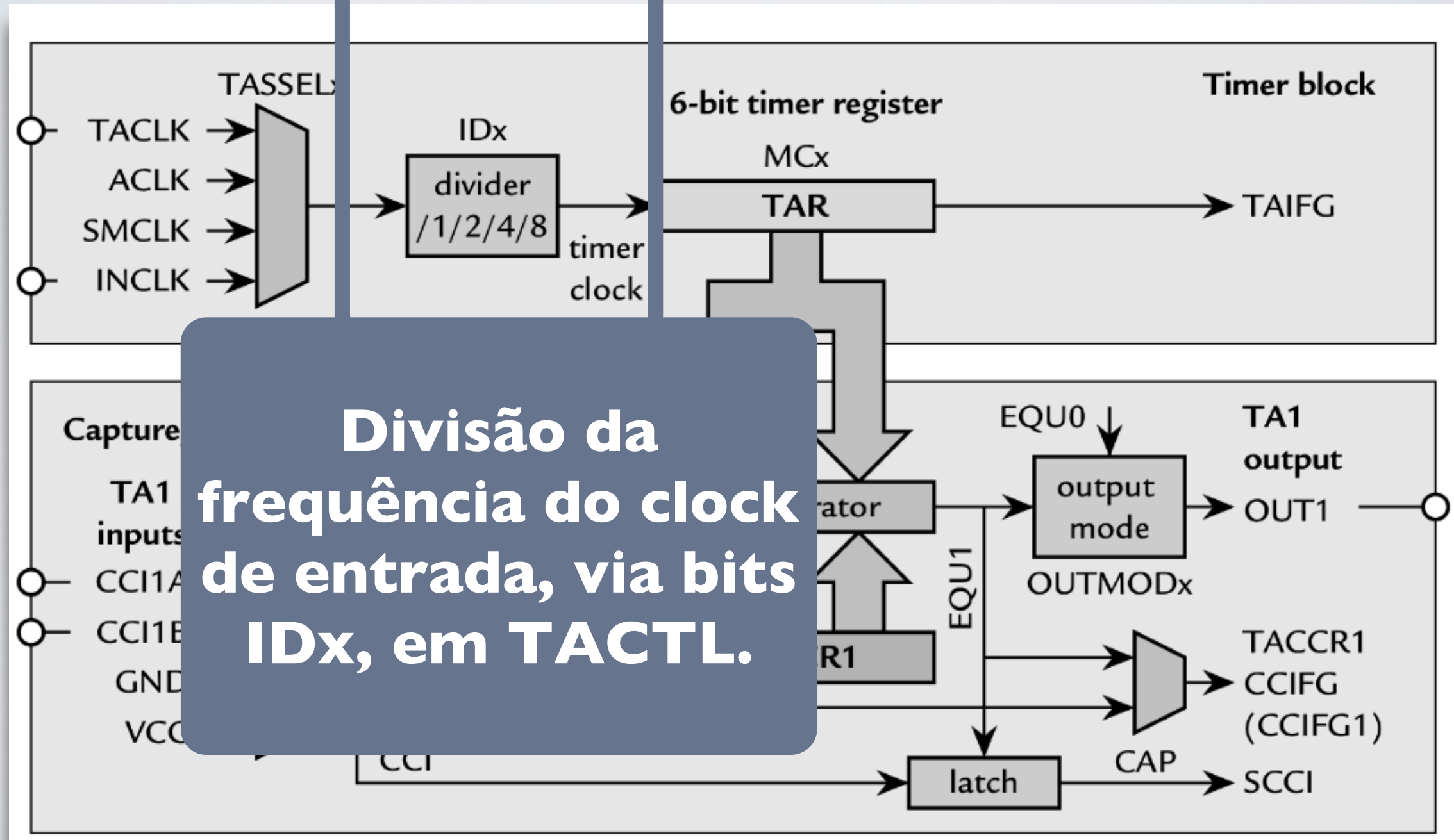


TIMER_A

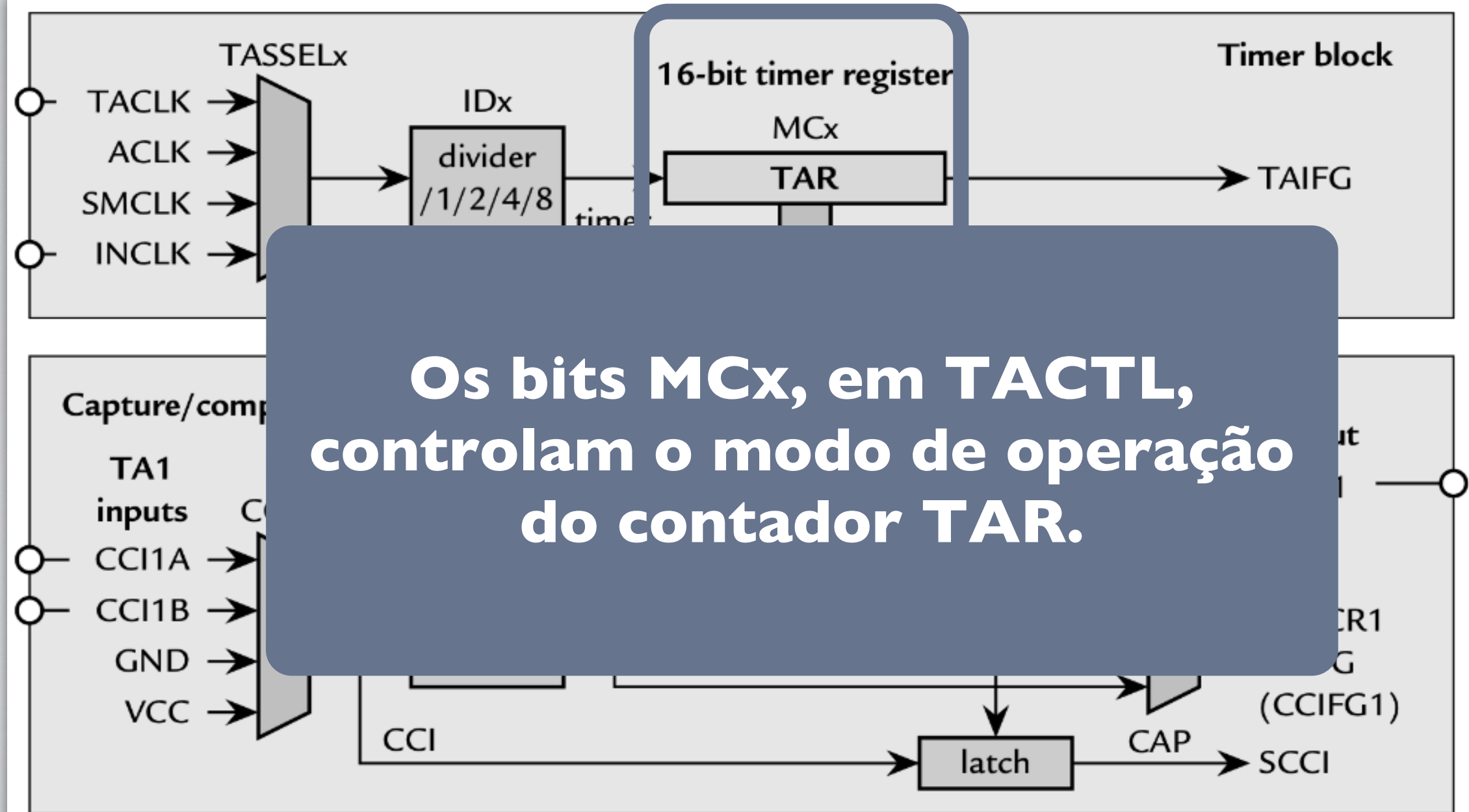
**TACLK e INCLK
são clocks externos
ao MSP430, e
INCLK=!TACLK**



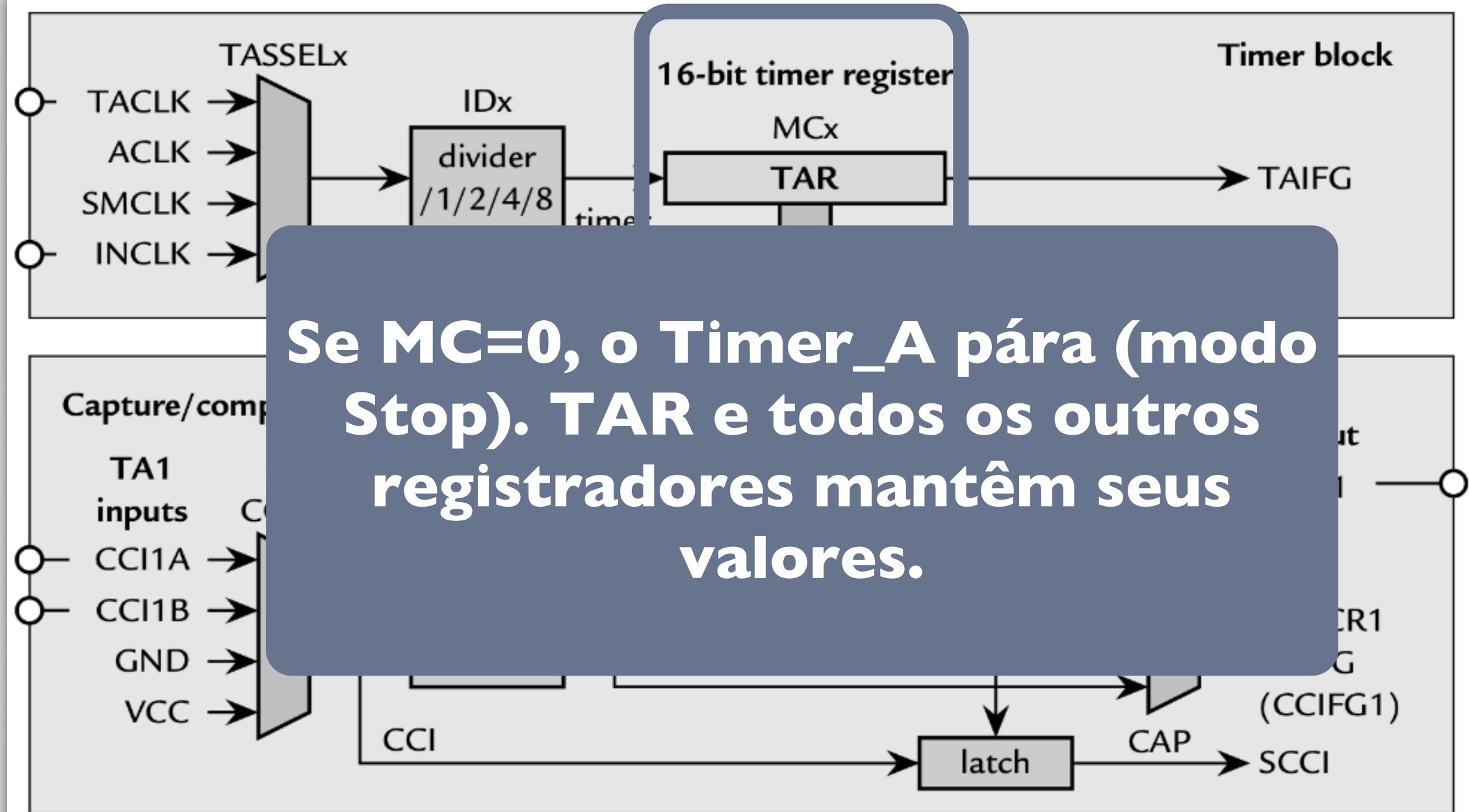
TIMER_A



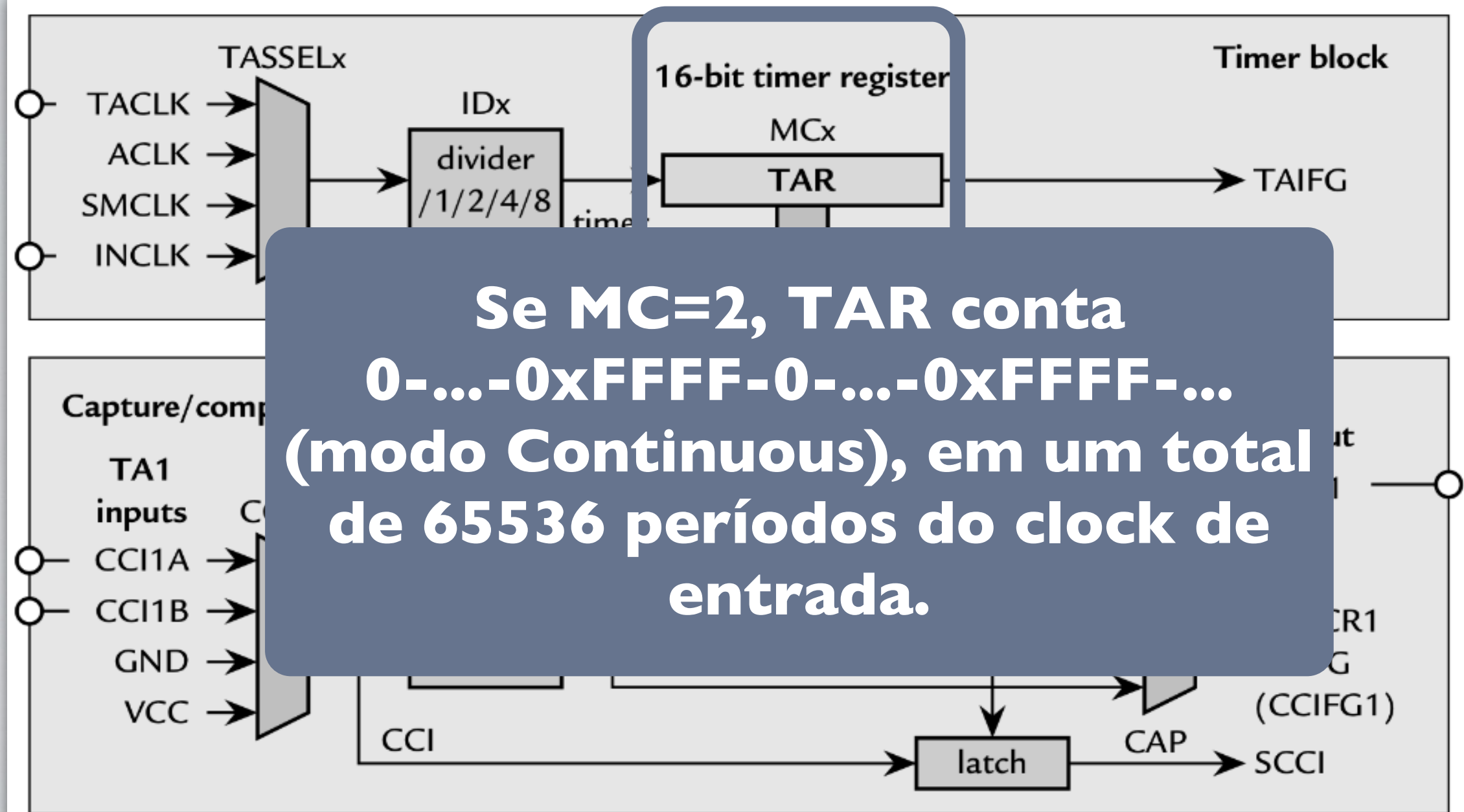
TIMER_A



TIMER_A



TIMER_A



TIMER_A

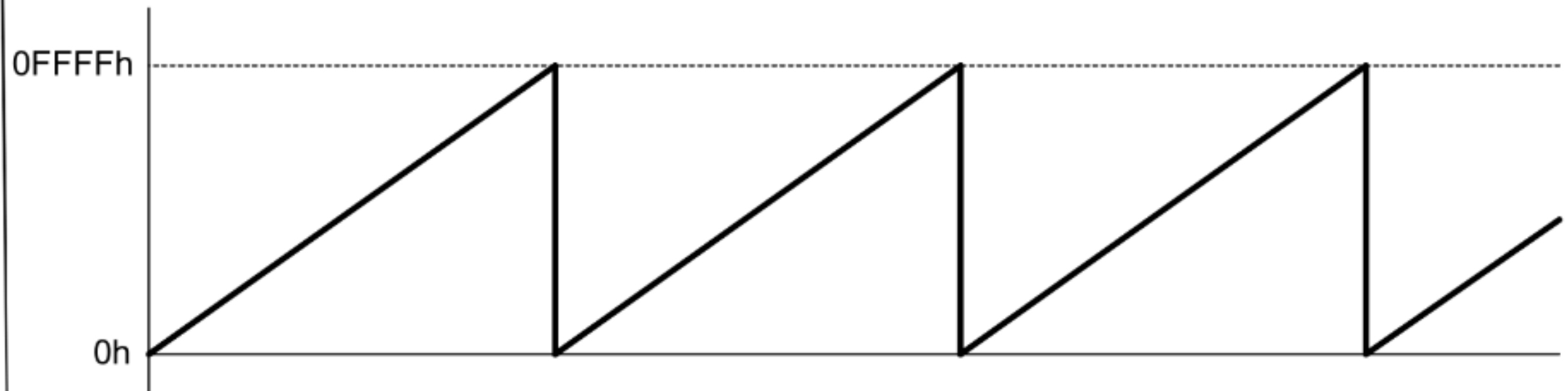
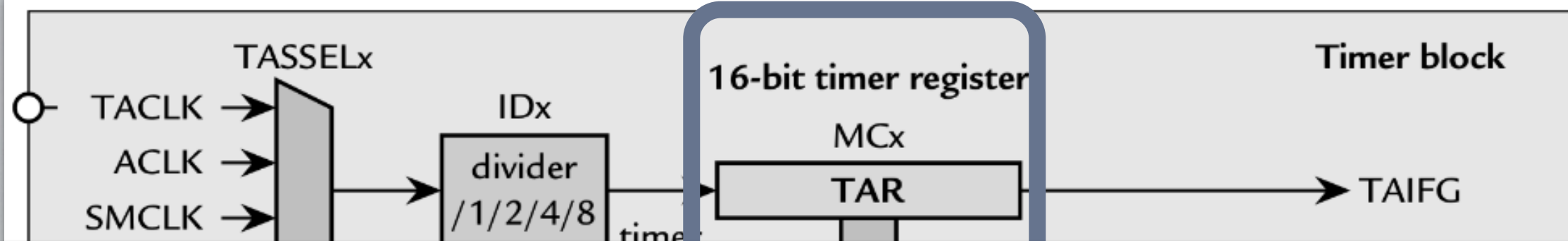
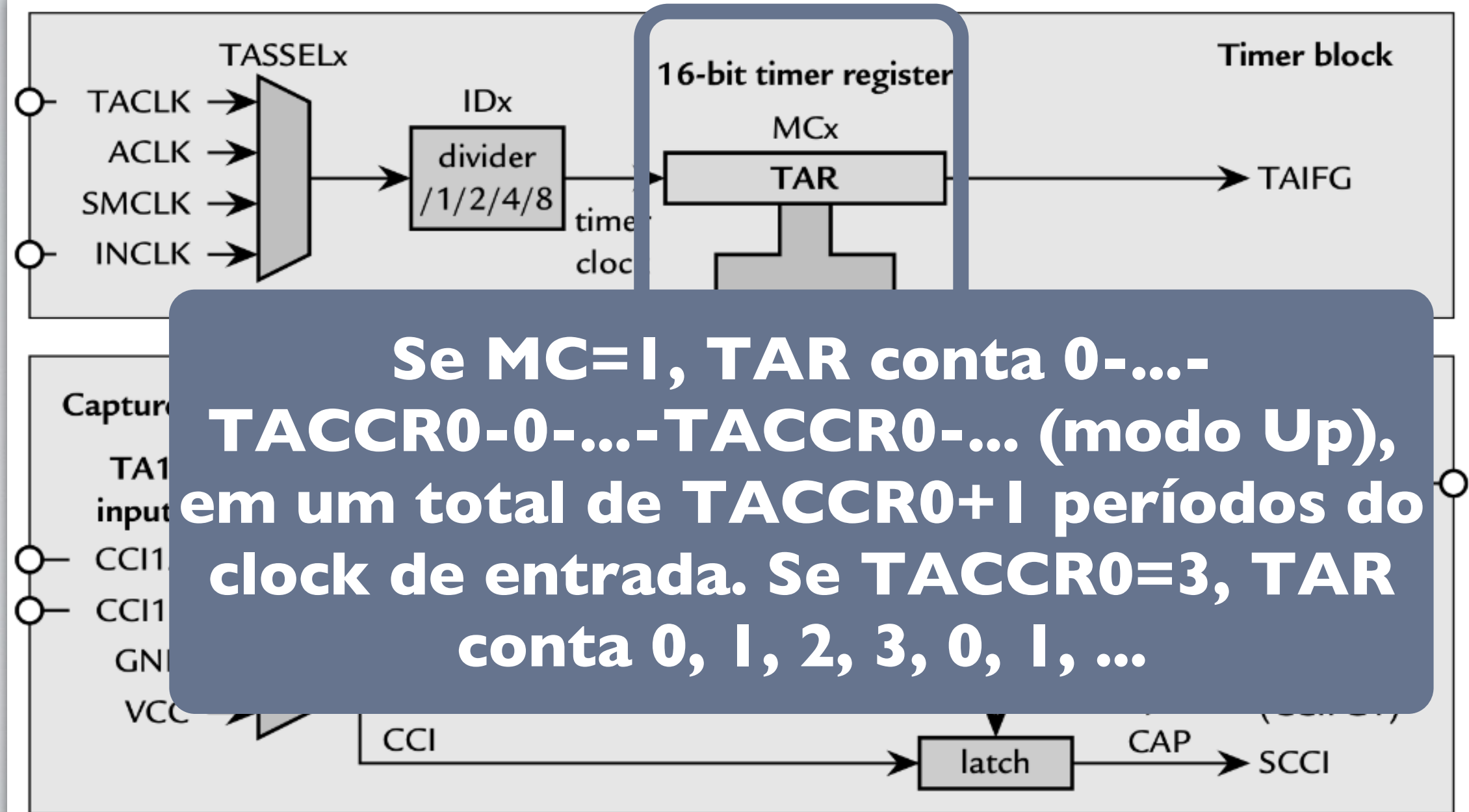


Figure 12-4. Continuous Mode

latch → SCCR

TIMER_A



TIMER_A

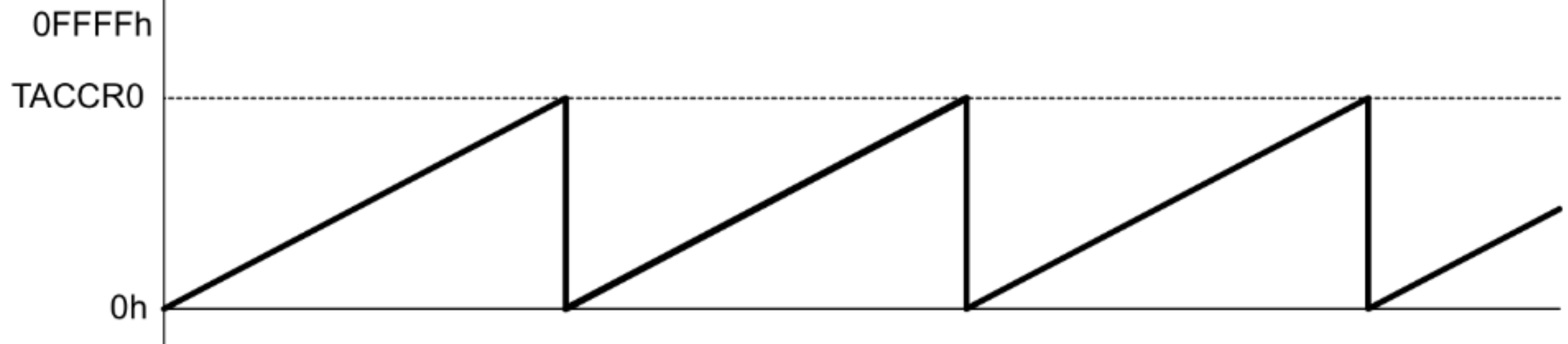
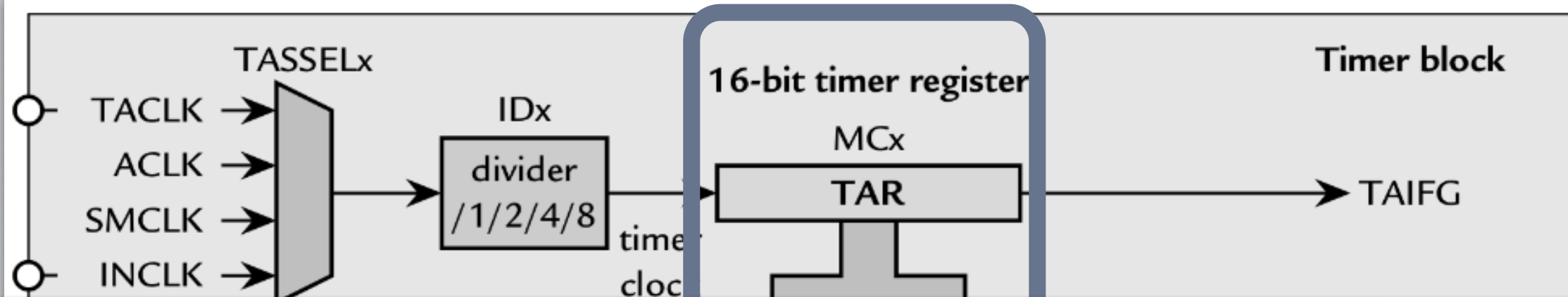
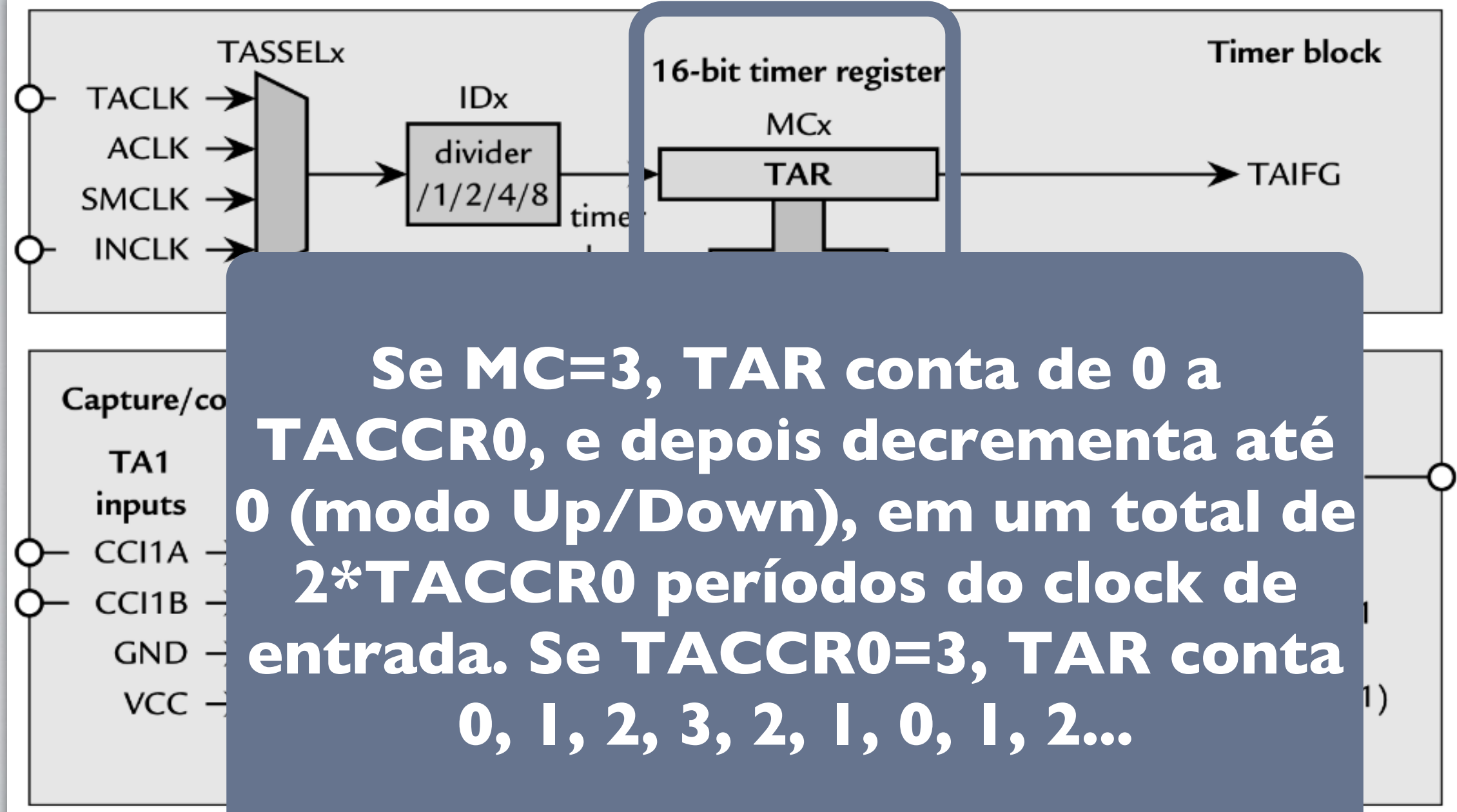


Figure 12-2. Up Mode

TIMER_A



Se MC=3, TAR conta de 0 a TACCR0, e depois decrementa até 0 (modo Up/Down), em um total de $2 \times TACCR0$ períodos do clock de entrada. Se TACCR0=3, TAR conta 0, 1, 2, 3, 2, 1, 0, 1, 2...

TIMER_A

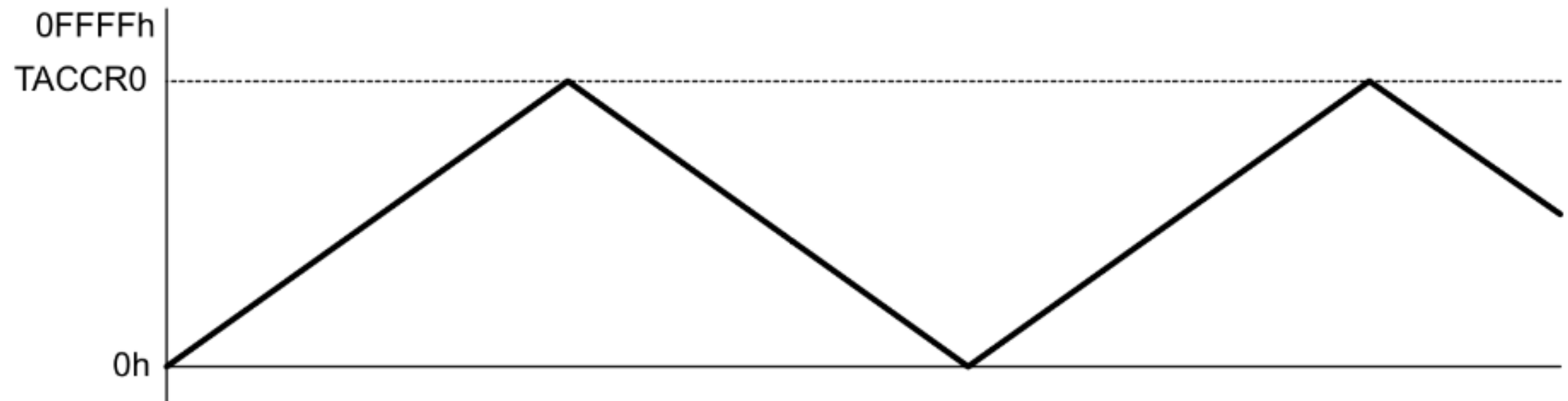
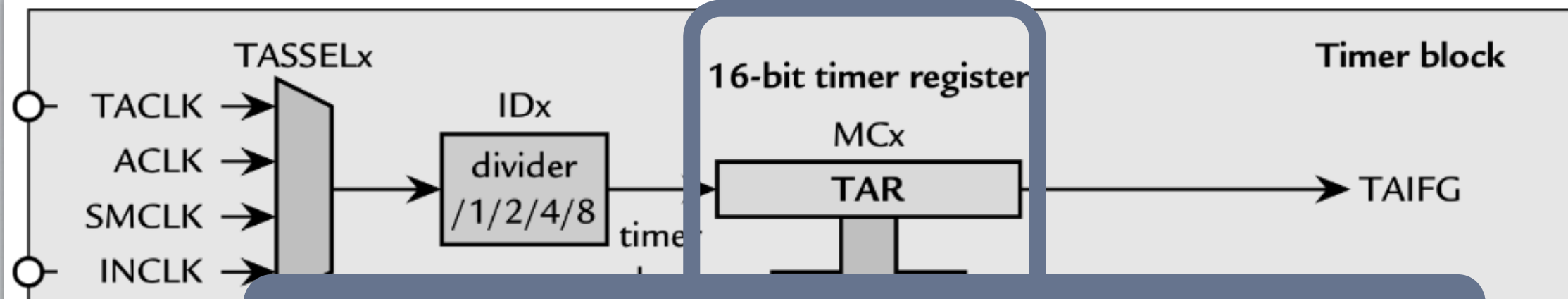
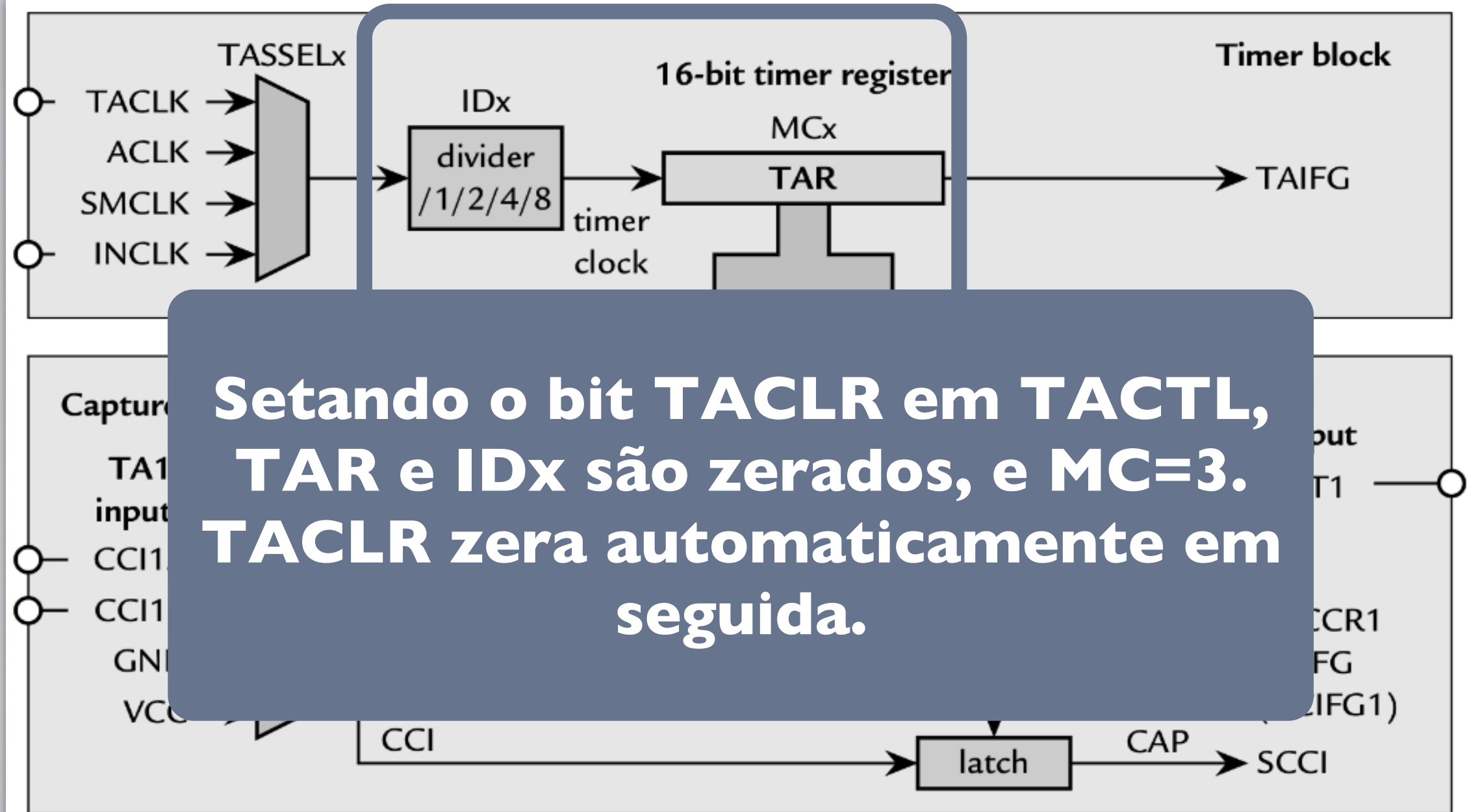
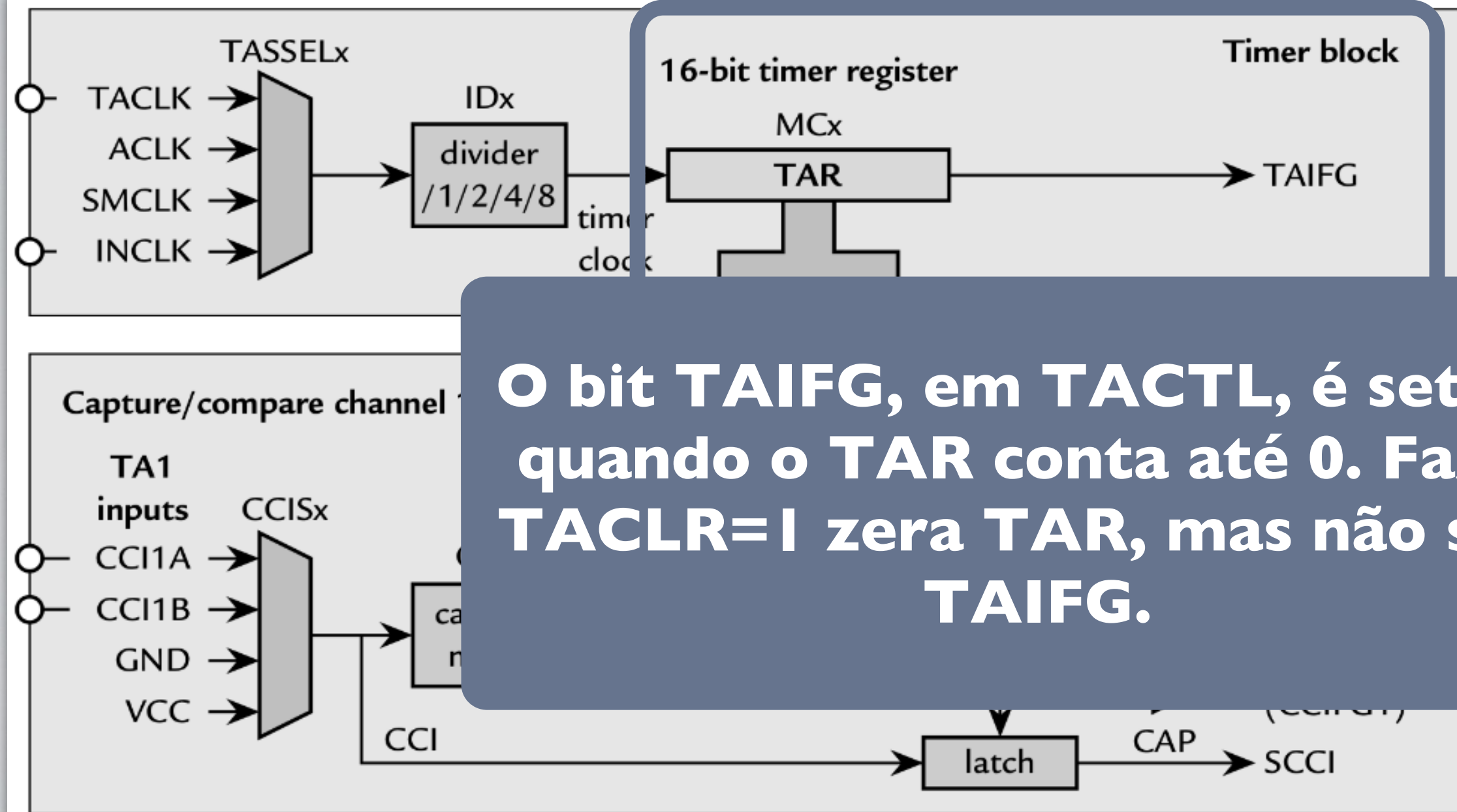


Figure 12-7. Up/Down Mode

TIMER_A

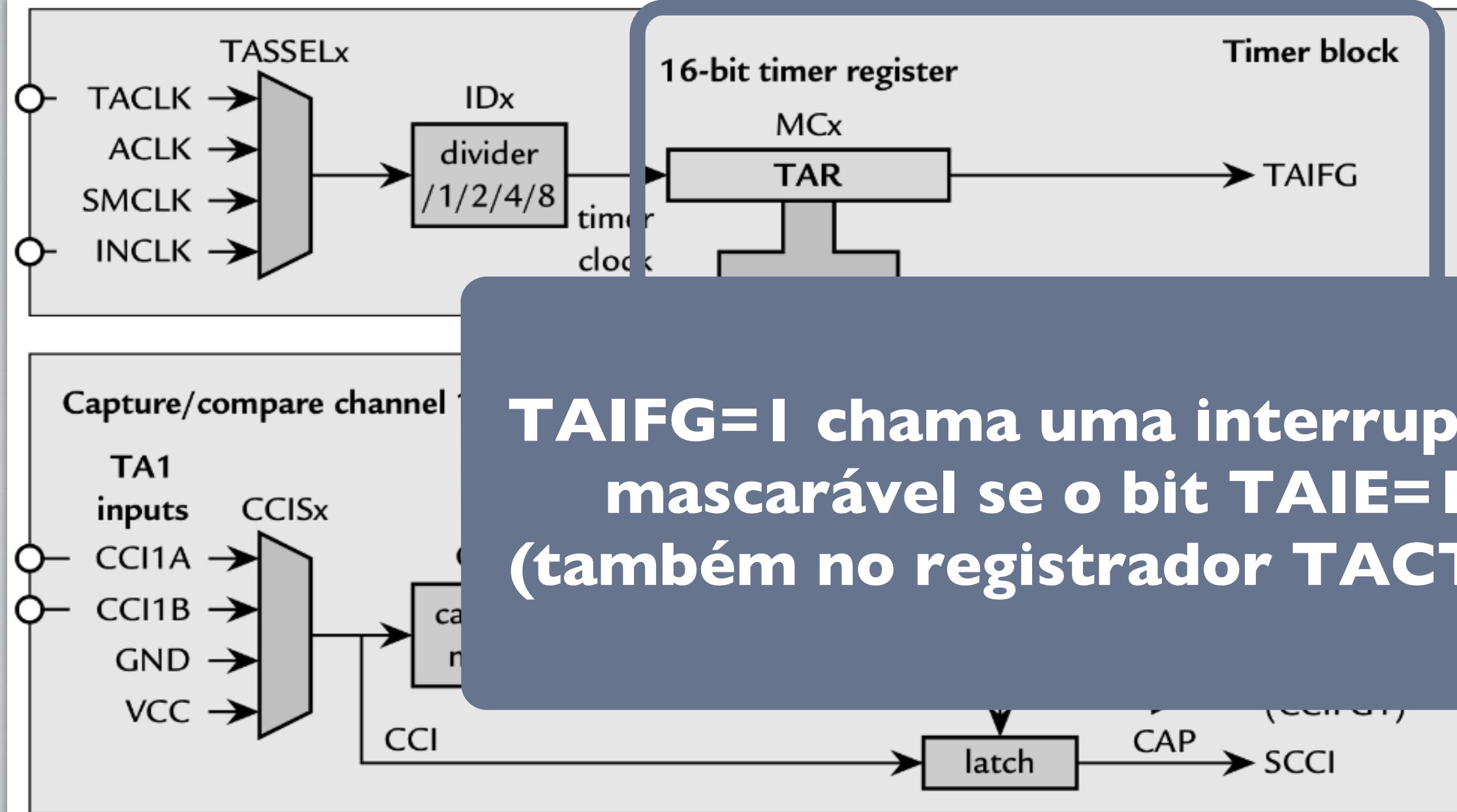


TIMER_A



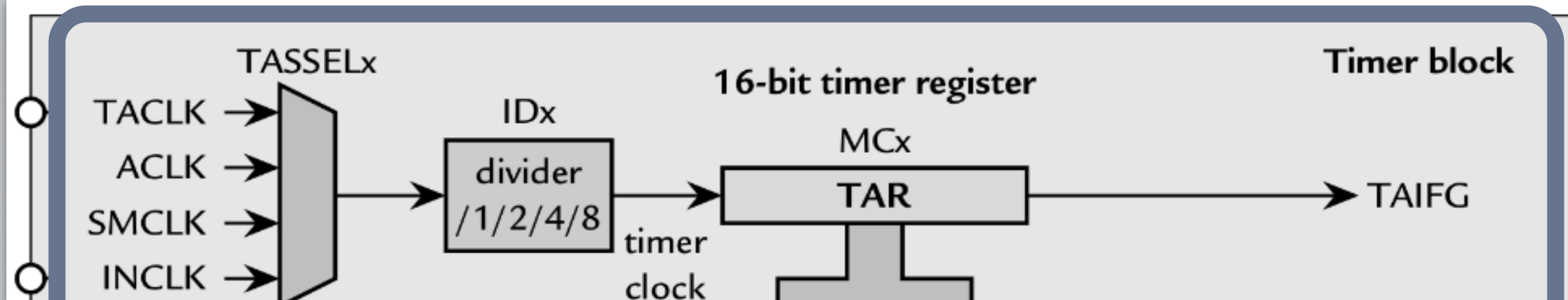
O bit TAIFG, em TACTL, é setado quando o TAR conta até 0. Fazer TACLR=1 zera TAR, mas não seta TAIFG.

TIMER_A



TAIFG=1 chama uma interrupção mascarável se o bit **TAIE=1** (também no registrador **TACTL**).

TIMER_A



É recomendado parar o Timer_A (MC=0) antes de mudar suas configurações.

