SENT
Single Edge Nibble Transmission

AURIX™ Microcontroller Training
V1.0 2019-03

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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
Extended feature set

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 up to 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
SENT provides a built-in 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™
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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