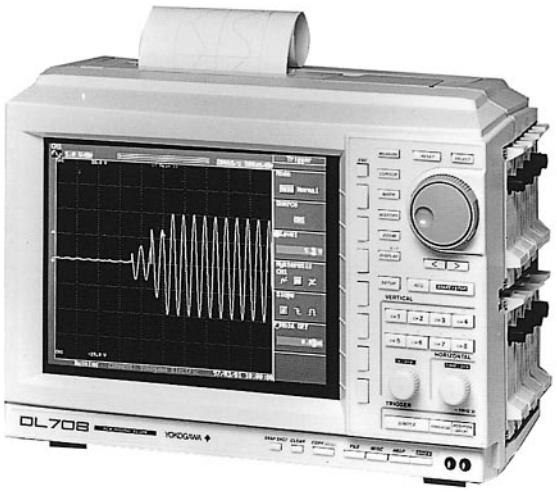
DIGITAL OSCILLOSCOPES & DIGITAL SCOPES

YOKOGAWA

DL708

7018
Digital Scope
DL708



NEW

RS-232-C
GP-IB

3-Year Warranty

DL708 (701810)
370 × 260 × 183mm 6.8kg
(14-5/8 × 10-1/4 × 7-1/4" 15.0 lbs)

The DL708 is designed for measuring multi-channel isolated physical signals. The DL708 has the same ease of operation and superb portability of the DL1500 series digital oscilloscope with the addition of a large color display. The modular inputs provide flexibility for various applications. The new DL708 provides data acquisition and recording technology to measure signals ranging from slow changing temperature to high-speed MHz signals. One instrument will provide a wide range of measurements.

- **Maintenance and inspection of turbines and Inspecting turbines and rotating machinery**
- **Measuring the behavior of engines**
- **Monitoring large plants**
- **Monitoring the operation of press machines**
- **Observing impact and vibration tests**
- **Observing sporadic one-shot events**
- **Recording changes in temperature and electric potential**
- **Maintaining substations**

701870 701860 701853 701852 701851 701850

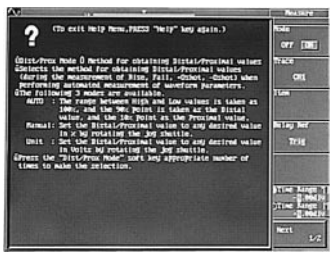
Plug-in Modules

FEATURES

- **Up to 8 channels isolated inputs**
  By changing the plug-in modules, you can perform temperature measurement, precision voltage measurement. (Non-isolated modules are also available.)
- **10 MS/s max. sampling rate, 10 bits 16 M words (with high-speed module)**
- **100 kS/s max. sampling rate, 16 bits, 16 M words (with high-resolution module)**
- **Large 10.4-inch color TFT display**
  A wide viewing angle color LCD enables waveforms to be displayed clearly.
- **1.2 GB internal hard disk (optional)**
  The hard disk can be used for real time recording with an ultra-long memory of up to 128 M word at 1 channel use.
- **Built-in printer and centronics interface**
  The DL708 has a built-in printer for fully independent use, and a Centronics interface to connect to an external printer. Color printers are supported.
- **Compact and light weight**
  The instrument weighs just 6.8 kg (15 lbs) including the 8-ch high-speed isolation module.
- **3.5-inch FDD, standard**

● Multi-language on-line HELP

English, French, German or Japanese may be selected. For greater convenience, the built-in HELP facility displays function information, setting ranges, and other information corresponding to the panel keys and software key menu. Error messages are also displayed in the selected language to improve efficiency.



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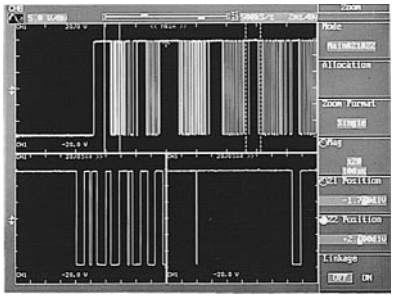
FUNCTIONS

■ WAVEFORM CAPTURING FUNCTIONS

Capture signals with a conventional oscilloscope functions. You can set the time axis, voltage axis and trigger while observing a waveform.

● Capturing Signals with Long Memory

You can capture signals using either the standard 400 k words of memory or the optional long memory of up to 16 M words. This long memory lets you record waveforms over a long period of time without having to reduce the sampling speed. You can home in on the details of the captured signals by using the zoom function or the long copy function.
You can easily save the captured signals to a large capacity medium such as the internal 1.2 GB HDD (optional), or an external 230 MB MO drive via a SCSI interface (optional).

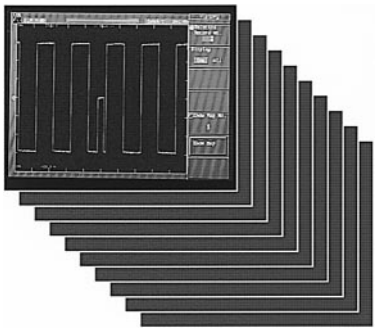


● A Wealth of Trigger Functions

The DL708 supports an enhanced trigger which is defined as a combination of parallel patterns, in addition to the normal edge trigger. You may set threshold values of A and B for each channel, then set the trigger using a combination of H (High), L (Low) and X (don't care).
The A and B parallel patterns may be set independently. When setting the Edge ON A trigger, you can combine the rising and / or falling edge of the specified signals.

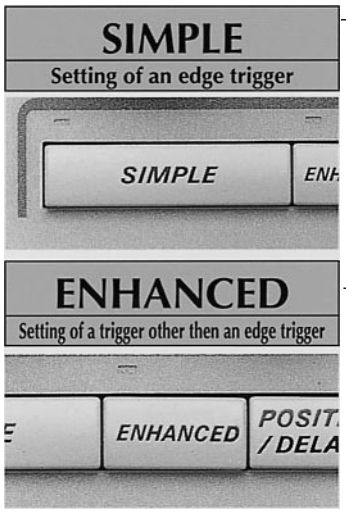
● History Memory and Sequential Store

The history memory and sequential store function divides the internal memory, enabling you to record the input signals a number of times. History memory will allow you to recall up to 1000 previous display screens.
The sequential store function is handy for capturing series of high-speed events generated at intervals of a few ms or less. Sequential store eliminates the process of displaying each captured waveform, so the signals are captured with a very short dead time. You may assign the number of acquisitions in advance and the captured waveform is displayed after the set number of acquisition.



● Envelope

The envelope function always records the peak values of the input signals at the maximum sampling speed, regardless of the observation time. This is useful when observing surge signals which occur intermittently over a period of several minutes or several hours.
When the envelope function is used, the sampling speed differs depending on the input module



Edge trigger	Sets a regular edge trigger.
A → B (n)	Causes a trigger the n-th time that conditon B goes true after conditon A has gone true.
A Delay B	Causes a trigger if condition B goes true after condition A has gone true and an interval at least equal to the delay setting has elapsed (condition B is ignored during the delay time).
Edge On A	Enables an edge trigger on another input during the interval when trigger condition A is true.
OR	Causes a trigger when any one of the individual channel conditions set with the patterns goes true.
B>Time (Pulse Width Trigger)	Causes a trigger when trigger conditon B (a pattern) has gone true and remained true for an interval equal to or longer than the set time, and then goes false.
B<Time (Glitch Trigger)	Causes a trigger when trigger condition B (a pattern) goes first true and then false within an interval shorter than the set time.
B Time Out	Causes a trigger if trigger condition B (a pattern) goes true and remains true for the time set.
Window	Causes a trigger if a signal falls inside a window defined by upper and lower thresholds, or if the signal falls outside the window.

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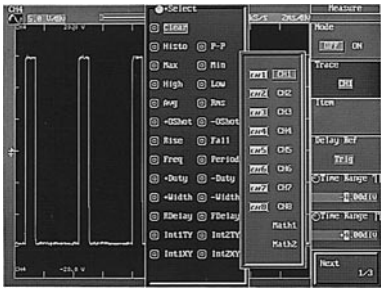
■ WAVEFORM ANALYSIS FUNCTION

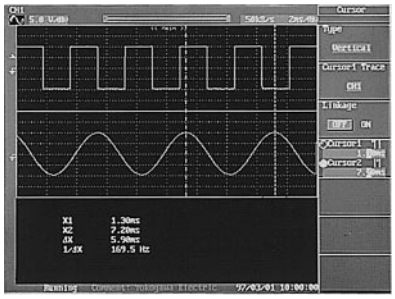
● **Measurement of 26 Kinds of Waveform Parameters**

The DL708 automatically computes the maximum and minimum values, RMS value and other voltage-related parameters, as will as frequency, rise time and other time axis parameters. These automatic measurements are useful for analyzing waveforms and are unaffected by human reading errors.



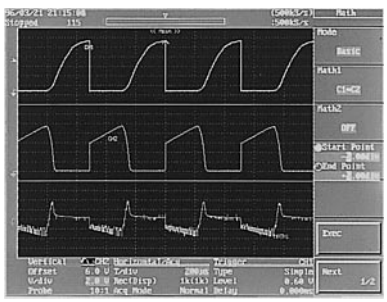
● **Cursors**

In addition to the horizontal cursor for measuring the voltage axis and the vertical cursor for measuring the time axis, the DL708 has a marker which can be moved over the captured waveform. The marker can be moved to the zoom screen which displays an enlarged waveform segment. This allows you to measure the time difference or potential difference between two points with high time resolution.



● **Inter-channel Computation**

The standard instrument supports addition, subtraction, multiplication, FFT (power spectrum) and phase shift computations (addition, subtraction and multiplication are performed after correcting the phase difference between channels). By installing the user defined computation function, you can freely define computation formulas incorporating a wide range functions. Trigonometric function, differential, integral, square root and digital filter functions, as well as the usual four arithmetic operations are available.



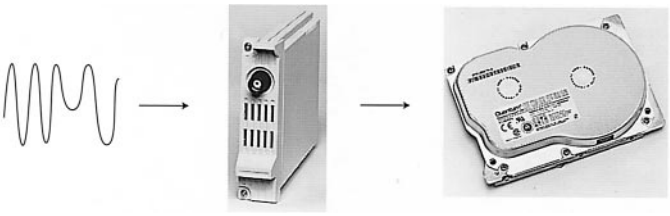
● **FFT Analysis Function**

The standard DL708 supports a power spectrum of up to 10,000 points. With the optional user define computation function, you can also use various functions such as linear spectrum and transfer functions.

■ WAVEFORM DATA RECORDING FUNCTIONS

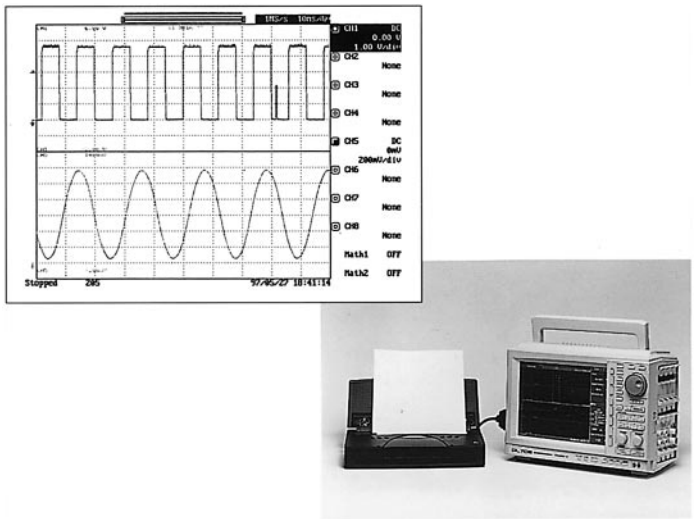
● **Real-time Hard Disk Recording (with Optional Internal Hard Disk)**

By using an internal 1.2 GB hard disk, you can record input signals in real-time. You can also record signals continuously over several days.



● **Output to an External Printer or Plotter**
(You can record several pages of waveform data using a printer.)

The DL708 can be connected via the Centronics interface to an external printer. You can record data on plain paper instead of thermal paper, eliminating the need to make copies of thermal paper printouts to preserve data records. You can also print onto several pages data which was recorded over a long period to the internal memory or the hard disk. You can even make a copy of the screen using an external plotter which supports HP-GL, via the GP-IB or RS-232-C interface.



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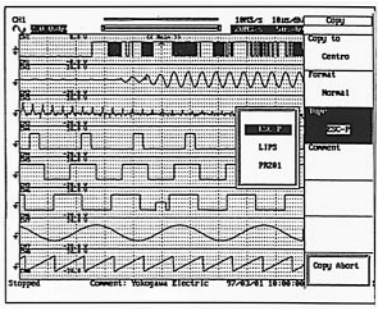
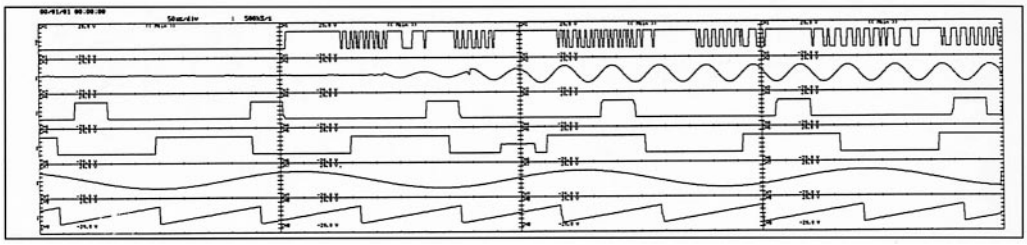
● **Output to The Built-in Printer**

Data can be sent to the built-in printer in one of three modes, display hard copy, long copy, and real-time recording. In the display hard copy mode, the image displayed on the screen is sent directly to the printer. In the long copy mode, an enlarged version of the waveform in memory is printed. In the real-time recording mode, the input signals are recorded directly to the printer in real-time. The maximum chart speed supported in the real-time recording is 20 mm/s.

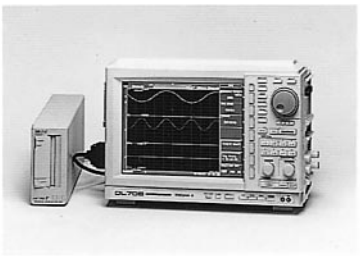


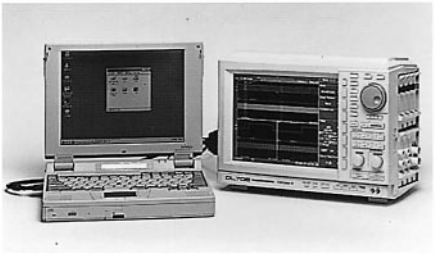


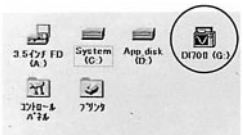
■ **CONNECTING THE DL708 TO PERIPHERAL UNITS**

● **SCSI Interface (optional)**

With the DL708, you can save waveform and panel setting information to an external hard disk, ZIP drive or MO disk. Or, if the optional internal HDD is installed, you can transfer the contents of the internal disk directly to a Windows 95 environment by connecting the DL708 to the PC via an SCSI cable.



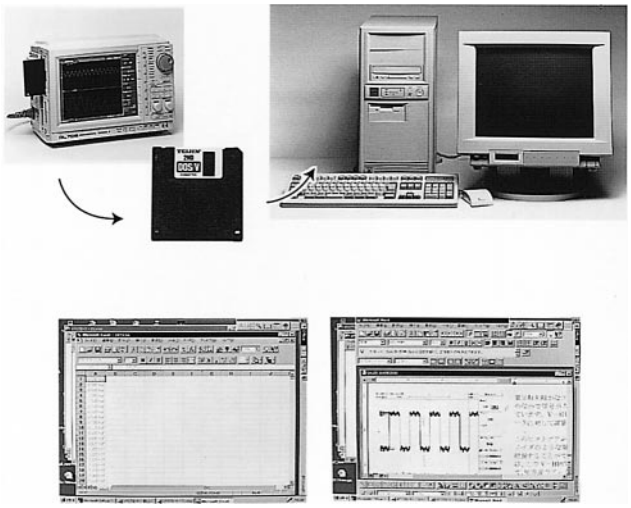




● **3.5-inch FDD**

You can save the DL708 panel setting information and waveform data to an FD in the MS-DOS format. You can then use the waveform data off-line in a PC. By using software such as Excel, you can save waveform data in the ASCII format so that data can be read directly.

You can also save data in five kinds of image files, HP-GL, ThinkJet, PostScript, TIFF, and BMP. You can then read these files into word processing software on a PC to create reports containing waveforms.



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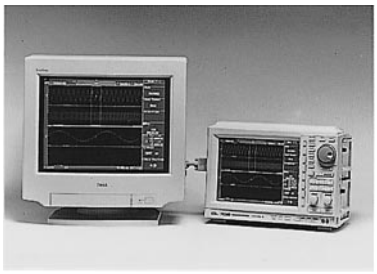
● **VGA Interface**
By simply connecting the VGA video output to a PC monitor, you can display waveforms on a large screen monitor. By using a commercially available VGA-to-NTSC or VGA-to-PAL converter, you can record display data to a video recorder over a long period of time.



● **GP-IB and RS-232-C Interfaces**
These interfaces enable you to control the DL708 on-line from a PC, transfer data to a PC and plot data on an external plotter.

● **Centronics Interface (color printers supported)**
This interface is for connecting a PC printer, and supports ESC-P,BJ, LIPS, PR201 and PCL5 printer description commands.
(Only ESC/P and BJ commands support color printers)

SPECIFICATIONS

■ SPECIFICATIONS OF MAIN UNIT

Basic Specifications

● **Input**
Form: Plug-in input units (Each unit contains an A/D converter.)
Number of slots: 8
Different kinds of units can be used together.

● **Horizontal**
Max. record length: 400 k words (100 k words/ch model, standard)
4 M words (1 M word/ch model, when /M1 option is added)
8 M words (2 M word/ch model, when /M2 option is added)
16 M words (4 M word/ch model, when /M3 option is added)
Time axis accuracy: ±0.005%
Sweep time:
100k words/ch model: 500 ns/div to 50000 s/div (1-2-5 steps)
Other models: 500 ns/div to 100000 s/div (1-2-5 steps)

● **Acquisition mode**
Envelope: Holds the peak value at the max. sampling rate, independent of time/div.
Box average: Resolution of the A/D converter is increased by max. 4 bits.
History memory: Holds up to 1000 screens of past waveforms.
Sequential store: Specify between 2 and 1000 storage operations.
Roll: Sampling rate of 100 kS/s can be used.

● **Trigger**
Mode: AUTO/AUTO-LEVEL/NORMAL
Pretrigger: 0 to 100% (1% steps)
Source: INT (1ch to 8ch)/EXT/LINE
Slope: Rise/Fall/Both
Type: Edge trigger
Event/Pattern trigger
A -> B (n), A Delay B, Edge on A
Pulse width trigger
B > Time, B < Time, B timeout
Window trigger
OR trigger

● **Screen update rate**
When 1 channel used: Max. 30 screens per sec
When 8 channels used: Max. 20 screens per sec

Display

Display: 10.4-inch TFT color liquid crystal display
Size: 211.2 (horizontal) × 158.4 mm (vertical)
Total number of pixels: 640 × 480 (Liquid crystal display may include defects of about 0.02% of all pixels.)
Number of waveform display pixels: 501 × 432
Display format: Divided format: Single/Dual/Quad/Hexa/Octal
Zoom: Main/Main & Z1/Main & Z1 & Z2/Z1 & Z2/Main & Z2/Z1 Only/Z2 Only
(Z1 and Z2 are abbreviations for zoom areas 1 and 2, respectively.)
X-Y: TY/XY/TY & XY
Accumulation display: PERSIST: Accumulation in one color
COLOR: Accumulation an infinite number of times in eight colors which contain data frequency information.
Max. number of display traces: 24 traces (in zoom mode) 8 captured traces + 16 enlarged traces

Recorder

● **Built-in printer**
Printing system: Thermal line dot method
Dot density: 8 dots/mm
Paper width: 112 mm
Effective recording width: 104 mm
Recording speed: Max. 20 mm/s
Real-time recording: Can be used at a time axis slower than 500 ms/div.

● **Real-time hard disk recording**
(requires the optional 1.2 GB hard disk)
Capacity at one time: Max. 128 M word (256 MB)
Time axis: 1 s/div or less
Max. sampling rate: 10 kS/s or less (8 channel use)
100 kS/s or less (1 channel use)
Restriction: This function cannot be used in combination with real-time printing, average or sequential storage.

Inter-channel Computation Function

Applicable data: Max. 100 k words in captured waveform (MATH1 only)
Max. 50 k words in captured waveform (MATH1 & MATH2 simultenous use)

● **Standard**
Operations: Addition, subtraction, multiplication, FFT and phase-shift
FFT: Type: PS (power spectrum)
Number of points: 1000, 2000, 10000(MATH 1 Only)
Window functions: Rectangular, hanning
Starting point specification: Possible
User define: NA

● **User Define computation function (optional)**
Operations: Addition, subtraction, multiplication, division, ABS, SQRT, LOG, EXP, trigonometric function, moving average, differential, integral
FFT: Type PS, LS, RS, PSD, CS, CH
Number of points: 1000, 2000, 10000 (MATH 1 Only)
Window functions: Rectangular, hanning
Starting point specification: Possible
User define: Possible

Waveform Measurement Functions

● **Cursor**
Type: Marker Two markers
Horizontal Two horizontal axis cursors
Vertical Two vertical axis cursors

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H & V Two horizontal axis and two vertical axis cursors
Cursor measurement value: The marker moves over the data, and indicates the time and numerical values of the measurement data and computed data.
A cursor other than the marker moves on the screen, and measurement takes place with respect to the data on the screen. For this reason, the resolution of the measurement value depends upon the resolution of the screen.

● **Automatic measurement of waveform parameters**
The waveform parameters for the range specified by the cursor are measured.
Max. number of measurement items: 8 (Can be set for multiple arbitrary waveform data, however, the total number of parameters is not more than 8.)
Measurement items: P-P (Peak to Peak), Max (maximum value), Min (minimum value), High (voltage with maximum amplitude and frequency), Low (voltage with minimum amplitude and frequency), Avg (average value), Rms (RMS value), +Ovr (overshoot), -Ovr (undershoot), Rise (rise time), Fall (fall time), Freq (frequency), Period, +duty (High duty ratio), -duty (Low duty ratio), +Width (High pulse width), -Width (Low pulse width), Amp (amplitude), StdDev (standard deviation), Integ1 and Integ2, F delay, R delay

Panel Data Output and Storage (Copying) Function

● **Output destination: Built-in printer**
Format
Normal: Hard copy of screen is output.
Long*n: Displayed waveform is output enlarged at a magnification specified by n.

● **Output destination: GP-IB interface, RS-232-C interface**
FDD, internal HDD, external SCSI device
Format: HP-GL, ThinkJet, PostScript, TIFF (BW), TIFF (Color), BMP (BW), BMP (Color)

● **Output destination: Centronics**
Format: ESC-P(BW), ESC-P(Color), BJ(BW), BJ(Color), LIPS, PR201, PCL5
(These formats support an output of several pages.)

External I/O

● **Trig-IN/Trig-OUT**
Connector: RCA pin jack
Input voltage: CMOS level

● **VGA video signal output**
Connector: D-Sub 15-pin
(VGA VIDEO OUT)
Output format: VGA compatible

● **GP-IB interface**
Electrical and mechanical specifications: IEEE St'd 488-1978 (JIS C 1901-1987)
Functional specifications: SH1, AH1, T5, L4, SR1, RL1, PP0, DC1, DT0, C0
Protocol: IEEE St'd 488.2 1987

● **RS-232-C interface**
Connector: D-Sub 9-pin
Standard: EIA RS-232-C
Transmission speed: 1200, 2400, 4800, 9600, and 19200 bps

● **Centronics interface**
Connector: Half pitch 36 pin connector

● **SCSI interface (optional)**
(Available if the DL708 comes with the optional 1.2 GB internal hard disk drive.)
Standard: SCSI (Small Computer System Interface), ANSI X3.131-1986
Connector: Half pitch 50-pin (pin type)
Connector pin assignment: Unbalanced type (single end)
Supported SCSI devices and conditions
HD drive: Drive formattable by the EZ-SCSI
MO drive: Up to 640 MB type which is formattable by the EZ-SCSI
Zip drive: Iomega Zip drive compatible

● **HP-GL plotter output (common to GP-IB and RS-232-C interfaces)**

External Media

● **Internal floppy disk drive**
Number of drives: 1
Size: 3.5"
Capacity: 640, 720 KB/1.2, 1.44 MB
(MS-DOS format)

● **1.2 GB internal hard disk drive (optional)**
Number of drives: 1
Size: 3.5"
Capacity: 1.2 GB (SCSI type)
Data transfer to Windows: The contents of the internal HDD can be transferred to a PC (Windows 95) via the SCSI interface.

General Specifications

Reference operating conditions
Ambient temperature: 23±5°C
Ambient humidity: 55±10% RH
Power supply voltage and frequency error: Within 1% of ratings
Calibration takes place after a warmup period of at least 30 minutes.
Storage temperature: -20 to 60°C
Storage humidity: 20 to 85% RH (No condensation allowed)
Operation temperature range: 5 to 40°C
Operation humidity range: 20 to 85% RH (when not using the printer)
35 to 85% RH (when using the printer)
Rated power supply voltage: 100 to 120 V AC (100 V power supply)
200 to 240 V AC (200 V power supply)
Rated power supply frequency: 50/60 Hz
Allowable power supply voltage: 90 to 132 V AC (100 V power supply)
180 to 264 V AC (200 V power supply)
Power supply frequency variation: 48 to 63 Hz
Power consumption: 250 VA max.
Withstand voltage: Between power supply and ground 1500 V AC for 1 minute
Insulation resistance: Between power supply and ground 10 MΩ or higher at 500 V DC
External dimensions: Approx. 370 (W) × 260 (H) × 183 mm (D)
(excluding handle and projections)
Weight: Approx. 6.8 kg
(Including an 8-ch high-speed isolation module)
Approx. 5.3 kg (Main unit only)

Standard Accessories (Main Unit)

Part name	Quantity
Power cable	1
Set of instruction manuals	1
Front panel protection cover (**B9946EA**, opaque type)	1
Printer roll paper	1
Cover panel	8
Soft case (for probes & leads)	1
Printer connecting cable (**B9946YY**)	1

■ SPECIFICATIONS OF INPUT PLUG-IN MODULES

High-speed Isolation Module

Number of input channels: 1
Input coupling: DC/AC/GND
A/D resolution: 10 bits
Max. 14 bits (when measuring the box average or average)
Max. sampling rate: 10 MS/s
Input type Isolation unbalanced
Frequency band (-3 dB)*1 DC to 2 MHz
Input range:
8 div/display: 20 V/div to 5 mV/div (1-2-5 steps) (main unit only)
200 V/div to 50 mV/div (1-2-5 steps)
(when instrument is combined with dedicated probe **700929**)
Max. input voltage (1 kHz or less):
In combination with **700929** probe (between H and L *3):
850 V (DC + AC peak)
(CAT I & II, 600 V rms)
Main unit only (between H and L *4):
250 V (DC + AC peak)
(CAT I & II, 177 V rms)
Max. allowable in-phase voltage:
In combination with **700929** probe (between probe tip H or L and case grounding *5)
400 V rms (CAT I & II)
Main unit only (between L and case ground *6)
42 V (DC + AC peak)
(CAT I & II, 30 V rms)
DC accuracy *1
20 V/div to 10 mV/div: (main unit only)
±(1.5% of 8 div + offset voltage accuracy)
Offset voltage accuracy *1: ±(0.04% of offset voltage range + 1% of set value)
Input impedance: 1 MΩ±1%, approx. 30pF
Input connector: Isolation type BNC connector
Input filter: OFF/500, 50, 5 kHz/500 Hz

High-Speed Module (701851)

Number of input channels: 1
Input coupling: DC/AC/GND
A/D resolution: 10 bits
Max. 14 bits
(when measuring the box average or average)
Max. sampling rate: 10 MS/s
Input type: Non-isolation unbalanced
Frequency band (-1 dB)*1: DC to 5 MHz
Input range:
8 div/display: 10 V/div to 5 mV/div (1-2-5 steps)

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Max. input voltage (1 kHz or less): 250 V (DC + AC peak)
(CAT I & II, 177 Vrms)
DC accuracy *1: 10 V/div to 10 mV/div (main unit only)
±(1.5% of 8 div + offset voltage accuracy)
Offset voltage accuracy *1: ±(0.04% of offset voltage range + 1% of set value)
Input impedance: 1 MΩ±1%, approx. 30 pF
Input connector: BNC connector
Input filter: OFF/5 MHz/500 kHz

High-Resolution High-Voltage Isolation Module (701852)

Number of input channels: 1
Input coupling: DC/AC/GND
A/D resolution: 16 bits
Max. sampling rate: 100 kS/s
Input type: Isolation unbalanced
Frequency band (-3 dB)*1: DC to 40 kHz (200 V/div to 100 mV/div)
DC to 40 kHz (50 mV/div)
Input range: 200 V/div to 50 mV/div (1-2-5 steps) 8 div/display
Max. input voltage (1 kHz or less): 850 V (DC + AC peak) (between signal H and L *7)
(CAT I & II, 600 Vrms)
Max. allowable in-phase voltage: 400 Vrms (CAT I & II) (between signal H or L and case grounding *8)
DC accuracy*1, *2 (excluding when Input filter is set to Auto)
200 V/div to 100 mV/div: ±(0.5% of 8 div)
50 mV/div: ±(1% of 8 div)
Input impedance: 1 MΩ±1%
Input connector: Safety connector (banana plug)
CMRR: 80db (50/60 Hz) or more
Temperature: cofficient (excluding when input filter is set to Auto)
Zero point: ±(0.02% of 8div)/°C
Gain: ±(0.02% of 8div)/°C
Input filter (LPF): OFF/4 kHz/400, 40 Hz
FFT anti-aliasing filter: OFF/40 kHz to 20 Hz

High-Resolution Isolation Module (701853)

Number of input channels: 1
Input coupling: DC/AC/GND
A/D resolution: 16 bits
Max. sampling rate: 100 kS/s
Input type: Isolation unbalanced
Frequency band (-3 dB)*1 DC to 40 kHz (20V/div to 10mV/div)
DC to 30 kHz (5mV/div)
Input range: 20 V/div to 5 mV/div (1-2-5 steps) 8 div display
Max. input voltage (1 kHz or less): 100 V (DC + AC peak) (between signal H and L *9)
(CAT I & II, 70 Vrms)
Max. allowable in-phase voltage: 400 Vrms (CAT I & II)
(between signal H or L and case grounding *10)
DC accuracy*1, *2 (excluding when Input filter is set to Auto)
20V/div to 20mV/div: ±(0.3% of 8 div)
10mV/div: ±(0.5% of 8 div)
5mV/div: ±(1% of 8 div)
Input impedance: 1 MΩ±1%
Input connector: Safety Connector (banana plug)
CMRR: 80db (50/60 Hz) or more
Temperature: cofficient (excluding when input filter is set to Auto)
Zero point: ±(0.02% of 8div)/°C
Gain: ±(0.02% of 8div)/°C
Input filter (LPF): OFF/Auto/4 kHz/400, 40 Hz
FFT anti-aliasing filter: OFF/40 kHz to 20 Hz

Temperature Module (701860)

Number of input channels: 1
Data update rate: Approx. 135 Hz
Input type: Isolation unbalanced
Applicable sensor: Thermocouple
Measurement range / Accuracy*1, *11

Type	Range	Accuracy
K E	-200 to 1300°C -200 to 800°C	±(0.2% of reading + 1.5°C) except: -200 to 0°C: (±0.5% of reading ± 1.5°C)
J T L U N	-200 to 1100°C -200 to 400°C -200 to 900°C -200 to 400°C 0 to 1300°C	
R S	0 to 1700°C 0 to 1700°C	±(0.2% of reading + 3°C) 0 to 200°C: ±8°C 200 to 800°C ±5°C
B	400 to 1800°C	±(0.2% of reading + 4°C) except: 400 to 700°C: ±8°C
W	0 to 2300°C	± (0.2% of reading + 3°C)
KPvsAu7Fe	0 to 300 K	0 to 50 K: ±8.0 K 50 to 300 K: ±4.5 K

Max. input voltage (1 kHz or less): 42 V (DC + AC peak) (between signal H and L)
(CAT I & II, 30 Vrms)
Max. allowable in-phase voltage: 42 V (DC + AC peak)
(1 kHz or less) (between signal H or L and case grounding)
(CAT I & II, 30 Vrms)
Input connector: Binding post
Input impedance: Approx. 1 MΩ
Vertical resolution: 0.1°C
Temperature coefficient: ±(0.02% of FS) / °C
Reference junction compensation accuracy (when input terminal temperature is balanced): ±1°C (K, E, J, T, L, U, N)
±1.5°C (R, S, B, W)
±1 K (KPvsAu7Fe)
Input filter: OFF / 2, 8 Hz

Logic Input Module (701870)

Number of logic channels: 16 (8 bit × 2)
Maximum sampling rate: 10 MS/s (response time varies depending on a probe)
Supported probe: **700986**, **700987**

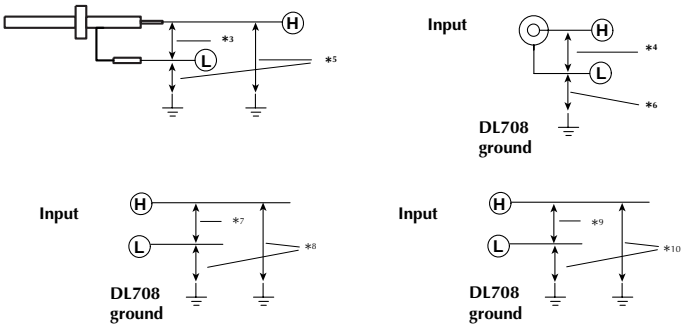
High Speed Logic Probe (700986)

Number of channels: 8
Input type: Non-isolation unbalanced
(All the logic channel share the same ground level.
The ground level of the probe and the module share the same ground level.)
Max. input voltage (1 kHz or less): (between probe tip and the ground.)
42 V (DC + AC peak)
(CAT I & II, 30 V rms)
Response time: 1µs or less
Input impedance: Approx. 22 kΩ
Threshold level: Approx. 1.4 V (fixed value)

Isolation Logic Probe (700987)*13

Number of channels: 8
Input type: Isolation unbalanced (All the logic channels are isolated.)
Input connector: Safety connector (banana type) × 8
Input mode: DC / AC mode selectable for each channel
Input mode indicator: LED indicates the input mode of each bit
Threshold level: DC mode: 6 V DC ± 50%
AC mode: 50 V AC ± 50%
Max. input voltage (1 kHz or less) (between signal H and L):
250 V rms*12 (CAT I & II)
Max. allowable in-phase voltage (1 kHz or less) (between signal H or L and case grounding): 250 V rms*12 (CAT I & II)
Max. allowable voltage between adjacent bit (1 kHz or less):
250 V rms*12 (CAT I & II)
Response time: DC mode: 1 ms or less
AC mode: 20 ms or less
Input impedance: Approx. 100 kΩ

*1 Under reference operating conditions
*2 At position center



*11 Excluding reference junction compensation accuracy
*12 Do not apply voltage over 353 V AC peak or 250 V DC
*13 **700987** does not include any measurement lead. To measure a signal, **366961** (42 V or less) or combination of **758917** and either **758922** or **758929** is required.

DIGITAL OSCILLOSCOPES & DIGITAL SCOPES

DL708

YOKOGAWA

AVAILABLE MODELS

Main Unit

Model	Suffix Code	Description
701810		DL708 Digital Scope*1
Power supply voltage	**-1**	100 to 120 V
	-5	200 to 240 V
Power cable	**-D**	UL, CSA standard
	-F	VDE Standard
	-Q	BS Standard
	-R	SAA Standard
Optional memory expansion specifications	**/M1**	Memory expansion to 1 M words/ch*2
	/M2	Memory expansion to 2 M words/ch*2
	/M3	Memory expansion to 4 M words/ch*2
Other optional specifications	**/C7**	SCSI interface*3
	/C8	1.2 GB internal HDD*3
	/G2	User define math function

*1: The main unit does not include plug-in modules.
*2: Select one of these. You cannot specify all.
*3: If you specify **/C8** (1.2 GB internal HDD), an SCSI interface is also added. For this reason, you cannot specify both at the same time.

Plug-in Module

Model Name	Description
701850	High-speed isolation module*1
701851	High-speed module*1
701852	High-Resolution, High-Voltage, Isolation Module*1 *2
701853	High-Resolution, Isolation Module*2
701860	Temperature Module*1
701870	Logic Input Module *1 *2

*1: The module does not include any probes.
To use a probe, you must pruchase one separately (accessory).
*2: The **DL708** has to have firmwave version 2.00 or later. Contact your local YOKOGAWA sales office to upgrade the firmwave in your **DL708**.

Probes

No.	Part Name	Model	Specifications	Order Q'ty
1.	Isolation probe	**700929**	For **701850**	1
2.	10:1, 1:1 selectable probe	**700998**	For **701851**	1

Logic Probes

No.	Part Name	Model	Specifications	Order Q'ty
3.	High speed logic probe*1	**700986**	For **701870**	1
4.	Isolation logic probe*2	**700987**	For **701870**	1

*1: The probe include both **B9879PX** & **B9879KX** measurement lead.
*2: The probe does not include any measurement lead.
To measure a signal, either **336961** or combination of **758917** and either (**758922** or **758929**) is required.

1. 700929

2. 700998

3. 700986

4. 700987

Measurement Lead for 700986 Logic Probe

No.	Part Name	Model	Specifications	Order Q'ty
5.	Measurement lead	**B9879PX**	Alligator clip. (for 8 bit measurement)	1
6.	Measurement lead	**B9879KX**	IC clip. (for 8 bit measuremnt)	1

Measurement Lead for 700987 Logic Probe

• For high voltage (42 or more) measurement

No.	Part Name	Model	Specifications	Order Q'ty
7.	Measurement lead	**758917**	Adaptor is optional. (for 1 bit measurment) (used in combination with **758922** of **758929**)	1
8.	Alligator clip set	**758922**	for **758917**. (for 1 bit measurement) rated voltage 300V.	1
9.	Alligator clip set	**758929**	for **758917**. (for 1 bit measurement) rated voltage 1000 V.	1

• For low voltage (42 or less) measurement

No.	Part Name	Model	Specifications	Order Q'ty
10.	Measurement lead	**366961**	With alligator clip (for 1 bit measurement)	1

ACCESSORIES (optional)

Main Unit

No.	Part Name	Model	Specifications	Order Q'ty
11.	Conversion adapter	**366927**	BNC (plug) - RCA (jack) conversion	1
12.	Conversion adapter	**366928**	BNC (jack) - RCA (plug) conversion	1
13.	Conversion connector	**366971**	RS-232-C conversion connector	1
–	Printer connecting cable	**B9946YY**	Exclusively for Centronics interface	1
14.	Carrying case	**700911**	For **DL708**	1
15.	Front panel protection cover	**700912**	For **DL708**, transparent	1
16.	Front panel protection cover	**B9946EA**	For **DL708**, Opaque	1

High-speed Isolation/High-Speed Module

No.	Part Name	Model	Specifications	Order Q'ty
17.	Conversion adapter*1	**366921**	Conversion adapter (BNC-banana (female))	1
18.	Conversion adapter*1	**366923**	Plug adapter (for T-shaped BNC)	1
19.	BNC cable *1	**366924**	BNC cable (BNC-BNC 1 m)	1
	BNC cable *1	**366925**	BNC cable (BNC-BNC 2 m)	1
20.	BNC cable*2	**366926**	BNC alligator clip cable	1

*1: These adaptors and lead are not isolated and should be used for measurement under 42 V.
*2: The cable can not be used in combination with High-Speed Isolation (**701850**) module.

High-Resolution High-Voltage Isolation / High-Resolution Isolation Module

• For high voltage (42 or more) measurement

No.	Part Name	Model	Specifications	Order Q'ty
7.	Measurement lead	**758917**	2 lead or 1 set. Adaptor is optional. (used in combination with **758922** or **758929**)	1
8.	Alligator clip set	**758922**	for **758917**. 2 clips for 1 set. rated voltage 300 V.	1
9.	Alligator clip set	**758929**	for **758917**. 2 clips for 1 set. rated voltage 1000 V.	1

• For low voltage (42 or less) measurement

No.	Part Name	Model	Specifications	Order Q'ty
10.	Measurement lead	**366961**	Measurement lead with alligator clip	1
21.	Conversion adapter	**366922**	Banana (male)-BNC conversion	1
22.	Conversion adapter	**751512**	Safety connector-Binding post conversion	1

Spares (for main unit)

Part Name	Part No.	Specifications	Order Q'ty
Roll recording paper	**B9850NX**	30 m (Unit: 1 roll)	5

DIGITAL OSCILLOSCOPES & DIGITAL SCOPES

DL708

5. B9879PX

6. B9879KX

7. 758917

8. 758922

9. 758929

10. 366961

11. 366927

12. 366928

13. 366971

17. 366921

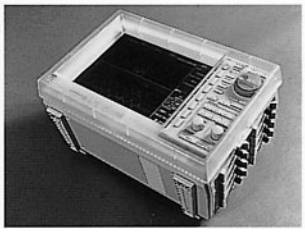
18. 366923

19. 366924
366925

20. 366926

21. 366922

22. 751512



15. 700912

14. 700911 16. B9946EA

DIMENSIONS

Unit: mm
(Approx. inch)