SMARTDAC+
Data Acquisition & Control

Paperless recorder GX/GP
Data Acquisition & Control

Your business environment is complex and fast changing. You need smart and powerful systems that can adapt to your process. **SMARTDAC+,** is a fresh approach to data acquisition and control, with smart and simple touch operation as a design priority. Measure, display and record process data with greater levels of clarity, intelligence and accessibility.

The **SMARTDAC+**, concept begins with the all-new GX/GP, an integrated I/O and recording system with a familiar touch operator interface. Highly adaptable, very capable and easy to operate is the new GX/GP.

*Now that’s SMART.*
3rd generation industrial recorders
µR10000/µR20000

3rd generation paperless recorders
DXAdvanced DX1000/DX2000

4th generation paperless recorders
GX10/GX20, GP10/GP20

2010

2012

2017
What’s New

Display & operation
- Arrange screens any way you like with the Custom Display function (option)
- Wide variety of powerful display functions
- Touch screen for greater ease of use
- Remote monitoring and setting control from a web browser

Data use
- Automatically print reports
- Powerful software for a variety of tasks including data analysis, settings, and acquisition
- Save to binary or text format
- SLMP Communication (Mitsubishi PLC)

Recording
- Supports long term multi-channel recording
- Redundancy through internal memory and external media
- Saves binary data for enhanced security (also supports plain text)

Measurement
- Inputs and outputs that support a wide range of DUTs (device under test)
- Modular construction for expandable input/output
- Multichannel measurement on up to 450 channels
- Pulse signal data acquisition with integration

Network

Whenever
Wherever
From anywhere
Paperless recorder GX/GP

Reliable technology
Proven reliability over a wide range of applications

Navigate with ease

Smart User Interface

Observe
- Wide variety of display formats
- Powerful data search functions
- Alarm/Status indicator functions

Interact
- Touch screen for intuitive operation
- Easy-to-navigate, user-oriented design
- Supports freehand messages

Ready for the future when you are

Smart Architecture

Adapt
- Add I/O modules as needed
- Wide ambient temperature operation
- Locking front panel for media security

Measure
- Wide range of I/O modules
- Multichannel I/O
- Easy-to-read screens

Data analysis made simple and mobile

Smart Functionality

Record
- Direct report output to printers
- User defined report creation tool
- Viewer software for data analysis

Connect
- Browser-based real time monitoring
- Centralized data management via FTP server
- Powerful networking functions
An intuitive UI engineered for ease-of-use

Smart User Interface

Efficiently search for key data

Easily review historical data
Seamless display of historical trends—flick or drag the trend display to scroll through the data, even during measurement.

Quickly find data using calendars and summary screens
From a calendar, jump to waveforms of a specific date. From the alarm summary, jump to the waveform active during the alarm.

Easily check off trouble spots

Write freehand messages
Immediately clear areas of concern with a hand-written message.

Save and output image files
Save trend waveforms of interest or screens displayed during alarms as image (PNG) files, and print them out at the same time.

Check waveforms of concern in detail

Display digital values at any location
Move the scale to display the value corresponding to that position as a numeric value. Instantly check maximum/minimum measured values.

Ascertain long-duration trends at a glance
All historical trends display Long-duration trends can be fitted to a single screen for easy viewing.

Zoom in/out - time axis and engineering units
The time axis and engineering axis can expanded and compressed using a simple pinch together or apart function.
Create your own screens

Custom display (/CG option)
You can arrange display objects such as trend, numeric, and bar graphs any way you like to create monitor displays that are customized to the environment. Start/stop pumps and perform other operations.

Custom display building software
DAQStudio DXA170
DAQStudio is software for creating custom displays. You can load screens you created onto the GX/GP via Ethernet or external memory media (SD/USB) and display them.

Common objects used in custom displays (DAQStudio)

Variety of display screens

Physical quantities are displayed and recorded on a log scale.
Log scale display (/LG option)

Multi-panel display
You can select from 9 layouts, and save up to 20 configurations. (Multi panel available on the GX20/GP20 only)
Highly flexible and scalable architecture

Smart Architecture

Modular input/output

Inputs and outputs are modular for easy expandability. The GX/GP multichannel paperless recorder main unit alone provides up to 100 channels (GX20/GP20) of measurement.

Select from a wide variety of input /output modules.

The I/O terminals are detachable.

Expandable to up to 450 channels (real actual input)

Supports up to 450 channels of measurement. Note that if MATH and communication channels are included, the GX20/GP20 large memory type can record on up to 1000 channels. The GX/GP main unit and expandable I/O can both use the same input/output modules.

The maximum distance between units is 100 m

You connect directly with a LAN cable without connecting through a hub or repeater.

* You can also connect subunits of the GM Data Acquisition System.

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Max. channels</th>
<th>Number of channels by configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>GX10/GP10</td>
<td>Standard</td>
<td>100ch</td>
<td>Main unit only: 0-30, Main + expandable I/O: 0-100</td>
</tr>
<tr>
<td>GX20/GP20</td>
<td>Standard</td>
<td>100ch</td>
<td>Main unit only: 0-100, Main + expandable I/O: 0-100</td>
</tr>
<tr>
<td></td>
<td>Large memory</td>
<td>450ch</td>
<td>Main unit only: 0-100, Main + expandable I/O: 0-450</td>
</tr>
</tbody>
</table>

The number of channels is for analog input only.

Reduce wiring with distributed installation

When the recorder is installed offsite (away from the DUT), you can place the expandable I/O at the site and monitor data without the need for long-distance wiring of thermocouples and other sensors.

Up to 100 m

Thermocouples
**Component Names**

**GX20**

- LCD screen: Displays operating screens such as trend graphs, and setting screens.
- Operation panel:
- MENU key: Simply press the MENU key to display a menu for access to a variety of screens.
- Front panel door lock mechanism:

**GP20**

- Handle:
- Battery: 12V DC powered model

**With front panel door open**

- START/STOP key: Starts and stops recording.
- Stylus: For writing freehand messages.
- USB port: Supports USB 2.0.
- SD memory card slot: SD memory card (up to 32 GB) (format: FAT12 or FAT16), 1 GB included
- Power switch: The main unit power switch.

**Connect a mouse and keyboard for a “PC feel”**

USB interface (/UH option)

- Keyboard
- Memory
- Mouse
- Bar code reader

**Runs on DC12 V power for in-vehicle data acquisition.**

Battery: 12V DC

GP10: 12 V DC powered model

**Choose by mounting design and application**

- Cover color (/BC option)(GX)
- Portable models (GP10/GP20)

**Easy-to-read display**

- GX20/GP20: 12.1” TFT color LCD, 800 x 600 dots
- GX10/GP10: 5.7” TFT color LCD, 640 x 480 dots

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Paperless recorder GX/GP 8
A full range of network functions and software

Smart Functionality

Real time remote monitoring from a web browser

Through a Web browser you can monitor the GX/GP in real time and change settings. You can easily build a seamless, low-cost remote monitoring system with no additional software.

Real time monitoring screen

You can view monitor screens in real time that are identical to the trends, digital, and other displays on the GX/GP main unit.

With the scroll bar, you can seamlessly scroll between past and current trends. When the sampling interval is 1 second, the instrument displays 1 hour’s worth of historical trends.

Enter settings online with a web browser

The setting screen lets you copy AI channel settings and other information to Excel for editing. You can reimport the data into the setting screen after editing.

Dedicated software (free download) is available for loading waveforms and GX/GP settings

Universal viewer

Data files saved on the GX/GP can be viewed and printed. You can perform statistical computation over an area and export to ASCII, Excel, or other formats.

Offline setting software

Save settings or transfer them to the GX/GP.

Load/save settings

SD card

Send/receive settings

Ethernet
Web screen

Mobile Web

Enables monitoring from a tablet

Aerospace Heat Treatment Supports heat treatment application AMS2750/NADCAP

Calibration correction schedule control function (/AH option)
Schedule management for periodically executing calibration correction configuration and the like. The correction factor can be set separately for unit and sensor dependency. TUS report software enables you to easily create TUS (temperature uniformity survey) reports.

* For information on TUS software, contact your Yokogawa representative.

Record data in separate files per equipment set

Multi-batch Function (/BT option)
Recorder pre-defined channel groups to separate data files with independent start and stop control. Up to 12 independent batches can be created.
PID control function

Control function
Enables PID and program control
- PID control module
  2-loops per module, up to 20 loops per system
- Setpoint program control function (/PG option)
  Up to 99 patterns

Remote operation and monitoring
The web application enables remote operation and monitoring from a browser.

Built in control screens and display
Various pre-configured control screens and display are available.

Seamless integration
Combine and integrate complex legacy control panel into a simple and flexible data acquisition station.

Custom display
Remote operation is possible through screens that are customized for your specific system.

Application examples

Industrial furnace
- Ideal for centralized control of multiple loops
- Modular structure makes for easy maintenance of individual loops

Utility equipment
- Simplifies loop control and remote monitoring of utility equipment
- Readily scalable for additional loops

Engine endurance test bench
- Measures evaluation data while generating test patterns

With the Web Server function, simply access the GX/GP from a web browser on a PC for easy operation and monitoring of control loops.
**High speed measurement (down to 1 ms)**

Yokogawa’s proprietary A/D converter allows the high speed module to measure data points as fast 1ms.

- **High speed (1 ms) measurement**
- **Proprietary A/D converter**

* With 1ch per module. At 2 ms, 2 ch per module, and at 5 ms or more, all 4 ch per module.

Max. channels

<table>
<thead>
<tr>
<th>Model</th>
<th>Scan interval</th>
<th>1ms</th>
<th>5ms</th>
<th>10ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>GX/GP10</td>
<td></td>
<td>1ch</td>
<td>5ch</td>
<td>10ch</td>
</tr>
<tr>
<td>GX20-1/GP20-1</td>
<td></td>
<td>1ch</td>
<td>5ch</td>
<td>10ch</td>
</tr>
<tr>
<td>GX20-2/GP20-2</td>
<td></td>
<td>5ch</td>
<td>25ch</td>
<td>40ch</td>
</tr>
</tbody>
</table>

**Dual interval measurement with two different scan intervals**

Users have the ability to choose two different scan intervals on a single GX/GP system. This allows users the flexibility to measure various types of inputs with two different scan intervals in a single system. For example, this provides for efficient, simultaneous measurement of signals with slow fluctuations such as temperature, and fast-changing signals such as pressure and vibration. Modules can be assigned to measurement groups.

**2 measurement groups**

**Easily switch groups**

**Superimpose data on Universal Viewer**

With Universal Viewer, you can superimpose measured data from 2 measurement groups.

**Application examples**

- **Acquire temperature and vibration data from power plant turbines**
  - Monitoring and recording of alarms when abnormal temperature or vibration are detected
  - At 5 ms sampling, reliably detect abnormalities
  - Dual interval multipoint measurement

- **Measures LCD projector overheating**
  - Evaluates the rise in temperature of parts near the projector lamp, and the drop in temperature after powering OFF
  - At 10 to 1 ms sampling, record steep temperature changes in detail

- **Car battery charge/discharge test**
  - Measures transient current during charging and discharging
  - Sampling requirement: 1 ms
**MATH (including reports), and event actions**

**MATH function (/MT option)**
Supports various kinds of math computation, including basic math and functions (square root, logarithms, trigonometry). Write formulas using variables for measured or computed data and save or display the results—this saves time and effort on post-processing. Create hourly, daily, monthly, and other reports with the Report function.

**Event actions**
Ability to assign actions tied to specific events during the operation of the data acquisition station.

**Report creation and network functions (/MT option)**
Provides a variety of convenient networking functions

Networking

Modbus/TCP and Modbus/RTU Communications

GX/GP supports Modbus TCP/IP client and server modes for Ethernet communications and Modbus RTU master and slave modes for optional serial communications.

Modbus/TCP (Ethernet connection), Modbus/RTU (RS-422/485 connection)

- Using the Modbus/TCP and Modbus/RTU functions, you can display and save data from the server and slave devices on the GX/GP.
  - Requires the communication channel (/MC option).

- Ethernet, RS-422/485

- GP10
- MW100
- FA-M3V
- UTA Advanced Series Controllers
- Power monitors

(Connect up to 16 Modbus/TCP servers, or up to 32 for the GX20-2 and GP20-2.)
(Up to 31 Modbus/RTU slaves can be connected.)

EtherNet/IP Function (/E1 option)

GX/GP supports EtherNet/IP server functions. You can access GX/GP from PLCs or other devices and load measurement/MATH channels or write to communication input channels (GX10/GP10: max. 50 ch, GX20-1/GP20-1: max. 300 ch, GX20-2/GP20-2: max. 500 ch).

- Communication channel function (/MC option) is required.

- PLC
- EtherNet/IP communication
  - Data reading
  - Data writing
- Ethernet
- MW100

CC-Link family SLMP communication (/E4 option)

Protocol function that enables connection from a GX/GP to Mitsubishi Electric PLCs without sequencer programs. You can run the GX/GP as an SLMP client, enabling writing of GX/GP measured data to the PLC and writing of PLC data to communication channels.

- Requires the communication channel function (/MC option).

Powerful tool for instrument performance evaluation testing (/E2 and /MC options)

Highly precise measured data from power measuring instruments (WT series power analyzers) can be acquired without loss of fidelity on the GX/GP, and recorded and displayed alongside the GX/GP’s own measured data. This is ideal for performance evaluation testing because you can record instrument power consumption, temperature, and other phenomena simultaneously.

Models that can be connected
- Yokogawa Meters & Instruments Corp., WT series power analyzers, WT300/WT300E (command mode WT300), WT500
- WT1800/WT1800E (command type WT1800)

- Max. no. of connections
  - 8 (GX10/GP10), 16 (GX20/GP20)
**OPC-UA Server (/E3 option)**

Data acquired by the GX/GP can be accessed through Ethernet communication from a host system (OPCUA client). Writing from an upstream system to a GX/GP communication channel requires the communication function (/MC option).

**DARWIN-compatible communication**

The GX/GP supports DARWIN communication commands. Use your current DARWIN communication programs as-is on the GX/GP. *See your dealer or nearest Yokogawa representative for details.*

**FTP-based file transfer**

The FTP client/server functions allow you to easily share and manage data from a centralized file server.

**E-mail messaging function**

The GX/GP can send a variety of informative e-mail messages that include alarm notification reports, periodic instantaneous data values, scheduled report data and other information.

**Time synchronization with network time servers**

GX/GP uses SNTP protocol in client mode to acquire time information from a network time-server. This function allows any number of GX/GP units within a facility to have precisely synchronized time; all units will record data with coordinated date and time stamp information. In addition, GX/GP can function as a server, providing time data to other SNTP client units on the network.

**Automatic network setup (DHCP) function**

Using Dynamic Host Configuration Protocol (DHCP), the GX/GP can automatically acquire the settings it needs (IP address) for network communications from a DHCP server. This makes it easier than ever to install the unit on a plant network.
Reliability and durability

Be confident that recorded data is saved

Measured and calculated data is continuously saved to secure, internal non-volatile memory. At manual or scheduled intervals, the files in memory are copied to the removable media. In addition, the files can be copied and archived to an FTP server.

Because of the inherent reliability and security of non-volatile memory, the possibility of losing data under any operating condition or power failure event is extremely small.

High Capacity Internal Memory

Even longer recording durations, and multichannel recording.

**Display data file sample time**
- Measurement CH = 30 channels. Math CH = 0 channels.
- Internal Memory: 500 MB
- Display update (minute/div): 30 minutes
- Sampling period (s): 60 s
- Total sample time: Approx. 2.5 years

**Event data file sample time**
- Measurement CH = 30 channels. Math CH = 0 channels.
- Internal Memory: 500 MB
- Sampling period (s): 1 s
- Total sample time: Approx. 1 months

Select file formats according to your application

For increased security, measured data can be saved in binary format. This format is very difficult to decipher or modify in traditional text editors or other programs. To enable easy and direct opening of the data in text editors or spreadsheet programs, choose text format. This allows you to work with your measurement data without dedicated software.

21 CFR Part 11 support (/AS option)

With the expanded security function option, the instruments support the USA FDA’s Title 21 CFR Part 11 regulations (for the pharmaceutical manufacturing industry). It gives you access to a credential-based login function, electronic signatures, audit trails, an anti-tampering function, an Active Directory-based password management function, a sign-in function, and other security features.

Front panel door lock

The front panel door can be locked to prevent mishandling of the power switch or external media.

Analog front end module

A proprietary A/D converter delivers high speed, high precision data acquisition. (High-speed AI, PID Control module)
**Reliable dust- and splash-proof construction**

Dust and splashproof front panel (Complies with IEC529-IP65 and NEMA No. 250 TYPE 4)  
With its IEC529-IP65 compliant front panel, the GX is ready for use in harsh environments.  
* Except the external icing test

**High environmental worthiness for use in most any setting**

The protective sheets on the touch panel display have a special coating on the front and back to prevent damage from scratches, chemicals, and solvents while maintaining a high display clarity and resistance to light interference.

**Multitouch operation even with gloves on**

Traditional resistive touch screens can detect only one touch point. The built-in controller and algorithm of the GX/GP can detect two touch points, allowing intuitive pan and zoom functions during trend monitoring—a first among paperless recorders.

**Heat dissipating construction**

The GX/GP was built for heat dissipation to ensure an even temperature distribution between module terminals.

**Actual values support high precision measurement**

The measuring accuracies noted in the general specifications have a margin of error that takes into account the product’s components and the equipment used for adjustment and testing. However, the actual values calculated from the accuracy testing data upon shipment of the instrument from the factory are as follows.

<table>
<thead>
<tr>
<th>Input type</th>
<th>Measuring accuracy(^1) (typical value(^2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCV</td>
<td></td>
</tr>
<tr>
<td>20mV</td>
<td>± (0.01% of rdg + 5 μV)</td>
</tr>
<tr>
<td>60mV</td>
<td>± (0.01% of rdg + 5 μV)</td>
</tr>
<tr>
<td>6V (1-5 V)</td>
<td>± (0.01% of rdg + 2 mV)</td>
</tr>
<tr>
<td>R</td>
<td>± 1.1°C</td>
</tr>
<tr>
<td>TC(^3)</td>
<td></td>
</tr>
<tr>
<td>K (-200~500 °C)</td>
<td>0.0~1370.0°C : ± (0.01% of rdg + 0.2°C)</td>
</tr>
<tr>
<td></td>
<td>-200.0~0.0°C : ± (0.15% of rdg +0.2°C)</td>
</tr>
<tr>
<td>J</td>
<td>0.0~1100.0°C : ± 0.2°C</td>
</tr>
<tr>
<td></td>
<td>-200.0~0.0°C : ± (0.10% of rdg +0.2°C)</td>
</tr>
<tr>
<td>T</td>
<td>0.0~400.0°C : ± 0.2°C</td>
</tr>
<tr>
<td></td>
<td>-200.0~0.0°C : ± (0.10% of rdg +0.2°C)</td>
</tr>
<tr>
<td>N</td>
<td>0.0~1300.0°C : ± (0.01% of rdg + 0.2°C)</td>
</tr>
<tr>
<td></td>
<td>-200.0~0.0°C : ± (0.22% of rdg +0.2°C)</td>
</tr>
<tr>
<td>RTD</td>
<td></td>
</tr>
<tr>
<td>Pt100</td>
<td>± (0.02% of rdg + 0.2°C)</td>
</tr>
<tr>
<td>Pt100 (high resolution)</td>
<td>± (0.02% of rdg + 0.16°C)</td>
</tr>
</tbody>
</table>

\(^1\) Applies to GX90XA-10-U2, A/D integration time 16.67 ms or more, General operating conditions: 23 ± 2°C, 55 ± 10% RH, supply voltage 90–132, 180–264 V AC, power frequency within 50/60 Hz ± 1%, warm-up of 30 minutes or more, no vibrations or other hindrances to performance.

\(^2\) For the measuring accuracy (guaranteed), see the module’s general specifications (GS 04L53B01-01EN).

\(^3\) These values do not include the reference junction compensation accuracy.
### Analog input module (Universal input module)

<table>
<thead>
<tr>
<th>Model</th>
<th>GX20</th>
<th>GP20</th>
<th>GX10</th>
<th>GP10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction</strong></td>
<td>Vertical panel mount</td>
<td>Portable</td>
<td>Vertical panel mount</td>
<td>Portable</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>12.1&quot; TFT color LCD (800 x 600 dots)</td>
<td>5.7&quot; TFT color LCD (640 x 480 dots)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Touch screen</strong></td>
<td>4 wire resistive touch screen, 2-point touch detection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. no. of connectable modules</strong></td>
<td>10 (When mounted on expansion module: 9)</td>
<td>3 (When mounted on expansion module: 2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The maximum number of connectable modules is limited by the maximum number of I/O channels, and differs depending on the types and combinations of modules.

<table>
<thead>
<tr>
<th>Analog input channels</th>
<th>Standard: 100, Large memory: 450 (with expansion unit)</th>
<th>Standard: 30, 100 (with expansion unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of mathematical channels</td>
<td>GX20-1: 100, GP20-1: 200</td>
<td>50</td>
</tr>
<tr>
<td>No. of communication channels</td>
<td>Standard: 300, Large memory: 500</td>
<td></td>
</tr>
</tbody>
</table>

| Internal memory (flash memory) | Standard: 500 MB, Large memory: 1.2 GB |

*1 Cannot be set for the current input type (type suffix code: -C1) or DI.DI | *2 Cannot be set for the current input type (type suffix code: -C1), electromagnetic relay type (type suffix code: -T1), or low withstand voltage type (type suffix code: -L1). |

#### Communication functions

**Options**

- Serial communications (IC2: RS-332, IC3: RS-422 or RS-485), Modbus/RTU (master/slave functions)
- EtherNet/IP communication (PLC communication protocol)(IE1), WT communication (IE2), OPC-UA server (IE3), SLMP communication (Mitsubishi PLC) (IE4)

*3 Cannot be set for the current input type (type suffix code: -C1) or 4-wire RTD/resistance type (type suffix code: -R1). |

| **Max. no. of connectable modules** | 30 (with expansion unit) |

*5 Can only be set with high speed universal type (type suffix code: -H0). |

#### External dimensions

- Main Unit: 288 x 288 x 169 mm
- Including modules: 288 x 288 x 220 mm

#### Weight

- Main Unit only: Approx. 6.0 kg
- Including modules: Approx. 5.4 kg

*4 Can only be set with 4-wire RTD/resistance type (type suffix code: -R1). |

#### Analog input channels

- Standard: 100, Large memory: 450 (with expansion unit)
- 100, 100 (with expansion unit)
- Standard: 30, 100 (with expansion unit)

#### Model | GX90XA
| **Input type** | DC voltage, standardized signal, thermocouple, DI, DC current (with external shunt resistor), DC current, resistance |
| **Input type (Inputs: 4/6/10)** | DC voltage: 20 mV, 60 mV, 200 mV, 1 V, 2 V, 6 V, 20 V ± 50 V |
| **Standard signal** | 0.4-2 V, 1-5 V |
| **Resistance** | 20, 200, 2000 Ω |
| **Thermocouple** | R, S, B, K, E, J, T, N, L, U, W97Re3-W75Re25, KpvsAu7Fe, Platelin 2, PR20-40, NINiMo, W/WRe26, Ni100 (SAMA), Ni100 (DIN), Cu10 (20˚C) |

#### Scan interval by type

**Scan interval** |

1/2/5/10/20/50/100/200/500ms, 1/2/5s |

<table>
<thead>
<tr>
<th><strong>Scan interval</strong></th>
<th>1ms</th>
<th>2ms</th>
<th>5ms</th>
<th>10ms</th>
<th>20ms</th>
<th>50ms</th>
<th>100ms</th>
<th>200ms</th>
<th>500ms</th>
<th>1s</th>
<th>2s</th>
<th>5s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scan intervals</strong></td>
<td>-</td>
<td>-</td>
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<td><strong>Scan intervals</strong></td>
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<tr>
<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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<td><strong>Scan intervals</strong></td>
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</tr>
</tbody>
</table>

#### Power supply and consumption

- Supplied from main unit, power consumption: 2 W or less |

#### Insulation resistance

- Between input circuits and internal circuitry: 20 MΩ or greater (at 500 V DC) |

#### Withstand voltage

- Between the input circuits and the internal circuitry: 3000 VAC for one minute (current input type and low withstand voltage type: 1500 VAC for one minute) |

#### Terminal types

- M3 screw terminals or clamp terminals |

**Weight** |

- Approx. 0.3 kg |

*1 Cannot be set for the current input type (type suffix code: -C1) or DI. |

*2 Cannot be set for the current input type (type suffix code: -C1), electromagnetic relay type (type suffix code: -T1), or low withstand voltage type (type suffix code: -L1). |

*3 Can only be set with current input type (type suffix code: -C1). |

*4 Can only be set with 4-wire RTD/resistance type (type suffix code: -R1). |

*5 Can only be set with high speed universal type (type suffix code: -H0).
**Analog output module**

<table>
<thead>
<tr>
<th>Model</th>
<th>GX60DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output type (outputs: 4)</td>
<td>Transmission output, manual output</td>
</tr>
<tr>
<td>Range</td>
<td>4–20 mA or 0–20 mA</td>
</tr>
<tr>
<td>Output update interval</td>
<td>100 ms (shortest)</td>
</tr>
<tr>
<td>Load resistance</td>
<td>600 Ω or less</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.02%</td>
</tr>
<tr>
<td>Power supply and consumption</td>
<td>Supplied from main unit, power consumption: 3W or less</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>Between output circuits and internal circuitry: 20 MD at (500 VDC)</td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>Between output circuits and internal circuitry: 1500 AC for one minute</td>
</tr>
<tr>
<td>Terminal type</td>
<td>M3 screw terminals or clamp terminals</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 0.2 kg</td>
</tr>
</tbody>
</table>

**Digital input module**

<table>
<thead>
<tr>
<th>Model</th>
<th>GX90XD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input types (inputs: 16)</td>
<td>DI or pulse input*</td>
</tr>
<tr>
<td>ON/OFF detection</td>
<td>Open collector: Voltage of 0.5 V DC or less when ON, leakage current of 0.5 mA or less when OFF Non-voltage contact: Resistance of 200 Ω or less when ON, 50 kΩ when OFF</td>
</tr>
<tr>
<td>Contact rating</td>
<td>12 V DC, 20 mA or more</td>
</tr>
<tr>
<td>Power supply and consumption</td>
<td>Supplied from main unit, power consumption: 0.7 W or less</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>Between input terminals and internal circuitry: 20 MD or greater at (500 VDC)</td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>Between input terminals and internal circuitry: 1500 V AC for one minute</td>
</tr>
<tr>
<td>Terminal types</td>
<td>M3 screw terminals or clamp terminals</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 0.3 kg</td>
</tr>
</tbody>
</table>

**Pulse input specifications**

- **Model GX90XD**
  - **DI or pulse input**
  - **ON/OFF detection**: Open collector: Voltage of 0.5 V DC or less when ON, leakage current of 0.5 mA or less when OFF Non-voltage contact: Resistance of 200 Ω or less when ON, 50 kΩ when OFF
  - **Contact rating**: 12 V DC, 20 mA or more
  - **Pulse measurement accuracy**: ± 1 pulse
  - **Pulse count interval**: Measurement interval
  - **Filter**: The chattering filter can be switched On/Off. (When the chattering filter is off, connect GX/GP so that it is not affected by the noise.)
  - **Hysteresis width**: Approx. 0.3 V

- **Model GX90XP**
  - **Number of inputs**: 10
  - **Measurement interval**: 100 ms (shortest)
  - **Input type**: Contact (open collector, voltage-free contact), level (5 V logic)
  - **Input range**: Up to 20 kHz*3 *30 Hz when the chattering filter is in use (On)
  - **Minimum detection pulse width**: 25 μs ± 15 μs when the chattering filter is in use (On)
  - **Measurement accuracy**: Count ± 1 pulse
  - **Chattering filter**: Removes chattering up to 5 ms (can be turned on/off on each channel)
  - **Hysteresis width**: Approx. 0.3 V
  - **Contact, transistor rating**: Contact: 15 V DC or higher and 30 mA or higher, Minimum applicable load current 1 mA or less, Transistor: With the following ratings: Vce=15 VDC, Ic=30 mA
  - **Maximum input voltage**: ± 10 V DC
  - **Insulation resistance**: Between input terminals and internal circuitry: 20 MD or greater at 500 V DC
  - **Withstand voltage**: Between input terminals and internal circuitry: 1500 V AC for 1 minute

**PID control module**

<table>
<thead>
<tr>
<th>Model</th>
<th>GX90UT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of control loops</td>
<td>Number of loops: 2</td>
</tr>
<tr>
<td>Analog input (measured input)</td>
<td>Measurement type: DC voltage (0V/standardized signal, TC/RTD, DI (LEVEL and non-voltage contact)/DC current (with external shunt resistance))</td>
</tr>
<tr>
<td>Scan (control) interval</td>
<td>100 ms or 200 ms (system global setting)</td>
</tr>
<tr>
<td>Power supply for current, voltage pulse, or sensors</td>
<td>Outputs: 2</td>
</tr>
<tr>
<td>Voltage pulse output: ON voltage = 12 V DC or more (load resistance 600 Ω or more), OFF voltage = 0.1 VDC or less</td>
<td></td>
</tr>
<tr>
<td>Can be used as a sensor power supply (10.3~18.3 VDC)</td>
<td>Digital input (switching the SP, operation mode, etc.)</td>
</tr>
<tr>
<td>Output type</td>
<td>Output type: Power supply for current, voltage pulse, or sensors</td>
</tr>
<tr>
<td>Current output: 4–20 mA or 0–20 mA</td>
<td>Output format: Contact rating: 12 VDC or more, 20 mA or more</td>
</tr>
<tr>
<td>Non-voltage contact and open collector</td>
<td>Outputs: 8</td>
</tr>
<tr>
<td>Contact rating: 12 VDC or more, 20 mA or more</td>
<td></td>
</tr>
<tr>
<td>Output format: Open collector (sink type)</td>
<td>Output contact capacity: Max 24 VDC, 50 mA</td>
</tr>
<tr>
<td>terminal type</td>
<td>Terminal type: M3 screw terminals</td>
</tr>
<tr>
<td>Weight</td>
<td>Weight: Approximately 0.3 kg</td>
</tr>
</tbody>
</table>

---

*1 Integration requires the math function (I/M option).

---

*2 Integration requires the math function (optional code /MT).

---

*3 Integration requires the math function (I/M option).
**GX10/GX20 MODEL AND SUFFIX CODES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Optimal code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GX10</td>
<td></td>
<td></td>
<td>Paperless recorder (Panel mount type, Small display)*1, 10 ch (Clamp terminal)</td>
</tr>
<tr>
<td>GX20</td>
<td></td>
<td></td>
<td>Paperless recorder (Panel mount type, Large display)*2, 20 ch (Clamp terminal)</td>
</tr>
</tbody>
</table>

**Display language**

- E: English, de, fr, en, dol, winter time

**Optional features**

- /AH: Aerospace heat treatment
- /AS: Advanced security function (Part 11)*3
- /BC: Black cover
- /BT: Multi-batch function*4
- /C2: RS-232
- /C3: RS-422/485
- /CG: Custom display
- /D2: VGA output
- /D5: EtherNet/IP communication (PLC communication protocol)
- /E1: EtherNet/IP communication (PLC communication protocol)
- /E2: WT communication
- /E3: OPC-UA server
- /E4: SLMP communication (Mitsubishi PLC)
- /FL: Fail output, 1 point
- /LG: Log scale
- /LT: Logarithmic function (with report function)
- /LC: Communication channel function
- /P1: 24 V DC/AC power supply
- /PG: Program control function
- /U: USB interface (Host 2 ports)

**Optional features (Digital I/O)**

- /CR01: With digital I/O module, (Output 6, Input 16)*5 to *7
- /CR02: With digital I/O module, (Output 12, Input 20)*7
- /CR03: With digital I/O module, (Output 16, Input 24)*7

**Optional features (Analog input)**

- /UC10: With analog input module, 10 ch (Clamp terminal)
- /UC20: With analog input module, 20 ch (Clamp terminal)
- /UC30: With analog input module, 30 ch (Clamp terminal)
- /UC40: With analog input module, 40 ch (Clamp terminal)
- /UC50: With analog input module, 50 ch (Clamp terminal)
- /US10: With analog input module, 10 ch (M3 screw terminal)
- /US20: With analog input module, 20 ch (M3 screw terminal)
- /US30: With analog input module, 30 ch (M3 screw terminal)
- /US40: With analog input module, 40 ch (M3 screw terminal)
- /US50: With analog input module, 50 ch (M3 screw terminal)

**Optional features (Analog output)**

- /CR01: With digital I/O module, (Output 6, Input 16)*5 to *7
- /CR02: With digital I/O module, (Output 12, Input 20)*7
- /CR03: With digital I/O module, (Output 16, Input 24)*7

**Model codes and numbers of units of modules included in the main unit**

- /CN x 1
- /CN x 2
- /CN x 3
- /CN x 4
- /CN x 5
- /CN x 6

**Paperless recorder GX/GP**

1. /C2 and /C3 cannot be selected together.
2. /D5 can be specified only for the GX20 or GP20.
3. /UC10, /UC50, /US40 and /US50 cannot be specified for the GX10 or GP10.
4. /CR20, /CR21, /CR40 and /CR41 cannot be specified for the GX10 or GP10.
5. If /UC20 or /US20 is specified, /CR11 cannot be specified for the GX10 or GP10.
6. /UC30 or /US30 is specified, /CR01, /CR02 and /CR11 cannot be specified for the GX10 or GP10.
7. A digital input module has M3 screw terminals.
8. The Display language is selectable from English, German, French, Russian, Korean, Chinese. To confirm the current available languages, please visit the following website:
   URL: http://www.yokogawa.com/ru/language/
9. Solid state relay scanner (type suffix code: -U2).
10. If you need the electromagnetic relay scanner type, purchase it separately.
11. Large memory type can be specified only for the GX20/GP20.
12. /MC option must be separately specified when the WT communication is selected.
13. To connect an expandable I/O, you need one expansion module for the GX/GP.
14. Creating custom displays requires DKA170 DAQStudio (sold separately).
15. GX/GP does not have a creation function.
16. Power code can be specified on the suffix code D, F, R, Q, or N.
17. 12 VDC power supply can be specified only for the GP10 without power code (suffix code: W).
18. Optional code /MT (MATH) required if using the GX90XD’s or GX90WD’s pulse input.
19. The /MT option (MATH) is required to perform pulse integration on GX90XP pulse input modules.
20. When the Advanced Security function is ON the scan interval is 100 ms or more, and the Dual Interval function and PID modules are unavailable.
21. When the Multibatch function is ON the scan interval is 500 ms or more, and the Dual Interval function is unavailable.
22. Using the Program Control function requires the PID control module.
23. When ordering units with built-in modules, the total number of channels allowed is 100 (10 modules) including any modules ordered individually.

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**GP10/GP20 MODEL AND SUFFIX CODES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Optimal code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP10</td>
<td></td>
<td></td>
<td>Paperless recorder (portable type, Small display)*14</td>
</tr>
<tr>
<td>GP20</td>
<td></td>
<td></td>
<td>Paperless recorder (portable type, Large display)*14</td>
</tr>
</tbody>
</table>

**Display language**

- E: English, de, fr, en, dol, winter time

**Power supply**

1. 100V AC, 240V AC
2. 12 VDC

**Optional features**

- /AH: Aerospace heat treatment
- /AS: Advanced security function (Part 11)*3
- /BT: Multi-batch function*4
- /C2: RS-232
- /C3: RS-422/485
- /CG: Custom display
- /D2: VGA output
- /D5: EtherNet/IP communication
- /E1: EtherNet/IP communication
- /E2: WT communication
- /E3: OPC-UA server
- /E4: SLMP communication (Mitsubishi PLC)
- /FL: Fail output, 1 point
- /LG: Log scale
- /LT: Logarithmic function (with report function)
- /MC: Communication channel function
- /PG: Program control function
- /U: USB interface (Host 2 ports)

---

**Analog input module, Digital I/O module: When the built-in module**

Please add the following suffix codes to the main unit model and specification codes.

<table>
<thead>
<tr>
<th>Option</th>
<th>Suffix Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/UC10</td>
<td></td>
<td>With analog input module, 10 ch (Clamp terminal)</td>
</tr>
<tr>
<td>/UC20</td>
<td></td>
<td>With analog input module, 20 ch (Clamp terminal)</td>
</tr>
<tr>
<td>/UC30</td>
<td></td>
<td>With analog input module, 30 ch (Clamp terminal)</td>
</tr>
<tr>
<td>/UC40</td>
<td></td>
<td>With analog input module, 40 ch (Clamp terminal)</td>
</tr>
<tr>
<td>/UC50</td>
<td></td>
<td>With analog input module, 50 ch (Clamp terminal)</td>
</tr>
<tr>
<td>/US10</td>
<td></td>
<td>With analog input module, 10 ch (M3 screw terminal)</td>
</tr>
<tr>
<td>/US20</td>
<td></td>
<td>With analog input module, 20 ch (M3 screw terminal)</td>
</tr>
<tr>
<td>/US30</td>
<td></td>
<td>With analog input module, 30 ch (M3 screw terminal)</td>
</tr>
<tr>
<td>/US40</td>
<td></td>
<td>With analog input module, 40 ch (M3 screw terminal)</td>
</tr>
<tr>
<td>/US50</td>
<td></td>
<td>With analog input module, 50 ch (M3 screw terminal)</td>
</tr>
</tbody>
</table>

**Model codes and numbers of units of modules included in the main unit**

- /CN x 1
- /CN x 2
- /CN x 3
- /CN x 4
- /CN x 5
- /CN x 6

---

**Paperless recorder GX/GP**
Analog input module, Digital I/O module: When the individual modules MODELSUFFIX Code (GX90XA)

<table>
<thead>
<tr>
<th>Number of channels</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>C1</td>
<td>Current type (isolated between channels)</td>
</tr>
<tr>
<td>-6</td>
<td>L1</td>
<td>Low resistance voltage DCV/TCD scanner type (isolated between channels)</td>
</tr>
<tr>
<td>-10</td>
<td>U2</td>
<td>Universal state relay scanner type (3-wire RTD terminal common)</td>
</tr>
<tr>
<td>-01</td>
<td>T1</td>
<td>DCV/TCD, electromagnetic relay scanner type (isolated between channels)</td>
</tr>
<tr>
<td>-01</td>
<td>H0</td>
<td>High speed universal, individual A/D type (isolated between channels)</td>
</tr>
<tr>
<td>-01</td>
<td>R1</td>
<td>4-wire RTD/resistance, scanner type (isolated between channels)</td>
</tr>
<tr>
<td>Area</td>
<td>N</td>
<td>General</td>
</tr>
</tbody>
</table>

* The dummy cover is not attached to the GX60 when shipped from the factory. If you need the dummy cover, please purchase it separately.

MODEL and SUFFIX Code (GX90WD)

<table>
<thead>
<tr>
<th>Number of channels</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0806</td>
<td>N</td>
<td>Always N</td>
</tr>
<tr>
<td>Area</td>
<td>N</td>
<td>General</td>
</tr>
</tbody>
</table>

Optional Accessories (Sold Separately)

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting bracket (GX10 or GX20)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SD memory card (1GB)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Stylos</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sheet (paper)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Power cord (for GP10 or GP20 of AC power supply only)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Application Software (sold separately)

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DXA170</td>
<td>DAQstudio</td>
<td>Windows 7/8.1/10</td>
</tr>
<tr>
<td>GA10</td>
<td>Data Logging Software</td>
<td>Windows 7/8/10</td>
</tr>
</tbody>
</table>

- Calibration certificate (sold separately): When ordering the GX10/GX20/GP10/GP20 with options (analog input), the calibration certificate for the modules is included in and shipped with the calibration certificate of the main unit. When ordering an analog input module separately, each module gets its own calibration certificate (one certificate per module).
- Test certificate (QIC, sold separately): When ordering the GX10/GX20/GP10/GP20 with options (analog/digital I/O), the QIC for each module is included in and shipped with the QIC of the main unit. When ordering analog input modules and digital I/O modules separately, each module gets its own QIC (one QIC per module).
- User’s Manual: Product user’s manuals can be downloaded or viewed at the following URL: URL: www.smartdacplus.com/manual/en/
When panel-mounting the GX10/GX20, use two panel mounting brackets. Locate the brackets on the top and bottom, or left and right. For detailed dimensions and panel cutouts, please see the General Specifications (GS 04L51B01-01EN).

**GM Data Acquisition System**

This is a flexible data logger that combines the safety and ease of use that is made possible through our years of experience in measurement technology. Modules and functions are interchangeable with the GX/GP.

**Flexibly scales to expand the number of channels**
- Measure up to 420 ch
- Slide lock for easy attachment and removal

**Easy access from a web browser**
- Hardware settings
- Real time monitoring

**Supports mobile connection**
- Bluetooth communication
- Monitor and configure from a tablet

**Open network**
- Supports Modbus, Ethernet/IP, SLMP, OPC-UA server

**Designed for high performance, high reliability**
- High measurement accuracy
- Redundancy through internal and external memory, plus media

**Environmental and noise resistance**
- Wide operating temperature range: -20 to 60 DEGC

**Configuration example**

(When ordering individual instruments)  
(with supply voltage of 100 to 240 VAC, universal input, and screw terminal)

<table>
<thead>
<tr>
<th>30 ch (analog input)</th>
<th>120 ch (analog input)</th>
<th>450 ch (analog input)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GX20-1E x1</td>
<td>GX20-2E × 1</td>
<td>GX20-2E × 1</td>
</tr>
<tr>
<td>GX90XA-10-U2N-3N x3</td>
<td>GX90EX-02-TP1N-N (for main unit) × 1</td>
<td>GX90EX-02-TP1N-N (for main unit) × 1</td>
</tr>
<tr>
<td></td>
<td>GX60-EXN1W (including GX60 Expandable I/O) × 1</td>
<td>GX60-EXN1W (including GX60 Expandable I/O) × 6</td>
</tr>
<tr>
<td></td>
<td>GX90XA-10-U2N-3N × 12</td>
<td>GX90XA-10-U2N-3N × 45</td>
</tr>
</tbody>
</table>

**Analog input module scan interval and measurement type**

<table>
<thead>
<tr>
<th>Type</th>
<th>Channels</th>
<th>Scan interval (shortest)</th>
<th>Scanner</th>
<th>TC</th>
<th>RTD</th>
<th>DCV</th>
<th>DI</th>
<th>mA</th>
<th>Resistance</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal (-U2)</td>
<td>10</td>
<td>100ms</td>
<td>SSR</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Resistance</td>
<td>Universal</td>
</tr>
<tr>
<td>Low withstand voltage relay (-L1)</td>
<td>10</td>
<td>500ms</td>
<td>SSR</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Mid-price</td>
<td></td>
</tr>
<tr>
<td>Electromagnetic relay (-T1)</td>
<td>10</td>
<td>1s</td>
<td>Relay</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Noise-resistance</td>
<td></td>
</tr>
<tr>
<td>DC current input (-C1)</td>
<td>10</td>
<td>100ms</td>
<td>SSR</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>mA only</td>
<td></td>
</tr>
<tr>
<td>High speed universal (-H0)</td>
<td>4</td>
<td>1ms</td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>High speed measurement</td>
<td></td>
</tr>
<tr>
<td>4-wire RTD/resistance (-R1)</td>
<td>6</td>
<td>100ms</td>
<td>SSR</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>4-wireRTD</td>
<td></td>
</tr>
</tbody>
</table>
Data Logging Software GA10 (sold separately)

Centrally acquire data from multiple devices on a PC

GA10 is a PC based software package that acquires real time data from SMARTDAC+ data acquisition systems and other devices connected to a network. Connected PCs can monitor real time and historical data, which can be stored on a PC hard drive or centrally on a network drive.

Max. connectable units: 100
Max. recording tags (channels): 2,000
Scan interval: 100 ms (channels)

Compatible with other models in addition to the GX/GP!

DX series
μR series
MV series

Supports many other models. For details, see the GA10 catalog.

Aggregate data for monitoring!

Easy to read screen layouts provide operator friendly real time monitoring.
- Group channels any way you like
- Play back data up to recording start, even during measurement
- Instantly recognize alarms (in red)

Save the data all together!

Data is stored in a binary tamper proof format preventing unauthorized access. Data can also be exported to excel format for data manipulation and analysis.

Application example

Data monitoring in manufacturing sites

Monitor factory data from the office.
You can also add clients and share data across multiple PCs.

Effect: No more moving around large factories to do work!

Recording data from multiple equipments

Saves testing/manufacturing equipment data on a PC. In addition to simultaneous acquisition, you can acquire data from different equipment at different timing (multilogging).

Effect: Manage all data on the PC, one set of equipment at a time!

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Before operating the product, read the instruction manual thoroughly for proper and safe operation.