CAN Bus Waveform Observation and Analysis

- **Supported CAN Bus Specifications**
  - Bit rate: 33.3, 83.3, 125, 250 and 500 Kbps, and 1 Mbps (High-speed CAN and Low-speed CAN)
  - Message format: Standard (11-bit ID)/Extended (29-bit ID)

- **CAN Bus Trigger Functions**
  - Start-of-Frame (SOF) Field trigger
  - Identifier (ID) Field trigger:
    - A maximum of four IDs can be specified to activate the trigger on their logical OR condition.
  - RTR Field trigger: The trigger is activated by a Remote frame.
  - Data Field trigger
    - You can set data of 1 to 8 bytes.
    - The trigger is activated by any data larger (> or smaller (<) than the specified byte size.
  - Error Frame trigger
    - The trigger is activated when an active error flag is set.
    - You can set trigger conditions with a combination (logical AND) of these five types of triggers.
    - You can also set a sample point as a percentage to define which part of a bit the analyzer should sample.

- **CAN Bus Analysis Functions**
  These functions analyze waveform data existing on the CAN bus and acquired into long-record-length memory with a maximum of 16 megawords (MW) in a time-series manner. The functions then list the results of analyzing the ID and Data field codes and examining the presence/absence of ACK field codes, along with the waveform data. A frame waveform corresponding to the one selected by the cursor on the list automatically appears in the Zoom window. This feature enables you to observe the bus signal while concurrently viewing the analysis results. Thus, you can easily verify how noise or level fluctuations affect the communication data and carry out debugging work very efficiently. In the Detailed View mode, you can view the type of frame, the time interval from the point of triggering to the start of the frame, and CRC data, along with error information. You can set two threshold levels, Upper and Lower, in order to judge the state of each bit. This feature lets you analyze Indefinite States.
Data Search and Field Jump Functions

The data search function makes a high-speed search of all the frames you acquired for a frame containing the specified ID Field, Data Field, and ACK Field codes. This function can also search for error frames. A magnified view of the frame found is shown in the Zoom window. This function can also search for a frame containing an Indefinite State.

Even for frames comprising no less than 100 bits, the Field Jump function automatically finds the starting point of a Data or Control field and shows it in the Zoom window.

Stuff Bit Calculation Function

This function calculates and extracts the stuff bit from the frame data and represents it as a waveform.

CAN Bus Signal Measurement in Synch with Other Signals

The CAN BUS SIGNAL ANALYZER comprises the DL7200 multichannel digital oscilloscope with four analog channels and 16-bit logic input channel (optional) as its base unit. You can analyze the CAN bus in synchronization not only with its signal but also with other signals, such as a signal from a sensor or a control signal sent to a module. Using this feature along with the CAN bus trigger and analysis functions, you can efficiently evaluate and debug the overall range of your system.

Performance Data of CAN Bus Signal Analyzer with CAN Bus Signal Analysis Functions Option

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<tr>
<th>Basic Specifications</th>
<th>CAN Bus Trigger Functions</th>
<th>CAN Bus Analysis Functions</th>
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</thead>
<tbody>
<tr>
<td>Number of input channels: Four analog channels plus 16-bit digital channel (optional)</td>
<td>Trigger source: CH1 (used with a differential probe)</td>
<td>Number of analyzable frames: 8000 maximum</td>
</tr>
<tr>
<td>Maximum sampling rate: 2 GS/s when the Interleave mode is on</td>
<td>Trigger type: SOF trigger</td>
<td>Analysis results display: Listing and waveform display of analysis results</td>
</tr>
<tr>
<td>Maximum record length: 16 MW when the Interleave mode is on</td>
<td>ID Field trigger, selectable from 4 types of IDs</td>
<td>Auxiliary analysis functions: Data Search function</td>
</tr>
<tr>
<td>Frequency characteristics: 500 MHz for 50-Ω input</td>
<td>Data Field trigger, configurable up to 8 bytes</td>
<td>Field Jump function</td>
</tr>
<tr>
<td>400 MHz for 1-MΩ input</td>
<td>Error Frame trigger</td>
<td>Stuff bit calculation function</td>
</tr>
</tbody>
</table>

Supported CAN Bus Specifications

- CAN Bus: CAN Version 2.0B
- Bit rate: 33.3, 83.3, 125, 250 and 500 Kbps, and 1 Mbps
- High-speed CAN = ISO11898
- Low-speed CAN = ISO11519-2

Example of Setting Data Search Function

Example of Stuff Bit Display

NOTICE

- Before operating the product, read the instruction manual thoroughly for proper and safe operation.
- If this product is for use with a system requiring safeguards that directly involve personnel safety, please contact the Yokogawa sales offices.