# CSENT-TX
Enhanced SENT/SAE J2716 TX Controller

The CSENT-TX core implements a transmitter for the Single Edge Nibble Transmission (SENT) protocol. It complies with the SAE J2716 standard and supports both synchronous and asynchronous transmission modes.

Under asynchronous mode, the core autonomously, without requiring any extra action from the host system, initiates transmission, as soon as data become available in its input-data register. Under synchronous mode, transmission is triggered by either the host system via the core's control registers, or when the core receives a valid master trigger pulse via the SENT interface.

Designed for ease of use and integration, the core reports its status using two signals, one indicating that a transmission is in progress, and a second one reporting the completion of a frame's transmission. Furthermore, the CSENT-TX provides access to its control, status, and data registers via a 32-bit APB, or an AXI4 or a generic subordinate interface. Implementation of the core is straightforward, as the core contains no latches or tri-states, is fully synchronous with a single clock domain, and includes no multicycle or false paths.

The CSENT-TX core is designed with industry best practices, has been rigorously verified and is production proven.
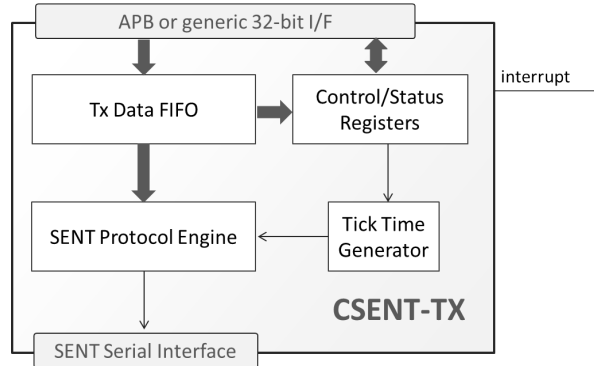
Size and Performance

The core can be mapped to any ASIC technology and any FPGA device. The following are sample implementation results, which do not represent the highest speed or smallest area possible for the core and exclude the FIFOs.

Target Technology	Core Configuration	Logic Resources	Memory Resources	Freq
Igloo2 M2GL150-STD	No FIFO Asynchronous Transmitter only	108 LUTs	-	290 MHz
PolarFire MPF300T-STD		103 LUTs	-	400 MHz
RTG4 RT4G150-STD		105 LUTs	-	220 MHz
Igloo2 M2GL150-STD	Sensor's Trigger Pulse Protocol Mode 8 x 32-bit FIFO Synchronous and Asynchronous Transmitter	754 LUTs	2 RAM64x18	110 MHz
PolarFire MPF300T-STD		719 LUTs	2 uSRAM	180 MHz
RTG4 RT4G150-STD		761 Gates	2 RAM64x18	100 MHz

Applications

The CSENT-TX core is suitable for automotive microcontrollers and SoCs.

Support

The core as delivered is warranted against defects for ninety days from purchase. Thirty days of phone and email technical support are included, starting with the first interaction. Additional maintenance and support options are available.

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