OVERVIEW

The SMARTDAC+ GM Data Acquisition System is a data logger that excels in versatility and expandability. The main unit includes on-board memory for data acquisition and also supports SD cards for external storage. The system consists of a Data Acquisition Module (GM10), Power Supply Module (GM90PS), and Module Base (GM90MB), which is used to mount a variety of modules.

SMARTDAC+ GM utilizes the same modules as the GX/GP series of SMARTDAC+.

- **High expandability and maintainability**: Employs YOKOGAWA's original block structure, making it easy to rearrange the combination of required modules. The structure also excels in maintainability because even after installation, every module can be removed separately.

- **Multichannel measurement**: Measures up to 420 analog input channels on the GM10-2 and up to 100 channels even on the GM10-1.

- **Flexible system configuration**: A wide variety of systems, such as multichannel measurement from 10 to 420 channels or data acquisition through communication, can be configured.

- **High environmental tolerance**: The guaranteed operating temperature range of -20°C to 60°C allows more freedom in where the system can be installed.

- **Mounting**: Not only can the system be installed on a desktop, it can also be mounted on DIN rails or a wall.

- **Less wiring through distribution**: Installation of sub units away from the main unit makes measurement possible without connecting sensor signal wires over a long distance.

- **Long-term recording and saving**: Large internal memory (500 MB on the GM10-1 and 1.2 GB on the GM10-2) allows long-term recording and saving.

- **Secure saving of recording data**: An SD card (SD/SDHC) up to 32 GB (1 GB included) can be used for the external storage medium. And the FTP client function can be used to provide data redundancy using a file server.

- **Rich I/O interface**: Four types of I/O modules are available: analog input, digital input, digital output, and digital I/O. DCV (DC voltage), TC (thermocouple), RTD (resistance temperature detector), DI (contact or TTL level voltage), mA (DC current) can be assigned to each channel as input signals.

- **Web server function**: Various settings can be configured online from a Web browser, without using a dedicated software application. Moreover, measured data can be monitored in real time.

- **Simple settings**: The standard USB port makes it easy to configure various settings offline from a PC.

- **Extensive network functions**: The standard Ethernet interface allows network features such as various e-mail notifications and FTP file transfer. In addition, Modbus/TCP, Modbus/RTU (IC3), and EtherNet/IP (IE1) are supported.

- **Universal Viewer software**: A free software application is available for displaying and printing waveforms of measured data on a PC.

- **Actual values underlying accurate measurements**

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Measuring accuracy<em>1 (typical value</em>2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCV</td>
<td>±(0.01% of rdg + 5μV)</td>
</tr>
<tr>
<td>6V (1-5V)</td>
<td>±(0.01% of rdg + 2mV)</td>
</tr>
<tr>
<td>TC*3</td>
<td>±1.1°C</td>
</tr>
<tr>
<td>K (-200 to 500°C)</td>
<td>±0.2°C (except ±0.15% of rdg +0.2°C for -200.0 to 0.0°C)</td>
</tr>
<tr>
<td>T</td>
<td>±0.2°C (except ±0.10% of rdg +0.2°C for -200.0 to 0.0°C)</td>
</tr>
<tr>
<td>RTD</td>
<td>±(0.02% of rdg + 0.2°C) (high resolution)</td>
</tr>
</tbody>
</table>

*1 These values have been calculated from the accuracy testing data at the time of shipment of the instrument from the factory. General operating conditions: 23±2 °C, 55±10% RH, supply voltage 90–132, 180–250 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.
**CONFIGURATION**

SMARTDAC+ GM handles a wide variety of applications through the combination of various modules.

The unit that includes GM10 (Data Acquisition Module) is called the **main unit**. A unit connected to the main unit via GX90EX (expansion module) is called a **sub unit**. Modules in a unit can be connected by installing a GM90MB (Module Base).

- **Unit Types**

  **Main Unit (Single Unit)**
  A unit consisting of a GM10 and a GM90PS. Up to 10 I/O modules* (up to 100 channels) can be connected to a unit.

  * Up to 8 when a GX90XA-T1 is connected

  **Main Unit (Multi Unit)**
  A unit consisting of a GM10, a GM90PS and a GX90EX. Up to six I/O modules can be connected to a unit. Up to six sub units can be connected via the GX90EX.

  **Sub Unit**
  A unit consisting of a GM90PS and a GX90EX. Up to six I/O modules can be connected to a unit. The main unit and sub units are connected using LAN cables. The maximum connection distance between two units is 100 m.

- **Module Types**

  **Model** | **Description**
  --- | ---
  GM10 | Data Acquisition Module for SMARTDAC+ GM
  A module that acquires data from I/O modules and expansion modules.
  A main unit requires one module of this type.
  GM90PS | Power Supply Module for SMARTDAC+ GM
  A module that supplies power to the modules connected in the unit.
  A unit requires one module of this type.
  GX90EX* | Expansion module
  A module that connects units to expand the system.
  A main unit or a sub unit requires one module of this type.

  * The firmware version of GX90EX that can be used on the SMARTDAC+ GM must be R1.02.01 or later.

  **Model** | **Description**
  --- | ---
  GM90MB | Module Base
  This is used to connect modules (excluding the GM90PS).

For the detailed specifications of the expansion module, see the following general specifications.

Material No.: GS 04LSB00-01EN

**I/O Modules**

The firmware version of I/O modules that can be used on the SMARTDAC+ GM must be R1.04.01 or later.

**Model** | **Description**
--- | ---
GX90XA | Analog input module (number of inputs: 10)
Type Suffix code -U2 | Universal, solid state relay scanner type (3-wire RTD b-terminal common)
DC voltage, standard signal, thermocouple, resistance temperature detector (RTD), DI (voltage, contact), DC current (when an external shunt resistor is connected)
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 0.7 W
GX90X | Digital input module
(number of inputs: 16)
A module that can receive various analog signals.
GX90XD | Digital input module
(number of inputs: 16)
A module that can receive open collector or voltage-free contact signals.
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 0.7 W
GX90WD | Digital I/O module
(number of inputs: 8, number of outputs: 6)
A module that can receive open collector or voltage-free contact signals and transmit relay contact (c contact) signals.
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 1.6 W
GX90YD | Digital output module
(number of outputs: 6)
A module that can transmit relay contact (c contact) signals.
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 1.4 W
GX90ZD | Digital output module
(number of outputs: 6)
A module that can transmit relay contact (c contact) signals.
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 1.4 W

For the detailed specifications of the expansion module, see the following general specifications.

Material No.: GS 04LSB00-01EN

**Model** | **Description**
--- | ---
GX90XA | Analog input module (number of inputs: 10)
Type Suffix code -U2 | Universal, solid state relay scanner type (3-wire RTD b-terminal common)
DC voltage, standard signal, thermocouple, resistance temperature detector (RTD), DI (voltage, contact), DC current (when an external shunt resistor is connected)
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 0.7 W
GX90X | Digital input module
(number of inputs: 16)
A module that can receive various analog signals.
GX90XD | Digital input module
(number of inputs: 16)
A module that can receive open collector or voltage-free contact signals.
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 0.7 W
GX90WD | Digital I/O module
(number of inputs: 8, number of outputs: 6)
A module that can receive open collector or voltage-free contact signals and transmit relay contact (c contact) signals.
Scan interval: 100/200/500 ms, 1/2/5 s
Power consumption: 1.6 W

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GS 04LSB00-01EN Oct. 27, 2014-00
For the detailed specifications of the I/O modules, see the following general specifications.

Material No.: GS 04L53B01-01EN

**System Configuration**
SMARTDAC+ GM supports both standalone operation and data acquisition using a PC.

**Single Unit System**
A system configured with only a main unit.

- **Use as a stand-alone type**
- **Use by connecting a PC**

**Multi Unit System**
A system configured with a main unit connected to sub units.
- Up to six sub units can be connected to a main unit. Each unit can connect up to six modules.
- For analog input, up to 420 channels (GM10-2) and up to 100 channels (GM10-1) can be measured.

**Use as a stand-alone type**

- **Main unit**
- **Sub unit**

Maximum connection distance between two units is 100 m.

**Use by connecting a PC**

- **Main unit**
- **Sub unit**

* The main unit and sub units are connected using LAN cables.
SMARTDAC+ GM COMMON SPECIFICATIONS

- **Compliant Standards**
  - CSA: CSA22.2 No.61010-1, installation category II\(^1\), pollution degree 2\(^2\), CSA C22.2 NO. 61010-2-030-12
  - UL: UL61010-1, UL 61010-2-030(CSA NRTL/C)
  - CE:
    - EMC directive: EN61326-1 compliance, Class A Table 2
    - EN61000-3-2 compliance
    - EN61000-3-3 compliance
    - EN55011 Class A Group 1
    - Low voltage directive: EN61010-1, EN 61010-2-030
      - Installation category II\(^1\), pollution degree 2\(^2\)
  - Measurement category II\(^3\)

- **/C8 option**
  - R&TTE directive:
    - HEALTH&SAFETY
      - EN61010-1 compliance
      - EN61010-2-030 compliance
      - Installation category II\(^1\), pollution degree 2\(^2\)
      - Measurement category II\(^3\)
    - EN62311 compliance
    - EMC
      - EN301 498-1 compliance
      - EN301 498-17 compliance
      - EN61326-1 compliance
    - SPECTRUM
      - EN300 328 compliance
      - EMC Regulatory Arrangement in Australia and New Zealand (RCM):
        - EN55011 compliance, Class A Group 1
      - Wireless communication standards of Australia and New Zealand (RCM) (optional code /C8):
        - AS/NZS4268, AS/NZS2772.2
      - KC marking: Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance
      - Wireless module certification and the like:
        - FCC Approval, IC Approval, Japanese Radio Law
        - Korea Certification (Radio Wave Act), China Certification (Radio Wave Act)

- **Category**
  - **Table 2**
    - **Category**
      - III CAT III Available in the testing and measuring circuits connected to a power distribution portion of a low-voltage main power supply facility.
    - **Measurement category**
      - Distribution board, circuit breaker, etc.
      - Overhead wire, cable systems, etc.

- **WEEE Directive**: Compliant

- **Normal Operating Conditions**
  - Rated supply voltage: 100 to 240 V AC
  - Allowable supply voltage: 90 to 132 V AC, 180 to 264 V AC
  - Power frequency: 50 Hz ±2 %, 60 Hz ±2 %
  - Power consumption:
    - **Supply voltage**
      - Normal operation
        - 100 V AC: 25 VA
        - 240 V AC: 35 VA

- **Shock**
  - When 10 analog input modules are connected
  - Ambient temperature: ~20 to 60 °C
  - ~20 to 50 °C in the following cases
    - When a GX90YD is used
    - When a GX90WD is used
    - When a GX90XA-T1 (electromagnetic relay type) is used
    - On a GM10 with the /C8 option
  - Ambient humidity: 20 to 85 %RH
  - (no condensation)
  - Magnetic field: 400 A/m or less (DC and 50/60 Hz)
  - Vibration: 5 ≤ f < 8.4 Hz amplitude 3.5 mm (peak) 8.4 ≤ f ≤ 160 Hz acceleration 9.8 m/s² or less
  - Shock: Power supply ON, 98 m/s² or less, 11 ms (excluding GX90YD and GX90WD)
  - Power supply OFF, 500 m/s² or less, approx. 10 ms
  - Mounting position: Left and right horizontal, front and back horizontal
  - Altitude: 2000 m or less
  - Installation location: Indoors
  - Warm-up time: At least 30 minutes after power on

- **Transport and Storage Conditions**
  - Ambient temperature: -25 to 70 °C
  - Ambient humidity: 5 to 95 %RH (no condensation)
  - Vibration: 10 to 60 Hz, 4.9 m/s² maximum
  - Shock: 392 m/s² maximum (in packaged condition)

- **Construction**
  - Mounting: Wall mount, DIN rail (panel storage, rack), desktop
  - Note: No stacking
  - Material: Polycarbonate
GM10 DATA ACQUISITION MODULE SPECIFICATIONS

- 7 segment LED (x2) Status display
- START/STOP key
- USER key
- USB port
- SD memory card slot
- Ethernet port

7 segment LED: Displays the operation mode, system No., self-check operation, key lock, operation error, process running, and module installation information.

Status display:

<table>
<thead>
<tr>
<th>Item</th>
<th>LED color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDY</td>
<td>Green</td>
<td>System normal indication</td>
</tr>
<tr>
<td>REC</td>
<td>Green</td>
<td>Recording status</td>
</tr>
<tr>
<td>SD</td>
<td>Orange</td>
<td>SD card access status</td>
</tr>
<tr>
<td>FAIL</td>
<td>Red</td>
<td>System error indication</td>
</tr>
<tr>
<td>MATH</td>
<td>Green</td>
<td>Computation status</td>
</tr>
<tr>
<td>SER</td>
<td>Orange</td>
<td>Serial communication status</td>
</tr>
<tr>
<td>BT</td>
<td>Orange</td>
<td>Bluetooth communication status</td>
</tr>
<tr>
<td>ALM</td>
<td>Red</td>
<td>Alarm status</td>
</tr>
</tbody>
</table>

START key: Starts recording and computation
STOP key: Stops recording and computation, clears errors
USER keys (USER1/USER2): Executes specified actions (event action function)

- Functional Specifications

**Measuring Function**

Number of connectable modules and number of I/O channels:

<table>
<thead>
<tr>
<th>Modules</th>
<th>I/O channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM10-1</td>
<td>Up to 10</td>
</tr>
<tr>
<td>GM10-2</td>
<td>Up to 42</td>
</tr>
</tbody>
</table>

Scan interval: Selectable from 100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s

Note: Some intervals will be unavailable depending on the system configuration and modules.

Module connection limitations:

- If a GX90XA analog input module (electromagnetic relay type: -T1) is connected, the maximum number of connectable I/O modules is eight.
- Up to a total of 10 GX90YD digital output modules and GX90WD digital I/O modules can be connected in each system.
- One GX90WD digital I/O module can be installed in each unit.
- The maximum number of connectable sub units is six.

- If the maximum number of I/O channels are assigned and the last channel is assigned to an intermediate channel of a connected I/O module, that module and subsequent modules will not be recognized.

GM10-1

<table>
<thead>
<tr>
<th>Module</th>
<th>Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>91</td>
<td>81</td>
</tr>
<tr>
<td>:</td>
<td>1</td>
</tr>
<tr>
<td>:</td>
<td>:</td>
</tr>
<tr>
<td>Maximum number of I/O channels</td>
<td></td>
</tr>
</tbody>
</table>

This module will not be detected.

Channel Specifications

Operations such as measurement, computation, and recording are performed on channels.

- Channel name: A channel name is expressed with a 4-digit number. Channel names are specific to the system, so they cannot be changed. By setting tags or tag numbers to the channels, you can use any names you like.

<table>
<thead>
<tr>
<th>Channel number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog input: 01 to 10</td>
</tr>
<tr>
<td>Digital input: 01 to 16</td>
</tr>
<tr>
<td>Digital output: 01 to 06</td>
</tr>
<tr>
<td>Digital I/O:</td>
</tr>
<tr>
<td>Digital input: 01 to 08</td>
</tr>
<tr>
<td>Digital output: 09 to 14</td>
</tr>
</tbody>
</table>

- Slot number: 0 to 9

- Unit number
  - Main unit: 0
  - Sub unit: 1 to 6

Data Saving Function

Data is recorded to internal memory and external storage medium. When the system recovers from a power failure, the operation that was being performed before the power failure is resumed.

- Internal memory: Temporarily saves various types of data.
  - Medium: Flash memory
  - Size: GM10-1: 500 MB
  - GM10-2: 1.2 GB

- External storage medium:
  - Medium: SD card (SD/SDHC)
  - Size: 1 to 32 GB (1 GB included)
  - Format: FAT32 or FAT16

Data saving to the external storage medium:

- Select whether to save automatically or when a medium is inserted for event data, display data, manual sampled data, and report data.

Auto save: Automatically saves to the internal memory when a data files is created.

Save when a medium is inserted:
- Saves unsaved data files when an external storage medium is inserted.
### Data type:

<table>
<thead>
<tr>
<th>Data type</th>
<th>Saved content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display data</td>
<td>Maximum and minimum values per recording interval</td>
</tr>
<tr>
<td>Event data</td>
<td>Instantaneous values at recording intervals</td>
</tr>
<tr>
<td>Alarm summary data</td>
<td>Summary of warnings</td>
</tr>
<tr>
<td>Manual sampled data</td>
<td>Instantaneous values at a user specified time</td>
</tr>
<tr>
<td>Setup data</td>
<td>GM10 and I/O module settings</td>
</tr>
<tr>
<td>Report data (MT option)</td>
<td>Report at each scheduled time of report</td>
</tr>
</tbody>
</table>

### Event data:

- **Target:** Measurement (I/O module)/math (MT)/communication (MC) channels, alarm summary, message summary
- **Recording interval:** 100 ms/200 ms/500 ms/1 s/2 s/5 s/10 s/15 s/20 s/30 s/1 min/2 min/5 min/10 min/15 min/20 min/30 min selectable
- **Number of channels:** Determined by the scan interval and recording data type

<table>
<thead>
<tr>
<th>GM10-1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording interval</td>
<td>Number of channels</td>
<td></td>
</tr>
<tr>
<td>100 ms</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>200 ms</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>500 ms or longer</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GM10-2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording interval</td>
<td>Number of channels</td>
<td></td>
</tr>
<tr>
<td>100 ms</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>200 ms</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>500 ms or longer</td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

### Display data:

- **Target:** Measurement (I/O module)/math (MT)/communication (MC) channels, alarm summary, message summary
- **Trend interval (div) (recording interval):** 5 s/10 s/15 s/20 s/30 s/1 min/2 min/5 min/10 min/15 min/20 min/30 min selectable
- **Number of channels:** Determined by the trend interval and recording data type

<table>
<thead>
<tr>
<th>GM10-1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend interval setting (div)</td>
<td>Recording interval</td>
<td>Number of channels</td>
</tr>
<tr>
<td>5 s</td>
<td>100 ms</td>
<td>100</td>
</tr>
<tr>
<td>10 s</td>
<td>200 ms</td>
<td>200</td>
</tr>
<tr>
<td>15 s or longer</td>
<td>500 ms or more</td>
<td>500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GM10-2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend interval setting (div)</td>
<td>Recording interval</td>
<td>Number of channels</td>
</tr>
<tr>
<td>5 s</td>
<td>100 ms</td>
<td>200</td>
</tr>
<tr>
<td>10 s</td>
<td>200 ms</td>
<td>500</td>
</tr>
<tr>
<td>15 s</td>
<td>500 ms</td>
<td>1000</td>
</tr>
<tr>
<td>30 s or longer</td>
<td>1 s or longer</td>
<td>1000</td>
</tr>
</tbody>
</table>

### Data size:

- **Analog input data:** 6 bytes/ch.
- **Digital I/O data:** 2 bytes/ch.
- **Math channel data:** 6 bytes/ch.
- **Communication channel data:** 12 bytes/ch.
- **File size:** Up to 18 MB
- **Number of files (including display data):**
  - GM10-1: Up to 500
  - GM10-2: Up to 1000
- **Internal memory operation:** FIFO (First In First Out)
- **Data format:** Binary or text
- **Display data file sample time (estimated):**
  - GM10-1 (when recording interval is 1 s)
    | I/O channels | Total sample time |
    |--------------|-------------------|
    | 30           | Approx. 914 days (2.5 years) |
    | 100          | Approx. 239 days (9 months)  |
  - GM10-2 (when recording interval is 1 s)
    | I/O channels | Total sample time |
    |--------------|-------------------|
    | 30           | Approx. 2184 days (5.9 years) |
    | 100          | Approx. 702 days (1.9 years)  |
    | 300          | Approx. 239 days (7 months)   |

### Alarm summary:

- **Saved item:** Alarm of each data item
- **Maximum number of items saved to internal memory:** 5000
- **Internal memory operation:** FIFO (First In First Out)
- **Maximum number of items displayed on Web screen:** Latest 1000
- **Save operation:** Saves alarm information to internal memory when an alarm occurrence or release is detected
- **Alarm information is saved to the corresponding event or display data file.

### Saved content:

- **Target channel name (tag name), time of occurrence or release, warning type, etc.
- **Save operation methods:** Web browser, communication command
- **Message summary:**
  
  **Description:** Saves a summary of written messages
  **Saved item:** Message string
  **Maximum number of items saved to internal memory:** 1000
  **Internal memory operation:** FIFO (First In First Out)
  **Maximum number of items displayed on Web screen:** Latest 500
  **Save operation:** Saves message information to internal memory when message writing operation is performed.
  - Message information is saved to the corresponding display or event data file.
  **Saved content:** Message name, writing interval, user name, write group

- **Manual sampled data:**
  **Saved item:** Measurement (I/O module)/math (/MT)/communication (IMC) channels
  **Number of saved channels:**
  - GM10-1: Up to 50, GM10-2: Up to 100
  **Save operation methods:** Web browser, communication command, event action
  **Maximum number of events saved to internal memory:** 400
  **Internal memory operation:** FIFO (First In First Out)
  **Auto saving to an external storage medium:** Every time manual sampling is executed

- **Data format:** Text format

- **Setup data**
  **Saved item:** GM10 and I/O module settings (including setup data of modules connected via GX90EX)
  **Saved events:** Operation from a Web browser, communication command, event action

- **Data format:** Text format

- **Report data (MT option)**
  **Saved item:** Measurement (I/O module)/math/communication channels
  **Select from average, maximum, minimum, sum, and instantaneous values**
  **Type:** Hourly + daily, daily + weekly, daily + monthly
  User specified time (batch, day custom)
  **Saved events:** Timeout time of each report type
  **Maximum number of events saved to internal memory:** 800
  **Internal memory operation:** FIFO (First In First Out)
  **Auto saving to an external storage medium:** Every time of the event

- **Data format:** Test format

- **User data**
  **Saved item:** Excel report template (/MT), PDF/print report template, SSL communication certificate (server certificate, trusted certificate), electronic signature certificate (/MT)
  **Recorded events:** Operation from a Web browser, communication command

**Message Write Function**
Messages can be written to event data and display data.

- **Message type:**
  - Preset message: Writes preset text
  - Free message: Writes text that you enter
  - Auto message: Writes fixed text when power recovers after a power failure occurs during recording.
  - Preset message, free message:
    - **Number of displayable characters:** Up to 32
    - **Displayable character types:** Alphanumeric, Japanese, and Chinese characters
    - **Number of messages:** Preset message: 100
      - Free message: 10
      - Free messages that you enter are also saved in setup files.
    - **Write method:** Operation from a Web browser, communication command, event action
    - **Write destination:** Specified event data or display data group or all groups
  - **Auto message**
    - **Displayed text:** "Power-fail" + the time of failure occurrence
      - Example: Power-fail 2014/01/06 09:49:21
    - **Write method:** Writes a message when power recovers after a power failure occurs during recording.
      - Whether or not to write is selectable.
      - **Write destination:** All display data or event data groups

**Alarm Function**

- **Number of alarms:** Up to four alarms (levels) for each measurement channel
- **Alarm type:** High limit, low limit, difference high limit, difference low limit, high limit on rate-of-change, low limit on rate-of-change, delay high limit, and delay low limit
- **Alarm delay time:** 1 s to 24 hours (for each channel)
- **Rate-of-change calculation interval of rate-of-change alarms:** 1 to 32 times the scan interval (common to all channels)
- **Hysteresis:** 0.0 to 5.0% of the span (for each alarm level)
- **Alarm output:**
  - **DO output:**
    - DO operation: Energize/de-energize, hold/nonhold, AND/OR, reflash
  - **Internal switch output:**
    - Number of internal switches: 100
    - Internal switch operation: AND/OR operation selectable
  - **Status LED display operation:** Select whether or not to hold the indication until an alarm acknowledge operation is performed
  - **Alarm no logging function:** Possible to output only to the DO or internal switch when an alarm occurs (warning display and recording to the alarm summary are not performed)
  - **Alarm information:** Displays a log of alarm occurrences on the alarm summary
  - **Reflash:**
    - The duration for which the reflash relays are deactivated can be set to 500 ms, 1 s, or 2 s.
  - **Individual alarm ACK function:** Alarm display and relay output can be canceled on individual alarms.

**Event Action Function**

- **Description:** Execute a specified operation when a given event occurs.
- **Number of settings:** 50
  - **Events:** Remote control input, etc.
  - **Timer:**
    - **Number of timers:** 4
    - **Match time timer:** Number of timers: 4
  - **Action:** Specify memory start/stop, alarm ACK, etc.
Security Function
- Key lock function: All GM10 key operations
- Login function: Only registered users can operate the GM (Ethernet/serial/I3)/USB/Bluetooth (I C8) operation) (including Web browsers)
System administrators and users: Up to 50
Number of Authority of user: 10 levels

Manual Sampling Function
- Description: Measured value at a user specified time
- Target: Measurement (I/O module)/math (I/MT)/communication (I/MC) channels
- Number of recording channels:
  GM10-1: Up to 50
  GM10-2: Up to 100
- Maximum number of data values that the internal memory can store: 400
- Data format: Text

Report Function (I/MT option)
- Description: Report at each scheduled time of report
- Target: Measurement (I/O module)/math/communication channels
- Number of report channels: 60
- Maximum number of data values that the internal memory can store: 800
- Data format: Text

Setup Function
- Description: GM10 and I/O module setup
- Setup method: Web browser, communication commands, Hardware Configurator
- Output/read destination (for saving/loading): External storage medium

Clock Function
- Clock: With a calendar function
- Accuracy: ±5 ppm
- Excludes the delay (of 1 second, maximum) caused when the power is turned on.
- Time setting: Using Web operation, communication commands, event action, or SNTP client function
- Time adjustment method:
  Limit in which the time is gradually adjusted:
  Select from the available settings between 5 s and 15 s.
  Whether to change an out-of-limit operation immediately or report it as an error can be selected.
  While memory sampling:
  Corrects the time by 1 ms for each second.
  While memory is stopped:
  Immediately change the time.
- Time zone: Sets the time difference from GMT
- Date format: Select "YYYY/MM/DD", "MM/DD/YYYY", "DD/MM/ YYYY" or "DD/ MM/ YYYY"
- MM expression can be selected from the numeric character or ellipsis. Ex. January: 01 or Jan
- The delimiter can be selected from "/", ".", "-".

Ethernet Communication Function
- Electrical specifications: Conforms to IEEE 802.3
- Connection: Ethernet (10BASE-T/100BASE-TX)
- Max. segment length: 100 m
- Max. connecting configuration:
  Cascade Max. 4 level (10BASE-T), Max. 2 level (100BASE-TX)
- Connector: RJ-45
- Protocols: TCP, UDP, IP, ICMP, ARP, DHCP, HTTP, FTP, SMTP, SNTP, Modbus, dedicated protocols, and DARWIN compatible communication
- E-mail client: Automatically sends e-mail at specified times
- E-mail is sent by events as below.
  - Alarm occurring/alarm canceling
  - Recover from power failure
  - Report data generating
  - Storage medium error, FTP client function error
  - Specified time period
- Supported authentication methods:
  POP before SMTP, SMTP authentication (Login, Plain, CRAM-MD5)
- FTP client: Automatically transfers data files to the FTP server
  Applicable files: Event data, display data, report data, etc.
- FTP server: Transfers files, delete files, manipulate directories, and outputs file lists
  Max. number of the simultaneous connections: 4
- Web server: GM10 real-time monitoring and setting changes/operations can be performed from a Web browser.
  Max. number of the simultaneous connections: 4
- SNTP client: Inquires the time to the SNTP server and sets the GM10
- SNTP server: Outputs the GM10 time.
  Time resolution: 5 ms
- DHCP client: Automatically obtains the network address settings from the DHCP server
- Modbus client: Reads data from another device and writes to the registers
  Number of connectable severs:
  GM10-1: Up to 16
  GM10-2: Up to 32
- Modbus server: Loads measurement and math channel data.
  Loads and writes communication channel data
  Some control commands such as memory start
  Filtering to accept connections only from specific IP addresses available
  Max. number of the simultaneous connections: 4
- Setting/Measurement server:
  Operate and set the GM10 and output data using a dedicated protocol.
  Max. number of the simultaneous connections: 4
- DARWIN compatible communication server:
  Supports some DARWIN commands
  Communication with the GM10 is possible using DARWIN communication commands.
- Output-related commands: Outputs measurement channel data, math channel data, relay status, decimal place of measurement channels, decimal place of math channels, system configuration information
- Setup-related commands: Range, Scale unit, Alarm, Time, Moving average
Batch Function
- Function: Data management using batch names. Enter text fields and batch comments in the data file.
- Batch name: Added to the file name of the event data and display data.
- Structure:
  - Batch number (up to 32 characters) +
  - Lot number (up to 8 digits)
  - Use/not use selectable for lot number,
  - On/off selectable for auto increment function.
- Text field: Adds text to the event data and display data.
  - Title: Up to 20 characters
  - Text: Up to 30 characters per field
  - Batch comment: Adds text to the event data and display data. 3 comments (max. 50 characters/comments) are available.

USB Communication Function
- Compliant standard: USB2.0
- Interface:
  - Connector: mini B type
  - Number of ports: 1
  - Power supply: Self powered
  - Implemented protocol: Dedicated protocol
  - Operate and set the GM10 and output data using a dedicated protocol.
- Communication conditions:
  - Baud rate: 115200bps, Parity: None, Data length: 8bit, Stop bit: 1bit, Handshake: Off

FAIL Output Function
- Function: Relay output from a specified channel of the GX90YD or GX90WD when a CPU error occurs.
- Output format: Relay contact
- FAIL output: Relay contact output when any of the various errors is detected
  - Normally energized; de-energized when a system error occurs
- Rated load voltage: 24 V DC or 250 V AC or less
- Rated load current: 3 A (DO)/3 A (DIO), resistance load

Printer Output Function
- Printers supporting the HP-PCL5c language and can print through port 9100 on a LAN connection
- Supports printing using the report template function (/MT).

SSL Communication Function
Communication that sends and receives information encrypted by the SSL (Secure Socket Layer) protocol is possible.
- Server function:
  - Supported servers: HTTP server and FTP server
  - Private key: Can be created on the GM10
  - Server certificate: Server certificates created by users can be saved in the internal memory.
  - Self-signed certificates can be created on the GM10.

Client function:
- Supported clients: FTP client and SMTP client
- Trusted certificate: Trusted certificates (up to 80 KB total) can be saved in the internal memory.

Electronic Signature Function
Electronic signatures can be added to report files created in PDF format using the PDF form creation function. An electronic signature is provided each time a report file is created.
- Electronic signature certificate:
  - Electronic signature certificates created by certificate issuing organizations can be saved in the internal memory.

Other Function
- Firmware update function:
  - The firmware of the GM10 and connected modules can be updated from the GM10.
- A/D calibration function:
  - The A/D calibration of connected modules can be operated from the GM10.

Web Server Function
Real-time data monitoring and setting changes/operations can be performed from a Web browser.

PC System Requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel Pentium IV, 3GHz or faster x64 or x86 processor</td>
</tr>
<tr>
<td>Internal memory</td>
<td>2 GB or more</td>
</tr>
<tr>
<td>Hard disk</td>
<td>100 MB or more free space, NTFS recommended</td>
</tr>
<tr>
<td>Printer</td>
<td>Printer compatible with the OS</td>
</tr>
<tr>
<td>Mouse</td>
<td>Mouse compatible with the OS</td>
</tr>
<tr>
<td>Display</td>
<td>Display compatible with the OS with 1024x768 dots or better, high color or better</td>
</tr>
<tr>
<td>Communication port</td>
<td>Ethernet port compatible with the OS and TCP/IP protocol</td>
</tr>
</tbody>
</table>
## Specifications of Options

### Software

Java Runtime Environment 1.7.0_xx (Version 7 Update xx), where xx is 51 or higher

### OS

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Vista</td>
<td>Home Premium SP2 (excluding 64-bit editions)</td>
</tr>
<tr>
<td></td>
<td>Business SP2 (excluding 64-bit editions)</td>
</tr>
<tr>
<td>Windows 7</td>
<td>Home Premium SP1 (32-bit edition and 64-bit editions)</td>
</tr>
<tr>
<td></td>
<td>Professional SP1 (32-bit edition and 64-bit editions)</td>
</tr>
<tr>
<td>Windows 8.1</td>
<td>None (edition without the edition name)</td>
</tr>
</tbody>
</table>

### Compatible Browsers

Internet Explorer 8, Internet Explorer 9, Internet Explorer 10, Internet Explorer 11 HTTP1.1 and JavaScript are used.

### Mathematical Functions with Report Function (/IMT)

**Mathematical Function:**
- Number of math channels: 100
- Operations:
  - General arithmetic operations: Four arithmetic operations (+, -, *, /), square root, absolute, common logarithm, natural logarithm, exponential, and power
  - Relational operations: <, ≤, >, ≥, =, and ≠
  - Logic operations: AND, OR, NOT, and XOR
- Statistical operations: TLOG (maximum, minimum, average, sum, P-P values of time series data), CLOG (maximum, minimum, average, sum, P-P values of a specified channel)
- Special operations: PRE, HOLD, RESET, CARRY
- Conditional operation: \[a?b:c\]
- Bit operation: BIT
- Integer extracting operation: INT
- Remainder extracting operation: MOD
- Trigonometric functions: SIN, COS
- Computation accuracy: Double-precision floating point
- Data that can be used
  - Channel data:
    - Measurement channels: 0001 to 6516
    - Math channels: A001 to A100
    - Communication channels:
      - fc001 to C300 (GM10-1)
      - C001 to C500 (GM10-2)
  - Constants: K001 to K100
  - Internal switches: S001 to S100
  - Flags: F01 to F20
  - Recording state: REC01

### Report function:
- Number of report channels: 60
- Report types:
  - Hourly + daily, daily + weekly, daily + monthly, batch, day custom
  - Computation types: Average, maximum, minimum, sum, instantaneous value
- Unit of sum: OFF, /s, /min, /hour, /day
- Report templates: According to a report template has been created, Office Open XML spreadsheet files (which can be displayed with Microsoft Office Excel) or PDF files can be exported or printed with any LAN-connected printer supporting the HP-PCL5c language.

### Communication Channel Function (/IMC)

Data of external devices, such as PLC and PC, can be displayed and recorded.

- Number of communication channels:
  - GM10-1: 300 (C001 to C300)
  - GM10-2: 500 (C001 to C500)
Log Scale (/LG)
A logarithmic voltage that has been converted from a physical value is applied to the GM10, and then the GM10’s Log scale (logarithmic scale) is used to display and record the physical value.

- **Input type:** Log input (logarithmic input), pseudo log input (input that supports pseudo logs), log linear input (input that is linear on a logarithmic scale)
- **Range:** 20mV/60mV/200mV/1V/2V/6V/20V/50V
- **Scalable range:**
  - Log input: 1.00E-15 to 1.00E+15 (15 decades maximum)
  - If the lower limit mantissa is 1.00, the difference between the exponents must be 1 or more.
  - If the lower limit mantissa is a value other than 1.00, the difference between the exponents must be 2 or more.
  - Pseudo Log Input/Log linear input: 1.00E-15 to 1.00E+15 (15 decades maximum)
  - The upper limit mantissa is the same as the lower limit mantissa.
  - If the lower limit mantissa is 1.00, the value must be between 1.00E–15 and 1.00E+15, the difference between the exponents must be 1 or more, and the maximum decades is 15.
  - If the lower limit mantissa is a value other than 1.00, the value must be between 1.01E–15 and 9.99E+14, the difference between the exponents must be 1 or more and the maximum decades is 15.

- **Alarm type:** High limit, low limit, delay high limit, delay low limit
- **Alarm setting range:** The range converted into the LOG scale corresponding to -5% to 105% of the span width.
- **Alarm hysteresis:** Fixed to 0
- **Green band setting range:** The lower limit to the upper limit of the scale. However, the lower limit of the display position must be smaller than the upper limit.
- **Decimal place:** 1 or 2
- **Misc:** Nonlinear input is possible by correcting the input value.

WT Communication (/E2)
- Acquires data by connecting to WT equipment manufactured by Yokogawa Meters & Instruments Corp. via Ethernet communication.
  - Supported models: WT1800, WT500, WT300
  - Number of connectable units: 16
  - Communication cycle: 500 ms/1 s/2 s/5 s/10 s/15 s/20 s/30 s
  - Types of data that can be obtained:
    - Voltage, current, power, power factor, phase, electrical energy, high-frequency wave, etc.
  - Number of data allocations: 300

EtherNet/IP Communication (/E1)
- Can join an Ethernet/IP network as an adapter (or a server)
  - Loading data from the measurement (I/O module) channel or math channel (/MT)
  - Loading and writing data from/to the communication channel (/MC)
  - Implementation level: Level 2
  - Maximum number of connections: 20 (up to 10 at the TCP/IP level)
  - Supported protocols: EIP/PCCC, EIP/native
## GM10 HARDWARE SPECIFICATIONS

- **Material:** Polycarbonate
- **External Dimensions:** 45.1(W)×111(H)×107.1(D) mm
- **Weight:** Approx. 0.25 kg

### Power Supply and Isolation
- **Power supply:** Supplied from the GM90PS Power Supply Module
- **Power consumption:** 2.8 W maximum
- **Insulation resistance:** Between RS-422/485 terminal and internal circuit and between Ethernet terminal and internal circuit, 20 MΩ or higher at 500 V DC
- **Isolation diagram**

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Description</th>
<th>Isolated by Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-422/485 terminal ([C3 option])</td>
<td>GM90PS ground terminal</td>
<td>Circuits delimited by lines are mutually isolated.</td>
</tr>
<tr>
<td>Ethernet port</td>
<td>Internal circuit</td>
<td></td>
</tr>
</tbody>
</table>

### Other Specifications
- **Memory backup:** A built-in lithium battery backs up the settings and runs the clock.

### External Dimensions

<table>
<thead>
<tr>
<th>Unit: mm [approx. inch]</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.5 [1.67]</td>
</tr>
<tr>
<td>45.1 [1.77]</td>
</tr>
<tr>
<td>117.1 [4.61] ([C3])</td>
</tr>
<tr>
<td>107.1 [4.22]</td>
</tr>
<tr>
<td>3 [0.12]</td>
</tr>
<tr>
<td>8 [0.31]</td>
</tr>
<tr>
<td>100 [3.94]</td>
</tr>
<tr>
<td>RS-422/485 terminal</td>
</tr>
<tr>
<td>([C3 option])</td>
</tr>
<tr>
<td>Ethernet port</td>
</tr>
<tr>
<td>USB port</td>
</tr>
</tbody>
</table>

---

## GM90MB MODULE BASE SPECIFICATIONS

### Slide locks (top and bottom)

<table>
<thead>
<tr>
<th>Unit: mm [approx. inch]</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.7 [2.27]</td>
</tr>
<tr>
<td>50 [1.97]</td>
</tr>
<tr>
<td>39.5 [1.56]</td>
</tr>
<tr>
<td>9.5 [0.37]</td>
</tr>
<tr>
<td>135 [5.31]</td>
</tr>
<tr>
<td>2×5.5(0.22)×5.9(0.23)</td>
</tr>
<tr>
<td>Oval hole for wall mounting</td>
</tr>
</tbody>
</table>

### External Dimensions

<table>
<thead>
<tr>
<th>Unit: mm [approx. inch]</th>
</tr>
</thead>
<tbody>
<tr>
<td>103.5 [4.07]</td>
</tr>
<tr>
<td>106.8 [4.20]</td>
</tr>
<tr>
<td>13 [0.51]</td>
</tr>
</tbody>
</table>

- **Number of installable modules:** 1
- **Power consumption:** Less than 0.01 W
- **Automatic module number assignment function:** Automatically assigns a module number when a module is connected
- **External Dimensions:** 56.8(W)×135(H)×103.1(D) mm
- **Weight:** Approx. 0.15 kg

---

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**GM90PS POWER SUPPLY MODULE SPECIFICATIONS**

- Rated supply voltage: 100 to 240 VAC
- Allowable supply voltage: 90 to 132 V AC, 180 to 264 V AC
- Power frequency: 50 Hz ± 2%, 60 Hz ± 2%
- Power switch: Available
- Terminal type: Inlet or M4 screw terminal
- Allowable interruption time: Less than 1 cycle of the power supply frequency
- Insulation resistance: Between the power supply terminal and earth: 20 MΩ or higher at 500 V DC
- Withstand voltage: Between the power supply terminal and earth: 3000 V AC (50/60 Hz) for 1 minute
- Grounding: Be sure to set a low grounding resistance.
- Material: Polycarbonate
- External Dimensions: 56.8(W)×135(H)×107.1(D) mm
- Weight: Approx. 0.55kg

**External Dimensions**

Unit: mm [approx. inch]

- [Diagram showing external dimensions with specific measurements]
## UNIT EXTERNAL DIMENSIONS

Unit: mm [approx. inch]

### Main unit (single unit)

<table>
<thead>
<tr>
<th>Number of I/O modules connected</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main unit (single unit)</td>
<td>188</td>
<td>238</td>
<td>288</td>
<td>338</td>
<td>388</td>
<td>438</td>
<td>488</td>
<td>538</td>
<td>588</td>
<td>638</td>
</tr>
</tbody>
</table>

### Main unit (multi unit)

<table>
<thead>
<tr>
<th>Number of I/O modules connected</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main unit (multi unit)</td>
<td>238</td>
<td>288</td>
<td>338</td>
<td>388</td>
<td>438</td>
<td>488</td>
<td>538</td>
<td>588</td>
<td>638</td>
<td>638</td>
</tr>
</tbody>
</table>

### Sub unit (multi unit)

<table>
<thead>
<tr>
<th>Number of I/O modules connected</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub unit (multi unit )</td>
<td>188</td>
<td>238</td>
<td>288</td>
<td>338</td>
<td>388</td>
<td>438</td>
<td>488</td>
<td>538</td>
<td>588</td>
<td>638</td>
</tr>
</tbody>
</table>
### Vertical Mounting Dimensions for DIN Rail Mounting

Unit: mm [approx. inch]

- DIN rail
  - 68.6 [2.70]
  - 185 [7.28]

### Wall Mount Dimensions

Unit: mm [approx. inch]

|--------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|

M4 depth 3 mm [0.12 inches] or more

Tolerance: ±0.3 [±0.012]
APPLICATION SOFTWARE
SMARTDAC+ STANDARD
• Universal Viewer
• Hardware Configurator
• IP Address Configurator

Download the latest version of the software from the following URL.
www.smartdacplus.com/software/en/

PC System Requirements
Operating system:

<table>
<thead>
<tr>
<th>OS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Vista</td>
<td>Home Premium SP2 (excluding 64-bit editions)</td>
</tr>
<tr>
<td></td>
<td>Business Edition SP2 (excluding 64-bit editions)</td>
</tr>
<tr>
<td>Windows 7</td>
<td>Home Premium SP1 (32- or 64-bit edition)</td>
</tr>
<tr>
<td></td>
<td>Professional SP1 (32- or 64-bit edition)</td>
</tr>
<tr>
<td>Windows 8.1</td>
<td>No edition, Pro</td>
</tr>
</tbody>
</table>

Processor and main memory:

<table>
<thead>
<tr>
<th>OS</th>
<th>Processor and main memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Vista</td>
<td>Intel Pentium 4, 3 GHz or faster x64 or x86 processor. At least 2 GB.</td>
</tr>
<tr>
<td>Windows 7</td>
<td>32-bit edition: Intel Pentium 4, 3 GHz or faster x64 or x86 processor. At least 2 GB.</td>
</tr>
<tr>
<td>Windows 8.1</td>
<td>64-bit edition: Intel Pentium 4, 3 GHz or faster x64 processor. At least 2 GB.</td>
</tr>
</tbody>
</table>

Web browser:
Supported browser: Windows Internet Explorer
Java Runtime Environment 1.7.0_xx
(Version 7 Update xx) where xx is 51 or higher
Version: Internet Explorer 8, Internet Explorer 9, Internet Explorer 10, or Internet Explorer 11

Hard disk:
100MB or more of free space (depending on the amount of data, you may need more memory).

Display:
A video card that is recommended for the OS and a display that is supported by the OS, has a resolution of 1024 x 768 or higher, and that can show 65,536 colors (16-bit, high color) or more.

Universal Viewer
The universal viewer can display the following data generated by data loggers or recorders on the screen and print it out on the printer.
• Display data file
• Event data file
• Report data file
• Manual sampled data file

Viewer function: Waveform display, digital display, circular display, list display, report display, operation log display, etc.
Data conversion: File conversion to Excel and ASCII format

Hardware Configurator
• Offline setting on Web browser
Settings can be configured from Internet Explorer 8, 9, 10, and 11.

IP Address Configurator
• GM10 IP address assignment
Edit the GM10’s host name, IP address, DNS server, domain name, domain suffix, and so on as well as register the host name to a DNS server.
• GM10 search Search for GMs in the same network segment and list them.
MODEL AND SUFFIX CODES

GM10 Model and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM10</td>
<td></td>
<td>Data Acquisition Module for SMARTDAC+ GM</td>
</tr>
<tr>
<td>Type</td>
<td>-1</td>
<td>Standard (Max. measurement channels: 100)</td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td>Large memory (Max. measurement channels: 500)</td>
</tr>
<tr>
<td>Area</td>
<td>E</td>
<td>General</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Always zero</td>
</tr>
</tbody>
</table>

SPECIFICATIONS OF OPTIONS

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/C3</td>
<td>RS-422/485</td>
</tr>
<tr>
<td>/C8</td>
<td>Bluetooth</td>
</tr>
<tr>
<td>/MT</td>
<td>Mathematical function (with report function)</td>
</tr>
<tr>
<td>/MC</td>
<td>Communication channel function</td>
</tr>
<tr>
<td>/LG</td>
<td>Log scale</td>
</tr>
<tr>
<td>/E1</td>
<td>EtherNet/IP communication*</td>
</tr>
<tr>
<td>/E2</td>
<td>WT communication*</td>
</tr>
</tbody>
</table>

* Communication channel function (/MC option) must be specified at the same time with WT communication.

GM90PS Model and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM90PS</td>
<td></td>
<td>Power Supply Module for SMARTDAC+ GM</td>
</tr>
<tr>
<td>Type</td>
<td>-1</td>
<td>Always –1</td>
</tr>
<tr>
<td>Area</td>
<td>N</td>
<td>General</td>
</tr>
<tr>
<td>Supply voltage</td>
<td></td>
<td>100-240V AC</td>
</tr>
<tr>
<td>Power supply connection</td>
<td></td>
<td>D Power inlet with UL/CSA cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F Power inlet with VDE cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H Power inlet with GB cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N Power inlet with NBR cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q Power inlet with BS cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R Power inlet with AS cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>W Screw terminal (M4) (without power cable)</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Always zero</td>
</tr>
</tbody>
</table>

GM90MB Model and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM90MB</td>
<td>-01</td>
<td>Module Base for SMARTDAC+ GM</td>
</tr>
<tr>
<td>Area</td>
<td>N</td>
<td>General</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Always zero</td>
</tr>
</tbody>
</table>

OPTIONAL ACCESSORIES (SOLD SEPARATELY)

<table>
<thead>
<tr>
<th>Product</th>
<th>Model/part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD card (1 GB)</td>
<td>773001</td>
</tr>
<tr>
<td>Shunt resistor for M3 terminal (10 Ω ± 0.1 %)</td>
<td>X010-010-3</td>
</tr>
<tr>
<td>Shunt resistor for M3 terminal (100 Ω ± 0.1 %)</td>
<td>X010-100-3</td>
</tr>
<tr>
<td>Shunt resistor for M3 terminal (250 Ω ± 0.1 %)</td>
<td>X010-250-3</td>
</tr>
<tr>
<td>Shunt resistor for clamp terminal (10 Ω ± 0.1 %)</td>
<td>438922</td>
</tr>
<tr>
<td>Shunt resistor for clamp terminal (100 Ω ± 0.1 %)</td>
<td>438921</td>
</tr>
<tr>
<td>Shunt resistor for clamp terminal (250 Ω ± 0.1 %)</td>
<td>438920</td>
</tr>
<tr>
<td>Dummy cover</td>
<td>B6740CZ</td>
</tr>
</tbody>
</table>

Test Certificate (QIC, sold separately)

QIC is available for each model.

User's Manual

Product user’s manuals can be downloaded from the following URL. You will need Adobe Reader 7 or later by Adobe Systems.


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