

# SENT

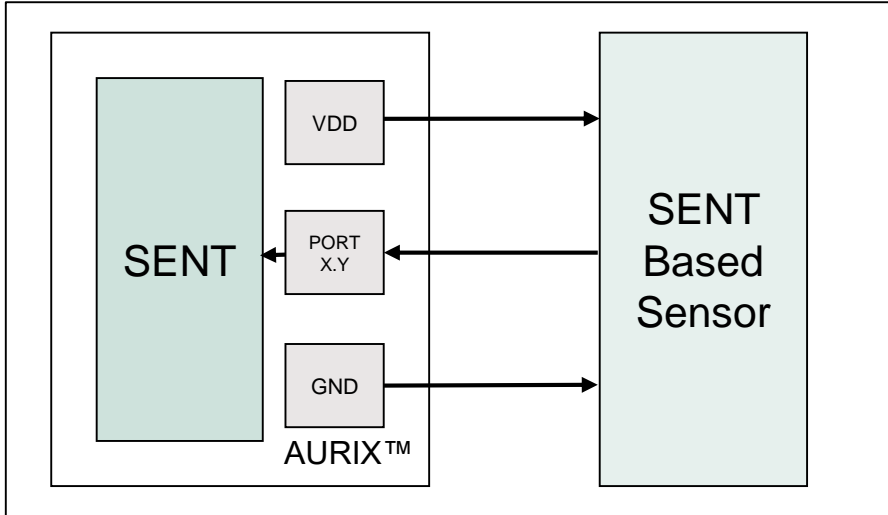
## Single Edge Nibble Transmission

AURIX™ Microcontroller Training  
V1.0 2019-03



# SENT

## Single Edge Nibble Transmission



### Highlights

SENT J2176\_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

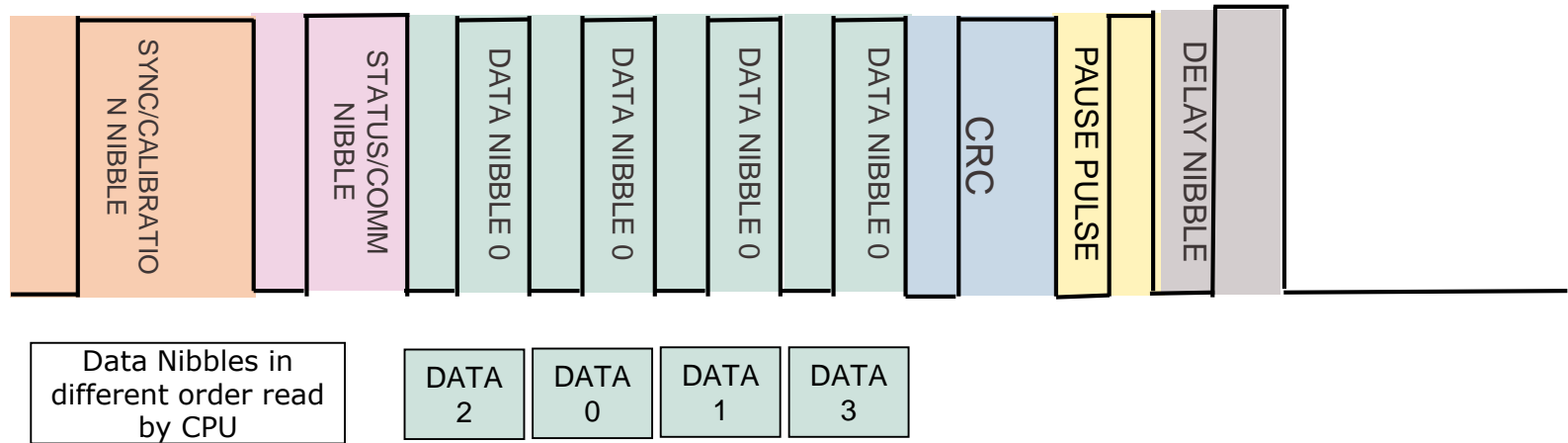
Supports different range & modes of SENT based sensors

Flexible configuration of readout of the received data nibbles to relief CPU

Enable bidirectional communication with multiple SENT sensors

- › SENT on AURIX™ 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 length 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 inversion 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

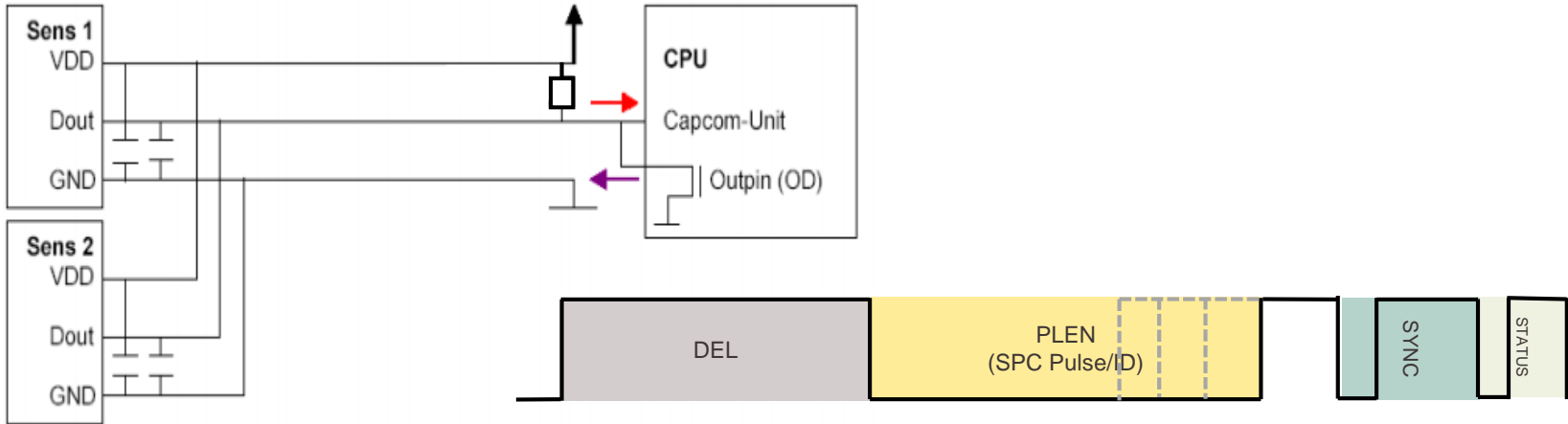
# Programmable nibble sorting



- › 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

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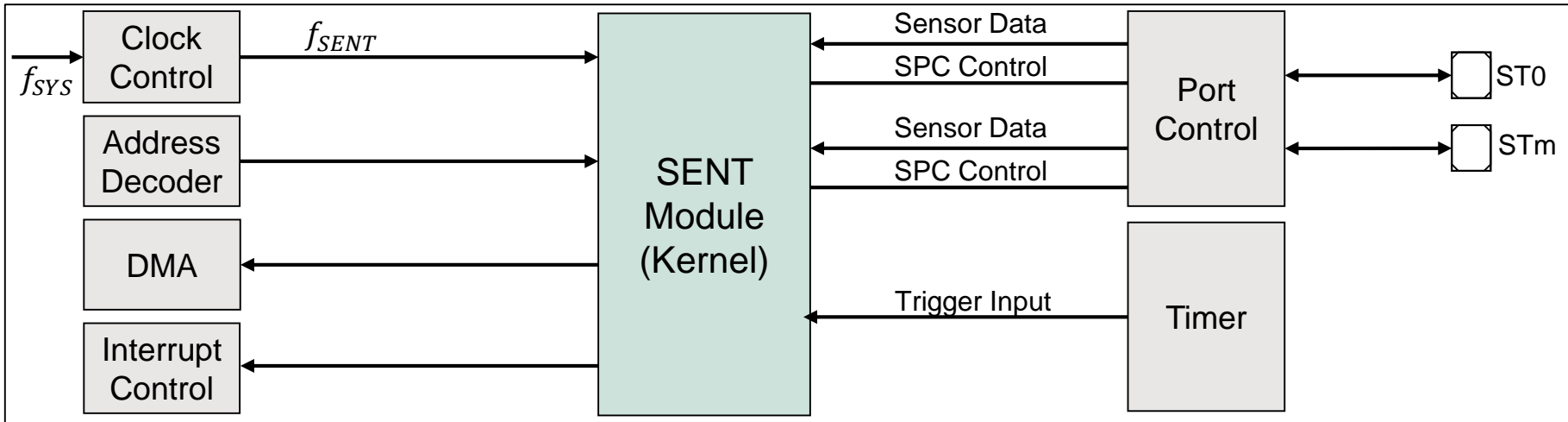
## Support for SPC



- › 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

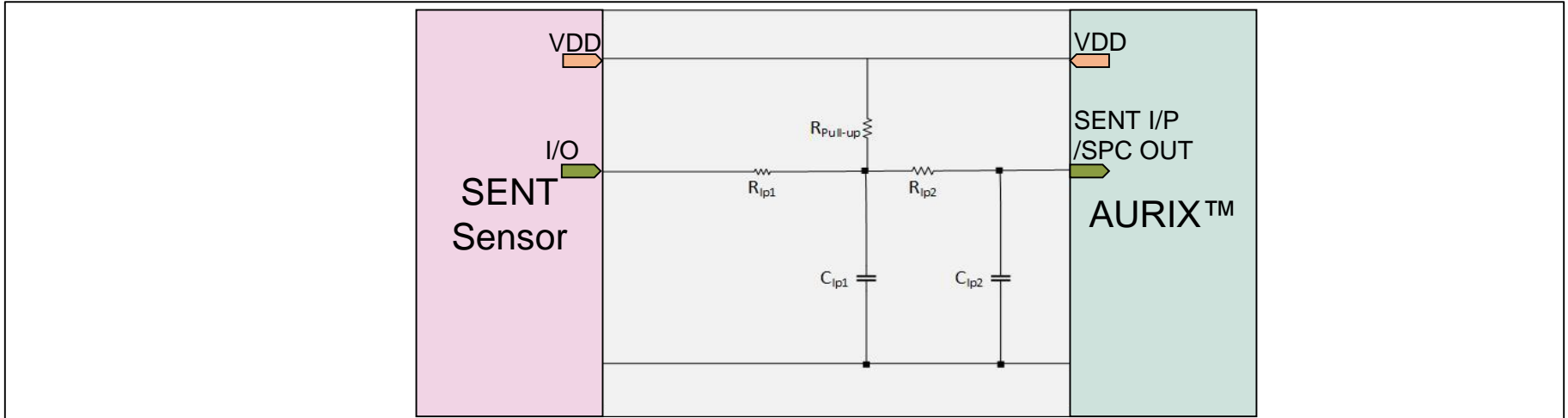
## System integration



- › 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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**Document reference**

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**Single\_Edge\_Nibble\_Transmission**

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