

TI C2000 Toolbox ePWM (Generic)

This document describes *ePWM* (Generic) component from TI C2000 Toolbox library.

Short description

Pulse-Width Modulator is the most important peripheral in many of the power electronic systems. *ePWM* (Generic) component enables user to configure the peripheral in order to generate desired gate driving signals in a simplified way without direct interaction with bitfields and registers. It supports several functionalities, such as:

- Variable carrier frequency;
- Variable carrier phase;
- Synchronizing multiple *ePWM* modules,
- ADC start-of-conversion trigger,
- Interrupt.

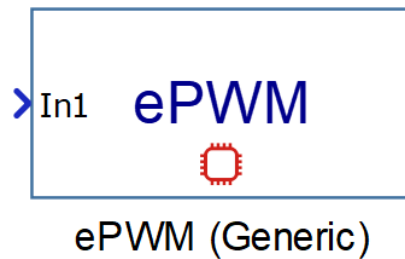


Figure 1. *ePWM* component icon.

Detailed overview

Properties are grouped in tabs named after *ePWM* submodules.

NOTE: It is recommended to select *target platform* on [TI C2000 Setup](#) component, *interface type* and *controller index* before configuring the component.

Component properties:

- Tab **HIL:**
 - HIL DI number – select digital input(s) of the HIL device where pwm signals will be applied. Combo values depend of *Number of channels* in *PWM* tab. Channel B signal of each *ePWM* module is applied to next HIL digital input (e.g. HIL DI 1&2).
- Tab **HIL Interface:**
 - Interface type - select interface board that is used, currently supported boards are '*HIL TI Launchpad Interface*' and '*HIL TI uGrid Launchpad Interface*', '*HIL DSP 180 Interface*' and '*HIL DSP Interface*'.

- Controller index - visible when '*HIL TI uGrid Launchpad Interface*' is selected, specifies which MCU slot on the interface board is used.
- **Tab PWM:**
 - Number of channels – select number of ePWM modules to be used,
 - Operation mode – fixed or variable carrier signal frequency,
 - Phase operation mode – fixed or variable carrier signal phase offset, visible only when *Number of channels* is more than one.
 - Frequency – carrier signal frequency value in Hz, visible if *Operation mode* is set to 'fixed carrier frequency',
 - Carrier phase offset – carrier signal phase offset value relative to previous ePWM module in degrees, visible if *Phase operation mode* is set to 'Fixed carrier phase offset',
 - Dead time – dead time value in seconds,
 - Load mode – timing of duty cycle value loading from shadow register to counter-compare register – on carrier signal minimum, maximum or either values. Recommended to use.
- **Tab Extras:**
 - ADC trigger enabled – enabled synchronous ADC sampling trigger when counter equals zero,
 - Interrupt enabled – enabled interrupt trigger when counter equals zero.

Selected HIL DI number(s) is mapped to corresponding MCU digital pin according to the selected [interface board](#). Currently supported interface boards are [HIL TI Launchpad Interface](#) and [HIL TI uGrid Launchpad Interface](#), [HIL DSP 180 Interface](#) and [HIL DSP Interface](#).

Component inputs:

- In1, In2... – duty cycle [0, 1] – one input per *Number of channels* for each channel,
- freq – carrier frequency In Hz, visible only when *Operation mode* is set to 'Variable carrier frequency',
- offset2, 3... – carrier phase offset in degrees relative to previous module in case of multiple synchronized ePWM modules, visible only when *Phase operation mode* is set to 'Variable carrier phase offset'.

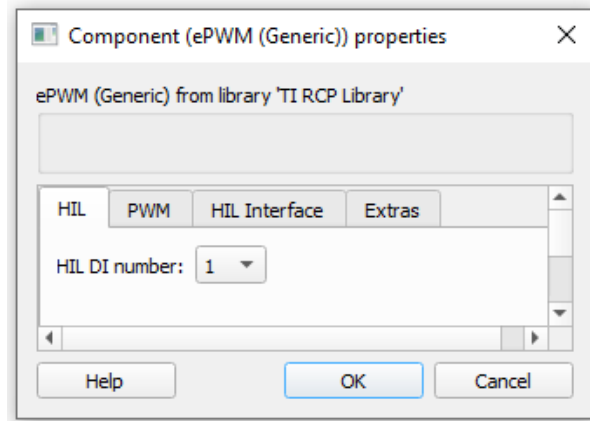


Figure 2. ePWM (Generic) component dialog - HIL tab.

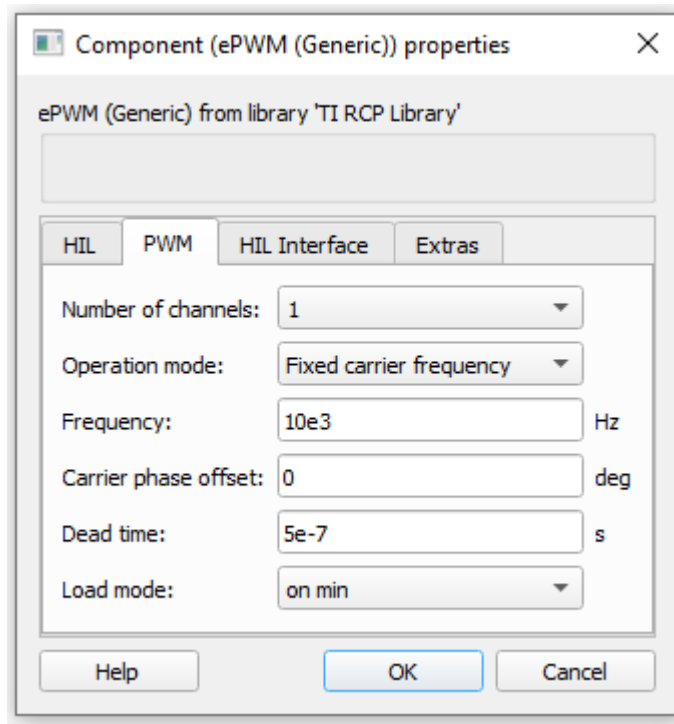


Figure 3. ePWM (Generic) component dialog - PWM tab.

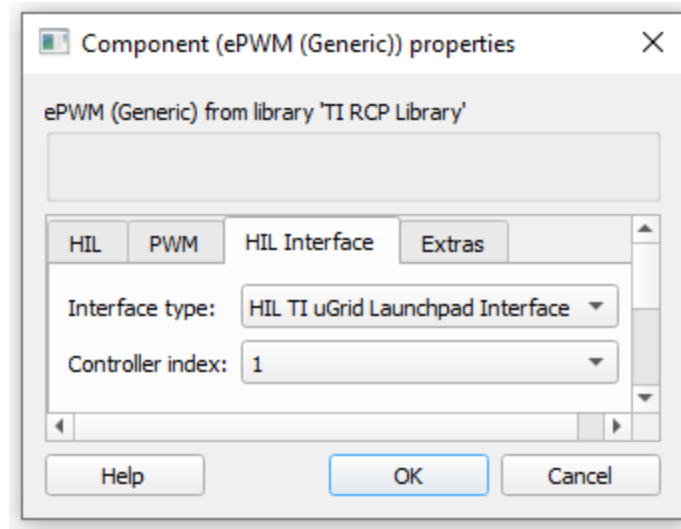


Figure 4. ePWM (Generic) component dialog – HIL Interface tab.

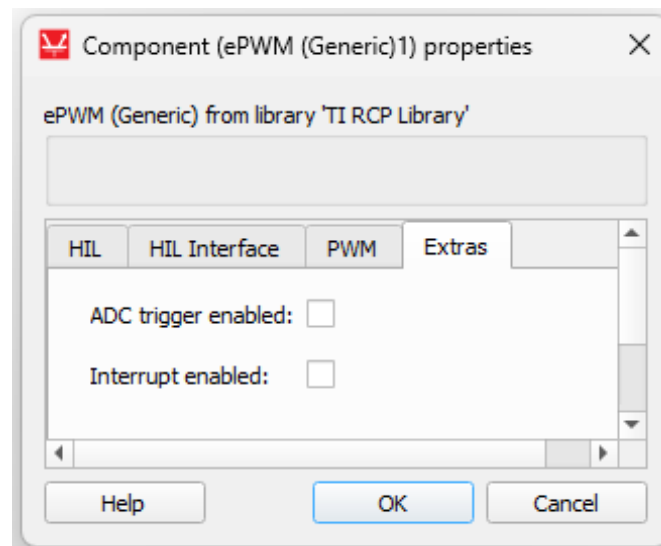


Figure 5. ePWM (Generic) component dialog - Extras tab.