

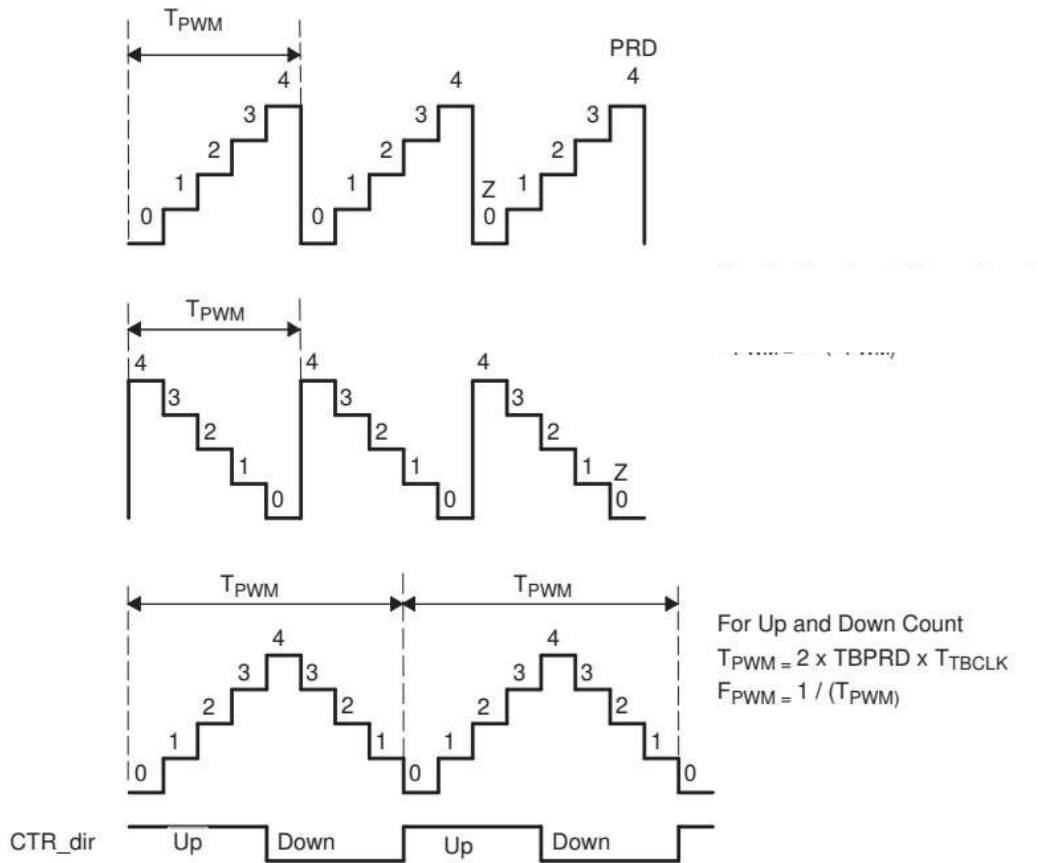
Table 3-24. Time-Base Control Register (TBCTL) Field Descriptions

Bit	Field	Value	Description
12:10	CLKDIV		Time-base Clock Prescale Bits These bits determine part of the time-base clock prescale value. $TBCLK = SYSCLKOUT / (HSPCLKDIV \times CLKDIV)$
		000	/1 (default on reset)
		001	/2
		010	/4
		011	/8
		100	/16
		101	/32
		110	/64
		111	/128

Table 3-25. Time-Base Control Register (TBCTL) Field Descriptions (continued)

Bit	Field	Value	Description
9:7	HSPCLKDIV		High Speed Time-base Clock Prescale Bits These bits determine part of the time-base clock prescale value. $TBCLK = SYSCLKOUT / (HSPCLKDIV \times CLKDIV)$ This divisor emulates the HSPCLK in the TMS320x281x system as used on the Event Manager (EV) peripheral.
		000	/1
		001	/2 (default on reset)
		010	/4
		011	/6
		100	/8
		101	/10
		110	/12
		111	/14
6	SWFSYNC	0	Software Forced Synchronization Pulse Writing a 0 has no effect and reads always return a 0.
		1	Writing a 1 forces a one-time synchronization pulse to be generated. This event is ORed with the EPWMxSYNCl input of the ePWM module. SWFSYNC is valid (operates) only when EPWMxSYNCl is selected by SYNCOSSEL = 00.
5:4	SYNCOSSEL	00	Synchronization Output Select. These bits select the source of the EPWMxSYNCO signal. EPWMxSYNC:
		01	CTR = zero: Time-base counter equal to zero (TBCTR = 0x0000)
		10	CTR = CMPB : Time-base counter equal to counter-compare B (TBCTR = CMPB)
		11	Disable EPWMxSYNCO signal

Figure 3-6. Time-Base Frequency and Period



MCU CLK:

$$f_{SYSCLKOUT} := 150 \text{ MHz}$$

$$HSPCLKDIV := \begin{bmatrix} 1 \\ 2 \\ 4 \\ 6 \\ 8 \\ 10 \\ 12 \\ 14 \end{bmatrix} \quad CLKDIV := \begin{bmatrix} 1 \\ 2 \\ 4 \\ 8 \\ 16 \\ 32 \\ 64 \\ 128 \end{bmatrix}$$

$$N := \text{length}(HSPCLKDIV) = 8$$

Frequency requirement:

$$f_{PWM} := 6400 \text{ Hz}$$

$$T_{PWM} := \frac{1}{f_{PWM}} = 156,25 \text{ } \mu\text{s}$$

$$\frac{f_{SYSCLKOUT}}{f_{PWM}} = \frac{46875}{2}$$

$$T_{SYSCLKOUT} := \frac{1}{f_{SYSCLKOUT}} = 6,6667 \text{ ns}$$

$$\frac{T_{PWM}}{T_{SYSCLKOUT}} = 23437,5$$

TIME BASE CLK:

$$T_{TBCLK} := \begin{array}{|l} \text{for } i \in [1..N] \\ \quad \text{for } j \in [1..N] \\ \quad \quad y_{ij} := \left(\frac{f_{SYSCLKOUT}}{HSPCLKDIV_i \cdot CLKDIV_j} \right)^{-1} \\ \quad \quad a_{ij} := \frac{T_{PWM}}{y_{ij}} - 1 \\ \quad \quad b_{ij} := \frac{T_{PWM}}{2 \cdot y_{ij}} \end{array}$$

y

$$T_{TBCLK} = \begin{bmatrix} 0,0067 & 0,0133 & 0,0267 & 0,0533 & 0,1067 & 0,2133 & 0,4267 & 0,8533 \\ 0,0133 & 0,0267 & 0,0533 & 0,1067 & 0,2133 & 0,4267 & 0,8533 & 1,7067 \\ 0,0267 & 0,0533 & 0,1067 & 0,2133 & 0,4267 & 0,8533 & 1,7067 & 3,4133 \\ 0,04 & 0,08 & 0,16 & 0,32 & 0,64 & 1,28 & 2,56 & 5,12 \\ 0,0533 & 0,1067 & 0,2133 & 0,4267 & 0,8533 & 1,7067 & 3,4133 & 6,8267 \\ 0,0667 & 0,1333 & 0,2667 & 0,5333 & 1,0667 & 2,1333 & 4,2667 & 8,5333 \\ 0,08 & 0,16 & 0,32 & 0,64 & 1,28 & 2,56 & 5,12 & 10,24 \\ 0,0933 & 0,1867 & 0,3733 & 0,7467 & 1,4933 & 2,9867 & 5,9733 & 11,9467 \end{bmatrix} \mu s$$

TIME BASE PERIOD, UP:

$$TBPRD_A := \begin{array}{|l} \text{for } i \in [1..N] \\ \quad \text{for } j \in [1..N] \\ \quad \quad y_{ij} := \left(\frac{f_{SYSCLKOUT}}{HSPCLKDIV_i \cdot CLKDIV_j} \right)^{-1} \\ \quad \quad a_{ij} := \frac{T_{PWM}}{y_{ij}} - 1 \\ \quad \quad b_{ij} := \frac{T_{PWM}}{2 \cdot y_{ij}} \end{array}$$

a

TIME BASE PERIOD, UP-DOWN:

$$TBPRD_B := \begin{array}{|l} \text{for } i \in [1..N] \\ \quad \text{for } j \in [1..N] \\ \quad \quad y_{ij} := \left(\frac{f_{SYSCLKOUT}}{HSPCLKDIV_i \cdot CLKDIV_j} \right)^{-1} \\ \quad \quad a_{ij} := \frac{T_{PWM}}{y_{ij}} - 1 \\ \quad \quad b_{ij} := \frac{T_{PWM}}{2 \cdot y_{ij}} \\ \quad b \end{array}$$

$$TBPRD_A = \begin{bmatrix} 23436,5 & 11717,75 & 5858,37 & 2928,69 & 1463,84 & 731,42 & 365,21 & 182,11 \\ 11717,75 & 5858,37 & 2928,69 & 1463,84 & 731,42 & 365,21 & 182,11 & 90,55 \\ 5858,37 & 2928,69 & 1463,84 & 731,42 & 365,21 & 182,11 & 90,55 & 44,78 \\ 3905,25 & 1952,12 & 975,56 & 487,28 & 243,14 & 121,07 & 60,04 & 29,52 \\ 2928,69 & 1463,84 & 731,42 & 365,21 & 182,11 & 90,55 & 44,78 & 21,89 \\ 2342,75 & 1170,88 & 584,94 & 291,97 & 145,48 & 72,24 & 35,62 & 17,31 \\ 1952,12 & 975,56 & 487,28 & 243,14 & 121,07 & 60,04 & 29,52 & 14,26 \\ 1673,11 & 836,05 & 417,53 & 208,26 & 103,63 & 51,32 & 25,16 & 12,08 \end{bmatrix}$$

$$TBPRD_B = \begin{bmatrix} 11718,75 & 5859,38 & 2929,69 & 1464,84 & 732,42 & 366,21 & 183,11 & 91,55 \\ 5859,38 & 2929,69 & 1464,84 & 732,42 & 366,21 & 183,11 & 91,55 & 45,78 \\ 2929,69 & 1464,84 & 732,42 & 366,21 & 183,11 & 91,55 & 45,78 & 22,89 \\ 1953,13 & 976,56 & 488,28 & 244,14 & 122,07 & 61,04 & 30,52 & 15,26 \\ 1464,84 & 732,42 & 366,21 & 183,11 & 91,55 & 45,78 & 22,89 & 11,44 \\ 1171,87 & 585,94 & 292,97 & 146,48 & 73,24 & 36,62 & 18,31 & 9,16 \\ 976,56 & 488,28 & 244,14 & 122,07 & 61,04 & 30,52 & 15,26 & 7,63 \\ 837,05 & 418,53 & 209,26 & 104,63 & 52,32 & 26,16 & 13,08 & 6,54 \end{bmatrix}$$