- High-speed (up to 100 MS/s), High Resolution (up to 16-bit), Isolated (up to 1kV\(^1\))
- Multichannel, 128-CH voltage/temperature, 128-bit logic measurement
- Continuous hard disk recording at 100 kS/s simultaneously on 16 channels\(^2\)
- Monitors CAN and LIN buses to display trend waveforms (DL850V only)
- 17 types of plug-in modules

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

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.

---

**NEW!**

The lineup includes two new module types: A 16-CH Temp./Voltage Input Module, and a CAN & LIN Bus Monitor Module (DL850V only).

All DL850 modules can be combined with measurement modules from the DL750 series products:

- High-speed Voltage
- High Voltage
- High-precision Voltage
- 16-CH Temperature
- 16-CH Temp./Voltage
- Strain
- Acceleration
- Frequency
- Logic Input
- CAN Monitor (DL850V only)
- CAN & LIN Monitor (DL850V only)

For dedicated module functions and specifications, see the module catalog (Bulletin DL850-01EN). For the 100 MS/s High-speed, 12-bit Isolation Module (model: 720210), a maximum of four modules can be installed in a single main unit.

---

* 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.

- **Zoom screen:**
  Divides and saves measured data across multiple files!

- **Key Points:**
  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

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

- **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

- **Efficiency from Settings to Measurement, Analysis, and Saving**
  1. Enter input conditions in a full-screen menu
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### Key Features:
- **10.4-inch LCD XGA (1024 x 768)**
- **4 directional cursor keys**
- **Zoom screen:** Divides and saves measured data across multiple files!
- **Key Points:**
  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

### Measurement Capabilities:

#### Large [2 GPoint] memory offers long duration measurement and two instantaneous zoom locations:

- **Sample rate**
  - With 1 ch: 100 MS/s, 10 MS/s, 100 kS/s, 10 kS/s, 200 S/s, 20 S/s
  - With 16 ch: 100 MS/s, 10 MS/s, 100 kS/s, 10 kS/s, 200 S/s, 20 S/s

#### Limited Memory Measurement Capabilities:

- **Sample rate**
  - With 1 ch: 1 MS/s, 200 kS/s, 100 kS/s, 1 kS/s, 200 S/s, 20 S/s
  - With 16 ch: 1 MS/s, 200 kS/s, 100 kS/s, 1 kS/s

#### 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

#### Measurements possible with a 2 GPoint long memory:

- **Sample rate**
  - With 1 ch: 100 MS/s, 10 MS/s, 100 kS/s, 10 kS/s, 200 S/s, 20 S/s
  - With 16 ch: 100 MS/s, 10 MS/s, 100 kS/s, 10 kS/s, 200 S/s, 20 S/s

#### Data Recording Options:

- **Hard disk recording (/HD0, /HD1 option)**
- **Ethernet or USB**

### Key Points:

1. **Key Point 1**
   - If an abnormality occurs during a long duration continuous test, you can analyze the saved measured data without having to stop measurement!

2. **Key Point 2**
   - Easily duplicate critical measured data on the main unit and a PC.

### Zoom to 2 locations instantaneously:

- **Zoom screen:**
  - 1 hour (12 min/div)
  - 1 second (100 ms/div)

### Long Memory and Easy Operation:

- **Measurement duration:**
  - With 1 ch: 10 hours, 60 hours, 5 days, 20 days, 30 days
  - With 16 ch: 10 hours, 2.5 days, 30 days

### GIGAzoom 2 Engine:

- Instantly zooms 1 second (100 ms/div) even when the main screen is displaying 20 days of recording (2 days/div).

### Memory Handling:

- Long memory does not guarantee better efficiency if the memory handling and display engine is slow. Our faster than ever GIGAZoom 2 Engine instantly zooms into two locations.

### Data Stream Measurement:

- Data being continuously recorded on the DL850/DL850V’s built-in HDD or external HDD can be transferred to a PC without stopping measurement. You can display and analyze the transferred waveform data using Xviewer, an accessory program for the PC.

### Data Transfer Options:

- **Ethernet or USB**

### Key Features:

- **Zoom to 2 locations instantaneously**

### Measured data can be streamed directly to a built-in 160 GB hard disk (/HD1 option) or through the external HDD interface (/HD0 option). With long duration evaluation testing, measurements can be performed at 100 kS/s on 16 channels simultaneously for 10 hours.

### Long Memory:

- 2 GPoint memory (/M2 option) — Long Duration, Continuous Saving of Waveforms — Hard disk recording (/HD0, /HD1 option) —魔導記憶器

### Sample Rate Options:

- **Sample rate**
  - With 1 ch: 1 MS/s, 200 kS/s, 100 kS/s, 1 kS/s
  - With 16 ch: 1 MS/s, 200 kS/s, 100 kS/s, 1 kS/s

### Measurement Duration Options:

- **Measurement duration:**
  - With 1 ch: 10 hours, 60 hours, 5 days, 20 days, 30 days
  - With 16 ch: 10 hours, 2.5 days, 30 days

### Data Recording Options:

- **Hard disk recording (/HD0, /HD1 option)**
- **Ethernet or USB**

### Divided Files:

- Divided files are automatically uploaded and linked.

### Xviewer:

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

### Key Points:

1. **Key Point 1**
   - If an abnormality occurs during a long duration continuous test, you can analyze the saved measured data without having to stop measurement!

2. **Key Point 2**
   - Easily duplicate critical measured data on the main unit and a PC.
**A ScopeCorder Shows You the Waveforms You Want**

**Catch transients in durability with high-speed sampling**  

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.

**Recall Past Waveforms**

When you spot an abnormal phenomenon during repetitive high speed measurements, often the anomaly has disappeared from the screen by the time you press Stop.  
Always active, the "History" function automatically divides the long memory into up to 5,000 "history waveforms" that can be redisplayed at any time.

**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.

**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 a 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**
  - **Trigger Detection**
  - **Wave Window**
  - **Surge**

---

**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.

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**Example: Measuring inverter gate signals**

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**CMRR:**

-90dB typ @100 kHz

---
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 digital filters, you can choose from 33 unique functions such as 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.

\[
\text{Active power } P_n = \frac{1}{T} \int V(t) \cdot I(t) \, dt
\]

\[
\Sigma P^* = P_1 + P_2
\]

* Summing the three results after performing calculation of each \( P_n \).

### Key Point

Computations occur in real time even when in Roll mode. Computed waveforms can also be used to activate triggers. Any vacant slots (CHs) can be utilized for the realtime math definition. Consequently, pre-computation waveform and post-computation waveform can be displayed simultaneously.

### 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.

Key Point
You can make periodic observations remotely by connecting commercially available GPS receivers that have IRIG output and using the Time Trigger function.

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.

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.

Magnetic flux density: \( B = \text{Integ} \left( C_1 \right) / (K_1\cdot K_2) \)
Magnetic field strength: \( H = C_2 \cdot K_1 / K_3 \)
C1: voltage, C2: current, K1: number of turns, K2: cross sectional area, K3: magnetic circuit length
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

You can compare waveforms from varied conditions

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.

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.

Saving screen images and displaying thumbnails

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.

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

Also, you can download free software and trial versions of retail software from this site.

### Model Numbers and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>701992</td>
<td>-SP01</td>
<td>Xviewer Standard Edition (1 license)</td>
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<tr>
<td></td>
<td>-GP01</td>
<td>Xviewer Math Edition (1 license)</td>
</tr>
<tr>
<td>Option</td>
<td>-JS01</td>
<td>DL850 Advanced Utility (1 license)</td>
</tr>
</tbody>
</table>

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

Also, you can download free software and trial versions of retail software from this site.
The DL850V ScopeCorder Vehicle Edition can display CAN- and/or LIN-protocol communication data as trend waveforms on the display by using the CAN Bus Monitor Module (720240) or CAN & LIN Bus Monitor Module (720241). It can also trigger on decoded waveforms. By identifying the correlation between communication data on the vehicle-installed LAN and analog data such as voltage, temperature, and sensor signals or the ECU’s control logic signal, a vehicle’s overall LAN system can be evaluated.

Furthermore, with the /DC option, the DL850V can be driven by DC power such as the vehicle’s battery, in addition to ordinary AC power.

1: The CAN & LIN Bus Monitor Module (model: 720241) is supported by the main unit firmware ver. 2.00 or later.

**Utilization of Vehicle-installed Network Definition Files (CAN DBC, LIN LDF)**

Data to be acquired using a bus monitor module (720240 or 720241) can be specified not only in digital code (hexadecimal or numeric), but also loaded from a network definition file (CAN DBC or LIN LDF).

**Support for both AC and DC power (/DC option, DL850V only)**

- Low power consumption of 60 – 120 VA (typ.)
- Low noise

- Can be driven by external DC power such as the vehicle’s battery
  12 V DC (10 – 18 V)

- Can also be driven by AC power.
  100 V AC (100 – 120 V)
  200 V AC (200 – 240 V)

The DL850V Vehicle Edition can be driven by a 12 V DC battery, vehicle’s cigarette lighter, or ordinary AC power. (We provide accessories for DC driving; see the list of accessories at the end of the catalog.)
Example of accessory combinations

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

10:1 Isolation Probe 700929

100:1 Isolation Probe 701947

1:1 Safety BNC Adapter Lead 701901

Measurement Lead Set 758917

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

1:1 Safety BNC Adapter Lead 701901

Plug-On Clip 701948

Large Alligator-Clip (Dolphin type) 701954

Safety Mini-Clip (Hook type) 701959

Alligator Clip Adaptor Set 758922

1:1 BNC-Alligator Cable 366925

1:1 Banana-Alligator Cable 366961

Strain Module (NDIS) 701270

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

Bridge Head (DSUB) 120 Ω: 701967
350 Ω: 701968

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

Passive Probe 701940

BNC Cable 366924/366925

±500V, 15MHz Differential Probe 700925

±1400V, 100MHz Differential Probe 700924

7000Vpk, 50MHz Differential Probe 701926

Strain Module (DSUB, Shunt-Cal) 701271

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

Probe Power Supply 4-output 701934

Accelration/Voltage Module (with AAF) 701275

1:1 Banana-Alligator Cable 366961

Shunt Resistor for 4-20 mA Measurement 438920 (250 Ω ±0.1%) 438921 (100 Ω ±0.1%) 438922 (10 Ω ±0.1%)

Universal (Voltage/ Temp.) Module 701261

Universal (Voltage/ Temp.) Module with AAF 701262

Temperature, High Precision Voltage Isolation Module 701265

Note: This unit is always required for measurement.

16-CH Temp./ Voltage Input Module 720221

Scanner Box 701953 (Provided with a connecting cable)

High-Speed Logic Probe 700986

Isolation Logic Probe 700987

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

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

Safety BNC Cable 1 m : 701902
2 m: 701903

Fork Terminal Adaptor Set 758921

Alligator Clip Adaptor Set 758929

1:1 Banana-Alligator Cable 366961

100:1 Isolation Probe 701947

10:1 Isolation Probe 700929

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

Probe Power Supply 4-output 701934

Accelerations/Voltage Module (with AAF) 701275

1:1 Banana-Alligator Cable 366961

Shunt Resistor for 4-20 mA Measurement 438920 (250 Ω ±0.1%) 438921 (100 Ω ±0.1%) 438922 (10 Ω ±0.1%)

Universal (Voltage/ Temp.) Module 701261

Universal (Voltage/ Temp.) Module with AAF 701262

Temperature, High Precision Voltage Isolation Module 701265

Note: This unit is always required for measurement.

16-CH Temp./ Voltage Input Module 720221

Scanner Box 701953 (Provided with a connecting cable)
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>Terminals</th>
<th>DC Accuracy</th>
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<td>100 MS/s</td>
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<td>100 Hz</td>
<td>2</td>
<td>Isolated</td>
<td>42 V</td>
<td>±0.08 (Voltage), ±0.25% (Temperature)</td>
<td></td>
</tr>
<tr>
<td>Strain</td>
<td>720221*7</td>
<td>10 S/s</td>
<td>16-Bit</td>
<td>600 Hz</td>
<td>16</td>
<td>Isolated</td>
<td>42 V</td>
<td>±0.15% (Voltage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>701270</td>
<td>100 kS/s</td>
<td>16-Bit</td>
<td>20 kHz</td>
<td>2</td>
<td>Isolated</td>
<td>10 V</td>
<td>±0.5% (Strain)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>701271</td>
<td>100 kS/s</td>
<td>16-Bit</td>
<td>20 kHz</td>
<td>2</td>
<td>Isolated</td>
<td>10 V</td>
<td>±0.5% (Strain)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>701275</td>
<td>100 kS/s</td>
<td>16-Bit</td>
<td>40 kHz</td>
<td>2</td>
<td>Isolated</td>
<td>42 V</td>
<td>±0.25% (Voltage), ±0.5% (Acceleration)</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>701280</td>
<td>25 kS/s</td>
<td>16-Bit</td>
<td>resolution 50 ns</td>
<td>2</td>
<td>Isolated</td>
<td>4200 V/4.2 V</td>
<td>±0.1% (Frequency)</td>
<td></td>
</tr>
<tr>
<td>Logic</td>
<td>720220</td>
<td>10 MS/s</td>
<td>—</td>
<td>—</td>
<td>8-bit x 2 ports</td>
<td>non-isolated</td>
<td>—</td>
<td>—</td>
<td>8-bit (port) x 2, compatible with four-type of logic probe (sold separately)</td>
</tr>
<tr>
<td>CAN</td>
<td>702240</td>
<td>100 kS/s</td>
<td>—</td>
<td>—</td>
<td>Isolated</td>
<td>10 V</td>
<td>—</td>
<td>CAN Data of max. 32-bit allowable</td>
<td></td>
</tr>
<tr>
<td>CAN, LIN</td>
<td>720241</td>
<td>100 kS/s</td>
<td>—</td>
<td>—</td>
<td>Isolated</td>
<td>1 (Can)</td>
<td>—</td>
<td>CAN port x 1, LIN port x 1</td>
<td></td>
</tr>
</tbody>
</table>

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

Variety of Connection Interfaces

- Video signal output (VIDEO OUT)
- EXT I/O (EXT CLK IN)
- External trigger input (EXT TRIG IN)
- External trigger output (EXT TRIG OUT)
- Probe power supply terminal (optional)
- External hard drive IF (optional)
- SD card slot
- USB peripheral connection terminal
- Ethernet 1000BASE-T
- Ethernet 10GBASE-T
- USB-PC connection terminal
- CAN and LIN bus connection terminal
- CAN (optional)
- LIN (optional)
- USB interface
- GO/NO-GO determinations can be output, and you can perform control based on start/stop and other external signals.
- GO/NO-GO (EXT CLK IN)
- Performing sampling timed to an external signal (up to 9.5 MHz).
- External trigger input (EXT TRIG IN)
- External trigger output (EXT TRIG OUT)
- GP-IB (optional)
- IRIG (optional)

*1: Probes are not included with any modules. *2: In combination with 10:1 probe model 700929.
*7: The 16-CH Scanner Box (701953) is required for measurement.

13
Main Specifications (Main Unit)

Input Section
- Plug-in module
- Number of slots: Max 4 for 72020i modules, Max 2 modules for 720240, 720241 (for DL850V only)

Number of input channels
- DL850: 16CH/Slot, 128CH/Unit
- DL850V: 120CH/Slot, 336CH/Unit
  (Maximum simultaneous display waveform is 64 waveforms x 4 screen selectable)

Max recording length
- Max recording length depends on kinds of modules and number of channels
  - Standard: 250 Mpts (1 CH), 10 Mpts/CH (16 CH)
  - /O1 option: 1 Gpts (CH1), 50 Mpts/CH (16 CH)
  - /O2 option: 2 Gpts (CH1), 100 Mpts/CH (16 CH)

Time axis setting range
- 100ns/div to 1/2 of Main waveform
  - 25CH, 4CH/div, 4CH/div, 3CH/div, 6CH/div, 8CH/div, 10CH/div, 20CH/div, 30CH/div, 60CH/div to 100CH/div (main screen)
  - 15min/div, 30min/div, 1hr/div to 1/10div (1st step), 1/10div, 1/2div, 1/5div, 1/10div (2nd step)

Time axis accuracy
- ±0.005%

Trigger Section
- Trigger mode: auto, auto level, normal, single (ON), front start

Frequency
- Trigger level setting range: 0 centered ±10div

Waveform parameters
- Maximum measurement range: 100M points

Display
- Display type: 10.4-inch TFT color LCD monitor, 1024×768(KG)

Display resolution of waveform display
- Selectable either 801×656 (normal waveform display) or 1001×656 (wide waveform display)

Display format
- Max 3 simultaneous displays available

Function
- Acquisition and display
  - Acquisition mode: Normal
    - Normal waveform acquisition
  - Acquisition type: CHn (n: any input channel), Time, External, Line
  - Time trigger: Rising, falling, or rising/falling
  - Time trigger: Date (year/month/day), time (hour/minute), time interval (10 seconds to 24 hours)

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

Dual capture
- Performs data acquisition on the same waveform at 2 different sample rates.
  - Main waveform (low speed)
    - Maximum sample rate: 100k/s (roll mode region)
    - Maximum record length: 100Mpoint
  - Capture waveform (high speed)
    - Maximum sample rate: 100Mbps
    - Maximum record length: 500kpoint

Realtime hard disk recording
- /O1 option: Maximum sample rate
  - Maximize 106/s (CH used), 100/s (16CH used) on channel used
  - Depends on HDD vacant capacity
  - Data can be stored in the hard disc at the same time of acquisition in accordance with trigger mode.

History memory
- Maximum: 5000 pages

Display
- Display type: TY display for 1, 2, 3, 4, 6, 8, 12, 16 division display

X/Y display
- Selectable X axis/Y axis in CHn, MATHn (max 4 trace x 2 window)

Accumulation
- Accumulates waveforms on the display (persistence mode)

Snapshot
- Retains the current displayed waveform on the screen.

ALL CH menu
- Set all channels while displaying waveforms.

Expansion/reduction of vertical axis direction
- X:0 to +100 (varies depending on the module), Y: -60 to 0

Vertical position setting
- ±Δy waveform move is available from the center of waveform screen frame.

Linear scaling
- Set AX±B mode or PM-P2 mode independently for CHn

Main Specifications (Main Unit)

Analysis, computation
- Cursored measurement: Horizontal, Vertical, Meter, Degree (for Y waveform display only), HAV

Zoom
- Expanded the displayed waveform along time axis (up to 2 locations using separate zoom rates)

Search and zoom
- Search for, then expand and display a portion of the displayed waveform.

History search function
- Search for and display waveforms from the history memory that satisfies specified conditions.

Statistical processing
- Statistics: Min, Max, Avg, Sdev, Cnt
- Mode: All waveforms/cycle statistics/history statistics

Maximum number of cycles
- 64,000 cycles (when the number of parameters is 1)

Computations
- Definable MATH waveform
  - Calculable record length
  - Operators: +, -, ±, ×, ÷, binary computation, shift, and power spectrum

Snapshot
- Retains the current displayed waveform on the screen.

File output data format
- PNG, JPEG, BMP

Ethernet network
- Operates selected actions each time trigger occurs.

SD card slot
- Memory cards conforms to SD, SDHC, maximum capacity 16GB

Built-in printer
- Prints hard copy of screens.

External printer
- Outputs the screen image to an external printer via Ethernet network.

Paper width
- 110mm

Effective printing width
- 104mm (B3 size)

Feedback detection resolution
- 8mm/point/minute

Function display
- Hard copy

Built-in printer
- Prints hard copy of screens.
Main Specifications (Main Unit)

USB memory
Mass storage device which conforms to USB Mass Storage Class Ver.1.1

External HDD (HDD option)
Hard disc conforms to cHDA5A

Built-in HDD (HD1 option)
2.5 inch, 160GB, FAT32

USB peripheral interface

Connector type
USB type A connector (receptacle) x 2

Electrical, mechanical specifications
Conforms to USB Rev.2.0

Supported transmission standards
HS (High Speed) mode, FS (Full Speed) mode, LS (Low Speed) mode

Supported device
Mass storage device which conforms to USB Mass Storage Class Ver.1.1

Power supply
5V, 500mA (in each port)

* Connect USB device directly. Composite device is not supported.

USB-PC connection

Connector type
USB type B connector (receptacle) x 1

Electrical, mechanical specifications
Conforms to USB Rev.2.0

Supported transmission standards
HS (High Speed) mode (480Mbps), FS (Full Speed) mode (12Mbps)

Supported protocol
USBTMC-USB488 (USB Test and Measurement Class, Ver.1.0)

Supported system environment
Windows7(32bit)/Vista(32bit)/XP(SP2 or later, 32bit)

Ethernet

Connector type
RJ-45 modular jack ×1

Electrical, mechanical specifications
Conforms to IEEE802.3

Transmission system
Ethernet (100BASE-T/10BASE-T)

Communication protocol
TCP/IP

Supported services
SMTP, SNTP, LPR, DHCP, DNS, FTP

Supported protocol
USBTMC-USB488 (USB Test and Measurement Class, Ver.1.0)

Measurement Range and Display Range

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).

SL1400 ScopeCorder LITE
- Easy operation
- Multilingual key labels

SL1000 High-Speed Data Acquisition Unit
- High speed transfer of data to a PC
- 100 MS/s simultaneously on 16-Ch • 8 units linked

IRG input (1/20 option)

Connector type
BNC connector x1

Supported IRG signals
A002, B002, A102, B122

Input impedance
50±25kΩ selectable

Maximum input voltage
±8V

Function
Main unit time synchronization, sample block synchronization

Clock synchronization range
±50ppm

Accuracy after synchronization
No drift against input signal

Auxiliary I/O section

EXT CLK IN
BNC connector, TTL level, minimum pulse width 50ns, ±3V or less

EXT TRG IN
BNC connector, TTL level, rising/falling

EXT TRG OUT
BNC connector, 5VCMOS level, fallen when triggered, and rising when acquisition completed.

EXT I/O
GO/NO-GO determination I/O

Video signal output
D-Sub15 pin receptacle

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
10 MΩ between DC power terminal and ground

Exterior dimensions including the main unit
Approx. 355 mm (W) x 259 mm (H) x 202mm (D), excluding the grip and projections

Weight
Approx. 6.5kg (for main unit only, include /B5/M2/HD1/P4 options, exclude chart paper)

Operating temperature range
5 to 40 ºC

12 V DC power (I/O option, for DL850V only)

Supply method
Automatic DC/AC switching (with priority on AC), isolated between DC power input terminal and main unit

Rated supply voltage
12 V DC

Allowable supply voltage
10 to 18 V DC

Power consumption
Approx. 150 VA maximum

Voltage input protection circuit
Overcurrent detection: Breaker (15 A)
Undervoltage detection: Interruption at approx. 9.5 V or lower

Overvoltage detection: Interruption at approx. 18 V or more

Withstand voltage
30 V AC between DC power terminal and ground for 1 minute

Insulation resistance
10 MΩ or more at 500 V DC between DC power terminal and ground

External dimensions including the main unit
Approx. 355 mm (W) x 259 mm (H) x 202mm (D), excluding the grip and projections

Weight of DC power box
Approx. 800 g

Standard operation conditions
Ambient temperature: 23 ±5 ºC
Ambient humidity: 20 to 80%RH

Errors in power supply voltage/frequency:
Within ±1% of rated voltage, within ±1% of rated frequency

Warm-up of 30 min. or more, after calibration.

Series related models — SL1400/SL1000 —
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- Yokogawa’s electrical products are developed and produced in facilities that have received ISO14001 approval.
- In order to protect the global environment, Yokogawa's electrical products are designed in accordance with Yokogawa's Environmental Friendly Product Design Guidelines and Product Design Assessment Criteria.

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