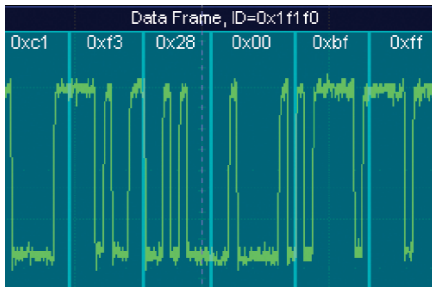


LeCroy

CANBUS TD CANBUS TDM



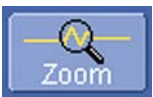
- **Trigger and Decode**
- **Mixed-mode
(Analog, Digital, CAN)**
- **Measure & Graph**

Understanding Performance Has Never Been Easier.

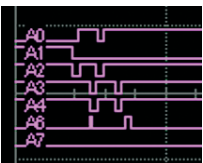
With CANbus TD/TDM, the right toolsets make all the difference in understanding CAN system performance. Anomalies are identified more readily; debugging proceeds more quickly.

- ① Powerful and flexible **TRIGGER** capability. Trigger on CAN or Analog signals. Set CAN message ID and DATA conditions. Trigger on Data, Remote, or Error frames.

- ② One touch **ZOOMING** of the CAN message—especially helpful with long acquisitions of thousands of CAN messages.



- ③ **DISPLAY ANALOG AND CAN SIGNALS.** Add digital measurement capability with LeCroy's MS-32 option.



capability with LeCroy's MS-32 option.

- ④ **ERROR FRAME HIGHLIGHT** allows you to intuitively locate error frames in long acquisitions.
- ⑤ **LONG CAPTURE TIME.** Optional memory (up to 12 Mpts/Ch) allows capture times of 10 s or more (2 Mpts/Ch standard).
- ⑥ **CAN DECODE** is done quickly and automatically, with information overlaid on the CAN physical layer signal.



- **STATISTICAL VIEWS**, including numerical calculations and histograms, of millions of events.

- Quickly **SEARCH** through CAN message data. Jump to next conditional frame. Automatically view the searched frame in a zoom window.



- **GRAPH** performance (see page 4).
- **EXACT NODE MATCHING** by setting Tseg1, Tseg2, and other values exactly the same as your nodes under test, just like the tools that you are used to.

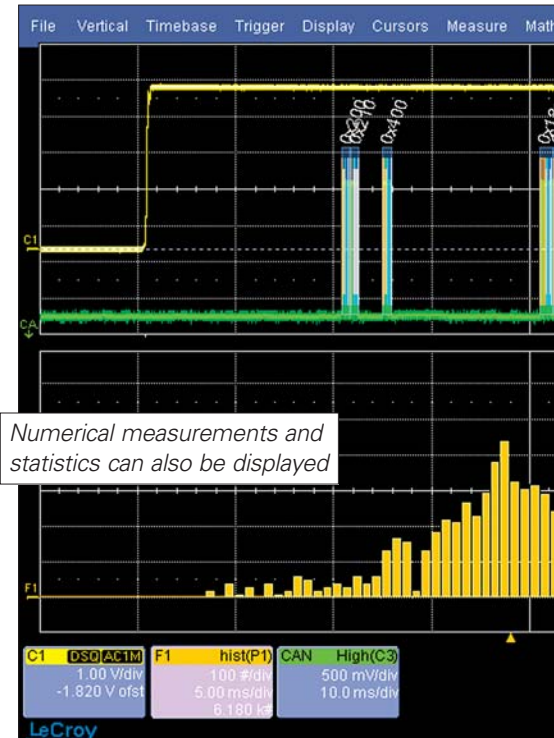
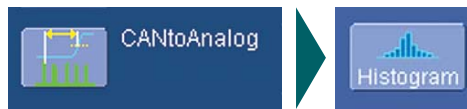


Maximum Insight. Maximum Test Efficiency.

Understand True Performance . . . Quickly

In this example, the CAN trigger is set to trigger on ID=300. There is an analog signal that correlates with CAN ID=300. An automatic measurement is used to determine by how much time this analog signal precedes the CAN signal. More than one measurement must be made, and statistical data must be accumulated to ensure that there are no infrequent events that would not meet specifications. The automatic CANtoAnalog parameter and the oscilloscope's NORMAL trigger are used to capture thousands of time measurements between the CAN

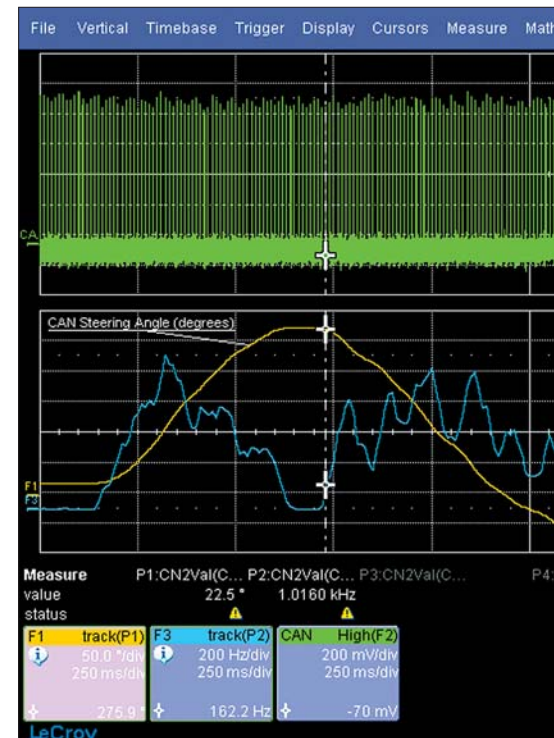
message and the Analog signal. The Histogram (shown as Trace F1, on the bottom) displays the distribution of the different measurements. It is clear that there is a wide range of different measurements, that there is modality to the measurements, and that there are outlying measurements. The Histogram display gives us a clear indication that the distribution is not Gaussian, enabling understanding of cause and effect, and worst-case events.



Insight You've Never Had Before

In this example, many CAN messages are acquired. These CAN messages represent the CAN data for a steering angle sensor. The automatic CANtoValue measurement parameters were used to extract angular speed in degrees/second and angular data in degrees for the steering angle sensor ID. A Track function was applied to each CANtoValue measurement parameter. Steering angle is displayed with a vertical scale of 50°/div. Steering angle speed is

displayed with a vertical scale of 200 angles/s. A cursor is also used to display instantaneous voltage, time, angle, and angle/s data. It is now easy to see how the data is varying with time, and how it corresponds to the original CAN signal, time aligned vertically. This data could also be compared to other analog signals, if desired.

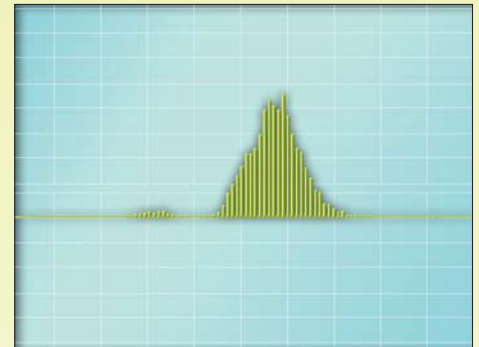


Graphing Tools

LeCroy CANbus TDM contains unique graphing and statistical analysis capability that can be used to validate and analyze CAN system performance.

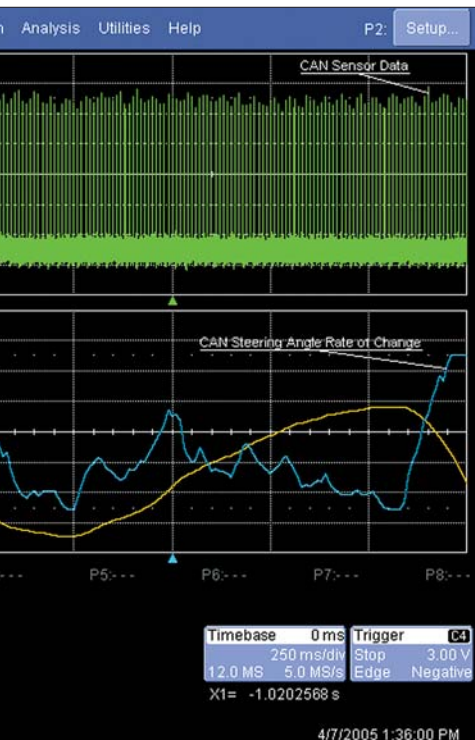
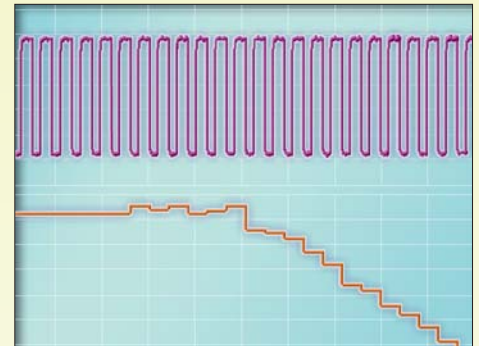
Histogram

A graphical plot of measurement data for any automatic measurement parameter, including CAN timing parameters, frequency, amplitude, etc. Worst-case values, modality, and stability can be intuitively understood quickly; and root cause of irregularities debugged. Up to 2 billion measurement values can be histogrammed.



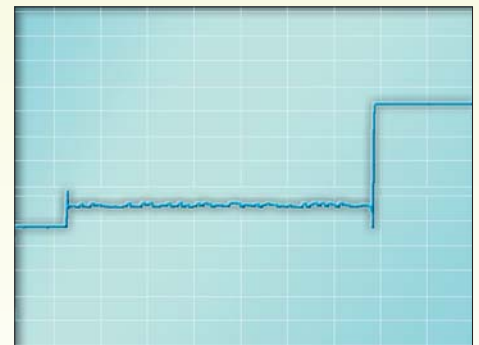
Track

A graphical plot of measurement data values that is time-correlated to all other measurement signals. The vertical scale of the Track is the measurement value, and the horizontal scale is time. As the measurement value changes with time, the Track changes, which enables intuitive understanding of signal modulation and other behavior. Track is ideal for understanding PWM or F-V converter signals.



Trend

A graphical plot of measurement data that is very similar to chart recorder functionality. Like Track, Trend displays measurement values on the vertical axis, but data can be accumulated over many oscilloscope acquisitions (up to 1 million events). Trend is ideal for recording temperature, pressure, stress, strain, or other slow-speed analog signals.



Debug and Validate Faster. Improve Reliability. Lower Costs.

With the new CANbus TDM/TD, LeCroy provides a dramatically improved solution for testing and debugging CAN systems. Now Analog, CAN Message data, and Digital signals can all be viewed on a single instrument—an easy-to-use, everyday bench oscilloscope. With this single display and the robust CANbus TDM/TD toolset, engineers will capture more information and develop more insight easily and quickly. By eliminating the need for a variety of instruments and displays, the LeCroy CANbus TDM/TD system sets a new standard for CAN bus testing.

Here's how efficient this new system is:

- The oscilloscope triggers on pre-defined CAN messages.
- It captures, decodes, and shows them on the display.
- Other analog or digital signals on the CAN ECU can also be captured and displayed.
- Cursors, measurement parameters, and graphing tools quickly characterize timing and other signal relationships.

Leading Features:

- Capture > 10,000 CAN messages in one acquisition.
- Trigger on CAN Data, Remote, or Error Frames.
- Decode CAN messages on the oscilloscope display.
- View analog, digital, and CAN signals.
- Measure performance and statistically analyze.
- Graph and plot performance data.



Specifications and Ordering Information

Product Summary	CANbus TD	CANbus TDM
Overview	View all of your analog and CAN signals in one place. Trigger on and Decode CAN messages on your oscilloscope display.	View all of your analog and CAN signals in one place. Trigger on and Decode CAN messages on your oscilloscope display. Increase test efficiency and operational reliability of CAN nodes by using advanced measurements and powerful graphing tools.
CAN Trigger	•	•
CAN Protocol Decode	•	•
Search	•	•
Error Frame Highlighting	•	•
CAN Timing Measurements (CAN-CAN, CAN-Analog, Time@CAN)		•
CAN Data Extraction Measurement		•
CAN Bus Load % Measurement		•
Histogram of Measurements		•
Track of Measurements		•
Trend Measurements		•

Product Description	Product Code
LeCroy CANbus TDM Trigger, Decode, and Measurement Graph Package	CANbus TDM
<ul style="list-style-type: none"> • Trigger Module with TC251-OPTO optically isolated Trigger Coupler installed (and room for one additional Trigger Coupler). Trigger Couplers are interchangeable. • LeCroy CANbus TD Series Oscilloscope Interface Module with 1.0 meter connection cable. Connects Trigger Module to LeCroy oscilloscope ProBus® interface. • Software for <ul style="list-style-type: none"> – Trigger Setup – CAN Protocol Decode – CAN Measurement, (CAN-analog, CAN-CAN, and Time@CAN timing parameters, CAN bus load% and CAN-Value Data Extraction parameters) – Histogramming – Graphing (Track and Trend). • 1.0 meter USB 2.0 cable from LeCroy external CANbus TD Trigger Module to LeCroy oscilloscope • Black fabric storage case (SAC-01) with foam insert and room for storage of all equipment and two additional Trigger Coupler accessories (not included) • Quantity 1 (one) 9-pin DSUB socket to 2-wire adapter cable (for ISO 11898-2 CAN) • Quantity 1 (one) 9-pin DSUB socket to 4-wire adapter cable (dual-use, for ISO 11519 CAN and GM-LAN/J2411 CAN) • Quantity 2 (two) 9-pin to 9-pin DSUB 120 ohm terminations • Quick Reference Guide in English • Instruction Manual in English • Quantity 1 (one) Phillips head screwdriver 	

Product Description	Product Code
LeCroy CANbus TD Trigger and Decode Package	CANbus TD
<ul style="list-style-type: none"> • Same hardware package as CANbus TDM • Software for <ul style="list-style-type: none"> – Trigger Setup – CAN Protocol Decode 	

Product Description	Product Code
CANbus TD for use on 5 oscilloscopes.	CANbus TD-5LIC
One hardware package and a license to use the software on 5 different oscilloscopes.	
CANbus TDM for use on 5 oscilloscopes.	CANbus TDM-5LIC
One hardware package and a license to use the software on 5 different oscilloscopes.	

Hardware Options and Accessories	
CAN 1041 Opto-isolated High-speed Trigger Coupler	TC1041-OPTO
CAN 1050 Opto-isolated High-speed Trigger Coupler	TC1050-OPTO
CAN 1054 Opto-isolated Low-speed Trigger Coupler	TC1054-OPTO
CAN 251 Opto-isolated High-speed Trigger Coupler (one is included with CANbus TD)	TC251-OPTO
CAN 5790c Opto-isolated Single-wire Trigger Coupler	TC5790c-OPTO
CAN B10011S Opto-isolated Truck and Bus Trigger Coupler	TC10011-OPTO
CAN Cable Set ISO 11898-2	902329-00
CAN Cable Set ISO 11519, GM-LAN/J2411	902330-00
CAN Bus Y Connection Cable, 2 m, with Terminating Resistor ISO 11898-2	902393-00
500 MHz Active Differential Probe (x10, ±1, ±10 or ±100)	AP033
1,400 V, 100 MHz Differential Probe	ADP305
1,400 V, 20 MHz Differential Probe	ADP300

Customer Service
LeCroy scopes 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. This warranty includes: <ul style="list-style-type: none"> • No charge for return shipping • Long term 7-year support • Upgrade to latest software at no charge



1-800-5-LeCroy
www.lecroy.com

Local sales offices are located throughout the world.
To find the most convenient one visit www.lecroy.com