CAN Newsletter Online

OSCILLOSCOPE

CAN FD analysis on the symbolic layer

Teledyne LeCroy has announced the addition of symbolic (application) layer analysis capabilities to their CAN and CAN FD serial trigger, decode, measurement, and graphing solutions.

Decoded protocol information is color-coded to specific portions of the CAN, CAN FD, and ISO CAN FD frame (Photo: Teledyne LeCroy)

THE CAN AND CAN FD SYMOLIC ANALYSIS packages allow a user-defined .dbc file to be used for symbolic triggering, decoding, measurements, and graphing of a Classical CAN or CAN FD network. This creates a more user-friendly environment for CAN developers to work in and removes the need for a manual lookup or conversion from the typical hexadecimal or binary format. All of the company's CAN FD trigger and decode packages support both ISO and non-ISO frames per the ISO 11898-1 standard.

A combination of CAN and CAN FD analysis capabilities

The ability to perform analysis directly on the symbolic layer increases efficiency when working with the company's CAN toolset. When debugging using the oscilloscope to trigger on the symbolic layer, it is possible to isolate a particular troublesome sequence of events by triggering on a specific message or range of values for a given message. The CAN and CAN FD decoders create a color-coded overlay directly on top of the physical layer waveform, making it possible to identify the different sections of the frame and flag any errors.

The .dbc file can be used to extract the encoded values to perform precise timing measurements, which correlate to specific occurrences on the network. Furthermore, these extracted values can be plotted to provide a visual representation of how behavior is changing over time. According to the company, the combination of these tools provides unprecedented insight into CAN systems, correlating physical layer signals and protocol layer data on a single display while also measuring and plotting bus performance.

Along with this method of displaying decoded data, Teledyne LeCroy offers the ability to decode four busses simultaneously. These four busses can be a combination of any protocols, including CAN FD and Classical CAN at the same time. Decoded data can also be seen in an

Data can be extracted from the CAN and CAN FD message streams and used to track functions to graphically plot the data (Photo: Teledyne LeCroy)

interactive table. Entries in this table can be selected and automatically zoomed, preventing the need to scroll through long records. A search function is built into the zoom trace to locate a specific Frame ID or data message.

CAN TDM Symbolic and CAN FD TDM Symbolic are available on a variety of Teledyne LeCroy oscilloscopes. They have a US list price of $4600 and $5400 respectively. Teledyne LeCroy oscilloscope users who already have CAN or CAN FD Trigger and Decode can upgrade their system to CAN or CAN FD TDM Symbolic at a US list price of $800.

CAN FD options for the WaveSurfer 3000 oscilloscope

The company has also introduced two additional trigger and decode options for the WaveSurfer 3000 oscilloscope: CAN FD and Flexray. These protocol analysis capabilities with CAN FD and Flexray trigger and decode enable engineers and technicians working with these standards to gain insight in to their systems, correlating physical layer signals and protocol layer data on a single display.

The trigger can isolate Frame IDs, specific data packets, remote frames, and error frames. The decodes use a color coded overlay that identifies different parts of the data being captured, allowing the user to identify different parts of the CAN FD and Flexray data such as Frame IDs, status bits, and message data.

Automotive trigger and decode solutions since 2004

Teledyne LeCroy was the first to provide a trigger and decode solution for CAN FD. The company pioneered serial data trigger and decode in an oscilloscope with the introduction of the original CAN trigger and decode product in 2004. Since then, the patented algorithms used to deconstruct physical layer serial data signals and display decoded data have been deployed to simplify the design and debug of automotive systems using LIN, Flexray, Sent, and now CAN FD.