Achieve New Measurement Capabilities with Higher Speeds, Isolation, Channel Count, and CAN.

Introducing Our Ultra-Fast Memory Recorder!

- High-speed (up to 100 MS/s), High Resolution (up to 16-bit), Isolated (up to 1kV*)
- Multi-channel, up to 128 voltage or 128 logic bits
- Continuous hard disk recording at 100 kS/s simultaneously on 16 channels**
- CAN bus monitoring and trend waveform display (DL850V only)
- 15 plug-in modules

*1. With the isolated probe (700929 or 701947)
*2. With the /HD0 or /HD1 option

For more information, please visit: tmi.yokogawa.com
Test & Measurement Instruments
Measure Fast Signals with High Accuracy and Time Resolution

The DL850 ScopeCorder Series are modular, waveform recording instruments that can measure voltage, current, strain, acceleration, and other phenomena—simultaneously. With high speed sampling, high isolation withstand voltage, and multichannel measurements, the DL850 Series offers powerful support in the development, evaluation, and quality control of energy efficient devices.

For increasingly fast inverter signals

High speed (100 MS/s), High resolution (12-bit), 1kV isolated measurements.*

Yokogawa’s isoPRO technology offers industry-leading isolation performance at the highest speeds. The isoPRO core technology is designed with energy savings applications in mind. It gives you the performance needed to develop high efficiency inverters, which employ high voltages, large currents, and high operating speeds.

Example: Measuring inverter output

Accurately observe inverter startup waveforms with sufficient time resolution. You can confirm that no excessive overshoots occurred.

Advanced—even more measurement points

Up to 128 CH of voltage input, and 128 bits of logic input

The 16-CH Voltage Input Module (scanner type) can measure at 10 kS/s sample rate even when using all 16 channels. With this module populating all 8 input module slots, the DL850 performs 128-CH voltage measurements.

The Logic Input Module supports everything from TTL levels, to high voltage contact closures at up to 10 MS/s*. With eight logic modules, the DL850 can monitor and capture 128 bits of logic.

Example: Measuring a multi-output power source

Power supplies used in home computing electronics have many outputs. With a multichannel module, you are not limited to voltage measurements; a single unit can also measure everything from PC control signals to AC fan operation and slow to high-speed signals.

Using high speed optical fiber-based transmissions, the module achieves high speed ADC clock and data isolation.

Example: Same inverter output waveform measured at 10 MS/s and 100 MS/s

● High-speed voltage
● High voltage
● High-precision voltage
● Multichannel voltage
● Temperature
● Strain
● Acceleration
● Frequency
● Logic input
● CAN monitoring (with the DL850)

* With a combination of the high-speed isolation module and the model 700929 or 701947 probe

NEW! NEW! NEW! NEW!

The DL850 is backwards-compatible with all modules of its predecessor, the DL750. In addition, four new modules have been added to the lineup. Combine modules at will to measure anything from minute voltages to high-speed, high withstand voltages.

* A response time for the logic input varies according as the probe.
**Display and Record Vast Amounts of Data with Long Memory and Easy Operation**

- **10.4-inch LCD XGA (1024 x 768)**
  - The large, high resolution LCD screen displays multiple channels in precise detail.

- **Jog shuttle**
  - Lets you easily set parameters with wide dynamic ranges.

- **4 directional cursor keys**
  - With large pop-up menus and 4 directional cursor keys, it is easy to enter and modify settings with many parameters.

- **One Button SAVE**
  - Select data or image format you wish to save in advance, then simply press one button to save everything at once.

- **ALL CH key**
  - A spreadsheet style view of all channel settings is displayed for easy editing.

- **Dedicated vertical axis and zoom knobs**
  - Direct accessibility means faster and easier settings!

- **Panel sheets in your language**
  - Select an adhesive sheet in any of 8 languages for the instrument’s front panel.

**Jog shuttle**

**100 kS/sec with 16 ch simultaneously**

**Performs waveform analysis without stopping measurement**

- **Zoom to 2 locations instantaneously**
  - Measured data can be streamed directly to a built-in 160 GB hard disk (/HD1 option). With long duration evaluation testing, measurements can be performed at 100 kS/s on 16 channels simultaneously for 10 hours.

- **ALL CH key**
  - Divides and saves measured data across multiple files!

**Efficiency from Settings to Measurement, Analysis, and Saving**

1. Enter input conditions in a full-screen menu
2. Easily zoom to a location of interest
3. Analyze using cursors
4. Save data for reports

**Key Point 1**

- Easily duplicate critical measured data on the main unit and a PC

**Key Point 2**

- Divided files are automatically uploaded and linked.

**Data being continuously recorded on the DL850/DL850V’s built-in HDD or external HDD can be transferred to a PC without stopping measurement.**

**Perform waveform analysis without stopping measurement**

- **If an abnormality occurs during a long duration continuous test, you can analyze the saved measured data without having to stop measurement!**

- **This function is Xviewer’s option**

**Long Memory, Continuous Saving of Waveforms**

- **Hard disk recording (/HD0, /HD1 option)**
  - Divided files are automatically uploaded and linked.

**Measured data can be streamed directly to a**

<table>
<thead>
<tr>
<th>Sample rate</th>
<th>With 1 ch</th>
<th>With 16 ch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MS/s</td>
<td>10 hours</td>
<td>-</td>
</tr>
<tr>
<td>200 kS/s</td>
<td>60 hours</td>
<td>-</td>
</tr>
<tr>
<td>100 kS/s</td>
<td>5 days</td>
<td>10 hours</td>
</tr>
<tr>
<td>20 kS/s</td>
<td>20 days</td>
<td>2.5 days</td>
</tr>
<tr>
<td>1 kS/s</td>
<td>30 days</td>
<td>30 days</td>
</tr>
</tbody>
</table>

*1 With the /M2 option, the maximum duration depends on the memory length.

*2 Real-time hard disk recording can be performed for a maximum of 30 days.
To visualize long term trends in durability testing and other situations, data is typically acquired at low-speed sample rates. On the other hand, suddenly-occurring transitional phenomena should be captured at high-speed sample rates.

The "Dual Capture" feature resolves these conflicting requirements by recording at two different sampling rates.

**Example: Parts durability testing**
Parts used in automobiles and other transportation vehicles must be highly reliable. The "Dual Capture" function is very effective when performing vibration testing of connectors under varying temperatures.

Allen Bradley's "Dual Capture" feature resolves these conflicting requirements by recording at two different sampling rates.

To check the history... To extract abnormal waveforms...

**Searching history waveforms**
When you want to extract specific abnormal phenomena, you can perform condition-based searches inside the history waveforms. You can create a rectangular zone on screen and extract only waveforms that pass through or do not pass through the zone. You can also extract data based on parameters such as amplitude or RMS.

**Key Point**
The History function requires no action during measurement. You can recall data at any time after measurement has been completed. Once waveforms have been recalled, you can zoom locations of interest or perform parameter measurements.
Armed with an array of trigger functions

— Simple & Enhanced Triggers —

The DL offers easy-to-use "Simple" triggers, or lets you combine various "Enhanced" triggers for even more advanced capturing. Enhanced trigger conditions are set up intuitively in advanced, easy-to-understand graphical user interfaces.

**SIMPLE**
- **Edge:** Trigger on a single trigger source condition (rising, falling, rising/falling)
- **Time:** Trigger at a specified time or fixed interval

**ENHANCED**
- **A -> B(N):** Trigger when condition B is true N times after condition A becomes true
- **A Delay B:** After condition A becomes true, trigger the first time condition B becomes true after a set time has passed
- **Edge On A:** Trigger on an OR condition of an edge trigger while the A trigger is true
- **OR:** Trigger if at least one trigger condition of multiple trigger sources is true
- **AND:** Trigger if all trigger conditions of multiple trigger sources are true
- **Period:** Trigger when a condition regarding the waveform period becomes true
- **Pulse Width:** Trigger on a condition relating a pulse width condition being true with a specified time width condition.
- **Wave Window:** Trigger when the signal passes outside of an real time template "Wave Window"

**— Wave Window trigger —**

The Wave Window trigger is useful for diagnosing typical power supply troubles such as momentary loss, sags, and surges. It can also detect frequency changes, voltage drops, and other phenomena, with support for AC waveforms of 40 to 1,000 Hz. A reference waveform (Real time template) is compared with the current waveform, and a trigger activates if the current waveform falls outside of the allowable range. The reference waveform is generated automatically from the previous waveform in real time.

**— Action ON trigger —**

To capture infrequently occurring phenomena, you can use an "Action ON Trigger" to perform multiple actions that are specified in advance when a trigger occurs.

**— Simple & Enhanced Triggers —**

- Beep sounds
- Prints out screenshots
- Saves waveform data
- Sends e-mails to a specified address

**Superior noise rejection**

Excellent noise rejection performance is achieved through meticulous low-noise design. Floating voltage switching waveforms in inverter circuits can also be captured with precision.
The DL850 is armed with a dedicated DSP (digital signal processor) for computations that enables between-channel math during waveform capture. These between-channel computations are powerful because they can be set up separately from filter computations. In addition to FIR, IIR, Gauss, and moving average filters, you can use arithmetic with coefficients, integrals and differentials, and higher-order equations.

- Display any combination of measured and math waveforms (up to 16 total).
- You can even assign channels without modules.

### Example: 3-phase power computation

Power is calculated as the integral of the product of voltage and current over time (an average based on the period). Using the Realtime Math function, you can display 3-phase 3-wire power waveforms in real time.

\[
P_{n} = \frac{1}{T} \int V(t) \cdot I(t) \, dt
\]

3-wire 3-phase power (P)

#### Key Point

Computations occur in real time even when in Roll mode. Computed waveforms can also be used to activate triggers.

### A wealth of functions gets you right to the waveform you want — User defined computation (/G2 option) —

The DL comes standard with arithmetic, time shift, FFT, and other computations that enable you to display waveforms with offsets and skew corrections. And with user defined computations (/G2 option), you can create equations using a combination of differentials and integrals, digital filters, and a wealth of other functions.

#### Example: Amplitude analysis using FFT

With the User Defined Computation function (option) included, you can perform various types of FFT analysis using two FFT windows. In applications such as vibration and shock tests, you can easily evaluate abnormal vibrations while simultaneously measuring other signals.

#### Key Point

You can assign a log scale to the frequency axis.

### Automatically extract waveform amplitude, frequency, and other parameters — Waveform parameter and statistical computation —

Extract and display up to 24 of the 26 available waveform parameters (amplitude, frequency, etc.) simultaneously. Menus can be shown as lists of easy-to-read icons.

#### Statistical computation

The DL can automatically extract cycle waveforms and find the standard deviation and other statistics. Computations can be performed on history waveforms as well.

### Detect abnormal waveforms, notify users, and determine pass/fail — GO/NO-GO determination —

The DL can determine whether waveforms or computed values of waveform parameters meet (GO) or do not meet (NO-GO) conditions that are specified in advance. Upon judgment of the measured results, a pre-set action is performed and users are notified that an abnormal waveform was observed, along with the pass/fail determination.

This is a very useful function for such things as studying signals from manufacturing lines of electronic devices and tracing abnormal phenomena.

#### Example: Evaluating motor startup characteristics

Parameter measurement is taken of the time until reaching a reference RPM after motor start, and the subsequent GO/NO-GO (pass/fail) determination is made.
New Functions, New Possibilities

Synchronize multiple units performing simultaneous measurements — IRIG input (/C20 option) —

Synchronized measurement across multiple DL850 units is made possible by inputting an IRIG time code signal.* The DL850/DL850V’s internal clock is also synchronized (locked) to the IRIG signal. Therefore, timing comparisons are highly precise even when continuously recording over long periods of time.

Example: Synchronous measurements for large transport vehicles

Simultaneously measuring both tips of airplane wings, or between railroad cars requires synchronizing multiple measuring instruments in time. With a single IRIG cable, the acquisition time of all data is made the same.

The flexibility of an external hard drive — External hard drive interface (/HD0 option) —

With an external hard drive interface, you can connect a commercially available eSATA standard hard drive. The DL can record to an external drive in real time (see p. 5) just like it can with the built-in hard drive. After saving waveforms, you can switch the DL850/DL850V from the PC to the external drive and use the waveform data immediately.

Key Point

(1) Ensures security
Simply remove the drive after measurement to protect data. Or, keep restricted data only at the measurement site.

(2) Increases capacity
If the external hard drive becomes full, you can simply switch to a new one (requires a restart).

(3) Hi-speed data transfer
A data can be transferred at high speed between a PC and a hard drive.

* The external hard drive is an option when specifying the internal hard drive.

The speed of realtime hard drive saving depends on the performance of the hard drive.

Check the relationship between hysteresis and phase — XY display function —

You can confirm the relationship between two signals using the X-Y display. This can be applied to measurements such as the phase angle of two sine waves.

You can select four combinations on the X and Y axes, and therefore display multiple X-Y waveforms simultaneously and find relationships between them.

Simultaneous observation of X-Y waveforms and normal T-Y waveforms (waveform display using voltage and time axes) is also possible.

Example: Computing dynamic BH characteristics of a magnetic substance

On the DL850 you can measure voltage and current, then analyze hysteresis of magnetic flux density B and magnetic field strength H. Energy loss generated by magnetostriction can be evaluated by measuring dynamic BH characteristics.
### Special Functions

**Snapshots**

With the push of “SNAP SHOT” key, you can save a “snapshot” of the measured waveform (the waveform displayed on screen). The waveform remains saved even if you restart measurement, therefore you can easily compare the snapshot with any newly measured waveforms. Snapshots can also be saved and loaded as files.

*Example: Comparison of a snapshot waveform (white) with another waveform*

**Web server**

The Web Server function displays the screen of any networked DL850/DL850V on a PC via Ethernet. From this screen, you can remotely start or stop measurement, update the DL’s display, and take snapshots (capture images) of the screens.

*You can operate controls and acquire screen images with a Web browser—no special software required on the PC.*

**Multilanguage support**

Adhesive front panel key label sheets (“panel sheets”) are available in eight different languages. Multilanguage support is also provided for menus and error messages.

**Saving screen images and displaying thumbnails**

Screen images can be saved to a specified storage medium in PNG, JPEG, or BMP format. These screen images can be imported into reports or other PC-created documents.

*Screen images saved to storage media are shown on screen as thumbnails for easy identification.*

**Accessory software (sold separately)**

**Xviewer (701992)**

Xviewer is a high cost-performance, integrated waveform analysis tool offering centralized control of the ScopeCorder, measurement, data transfer, waveform observation, and analysis. The program displays waveforms measured by the DL850/DL850V on a PC and performs analysis. Waveform data (files) can be transferred from the DL850/DL850V to Xviewer via SD memory card or other media, USB, or Ethernet interface. The program supports a variety of functions for the PC including zoom display, cursor measurements, waveform parameter computation, data conversion to CSV and other formats, creation of reports, and printing. The program not only displays and analyzes waveforms, but also displays an image of the DL850/DL850V front panel on a PC (a “control image”) using the GP-IB/Ethernet/USB interface that allows you to control the instrument remotely as if you were operating its actual keys.

<table>
<thead>
<tr>
<th>Model Numbers and Suffix Codes</th>
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<tbody>
<tr>
<td>Model</td>
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<tr>
<td>701992</td>
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</table>

For details on accessory software, visit [https://y-link.yokogawa.com/YL000.po](https://y-link.yokogawa.com/YL000.po)

Also, you can download free software and trial versions of retail software from this site.
CAN bus is a standard in-vehicle serial bus used for control networks. The DL850V ScopeCorder Vehicle Edition can include a CAN Monitor Module (model 720240) that enables monitoring of CAN protocol communication data as analog values, from which triggers can be activated.

Correlations can be identified between communication data on the CAN bus; voltage, temperature, sensor signals, and other analog data; and ECU control logic signals-this lets you evaluate the overall CAN system.

**CAN data acquisition and trend display — CAN bus monitor module (model 720240) —**

You can also use DBC database files (.dbc) to specify the data to be monitored. Database (definition) files can be loaded and edited by our free Symbol Editor program for conversion to an .sbl file that can be read by the DL850V. Instead of digital code (hex or numeric), you can monitor CAN signals using Messages, Signal names, and physical units.

Example: Comparison and verification of actually measured signals and CAN bus signals

You can check physical value trends of CAN bus data and the corresponding actually measured waveforms on the same screen at once. For example, ignition switch ON/OFF signal and the ignition command’s corresponding CAN signal can be displayed together with the actually-measured signal from the related voltage sensor or other devices in order to verify any correlation between these signals.

**Model 720240 CAN Bus Monitor module Main specifications**

- Input ports: 2 (60 signals x 2 ports)
- Connector type: D-sub 9 pin (male)
- Supported protocols:
  - Physical layer: ISO-11898 (High Speed Communication)
  - CAN in Automation: CAN2.0B (Standard & extended message format)
- Bit rates: 10 k, 20 k, 33.3 k, 50 k, 62.5 k, 66.7 k, 83.3 k, 125 k, 250 k, 500 k, 800 k, 1 Mbps
Example of accessory combinations

High-Speed 10 MS/s, 12-Bit Non-Isolation Module 701255

- Passive Probe 701940
- BNC Cable 366924/366925
- 1:1 BNC-Alligator Cable 366926
- ±500/15MHz Differential Probe 700925
- ±1000/100MHz Differential Probe 700924
- 7000Vpk.50MHz Differential Probe 701926

Acceleration/Voltage Module (with AAF) 701275

- ±500V/15MHz Differential Probe 700925
- ±1000/100MHz Differential Probe 700924
- 7000Vpk.50MHz Differential Probe 701926

Warning: Connect the probe earth cable to ground (grounding potential) when using these differential probes with isolation modules.

Universal (Voltage/ Temp.) Module 701261

- 1:1 Banana-Alligator Cable 366961
- Shunt Resistor for 4-20 mA Measurement 438920 (250Ω ±0.1%)
- 438921 (100Ω ±0.1%)
- 438922 (10Ω ±0.1%)

Universal (Voltage/ Temp.) Module with AAF 701262

- Temperature, High Precision Voltage Isolation Module 701265

- 1:1 Banana-Alligator Cable 366961
- Shunt Resistor for 4-20 mA Measurement 438920 (250Ω ±0.1%)
- 438921 (100Ω ±0.1%)
- 438922 (10Ω ±0.1%)

10:1 Isolation Probe 700929

- Plug-On Clip 701948
- Safety Mini-Clip (hook type) 701959
- Alligator Clip Adaptor Set 705822

100:1 Isolation Probe 701947

- 1:1 Safety BNC Adapter Lead 701901
- Safety BNC Cable 1 m : 701902
  2 m : 701903
- Alligator Clip Adaptor Set 705822

Measurement Lead Set 758917

- 1:1 Safety BNC Adapter Lead 701901
- Safety BNC Cable 1 m : 701902
  2 m : 701903
- Alligator Clip Adaptor Set 705822

Frequency Module 701280

- Current Probe 30 Arms DC to 50 MHz 701933
- Current Probe 150 Arms DC to 10 MHz 701930
- Current Probe 500 Arms DC to 2 MHz 701931
- Fork Terminal Adaptor Set 758921
- 1:4 Probe power 4-output 701934

Current Probe 30 Arms DC to 50 MHz 701933

- Current Probe 150 Arms DC to 10 MHz 701930
- Current Probe 500 Arms DC to 2 MHz 701931
- Fork Terminal Adaptor Set 758921
- 1:4 Probe power 4-output 701934

Probe Power Supply 4-output 701934

- Bridge Head (NDIS) 120 Ω: 701965
  350 Ω: 701966
- Bridge Head (DSUB) 120 Ω: 701965
  350 Ω: 701966

Strain Module (NDIS) 701270

- Strain Module (DSUB, Shunt-Cal) 701271
- Bridge Head (NDIS) 120 Ω: 701965
  350 Ω: 701966
- Bridge Head (DSUB) 120 Ω: 701965
  350 Ω: 701966

High-Speed Logic Probe 700986

- Isolation Logic Probe 700987
- Logic Probe (TTL level Contact Input) 1m: 702911
  3m: 702912

High-Speed 100 MS/s, 12-Bit Isolation Module 720210

High-Speed 10 MS/s, 12-Bit Isolation Module 701250

High-Speed 1 MS/s, 16-Bit Isolation Module 701251

High-Voltage 100 kS/s, 16-Bit Isolation Module 701260

Frequency Module 701280

- Current Probe 30 Arms DC to 50 MHz 701933
- Current Probe 150 Arms DC to 10 MHz 701930
- Current Probe 500 Arms DC to 2 MHz 701931
- Fork Terminal Adaptor Set 758921
- 1:4 Probe power 4-output 701934

Probe Power Supply 4-output 701934

- Bridge Head (NDIS) 120 Ω: 701965
  350 Ω: 701966
- Bridge Head (DSUB) 120 Ω: 701965
  350 Ω: 701966

Strain Module (NDIS) 701270

- Strain Module (DSUB, Shunt-Cal) 701271
- Bridge Head (NDIS) 120 Ω: 701965
  350 Ω: 701966
- Bridge Head (DSUB) 120 Ω: 701965
  350 Ω: 701966

High-Speed Logic Probe 700986
## Module Selection

<table>
<thead>
<tr>
<th>Input</th>
<th>Model No.</th>
<th>Sample Rate</th>
<th>Resolution</th>
<th>Bandwidth</th>
<th>Number of Channels</th>
<th>Isolation</th>
<th>Isolation Voltage (DC+ACpeak)</th>
<th>DC Accuracy</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analog Voltage</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>720210</td>
<td>100 MS/s</td>
<td>12-Bit</td>
<td>20 MHz</td>
<td>1000 V V*2</td>
<td>±0.5%</td>
<td>High-speed · High-voltage · Isolated</td>
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<td></td>
<td>701250*3</td>
<td>10 MS/s</td>
<td>12-Bit</td>
<td>3 MHz</td>
<td>600 V V<em>1 250 V V</em>1</td>
<td>±0.5%</td>
<td>High noise immunity</td>
<td></td>
<td></td>
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<td></td>
<td>701251</td>
<td>1 MS/s</td>
<td>16-Bit</td>
<td>300 kHz</td>
<td>600 V V<em>1 140 V V</em>1</td>
<td>±0.25%</td>
<td>High sensitivity range (1mV/div), low noise (±50 μA/div), and high noise immunity</td>
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<td></td>
<td>701260</td>
<td>100 kS/s</td>
<td>16-Bit</td>
<td>40 kHz</td>
<td>1000 V V<em>1 250 V V</em>1</td>
<td>±0.5%</td>
<td>Non-isolation version of model 701250</td>
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<td></td>
<td>720220</td>
<td>200kS/s</td>
<td>16-Bit</td>
<td>5 kHz</td>
<td>16 Isolated (GND terminal on isolated (CH1-4))</td>
<td>±0.3%</td>
<td>16CH voltage measurement (Scan-type)</td>
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<tr>
<td><strong>Temperature</strong></td>
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<tr>
<td></td>
<td>701261</td>
<td>100 kS/s</td>
<td>Voltage</td>
<td>40 kHz</td>
<td>42 V ±0.25% (Voltage)</td>
<td></td>
<td>thermmcouple K, E, J, T, L, U, N, R, S, B, W, iron-doped gold/chromel</td>
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<tr>
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<td>701262</td>
<td>100 kS/s</td>
<td>Voltage</td>
<td>40 kHz</td>
<td>42 V ±0.25% (Voltage)</td>
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<td>thermmcouple K, E, J, T, L, U, N, R, S, B, W, iron-doped gold/chromel, with AAF</td>
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<td>701265</td>
<td>500 S/s</td>
<td>Voltage</td>
<td>100 Hz</td>
<td>42 V ±0.08 % (Voltage)</td>
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<td></td>
<td>701270</td>
<td>100 kS/s</td>
<td>16-Bit</td>
<td>20 kHz</td>
<td>10 V ±0.5% (Strain)</td>
<td></td>
<td>Supports strain N, S, 2, 5, 10 V built-in bridge power supply</td>
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<tr>
<td></td>
<td>701271</td>
<td>100 kS/s</td>
<td>16-Bit</td>
<td>20 kHz</td>
<td>10 V ±0.5% (Strain)</td>
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<td>Supports strain DSUB, 2, 5, 10 V built-in bridge power supply, and shunt CAL</td>
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<td><strong>Analog Voltage, Acceleration</strong></td>
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<tr>
<td></td>
<td>701275</td>
<td>100 kS/s</td>
<td>16-Bit</td>
<td>40 kHz</td>
<td>42 V ±0.25% (Voltage) ±0.5% (Acceleration)</td>
<td></td>
<td>built-in anti-aliasing filter, Supports built-in amp type acceleration sensors (4 mA/22 V)</td>
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<tr>
<td><strong>Frequency</strong></td>
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<tr>
<td></td>
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<td>25 kS/s</td>
<td>16-Bit</td>
<td>resolution 50 ns</td>
<td>420 V V<em>1 42 V V</em>1</td>
<td>±0.1% (Frequency)</td>
<td>Measurement frequency of 0.01 Hz to 200 kHz, Measured parameters (frequency, rpm, period, duty, power supply frequency, distance, speed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Logic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>702230</td>
<td>10 MS/s</td>
<td>—</td>
<td>—</td>
<td>8-bit x 2 ports non-isolated — —</td>
<td></td>
<td>(8-bit/port) x 2, compatible with four-type of logic probe (sold separately)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CAN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>720240</td>
<td>100 kS/s</td>
<td>—</td>
<td>—</td>
<td>Isolated 10V — —</td>
<td></td>
<td>CAN Data of max, 16-bit allowable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: Probes are not included with any modules. *2: In combination with 10:1 probe model 700929 *3: Direct input *4: In combination with 10:1 probe model 701940

### For DL850/DL850V plug-in modules specifications, see the “Bulletin DL850-01E” catalog.

### Variety of Connection Interfaces

- **Video signal output (VIDEO OUT)**
  - Confirm waveforms on an analog RGB (XGA) external display.
- **EXT I/O**
  - GO/NO-GO determinations can be output, and you can perform control based on start/stop and other external signals.
  - External I/O cable 720391
- **External clock I/O (EXT CLK IN)**
  - Perform sampling timed to an external signal (up to 0.5 MHz).
- **External trigger input (EXT TRIG IN)**
- **External trigger output (EXT TRIG OUT)**
- **GP-III (optional)**
- **IRIG (optional)**
  - Inputting an external time signal lets you synchronize multiple DL850s.
- **External hard drive IF (optional)**
  - Connect an eSATA standard hard drive.
- **SD card slot**
  - SD, SDHC compliant, comes standard
- **USB-PC connection terminal**
  - Enables control from a PC.
- **USB peripheral connection terminal**
  - Supports USB storage, keyboards, and mouse input.
- **Ethernet 1000BASE-T**
  - Comes standard

*1: Built-in hard disk and external hard disk IF are not available together.
*2: The GP-III is also available when IRIG (C20) option is specified.
Main Specifications (Main Unit)

**Input Section**
- Plug-in module
- Number of slots: 8
- Max 4 for 72020 modules
- Max 2 for 720240 modules (for DL850 only)

**Number of input channels**
- DL850: 16CH/Slot, 128CH/Unit
- DL850V: 32CH/Slot, 160CH/Unit

**Trigger Section**
- Realtime hard disk recording
- Maximum sample rate: 1MS/s (1CH used), 100kS/s

**Display format**
- Max 3 simultaneous displays available

**Input Section**
- Plug-in module

**Display**
- 10.4-inch TFT color LCD monitor, 1024×768/1024/768/9GA

**Display resolution of waveform display**
- Selectable either 600×655 (normal waveform display) or 1001×655 (wide waveform display)

**Display format**
- Max 3 simultaneous displays available

**Function**

### Acquisition and display
- **Acquisition mode**
  - Normal
  - Envelope: Maximum sample rate regardless of record time, holds peak value

- **Averaging**
  - Average count: 2 to 65536
  - Box average: Increase A/D resolution up to 4 bits

- **Roll mode**
  - It is effective when the trigger mode is set to auto/auto level/single/ON start, and time axis is greater than 100m/s/div.

- **Dual capture**
  - Performs data acquisition on the same waveform at 2 different sample rates.
  - Main waveform (low speed)
    - Maximum sample rate: 100kS/s (roll mode region)
    - Maximum record length: 100M point
  - Capture waveform (high speed)
    - Maximum sample rate: 1M/s
    - Maximum record length: 50k point

- **Realtime hard disk recording**
  - Maximum sample rate: 250kS/s (1CH used), 10M Sps/CH (16 CH)
  - /M1 option: 1 Gpts (CH1), 50M pts/CH1 (32 CH)
  - /M2 option: 2 Gpts (CH1), 100M pts/CH1 (16 CH)

- **History memory**
  - Maximum: 5000 pages

### Display
- **Display format**
  - TV display for 1, 2, 3, 4, 6, 8, 12, 16 division display

- **Maximum number of display traces**
  - 64 trace per 1 display group, selectable in every 4 displays

- **X-Y display**
  - Selectable X axis/Y axis is CHn, Mathn (max 4 trace x 2 window)

### Accumulation
- Accumulates waveforms on the display (monitor persistence)
- Retains the current displayed waveform on the screen.
- Snapshots can be saved to the hard disk.
- ALL CH menu
  - Set all channels while displaying waveforms.
  - Operation using USB keyboard and USB mouse are available.

### Expansion/Reduction of vertical axis direction
- X: 0.1 to 1 (varies depending on the module), DS/SPAN set selectable
- Vertical position setting
  - +/- waveform move is available from the center of waveform screen frame.

### Linear scaling
- Set AX/B mode or P1-P2 mode independently for CHn.
The measurement range of the ScopeCorder is ±10 divisions (20 divisions of absolute width (span)) around 0 V. The display range of the screen is ±5 divisions (10 divisions of span). The following functions can be used to move the displayed waveform and display the waveform outside the display range by expanding/reducing the displayed waveform.

- Move the vertical position.
- Set the offset voltage.
- Zoom in or out of the vertical axis (expand/reduce).

**Main Specifications (Main Unit)**

**Function**
- Main unit time synchronization, sample block synchronization
- Clock synchronization range ±30ppm
- Accuracy after synchronization No drift against input signal

**Auxiliary I/O section**
- EXT CLK IN BNC connector, TTL level, minimum pulse width 50ns, 5-V peak or less
- EXT TRIG IN BNC connector, TTL level, rising/falling
- EXT TRIG OUT BNC connector, 5-V CMOS level, taken when triggered, and rising when acquisition completed.
- GO/NO-GO determination I/O
  - Connector type: RJ-45 modular jack
  - Input level: TTL or contact input
  - Output level: 5-V CMOS
- External start/stop input
  - Input level: TTL or contact input
- Manual event
  - Input level: TTL or contact input

**Video signal output**
- D-Sub 15 pin receptacle
  - Analog RGB, quasi XGA output 1024×768 dot, approx 60Hz VSync

**Probe power output (P4 option)**
- Number of terminals: 4, output voltage ±12V

**General specifications**
- Rated power supply voltage: 100 to 120VAC/220 to 240VAC (automatic switching)
- Rated power supply frequency: 50/60Hz
- Maximum power consumption: 200VA
- Withstand voltage: 1500V AC between power supply and earth for 1 minute
- Insulation resistance: 10MΩ or higher at 500V DC between power supply and earth
- Operating temperature range: 5 to 40 ºC
- Standard operation conditions: Ambient temperature: 23 ±5 ºC, Ambient humidity: 20 to 80 %RH
- Errors in power supply voltage/frequency:
  - Within ±10% of rated voltage,
  - Within ±5% of rated frequency

**Series related models**

**DL750P ScopeCorder**
- Comes with 210 mm wide chart paper
- Realtime printing function

**SL1400 ScopeCorder**
- Easy operation
- Multilanguage key labels

**SL1000 High-Speed Data Acquisition Unit**
- High speed transfer of data to a PC
- 100 M/s simultaneously on 16-Ch
- 8 units linked
### Plug-in Module Model Numbers

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL850</td>
<td>DL850 main unit, 250Mpts(W) memory</td>
</tr>
<tr>
<td>DL85OV</td>
<td>DL850V main unit, 250Mpts(W) memory</td>
</tr>
</tbody>
</table>

#### Power Code

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>UL and CSA standard</td>
</tr>
<tr>
<td>IR</td>
<td>IEC standard</td>
</tr>
<tr>
<td>Q</td>
<td>AS standard</td>
</tr>
<tr>
<td>B</td>
<td>BS standard</td>
</tr>
<tr>
<td>IN</td>
<td>CE standard</td>
</tr>
</tbody>
</table>

#### Languages

<table>
<thead>
<tr>
<th>Language</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-EN</td>
<td>English menu and panel</td>
</tr>
<tr>
<td>H-JP</td>
<td>Japanese menu and panel</td>
</tr>
<tr>
<td>H-KR</td>
<td>Korean menu and panel</td>
</tr>
<tr>
<td>H-DE</td>
<td>German menu and panel</td>
</tr>
<tr>
<td>H-ES</td>
<td>Spanish menu and panel</td>
</tr>
<tr>
<td>H-FR</td>
<td>French menu and panel</td>
</tr>
<tr>
<td>H-IT</td>
<td>Italian menu and panel</td>
</tr>
<tr>
<td>H-GB</td>
<td>Italian menu and panel</td>
</tr>
<tr>
<td>H-IT</td>
<td>German menu and panel</td>
</tr>
<tr>
<td>H-ES</td>
<td>Spanish menu and panel</td>
</tr>
</tbody>
</table>

#### Options

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/M1</td>
<td>Built-in printer (112mm)</td>
</tr>
<tr>
<td>/M2</td>
<td>Memory expansion to 1Gpts(W)</td>
</tr>
<tr>
<td>/HD1</td>
<td>External HDI interface</td>
</tr>
<tr>
<td>/HD2</td>
<td>Internal HDI (100GB)</td>
</tr>
<tr>
<td>/F1</td>
<td>GP-B interface</td>
</tr>
<tr>
<td>/F2</td>
<td>Real time math function (coming soon)</td>
</tr>
<tr>
<td>/F3</td>
<td>Four probe outputs</td>
</tr>
</tbody>
</table>

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*1: Plug-in modules are not included.
*2, *3, *4: Choose either one for each item when specified.

### Plug-in Module Numbers

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>701250</td>
<td>High-speed 10 MS/s 12-Bit Isolation Module (2 ch)</td>
</tr>
<tr>
<td>701255</td>
<td>High-speed 10 MS/s 16-Bit non-isolation Module (2 ch)</td>
</tr>
<tr>
<td>701260</td>
<td>High-voltage 100 kS/s 16-Bit Isolation Module (with RMs, 2 ch)</td>
</tr>
<tr>
<td>701261</td>
<td>Universal Module (2 ch)</td>
</tr>
<tr>
<td>701262</td>
<td>Universal Module (with Anti-Aliasing Filter, 2 ch)</td>
</tr>
<tr>
<td>701265</td>
<td>Temperature/high-precision voltage Module (2 ch)</td>
</tr>
<tr>
<td>701270</td>
<td>Strain Module (NDS, 2 ch)</td>
</tr>
<tr>
<td>701271</td>
<td>Strain Module (ESUB, Shunt CAL, 2 ch)</td>
</tr>
<tr>
<td>701275</td>
<td>Acceleration/Voltage Module (with Anti-Aliasing Filter, 2 ch)</td>
</tr>
<tr>
<td>701280</td>
<td>Frequency Module (2 ch)</td>
</tr>
<tr>
<td>702070</td>
<td>High-speed 10 MS/s 12-Bit Isolation Module (2 ch)</td>
</tr>
<tr>
<td>702072</td>
<td>Voltage Input Module (16 ch)</td>
</tr>
<tr>
<td>702075</td>
<td>Logic Input Module (16 ch)</td>
</tr>
<tr>
<td>702080</td>
<td>CAN/Bus Monitor Module (32 ch, available DL850V only)</td>
</tr>
</tbody>
</table>

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*4: Probes are not included with any modules.

Note 1: These modules can be used with the DL750/DL750P/SL1000 and SL1400 as well with some exceptions.

Note 2: When using these module(s) with the SL1000, some indications for specifications are different. See the SL1000 instruction manual for details.