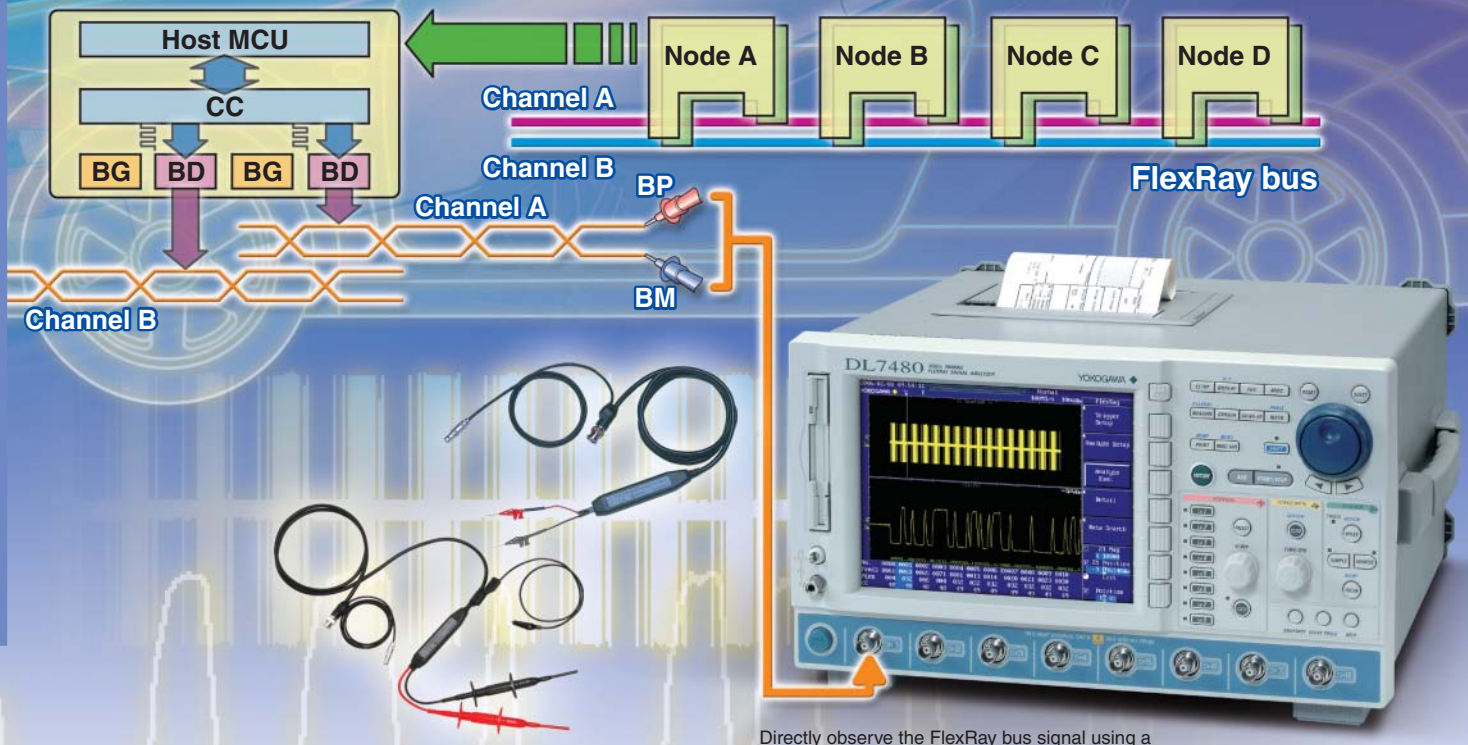
YOKOGAWA

FlexRay Signal Analyzer

DL7440 / DL7480



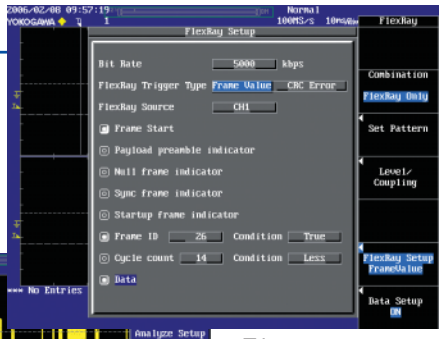
Directly observe the FlexRay bus signal using a Yokogawa differential probe.

Physical Layer Waveform Observation & Protocol Analysis Tool for "FlexRay" the new high speed In-Vehicle network

Now, physical layer waveform observation and protocol analysis of FlexRay bus signals are available in a single measuring instrument. Easily trouble-shoot voltage surges, noise, level fluctuations, and other sources of FlexRay bus errors.

Capture FlexRay Bus Signals with Dedicated FlexRay Triggers

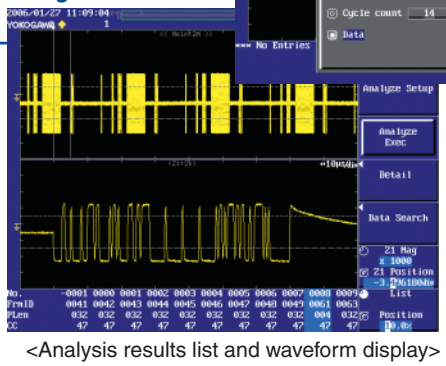
Capture the desired FlexRay bus signal by specifying combinations of trigger bit conditions of the Frame Start, Payload preamble, Null frame, Sync frame, Startup frame indicators, Frame ID, Cycle count and (Payload) Data. Triggers can also be activated on combinations of the FlexRay bus signal bit conditions and other analog signals, or CRC errors on the FlexRay bus.



<Trigger setup menu>

Simultaneous Display of Analysis Results and Corresponding Signal Waveforms

After signal capture, waveforms are displayed together with a list of analyzed frames. Frame waveforms can also be zoomed. Using 8 MW of internal memory, continuous bus waveforms of up to 80 ms can be captured at a sampling rate of 100 MS/s and analyzed. Since the frame waveform at the cursor in the list is automatically displayed, bus signals can be observed while the analysis results are viewed. The effect of noise and level fluctuations on the communication data can be easily determined for quick and efficient debugging. Analysis results can be saved to a file in text format.



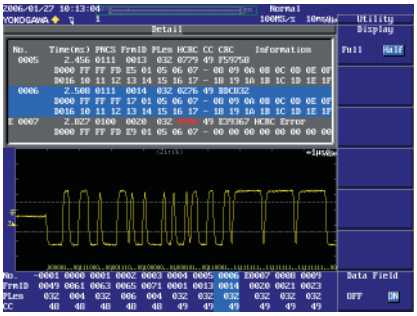
<Analysis results list and waveform display>

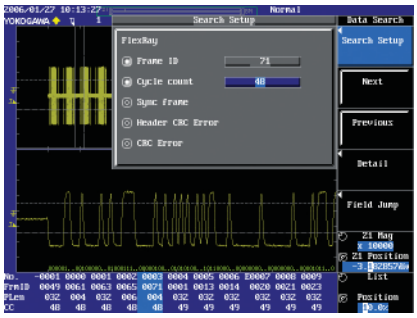
Bulletin 7014-55E

FlexRay Signal Analyzer

A Wealth of Powerful Auxiliary Functions to Support Analysis

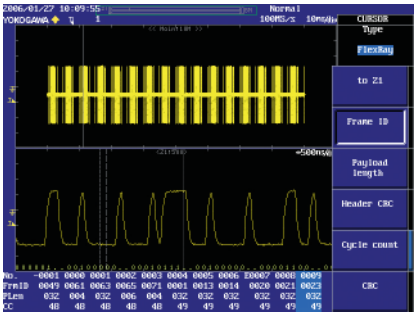
The detailed display mode allows the analyzed results to be displayed frame by frame, and show the time from the trigger point, each indicator bit, Frame ID, Payload length, Data, CRC, and Cycle count in relationship to the waveform.





The desired frame or segment can be located from within the captured data by searching using the Frame ID, Cycle Count, Sync frame, and CRC Error (with AND logic). When frames are found that match the search conditions, their signal waveforms are displayed in the zoom area.

The bit width can be displayed according to the bit rate with two cursors, and values can be checked while the cursor is moved by one or several bits at a time. In the example below, the area corresponding to the frame ID is shown using two cursors, and one bit width is indicated by the two dotted line cursors.



The FlexRay Signal Analyzer DL7440/DL7480 meets the following measurement and analysis needs.

• To observe long durations of bus data (multiple cycles), and confirm changes in timing and period	**Detailed analysis results list display.**
• To confirm whether or not the FlexRay chip is functioning normally, focusing on the interface	**Dedicated triggers, and simultaneous display of analysis results and waveforms.**
• To confirm whether specific frames such as the sync frame were definitely sent	**Dedicated triggers, analysis results list display, search function**
• To observe the relationships between waveforms and analysis results	**Simultaneous display of analysis results and waveforms**
• To check for glitches and other phenomena in the bus signal.....	**Waveform display**

Specifications

Supported FlexRay bus:	FlexRay Protocol Specification version 2.1
Max. sampling rate:	2GS/s
Bandwidth:	500MHz
Max. record length:	16MW(changeable depends on model)
FlexRay signal input:	Differential signal input between BP and BM using a differential probe.
Bit rate:	10Mbps/5Mbps/2.5Mbps

• Trigger functions

Trigger source:	CH1 or CH3: FlexRay signal The other CHs: Analog signal
Trigger types:	Frame Start / Payload preamble, Null frame, Sync Frame, Startup Frame indicators / Frame ID / Cycle count (Payload) Data. CRC Error Trigger Combination trigger of FlexRay signal and the other analog signals

• Analysis functions

Analysis target channels:	CH1, CH3, CH5* or CH7* (*: DL7480 only)
Max. analyzable length:	8MW (701460/701480) 2MW(701450/701470)
Min. required sampling rate for analysis:	Eight(8) times or more of the FlexRay signal bit rate
Sample point:	Approximate point is accepted when the sample rate and the multiple of eight(8) times as bit rate are different.
Number of analyzable frame:	Max.4,000
Auxiliary analysis functions:	Bit value display, Search function, Field jump function, FlexRay cursor, Cursor jump function
Error detection:	Header CRC / CRC discrepancy error TSS / BSS / FES undetactable error
Others	Voting window management, Bit Clock Alignment management

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.

Model Number and Suffix Codes

Model	Suffix Code	Description
701450		DL7440 with 4 CH input and maximum 4 MW memory
701460		DL7440 with 4 CH input and maximum 16 MW memory
701470		DL7480 with 8 CH input and maximum 4 MW memory
701480		DL7480 with 8 CH input and maximum 16 MW memory
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Internal storage drive	-J1	Floppy disk drive [1]
	-J2	Zip® drive[1]
Options	/B5	built-in printer
	/E4	Four additional passive probes(701470, 701480 only) [2]
	/EX4	Attach four 701941 probes [7,9]
	/EA4	Add four 701941 probes [8,9]
	/P4	Four additional probe power connectors(701470, 701480 only) [3]
	/N3	Logic input for 701450/701470 [4] (Standard option)
	/N4	Logic input for 701460/701480 [4] (Standard option)
	/C7	SCSI interface
	/C10	Ethernet interface
	/G2	User-defined math function [5]
	/G4	Power Supply Analysis Function [5]
	/F5	I^2C + SPI Bus Analyzer [6]
	/F7	CAN + SPI Bus Analyzer [6]
	/F8	I^2C + CAN + SPI Bus Analyzer [6]
	/F9	FlexRay Signal Analyzer

1: Select one only.
2: The DL7400 Series is equipped with four passive probes (700988) as standard.
3: The DL7400 Series is equipped with four probe power connectors as standard.
4: Select /N3 for models 701450 and 701470, and /N4 for models 701460 and 701480. Logic probes are sold separately. These options can be installed free of charge.
5: /G2 and /G4 cannot be ordered together. /G4 includes /G2
6: Option /F5, /F7, and /F8 cannot be specified together. Select one only. The SPI Bus Analysis and Search functions are standard feature. The SPI Bus Triggers are only available as an option.
7: Four 700988 probes are not included when this option is specified.
8: This option can be specified with model 701470, 701480 only.
9: When the option /E4 is specified, neither /EX4 nor /EA4 can be specified together.

Accessories (Sold separately)

Name	Model	Description
Differential Probe	701922	DC to 200 MHz
Differential Probe	701920	DC to 500 MHz

YOKOGAWA

YOKOGAWA ELECTRIC CORPORATION
Communication & Measurement Business Headquarters /Phone: (81)-422-52-6768, Fax: (81)-422-52-6624
E-mail: tm@cs.jp.yokogawa.com

YOKOGAWA CORPORATION OF AMERICA Phone: (1)-770-253-7000, Fax: (1)-770-251-6427
YOKOGAWA EUROPE B.V. Phone: (31)-33-4641858, Fax: (31)-33-4641859
YOKOGAWA ENGINEERING ASIA PTE. LTD. Phone: (65)-62419933, Fax: (65)-62412606