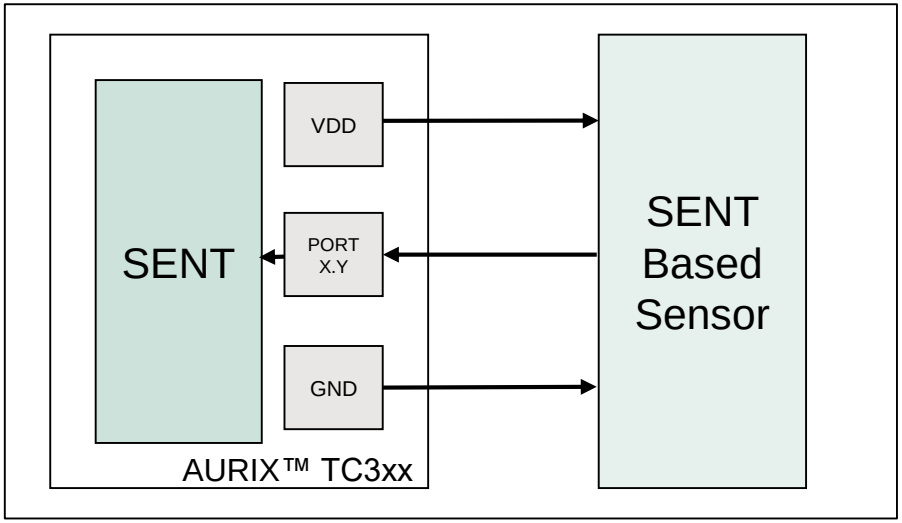
SENT

Single Edge Nibble Transmission

AURIX™ TC3xx Microcontroller Training
V1.0 2020-06

SENT
Single Edge Nibble Transmission



Highlights

SENT J2716_201604 standard compatible module supporting standard SENT unidirectional communication as well as supports bidirectional communication with multiple sensors on a single SENT bus using SPC. Supports ticks time in the range of 0.2 us to 1024 us.

Key Features

- Extended feature set
- Programmable nibble sorting
- Support for SPC

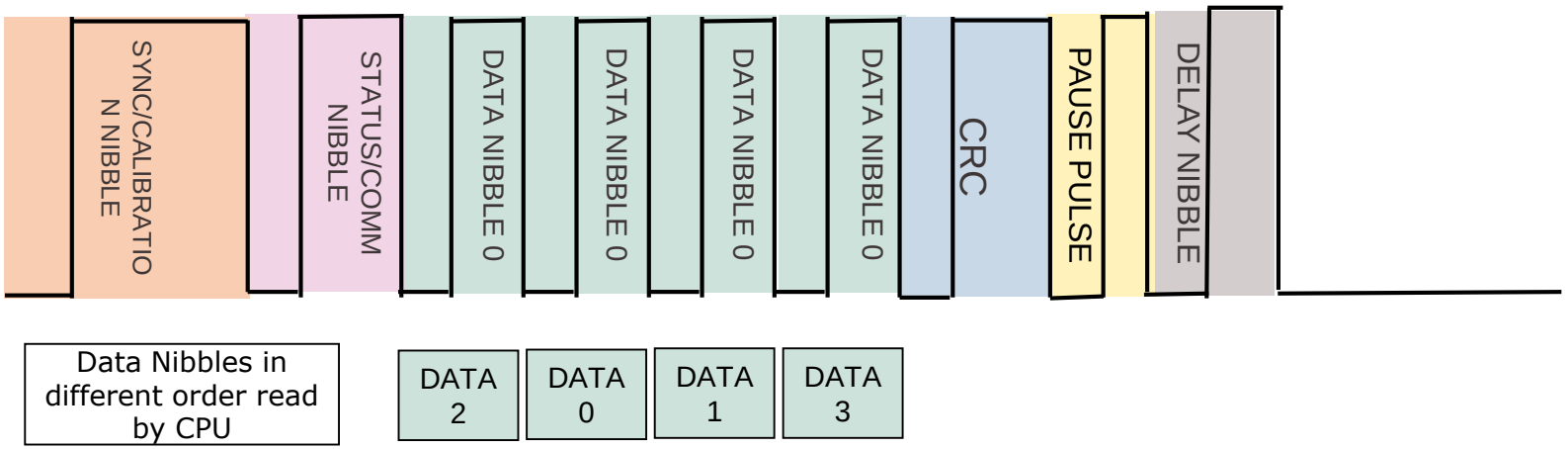
Customer Benefits

- Supports different range & modes of SENT based sensors
- Flexible configuration of readout of the received data nibbles to relief CPU
- Enable bidirectional communication with multiple SENT sensors

SENT
Extended feature set

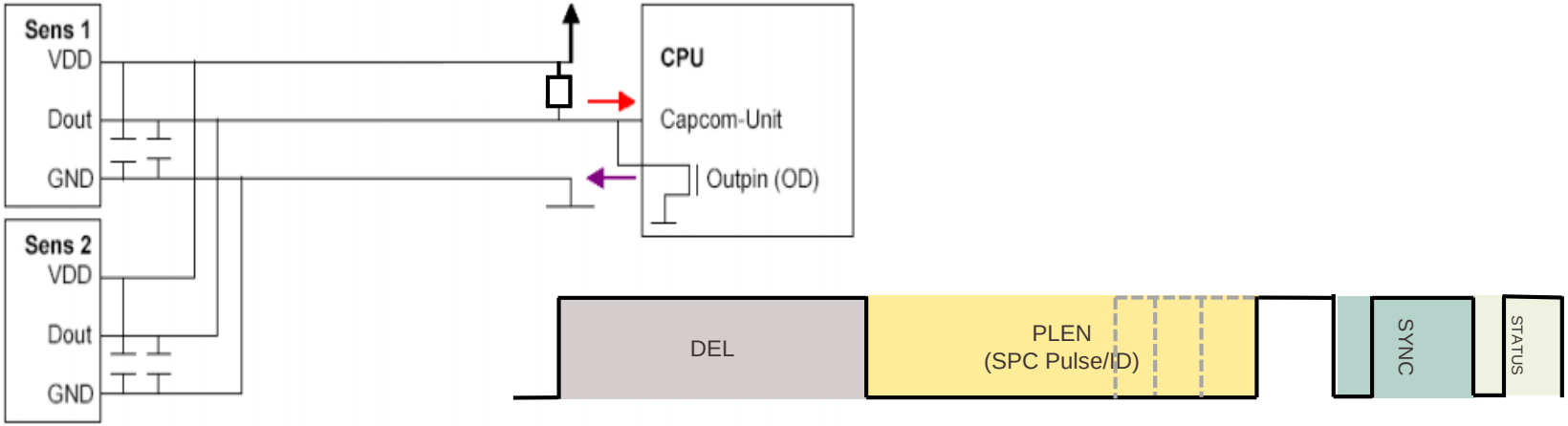
- SENT on AURIX™ TC3xx implements extended features beyond the J2716 SAE standard
- Message tick time range is extended to support 0.2 us as compared to 3 us
- Option for bigger frame lenth with upto 255 data nibbles as compared to 6 nibbles as per standard
- Watchdog on incoming frames to detect timeouts
- Optional output inversion for use of external open drain transistor
- Optional input inverison for use of external open drain transistor or level shifting
- Support of FDFL support for check of frequency range drift based on complete frame length instead of just synchronization pulse

SENT
Programmable nibble sorting



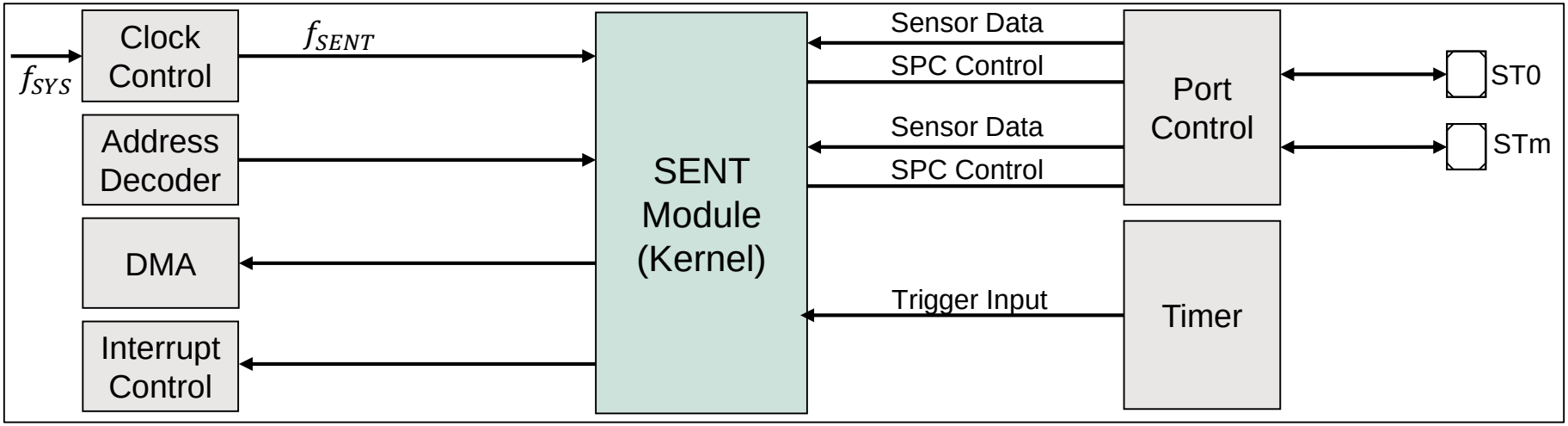
- SENT provides a in-built feature which allows to sort the received data nibbles directly in HW without software intervention leading to off-loading the CPU
- Provides a VIEWx register which can be used by the user to define a desired order of the received data nibbles in the receive register

SENT
Support for SPC



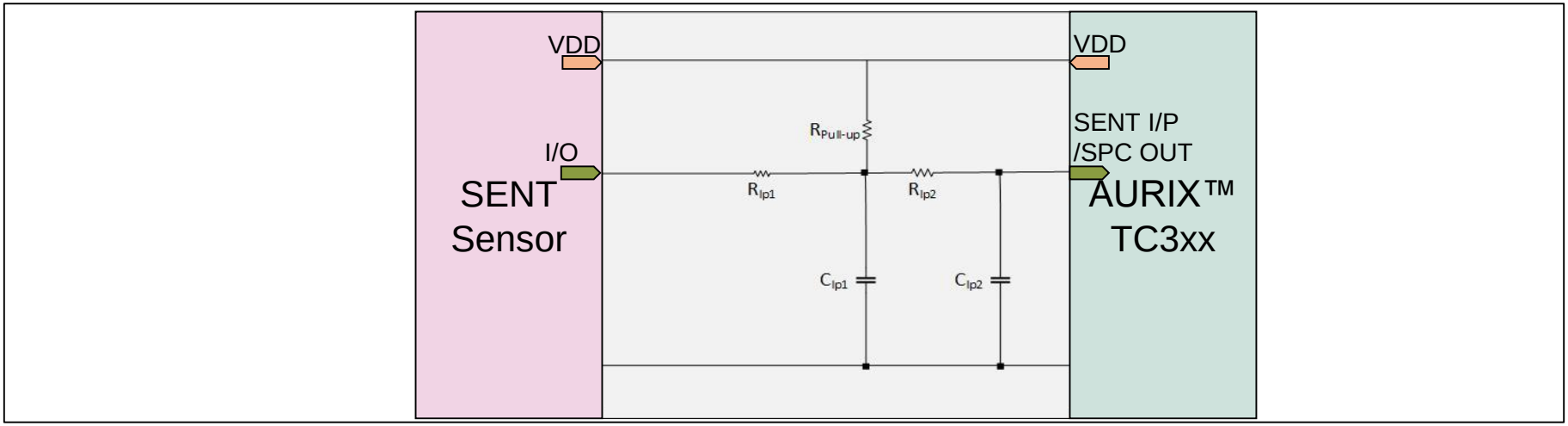
- SPC (Short PWM Code) is an Infineon proprietary standard which allows the AURIX™ to communicate with a SENT sensor
- SENT based communication is bidirectional
- Provides the ability to multiplex up to 4 sensors on a single SENT input while each sensor can be individually addressed with an address ID encoded in the SPC pulse from AURIX™

OCDS
System integration



- SENT is integrated to provide flexible connectivity to multiple GPIOs
- SENT generates various interrupts signals including error interrupts signals to the interrupt router to instant action
- SENT gets a trigger input from timer like GTM (Generic Timer Module) to synchronize SENT communication with other events on system level

Application example
Interfacing with angle/temperature sensor



Overview

- Description of issue: Interface AURIX™ with a SENT based sensor to read in angle/temperature readings
- Procedure: Setup the desired modes and micro tick/frequency on each SENT on AURIX and sensor respectively along with above external recommended circuit

Advantages

- Various format of data encoded by different sensors supported including:
  - Single sensor secure A3 encoding
  - Dual throttle position sensor A1 encoding

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