

TI C2000 Toolbox eQEP

This document describes eQEP component from TI C2000 Toolbox library.

Short description

eQEP component enables the user to acquire data for machine position and speed sensing. It processes digital signals by sampling the digital inputs of MCU *Enhanced Quadrature Encoder Pulse* peripheral. These types of signals typically come from incremental encoder that is attached to the machine rotor shaft.

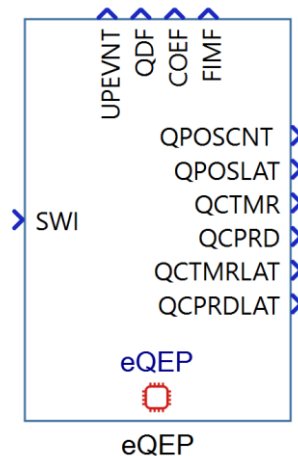


Figure 1. eQEP component icon.

Detailed overview

Component tabs are grouped according to the main eQEP peripheral submodules (see [TI Technical Reference Manual](#)).

NOTE: Machine encoder resolution must be considered when parametrizing the eQEP component!

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

Component properties:

- Tab **General**:
 - Module – select the eQEP module (1 or 2),
 - Execution rate – rate of applying data to component outputs
- Tabs **Position counter**, **Unit timer**, **Capture unit**:
 - Property labels contain names of relevant bitfields/registers to which properties are mapped, for detailed explanation see [TI Technical Reference Manual](#).

- **Tab Outputs**

- Each property is a checkbox which indicates whether the register value is read. For every checked output, separate output port is created on the component and the value of the corresponding register/bitfield is applied.
- Values stored into selected (checked) registers from this tab are applied to component outputs on execution rate. Counter and latched counter register values are applied to terminals on the right side, while selected flag (status) register values are applied to terminal on the top side of the component icon.

Ports:

- **Outputs**

- QPOSCNT – position counter register – number of counted events,
- QPOSLAT – position counter register value latched on a unit time out event,
- QCTMR – timer value for edge capture unit,
- QCPRD – capture period value between the last successive edge events,
- QCTMRLAT – capture timer value latched on event defined by *QCLM* property,
- QCPRDLAT – capture period value latched on event defined by *QCLM* property,
- UPEVNT – edge event flag, indicates whether a edge event is detected,
- QDF – direction flag – 0 for CCW rotation and 1 for CW rotation,
- COEF – capture timer overflow error flag,
- FIMF – first index marker flag, it is set by the first occurrence of index pulse. Once this flag has been set, if the flag is cleared the flag will not be set again until the module is reset by a peripheral or system reset.

- **Inputs**

- SWI – Software position counter initialization. A signal with rising edge aligned with the simulation start should be connected to this input (most commonly, a digital output of the HIL device that is always in high state during the simulation will change its state from low to high on simulation start). This signal resets the value of the position counter register (*QPOSCNT*). The reason behind this is the fact that motor position resets before simulation starts, but the DSP is not aware of that so the old, non-zero position counter register value does not correspond to the rotor position which can cause unexpected behavior.

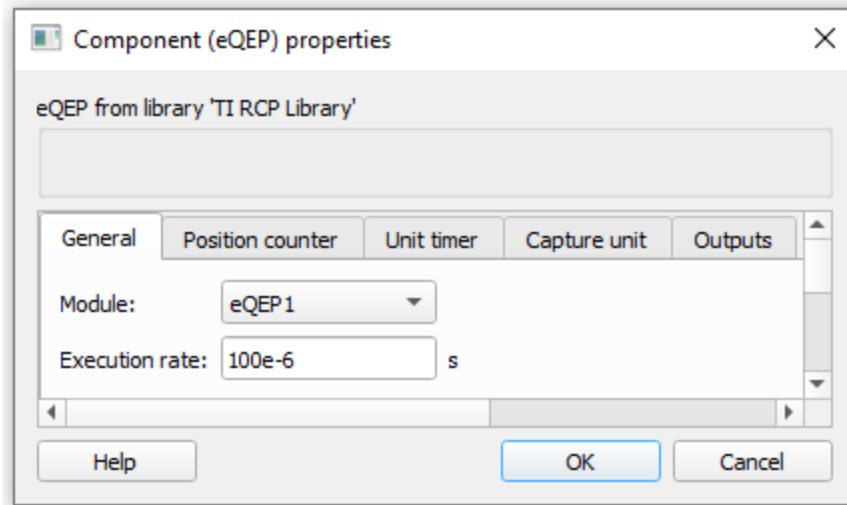


Figure 2. eQEP component dialog - General tab.

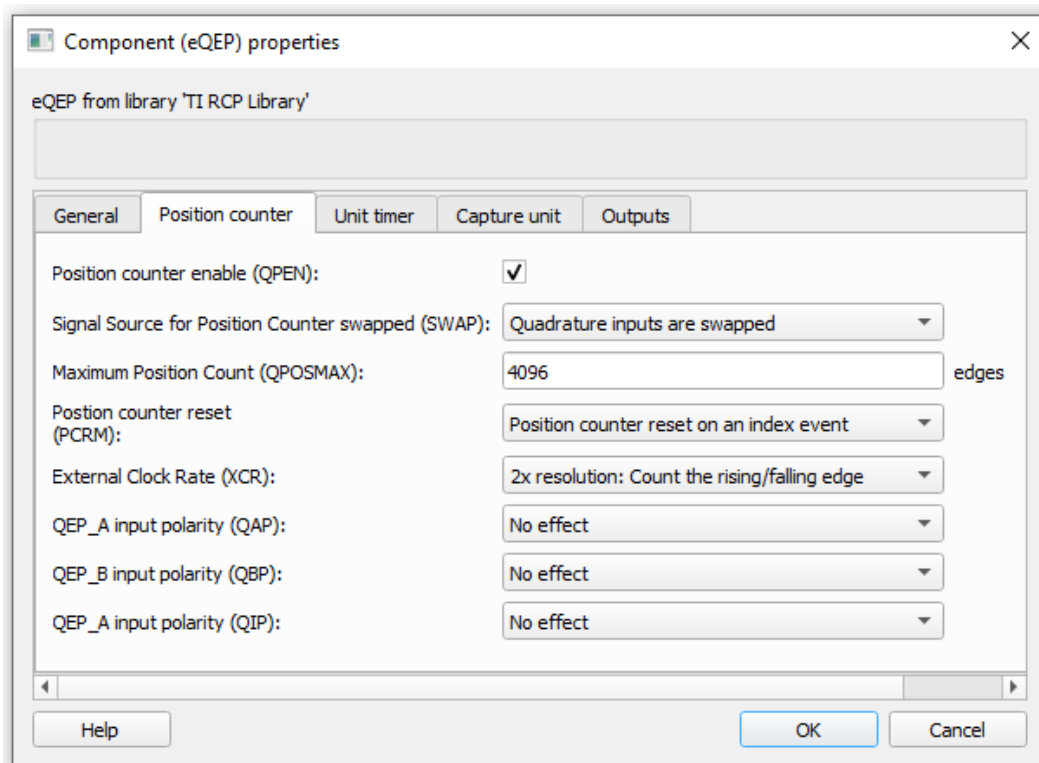


Figure 3. eQEP component dialog - Position counter tab.

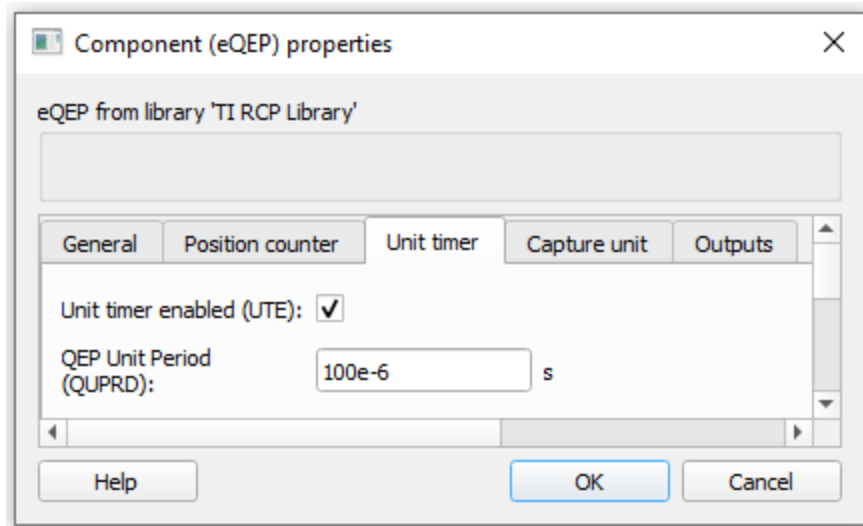


Figure 4. eQEP component dialog - Unit timer tab.

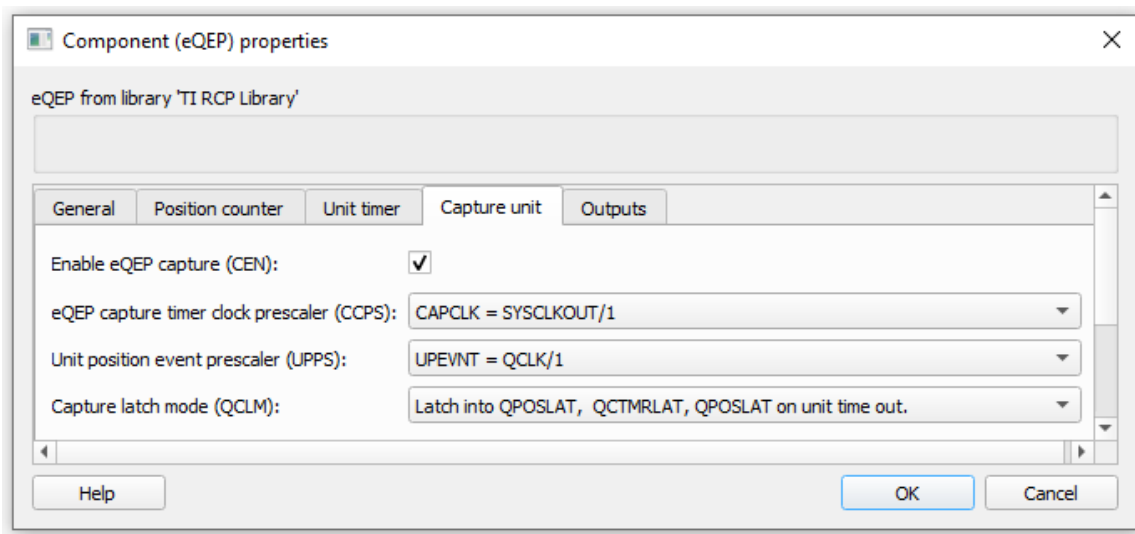


Figure 5. eQEP component dialog - Capture unit tab.

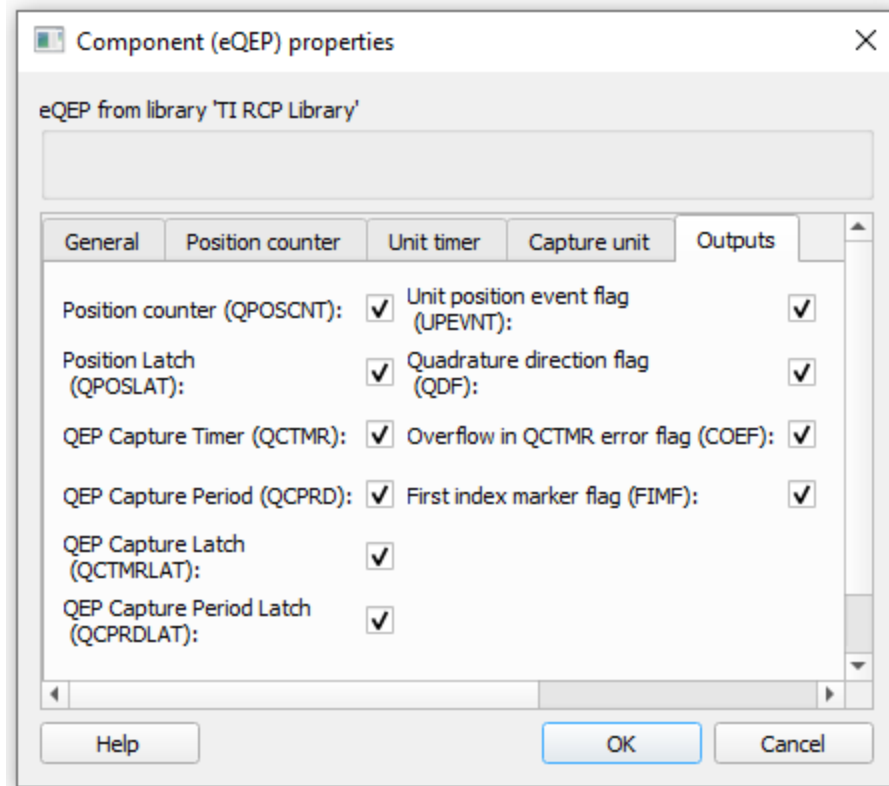


Figure 6. eQEP component dialog - Outputs tab.