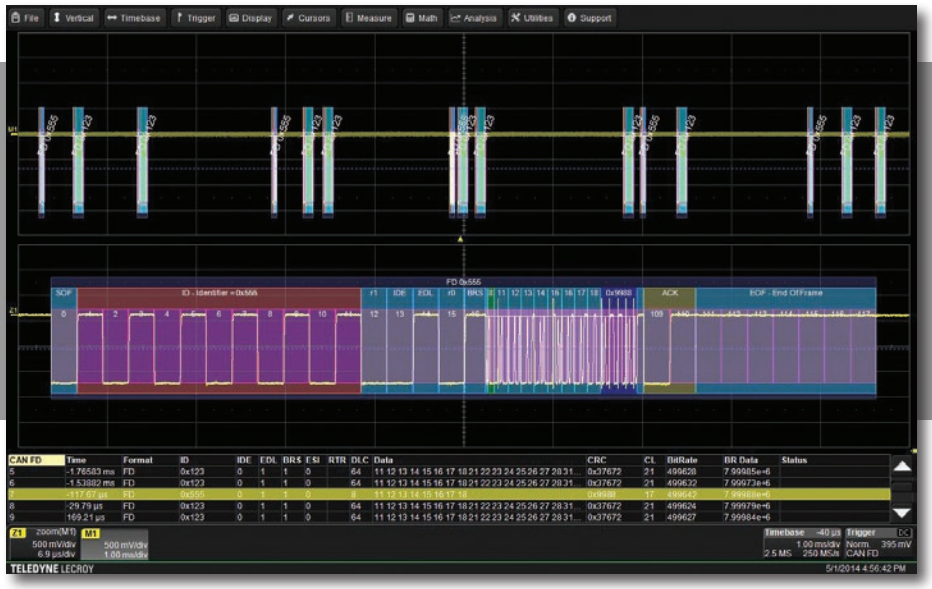
TELEDYNE LECROY
Everywhereyoulook™

CAN and CAN FD Trigger, Decode and Measure



Key Features

- **Comprehensive CAN and CAN FD trigger and decode**
- **Flexible triggering for CAN and CAN FD data, error and remote frames**
- **Supports CAN signals up to 1 Mb/s and CAN FD signals up to 10 Mb/s**
- **Powerful conditional ID and Data triggering (in range, out of range, less than, greater than)**
- **Convenient table display with "zoom to byte" capability**
- **Quick search to identify specific message packets**
- **Easily view decoded signals with intuitive color-coded decode overlay**
- **CAN specific parameters to measure, plot and analyze bus performance**
- **Simultaneously decode up to 4 busses including CAN, CAN FD or other protocols**

With CAN and CAN FD trigger and decode the oscilloscope becomes the ideal tool for debugging CAN controllers, busses and systems. Identify and isolate specific CAN frames with ID, Remote and Error frame triggering. Decoding CAN signals provides tremendous insight into activity on the bus and measurement tools enable fast analysis of bus performance.

The Most Intuitive Decode

Decoded protocol information is color coded to specific portions of the CAN and CAN FD frame such as Frame ID, status bits and message data, then displayed directly on top of physical layer signals creating an intuitive and easy-to-understand visual display. The decoded information is condensed or expanded as the horizontal scale is changed to always provide the right amount of detail in both short or long acquisitions

Powerful CAN Triggering

The integrated CAN and CAN FD trigger will isolate Frame IDs, specific data packets, remote frames or error frames. For CAN FD signals, the oscilloscope can trigger on specific frames with the Bit Rate Shift (BRS) bit identifying frames which will shift from the nominal bitrate to the faster bitrate. Powerful, conditional triggering enables triggering on a range of events such as a series of Frame IDs or data messages

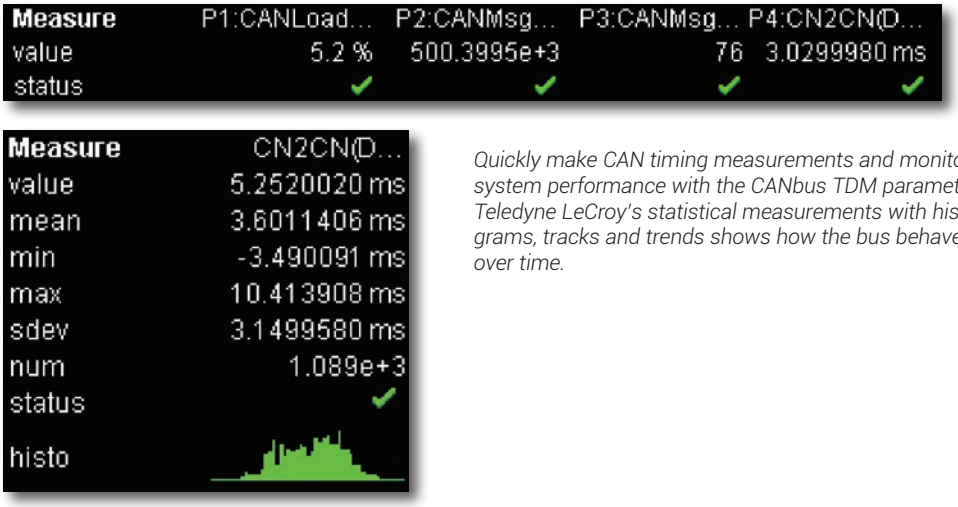
Measure and Plot Bus Performance

Powerful measurements and sophisticated statistical, graphical and plotting tools simplify CAN system debugging. Understanding CAN bus problems and performance is quick and easy.

TIME SAVING ANALYSIS AND DEBUG TOOLS

Timing and Bus Measurements

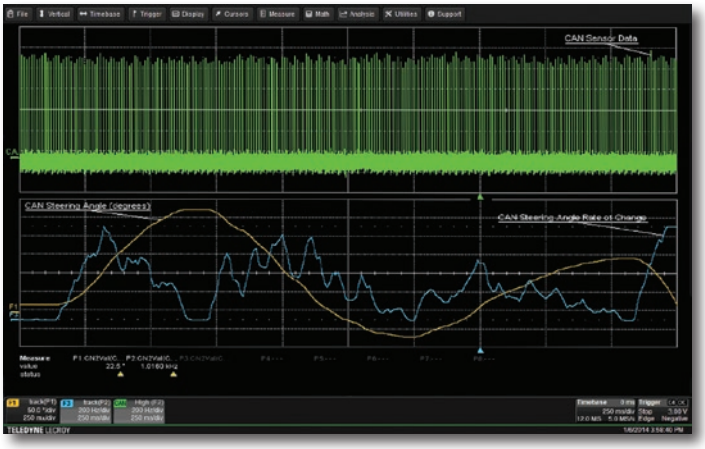
CAN specific measurement parameters allow you to quickly and easily characterize a CAN system and make gateway measurements. Measure the time between two messages on the bus or from a CAN message to analog signal. Measurement statistics and histicons provide insight into the range of measurements on the bus.



Quickly make CAN timing measurements and monitor system performance with the CANbus TDM parameters. Teledyne LeCroy's statistical measurements with histograms, tracks and trends shows how the bus behaves over time.

Data Extraction and Graphing

Extract data from the CAN message stream and use track functions to graphically plot the data. Measured CAN values are used to convert digital information into an analog waveform for easy comparison to other electrical signals.



Here, information on the steering angle and steering angle rate of change is extracted from the CAN message acquisition, rescaled to decimal values, and plotted as a time-correlated "Track"

Interactive Table Display Summarizes Results

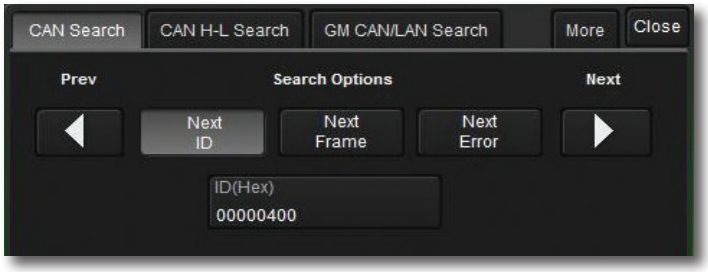
Turn the oscilloscope into a protocol analyzer with the table display of decoded information. Customize the table to show only the data of interest and touch a message in the table to automatically display it on the screen. Export the table for offline analysis.

CAN	Time	ID	DLC	Data	CRC	ACK	Bit Rate/Msg	ID Len...
219	-194.998 ms	0x12f83210	1	00	0x0a8e	0	33.285e+3	29
220	-192.594 ms	0x12f83130	1	00	0x7829	0	33.285e+3	29
221	-190.190 ms	0x0ef81690	1	00	0x1f04	0	33.287e+3	29
222	-187.697 ms	0x0ef81230	1	00	0x4669	0	33.295e+3	29
223	-99.8520 ms	0x0ef81690	1	00	0x1f04	0	33.287e+3	29
224	-97.3583 ms	0x0ef81230	1	00	0x4669	0	33.286e+3	29
225	-94.9547 ms	0x12f85050	4	00 00 00 00	0x551d	0	33.305e+3	29
226	24.1402 ns	0x0ef81230	1	00	0x4669	0	33.285e+3	29
227	2.40374 ms	0x0ef81690	1	00	0x1f04	0	33.287e+3	29
228	4.89740 ms	0x12f85050	4	00 00 00 00	0x551d	0	33.306e+3	29

Display decoded values in an easy-to-understand table. Touch a row to zoom, or export to Excel with one button push.

Time Saving Search

Search through long records of decoded CAN data for specific Frame IDs, data values, frame types or status bits.



Search through long records of decoded data by entering specific message or frame details.

SPECIFICATIONS

	CANbus TD	CANbus TDM	CAN FDbus TD
	Definition		
Protocol Setup	Select bit rate (10, 25, 33.333, 50, 83.333, 100, 125, 250, 500, 1000 kb/s or user-defined between 10-1000 kb/s)		Select Nominal bit rate (10, 25, 33.333, 50, 83.333, 100, 125, 250, 500 kb/s, 1 Mb/s or user-defined between 10 kb/s -1 Mb/s) Select Data bit rate (0.5, 1.0, 1.5, 2.0, 5.0, 8.0, 10.0 Mb/s or user-defined between 0.5 - 10 Mb/s)
	Decode Capability		
Format	Hexadecimal		
Decode Setup	Threshold definition required. Default is to Percent amplitude. Select bit rate.		
Decode Input	Any analog Channel, Memory or Math trace.		
# of Decode Waveforms	Up to 4 buses may be decoded at one time. In addition, zooms can be displayed (with decoded information)		
Location	Overlayed over DATA waveform, on Grid. (Note: Use multi-grid if there is more than one decoder ON)		
Visual Aid	Color Coding for Frame, ID, DLC, DATA, CRC, Ack, Stuff Bits and Errors Decode information is intelligently annotated based on timebase setting		Color Coding for Frame, ID, IDE, EDL, BRS, ESI, RTR, DLC, DATA, CRC, Ack, Stuff Bits, Bit Index, and Errors Decode information is intelligently annotated based on timebase setting
	Trigger Capability		
Format	Hexadecimal or Binary		
Trigger Setup	Trigger on All Frames, Frame ID, ID with Data, Remote Frames or Error Frames		
Address (ID) Condition Setup	Specify one Frame ID or a range of Frame IDs. Frame ID trigger can be combined with Data		
Conditional Trigger Setup	Conditional Frame ID and Conditional Data triggering available. Choose from ≤, <, =, >, ≥, <>, in range, out of range or don't care conditions		
Data Setup	Hexadecimal: # Data Bytes = 0 to 8. Data can be defined by nibble. Triggers on that data pattern regardless of position Binary: Any combination of 0,1, or X for 1-64 bits. Triggers on that data pattern regardless of position.		
Bit Rates	10, 25, 33.333, 50, 83.333, 100, 125, 250, 500, 1000 kb/s or user-defined between 10–1000 kb/s		
Nominal Bit Rates	NA		10, 25, 33.333, 50, 83.333, 100, 125, 250, 500 kb/s, 1 Mb/s or user-defined between 10 kb/s -1 Mb/s
Data Bit Rates	NA		0.5, 1.0, 1.5, 2.0, 5.0, 8.0, 10.0 Mb/s or user-defined between 0.5 - 10 Mb/s
Sampling Point	NA		Configure trigger sampling point for Nominal and Data bitrate
Trigger Input	Any analog Channel or the EXT input		
Trigger Design	Internal to oscilloscope, settable like any other oscilloscope trigger		
	Search Capability		
Search Options	Search for Any Frame, Any Error or Frame ID in Hexadecimal format		
	Measure/Graph Capability		
CAN Timing Measurements	NA	CAN-CAN, CAN-Analog, Time@CAN, CAN Message bit rate	NA
CAN Data Extraction	NA	CAN-Value	NA
CAN Bus Load Measurements	NA	CAN Bus Load %	NA
Graphing Functions	NA	Track, Trend and Histogram of CAN measurements	NA
	Compatibility		
Compatible With:	CANbus TDM is compatible with WaveRunner Xi-A and 6 Zi, HDO6000, WavePro 7 Zi/Zi-A and WaveMaster 8 Zi/Zi-A oscilloscopes. CANbus TD and CANbus FD TD are compatible with WaveSurfer MXs-B and MSO MSXs-B, HDO4000, WaveRunner Xi-A and 6 Zi, HDO6000, WavePro 7 Zi/Zi-A, WaveMaster 8 Zi/Zi-A, Labmaster 9 Zi-a and LabMaster 10 Zi oscilloscopes. The minimum required software version for CANbus TDM and CANbus TD is 5.7.2.1. The minimum software version for CAN FDbus TD is 7.4.0.0.		

ORDERING INFORMATION

	CANbus TD	CANbus FD TD	CANbus TDM
CAN Trigger	•	•	•
CAN Decode	•	•	•
CAN FD Trigger		•	
CAN FD Decode		•	
CAN Measure			•
CAN Graphing			•

CAN and CAN FD products are available in 3 differnt configurations. CANbus TD provides trigger and decode for the legacy CAN protocol. CAN FDbus TD provides trigger and decode for CAN FD and legacy CAN protocols. CANbus TDM provides trigger, decode, measurement and graphing capabilities for the legacy CAN protocol.

Product Description	Product Code
CANbus TD	
CAN Trigger and Decode Option for WaveSurfer MXs-B and MSO MXs-B Oscilloscopes	WSXs-CANbus TD
CAN Trigger and Decode Option for HDO4000 Oscilloscopes	HDO4k-CANbus TD
CAN Trigge and Decode Option for WaveRunner Xi Oscilloscopes	WRXi-CANbus TD
CAN Trigger and Decode Option for WaveRunner 6 Zi Oscilloscopes	WR6Zi-CANbus TD
CAN Trigger and Decode Option for HDO6000 Oscilloscopes	HDO6k-CANbus TD
CAN Trigger and Decode Option for HDO8000 Oscilloscopes	HDO8K-CANbus TD
CAN Trigger and Decode Option for WavePro 7 Zi-A Oscilloscopes	WPZi-CANbus TD
CAN Trigger and Decode Option for WaveMaster 8 Zi-A Oscilloscopes	WM8Zi-CANbus TD
CAN Trigger and Decode Option for LabMaster 9 Zi-A Oscilloscopes	LM9Zi-CANbus TD
CAN Decode Option for LabMaster 10 Zi Oscilloscopes	LM10Zi-CANbus D
CAN FD bus TD	
CAN FD Trigger and Decode Option for WaveSurfer MXs-B and MSO MXs-B Oscilloscopes	WSXs-CAN FDbus TD
CAN FD Trigger and Decode Option for HDO4000 Oscilloscopes	HDO4K-CAN FDbus TD
CAN FD Trigger and Decode Option for WaveRunner Xi Oscilloscopes	WRXi-CAN FDbus TD
CAN FD Trigger and Decode Option for WaveRunner 6 Zi Oscilloscopes	WR6Zi-CAN FDbus TD
CAN FD Trigger and Decode Option for HDO6000 Oscilloscopes	HDO6K-CAN FDbus TD
CAN FD Trigger and Decode Option for HDO8000 Oscilloscopes	HDO8K-CAN FDbus TD
CAN FD Trigger and Decode Option for WavePro 7 Zi-A Oscilloscopes	WPZi-CAN FDbus TD
CAN FD Trigger and Decode Option for WaveMaster 8 Zi-A Oscilloscopes	WM8Zi-CAN FDbus TD
CAN FD Trigger and Decode Option for LabMaster 9 Zi-A Oscilloscopes	LM9Zi-CAN FDbus TD
CAN FD Decode Option for LabMaster 10 Zi Oscilloscopes	LM10Zi-CAN FDbus D
CANbus TDM	
CAN Trigger, Decode and Measure/Graph Option for WaveRunner Xi-A Oscilloscopes	WRXi-CANbus TDM
CAN Trigger, Decode and Measure/Graph Option for WaveRunner 6 Zi Oscilloscopes	WR6Zi-CANbus TDM
CAN Trigger, Decode and Measure/Graph Option for HDO6000 Oscilloscopes	HDO6k-CANbus TDM
CAN Trigger, Decode and Measure/Graph Option for HDO8000 Oscilloscopes	HDO8k-CANbus TDM
CAN Trigger, Decode and Measure/Graph Option for WavePro 7 Zi-A Oscilloscopes	WPZi-CANbus TDM
CAN Trigger, Decode and Measure/Graph Option for WaveMaster 8 Zi-A Oscilloscopes	WM8Zi-CANbus TDM

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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