

# SENT/SPC Serial Data Decode



## Key Features

- Supports SENT and SENT SPC Protocols per Version 2008, 2010, and 2016
- Flexible Payload Decomposition
- Decodes Bursts as Nibbles or Words
- Color-coded decode overlaid on waveforms is intuitive and easy-to-read
- Decode information expands as time base is adjusted
- Convenient table display with quick “zoom to message” capability
- Quick search capability for specific frame content
- Supports Fast and Slow Channel Decode and Analysis
- Extract and plot embedded SENT data
- SAE Compliance Test Support

High-resolution SENT sensor and ECU message frames are intuitively decoded on the waveform, provided in an interactive table, and payload content search tools make debugging fast and effective.

## Decode Annotation Complements Physical Layer Views

The SENT protocol layer is decoded and displayed directly on the physical layer waveform. Various sections of the protocol are color coded making it easy to isolate message frame content. Decode annotation, for both Nibble and Word decode formats, condenses or expands depending on the timebase/zoom ratio setting. Contents of both Fast Channel frames as well as Slow Channel frames make analysis of sensor communication fast and easy. A unique tool presents the decoded data payload values with choices in offsets and number of nibbles that match the message frame format.

Decode annotation provides the ability to view protocol traffic on the oscilloscope and verify that the link is alive and transmitting properly. It also aids in debugging problems

that are not solely analog or digital in nature, such as interoperability issues, uncertain error causes, and physical layer issues not evident with a protocol analyzer.

## Convenient Table Display and Search

Deep oscilloscope acquisition memory provides long capture times of SENT sensor transmissions. Decoded information is conveniently shown in a table format, displayed with either Nibble or Word type detail, and contents of Fast and Slow Channels can be displayed together or individually. Specific message frame content can be easily scanned and searched. In addition, table data may be exported as a .csv file.

## Support on Multiple Oscilloscope Platforms

The SENT decode option is available on a wide range of oscilloscope models from 200 MHz to 100 GHz.

# SPECIFICATIONS AND ORDERING INFORMATION

<b>SENTbus D</b>	
<b>Definition</b>	
<b>Protocol Setup</b>	Selection is provided for SENT FEB 2008, JAN 2010, and APR 2016 versions.
<b>Decode + Search Capability</b>	
<b>Format</b>	Hexadecimal or Decimal.
<b>Decode Setup</b>	Viewing: Decode Type (Nibbles or Words); Physical Layer: Tick Time (400 nsec to 3 msec), Tick Time Tolerance (1% to 30%), Idle State (High or Low), Nibbles (3 or 8); Protocol Details: SENT Version (FEB 2008, JAN 2010, or APR2016), New CRC (On/Off), Pause Pulse (On/Off); Channel Selection: Fast Only, Slow Only or Both. For decode in "Words", "Fast Channels" has four fields available for Payload Interpretation (D0, D1, D2, or D3), includes controls to define Offset, Nibble and Order (MSB or LSB). For decode in "Words", "Slow Channels" has control for User Defined Tables, entered via a TXT file, allowing symbolic decode on Slow Channels.
<b>Decode Input</b>	Any Analog Channel, Memory or Math Trace and any Digital trace.
<b># of Decodes</b>	Up to 4 buses may be decoded at one time. In addition, zooms can be displayed (with decoded information).
<b>Visual Aid</b>	Color Coding for overall SENT Packet, Synchronization Pulse, Status and Communication Nibble, Reserved for Application Status, Serial Data Message Bits, Data Nibbles, CRC, and Pause Pulse. For Slow Channels, Bit Level Annotate. Decode information is intelligently annotated based on timebase setting, and overlaid on acquired waveform.
<b>Table Configure, Export Table</b>	Display 1 to 20 rows of decoded information for up to 4 different protocols or decodes in time order in a single table. Displayed information includes Index, Timestamp, and other various protocol-specific information. Table permits scrolling, touch to zoom, export to .csv file, and special display of long data or other patterns.
<b>Pattern Search</b>	When decoder set for "Nibbles", search for any of the following: Idx, Time, Sync, Tick Time, Message, Nibbles, Pause Pulse, S and Status. When decoder set for "Words", search for Idx, Time, Sync, Tick, Message, Stat, b0, b1, b2, b3, D0, D1, D2, D3, crc, rms, Pause Pulse, S, Status. When decoder set for Slow Channels, search of ID and Data value of the Slow messages.
<b>SAE Compliance Test</b>	SAE tests for more than N messages out of 100 are faulted, more than M consecutive messages are faulted, Error in Message Counter, CAL Pulse deviations.
<b>Table Filtering</b>	Select a column header to create filter data.

## Ordering Information

### Product Description

### Product Code

#### SENT Decode Options

SENT Decode Option for WaveSurfer 10 Oscilloscopes	WS10-SENTbus D
SENT Decode Option for HDO4000 Oscilloscopes	HDO4K-SENTbus D
SENT Decode Option for WaveRunner 6 Zi and HRO 6 Zi Oscilloscopes	WR6Zi-SENTbus D
SENT Decode Option for HDO6000 Oscilloscopes	HDO6K-SENTbus D
SENT Decode Option for WaveRunner 8000 Oscilloscopes	WR8K-SENTbus D
SENT Decode Option for HDO8000 Oscilloscopes and MDA800 Motor Drive Analyzers	HDO8K-SENTbus D
SENT Decode Option for HDO9000 Oscilloscopes	HDO9K-SENTbus D
SENT Decode Option for WavePro 7 Zi/SDA/DDA 7 Zi/Zi-A Oscilloscopes, Serial Data Analyzers and Disk-drive Analyzers	WPZi-SENTbus D
SENT Decode Option for WaveMaster 8 Zi/Zi-A/Zi-B Oscilloscopes, Serial Data Analyzers, and Disk-drive Analyzers	WM8Zi-SENTbus D
SENT Decode Option for LabMaster 9 Zi-A Oscilloscopes	LM9Zi-SENTbus D
SENT Decode Option for LabMaster 10 Zi/Zi-A Oscilloscopes	LM10Zi-SENTbus D

#### Recommended Probe Accessories

200 MHz, 3.5 pF, 1 MΩ Active Differential Probe, ±20 V	ZD200
1kV, 25 MHz High Voltage Differential Probe	HVD3102
1kV, 120 MHz High Voltage Differential Probe	HVD3106
500 MHz, 18 Ch, 2 GS/s, 50 Mpts/Ch Mixed Signal Oscilloscope Option	MS-500
250 MHz, 36 Ch, 1 GS/s, 25 Mpts/Ch (500 MHz, 18 Ch, 2 GS/s, 50 Mpts/Ch Interleaved) Mixed Signal Oscilloscope Option	MS-500-36
250 MHz, 18 Ch, 1 GS/s, 10 Mpts/Ch Mixed Signal Oscilloscope Option	MS-250

## Customer Service

Teledyne LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year. This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge



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Local sales offices are located throughout the world.  
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