signal Xplorer™

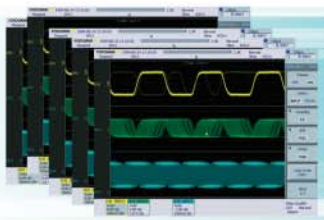
YOKOGAWA

Digital Oscilloscopes

DL9040 / DL9040L NEW!

Introducing New Models of the DL9000 Series
High-speed Digital Sampling Oscilloscopes for Midrange Bandwidths

- **500 MHz bandwidth with up to 5 G samples/sec**
- **High acquisition rates**
  - Continuous mode (when the accumulation function is used): Up to 25,000 frames/sec for each channel
  - N Single mode: Up to 2.5 million frames/sec for each channel
- **History memory**
  - The large-capacity memory can be partitioned to automatically accumulate and display up to 2,000 waveform frames.



Large-capacity Memory and High acquisition rates!
- The DL9040/9040L constantly updates and stores up to 2,000 of the most-recent waveform frames.
- In continuous acquisition mode, the DL9040/9040L updates the display at the exceptionally high rate of 25,000 frames/sec.

- **Thin and compact**
  - A thin (only 18 cm), compact, and lightweight (only 6.5 kg) design makes the DL9040/9040L easy to carry around.

DL9000 Series Model Selection Table

Model Name	DL9040/DL9040L NEW!	DL9140 / DL9140L	DL9240 / DL9240L
Frequency bandwidth	500MHz	1.0GHz	1.5GHz
Maximum sampling rate	5GS/s	5GS/s	10GS/s
Memory size	DL9040: 2.5MW DL9040L: 6.25MW	DL9140: 2.5MW DL9140L: 6.25MW	DL9240: 2.5MW DL9240L: 6.25MW

Specifications

Models

Model name (No.)	Max. sampling rate	Freq. bandwidth	Max. record length
DL9040 (701307)	5 GS/s	500 MHz	2.5 MW
DL9040L (701308)	5 GS/s	500 MHz	6.25 MW

Basic Specifications

Input channels: 4 (CH1 to CH4)
Input coupling: AC, DC, GND, DC50Ω
Input impedance: 1 MΩ ±1.0% approx. 20 pF (when using PB500 probe, 10 MΩ ±2.0%, approx. 14 pF)
50 Ω ±1.5%
Voltage axis sensitivity ranges:
For 1 MΩ input: 2 mV/div to 5 V/div (steps of 1-2-5)
For 50 Ω input: 2 mV/div to 500 mV/div (steps of 1-2-5)
Maximum input voltage:
For 1 MΩ input: 150 Vrms CAT I (Less than 1 kHz)
For 50 Ω input: 5 Vrms or less and 10 Vpeak or less
DC offset max. setting range (When probe attenuation set to 1:1)
For 1 MΩ input
2 mV/div to 50 mV/div: ±1 V
100 mV/div to 500 mV/div: ±10 V
1 V/div to 5 V/div: ±100 V
For 50 Ω input
2 mV/div to 50 mV/div: ±1 V
100 mV/div to 500 mV/div: ±5 V
Vertical (voltage) axis sensitivity
DC accuracy[1]:
For 1 MΩ input: ±(1.5% of 8 div + offset voltage accuracy)
For 50 Ω input: ±(1.5% of 8 div + offset voltage accuracy)
Offset voltage axis accuracy[1]:
2 mV/div to 50 mV/div: ±(1% of setting + 0.2 mV)
100 mV/div to 500 mV/div: ±(1% of setting + 2 mV)
1 V/div to 5 V/div: ±(1% of setting + 20 mV)
Frequency characteristics[1, 2]: For 50 Ω input, For 1 MΩ input (from the probe tip when using the dedicated passive probe (PB500))
(Attenuation point of -3 dB when inputting a sinewave of amplitude ±2 div or equivalent)
5 V/div to 10 mV/div: DC to 500 MHz
5 mV/div to 2 mV/div: DC to 400 MHz
Residual noise level[3]: 0.4 mV rms or 0.05 div rms, whichever is larger (typical value)
A/D conversion resolution: 8-bit (25 LSB/div)
Bandwidth limit: For each channel, select FULL, 200 MHz, 20 MHz, 8 MHz, 4 MHz, 2 MHz, 1 MHz, 500 kHz, 250 kHz, 125 kHz, 62.5 kHz, 32 kHz, 16 kHz, 8 kHz.
Max. sampling rate
Real time sampling mode
Interleave mode ON: 5 GS/s
Interleave mode OFF: 2.5 GS/s
Repetitive sampling mode: 2.5 TS/s

Model and Suffix Codes

Model	Suffix Codes	Description
701307		Digital Oscilloscope DL9040 4 ch, 500 MHz, max. 5 GS/s (2.5 GS/s/ch), 2.5 Mword/ch
701308		Digital Oscilloscope DL9040L 4 ch, 500 MHz, max. 5 GS/s (2.5 GS/s/ch), 6.25 Mword/ch
701310		Digital Oscilloscope DL9140 4 ch, 1 GHz, max. 5 GS/s (2.5 GS/s/ch), 2.5 Mword/ch
701311		Digital Oscilloscope DL9140L 4 ch, 1 GHz, max. 5 GS/s (2.5 GS/s/ch), 6.25 Mword/ch
701312		Digital Oscilloscope DL9240 4 ch, 1.5 GHz, max. 10 GS/s (5 GS/s/ch), 2.5 Mword/ch
701313		Digital Oscilloscope DL9240L 4 ch, 1.5 GHz, max. 10 GS/s (5 GS/s/ch), 6.25 Mword/ch
Power cable	-D	UL/CSA standard
	-F	VDE standard
	-Q	BS standard
	-R	AS standard
	-H	GB standard
Help menu language	-HE	English Help
	-HC	Chinese Help
Options	/B5	Built-in printer
	/P2 [1]	Probe power connections on rear panel (2 outputs for current probes, differential probes)
	/C10 [2]	Ethernet interface
	/C8 [2]	Built-in HDD + Ethernet interface
	/F5 [3]	I²C + SPI bus analyzer

1: Please order /P2 option if you use either current probes or differential probes from Yokogawa. For 2.5 GHz active probe and 5 GHz low capacitence probe, this option is not necessary.
2: Choose either one
3: I²C and SPI triggers are standard. This will be available later Please contact Yokogawa for detail.

Trigger Section

Trigger modes: Auto, Auto Level, Normal, Single, and N Single
Trigger source: CH1 to CH4, LINE, EXT
Window comparator: Channels CH1 to CH4, or individual channels
Trigger types:
Edge/State: Edge, Edge (Qualified), Edge OR, State
Width: Pulse, Pulse (Qualified), Pulse State
Event Interval: Event Cycle, Event Delay, Event Sequence
Enhanced: TV (NTSC, PAL, HDTV, USER)/I²C, SPI (3 wire, 4 wire), Serial pattern

Display

Display: 8.4-inch color TFT liquid crystal display

Functions

Waveform Acquisition/Display Functions

Acquisition modes: Select from three acquisition modes: Normal, Envelope, and Average.
Other acquisition modes: High resolution mode, Repetitive sampling mode, Interleave mode, Interpolate mode
Interpolate function: Interpolates actual sampled data by up to 1000 times (or up to 2000 times in High-Res. mode) and increases the time resolution (up to 2.5 TS/s)
X-Y: displays XY1, XY2 and T-Y simultaneously
Accumulation: Accumulates waveforms on the display. Choose Count/Time and Inten/Color.
Snapshot: Retains the current displayed waveform on the screen.

Analysis Functions

Search and Zoom function: Zooms the displayed waveform along the time (Horizontal Zoom) and voltage (Vertical Zoom) axes. Independent zooming factors can be applied to two zoom areas.
Search types: Edge, Edge Qualified, State, Pulse, Pulse Qualified, Pulse State, Serial Pattern, I²C (optional), SPI (optional)
History memory:
DL9040L: 2000 wareforms (2.5 kW)
DL9040: 1000 wareforms (2.5 kW)
Cursor measurements: Vertical, Horizontal, VT, Marker, Serial
Automatic measurement of Waveform Parameters function
MAX, MIN, HIGH, LOW, P-P, HIGH-LOW, +OVER, -OVER, RMS, MEAN, Sdev, IntegTY
C.rms, C.mean, C.Sdev, C.IntegTY, (1/FREQ), FREQ, COUNT, BURST
+WIDTH, -WIDTH, PERIOD, DUTY, RISE, FALL, DELAY
Telecom Test: Performs mask test and eye pattern measurement
Computation functions: Computes up to eight traces (CH1-CH4/M1-M4)
Reference functions: Display and analysis (computation and cursors) on up to four traces (M1-M4) of the saved waveform data.
Action-on-trigger:
Modes: OFF, All Condition, (GO/NOGO Zone/Param), GO/NOGO Telecom Test)
Actions: Buzzer, Print, Save, Mail

Optional Functions

Built-in Printer (/B5 Option)
Internal Hard Disk Drive (/C8 Option)
Ethernet Communication (/C10 and /C8 Option)
I²C + SPI Bus Analysis Function (/F5 Option)

1. Measured value under standard operating conditions after 30-minute warm-up and performing calibration.
Standard operating conditions: Ambient temperature: 23 ±5°C
Ambient humidity: 55 ±10%
Error in supply voltage and frequency: Within 1% of rating
2. Value in the case of a repetitive signal
The frequency bandwidth of a single-shot phenomenon is the smaller of the two values, DC to sampling frequency/2.5 or the frequency bandwidth of the repetitive phenomenon.
3. When the input section is shorted, the acquisition mode is set to normal, interleave mode is OFF, accumulation is OFF, and the probe attenuation is set to 1:1.
(For detaild specifications, read the "Bulletin 7013-00E Digital Oscilloscope DL9000 Series".

Standard Accessories

Name	Q'ty
Power cable	1
PB500 (500 MHz passive probe)	4
Printer roll paper (when option/B5 is specified)	3
User's manual (1 set)	1
Front cover (transparent)	1

Accessories (Optional)

Name	Model	Specifications
PB500 (10:1 passive probe)	701943	10 MΩ, 500 MHz BW
PBA2500 (2.5 GHz active probe)	701913	2.5 GHz BW
PBD2000 (2 GHz differential probe)	701923	2.0 GHz BW
PBL5000 (5 GHz low capacitance probe)	701974	5 GHz BW

Note

- Before operating the product, read the user's 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.

Yokogawa's Approach to Preserving the Environment

- Yokogawa's electrical products are developed and produced in facilities that have received ISO14001 approval.
- In order to protect the global environment, Yokogawa's electrical products are designed in accordance with Yokogawa's Environmentally Friendly Product Design Guideline and Product Design Assessment Criteria.

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