

IOM

Input Output Monitor

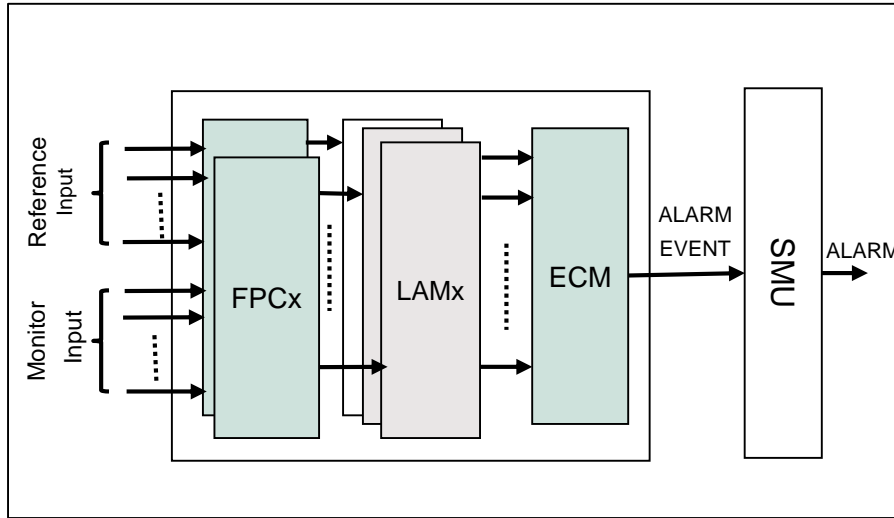
AURIX™ TC2xx Microcontroller Training
V1.0 2019-03



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IOM

Input Output Monitor



Highlights

Checking of correct operation of system peripheral outputs as well as of the external hardware based on input signal through monitoring and comparison of the control signal under given conditions or comparison with a reference signal

Key Features

Smart & flexible input/output comparison

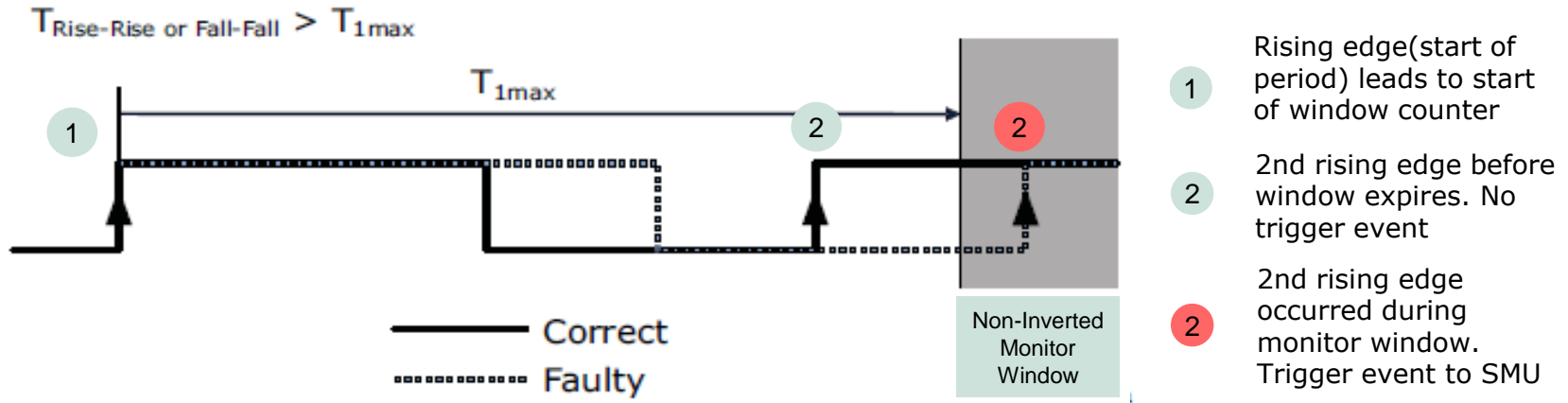
Fast alarm generation

Glitch filtering

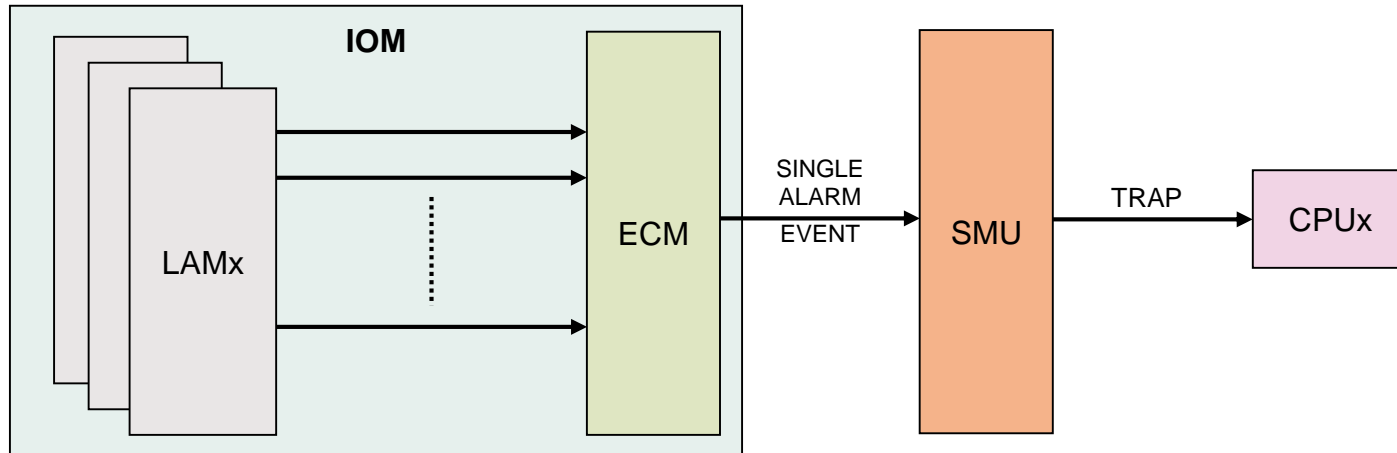
Customer Benefits

- > Check boundary conditions on digital input/output from different sources in hardware
- > Customer can take appropriate action without much delay
- > Ability to filter glitches in input with different modes

Smart & flexible input/output comparison



- > Validation of a digital control signal by checking the occurrence of rising or falling edge with respect to a threshold in a defined event window
- > Signal in the above example is monitored to check for maximum time between two rising edges under a given threshold
- > Signal can also be compared with another signal as reference to monitor deviations with certain given tolerances
- > Multiple possible inputs of internal peripherals as well as input from port pins can be routed as monitor or reference signal input to IOM

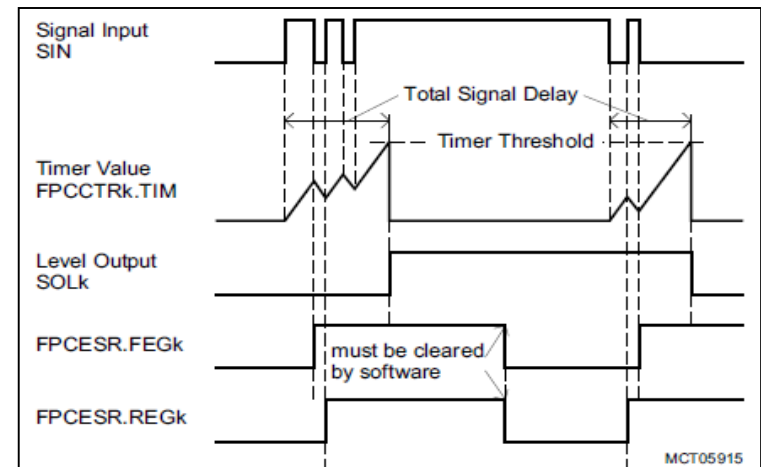
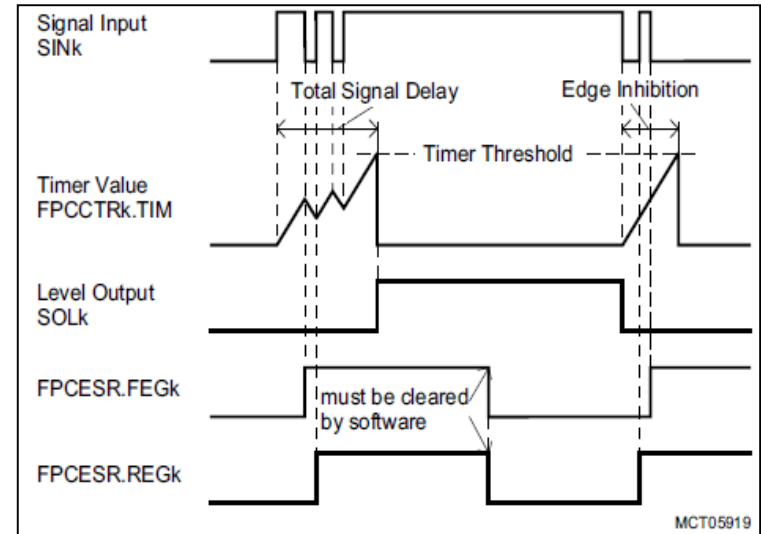


- › Event Combiner Module (ECM) within IOM allows logical combinations of alarms coming from LAM (Logic Analyzer Module) to send a single alarm event to SMU (Safety Management Unit)
- › Input to SMU leads to a fast response by the system in case of safety violations in form of an interrupt/trap where the user can configure the required behavior

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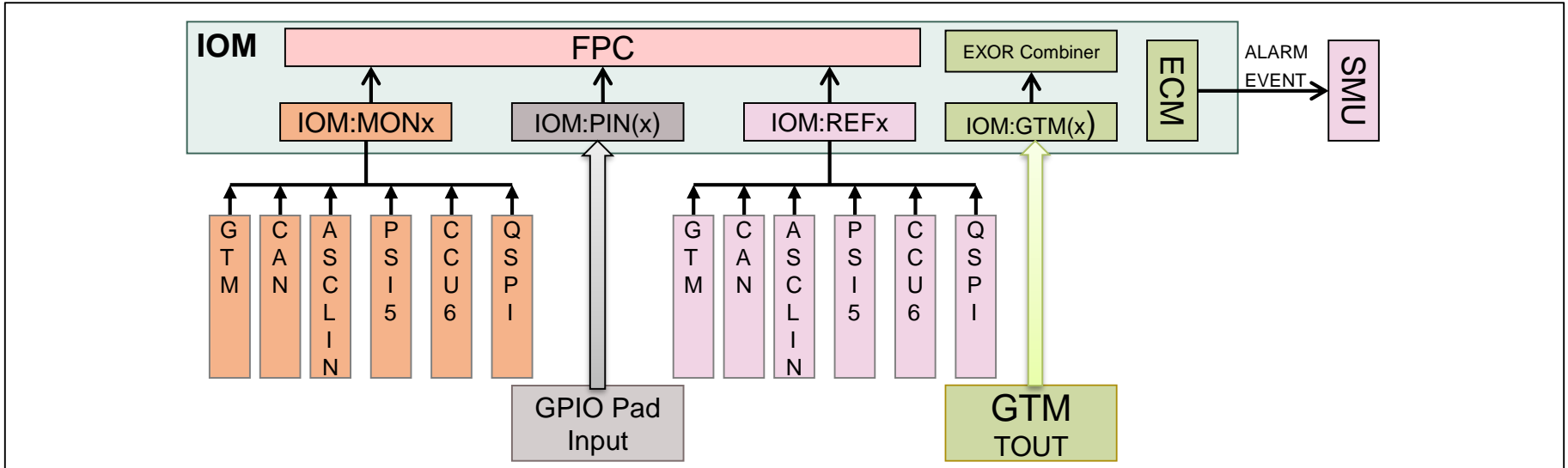
Glitch filtering

- › The dedicated hardware for Filtering and Pre-Conditioning (FPC) of input signals used as monitor or reference signal inputs ensures that multiple filtering modes are available:
 - Delayed debounce filter mode
 - Immediate debounce filter mode
 - Mixed filter mode
 - Prescalar mode



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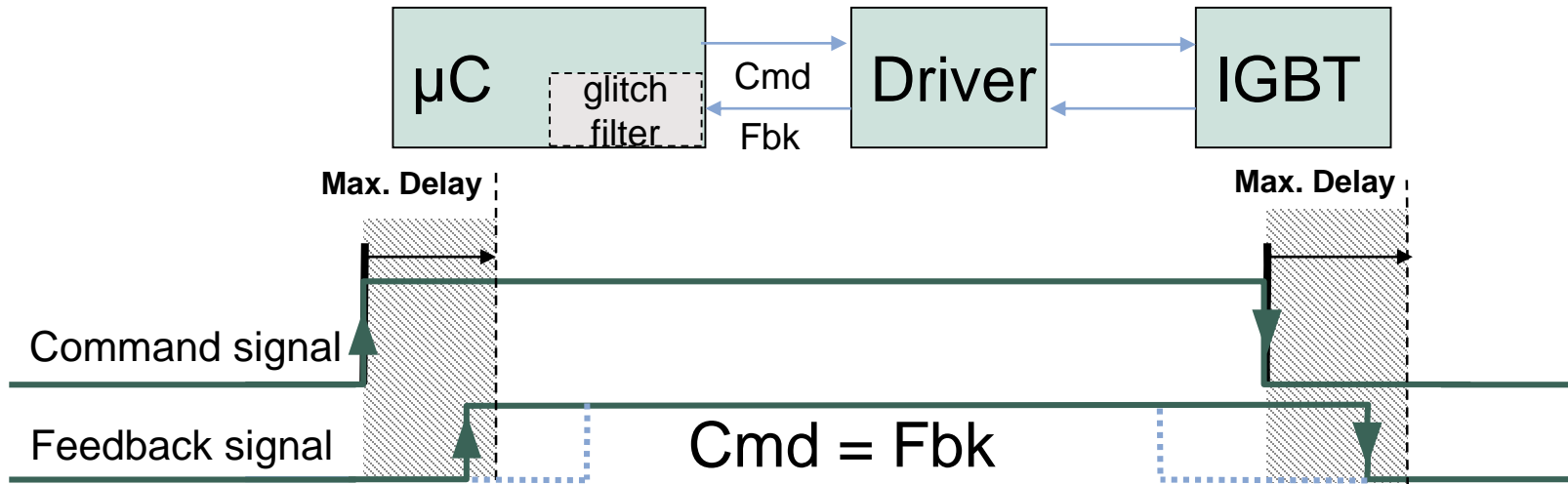
System integration



- > IOM offers flexibility to get inputs from multiple sources as monitor or reference as shown above
- > Input signals can be provided by timers like GTM & CCU6 or communication peripherals
- > IOM outputs are routed to the Safety Management Unit (SMU) to generate the appropriate alarms to the system

Application example

IGBT gate driver communication



Overview

- > Description of issue: Ensure that the delay between Command and Feedback is below a maximum delay.
- > Procedure: Use the Feedback signal as the monitor input signal. Compare the two with respect to their distance of the edges.

Advantages

- > The violation of the maximum will be detected fully automatic by the IOM and an alarm is generated in case of delay violation.

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Document reference

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Input_Output_Monitor**

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