Test&Measurement

YOKOGAWA


DLM5000

# More channels, more possibilities, more insight

## DLM5000 Series
Mixed Signal Oscilloscope

**Precision Making**

Bulletin DLM5000-01EN

**As the creator of the world's first 8 channel oscilloscope, and with over 100 years of industry experience, the DLM5000 is Yokogawa's latest addition to our line-up and takes you beyond 8 channels. Adaptability is a key requirement during the development of high-performance and intelligent power-semiconductor technologies and mechatronics applied in a modern electric vehicles, motor controls and energy efficient electronic designs.**

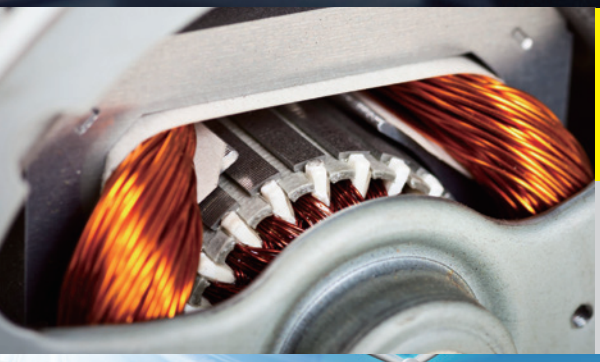
**Combining a large, highly responsive touchscreen and a traditional oscilloscope panel, the 4 to 8 channel DLM5000 mixed signal oscilloscope allows users to easily navigate through a wealth of analysis features at the touch of their fingertips.**

**Simple** – With a highly responsive touchscreen, users can intuitively navigate through a variety of menus, access zoom features, and search for and identify specific events in a waveform, while still having access to the traditional oscilloscope control panel. The DLM5000 is compact 8-channel scope, making it ideal for your laboratory and design environments.

**Adaptable** – With up to 8 analog channels and 32 bits of logic, along with additional math channels, vehicle serial bus, and other analysis features, the DLM5000 provides the flexibility users need to capture every measurement. Additionally, DLMsync supports multi-unit synchronization extending measurements up to 16 channels to gain even more application insights.

**Dependable** – Yokogawa is committed to measurement quality, and the DLM5000 features low residual noise, extensive voltage ranges and a variety of real-time low pass filters to ensure signal fidelity. The history memory allows users to save and analyze each trigger captured, ensuring no data will be lost. Its purpose-built operating system makes the DLM5000 stable and reliable.


1.6MHz
POWER SUPPLY SWITCHING FREQUENCY
0.35WATT
POWER LOSS
500kbps
CAN BUS BIT RATE
145H
CAN IDENTIFIER
19.2kbps
CXPI BUS BIT RATE

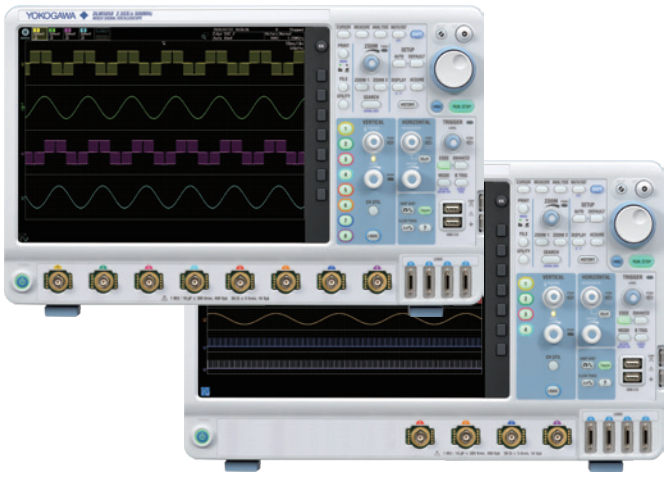


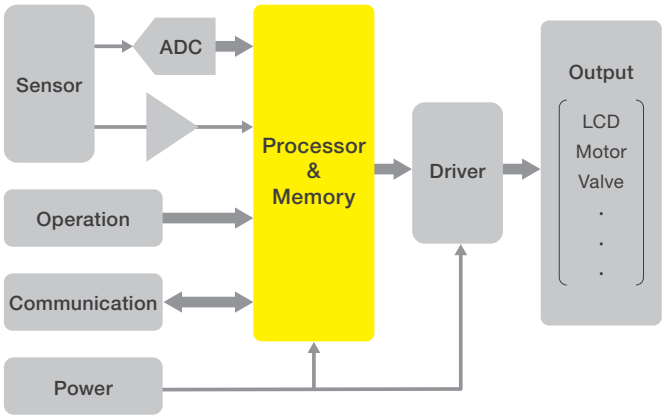

89kWh LITHIUM-ION
BATTERY PACK
74.235 %
38,266.596 s
TIME BEFORE NEXT CHARGE
LITHIUM ATOM
LITHIUM-ION
BATTERY
465.55357km
SUBURBAN MAXIMUN RANGE
14.6Wh/100km
POWER LOSS
40.28°C
BATTERY TEMPERATURE

# Basic functions ideal for circuit evaluation/software debugging

## 8 Analog ch + 32 bits of logic are collectively measured by one unit.

A single DLM5000 has 8 analog channels and 32 bits of logic, which usually requires two mixed signal oscilloscopes. By viewing sensor signals and amplifier inputs and outputs on the analog channels and serial/parallel bus signals on the logic channel, one unit is sufficient for embedded system debugging. The 4 ch model has been newly added to the series lineup.



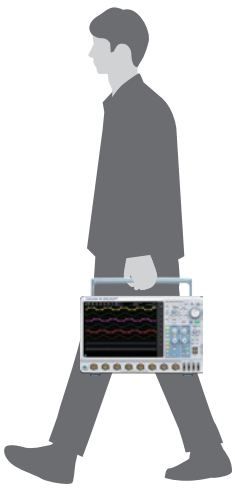



## 12.1 inch large screen provides a comfortable debugging environment

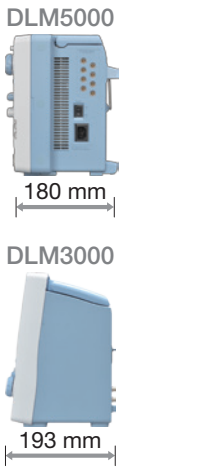
Equipped with a 12.1-inch large touch screen.
The large screen is useful for observing analog signals in detail and displaying information for debugging, such as parameters, zoom screen, XY display, and FFT analysis results.

## Easy to carry and measures quickly

While the DLM5000 is a large screen model with multi-channel inputs, it comes in a portable, thin & lightweight design. The instrument starts up from OFF to waveform display in 18 seconds. You can start measurement work immediately.



Portable

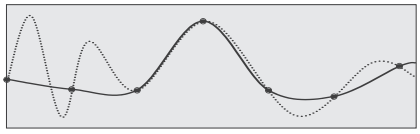



Modest 180 mm depth
Thinner than the 193 mm DLM3000

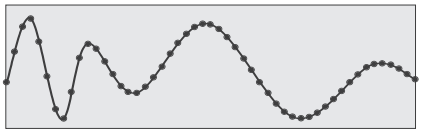
## Up to 2.5 GS/s (8 channels at the same time) Up to 500 Mpoints long memory

The evaluation of an embedded system requires the verification of its operation over a relatively long period of time with software commands and the simultaneous viewing of waveforms of high-speed signals such as clock noise.
The DLM5000 is equipped with a memory that allows waveform capture of 50 Mpoints in single mode/12.5 Mpoints in repeat mode. You can observe waveforms with very few omissions.
If 500 Mpoints memory (optional) is installed, 0.2 seconds waveform can be captured even at 2.5 GS/s sample rate.

Sample rate is too low.



Sample rate is fairly high.



More memory is needed to use higher sample rates and capture the most accurate waveform representation.

**Relationship between measuring time and sample rate in for 500 Mpoints**

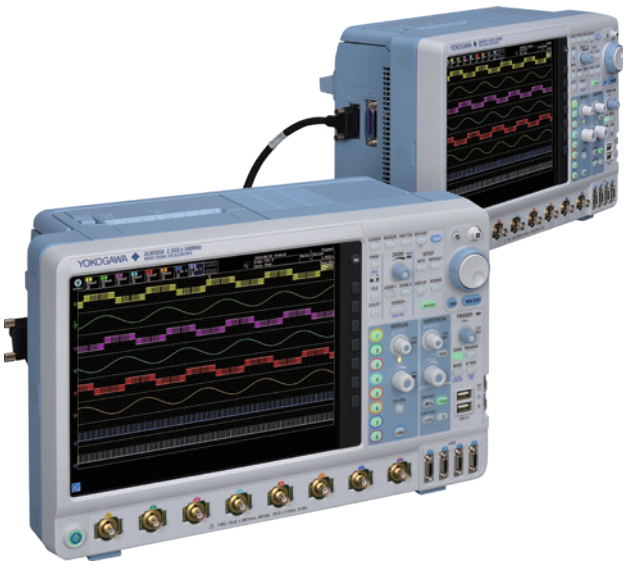
| Sample rate | Maximum measuring time |
|---|---|
| 2.5 GS/s | 0.2 s |
| 250 MS/s | 2 s |
| 25 MS/s | 20 s |
| 2.5 MS/s | 200 s |
| 250 kS/s | 2000 s |
| 100 kS/s | 5000 s |

**Maximum record length (Points)**

| | Repeat | Single (when odd ch only) |
|---|---|---|
| Standard model | 12.5 M | 50 M (125M) |
| /M1 or /M1S | 25 M | 125 M (250 M) |
| /M2 or /M2S | 50 M | 250 M (500 M) |

## Two-unit connection function “DLMsync” in response to the request for more channels (option: coming soon)

Connecting two DLM5000s with a dedicated cable enables synchronous measurement of up to 16 analog channels. Captured waveforms are displayed on each unit. Triggers operate in common, and common items, such as memory length, sampling rate, acquisition settings and horizontal axis scale settings, are linked, so they can be used like a single 16-channel oscilloscope.
You can connect 4 ch models too, so “8 + 4 = 12 channels” or “4 + 4 = 8 channels” is also possible.



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# Multi-channel measurement application

## Motor control & inverter circuit development

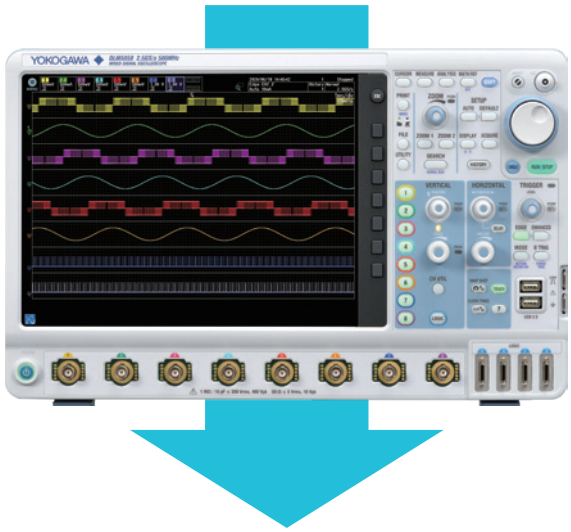
4 ch **Limitation of 4 ch scope**

Whole-system measurement is impossible with a four channel scope; the real difficulty is measuring the timing between IGBT gate signals within the inverter. Voltage and current measurements between 3 phases and the IO of the motor driver IC is a very challenging test with a four channel scope. The truly practical solution is an eight channel MSO.

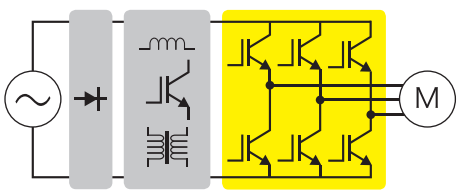
## Electronic control unit & mechatronic test

4 ch **Limitation of 4 ch MSO**

The additional logic inputs of a four-channel MSO mixed signal oscilloscope provides enough channels, but this method has a blind-spot. Digital waveform analysis using logic inputs alone cannot reveal anomalies such as voltage drift, noise, distortion or ringing, and measure rise-fall times. ECU testing requires stringent examination of all digital waveforms – and analog input channels are the best tool for the job.

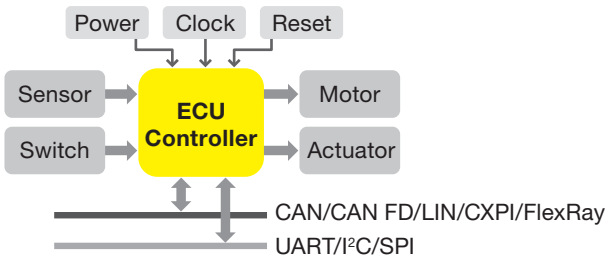



8 ch The key to efficient and reliable high performance electric motors is the modern inverter design, or 'Intelligent Power Module'. Multi-channel, high-speed waveform measurement is an absolute necessity. Four channels are simply not enough. Boasting eight true analog inputs, the DLM5000 empowers today's engineer with a convenient and comprehensive measurement system.




Example: 3 voltage & 3 current measurements of a 3-phase motor
Measurement of the gate-drive signals of six IGBTs within the inverter

8 ch Numerous I/O analog, digital, and serial-bus waveforms surrounding the Electronic Control Unit (ECU) must be measured. The DLM5000 offers ample channel-count and architecture to monitor eight analog channels and up to 32-bits of logic input while simultaneously performing protocol analysis such as UART, I²C, SPI, CAN, CAN FD, LIN, CXPI and FlexRay. The DLM5000 can speed up the R&D process when four channels are not enough.




Example: Analog I/O and serial bus controller signals Stringent real time test of digital waveforms in the analog domain.

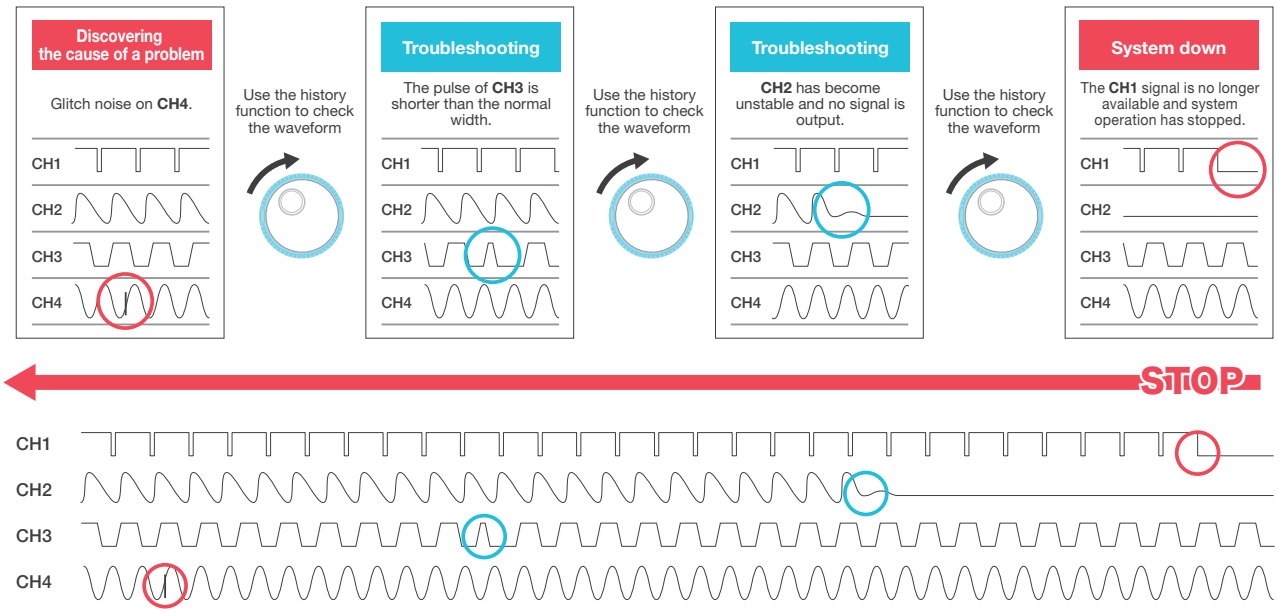
# DLM5000's functions and features

## You can replay waveforms later on, so you'll never miss an abnormal waveform

### Original history function

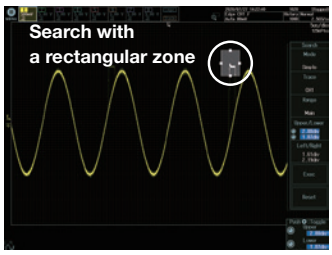
**Automatically save previously captured waveforms**

With the DLM5000 series, up to 100000 previously captured waveforms can be saved in the acquisition memory. With the History function, you can display just one or all of the previously captured waveforms (history waveforms) on screen.
You can also perform cursor measurement, computation, and other operations on history waveforms. Using the History function, you can analyze rarely-occurring abnormal signals even when an appropriate trigger condition is hard to find because its waveform shapes are not constant.

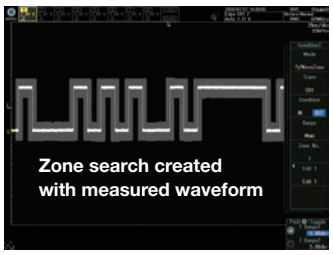



**History search function**

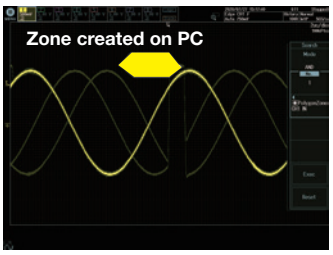
Various and powerful search methods are available to search up to 100000 waveforms for events meeting your custom requirements.
Intuitive and simple waveform search functions are provided. For example, you can specify a rectangular zone that captures a part of a waveform on the screen, a zone that covers an entire measured waveform, or a polygonal zone. If you know a value of interest, such as an abnormal value of voltage or pulse width, you can search history waveforms using waveform parameters.



RectZone



WaveZone



PolygonZone

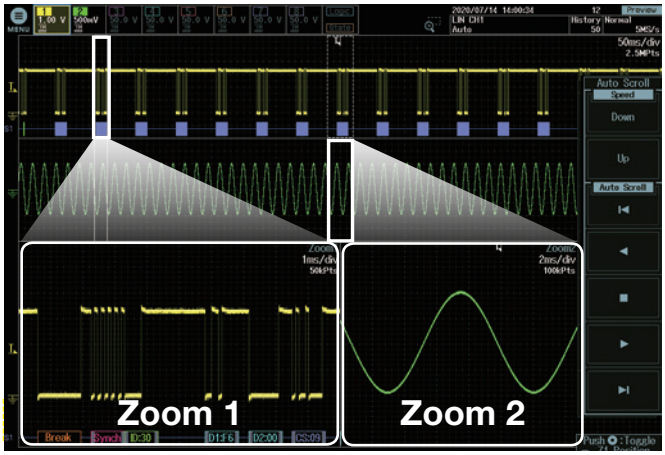
Parameter

## Zoom & search function

Multi-channel waveforms captured in the long memory need to be zoomed in vertically and horizontally for detailed viewing. The DLM5000 has the dedicated zoom keys and knob, allowing you to quickly zoom in on the part you want to see. You can also specify the area you want to zoom in on by using the the touch screen.

### Zoom two locations simultaneously

You can display two zoomed waveforms with different time axis scales at the same time. Also, use Auto Scroll to sweep the zoom window across the waveforms automatically.
Being able to zoom in on two distant locations at the same time, such as "cause" and "effect" of a certain event, or to display them with different zoom factors is very useful for software debugging.

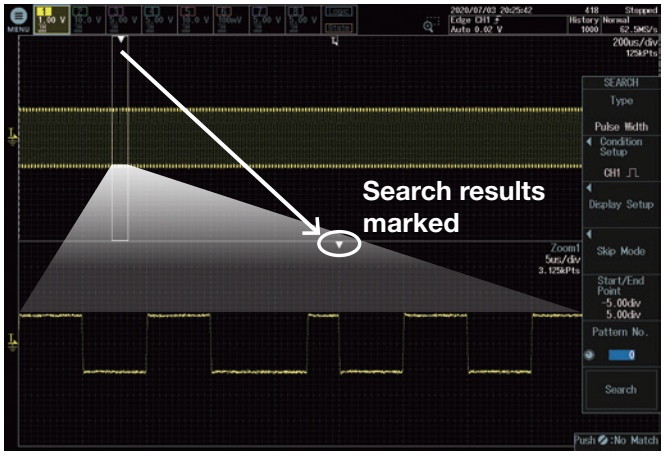



### Zoom Search function

Use several search criteria to automatically find and zoom into features in the waveform for further inspection. The locations of the found waveforms are marked on screen (▼shows the current location).

### Waveform search criteria

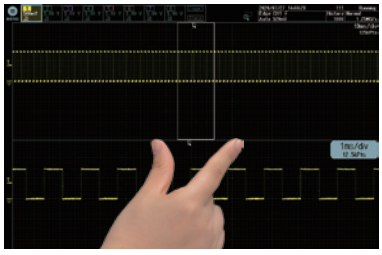
Edge, edge (qualified), state/pattern, pulse width, state width, serial bus (only on models with the serial bus analysis option)



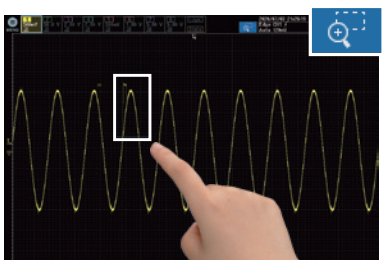

Waveform search using edge criterion

## Touchscreen

By using the touchscreen to move the waveform position, change the scale, move the cursor, and such, you can operate the instrument without taking your eyes off the waveform.
If you want to zoom in a part of the waveform, use Rect Zoom for easy zooming by swiping your finger diagonally across the screen to specify the area.
To select items on the dialog box, you can directly touch them, which eliminates the trouble of using select keys.



Changing zoom ratio by pinching in and out



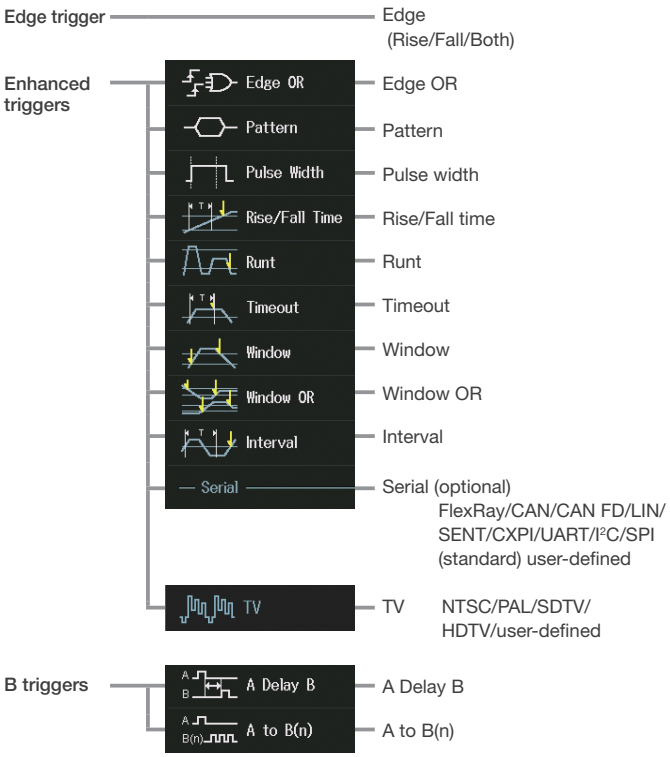
Rect Zoom

Selecting waveform parameter items

## Large selection of triggers — Trigger function captures combined analog/digital complex waveforms —

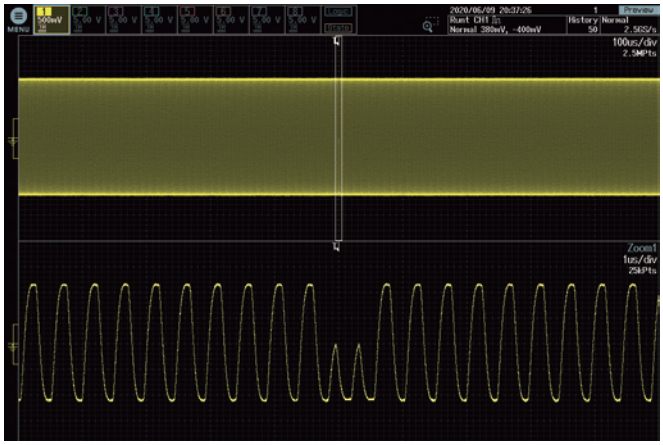
The DLM5000 series comes with a variety of easy-to-configure triggers combining analog and logic inputs such as edge, enhanced, and B triggers. By using a digital trigger system, trigger errors are minimized.

### Trigger types




### Runt trigger

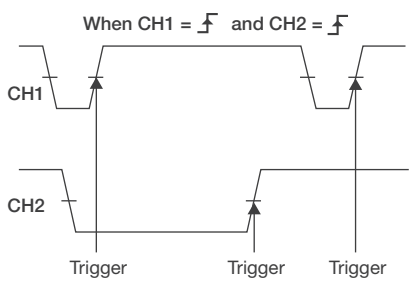
In a circuit that synchronizes external input signals with a clock, metastable phenomena can cause problems, such as narrowing the pulse width or generating abnormal waveforms where the signal level does not reach the specified value.
A runt trigger is useful to trigger on such phenomena. Runt trigger can be used to trigger on a constant pulse train, for example, when the signal level does not rise to the specified high level and then falls to the specified level. It detects and triggers a halfway pulse (runt pulse) that has fallen to a low level.



### Triggers on multiple channels (Edge OR / Pattern)

Multiple channels can be monitored simultaneously and triggered by the timing of any edge change or a combination of High and Low conditions.

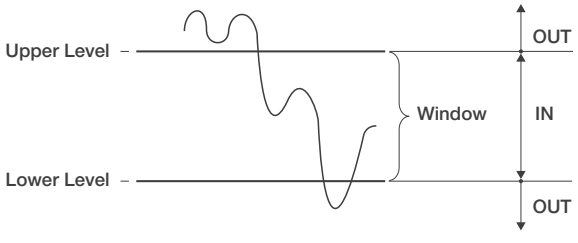
### Edge OR trigger




Although normal edge trigger targets only one channel, edge OR trigger targets all input channels and can be triggered when there is a change in any of them.
This is a powerful tool in cases where it is not possible to specify in advance which channel the change will occur.

### Triggers on a range set by upper level and lower level. (Window)

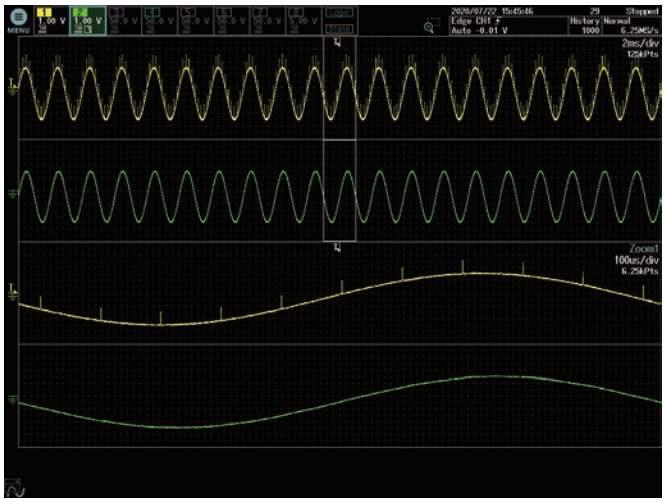
It sets two signal levels, an upper and lower limit, and triggers on the condition of whether or not it is IN / OUT of range and how long it stays in that range.



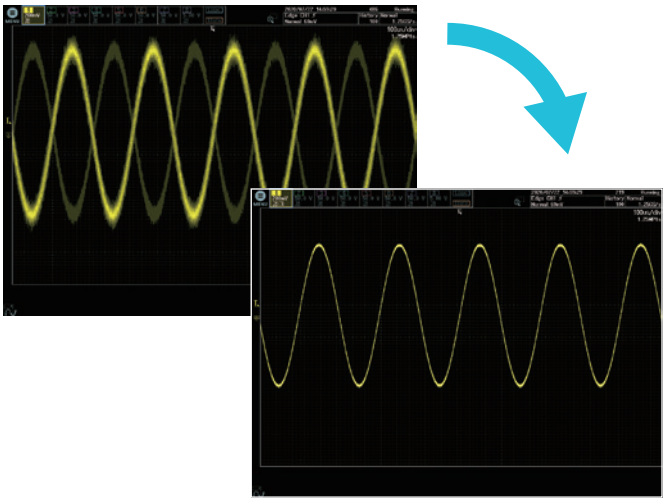

In case of normal edge trigger, only one level can be set, but in case of window trigger, two levels can be set, Upper and Lower.
This is very useful for checking whether the voltage is within the upper and lower limits.

## Filter functions

**Real time filter with optimum noise reduction supports a wide range of frequencies — from 8 kHz to 200 MHz —**
Each channel has 14 low pass filters available with cutoff frequencies from 8 kHz to 200 MHz. Waveforms are filtered prior to storage in memory. Real-time filters allow for stable triggering of superimposed noise signals.



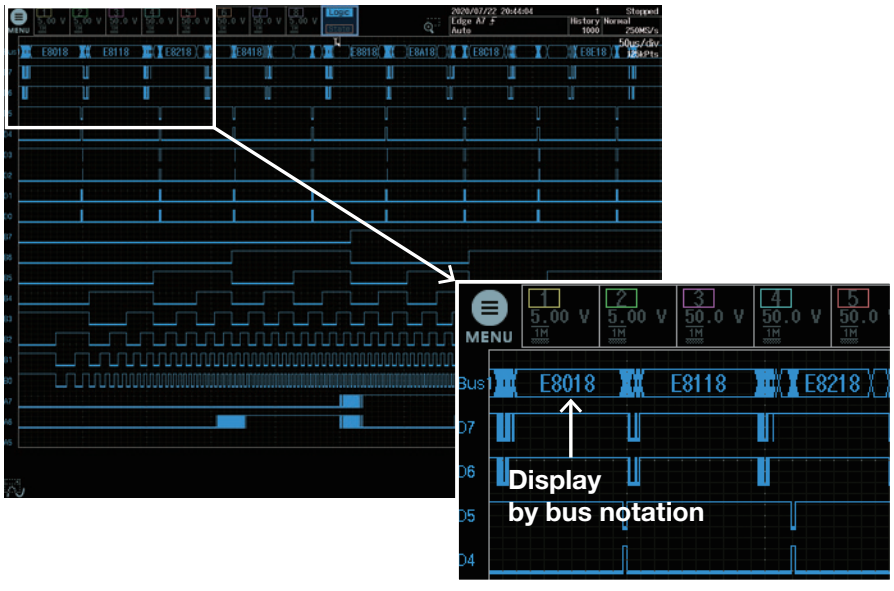
Processing with Real time filters

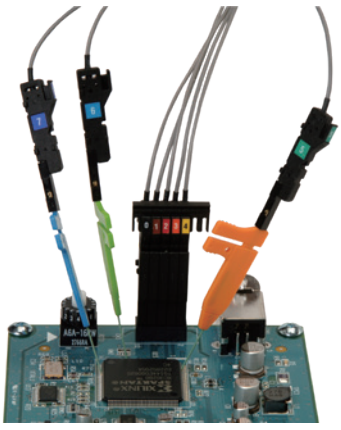


Stable trigger as a result of noise reduction

## Logic signal measurement and analysis

The flexible MSO inputs are included as standard. This enables the DLM5000 to be converted to a 8 analog and 16 digital input MSO. With the /L32 option, up to 32 logic signals can be measured. Bus/State display and optional DA calculation function, which is useful for evaluating AD/ DA converters, are also provided.



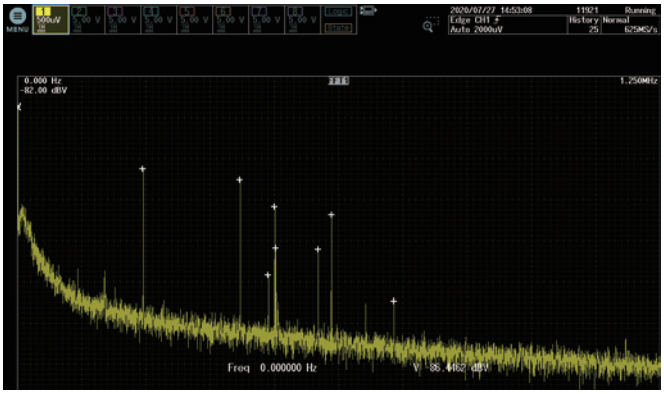
# Features designed for productivity

## Measure function and statistics

Twenty-nine waveform parameter measurements are included.
Automated measurement of up to 30 simultaneous measurements is available. Statistical values can also be measured continuously, cycle-by-cycle or using history memory. In addition, cycle-by-cycle parameter measurement is possible to calculate fluctuations of a captured waveform.

## FFT analysis

Up to 4 FFT analyses can be performed simultaneously. FFT can be performed on computed waveforms in addition to the actual waveforms on CH1 to CH8. The peak detection function that automatically detects the spurious frequency is a useful feature for searching for a noise source, such as clock and power supply switching noise.

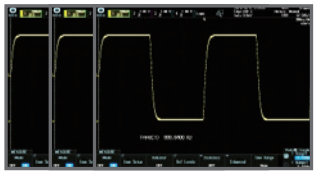


## Statistical calculation of waveform parameters

For repetitive waveforms, a large number of periodic waveforms are captured on the memory. The DLM5000 can statistically analyze the parameters of repetitive waveforms. Jitter measurement and level fluctuation analysis are possible.

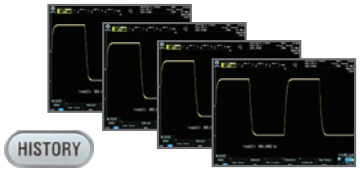
### Normal statistical processing

The waveform parameters for each successive trigger are calculated and statistically processed.



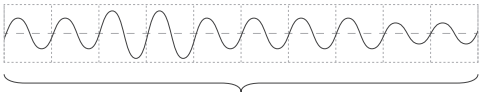
### Statistical Processing of History Waveforms

Calculates and statistically processes the waveform parameters of each trigger waveform in history memory.

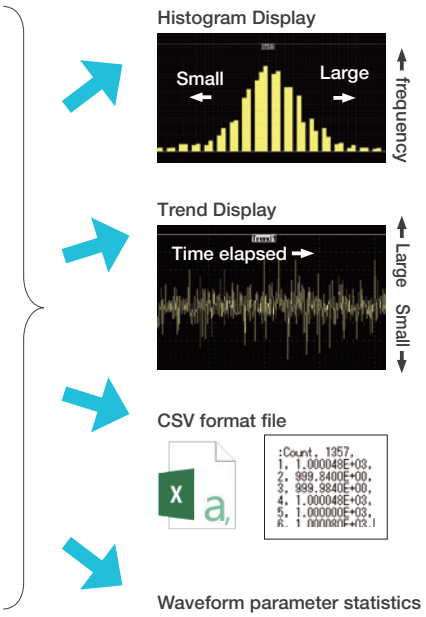



### Cyclic Statistical Processing

The waveform displayed on the screen is divided into each cycle and the waveform parameters are calculated and statistically processed individually.



Waveform parameters for each cycle in the captured waveform


**Waveform parameter statistics**

- Maximum / Minimum
- Mean / Standard deviation

## Snapshot

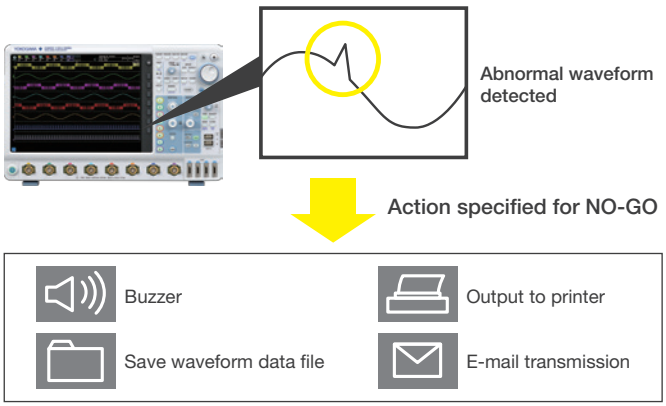
By pressing the "camera" key to the lower right of the screen, you can freeze a white trace of the currently displayed waveform on the screen. You can press the key repeatedly and conveniently leave traces for comparing multiple waveforms.


## Thumbnails of saved files

Display thumbnails of saved waveforms, waveform images, and Wave Zone files for easier browsing, copying or deleting. A full-size view shows even more details.

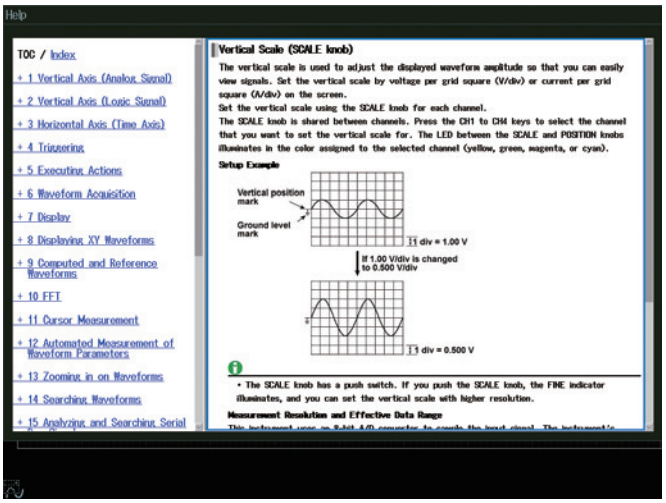

## Action on trigger, GO/NO-GO

GO/NO-GO automates pass or fail determination for trigger conditions, waveforms, measured parameters, and other criteria. Actions automate buzzer sounds, file saving, or email notification. Waveforms in which an abnormality occurred can be saved for confirmation and analysis of the phenomena at a later time.




## Graphical online help

Get help without having to find the user manual. Pressing the "?" key opens detailed graphical explanations of the oscilloscope's functions.



# Application-specific analysis options

## Serial analysis function options (/F01 to /F05)

### UART (RS232) /I²C/SPI/CAN/CAN FD/LIN/FlexRay/SENT/CXPI

Dedicated trigger and analysis options are available for various serial buses of both in-vehicle and embedded systems. Logic input can also be used for I²C/SPI/UART/SENT. When it is not necessary to observe waveform quality of a bus, decoding or analysis using logic inputs is possible.

### Unique auto setup

Yokogawa's proprietary auto setup function automatically analyzes the input signal and complex parameters such as bit rate and threshold level, selecting the optimal settings in seconds. This feature not only saves time but is also a powerful debugging feature when the bit rate and other parameters are unknown.

### Simultaneous analysis of up to 4 buses

Perform high-speed simultaneous analysis on up to four different serial buses operating at different speeds. Extensive search capabilities enhance the usability, allowing the user to find specific data in the very long memory. The dual-zoom facility means that different buses can be viewed and debugged alongside each other.


4-bus list display

Waveform display and decode results

## Related accessories (sold separately)

**Differential probe PBDH1000 (701924)**

DC to 1.0 GHz bandwidth1 MΩ, approximately 1.1 pF
Maximum differential input voltage range: ±25 V

**Logic probe PBL100/PBL250 (701988/701989)**

100 MHz/250 MHz toggle
frequency 1 MΩ, 10 pF/100 kΩ, 3 pF

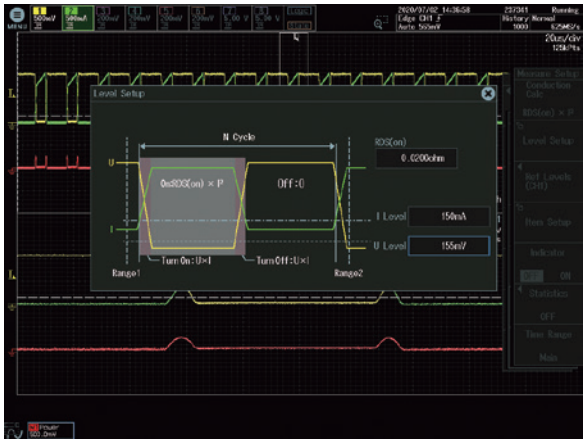
## User defined math option (/G02)

Equations can be arbitrarily created using a suite of operators such as trigonometric and logarithmic operators, integration and differentiation, pulse width operators, phase measurement and digital to analog conversion.

## Power supply analysis option (/G03)

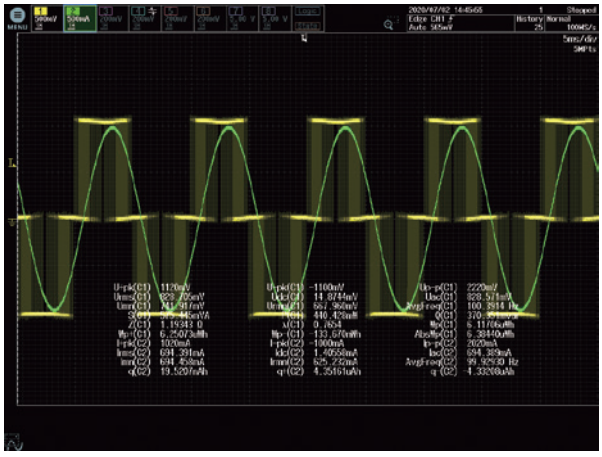
### Switching loss analysis

Calculate switching loss [V(t) × i(t)] over long test cycles utilizing the long built-in memory. A wide variety of switching loss analyses are supported, including turn-on/off loss calculation, loss including continuity loss, and loss over long cycles of 50 Hz/60 Hz power line.




### Power parameter measurement

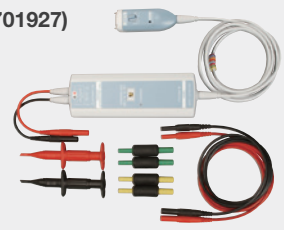
Measure power parameters automatically for up to two pairs of voltage and current waveforms, such as active power, apparent power, power factor, and more. Cycle statistics and history statistics can also be calculated.



### Related accessories (sold separately)

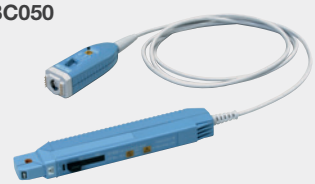
**Differential probe PBDH0150 (701927)**

DC to 150 MHz
1000 Vrms/ ±1400 Vpeak

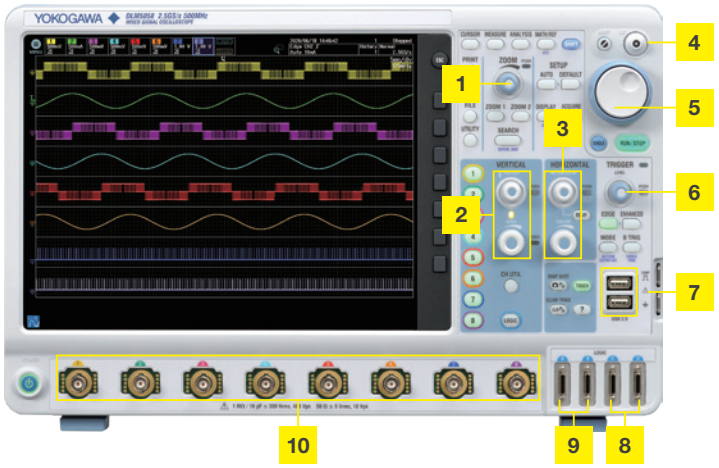


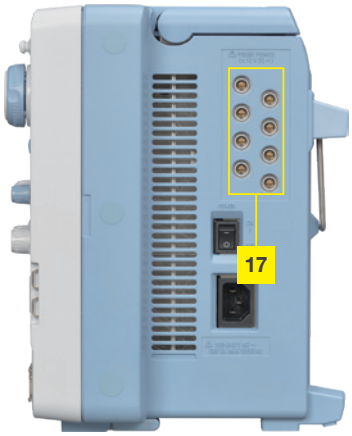
**Current probe PBC100/PBC050 (701928/701929)**

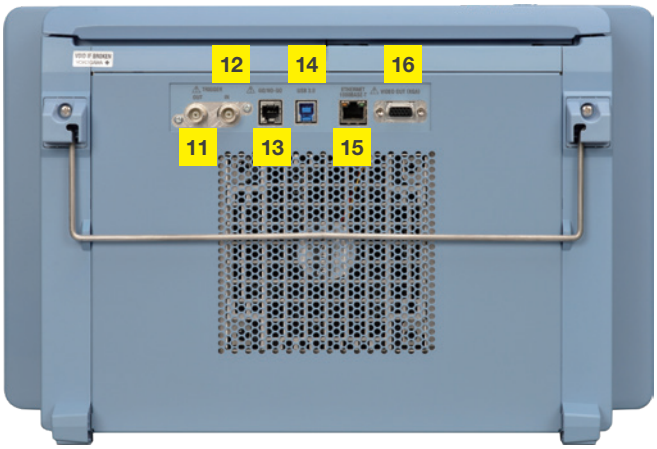
DC to 100 MHz (701928)
DC to 50 MHz (701929)
30 Arms



# Intuitive control panel and connectivity





* The photo shows the 8-channel model.

1 Dedicated Zoom Knob

2 Vertical Position and Scale Knob

3 Horizontal Position and Scale Knob

4 Four-Direction Selector Button Select key moves the cursor up/down/left/right

5 Jog Shuttle and Rotary Knob

6 Dedicated Trigger Level Knob

7 USB peripheral connection terminal × 2

8 Logic input connector 16 bit (optional)

9 Logic input connector 16 bit (standard)

10 Eight Analog Input Channels*1

11 External trigger output

12 External trigger input

13 GO/NO-GO output terminal

14 USB-PC connection terminal

15 1000 BASE-T Ethernet

16 RGB video output terminal

17 Probe power supply terminal × 8 (optional)*2

18 GP-IB connection terminal (optional)

19 Synchronous operation terminal (for DLMsync*3)

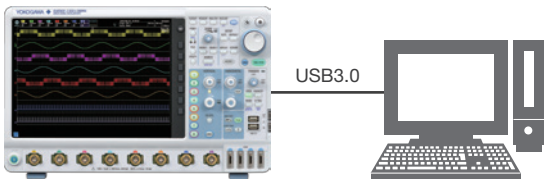
*1: Four ch model has 4 analog inputs
*2: Four ch model has 4 terminals
*3: Option is required for feature activation

# Wide range of interfaces and software

## Increase work efficiency by using PC

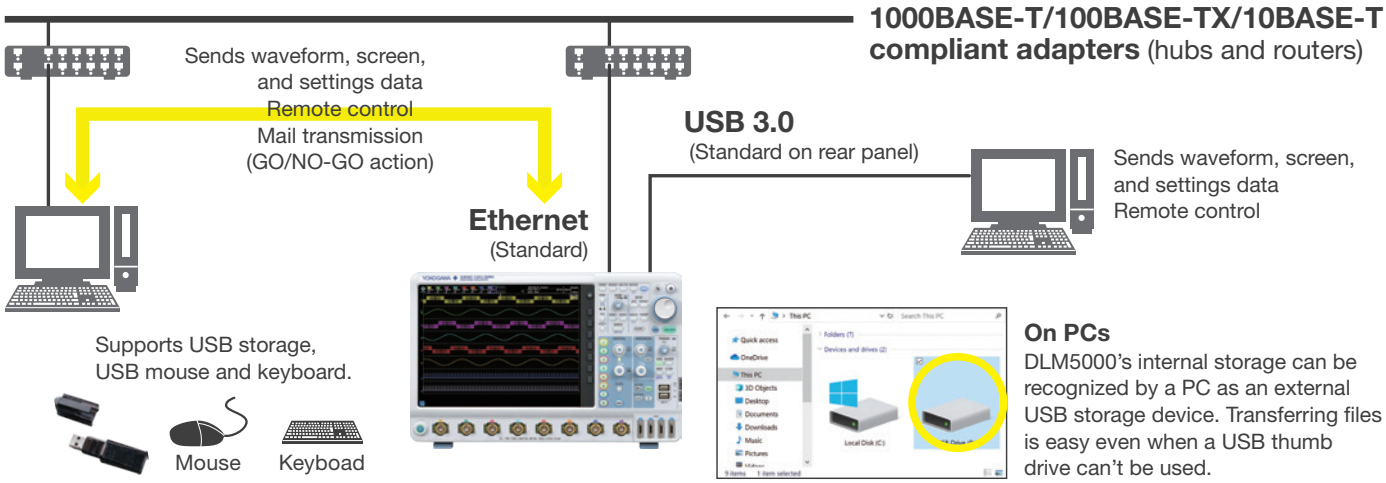
### Gigabit Ethernet and USB 3.0*1 as standard communication interfaces

DLM5000's long memory is useful for suppressing failure in capturing waveforms, such as the history function, but it takes time to transfer data to a PC.
With the standard-equipped Gigabit Ethernet and USB 3.0, the DLM5000 is approximately 10 times faster at saving data to the internal storage and at transferring data to a PC.*2
Get answers faster, even with large data sets.




*1: USB function only. USB host function uses USB 2.0 communication.
*2: When /C8 option (SSD) is installed for internal storage and USB 3.0 mass storage connection is used for transfer.
Compare with the conventional model (DLM4000).

## Purpose-built operating system to realize stability and reliability




**On PCs**
DLM5000's internal storage can be recognized by a PC as an external USB storage device. Transferring files is easy even when a USB thumb drive can't be used.

## Software Control

| | Free Software | Optional Software (Trial version available) |
|---|---|---|
| Off-line waveform display and analysis | **XviewerLITE** –Basic viewing–<br>Zoom, V-cursor, conversion to CSV format | **Xviewer** –Advanced Analysis–<br>Advanced and useful functions are supported. Good for precise, off-line waveform analysis.<br>• Waveform observation and analysis<br>• Cursor, Parametric Measure<br>• Statistical Analysis<br>• Multiple file display<br>• Advanced waveform operations<br>• Comment, marking, printing and making report<br>• Optional Math computation feature<br>• Remote monitor<br>• Instruments communication function<br>• Transferring waveform & image files |
| Waveform monitoring on a PC | **XWirepuller**<br>Remote monitor and operation<br>Transferring image files | |
| Data transfer to a PC | | |
| Command control Custom software development | **Control library "TMCTL"** For Visual Studio<br>**DL-Term** Interactive tool<br>**LabVIEW instrument driver***1 *3<br>**MATLAB***2 *3 **WDF Access ToolBox**<br>Transfer data file to MATLAB | |

*1, *2: Coming soon
*1: Program development environment provided by National Instruments (NI)
*2: MathWorks's product.
*3: DLM5000 will be supported soon.

# Specifications

**(On the 4-channel model, CH8 should be read as CH4 and M8 should be read as M4.)**

## Models

| Model name | Frequency bandwidth | Analog input | Logic input | Max. sample rate |
|---|---|---|---|---|
| DLM5038 | 350 MHz | 8 channels | 16 bit (Standard) or 32 bit (/L32) | 2.5 GS/s |
| DLM5058 | 500 MHz | | | |
| DLM5034 | 350 MHz | 4 channels | | |
| DLM5054 | 500 MHz | | | |

## Analog Signal input

| | | | |
|---|---|---|---|
| Input channels | | | |
| Analog input | DLM50x8: CH1 to CH8<br>DLM50x4: CH1 to CH4 | | |
| Input coupling setting | AC 1 MΩ, DC 1 MΩ, DC 50 Ω | | |
| Input impedance | | | |
| Analog input | 1 MΩ | ±1.0%, approximately 16 pF | |
| | 50 Ω | ±1.0% (VSWR 1.4 or less, DC to 500 MHz) | |
| Voltage axis sensitivity setting range | 1 MΩ | 500 µV/div to 10 V/div (steps of 1-2-5) | |
| | 50 Ω | 500 µV/div to 1 V/div (steps of 1-2-5) | |
| Max. input voltage | 1 MΩ | Must not exceed 300 Vrms or 400 Vpeak | |
| | 50 Ω | Must not exceed 5 Vrms or 10 Vpeak | |
| Max. DC offset setting range | 1 MΩ | 500 µV/div to 50 mV/div | ±1 V |
| | | 100 mV/div to 500 mV/div | ±10 V |
| | | 1 V/div to 10 V/div | ±100 V |
| | 50 Ω | 500 µV/div to 50 mV/div | ±1 V |
| | | 100 mV/div to 1 V/div | ±5 V |
| Vertical-axis (voltage-axis) | | | |
| DC accuracy[*1] | 500 µV/div | ±(3.0% of 8 div + offset voltage accuracy) | |
| | 1 mV/div to 10 V/div | ±(1.5% of 8 div + offset voltage accuracy) | |
| Offset voltage accuracy[*1] | 500 µV to 50 mV/div | ±(1% of setting + 0.2 mV) | |
| | 100 mV to 500 mV/div | ±(1% of setting + 2 mV) | |
| | 1 V to 10 V/div | ±(1% of setting + 20 mV) | |

Frequency characteristics (–3 dB attenuation when inputting a sinewave of amplitude ±3 div)[*1*2]

| | | DLM503x | DLM505x |
|---|---|---|---|
| 1 MΩ (when using attached 10:1 passive probe) | 20 mV to 100 V/div | 350 MHz | 500 MHz |
| | 10 mV/div | 350 MHz | 350 MHz |
| | 5 mV/div | 200 MHz | 200 MHz |
| 50 Ω | 2 mV to 1 V/div | 350 MHz | 500 MHz |
| | 1 mV/div | 350 MHz | 350 MHz |
| | 500 µV/div | 200 MHz | 200 MHz |

| | | |
|---|---|---|
| Isolation between channels | Maximum bandwidth: –34 dB (typical value) | |
| Residual noise level[*3] | The larger of 0.2 mVrms or 0.05 div rms (typical value) | |
| A/D resolution | 8 bit (25 LSB/div) Max. 12 bit (in High Resolution mode) | |
| Bandwidth limit | FULL, 200 MHz, 100 MHz, 20 MHz, 10 MHz, 5 MHz, 2 MHz, 1 MHz, 500 kHz, 250 kHz, 125 kHz, 62.5 kHz, 32 kHz, 16 kHz, 8 kHz (can be set for each channel) | |
| Maximum sample rate | Real time sampling mode | 2.5 GS/s |
| | Repetitive sampling mode | 250 GS/s |

Maximum record length (Points)

| | Repeat | Single (when odd ch only) |
|---|---|---|
| Standard model | 12.5 M | 50 M (125M) |
| /M1 or /M1S | 25 M | 125 M (250 M) |
| /M2 or /M2S | 50 M | 250 M (500 M) |

| | |
|---|---|
| Ch-to-Ch deskew | ±1 µs |
| Time axis setting range | 1 ns/div to 500 s/div (steps of 1-2-5) |
| Time base accuracy[*1] | ±2.5 ppm (at shipping or calibration), ±1.0 ppm/year (ageing) |
| Dead time in N Single mode | Approx. 0.9 µs |

## Logic Signal Input

| | |
|---|---|
| Number of inputs | 16 bit (/L32: 32 bit) |
| Maximum toggle frequency[*1] | Model 701988: 100 MHz, Model 701989: 250 MHz |
| Compatible probes | 701988, 701989 (8 bit input) |
| Min. input voltage | 701988: 500 mVp-p, 701989: 300 mVp-p |
| Input range | Model 701988: ±40 V<br>Model 701989: threshold ±6 V |
| Max. nondestructive input voltage | Model 701988: ±42 V (DC + ACpeak) or 29 Vrms<br>Model 701989: ±40 V (DC + ACpeak) or 28 Vrms |
| Threshold level setting range | Model 701988: ±40 V (setting resolution of 0.05 V)<br>Model 701989: ±6 V (setting resolution of 0.05 V) |
| Input impedance | 701988: Approx. 1 MΩ/approx. 10 pF,<br>701989: Approx. 100 kΩ/approx. 3 pF |
| Maximum sampling rate | 1.25 GS/s |

Maximum record length (Points)

| | Repeat | Single |
|---|---|---|
| Standard | 12.5 M | 50 M |
| /M1 or /M1S | 25 M | 125 M |
| /M2 or /M2S | 50 M | 250 M |

## Triggers

| | | | |
|---|---|---|---|
| Trigger modes | Auto, Auto Level, Normal, Single, N-Single, Force trigger | | |
| Trigger type, trigger source | | | |
| A triggers | Edge | CH1 to CH8, Logic, EXT, LINE | |
| | Edge OR | CH1 to CH8 | |
| | Pulse Width | CH1 to CH8, Logic | |
| | Timeout | CH1 to CH8, Logic | |
| | Pattern | CH1 to CH8, Logic | |
| | Runt | CH1 to CH8 | |
| | Rise/Fall Time | CH1 to CH8 | |
| | Interval | CH1 to CH8, Logic | |
| | Window | CH1 to CH8 | |
| | Window OR | CH1 to CH8 | |
| | TV | CH1 to CH8 | |
| | Serial Bus | I²C (optional) | CH1 to CH8, Logic |
| | | SPI (optional) | CH1 to CH8, Logic |
| | | UART (optional) | CH1 to CH8, Logic |
| | | FlexRay (optional) | CH1 to CH8 |
| | | CAN (optional) | CH1 to CH8 |
| | | CAN FD (optional) | CH1 to CH8 |
| | | LIN (optional) | CH1 to CH8 |
| | | SENT (optional) | CH1 to CH8, Logic |
| | | CXPI (optional) | CH1 to CH8 |
| | | User Define | CH1 to CH8 |
| AB triggers | A Delay B | 10 ns to 10 s | |
| | A to B(n) | 1 to 10[9] | |

| | | | |
|---|---|---|---|
| Trigger level setting range | CH1 to CH8 | ±4 div from center of screen | |
| Trigger level setting resolution | CH1 to CH8 | 0.01 div (TV trigger: 0.1 div) | |
| Trigger level accuracy[*1] | CH1 to CH8 | ±0.04 div | |

## Display

| | |
|---|---|
| Display[*4] | 12.1-inch TFT LCD with a capacitive touch screen, 1024 × 768 (XGA) |

## Functions

| | | |
|---|---|---|
| Waveform acquisition modes | Normal, Envelope, Average | |
| High Resolution mode | Max. 12 bit | |
| Sampling modes | Real time, interpolation, repetitive | |
| Accumulation | Select OFF, Intensity (waveform frequency by brightness), or Color (waveform frequency by color)<br>Accumulation time: 100 ms to 100 s, Infinite | |
| Roll mode | Enabled at 100 ms/div to 500 s/div (depending on the record length setting) | |
| Zoom function | Two zooming windows can be set independently (Zoom1, Zoom2) | |
| | Zoom factor | ×2 to 2.5 points/10 div (in zoom area) |
| | Scroll | Auto Scroll |
| | Search functions | Edge, Pulse Width, Timeout, Pattern, I²C (optional), SPI (optional), UART (optional), CAN (optional), CAN FD (optional), LIN (optional), FlexRay (optional), SENT (optional), CXPI (optional), User Define |
| History memory | Max. data (record length 1.25 k Points, with) | /M2 or /M2S: 100000, /M1 or /M1S: 50000, Standard: 20000 |
| | History search | Select Rect, Wave, Polygon, or Parameter mode |
| | Replay function | Automatically displays the history waveforms sequentially |
| | Display | Specified or average waveforms |
| Cursor | Types | ΔT, ΔV, ΔT & ΔV, Marker, Degree |
| Snapshot | Currently displayed waveform can be retained on screen | |

## Computation and Analysis Functions

| | |
|---|---|
| Parameter Measurement | Max, Min, P-P, High, Low, Amplitude, Rms, Mean, Sdev, IntegTY+, IntegTY, +Over, –Over, Pulse Count, Edge Count, V1, V2, ΔT, Freq, Period, Avg Freq, Avg Period, Burst, Rise, Fall, +Width, –Width, Duty, Delay |
| Statistical computation of parameters | Max, Min, Mean, σ, Count |
| Statistics modes | Continuous, Cycle, History |
| Trend/Histogram display of wave parameters | Up to 2 trend or histogram display of specified wave parameters |
| Computations (MATH) | +, –, ×, Filter (Delay, Moving Avg, IIR Lowpass, IIR Highpass), Integ, Count (Edge, Rotary), user defined math (optional) |
| Computable no. of traces | 8 (M1 to M8) (4 trace for 4 ch model) (mutually exclusive with REF trace) |

| | | |
|---|---|---|
| Max. computable memory length | Same as the maximum record length | |
| Reference function | Up to 8 traces (Ref1 to Ref8) of saved waveform data can be displayed and analyzed (4 trace for 4 ch model) (mutually exclusive with MATH trace) | |
| Action-on-trigger | Actions: Buzzer, Print, Save, Mail | |
| GO/NO-GO | Modes: Rect, Wave, Polygon, Parameter<br>Actions: Buzzer, Print, Save, Mail | |
| X-Y | Displays XY1 to XY4 and T-Y simultaneously (XY1, XY2 and T-Y for 4ch model) | |
| FFT | Number of points: 1.25 k, 2.5k, 12.5 k, 25 k, 125 k, 250 k, 1.25 M<br>Window functions: Rectangular, Hanning, Flat-Top<br>FFT Types: PS (LS, RS, PSD, CS, TF, CH are available with /G02 option) | |
| Histogram | Displays a histogram of acquired waveforms | |
| User-defined math (/G02 option) | The following operators can be arbitrarily combined in equations:<br>+, –, ×, /, SIN, COS, TAN, ASIN, ACOS, ATAN, INTEG, DIFF, ABS, SQRT, LOG, EXP, LN, BIN, DELAY, P2 (power of 2), PH, DA, MEAN, HLBT, PWHH, PWLL, PWHL, PWLH, PWXX, FV, DUTYH, DUTYL, FILT1, FILT2<br>The maximum record length that can be computed is the same as the standard math functions. | |
| Power supply analysis (/G03 option) | | |
| Power analysis | Selectable from 4 analysis types<br>Deskweing between the voltage and current waveforms can be executed automatically. | |
| | Switching loss | Measurement of total loss and switching loss, power waveform display, Automatic measurement and statistical analysis of power analysis items (PTurn On, PTurn Off, POn, PTotal, WpTurn On, WpTurn Off, Wp On, WpTotal, Cycle Count) |
| | Safety operation area | SOA analysis by X-Y display, using voltage as X axis, and current as Y axis is possible |
| | Harmonic analysis | Basic comparison is possible with following standard Harmonic emission standard IEC61000-3-2 edition 4.0, EN61000-3-2 (2006), IEC61000-4-7 edition 2.1 |
| | Joule integral | Joule integral ($I^2t$) waveform display, automatic measurement and statistical analysis is possible |
| Power Measurement | Automated measurement of power parameters for up to four pairs of voltage and current waveforms. Values can be statistically processed and calculated. | |
| | Measurement parameters | Urms, Umn, Udc, Urmn, Uac, U+pk, U–pk, Up–p, Irms, Imn, Idc, Irmn, Iac, I+pk, I–pk, Ip–p, P, S, Q, Z, λ, Wp, Wp+, Wp–, Abs.Wp, q, q+, q–, Abs.q, Avg Freq (voltage, current) |

**Common Features of Serial Bus Signal Analysis Functions**

| | |
|---|---|
| Analysis result display | Decoded information is displayed together with waveforms or in list form. |
| Auto setup function | A threshold value, time axis scale, voltage axis scale and other bus-specific parameters such as a bit rate and recessive level are automatically detected.<br>Trigger conditions are set based on the detected result and decoded information is displayed.<br>(The type of a bus signal needs to be specified in advance.) |
| Search function | Search of all waveforms for a position that matches a pattern or condition specified by data information. |
| Analysis result saving function | Analysis list data can be saved to CSV-format files. |

**$I^2C$ Bus Signal Analysis Functions (/F01 Option)**

| | | |
|---|---|---|
| Applicable bus | $I^2C$ bus | Bus transfer rate: 3.4 Mbit/s max.<br>Address mode: 7 bit/10 bit |
| | SM bus | Complies with System Management Bus |
| Analyzable signals | CH1 to CH8, Logic input, or M1 to M8 | |
| $I^2C$ trigger modes | Every Start, Address & Data, NON ACK, General Call, Start Byte, HS Mode | |
| Analyzable no. of data | 300000 bytes max. | |
| List display items | Analysis no., time from trigger position [Time (ms)], 1st byte address, 2nd byte address, R/W, Data, Presence/absence of ACK, information | |

**SPI Bus Signal Analysis Functions (/F01 Option)**

| | |
|---|---|
| Trigger types | 3 wire, 4 wire<br>After assertion of CS, compares data after arbitrary byte count and triggers. |
| Analyzable signals | CH1 to CH8, Logic input, M1 to M8 |
| Byte order | MSB, LSB |
| Analyzable no. of data | 300000 bytes max. |
| List display items | Analysis no., time from trigger position [Time (ms)], Data 1, Data 2 |

**UART Signal Analysis Functions (/F01 Option)**

| | |
|---|---|
| Bit rate | 115200 bps, 57600 bps, 38400 bps, 19200 bps, 9600 bps, 4800 bps, 2400 bps, 1200 bps, User Define (an arbitrary bit rate from 1 k to 10 Mbps with resolution of 100 bps) |
| Analyzable signals | CH1 to CH8, Logic input, or M1 to M8 |
| Data format | Select a data format from the following<br>8 bit (Non Parity), 7 bit Data + Parity, 8 bit + Parity |
| UART trigger modes | Every Data, Data, Error |
| Analyzable no. of data | 300000 bytes max. |
| List display items | Analysis no., time from trigger position [Time (ms)], Data (Bin, Hex) display, ASCII display, Information. |

**CAN Bus Signal Analysis Functions (/F02 Option)**

| | |
|---|---|
| Applicable bus | CAN version 2.0A/B, Hi-Speed CAN (ISO11898), Low-Speed CAN (ISO11519-2) |
| Analyzable signals | CH1 to CH8, M1 to M8 |
| Bit rate | 1 Mbps, 500 kbps, 250 kbps, 125 kbps, 83.3 kbps, 33.3 kbps, User Define (an arbitrary bit rate from 10 kbps to 1 Mbps with resolution of 100 bps) |
| CAN bus trigger modes | SOF, ID/Data, ID OR, Error, Message and signal (enabled when loading physical values/symbol definitions) |
| Analyzable no. of frames | 100000 frames max. |
| List display items | Analysis no., time from trigger position [Time (ms)], Frame type, ID, DLC, Data, CRC, presence/absence of Ack, Information |
| Auxiliary analysis functions | Field jump functions |

**CAN FD Bus Signal Analysis Functions (/F02 Option)**

| | | |
|---|---|---|
| Applicable bus | CAN FD (ISO 11898-1:2015 and non-ISO) | |
| Analyzable signals | CH1 to CH8, M1 to M8 | |
| Bit rate | Arbitration | 1 Mbps, 500 kbps, 250 kbps, User Define (an arbitrary bit rate from 20 kbps to 1 Mbps with resolution of 100 bps) |
| | Data | 8 Mbps, 5 Mbps, 4 Mbps, 2 Mbps, 1 Mbps, 500 kbps, User Define (an arbitrary bit rate from 250 kbps to 10 Mbps with resolution of 100 bps) |
| CAN FD bus trigger modes | SOF, Error, ID/Data, ID OR, FDF, ESI, Message (enabled when loading physical values/symbol definitions) | |
| Analyzable no. of frames | 50000 frames max. | |
| List display items | Analysis no., time from trigger position [Time (ms)], Frame type, ID, DLC, Data, CRC, presence/absence of Ack, Information | |
| Auxiliary analysis functions | Field jump functions | |

**LIN Bus Signal Analysis Functions (/F02 Option)**

| | |
|---|---|
| Applicable bus | LIN Rev. 1.3, 2.0, 2.1 |
| Analyzable signals | CH1 to CH8, M1 to M8 |
| Bit rate | 19.2 kbps, 9.6 kbps, 4.8 kbps, 2.4 kbps, 1.2 kbps, User Define (an arbitrary bit rate from 1 kbps to 20 kbps with resolution of 10 bps) |
| LIN bus trigger modes | Break Synch, ID/Data, ID OR, Error |
| Analyzable no. of frames | 100000 frames max. |
| List display items | Analysis no., time from trigger position [Time (ms)], ID, ID-Field, Data, Checksum, Information |
| Auxiliary analysis functions | Field jump functions |

**FlexRay Bus Signal Analysis Functions (/F03 Option)**

| | |
|---|---|
| Applicable bus | FlexRay Protocol Version 2.1 |
| Analyzable signals | CH1 to CH8, M1 to M8 |
| Bit rate | 10 Mbps, 5 Mbps, 2.5 Mbps |
| FlexRay bus trigger modes | Frame Start, Error, ID/Data, ID OR |
| Analyzable no. of frames | 5000 frames max. |
| List display items | Analysis no., time from trigger position [Time (ms)], Segment (Static or Dynamic), Indicator, FrameID, PayLoad length, Cycle count, Data, Information |

**SENT Signal Analysis Functions (/F04 Option)**

| | | |
|---|---|---|
| Applicable standard | | J2716 APR2016 and older |
| Analyzable signals | | CH1 to CH8, Logic input, or M1 to M8 |
| Clock period | | 1 µs to 100 µs with resolution of 0.01 µs |
| Data type | Fast channel | Nibbles/User Defined |
| | Slow channel | Short/Enhanced |
| SENT trigger modes | | Every Fast CH, Fast CH Status & Communication, Fast CH Data, Every Slow CH, Slow CH ID/Data, Error |
| Analyzable no. of frames | | 100000 frames max. |
| List display items | Fast channel | Analysis no., time from trigger position [Time (ms)], Sync/Cal period, Tick, Status & Comm, Data, CRC, frame length, Information |
| | Slow channel | Analysis no., time from trigger position [Time (ms)], ID, Data, CRC, information |
| Auxiliary analysis functions | | Trend functions (up to 4 trend waveforms) |

**CXPI Bus Signal Analysis Functions (/F05 Option)**

| | |
|---|---|
| Applicable bus | CXPI JASO D 015-3:2015 |
| Analyzable signals | CH1 to CH8, M1 to M8 |

| | |
|---|---|
| Bit rate | 19.2 kbps, 9.6 kbps, 4.8 kbps, User Define (an arbitrary bit rate from 4 kbps to 50 kbps with resolution of 10 bps) |
| Analyzable no. of frames | 10000 frames max. |
| List display items | Analysis no., time from trigger position [Time (ms)], ID, DLC, W/S, CT, Data, CRC, error information, Wakeup/Sleep |

| **GP-IB (/C1 Option)** | |
|---|---|
| Electromechanical specifications | Conforms to IEEE std. 488-1978 (JIS C 1901-1987) |
| Protocol | Conforms to IEEE std. 488.2-1992 |

| **Auxiliary Input** | |
|---|---|
| Rear panel I/O signal | External trigger input, External trigger output, GO/NO-GO output, Video output |
| Probe interface terminal (front panel) | 8 terminals (DLM50x8), 4 terminals (DLM50x4) |
| Probe power terminal (side panel) | 8 terminals (/P8 option), 4 terminals (/P4 option) |

| **Internal Storage (Standard model, /C8 Option)** | |
|---|---|
| Capacity | Standard model: Approx. 1.7 GB, /C8 option: Approx. 64 GB |

| **Built-in Printer (/B5 Option)** | |
|---|---|
| Built-in printer | 112 mm wide, monochrome, thermal |

| **USB Peripheral Connection Terminal** | |
|---|---|
| Connector | USB type A connector × 2 (front panel × 2) |
| Electromechanical specifications | USB 2.0 compliant |
| Supported transfer standards | High Speed, Full Speed, Low Speed |
| Supported devices | USB Printer Class Ver. 1.0 compliant HP (PCL) inkjet printers, USB Mass Storage Class Ver. 1.1 compliant mass storage devices (Usable capacity: 8 TB, Partition format: GPT/MBR, File format: exFAT/FAT 32/FAT 16)<br>* Please contact your local YOKOGAWA sales office for model names of verified devices |

| **USB-PC Connection Terminal** | |
|---|---|
| Connector | USB type B connector × 1 |
| Electromechanical specifications | USB 3.0 compliant |
| Supported transfer standards | Super Speed, High Speed, Full Speed |
| Supported class | Mass Storage Class Ver. 1.1<br>USBTMC-USB488 (USB Test and Measurement Class Ver. 1.0) |

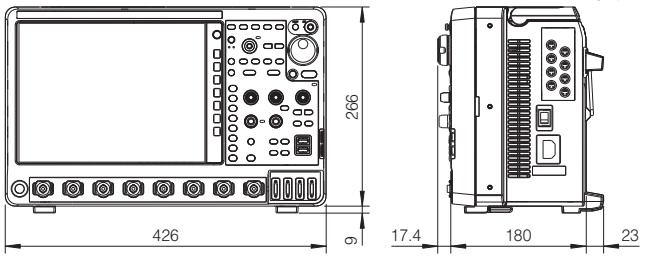
| **Ethernet** | |
|---|---|
| Connector | RJ-45 connector × 1 |
| Transmission methods | Ethernet (1000BASE-T/100BASE-TX/10BASE-T) |
| Supported services | Server: FTP, VXI-11, Socket<br>Client: FTP, SMTP, SNTP, LPR, DHCP, DNS |

| **General Specifications** | |
|---|---|
| Rated supply voltage | 100 to 120 VAC/220 to 240 VAC (Automatic switching) |
| Rated supply frequency | 50 Hz/60 Hz |
| Maximum power consumption | 290 VA |
| External dimensions | 426 (W) × 266 (H) × 180 (D) mm (when printer cover is closed, excluding protrusions) |
| Weight | Approx. 7.3 kg, With no options |
| Operating temperature range | 5℃ to 40℃ |

*1: Measured under standard operating conditions after a 30-minute warm-up followed by calibration.
Standard operating conditions: Ambient temperature: 23℃±5℃, Ambient humidity: 55±10% RH
Error in supply voltage and frequency: Within 1% of rating
*2: Value in the case of repetitive phenomenon. 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, accumulation is OFF, and the probe attenuation is set to 1:1.
*4: The LCD may include a few defective pixels (within 3 ppm over the total number of pixels including RGB).

**External Dimensions**

Unit: mm



## Model and Suffix Codes

| Model[*1] | Suffix code | Description |
|---|---|---|
| DLM5038 | | Mixed Signal Oscilloscope: 8 ch, 350 MHz |
| DLM5058 | | Mixed Signal Oscilloscope: 8 ch, 500 MHz |
| DLM5034 | | Mixed Signal Oscilloscope: 4 ch, 350 MHz |
| DLM5054 | | Mixed Signal Oscilloscope: 4 ch, 500 MHz |
| Power cord | -D | UL/CSA Standard and PSE compliant |
| | -F | VDE/Korean Standard |
| | -Q | British Standard |
| | -R | Australian Standard |
| | -H | Chinese Standard |
| | -N | Brazilian Standard |
| | -T | Taiwanese Standard |
| | -B | Indian Standard |
| | -U | IEC Plug Type B |
| Language | -HJ | Japanese message and panel |
| | -HE | English message and panel |
| | -HC | Chinese message and panel |
| | -HG | German message and panel |
| | -HF | French message and panel |
| | -HK | Korean message and panel |
| | -HL | Italian message and panel |
| | -HS | Spanish message and panel |
| Option | /L32 | Expansion logic 16bit (Total 32 bit) |
| | /B5 | Built-in printer (112 mm) |
| | /M1[*2] | Memory expansion option (8 ch model only)<br>During continuous measurement: 25 Mpoints;<br>Single mode: 125 Mpoints/250 Mpoints[*3] |
| | /M2[*2] | Memory expansion option (8 ch model only)<br>During continuous measurement: 50 Mpoints;<br>Single mode: 250 Mpoints/500 Mpoints[*3] |
| | /M1S[*2] | Memory expansion option (4 ch model only)<br>During continuous measurement: 25 Mpoints;<br>Single mode: 125 Mpoints/250 Mpoints[*3] |
| | /M2S[*2] | Memory expansion option (4 ch model only)<br>During continuous measurement: 50 Mpoints;<br>Single mode: 250 Mpoints/500 Mpoints[*3] |
| | /P8[*4] | 8 probe power terminals (for 8 ch model) |
| | /P4[*4] | 4 probe power terminals (for 4 ch model) |
| | /C1 | GP-IB interface |
| | /C8 | Internal storage (64 GB) |
| | /G02 | User-defined math function |
| | /G03 | Power supply analysis function |
| | /F01 | UART + I²C + SPI trigger and analysis |
| | /F02 | CAN + CAN FD + LIN trigger and analysis |
| | /F03 | FlexRay trigger and analysis |
| | /F04 | SENT trigger and analysis |
| | /F05 | CXPI trigger and analysis |
| | /E1[*5] | Four additional 701937 probes (8 in total) (for 8 ch model) |
| | /E2[*5] | Attach four 701949 probes |
| | /E3[*5] | Attach eight 701949 probes (for 8 ch model) |

**Standard Main Unit Accessories**
Power cord, Passive probe[*6], Protective front cover, Panel sheet[*7], Soft carrying case for probes, Printer roll paper (for /B5 option), User's manuals[*8]

*1: Standard memory capacity: During continuous measurement: 12.5 Mpoints; Single mode: 50 Mpoints/125 Mpoints (when odd channels only)
Logic probes sold separately.
*2,*5: When selecting from these options, please select only one.
*3: When odd channels only
*4: Specify this option when using current probes or other differential probes that don't support probe interface.
*6: Four 701937 except /E2 or /E3.
*7: Except suffix code "-HE".
*8: Start guide as the printed material, and User's manual as CD-ROM are included.

## Accessory Models

| Name | Model | Specification |
|---|---|---|
| Logic probe (PBL100) | 701988 | 1 MΩ, toggle freq. of 100 MHz |
| Logic probe (PBL250) | 701989 | 100 kΩ, toggle freq. of 250 MHz |
| Passive probe[*1] | 701937 | 10 MΩ (10:1), 500 MHz, 1.3 m |
| Miniature passive probe | 701949 | 10 MΩ (10:1), 500 MHz, 1.3 m |
| Passive probe<br>(Wide temperature range) | 702907 | 10 MΩ (10:1), 200 MHz,<br>2.5 m –40°C to +85°C |
| FET probe[*1] | 700939 | DC to 900 MHz BW, 2.5 MΩ/1.8 pF |
| 100:1 voltage probe | 701944 | DC to 400 MHz BW, 1.2 m, 1000 Vrms |
| 100:1 voltage probe | 701945 | DC to 250 MHz BW, 3 m, 1000 Vrms |
| Differential probe | 701920 | DC to 500 MHz BW, max. ±12 V |
| Differential probe | 701921 | DC to 100 MHz BW, max. ±700 V |
| Differential probe | 701922 | DC to 200 MHz BW, max. ±20 V |
| Differential probe (PBDH1000) | 701924 | DC to 1 GHz BW, 1MΩ, max. ±25 V |
| Differential probe | 701926 | DC to 50 MHz BW, 7000 Vpeak |
| Differential probe (PBDH0150) | 701927 | DC to 150 MHz BW, max. ±1400 V |
| Differential probe | 700924 | DC to 100 MHz BW, max. ±1400 V |
| Differential probe | 700925 | DC to 15 MHz BW, max. ±500 V |
| Current probe[*2] | 701917 | DC to 50 MHz BW, 5 Arms |
| Current probe[*2] | 701918 | DC to 120 MHz BW, 5 Arms |
| Current probe (PBC050)[*2] | 701929 | DC to 50 MHz BW, 30 Arms |
| Current probe (PBC100)[*2] | 701928 | DC to 100 MHz BW, 30 Arms |
| Current probe[*2] | 701930 | DC to 10 MHz BW, 150 Arms |
| Current probe[*2] | 701931 | DC to 2 MHz BW, 500 Arms |
| Deskew correction signal source | 701936 | For deskew correction |
| Go/No-Go Cable | 366973 | For GO/NO-GO output terminal |
| Printer roll paper | B9988AE | Lot size is 10 rolls, 10 meters each |
| Probe stand | 701919 | Round base, 1 arm |
| Soft carrying case | 701968 | With 3 pockets for storage |
| Rack mount kit | 701969-E | EIA standard-compliant |
| Rack mount kit | 701969-J | JIS standard-compliant |

*1: Please refer to the Probes and Accessories brochure for probe adapters.
*2: Current probes' maximum input current may be limited by the number of probes used at a time.

## Accessory Software

| Model | Name | Specification |
|---|---|---|
| 701992-SP01 | Xviewer | Standard edition |
| 701992-GP01 | | Math edition |

## Additional Option License for DLM5000[*1]

| Model | Suffix code | Description |
|---|---|---|
| 709821 | -G02 | User defined math |
| | -G03 | Power supply analysis function |
| | -F01 | UART + I²C + SPI trigger and analysis |
| | -F02 | CAN + CAN FD + LIN trigger and analysis |
| | -F03 | FlexRay trigger and analysis |
| | -F04 | SENT trigger and analysis |
| | -F05 | CXPI trigger and analysis |

*1: Separately sold license product (customer-installable).



NOTICE
● Before operating the product, read the user's manual thoroughly for proper and safe operation.

This is a Class A instrument based on Emission standards EN61326-1 and EN55011, and is designed for an industrial environment. Operation of this equipment in a residential area may cause radio interference, in which case users will be responsible for any interference which they cause.

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