User's Manual

SMARTDAC+

Model GA10/GA10CL/GA10UP

Data Logging Software User's Manual

YOKOGAWA
Yokogawa Electric Corporation

IM 04L65B01-01EN
12th Edition

Introduction

This manual explains how to use Data Logging Software GA10 (hereafter referred to as GA10). To ensure correct use, please read this manual thoroughly before beginning operation.

For details on the functions related to SMARTDAC+ series options, see also the manual for the options.

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- **Electronic Manuals (this manual, and related manuals)**

Manual Title	Manual No.
Model GA10/GA10CL/GA10UP Data Logging Software User's Manual (this manual)	IM 04L65B01-01EN
SMARTDAC+STANDARD Universal Viewer User's Manual	IM 04L61B01-01EN

- **Paper Manuals (manuals supplied with the product)**

Manual Title	Manual No.
GA10 Data Logging Software Downloading the Latest Software and Manuals	IM 04L65B01-02Z2

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12th Edition: June, 2018 (YK)

How to Use This Manual

Structure of the Manual

This manual contains the following chapters.

Chap.	Title	Description
1	Before Using the Product	Provides an overview of Data Logging Software GA10. It also explains the main specifications of the software and the PC system requirements.
2	Preparing to Collect and Record Data	Provides a flowchart and the procedure to prepare the software for data collection and recording.
3	Configuring and Starting Data Collection and Recording	Explains two configuration modes for data collection and recording with GA10: Simple Settings and Detail Settings.
4	Using the Math Function (/MT option)	Explains the GA10's math function (/MT option).
5	Using the Report/Print Function (/RP option)	Explains the GA10's report/print function (/RP option).
6	Monitoring Data Collection	Explains how to use the Monitor Page to monitor data collection.
7	Using the Custom Display Function (/CG option)	Explains the GA10's custom display function (/CG option).
8	Managing Recording Data	Explains how to edit recording data files from a list and how to display recording data files on a viewer.
9	Managing Users	Explains how to register, delete, and edit information of users that will perform data collection and recording with GA10.
10	OPC-UA Server Function (/UA option)	Explains the OPC-UA server function (/UA option).
11	Modbus Server Function	Explains the Modbus server function
12	Troubleshooting	Provides messages that GA10 may display and how to deal with them as well as answers to frequently asked questions.
--	Appendix	Provides examples on how to create templates and definitions of keywords.

Scope of This Manual

This manual does not explain the operations of your PC's operating system. For this information, read the Windows user's guide or related materials.

Conventions Used in This Manual

Notes	
Important	Identifies important information required to understand operations or functions.
Note	Calls attention to information that is important for the proper operation of GA10.
Reference Item	
▶	Reference to related operation or explanation is indicated after this mark. Example: ▶ section 4.1
Conventions Used in the Procedural Explanations	
Bold characters	Indicates character strings that appear on the screen. Example: **Voltage**

Images

The images used in this manual may differ from those that actually appear in the software. Such differences do not affect the procedural explanation.

Version and Functions Described in This Manual

Ed.	Product	Addition and Change
1	Ver. 1.01.xx	—
2	Ver. 1.02.xx	Modified to support GX/GP R2. Expansion to Modbus Device Definition Files (UTA advanced series), other improvements, changes to display and system requirements.
3	Ver. 2.01.xx	Modified to support GM10. Modified to include mail function enhancements, language switching, and the following options. Report/Print function (/RP), OPC-UA server function (/UA), and Math function (/MT)
4	Ver. 2.02.xx	Modified for functional improvements (retention of settings when connected devices are added, warning display when communication is disconnected, etc.)
5	Ver. 2.02.02	Modified for functional improvements (fixed report printing problems on some printers and the like), improvements to descriptions.
6	Ver. 2.03.xx	Modified to support GX/GP/GM R3. Added descriptions for project setting display and print functions. Added descriptions for starting multiple client screens and DDE server's Visual Basic 6.0 support. Modification to the operating environment.
7	Ver. 2.04.xx	Addition of new functions (common alarm ACK setting, sharing of the temporary suspension of warning beeps, etc.) and improvements to the report/print function (/RP option). Modified to support GX/GP/GM R3.02.01 (AO module).
8	Ver.3.01.xx	Added descriptions for the custom display function (/CG option). Modified to support connections with the WT3000/WT3000E. Expansion to the number of channels of the math function (/MT option). Added descriptions for manual save and other functions. Improved screens. Improvements to descriptions.
9	Ver. 3.02.xx	Modified to support GX/GP/GM R4. Added descriptions for functional improvements such as Alarm foreground window and Operation dialog boxes (/CG). Improved screens. Improvements to descriptions.
10	Ver. 3.03.xx	New functions were added such as different alarm sounds, individual alarm ACK, clearing of alarm log, storing of viewer display condition files in the GA10 server folder, linked viewer display of data via a GA10 client, and test mail transmission.
11	Ver. 3.04.xx	Added descriptions for the improvement (font size, grid, zone, legend position, etc.) to the waveform printing of the report/print function, the improvement to the deletion of entries from the Register Device list, and the improvement to the manual save operation.
12	Ver. 3.05.xx	Addition of the Modbus server function, improvements to the difference between the GA10 server time and data time, statistics on the trend monitor, GA10 server port change function, support for the formula ABS, alarm information export selection function for EXCEL format recording files, support for 16-character channel names in Modbus device definition files, performance improvements in displaying large operation logs on Universal Viewer, show/hide function for the parameters shown in the statistics dialog box on Universal Viewer.

Revisions

1st Edition	February, 2014
2nd Edition	June, 2014
3th Edition	January, 2015
4th Edition	April, 2015
5th Edition	June, 2015
6th Edition	December, 2015
7th Edition	April, 2016
8th Edition	November, 2016
9th Edition	June, 2017
10th Edition	December, 2017
11th Edition	March, 2018
12th Edition	June, 2018

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SMARTDAC+ Data Logging Software GA10

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==========
This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).
This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Contents

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Chapter 10 OPC-UA Server Function (/UA option)

Chapter 11 Modbus Server Function

Chapter 12 Troubleshooting

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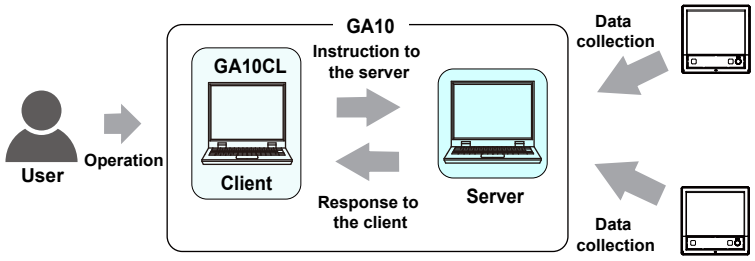
Chapter 1 Before Using the Product

1.1 Overview

Data Logging Software GA10 is used to collect data from measuring instruments and controllers via communication and monitor and record the collected data. Recorded data can be displayed and printed from the Viewer software.
To use GA10, you need a PC that can connect to target devices. The connection between the PC and target devices is established through Ethernet communication, serial communication, or USB communication (GM only.)
You can use the Simple Settings mode to easily start data collection.

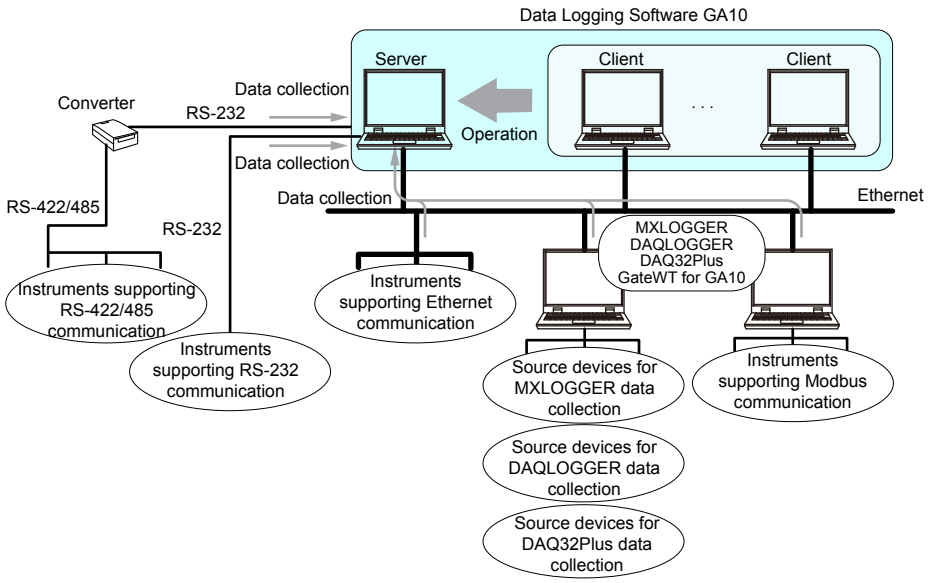
Server and Client

GA10 is a client-server software application. Users perform various server operations from a client. The server collects, records, and manages data received from connected devices on the basis of the instructions received from the client.
When you install GA10 to a single PC, the client function and server function are installed together. You can also install GA10CL, which is a version that contains only the client function, in other PCs. Multiple clients can simultaneously access a single server.



Connectivity with Many Devices

GA10 is a software application that consolidates various devices connected over a network and performs data collection. GA10 can connect to YOKOGAWA recorders and data loggers. It can also collect data that has been acquired by YOKOGAWA's data acquisition software (MXLOGGER, DAQLOGGER, and DAQ32Plus) Further, it can connect and collect data from YOKOGAWA's data acquisition software (MXLOGGER, DAQLOGGER, and DAQ32Plus) and Yokogawa Test & Measurement's power meters (WT3000/WT3000E). Moreover, it supports the Modbus protocol, enabling data collection from YOKOGAWA's control instruments (temperature controllers, signal conditioners, and power monitors). GA10 can also collect data from other manufacturers' devices that support Modbus communication.



- MXLOGGER, DAQLOGGER, DAQ32Plus are YOKOGAWA's data collection applications. GateWT for GA10 is YOKOGAWA's driver software.
- Modbus ASCII protocol is not supported.

Data Collection Project

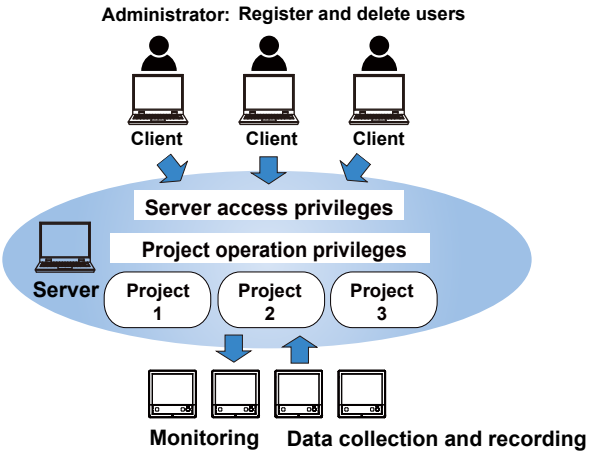
GA10 collects data in units of projects. Projects are created by users to suite their purposes. For example, a project named “Process A” can be created to collect measured data from a process called “A.” In this way, a project can be created for each set of collected data.
For each project, the data to be collected, data to be recorded, the monitor page layout, and the like are specified.
Multiple projects can be created in a single server.

Monitoring

Collected data can be monitored on the Monitor Page.
On the Monitor Page, you can arrange four types of displays (trend, digital, meter, and alarm) or five types of displays that include the custom display on models with the /CG option in an easy-to-view layout.
In addition, related data can be displayed in groups to monitor measurements efficiently. In the trend display, you can refer to past data.

User Management

GA10 users can be registered and managed. There are two user levels: administrator and user. Administrators are responsible for registering and deleting all users. Users enter their IDs and passwords to access a server.
Of the users registered in a server, only those that have been granted privileges can access projects. The operation scope of each user can be managed by assigning one of four levels: owner, manager, operator, and monitor. If a user is accessing a project, other users cannot access that project.

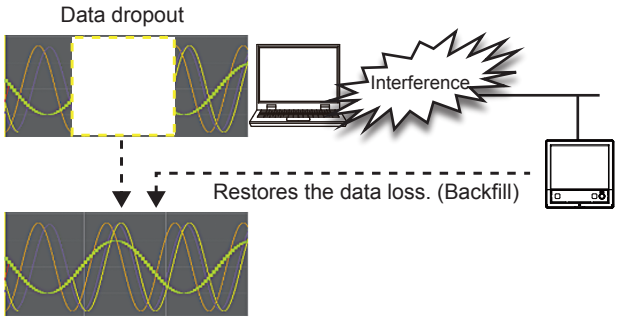


Features to improve reliability

GA10 features the following functions to ensure reliable data collection.

Data supplementing function (Backfill function)

If a data dropout occurs in the data file that is being recorded due to a communication interference, this function automatically acquires data from the internal memory of the device and restores the data loss in the file.



Several conditions must be met for the backfill function to operate properly.
For details, see **Q4 on page 12-7**.

Auto reconnection when communication is disconnected

If the communication is disconnected and data collection is interrupted, communication retry is performed every approximately 30 seconds. When communication recovers, the server resumes data collection and recording. This allows data loss to be kept to a minimum.

Protection of data files up to the moment of power failure

GA10 writes to the data file every approximately 10 seconds. This reduces the chances of the data file being lost in the event the PC shuts down unexpectedly.

Convenient Features

- You can use the Simple Settings feature to easily start data collection.
- You can set the data timestamp to PC time or Device time.
- The DDE (Dynamic Data Exchange) server feature allows collected data to be loaded into Excel and other applications.
- Multiple screens (operation and monitor) can be started on a single PC.
- Project settings can be displayed and printed.
- GA10 has a trial mode that can be used for 60 days without a license.

Functional Addition Option

The following options can be added to the GA10.

- Report/Print function (/RP option)
- Math function (/MT option)
- OPC-UA server function (/UA option)
- Custom display function (/CG option)

Connectable Devices and Software

The following table lists the devices and software applications that GA10 can connect to.

Registering devices for connection: ▶ page 3-3, 3-10
Connectable devices and interfaces: ▶ page 3-16

Compatible Devices and Software		Text Appearing on the GA10 Screen When Connected	
DAQSTATION	CX1xxx	**CX1000**	
	CX2xxx	**CX2000**	
	DX1xxx	**DX1000**	
	DX2xxx	**DX2000**	
FX1000	FX1xxx	**FX1000**	
DAQMASTER	MV1xxx	**MV1000**	
	MV2xxx	**MV2000**	
	MX100	**MX100**	
	MW100	**MW100**	
µR	µR10000	**µR10000**	
	µR20000	**µR20000**	
DARWIN	DA100	**DA100**	
	DR130	**DR130**	
	DR230	**DR230**	
	DR240	**DR240**	
SMARTDAC+	GX10	**GX10**	**or, GXGPGM_PIDSlot0** [2] **to GXGPGM_PIDSlot9** [2]
	GX20	**GX20**	
	GP10	**GP10**	
	GP20	**GP20**	
	GM10 [1]	**GM10**	
UTAdvanced	UT32A	**UP35A**	**or UP35A_R3** [2]
	UT35A	**UP55A**	**or UP55A_R3** [2]
	UT52A	**UT52A**	**or UT52A_R3** [2]
	UT55A	**UT55A**	**or UT55A_R3** [2]
	UT75A	**UT75A**	**or UT75A_R3** [2]
	UP35A	**UP35A**	**or UP35A_R3** [2]
	UP55A	**UP55A**	**or UP55A_R3** [2]
	UM33A	**UM33A**	
WT3000 [3]	WT3000	**WT3000**	
	WT3000E	**WT3000E**	
DAQWORX	DAQLOGGER	**DAQLOGGER**	
	DAQ32Plus	**DAQ32Plus**	
	MXLOGGER	**MXLOGGER**	
GateWT for GA10 [4]		**GateWT for GA10**	
Devices supporting the Modbus protocol [5]		***hardware***	

1 Supported in GA10 R2.01.01. The advanced security function (/AS) option is supported in GA10 R2.03.01.

2 The displayed characters of the product name that is used when connecting to a GA10 with the custom display function (/CG option). (It corresponds to the output channel.)
On the GX/GP/GM, you use the PID control module by selecting the slot in which it is installed on the custom display at the time the module is installed.

3 The WT3000 and WT3000E are precision power analyzers by Yokogawa Test & Measurement Corporation.

4 GateWT for GA10 is YOKOGAWA's driver software. It is software for connecting to the WT series power meters (excluding the WT3000/WT3000E) of Yokogawa Test & Measurement Corporation. Only Ethernet connection is supported between the GA10 and GateWT.

5 Devices, including YOKOGAWA control instruments, defined using Modbus device definition files. However, Modbus ASCII protocol is not supported.

Main GA10 Specifications

Maximum number of simultaneous device connections	100
Maximum number of simultaneous client connections [1]	No limit (operation guaranteed up to 32 clients)
Maximum number of simultaneous operation projects	30
Maximum number of device registrations	1000
Maximum number of project registrations	10000
Maximum number of user registrations	100
Maximum number of clients that can run simultaneously on the same PC	Multiple clients possible (See "Starting Multiple Screens" described later.)
Monitor interval (when set to PC time)	100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min
Monitor interval (when set to device time)	The acquisition interval of each device [2]
Record interval (when set to PC time)	100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min (limited to an integer multiple of the monitor interval.)
Record interval (when set to device time)	Same as the monitor interval of GA10
Maximum number of recording channels (tags) per project	2000 Models with the math function: 4000 (including the maximum math tags of 2000)
Number of display groups	50
Number of channels (tags) per display group	50
Language [3]	English, Japanese, Chinese, French, German, Russian, Korean

1 Make sure that the version of the added client is the same as the server version.

2 GX10/GX20/GP10/GP20/GM10 (R4.0 or later): 1 ms (shortest)
MX/MW, MXLOGGER: 10 ms (shortest).
WT3000/WT3000E: Same as the recorder's data update rate (except 50 ms). Shortest 100 ms.

3 Make sure to use the same language setting for this software, Windows OS, and the recorders that data is to be collected from.

On Models with the Math Function (/MT option)

Computation interval	Same as the monitor interval of measurement tags
Number of math tags	200 to 2000 [1]

1 The number is synchronized to the number of measurement tags (number of measurement channels) as shown in the following table.

Measurement tags	Math tags
100	200
200	200
500	500
1000	1000
2000	2000

If the number of measurement tags increases due to an upgrade, the number of math tags also increases accordingly.

Note

- Depending on the model and the model firmware version, older versions of GA10 may not be compatible. Update GA10 to the latest version.
- Data acquisition may not be possible depending on the communication status, monitor interval, or number of data acquisition channels.
- Data update interval of the monitor screen depends on the data acquisition interval as follows:

Data acquisition interval	Data update interval of the monitor screen
Less than 100 ms	100 ms
100 ms - 10 s	As specified
20 s or more	Half the specified interval (i.e., 10 seconds if 20 seconds is specified)

1.2 MODEL and SUFFIX Codes

- **Basic Software**

Data Logging Software

Model	Suffix Code	Optional Code	Name
GA10			Data Logging Software license
Channels	-01		100ch
	-02		200ch
	-05		500ch
	-10		1000ch
	-20		2000ch
Options		/RP	Report/Print function
		/MT	Math function
		/UA	OPC-UA server function
		/CG	Custom display function [1]

1 To create custom display monitors, you need DAQStudio (DXA170), a software sold separately. The /CG option includes a license for DAQStudio.

- **Additional Channels or Functions**

Data Logging Software Upgrade license

Model	Suffix Code	Name
GA10UP		Upgrade license for GA10
Upgrade	-01	Channel upgrade 100ch→200ch, 200ch→500ch, 500ch→1000ch, 1000ch→2000ch
	-02	Channel upgrade 100ch→500ch, 200ch→1000ch, 500ch→2000ch
	-03	Channel upgrade 100ch→1000ch, 200ch→2000ch
	-04	Channel upgrade 100ch→2000ch
	-RP	Report/Print function
	-MT	Math function
	-UA	OPC-UA server function
	-CG	Custom display function [1]

1 To create custom display monitors, you need DAQStudio (DXA170), a software sold separately. The -CG option includes a license for DAQStudio.

- **Additional Monitoring PCs (Clients)**

Data Logging Software Client license

Model	Suffix Code	Name
GA10CL		Client license for GA10
Number of licenses	-01	1 license
	-05	5 licenses
	-10	10 licenses
	-50	50 licenses

- **How the software is provided**

Name	Description
License sheet	Contains the license keys. Check that the correct number of licenses are present.
GA10 Data Logging Software Downloading the Latest Software and Manuals	1 sheet (A4 size)

1.3 PC System Requirements

- **Hardware [1]**

Item	Description
CPU	Pentium 4, 3.2 GHz or faster
Internal memory	2 GB or more
Hard disk	100 MB or more of free space, NTFS recommended
Mouse	Mouse compatible with the OS
Display	1024 x 768 dots or higher, 65536 colors or more
Communication ports [2]	RS-232 or Ethernet port compatible with the OS To perform RS-232 communication or RS-422/485 communication with a connected device, the server PC needs a RS-232 serial port. A USB port is required for USB communication.

1 If you plan to use GA10 continuously for a long period of time, we recommend that you run it on a desktop PC rather than a notebook.

2 Operation is not guaranteed if you use the converter cables, such as USB-to-serial, for the communication.

- **Operating System [1]**

OS	Edition	32 bit	64 bit	SP	Browser
Windows 7	Home Premium	Yes	Yes	SP1	IE11
	Professional	Yes	Yes	SP1	IE11
Windows 8.1	—	Yes	Yes	Update	IE11
	Pro	Yes	Yes	Update	IE11
Windows 10	Home	Yes	Yes	No SP	IE11
	Pro	Yes	Yes	No SP	IE11
Windows Server 2008 R2	Standard	No	Yes	SP1	IE11
Windows Server 2012	Standard	No	Yes	No SP	IE10
Windows Server 2012 R2	Standard	No	Yes	Update	IE11
Windows Server 2016	Standard	No	Yes	No SP	IE11

1 Exclude operating systems that Microsoft has finished supporting from the above list.

- **Other Operating Environment**

Item	Description
Microsoft Office Excel [1]	2007, 2010, 2013, 2016
Windows Internet Explorer	IE9, IE10, IE11 (Corresponding OSs are shown above.)
Windows Media Player	Version 10 or later
Adobe Reader	Adobe Reader X or later (latest version recommended)
RS-232 - RS-422/485 converter	To perform RS-422/485 communication with a connected device, use a converter. (YOKOGAWA ML2 recommended)

1 Use Microsoft Office Excel 2010 or later to view Excel reports generated with the Report/Print function (/RP option).

1.4 Menu and Icons

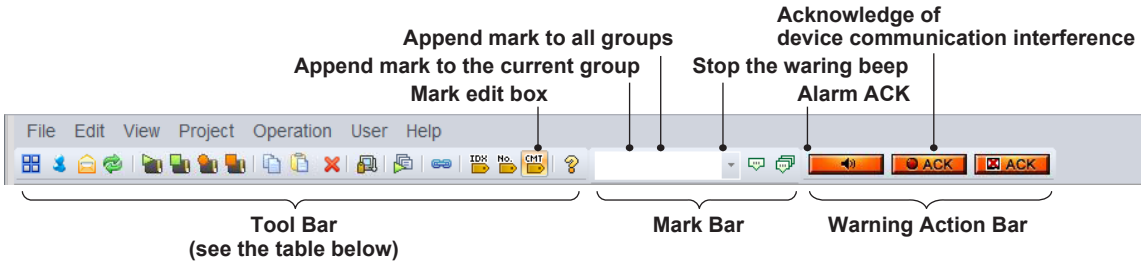
This section describes the GA10 menus and icons and page references on how to use them.

Menu before logging in

Tool Bar (see the table below)

Menu			Description	See pages...
File(F)				
	Login		Login server	2-4
	Exit		Exit application	-
View				
	Style	▶	Switch the display style	2-5
	Tool Bar		Show or hide the tool bar	-
Help(H)				
	User's &Manual	F1	Display user operation manual	-
	Input Server License...		Display server license dialogue	2-14
	About...		Display program information, version number and copyright	2-14
	Server information...		Display server version information dialogue	2-18
	To Update Website		Display website of Data Logging Software	-

Menu after logging in



Menu			Description	See pages...
File				
	Logout...		Logout from server	2-5
	New Project...		Create a Project	2-8, 1-6, 3-6
	Import Project...		Import Project information to create Project from file.	3-7
	Export Project...		Export Project information to file	3-7
	Import tags...		Import tags from tag information tag message file	3-26
	Export tags...		Export tags from tag information tag message file	3-26
	Server Port No....		Display or change the server port number.	2-13
	Modbus Server Setting...		Display or change the port number or timeout value of the Modbus server.	2-13
	Start DDE		Start DDE service	3-50
	Stop DDE [DDEServer Connection: *Host name/IP address*] (P)		Stop DDE service. While the DDE server is running, the host name or IP address of the server connected to the DDE server is displayed.	3-50
	Exit		Exit application	-
Edit				
	Copy	Ctrl+C	Copy the selection and put it on the Clipboard	3-9
	Paste	Ctrl+V	Paste the copied content	3-9
	Delete	Delete	Delete the selected content	3-4, 9-4

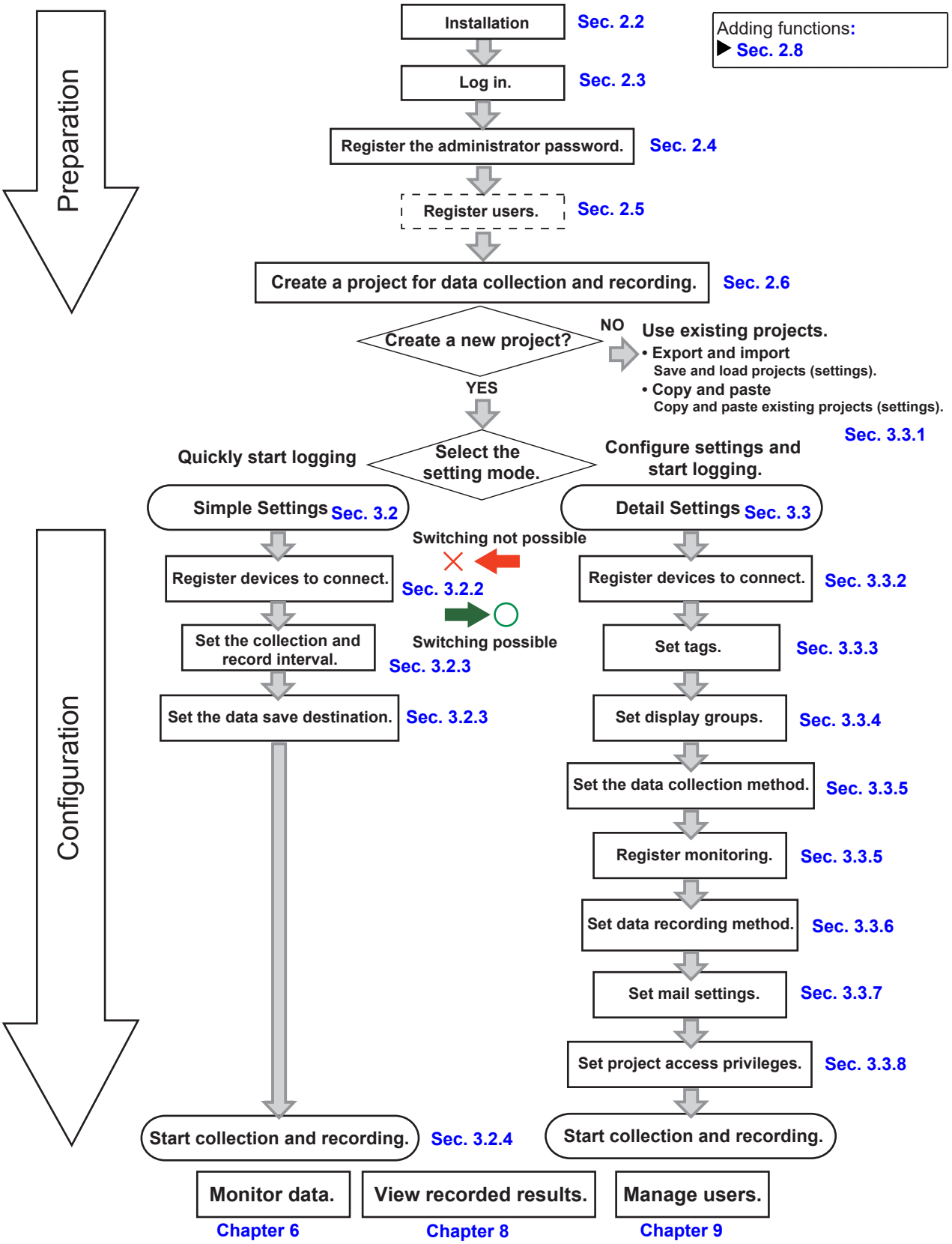
Menu		Description	See pages...
View			
	Project List Page	Switch to Project list page	2-8 , 3-5 , 6-1
	User Management Page	Switch to user management page	2-7, 9-2
	Log...	Display log dialogue	6-16
	Refresh	Update the current page	8-2
	Alarm	Show or hide alarm	6-7
	Alarm List...	Show alarm list dialogue	6-11
	Move The Window To The Top When Alarm Occurred	Show this window in front when an alarm occurs.	6-13
	Group Link	Linkage shows when switching between different groups	6-2
	Cursor value...	Open the Cursor Window	6-6
	Cursor Value Transparency ▶	Switch cursor value transparency	6-6
	Erase Cursor	Erase Cursor	6-6
	Statistics...	Display a statistics dialog box.	6-6
	Tag Display Form. ▶	Switch tag display format (Tag Index, Tag No., Tag Comment)	3-22
	User Display Form. ▶	Switch user display format	3-49
	Style ▶	Switch the display style	2-5, 6-3
	Date Format ▶	Switch the date format	6-3
	Month Display Form. ▶	Switch the month display format	6-3
	Decimal Point ▶	Switch the decimal point	6-3
	Tool Bar	Show or hide the tool bar	-
	Mark Bar	Show or hide the mark bar	-
	Warning Action Bar	Show or hide the warning action bar	-
	Language (M) ▶	Switch the language (English, Japanese, German, French, Chinese, Korean, Russian)	2-18
	Manual Save Button	Switching the show or hide Manual Save button	6-1
	Manual Save Confirm (Q)	Show or hide the manual save confirmation dialog box.	-
	Frame Size Display	Shows or hides the screen size of the custom display monitor.	7-3
	Full Screen (J)	Display the selected monitor in full screen	6-2
Project			
	Open with specified permission	Open the project according to the specified permission	9-5
	Modify Basic Information	Modify project's basic information	3-9
	Modify Owner	Modify project's owner	9-4
	Append Mark ▶	Append mark to the current group or all groups	6-7
	Reset Computing	Reset computing on the server (when math tags are enabled on GA10 with the /MT option)	4-8 , 6-14
	Start Device's Computing	Start computing in the devices used in the Project	6-14
	Stop Device's Computing	Stop computing in the devices used in the Project	6-14
	Reset Device's Computing	Reset computing in the devices used in the Project	6-14
	Reset & Start Device's Computing	Reset and start computing in the devices used in the Project	6-14
	Alarm ACK	Alarm ACK	6-11
	Clear Alarm Log	Clears the alarm log.	6-9
	Update Tag Information ▶	Updates the selected tag information manually. "Tag No., Tag Comment" or "Except Tag No., Tag Comment"	3-27
	Assign Tag Automatically...	Assign tags automatically	3-31
	Sorting Tags in Order of the Device No.	Sort tags in order by device number	3-26
	Unlock Project Forcibly	Change the project's lock state forcibly	9-5
	Setting Printout Config...(G)	Configure the setting display (select the settings to be shown)	3-57
	Config Display(I)	Displays settings	3-59

Menu		Description	See pages...
Operation			
	Start Monitoring Simultaneously	All opened Projects start monitoring simultaneously	3-5
	Stop Monitoring Simultaneously	All opened Projects stop monitoring simultaneously	3-5
	Start Recording Simultaneously	All opened Projects start recording simultaneously	3-5
	Stop Recording Simultaneously	All opened Projects stop recording simultaneously	3-5
	Re-execute Modbus Server	Restart the Modbus server.	3-52 , 11-1
	Warning Beep	Turn on or off the warning beep that sounds when a warning occurs	6-11
	Share the Warning Beep across clients	Specifies sharing or non-sharing mode of the temporary suspension of warning beeps.	
	Stop the Warning Beep	Stop the warning beep	
	Acknowledge of Device Communication Interface	Perform an acknowledge of device communication interference.	6-12
User			
	Change Information	Change user's information	2-6, 9-2
	Register New User	Register new user in server	2-7, 9-3

Chapter 2 Preparation

2.1 Preparation from Installation up to Data Collection and Recording

The following flowchart shows an outline of the procedure from GA10 installation up to data collection and recording.



2.2 Installation

The GA10 installer package includes a server, client, and viewer programs. Executing the procedure below installs all programs in a single PC.
The server runs as a Windows service and starts running as soon as it is installed.
(Hereafter, a PC with the server function installed will be referred to as a "server PC.")

Note

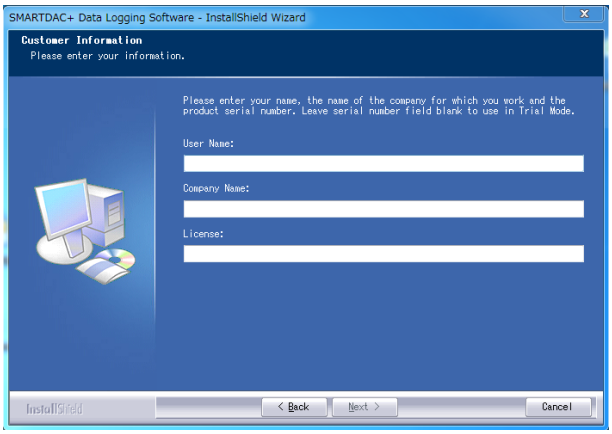
- Before installing the software, check that your PC is not infected by a virus.
- Install the programs as a Windows administrator.
- Uninstall GA10 before reinstalling.

The procedure here is explained for Windows 7.

1 Double-click the downloaded file to extract the files.

2 In the extracted folder, right-click Install_x86.exe (Install_x64.exe for a 64 bit edition), and click **Run as administrator**.

3 If you accept the license agreement, click Next.
The Customer Information dialog box appears.



4 Enter the user name, company name, and license number and then click **Next**.
If you do not enter the license number here, a 60-day trial version will be installed.

5 Continue to follow the instructions on the screen to install the software.

6 When the installation is complete, click **Finish**.
Check that SMARTDAC+ Data Logging Software has been added to the **Start** menu under **All Programs**.

Trial periods

If the GA10 is installed without the license number, the trial period starts running.

- Continuous operation is possible for 60 days. When the trial period expires, the software will no longer run.
- During the trial period, the maximum number of recording channels (tags) is 4000 (2000 tags + 2000 math tags), and all options can be used.
- Projects created with the trail version can only be passed on to products with 2000 device channels (suffix code “-20”) and with all options.
- In the software, click About on the Help menu, and check the remaining number of days in the dialog box that appears.

Installing different versions

- In case you already purchased a license for the old version but would like to try the new version for 60 days:
  You can try the new version. However, install the new version in a PC different from the one you are running the old version on.

- In case you have tried the old version before and would now like to try the new version:
  You can try the new version. However, install the new version in a PC different from the one that you tried R1 on.

- In case you already purchased a license for the old version and would like to upgrade to the new version:
  You can upgrade for free. Uninstall the old version, enter your license, and install the new version. You can use it with the same specifications as the purchased (old) version.

Project Compatibility

- Projects created in an earlier server version can be used in later server versions. Projects are not displayed for the opposite case.
- If an option is added to the GA10, projects created in the previous configuration can be used with the GA10 in the current configuration. Projects are not displayed for the opposite case.

For details on adding option functions and clients, see the following sections.

Adding Functions (GA10UP-RP, -MT, -UA, -CG)
or
Adding a Client (GA10CL)

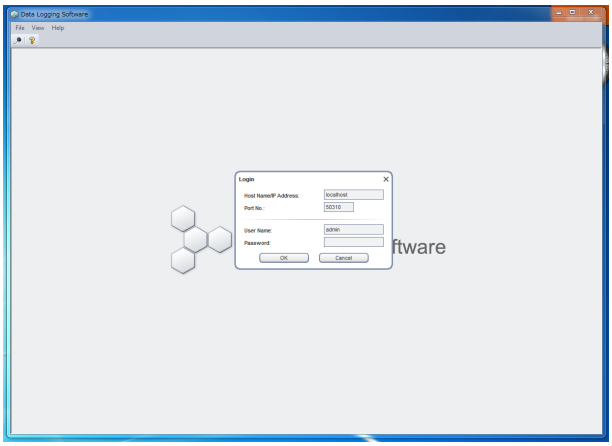
For details on the trial period and entering license information after the period ends, see the following sections.

Entering a License Number during the Trial Period
or
Entering a License Number after the Trial Period

2.3 Logging In

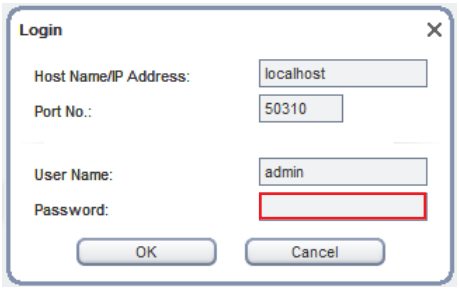
Logging in is an operation carried out to connect a GA10 client to a server.
Users start the client, log in, and perform various operations. When logging in for the first time, you do not enter a password.

1 On the **Start** menu, click **All Programs**, **SMARTDAC+ Data Logging Software**, and **Data Logging Software**.



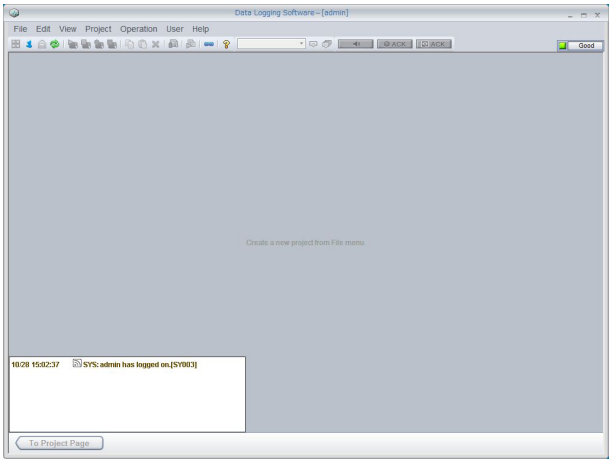
A Login dialog box appears.

2 Leave the username admin and the password blank.
User name: admin
Password: (blank)
If you want to change the port number, specify a number between 1 and 65534.



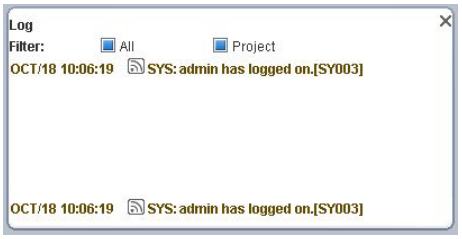
For changing the port number: ▶ Sec. 2.7.4

3 Click **OK**.
The dialog box closes, the initial Project List Page appears.



If the software is started for the first time after installation, a log dialog box appears.

4 Adjust the log dialog box display.



- Change the displayed position: Drag the dialog box to move it.
- Change the size: Point to a corner of the dialog box so that the pointer changes to an arrow. Then, drag to change the size.
- Hide: Click the × button at the top of the dialog box.
- Show again: On the View menu, click Log.

What is the log dialog box?: ▶

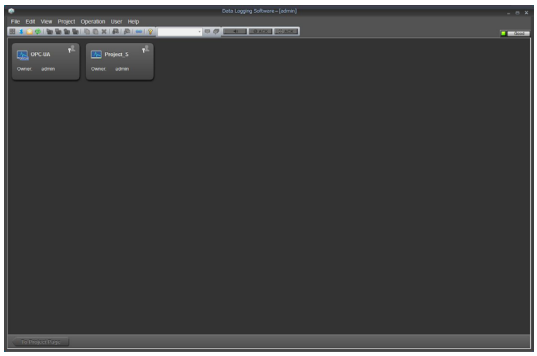
5 To create a project, on the File menu, click Create New Project.

6 To log out, on the **File** menu, click **Logout**.
A confirmation message appears. Click OK to log out.

Registering the administrator password: ▶ **Sec. 2.4**
Registering users: ▶ **Sec. 2.5**

Note

You can change the background color from the two available colors by using Style in the View menu. The following figure shows the “dark” style window. (The windows shown in all other figures of this manual is “light” style.)



Setting general display options: ▶ **Sec. 6.1.3**

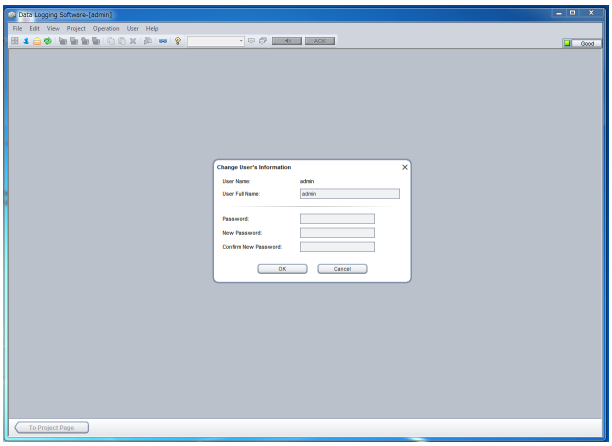
Starting Multiple Screens

- You can display multiple operation screens (clients) on the same PC. To start multiple screens, repeat the login procedure from step 1 to 3.
- When multiple screens are shown, the screens use the same display conditions stored in the PC. Be careful when you change the display settings.
- Limitations may be placed on the number of screens that can be started depending on the PC performance, collection and recording environment, and the like.
- For details on display conditions, see **Sec. 6.9.6**

2.4 Registering the Administrator Password

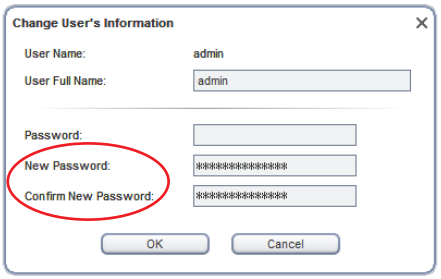
After installation, first set the administrator (admin) password. The administrator can register and delete other users and initialize their passwords.

1 After logging in, click **Change Information** on the **User** menu.



The Change User's Information dialog box appears.

2 Enter the new password for the administrator, and click **OK**.
Enter the password using 4 to 30 alphanumeric characters.



The Change User's Information dialog box closes. The new administrator password has been set.

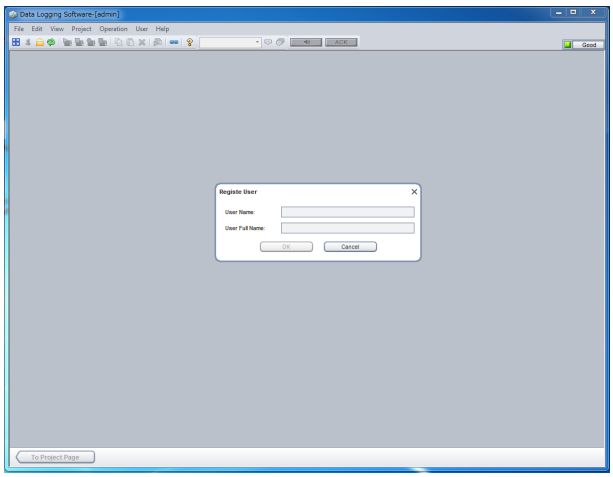
Important

After registering their passwords, users will need to enter the passwords to log in to the server. If the administrator cannot log in, administrator privileges cannot be used. Make a note of the administrator password, and do not lose it.

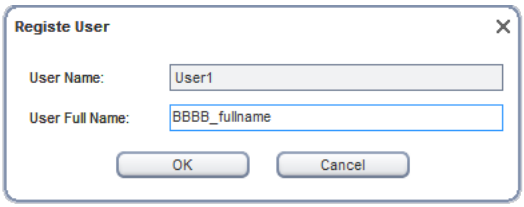
2.5 Registering Users

After registering the administrator, register users as necessary. The administrator registers users.

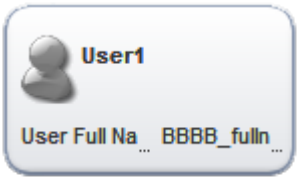
1. Start the client, and enter the administrator password that you set earlier to log in.
2. On the **View** menu, click **User Management Page**.
   Or, click the icon.
   The User Management Page appears.
3. On the **User** menu, click **Register New User**.



   The Change User's Information dialog box appears.
4. Type the user name and user full name.
   Enter up to 20 alphanumeric characters (ASCII except for the control characters) for the user name.



5. Click **OK**.
   The user is registered, and an icon is added in the window.



6. To add more users, repeat the procedure above.
   Registered users will be able to log in, set their passwords, and perform their assigned tasks.

Note

User names are case-sensitive. When logging in, enter the user name exactly as it was registered.

Differences between the administrator and users and changing and deleting users: ▶ Sec. 9.1

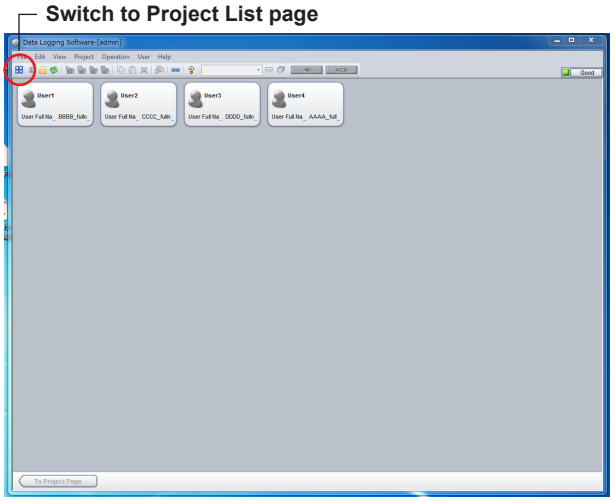
2.6 Creating a Project

After logging in to the server, create a project to manage data collection and recording.
You can create a project in one of the following ways.

- Create a new project: You can create a new data collection project.
- Export and import: You can export and import a project.
- Copy and paste: You can duplicate an existing project.

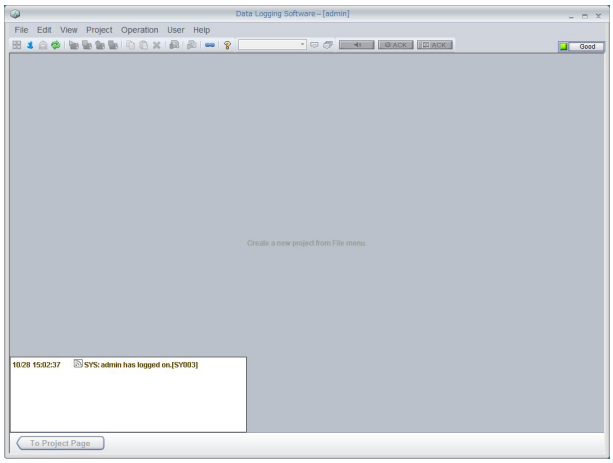
1 Switch from the User Management Page to the Project List page.

On the **View** menu, click **Project List Page**. Or, click the icon.



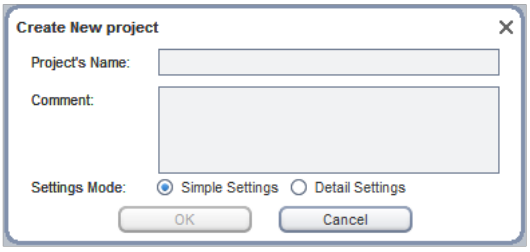
The Project List Page appears.

The first page that appears when you log in is the Project List Page.



2 On the **File** menu, click **New Project**.

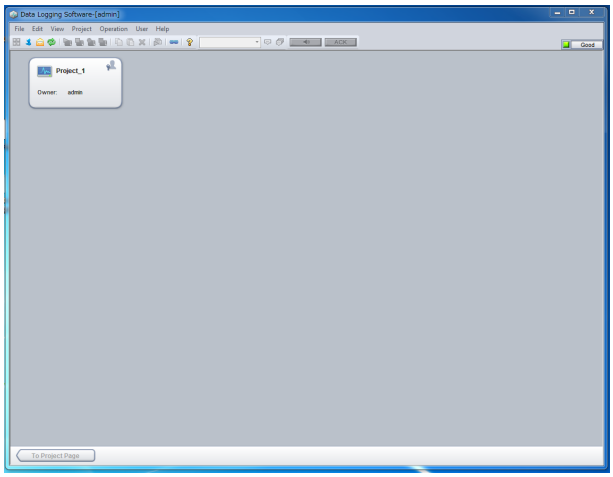
The Create New Project dialog box appears.



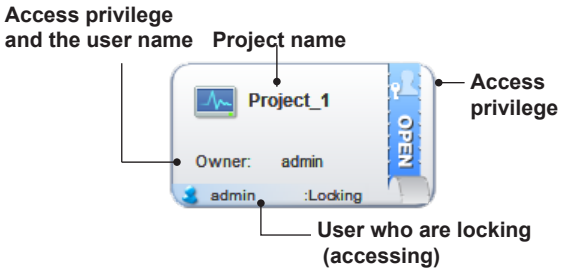
3. Type the project name and comment.
You can enter up to 20 characters for Project's Name and 60 characters for Comment.
Following characters are unavailable for Project's name: \ /:,;*?"<>|

4 Set Settings Mode to **Simple Settings** or **Detail Settings**.
To start data collection and recording with a few steps, select Simple Settings.
To set operation details, select Detail Settings.

5 Click **OK**.
A new project is created in the Project List Page.



A project that you create is shown in the Project List Page along with the information about the project.



The following types of access privileges are available.

Project access privileges: ▶ Sec. 3.3.8

6 To continue with the configuration, double-click to open the project.
For the setting procedure, see the following pages.

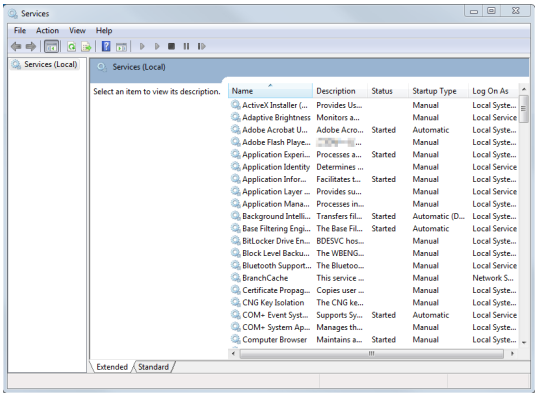
Easy Configuration (Simple Settings): ▶ Sec. 3.2
Detailed Configuration (Detail Settings): ▶ Sec. 3.3

2.7 Controlling the Server

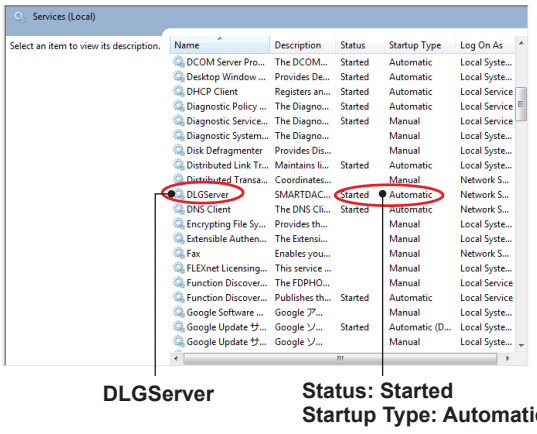
This section explains how to manually control (start, stop, and change) the GA10 server program “DLGServer. ”Perform these operations as necessary.

2.7.1 Checking Whether the Server Is Running

1 On the **Start** menu, click **Control Panel** and **Administrative Tools**, and double-click **Services**.
The Services window appears.



2 Scroll down to find DLGServer in the Name column. Check the Status column.
The DLGServer status should be indicating Started, and Startup Type should be set to Automatic.



If the DLGServer status indicates Started, the GA10 server is running.

3 After confirmation, close the window.

Note

If Startup Type is set to Automatic, the server will start and stop when Windows start and stop.

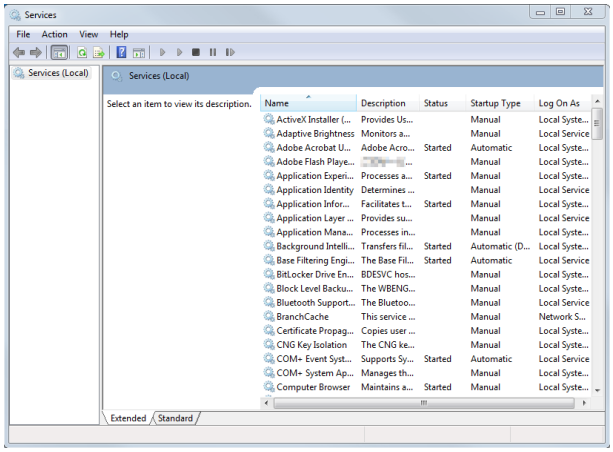
2.7.2 Starting (Restarting) or Stopping the Server

To manually start or stop the GA10 server, follow the procedure below.

Important

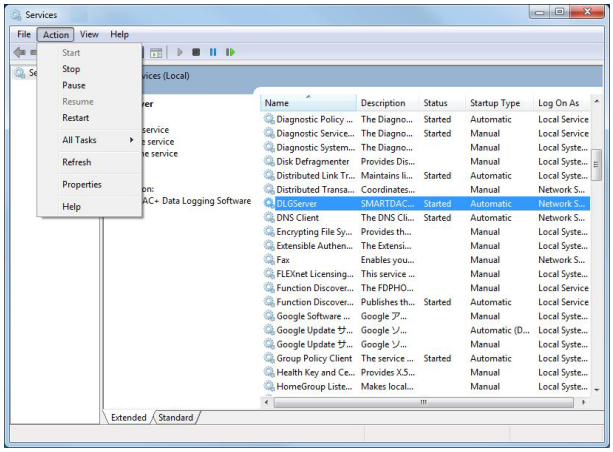
Before stopping the server, stop data collection and recording, and log out.

1. On the **Start** menu, click **Control Panel** and **Administrative Tools**, and double-click **Services**.
   The Services window appears.



2. In the Services window, choose **DLGServer**.

3. To stop the server, on the **Action** menu, click **Stop**.
   The status turns blank.



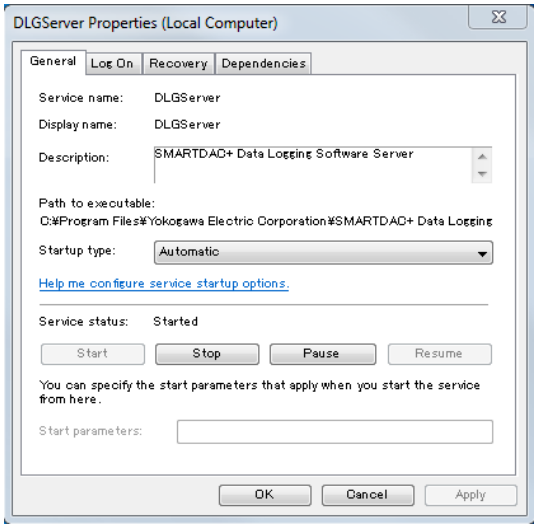
   The status turns blank.

4. To start the server, on the Action menu, click Start.
   Click Restart on the Action menu to stop the server once and restart.
   The status shows Started.

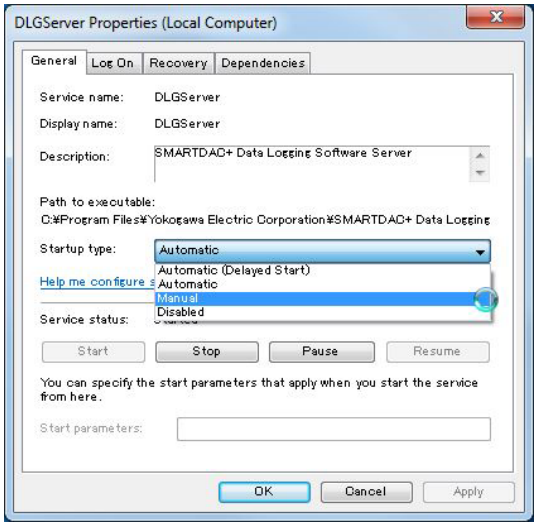
2.7.3 Changing the Server Startup Type from Automatic to Manual.

1. Carry out steps 1 to 3 in the previous section to stop the server.

2. In the Services window, double-click **DLGServer**.
The DLGServer Properties appear.



3. Click the **Startup type** arrow, and click **Manual**.



4. Click **OK** to close the dialog box.

2.7.4 Changing the Server Port Number

By default, the GA10 server port number is set to 50310. If necessary, change the port number by following the procedure below.

The port number can be changed only when a GA10 administrator logs in. Because two ports will be used, you cannot use other servers.

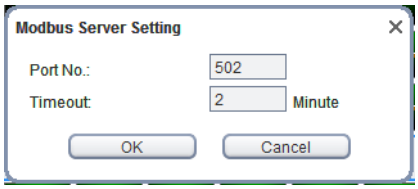
1 On the **File** menu, click **Server Port Number**.
A **Server Port Number** dialog box appears. (setting range: 1 to 65534)

2 Click **OK**.
Then, restart the GA10 server. (See the section 2.7.2)

2.7.5 Viewing or Setting the Port Number and Timeout Value of the Modbus Server

The port number and timeout value can be displayed or changed only when a GA10 administrator logs in.

1 On the **File** menu, click **Modbus Server**.
A **Modbus Server Setting** dialog box appears. (port number setting range; Port number: 1 to 65535, timeout value setting range: 1 to 120 minutes)



2 Click **OK**.
Then, restart the Modbus server. (See the section 2.7.6)

2.7.6 Restarting the Modbus Server

The Modbus server can be restarted only when a GA10 administrator logs in.

1 On the **Operation** menu, click **Re-excute Modbus Server**.

2.8 Entering a License Number

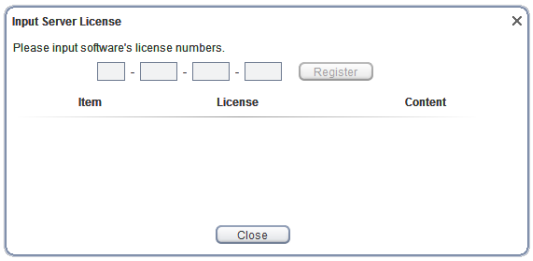
When entering a license number, use Windows administrator privileges. If you are using Windows 7, follow steps 1 and 2 below to start the software, and then enter the license number. Before entering the license, we recommend you to back up your projects.

Checking the Remaining Trial Period

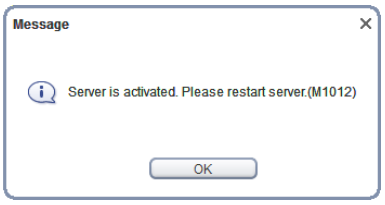
In the software, click **About** on the **Help** menu, and check the remaining number of days in the dialog box that appears.

Entering a License Number during the Trial Period

1. Right-click **Data Logging Software** in the Start menu.
2. On the shortcut menu, click **Run as administrator**.
   Data Logging Software starts.
3. Log in to the server.
4. On the **Help** menu, click **Input Server License**.
   A dialog box appears.



5. Type the license number, and click **Register**.
   A message is displayed.



6. Click **OK**.
   The license number appears in the dialog box.

7. Click **Close**.
   Restart the server.

Note

After registering the license, you must restart the server.
Restarting the server: ▶ **Sec. 2.7.2**.

Important

If you enter the server license after the trial period has expired, projects that were registered up to that point can no longer be used.
Export the project (output and save) before entering the license. Register the license, restart the server, and then import the project (reload) for use. For the procedure, see "Exporting and Importing" on page 3-7.

Entering a License Number after the Trial Period

If the trial period expires, you will no longer be able to log in. When you start the software, you will be prompted to enter the license number. If you have purchased a license, type the number.

Adding Functions (GA10UP-RP, -MT, -UA, -CG)

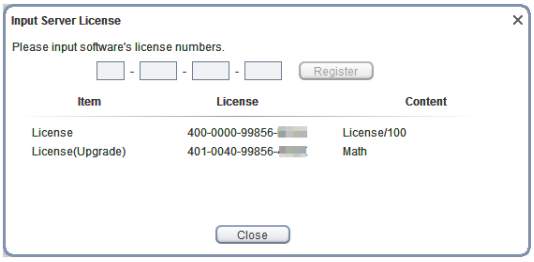
To add an option, in the Input Server License dialog box, register the upgrade license number.

Model		Name
GA10UP	-RP	Report/Print function
	-MT	Math function
	-UA	OPC-UA server function
	-CG	Custom display function

1. Right-click **Data Logging Software** in the Start menu.
2. On the shortcut menu, click **Run as administrator**.
   Data Logging Software starts.
3. Log in.
   Export the project (output and save) before entering the license.
   After registering the license, import the project (reload) for use.
4. On the **Help** menu, click **Input Server License**.
   A dialog box appears.

5. Type the license number, and click **Register**.
   A message is displayed.

6 Click **OK**.
The description of options is displayed on the second and subsequent lines under license items.



7 Click **Close**.
Then restart the server.

Restarting the server: ▶ **Sec. 2.7.2**

Adding Channels (GA10UP-01, -02, -03, -04)

To add channels (tags), in the Input Server License dialog box, register the upgrade license number. The procedure is similar to adding an option.

The following table shows the maximum number of tags in a project after channels are added.

Model	Name		Maximum Number of Tags in a Project	
			Before	After
GA10UP	-01	1 level upgrade	100	200
			200	500
			500	1000
			1000	2000
	-02	2 level upgrade	100	500
			200	1000
			500	2000
	-03	3 level upgrade	100	1000
			200	2000
	-04	4 level upgrade	100	2000

Note

On a GA10 with the math function (/MT option), adding measurement tags by upgrading also increases the math tags according to the number of tags there are after the addition.: ▶ **"Number of math tags" on page 1-4**

Adding a Client (GA10CL)

To add a client, use the installer InstallClient_x86.exe, which installs only clients. (InstallClient_x64.exe for the 64 bit edition)
You can download the installer from the following URL.

www.smartdacplus.com/software/en/

You will need to enter the client (GA10CL) license number when you install the client.

Model		Name
GA10CL		Client license (for GA10)
Number of license	-01	1 license
	-05	5 licenses
	-10	10 licenses
	-50	50 licenses

Install additional GA10CLs in different PCs from the one in which the GA10 basic software (server and client) is installed. The installation procedure is the same as the GA10 basic software.

When you start the client after installation, enter the following information.

- Host name/IP Address
  The host name or IP address of the PC in which the GA10 (server) is installed.
- Port Number
  GA10 (server) port number (default value: 50310)
- User Name
  User name already set on GA10 (default value: admin)
- Password
  The password of the above user (default value: blank)

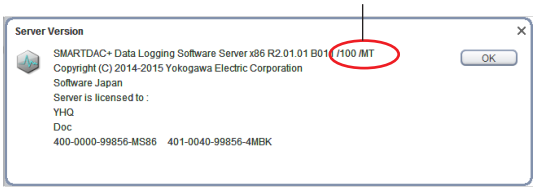
Note

Make sure that the version of the added client is the same as the server version.

2.9 Checking the Number of Channels (Tags) and Options That Can Be Used

You can check the maximum number of channels (tags) and the options that can be used in the server information dialog box.
On the **Help** menu, click **Server Information** to display the information of the server that you are logged in to.

Maximum number of channels (tags) and options



Item	Display	Description
Maximum number of channels (tags)	/number of tags	Display example: /500
Math function availability	/MT	Displayed when the Math function (option or added with an upgrade) is available.
Report/Print function availability	/RP	Displayed when the Report/Print function (option or added with an upgrade) is available.
OPC-UA server function availability	/UA	Displayed when the OPC-UA server function (option or added with an upgrade) is available.
Custom display function	/CG	Displayed when the Custom display function (option or added with an upgrade) is available.

2.10 Changing the Language

On the **View** menu, click **Language** to switch the user interface language. You can select from English, Japanese, Chinese, French, German, Russian, and Korean.

- The language setting is managed at the PC level.
- The default language is the OS language. If the OS language is an unsupported language, the language is set to English.

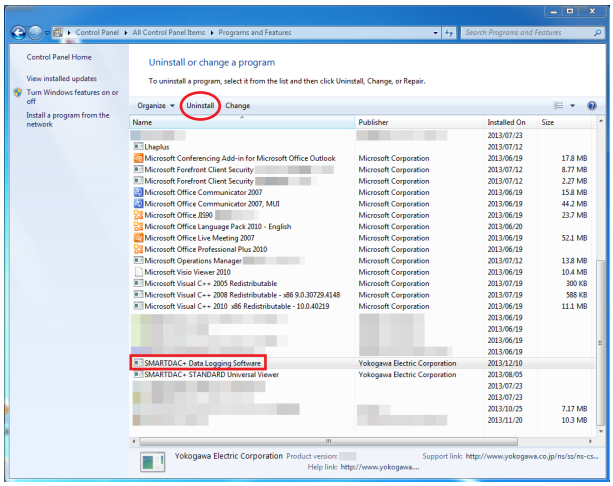
2.11 Uninstallation

To uninstall GA10, follow the procedure below.

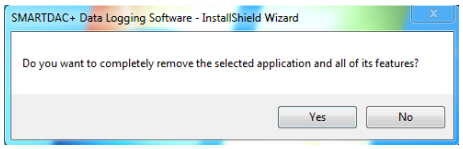
1. On the **Start** menu, click **Control Panel** and **Programs and Features**.
   A list of programs installed in your PC appears.

2. Select **SMARTDAC+ Data Logging Software**.

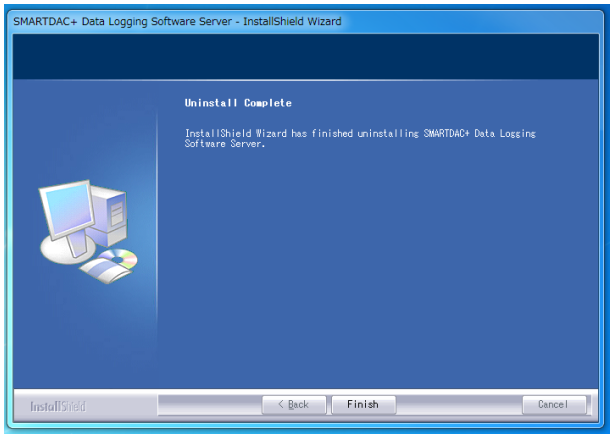
3. Click **Uninstall**.



4. A confirmation message appears. To proceed, click **Yes**.



Uninstallation begins.



Uninstallation is complete when the progress bar disappears.

Note

On Windows 8, click **Settings**, **Control Panel**, and **Programs and Features**.

Important

Do not change or delete files in the following folder: local disk > ProgramData > Yokogawa > SMARTDAC+ Data Logging Software > Config.
These files contain user information, project setting information, project status information, and device information.

Blank

Chapter 3 Configuring and Starting Data Collection and Recording

3.1 What Are Simple Settings and Detail Settings?

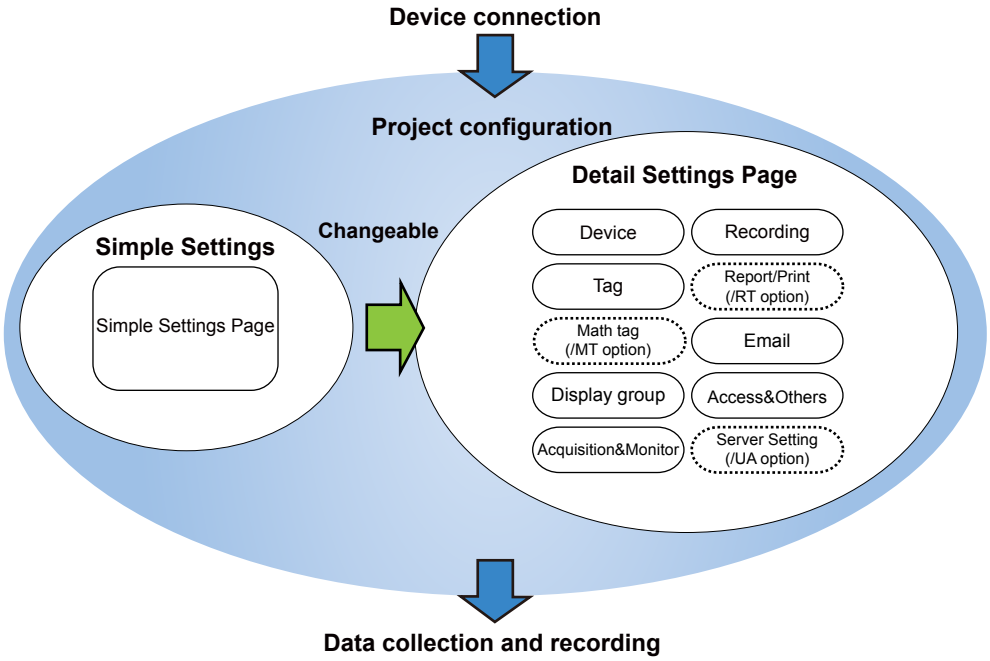
In GA10, you need to configure various project settings before beginning data collection and recording. There are two modes to configure these settings: Simple Settings and Detail Settings. You can select which setting mode to use when you create a project.

In Simple Settings mode, you only have to specify the device to connect to, data collection and recording interval, and data file save destination in a single window to begin data collection and recording.

In Detail Settings mode, you can configure settings in detail to customize data collection, monitoring, and recording.
Detail Settings mode consists of the following seven Setting Pages that you switch between to configure the settings.

- Device Setting Page
- Tag Setting Page
- Display Group Setting Page
- Collection & Monitor Page
- Record Setting Page
- Email Setting Page
- Access & Others Setting Page

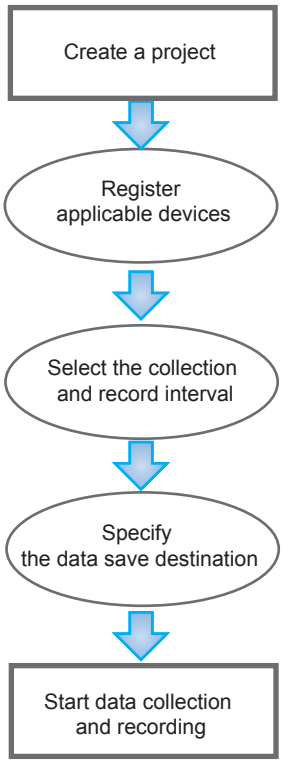
If you select Simple Settings, you can change to Detail Settings while you are configuring a new project, but you cannot change from Detail Settings to Simple Settings.



Report/Print, math tag, and OPC-UA server Setting Pages appear on GA10 that have the corresponding options.

3.2 Easy Configuration (Simple Settings)

This section explains how to configure the settings in Simple Settings mode before starting data collection.
In Simple Settings mode, you can set the device to connect to, data collection and recording interval, and data save destination in a single window. You can start data collection and recording with fewer steps than in Detail Settings mode.



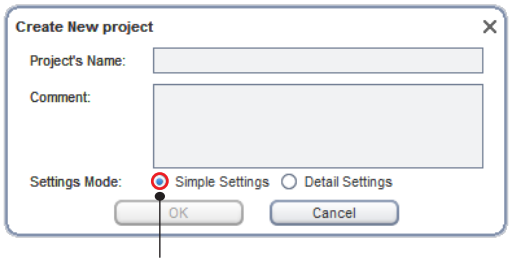
Note

If you select Simple Settings, you can change to Detail Settings while you are configuring a new project, but you cannot change from Detail Settings to Simple Settings.

Detailed Configuration (Detail Settings): ▶ Sec. 3.3

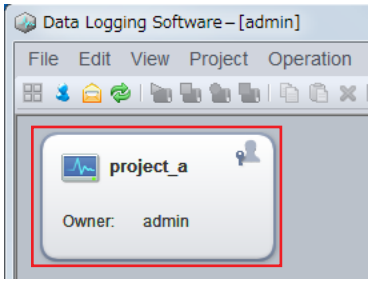
3.2.1 Creating a Project in Simple Settings Mode

1. Start GA10, and log in by typing the user name and password. (When logging in for the first time, set the user name to “admin” and leave the password blank.)
2. On the **File** menu, click **New Project**.
   The Create New Project dialog box appears.
3. Type the project name and comment. Leave Settings Mode at **Simple Settings**.



Leave this at Simple Settings.

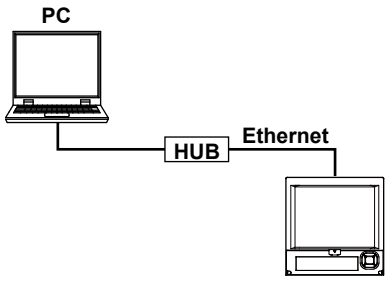
4. Click **OK**.
   A new project is created.



3.2.2 Registering Devices to Connect

Add devices to the project you created.
Below is an example of connecting a DX1000 to the PC through the Ethernet interface and registering the DX1000 in GA10.

1 Connect the device and the PC through a network using LAN cables.



* The figure shows a one-to-one connection.

2 Configure the Ethernet settings on the device. Set the device's IP address and subnet mask.

On the DX1000

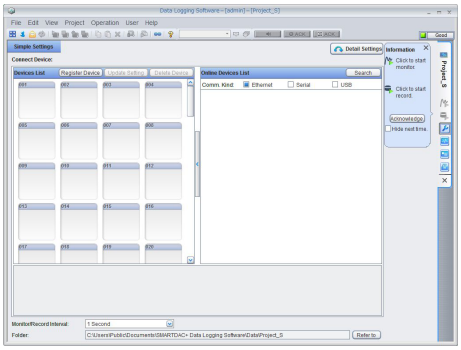
Press MENU, hold down FUNC for 3 s (to switch to basic setting mode), and select the Menu tab > Communication (Ethernet).

Note

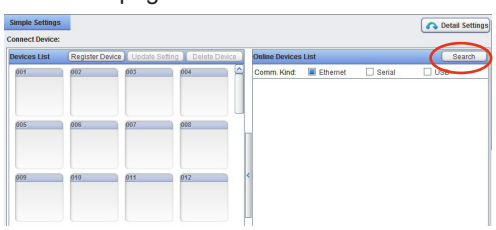
For details on where the Ethernet port is located and the hierarchy of setting menus, see the user's manual of the relevant device.

3 Check that the PC and the device have been connected.
You can check the connection using Windows Device Manager or from the command prompt.

4 Double-click the project that you created.
The Simple Settings page opens.

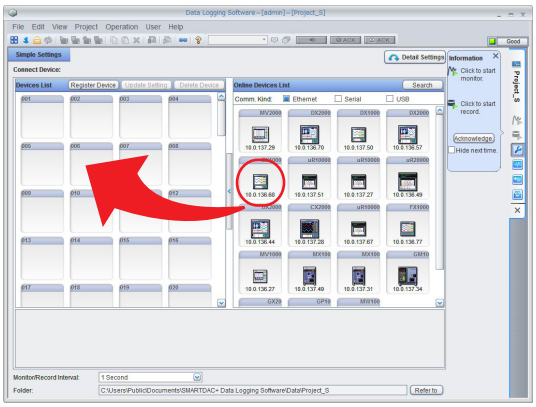


5 Click Search in the Online Devices List on the right side of the page.



Devices connected to the network are detected and displayed.

6 Drag & drop the icon of the device that you want to register to the **Device List** on the left side of the page.



In the center of the page, a window appears showing the details of the device that you are about to register.

7 If the displayed information is correct, click **OK**. To reselect a different device, click **Cancel**.

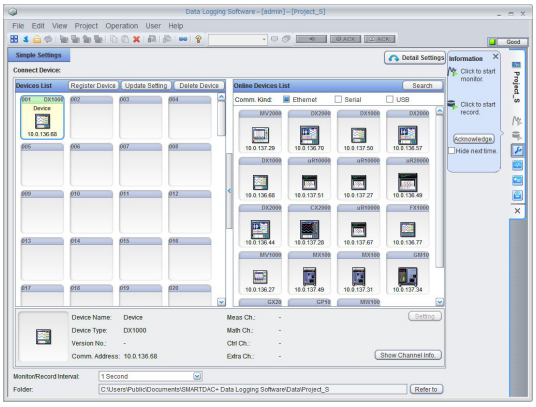
If the security settings on the device being registered are enabled, you need to enter the user information* for accessing the device. Otherwise, you can leave the user information blank and click OK.

* Not the user privileges for GA10

The DX is added to the Device List.

Note

- If a login is required for communicating with the device, you need to specify the user information. Check the user name, user ID, and password for the device, and enter them.
- When connecting to a DXAdvanced (DX1000, DX1000N, DX1000T, DX2000, or DX2000T) with the /AS1 advanced security option through the Ethernet interface, log in as an administrator to access the DX. In this situation, only one administrator will be able to log in.



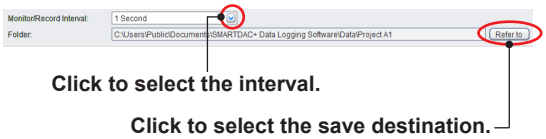
- To delete a registered device, click the device icon to select it, and click **Delete** on the **Edit** menu or click the **Delete** button. You can also select the device icon and press the DELETE key.

Note

There are two ways to register devices to a project. One way is to connect the target devices to the network first and then register, and the other way is to register without connecting the devices (offline registration).
For details on the registration procedure, see the following pages.
Offline registration: ▶ page 3-15
Register device dialog box details: ▶ page 3-17

3.2.3 Setting the Monitor and Record Interval and Save Destination

After registering the device, set the Monitor and record interval and the measurement data save destination.



1 Choose the interval from the **Monitor/Record Interval** list at the bottom of the page.

Name	Default Value	Options
Monitor/Record Interval	1 Second	100 Millisecond, 200 Millisecond, 500 Millisecond, 1 Second, 2 Second, 5 Second, 10 Second, 20 Second, 30 Second, 1 Minute, 2 Minute, 5 Minute, 10 Minute

2 Click **Refer to**, and select the directory for saving recording files.

Note

- The Refer to button for specifying the save destination folder is available only when the server and client are installed in the same PC.
- We recommend you use the default setting for the data save destination folder. (See **"Folder" on page 3-39**.)

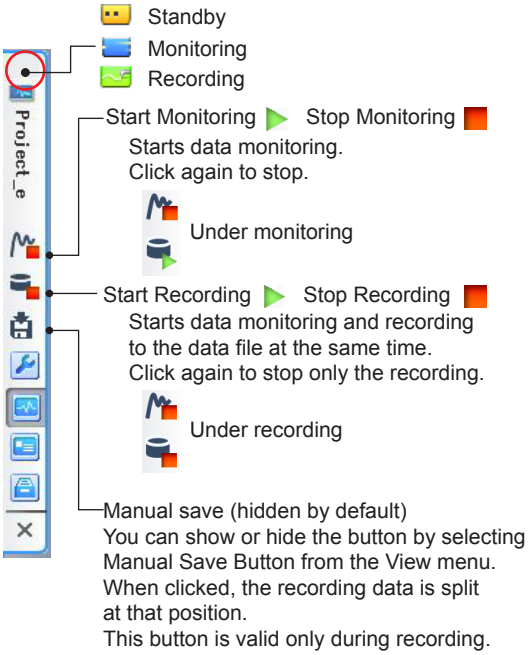
3.2.4 Starting Data Monitoring and Recording

You can start data collection and recording using a configured project.

- To close the project without collecting data, click the icon on the right edge of the page.
- To return to the list page with the project open, click at the left end of the toolbar.

Controlling an Opened Project Individually

Click the icons that are displayed on the tab on the right side of the screen to collect or start and stop recording.



1 Click the icon to start data collection.

2 Click again to stop.

3 Likewise, click the icon on the right to start recording.

4 Click again to stop only the recording.
To also stop data monitoring, click .
To return to the Setting Page, click .
Recorded data files are listed when you click

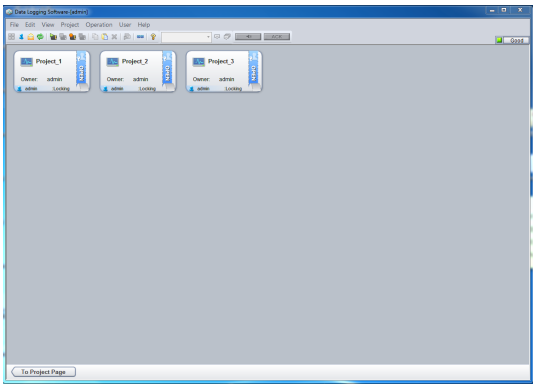
Data files Page. ▶ Sec. 8.1

Controlling Multiple Projects Simultaneously

If you want to start or stop recording or start or stop monitoring on multiple projects simultaneously, follow the procedure below.

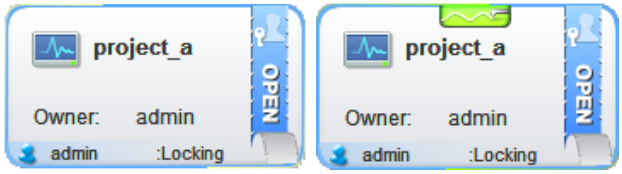
1 Click the icon at the left end of the toolbar.

The Project List Page appears.



2 On the **Operation** menu, click **Start Monitoring Simultaneously**. Or, click the icon.
To start recording, on the **Operation** menu, click **Start Recording Simultaneously**. Or, click the icon.
A confirmation message appears.

3 Click **OK**.
Data collection (or recording) will start.



Data collecting **Recording**

4 To stop, on the **Operation** menu, click **Stop Monitoring Simultaneously**. Or, click the icon.
To stop recording, on the **Operation** menu, click **Stop Recording Simultaneously**. Or, click the icon.

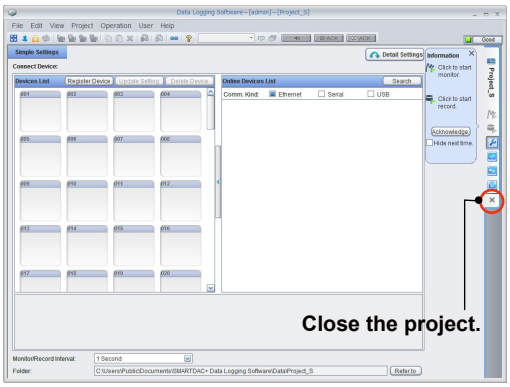
Note

Projects that you can simultaneously control are those that you have Operator or higher privileges for.
Project Access Privileges: ▶ Sec. 3.3.8

3.2.5 Closing a Project

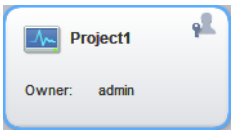
To close a project, click the × icon on the right edge of the page.

- Note that clicking the close button in the upper right of the window closes the software.

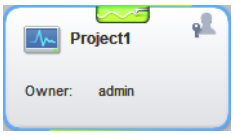


When you close a project, the Project List Page appears.

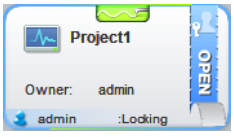
When data collection and recording are stopped and the project is closed



When the project is closed with data collection and recording in progress



- An open project is locked (other users cannot edit it). Click Project List Page to view projects that are locked.



Details on the page when data collection and recording is in progress: **Chapter 6**

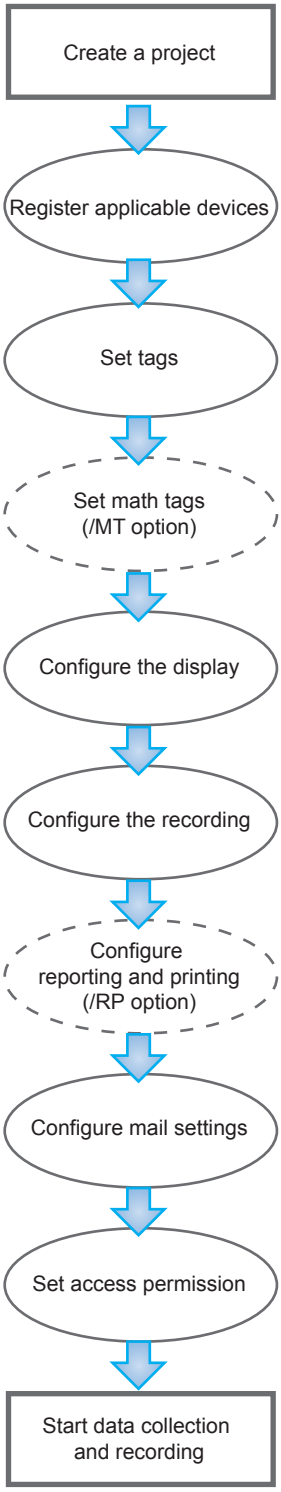
Note

You cannot perform the following operations while data is being collected.

- Register devices from the Online Devices List to the Devices List
- Register a new device on the Devices List
- Change device registration positions on the Devices List
- Delete registered devices from the Devices List
- Change the settings of registered devices on the Devices List
- Specify the record interval

3.3 Detailed Configuration (Detail Settings)

In Detail Settings mode, you can customize data collection, monitoring, and recording. This section explains how to configure the settings in Detail Settings mode before starting data collection.



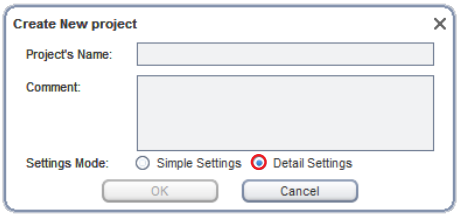
3.3.1 Creating a Project in Detail Settings Mode

First, create a project, which is a set of data collection and recording. For each project, connected devices and data collection and recording conditions can be saved.

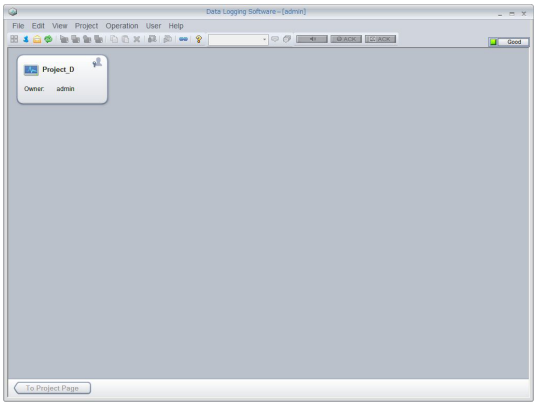
Creating a New Project

Create a new project in Detail Settings mode.

1. Start GA10, and log in.
   The Project List Page appears.
2. On the **File** menu, click **Create New Project**.
3. Type the project name and comment. Set Settings Mode to **Detail Settings**.

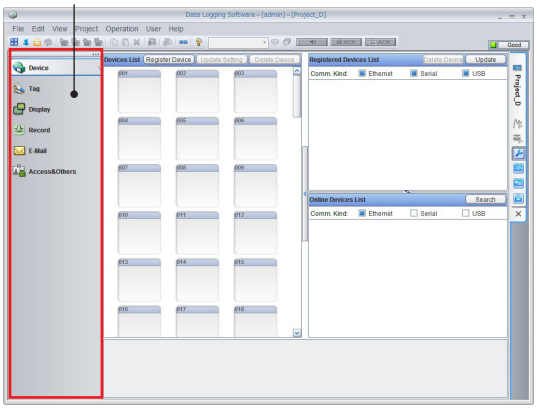


4. Click **OK**.
   A new project is created in the Project List Page.



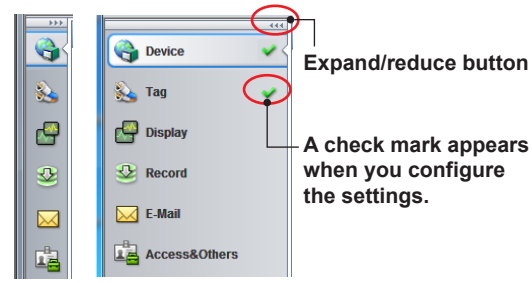
5. Double-click a new project.
   The initial setting window appears.

Configuration navigation area



Setting page area

You can switch between different setting pages by clicking the items in the left navigator.



To continue configuring the project, proceed to **Sec. 3.2.2**.

Exporting and Importing

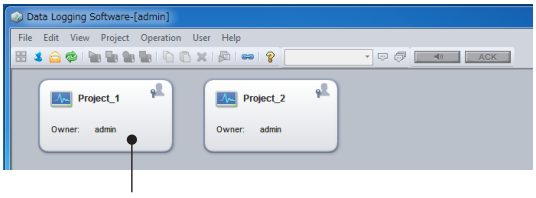
You can export the information of a created project to a file (.pjf extension).
This file is referred to as the project information file. The procedure to export and import a project is explained below.

Note

- Projects created in an earlier server version can be used in later server versions. Projects are not displayed for the opposite case.
- If an option is added to the GA10, projects created in the previous configuration can be used with the GA10 in the current configuration. Projects are not displayed for the opposite case.
  Related topic: ▶

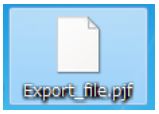
Export procedure

1 From the list of projects, select the project that you want to export.



2 On the **File** menu, click **Export Project**.
The Save As dialog box appears.

3 Select the save destination, assign a name, and save it.
The project information file (.pjf extension) is saved to the specified location.

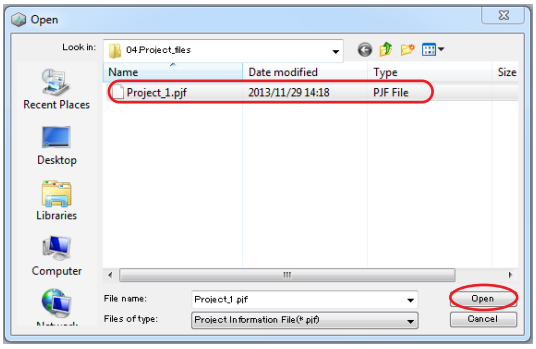


Note

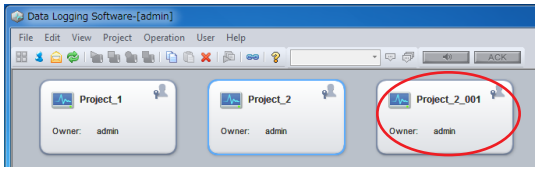
- If you do not have access permission to the project, you cannot export it.
- If the project contains Modbus device connections, the register and channel information of the Modbus devices are not exported. You must save the definition files separately.
  Modbus device definition file: ▶ **Sec. 3.4**
- OPC-UA projects when the OPC-UA server function (/UA option) is in use cannot be imported or exported.

Import procedure

1. On the **File** menu, click **Import Project**.
   An Open dialog box appears.
2. Select the file that you want to import (.pjf extension), and click **Open**.



The imported project is added to the list of projects.



Note

When you import a project, you become the project owner.
Owner: ▶ **Sec. 3.3.8**
To modify the owner: ▶ **Sec. 9.4.3**

Importing a project created on a GA10 with a different system configuration (GA10 version R2.02.xx or later)

If you try to import a project created on a GA10 with option functions (additional channels, math, etc.), a message (W2008) may appear.
This is because the project being imported contains functions that the importing GA10 does not have. You can continue importing by clicking OK in the message dialog box. The following table shows the result of importing.

Result of importing

GA10 Settings	Functions not available on the import destination GA10 server			
	Channels (Tags)	**Math function (Option, /MT)**	**Report function (Option, /RP)**	**Custom Display functon (Option, /CG)**
Device	--	--	--	--
Tag	Tags outside the server's tag range are set to None.		--	--
Math Tag	--	Not displayed.	--	--
Display Display Group	Tags outside the server's tag range are set to None.	Math tags are set to None.	--	--
Display Aquisition &Monitor	--	--	--	Register button is not displayed.
Record When Start Condition or Stop Condition is Alarm.	If the start tag or end tag is outside the server's tag range, the range is set to the server's maximum Tag Index. If the start tag exceeds the server's tag range, Start Condition is set to Immediate and Stop Condition is set to Continuous.	If both the start tag and end tag are math tags, Start Condition is set to Immediate and Stop Condition is set to Continuous. If the start tag is a measurement tag and the end tag is a math tag, the range is set to the server's maximum Tag Index.	--	--
Report/ Print When Task is Report Output.	Tags outside the server's tag range are set to None.	Math tags are set to None.	Not displayed.	--

GA10 Settings	Functions not available on the import destination GA10 server			
	Channels (Tags)	Math function (Option, / MT)	Report function (Option, / RP)	Custom Display functon (Option, / CG)
E-Mail TRIG:, Range	If the start tag exceeds the server's maximum Tag Index, mail is set to OFF. If the start tag or end tag is outside the server's tag range, the range is set to the server's maximum Tag Index. In Detail Settings mode, tags exceeding the server's tag range are not displayed.	If both the start tag and end tag are math tags, mail is set to OFF, and the start and end tags in the selected range are set to the server's maximum Tag Index. In Detail Settings mode, math tags are not displayed.	--	--
Attached Files:, Range	If the start tag exceeds the server's maximum Tag Index, the inclusion of Alarm Information and Instantaneous Value is set to OFF. If the start tag or end tag is outside the server's tag range, the range is set to the server's maximum Tag Index. In Detail Settings mode, tags exceeding the server's tag range are not displayed.	If both the start tag and end tag are math tags, the inclusion of Alarm Information and Instantaneous Value is set to OFF. In Detail Settings mode, math tags are not displayed.	--	--
Access & Others	--	--	--	--

Copying and Pasting

You can easily copy and paste projects.

1. From the list of projects, select the project that you want to copy.
2. On the **Edit** menu, click **Copy**, or press **Ctrl+c** on the keyboard.
   The project is copied.
3. To paste the copied project, on the **Edit** menu, click **Paste**, or press **Ctrl+v** on the keyboard.
   The project is pasted in the list.

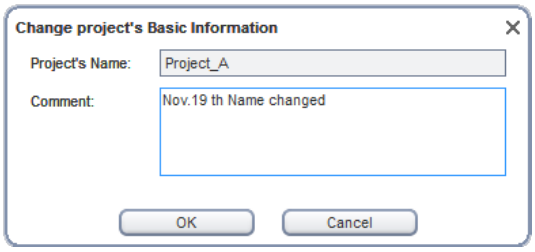
Note

- The copied project is retained until you log out.
- When you import or paste a project, if the original file is on the list, a serial number starting with 001 is added to the original project name.

Renaming a project

To rename a project, follow the procedure below.

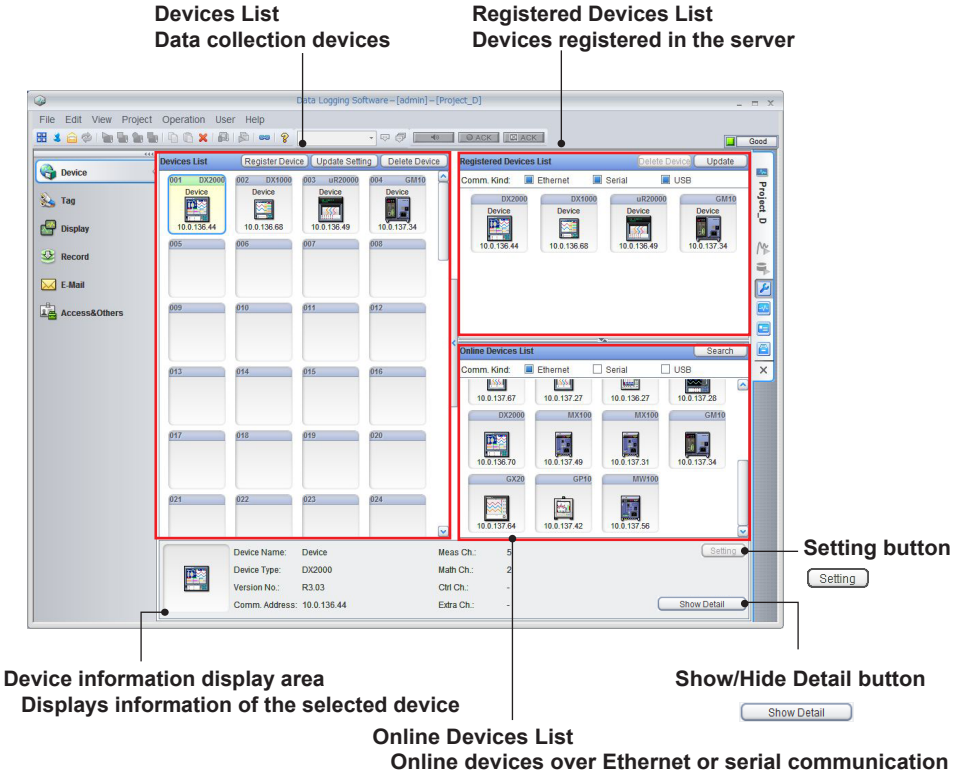
1. From the list of projects, select the project that you want to rename.
2. On the **Project** menu, click **Modify Basic Information**.
   A Change project's Basic Information dialog box appears.
3. Type the new project name or comment.



4. When you are finished, click **OK**.
   The project name will change.

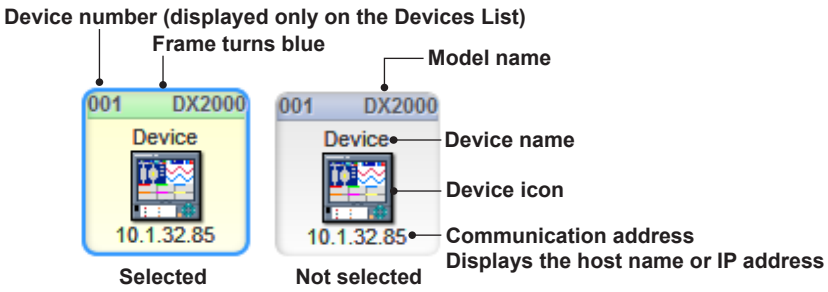
3.3.2 Registering Devices to Connect

After you create a project, register the devices to collect and record data from. The Device Setting Page that you use to register devices is composed of the following four areas.



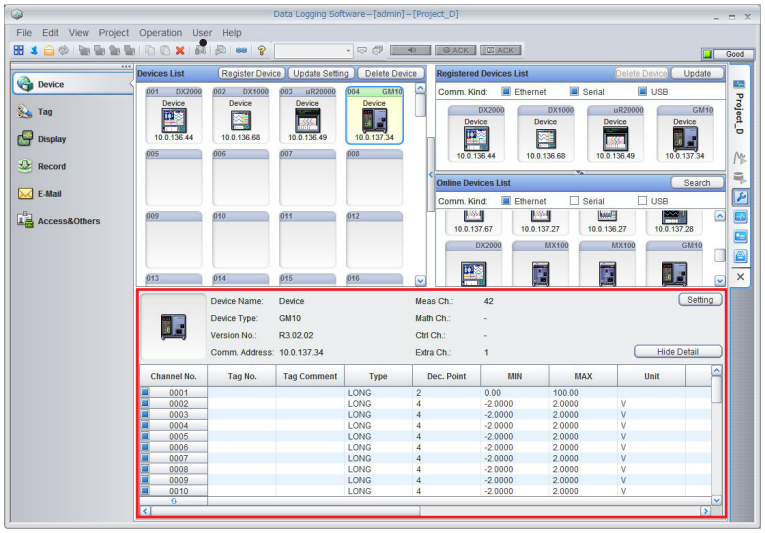
- **Devices List**
  List of target devices for data collection and recording.
- **Registered Devices List**
  List of devices registered in the GA10 server.
- **Online Devices List**
  List of online devices over Ethernet or serial communication.
- **Device information display area**
  Information about the selected device.
- **Setting button**
  Click to start the device setting page (Web application).
  : ▶ **"Starting the Web Application (GX/GP and GM)" on page 3-20**
- **Show/Hide Detail button**
  Click to display detailed information about the selected device in a worksheet format. Click again to hide detail.
  Description of the displayed detailed information: ▶ See next page.

Device icons (shown in the following figure) display the devices' information. These icons can be used to register and delete devices.



Displaying Detailed Information

When a device icon is selected from Devices List or Registered Devices List, click Show Detail to display the channel information of the device in a tabular format. Click again to hide detail.



No.	Item Name		Default Value	Setting	Description
1	Check box on/off		On (Blue)	Available	When the check box is selected, it means that the channel is in use. When set to “not use,” tags cannot be assigned on the GA10’s Tag Setting page. Tags that are already assigned appear as “None
2	Used Cnannel No.		Channel numbers of the device	Not available	
3	Tag No.		Tag numbers of the device	Not available	
4	Tag Comment		Tag comments of the device	Not available	
5	Type		Tag data types	Not available	
6	Dec. Point		Number of decimal places for tags	Not available	
7	MIN		Minimum scale value set on the device	Not available	
8	MAX		Maximum scale value set on the device	Not available	
9	Unit		Scale unit set on the device	Not available	
10	Alarm	Type	Alarm type	Not available	
	1 to 4	Value	Input value	Not available	
11	Tool button (collectively change between use and not use)		--	--	Selecting and clicking a line switches the channel of the selected line between use and not use (check box selected and not selected).

Note

- Setting becomes possible only when a device from the Device List is selected.
- Buttons remain disabled when a device is selected from the Online Devices List.

Detailed Information of the WT3000/WT3000E

If the connected device is a WT3000/WT3000E, the measurement functions of the WT become the data (tag) that the GA10 collects. Measurement functions (hereafter referred to as “data”) vary depending on the model, the number of elements, and options of the WT3000/WT3000E (Table 1).

Item Name		Default Value
Used Channel No.		Assigned from 0001 up to 0251. (depending on the WT3000/WT3000E element and option configurations)
Tag No. Tag Comment		Displayed in the following format: data group number: data name In addition, “Total” and “dc,” which indicate the harmonic orders of harmonic data, are displayed as “TOT” and “DC,” respectively. For example, data “U” of data group “Element 1” is displayed as “1:U.” “1:U(Total)” is displayed as U(TOT) and “U(dc)” as “U(DC).” For details, see the mapping in Tables 2 and 3 on the next page.
Type		FLOAT
Dec. Point		3
MIN		-20.000
MAX		20.000
Unit		For the unit of each type of data, see the mapping in Table 4 on the next page.
Alarm	Type	Blank
1 to 4	Value	0.000

Table1 Configuration table of WT3000/3000E elements, options, and data groups

Number of elements	Option	Data group name			
1	--	Element1			
	/G6 (Advanced Calculation)	ElemHrm1			
	--	Other			
	/MTR (Motor Evaluation Function)	Motor			
2	--	Element1	Element2		
	/G6	ElemHrm1	ElemHrm2		
	--	SigmaA			
	--	Other			
	/DT (Delta Calculation Function) 1	Delta			
	/MTR	Motor			
3	--	Element1	Element2	Element3	
	/G6	ElemHrm1	ElemHrm2	ElemHrm3	
	--	SigmaA			
	--	Other			
	/DT	Delta			
	/MTR	Motor			
4	--	Element1	Element2	Element3	Element4
	/G6	ElemHrm1	ElemHrm2	ElemHrm3	ElemHrm4
	--	SigmaA	SigmaB		
	--	Other			
	/DT	Delta			
	/MTR	Motor			

1 The Delta Calculation Function (/DT option) is a standard function on the WT3000E.

Table2 WT3000/WT3000E data group and data, which become tags collected by GA10

Group	Data name	Group	Data name	Group	Data name	Group	Data name
Element1 to 4	U	ElemHrm1 to 4	U(dc)	SigmaA to B	U	Other	ETA1
	I		U(1)		I		ETA2
	P		U(Total)		P		ETA3
	S		I(dc)		S		ETA4
	Q		I(1)		Q		F1
	Lambda		I(Total)		Lambda		F2
	PHI		P(dc)		PHI		F3
	fU		P(1)				F4
	fI		P(Total)				F5
	U+pk		S(dc)				F6
	U-pk		S(1)				F7
	I+pk		S(Total)				F8
	I-pk		Q(dc)				F9
	Time		Q(1)				F10
	WP		Q(Total)		WP		F11
	WP+		Lambda(dc)		WP+		F12
	WP-		Lambda(1)		WP-		F13
	q		Lambda(Total)		q		F14
	q+		PHI(1)		q+		F15
	q-		PHI(Total)		q-		F16
	WS		PHIU(3)		WS		F17
	WQ		PHII(3)		WQ		F18
			Uthd				F19
			Ithd				F20
			Pthd				
						Delta	DELTA1
							DELTA2
							DELTA3
							DELTA4
						Motor	Speed
							Torque
							SyncSp
							Slip
							Pm

Table3 WT3000/WT3000E data group number mapping table

Group	Data group number
Element1 to Element4	1 to 4
ElemHrm1 to ElemHrm4	1 to 4
SigmaA	SIGM
SigmaB	SIGMB
Other	Omitted
Delta	Omitted
Motor	Omitted

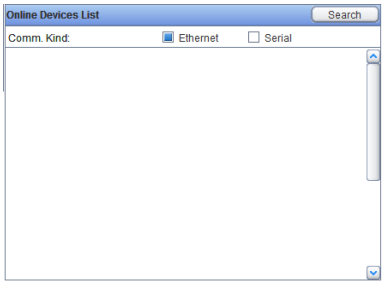
1 These are omitted in the initial display of tags and tag comments.

Table4 WT3000/WT3000E unit mapping table

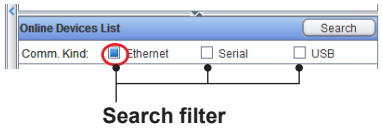
Data name	Unit	Data name	Unit
U	V	q	Ah
I	A	q+	Ah
P	W	q-	Ah
S	VA	WS	Vah
Q	var	WQ	varh
PHI	deg	PHIU	deg
fU	Hz	PHII	deg
fI	Hz	Uthd	%
U+pk	V	Ithd	%
U-pk	V	Pthd	%
I+pk	A	ETA1	%
I-pk	A	ETA2	%
Time	sec	ETA3	%
WP	Wh	ETA4	%
WP+	Wh	Slip	%
WP-	Wh	Others	Blank

Searching for Network Devices

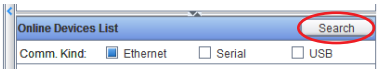
Search for devices connected to the network to display them in the Online Devices List. Simply click the button to search and display the devices as icons in the list.



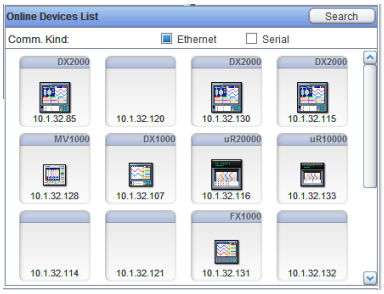
1 Set the search filter to **Ethernet** or **Serial**.



2 Click **Search**.



The connected devices are detected and displayed in the Online Devices List.



Note

The icons of the following devices will not appear by searching. To add them to the project, use the Register Device button as explained in the next section.

Devices that cannot be detected on the Ethernet network
GX10, GX20, GP10, GP20 (up to R1.03.02)
DA100, DR130, DR230, DR240
DAQLOGGER, DAQ32Plus, MXLOGGER
WT3000, WT3000E (devices up to R6.20)
Devices defined using Modbus device definition files [1]

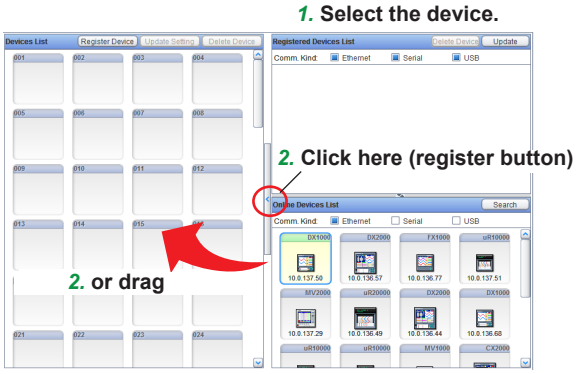
Devices that cannot be detected through the serial interface
MX100, MW100
DAQLOGGER, DAQ32Plus, MXLOGGER
Devices whose baud rate is not 9600 bps, parity is not even, or stop bit is not 1.
Devices whose interface is RS-422 or RS-485

1 Modbus device definition file: ▶ Sec. 3.4

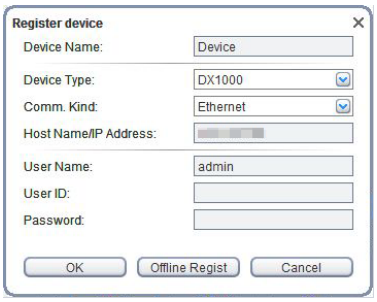
Registering Files to the Devices List

1 Select a device from the **Online Devices List**.

2 Click **Register** in the center of the page. Or, drag the device to the **Devices List**.



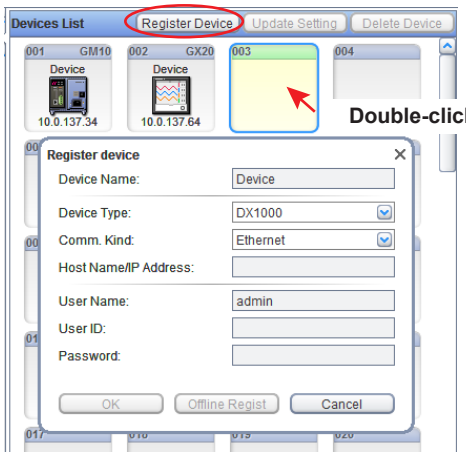
The details of the device that you are about to register (Register Device dialog box) appear.



3 To register the device, click OK. To reselect a different device, click Cancel.

To add a device using the **Register Device** button, follow the procedure below.

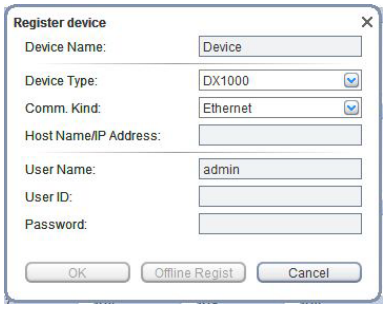
1 Click **Register Device** at the top of the **Devices List**. Or, double-click an empty icon in the **Devices List**.



The initial page of the Register device dialog box appears.

2 Enter the information about the device to be registered.
For details on the input items, see the next page.

Because the available interface varies depending on the device that you are connecting, the communication parameters in the dialog box will change according to the device.



3 Click **OK**.
The device is added to the Devices List and Registered Devices List.

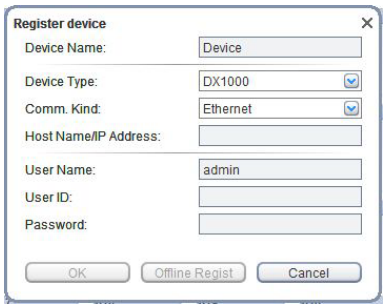
Note

To delete a registered entry, click the device icon to select it, and press the DELETE key or click the Delete button.

Registering Offline

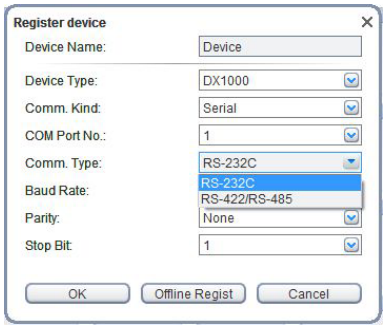
Devices that are not connected to the network can be registered before they are connected.

1 Click **Register Device**. Or, double-click an empty icon in the **Devices List**.
A Register device dialog box appears.



2 In the **Register device** dialog box, enter the device name, and select the device type and communication kind.

3 If **Comm. Kind** is set to Serial, also select the communication type.



4 Click **Offline Registration**.
The device is registered.

Note

- Devices that are registered offline are registered with channel set to 0 and no options.
- When you click Update Setting, GA10 connects to the registered devices and updates the setting information of those devices. In addition, those devices are added to the Registered Devices List.
- If a registered device is not detected on the network, none of the setting information of that device is updated. However, even in this case, the registered information will be retained.

Adding Devices

To add devices to the Devices List, repeat the “Registering Files to the Devices List” procedure.

Note

If you move to another setting page, return to the Register Device Page, and add devices, a confirmation message (M1015) will appear when you try to move to another page.
Clicking OK will add the tag of the added device after the existing tags on the Tag Setting Page. Clicking Cancel will not add the tag.

Connectable Devices and Interfaces

The following table shows the devices that can connect to the GA10 and the interfaces that can be used.
When you are registering the device type on the Register device dialog box, clicking ▼ will show the following devices in the list.
The names shown in green cells are used when connecting to GA10s with the custom display function (/CG option).

Supported Models or Software	Name	Interface [1]			
		Serial	USB	Ethernet (connection port number)	
GM10	GM10	RS-422/485 only	Yes	Yes	34434 [3]
GX10 [2]	GX10	Yes	No	Yes	34434 [3]
GX20 [2]	GX20	Yes	No	Yes	34434 [3]
GP10 [2]	GP10	Yes	No	Yes	34434 [3]
GP20 [2]	GP20	Yes	No	Yes	34434 [3]
GX/GP/GM (PID control module)	GXGPGM_PIDSlot0 to GXGPGM_PIDSlot9	RS-422/485 only	No	Yes	502
DX1xxx	DX1000	Yes	No	Yes	34260
DX2xxx	DX2000	Yes	No	Yes	34260
CX1xxx	CX1000	Yes	No	Yes	34260
CX2xxx	CX2000	Yes	No	Yes	34260
FX1xxx	FX1000	Yes	No	Yes	34260
MV1xxx	MV1000	Yes	No	Yes	34260
MV2xxx	MV2000	Yes	No	Yes	34260
MX100	Same as left	No	No	Yes	34316
MW100		No	No	Yes	34316
µR10000	Same as left	Yes	No	Yes	34260
µR20000		Yes	No	Yes	34260
DA100	Same as left	Yes	No	Yes	34150
DR130		Yes	No	Yes	34150
DR230		Yes	No	Yes	34150
DR240		Yes	No	Yes	34150
UT32A [4]	UT32A	RS-422/485 only	No	See note 4	502
	UT32A_R3 [5]				
UT35A	UT35A		No	Yes	502
	UT35A_R3 [5]				
UT52A [4]	UT52A		No	See note 4	502
	UT52A_R3 [5]				
UT55A	UT55A		No	Yes	502
	UT55A_R3 [5]				
UT75A	UT75A		No	Yes	502
	UT75A_R3 [5]				
UP35A	UP35A		No	Yes	502
	UP35A_R3 [5]				
UP55A	UP55A		No	Yes	502
	UP55A_R3 [5]				
UM33A [4]	UM33A		No	See note 4	502
Modbus protocol [6] compatible devices (including YOKOGAWA control instruments)	*hardware*	RS-422/485 only	No	Yes	502
WT3000 [7]	WT3000	RS232C only	No	Yes	10001
WT3000E [7]	WT3000E		No	Yes	10001
GateWT for GA10	GateWT for GA10	No	No	Yes	50295 [8]
DAQLOGGER	DAQLOGGER	No	No	Yes	50280 [8]
DAQ32Plus	DAQ32Plus	No	No	Yes	50278 [8]
MXLOGGER	MXLOGGER	No	No	Yes	50284 [8]

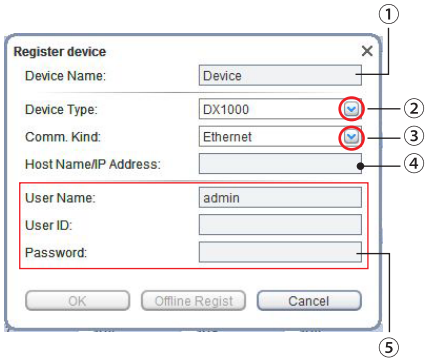
1 Yes: Supported No: Not supported
2 The GX/GP version R1.03.03 and later supports auto searching on an Ethernet network.
3 The communication port can be specified on the GX/GP, but GA10 only supports the default value, 34434.
4 Open network function is not built in. Ethernet connection requires VJET (Yokogawa Ethernet/RS485 adapter).
5 Model names with “_R3” correspond to SP and other output channels. When connecting to a GA10 with the custom display function (/CG option), use the ones with “_R3.”
6 Modbus protocol is not supported.
7 The WT3000 and WT3000E are precision power analyzers by Yokogawa Test & Measurement Corporation. Auto searching on Ethernet is available on R6.21 and later.
8 A port number must be specified as a parameter when the interface is specified. (The port numbers in the table are default values.)

Note

- GX/GP/GM_PIDSlot0 to GX/GP/GM_PIDSlot9 are used to control from GA10s with the custom display function (/CG option) the output and the like of a GX/GP/GM with PID control modules (GX90UT) installed. Related topic: ▶page 7-4
- In the UTAdvanced series, model names with “_R3” correspond to SP and other output channels. When connecting to a GA10 with the custom display function (/CG option), use the ones with “_R3.”

Register Device Dialog Box Details

The Register Device dialog box is used to register the devices that you want to connect to. The following figure shows the initial screen after you click the Register Device button.



No.	Item Name	How to Specify	Default Value	Description
1	Model name	Enter text. (Input range: up to 20 alphanumeric characters)	Device	Enter the name of the device to be registered.
2	Device Type	Select from the list.	DX1000	Select the name of a supported model or software from a list.
3	Comm. Kind	Select from the list. (Selectable range: Ethernet, Serial, USB. But, depends on the model.)	Ethernet	Select the interface from the list. If Device Type is MX100/MW100, DAQLOGGER, DAQ32Plus, MXLOGGER, or GateWT, this is fixed to Ethernet. USB is selectable only when Device Type is GM10.
4	Host name/ IP address	Enter text. (Input range: up to 255 alphanumeric characters)	Blank	This appears only when Comm. Kind is set to Ethernet. Enter the host name or IP address of the device.
5	User Name	Enter text. (Input range: up to 63 alphanumeric characters)	Admin	Customer information items appear in the following conditions. When Comm. Kind is set to Ethernet, and Device Type is not DAQLOGGER, DAQ32Plus, MXLOGGER, GateWT, or a Modbus device When Comm. Kind is set to Serial, and Device Type is GX10, GX20, GP10, GP20, or GM10
	User ID	Same as above	Blank	You need to enter this if the security settings on the device being registered are enabled. Otherwise, leave the user name (admin), user ID, and password blank, and click OK.
	Password	Same as above	Blank	

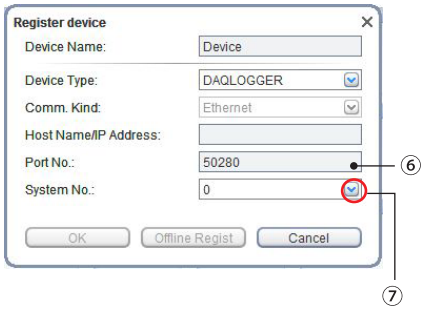
Representative examples for different interfaces and connected devices are provided below.

When connecting to DAQLOGGER, DAQ32Plus, MXLOGGER, GateWT

- Comm. Kind is fixed to Ethernet.
- Enter the IP address of the PC in which the software specified with Device Type is installed.
- To connect to DAQLOGGER or DAQ32Plus, leave the System No. at zero (default value).
- To connect to MXLOGGER, select the System No. that is being used in MXLOGGER.
- When connecting to GateWT for GA10, to display models after models numbered 02 under GateWT's "WT Setting", set System No. to None in the GA10's Register Device dialog box.
  Or, click the Register Device button, and specify the system number in the Register Device dialog box.
  For models numbered 02 under GateWT's "WT Setting", set the System No. to 01. For example, for GateWT numbers 1, 2, 3, and so on, set the GA10's system numbers to 0, 1, 2, and so on.
- To start GateWT for GA10, right-click and choose Run as administrator.

Note

When using GateWT for GA10, see the WX1 GateWT User's Manual (IM No: IM WX1-03EN). Change the terms to read as follows:
"GateWT" to "GateWT for GA10."
"DAQLOGGER" to "Data Logging Software GA10"



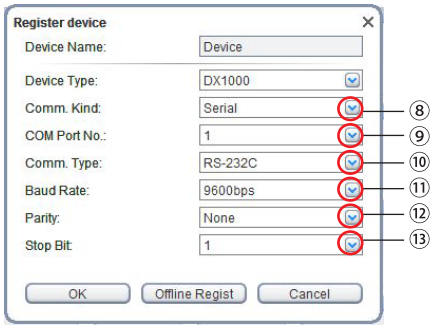
	Item Name	How to Specify	Default Value	Description
6	Port No.	Enter text. (Input range: 1025 to 65535)	See **Connectable Devices and Interfaces.**	This appears when Comm. Kind is set to Ethernet and Device Type is DAQLOGGER, DAQ32Plus, MXLOGGER, GateWT.
7	System No.	Select from the list. (Selectable range: None, 0 to 60)	0	Same as above

When connecting to a WT3000/WT3000E

- WT3000/WT3000E can be connected without using GateWT for GA10. Select from the list of target devices.
- When using RS-232C communication, in the WT3000/3000E settings, set MISC > Remote Control > Device > RS232 control as follows:
  Format (data format): 8-NO-1
  Rx-Tx (handshaking): NO-NO
  Terminator: Lf
- When using Ethernet communication, in the WT3000/3000E settings, set MISC > RemoteControl > Network > UserAccount > Timeout to 30 seconds or longer. If the timeout is set to the default value (Infinite: no time limit), retrials when communication errors occur will not be performed.

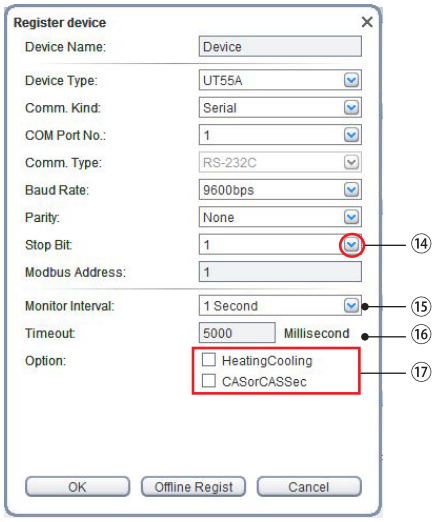
Detailed information: ▶ WT3000 Precision Power Analyzer Communication Interface (IM 760301-17)

When Comm. Kind is set to Serial



	Item Name	How to Specify	Default Value	Description
8	COM Port No.	Select from the list. (Selectable range: 1 to 20)	1	This appears when Comm. Kind is set to Serial or USB.
9	Comm. Type	Select from the list. (Selectable range: RS-232C, RS-422/RS-485)	RS-232C	This appears when Comm. Kind is set to Serial.
10	Baud Rate	Select from the list. (Selectable range: 9600bps, 19200bps, 38400bps)	9600bps	Same as above
11	Parity	Select from the list. (Selectable range: None, EVEN, ODD)	None	Same as above
12	Stop Bit	Select from the list. (Selectable range: 1 or 2)	1	Same as above
13	Address	Select from the list. (Selectable range: 1 to 99)	1	This appears when Comm. Kind is set to Serial and Comm. Type is set to RS-422/RS-485.

When Comm. Kind is set to Serial and Device Type is a Modbus device



No.	Item Name	How to Specify	Default Value	Description
14	Modbus Address	Enter text. (Input range: 1 to 247)	1	This appears when Device Type is a Modbus device.
15	Monitor Interval	Select from the list. (Selectable range: 100 msec, 200 msec, 500 msec, 1 sec, 2 sec, 5 sec, 10 sec, 20 sec, 30 sec, 1 min, 2 min, 5 min, 10 min)	1 sec	Same as above
16	Timeout	Enter text. (Input range: 100 msec to 10000 msec)	5000 msec	Same as above
17	Option	Check box	Not selected	Displays the optional text strings defined in the Modbus device definition file in the order that they were defined.

Note

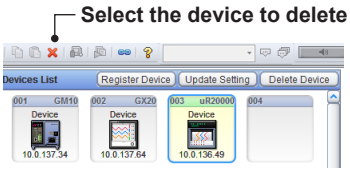
- To register any of the following instruments by specifying “Comm. Kind: Serial” and “User,” set the A/D scan interval and FIFO writing interval of the device to the same value.
  DX1000, DX1000N, DX1000T, DX2000, DX2000T, MV1000, MV2000, CX1000, CX2000, FX1000
- When connecting to a DXAdvanced (DX1000, DX1000N, DX1000T, DX2000, or DX2000T) with the /AS1 advanced security option through the Ethernet interface, log in as an administrator to access the DX. In this situation, only one administrator will be able to log in.
- When connecting an UTAdvanced device (UT32A, UT35A, UT52A, UT55A, UT75A, UP35A, UP55A) to a GA10 with the custom display function (/CG option), select a model name with “_R3” from the list. (This corresponds to the SP or other output channel.)

Changing the Registration Information

Select a device icon on the Devices List, and double-click it. A Change Device's Basic Information dialog box appears. Edit the items you want to change.
The items that you can change in this dialog box are the same as those in the Register Device dialog box when you register devices.

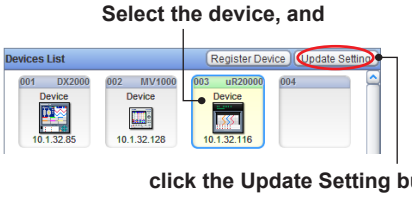
Deleting a Registration

To delete a registered device, click the device icon to select it, and click Delete on the Edit menu or click the Delete button.
You can also select the device icon and press the DELETE key.
If you click DELETE when no device icons are selected, all unused devices will be deleted.



Updating the Settings

If you change the device settings after registering it to the Devices List, click **Update Setting**. The most recent information will be retrieved from the device and applied.

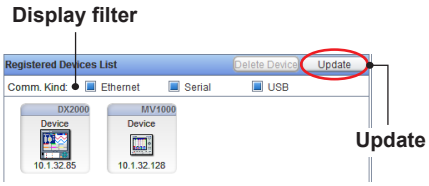


Important

If Tag No. and Tag Comment are already registered on the GA10 (version R2.01.xx or earlier), do not execute Update Setting. Doing so may erase the registered information.

Registering Devices to the Registered Devices List

The Registered Devices List shows a list of devices registered to the server. In the initial page, nothing will appear. When you add a new device to the Devices List, it is also automatically added to the Registered Devices List. You can also drag a device from the Online Devices List to register it.



Click **Update** to retrieve the most recent list of devices from the server.
You can set the Comm. Kind filter to display only the devices using the specified interface. If you select **Serial**, the devices connected to the serial port of the server PC will be displayed.

Starting the Web Application (GX/GP and GM)

Click **Setting** Setting in the device information display area to start the Web application for configuring devices.

1. In the Project List Page, double-click the appropriate project.
2. Change the project setting window to the Device Setting Page.
3. Select the icon of the device that you want to change the settings of.
   The information of the selected device appears in the bottom device information area.
4. Click **Setting** in the device information area.
   The corresponding setting Web page will appear in Windows Internet Explorer.

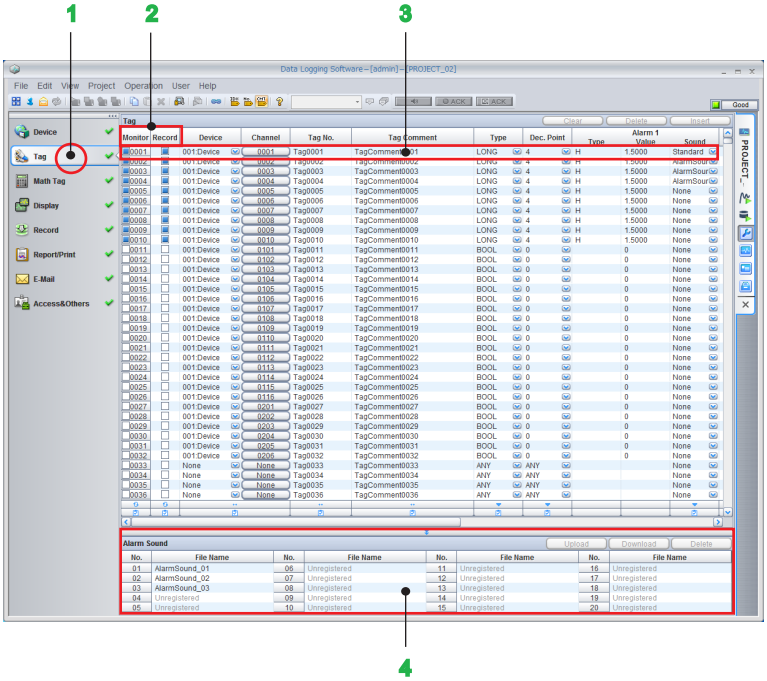
For instructions on how to use the Web application, see the GX/GP User's Manual (IM 04L51B01-01EN) or the GM User's Manual (IM 04L55B01-01EN).
URL: **www.smartdacplus.com/manual/en/**

Limitations on the Device Setting Page

- The following operations cannot be executed on the Device Setting Page while data collection is in progress.
  - Register devices from the Registered Devices List to the Devices List
  - Register devices from the Online Devices List to the Devices List
  - Register a new device on the Devices List
  - Change device registration positions on the Devices List
  - Delete registered devices from the Devices List
  - Change the settings of devices on the Devices List
- The Web application can be started only when the connected device is GX/GP and the interface is Ethernet.
- If multiple devices use the same COM port, observe the following rules.
  - Do not mix Modbus devices with other devices.
  - Use the same communication type.
  - Use the same settings for baud rate, parity, and stop bit.

3.3.3 Setting Tags

GA10 collects and records data from multiple connected devices. Tags are assigned to channels of connected devices for identification.
After registering devices in a project, when you open the Tag Setting Page for the first time, the channels of registered devices are assigned automatically to the tags as default values. You can edit them to customize the data collection.



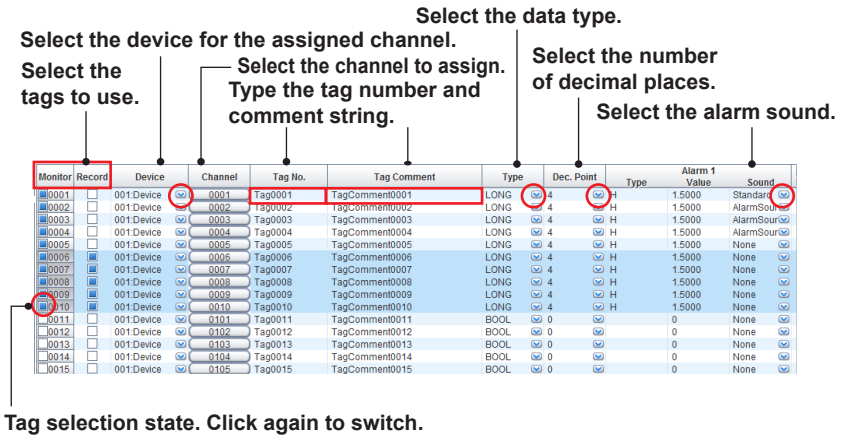
Basic Operation

1 Select Tag in the navigation area on the left of the window.
The Tag Setting Page appears.

2 Select a tag to use in data collection or recording (1 line = 1 tag = 1 channel).
Click the check boxes in the Monitor or Record column.
To select consecutive boxes, click the first cell, and then click the last cell while holding down the SHIFT key.

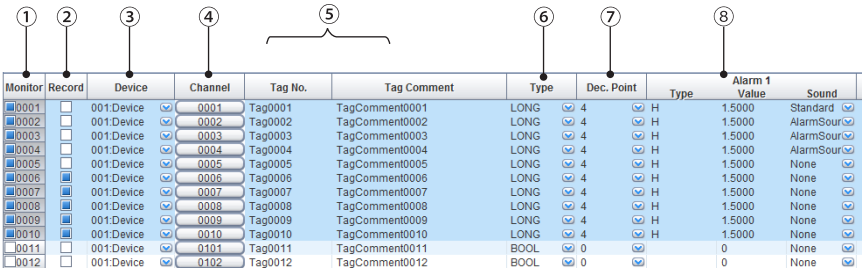
3 Set the tags.
Clicking a cell in a column other than Collect or Record displays a list box or a window containing options. Select the desired setting. For the **Tag No.** and **Tag Comment** cells, type text strings.
The type and value of alarms 1 to 4 are view only.

4 Register the alarm sound file to assign to the tag.
Alarm sounds are .mp3 files. Up to 20 files can be used.



Setup Item

Tag settings are used to set display groups and other settings in a project. Therefore, even if you change the device channel assigned to a tag, there is no need to change display group settings or other settings that use tags.



The tag settings are explained below.

(1) Monitor (tag index)

These are unique tag numbers assigned sequentially starting with 0001. You cannot change the numbers. Click the boxes to specify whether to enable data monitoring.

(2) Record

Click the boxes to specify whether to enable data recording.

(3) Device

Specify the names of the devices to assign to the tags.

(4) Channel

Specify the channels to assign to the tags. Clicking a button displays a separate window. Select a channel number to apply it to the sheet.

(5) Tag No. and Tag Comment

Enter aliases for the tags as tag numbers and tag comments. Specify up to 16 characters for tag numbers and 32 characters for tag comments. You can select which name to display (Tag Index, Tag No., or Tag Comment) to suit your purpose. To select which name to display, on the **View** menu, click **Tag Display Form**.

(6) Type

Specify the tag data types. Click the arrows, and select from the following data types.

Data Type	Description
ANY	Any data type
BOOL	Boolean
SHORT	2-byte signed integer
USHORT	2-byte unsigned integer
LONG	4-byte signed integer
ULONG	4-byte unsigned integer
FLOAT	4-byte single-precision floating-point number
FLOAT(LOG)	Data type for LOG input channels [1]
LOG (Old)	Data type for LOG input channels (DXAdvanced series)
LOG	Data type for LOG input channels (FX1000 series)

Refer to the following table for the data types of the channels on data source devices.

Model	Channel Type	Data Type
DAQLOGGER DAQ32Plus MXLOGGER	All channels	Undefined (LONG, FLOAT, or LOG)
GX/GP GM	Measurement channels (excluding DI), math channels, communication channels	LONG
	DI channels	BOOL
	Measurement channel whose input type is LOG *1	FLOAT(LOG)
	Excluding the above	Same as "Other"
Devices defined using Modbus device definition files	All channels	Data types of registers defined in the Modbus device definition file are retained and used for displaying and recording. Data type mapping table : "Data Types" on page 3-56
Other	Measurement channels	SHORT
	Math channel	LONG
	Control channel	SHORT
	Extra channel	SHORT
	Math channel whose input is LOG	LOG

1 For GX/GP firmware version R2.01 or later with the Log scale option (/LG).

(7) Dec. Point

Specify the number of decimal places for tags. Click the arrows to select the number of digits (0 to 5).
Select the same setting as the decimal place setting specified on the device. Specify ANY to retrieve the decimal place information from the device at the start of data collection. (See below.)

Type, Dec. Point, and ANY

- GA10 can continue data collection even if you change the connected device in the middle of data collection as long as the Type and Dec. Point settings are the same. For example, assume you set the tag Type to SHORT. If another device is connected in the middle of data collection (for maintenance or other purpose), as long as the measurement channels use the same Type and Dec. Points settings, you can continue data collection.
- You can select ANY if you want to retrieve the channel information from the device at the start of data collection and use those settings to perform data collection. However, if the data collection time is set to PC time and the device is not connected within 3 seconds after the start of data collection, the channel information will not be retrieved at the start of data collection even if ANY is specified.
- In this situation, the channel information that was retrieved from the device at the time of device registration is used. This is not a problem as long as the channel information at the start of data collection is the same as the channel information that was retrieved from the device at the time of device registration.
- Using ANY makes the data type and decimal place settings easier. However, you cannot verify the actual data type.

Related topic: ▶ "Q11" on page 12-11

Note

- If the data collection channel is LOG input, set the data type to LOG. If set to LOG, the decimal place setting is void.
- If the data type is set to BOOL, the decimal place setting is void.

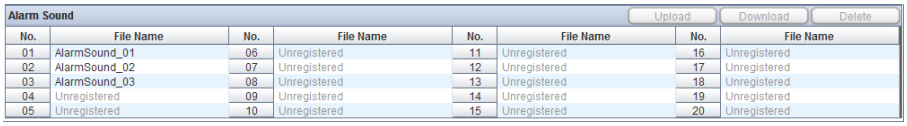
(8) Type, value, and sound of alarms 1 to 4

You can assign an alarm sound to each tag.
The type and value of an alarm are those assigned to the device and cannot be changed.
The alarm sound settings and alarm sound files are saved in the project file.

Alarm sound	Description
None	This is when an alarm type is not assigned.
Standard	If an alarm type is assigned, this is the GA10's standard alarm sound.
Alarm sound file	If an alarm type is assigned and alarm sound files are registered, file names are displayed for you to select from.

Registering and deleting alarm sound files

Alarm sound files can be uploaded to the server, downloaded from the server, or deleted.



- Upload
  Click a number, click Upload, and specify an .mp3 file.
- Download
  Click a number, click Download, and specify the client's save destination to save the file.
- Delete
  You can select alarm sound files registered in the server. Click a number, and click Delete to delete the file.

WT3000/WT3000E Tag Setting Page

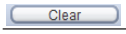
When the connection target is the WT3000/WT3000E, the WT3000/WT3000E data group and data become the tags collected by GA10. The following table shows the items on the Tag Setting Page. For details, see the relevant tables in **"Detailed Information of the WT3000/WT3000E" on page 3-12**.

Data Type	Description
Monitor	Same as other devices
Record	
Device	
Channel	Assigned from 0001 up to 0251. (depending on the WT3000/WT3000E element and option configurations)
Tag No. Tag Comment	Displayed in the following format: data group number: data name For example, data "U" of data group "Element 1" is displayed as "1:U." For details, see the mapping on page 3-13.
Type	FLOAT
Dec. Point	3

Editing Tags

Clearing, Deleting, and Inserting Rows

To clear, delete, or insert tag setting data (row), select the target rows, and then click the appropriate button.
You can select rows by clicking the left edge of rows (the numbers of Monitor tags).

Button	Result
Clear 	Click to delete the settings of the selected rows and initialize the items.
Delete 	Click to delete the tag settings of the selected rows and shift up.
Inserting Rows 	Click to insert tag information (default values) for the selected number of rows.

Collectively Editing Tags

To collectively edit setup data, you must select the target setup data and then click a button on the action bar, which is at the bottom of the window. The result varies depending on the type of icon you click on the action bar (see the following table).

Type	Name	Result
	Enable or disable	Switches the check box state between selected and unselected. If all the data values in the selected range are the same, clicking this icon will switch all of them in the same way. If the data values in the selected range are not all the same, clicking this icon will switch all of them to match the first data value in the selected range.
	Increment	Assigns increasing channel numbers starting with the first tag in the selected range.
	Copy	Copies the settings of the first tag in the selected range to the other tags in the selected range.
	Copy flag	Switches between selected and unselected states for items to be pasted when copying setup data. The items are normally selected (pasted). Clicking this button causes the corresponding item to become unselected. The item will not be pasted.

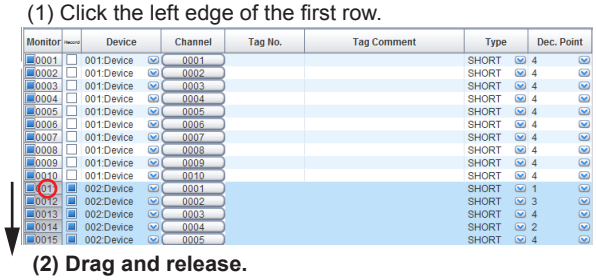
You can also copy and paste selected content using the Edit menu.
To select the range of setup data, follow one of the methods below.

- Select by dragging
  Click the first line you want to select. Drag to the last line you want to select and release the mouse button.
- Select using the Shift key
  After selecting the first line you want to select, hold down the Shift key, and click the last line you want to select.
- Select all lines
  Click the title area of the **Monitor** column to select all setup data.

Collective Editing

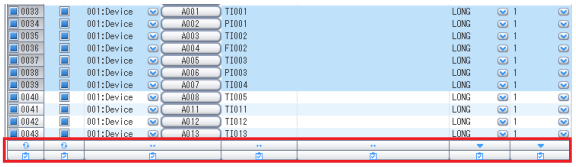
1 Select the rows that you want to edit collectively.

(1) Click the left edge of the first row.



(2) Drag and release.

2 Click an icon at the bottom for the column that you want to edit.
The values in the selected range will be changed.



Sorting tags in order of the device No.

The specified tags can be sorted in order by device number registered in the Devices List (first precedence) and by channel number of each device (second precedence). On the Project menu, click Sorting tags in order of the device No. Or, click the icon on the toolbar.

Note

Sorting is not applied to math tags (/MT option).

When you perform Sorting tags in order of the device No., various settings are arranged as follows.

- Tag settings (Tag No., Tag Comment, Type, Dec. Point) remain the same.
- Display Group: Remains the same.
- Record: Tag indexes (fixed sequence) are changed. If a tag range is specified, the numbers are sorted while maintaining the range position.
- Report/Print (/RP option): Tag Index numbers are changed.
- Mail: Tag indexes are changed. If a tag range is specified for Trigger, the numbers are sorted while maintaining the range position. At this point, the Trigger setting changes from Easy to Detail.

Exporting and Importing Tags

Tag information can be converted (exported) to a TSV file You can edit the TSV file using an appropriate software application and load (import) it back into GA10.

Note

Only tag numbers and tag comments are exported and imported.

- **Export Procedure**

1 Display the Tag Setting Page of the project whose tag information you want to save.

2 On the **File** menu, click **Export tags**.

3 Select the save destination, assign a name, and save it.
The tag information file (.tsv extension) is saved to the specified location.
Tag numbers and tag comments are exported in pairs in separate lines as shown below.

```
Tag0001 TagComment0001
Tag0002 TagComment0002
Tag0003 TagComment0003
Tag0004 TagComment0004
```

- **Import Procedure**

1 Display the Tag Setting Page of the project whose tag information you want to update.

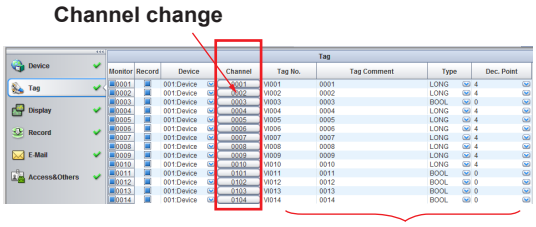
2 On the **File** menu, click **Import tags**.
An Open dialog box appears.

3 Select the file that you want to import, and click **Open**.
The content of the imported tag information TSV file is applied to the Tag Setting Page.

Update Tag Information (Refresh)

The tag information on the Tag Setting Page is updated in the following situations.

- When a channel (device) is changed on the Tag Setting Page
  If you change the channel (or device) on the Tag Setting Page, Tag No., Tag Comment, Type, and Dec. Point are retrieved from the specified channel.

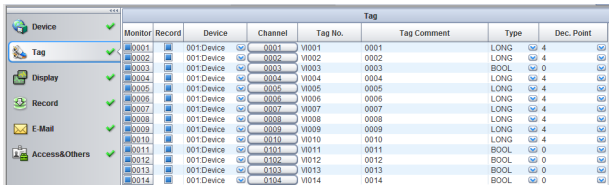


- When monitoring is started
  At the start of monitoring (when the device is connected), the most recent channel information is retrieved from the device, and the alarm value, range, and unit are updated. These are entered in the recording data file at the start of recording. However, if PC time is specified and connection cannot be established with the device even after 3 seconds passes after the start of monitoring, tag information is not updated, and the channel information of the device already registered is used.
- When tag information is changed manually
  If the tag information is changed on the connected device side, you can update the tag information by clicking Update Tag Information on the Project menu. The information to be updated can be selected from a submenu.

Sub Menu	Description
Tag No., Tag Comment	Update Tag No. and Tag Comment to the latest information on the connected device side.
Except Tag No., Tag Comment	Update Type and Dec. Point to the latest information on the connected device side.

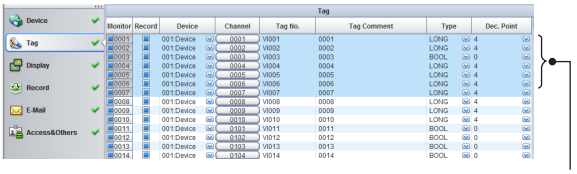
1 Open the project that you want to change the tag information of.
- Open the project with manager or higher access privileges (privileges that allow setting operation).
- Only projects in which data monitoring is stopped can be used.

2 Select Tag in the navigation area on the left of the window.



A Tag Setting Page opens.

3 Select the tags you want to update.



4 On the **Project** menu, click **Update Tag Information**. Then, click the information to update on the submenu.
A confirmation message appears.

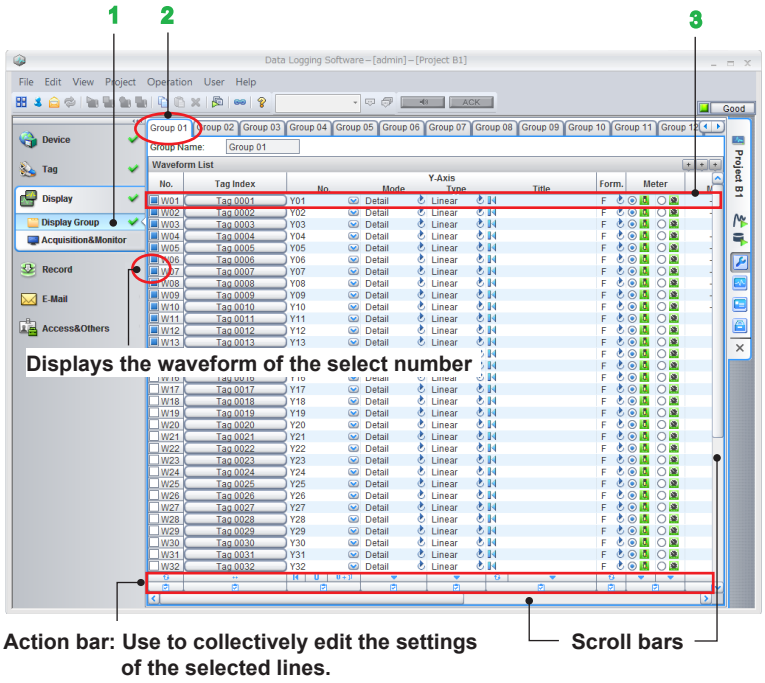
5 Click **OK**.
Type and Dec. Point information of the selected tags is updated.

Note

- Even if you execute Update Tag Information, the tag settings specified on the GA10 are not changed.
- In following situations, an error message will be displayed.
- Some of the connected devices cannot communicate with the server.
- The number of registered devices on the server is at the maximum.
- If the A/D scan interval and the FIFO writing interval of the device are not the same, the following devices cannot be updated by a “user.” To update, log in as an administrator.
  DX1000, DX1000N, DX1000T, DX2000, DX2000T, MV1000, MV2000, CX1000, CX2000, FX1000

3.3.4 Setting Display Groups

The GA10 Monitor Page can display multiple channels in groups.
The Display Group Setting Page is used to group channels and set the tag data display method. The Display Group Setting Page consists of multiple tabbed pages. Each tabbed page shows the settings of each waveform in rows and the setup items in columns.



Basic Operation

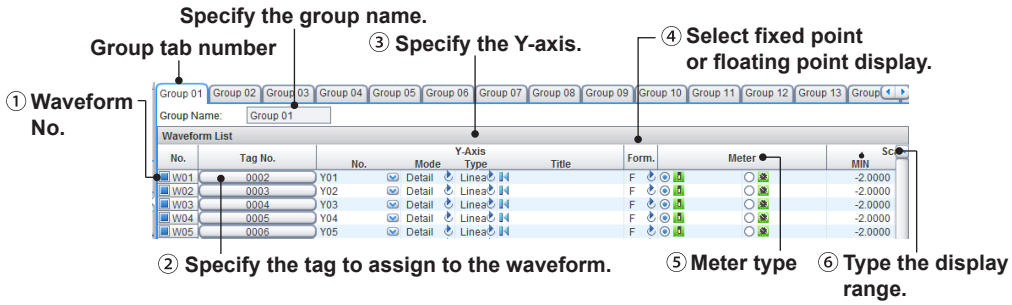
1 Select Display Group in the navigation area on the left of the window.
The Display Group Setting Page appears.

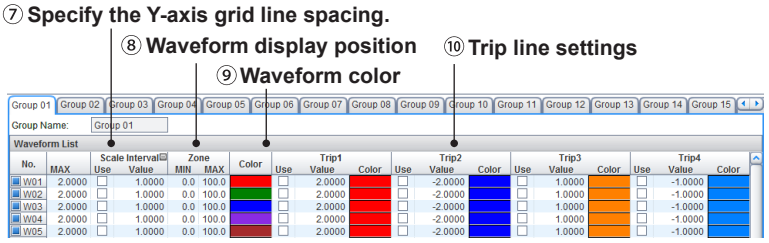
2 Click the tab of the group you want to configure.

3 Edit the setup data. Click the No. cells (left-most column) to show or hide the waveforms.
Details of settings: ▶ The details are provided on the next page and subsequent pages. Use the numbers in the figure to reference the corresponding descriptions.

Note

On the initial Display Group Setting Page, tags are assigned automatically for each device (when there are tags specified as data collection channels on the Tag Setting Page).
If you want to perform **Assign Tag Automatically** again, do this first before setting the displays.





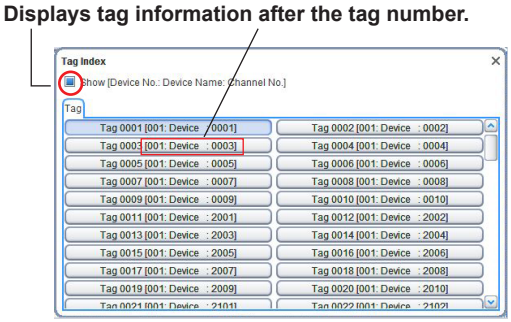
Setup Item

(1) No.

These are waveform numbers assigned sequentially starting with W01. You cannot change the numbers. Click the boxes to specify whether to display the waveform.

(2) Tag

Specify the tag to assign to the waveform. Clicking a button displays a separate window (figure below). Select a tag number to apply it to the sheet. If you select the “Show [Device No.: Device Name: Channel No.]” check box, the following information is displayed after the tag number.



Device No.: Displays the number in the GA10 Devices List.
Device Name: Displays the first 9 characters of the device name assigned on the GA10 Tag Setting Page.
Channel No.: Displays the channel number of the connected device.

(3) Y-Axis

No.: Specify the Y-axis to use in the waveform display.
Mode: Select Detail or Compact mode.
Type: Specify the type of scale to add to the Y-scale of the waveform. Select Linear or Logarithmic.
Title: Type the Y-axis title of the waveform. Enter up to 30 characters.

(4) Form.

Set the display format on the Monitor Page to fixed point or floating point.
F: Fixed point display
E: Floating point display

(5)Meter

Specify the type of meter to display on the Meter Monitor. Select bar meter  or analog meter  .

(6)Scale MIN and MAX

Type the minimum and maximum values of the scale on the Monitor Page to define the display range.

(7)Scale Interval

Set whether to specify the Y-axis scale interval of the waveform. Leave unselected to use the default scale interval. To specify the scale interval, select the check box and enter a value.

(8)Zone

MAX: Specify the maximum Y-axis position for displaying the waveform.
MIN: Specify the minimum Y-axis position for displaying the waveform.
This determines the waveform display position.

(9)Color

Specify the waveform display color. To change the color, click the appropriate cell to display a separate window. Select a color to apply it to the sheet.

(10) Trip

Use: Click to use the waveform trip line.
Value: Type the value.
Color: Specify the trip line color. To change the color, click the appropriate cell to display a separate window. Select a color to apply it to the sheet.

Collectively Edit Setup Data

To collectively edit setup data, you must select the target setup data and then click a button on the action bar, which is at the bottom of the window. The result varies depending on the type of icon you press on the action bar (see the following table).

To select the range: The procedure is the same as explained on ▶ **"Editing Tags"**

Type	Name	Result
	Show or hide Enable or disable F-Type/E-Type	Switches the check box state between selected and unselected. Switches the item selection state. If the data values in the selected range are not all the same, clicking this icon will switch all of them to match the first data value in the selected range.
	Increment	Assigns increasing tag index numbers starting with the first tag in the selected range.
	Default	Resets the value to default.
	Y-axis grouping (unit)	Groups Y-axes whose unit is the same together.
	Y-axis grouping (unit & scale)	Groups Y-axes whose unit and scale value are the same together.
	Copy	Copies the settings of the first tag in the selected range to the other tags in the selected range.
	Copy flag	Switches between selected and unselected states for items to be pasted when copying setup data. The items are normally selected (pasted). Clicking this button causes the corresponding column to become unselected and will not be pasted to.

You can also copy and paste selected content using the **Edit** menu.

Assigning Tags Automatically

Tags assigned on the Tag Setting Page can be assigned automatically to display groups.
There are two methods for automatic assignment.

- **Assign According to Tag Number**

  When you specify the number of tags to assign to each display group, the specified number of tags are assigned in order from the first number of display group 1 on the Tag Setting Page.
  For example, if the total number of tags is 50 and you set the number of tags to 10, 10 tags will be assigned to each group from Group 1 to 5.
  If the Math function (/MT) is installed, math tags will be assigned in order after tags are assigned.

- **Assign According to Device**

  The tags of a single device are assigned to each display group. For each device (device number) that a tag has been assigned to, assign the tag to a display group. Tags are assigned in ascending order by device number starting with display group 1. Within a display group, tags are assigned in ascending order by tag number.
  If the number of tags of a device is greater than the number of waveforms in a display group, multiple display groups will be used for the device.

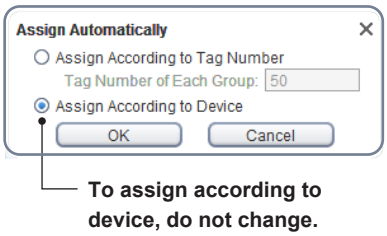
Note

- When you assign tags automatically, the settings of all display groups are reset to their default conditions. After automatic assignment, you must configure the settings again.
- Tags that are automatically assigned are those whose **Monitor** item is selected on the Tag Setting Page and whose channel is specified.
- Math tags are assigned automatically using Assign According to Tag Number.

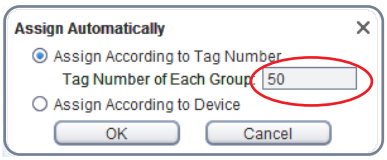
- **Automatic Assignment Procedure**

1 On the **Project** menu, click **Assign Tag Automatically**.
An Assign Automatically dialog box appears.

2 Select the assignment method.



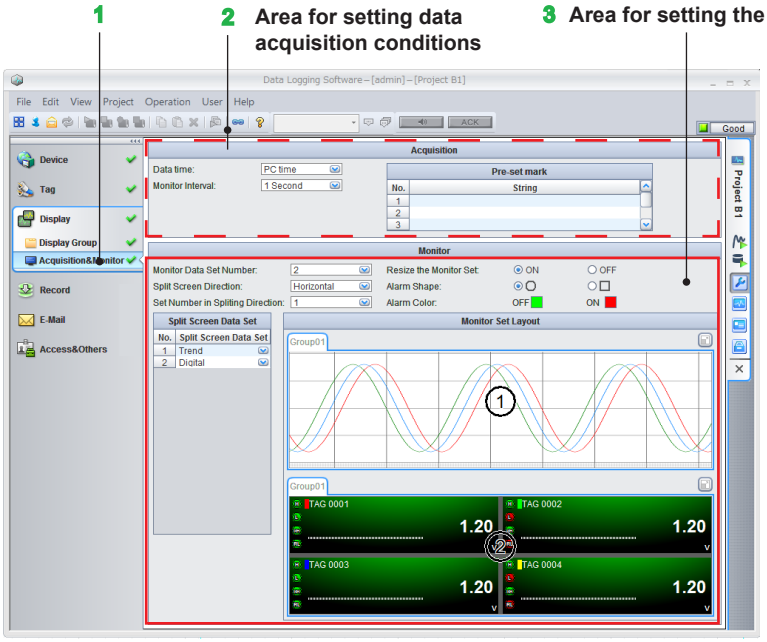
3 To assign according to tag numbers, select **Assign According to Tag Number** and type the number of tags to share in each group.



4 Click **OK**.
All display group settings are initialized, and tags are assigned to display groups on the Display Group Setting Page.

3.3.5 Registering Data Collection Method and Monitor Page

After setting the display groups, register the data collection method and monitor page. Data collection is performed for tags that are set to collect data on the Tag Setting Page. On the Acquisition & Monitor Page, set the data collection conditions, namely the type of timestamps to attach to data and data collection interval. In addition, specify the number of windows to divide the Monitor Page into and their layout.

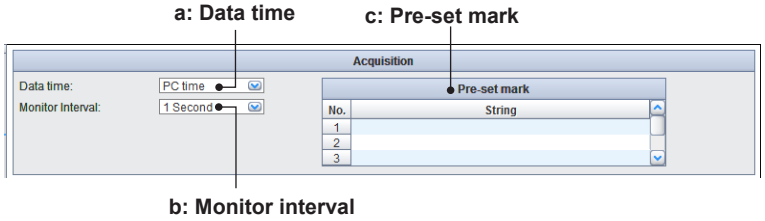


Basic Operation

1. Select Acquisition&Monitor in the navigation area on the left of the window.
   The Acquisition&Monitor Page appears.
2. Set the data acquisition conditions, namely the type of timestamps to attach to data and acquisition interval.
3. Configure the Monitor Page (monitor type, layout, etc.).

The Acquisition&Monitor Page is divided into two areas: an area for setting data acquisition conditions and another for configuring the monitor. The details of each are provided in the following pages. Use the letters (a to j) in the figure to reference the corresponding descriptions.

Acquisition area



Setting Data Collection Conditions

a Data time

Timestamps are attached to data that GA10 collects from devices. You can set the type of timestamp to use to **Device time** or **PC time**. Device time is the time information that the data collection device uses. PC time is the time information that the PC in which the server is installed uses.

If Device time is selected

By selecting Device time, you can synchronize the data in GA10 with the data in the corresponding device.
In addition, the backfill function becomes available.
However, if data is collected from multiple devices, time offset can occur between the devices and the collection interval may be different. In other words, data cannot be collected simultaneously with synchronized timestamps.
Moreover, if you are using the multi batch function, the backfill function will not work.

Operating conditions of the backfill function: ▶ **"Q4" on page 12-7**

Important

The Math function (/MT option) does not work when "Device time" is in use. If you change to "Device time" after setting math tags, a confirmation message will appear. To keep the math settings enabled, click Cancel. If you click OK, the changes will be applied, and the math settings will be disabled.

Note

Data collection using device time has the following limitations.

- You cannot specify the data collection and record interval on GA10. The acquisition interval of each device is used.
- If different acquisition intervals are used during recording in different devices or even within the same device, the collected data will be saved to separate files according to the intervals.
- The trend monitor on the Monitor Page displays data based on a single time axis. Therefore, if there are multiple devices whose time or interval is different in a display group, the Monitor Set will be divided and waveforms in the display group will be displayed in windows divided at the interval level. Only up to four divided windows can be displayed. Anything in excess will not be displayed.
- A similar behavior will also occur in alarm lists. The page will be divided, and the lists will be displayed separately at the device level. If there are multiple acquisition intervals in the same device, the page will not be divided at the interval level but at the device level.

If PC time is selected

If PC time is selected, data will be created using synchronized timestamps. You can specify the data collection interval and record interval, and save data to a single data file during recording. There are no display limitations on the Monitor Page.

Note

- Data collected using PC time will not necessarily be the same as those of the corresponding devices:
  ▶ **"Q9" on page 12-10**
- The timestamps attached to data in PC time mode are determined so that data collection would always occur at 0:00 am (00:00:00).

The difference between setting the Data time to PC time and setting the Data time to Device time is also described in **"Q12" on page 12-11**.

b Monitor Interval

Click the arrow, and select from the following intervals. If Data time is set to Device time, you cannot specify the Scan Interval.

Interval: 100 Millisecond, 200 Millisecond, 500 Millisecond, 1 Second, 2 Second, 5 Second, 10 Second, 20 Second, 30 Second, 1 Minute, 2 Minute, 5 Minute, 10 Minute

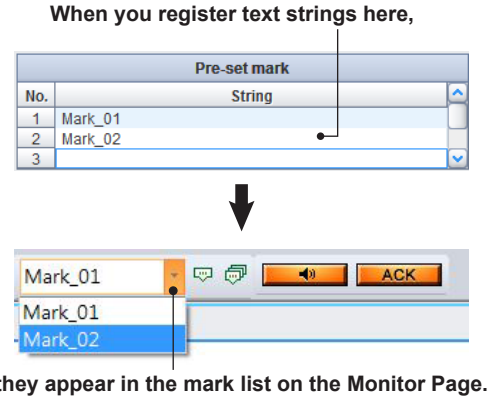
Note

Data update interval of the monitor screen depends on the data acquisition interval as follows:

Data acquisition interval	Data update interval of the monitor screen
Less than 100 ms	100 ms
100 ms - 10 s	As specified
20 s or more	Half the specified interval (i.e., 10 seconds if 20 seconds is specified)

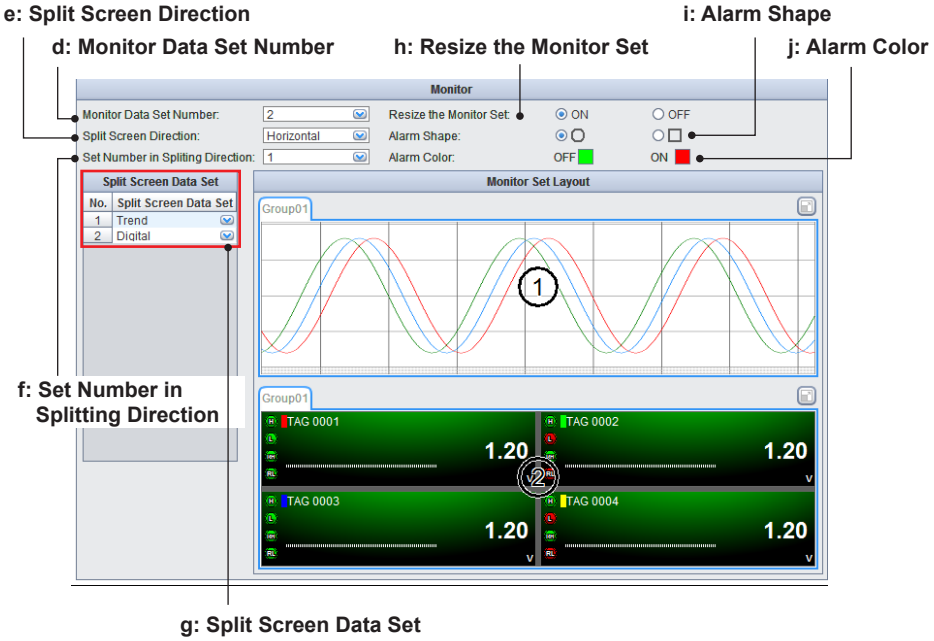
c Pre-set mark

Specify text strings to assign to marks if you want to add marks on the Trend Monitor Page. You can assign up to 16 characters to each mark. You can register up to five marks. When you register text strings here, they appear in a list on the Monitor Page as shown below, allowing you to easily add marks.



If you click , the mark appears on the monitoring page.
And if you click , the marks appear on all monitoring pages.

Monitor area



Configuring the Monitor Page

The GA10 Monitor Page can display four types of displays (referred to as Monitor Data Sets): trend, digital, meter, and alarm. A total of up to 16 monitors can be arranged on the Monitor Page.
To display multiple Monitor Data Sets simultaneously, specify how to divide the page and where to arrange each Monitor Data Set.
When you specify items d to g below, a display layout appears in the Monitor Set Layout area. By dragging the splitters that appear between rows and columns when you move the pointer over the boundaries, you can adjust the size of Monitor Data Sets.

d Monitor Data Set Number

Select a number between 1 and 16.

e Split Screen Direction

Set the direction to arrange the Monitor Sets to Horizontal or Vertical.

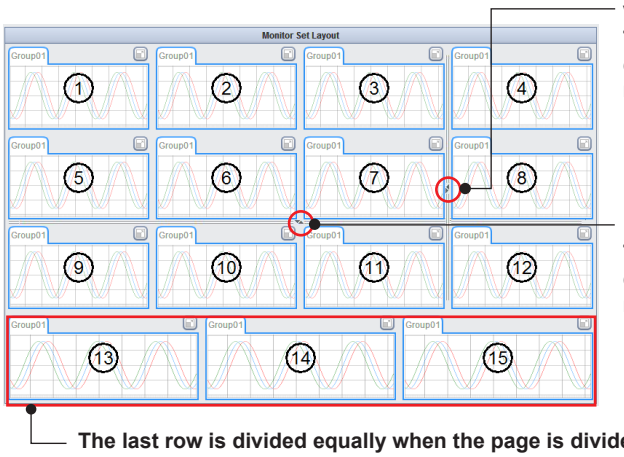
f Set Number in Splitting Direction

Select a number between 1 and 16. Options that exceeds the Monitor Data Set Number are not displayed.

g Split Screen Data Set

Assign Trend, Digital, Meter, or Alarm to each Monitor Data Set.

The Monitor Data Sets can be arranged vertically or horizontally on the page.
The following figure shows the layout when the Monitor Data Sets are arranged horizontally. The number of vertical divisions is determined by the number of Monitor Data Sets in the horizontal direction and the total number of Monitor Data Sets on the entire Monitor Page. (When arranged vertically, the horizontal and vertical arrangement of the Monitor Data Sets is swapped.)



h Resize the Monitor Set

When set to **On**, you can make fine adjustments to the arrangement also on the Monitor Page.

i Alarm Shape

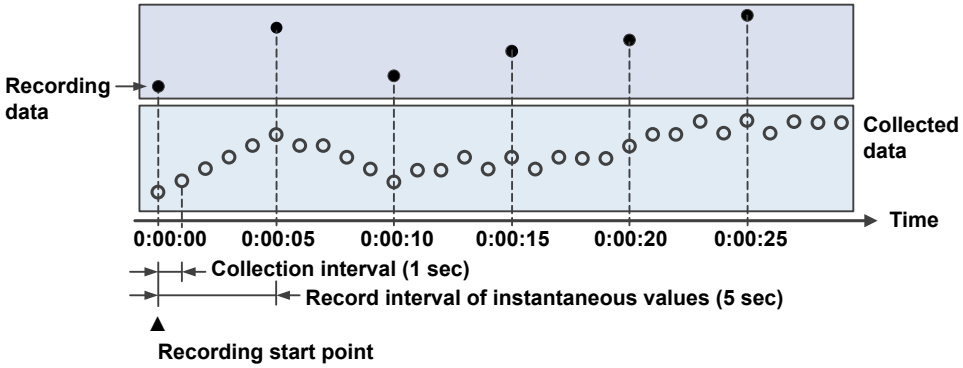
You can set the shape of the alarm display area to circle (○) or rectangular (□).

j Alarm Color

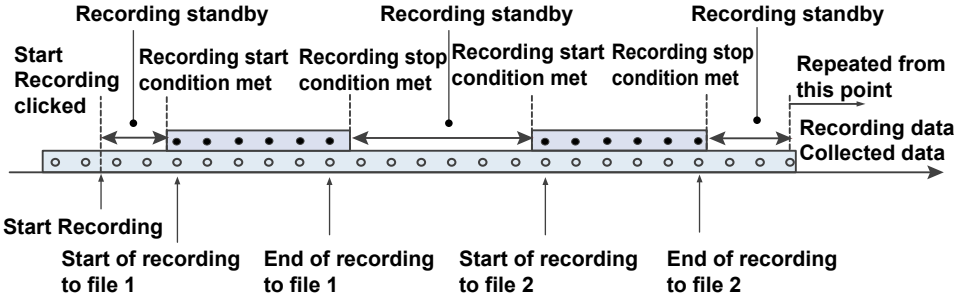
You can change the color that appears when alarms are active (On) and when alarms are inactive (Off). Clicking a color displays a Color Setting dialog box where you can select the color.

3.3.6 Setting the Data Recording Method

GA10 saves the data collected at the collection interval to data files at a specific record interval. The instantaneous values of data are recorded. The collected data at each record interval is saved to files without any data processing.
The figure shows an example of how data is recorded when the collection interval is 1 second, the record interval for instantaneous values is 5 seconds, and recording is started at 0:00:00. In instantaneous-value recording, the collected data at 0:00:00, 0:00:05, and 0:00:10 are saved as record data. The first collected data is called “recording start point.”



Click the **Start Recording** button to start data recording.
Note that the actual recording of data to data files starts when the recording start conditions are met. Therefore, GA10 may enter the recording standby state when the Start Recording button is clicked.
The following figure shows an example of how GA10 operates when an interval (everyday, every week, every month) and start time are specified as recording start conditions.



The following settings are available on the Record Setting Page.

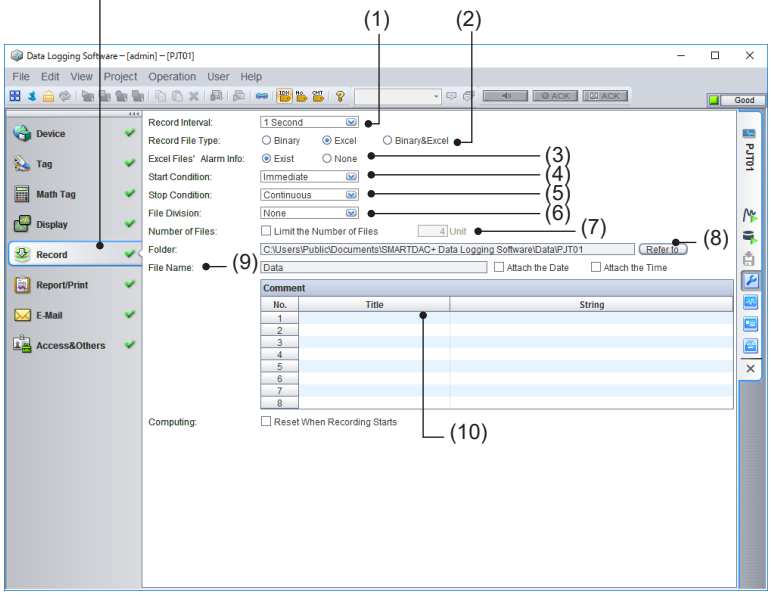
- Record Interval
- Record File Type
- Start/Stop Condition
- File Division
- Number of Files
- Folder
- File Name
- Comment

The details of these settings are provided in the following pages.

Note

- The data recording settings vary depending on whether the data collection condition was set to PC time or Device time. Also, the handling of alarm information and the number of record data files vary.
- If the server stops for some reason during recording, the recording will resume when the server recovers. However, if the server is stopped manually, or if the PC in which the server is installed stops, the data file is cut at this point and saved. Recording will not resume even if the server is restarted. When the server stops.

Click here to display the Record Setting Page.



(1) Record Interval

Select the interval from the drop-down list.
Options: 100 Millisecond, 200 Millisecond, 500 Millisecond, 1 Second, 2 Second, 5 Second, 10 Second, 20 Second, 30 Second, 1 Minute, 2 Minute, 5 Minute, 10 Minute
The intervals that are displayed in the list are integer multiples of the collection period specified on the Monitor Page. If Data time is set to Device time, you cannot specify the record interval.

(2) Record File Type

Specify the data output format.
You can save the recorded file in binary format (.dld extension) or Excel format (.xlsx extension).

Note

If you want to record data on a device with the scan interval set shorter than 10 ms using multiple projects, we recommend that data be recorded in binary format.

(3) Excel Files' Alarm Info

Select whether to export alarm information to Excel.

Setting	Description
Exist	Alarm information is exported to an Excel file.
None	Alarm information is not exported to an Excel file.

(4) Start Condition

You can specify the following for the start condition.

Start Condition	Description
Immediate	Starts recording when the Start Recording button is clicked.
Specified Time	Starts recording when the specified time arrives.
Specified Period	Records at the specified period.
Alarm	Starts recording using the alarm status as a trigger.
Level	Starts recording using a collected data value as a trigger.

(5) Stop Condition

You can specify the following for the stop condition.

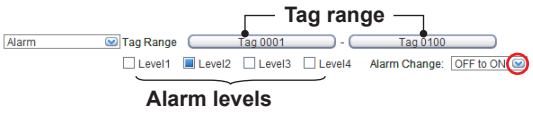
Stop Condition	Description
Continuous	Stops recording when the Stop Recording button is clicked.
Specified Time	Stops recording at the specified time. If the start condition is set to Alarm or Level, GA10 enters a recording standby state.
Specified Duration	Stops recording when the specified time elapses after recording starts. If the start condition is set to Alarm or Level, GA10 enters a recording standby state.
Data Number	Stops recording at the specified number of data points. If the start condition is set to Alarm or Level, GA10 enters a recording standby state.
Specified Period	Stops recording at the specified period and enters recording standby state.
Alarm	Stops recording using the alarm status as a trigger and enters recording standby state.
Level	Stops recording using a collected data value as a trigger and enters recording standby state.

Note

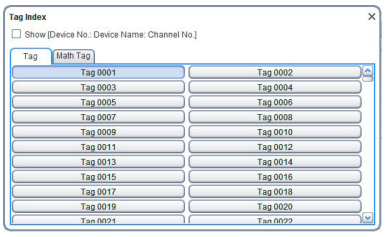
- If you set the start condition to Specified Period, the stop condition is fixed to Specified Period.
- If the start condition is set to Specified Period and the recording start time is set to the same time as the record stop time, the recorded data file is not divided at every interval.
- If the start condition is set to Specified Period and the period is set to the 31st of every month, for months that do not have 31 days, the date is automatically set to the last day of the month.
- If you set the start condition to Specified Time, you cannot specify a nonexistent time due to DST (daylight saving time) transition.
- If the specified time overlaps due to the DST transition, the first time is used to start recording.

If the Start Condition is set to Alarm

1. Set Start Condition to **Alarm**.
   The tag range, **Level** (1 to 4), and **Alarm Change** are displayed.



2. Click the first or last tag selection button.
   The Tag Index dialog box appears.



3. Select the applicable tag range.
   The dialog box closes, and the tag selection button display changes to the selected tag.
4. Select **Level** (alarm level).
5. Set the **Alarm Change** to **OFF to ON** (alarm activated state) or **ON to OFF** (alarm released state).

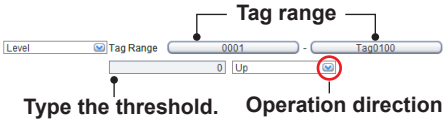
   Click the Start Recording button to enter the recording standby state. When the monitored alarm reaches the specified alarm value, recording starts.

If the Stop Condition is set to Alarm

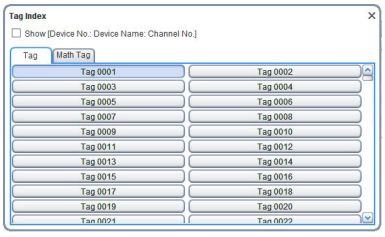
The setting procedure is the same as described above. When the specified alarm value is reached during recording, GA10 stops recording and enters the recording standby state.

If the Start Condition is set to Level

1. Set Start Condition to **Level**.
   Tag range, threshold value, and operation direction appear.



2. Click the first or last tag selection button.
   The Tag Index dialog box appears.



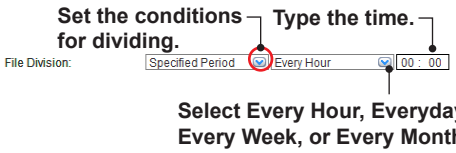
3. Select the applicable tag range.
   The dialog box closes, and the tag selection button display changes to the selected tag.
4. Enter the threshold value.
5. Set the operation direction to Up (data value is greater than or equal to the threshold) or Down (data value is less than or equal to the threshold).
   Click the Start Recording button to enter the recording standby state. When the monitored tag value reaches the threshold in the specified direction, recording starts.

If the Stop Condition is set to Level

The setting procedure is the same as described above.
When the monitored tag value reaches the threshold in the specified direction, GA10 stops recording.

(6) File Division

Set the conditions for dividing data files. The settings vary depending on the selected condition. The figure below shows an example when Specified Period is selected.



Off
File is not divided.

Specified Duration
Based on the time of the first recorded data, the file is divided at every specified hour and minute.
Example: If the division time is 1 hour, the time of the first recorded data is 3:00:00, and the record interval is 1 second, the first file will contain the data from 3:00:00 to 3:59:59, and the second file will contain the data from 4:00:00 to 4:59:59.

Specified Period
Select Every Hour, Everyday, Every Week, or Every Month and the absolute time to divide the data file.

Data Number
The file is divided when the number of data values in the data file reaches the specified number. Input range: 100 to 2600000

Note

The file is divided in the following situations.

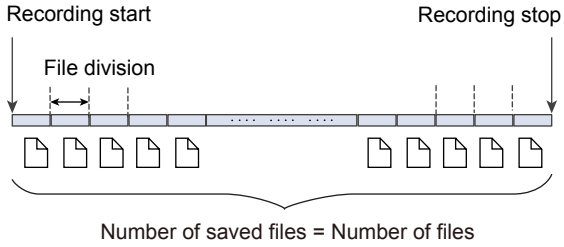
- When the data file size exceeds 1 GB
- When the data file output format is Excel and the number of recorded tags is 180 or less, the files will be divided every 65535 rows.
  When the number of recorded tags is 181 or more, the files will be divided in groups of the maximum number of rows that meets the following condition: number of tags No number of rows < 11796428.
- When the data file output format is binary and the number of recorded data points exceeds 10 million
  This number is the number of timestamps that is recorded and is not related to the number of tags.

(7) Number of Files

If you use File Division, you can specify a upper limit to the number of files to save for the data files that have been divided during one iteration from recording start to recording stop.
You can limit the number of data files that are saved from the start of recording to the end of recording. When the number of data files reaches the limit, the oldest file is deleted to save the most recent file.
The handling of the number of files is different when the data time of collected data is set to PC time or Device time. The range of values that you can enter is 4 to 2000.

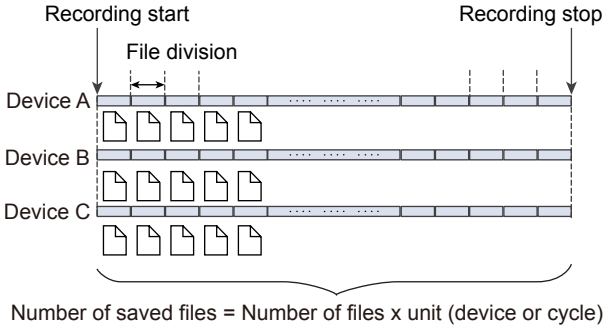
PC time

Because the data of every device is saved in a single file, the number of data files of one iteration from recording start to recording stop is applicable.



Device time

Because a file is saved for each device or each interval, the number of data files of one iteration from recording start to recording stop for each device or interval is applicable.



(8) Folder

Specify the data file save destination.

Server PC Operation System	Default destination
Windows XP	C:\Documents and Settings\All Users\Documents\SMARTDAC+Data Logging Software\Data
Windows Vista, 7, 8	C:\Users\Public\Documents\SMARTDAC+Data Logging Software\Data

Note

We recommend you use the default setting for the data save destination folder.
If you want to change the save destination, select a folder that the server (Network service account) can write to. Note that files cannot be saved to the desktop or Document folders. If you select an area where writing is not possible, an error message (E3055) will appear.

(9) File Name

Specify the name of the data file. When recording data using Specified Period, it is convenient to add the date or time to the file name. The date or time of the first data point is added to the file name.

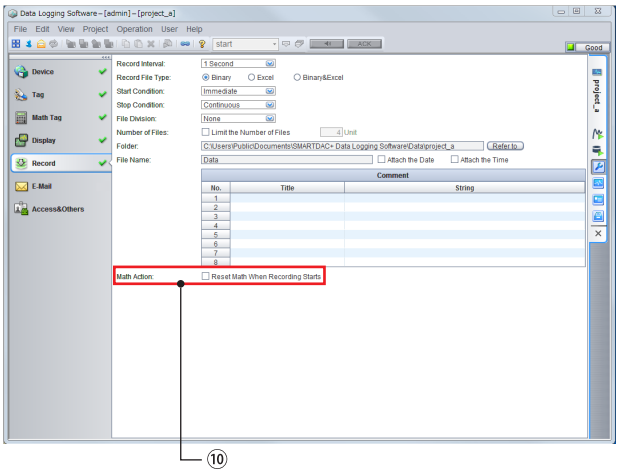
(10) Comment

You can attach comments to data files. You can view these comments when you display the data in Universal Viewer.
You can change the comments until you click Start Recording but not afterwards.

(11) Math Action (Appears only when the /MT option is in use)

On GA10 with the Math function (/MT option), the Math Action item appears on the Record Setting Page. To reset math when recording starts, select the check box. However, the math reset timing is delayed by one recording interval from the record start timing. Also depending on your PC environment, it could be delayed by more than two record intervals.

Record Setting Page When the Math Function (/MT option) Is in Use



Note

Differences in Data Recording When PC Time Is Used and When Device Time Is Used

The table below summarizes the differences in the recording files created when Data time is set to Device time and when set to PC time.

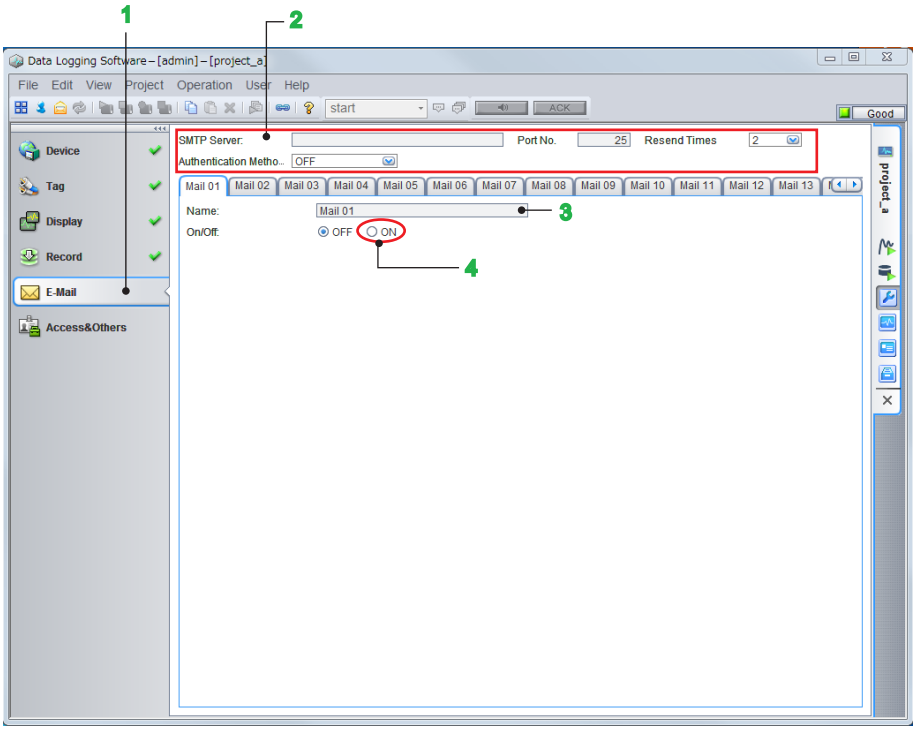
Data Time Influence	Specified Data Time	
	PC Time	Device Time
Number of recording files	One data file is created.	A data file is created for each device. Or if there are multiple acquisition intervals in the same device, a data file is created for each interval.
Alarm information	Alarm information is recorded by taking the logical OR of the alarm information from the collected data immediately after the previous recording data point to the current recording data point.	The data files and alarm information are aligned.
DST (daylight saving time) when a recording file is displayed on the viewer	When a recording file is displayed on the viewer, the time information is displayed correctly according to the DST.	When the DST settings on the PC and device are the same, the time information is displayed correctly. If they are not the same, the DST information of the device is not reflected correctly.
When device settings are changed during recording	The changes are not reflected.	Recording stops.

Changes to devices during data collection and recording: ▶ **"Q11" on page 12-11**

What is PC time, or Device time?: ▶**"Q12" on page 12-11**

3.3.7 Configuring Mail Settings

GA10 can send email when alarms occur or when the communication status changes. Configure email settings on the Mail Setting Page.
You can specify up to 20 sets of mail settings of your choice.
The Email Setting Page consists of an area for SMTP server settings and an area for detailed mail settings.



Basic Operation

1 Select E-Mail in the navigation area on the left of the window.
The Email Setting Page appears.

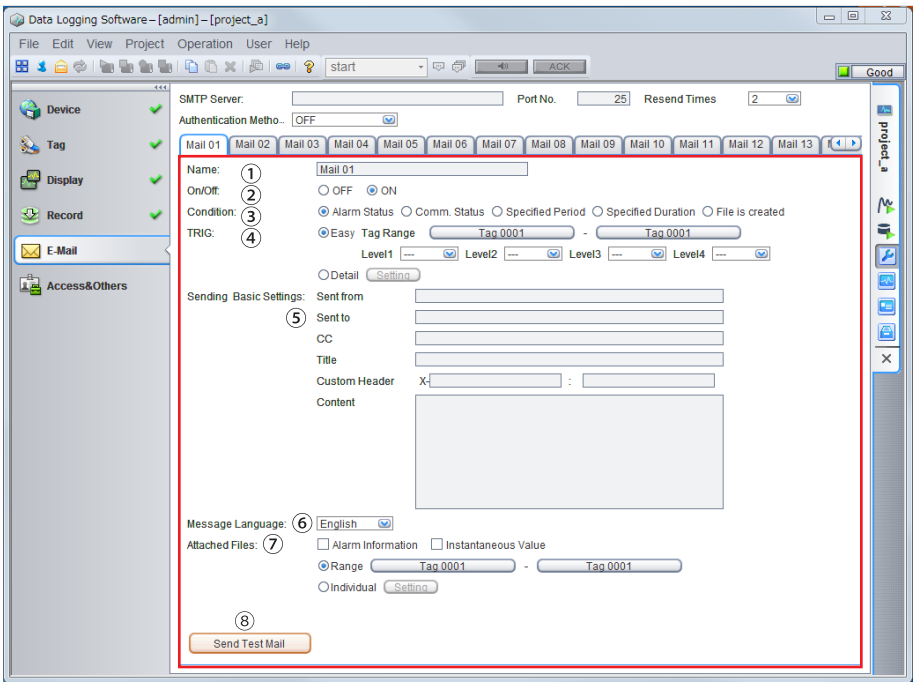
2 Specify the following SMTP server settings.
- SMTP Server: SMTP server name (up to 255 characters)
- Port No.: Port number that the SMTP server will use (0 to 65535)
- Resend Times: Select 0, 1, 2, 3, 4, or 5. If email transmission fails, GA10 retries the specified number of times. GA10 will retry to transmit 5 minutes after the previous transmission failure.
- Authentication Methods: OFF (no authentication), SMTP Authentication, or POP Before SMTP.

3 Select the mail tapped pages, and enter their names. (“Mail01” is used in this example.)

4 Set On/Off to On.
The Email Event Setting Page appears.

Email Event Setting Page

You can set the following items on the Email Event Setting Page. Set one set of conditions on each tabbed page.



(1) Name

Enter the name of the mail event. This name becomes the tab name.
Default values: Mail01 to Mail20
Input range: Up to 30 characters

(2) On/Off

Enable or disable the mail event setting. The default value is OFF. Selecting ON displays a setting page.

(3) Condition and (4) Trigger

Select the conditions for sending email.
Default value: Alarm Status

Send Conditions	Description
Alarm Status	Send an email when the alarm of the specified tag changes.
Comm. Status	Send an email when the communication status between the server and a data acquisition device changes or when a data dropout occurs on the server.
Specified Period	Send an email at specified intervals (such as everyday, every week, and every month) or at a specific time within the interval.
Specified Time	Send an email at specified intervals after data acquisition starts.
File is created	Send an email when the creation of a data file is completed.

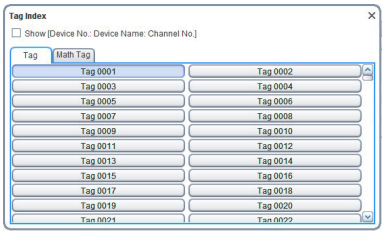
Depending on the send condition you select, the trigger display changes as shown in the following table.

Send Conditions	Trigger	
	Default Value	Range
Alarm Status	Easy	Easy or Detail[1]
Comm. Status	Communication Disconnect	Communication Disconnect, Communication Recover, Loss Data
Specified Period	Everyday Time: 00:00:00	Everyday, Time
		Every Week, Sunday to Saturday, Time
		Every Month, 1st to 31st, Time
Specified Time	00:01:00	Enter the trigger time interval.
File is created	No trigger setting	---

1 If you select Easy, set Tag Range and Level 1 to Level 4. If you select Detail, select the alarm level for each tag in the **Select alarm dialog box** shown on the next page.

If Send Condition Is Alarm Status and Trigger Is Set to Easy

1 Click the start tag button of Tag Range.
A Tag Index dialog box appears.

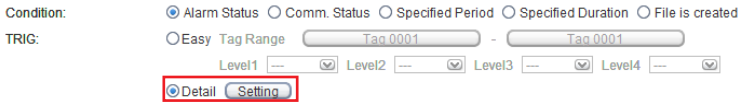


2 Select the start tag.
The Tag Index dialog box closes, and the selection is reflected on the Email Event Setting Page.

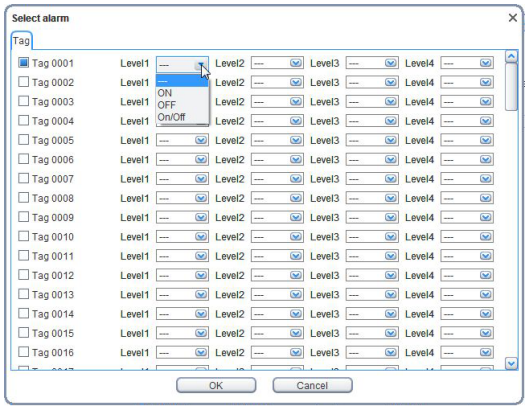
3 Likewise, set the end tag.
The tag range is now set on the Email Event Setting Page.

4 Specify the changes in the alarm levels of Level 1 to Level 4.

If Send Condition Is Alarm Status and Trigger Is Set to Detail



1 Click Setting.
A Select alarm dialog box appears.

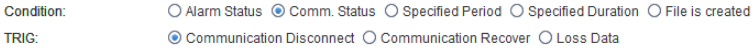


2 Click the check boxes of the tags you want to select.
To clear a selected check box, click it again.

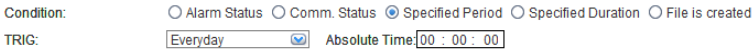
3 Click the arrows of alarm Level 1 to Level 4, and select the changes in the alarm levels.
Options: ---, On, Off, On/Off. Default value: ---

4 To apply the selections, click OK. To cancel, click Cancel.
The dialog box closes, and the Email Event Setting Page returns.

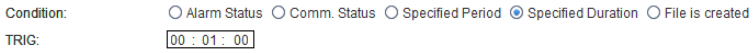
Trigger Display When Send Condition Is Set to Comm. Status



Trigger Display When Send Condition Is Set to Specified Period



Trigger Display When Send Condition Is Set to Specified Duration



When Send Condition Is Set to File is created (No trigger display)

(5) Sending Basic Settings

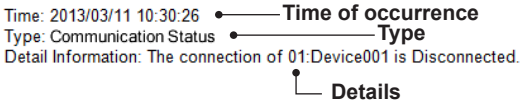
Enter the following sending basic settings. You can specify up to 10 email addresses for Sent to and CC. To specify multiple email addresses, separate each address with a semicolon.

Sent from: Sender email addresses (up to 100 characters.)
Sent to: Recipient email addresses (up to 500 characters, up to 255 for each address.)
CC: Carbon copy email addresses (up to 500 characters, up to 255 for each address.)
Title: Subject of the email (up to 250 characters.)
Custom Header: Enter up to 30 alphanumeric characters in first and second fields. (Colon and space excluded. Characters outside the range are replaced with hyphens.) If you enter “Mailer” in the first field and “GA10” in the second field, the email’s custom header will be “X-Mailer : GA10.”

Content: Body of the email message. Enter up to 1000 characters per line and up to 500 lines (up to 1000 characters for the entire body of text).

(6) Message Language

The body of email messages consists of the message specified by the user and the message automatically added according to the send conditions.
The following figure shows the message that is automatically added. It displays the event information (send conditions) divided into the time of occurrence, type, and details.



You can change the language of these messages. You can select from English, Japanese, Chinese, German, French, Korean, and Russian. The default value is the OS language. For details on the body of messages, see the table on the next page.

Details on the Body of Messages

Send Condition	Event Information	Message Strings
Alarm Status	Alarm Status	If a message occurs at alarm level 1: Time: *YYYY/MM/DD hh:mm:ss* Type: Alarm Detail Information: *ProjectName TagIndex TagNo TagComment [AlarmLevel1AlarmType] is occurred./is released.*
		If a message occurs simultaneously at alarm level 1 and alarm level 2: Time: *YYYY/MM/DD hh:mm:ss* Type: Alarm Detail Information: *ProjectName TagIndex TagNo TagComment [AlarmLevel1AlarmType] is occurred./is released.* *ProjectName TagIndex TagNo TagComment [AlarmLevel2AlarmType] is occurred./is released.*
Comm. Status	Comm. Status	Communication Disconnect/Communication Recover Time: *YYYY/MM/DD hh:mm:ss* Type: Communication Status Detail Information: The connection of *DeviceIndex : DeviceName* in *ProjectName* is disconnected/recovered.
		Loss Data (PC time) Time: *YYYY/MM/DD hh:mm:ss* Type: Communication Status Detail Information: Data Lack in *ProjectName* is detected.
		Loss Data (Device time) Time: *YYYY/MM/DD hh:mm:ss* Type: Communication Status Detail Information: Data Lack in *DeviceIndex : DeviceName* in *ProjectName* is detected. The duration of Data Lack is from *YYYY/MM/DD hh:mm:ms* to *YYYY/MM/DD hh:mm:ms*.
Specified Period	Specified Period	Everyday Time: *YYYY/MM/DD hh:mm:ss* Type: Periodically Notification Detail Information: The condition of sending mail in *ProjectName* is at *hh:mm:ss* of every day.
		Every Week Time: *YYYY/MM/DD hh:mm:ss* Type: Periodically Notification Detail Information: The condition of sending mail in *ProjectName* is at *hh:mm:ss* of each xxday.
		Every Month Time: *YYYY/MM/DD hh:mm:ss* Type: Periodically Notification Detail Information: The condition of sending mail in *ProjectName* is at *hh:mm:ss* of each month.
Specified Duration	Specified Duration	Time: *YYYY/MM/DD hh:mm:ss* Type: Regularly Notification Detail Information: The condition of sending mail in *ProjectName* is every *hh:mm:ss*.
File is created	File is created	Time: *YYYY/MM/DD hh:mm:ss* Type: Data file Detail Information: A data file(*FileName*) in *ProjectName* is created.

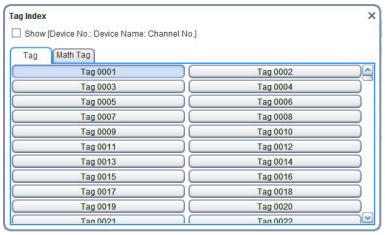
(7) Attached Files

The alarm information and instantaneous value of tags can be attached as a file to outgoing messages. The types and selectable range of Attached Files vary depending on the sending condition.

Send Condition	File Attachment	File Type	Tag Specification
Alarm Status	Yes	Alarm information, instantaneous value	A tag range can be specified, or tags can be specified in detail (individually).
Comm. Status	No	Not available	Not available
Specified period	Yes	Alarm information, instantaneous value	A tag range can be specified, or tags can be specified in detail (individually).
Specified duration	Yes	Alarm information, instantaneous value	A tag range can be specified, or tags can be specified in detail (individually).
File is created	Yes	Data file	Not available

When Range Is Used for Attached Files

1 Click the start tag button of Tag Range.
A Tag Index dialog box appears.

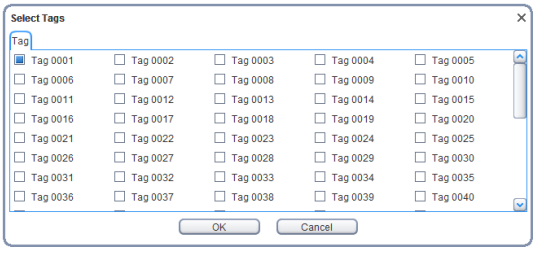


2 Select the start tag.
The Tag Index dialog box closes, and the start tag is updated.

3 Likewise, set the end tag.
The tag range is now set.

When Individual Is Used for Attached Files

1 Click Setting.
A Select Tags dialog box appears.

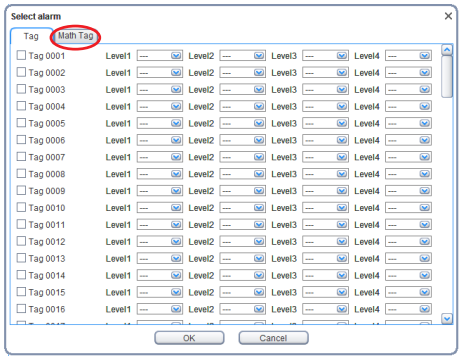


2 Click the check boxes of the tags you want to select.
To clear a selected check box, click it again.

3 To apply the selections, click OK. To cancel, click Cancel.
The dialog box closes, and the Email Event Setting Page returns.

Note

On a GA10 with the Math function (/MT option), a Math tag page is displayed in the Tag Index, Select alarm, and Select Tags dialog boxes. The following figure shows an example of a Math tag page in the Select alarm dialog box.



Note that the method of specifying math tags is the same as that for normal measurement tags.

(7) Send Test Mail

A test mail is sent according to the settings on the Mail tabbed page.
Attachments are not sent during a test transmission.

Note

Test mail transmission to multiple clients is not possible to prevent affecting server communication.

Behavior When Sending Email When Alarms Occur

If email send condition is set to **Alarm Status**, note the following points.

- The timing for sending email is different when Data time is set to PC time and when Data time is set to Device time.

  PC time

  The specified tag range is assumed to be a single group. If any of the alarms of the tags in the group occurs, an email is sent.

  Device time

  The specified tag range is grouped by device or interval. If any of the alarms of the tags in the group occurs, an email is sent.

  In each 1 second interval of each group, the data timestamp of the earliest occurring alarm is used as the alarm timestamp, and a single email message is sent for this alarm.
  The alarm information and instantaneous value in the file attachment will only be for this earliest occurring alarm.
  Email is not sent for all other alarms that occur.

- The condition for sending email is based on the alarm information of data collected at the data collection interval. The condition for starting and stopping recording is based on the alarm information of data recorded at the record interval.

Behavior When Sending Email at Specified Intervals

If email send condition is set to **Specified Period**, note the following points.

- Do not change the time during data collection and recording. Doing so will affect the timestamps of data attached to e-mails.
- The timing for sending email is different when Data time is set to PC time and when Data time is set to Device time.

  PC time

  The time on the PC in which the server is installed is used. The data in the file attachment is all the tag data within the specified range.

  Device time

  If Device time is specified, tags are grouped by device or interval. Because the timestamps attached to the data is used in each group, multiple emails may be sent at the device level or interval level.
  If there are no tags that belong to a group in the specified range, file attachment is not created.

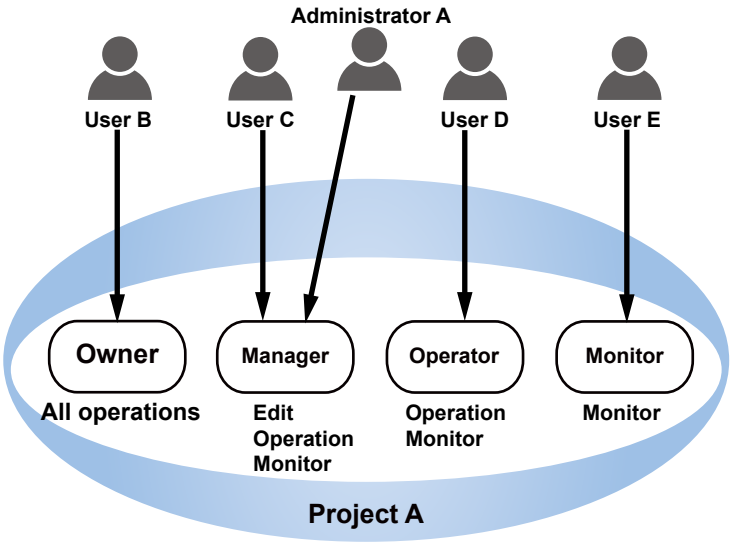
Note

- The maximum number of emails that the server can hold is 40 per project. (This includes emails that fail transmission and retransmissions.)
- Emails held in the server are deleted when the specified retransmission count is reached or when the server stops.

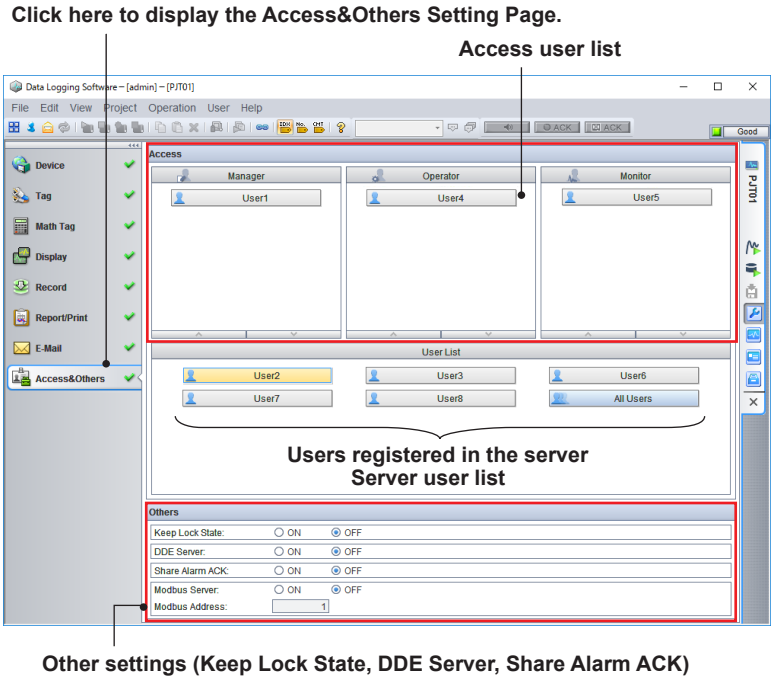
3.3.8 Setting Project Access Privileges

In GA10, you can set access privileges at the project level separately from the server access privileges (administrator and user privileges).
These privileges define the operation scope of the project; they apply in the same way to the administrator and users.

There are four types of project access privileges: Owner, Manager, Operator, and Monitor. Only the owner can assign access privileges. The person creating the project is the initial owner of the project. (To change owners: ▶ Sec. 9.4.3)



Privileges are assigned on the Access & Others Setting Page of the project.
From the users registered in the server, you can specify the users that can access the current project and their operation scope.



Access Privilege Types and Operation Scope

The table below shows the available project access privilege types and their operation scope.

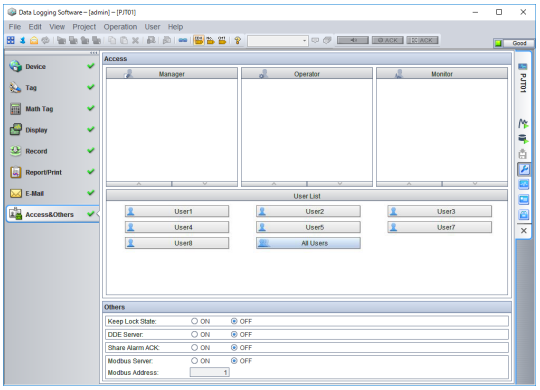
Level	Privilege Type	Allowed Operations	Operation Details
1	Owner	All operations	All operations (including deleting the project) Set project access privileges.
2	Manager	Setup Operation Monitor	Edit setup data. Start/stop data monitoring or recording. View recorded data files. Open data files. Delete data files. Monitor collected data.
3	Operator	Operation Monitor	View setup data. Start/stop data monitoring or recording. View recorded data files. Open data files. Delete data files. Monitor collected data.
4	Monitor	Monitor	View recorded data files. Open data files. Monitor collected data.

To assign access privileges, follow the procedure below. Skip steps 1 and 2 if you are already setting the details of a project.

1 The user who has owner privileges to the project logs in.

2 In the Project List Page, double-click the appropriate project to open the project.
The selected project appears on the Project Page.

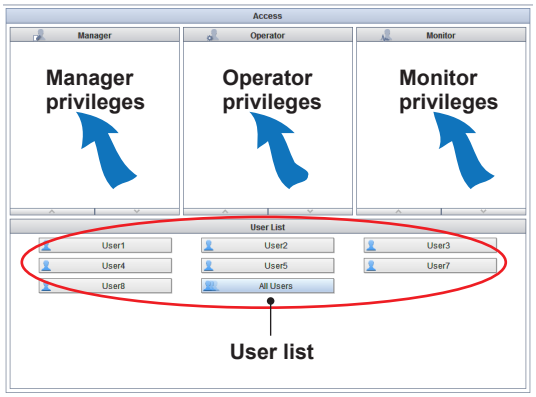
3 Change the project setting window to the Access & Others Setting Page.
A list of users registered in the server appears.



Note

You can change how the users are displayed between User Name and User Full Name by clicking **User Display Form** on the **View** menu.

4 Drag the appropriate user to the appropriate privilege area.



5 Or, select the user, and click the Move button pointing to the appropriate privilege area.

The user moves to the specified privilege area.
The user can now perform the granted operations in the project.

Note

You can select multiple users by clicking while holding down the SHIFT or CTRL key on the keyboard.

All Users

The user list displays a user named “All Users.” You can use this to assign access privileges to all users in the server user list.
You can assign access privileges to both “All Users” and individual users. If you do, the higher privilege takes effect for such users.

Note

- If you assign access privileges to All Users on the Setting Page and then add or delete individual users, All Users will also be updated.
- Before deleting project access privileges of a user, check the user status.

If you delete an owner user: ▶ **Sec. 9.4.3**
To open a project with lower access privileges: ▶ **Sec. 9.4.4**

3.3.9 Holding the Lock State

When Keep Lock State is enabled under Others on the Access & Others Page, only the user that starts data collection will be able to operate the relevant project. The Keep Lock state is retained until the user that started data collection logs in again and stops the data collection. This feature is set to OFF by default. To use it, select ON.

Select ON to set the Keep Lock State feature.

Note

The administrator can clear the Keep Lock state if there is some reason in which data collection must be stopped. To clear the Keep Lock state: ▶ Sec. 9.4.5

3.3.10 Using the DDE Server Feature

GA10 supports the DDE (Dynamic Data Exchange) Server feature, which is used to send data to other applications.

By using a DDE client, such as Excel, to access the DDE server, you can retrieve the tag values that are being collected in the project. You can begin retrieving the data from a DDE client after the DDE server starts.

Retrievable Information	Description
Date	The date when the data was collected
Time	The time when the data was collected (excluding the millisecond)
Millisecond	The millisecond when the data was collected
Data number	The serial number of the data. The first data value collected when data collection is started is number zero.
Value	The collected tag value

The application name, topic name, and item name that are used to retrieve data are shown below.

Item		Text String to Specify and Output Information	
Application name		DLGDDE (fixed)	
Topic name		Specify the name of the target project.	
Item name	Date	date	Outputs the date as a text string. The date format is YYYY/MM/DD.
	Time	time	Outputs the time as a text string. The time format is hh:mm:ss.
	Millisecond	msec	Outputs the millisecond as a text string. The millisecond format is msec. The millisecond is expressed using a number between 000 and 999.
	Data number	no	Outputs the data number as a number. The data number starts with zero.
	Value	tagxxxx xxxx is the tag index number.	Outputs the tag value as a number. The value is displayed using the number of decimal places for tags that is specified on the Tag Setting Page.

Even when multiple operation screens (clients) are displayed on the same PC, there is only one DDE server. The clients share the first DDE server that is started. Clients connected to another GA10 server cannot share the same DDE server.

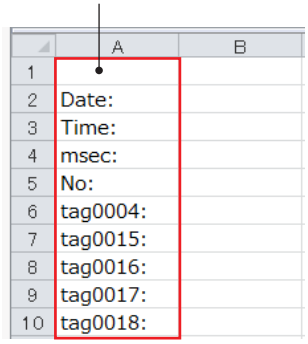
When a DDE server is started, the host name or IP address of the connected GA10 server is displayed after Stop DDE on the File menu.

Example in Which Excel Is Used as a DDE Client

Create a link to Excel for using DDE in advance.

1 In an Excel sheet, enter the indexes for the data you want to retrieve.

Enter the index (item name).



	A	B
1		
2	Date:	
3	Time:	
4	msec:	
5	No:	
6	tag0004:	
7	tag0015:	
8	tag0016:	
9	tag0017:	
10	tag0018:	

2 In the cells you want to display data (column B in this example), enter the link expressions.

	A	B
1		
2	Date:	=DLGDDE|test!Date
3	Time:	=DLGDDE|test!Time
4	msec:	=DLGDDE|test!msec
5	No:	=DLGDDE|test!No
6	tag0004:	=DLGDDE|test!tag0004
7	tag0015:	=DLGDDE|test!tag0015
8	tag0016:	=DLGDDE|test!tag0016
9	tag0017:	=DLGDDE|test!tag0017
10	tag0018:	=DLGDDE|test!tag0018
11		

Example: =DLGDDE|project!Date

(=application name|topic name!item name)

- The pipe symbol (|) and exclamation point (!) are delimiters that are necessary in expressions.
- For details on the application name, topic name, and item name, see the table on the previous page.
- In the above figure, column B is intentionally set to display the expressions.

3 After you enter the expressions, save the Excel file, and close it.

4 On the GA10's File menu, click Start DDE.
The DDE server starts on the PC running the GA10 client.

5 In the Project List Page, double-click the project that you want to use the DDE server with to open the project.

6 Change the project setting window to the Access & Others Setting Page.

7 Set DDE Server to ON.

Start the DDE server and data collection.

8 Click  to start data collection.
Start collection and recording: ▶Sec. 3.2.4

9 Open the Excel file.
If a message appears asking you whether to update the links, update them.
The collected data will be displayed in Excel cells.

	A	B
1		
2	Date:	2014/8/20
3	Time:	15:44:09
4	msec:	0
5	No:	181
6	tag0004:	-1.6294
7	tag0015:	0
8	tag0016:	0

10 To stop the DDE server, on the **File** menu, click **Stop DDE**.
The host name or IP address of the GA10 server connected to the DDE server is displayed after Stop DDE.

Important

- **While DDE is running, do not change the project name (topic name).**
- **To save files using Excel as a DDE client, set Files of type to Excel 97-2003 book (*.xls).**

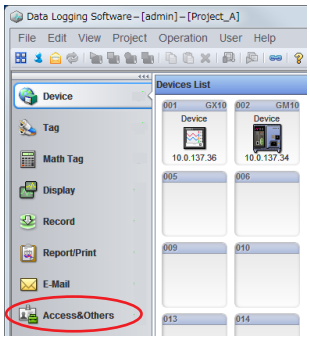
Note

- If data collected by the DDE server is in error, it is output using indications other than values.
  For the different types of error data, see Sec. 6.9.2.
- The time information that is used for DDE queries is the PC time in which the server is installed. The time when the collected data is set to the DDE server is the time that is output.
  Therefore, if Data time is set to Device time, the time and value of the data on the Monitor Page or data recorded to the data file will not be synchronized to the time and value output by the DDE server.
- The data number is output only when Data time is set to PC time. It is not output when Data time set to Device time.In the Project List Page, double-click
- If communication between the data collection device and the server is disconnected and Data time is set to PC time, OFF is output for the data value. If set to Device time, data updating stops regardless of whether FIFO is being used. This is the same behavior as when the data collection from the device is delayed.
- For information on how to use a DDE client, see the manual for the DDE client.

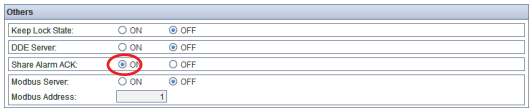
3.3.11 Sharing Alarm ACK Operations

If Share Alarm ACK under Others of the Access&Others Setting Page is set to ON, the ACK operation can be shared among multiple clients connected to the same server. If an alarm occurs in a project, you do not have to perform ACK operation on each client.

1. Log in with a user who has privileges for editing the settings of the project.
2. Open the project in which you want to share the alarm ACK operation.
3. Click Access&Others.



4. Click ON next to Share Alarm ACK.



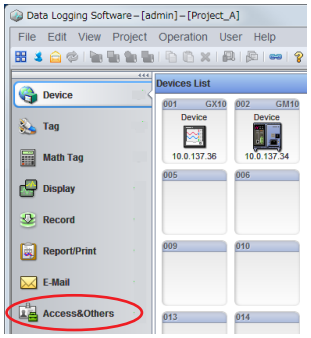
The alarm ACK operation is shared among clients that are connected to the same server.

Alarm ACK operations: ▶ **Sec. 6.6.3**

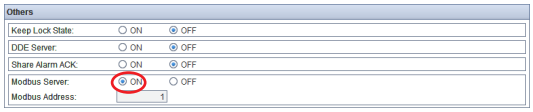
3.3.12 Starting the Modbus Server and Setting the Modbus Address

If Modbus Server under Others of the Access&Others Setting Page is set to ON, responses are returned when requests are received from a Modbus client.

1. Log in with a user who has privileges for editing the settings of the project.
2. Open the project you want to access from the Modbus client.
3. Click Access&Others.



4. Click ON next to Modbus Server.



5. Set the address in Modbus Address.

   Assign an address (setting range: 1 to 247) to each GA10 project.

For Modbus Server function: ▶ **"Chapter 11 Modbus Server Function"**

3.4 Registering Modbus Devices

3.4.1 Registration of Modbus Devices

GA10 can connect to devices that use the Modbus protocol.
To register such a device, you must create a Modbus device definition file in advance and save it in **a specific server folder** (step 3 below).

- If you are using GA10 R1.02 or later, UTAdvanced series devices can be connected without creating definition files. Select from the devices list.
- When connecting an UTAdvanced device (UT32A, UT35A, UT52A, UT55A, UT75A, UP35A, UP55A) to a GA10 with the custom display function (/CG option), select a model name with "_R3" from the list. (This corresponds to the SP or other output channel.)

Basic Operation

1. Create a Modbus device definition file using the Modbus Device Definition File Creating Tool.

   You can download the Modbus Device Definition File Creating Tool from the following URL.
   www.smartdacplus.com/software/en/

   Or, create the file in XML format by referring to the provided example. We suggest that you use the Windows standard Notepad or a text editor to edit the file.

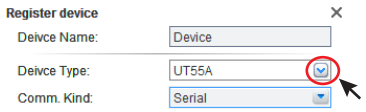
2. Save the file using UTF-8 encoding.

3. Place the Modbus device definition file in the C:\Program Files\Yokogawa Electric Corporation\SMARTDAC+ Data Logging Software\Modbus folder of the PC in which the server is installed.

4. Start the GA10 client, and log in to the server.

   The name of the registered Modbus device appears next to Device Type in the **Register Device Dialog Box**.*
   * A dialog box for registering new devices.

5. Select the registered Modbus device from the **Device Type.**
   The input items for communication appear.



6. Input the information, then click **OK**.

Note

When using a Modbus definition file to perform communication through the Ethernet interface, set the scan interval to a value less than the communication timeout value of the device.

3.4.2 What Is a Modbus Device Definition File?

The Modbus device definition file is a file that is referred to when a new Modbus device is registered on the Device Setting Page.
A Modbus device definition file is composed of the following four sections.

Option list
This is where the Modbus device options are defined.

Register list
This is where the Modbus device's registers that are read during data collection are defined. Modbus Function codes, register addresses, data types, and register names are specified in this section.

Channel list
This is where the Modbus device's channels that are read during data collection are defined. You can also specify channel settings, collection data positions, and related alarm information.

Value conversion table
This is where the table for converting the data read from the Modbus device's registers into values for actual use is defined.

Modbus device definition files are in XML format.
Descriptions in files have a hierarchical structure.
For details on the format, see "Node Structure" and subsequent pages.

Modbus device definition file example: ▶ **page App-10**

Node Structure of Modbus Device Definition Files

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Description	Quantity
ModbusDevice						Definition file root element	1
	Options					Option list node	0 or 1
		Option				Option information	0 to 5
	Registers					Register list node	1
		Register				Register information	1 to 3000
	Channels					Channel list node	1
		Channel				Channel information	1 to 500
			Init			Channel default setting	0 or 1
				DecimalPos		Default decimal place	0 or 1
				Min		Default minimum span	0 or 1
				Max		Default maximum span	0 or 1
				Unit		Default unit	0 or 1
			Value			Channel value	1
				Write		Write register	0 or 1
				DataError		Error data status	0 or 1
				ADError		A/D converter status	0 or 1
				PlusOver		+OVER status	0 or 1
				MinusOver		-OVER status	0 or 1
				Burnout		Burnout information	0 or 1
					Type	Burnout type	0 or 1
					Value	Burnout status	0 or 1
			Alarms			Alarm list node	0 or 1
				Alarm		Alarm information	0 to 4
					Type	Alarm type	0 or 1
					Value	Alarm value	0 or 1
					Set Value	Alarm set value	0 or 1
	TransTables					Value conversion table node	0 or 1
		Table				Value conversion table	0 to 100
			Value			Conversion value	0 to 100

Node Attributes of Modbus Device Definition Files

If an attribute is not specified, the default value will be applied. However, if the Option, Mask, or Trans attribute is not specified, GA10 assumes that the corresponding function is not used and does not apply the default value.

Node Name	Attribute	Type	Mandatory	Range	Default Value	Description
ModbusDevice	Type	string	(A)	Alphanumeric characters, 1 to 15 characters		Modbus device type Note: Match this with the file name of Modbus device definition file.
	PortNo	int		1 to 65535	502	Ethernet port number of the Modbus device
	CommandDelay	int		0 to 10000	0	Command delay of the Modbus device. Unit: msec
Option	Name	string	(B)	Alphanumeric characters, 1 to 15 characters		Names of options supported by the Modbus device
Register	Name	string	(A)	Alphanumeric characters, 1 to 15 characters		Register names in the Modbus device
	FunctionCode	int	(A)	Read: 1, 2, 3, or 4 Write: 5, 6 or 16		Modbus communication function code
	Address	int [2]	(A)	1-465535		Modbus register
	DataType	enum	(A)	INT16 UNIT16 INT32_B INT32_L UINT32_B UINT32_L FLOAT_B FLOAT_L BIT		Read data type
Channel	Name	string	(A)	1 to 16 Unicode characters		Channel name
	DecimalPos	int		0 to 5	0	Channel decimal place
	Min	double		-1E16 to 1E16	0	Minimum channel span
	Max	double		-1E16 to 1E16	100	Maximum channel span
	ScaleRatio	double		-1E16 to 1E16	1	Channel scaling coefficient
	ScaleOffset [4]	double		-1E16 to 1E16	0	Channel scaling offset
	Unit	string		Up to 6 Unicode characters	""	Channel unit
	Option	string		Alphanumeric characters, up to 15 characters		Option name
Channel\Value DecimalPos Min Max Unit DataError [5] ADError [5] PlusOver [5] MinusOver [5] Burnout\Type [5, 6] Burnout\Value Alarm\Type Alarm\Value	Register	string	(A)	Alphanumeric characters, 1 to 15 characters		Register name
	Mask [1]	int [2]		Hexadecimal number, 0 to 65535		Data bit mask
	Trans	string		Alphanumeric characters, up to 15 characters		Value conversion table name
Write	Register	string	(A)	Alphanumeric characters, 1 to 15 characters		Register name
Alarm\Type	Kind	enum		"OFF","H","L","dH","dL","RH","RL","tH","tL","PVH","PVL","DVH","DVL","DVO","DVI","SPH","SPL","OTH","OTL","ETC"	"OFF"	Default alarm type
Alarm\SetValue	Register	string		Alphanumeric characters, 1 to 15 characters		Register name
Alarm\SetValue	Value	double		-1E16 to 1E16	0	Initial value of the alarm set value
Table	Name	string	(C)	Alphanumeric characters, 1 to 15 characters		Value conversion table name
	ToDataType	enum		Int, String	Int	Target conversion data type
Value	From	int [2]	(C)	-2147483648 to 2147483647		Conversion source value
	To	string	(C)	Up to 15 Unicode characters		Conversion target value To convert to a value, specify the value using a character string.

(A): Mandatory item. However, for attribute name Register, node name Type is not mandatory.

(B): Mandatory item to use the option

(C): Mandatory item to convert data

1 If only a mask is available, bit mask is applied to the data value read from the register, and the result is handled as TRUE or FALSE.

2 Decimal and Hexadecimal integers are supported. For hexadecimals, the number must be preceded by a "0x."

3 For a description of Data Type, see the table below.

4 These are retrieved from registers or the definition file. The user can specify either one or both. In the latter case, register information takes precedence.

5 Scaling calculation: Y = ScaleRatio * X + ScaleOffset
X: Modbus register value (after decimal point calculation; after conversion is a value conversion table is available)
Y: Computed result

6 Channel data status is processed in the following order of precedence: ADError, DataError, Burnout, PlusOver, MinusOver.

7 If the burnout type is set to DownScale (type value is 2) and the burnout status is 1, the data status will be −BURNOUT. If the burnout type is set to UpScale (type value is not 2) and the burnout status is 1, the data status will be +BURNOUT.

8 Node channels include optional attributes. When registering a device in the Register Device dialog box, if you do not select this option, this channel will not be available in the registered device.

Description of Data Type

Value	How to Use
INT16	Use when a signed 16-bit integer is assigned to the device register.
UINT16	Use when an unsigned 16-bit integer is assigned to the device register.
INT32_B	Use when a signed 32-bit integer is assigned to the device register and the smallest register number is assigned to the highest bit.
INT32_L	Use when a signed 32-bit integer is assigned to the device register and the smallest register number is assigned to the lowest bit.
UNIT32_B	Use when an unsigned 32-bit integer is assigned to the device register and the smallest register number is assigned to the highest bit.
UINT32_L	Use when an unsigned 32-bit integer is assigned to the device register and the smallest register number is assigned to the lowest bit.
FLOAT_B	Use when a 32-bit floating-point number is assigned to the device register and the smallest register number is assigned to the highest bit.
FLOAT_L	Use when a 32-bit floating-point number is assigned to the device register and the smallest register number is assigned to the lowest bit.
BIT	Use when a bit value (e.g., DI, DO) is assigned to the Modbus device register.

Data Type Defined in a MODBUS Device Definition File

GA10 (R2.02.xx and later) retains the data types of registers defined in the Modbus device definition file and uses them for displaying and recording. The data types of each register correspond to the following channel data types.

Register Data Type	Channel Data Type
INT16	SHORT
UINT16	USHORT
INT32_B	LONG
INT32_L	LONG
UNIT32_B	ULONG
UINT32_L	ULONG
FLOAT_B	FLOAT
FLOAT_L	FLOAT
BIT	BOOL

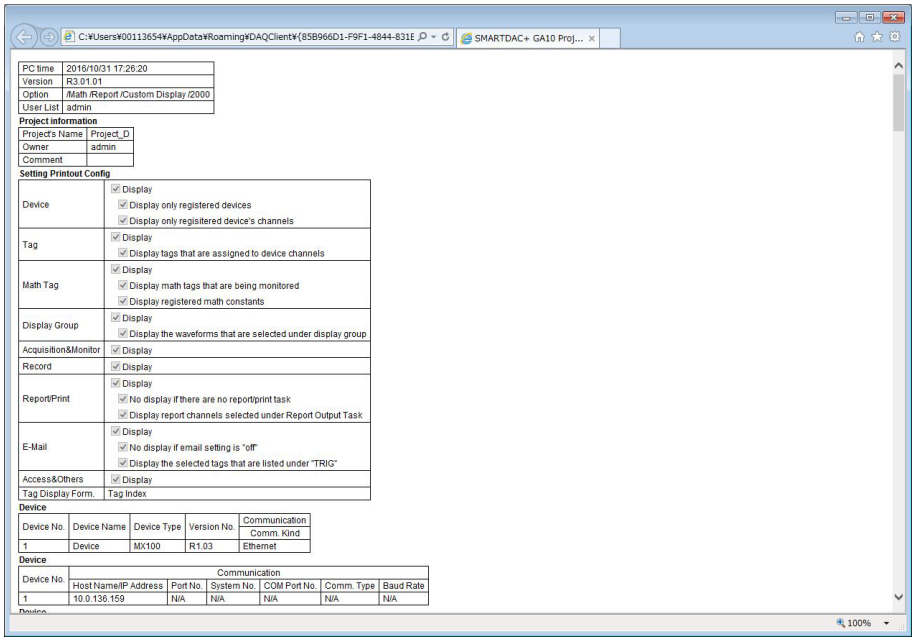
Note

A read error will occur in the following situations.

- A mandatory item is missing.
- There is a syntax error. However, in the following situations, an error will not occur and the value will be corrected when it is read.
  - There is a limit to the string length for a node attribute, and this limit is exceeded.
  - There is an allowable range for a node attribute, and the value is outside the range.

3.5 Displaying Project Settings

Project settings can be displayed in tables on a browser. You can select whether to show or hide the settings for each item.



PC time 2016/10/31 17:26:20
Version R3.01.01
Option /Math /Report /Custom Display /2000
User List admin

Project information

Project's Name	Project_D
Owner	admin
Comment	

Setting Printout Config

Device	Display Display only registered devices Display only registered device's channels
Tag	Display Display tags that are assigned to device channels
Math Tag	Display Display math tags that are being monitored Display registered math constants
Display Group	Display Display the waveforms that are selected under display group
Acquisition&Monitor	Display
Record	Display
Report/Print	Display No display if there are no report/print task Display report channels selected under Report Output Task
E-Mail	Display No display if email setting is "off" Display the selected tags that are listed under "TRIG"
Access&Others	Display
Tag Display Form.	Tag Index

Device

Device No.	Device Name	Device Type	Version No.	Communication: Comm. Kind
1	Device	MX100	R1.03	Ethernet

Device

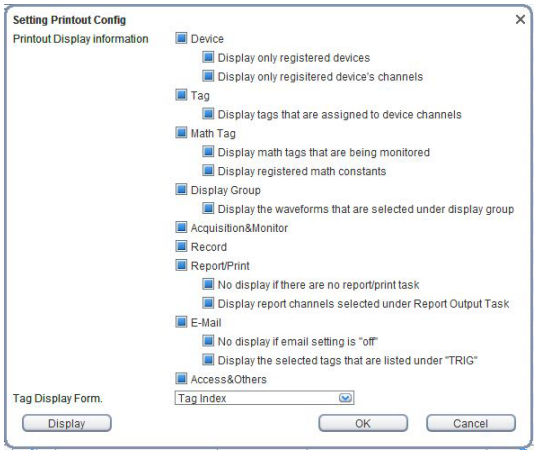
Device No.	Communication: Host Name/IP Address	Port No.	System No.	COM Port No.	Comm. Type	Baud Rate
1	10.0.136.159	N/A	N/A	N/A	N/A	N/A

3.5.1 Selecting the Settings to Be Shown

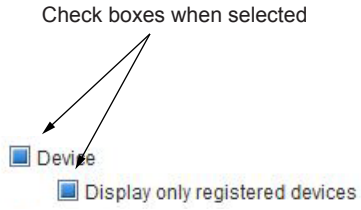
Follow the procedure below to select the project settings you want to show on the browser.

1 In the Project List Page, double-click the appropriate project to open the project.

2 On the **Project** menu, click **Setting Printout Config.**
The Setting Printout Config dialog box opens.



3 Select the items you want to show.
By default, all items are selected. Click the items you want to hide to clear the check boxes.



4 For **Tag Display Form**, click ▼ to select **Tag No.**, **Tag Comment**, or **Tag Index**.

5 Click **OK**.
The selected items in the dialog box are saved.

Click **Display** to show the project settings on the browser according to the selected items.

Click **Cancel** to cancel the items selected in step 3.

Note

The saved settings are applied to all projects at the client level. These settings are retained even after you log out.

The following table shows the items and descriptions in **Setting Printout Config**. The details of each item are displayed when the corresponding check box is selected.

Items		Contents to be specified
Device		Shows or hides device information.
	Display only registered devices	Shows or hides unregistered devices.
	Display only registered device's channels	Shows or hides detailed channel information of registered devices.
Tag		Shows or hides tag information.
	Display tags that are assigned to device channels	Shows or hides tags that are not assigned to channels.
Math Tag		Shows or hides math tag information.
	Display math tags that are being monitored	Shows or hides tags that are not being monitored.
	Display registered math constants	Shows or hides unregistered math constants.
Display Group		Shows or hides display groups.
	Display the waveforms that are selected under display group	Shows or hides waveforms that are not assigned to tags.
Acquisition& Monitor		Shows or hides acquisition and monitor information.
Record		Shows or hides recording setting information.
Report/Print		Shows or hides report and print.
	No display if there are no report/print task	Shows or hides report settings when Task is set to None.
	Display report channels selected under Report Output Task	Shows or hides report channels that are not assigned to tags.
E-Mail		Shows or hides email setting information.
	No display if email setting is "off"	Shows or hides email setting information when email is set to Off.
	Display the selected tags that are listed under TRIG	Shows or hides tags that are not specified as email triggers.
OPC-UA (/UA option)		Shows or hides OPC-UA server setting information.
Access&Others		Shows or hides Access&Others setting information.

3.5.2 Showing Settings

Follow the procedure below to show project settings on the browser. You can also show the settings by clicking **Display** in the Setting Printout Config dialog box.

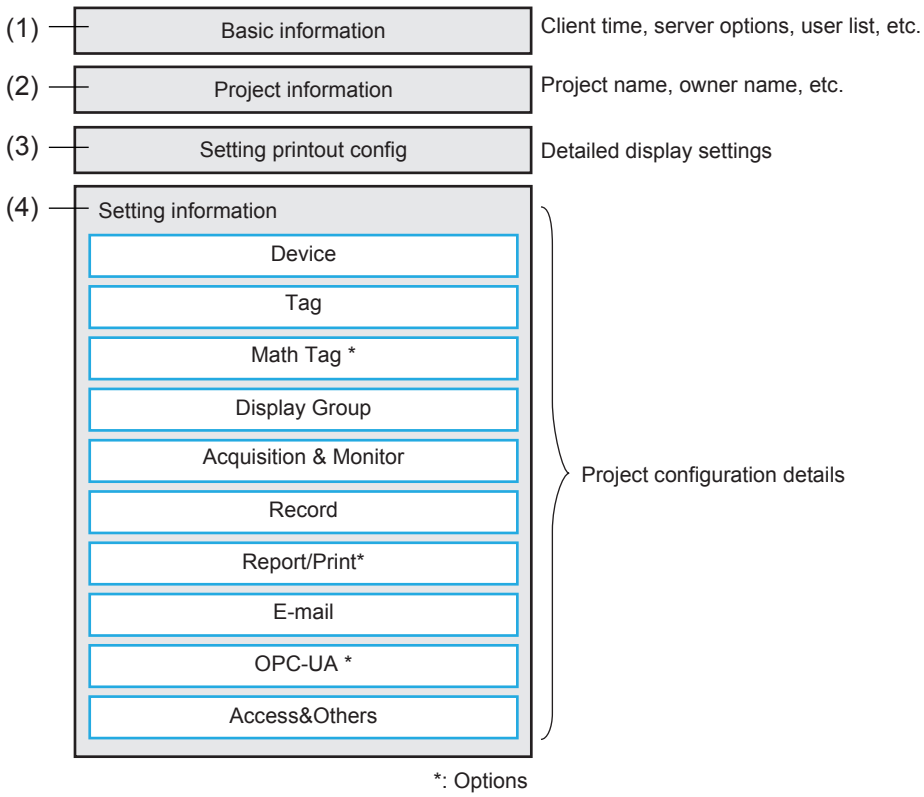
1. In the Project List Page, double-click the appropriate project to open the project.
   The selected project appears on the Project Page.

2. On the **Project** menu, click **Config Display**.
   The Web browser starts, and the settings are displayed in tables.

To change or omit the displayed items, follow the procedure in section 3.5.1.

Structure of the Setting Display Screen

The following figure illustrates the structure of the setting display screen. Each information is displayed in a table.



(1) Basic information

Items displayed as basic information are GA10 server and client information. They are displayed at the top of the display screen.

Items	Explanation/Display contents
PC time	Time of output of the PC in which the GA10 client showing the information is installed.
Version	GA10 server version
Option	Options added to the GA10 server
User List	List of users registered in the GA10 server

(2)Project information

The items shown as basic project information are as follows.

Items	Explanation/Display contents
Project's name	Name of the project showing the information
Owner	Project owner name
Comment	Comment added to the basic project information

(3)Setting Printout Config

The display settings saved using Setting Printout Config. on the Project menu (section 3.5.1) are shown in table format.

(4)Setting information

The project setting details are displayed for each setting item.

- **Device**

Up to 20 devices are displayed in a table. If there are more than 20 devices, the tables are divided. If the entire width of the table cannot be displayed depending on the print paper size (A4 portrait), the table is divided into several tables.

Table	Items		Explanation/Display contents
Device	**Device No.**		Device number
	Device Name		Device name (e.g.,: Device01)
	Device Type		Device type (e.g.,: GX10)
	Version No.		Firmware version for the connected device.
	Communication	**Comm. Kind**	Ethernet, Serial, or USB
		Host Name/IP Address	“N/A” is displayed when Comm. Kind is set to Serial.
		Port No.	“N/A” is displayed when Device Type is not DAQWORX.
		System No.	Same as above
		COM Port No.	COM1 to COM20. “N/A” is displayed when Comm. Kind is set to Ethernet.
		Comm. Type	RS-232C or RS-422/RS-485 “N/A” is displayed when Comm. Kind is not set to Serial.
		Baud Rate	“N/A” is displayed when Comm. Kind is not set to Serial.
		Parity	
		Stop Bit	
		Address	“N/A” is displayed when Comm. Kind is not set to RS-422/RS-485.
		User Name	User name and user ID when the security function of the connected device is set to communication login.
		User ID	
	Modbus	**Modbus Address**	“N/A” is displayed when Device Type is not a Modbus device.
		Monitor Interval	
		Timeout	
		Option	
	Channel	**Meas Ch.**	Displays the number of channels of each.
		Math Ch.	
		Ctrl Ch.	
		Extra Ch.	
Device's channels (Device No.:x, Device Name:xxx)	**Channel**		Channel number
	Use		ON or OFF
	Tag No.		Specified tag number
	Tag Comment		Entered tag comment
	Type		Tag (channel) data type
	Dec. Point		Number of decimal places
	MIN		Minimum scale
	MAX		Maximum scale
	Unit		--
	Alarm 1 to 4	**Type**	Alarm type
		Value	Input value

- **Tag**

  Up to 20 tags are displayed in a table. If there are more than 20 tags, the tables are divided. If the entire width of the table cannot be displayed depending on the print paper size (A4 portrait), the table is divided into several tables.

Items		Explanation/Display contents
Tag Index		Tag0001 to Tag2000
Monitor		ON or OFF
Record		ON of OFF Not displayed when the project is an OPC-UA project (/UA option)
Device		Device number : Device name
Channel		Channel number
Tag No.		Specified tag number
Tag Comment		Input tag comment
Type		Tag data type
Dec. Point		Number of decimal places
Alarm 1 to 4	**Type**	Alarm type
	Value	Alarm threshold
	Sound	Assigned alarm sound fil

- **Math Tag (/MT option)**

  Math tag settings are displayed in math tag and math constant tables. Up to 20 tags or constants are displayed in a table. If there are more than 20, the tables are divided. If the entire width of the table cannot be displayed depending on the print paper size (A4 portrait), the table is divided into several tables.

Items			Explanation/Display contents
Math Tag	**Tag Index**		A0001 to A2000
	Acquisition & Computing		ON or OFF
	Record		ON or OFF
	Expression		Expression
	Span	**Dec. Point**	Number of decimal places
		MIN	Input value
		MAX	Input value
	Unit		Input value
	Tag No.		Tag number
	Tag Comment		Tag comment string
	Alarm 1 to 4	**Type**	Alarm type
		Value	Input value
		Hysteresis	Input value
		Sound	Assigned alarm sound fil
Constant	**Label**		Input value
	Value		Input value

- **Display Group**

  Each display group is displayed in a table. If there are more than 20 waveforms, the tables are divided. If the entire width of the table cannot be displayed depending on the print paper size (A4 portrait), the table is divided into several tables.

Items		Explanation/Display contents
No.		W01 to W50
ON/OFF		ON or OFF
Tag Index/Tag No./Tag comment		Displays the item name selected in the display settings
Y-Axis	**No.**	Y01 to Y50
	Mode	Detail or compact mode
	Type	Linear or logarithmic
	Title mode	Default, or customize (customize when you enter a title)
	Title	Waveform's Y-axis title
Form.		F, or E
Meter		Bar, or analog
Scale	**MIN**	Input value
	MAX	Input value
Scale interval	**Use**	ON or OFF
	Value	Input value
Zone	**MIN**	Input value
	MAX	Input value
Color		RGB value
Trip1 to Trip4	**Use**	ON or OFF
	Value	Input value
	Color	RGB value

- **Acquisition & Monitor**

  Acquisition and monitor information is shown in Acquisition, Pre-set mark, Monitor, and Split Screen Data Set tables. The following items are displayed.

Items			Explanation/Display contents
Acquisition	**Data time**		Device time or PC time
	Monitor Interval		If Device time is selected, "–" is displayed. If PC time is selected, Monitor interval selected from options is displayed.
Pre-set mark	**No.**		Pre-set mark
	1 to 5		Displays the set mark
Monitor	**Monitor Data Set Number**		1 to 16
	Split Screen Direction		Horizontal or vertical
	Set Number in Spliting Direction		1 to the Monitor Set Number
	Resize the Monitor Set		ON or OFF
	Alarm Shape		Round or rectangle
	Alarm Color	**ON**	RGB value
		OFF	RGB value
Split Screen Data Set	**No.**		1 to 16
	Split Screen Data Set		Trend, Digital, Meter, Alarm

- **Record**

  Recording setting information is displayed in Record and Comment tables. The following items are displayed.

Items			Explanation/Display contents
Record	**Record Interval**		If Device time is selected, N/A is displayed. If PC time is selected, Record interval selected from options is displayed.
	Record File Type		Binary/Excel/Binary & Excel
	Start Condition		Displays specified conditions.
	Stop Condition		
	File Division		
	Number of Files	**Limit the Number of Files**	ON or OFF
		Number	Number of files, or N/A
	Folder		Path to the save directory
		File Name	File name
	File Name	**Attach the Date**	ON or OFF
		Attach the Time	ON or OFF
	Computing	**Reset When Recording Starts**	ON or OFF Displayed only on models with the math function (/MT option)
Comment	**No.**		1 to 8
	Title		Title string
	String		Comment string

Note

In report/print setting information and email setting information, the time of Condition and Range is displayed using the following symbols.

- ***YYYY***: *year*
- ***MM***: *month*
- ***DD***: *day*
- ***hh***: *hour*
- ***mm***: *minute*
- ***ss***: *second*
- ***ms***: *millisecond*
- ***w*** Weekday every week: *Monday to Sunday*
- ***d*** Day every month: *1 to 31*

- **Report/Print (/RP option)**

  For Report/Print setting information, report/print schedule list of the entire project is displayed in a table first. Then, for each report in the list, the schedule, graph, and template file tables are displayed. The items in the graph information display varies depending on Print Type.

Report/Print-Schedule list

Items		Explanation/Display contents
Schedule No.		Report01 to Report20
Name		Report name
Task		None/Standard Print/Custom Print/Report Output

Report/Print-Schedule (Task: Standard Print)

Items		Explanation/Display contents
Name		Report name
Task		Standard Print
Condition		Displays specified conditions. (e.g., *Every Hour mm:ss*)
Range	Start Time	Displays specified start time. (e.g., *Prev. Hour mm:ss*)
	End Time	Displays specified end time. (e.g., *Current Hour mm:ss*)
Print Type		Trend Graph/Circular/Sheet/Alarm List/Mark List
Group		Start group to end group (e.g., *01~10*)
Print Header	Header items	File name, type, serial number, time change, number of measurement channels, print comment, number of math channels, sample interval, comment (one from 1 to 8 for the comment)
	Comment	
Printout Setup	Print Graph Format	Single page or multiple pages
	Font size	6pt to 20pt
	Line Thick	0.25pt/0.5pt/1.0pt/1.5pt/3.0pt
	Tag Display Form.	Tag No./Tag Comment/Tag Index
	Pring Graph Grid	Standard Grid, Dense Grid 1 to 4 1min, 2min, 5min, 10min, 20min, 30min, 1h, 2h, 3h, 4h, 6h, 8h, 12h, 1day, 7days, 1month when the waveform print format is multiple pages.
	Sub Grid	Same as above. (depends on the Print Graph Grid setting)
	Y-axis grid	Standard Grid, Dense Grid1, Dense Grid2, Dense Grid3, Dense Grid4
	Y-axis zone	Full Zone, Slide Zone, Auto Zone, Free Zone
	Active Y-axis	1 to 50
	Y Axis Column Num	1 to 50
	Legend	Yes/No
	Legend position	Top, Bottom, Left, Right
	Color Mode	Black and white/color
	Mark Color	RGB value
Print Setup	Printer	Printer name
	Paper Size	Print paper size
	Orientation	Portrait or landscape
Output Language		Japanese/English/Chinese/German/French/Korean/Russian

Report/Print-Schedule (Task: Custom Print)

Items		Explanation/Display contents
Name		Report name
Task		Custom Print
Condition		Displays specified conditions. (e.g., *Every Hour mm:ss*)
Template File		Template file name
Printer		Specified printer name
Output Language		Japanese/English/Chinese/German/French/Korean/Russian

Report/Print-Schedule (Task: Report Output)

Items		Explanation/Display contents
Name		Report name
Task		Report Output
Type		Hourly + Daily, Daily + Weekly, Daily + Monthly, Batch, Daily custom
Condition		Displays specified conditions.
Filename Naming Rule	Rule	Auto/Specify
	File Name	Specified file name, or N/A
Output Folder	Folder type	Data Folder, Subfolder in the data folder, Specified folder
	Folder	Path to the save directory
Template File		Template file name
Print Setup	Print Out	Yes/No
	Printer	Specified printer name
Output Language		Japanese/English/Chinese/German/French/Korean/Russian

Report/Print-[*Report name*] 's graph (Print Type: Trend Graph)

Items		Explanation/Display contents
Print Type		Trend Graph
Range	**Start Time**	Displays specified start time. (e.g., *Prev. Hour mm:ss*)
	End Time	Displays specified end time. (e.g., *Current Hour mm:ss*)
Group		Group name
Printout Setup	**Line Thick**	0.25pt/0.5pt/1.0pt/1.5pt/3.0pt
	Font size	6pt to 20pt
	Tag Display Form	Tag No./Tag Comment/Tag Index
	Print Graph Grid	Standard Grid, Dense Grid 1 to 4
	Y-axis grid	Standard Grid, Dense Grid1, Dense Grid2, Dense Grid3, Dense Grid4
	Y-axis zone	Full Zone, Slide Zone, Auto Zone, Free Zone
	Active Y-axis	1 to 50
	Y Axis Column Num	1 to 50
	Legend	Yes/No
	Legend position	Top, Bottom, Left, Right
	Color Mode	Black and white/color
	Mark Color	RGB value
	Print Quality	Standard/High

Report/Print-[*Report name*]'s graph (Print Type: Alarm List)

Items		Explanation/Display contents
Print Type		Alarm List
Range	**Start Time**	Displays specified start time. (e.g., *Prev. Month 1Day hh:mm:ss*)
	End Time	Displays specified end time. (e.g., *Current Month 1Day hh:mm:ss*)
Printout Setup	**Tag Display Form**	Tag No./Tag Comment/Tag Index
	Color Mode	Black and white/color
	Print Quality	Standard/High

Report/Print-[*Report name*]'s graph (Print Type: Mark List)

Items		Explanation/Display contents
Print Type		Mark List
Range	**Start Time**	Displays specified start time. (e.g., *Prev. Cycle hh:mm:ss*)
	End Time	Displays specified end time. (e.g., *Current Cycle hh:mm:ss*)
Printout Setup	**Color Mode**	Black and white/color
	Print Quality	Standard/High

Report/Print-Template File

Items	Explanation/Display contents
No.	01 to 20
File Name	Displays registered template file name.(Displayed as "Unregistered" if there are no registrations.
Type	---/Print/PDF/Excel (Displayed as “---” if there are no registrations)

- **E-mail**

For email setting information, mail server, mail setting list, mail setting*(up to 20), and mail trigger settings are displayed. The following items are displayed.

*: The displayed items of mail setting information varies depending on Condition.

E-Mail-Mail server

Items	Explanation/Display contents
SMTP Server	Server name specified by the user.
Port No.	Port number specified by the user.
Resend Times	0 to 5
Authentication Methods	OFF/SMTP Authentication/POP Before SMTP
POP Server	Displays the server name when the authentication method is set to POP Before SMTP.
Port No.	Displays the port number when the authentication method is set to POP Before SMTP
User Name	User name

E-Mail-Mail setting list

Items	Explanation/Display contents
Schedule No.	Schedule number of the specified mail Mail01 to Mail20
Name	Mail name
On/Off	OFF/ON
Condition	Alarm Status/Comm. Status/Specified Period/Specified Duration/File is created

E-Mail-Mail setting (Condition: Alarm Status)

If Condition is set to Alarm Status, the mail and its trigger settings are displayed.

Items		Explanation/Display contents
Name		Mail name (e.g., Mail 01)
On/Off		OFF/ON
Condition		Alarm Status
TRIG		Easy/Detail
Sending Basic Settings	**Sent from**	Sender email addresses
	Sent to	Recipient email addresses
	CC	Carbon copy (CC) email addresses
	Title	Message title
	Custom Header	Header information entered by the user
	Content	Message content
Message Language		Japanese/English/Chinese/German/French/Korean/Russian
Attached Files	**Alarm Information**	ON/OFF
	Instantaneous Value	ON/OFF
	Tag select type	Range/Detail
	Specified tag	Range: Start tag to end tag (e.g., Tag001 to Tag0100)
		Detail: List of selected tags (e.g., Tag001, Tag002, Tag005...)

E-Mail-[*Mail name*]'s trigger

Items	Explanation/Display contents
Range	If Tag select type is Easy, start tag to end tag are displayed (e.g., Tag001 to Tag0100).
Tag Index	If Tag select type is Detail, a list of selected tags is displayed. (e.g., Tag001, Tag002, Tag005...)
Use	If Tag select type is Detail, ON/OFF is displayed for each tag.
Level 1 to 4	---, ON, OFF, On/Off

E-Mail-Mail setting (Condition: Comm. Status)

Items		Explanation/Display contents
Name		Mail name
On/Off		OFF/ON
Condition		Comm. Status
TRIG		Communication Disconnect/Communication Recover/Loss Data
Sending Basic Settings	**Sent from**	Sender email addresses
	Sent to	Recipient email addresses
	CC	Carbon copy (CC) email addresses
	Title	Message title
	Custom Header	Header information entered by the user
	Content	Message content
Message Language		Japanese/English/Chinese/German/French/Korean/Russian

E-Mail-Mail setting (Condition: Specified Period)

Items		Explanation/Display contents
Name		Mail name
On/Off		OFF/ON
Condition		Specified Period
TRIG		Every day *hh:mm:ss* Every week *w day hh:mm:ss* Every month *d hh:mm:ss*
Sending Basic Settings	**Sent from**	Sender email addresses
	Sent to	Recipient email addresses
	CC	Carbon copy (CC) email addresses
	Title	Message title
	Custom Header	Header information entered by the user
	Content	Message content
Message Language		Japanese/English/Chinese/German/French/Korean/Russian
Attached Files	**Alarm Information**	ON/OFF
	Instantaneous Value	ON/OFF
	Tag select type	Range/Detail
	Specified tag	Range: Start tag to end tag (e.g., Tag001 to Tag0100) Detail: List of selected tags (e.g., Tag001, Tag002, Tag005...)

E-Mail-Mail setting (Condition: Specified Duration)

Items		Explanation/Display contents
Name		Mail name
On/Off		OFF/ON
Condition		Specified Duration
TRIG		*hh:mm:ss*
Sending Basic Settings	**Sent from**	Sender email addresses
	Sent to	Recipient email addresses
	CC	Carbon copy (CC) email addresses
	Title	Message title
	Custom Header	Header information entered by the user
	Content	Message content
Message Language		Japanese/English/Chinese/German/French/Korean/Russian
Attached Files	**Alarm Information**	ON/OFF
	Instantaneous Value	ON/OFF
	Tag select type	Range/Detail
	Specified tag	Range: Start tag to end tag (e.g., Tag001 to Tag0100) Detail: List of selected tags (e.g., Tag001, Tag002, Tag005...)

E-Mail-Mail setting (Condition: File is created)

Items		Explanation/Display contents
Name		Mail name
On/Off		OFF/ON
Condition		File is created
Sending Basic Settings	**Sent from**	Sender email addresses
	Sent to	Recipient email addresses
	CC	Carbon copy (CC) email addresses
	Title	Message title
	Custom Header	Header information entered by the user
	Content	Message content
Message Language		Japanese/English/Chinese/German/French/Korean/Russian
Attached Files		None/Data file

- **OPC-UA (/UA option)**

For OPC-UA server information, monitor, server setting, and server certificate are displayed. The following items are displayed.

Server Operation-Acquisition

Items	Explanation/Display contents
Data time	PC time/Device time
Monitor Interval	If Device time is selected, "–" is displayed. If PC time is selected, Monitor interval selected from options is displayed.

Server Operation-Server Setting

Items	Explanation/Display contents
Server Name	Server name specified by the user
Port No.	Port number specified by the user
Anonymous Login	

Server Operation-Server Certificate

Items	Explanation/Display contents
Version	Version
Serial No.	Serial number
Signature Algorithm	Signature Algorithm
Signature Hash Algorithm	Signature Hash Algorithm
Issuer	Issuer
Valid from	*YYYY/MM/DD hh:mm:ss*
Valid to	*YYYY/MM/DD hh:mm:ss*

- **Access & Others**

For Access&Others setting information, access and other settings are displayed.

Access&Others-Access

Items	Explanation/Display contents
Manager	User name e.g., User01/User02/User03/...
Operator	
Monitor	

Access&Others-Others

Items	Explanation/Display contents
Keep Lock State	ON/OFF
DDE Server	ON/OFF
Share Alarm ACK	ON/OFF
Modbus Server	ON/OFF
Modbus Address	1 to 247

3.5.3 Printing and Saving Displayed Information

You can print or save the setting display screen using the Web browser functions. The following are examples using Internet Explorer 11 (IE).

Printing the Display Screen

1. On the IE's **File** menu, click **Print**.
   A Print dialog box appears.
2. Click **Print**.
   The setting display screen on the browser are printed on the specified printer.
   - To a print preview, on the IE's File menu, click Print Preview.

Saving the Display Screen

1. On the IE's **File** menu, click **Save As**.
   A Save Webpage dialog box appears.
2. Move to the folder in which to save the page.
3. Enter a new name in **File name**.
4. Click **Save**.
   The setting display screen (HTML page) is saved in the specified location.

Note

- You can use Copy on the IE's Edit menu to copy the displayed information to Excel or other applications.
- For details on the IE functions and how to use them, see the Microsoft user's guide, support sites, and the like.

Blank

Chapter 4 Using the Math Function (/MT option)

4.1 Setting Math Tags

The GA10's Math function (/MT option) can be used to set expressions with constants, operators, and functions to display and record (save) the calculated results. To use the Math function, you need to set the math tags on the Math Tag Setting Page. You can set up to 2000 math tags. If the number of measurement tags increases due to a GA10 upgrade, the number of math tags also increases accordingly. The following table shows the relationship between the number of measurement tags and the number of math tags.

Measurement tags	Math tags
100	200
200	200
500	500
1000	1000
2000	2000

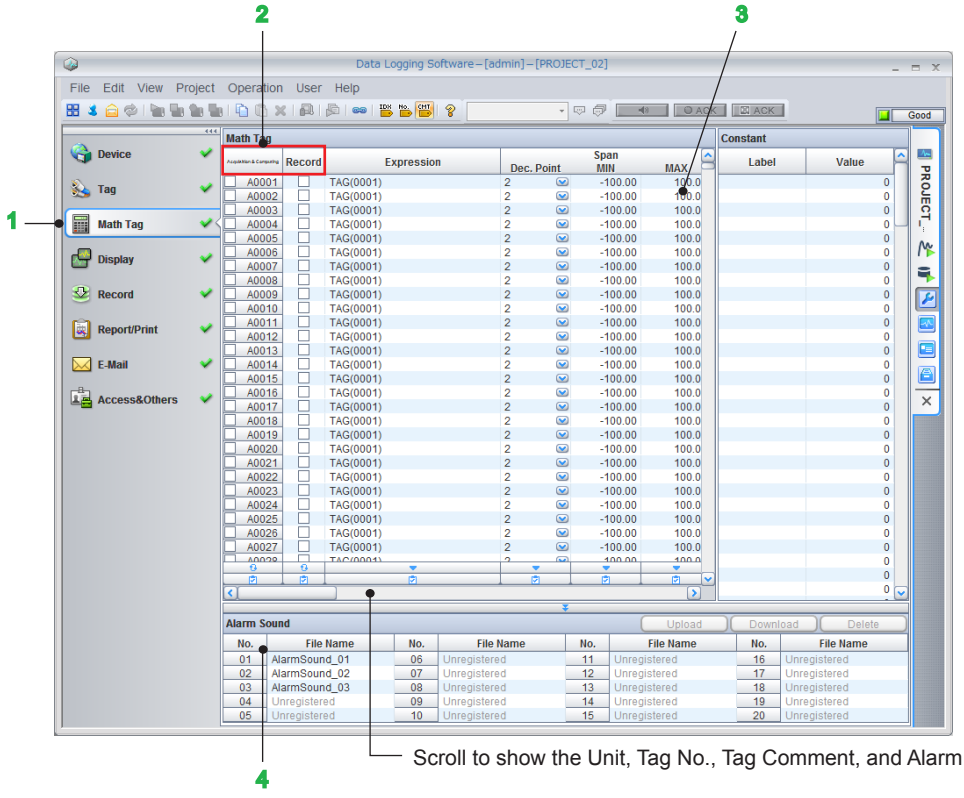
Note

Before using the Math function, set the data time acquisition condition (on the Acquisition&Monitor Page) to PC time.

Basic Operation

1 Select Math Tag in the navigation area on the left of the window.
Math Tag appears when the license for the Math function (/MT option) is already registered.

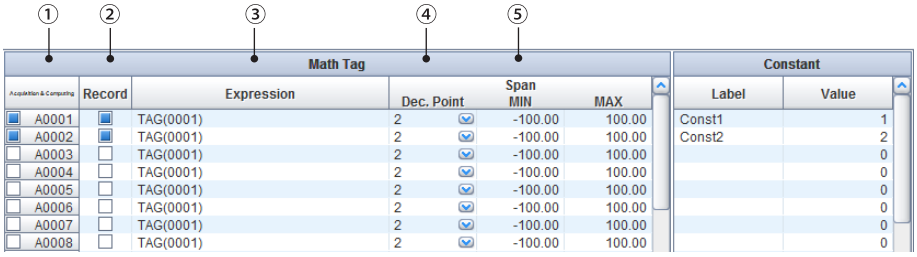
The Math Tag Setting Page appears.



2 Select a tag to use (1 line = 1 tag = 1 math tag).
Click the check boxes in the Acquisition & Computing or Record column.

3 Set the expressions and the like of the math tags you want to use.
Setting details: ▶ next page

You can set the following items for math tags.



(1) Acquisition & Computing (Math Tag Index)

These are unique tag numbers assigned sequentially from A0001 to A2000. You cannot change the numbers. Click to specify whether to acquire and compute. Blue is on (record).

(2) Record

Click to specify whether to record (save the math data). If you set Record to On, Acquisition & Computing will also be automatically set to On.

(3) Expression

Set the expression. If the expression that you enter is invalid, it will be displayed with red characters.

- Default value: TAG(0001)
- Input range: Enter a text string using up to 127 characters. Constants and functions are not case sensitive.

Available operators and functions: ▶ page 4-5

(4) Dec. Point

Select the number of decimal places.

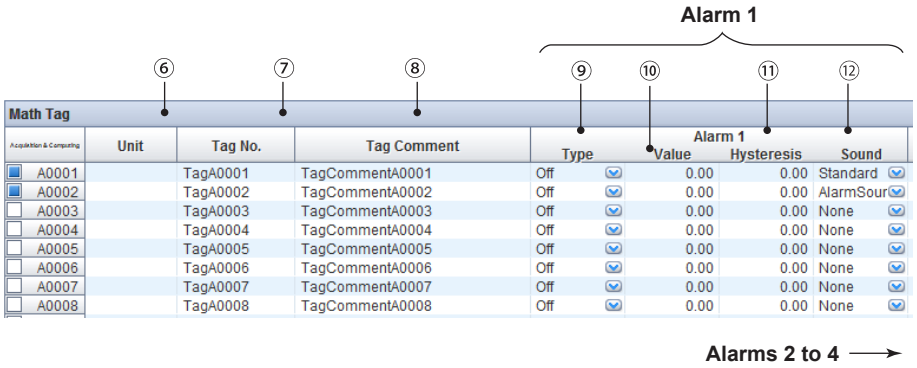
- Default value: 2

(5) Span

Enter the minimum and maximum values of the span.

- Default value: -100.00 (minimum value) 100.00 (maximum value)
- Input range: –3.4028235E+38 to 3.4028235E+38

Constants are detailed later.



(6) Unit

Enter the unit.

- Default value: Blank
- Input range: Enter up to 6 characters.

(7) Tag No.

Enter the tag number.

- Default value: TagA0001 to TagA2000
- Input range: Enter up to 16 characters.

(8) Tag Comment

Enter the tag comment.

- Default value: TagCommentA0001 to TagCommentA2000
- Input range: Enter up to 32 characters.

(9) Alarm 1 to 4* Type

Select the alarm type from the list.

- Default value: Off
- Selectable range: Off, High (high limit alarm), Low (low limit alarm), rHigh (high limit on rate-of-change alarm), rLow (low limit on rate-of-change alarm)

* For alarms, you can set Alarm 1 to Alarm 4.

(10) Alarm 1 to 4 Value

Enter the alarm value.

- Default value: 0.00
- Input range: –3.4028235E+38 to 3.4028235E+38

(11) Alarm 1 to 4 Hysteresis

Enter the alarm hysteresis.

- Default value: 0.00
- Input range: 0 to 3.4028235E+38

(12) Alarm 1 to 4 Sound

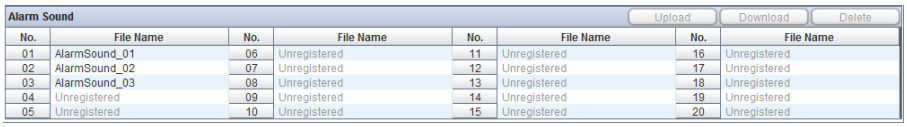
Set the alarm sound.

You can assign an alarm sound to each math tag.
The alarm sound settings and alarm sound files are saved in the project file.

Alarm sound	Description
None	This is when an alarm type is not assigned.
Standard	If an alarm type is assigned, this is the GA10's standard alarm sound.
Alarm sound file	If an alarm type is assigned and alarm sound files are registered, file names are displayed for you to select from.

Registering and deleting alarm sound files

Alarm sound files can be uploaded to the server, downloaded from the server, or deleted.



- Upload
  Click a number, click Upload, and specify an .mp3 file.
- Download
  Click a number, click Download, and specify the client's save destination to save the file.
- Delete
  You can select alarm sound files registered in the server. Click a number, and click Delete to delete the file.

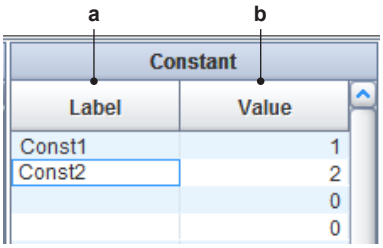
Setting Math Constants

You can use the following three types of constants. (They cannot be used in event functions or time functions.)

- User-defined math constant: A constant that the user sets for specific text strings (labels).
- Predefined math constant: A constant that is already defined in the GA10 Math function.
- Numeric math constant: A constant that the user enters directly in expressions using a number without setting a definition.

User-Defined Math Constant

User-defined math constants are set in the Constant area (the right side) of the Math Tag Setting Page. You can set up to 200 pairs of labels and values.



Basic Operation

1. Click a cell in the Label column under Constant, and enter a name for identifying the constant.
2. Click a cell in the Value column, and enter the value.

a. Label

The name of the label. Set using a text string that is not already used in predefined constants. If duplicate constant names exist, the first definition is used by expressions.

- Default value: Blank
- Input range: Enter up to 10 characters.

b. Value

Enter the constant value.

- Default value: 0
- Input range: –3.4028235E+38 to 3.4028235E+38
- Value's displayed number of decimal places: The number of displayed decimal places is undefined (the number of significant numeric digits is seven). When necessary, it is displayed in exponential form to match the display of the actual value (e.g., 1.234E12).

Predefined Math Constant

The following table shows the predefined math constants.

Constant Name (Label)	Description
NaN	Undefined or error value
POver	+Overrange
MOver	–Overrange
Pi	π (3.14...)
e	Base of natural logarithm (2.718...)

Numeric Math Constant

To express a constant by entering a number directly in an expression, use the following syntax.
[digits][.digits][{d | D | e | E}[digits]]
Example: "1.0d+1" represents "10.0."

Available Operators

The following operators can be used in expressions.

Operator	Description
+	Unary plus operator
-	Unary minus operator
!	Logical negation operator, 1 if 0, otherwise 0
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Remainder
<	Less than, 1 if true, 0 if false
>	Greater than, 1 if true, 0 if false
<=	Less than or equal to, 1 if true, 0 if false
>=	Greater than or equal to, 1 if true, 0 if false
==	Equal to, 1 if true, 0 if false
!=	Not equal to, 1 if true, 0 if false
&&	Logical AND, continue calculation even if false
||	Logical OR, continue calculation even if true
^^	Exclusive OR
?:	Conditional operator
,	Comma operator

The operator precedence is shown below. The operator on the left of the arrow has higher precedence than that on the right.
"+ – !"(unary operator) ←"+ – * / %"(arithmetic operator) ←"< > <= >= == !="(relational operator) ←"&& || ^^"(logical operator) ←"?"(conditional operator) ←","(comma operator)

Available Functions

The following functions can be used in expressions. (Math constants cannot be used in event functions.)

Event Functions

Functions that perform specific actions. (Math constants cannot be used in event functions.)

Function	Action	Example
ResetMath()	Resets math.	TAG(00010)>=1.0 ? ResetMath() : 0
Mark("mark")	Creates a mark. Characters of your choice inside the double quotations.	Mark("alarmMark")

Reference Functions

Functions for retrieving measured values and alarm values.

Function	Action	Example
Tag(<TagIndex>)	Returns the current value of the specified tag. Either tag index or tag number can be specified.	Tag(0001)
PreTag(<TagIndex>)	Returns the previous value of the specified tag. Either tag index or tag number can be specified.	PreTag(0001)
Alarm(<TagIndex>,<alarmLevel>)	Returns the alarm value of the specified tag. ON=1, OFF=0 Either tag index or tag number can be specified.	Alarm(0001,4)
Alarm(<TagIndex>)	Returns the alarm value of the specified tag. ON=1, OFF=0 Either tag index or tag number can be specified.	Alarm(0001)
Alarm()	Returns the alarm value of any tag. ON=1, OFF=0	Alarm()==1

Arithmetic Functions

Function	Action	Example
sin(<Value>)	Returns the sine of <Value>.	sin(TAG(0001))
cos(<Value>)	Returns the cosine of <Value>.	cos(TAG(0001))
tan(<Value>)	Returns the tangent of <Value>.	tan(TAG(0001))
asin(<Value>)	Arc sine.	asin(TAG(0001))
acos(<Value>)	Arc cosine.	acos(TAG(0001))
sinh(<Value>)	Hyperbolic sine.	sinh(TAG(0001))
cosh(<Value>)	Hyperbolic cosine.	cosh(TAG(0001))
tanh(<Value>)	Hyperbolic tangent.	tanh(TAG(0001))
pow(<Value1>,<Value2>)	<Value1> to the power of <Value2>	pow(TAG(0001),TAG(0002))
abs(<Value>)	Absolute value	abs(TAG(0001))
sqrt(<Value>)	Square root	sqrt(TAG(0001))
logE(<Value>)	Natural logarithm	logE(TAG(0001))
log10(<Value>)	Common logarithm	log10(TAG(0001))
expE(<Value>)	E to the power of <Value>	expE(TAG(0001))
exp10(<Value>)	10 to the power of <Value>	exp10(TAG(0001))
max(<Value>,..., <Value>)	Maximum value among multiple specified values.	max(TAG(0001),TAG(0002),TAG(0003))
min(<Value>,..., <Value>)	Minimum value among multiple specified values.	min(TAG(0001),TAG(0002),TAG(0003))
pp(<Value>,..., <Value>)	(Maximum value – minimum value) among multiple specified values.	pp(TAG(0001),TAG(0002),TAG(0003))
sum(<Value>,..., <Value>)	Sum of multiple specified values.	sum(TAG(0001),TAG(0002),TAG(0003))
ave(<Value>,..., <Value>)	Average of multiple specified values.	ave(TAG(0001),TAG(0002),TAG(0003))
poly(<x>,<a0>,<a1>,..., <an>)	Polynomial, variable parameters Calculates a0xn+a1xn-1+...+anx0.	poly(TAG(0001),TAG(0002),TAG(0003))
ceil(<Value>)	Returns the minimum integer greater than or equal to <Value>.	ceil(TAG(0001))
floor(<Value>)	Returns the maximum integer less than or equal to <Value>.	floor(TAG(0001))
limit(<x>, <a>, <b>)	Rounds the value to [a] or [b] if x is outside the range [a,b].	limit(TAG(0001),10,20)
rnd()	Returns a random number between 0 and 1.	TAG(0001)*rnd()
IsNaN(<Value>)	Returns 1 if <Value> is NaN, 0 otherwise.	IsNaN(TAG(0001))

Time Functions

The following table shows the available time functions. (Math constants cannot be used in time functions.)

Function	Action
time(<year>,<month>,<day>,<hour>,<minute>)	Edge action on the date and time
bfTime(<year>,<month>,<day>,<hour>,<minute>)	Previous edge action on the date and time
time(<year A>,<month A>,<day A>,<hour A>,<minute A>,<year B>,<month B>,<day B>,<hour B>,<minute B>)	Level action between time A and B
monthly(<day>,<hour>,<minute>)	Edge action on <day> every month at <hour>, <minute>.
bfMonthly(<day>,<hour>,<minute>)	Previous edge action on <day> every month at <hour>, <minute>.
monthly(<day A>,<hour A>,<minute A>,<day B>,<hour B>,<minute B>)	Level action between <day A>, <hour A>, <minute A> and <day B>, <hour B>, <minute B> every month.
weekly(<day of week>,<hour>,<minute>)	Edge action on <day of week> every week at <hour>, <minute>.
bfWeekly(<day of week>,<hour>,<minute>)	Previous edge action on <day of week> every week at <hour>, <minute>.
weekly (<day of week A>,<hour A>,<minute A>,<day of week B>,<hour B>,<minute B>)	Level action between <day of week A>, <hour A>, <minute A> and <day of week B>, <hour B>, <minute B> every week.
daily(<hour>,<minute>)	Edge action at <hour>, <minute> every day.
bfDaily(<hour>,<minute>)	Previous edge action at <hour>, <minute> every day.
daily(<hour A>,<minute A>,<hour B>,<minute B>)	Level action between time A and B every day
hourly(<minute>)	Edge action at <minute> every hour.
bfHourly(<minute>)	Previous edge action at <minute> every hour.
hourly(<minute A>,<minute B>)	Level action between minute A and B every hour.

- Edge: Returns 1.0 at the time of computation immediately after the specified duration or time.
- Previous edge: Returns 1.0 at the time of computation immediately before the specified duration or time.
- Level: Returns 1.0 during the specified duration or time.
- Parameter setting range
  <year>: 1970 to 2036
  <month>: 1 to 12
  <day>: 1 to 31
  <day of week>: 0 to 6 (0: Sunday, 1: Monday, ..., 6: Saturday)
  <hour>: 0 to 23
  <minute>: 0 to 59

Bit Operation

This is an operation function that retrieves the value of the specified bit position of an integer that is 32 bits maximum.

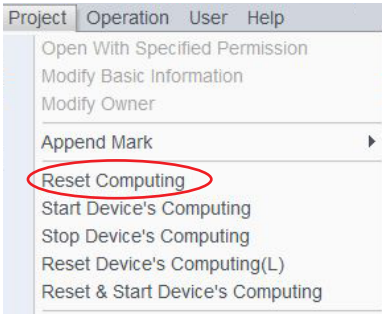
Function	Action	Example
Bit(<Value1>,<Value2>))	Returns the value of the <Value2>th bit of <Value1>. Value2: 0 to 31 (values below zero are assumed to be zero, and values above 31 area assumed to be 31)	Bit(5,1) Bit(Tag(0001),1)

4.2 Performing Computations

Computation starts when data collection starts. Click the  icon displayed on the tab on the right side of the screen to start data collection. Click the  icon to start data collection and recording.
The execution interval of computation is the same as the monitor interval (for PC time).

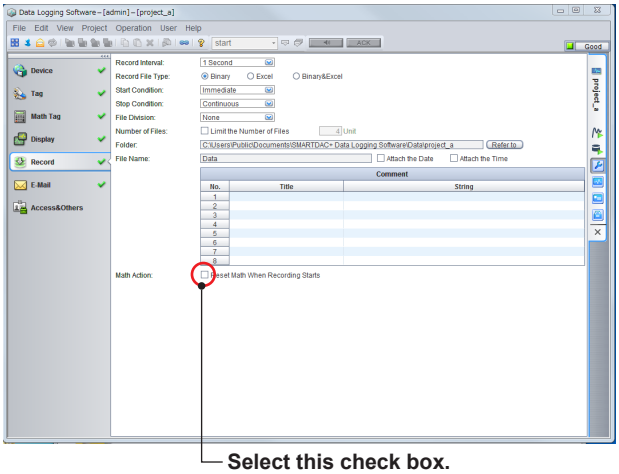
4.3 Resetting Computation

You can reset computation from the menu, separately from the acquisition and recording operation.
On the Project menu, click Reset Computing.



This command appears only if the user who opened the project has operator or higher privileges and data collection (computation) is in progress.

You can also configure the software to reset computing automatically when recording is started. On the Record Setting Page of the project, select the Reset Math When Recording Starts check box next to Math Action.



In this situation, the math reset timing is delayed by up to two recording intervals from the record start timing.

Setting the data recording method: ▶ Sec. 3.3.6

Chapter 5 Using the Report/Print Function (/RP option)

5.1 Configuring Auto Print

5.1.1 Print Types and Basic Operation

The GA10's Report/Print function (/RP option) can be divided into the following three functions.
You can set which function to use and with what kind of schedule to print from the Report/Print Setting Page.

Standard Print

You can select the display group and display format (trend graph, circular, sheet, alarm list, mark list) and print from a data file at the specified time on the specified printer.

Custom Print

You can select the display group and display format (trend graph, alarm list, mark list) and print from a data file according to the specified template file at the specified time on the specified printer.

Report Output

You can create a report file (PDF, Excel) from a data file according to the specified template file and specified report settings. You can create report data (PDF, Excel) of the average, maximum, minimum, sum, and instantaneous values over a specified duration.

In addition, custom print and report output can be performed manually from the Data files
:▶ Sec. 5.3

The following table shows the print types and their characteristics.

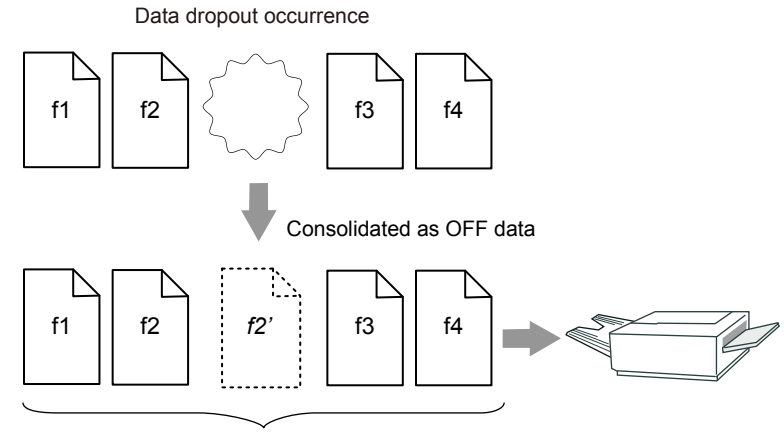
		Standard	Custom	Report Output
Use		Auto printing at the specified time	Auto printing at the specified time using the specified layout	Auto printing at the specified time using the specified layout and report type
Condition		Hourly, Daily, Weekly, Monthly, Periodically, End of record	Hourly, Daily, Weekly, Monthly, Periodically, End of record	Hourly + Daily, Daily + Weekly, Daily + Monthly, Batch, Daily custom
Print Layout		Cannot be specified	Can be specified	Can be specified
		None	Report templates for PDF report files (*.tpl)	Report templates for Excel report files (*.xlsx, *.xlsm), Report templates for PDF report files (*.tpl)
Graph	Print type	Trend Graph, Circular, Sheet, Alarm List, Mark List	Trend Graph, Alarm List, Mark List	Trend Graph, Alarm List, Mark List
	Number of graphs	1 graph/setting	Up to 4 graphs/setting	Up to 4 graphs/setting
	Items	Specified with Print Header	Specified with keyword	Specified with keyword
Output channel		Cannot be specified	Cannot be specified	Max. 100ch
Print Destination		Local printer	Local printer PDF file	Local printer Excel file
Number of Graph Print Pages		Multiple pages	Number of pages defined in the template	Number of pages defined in the template

When using the Report/Print function (/RP option), note the following points

- Report schedule is executed only when a project is "Recording".
- Report output and auto printing may be delayed up to 10 minutes depending on the specified conditions. This is because the execution time is shifted after a temporary file is created internally.
- If the recording duration is long and the number of data points in the target range is large, standard print, custom print, and report output may take time.
- To perform custom print or report output, you must specify a template file (**Sec. 5.1.2**).
- If Data time is set to Device time and data of multiple devices is being recorded, data is saved to separate files for each device and for each data acquisition interval. Therefore, report files are also created for each device and for each data acquisition interval. If Data time is set to PC time, a single report file is created even when multiple devices are being recorded.
- The printers that can be used with the Report/Print function are the local printers registered on the server PC. Network printers are not displayed in print settings. Virtual printers of local printers are displayed, but interactive virtual printers (e.g., WindowsXPS DocumentWriter) that require users to enter the file name cannot be used.

Report Output When Communication Is Disconnected

If a communication interference occurs between the GA10 server and the connected devices, dropouts may occur in the report or print data. Only when Data time is set to Device time, the data in the dropout section is consolidated as “Off data,” and the dropout section is output with compensation. (See the figure below.)



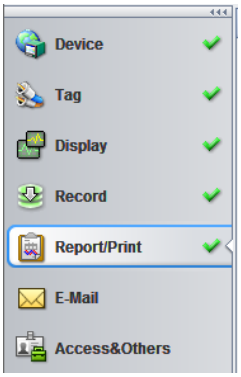
f1, f2, *f2’*, f3, and f4 are included in reports and printing.

- This function is not supported on versions earlier than GA10 R2.03.xx. (The file is divided at the data dropout section and output.) We recommend that you use the latest version of GA10.

Basic Operation

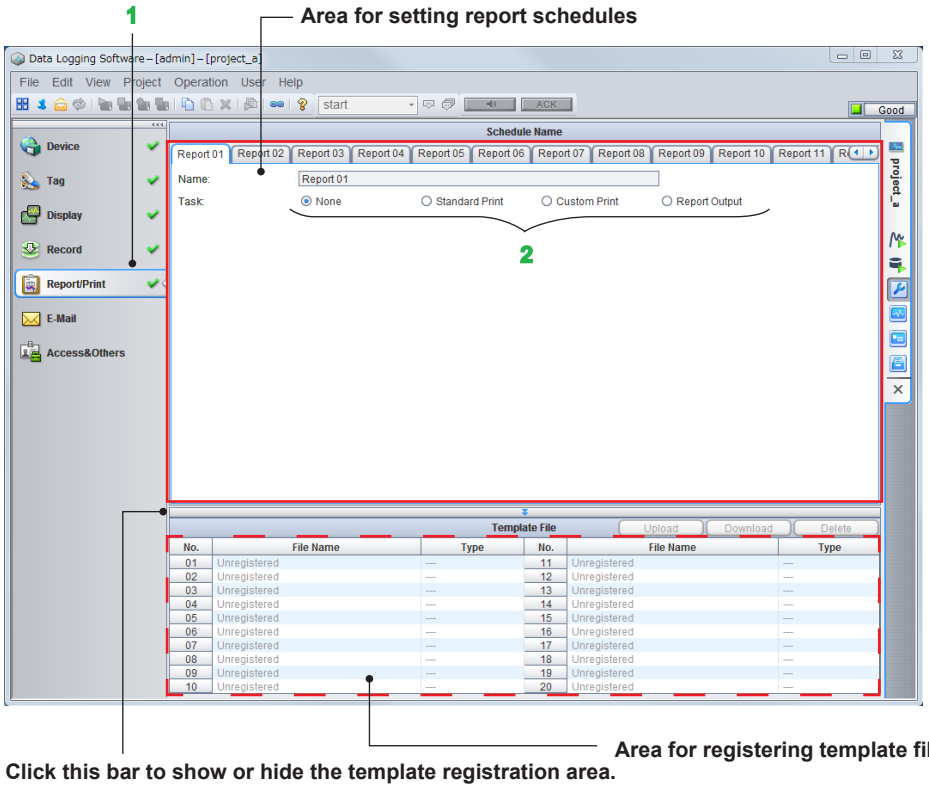
The following procedure is for setting a schedule and printing automatically.

1 Select Report/Print in the navigation area on the left of the window.
Report/Print appears when the license for the Report/Print function (/RP option) is already registered.



The Report Setting Page appears. (See the figure on the next page.)

- The Report Setting Page consists of a tabbed page area for setting schedules in the top half and an area for registering template files in the lower half. You can register up to 20 schedule settings (tabbed pages) and up to 20 template files (PDF, Excel).
- The template registration area can be shown or hidden by clicking the up/down slide bar. By default, the template registration area is shown, but once you change its state, it is stored for each Windows user.



2 Select the task (default value: None).
Settings appear in the schedule setting area depending on the selected task.

3 Set the print schedule in line with the task.
- For details on the settings for each task, see **Standard Print, Custom Print, and Report Output**.
- For Custom Print and Report Output, you use a template file. For instructions on how to register templates, see the next page.

4 Start recording  .

The report is output or printed according to the schedule.

Note

- You can view the schedule and history of report schedules that have been set on the Status Page.
  Viewing report schedules: ▶ **Sec. 5.2**
- The results of auto report printing is displayed in the project log of the Log dialog box. A log entry is sent when printing completes successfully or unsuccessfully.
  Opening the Log dialog box: ▶ **Sec. 6.10**
- All unexecuted report schedules of the relevant project registered in the server are executed after the last recording file is created upon the completion of a recording.
- Auto print schedules that have not been completed due to a PC shutdown are executed again when the server recovers. However, output results of auto print executed in this way may have up to 10 minutes of data missing before the shutdown.

5.1.2 Registering Template Files

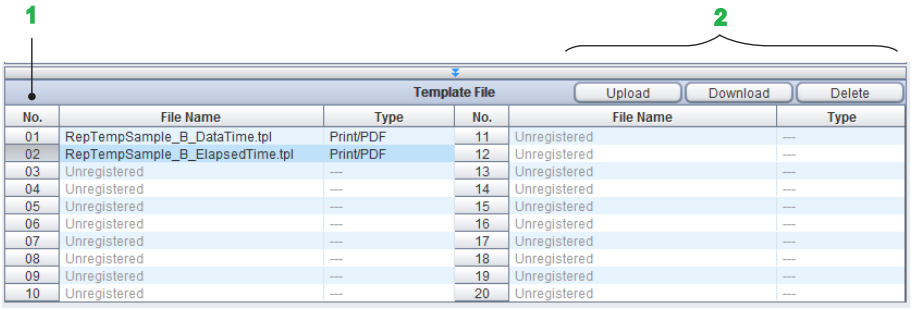
Before performing a custom print or report print, register template files. The area for registering template files is in a two-column tabular form. You can register up to 20 report template files in the following format.

Template Files That You Can Use

Template File Save Format	Extension	Remarks
Excel format	*.xlsx	A template created by entering keywords* and text of your choice in Excel cells.
Excel macro-enabled format	*.xlsm	Same as above
PDF format	*.tpl	Created using the SMARTDAC+ Report Template Builder (a tool for creating and viewing report templates in PDF format). You can download Report Template Builder from the following URL. **www.smartdacplus.com/software/en/**

* Keywords specify the type of data that will be entered into a cell. Entering keywords makes it possible to print the information. ▶ **"Keyword Definitions" on page App-3**

On the template file registration area, you can use the control buttons in the upper right to register (to a PC), save, and delete template files.



1 Click the No. cell for the File Name that you want to perform the action on.
To register, select a row showing "Unregistered."

The selected row turns blue. You cannot select multiple rows.

2 Click a control button.

Clicking Upload displays a standard Open dialog box.
Clicking Download displays a standard Save As dialog box.
Clicking Delete deletes the file registered in the GA10 server.

3 If you click Upload, select the file you want to register, and click OK.
If you click Download, select the save destination, and click OK.

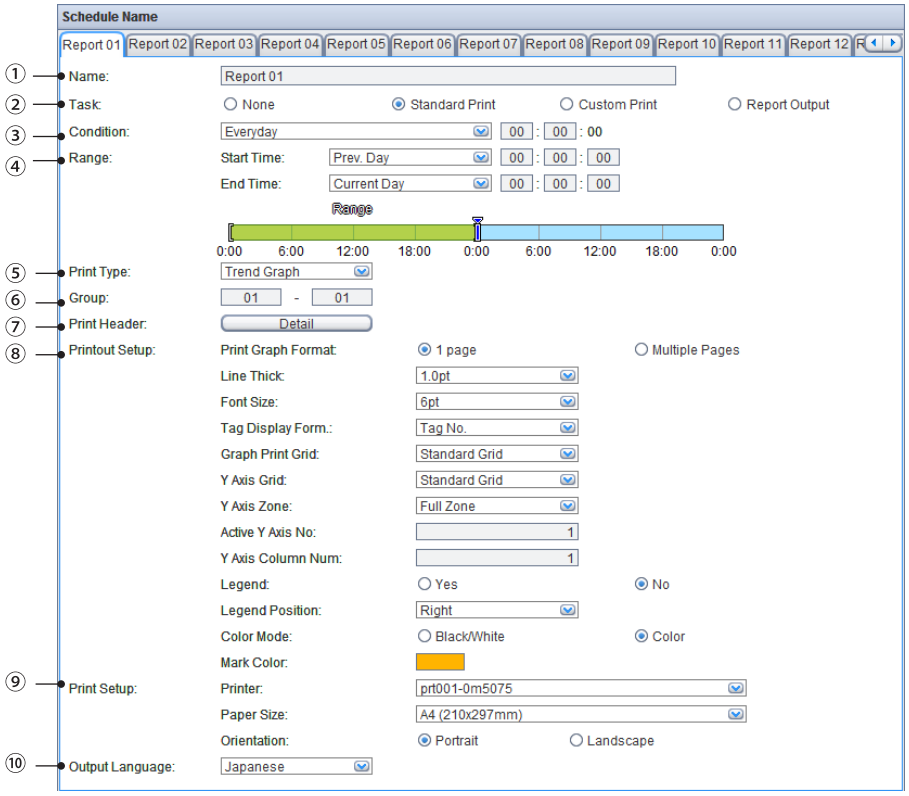
The file will be registered or saved.

Note

- If you place the SMARTDAC+ Report Template Builder installer in the same folder as the GA10 installer, Report Template Builder will be installed automatically when you install GA10.
- For information on how to use SMARTDAC+ Report Template Builder, see the Help menu of Report Template Builder.
- For instructions on how to create report templates for Excel report files and examples of how to write keywords, see **"Appendix 1 Creating Report Templates"**.

5.1.3 Standard Print

If you set Task to Standard Print, the schedule page shows the Standard Print settings. In standard print, the specified content is printed automatically from a data file at the specified time.



Setup Item

In a Standard Print schedule, set the following items.

(1) Name

Enter the name of the schedule.

- Default value: Report01 to Report 20
- Input range: Enter a text string using up to 30 characters.

(2) Task

Select Standard Print.

- Options: None, Standard Print, Custom Print, Report Print

(3) Condition

From the list, select the time to execute printing.

- Default value: 00:00:00 every day
- Options: Every Hour, Everyday, Every Week, Every Month, Interval, Recording is finished

The range (4) will vary depending on this condition.

(4) Range

Set the target data range. For details, see **Schedule Conditions and Range** described later.

(5) Print Type

Select the print type from the list.

- Default value: Trend Graph
- Options: Trend Graph, Circular, Sheet, Alarm List, Mark List

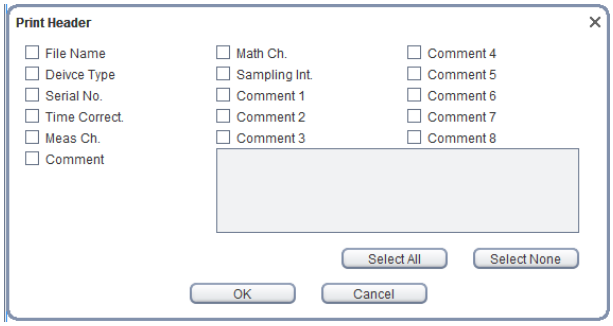
(6) Group

Specify the range of display groups to print using group numbers.

- Default value: 01-01
- Input range: Enter the display group numbers in the range of Group 01 to 50. Enter them so that the start group number is less than the end group number.

(7) Print Header

Click the Detail button, and click the items you want to print in the Print Header Detail dialog box shown below. For File Name, the character strings of Schedule Name and Date will be output.



(8) Printout Setup

Set the graph details. The items vary depending on the print type set in (5).

Item	Default Value	Show or hide	Range
Print Graph Format	1 page	Displayed for Standard Print and Trend Graph	1 page, Multiple Pages
Line Thick	1.0pt	Displayed for Trend Graph and Circular	0.25pt, 0.5pt, 1.0pt, 1.5pt, 3.0pt
Font size	6pt	Displayed for Trend Graph	6pt, 7pt, 7.5pt, 8pt, 9pt, 10pt, 11pt, 12pt, 14pt, 16pt, 20pt
Print Graph Grid	1h(/div)	Displayed for Trend Graph and Multiple Page	1min, 2min, 5min, 10min, 20min, 30min, 1h, 2h, 3h, 4h, 6h, 8h, 12h, 1day, 7days, 1month
Print Graph Grid	Standard Grid	Displayed for Standard Print or Trend Graph when 1 Page is selected Displayed for Custom Print or Report Output.	Standard Grid, Dense Grid1, Dense Grid2, Dense Grid3, Dense Grid4
Sub Grid	None	Displayed for Trend Graph and Multiple Page	Varies depending on the Print Graph Grid setting. (See the separate table.)
Split Circular Interval	1h(/rev.)	Displayed for Circular	1h, 2h, 6h, 8h, 12h, 16h, 1day, 2days, 1week, 2weeks, 4weeks
Sub Split	None	Displayed for Circular	Varies depending on Split Circular Interval. (See the separate table.)
Y-axis grid	Standard Grid	Displayed for Trend Graph	Standard Grid, Dense Grid1, Dense Grid2, Dense Grid3, Dense Grid4
Y-axis zone	Full zone	Displayed for Trend Graph	Full Zone, Slide Zone, Auto Zone, Free Zone
Active Y-axis	1	Displayed for Trend Graph	1 to 50
Tag Display	Tag No.	Displayed for Trend Graph, Circular, Sheet, and Alarm List.	Tag No., Tag Comment, Tag Index
Y Axis Column Num	1	Displayed for Trend Graph and Circular	Enter a number between 1 to 50.
Legend	No	Displayed for Trend Graph and Circular	Yes or No
Legend position	Right	Displayed for Legend [Yes]	Top, Bottom, Left, Right
Color Mode	Color	Displayed always.	Black/White or color
Mark Color	Orange	Displayed for Trend Graph, Circular, and Sheet	Click the color to select the color from a Color Setting dialog box.
Print Quality	Standard	Displayed for Custom Print, Report Output as well as when Graph Type is set to None for manual Custom Print and manual Report Output.	Standard, High Standard: 300 dpi High: 600 dpi

Sub Grid Range (Trend)

Print Waveform Grid	Range
1min	None, 30sec, 10sec, 5sec, 2sec, 1sec
2min	None, 1min, 30sec, 10sec, 5sec, 2sec
5min	None, 2min, 1min, 30sec, 10sec, 5sec
10min	None, 5min, 2min, 1min, 30sec, 10sec
20min	None, 10min, 5min, 2min, 1min, 30sec
30min	None, 10min, 5min, 2min, 1min, 30sec
1h	None, 30min, 10min, 5min, 2min, 1min
2h	None, 1h, 30min, 10min, 5min, 2min
3h	None, 1h, 30min, 10min, 5min, 2min
4h	None, 2h, 1h, 30min, 10min, 5min
6h	None, 3h, 1h, 30min, 10min, 5min
8h	None, 4h, 2h, 1h, 30min, 10min
12h	None, 6h, 3h, 1h, 30min, 10min
1day	None, 12h, 6h, 3h, 1h, 30min
7days	None, 1day, 12h, 6h, 3h, 1h
1month	None, 15days, 10days, 5days, 1day, 12h

Sub Split Range (Circular)

Split Circular Interval	Range
1h	None, 2min, 1min, 30sec, 10sec, 5sec
2h	None, 5min, 2min, 1min, 30sec, 10sec
6h	Nonec, 10min, 5min, 2min, 1min, 30se
8h	None, 30min, 10min, 5min, 2min, 1min
12h	None, 30min, 10min, 5min, 2min, 1min
16h	None, 1h, 30min, 10min, 5min, 2min
1day	None, 1h, 30min, 10min, 5min, 2min
2days	None, 2h, 1h, 30min, 10min, 5min
1week	None, 12h, 6h, 3h, 1h, 30min
2weeks	None, 12h, 6h, 3h, 1h, 30min
4weeks	None, 12h, 6h, 3h, 1h, 30min

(9) Printer Setup

- Printer: Displays a list of registered printers. Select the printer on the server side to perform printing. Network printers are not displayed. Select a local printer registered on the server PC.
- Paper size: Displays a list of paper sizes retrieved from the specified printer. Use paper whose size is between A4 and A3.
- Orientation: Set to Portrait or Landscape.

(10) Output Language

Specify the language for the printed materials. The date format and decimal point format vary depending on the language.

- Default value: Language of each user (the registered language if a schedule registered on the server has already been displayed)
- Options: Japanese, English, Chinese, German, French, Korean, Russian

Language vs. Date Format and Decimal Point Format

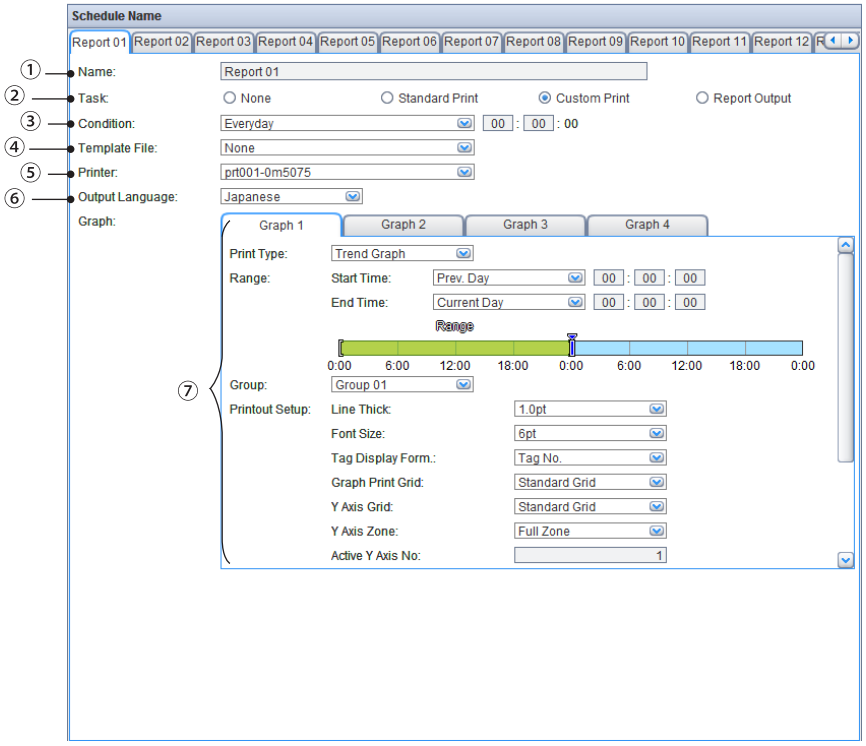
Output Language	Date Format	Decimal Point Format
Japanese	YY/MM/DD	Point (.)
English	MM/DD/YY	Point (.)
German	DD.MM.YY	Comma (,)
French	DD/MM/YY	Comma (,)
Russian	DD.MM.YY	Comma (,)
Chinese	YY/MM/DD	Point (.)
Korean	YY/MM/DD	Point (.)

5.1.4 Custom Print

If you set Task to Custom Print, the schedule page shows the Custom Print settings. In custom print, the specified content is printed automatically from a data file according to a template at the specified time.

Auto print is performed only when a template is specified. Be sure to register a template in advance.

:▶"Registering Template Files" on page 5-5



Setup Item

In a Custom Print schedule, set the following items.

(1) Name

Enter the name of the schedule. (The default value and input range are the same as those for Standard Print.)

(2) Task

Select Custom Print.

(3) Condition

From the list, select the time to execute printing.
The range (7) will vary depending on this condition. : ▶Schedule Conditions and Range

(4) Template file

From the list, select the template file (*.tpl) to apply to printing. If no template files (*.tpl) are registered, only None is displayed.

Note

- You can create template files (*.tpl) using SMARTDAC+ Report Template Builder. You can download it from the **YOKOGAWA website** for free.
- If the template file is set to None, custom print is not possible.
- Excel templates cannot be used for custom print.

(5) Printer

Displays a list of printers registered in the server.

(6) Output Language

Specify the language for the printed materials. The date format and decimal point format vary depending on the language (See **Language vs. Date Format and Decimal Point Format** provided earlier).

(7) Graph 1 to 4

Print Type

Select the type of graph defined in the template file.

- Options: None, Trend Graph, Alarm List, Mark List

Range

Set the print target data range. :▶**Schedule Conditions and Range**

Group

Specify the number of the group to print. Only the valid group numbers (groups that are assigned tags) among Group 01 to 50 are displayed as options.

Printout Setup

Same as **"Printout Setup" on page 5-7**. See the items in the table.

Note

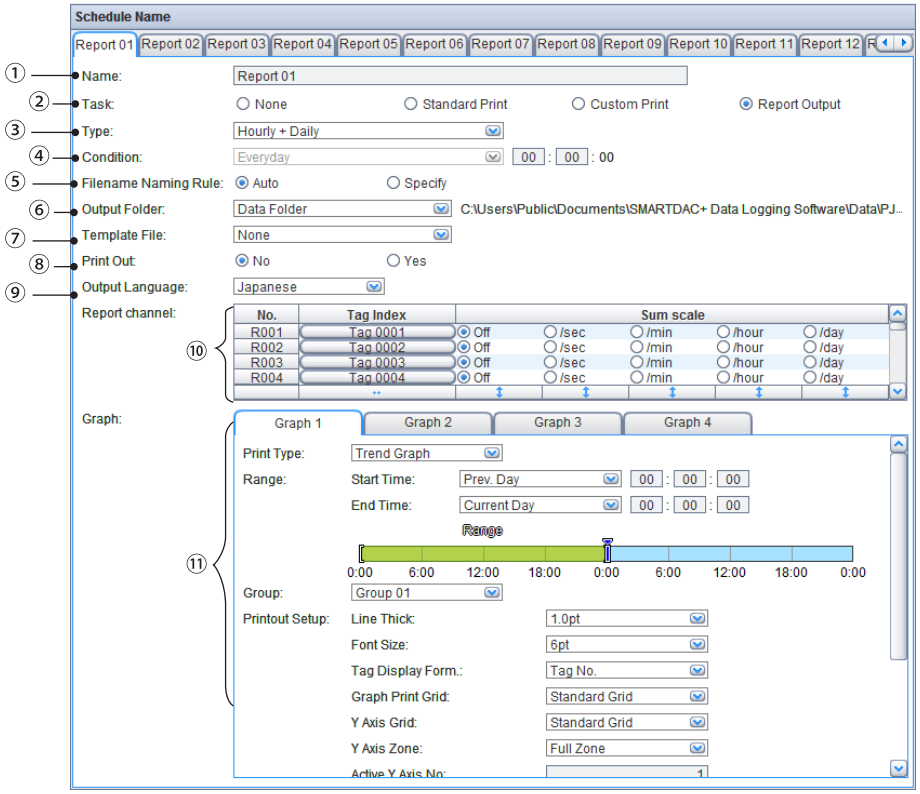
The graph output varies depending on the defined size as follows.

- For a trend graph, all trends in the setting range are output according to the size.
- For an alarm list and mark list, the number of output lines is calculated from the vertical length and font size, and data is printed over the calculated output lines in order from the latest time.
- Set the width of the alarm list to at least 102 mm and that of the mark list to at least 196 mm. Otherwise, character strings that do not fit width wise will be cut and not be output.

5.1.5 Report Output

If you set Task to Report Output, the schedule page shows the Report Output settings. In Report Output, report files (PDF, Excel) are created according to the specified template.

Report files are output only when a template is specified. Be sure to register a template in advance.
:▶"Registering Template Files" on page 5-5



Setup Item

(1) Name

Enter the name of the schedule. (The default value and input range are the same as those for Standard Print.)

(2) Task

Select Report Output.

(3) Type

Select the report type. Condition (explained next) varies depending on the selected report type. See the table below.

- Default value: Hourly + Daily

Relationship between Report Type and Condition

Report Type	Condition
Hourly + Daily	Fixed to Everyday. hh:mm can be set.
Daily + Weekly	Fixed to Every Week. The day of week and hh:mm can be set.
Daily + Monthly	Fixed to Every Month. The day and hh:mm can be set.
Batch	Condition is not displayed.
Daily custom	Fixed to Interval. The hour and base time (hh:mm) can be set.

(4) Condition

From the list, select the time to execute printing.

- Default value: Everyday

The range (11) will vary depending on this condition. :▶**Schedule Conditions and Range**

Save Interval (Hidden on the initial page because the report type is Hourly + Daily)

This appears only when the report type is Batch or Daily custom. Set the data recording interval.

- Default value: 10min
- Options: 1min, 2min, 3min, 4min, 5min, 10min, 15min, 30min, 1hour

(5) Filename Naming Rule

- Default value: Auto
- Options: Auto, Specify

When Auto is selected

PDF file name example: YYYYMMDDhhmmss_serial number.pdf
Excel file name example: YYYYMMDDhhmmss_serial number.xlsx

When Specify is selected

You can specify the front text string of the report file name. Enter up to 32 characters. The default value is “Report.”
PDF file name example: Report_YYYYMMDDhhmmss_serial number.pdf
Excel file name example: Report_YYYYMMDDhhmmss__serial number.xlsx

YYYY (year), MM (month), DD (day), hh (hour), mm (minute), and ss (seconds) are the date and time of the condition date.

(6) Output Folder

Select the folder to save the generated reports in.

- Default value: Data Folder
- Options: Data Folder, Subfolder in the data folder, Specified Folder

Save Location	Description
Data Folder	Displays the GA10 data folder. Example: C:\Users\Public\Documents\SMARTDAC+ Data Logging Software\Data
Subfolder in the data folder	Enter the name of a subfolder in the data folder. Enter up to 255 characters.
Specified Folder	Enter the path to the specified folder or use the Browse button to specify it. When entering the path, use up to 255 characters.

Note

If Output Folder is set to Desktop, My Documents, or any other Windows user folder, report file output will fail. Select a folder other than a Windows user folder.

(7) Template File

From the list, select the template file (*.tpl) to apply to printing or an Excel template file (*.xlsx, *.xlsm). If no template files are registered, only None is displayed.

Note

- You can create template files (*.tpl) using SMARTDAC+ Report Template Builder. You can download it from the **YOKOGAWA website** for free.
- If the template file is set to None, report output is not possible.

(8) Print Out

Displays a list of printers registered in the server. This item is valid for a template file (*.tpl). It does not appear for an Excel template file. (When using an Excel template file, you cannot print directly from GA10).

(9) Output Language

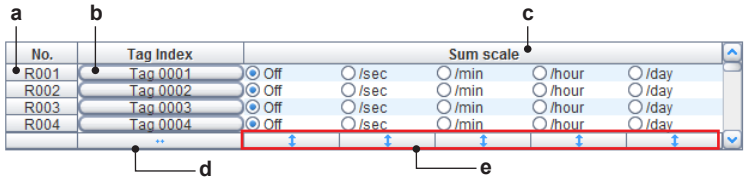
Specify the language for the printed materials. The date format and decimal point format vary depending on the language (See **Language vs. Date Format and Decimal Point Format** provided earlier).

(10) Report channel

Set the channel to output in reports.

Note

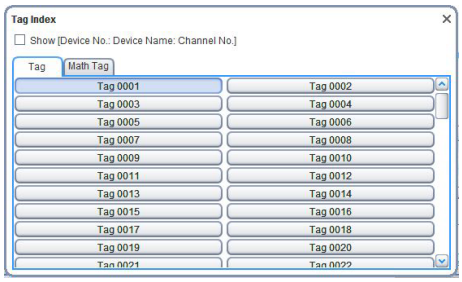
The device's LOG input channel is not output. If a tag corresponding to the device's LOG input channel is specified, the report channel value will be blank, and the status will be error.



Report Channel Settings

Symbol	Item Name	Default Value	Range	Description
a	No.	R001 to R100	001 to 100 (fixed)	Report channel number. Click a No. cell to select the row.
b	Tag Index1	Valid tags are assigned in ascending order.	Tag range (including math tags) of the project.	Select the tag. Click the tag to display the Tag Index dialog box. Then, click the tag you want to specify.
c	Sum scale	Off	Off, /sec, /min, /hour, /day	Displays the sum scale of the report channel.
d	Auto increment button	None	R001 to R100	Assigns tag indexes in ascending order from the first tag in the selected range.
e	All On button	None	R001 to R100	Clicking the button collectively turns on the sum scales in the selected range.

* To select a tag, click a tag button under Tag Index, and select the tag from the displayed dialog box shown below. If the Math function (/MT option) is installed, you can also select math tags.



(11) Graph 1 to 4

Print Type

Select the type of graph defined in the template file.

- Options: None, Trend Graph, Alarm List, Mark List

Range

Set the target data range. : ▶Schedule Conditions and Range

Group

Specify the number of the group to print. Only the valid group numbers (groups that are assigned tags) among Group 01 to 50 are displayed as options.

Printout Setup

Same as in Standard Print (**"Printout Setup" on page 5-7**). See the items in the table.

5.1.6 Schedule Conditions and Range

Display examples of Condition (report output and time to execute printing) and Range on the report schedule setting page are provided below. The schedule range display allows you to view the specified range on a time table. The condition time is displayed with ⌶, the start time of the specified range with ⟦, and the end time with ⟧. The range display for each condition applies both to auto print and manual print. You can view the schedule and history of report schedules that have been set on the Status Page.

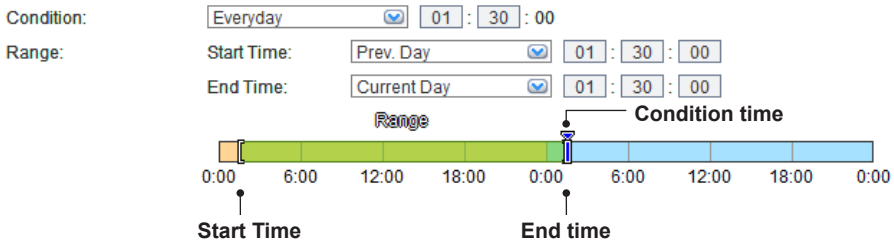
Note

- If the Beginning Time of Recording and the time of the report schedule condition are the same, a report is output for the data at that time.
- When recording is finished, all scheduled events will be executed.

When Condition Is Set to Every Hour

Below is the display example for Condition and Range when Condition is set to Every Hour.

- Time span: 2 hours
- Scale (minute): 0, 15 , 30 , 45, 0, 15, 30, 45, 0

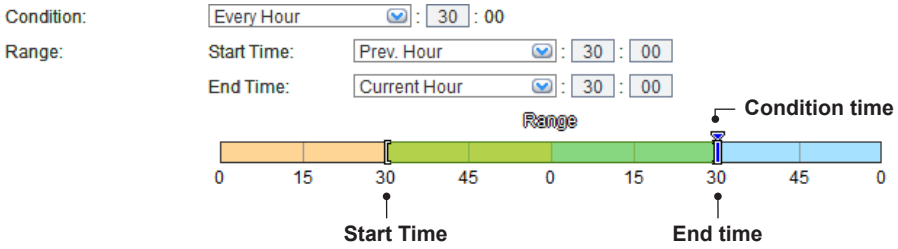


Item	Default Value	Selectable Range	
Condition: Every Hour	0:00 (mm:ss) every hour	Every Hour Minute: 00 to 59	
Range	Prev. Hour 0:00 to Current Hour 0:00	Prev. Hour and Current Hour Minute: 00 to 59 Second: 00 to 59	• Start Time: 0 minutes or later of the Prev. Hour • End Time: Up to the specified minute of the condition • The maximum time between start and end is 1 hour. • Start Time < End Time (Standard Print, Custom Print, Report Output)

When Condition Is Set to Everyday or When Report Type Is Set to Hourly + Daily

Below is the display example for Condition and Range when Condition is set to Everyday.

- Time span: 2 days
- Scale (every 6 hours): 0:00, 6:00, 12:00, 18:00, 0:00, 6:00, 12:00, 18:00, 0:00



Item		Default Value	Selectable Range	
Condition: Every Hour		Everyday 00:00:00	Everyday Hour: 00 to 23 Minute: 00 to 59	
Range	Standard Print Custom Print	Prev. Day 0:00:00 to Current Day 0:00:00	Hour: 00 to 23 Minute: 00 to 59 Second: 00 to 59	• Start Time: 0:00:00 or later of Prev. Day • End Time: Up to the specified time of the condition The maximum time between start and end is 24 • hour. Start Time < End Time (Standard Print, Custom Print, Report Output)
	Hourly + Daily Report	Prev. Day 0:00:00 to Current Day 00:00:00	Same as above	• Start Time: Time of Prev. Day Condition or later • End Time: Up to the time of Current Day condition • The maximum time between start and end is 24 • hour. Start Time < End Time (Standard Print, Custom • Print, Report Output) Not split even the time spans over two days.

Example: Hourly + Daily output data time

Note

To create a report using the data from 1:30:00 (not including 1:30:00) of the previous day to 1:30:00 (including 1:30:00) of the current day, set the conditions and range as follows.
If you want to create a report every day with these conditions, set Stop Condition to Continuous and File Division to Everyday 1:30:00.

Condition: Everyday 01:30:00
Range: Prev. Day 01:30:00 to Current Day 01:30:00

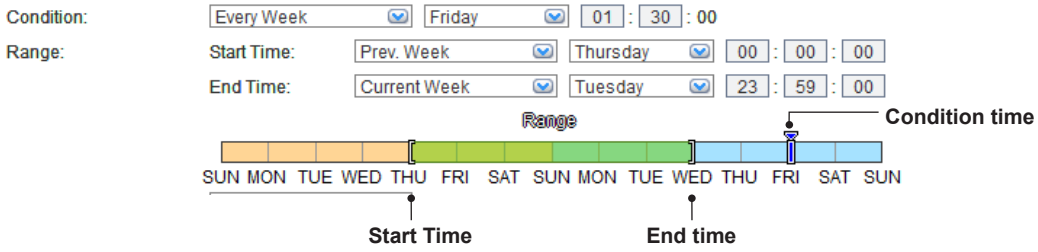
Data times will take on the following values.
Hourly data
yyyymmdd 02:30:00
yyyymmdd 03:30:00
yyyymmdd 04:30:00
...
yyyymmdd 23:30:00
yyyymmdd 00:30:00
yyyymmdd 01:30:00

Daily data
yyyymmdd 01:30:00

When Condition Is Set to Every Week or When Report Type Is Set to Daily + Weekly

Below is the display example for Condition and Range when Condition is set to Every Week.

- Time span: 2 weeks
- Scale (day-of-week steps): SUN, MON, TUE, WED, THU, FRI, SAT, SUN, MON, TUE, WED, THU, FRI, SAT, SUN, ...

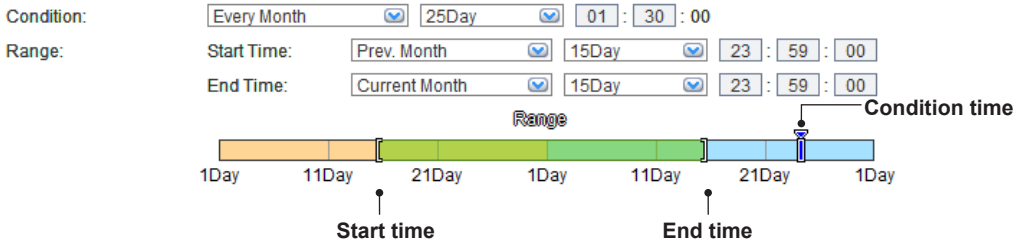


Item		Default Value	Selectable Range	
Condition: Every Week		Every Week Sunday 00:00:00	Every Week Sunday to Saturday Hour: 00 to 23 Minute: 00 to 59	
Range	Standard Print Custom Print	Prev. Week Sunday 0:00:00 to Current Week Sunday 0:00:00	Prev. Week and Current Week Day of week: Sunday to Saturday Hour: 00 to 23 Minute: 00 to 59 Second: 00 to 59	• Start Time: 0:00:00 or later on Sunday of Prev. • Week • End Time: Up to the specified time on the specified • day of the condition The maximum time between start and end is 7 days. Start Time < End Time (Standard Print, Custom Print, Report Output)
	Daily + Weekly Report	Prev. Week Sunday 0:00:00 to Current Week Sunday 0:00:00	Same as above	• Start Time: Time on the day of the week of • Condition in Prev. Week or later • End Time: Up to the time on the day of the week of • Condition in Current Week The maximum time between start and end is 7 • days. Start Time < End Time (Standard Print, Custom Print, Report Output) Not split even the time spans over two weeks.

When Condition Is Set to Every Month or When Report Type Is Set to Daily + Monthly

Below is the display example for Condition and Range when Condition is set to Every Month.

- Time span: 2 months
- Scale (10-day steps): 1 day, 11 days, 21 days, 1 days, 11 days, 21 days, 1 day, ...
- Displayed using the previous month's color and current month's color (light green and green) from the start time to the end time.



Item		Default Value	Selectable Range	
Condition: Every Month		Every Month 1 day 00:00:00	Every Month Day: 1 to 31 Hour: 00 to 23 Minute: 00 to 59	
Range	Standard Print Custom Print	Prev. Month 1 day 0:00:00 to Current Month 1 day 0:00:00	Prev. Month and Current Month Day: 1st to 31st Hour: 00 to 23 Minute: 00 to 59 Second: 00 to 59	• Start Time: 0:00:00 on the 1st of Prev. Month • End Time: Up to the specified time on the specified day of the condition • The maximum time between start and end is 31 days. • Start Time < End Time (Standard Print, Custom Print, Report Output) If a day that does not exist in the relevant month (e.g., 31st, 30th, or 29th) is specified, it is corrected to the last day of the month.
	Daily + Monthly Report	Prev. Month 1 day 0:00:00 to Current Month 1 day 0:00:00	Same as above	• Start Time: Time on the day of the week of • Condition in Prev. Week or later • End Time: Up to the time on the day of the week of • Condition in Current Week The maximum time between start and end is 7 • days. Start Time < End Time (Standard Print, Custom • Print, Report Output) If a day that does not exist in the relevant month (e.g., 31st, 30th, or 29th) is specified, it is corrected to the last day of the month. Not split even the time spans over two months.

Example: Daily + Monthly output data time

Condition: 25th of every month 01:30:00
Range: 25th of Prev. Month 01:30:00 to 25th of Current Month 01:30:00

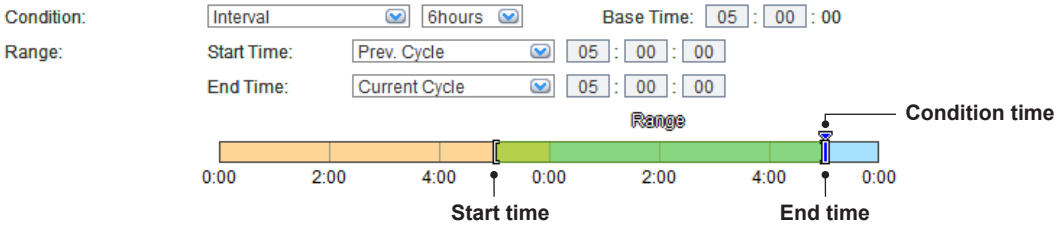
Data times will take on the following values.
Daily data
yyyymm26 01:30:00
yyyymm27 01:30:00
...
yyyymm01 01:30:00
...
yyyymm24 01:30:00
yyyymm25 01:30:00

Monthly data
yyyymmdd 01:30:00

When Condition Is Set to Interval or When Report Type Is Set to Daily custom

Below is the display example for Condition and Range when Condition is set to Interval.

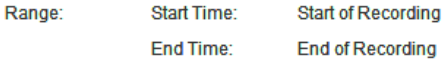
- Time span: 2 cycles
- Scale: When Interval = 4 hours: 0:00, 1:00, 2:00, 3:00, 0:00, 1:00, 2:00, 3:00, 0:00
  When Interval = 6 hours: 0:00, 2:00, 4:00, 0:00, 2:00, 4:00, 0:00
  When Interval = 8 hours: 0:00, 2:00, 4:00, 6:00, 0:00, 2:00, 4:00, 6:00
  When Interval = 12 hours: 0:00, 4:00, 8:00, 0:00, 4:00, 8:00, 0:00
  When Interval = 24 hours: 0:00, 8:00, 16:00, 0:00, 8:00, 16:00, 0:00
- Displayed using the previous cycle's color and current cycle's color (light green and green) from the start time to the end time.



Item	Default Value	Selectable Range	
Condition: Interval	Interval 6h Base time 00:00:00 (For Daily custom, the interval is the file division interval.)	Interval Hour: 4h, 6h, 8h, 12h, 24h Base time Hour: 00 to 23 Minute: 00 to 59	• Interval and specifiable base time range When Interval = 4h, 00:00:00 to 03:59:00 When Interval = 6h, 00:00:00 to 05:59:00 When Interval = 8h, 00:00:00 to 07:59:00 When Interval = 12h, 00:00:00 to 11:59:00 When Interval = 24h, 00:00:00 to 23:59:00
Range	Prev. Cycle 0:00:00 to Current Cycle 0:00:00	Prev. Cycle and Current Cycle Start Time Hour: 0 to 3, 5, 7, 11, 23 (interval – 1 hour) Minute: 00 to 59 Second: 00 to 59 End Time Hour: 0 to 4, 6, 8, 12, 24 Minute: 00 to 59 Second: 00 to 59	• Start Time: Base time of the previous Condition or later • End Time: Up to the time the Condition is met • The maximum time between start and end is 1 cycle. • Start Time < End Time (Standard Print, Custom Print, Report Output)

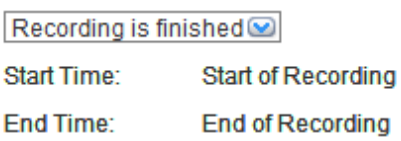
When Report Type Is Set to Batch

If Report Output is set to Batch, you do not need to set Condition. The graph range is the entire duration (the following figure), and a time table is not displayed.



If Condition Is Set to Recording is finished

If Condition is set to Recording is finished, the range is fixed to the entire duration. A time table is not displayed.



Note

Graphs are created on the basis of the End Time of Range. As such, if the device time is changed, the start time of the graph may differ from the start time of the range.

Note

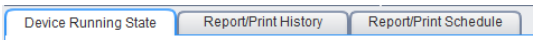
The following limitations apply to DST (Daylight Saving Time).

- If the time for Condition or Range is set to a time that does not exist in DST (Daylight Saving Time), it is executed at the time DST takes effect.
  Example: If the setting is at 02:30:00 and the time for switching to DST is between 02:00:00 and 03:00:00, the condition will be executed at 03:00:00.
- If Condition is set to Interval, Base time to a time on the hour (e.g., 0:00:00), and Range to a duration equal to Interval, the range of the graph will be longer than the specified interval when the time changes from DST to standard time.
  Example: If the time change from DST to standard time is 1:00 to 0:00, Interval is 4hours, Base time is a time on the hour, and the range is from 0:00:00 to 4:00:00, the actual graph will be 5 hours between 0:00:00 and 4:00:00.
- If the Start Time (or the End Time) of the specified range in manual Custom Print or manual Report Output is in the DST transition time period, the range will assumed to be from before the DST transition (or up to the end of the DST transition).
  Example: If the transition from DST to standard time is 1:00 → 0:00 and the specified start and end times are 0:50 and 2:00, the range will be 2 hours 10 minutes.

5.2 Viewing Report Schedules

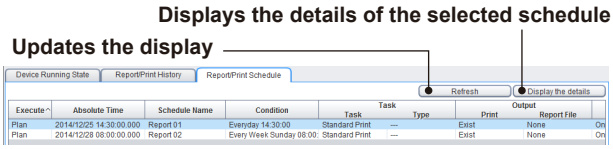
On GA10 with the Report/Print function (/RP option), you can view the execution schedule and history of reports and printing that have been set.

Click the Status Page icon on the Project tab to display the Status Page. The Report/Print History and Report/Print Schedule tabs appear behind the device status tab described earlier.



5.2.1 Report/Print Schedule

The Report/Print Schedule tab shows the print execution schedule in a list. To view the details of a selected schedule, you can click Display the details.



The following items are displayed in the list. If all the items do not fit on the screen, you can use the scroll bar to see the hidden items.

Item		Description
Execute		Plan
Absolute Time		The time when the schedule will be executed
Schedule Name		The name of the report schedule For projects whose Data time is set to Device time, the name will be schedule name + (device number + recording interval).
Condition		The condition for executing the schedule.
Task	Task	Standard Print, Custom Print, Report Print
	Type	Report type "---" is displayed for Standard Print and Custom Print.
Output	Print	None, Exist
	Report File	PDF, Excel, None
Output Folder	Printer	The selected printer.
	Folder	The specified output folder.

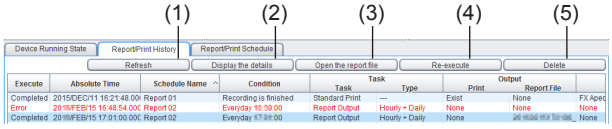
Details-of-schedule Screen

On the Details-of-schedule screen, the details of the specified print schedule are displayed.

Setting the Report/Print function (/RP option): ▶Sec. 5.1

5.2.2 Report/Print History

The Report/Print History tab shows the print execution history in a list. The result of each schedule is displayed as “Completed” or “Error” in the Execute column.
In addition, the following control buttons can be used to display the result of a selected schedule, re-execute the schedule, and delete logs. However, with the exception of Delete, you cannot operate more than one schedule at once.



(1) Refresh

Click this button to refresh the list.

(2) Display the details

Select a schedule from the list and click this button to display the details of the schedule.

(3) Open the report file

Select a schedule from the list and click this button to display the report file that has been generated.

(4) Re-execute

Click this button to re-execute the selected schedule.

(5) Delete

Deletes the print execution log. From the list, select the schedule that you want to delete, and click to display a confirmation message. Click OK to delete it. If you select schedules while holding down the SHIFT key, you can delete several logs at once.

Note

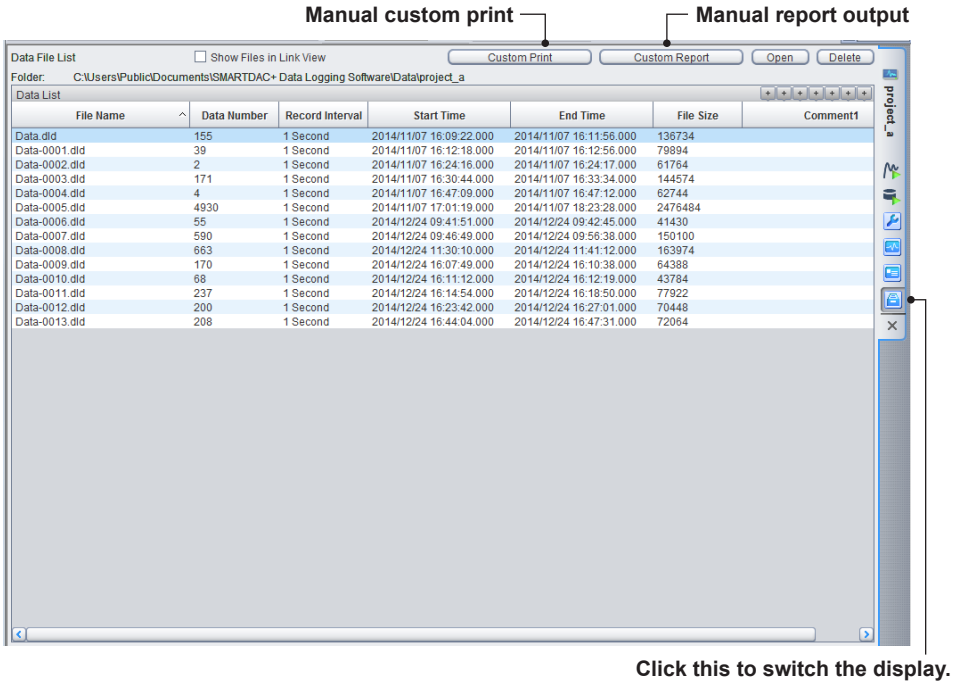
- A history of up to the most recent 100 schedules is displayed.
- Clicking an item name in the list sorts the list using the item. The first click specifies ascending order; the second descending order. The sort condition is displayed with an icon next to the item name.
- Entries whose schedule result is error are displayed using red characters.

5.3 Printing Recorded Data Manually

On GA10 with the Report/Print function (/RP option), the **Custom Print** and **Custom Report** buttons are displayed at the top of the Data File List screen (**Page 8-1**). You can use these buttons to print manually.

5.3.1 Manual Custom Print

You can use the Custom Print button at the top of the Data File List screen to manually perform printing that is equivalent to the Custom Print of scheduled (auto) printing.

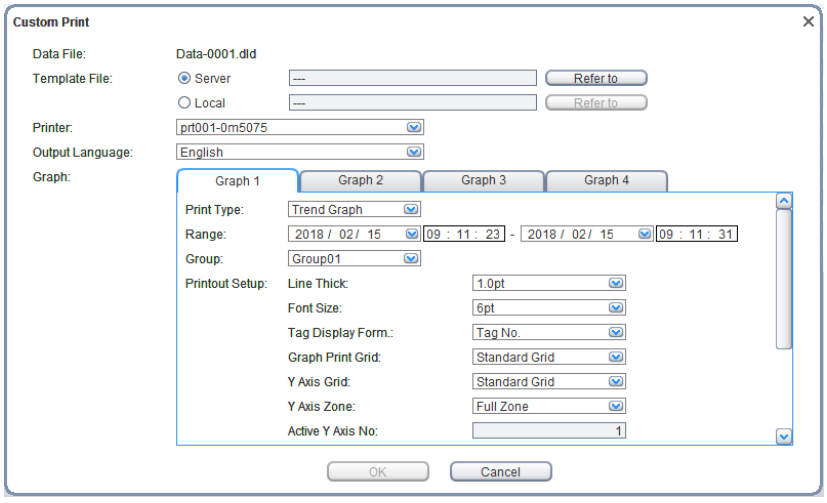


Basic Operation

1 Click the **Data files Page** icon .
The Data File List screen appears.

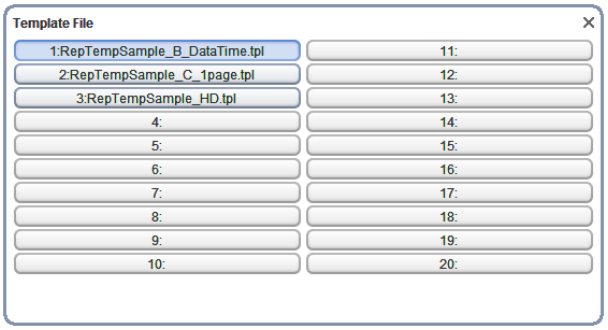
2 Click the file (a single file or several files that have been linked into one) you want to print.
The selected line turns blue.

3 Click **Custom Print**.
A Custom Print dialog box appears.



4 Select the template file to apply to printing.
To use a template registered in GA10, click **Server**.
To use a template from a PC, click **Local**.

5 Click **Browse**. (This example assumes that Server has been selected.)
A Template File dialog box appears.
If you selected Local in step 4, a standard Open dialog box will appear.



6 From the list, select the template file you want to use.
The dialog box closes, and the template appears in the Custom Print dialog box.

7 Set the **Print Type**, **Range**, **Group**, and **Printout Setup** items on the Graph 1 to 4 tabs.

8 Click **OK**.
Printing will be executed.

Setup Item

Data File

Displays the data file name of the print target (line) selected in the list. If the entire file name cannot be displayed, the end is abbreviated with ellipses.

Template File

Displays the name of template file selected from the server or the local PC. If the entire file name cannot be displayed, the end is abbreviated with ellipses.

Server

Select this to use a template file registered in GA10. Registered templates will be displayed in a list (Template File dialog box).

Local

Click this to use a template file from a PC. An standard Open dialog box will appear.

Printer

Displays a list of registered printers. Select a printer on the server side that will be used. Network printers are not displayed. Select a local printer registered on the server PC.

Output Language

Specify the language for the printed materials. The date format and decimal point format vary depending on the language.
Display format of each language: ▶**"Language vs. Date Format and Decimal Point Format" on page 5-8**

Graph 1 to 4

Print Type

Select the type of graph defined in the template file.

- Options: None, Trend Graph, Alarm List, Mark List

Range

From the start time of the first file to the end time of the last file in the selected data file list.

Group

Select the number of the group to print from the Group 01 to 50 options.

Printout Setup

Same as **“Printout Setup” on page 5-7**.

5.3.2 Manual Report Output

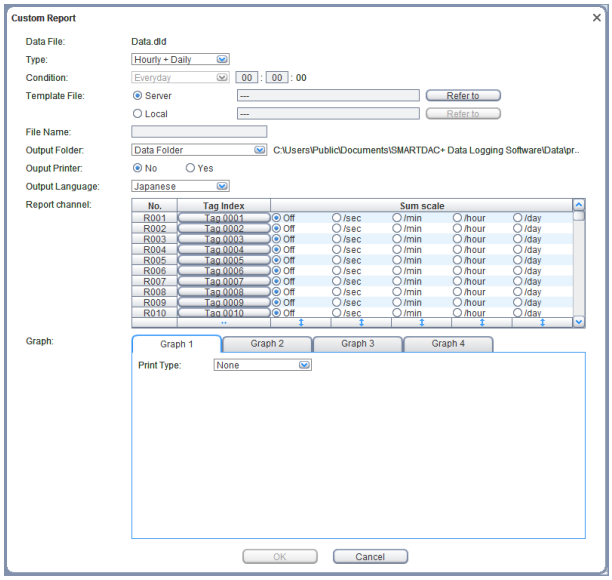
You can use the Custom Report button at the top of the Data File List screen to manually perform printing that is equivalent to the Report Output of scheduled (auto) printing.

Basic Operation

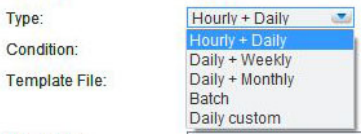
1 Click the **Data files Page** icon .
The Data File List screen appears.

2 Click the file (a single file or several files that have been linked into one) you want to print.
The selected line turns blue.

3 Click **Custom Report**.
A Custom Report dialog box appears.

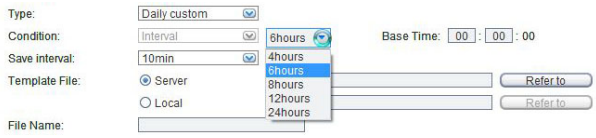


4 Select the report type from the list.

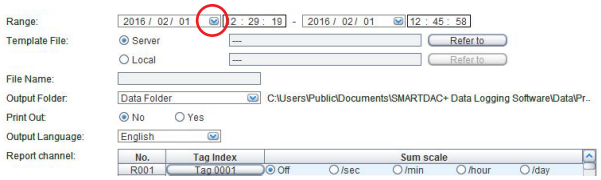


5 Set the condition.

6 If you set the report type to **Batch** or **Daily custom**, select the save interval.



7 Set the report output range.
Date: Click the drop-down button and select from the calendar that appears.
Time: Enter the hour, minute, and second.
A value cannot exceed the data start time or end time.



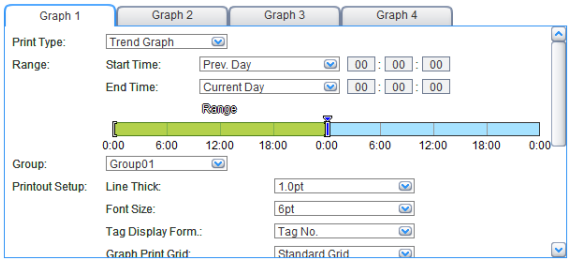
8 Select the template file to apply to printing.
To use a template registered in GA10, click Server.
To use a template from a PC, click Local.

9 Click **Browse**, and select the template.
The procedure for selecting the template is the same as step 5 in **"Custom Print" on page 5-9**.

10 Set the **File Name**, **Output Folder**, **Output Printer**, and **Output Language** items.

11 Set the report channel.

12 Set the **Print Type**, **Range**, **Group**, and **Printout Setup** items on the Graph 1 to 4 tabs.



13 Click **OK**.
Printing will be executed.

Setup Item

Data File

Displays the data file name of the print target (line) selected in the list. If the entire file name cannot be displayed, the end is abbreviated with ellipses.

Type

Select the report type from Hourly + Daily, Daily + Weekly, Daily + Monthly, Batch, and Daily custom.

Condition

The condition varies depending on the report type.
For details, see **"Schedule Conditions and Range" on page 5-14**.

Save Interval (Hidden on the initial page because the report type is Hourly + Daily)

This appears only when the report type is Batch or Daily custom. Set the data recording interval.

- Default value: 10min
- Options: 1min, 2min, 3min, 4min, 5min, 10min, 15min, 30min, 1hour

Range

Set report output data range.

- Default value: From the start time to the end time of the selected data file.
- Input range: Same as above (from the start time of the first data file to the end time of the last data file)

Template File

Displays the name of template file selected from the server or the local PC. If the entire file name cannot be displayed, the end is abbreviated with ellipses.

Server

Select this to use a template file registered in GA10. Registered templates will be displayed in a list (Template File dialog box).

Local

Click this to use a template file from a PC. An standard Open dialog box will appear.

File Name

Enter the name of the report file to create manually (using up to 60 characters).
The file name is created according to the following rules.
Input file name_creation time_serial number
Creation time: YYYYMMDDhhmmss (no spaces)
Serial number: 6 digits, 0 filled

Output Folder

Select the folder to save the generated reports in.

- Default value: Data Folder
- Options: Data Folder, Subfolder in the data folder, Specified Folder

Save Location	Description
Data Folder	Displays the GA10 data folder. Example: C:\Users\Public\Documents\SMARTDAC+ Data Logging Software\Data
Subfolder in the data folder	Enter the name of a subfolder in the data folder. Enter up to 255 characters.
Specified Folder	Enter the path to the specified folder or use the Browse button to specify it. When entering the path, use up to 255 characters.

Output Printer

Select whether to print. Selecting Yes displays a list of registered printers. However, Output Printer does not appear for an Excel template file. (When using an Excel template, you cannot print directly from GA10).

Output Language

Specify the language for the printed materials. The date format and decimal point format vary depending on the language.

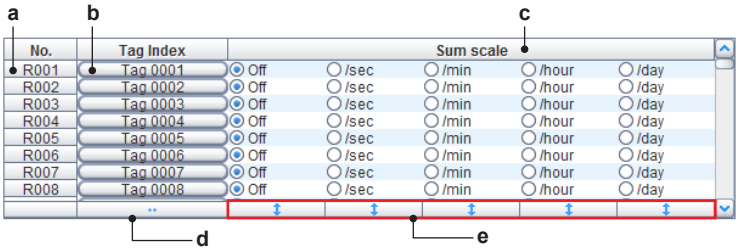
Display format of each language: ▶**“Language vs. Date Format and Decimal Point Format” on page 5-8**

Report channel

Set the channel to output in reports.

Note

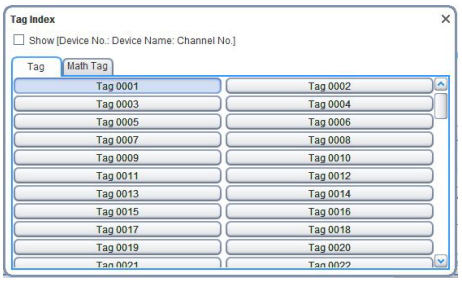
The device's LOG input channel is not output. If a tag corresponding to the device's LOG input channel is specified, the report channel value will be blank, and the status will be error.



Report Channel Settings

Symbol	Item Name	Default Value	Range	Description
a	No.	R001 to R100	001 to 100 (fixed)	Report channel number. Click a No. cell to select the row.
b	Tag Index[1]	Tag0001 to Tag0100	Tag range (including math tags) of the project.	Select the tag. Click the tag to display the Tag Index dialog box. Then, click the tag you want to specify.
c	Sum scale	Off	Off, /sec, /min, /hour, /day	Displays the sum scale of the report channel.
d	Auto increment button	None	R001 to R100	Assigns tag indexes in ascending order from the first tag in the selected range.
e	All On button	None	R001 to R100	Clicking the button collectively turns on the sum scales in the selected range.

* To select a tag, click a tag button under Tag Index, and select the tag from the displayed dialog box shown below. If the Math function (/MT option) is installed, you can also select math tags.



Graph 1 to 4

Print Type

Select the type of graph defined in the template file.

- Options: None, Trend Graph, Alarm List, Mark List

Range

Set the data range of the graph to be output in reports.

- Display format: If the report type is Batch, an absolute time (clock time) is displayed. Otherwise, a relative time (interval from the current time) is displayed.
- Default value: The start time and the end time of the selected data file if the report type is Batch. Otherwise, it is the same as the graph range setting when auto printing report schedule is set.
- Input range: From the start time to the end time (maximum-minimum value) in the report output range if the report type is Batch. Otherwise, it is the same as the graph range setting when auto printing report schedule is set.

For details, see **"Schedule Conditions and Range" on page 5-14**.

Group

Specify the number of the group to print. Select the number of the group to print from the Group 01 to 50 options.

Printout Setup

Same as **"Printout Setup" on page 5-7**.

Blank

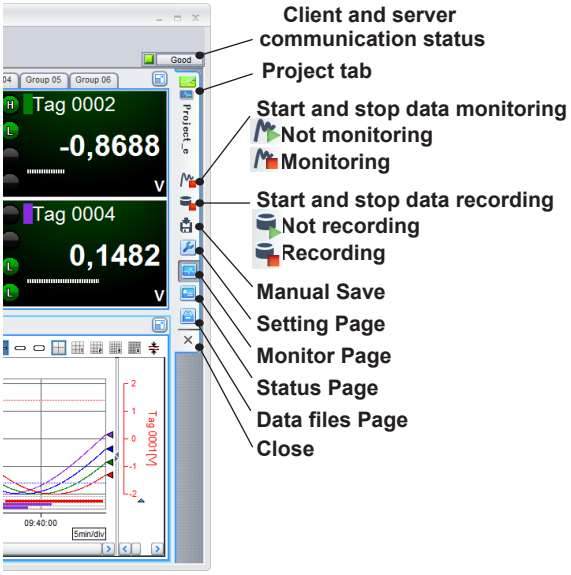
Chapter 6 Monitoring Data Collection

6.1 Monitoring on the Monitor Page

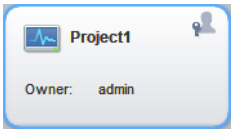
This section explains the Monitor Page for Detail Settings mode. In Simple Settings mode, the Monitor Page consists of the Trend Monitor Set and Digital Monitor Set. The operation is the same.

6.1.1 Displaying the Data Collection Status

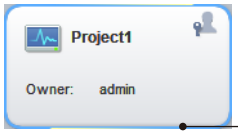
You can monitor data collection in the following page.



- **Client and Server Communication Status**
  The client and server communication status is indicated as Good, Ordinary, or Bad.
- **Project Tab**
  The tab shows the project name, and operation icons. The project alarm status is indicated in red.*
  * Blinking red: Alarm occurring
    Solid red: Alarm acknowledged
- **Start and Stop Data Monitoring**
  Click to start or stop data collection.
- **Start and Stop Data Recording**
  Click to start or stop data recording.
- **Setting Page, Monitor Page, Status Page, and Data files Page**
  Click to display the corresponding page.
  Setting Page ▶ **Sec. 3.2, Sec. 3.3**
  Monitor Page ▶ **Sec. 6.1.2**
  Status Page ▶ **Sec. 6.7**
  Data files Page ▶ **Sec. 8.1**
- **Manual Save Button**
  When clicked, the recording data is split at that position. This button is valid only during recording. You can show or hide the button by selecting Manual Save Button from the View menu.
- **Close**
  Click to close the project.
- **Viewing the Project Status in the Project List Page**
  Click the icon to show the Project List Page. You can view the project status.

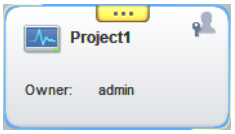


Data not being monitored

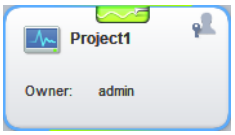


Data monitoring in progress

The boundary color changes.

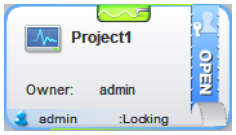


Data recording standby

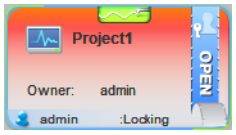


Data recording in progress

You can check the alarm status and alarm ACK status for the opened project.



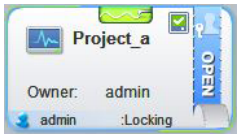
When an alarm is not occurring



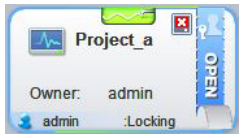
When an alarm is occurring (indicated in red)

Related topic: ▶ **Sec. 6.6.3**

If communication with a data acquisition device is disconnected, you can check which projects are affected.



Normal device connection (displayed with a green icon)

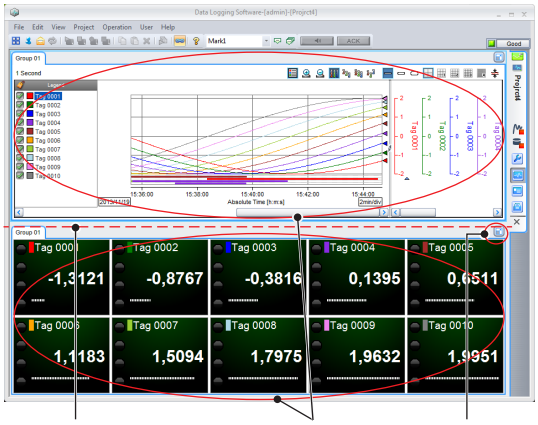


Disconnected device connection (displayed with a red icon)

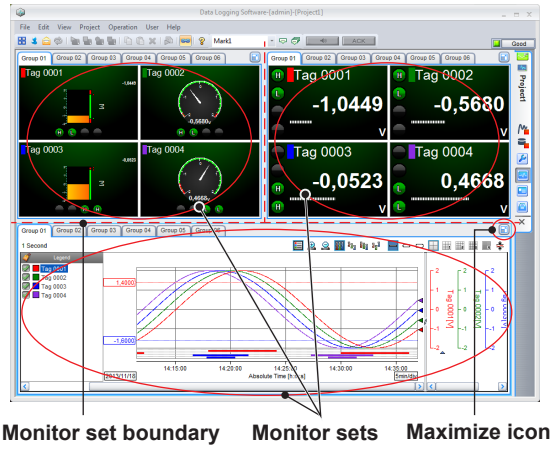
Related topic: ▶ **Sec. 6.6.4**

6.1.2 Displaying the Monitor Page

Open a project, and click the **Monitor Page** icon on the **Project** tab to open the Monitor Page.
In Simple Settings mode, the Monitor Page consists of the Trend Monitor Set and Digital Monitor Set as shown below.



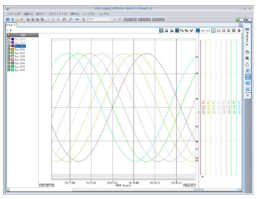
In Detail Settings mode, the Monitor Page that you configured opens.

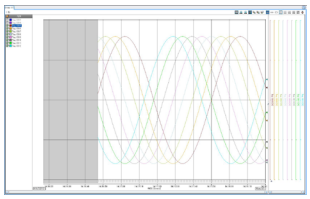


- **Resizing the Monitor Set**
  To resize the Monitor Set, **Resize the Monitor Set** on the Acquisition & Monitor Setting page must be set to **On**.
  Move the pointer near the boundary of the Monitor Set to change the pointer to ↕ or ↔. In this condition, drag the pointer to move the boundary to the desired position.

- **Maximizing the Monitor Set**
  Click the Maximize icon in the upper right of the Monitor Set to expand the Monitor Set to fill the entire window. Click to return to its original size.

- **Full Screen**
  If you click Full Screen on the View menu, the selected Monitor Set is displayed in a full screen. When there are multiple Monitor Sets, the selected Monitor Set is indicated with a light blue frame. Press ESC to change the full screen display back to the normal condition.


Maximize


Full Screen

- **Switching the Display Group at Once**
  On the **View** menu, click **Group Link**. Or, click the icon on the toolbar.
  When you change the display group of one Monitor Set, the display group of other Monitor Sets also changes.
  To cancel linking, on the **View** menu, click **Group Link** to unselect it. Or, click the icon on the toolbar to unselect it.

6.1.3 Setting General Display Options

- **Tag Display Form**
  From the list of options that appears when you click **Tag Display Form** on the **View** menu, select the items to display as tags. This applies to all pages.
- **User Display Form**
  From the list of options that appears when you click **User Display Form** on the **View** menu, select the items to display as user names. This applies to all pages.
- **Screen Background Color**
  On the **View** menu, click **Style**, and click **Light** or **Dark** to select the background color. This applies to all pages.
- **Date Format**
  From the list of options that appears when you click **Date Format** on the **View** menu, select the date format. This applies to all pages.
- **Month Display Form**
  From the list of options that appears when you click **Month Display Form** on the **View** menu, select the month display format. This applies to all pages.

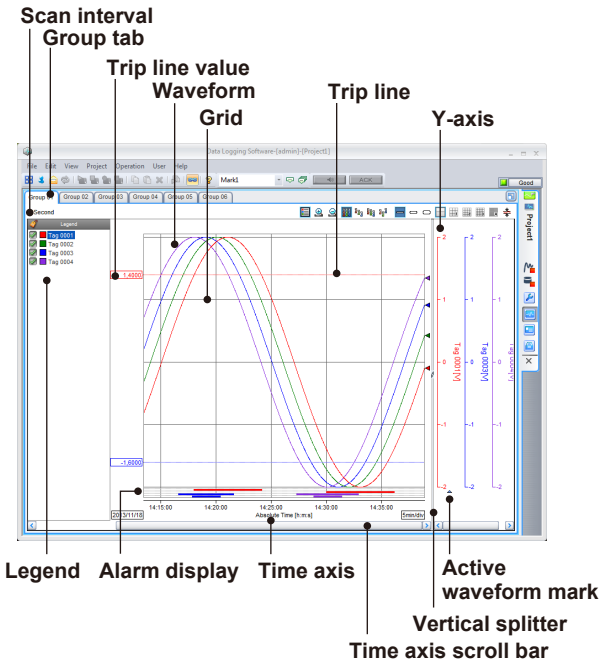
Item	Description
Digit	Example: “10” for October
Character	Example: “OCT” for October

- **Decimal Point**
  On the **View** menu, click **Decimal Point** to select the symbol to use for the decimal point. This applies to all pages.

Item	Description
.	Period
,	Comma

6.2 Monitoring on the Trend Display

6.2.1 Displayed Content



- **Scan Interval**
  The data collection interval.
- **Group Tab**
  Switches the displayed group. Alarms occurring in tags of each group are indicated in red.
- **Waveform**
  Displays each waveform according to its corresponding data tag color.
  ▶ See "Waveform Display" on next page.
- **Grid**
  The grid shown in the waveform display area.
- **Trip Line**
  Trip line assigned to a tag. Only the trip line of the active waveform is displayed.
  Moving the trip line
  Drag the value of the trip line to the desired position.
- **Y-axis**
  Displays the Y-axis scale, title, and unit. Each y-axis is displayed according to its corresponding tag color.
- **Legend**
  Displays tags, tag colors, waveform display on/off check boxes, and Y-axis display on/off check boxes.
- **Alarm Display**
  Displays alarms using bars from occurrence to release.
- **Time Axis**
  The right end shows the most recent data time.

- **Vertical Splitter**
  Use the vertical splitter to adjust the width of the Y-axis display area.
  When you move the pointer over the vertical splitter, the pointer changes to ⟺. In this condition, drag the pointer to expand or reduce the width of the Y-axis display area.

Waveform Display

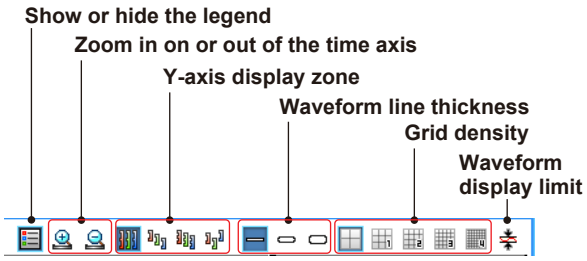
- **Active Waveform**
  The front-most displayed waveform is called the *active waveform*.
- **Changing the Active Waveform**
  Click a tag in the Legend or a Y-axis to make the corresponding waveform the active waveform. When a Y-axis is shared among multiple waveforms, the waveform with the smallest waveform number will become the active waveform. The active waveform mark (▲) moves below the Y-axis of the active waveform.
- **Automatically Updating the Displayed Data (monitor mode)**
  When the time-axis scroll bar is at the right end or when it is not displayed, the data display is automatically updated. This mode is called *monitor mode*. The right end of the waveform is the most recent data.
- **Viewing Past Data (playback mode)**
  Move the time-axis scroll bar from the right end to view past data. This mode is called *playback mode*. Automatic updating of the data display stops. Returning the scroll bar to the right end switches GA10 back to monitor mode. If you do not operate the scroll bar for 30 minutes, GA10 will return to monitor mode.

When Collecting Data Using Device Time

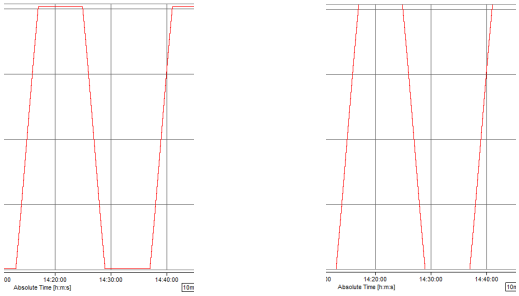
The window is divided by a combination of device and scan interval. Trends of up to four devices can be displayed at each scan interval.

6.2.2 Changing the Display

You can change the display using the icons in the upper right.



- **Show or Hide the Legend**
  You can show or hide the legend.
- **Zoom in on or out of the Time Axis**
  You can zoom in on or out of the time axis.
- **Y-axis Display Zone**
  You can switch the Y-axis display zone.
  ▶ Sec. 6.2.3
- **Waveform Line Thickness**
  You can change the waveform line thickness. This applies to all waveforms.
- **Grid Density**
  You can change the grid density.
- **Waveform Display Limit**



With limit Without limit

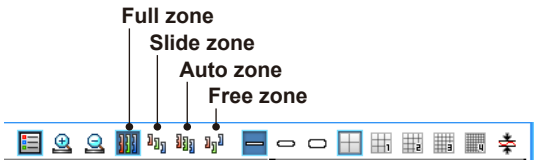
When you click the icon to select it, waveform display limit is enabled. When you apply the waveform display limit, the Y-axis display range is limited to the minimum and maximum values that you specified using Scale in Display Group. Measured values that are less than the minimum scale value are set to the minimum value, and values that are greater than the maximum scale value are set to the maximum value. When you click the icon to unselect it, waveform display limit is disabled. In this condition, measured values outside the scale are displayed as they are.

Note

If multiple operation screens are displayed on the same PC, the display conditions stored in the PC are shared. Be careful when you change the display conditions on the screen.
Display conditions when multiple screens are shown:
▶ Sec. 6.9.6

6.2.3 Controlling the Y-axis

- **Y-axis Display Zone**
  You can select the Y-axis display zone.
  Y-axis display zone specifies the scale position and length. It is the waveform position and range.



  - Full Zone: Displays all waveforms in the maximum range
  - Slide Zone: Displays each waveform cascaded from the top to the bottom of the waveform display area
  - Auto Zone: Divides the waveform display area into equally spaced zones in accordance with the number of waveforms and displays the waveforms
  - Free Zone: Displays waveforms in user-specified zones

- **Operations in Free Zone**
  In Free Zone mode, you can change the Y-axis display zone as you like.
  Zoom in/out on the Y-axis
  When you move the pointer near the lower or upper edge of the Y-axis scale, the pointer changes to ⇕. In this condition, drag the pointer to move the desired position to zoom in or out on the Y-axis.
  Moving the Y-axis
  When you move the pointer on an Y-axis scale, the pointer changes to ⇕. In this condition, drag the pointer to move the desired position to move the Y-axis to the desired position.

- **Compact Mode and Detail Mode**
  A Y-axis can be displayed in compact or detail mode. In compact mode, scale values are hidden, narrowing the width of the Y-axis.
  In detail mode, if you move the pointer on the Y-axis and click the  icon at the top of the Y-axis, the mode changes to compact. In compact mode, if you click the  icon, the mode changes to detail.

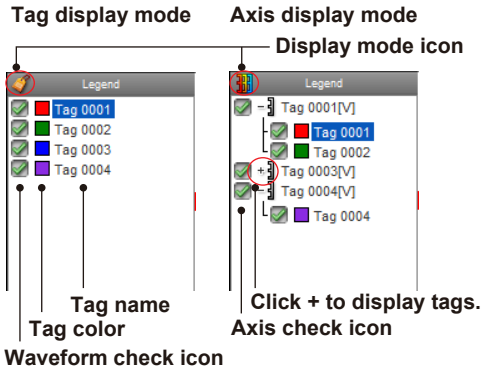
- **Scrolling a Y-axis Scale**
  When you move the pointer on an Y-axis scale, the pointer changes to 🔍 or ⇕.
  Spinning the mouse wheel in this condition causes the Y-axis scale to scroll, maintaining the difference between the upper and lower limits of the scale.
  Click the scale initialization icon  to return the scale to its original position.

- **Zooming in or out on an Y-axis Scale**
  When you move the pointer on an Y-axis scale, the pointer changes to 🔍 or ⇕. Clicking when the pointer is 🔍 shows a scale zoom in/zoom out icon  .
  Click an arrow of the icon or spin the mouse wheel to zoom in or out on the scale value in reference to the icon position.
  Click the scale initialization icon  to return the scale to its original position.

- **Changing the Active Waveform**
  ▶ "Waveform Display"

6.2.4 Showing and Hiding Waveforms (Using the Legend)

The legend can be displayed in tag display mode or axis display mode. Each time you click the display mode icon, the mode toggles between tag display and axis display.

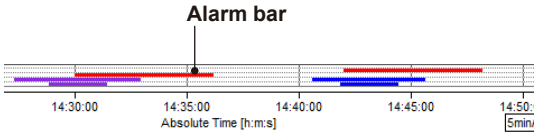


- **Tag Display Mode**
  The tags assigned to the display group are displayed. Waveforms whose waveform check icons are selected are shown. If you click an icon to clear the check box, the waveform will be hidden.

- **Axis Display Mode**
  A list of Y-axes used by tags is displayed. Expand a Y-axis to display a list of tags that are using the Y-axis. If you click an Y-axis check icon to clear the check box, the axis and waveform data sharing the axis will be hidden.

6.2.5 Viewing the Alarm Occurrence Status

When you click **Alarm** on the **View** menu to add a check mark, alarm bars are displayed in the alarm display area. Remove the check mark to hide the alarm bars.



The bars show the data range in which alarms are occurring for the tags displayed in the group. The alarms are from the top alarm level 1, alarm level 2, alarm level 3, and alarm level 4.

- Alarm bars are displayed with tag display colors.
- The alarm bars of the active waveform area always shown in front. If the alarm bars of multiple tags are overlapped and you want to view the alarm bars in the back, make the appropriate waveform the active waveform.

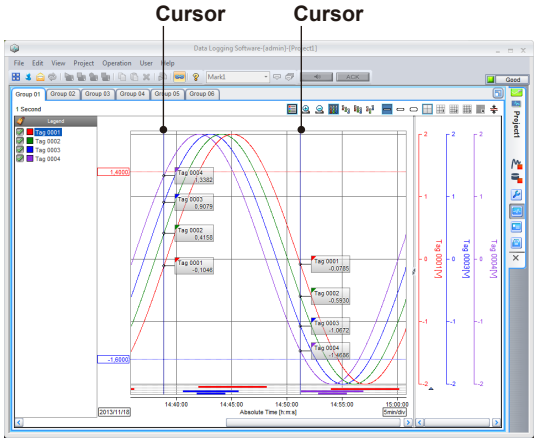
6.2.6 Reading Values with Cursors

You can use cursors to read values from waveforms. You can display two cursors: cursor A and cursor B.

- **Showing and Hiding Cursors**

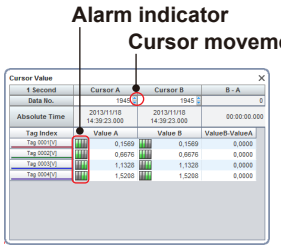
1. Click a point in the waveform graph.
   Cursor A (vertical line) appears, and the value at the intersection of the cursor and waveform is displayed.
2. Drag the cursor, and release the mouse button.
   Cursor B (vertical line) appears, and the value at the intersection of the cursor and waveform is displayed.
3. To clear the cursors, on the **View** menu, click **Erase** cursor.

If the cursor value displays of multiple tags are overlapped and you want to view the cursor values in the back, make the appropriate waveform the active waveform. Or, use the cursor value dialog box.
When a cursor is displayed, the waveform display enters playback mode, and automatic updating of data display stops.



- **Cursor Value Transparency**
  On the **View** menu, click **Cursor value transparency** to choose **Transparent** or **Opaque**.

- **Reading the Difference between Two Cursors**
  On the **View** menu, click **Cursor value**. The Cursor Value dialog box appears. From this dialog box, you can read the difference between cursors A and B.
  Click the cursor move icon ( ) to move the cursor by 1 data point.



- Data No.
  A sequence number of collected data points taking the first collected data point to be zero.
- Alarm indicator
  The status of alarm level 1, alarm level 2, alarm level 3, and alarm level 4, are displayed from the left.

Displayed Content	Description
Red	Alarm occurrence
Green	Alarm release
Gray	Alarm not set

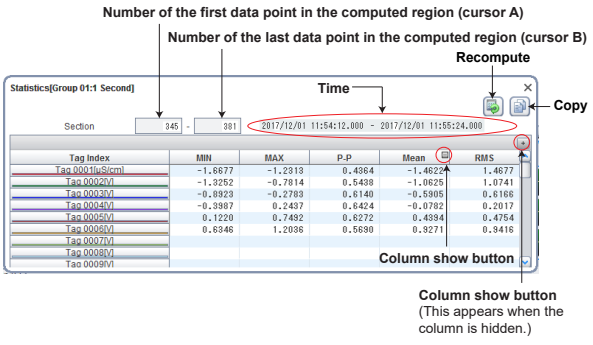
When **Alarm** in the **View** menu is not checked, alarm indicators are not shown.

To close the cursor value dialog box, click the × icon in the upper right.

6.2.7 Displaying Statistical Results

The minimum, maximum, P-P, mean, and rms values for each waveform in the range specified by cursors A and B are calculated and displayed.

1. On the **View** menu, click Statistics.



Note

- Calculated results are not synchronized to the cursor positions or waveform group. If you change the cursor A or B position or the display group, click Re-calc. to update the calculated results.
- The formula for calculating the rms value is as follows:

$$RMS = \sqrt{\frac{1}{n}\sum_{k=0}^{n-1}(x_k)^2}$$

n : Number of data
x_k : value

- **Copying Data to the Clipboard**

Clicking the Copy button copies the contents of the Cursor Value dialog box to the clipboard. You can paste the contents to a tab separated text file or to an Excel spreadsheet.

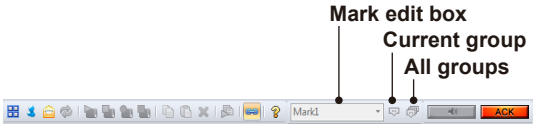
- **Showing or Hiding Columns**

When you move the cursor over a column title, a hide button appears. Clicking the hide button hides the target column. To show a column, click the show button.

6.2.8 Adding Marks

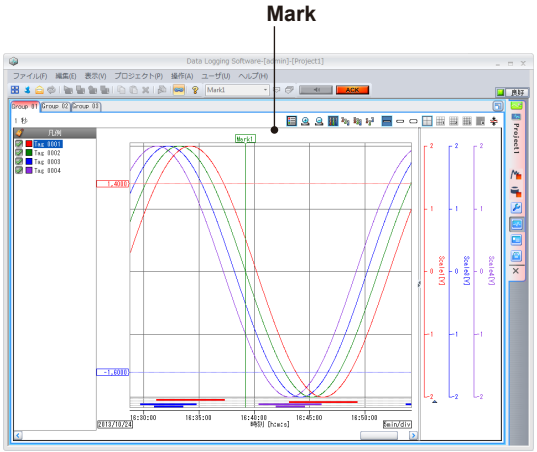
You can add marks to data. To add a mark, specify the mark string and the data to add the mark to.

1 Type the string in the mark edit box.
You can edit the displayed string as well as select from a list of strings that you used in the past from the drop-down menu. The drop-down menu displays the most recent five strings.



2 Click the data position you want to add a mark to display a cursor.
To add a mark to the most recent data, perform step 3 in monitor mode. Step 2 is not necessary.

3 On the **Project** menu, click **Append Mark** and then **Current Group** or **All Groups**. Or, click the **Current Group** or **All Groups** icon.
A mark is added to the specified position.



- **Adding a Mark to the Current Group**

If you select Current Group, a mark is added only to the group shown on the trend monitor.

- **Adding a Mark to All Groups**

If you select All Groups when data is being collected using PC time, a mark is added to all groups.
If data is being collected using device time,
  - In playback mode, a mark is added at the same position as cursor A to all display groups that contain tags of the same device and of the same collection interval as the monitor set subwindow that you added a mark to.
  - In monitor mode, a mark is added to all groups.

- **When Marks Are Overlapped**

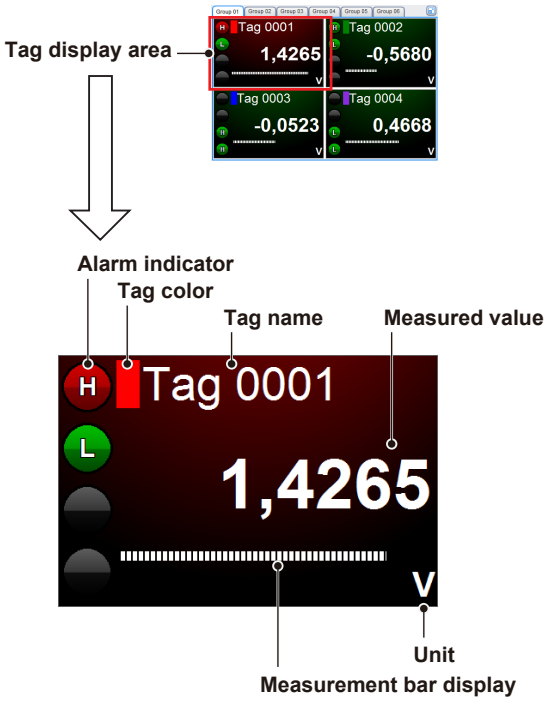
Sometimes marks overlap and the string of the lower mark cannot be read. Clicking a mark with Shift held down moves the mark to the back.

Note

- Marks that have been added cannot be deleted or edited.
- Mark information is saved in data files. (Only binary data files.) Mark information added to data positions in files that have already been closed is saved in the data file that is currently being recorded. You can view these marks by displaying connected data files.
- The maximum number of marks that can be added from the start to the end of monitoring is 10,000.
- The maximum number of marks that the expression's mark function (/MT option) can add to a data point at the same time position is 200.
- The data range that can be referenced in playback mode is up to 3600 points from the most recent acquired data. However, if recording is in progress and the recording interval is the same as the data acquisition interval (Monitor Interval), data can be referenced up to the start point of recording (exceeding the 3600 point limitation). Displaying may take some time if the amount of data to be played back is large.

6.3 Monitoring on the Digital Display

6.3.1 Displayed Content



- **Tag Display Area**
  Tag alarm status is indicated in the alarm color.
  * The alarm colors specified on the Acquisition & Monitor page.
- **Alarm Indicator**
  The status of alarm level 1, alarm level 2, alarm level 3, and alarm level 4, are displayed from the top. Tag alarm status is indicated in the alarm color. Alarm indicators show a character that indicates the alarm type.*
  * It is not shown if the display area is limited.

  Characters that indicate alarm types ▶ Sec. 6.5.3

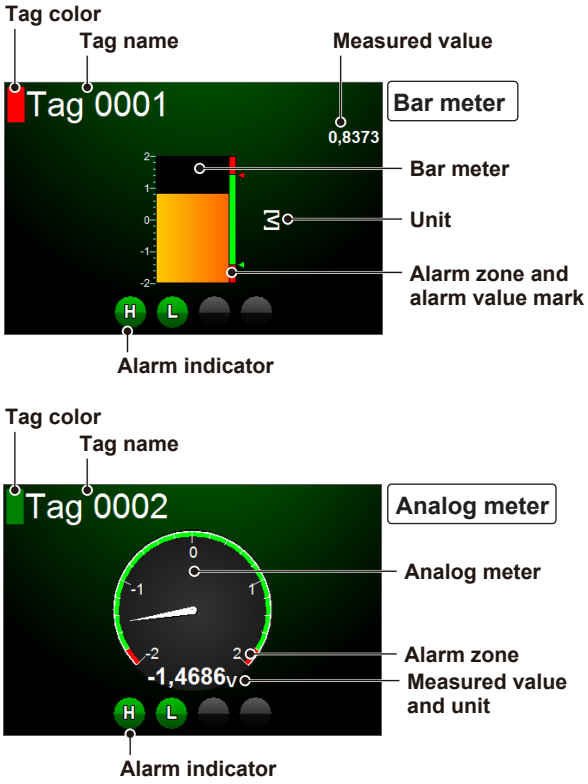
6.3.2 Showing and Hiding Alarm Indicators

When you click **Alarm** on the **View** menu to add a check mark, alarm indicators are shown. To not show alarm indicators, click **Alarm** on the **View** menu to unselect the command.

6.4 Monitoring on the Meter Display

6.4.1 Displayed Content

There are bar meters and analog meters.



- **Tag Display Area**
  Tag alarm status is indicated in the alarm color.
- **Alarm Zone**
  The zone where alarms occur is indicated in the alarm color.
- **Alarm Value Mark (bar meters only)**
  Indicates the alarm value of data collection devices. This appears when the alarm type is set to high limit, low limit, difference high limit, difference low limit, delay high limit, or delay low limit.

Displayed Content	Description
	Indicates that the alarm type is high limit or difference high limit.
	Indicates that the alarm type is low limit or difference low limit.
	Indicates that the alarm type is delay high limit.
	Indicates that the alarm type is delay low limit.

- **Alarm Indicator**
  The status of alarm level 1, alarm level 2, alarm level 3, and alarm level 4, are displayed from the left. Tag alarm status is indicated in the alarm color. A character that indicates the alarm type is displayed.*
  * It is not shown if the display area is limited.

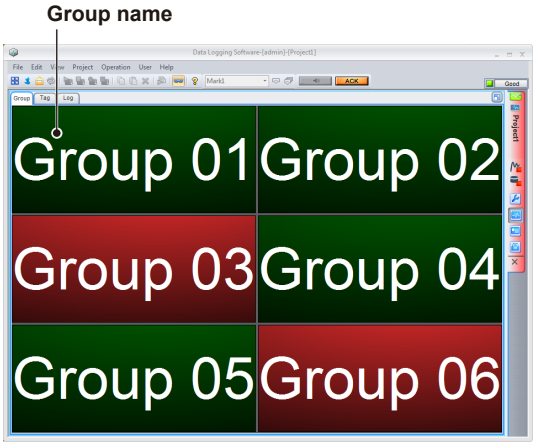
  Characters that indicate alarm types ▶ Sec. 6.5.3
  You can show and hide alarm indicators.
  ▶ Sec. 6.3.2

6.5 Monitoring Alarms

An alarm Monitor Set displays alarm information of monitored tags in three formats.

6.5.1 Group Overview

Click the **Group** tab. Alarm information is displayed at the group level. Groups that do not have alarms set on any tags are not displayed.



- **Alarm Occurrence Display**
  Alarm occurrence is displayed in the alarm color in the group display area.ACK operation can be performed on groups in which alarms activated.

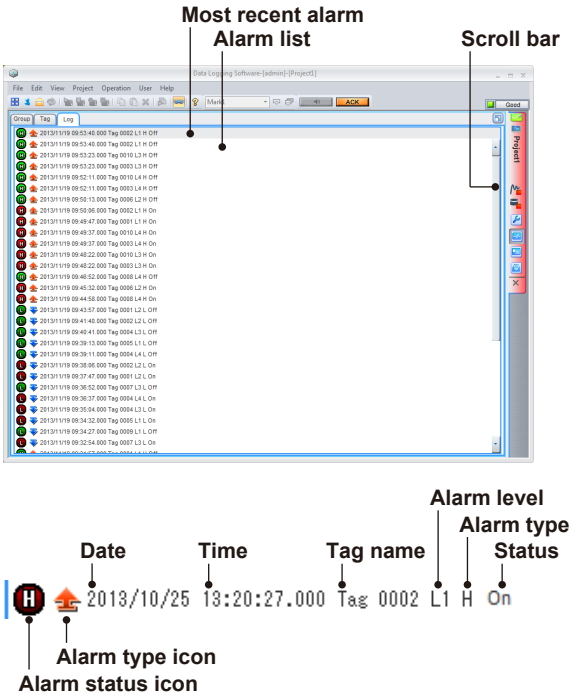
6.5.2 Tag Overview

Click the **Tag** tab. Alarm information is displayed for tags in the display group. Tags that do not have alarms set are not displayed.

- **Alarm Occurrence Display**
  Alarm occurrence is displayed in the alarm color in the tag display area.ACK operation can be performed on groups in which alarms activated.
- **Alarm Indicator**
  The status of alarm level 1, alarm level 2, alarm level 3, and alarm level 4, are displayed from the left. Tag alarm status is indicated in the alarm color.

6.5.3 Alarm Overview

Click the **Log** tab. The history of all monitored tags' alarm occurrences and releases is displayed. The top line is the most recent entry. The display is automatically updated as alarms occur and are released.
If data is being collected in device time, the history is displayed by dividing the window for each device.



- **Most Recent Alarm**
  The top line always displays the most recent entry.
- **Alarm List**
  The history of alarms are displayed in the order of occurrence. Move the scroll bar down to view past alarms. This condition is called *playback mode*. In playback mode, the history is not automatically updated (the line showing the most recent alarm is automatically updated). Move the scroll bar to its top position to exit playback mode.
- **Alarm Status Icon**

Indication	Description
Alarm-on color*	Alarm occurrence
Alarm-off color*	Alarm release

* The alarm colors specified on the Acquisition & Monitor page. If ACK has not been executed, the icon background blinks.

- **Clearing the alarm log**
  On the Project menu, click Clear Alarm Log to clear the alarm log of all devices.

- **Alarm Type Icons**

Displayed Content	Description
	High limit alarm, measurement high limit alarm, deviation high limit alarm, setting high limit alarm, output high limit alarm
	Low limit alarm, measurement low limit alarm, deviation low limit alarm, setting low limit alarm, output low limit alarm
	Difference high limit alarm
	Difference low limit alarm
	High limit on rate-of-change alarm
	Low limit on rate-of-change alarm
	Delay high limit alarm
	Delay low limit alarm
	Deviation out limit alarm
	Deviation in limit alarm
	Other alarm

- **Date and Time**

  The date and time of alarm occurrence and release.

- **Alarm Level**

Displayed Content	Description
L1	Alarm level 1
L2	Alarm level 2
L3	Alarm level 3
L4	Alarm level 4

- **Alarm Type**

Displayed Content	Description
H	high limit alarm
L	Low limit alarm
dH	Difference high limit alarm
dL	Difference low limit alarm
RH	High limit on rate-of-change alarm
RL	Low limit on rate-of-change alarm
tH	Delay high limit alarm
tL	Delay low limit alarm
PVH	Measurement high limit alarm
PVL	Measurement low limit alarm
DVH	Deviation high limit alarm
DVL	Deviation low limit alarm
DVO	Deviation out limit alarm
DVI	Deviation in limit alarm
SPH	Setting high limit alarm
SPL	Setting low limit alarm
OTH	Output high limit alarm
OTL	Output low limit alarm
ETC	Other alarm

- **Status**

Displayed Content	Description
ON	Indicates that an alarm has occurred.
OFF	Indicates that an alarm has been released.

- **Changing Alarm Types during Data Collection and Recording**

  If alarm types (including use and not use) are changed on the connected device side during data collection, recording, or record standby, the changes are reflected on the alarm monitor. Changes in alarm types are not reflected in the alarm list of the recording file. Further, this applies only when the connected device is a SMARTDAC+ series (GX/GP, GM) device and the GA10 version is R2.02.xx or later.

  The changes are reflected in the following areas.
  - Digital, alarm, and meter monitor sets
  - Alarm display of the value display area in the cursor value dialog box
  - Alarm list display
  - Alarm zone and alarm value mark of the meter display

6.6 Checking Alarms

6.6.1 Displaying the Alarm Overview Dialog Box

While displaying the Monitor Page, click **Alarm List** on the **View** menu to display the alarm overview dialog box.
The displayed content and operation in this dialog box are the same as those of the alarm list of the alarm Monitor Set.
Click × in the upper right of the dialog box to close it.

- **Page Switching and Dialog Box Display**
  The dialog box stays open until you close it. If you move to another page with the dialog box open, the dialog box disappears. But, if you return to the Monitor Page, the dialog box will appear again.
  If you change the project while the dialog box is open, the alarm information of the opened project will be displayed in the dialog box.

6.6.2 Notification of Alarms and Communication Errors with Sound

On the **Operation** menu, click **Warning Beep** to add a check mark. When an alarm or communication error with connected devices occurs, the PC will beep.
To stop the sound, on the **Operation** menu, click **Stop the Warning Beep**. Or, click the  icon.
To disable the alarm sound, on the **Operation** menu, click **Warning Beep** to remove the check mark.

Note

- To generate sounds, the PC must be equipped with a sound generating function and sound must be turned on.
- You cannot change the sound.

- **Sharing of the Temporary Suspension of Warning Beeps**
  If multiple clients are connected to the same server, the Stop The Warning Beep operation can be shared.
  On the Operation menu, click **Share the Warning Beep across clients**. Add a check mark to use shared mode; clear it to use non-shared mode. You can configure this function on each client. If warning beeps are temporarily stopped on a client that is set to shared mode, warning beeps are also stopped on other clients (see Note). If set to non-shared mode, other clients are not affected even if you perform the same operation.

Note

- The suspension of warning beeps is shared among clients that are connected to the same server and that are set to shared mode.
- This mode setting is stored internally, so it will be valid when the clients are restarted the next time.

6.6.3 Perform Alarm ACK Operations

If an alarm occurs in a monitored tag after data monitoring is started, the corresponding area blinks in the alarm color to indicate the alarm occurrence. An alarm ACK operation refers to the act of stopping this blinking.

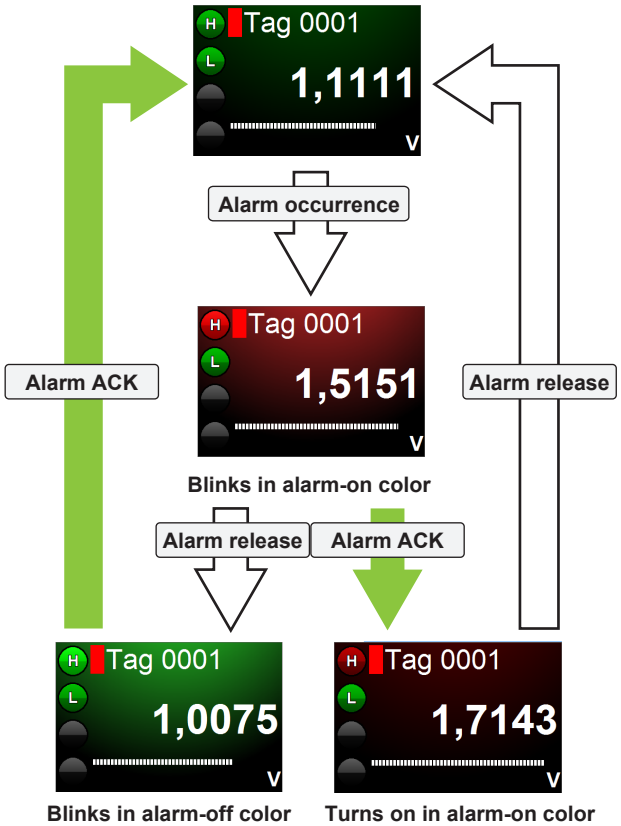
The following three ACK operation methods are available. The blinking alarm indication stops when you perform an ACK operation.

- Alarm ACK on all tags
  On the **Project** menu, click **Alarm ACK**. Or, click the 

 icon.
- Alarm ACK on each group
  Open the Group tabbed page of the alarm monitor screen, click the applicable group to perform ACK operation.
- Alarm ACK on each tag
  Open the Tag tabbed page of the alarm monitor screen, click the applicable tag to perform ACK operation.

To display the alarm monitor screen, see section 3.3.5, “Registering Data Collection Method and Monitor Page.”

- **Alarm ACK Operation and Alarm Indication Transition**
  The following figure shows how the alarm indication transitions as an alarm occurs, is released, and is acknowledged with alarm ACK. The figure shows an example of a Digital Monitor Set tag.

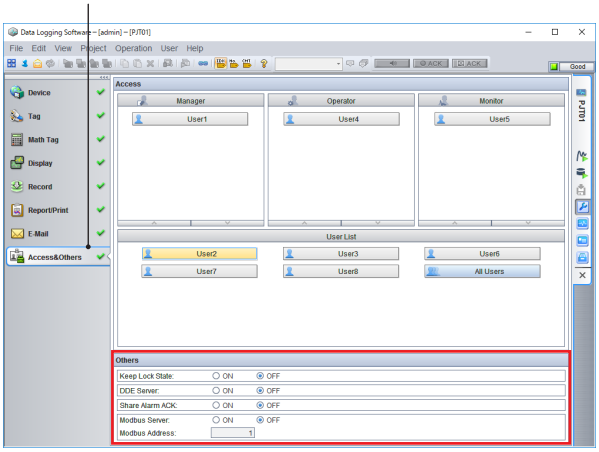


- If an alarm occurs and is released before the alarm ACK operation, the color changes to that when alarm is not occurring, but blinking continues until the alarm ACK operation is executed.
- If an alarm occurs again after an alarm ACK operation is executed, blinking will start again.
- Alarm ACK operations do not affect data collection devices.

- **Sharing Alarm ACK Operations**

  The alarm ACK status of a project can be shared among multiple clients that are connected to the same server. Alarm ACK can be shared by setting Share Alarm ACK under Others on the Access&Others Setting Page. This feature is set to OFF by default. If set to ON, the setting is applied starting from the next acquisition.

Access & Others



If a single client performs an ACK operation for an alarm that occurs in a project whose this setting is set to ON, the blinking stops on all clients connected to the same server. If set to OFF, other clients are not affected even if you perform an ACK operation on a single client.

Related topic: Sec. 3.3.11

6.6.4 Performing an Acknowledge of Device Communication Interference

If communication with connected devices is disconnected during data collection and recording, the icon on the toolbar blinks in the alarm color to indicate the error. Acknowledge of Device Communication Interference is an operation for checking the communication error and the affected projects.

- **Stopping the Warning Beep**

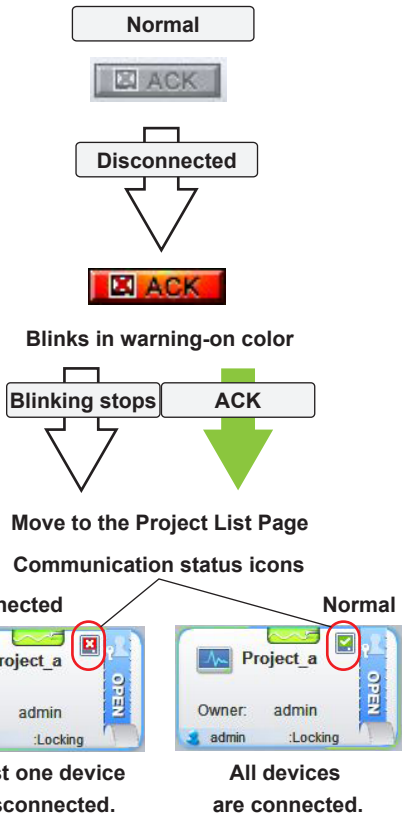
  To stop the warning beep, click the  icon or click **Stop the Warning Beep** from the **Operation** menu.

  You cannot stop the sound just by performing an ACK operation. Note that even when the beep is stopped, if a communication disconnection occurs again, it will beep again.

  Related topic: Sec. 6.6.2

- **Checking the Device Communication Disconnection**

  On the Operation menu, click Acknowledge of Device Communication Interference. Or, click the  icon. The icon blinking stops, and the Project List Page appears. On the Project List Page, you can determine which projects are affected by the communication disconnection by checking the changes in the communication status icon of each project. The status icons are valid only when the project is open.



- When communication is restored, data collection and recording resume.
- If communication recovers before an Acknowledge of Device Communication Interference is performed, the communication status icon will return to normal.

6.6.5 Showing the Alarm Indication Window in Front

The client window can be shown in front when an alarm occurs.

- You can set it by clicking **Move The Window To The Top When Alarm Occurred** on the **View** menu.
- If there are multiple client windows, you can select whether to show the window in front for each of the windows.
- If an alarm occurs in an opened project, the corresponding window moves to the front of all other windows (except the window you are using).
- Even when an alarm is activated, if the alarm type changes, it is considered a new alarm.
- If the window is minimized, it is restored.
- Even if you close the window, the setting is applied each time the window is opened.

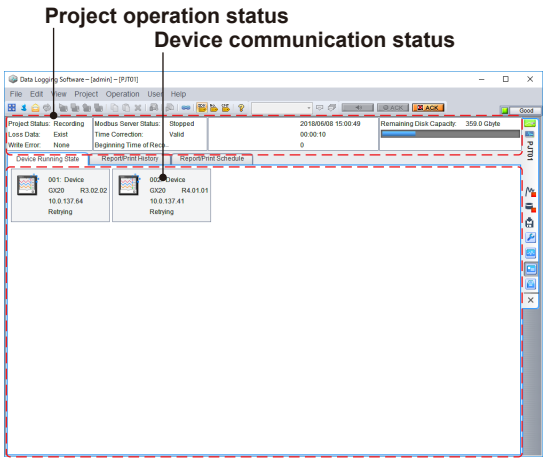
6.7 Checking the Project Operation Status

Click the **Status Page** icon on the Project tab to display the Status Page. A Status Page is used to monitor:

- The project data collection and recording status
- The communication status between the data collection device in the project and the server

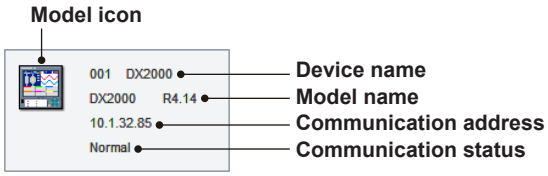
The displayed data is automatically updated periodically.

6.7.1 Displayed Content



- **Project Status**
  Stopped, Monitoring, Record Standby, or Recording
- **Loss Data**
  Recording data dropout status
- **Write Error**
  Whether data writing to the data file is being performed normally
- **Modbus Server Status**
  Stopped, Executing, or Error (an error occurs when the Modbus address overlaps with that of another project.)
- **Time Correction**
  ----, Valid, Correcting, Invalid
  Corrects the difference between the PC time and the data time of each project. This requires a connection to a time server.
  If a difference of 1 second to 15 seconds occurs between the PC time and the data time of each project, the data time is gradually corrected to match the PC time. If a difference of more than 15 seconds occurs between the GA10 server time and data time, subsequent times (at the project level) are not corrected. Time correction is performed for each project separately. The time correction state is reset when the data monitoring of a project is stopped.
  If monitoring has not been started on a “Device time” project or “PC time” project, “----” is displayed.

- **Beginning Time of Recording**
  The time of the first data value in the first data file that is created after recording to data files is started
- **Total Time of Recording**
  The elapsed time since the start of recording.
  The timer continues until all recordings stop or when Recording Standby is reached.
- **Number of Generated Files**
  The number of data files that have been created after recording was started
- **Remaining Disk Capacity**
  The free space on the disk that contains the data file save destination directory.
  In the following conditions, "-----" is displayed, and the bar does not display the amount of space used.
  - Not recording.
  - The data file save destination folder is set to a network folder.
- **Device Communication Status**
  The status of communication with the devices in the Device List is displayed. Nothing is displayed when data collection is stopped.



Item	Description
Model icon	Device icon
Device name	Device name and device number
Model name	Model name and release number or software name and release number
Communication address	IP address
Communication status	Communication status between the server and device Normal, Error, Retrying

6.8 Controlling Device Computation from GA10

On the Project menu, click Start Device's Computing, Stop Device's Computing, Reset Device's Computing, or Reset & Start Device's Computing.
Computation is collectively controlled on the devices that meet the following conditions.

- Devices that are in the Device List of the project
- Devices that have computation functionality
- Devices that support **Start Device's Computing**, **Stop Device's Computing**, **Reset Device's Computing**, or **Reset & Start Device's Computing**

Connected Device, Software	Start Comp.	Stop Comp.	Clear Comp.	Clear&Start Computing
µR10000, µR20000	Yes	Yes	No	Yes
DX1000, DX1000N, DX1000T	Yes	Yes	Yes	Yes
DX2000, DX2000T	Yes	Yes	Yes	Yes
MV1000, MV2000	Yes	Yes	Yes	Yes
CX1000, CX2000	Yes	Yes	Yes	Yes
FX1000	Yes	Yes	Yes	Yes
MX100, MW100	No	No	No	No
DA100, DR130, DR230, DR240	Yes	Yes	Yes	Yes
GX10, GX20, GP10, GP20	Yes	Yes	Yes	Yes
DAQLOGGER, DAQ32Plus, MXLOGGER	No	No	No	No
Devices supporting the Modbus protocol	No	No	No	No

Yes: Supported No: Not supported
* When connected over an Ethernet network, the user registered in the device must have privileges to use computation for this feature to work.

6.9 Things to Consider

6.9.1 Time Zone and Daylight Saving Time

Be sure to set the same time zone and daylight saving time settings on the PC running the GA10 server, the PC running the GA10 client, and the data collection devices. If they are not the same, data time may not be displayed correctly.

6.9.2 Error Data

If collected or recorded data is in error, it is displayed or recorded using indications other than values. For the different types of error data, see “Data that indicates errors.”

- **Data Display in a Digital Monitor Set or Meter Monitor Set**

Display	Data Condition*
+OVER	+OVER
–OVER	-OVER
INVALID	INVALID
BURNOUT	BURNOUT
ILLEGAL	ILLEGAL
LACK	LACK
OFF	OFF

* See “Data that indicates errors.”

- **Display in the Trend Monitor Set**

Waveform	Cursor Value	Data Condition*
Drawn exceeding the scale upper limit	+OVER	+OVER
Drawn exceeding the scale lower limit	-OVER	-OVER
Nothing	INVALID	INVALID
	BURNOUT	BURNOUT
	ILLEGAL	ILLEGAL
	LACK	LACK
	(blank)	OFF

* See “Data that indicates errors.”

- **Data in Recording Data Files**

Data in Binary Data Files	Data in Excel Data Files	Data Condition*
+OVER	+OVER	+OVER
–OVER	–OVER	-OVER
INVALID	INVALID	INVALID
BURNOUT	BURNOUT	BURNOUT
ILLEGAL	ILLEGAL	ILLEGAL
LACK	LACK	LACK
OFF	OFF	OFF

* See “Data that indicates errors.”

- **Data That Indicates Errors**

  The following table shows the different types of data that indicates errors.

Data	Description
+OVER	+Over-range data
–OVER	-Over-range data
SKIP	Channels that have been set to skipped
INVALID	Invalid data
	The data type and decimal place specified on the Tag Setting Page do not match those of the collected data.
BURNOUT	Burnout data
ILLEGAL	Illegal data
LACK	Indicates that the device failed to acquire the data
OFF	Indicates one of the following conditions. • Data collection has not been performed since the project was opened. • Channels are not assigned to tags. • When the data time is set to PC time, the collected data is SKIP data. • Communication error condition • Initialized condition as a result of changing the Device Setting Page or Tag Setting Page while data collection is stopped • An attempt was made to collect data from a device using the backfill function, but there is no data recorded in the device.

6.9.3 Reflecting Changes Made on the Monitor Page to the Setting Page

If the access privilege is Owner or Manager, changes made to the following settings on the Monitor Page are reflected on the corresponding Setting Page (Display Group or Acquisition & Monitor). If the access privilege is Operator or Monitor, the changes are not reflected.

- Monitor Set size adjustment
- Waveform display on/off state, Y-axis display on/off state, Detail/Compact, Zoom in/Zoom out, and movement in the Trend Monitor Set
- Trip line position

6.9.4 Changing the Time on the Device after Starting Data Collection and Recording

Do not change the time on the device after starting data collection and recording, because doing so will cause adverse effects on the monitor screen and recorded data.

Related topic “Changes to devices during data collection and recording”: ▶ Q11 on page 12-11

6.9.5 Changing the PC Time after Starting Data Collection and Recording

If the PC time is changed after starting data collection with the [PC time] setting, adjustments exceeding 5 seconds will not be reflected in the data time.

6.9.6 Conditions When Multiple Screens Are Shown

When multiple screens (clients) are shown on the same PC, the screens use the same display conditions in the PC. If a setting included in these conditions is changed on a given screen, the change is not immediately applied to the other screens. However, such changes are applied the next time the clients are started.
The display conditions held in the PC are listed below.

- Window size and position
- Alarm show/hide stateGroup link state
- Cursor value transparency
- Display items of tag display
- User display form
- Screen background color (style)
- Date and moth display form
- Decimal point
- Toolbar show/hide state
- Mark bar show/hide state
- Warning action bar show/hide state
- Language
- Width of each column on the setting page (Tag, Math Tag, Display Group, Data File List, Report/Print History, Report/Print Schedule) sheets
- Show/hide state of each column on the Display Group and Data File List sheets
- Sort method on the Data File List page, Report/Print History, and Report/Print Schedule sheets
- Login information in the startup login dialog box
- Show/hide state of tooltips on the Simple Settings page

The CPU and memory usage when multiple clients are running varies depending on the collection and recording environment (PC performance, number of tags, interval, number of projects, etc.) and the number of monitor sets on the Monitor Page. As such, limitation may be placed on the number of screens that can be started. See the table below for the CPU and memory usage rates.

- When running a single project with four monitor sets

Clients	Tags	Acquisition interval	CPU usage	Memory usage
2	2000	500 msec	Approx. 19%	Approx. 470 MB
4	2000	500 msec	Approx. 36%	Approx. 940 MB
2	500	100 msec	Approx. 18%	Approx. 400 MB
4	500	100 msec	Approx. 38%	Approx. 800 MB

This example was verified in the following environment.
CPU: Intel Core i5 (2.67GHz), Memory: 4.0 GB,
OS: Windows 7 Ultimate SP1

6.10 Viewing the Log

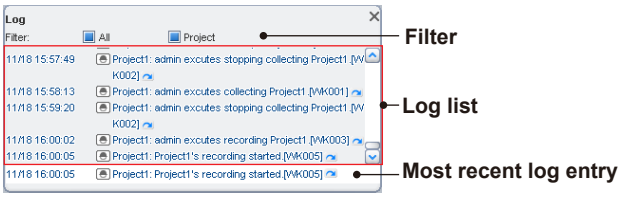
You can view the log that the server sends in the Log dialog box. You can open the Log dialog box at any time when you are logged in to the server. The dialog box stays open until you close it. If you log in for the first time after installation, a log dialog box appears. At this point, if you switch between show and hide, the state is stored and reflected the next time the software is started.

6.10.1 Displayed Content in the Log Dialog Box

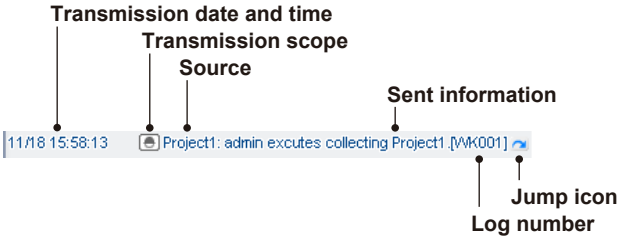
Up to 1000 log events that occur from when the user logs in to the server until the user logs out are displayed.
There are two types of logs: system log (displayed in yellow), which deals with the server, and project log (displayed in blue), which deals with projects.
System log includes events such as server login and logout. Project log includes data collection start and stop.
System logs are sent to all users. Project logs are sent to users that have the projects opened.

6.10.2 Opening the Log Dialog Box

On the **View** menu, click **Log**. The log dialog box opens.



- **Filter**
  The events that correspond to the filter box that you clicked and turned blue appear. For details, see “Transmission scope.”
- **Log List**
  The log events are displayed in the order of occurrence. If there are events that do not fit in the dialog box, a scroll bar appears.



- **Most Recent Log Entry**
  This line always displays the most recent log entry.
- **Transmission Date and Time**
  The date and time when the log was transmitted.

- **Transmission Scope**
  Indicates the log transmission scope

Icon	Description
	Sent to all users (system log). Set the Filter to Log to display the corresponding log.
	Sent to users that that have the relevant projects opened (project log). Set the Filter to project to display the corresponding log.

- **Source**
  SYS or the project name.
- **Sent Information**
  The log information.
- **Log Number**
  Displays the number that corresponds to the log event.
- **Jump Icon**
  Displayed when there is a page associated with the log event. Clicking the icon shows the relevant page. For example, if you click the icon for a “recording started” event, the corresponding project’s Monitor Page will be displayed.

To close the log dialog box, click the ✕ icon in the upper right.

6.10.3 Changing the Size of the Log Dialog Box

Point to a corner of the dialog box so that the pointer changes to an arrow. Then, drag to change the size.

6.10.4 Log Shown in the Log Dialog Box

System Log

Number	Message	Description
SY002	Server is trial version.	When an attempt is made to log in to a running server using a trial version.
SY003	[*UserName*] has logged on.	--
SY004	[*UserName*] has logged off.	This does not appear when a logout occurs due to a communication error.

Project Log

Number	Message	Description
WK001	[*Username*] executes monitoring [*Projectname*].	--
WK002	[*UserName*] executes stopping monitoring [*ProjectName*].	--
WK003	[*UserName*] executes recording [*ProjectName*].	--
WK004	[*UserName*] executes stopping recording [*ProjectName*].	--
WK005	[*ProjectName*]'s recording started.	--
WK006	[*ProjectName*]'s recording stopped.	--
WK007	In [*ProjectName*] data file([*FileName*]) has been generated.	--
WK008	[*ProjectName*]'s data file has been deleted automatically.	When the number of data files has reached the limit and a data file is deleted to create a new data file
WK009	Data loss happened in [*ProjectName*].	When a data dropout occurs during data recording. If data dropouts occur consecutively, a log entry is made on the first dropout. If the data time is set to PC time, a log entry is made when a communication timeout occurs and the data dropout is confirmed. If the data time is set to Device time, a log entry is made when the data dropout is confirmed from the FIFO data acquired after the communication recovers.
WK010	[*UserName*] has opened [*ProjectName*].	--
WK011	[*UserName*] has closed [*ProjectName*].	This includes the case when a project is forcibly closed as a result of losing access privileges to the project.
WK012	[*UserName*] has locked [*ProjectName*].	When a user with operator or higher privileges opens a project.
WK013	[*UserName*] has unlocked [*ProjectName*].	When a user with operator or higher privileges closes a project. When an administrator unlocks a project forcibly or when an unlock occurs due to a communication error.
WK014	Project([*ProjectName*])'s owner changed from [*FormerUserName*] to [*NextUserName*].	--
WK015	In [*ProjectName*], disconnect from [*Device name*]	When the communication between the server and device is disconnected.
WK016	In [*ProjectName*], have connected from [*Device name*] again.	When the communication between the server and device is restored
WK017	Disk remaining capacity of [*ProjectName*] is less than 50M.	Transmitted periodically (once a minute) while the free space on the data save destination drive is less than 50 MB.
WK018	Failed to send mail to [*ProjectName*](*MailName*). (*Cause*)	--
WK019	Fail to write data file in [*ProjectName*].	When data cannot be written due to some problem at the data save destination. Some problems include the full data file path exceeding 260 characters, starting to record to a read-only destination, or not having write privileges.
WK020	The event of [*ProjectName*] (ScheduleName) executed successfully.	--
WK021	Failed to execute the event of [*ProjectName*] (ScheduleName) .	--
WK022	Sending mail of [*ProjectName*](*MailName*) completed successfully.	--

UserName: User that executed the operation.
Tag: Tag that the alarm occurred on
FileName: Name of the data file.
DeviceName: Name of the connected device.
ProjectName: Name of the project.
FormerUserName: User name of the project’s owner before the change
NextUserName: User name of the project’s owner after the change
ScheduleName: Schedule name for auto report printing.
MailName: Name of the mail event.
Cause: Cause of the mail transmission failure.

The following causes are displayed.
Fail to connect POP server.
Fail to connect SMTP server.
Authentication failed.
Sender address does not exist.
All of sending address do not exist.
Some of sending address do not exist.
Communication with SMTP server failed while sending mail. (This message is displayed also when the attached file size is larger than the supported size.)
System error occurred.

Chapter 7 Using the Custom Display Function (/CG option)

7.1 What Is the Custom Display Function?

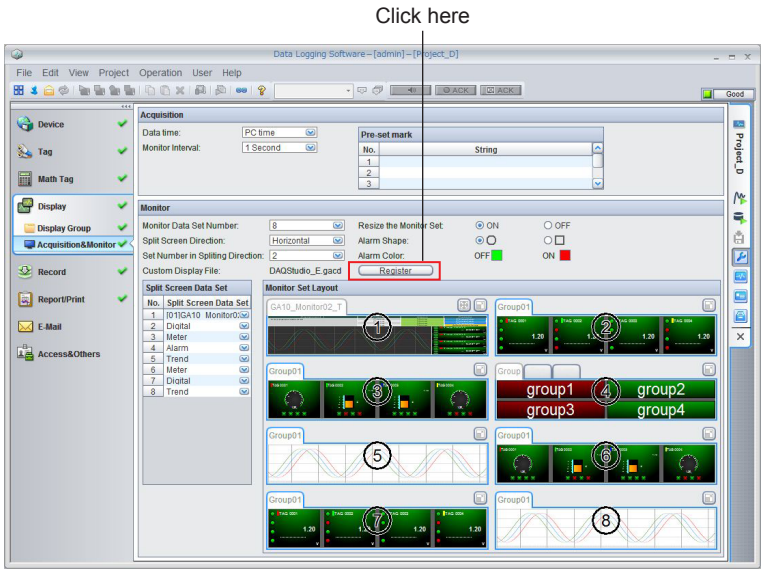
By using the custom display function (/CG option), you can add original monitor pages to the GA10's standard monitor pages (trend, meter, digital, and alarm). These additional monitor pages are called custom display monitors. Custom display monitors are created using DAQStudio (DXA170), a software application for creating screens. Screen data that you create can be saved to custom display files (.gacd extension).

Note

- The GA10's custom display function includes a license for DAQStudio (DXA170) Custom Display Builder. This license is different from the GA10's option license (a number that starts with 400-).
- Download DAQStudio from YOKOGAWA's website, and install it in your PC. For instructions on how to use it, see the DXA170 DAQStudio User's Manual (IM04L41B01-62EN).

7.2 Registering a Custom Display

Register the custom display files (.gacd extension) created with DAQStudio in the GA10's Acquisition&Monitor page and Monitor Set Type.

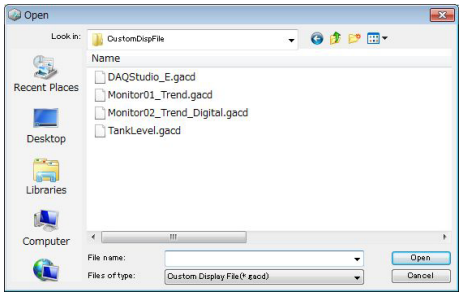


Basic Operation

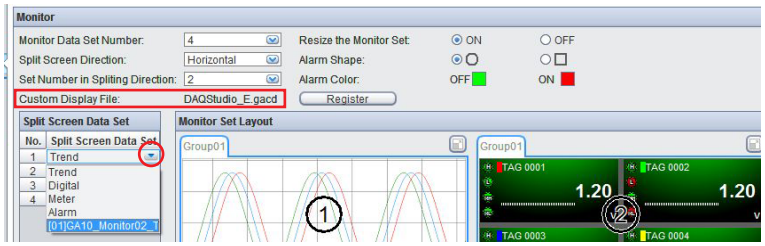
1. Open the Collect & Monitor Page setting page of the project.

2. Click **Regist** for the custom display file.
   An Open dialog box appears.

3 Move to the location where the custom display file created with DAQStudio is saved.



4 Select the file that you want to register, and click Open.
The file name appears to the left of the Register button, and the custom display monitor becomes available in the Monitor Set Type list.



If the file fails to be loaded, an error message appears.

Note

- The Register button appears only on GA10s that have the /CG option installed.
- One custom display file can be registered in a single GA10 project. If you register a second file, it overwrites the registration.
- Up to 50 screens can be defined in a single custom display file.

Setting the Monitor Set Type

When you register a custom display file, the custom display monitors defined in that file appear in the Monitor Set Type list. The displayed name is the name that is defined when the file is created. The method to set the Monitor Set Type, layout, and so on are the same as that of a standard Monitor Page.

Related topic: **Section 3.3.5**

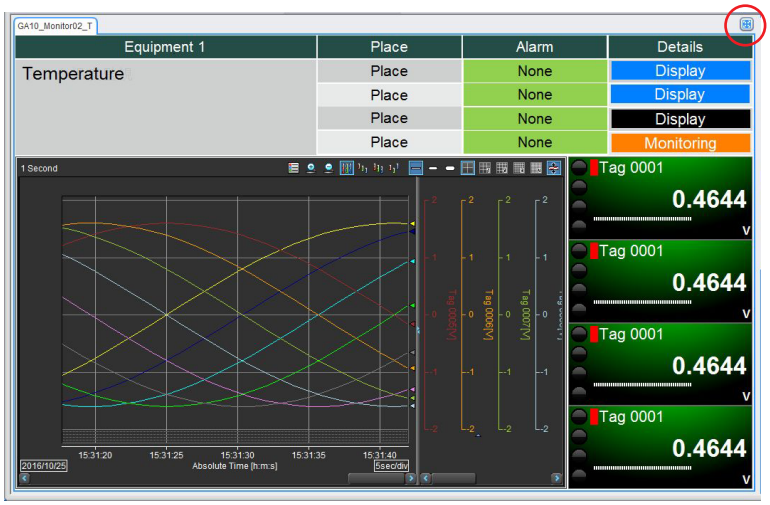
7.3 Displaying a Custom Display Monitor

Click the Monitor Page icon !!! on the Project tab to open the custom display monitor page. In addition to the normal Monitor Set Maximize button, the size of the custom display monitor can be adjusted by clicking the following buttons. The custom display is expanded or reduced according to the Monitor Page size.
Select the Frame Size Display check box on the View menu to display the screen size in the upper right of the window. Remove the check to hide it.

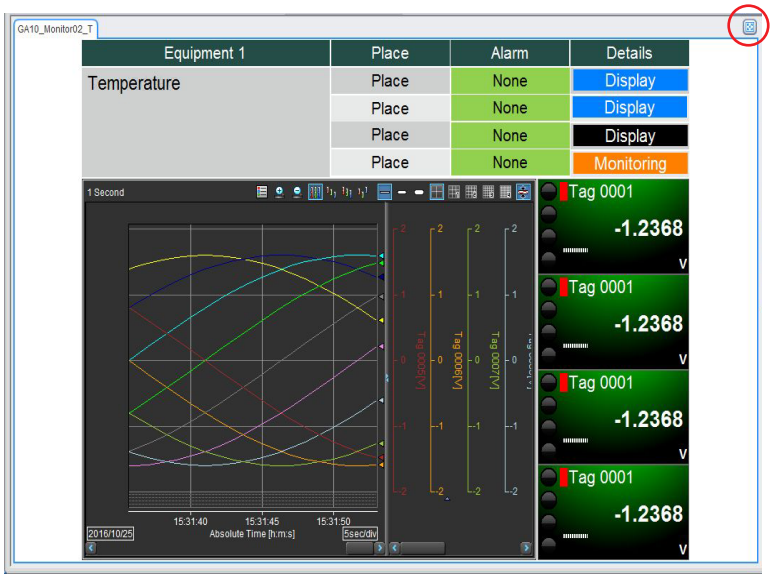
(Light style) (Dark style)	Fit to Monitor Page	The custom display is expanded or reduced according to the Monitor Page size.
(Light style) (Dark style)	Fit to Monitor Page keeping the aspect ratio constant	The custom display is expanded or reduced to the page's width or height, whichever is shorter, keeping the aspect ratio constant. For the long side, the display is aligned to the center.

Related topic: Displaying the Monitor Page ▶ page 6-2

Fit to Monitor Page



Fit to Monitor Page keeping the aspect ratio constant



Note

If there is only one Monitor Set, the Maximize Monitor Set button does not appear.

7.4 Custom Display Components

GA10 custom display screens are created using DAQStudio (DXA170), a software application. This section provides an overview of the components used to create screens. For details on components and settings, see the DXA170 DAQStudio User's Manual (IM04L41B01-62EN).

GA10 Custom Display Monitor Components

Component Type	Component Name
Diagram components	Line, Triangle, Rectangle, Arc, Ellipse,
Components for channel assignment	Simple digital, Digital, Simple bar meter, Simple analog meter, Analog meter, Alarm, Representative alarm
Status display component	Disk memory bar
Label components	Label, System label
Components with action functions	Button operation, Digital output, Value list output, controller component
Components for summary display (GA10: Components for Alarm list)	Alarm summery
Components for trend display	Trend
Components for static image display	Image

You can control GA10 and devices on the custom display monitor by using the following components. Depending on the action assigned to the components, a confirmation dialog box appears when the component is used.

- **Button operation** 

"Page switching," "data collection and recording operation," "Display image" and other actions assigned to the button is executed when the push button is used.

Assignable Action	Dialog	Timing of Execution
Page switching	M1023 Do you want to run the operation??	Executed when you click OK.
Start Monitoring		
Stop Monitoring		
Start Recording		
Acknowledge alarm sound		
Alarm ACK		
Acknowledge device error		
Append Mark		
Bit Write		
Constant Write		
Reset Computing		
Manual save		
Stop Recording	M1006 Do you want to stop the recording?	
Display message	No confirmation dialog box is displayed.	Executed immediately when the button is clicked.
Display image	A Display image dialog box appears, and the image registered when the window was created is shown.	Image shown when the button is clicked.

- **Digital output** 

The input value is output to the assigned tag (see Note).

Assignable Action	Dialog	Timing of Execution
Value output	A dialog box for entering a value appears.	Enter a value in the edit box of the dialog box and click OK to output the value

- **Value list output**

The input value is output to the assigned tag (see Note).

Assignable Action	Dialog	Timing of Execution
Output the selected value from a list	A list box for selecting a value appears.	Select a value from the list and click OK to output the value.

Note

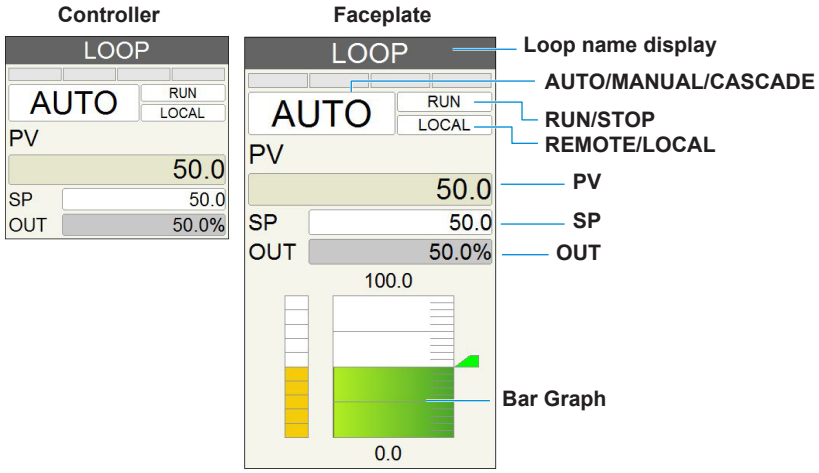
The tag that the value is output to must have a writable channel of a Modbus device assigned to it.

7.5 Controlling GX/GP/GMs or Controllers with the Custom Display Function

Using the GA10 (R3.02 or later) custom display function, you can monitor and control the custom display function status of GX/GP/GMs with PID control modules and UTAdvanced series controllers. This section describes the controller component that you use and their operation dialog boxes.

Controller Component

The component that you use for the control operation on the custom display is called a controller component. There are two display types to the controller component: faceplate and controller.



The following table details each component item.

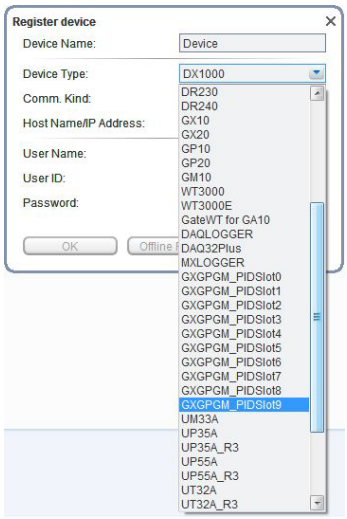
Item	Initial value	Description
Loop name	Name specified on DAQSTUDIO	--
Alarm	Gray	Control alarms L1 to L8 are shown.
AUTO/MANUAL	AUTO	The assigned tag value is shown during monitoring. "****" is shown for values other than AUTO/MANUAL, and you cannot click it.
RUN/STOP	RUN	The assigned tag value is shown during monitoring. "****" is shown for values other than RUN/STOP, and you cannot click it.
REMOTE/LOCAL	LOCAL	The assigned tag value is shown during monitoring. "****" is shown for values other than REMOTE/LOCAL, and you cannot click it.
PV	Off	The assigned tag value is shown during monitoring. The value is shown in red while an alarm is occurring.
SP	Off	The assigned tag value is shown during monitoring. When you set the value, it is written to an assigned, writable tag.
OUT	Off	The assigned tag value is shown during monitoring. When you set the value, it is written to an assigned, writable tag. The decimal place is fixed to 1.
PV Bar graph	-2.000 to 2.0000	The upper and lower limits of the assigned tag value are shown during monitoring. The bar is shown in red while an alarm is occurring.
OUT Bar graph	--	--

Like other component screens, screens using these components are created using the DAQStudio, a software application for creating screens. For instructions on how to create screens and descriptions of component attributes, see DXA170 DAQStudio User's Manual (IM04L41B01-62EN).

Basic Operation

The control operation procedure on the GA10 is shown below.

1 Register a GX/GP/GM (firmware version R4.01 or later, with a PID control module) or a UTAdvanced series controller in the GA10 devices list.



Select the device to register in the GA10 Register device dialog box from the following.

- When the connected device is a GX/GP/GM: GX/GP/GM_PIDSlot0 to GX/GP/GM_PIDSlot9 For "Slot," select the number of the slot that the PID module is installed in.
- When the connected device is a UTAdvanced controller: A UT model that ends with "_R3"

Note

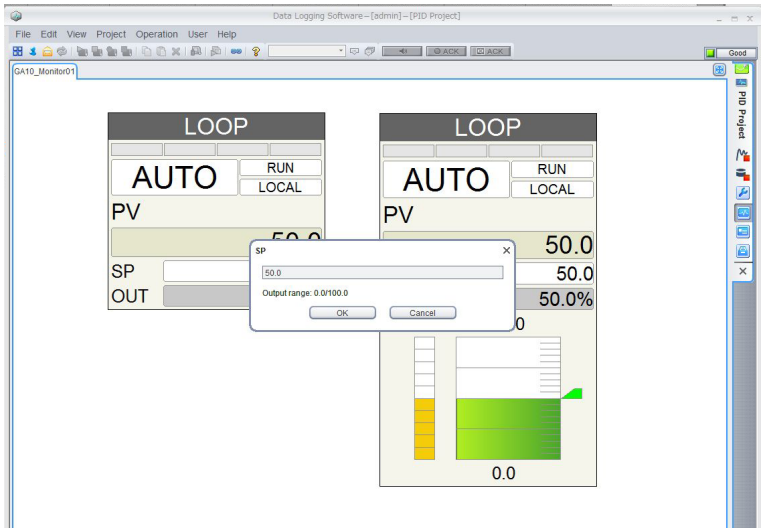
When connecting to a GX/GP/GM, check the following on the main unit.

- The PID control module is installed (detected).
- In the main unit settings, Communication (Ethernet) settings > Server settings > Server list > MODBUS is set to ON.

2 Using DAQStudio, edit the controller component, assign the device tag (e.g., PV, SP) registered in step 1 to the component, and save the custom display file (*.gacd).

3 Register the custom display file saved in step 2 in the GA10 Acquisition&Monitor page.
Registration procedure: ▶ page 7-1

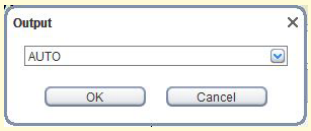
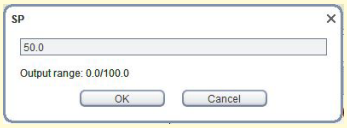
4 On the loaded custom display monitor, click the operation mode (AUTO/MANUAL, RUN/STOP, LOCAL/REMOTE), target setpoint (SP), or control output value (OUT) are of the controller component to display an operation dialog box.



5 Enter values in the dialog box, and click OK.
If you click Cancel, the dialog box will close, and the settings will not be sent.

Description of the Operation Dialog Box

The following table shows the operating range and operating procedure on the controller component's operation dialog box.

Operation	Operating Range	Dialog
AUTO/MANUAL switching	Selectable range: AUTO/MANUAL	
RUN/STOP switching	Selectable range: RUN/STOP	
REMOTE/LOCAL switching	Selectable range: REMOTE/LOCAL	Select the operation mode from the list, and click OK to send the setting and close the dialog box. If you click Cancel, the dialog box will close, and the settings will not be sent.
Target setpoint (SP)	When the operation mode is LOCAL, clicking this displays a setting dialog box. Data type / Range: INT16: -32768 to 32767 UINT16: 0 to 65535 INT32: -9999999 to 99999999 UINT32: -9999999 to 99999999 FLOAT: -9999999 to 99999999 BIT: 0 to 1	
Control output value (OUT)	When the operation mode is MANUAL and RUN, clicking this displays a setting dialog box. Input range: -50% to 105.0%	The title is either SP or OUT. Enter the value in the edit box. If the value is out of range, it is corrected to the upper or lower limit. For SP, the range shows the upper and lower limits. For OUT, the range is fixed to -5.0% to 105.0%. Click OK to send the setting and close the dialog box. If you click Cancel, the dialog box will close, and the settings will not be sent.

Note

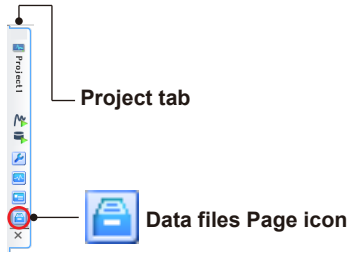
The following displays and operations are not available on the controller component.

- PV error string display
- RSP error string display
- Alarm blinking
- Deviation display
- Alarm type string display
- Tag string display
- Alarm setpoint mark display on the PV value bar graph
- PV switching
- Updating values when the setting dialog box is open
- Displaying device errors (e.g., access rejection)
- Displaying the loop information dialog box
- Alarm ACK
- AUTO/MAN/CASCADE switching
- PROGRAM/LOCAL switching
- Writing SP and OUT values in REMOTE mode

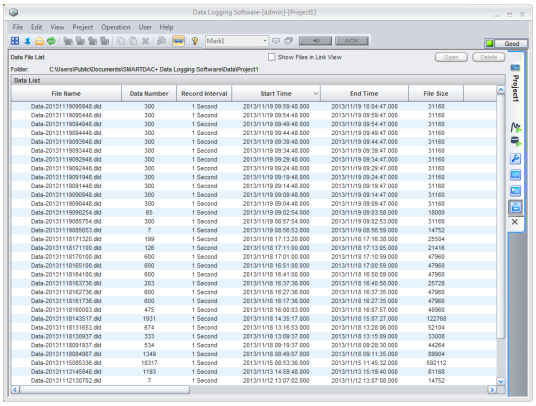
Chapter 8 Managing Recording Data

8.1 Displaying a List of Data Files

Click the **Data files Page** icon on the Project tab to display the Data File List Page.



The data files in the data file save destination directory are listed. Only data files saved in binary format are displayed. Data files saved in Excel format are excluded.

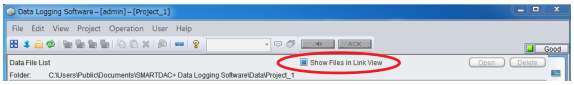


Item	Displayed Content
File Name	Name of the data file
Data Number	Number of data values in the data file
	The total number of data values if files are linked and displayed*
Record Interval	Recording interval used to create the data file
Start Time	The time of the first data value in the data file
	The time of the first data of the entire data if files are linked and displayed*
End Time	The time of the last data value in the data file
	The time of the last data of the entire data if files are linked and displayed*
File Size (Unit: byte)	Data file size
	The total data size if files are linked and displayed*
Comment 1	Title and content of Comment 1 to 8 that were specified when the file was created
Comment 2	
Comment 3	
Comment 4	
Comment 5	
Comment 6	
Comment 7	
Comment 8	

* Does not include the values of deleted files and other files that do not exist

- **Showing Files in Link View**

  You can link and display files that have been divided by the recording stop condition or other factors.
  Click the **Show Files in Link View** to turn the box blue. Files are linked from the start of recording to the end of recording and displayed in one line. Clicking the box again to turn it to white returns the page to the individual file display.



- **Deleting Files**

1. Click the file you want to delete.

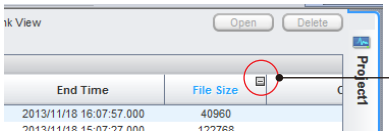
   Selecting multiple consecutive files
   Example: Selecting consecutive files: File005, File006, and File007
   - Click File005. Drag to File007, and release the mouse button.
   - Click File005 to select it. While holding the Shift key down, click File007.

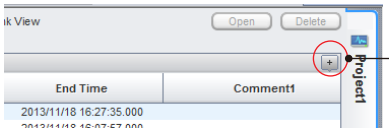
2. Click **Delete**.
   A confirmation dialog box appears.

3. Click **OK**.
   The files are deleted.

- **Showing and Hiding Columns**

  If you move the pointer over a column title, a hide icon appears. Click it to hide the column. When you hide a column, a show icon will appear in the upper right of the page. Click this icon to show the hidden columns.





The results of showing and hiding columns apply to every project in the same client.

- **Adjusting Column Widths**
  When you move the pointer near a boundary of a column title, the pointer changes to ⟺. In this condition, drag the pointer to move the boundary to the desired position. The results of adjusting column widths apply to every project in the same client.

- **Sorting the File List**
  Click a column title to sort the file list on the basis of the clicked column. Click it again to sort in reverse order. A sort mark (△, ▽) appears in the column title area.

- **Refreshing the Display**
  On the **View** menu, click **Refresh**.
  The most recent file information is retrieved from the server, and the page is refreshed.

8.2 Displaying Recording Data

Recording data can be displayed in a viewer (Universal Viewer).

1. Select the file you want to view.
   You can select multiple link files.

2. Click **Open**.
   The viewer (Universal Viewer) starts, and the data in the file is displayed.

   You can also double-click the file to display the data.

- **Editing and Saving Recording Data**
  The following file [1] saved on the viewer for the file displayed using the above procedure is discarded when the GA10 client software is closed.

  • Link settings file (.ldx)
  • Display template file (.tdx)

  To edit and save data, start the viewer according to the following procedure, and directly open the files [2] stored in the server. The tag that the value is output to must have a writable channel of a Modbus device assigned to it.
  Windows Start--> All Programs --> SMARTDAC+ Data Logging Software --> Viewer

  1 For details on the viewer's display condition file, see chapter 4 in the viewer user's manual (IM 04L61B01-01EN).
  2 Files saved in the directory specified by Folder on the GA10 Record Setting Page.

  To convert data on the viewer, set the file save destination to a folder other than the default. The default folder is discarded when the Universal Viewer software is closed.

Note

- For instructions on how to use Universal Viewer, see the Universal Viewer User's Manual (IM 04L61B01-01EN).
- GA10 recording data (.dld extension) can be displayed on Universal Viewer version R1.03 and later.
- The language set in GA10 do not apply to the language of the viewer. To change the language for displaying files on the viewer, set it in the viewer.

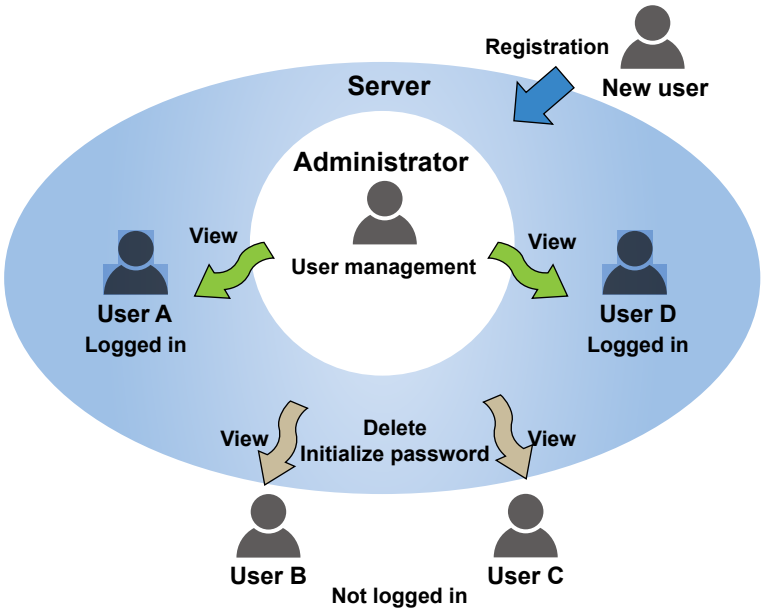
Chapter 9 Managing Users

9.1 Administrator and Users

In GA10, you can set server access privileges.
There are two types of server access privileges: administrator and user. The administrator manages all users. The administrator can perform the following operations in addition to all the operations available to users.

- Register users
- Delete users
- Initialize user passwords
- View the login status of users

The following sections explain how to use the User Management Page.



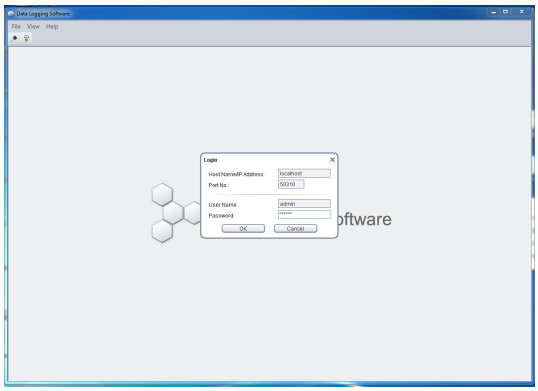
Note that at the GA10 project level, users can be assigned one of four project access privileges: Owner, Manager, Operator, and Monitor. These privileges are assigned for each project using Details Settings mode.
For details, see **"3.3.8 Setting Project Access Privileges"**.

9.2 Managing User Status

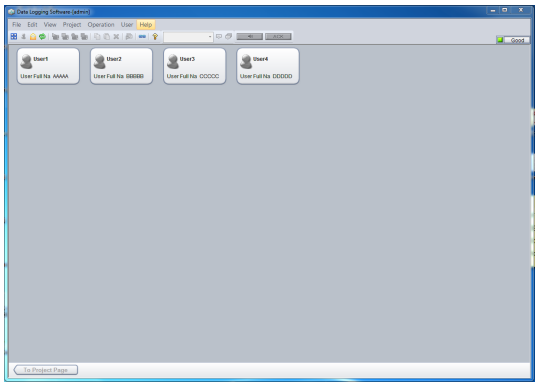
9.2.1 Using the User Management Page

The administrator can view the status of other users on the User Management Page.

1. Start the client, and log in to the server with GA10 administrator privileges.

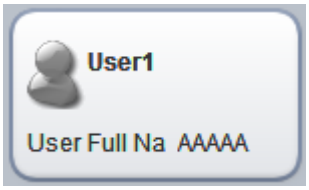


2. On the **View** menu, click **User Management Page**.
   Or, click the icon.
   The User Management Page appears.

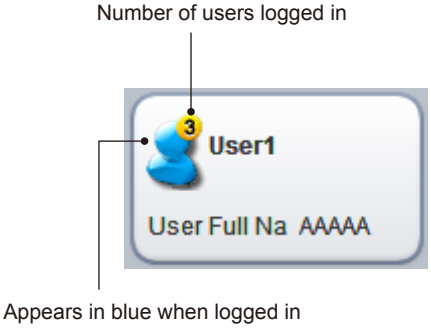


3. Check the user status by looking at the icons (see below).

Not logged in



Logged in



9.3 Changing User Information

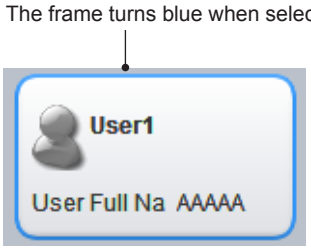
This section explains how to change the user full name and password. This procedure can also be performed by a user who is logged in.

9.3.1 How the Administrator Changes Other User Information

The administrator performs the following procedure to change the full name and initialize the password of a user.

1. Follow steps 1 and 2 in section 9.2 to display the User Management Page.

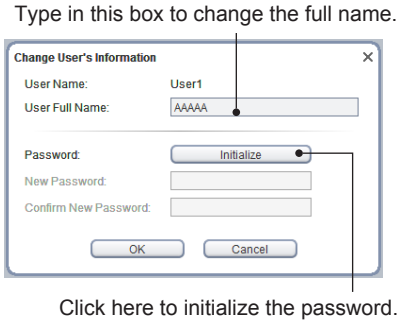
2. Select the user you want to change.
   The user is selected.



3. Double-click the selected user.
   The Change User's Information dialog box opens.

4. To change the full name, type the new name.

   To initialize the password, click **Initialize**.



5. Check the information, and click **OK**.
   The full name or password will be changed.

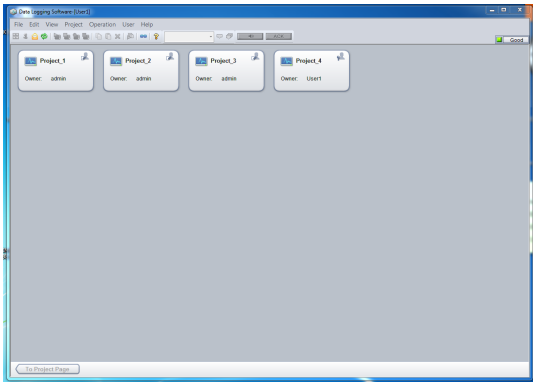
Note

You cannot change the information if the applicable user is logged in or if the user has been deleted from another client.

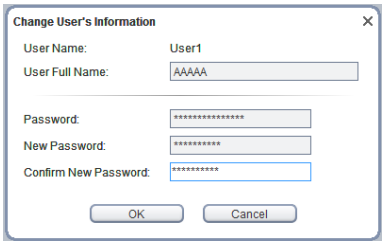
9.3.2 How Users Change Their Information

The following example shows how the administrator or a user changes his or her full name and password.

1. Start the client, and log in to the server.
   The Project List Page appears.



2. On the **User** menu, click **Change Information**.
   The Change User's Information dialog box opens.
3. Change the full name or password, view the changes, and click **OK**.
   To change the password, type the current and new passwords.



Note

- You can change the full name and password simultaneously.
- Enter the password using 4 to 30 alphanumeric characters..

The default values of the settings in the Change User's Information dialog box are shown below.

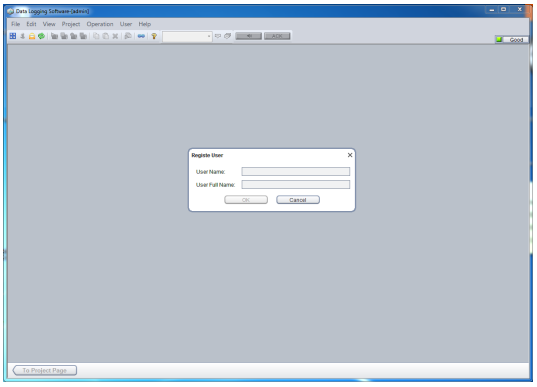
Item	Initial value
Full Name	User full name before change
Password	Nothing is displayed.
New Password	Nothing is displayed.
Confirm New Password	Nothing is displayed.

9.4 Registering and Deleting Users

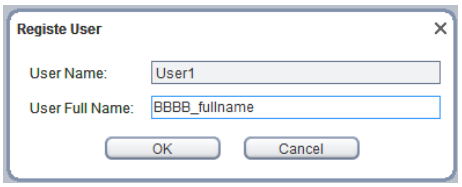
Only the administrator can register and delete other users.

9.4.1 Registering a New Users

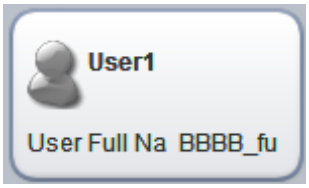
1. Start the client, and log in with the administrator account that you created earlier.
2. On the **View** menu, click **User Management Page**.
   Or, click the icon.
   The User Management Page appears.
3. On the **User** menu, click **Register New User**.



   The Change User's Information dialog box appears.
4. Type the user name and user full name that you want to register.
   Enter a name that is easy for the administrator to identify.



5. Check the entered information, and click **OK**.
   The user is registered, and an icon is added in the window.



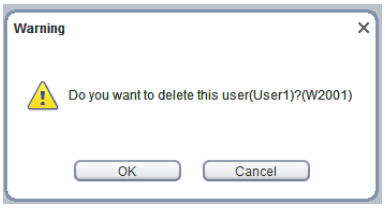
6. In the case of an administrator, on the **File** menu, click **Logout** to log out.

A registered user can log in without a password.
Follow the instructions in Sec. 9.3.2 to set a password.

9.4.2 Deleting a User

You cannot delete a user that is logged in.
We recommend that you check the user access privileges before deleting the user.

1. Follow steps 1 and 2 in section 9.2 to display the User Management Page.
2. Select the user you want to delete.
   The user is selected.
3. On the **Edit** menu, click **Delete**.
   Or, click the icon.
   A warning message appears.

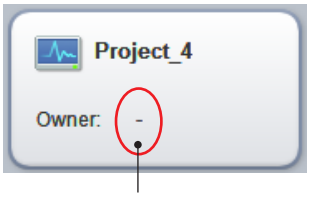


4. To proceed, click **OK**.
   The user will be deleted.

9.4.3 Changing a Project Owner

If you delete an owner user

If the administrator deletes a user, the access privileges granted to the user is lost. If the deleted user had been a project owner, the project will no longer have any owner. This condition is displayed as follows.



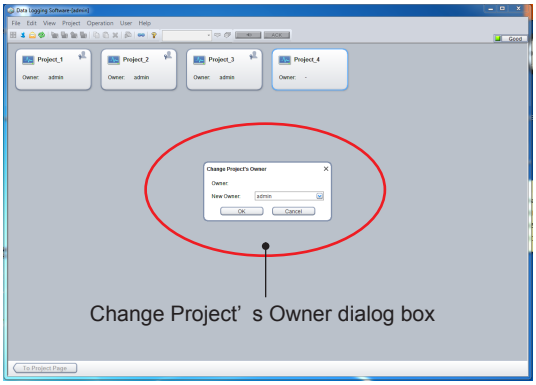
Displays a dash when there is no owner.

To change a project owner (specify a new owner), follow the procedure below.

Note

Only the owner of the relevant project or the administrator can change the owner.

1. Display the Project List Page.
   On the **View** menu, click **Project List Page**. Or, click the icon.
2. Select the project you want to change.
3. On the **Project** menu, click **Modify Owner**.
   A Change Project's Owner dialog box appears.



4. From the **New Owner** list, select a user.
   Any user registered in the server can become a project owner.

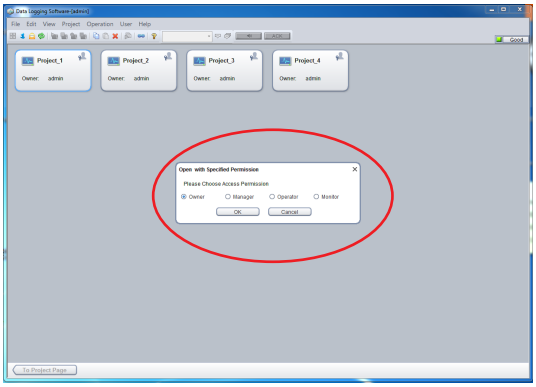
Select a new owner.

5. After selecting the new owner, click **OK**.
   The owner will be changed.

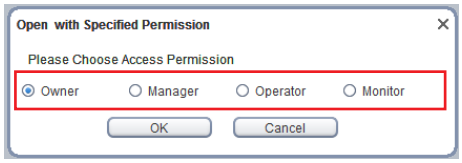
9.4.4 Opening a Project at a Specific Privilege Level

A user assigned to a project can open the project at a privilege level that is lower than the assigned privilege level.

1. Display the Project List Page.
2. Select a project.
3. On the **Project** menu, click **Open with Specified Permission**.
   An Open with Specified Permission dialog box appears.



4. Select the privilege level that you want to use to open the project.
   You can select any level up to your assigned level.
   The following figure is an example of a user who is assigned the Manager level. The user cannot select the Owner level, because it is higher than the Manager level.



5. Click **OK**.
   The dialog box closes, the Project Page appears.

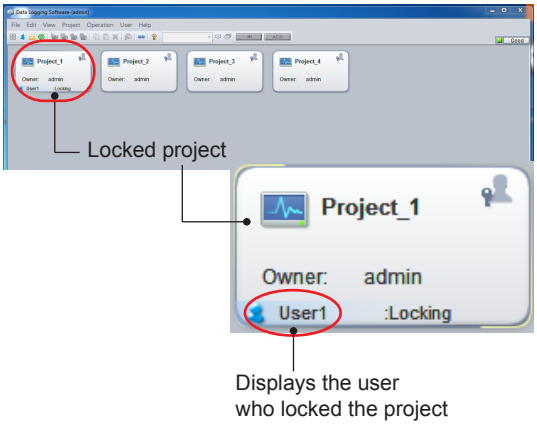
Note

Only the operations allowed at the specified privilege level can be used in the project. However, if the project is locked, users other than the user who applied the lock can only access the project at the Monitor level.

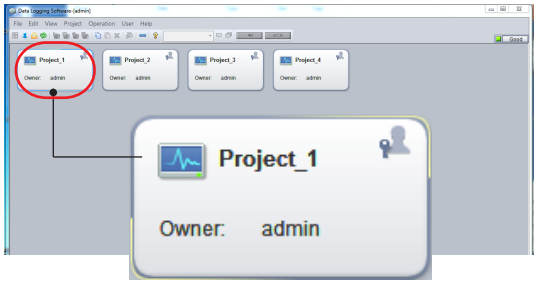
9.4.5 Unlocking a Project by Force

The administrator can only unlock locked projects.

1. On the Project List Page, select the locked project.



2. On the **Project** menu, click **Unlock Project Forcibly**.
   A confirmation message for unlocking appears.
3. To proceed, click **OK**.
   The dialog box closes, and the name of the user who locked the project disappears from the project.



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Chapter 10 OPC-UA Server Function (/UA option)

10.1 Overview

10.1.1 Basic Functions of the OPC-UA Server

The GA10's OPC-UA server function enables OPC-UA clients of a host system to access GA10's data. This function can be used to deliver tag information and measured values to OPC-UA clients.

Basic functions of the OPC-UA server are listed below.

Specification	Description
Compatible profile	UA 1.02 Micro Embedded Server DataAccess Server Facet
Used port	4840: OPC UA TCP Protocol (can be changed)
Maximum number of client connections	16 (Max 16 sessions)
Maximum number of subscriptions	100/session
Maximum number of monitor items	2000/session
Sampling interval	100ms, 200ms, 500ms, 1s, 2s, 5s, 10s, 20s, 30s, 1min, 2min, 5min, 10min
Supported services	FindServers GetEndpoints
	CreateSession ActivateSession CloseSession
	Browse BrowseNext TranslateBrowsePathsToNodeIds RegisterNodes UnregisterNodes
	Read
	CreateMonitoredItems ModifyMonitoredItems DeleteMonitoredItems SetMonitoringMode
	CreateSubscription ModifySubscription DeleteSubscriptions Publish Republish SetPublishingMode

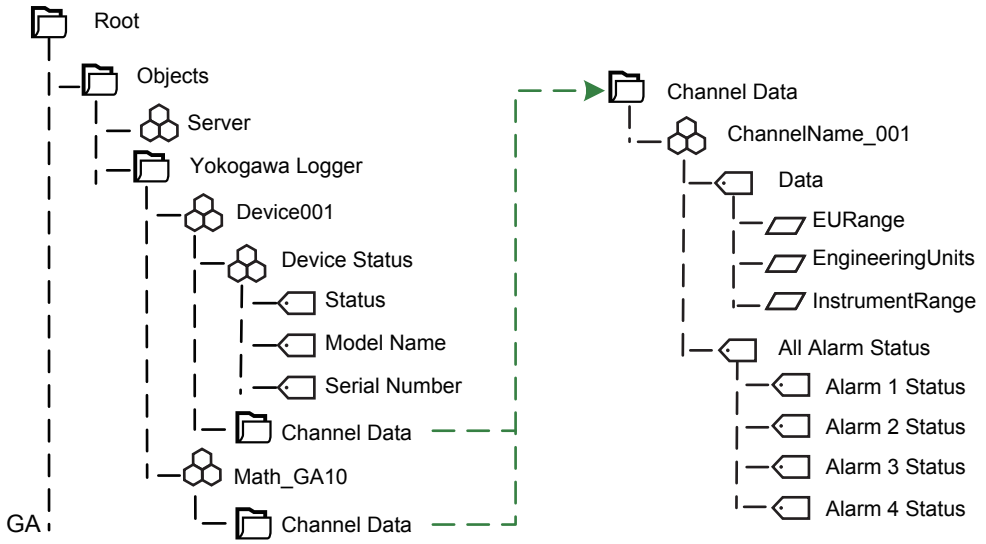
OPC-UA clients' access privileges are controlled by the GA10's user management function. The user privilege relationship between GA10 and OPC-UA client users is shown below.

GA10 User Privileges	OPC-UA Client User Privileges
Owner	Read/Write
Manager	Read/Write
Operator	Read/Write
Monitor	Read Only

Note

OPC-UA clients can access GA10 only while data collection is in progress.

10.1.2 GA10 Data Structure



Node [1]	Description	Class	Data Type	Note
Server	Server information	Object	--	--
Yokogawa Logger	Data	Object	--	--
DeviceXXX	Data of each device	Object	--	--
Device Status	Device status information	Object	--	--
Status	Registered device status	Variable	Int32	1: normal, 2: error, 3: error (In communication retry)
Model Name	Registered device name	Variable	String	ex.) DX1000, GX20
Serial Number	Registered device serial number	Variable	String	ex.) X5G905023
Math_GA10	Math tag data	Object	--	--
Channel Data	Channel data	Object	--	--
ChannelName_XXX [2]	Data of each channel	Object	String	--
Data	Measured value	Variable	Float	ex.) 123.4
EURange	Upper and lower range limits	Variable	Range (ExtensionObject)	ex.) -10 ~ 10
EngineeringUnits	Unit	Variable	EUInformation (ExtensionObject)	ex.) °
InstrumentRange	Upper and lower range limits (display boundaries)	Variable	Range (ExtensionObject)	ex.) 11~11
All Alarm Status	Status of all alarms	Variable	Boolean	true: alarm ON, false: alarm OFF
Alarm Status 1 to 4	Status of each alarm	Variable	Boolean	true: alarm ON, false: alarm OFF

1 All nodes are read only.
2 Tag name and tag comment are displayed in the description of ChannelName_XXX.

10.1.3 Server Certificate Operations

This function can be used to perform the following server certificate operations. For the actual procedure, see **Sec. 10.2.4**.

Installation

Installs the certificate file that the user has prepared in GA10 to make it an OPC-UA server certificate. The certificate must be generated from an internal private key.

Creating a Self-Signed Certificate

A server certificate is typically issued by a certification authority (CA) signing a certificate signing request (CSR). This function can generate a self-signed certificate that can be used when a certification authority (CA) signature is not necessary. A self-signed certificate can be generated from the internal private key and installed.

Creating a Certificate Signing Request (CSR)

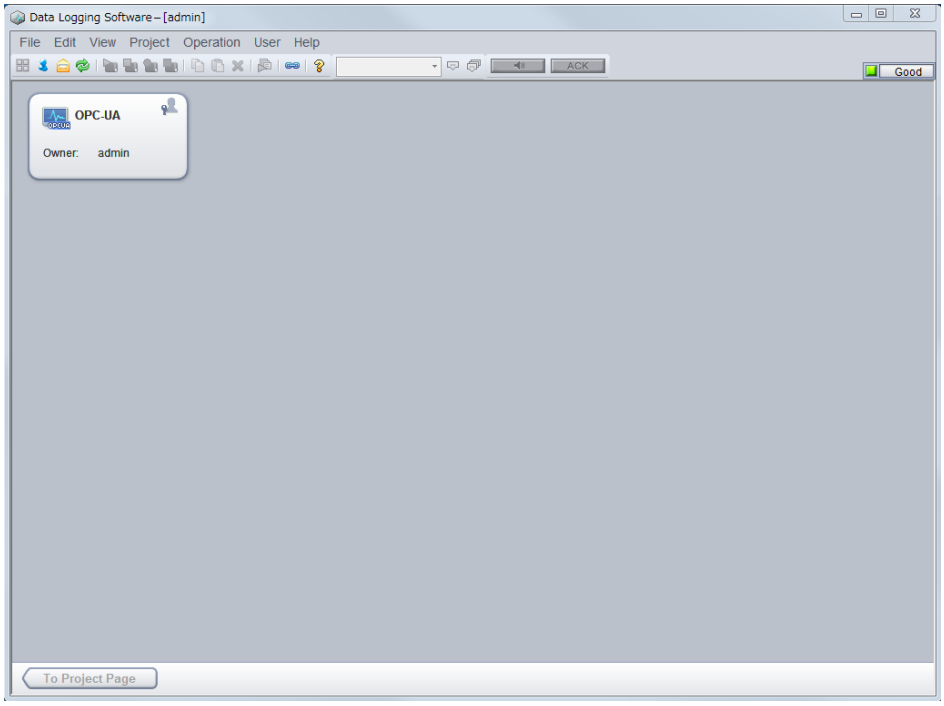
A certificate signing request (CSR) to be signed by a certification authority (CA) can be created. It is created from the internal private key available at the time of execution.

10.2 OPC-UA Server Project

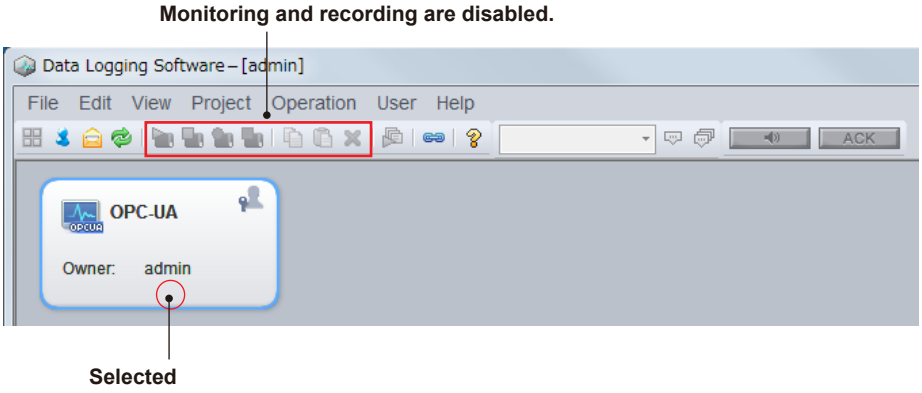
This section describes the various setting pages of the OPC-UA server function and how the operations differ from those of normal projects.

10.2.1 Project List Page

When GA10 with the OPC-UA server function starts, the Project Page shows a single “OPC-UA” server project. You cannot delete this project. Nor can you change its basic information. The following figure shows the initial screen that appears when you log in to GA10 with the OPC-UA server function.

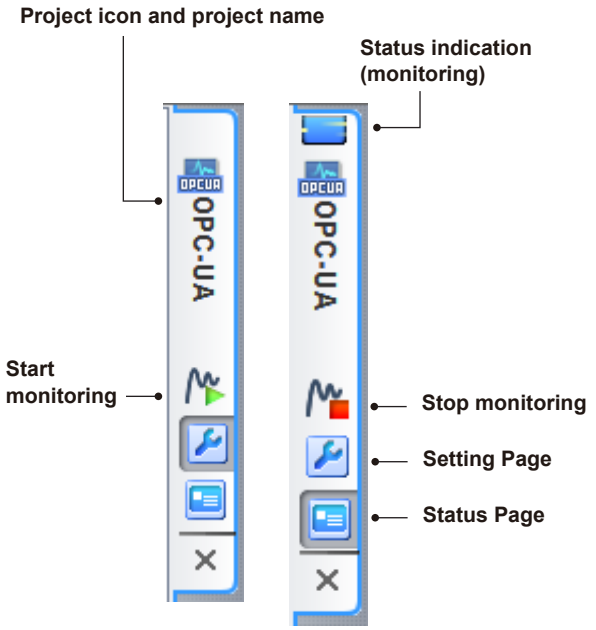


Note that because an OPC-UA server project does not have a recording function, record control buttons are disabled and adding marks is also not allowed.



10.2.2 Project Tab

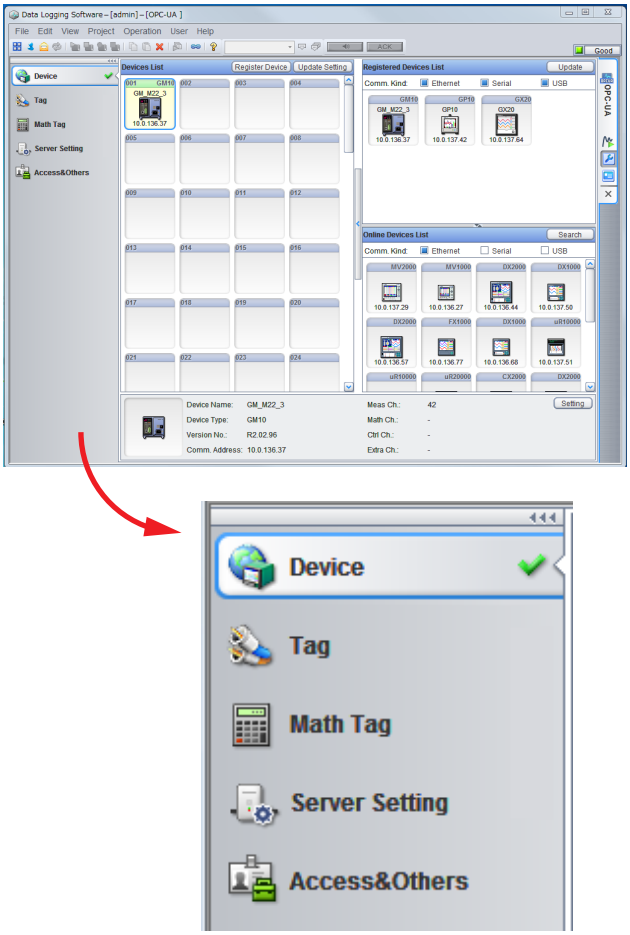
An OPC-UA server project consists of a setting page and status page. Depending on the privileges of the user who opened the project and the lock status, if the setting page is enabled, the setting page appears. Otherwise the status page appears.
The following figure shows the OPC-UA server project tab. Unlike normal projects, the record button and buttons for displaying the Monitor Page and Data files Page are not available.



Item Name	Description	Condition
Status indication	Indicates the project status. The behavior is the same as that for typical projects.	None
Icon	OPC-UA server icon	None
Project name	OPC-UA	None
Start Monitoring button	A button for starting or stopping monitoring. The behavior is the same as that for typical projects. If monitoring starts, the Status Page will appear. Clicking the Start Monitoring button starts the OPC-UA server. If the server fails to start, error message E3069 will appear. Then, a consistency check is performed between the server certificate and private key. If the check fails, error message E3070 will appear.	Disabled in a locked state. Disabled for monitor users.
Setting Page button	A button for calling up the project setting window. The behavior is the same as that for typical projects.	Disabled in a locked state. Disabled for monitor users.
Status Page button	A button for calling up the Status Page. The behavior is the same as that for typical projects.	None

10.2.3 Setting Pages

An OPC-UA server project consists of Device, Tag, Math Tag, Server Operation, and Access&Others Setting Pages. Device, Tag, Math Tag, and Access&Others are the same functions as those of typical projects. There is no Simple Settings mode. Math Tag appears when the Math function (/MT option) is installed.



Depending on the access privileges of the user when the project is opened and the project status, each of the displayed setting pages may be enabled or disabled. (See the table below.)

Running State	Setting Page	Access Privileges When the Project Is Opened		
		Owner	Manager	Operator
Not monitoring	Device	Enabled	Enabled	Enabled[2]
	Tag	Enabled	Enabled	Disabled
	Math Tag	Enabled	Enabled	Disabled
	Server Operation	Enabled	Enabled	Disabled
	Access&Others	Enabled	Enabled[1]	Disabled
Monitoring	Device	Enabled[2]	Enabled[2]	Enabled[2]
	Tag	Disabled	Disabled	Disabled
	Math Tag	Disabled	Disabled	Disabled
	Server Operation	Disabled	Disabled	Disabled
	Access&Others	Enabled[3]	Disabled	Disabled

1 Only Keep Lock State and DDE Server in the page are enabled. All others are disabled.
2 Devices List in the page is disabled. All others are enabled.
3 Keep Lock State and DDE Server are enabled. All others are enabled.

Device Setting Page

Selecting Device displays the Device Setting Page. The function is the same as that for normal projects.
For the procedure, see **"3.3.2 Registering Devices to Connect"**.

Tag Setting Page

Selecting Tag displays the Tag Setting Page. The basic tag functions are the same as those for normal projects. However, because there is no recording function, the corresponding column does not exist.
For the procedure, see **"3.3.3 Setting Tags"**.

Math Tag Setting Page

Selecting Math Tag displays the Math Tag Setting Page. The basic math tag functions are the same as those for normal projects. However, because there is no recording function, the corresponding column does not exist.
For the procedure, see **"4.1 Setting Math Tags"**.

Note

Before using the Math function, set the data time acquisition condition to PC time. This is set using Data time on the Server Setting Page described later.
If set to Device time, the Acquisition & Computing check box for the math tag will be cleared, and you will not be able to set math tags.

Server Setting Page

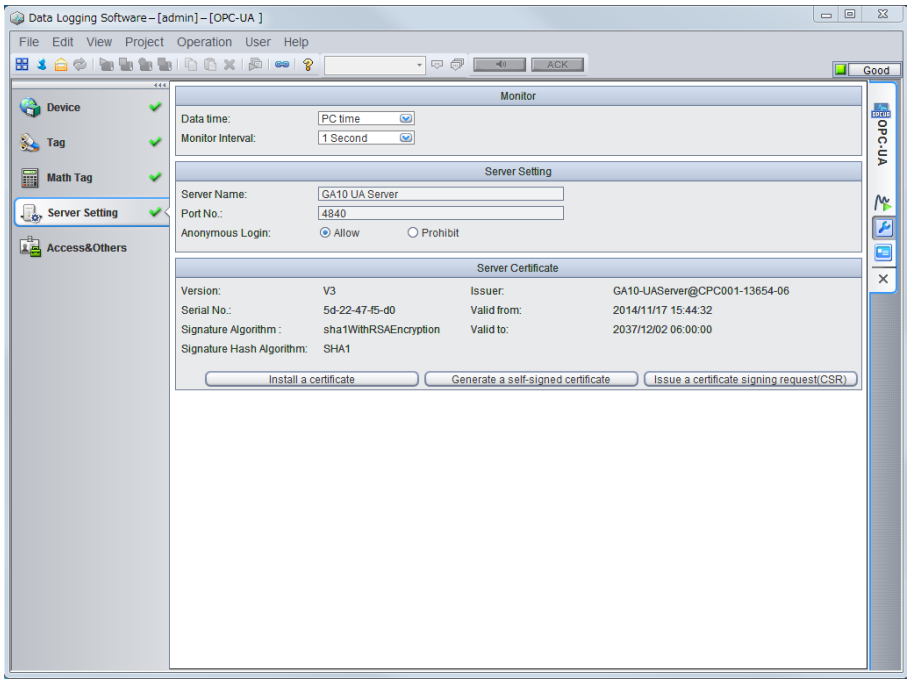
Selecting Server Operation displays the Server Setting Page. The details are described on the next page.

Access&Others Setting Page

Selecting Access&Others displays the Access&Others Setting Page. The function is the same as that for normal projects.
For the procedure, see **"3.3.8 Setting Project Access Privileges"**.

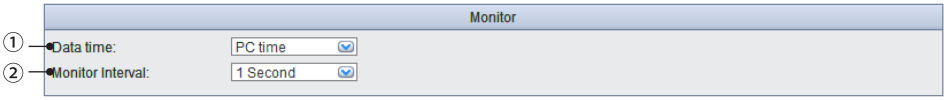
10.2.4 Server Setting Page

On the OPC-UA server project setting page, selecting Server Operation displays the Server Setting Page (see the following figure).



The page is divided into three areas: Monitor, Server Setting, and Server Certificate. Each area is described below.

- **Monitor**



(1) Data time

Select the time to assign to data.

- Default value: PC time
- Input range: PC time, Device time

You cannot set this when monitoring is in progress.

(2) Monitor Interval

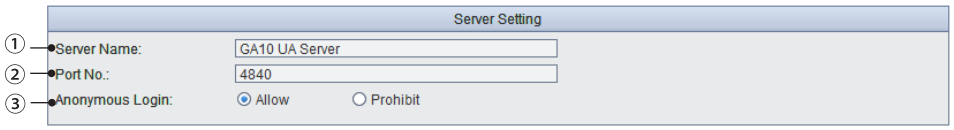
Select the data monitor interval.

- Default value: 1s
- Input range: 100ms, 200ms, 500ms, 1s, 2s, 5s, 10s, 20s, 30s, 1min, 2min, 5min, 10min

You cannot select this when Data time is set to Device time. In addition, note that if set to Device time, math tag settings will be disabled.

Related topic: ▶ **"Setting Data Collection Conditions"**

- **Server Setting**



(1) Server Name

Enter the OPC-UA server name using a character string.
- Default value: GA10 UA Server
- Input range: Up to 20 characters

You cannot set this when monitoring is in progress.

(2) Port No.

Enter the OPC-UA port number.
- Default value: 4840
- Input range: 1025 to 65535

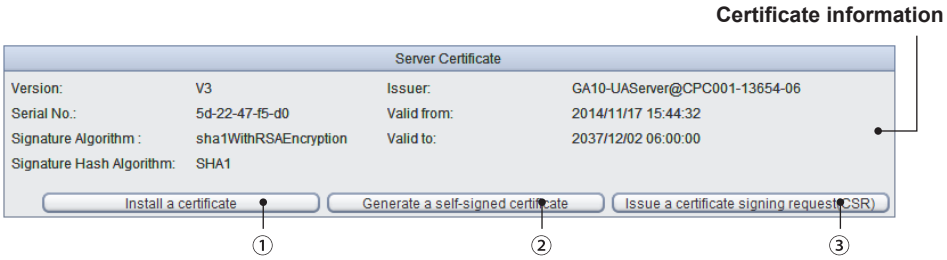
If the input is outside the range, the value will be reset to 4840 (default value).
You cannot set this when monitoring is in progress.

(3) Anonymous Login

Select Allow to allow anonymous connection from an OPC-UA client. The privilege for such connection is ReadOnly.
- Default value: Allow
- Options: Allow, Prohibit

You cannot set this when monitoring is in progress.

- **Server Certificate**



The Server Certificate area shows the certificate information (see the following table).

Item Name	Description
Version	Certificate version
Serial No.	Certificate serial number
Signature Algorithm	Certificate signature algorithm
Signature Hash Algorithm	Certificate signature hash algorithm
Issuer	Certificate issuer (common name)
Valid from	Start of the certificate's valid period
Valid to	End of the certificate's valid period

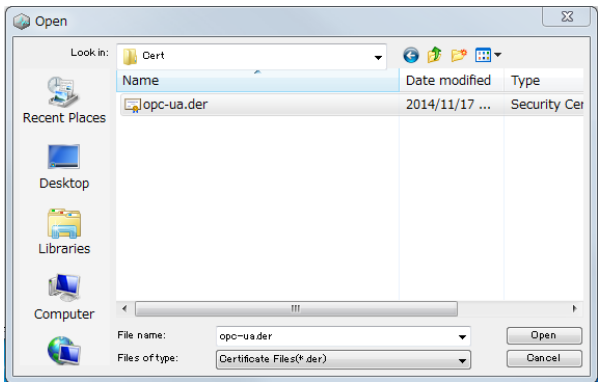
* The area will be blank if there is no certificate.

Clicking the Install a certificate, Generate a self-signed certificate, or Issue a certificate signing request(CSR) button displays a dialog box for executing or creating the relevant item. (For the procedure, see the next page.)

Basic Operation

(1) Installation of certificate

1 Click **Installation of certificate**.
An Open dialog box appears.

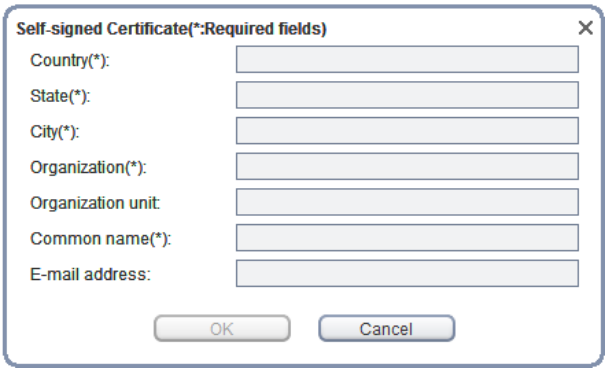


2 Select the certificate file (*.der) that you want to install, and click **Open**.
The certificate is installed, and the server certificate information is updated.
If registration fails, an error (E3057) will appear.

Basic Operation

(2) Generate a self-signed certificate

1 Click **Generate a self-signed certificate**.
A Generate a self-signed certificate dialog box appears.



2 Enter the items. The input ranges are as follows.
- Country: 2 alphabet characters
- State, City: Alphanumeric characters, spaces, and symbols. Up to 128 characters.
  Prohibited characters: !"# $%&';?^|
- Organization, Organization Unit, Common Name, E-Mail address: Alphanumeric characters, spaces, and symbols. Up to 64 characters.
  Prohibited characters: !"# $%&';?^|

3 Click **OK**.
A self-signed certificate is created.
If creation fails, an error (E3072) will appear.

Note

- If a character string that you enter exceeds the limit, it is truncated within the limit.
- Issuer information and subject information will be the same.

The following table shows the items and descriptions of the self-signed certificate that is created.

Item Name	Description
Version	“V3”
Serial No.	Auto generation[1]
Signature Algorithm	Sha1RSA
Signature Hash Algorithm	Sha1
Issuer: Country	Setting entered in the dialog box
Issuer: State	Same as above
Issuer: City	Same as above
Issuer: Organization	Same as above
Issuer: Organization unit	Same as above
Issuer: Common name	Same as above
Issuer: E-Mail address	Same as above
Valid from	PC time when the certificate was created
Valid to	2037/12/1 21:00:00
Subject: Country	Setting entered in the dialog box
Subject: State	Same as above
Subject: City	Same as above
Subject: Organization	Same as above
Subject: Organization unit	Same as above
Subject: Common name	Same as above
Subject: E-Mail address	Same as above

1 Generated automatically from the server software license number.

If a certificate does not exist when the GA10 OPC-UA server is started, a self-signed certificate is automatically created with the following information. Issuer information and subject information will be the same.

Details of the Items in the Self-Signed Certificate Created Automatically

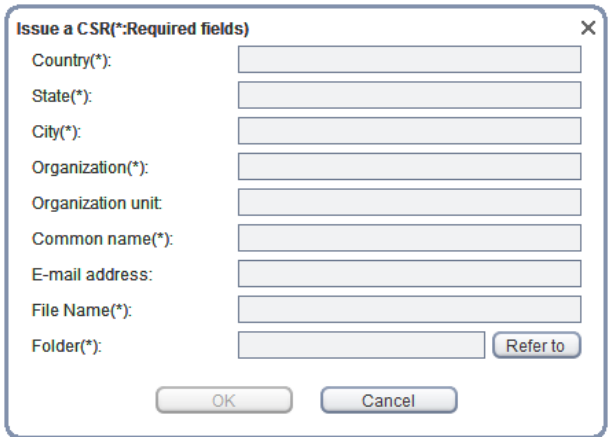
Item Name	Description
Version	“V3”
Serial No.	Auto generation[1]
Signature Algorithm	Sha1RSA
Signature Hash Algorithm	Sha1
Issuer: Country	“JP”
Issuer: State	“Tokyo”
Issuer: City	“Musashino”
Issuer: Organization	“Yokogawa Electric Corp.”
Issuer: Organization unit	“Product Business Center”
Issuer: Common name[2]	“GA10-UAServer@“+[ComputerName]
Issuer: Domain component[2]	[ComputerName]
Valid from	PC time when the certificate was created
Valid to	2037/12/1 21:00:00
Subject: Country	“JP”
Subject: State	“Tokyo”
Subject: City	“Musashino”
Subject: Organization	“Yokogawa Electric Corp.”
Subject: Organization unit	“Product Business Center”
Subject: Common name[2]	“GA10-UAServer@“+[ComputerName]
Subject: E-Mail address[2]	Blank

1 Generated automatically from the server software license number.
2 The PC name is entered in ComputerName.

Basic Operation

(3) Creating a Certificate Signing Request (CSR)

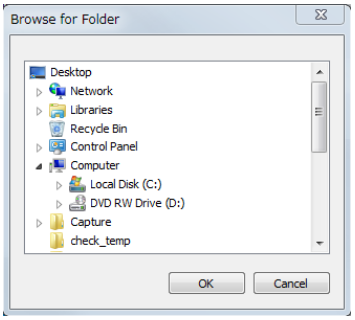
1 Click **Issue a certificate signing request (CSR)**.
A Issue a certificate signing request (CSR) dialog box appears.



2 Enter the items up to **File Name**. The character input range is as follows.

- Country: 2 alphabet characters
- File Name: Up to 60 characters excluding \/:,;*?"<>|
- State, City: Alphanumeric characters, spaces, and symbols. Up to 128 characters.
  Prohibited characters: !"# $%&';?^|
- Organization, Organization Unit, Common Name, E-Mail address: Alphanumeric characters, spaces, and symbols. Up to 64 characters.
  Prohibited characters: !"# $%&';?^|

3 Click **Browse** to specify the save destination folder.
The Browse for Folder dialog box appears.



The character input range is as follows.

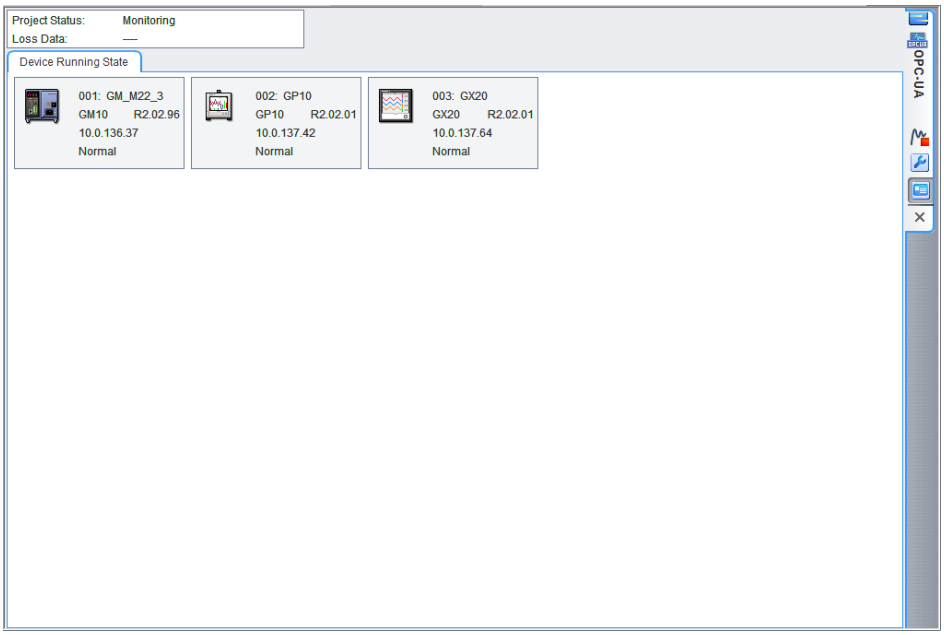
- Up to 255 characters.
  Prohibited characters: /?"<>|

4 Click **OK**.
A certificate signing request (CSR) is created in the specified folder. The file name extension is .csr.
If creation fails, an error (E3067) will appear.
The following table shows the items and descriptions of the certificate signing request (CSR) that is created.

Item Name	Description
Country	Setting entered in the dialog box
State	Same as above
City	Same as above
Organization	Same as above
Organization unit	Same as above
Common name	Same as above
E-Mail address	Same as above

10.2.5 Status Page

OPC-UA server projects do not have a recording function, so unlike normal projects, items related to recording are not displayed on the Status Page.

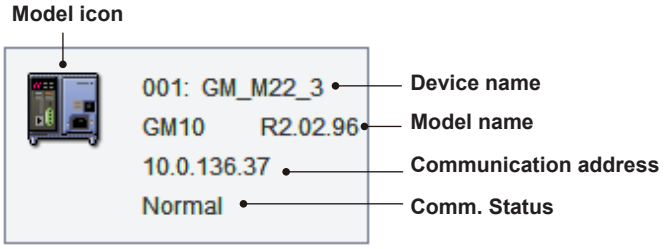


- **Project Status**

  Not monitoring or monitoring
- **Loss Data**

  Recording data dropout status
- **Device Running State**

  The status of communication with the devices in the Device List is displayed. Nothing is displayed when data collection is stopped.



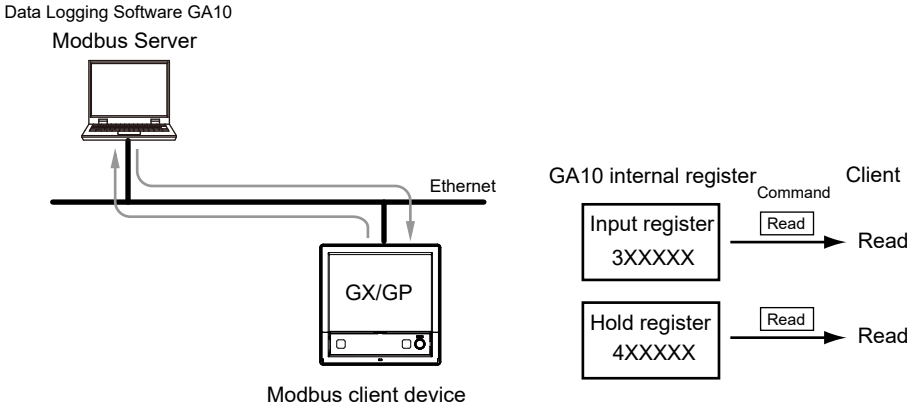
Chapter 11 Modbus Server Function

11.1 Basic Functions of the Modbus Server

The Modbus server function receives requests from Modbus/TCP client devices and returns information about the currently running GA10 project specified by the Modbus address as responses.

A Modbus client device can carry out the following operations on the GA10.

- Read the data of tags and math tags
  Value, status, scale upper and lower
- Read project information data
  Data collection and recording status, alarm status, alarm ACK status, data dropout presence/absence, write error presence/absence, beginning time of recording, total time of recording, number of generated files



Basic functions of the Modbus server are listed below.

Specification	Description
Protocol	Modus TCP
Port number	502 (default value)
Function code	3 (read hold register), 4 (read input register)
Maximum number of connectable clients	30
Data update interval	Same as the scan interval of the corresponding GA10 project
Address range	1 to 247 (assigned to the GA10 project)

11.2 Modbus Server and Register Assignments

11.2.1 Modbus Server

Function code

The GA10 supports the following functions.

Function Code	Function	Operation
3	Read the hold register (4XXXX, 4XXXXX)	The client (master) device reads the GA10 tag and math tag data.
4	Read the input register (3XXXX, 3XXXXX)	The client (master) device reads the GA10 tag and math tag data.

11.2.2 Register Assignments

The Modbus register addresses for tabs and math tags are assigned fixed address in order by the GA10 project's tag indexes (1 to 2000) and math indexes (1 to 2000) as shown in the following table.

Tag and Math Input Registers

Type		Input Register	Data Type
Value	Tag	300001 to 304000	32-bit floating point (little endian)
	Math tag	310001 to 314000	32-bit floating point (little endian)
Status	Tag	320001 to 322000	16-bit unsigned integer
	Math tag	324001 to 326000	16-bit unsigned integer
Scale lower and upper	Tag	330001 to 338000	32-bit floating point (little endian)
	Math tag	346001 to 362000	32-bit floating point (little endian)

Tag and Math Hold Registers

Type		Hold Register	Data Type
Value	Tag	400001 to 404000	32-bit floating point (little endian)
	Math tag	410001 to 414000	32-bit floating point (little endian)
Status	Tag	420001 to 422000	16-bit unsigned integer
	Math tag	424001 to 426000	16-bit unsigned integer
Scale lower and upper	Tag	430001 to 438000	32-bit floating point (little endian)
	Math tag	446001 to 462000	32-bit floating point (little endian)

Project Information Input Registers

Type		Register	Value	Data type
Project Status		365001	0: Stopped, 1: Monitoring, 2: Recording	16-bit unsigned integer
Data dropout		365002	0: No, 1: Yes	16-bit unsigned integer
Write error		365003	0: No, 1: Yes	16-bit unsigned integer
Time correction		365004	0: Disabled, 1: Enabled (correcting), 2: Enabled, 3: Not used	16-bit unsigned integer
Recording start time	Year	365005	—	16-bit unsigned integer
	Month	365006	1-12	16-bit unsigned integer
	Day	365007	1-31	16-bit unsigned integer
	Hour	365008	0-23	16-bit unsigned integer
	Minute	365009	0-59	16-bit unsigned integer
	Second	365010	0-59	16-bit unsigned integer
	Millisecond	365011	0-999	16-bit unsigned integer
Total time of recording (s)		365012	—	32-bit unsigned integer (little endian)
Number of Generated Files		365014	—	32-bit unsigned integer (little endian)
Total disk capacity		365016	The unit is MB.	32-bit floating point (little endian)
Remaining disk capacity		365018	The unit is MB.	32-bit floating point (little endian)

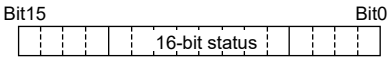
11.2.3 Input Registers

Client devices can read the input registers.

Tag, Math Data

Type		Tag data	Input Register	Data Type
Value	Tag	Lower bytes of the tag 0001 data	300001	32-bit floating point (little endian)
		Higher bytes of the tag 0001 data	300002	
		Lower bytes of the tag 2000 data	303999	
		Higher bytes of the tag 2000 data	304000	
	Math tag	Lower bytes of the math tag 0001 data	310001	
		Higher bytes of the math tag 0001 data	310002	
		Lower bytes of the math tag 2000 data	313999	
		Higher bytes of the math tag 2000 data	314000	
Status	Tag	Tag 0001 status information	320001	16-bit signed integer
		Tag 2000 status information	322000	
	Math tag	Math tag 0001 status information	324001	
		Math tag 2000 status information	326000	
Scale minimum, maximum	Tag	Lower bytes of the tag 0001 data	330001	32-bit floating point (little endian)
		Higher bytes of the tag 0001 data	330002	
		Lower bytes of the tag 2000 data	337999	
		Higher bytes of the tag 2000 data	338000	
	Math tag	Lower bytes of the math tag 0001 data	346001	
		Higher bytes of the math tag 0001 data	346002	
		Lower bytes of the math tag 2000 data	361999	
		Higher bytes of the math tag 2000 data	362000	

Status



Bit	Description
0	Alarm level 1 (On: 1, Off: 0)
1	Alarm level 2 (On: 1, Off: 0)
2	Alarm level 3 (On: 1, Off: 0)
3	Alarm level 4 (On: 1, Off: 0)
4 to 7	Reserved
8 to 15	Error code (5-bit binary into decimal) 0: No error 1: +OVER 2: -OVER 3: Skip 4: Data dropout (recorder) Data dropout at the relevant measurement point on the recorder. 5: Undefined data 6: No data 7: Invalid 8: +OVER burnout 9: -OVER burnout 10: Not a number 11: Error 12: Off 13, 14: Not used 15: Data dropout (GA10) Data not acquired or data dropout at the relevant acquisition point on the GA10.

11.2.4 Hold Registers

Client devices can read the hold registers.

Tag, Math Data

Type		Tag data	Hold Register	Data Type
Value	Tag	Lower bytes of the tag 0001 data	400001	32-bit floating point (little endian)
		Higher bytes of the tag 0001 data	400002	
		Lower bytes of the tag 2000 data	403999	
		Higher bytes of the tag 2000 data	404000	
	Math tag	Lower bytes of the math tag 0001 data	410001	
		Higher bytes of the math tag 0001 data	410002	
		Lower bytes of the math tag 2000 data	413999	
		Higher bytes of the math tag 2000 data	414000	
Status	Tag	Tag 0001 status information	420001	16-bit unsigned integer
		Tag 2000 status information	422000	
	Math tag	Math tag 0001 status information	424001	
		Math tag 2000 status information	426000	
Scale minimum, maximum	Tag	Lower bytes of the tag 0001 data	430001	32-bit floating point (little endian)
		Higher bytes of the tag 0001 data	430002	
		Lower bytes of the tag 2000 data	437999	
		Higher bytes of the tag 2000 data	438000	
	Math tag	Lower bytes of the math tag 0001 data	446001	
		Higher bytes of the math tag 0001 data	446002	
		Lower bytes of the math tag 2000 data	461999	
		Higher bytes of the math tag 2000 data	462000	

Status

See the status in section 11.2.3, “Input Registers.”

11.2.5 Responses to Requests and Timeout Processing

Responses to requests are described below, including normal cases.

- If the specified function code is not 3 (read hold register) or 4 (read input register), exception code 1 is returned.
- If there is no specified project or if monitoring is not in progress, exception code 2 is returned.
- If the register of the specified tag exceeds the range, exception code 2 is returned.
- If the register of the specified tag is within range but the tag does not exist, “no data” status is returned.
- For all other cases, a normal response is returned.

Timeout Procedure

If there is no communication with a Modbus client for 2 minutes (the value specified on the GA10 client screen), the connection to the Modbus client will be disconnected.

Chapter 12 Troubleshooting

12.1 Messages That GA10 May Display

Messages may appear on the screen during operation. This section describes the messages and how to respond to them.

Messages

Code	Message	Description and Solution
M1001	OK to switch to detail setting mode? Unavailable to back to simple setting mode.	------
M1002	Do you want to start the monitoring all at once?	------
M1003	Do you want to stop the collecting all at once?	------
M1004	Do you want to start the recording all at once?	------
M1005	Do you want to stop the recording all at once?	------
M1006	Do you want to stop the recording?	------
M1007	Do you want to log out?	------
M1008	Do you want to enforce to be unlock?	This is a message that asks the administrator to confirm the unlocking of the locked project.
M1009	Do you want the user(%s)'s password to be initialized?	This is a message that asks the administrator to confirm the initialization of a user password. %s indicates the name of the user whose password will be initialized.
M1010	Trial version is time up, operation is prohibited.	This message appears when a client accesses the server after the server trial period has expired.
M1011	Successed in Activation.	This message indicates that the client license has been registered successfully.
M1012	Server is activated. Please restart server.	After the server license registration is complete, the server needs to be restarted.
M1013	Option is added to server. Please restart server to enable option.	After an option is added to the server, the server needs to be restarted.
M1014	Is it OK to exit?	This message asks whether you want to close the client.
M1015	OK to add new channels of new devices or changed devices in the tag settings? (The current tags information is not changed)	This message appears when a device is added to the Devices List or when a device channel is added. If you click OK, the changed device and channel information are reflected in the Tag Setting Page and Display Group Setting Page.
M1016	OK to update the selected device's channel information? (Updated tag information will appear in the tag settings screen.)	This message asks whether you want to update the device channel information. If you click OK, GA10 will access the selected device, retrieve its channel information, and reflect the information on the Tag Setting Page.
M1017	Update the selected tag information?	Click OK to update information other than tags and tag comments.
M1018	Schedule re-executed successfully.	The re-execution of the specified schedule is complete.
M1019	Print completed successfully.	------
M1020	Generating a report completed successfully.	------
M1021	OK to execute sorting of tags in order of the device number? (Resetting is needed in Math tags)	If you click OK, tags are sorted by device number. If you select [Cancel], tags are not sorted.
M1022	Reflect Tag No, Tag Comments by Device setting?	If you click OK, the character strings of the tags and tag comments set in the device are retrieved. If you select Cancel, they are not retrieved.
M1023	Do you want to run the operation?	A confirmation message. If you click OK, the operation is executed.
M1024	Mail sending is successful.	------
M1025	Some mail sending is successful.	------
M1026	Mail test is in process in other projects. Please try again after a while.	------
M1027	Do you want to save manually?	------
M1028	“The port number is already in use. Specify another port number.”	------

Warning Messages

Code	Message	Description and Solution
W2001	Do you want to delete this user(%s)?	This message asks whether you want to delete the registered user. %s indicates the name of the user that will be deleted.
W2002	Do you want to delete this device(%s)?	This message asks whether you want to delete the device from the Devices List on the Device Setting Page or the Registered Devices List. %s indicates the name of the device that will be deleted.
W2003	Do you want to delete this data file(%s)?	This message asks whether you want to delete the data file from the Data files Page. %s indicates the name of the data file that will be deleted.
W2004	Do you want to delete the Project(%s)?	This message asks whether you want to delete the project. %s indicates the name of the project that will be deleted.
W2005	The release number(%s)of handled meters is out of support.	The release number of the device is not supported. Thus, proper data collection cannot be guaranteed. Consider updating the firmware or using a supported device. For the supported models and versions, See the General Specifications (GS 04L65B01-01EN).
W2006	Total number of channels of registered devices exceeded the supported range.	This message notifies that when you are registering a device to the device list or updating the device information, the total number of channels of registered devices exceeds the number of tags that can be supported. Click OK to proceed with the operation.
W2007	If changed to Device time, math tags will be unavailable.	This message appears when you try to change Data time to Device time. The Math function works when PC time is selected. Clicking OK will change the setting to Device time. Clicking Cancel will discard the change.
W2008	Option configuration of project does not have compatibility with the server. It will be converted to match the options configuration of the server during importing. Continue importing?	This message appears when you try to import a project that was created on a GA10 with different number of channels or options. (The importing GA10 has less channels or does not have the functions.) If you click OK, import is executed to the greatest extent possible. If you click Cancel, importing does not take place. For details, see **“Importing a project created on a GA10 with a different system configuration (GA10 version R2.02.xx or later)” on page 3-8**.
W2009	Failed to add some of new channels.	This message appears when new devices or channels on the Devices List fail to be assigned completely to the Tag Setting Page. If you click OK, you can resume operation.
W2010	Do you want to delete report/print history (%s) ?	Confirms whether print logs will be deleted on the Report/Print History tab of the report/print function (/RP option). %s indicates the name of the schedule that will be deleted.
W2011	Do you want to delete all unused devices?	Select whether to delete unused devices.

Error Messages

Code	Message	Description and Solution
E3001	Unable to connect to the specified server.	Check whether the DLGServer server program is running as a service. How to check: ▶page 2-10 2.7.1 Checking Whether the Server Is Running Check for problems in the communication path to the server and IP address and port number settings. If you cannot connect to the server, stop the server firewall, or register DFMServer.exe and DLGServer.exe as exceptions in the server firewall configuration.
E3002	Login failed. Please confirm the user name or the password.	GA10 is connected to the server, but the user information for logging in is not correct. Check the user name and password that you have entered.
E3003	Connected clients has reached maximum, you can not log in.	Wait for the other client to log out.
E3004	Unable to connect to the server.	Check for problems in the communication path to the server.
E3005	The user name already exists, the user can not be registed.	A user with the same name is already registered. Check the user name, and register with a different name.
E3006	The password is incorrect.	The password that you entered for changing the password is incorrect. Check the current password, and re-enter it.
E3007	Please enter at least four characters for the password.	Enter 4 to 30 characters for the password.
E3008	The new password and the comfirmed password does not match.	Enter the new password and confirmation password so that they match.
E3009	You can not delete the logged user.	Delete the user after the relevant user logs out.
E3010	Users to change is logged into the server. The basic information can not be changed.	Modify the basic information after the relevant user logs out.
E3011	User to be initialized is logged in to the server, user can not be initialized.	Initialize the user after the relevant user logs out.
E3012	The maximum number of logins has been reached, the user can not log in.	Delete registered users first, and then register additional users.
E3013	Since the Project name you entered already exists, the project can not be created.	A project with the same name is already registered. Check the project name, and register with a different name.
E3014	Since the Project name you entered already exists, you can not change it.	A project with the same name is already being used. Check the project name, and change to a different name.
E3015	The Project which is opening, can not be deleted.	Delete the project after closing the relevant project.
E3016	The Project which is running, can not be deleted.	Delete the project after stopping the relevant project.
E3017	The maximum number of registered devices has been reached ,the device cannot be registered.	Delete any of the devices registered in the server first, and then register the new device.
E3018	The equipment in use can not to be removed.	The device that you want to delete is being used in a project. Check that the device is not being used in another project. Delete the device from the Devices List on the Device Setting Page of other projects, and then delete the device.
E3019	Original owner is opening projects, you cannot change the owner.	When the administrator tried to change the owner of a project, the current owner had the project opened. Change the owner after the current owner closes the project.
E3020	Server can not receive device information.	• Check the information for accessing the device and the communication path between the server and device. • Device with the channel set to zero cannot be registered. Reconfigure the connected devices to detect the I/O modules, turn on the communication channel, or perform other appropriate measures. (To register temporarily, use offline registration.) • To register GateWT for GA10 as a connection target in the GA10 Device List and then start it, right-click and choose Run as administrator.
E3021	Fail to create record folder.	The specified drive does not exist. Change the data file save destination folder.
E3022	Failed to start Universal Viewer.	Check whether Universal Viewer is installed in the PC.

Code	Message	Description and Solution
E3023	An error occurred while reading the file.	Failed to load the file when importing a project or tag information. Check that the file for importing is correct.
E3024	An error occurred while writing the file.	Check that the export destination folder is not set to read-only and that there is enough free disk space.
E3025	User manual does not excit in the specified location.	Place the PDF manuals in the client installation folder.
E3026	Failed to start Adobe Reader.	Check whether Adobe Reader is installed and the version.
E3027	Simultaneous running projects has reached the maximum number, failed to start monitoring.	The number of running projects in the server has reached the maximum number. Stop data collection in other projects.
E3028	Because the maximum concurrent number of connected devices is reached, collecting cannot start.	Data collection cannot be started because the maximum device connections will be exceeded. Stop data collection in other projects or change the data collection device.
E3029	Because the maximum device number that can be registered is reached, the Project can not be created.	Delete any of the registered projects first, and then register the new project.
E3030	Because the maximum number of open projects is reached, the project cannot be opened.	The number of projects that the client has opened has reached the maximum number. Close any of the opened projects.
E3031	Failed to delete data file.	Another client may be using the data file that you want to delete.
E3032	Failed to open data files.	Update the information on the Data files Page, and check that the relevant data file exists.
E3033	Fail to launch web browser.	A Web browser may not be installed.
E3034	Operation failed because there is no right to access Project.	Ask the project owner to grant project access privileges.
E3035	Operation failed because the target user does not exist.	The user may already have been deleted. Update the information on the User Management Page, and check whether the user exists.
E3036	Fail to import project because registered devices reach the maximum number.	Delete unneeded devices from the Registered Devices List.
E3037	Project is closed, because Project lock status is released forcibly.	To use the project, open it again.
E3038	Operation failed because the project is locked by another user.	Use the project after the project is unlocked.
E3039	Specified new owner does not exist, you can not change the owner.	The user may already have been deleted. Set the new owner to an existing user.
E3040	Operation failed because Project is deleted.	The project may already have been deleted. Update the information on the Project List Page, and check that the project exists.
E3041	Serial no is invalid. Activation failed.	Check the license number, and enter it correctly.
E3042	Server has not been activated. Adding option to software failed.	Register the server license first, and then add options.
E3043	Tag upgrade option's serial no is invalid. Fail to add option's serial no.	Adding the option would cause the number of tags to exceed the maximum recording tags in the project. In the server information dialog box, check the current number of tags, and check whether the option that you tried to add is appropriate.
E3044	Part of the data files can not be deleted.	Some of the data files that you tried to delete could not be deleted. They may be in use.
E3045	Part of the data files can not be opened.	Some of the data files that you tried to open could not be opened. Update the information on the Data files Page, and check that the data files exist.
E3046	Failed in registration. The administrator authority is required. Please restart as an administrator or run as administrator and restart.	Log on again as a Windows administrator. Or, choose Run as administrator when starting Data Logging Software. (In Windows 7, right-click the software icon, and click Run as administrator.)
E3047	Insufficient memory available to the OS. Operation failed.	Try the following: • Stop other running programs. • Reduce the number of simultaneously running projects. • Increase the PC RAM. • If you are using a 32 bit edition, try a 64 bit edition.
E3048	Since the number of tags in the imported project configuration information exceeded the number of tags supported by the current server,failed to import.	The number of tags in the project that you are trying to import exceeds the number of tags handled by the current server. Consider increasing the number of tags handled by the server.

Code	Message	Description and Solution
E3049	Failed to operate some projects or all project at once.	If Start Monitoring Simultaneously cannot be executed, it could be any of the following reasons. • The number of simultaneously running projects or simultaneously connected devices exceeds the limit. • There is not enough available memory on Windows. If Start Recording Simultaneously cannot be executed, it could be any of the following reasons in addition to the reasons listed above. • The data save destination folder failed to be created. Close projects that do not require data collection. To start recording, change the data file save destination folder.
E3050	Insufficient memory available to the OS. Project will close.	Try the following: • Stop other running programs. • Reduce the number of simultaneously running projects. • Increase the PC RAM. • If you are using a 32 bit edition, try a 64 bit edition.
E3051	Fail to start monitoring because the necessary setting is not correct.	There is an error in the information that is used during data collection. Check for errors in Modbus device definition files.
E3052	Operation failed because device has been deleted.	Update the device information on the Registered Devices List.
E3053	Searching is not allowed because auto-search in progress.	Another client is searching devices with different search conditions. Wait for the search operation to complete, and try searching again.
E3054	Failed to update the information of some specified tags or all tags.	Check the communication status of the device used by the tag to be updated.
E3055	Cannot write to specified recording folder.	Below are possible reasons. Check the condition of the save destination. • There is not enough free space on the data save destination drive. • If the data save destination is an external storage device, the device is not inserted properly or is removed. • The data save destination is set to read-only. • The data save destination drive is broken. • A location (folder) that is restricted by the operating system of the server is specified.
E3056	Connecting this version's server is not available.	Make sure that the version of the added client is the same as the server version. Download the latest version of the software from the following URL: **www.smartdacplus.com/software/en/**
E3057	Failed to install the certificate.	The certificate cannot be stored in the server. Check the certificate format, file size, free space in the save destination folder, and write privileges.
E3059	Failed to register the template file.	The template file cannot be stored in the server. Check the free space in the save destination folder and write privileges.
E3060	Failed to download the template file.	The template file cannot be downloaded to the specified folder. Check the free space in the specified folder and write privileges.
E3061	Failed to delete the template file.	The template file cannot be deleted. Check write privileges of the save destination folder. Check that the file is not opened with another application.
E3062	Failed to delete the schedule.	A schedule that is in the middle of monitoring or recording cannot be deleted.
E3063	Excel is not installed.	Install Excel.
E3064	Can not open the report file.	Check that the report file is in the report folder.
E3065	Failed to generate a report file.	Check the disk space of the server's report file save destination and folder's write privileges. Check the presence of the data file.
E3066	Failed to print.	Check the presence of the data file.
E3067	Failed to issue a certificate signing request.	Check the presence of the data file. Check that the file name, destination folder, and other settings are correct.
E3068	The option is already enabled.	The option corresponding to the license number you entered is already enabled. You can check enabled options by clicking Server Information or Input Server License (license input screen) on the server's Help menu.
E3069	Failed to start the OPC-UA server. The port number is already in use.	There may be a port number collision. Check that the OPC-UA server port number is not being used by another process.
E3070	The server certificate is invalid.	The private key and certificate are inconsistent.

Code	Message	Description and Solution
E3071	Can not import the project. It contains unavailable function.	There is not enough number of channels (tags) or an option is not available for importing the relevant project. The number of channels (tags) or optionson the server do not meet the configuration requirements of the project that you are trying to import.
E3072	Failed to generate a self-signed certificate.	The private key does not exist, or you do not have write privileges to the folder.
E3073	Failed to paste project.	The project cannot be pasted because there is not enough disk space on the server.
E3074	Failed to register the custom display file.	Custom display setting file cannot be registered. Check the disk space of the server and folder's write privileges.
E3075	Failed to register the alarm sound file.	Check the disk space of the server's alarm sound file save destination and folder's write privileges.
E3076	Failed to download alarm sound file.	Check the disk space and write privileges of the client's specified folder.
E3077	Failed to delete alarm sound file.	Check the write privileges of the alarm sound file storage folder of the server, and check that the file is not opened by another application.
E3078	Failed to send mail.	Check that the SMTP server, authentication method, and sender settings are correct.

12.2 Frequently Asked Questions (FAQ)

Q1 Can GA10 and GA10CL be installed and run in the same PC?

A1

GA10 and GA10CL cannot be installed on the same PC.

Q2 Is there a way to back up the recording data files automatically?

A2

You can use the mail transmission feature to send generated data files as email attachments. You can store the data files as back up in the device receiving the email messages.

Q3 The communication between the server and the data acquisition device was disconnected. How does the server behave when communication is restored?

A3

Resuming data collection and recording

The server will retry to connect approximately every 30 seconds. When reconnection is successful, the server resumes data collection and recording.

Recording data

The way that the server handles recording data when communication is restored varies depending on whether data is being collected in PC time or device time.

- **If data is being collected using PC time**

  The data during which communication was not possible will not be recorded.

- **If data is being collected using device time**

  After communication is restored, the server prioritizes the collection of data that can be gathered in real time through communication. Then, the server collects data that could not be collected from devices and fills the missing data in the recorded data files. This function is called *backfill*. Backfill only works when the necessary conditions are met. If the conditions are not met, the data during which communication was not possible will not be recorded. See **Q4**.

Q4 How does backfill work?

A4

When a communication error occurs between a server and device, data dropout occurs in the data file that the server is recording. Backfill is a function that fills the dropped data in the recording file by retrieving the missing data from the device after the system recovers. Data is retrieved automatically from the device when the operating conditions are met.

When the communication interference is eliminated, the backfill function operates automatically. The restored data is saved as a new file, and you can view it on the Data files Page. Marks that indicate that backfill has been performed are added to the beginning and end of the restored section of the data.

In the case of a short communication interference,* data loss may be restored even when the above settings are not specified. In such a case, GA10 does not create a new file but writes directly to the recording file.

* The length of interruption time that makes this operation possible varies depending on the connected device.

Backfill Operation Conditions

On the GA10 side

- Applicable data: Binary data (Excel data is not included)
- Data time is set to Device time.

On the connected device side

- Applicable devices: GX10, GX20, GP10, GP20, GM10, DX1000, DX2000, DX1000N, DX1000T, DX2000T, FX1000, MV1000, MV2000
- Device's internal memory contains the event data file corresponding to the data loss location.
- The scan interval of the device is the same as the recording interval of the event data.
- FTP transferring of files is enabled.(FTP server function: ON, Port number: 21)
- The multi batch function is not in use. If the multi batch function is enabled, backfilling is not performed.
- The time zone and daylight saving (DST) settings on the main unit are the same as those on the PC.

On the GX/GP/GM with Advanced Security function (/AS option) side

- If the advanced security function is disabled, backfill operates.
- If enabled, backfill operates when Communication in Security basic settings is set to Off.
- If Communication in Security basic settings is set to Login, backfill operates only when a Monitor user is connected.

On the DXAdvanced series with Advanced Security function (/AS option)

- Backfill operates regardless of whether the advanced security function is enabled or disabled.

Handling of files collected by backfilling

Files collected by backfilling are the same as normal data files except for the point given below.

- The file division conditions specified on the recording setting page do not apply. Therefore, the files may become larger than normal data files.

Other information

- Backfill is not performed if a communication error or other error had occurred at the start of recording.
- If a data backfill operation cannot start due to a device access failure, because an event data file is being created, or due to some other reason, GA10 will access the device every hour.
- If the server stops during a backfill operation, the operation will stop. Even if the server is restarted, the previous backfill operation will not be performed.
- If any of the following settings on the device is changed after starting data collection, backfill will not be performed.
  Acquisition interval, time, channel on/off, decimal place, unit, span (scale), alarm on/off, alarm type, and alarm value
- If the advanced security function (/AS) option is enabled on the GX/GP/GM, backfill operation is not performed for user levels other than monitor.

Q5 The server stopped or the server PC shut down. How does the server operate after it restarts?

A5

Server recovery

The server retains the most recent status information just in case the host PC shuts down. When the PC restarts, the server recovers the operation based on the status information.

Resuming data collection and recording

The server resumes data collection and recording after it restarts unless the user had manually stopped the server or shut down the host PC.
Depending on the power-off condition, monitoring and recording after restarting will behave as shown in the following table.

Power-off Condition	Description	Monitoring/Recording after Restart	File Division Display Division	Backfill Operation
Sudden power-off	Unpredictable shutdown such as a power failure or PC power cord disconnection	Resume	Divide	No operation
Normal restart	Shutdown by a user, restart due to Windows updating, and the like	Resume (version R2.02.xx and later) Resuming is not possible on older versions of GA10.	Divide	No operation

Monitoring and recording are not affected by logging off of the PC.

When the report/print function (/RP option) is in use

Auto print schedules that have not been completed due to a PC shutdown are executed again when the server recovers. However, output results of auto print executed in this way may have up to 10 minutes of data missing before the shutdown.

Q6 A communication error occurred between the client and server. Will data collection continue?

A6

Because data collection is performed between the server and data collection devices, the operation continues even when a communication error occurs between the client PC and server PC.
When a communication error occurs between the client PC and server PC, the client logs out from the server. The project that was open is closed. In this situation, if data collection was in progress and the project's Keep Lock State was set to ON, the project will remain locked.
To control the project before the communication recovers, perform either of the procedures below from a client on another PC using the same project.

- Open the project using the same user.
- Log in as an administrator. On the **Project** menu, click **Unlock Project Forcibly** to unlock the project.

Q7 Unable to control the project. Why?

A7

Below are possible reasons.

- The user is not assigned privileges to control the project. → Open the project using a user who has privileges to control the project, such as Owner, Manager, or Operator.
- The project is locked. → If an owner, manager, or operator user is logged in, the project is locked. Other users can only monitor the project. Wait until the other user using the project closes it.
- The project is locked. → If data collection is in progress and the project's Keep Lock State is set to ON, the project remains locked even when an owner, manager, or operator closes the project. To control the project, perform either of the following procedures.
  - Ask the user who locked the project to unlock the project.
  - Clear the Keep Lock state.

Q8 I forgot the user password. What do I do?

A8

If the administrator password is lost, there is no recovery method. Contact your nearest YOKOGAWA dealer.
If a user password is lost, the administrator can initialize the password. Then, the user can log in with the initialized password (blank) and set a new password.

Q9 The device data and the data collected and recorded by GA10 are not synchronized. Why?

A9

Data collected using Device time is recorded as-is by the software. In this situation, the device data and the collected and recorded data are synchronized.
However, data collected using PC time are timestamped with the PC time and the values are adjusted accordingly. In this situation, the device data and the collected and recorded data based on PC time may not be synchronized.

Q10 Can the recorded data be printed?

A10

Data files can be printed using Universal Viewer. Universal Viewer is supplied with this software and installed along with this software.
You can also print a specified range of data at the specified time by adding the /RP option. :
▶ 5.1 Configuring Auto Print

Q11 Device settings were changed. At what point are the changes applied to data collection?

A11

Changes to devices before data collection is started

This software retrieves device information when the device is registered to the Device List. If this information is different from the actual device information at the start of data collection, the software will collect data but will handle it as invalid data.
Check the following settings and match them.

Channel data type, unit, span, decimal place, alarm type, and alarm value

You can use **Update Setting** on the Device List to update the settings.

Changes to devices during data collection and recording

If you change the device settings during data collection and recording, the changes will not be reflected to the software. Stop the data collection, apply the setting changes using either of the methods below, and restart the data collection.

- Execute Update Setting of the devices in the devices List.
- Register the device again.

However, if data is being collected using Device time and you change the device's acquisition interval, the software will reset the entire monitor data, restart monitoring, and stop recording.

Do not change the time on the device after starting data collection and recording, because doing so will cause adverse effects on the monitor screen and recorded data.

When the connected device is a SMARTDAC+ series (GX/GP or GM) device and the GA10 version is R2.02.xx or later, alarm information changed on devices during data collection is reflected on the monitor. Changes in the alarm on/off states and types are reflected on the monitor. Note that changes in alarm types are not reflected in the alarm list of the recording file.

Q12 What is the difference between setting the Data time to PC time and setting the Data time to Device time?

A12

For information on the different data collection conditions, see also **Setting Data Collection Conditions on page 3-33**.
The following table summarizes the major differences. For a detailed explanation, see the following pages.

Differences / Mode	Description	Backfill	Collection and Record Interval	Display		Saved Data Files
				Trend Monitor	Alarm Overview	
PC time	Time on the server PC	No	Select from available options	No display limitations because all the data can be displayed on the same time axis.		Data can be saved to a single file.
Device time	Time on the device	Yes (fills dropped data using data on the device)	The interval on each device is used, so it is not possible to specify a single interval.	If there are multiple devices with different times or scan intervals, Monitor Sets are subdivided to display each combination of device and scan interval..	The page is subdivided and a list is displayed for each device.	Files are divided by a combination of device and scan interval.

What is PC time?

PC time is the time information that the server PC uses. In PC time mode, the server attaches PC timestamps on the data collected from devices. This data is displayed on the Monitor Page and saved in recording files.

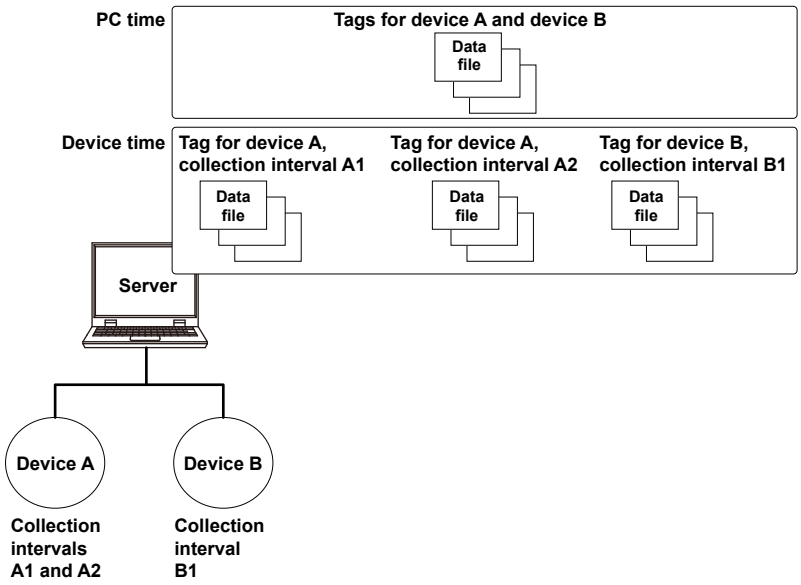
- Data collected using PC time will not necessarily be synchronized to the data of the corresponding devices.
  ▶ Q9

- The timestamps attached to data in PC time mode are determined so that data collection would always occur at midnight (00:00:00).
- The data collection interval and record interval are specified on GA10.
- The data of all tags is saved to the same file.

What is Device time?

Device time is the time information that the data collection device uses. In Device time mode, the server collects and records data at the data acquisition intervals of devices. If there are multiple acquisition intervals in a single device, data is collected and recorded at each acquisition interval. Device data and collected data are synchronized (the values and timestamps match).

- **Data collection and recording**
  - Data is collected separately for each device and for each data collection interval.
  - Data is collected and recorded at the devices' data acquisition intervals. You cannot specify the data collection interval or record interval on GA10.
  - Data is saved to separate files for each device and for each data acquisition interval.



The device number, device name, and device acquisition interval are included in the names of data files. Below is the file name format when date and time are included.
FileName-DeviceNo-DeviceName-Interval-YYYYMMDDhhmmss.ext
FileName: The file name string specified by the user
DeviceNo: Device number on the Device Setting Page
DeviceName: Device name on the Device Setting Page
Interval: The acquisition interval of each device

- **Monitor**
  The trend monitor displays data based on a single time axis. If there are multiple devices, the Monitor Set will be divided and waveforms in the display group will be displayed in windows divided at the interval level. Only up to four divided windows can be displayed. Anything in excess will not be displayed.

  A similar behavior will also occur in alarm lists. The page will be divided, and the lists will be displayed separately at the device level.

- **Filling data dropouts**
  If data collection is set to Device time mode, the backfill function can be used.
  What is the backfill function? **Q4**

- **Mail transmission function**
  In the email transmission based on alarm occurrence and release, the software monitors relevant tags for each device and for each data collection interval to transmit email.
  In the email transmission based on the specified period, the software sends email for each device and for each data collection interval.
  In the email transmission based on the specified duration, the software calculates the duration and sends email for each device and for each data collection interval.

Blank

Appendix 1 Creating Report Templates

Creating Report Templates for Report Files in Excel Format

To create a report template, enter keywords and text in the cells of an Excel file. Keywords specify the type of data that will be entered into a cell. Text are output as they are in reports. Save the report templates that you create in Excel format (.xlsx extension) or Excel macro format (.xlsm extension).

- Function: See page App-1 in section 1.12, “Using the Report Template Function (/MT option)”.
- Setup: See page App-1 in section 1.11, “Configuring the Report Function (/MT option)”.
- Loading and saving report templates: See page App-1 in section 1.12.5, “Loading and Saving Report Template Files”.

Template Example

Channel number	**$Ch(R001)$**	**$Ch(R002)$**
Name	**Tank 1 temperature**	**Tank 1 pressure**
Unit	**$Unit(R001)$**	**$Unit(R002)$**
$ReportDataTime(Hour)$	$ReportDataInst(Hour, R001)$	$ReportDataInst(Hour, R002)$
$Repeat$	$Repeat$	$Repeat$
$Repeat$	$Repeat$	$Repeat$

Report Output Example

Channel number	**TIC-001**	**PIC-002**
Name	**Tank 1 temperature**	**Tank 1 pressure**
Unit	**°C**	**kPa**
2012/12/01 00:00:00	76.5	45.6
2012/12/01 01:00:00	78.9	56.7
2012/12/01 02:00:00	77.7	50.8

Keyword Format

Keywords are written by themselves or with parameters.

$ Keyword(parameter)$	Example: $ReportDataSum(Hour,R001,00,23)$

Basic Rules

- The dollar sign on the left indicates the start of a keyword, and the dollar sign on the right indicates the end of a keyword.
- You can only write keywords using letters of the alphabet, dollar signs, parentheses, commas, and spaces. You can put a space after an opening parenthesis, before and after a comma, and before a closing parenthesis. Keywords are not case sensitive. You cannot use a dollar sign inside of a keyword.
- The maximum length of a keyword, including spaces, is 100 characters.

Parameter Rules

- Parameters are enclosed in parentheses.
- Multiple parameters (up to 4) are separated by commas.
- Examples of how parameters can be omitted are shown below.

$ReportDataSum(Hour, R001, ,23)$	The third parameter has been omitted.
$ReportDataSum(Hour, R001, 01,)$ or $ReportDataSum(Hour, R001, 01)$	The fourth parameter has been omitted.

Excel Format Rules

- Set the data format by setting the cell format.
- Set the proper format for each keyword's cell in the cell's Number properties.
- The keyword in a cell is only valid when the keyword name and parameters are all in the same format. When a keyword's font size or some other property is not consistent, it is invalid.

$ReportDataSum(Hour, R001, 00, 23)$	The font size of "Hour" is different, so the keyword is invalid.

- If a single cell contains text and a keyword, only the format of the keyword has to be consistent. The format of the text can be different.

Date and time: $DateTime$	The format of the keyword is consistent, so it is valid.

Limitations on Report Types and Template Types

If you violate the rules illustrated below, data will not be output.

Keyword Parameter	Template Type								
Report Kind	Hour	Day	Week	Month	Hour + Day	Day + Week	Day + Month	Batch	Day Custom
Hour	✓				✓				
Day		✓			✓	✓	✓		
Week			✓			✓			
Month				✓			✓		
Batch								✓	
Custom									✓
Free									✓

Limitation on Report Types and Parameter Omissions

If you violate the rules illustrated below, it will be considered a keyword format error. The keyword will not be converted and will remain as is.

Report Kind	Start date and time	End date and time	Start number	End number
Hour	Start time (hour)	End time (hour)	—	—
Day	Start day	End day	—	—
Week	—	—	—	—
Month	—	—	—	—
Batch	Relative start time (minute)	Relative end time (minute)	Start number	End number
Custom	Start time (hour:minute)	End time (hour:minute)	—	—
Free	—	—	—	—

Keyword Definitions

For examples and details, see “Report Template Examples”.

- **System Keywords**

Keyword	Meaning	Display Format
Time	Current time	Time[4]
Date	Current date	Date[4]
DateTime	Current date and time	
DateTimeString	Current date and time	Character string
Serial	Serial number	
Ch	Channel number[1]	
Tag	Tag string[1]	
ChId	Tag number[1]	
Unit	Unit[1]	
FileName	File name	
Model	Model	
MeasCh	Number of measurement channels	Number
MathCh	Number of math channels	Number
SampleInterval	Sample interval	Character string
CommentTitle	File comment title[2] Range: 1 to 8	
CommentDetail	File comment details[2] Range: 1 to 8	
PrintGroup	Group number	
PrintGroup(p1)	Group number of the specified graph[*5]	
PrintGroupName	Group name	
PrintGroupName(p1)	Group name of the specified graph[*5]	
PrintRange	Print range[3] Range: G1 to G4	

1 The parameter is the report channel number (it cannot be omitted).
2 The parameter is the comment number (it cannot be omitted).
3 The parameter is the graph number (it cannot be omitted). Excel templates can show down to seconds.
4 The item becomes a character string in PDF and printer output.
5 The parameter is the graph number (it cannot be omitted).

- **Report Data Keywords(*)**

*: These keywords cannot be used for the Custom Print.

Keyword	Meaning	Display Format
ReportDateTime	Report creation/print date and time[*6]	Date and time
ReportDataDate	Report creation date[1]	Date[5]
ReportDataTime	Report creation time[1]	Time[5]
ReportDataDateTime	Report creation date and time[1]	Date[5]
ReportDataDateTimeString	Report creation date and time[1]	Character string
ReportDataElapsedTimeString[4]	Report data time out date and time	
ReportDataStatus	Report data status[2]	
ReportDataSum	Report data sum[2]	Number or character string[3]
ReportDataInst	Instantaneous report data value[2]	
ReportDataAve	Average report data value[2]	
ReportDataMax	Maximum report data value[2]	
ReportDataMin	Minimum report data value[2]	

1 Write the parameters in this order: report type (cannot be omitted), report start date and time (can be omitted), report end date, time (can be omitted), start number (can be omitted), and end number (can be omitted).
2 Write the parameters in this order: report type (cannot be omitted), report channel number (cannot be omitted), report start date and time (can be omitted), report end date and time (can be omitted), start number (can be omitted), and end number (can be omitted).
3 The decimal point type (dot or comma) depends on whether the converted data is a value or character string. Whether the converted data is a value or character string depends on the format of the cell that the keyword is written in. When the cell format is numerical, the decimal point type is determined by the cell format. When the cell format is text, the decimal point type matches the format of the report data.
4 Valid only when the report type is Batch.
5 The item becomes a character string in PDF and printer output.
6 Write the parameters in this order: data reference (cannot be omitted), date type (cannot be omitted).

- **Report Graph Keywords**

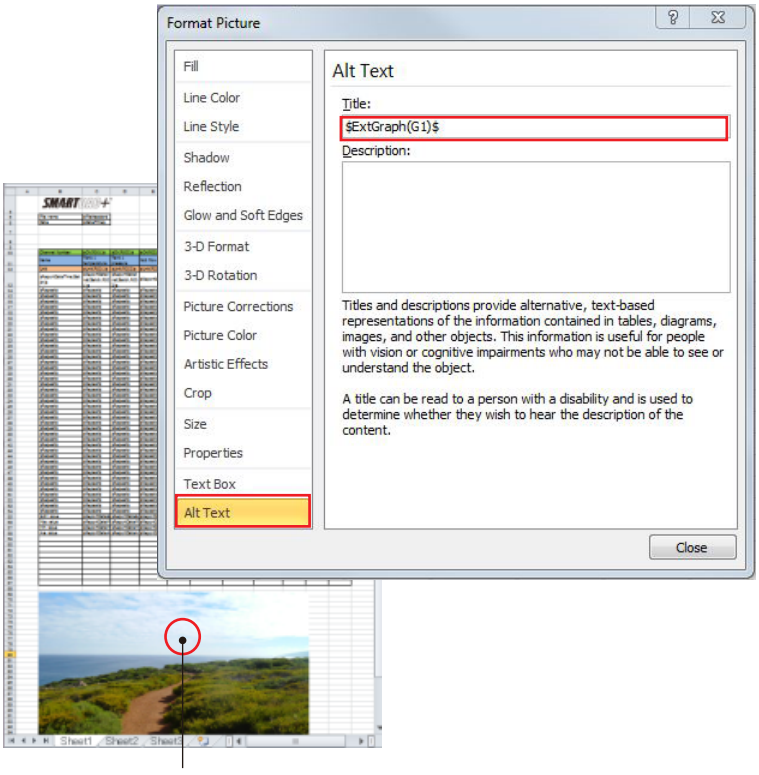
Keyword	Meaning	Display Format	Example
ExtGraph	Report graph[1]	Image	$ExtGraph(G1)$ Range: G1 to G4

1 The parameter is the graph number (it cannot be omitted).

Inserting a Graph

To insert a graph in a report template for Excel report files, follow the procedure below.

1. Insert a graph (image file) at the appropriate location in the created Excel template.
2. Right-click the graph, and select Format Picture.
3. From the menu on the left, select Alt Text.
4. In the Title box under Alt Text, type the above key word (“$ExtGraph(G1)$”).



Right-click on the picture

- **Special Keywords**

Keyword	Meaning	Display Format
Repeat	Specifies the output location of the data that corresponds the report data keyword and the Index keyword (a special keyword).	The same as the corresponding keyword.
Copy	Outputs all data that corresponds the report data keyword and the Index keyword (a special keyword). This keyword is valid for PDF and printer output.	The same as the corresponding keyword.
Index	Outputs serial numbers from the value specified by “start” to the value specified by “end.”	Number

- **Parameters**

Parameter Name	Format	Range	Description	Remarks
Report channel number	Rxxx[1]	R01-R100	The software's report channel	
Report Kind	Hour	—	Hourly report	
	Day	—	Daily report	
	Week	—	Weekly report	
	Month	—	Monthly report	
	Batch	—	Batch report	
	Custom	—	Daily custom	
	Free	—	For daily custom reports, Computed results, such as sum values, of data in the file are appended to the file. This piece of data is called "Free."	
Start date and time	hh[2]	00 to 23	Specifies the start hour	Used in hourly reports
	dd[3]	01 to 31	Specifies the start day	Used in daily reports
	mm[4]	0 to 12000	Specify the start minute	Used in batch reports
	hh:mm[5]	hh: 00 to 23 mm: 00 to 59	Specifies the start hour:time	Used in Daily custom reports
End date and time	hh[2]	00 to 23	Specifies the end hour	Used in hourly reports
	dd[3]	01 to 31	Specifies the end day	Used in daily reports
	mm[4]	0 to 12000	Specify the end minute	Used in batch reports
	hh:mm[5]	hh: 00 to 23 mm: 00 to 59	Specifies the end hour:minute	Used in Daily custom reports
Start number	xxx[1]	001 to 200	Specifies the start number	Used in batch reports
End number	xxx[1]	001 to 200	Specifies the end number	
Data Reference	Start	—	Report start reference	
	End	—	Report end reference	
Date Type	Year	—	Year	
	Month	—	Month	
	Day	—	Day	
	Hour	—	Hour	
	Minute	—	Minute	
	Second	—	Second	
	WeekOfMonthSun	—	Week No. of the month. Regard Sunday as the first day of a week.	
	WeekOfMonthMon	—	Week No. of the month. Regard Monday as the first day of a week.	
	WeekOfYearSun	—	Week No. of the year. Regard Sunday as the first day of a week.	
	WeekOfYearMon	—	Week No. of the year. Regard Monday as the first day of a week.	

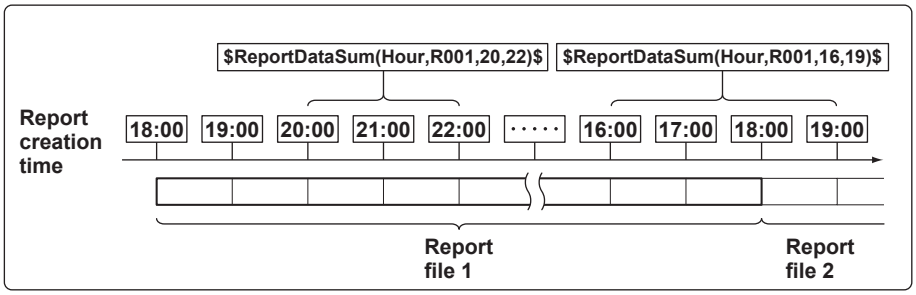
1 xxx is a number without a limitation on the number of digits
2 hh is a number without a limitation on the number of digits
3 dd is a number without a limitation on the number of digits
4 mm is a number without a limitation on the number of digits
5 Spaces are allowed before and after colons.
6 Start time and end time are relative to the record start time.

Starting and Ending Dates and Times

Use the start date and time and end date and time to specify the parts of the report file's report data that you will output to the file that you create with the template.
You can specify the starting and ending dates (for daily reports) or times (for hourly reports).

Report Kind	Start Date and Time	End Date and Time
Hour	Start time (hour)	End time (hour)
Day	Start time (day)	End time (day)
Batch	Start time (minute)	End time (minute)
Day custom	Start time (hour:minute)	End time (hour:minute)

Example when the report type is hourly and the report is created at 18:00.



Keyword: $ReportDataSum(Hour,R001,20,22)$

From the hourly data from 19:00:01 to 22:00:00, the report data (sums) of report channel R001 for 20:00, 21:00, and 22:00 is output.

Keyword: $ReportDataSum(Hour,R001,16,19)$

From the hourly data from 15:00:01 to 19:00:00, the report data (sums) of report channel R001 for 16:00, 17:00, and 18:00 is output. Because the report data for 19:00 is in another report file, it is not output.

Keyword: $ReportDataSum(Hour,R001)$

One file's worth (18:00:01 to 18:00:00) of data from report channel R001 is output, starting from 19:00.
When you omit the start and end times for an hourly report, the data for the hour after the report creation time until the 24th hour is output. For daily reports, the data for the day after the report creation time until the end of the month is output.

Keyword: $ReportDataSum(Hour,R001,08)$

From the hourly data from 07:00:01 to 18:00:00, the report data (sums) of report channel R001 for 08:00 to 18:00 is output.

Report Template Examples

System Keyword Examples

Intermixed Keyword and Text

File header: $FileHeader$
Date and time: $DateTime$

↓

File header: GX20
Date and time: 2012/12/01 12:00:00

Intermixed Multiple Keyword and Text

Device number: $Serial$ File Header: $FileHeader$

↓

Device number: ABCDEFG File Header: GX20

Report Data Keyword Examples

The following examples are for when the hourly report data for report channel R001 is 101, 102, 103, 104, and 105 and the hourly report data for report channel R002 is 201, 202, 203, 204, 205, and 206.

The $Repeat$ command applies to the closest keyword above the command in the same column.

$ReportDataInst(Hour,R001)$		101	
$Repeat$		102	
$Repeat$		103	
$Repeat$		104	
$ReportDataInst(Hour,R002)$		201	
$Repeat$		202	
$Repeat$		203	
$Repeat$		204	
$Repeat$		205	

→

The $Repeat$ command applies to the keyword above it in the same column, even when that keyword is not directly above the command.

$ReportDataInst(Hour,R001)$		101	
$Unit(R001)$		°C	
$Repeat$		102	
$Unit(R001)$		°C	
$Repeat$	$Unit(R001)$	103	°C

→

You can mix system keywords, report data keywords, and text. If the data specified by a keyword does not exist, nothing is output.

$ReportDataInst(Hour,R001)$($Unit(R001)$)		101 (°C)	
$Repeat$		102	
$Repeat$		103	
$Repeat$($Unit(R001)$)		104 (°C)	
$Repeat$(°C)		105 (°C)	
$Repeat$			

→

App

Appendix

Keywords in merged cells are affected by the leftmost cells above them.

	$ReportDataInst(Hour,R001)$		$ReportDataInst(Hour,R002)$	
	$Repeat$		$Repeat$	
$Repeat$			$Repeat$	
	$Repeat$		$Repeat$	
↓				
	101		201	
	102		202	
			203	
	103		204	

When a keyword is written incorrectly or its formatting is wrong, the keyword will be output to the file as it is written.

$ReportDataInst(Hour,R)$		→	$ReportDataInst(Hour,R)$	
$ReportDataInst(Hour,R002)$			201	
$R**epeat**$			$R**epeat**$	
$Repeat$			202	
$Repeat$			203	
$Repeat$			204	
$ReportDataInst(Hour,R001)$ $ReportDataInst(Hour,R002)$		[1]	101 $ReportDataInst(Hour,R002)$	

1 When there are multiple system keywords in the same cell, only the first keyword is valid.

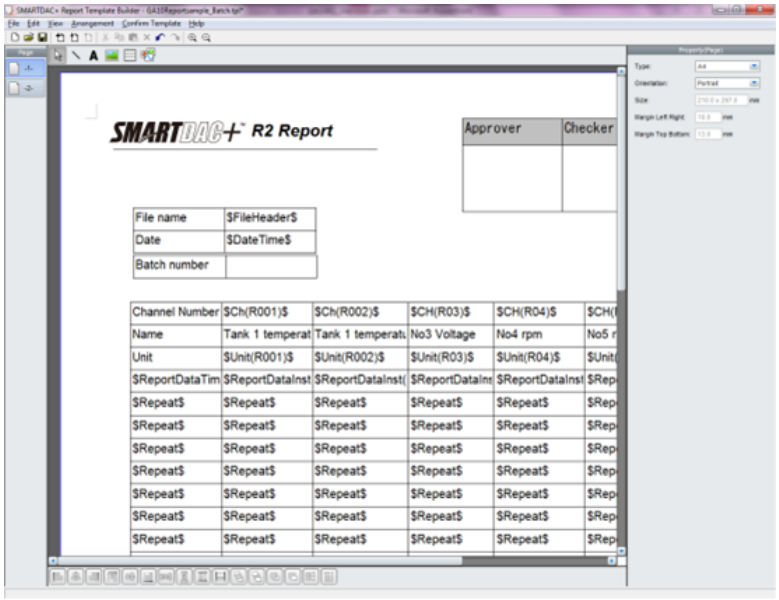
Creating Report Templates for PDF Report Files and Printer Output

Report templates for PDF report files (*.tpl) are created using SMARTDAC+ Report Template Builder. Report Template Builder can be downloaded from the following URL for free.

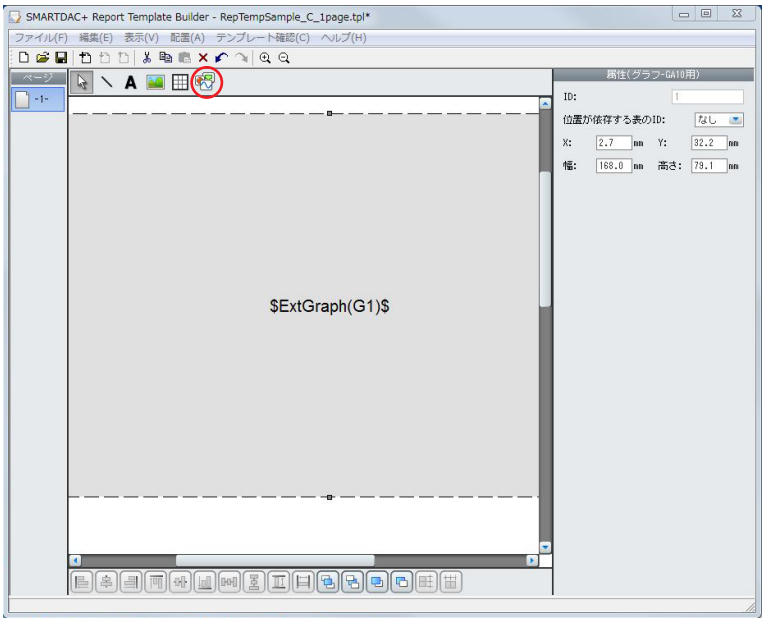
www.smartdacplus.com/software/en/

In Report Template Builder, keywords, text, and images (JPG, PNG, BMP) are arranged in tables, graphs, and text components to create report templates.

Keywords specify the type of data that will be entered into a cell. Text are output as they are in reports.



To insert a graph in a template, click the Graph for GA10 icon and enter the keyword $ExtGraph(G1)$.



For the keywords that you can use, see **Creating Report Templates for Report Files in Excel Format**.

Appendix 2 Modbus Device Definition File Example

A sample Modbus device definition file is provided in the following pages. The sample shows how the XML file should be structured.
When you create a Modbus device definition file, refer to the description of registers in the user's manual of the Modbus device that you want to connect. You can also use the Modbus Device Definition File Creating Tool by downloading it from the YOKOGAWA website.
www.smartdacplus.com/software/en/

```
<?xml version="1.0" encoding="utf-8"?>
<ModbusDevice Type="A" PortNo="502" CommandDelay="0">  Match Type (Modbus device name) with the file name.
  <Options>
    <Option Name="remote" />
  </Options>
  <Registers>  Specify all the data to load from the device.
    <Register Name="PVERROR1" FunctionCode="3" Address="42002" DataType="INT16"></Register>
    <Register Name="PV1" FunctionCode="3" Address="42003" DataType="INT16"></Register>
    <Register Name="CSP1" FunctionCode="3" Address="42004" DataType="INT16"></Register>
    <Register Name="OUT1" FunctionCode="3" Address="42005" DataType="INT16"></Register>
    <Register Name="HOUT1" FunctionCode="3" Address="42006" DataType="INT16"></Register>
    <Register Name="COUT1" FunctionCode="3" Address="42007" DataType="INT16"></Register>
    <Register Name="MOD1" FunctionCode="3" Address="42008" DataType="INT16"></Register>
    <Register Name="PID1" FunctionCode="3" Address="42009" DataType="INT16"></Register>
    <Register Name="CSPNO" FunctionCode="3" Address="42010" DataType="INT16"></Register>
    <Register Name="ALM1" FunctionCode="3" Address="42011" DataType="INT16"></Register>
    <Register Name="ALM2" FunctionCode="3" Address="42013" DataType="INT16"></Register>
    <Register Name="PVERROR2" FunctionCode="3" Address="42018" DataType="INT16"></Register>
    <Register Name="PV2" FunctionCode="3" Address="42019" DataType="INT16"></Register>
    <Register Name="CSP2" FunctionCode="3" Address="42020" DataType="INT16"></Register>
    <Register Name="OUT2" FunctionCode="3" Address="42021" DataType="INT16"></Register>
    <Register Name="HOUT2" FunctionCode="3" Address="42022" DataType="INT16"></Register>
    <Register Name="COUT2" FunctionCode="3" Address="42023" DataType="INT16"></Register>
    <Register Name="MOD2" FunctionCode="3" Address="42024" DataType="INT16"></Register>
    <Register Name="PID2" FunctionCode="3" Address="42025" DataType="INT16"></Register>
    <Register Name="A11" FunctionCode="3" Address="42104" DataType="INT16"></Register>
    <Register Name="A21" FunctionCode="3" Address="42105" DataType="INT16"></Register>
    <Register Name="A31" FunctionCode="3" Address="42106" DataType="INT16"></Register>
    <Register Name="A41" FunctionCode="3" Address="42107" DataType="INT16"></Register>
    <Register Name="A12" FunctionCode="3" Address="42154" DataType="INT16"></Register>
    <Register Name="A22" FunctionCode="3" Address="42155" DataType="INT16"></Register>
    <Register Name="A32" FunctionCode="3" Address="42156" DataType="INT16"></Register>
    <Register Name="A42" FunctionCode="3" Address="42157" DataType="INT16"></Register>
    <Register Name="AL11" FunctionCode="3" Address="42801" DataType="INT16"></Register>
    <Register Name="AL21" FunctionCode="3" Address="42805" DataType="INT16"></Register>
    <Register Name="AL31" FunctionCode="3" Address="42809" DataType="INT16"></Register>
    <Register Name="AL41" FunctionCode="3" Address="42813" DataType="INT16"></Register>
    <Register Name="AL12" FunctionCode="3" Address="43901" DataType="INT16"></Register>
    <Register Name="AL22" FunctionCode="3" Address="43905" DataType="INT16"></Register>
    <Register Name="AL32" FunctionCode="3" Address="43909" DataType="INT16"></Register>
```

```
  <Register Name="AL42" FunctionCode="3" Address="43913" DataType="INT16"></Register>
  <Register Name="BSL" FunctionCode="3" Address="45109" DataType="INT16"></Register>
  <Register Name="PUNI1" FunctionCode="3" Address="45201" DataType="INT16"></Register>
  <Register Name="PDP1" FunctionCode="3" Address="45202" DataType="INT16"></Register>
  <Register Name="PRH1" FunctionCode="3" Address="45203" DataType="INT16"></Register>
  <Register Name="PRL1" FunctionCode="3" Address="45204" DataType="INT16"></Register>
  <Register Name="PUNI2" FunctionCode="3" Address="45221" DataType="INT16"></Register>
  <Register Name="PDP2" FunctionCode="3" Address="45222" DataType="INT16"></Register>
  <Register Name="PRH2" FunctionCode="3" Address="45223" DataType="INT16"></Register>
  <Register Name="PRL2" FunctionCode="3" Address="45224" DataType="INT16"></Register>

  <Register Name="CTRLMODE" FunctionCode="3" Address="45001" DataType="INT16"></Register>
  <Register Name="CTRLTYPEL1" FunctionCode="3" Address="45003" DataType="INT16"></Register>
  <Register Name="CTRLTYPEL2" FunctionCode="3" Address="45004" DataType="INT16"></Register>
  <Register Name="AMR" FunctionCode="3" Address="42301" DataType="INT16"></Register>
  <Register Name="AMW" FunctionCode="6" Address="42301" DataType="INT16"></Register>
  <Register Name="CAMR" FunctionCode="3" Address="42303" DataType="INT16"></Register>
  <Register Name="CAMW" FunctionCode="6" Address="42303" DataType="INT16"></Register>
  <Register Name="RSR" FunctionCode="3" Address="42304" DataType="INT16"></Register>
  <Register Name="RSW" FunctionCode="6" Address="42304" DataType="INT16"></Register>
  <Register Name="LRL1R" FunctionCode="3" Address="42306" DataType="INT16"></Register>
  <Register Name="LRL1W" FunctionCode="6" Address="42306" DataType="INT16"></Register>
  <Register Name="LRL2R" FunctionCode="3" Address="42307" DataType="INT16"></Register>
  <Register Name="LRL2W" FunctionCode="6" Address="42307" DataType="INT16"></Register>
  <Register Name="ATL1R" FunctionCode="3" Address="42308" DataType="INT16"></Register>
  <Register Name="ATL1W" FunctionCode="6" Address="42308" DataType="INT16"></Register>
  <Register Name="ATL2R" FunctionCode="3" Address="42309" DataType="INT16"></Register>
  <Register Name="ATL2W" FunctionCode="6" Address="42309" DataType="INT16"></Register>
  <Register Name="SPNOR" FunctionCode="3" Address="42312" DataType="INT16"></Register>
  <Register Name="SPNOW" FunctionCode="6" Address="42312" DataType="INT16"></Register>
  <Register Name="MOUTL1R" FunctionCode="3" Address="42333" DataType="INT16"></Register>
  <Register Name="MOUTL1W" FunctionCode="6" Address="42333" DataType="INT16"></Register>
  <Register Name="MOUTCL1R" FunctionCode="3" Address="42334" DataType="INT16"></Register>
  <Register Name="MOUTCL1W" FunctionCode="6" Address="42334" DataType="INT16"></Register>
  <Register Name="MOUTL2R" FunctionCode="3" Address="42335" DataType="INT16"></Register>
  <Register Name="MOUTL2W" FunctionCode="6" Address="42335" DataType="INT16"></Register>
  <Register Name="MOUTCL2R" FunctionCode="3" Address="42336" DataType="INT16"></Register>
  <Register Name="MOUTCL2W" FunctionCode="6" Address="42336" DataType="INT16"></Register>

 </Registers>

 <Channels>
  <Channel Name="PV1">      PV1 channel settings
   <Init>
    <DecimalPos Register="PDP1"></DecimalPos>      Decimal place
    <Min Register="PRL1"></Min>
    <Max Register="PRH1"></Max>      Maximum and minimum values
    <Unit Register="PUNI1" Trans="temperature"></Unit>      Unit
   </Init>
```

PV1 basic information

```
<Value Register="PV1">
 <PlusOver Register="PVERROR1" Mask="0x0010"></PlusOver>
 <MinusOver Register="PVERROR1" Mask="0x0020"></MinusOver>
 <DataError Register="PVERROR1" Mask="0x4000"></DataError>
 <Burnout>
  <Type Register="BSL"></Type>
  <Value Register="PVERROR1" Mask="0x0001"></Value>
 </Burnout>
</Value>
<Alarms>
 <Alarm>
  <Type Register="AL11" Trans="alarmTypesPV"></Type>
  <Value Register="ALM1" Mask="0x0001"></Value>
  <SetValue Register="A11"></SetValue>
 </Alarm>
 <Alarm>
  <Type Register="AL21" Trans="alarmTypesPV"></Type>
  <Value Register="ALM1" Mask="0x0002"></Value>
  <SetValue Register="A21"></SetValue>
 </Alarm>
 <Alarm>
  <Type Register="AL31" Trans="alarmTypesPV"></Type>
  <Value Register="ALM1" Mask="0x0004"></Value>
  <SetValue Register="A31"></SetValue>
 </Alarm>
 <Alarm>
  <Type Register="AL41" Trans="alarmTypesPV"></Type>
  <Value Register="ALM1" Mask="0x0010"></Value>
  <SetValue Register="A41"></SetValue>
 </Alarm>
</Alarms>
</Channel>
<Channel Name="SP1">
 <Init>
  <DecimalPos Register="PDP1"></DecimalPos>
  <Min Register="PRL1"></Min>
  <Max Register="PRH1"></Max>
  <Unit Register="PUNI1" Trans="temperature"></Unit>
 </Init>
 <Value Register="CSP1"> </Value>
 <Alarms>
  <Alarm>
   <Type Register="AL11" Trans="alarmTypesSP"></Type>
   <Value Register="ALM1" Mask="0x0001"></Value>
   <SetValue Register="A11"></SetValue>
  </Alarm>
  <Alarm>
   <Type Register="AL21" Trans="alarmTypesSP"></Type>
   <Value Register="ALM1" Mask="0x0002"></Value>
```

+over, -over

Error [1]

Burnout

PV1 values

1. Masked because the parameter contains multiple pieces of information.

First alarm (up to four)

Alarm type

Alarm setting

Alarm value

Second alarm

Third alarm

Fourth alarm

PV1 alarm information

SP1 channel settings

```
      <SetValue Register="A21"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL31" Trans="alarmTypesSP"></Type>
      <Value Register="ALM1" Mask="0x0004"></Value>
      <SetValue Register="A31"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL41" Trans="alarmTypesSP"></Type>
      <Value Register="ALM1" Mask="0x0010"></Value>
      <SetValue Register="A41"></SetValue>
    </Alarm>
  </Alarms>
</Channel>
<Channel Name="OUT1" DecimalPos="1" Min="0" Max="100" Unit="%">   OUT1 channel settings
  <Value Register="OUT1"></Value>
  <Alarms>
    <Alarm>
      <Type Register="AL11" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM1" Mask="0x0001"></Value>
      <SetValue Register="A11"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL21" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM1" Mask="0x0002"></Value>
      <SetValue Register="A21"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL31" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM1" Mask="0x0004"></Value>
      <SetValue Register="A31"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL41" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM1" Mask="0x0010"></Value>
      <SetValue Register="A41"></SetValue>
    </Alarm>
  </Alarms>
</Channel>
<Channel Name="HOUT1" DecimalPos="1" Min="0" Max="100" Unit="%">
  <Value Register="HOUT1"></Value>
  <Alarms>
    <Alarm>
      <Type Register="AL11" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM1" Mask="0x0001"></Value>
      <SetValue Register="A11"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL21" Trans="alarmTypesOUT"></Type>
```

```
        <Value Register="ALM1" Mask="0x0002"></Value>
        <SetValue Register="A21"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL31" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM1" Mask="0x0004"></Value>
        <SetValue Register="A31"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL41" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM1" Mask="0x0010"></Value>
        <SetValue Register="A41"></SetValue>
      </Alarm>
    </Alarms>
  </Channel>
  <Channel Name="COUT1" DecimalPos="1" Min="0" Max="100" Unit="%">
    <Value Register="COUT1"></Value>
    <Alarms>
      <Alarm>
        <Type Register="AL11" Trans="alarmTypesCOUT"></Type>
        <Value Register="ALM1" Mask="0x0001"></Value>
        <SetValue Register="A11"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL21" Trans="alarmTypesCOUT"></Type>
        <Value Register="ALM1" Mask="0x0002"></Value>
        <SetValue Register="A21"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL31" Trans="alarmTypesCOUT"></Type>
        <Value Register="ALM1" Mask="0x0004"></Value>
        <SetValue Register="A31"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL41" Trans="alarmTypesCOUT"></Type>
        <Value Register="ALM1" Mask="0x0010"></Value>
        <SetValue Register="A41"></SetValue>
      </Alarm>
    </Alarms>
  </Channel>
  <Channel Name="PIDNO1" DecimalPos="0" Min="0" Max="8">
    <Value Register="PID1"></Value>
  </Channel>
  <Channel Name="PV2">
    <Init>
      <DecimalPos Register="PDP2"></DecimalPos>
      <Min Register="PRL2"></Min>
      <Max Register="PRH2"></Max>
      <Unit Register="PUNI2" Trans="temperature"></Unit>
```

```
  </Init>
  <Value Register="PV2">
   <PlusOver Register="PVERROR2" Mask="0x0010"></PlusOver>
   <MinusOver Register="PVERROR2" Mask="0x0020"></MinusOver>
   <DataError Register="PVERROR2" Mask="0x4000"></DataError>
   <Burnout>
    <Type Register="BSL"></Type>
    <Value Register="PVERROR2" Mask="0x0001"></Value>
   </Burnout>
  </Value>
  <Alarms>
   <Alarm>
    <Type Register="AL12" Trans="alarmTypesPV"></Type>
    <Value Register="ALM2" Mask="0x0001"></Value>
    <SetValue Register="A12"></SetValue>
   </Alarm>
   <Alarm>
    <Type Register="AL22" Trans="alarmTypesPV"></Type>
    <Value Register="ALM2" Mask="0x0002"></Value>
    <SetValue Register="A22"></SetValue>
   </Alarm>
   <Alarm>
    <Type Register="AL32" Trans="alarmTypesPV"></Type>
    <Value Register="ALM2" Mask="0x0004"></Value>
    <SetValue Register="A32"></SetValue>
   </Alarm>
   <Alarm>
    <Type Register="AL42" Trans="alarmTypesPV"></Type>
    <Value Register="ALM2" Mask="0x0010"></Value>
    <SetValue Register="A42"></SetValue>
   </Alarm>
  </Alarms>
 </Channel>
 <Channel Name="SP2">
  <Init>
   <DecimalPos Register="PDP2"></DecimalPos>
   <Min Register="PRL2"></Min>
   <Max Register="PRH2"></Max>
   <Unit Register="PUNI2" Trans="temperature"></Unit>
  </Init>
  <Value Register="CSP2"> </Value>
  <Alarms>
   <Alarm>
    <Type Register="AL12" Trans="alarmTypesSP"></Type>
    <Value Register="ALM2" Mask="0x0001"></Value>
    <SetValue Register="A12"></SetValue>
   </Alarm>
   <Alarm>
    <Type Register="AL22" Trans="alarmTypesSP"></Type>
```

```
        <Value Register="ALM2" Mask="0x0002"></Value>
        <SetValue Register="A22"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL32" Trans="alarmTypesSP"></Type>
        <Value Register="ALM2" Mask="0x0004"></Value>
        <SetValue Register="A32"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL42" Trans="alarmTypesSP"></Type>
        <Value Register="ALM2" Mask="0x0010"></Value>
        <SetValue Register="A42"></SetValue>
      </Alarm>
    </Alarms>
  </Channel>
  <Channel Name="OUT2" DecimalPos="1" Min="0" Max="100" Unit="%">
    <Value Register="OUT2"></Value>
    <Alarms>
      <Alarm>
        <Type Register="AL12" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM2" Mask="0x0001"></Value>
        <SetValue Register="A12"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL22" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM2" Mask="0x0002"></Value>
        <SetValue Register="A22"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL32" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM2" Mask="0x0004"></Value>
        <SetValue Register="A32"></SetValue>
      </Alarm>
      <Alarm>
        <Type Register="AL42" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM2" Mask="0x0010"></Value>
        <SetValue Register="A42"></SetValue>
      </Alarm>
    </Alarms>
  </Channel>
  <Channel Name="HOUT2" DecimalPos="1" Min="0" Max="100" Unit="%">
    <Value Register="HOUT2"></Value>
    <Alarms>
      <Alarm>
        <Type Register="AL12" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM2" Mask="0x0001"></Value>
        <SetValue Register="A12"></SetValue>
      </Alarm>
```

```
    <Alarm>
      <Type Register="AL22" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM2" Mask="0x0002"></Value>
      <SetValue Register="A22"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL32" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM2" Mask="0x0004"></Value>
      <SetValue Register="A32"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL42" Trans="alarmTypesOUT"></Type>
      <Value Register="ALM2" Mask="0x0010"></Value>
      <SetValue Register="A42"></SetValue>
    </Alarm>
  </Alarms>
</Channel>
<Channel Name="COUT2" DecimalPos="1" Min="0" Max="100" Unit="%">
  <Value Register="COUT2"></Value>
  <Alarms>
    <Alarm>
      <Type Register="AL12" Trans="alarmTypesCOUT"></Type>
      <Value Register="ALM2" Mask="0x0001"></Value>
      <SetValue Register="A12"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL22" Trans="alarmTypesCOUT"></Type>
      <Value Register="ALM2" Mask="0x0002"></Value>
      <SetValue Register="A22"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL32" Trans="alarmTypesCOUT"></Type>
      <Value Register="ALM2" Mask="0x0004"></Value>
      <SetValue Register="A32"></SetValue>
    </Alarm>
    <Alarm>
      <Type Register="AL42" Trans="alarmTypesCOUT"></Type>
      <Value Register="ALM2" Mask="0x0010"></Value>
      <SetValue Register="A42"></SetValue>
    </Alarm>
  </Alarms>
</Channel>
<Channel Name="PIDNO2" DecimalPos="0" Min="0" Max="8">
  <Value Register="PID2"></Value>
</Channel>
<Channel Name="SPNO" DecimalPos="0" Min="1" Max="8">
  <Value Register="CSPNO"></Value>
</Channel>
```

```
<Channel Name="AUTO/MAN" DecimalPos="0" Min="0" Max="1">
  <Value Register="MOD1" Mask="0x0001"></Value>
</Channel>
<Channel Name="AUTO/MAN/CAS" DecimalPos="0" Min="0" Max="2">
  <Value Register="MOD1" Mask="0x0070" Trans="AMCValue"></Value>
</Channel>
<Channel Name="LOCAL/REMOTE1" DecimalPos="0" Min="0" Max="1">
  <Value Register="MOD1" Mask="0x0002"></Value>
</Channel>
<Channel Name="LOCAL/REMOTE2" DecimalPos="0" Min="0" Max="1">
  <Value Register="MOD2" Mask="0x0002"></Value>
</Channel>
<Channel Name="RUN/STOP" DecimalPos="0" Min="0" Max="1">
  <Value Register="MOD1" Mask="0x0004"></Value>
</Channel>
<Channel Name="AutoTuning1" DecimalPos="0" Min="0" Max="1">
  <Value Register="MOD1" Mask="0x4000"></Value>
</Channel>
<Channel Name="AutoTuning2" DecimalPos="0" Min="0" Max="1">
  <Value Register="MOD2" Mask="0x4000"></Value>
</Channel>
<Channel Name="CTRLMODE" DecimalPos="0" Min="0" Max="100">
  <Value Register="CTRLMODE">
  </Value>
</Channel>
<Channel Name="CTRLTYPE1" DecimalPos="0" Min="0" Max="100">
  <Value Register="CTRLTYPEL1">
  </Value>
</Channel>
<Channel Name="CTRLTYPE2" DecimalPos="0" Min="0" Max="100">
  <Value Register="CTRLTYPEL2">
  </Value>
</Channel>
<Channel Name="C_AUTO/MAN" DecimalPos="0" Min="0" Max="1">
  <Value Register="AMR">
  <Write Register="AMW">
  </Write>
  </Value>
</Channel>
<Channel Name="C_AUTO/MAN/CAS" DecimalPos="0" Min="0" Max="2">
  <Value Register="CAMR">
  <Write Register="CAMW">
  </Write>
 </Value>
</Channel>
<Channel Name="C_RUN/STOP" DecimalPos="0" Min="0" Max="1">
  <Value Register="RSR">
  <Write Register="RSW">
  </Write>
```

```
  </Value>
</Channel>
<Channel Name="C_LOCAL/REMOTE1" DecimalPos="0" Min="0" Max="1">
  <Value Register="LRL1R">
  <Write Register="LRL1W">
  </Write>
  </Value>
</Channel>
<Channel Name="C_LOCAL/REMOTE2" DecimalPos="0" Min="0" Max="1">
  <Value Register="LRL2R">
  <Write Register="LRL2W">
  </Write>
  </Value>
</Channel>
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  <Value Register="ATL1R">
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  </Write>
  </Value>
</Channel>
<Channel Name="C_AUTOTUNING2" DecimalPos="0" Min="0" Max="9">
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  </Write>
  </Value>
</Channel>
<Channel Name="C_SPNO" DecimalPos="0" Min="1" Max="8">
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  <Write Register="SPNOW">
  </Write>
  </Value>
</Channel>
<Channel Name="C_MOUT1" DecimalPos="1" Min="0" Max="100" Unit="%">
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  <Write Register="MOUTL1W">
  </Write>
  </Value>
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      <SetValue Register="A11"></SetValue>
    </Alarm>
    <Alarm>
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      <Value Register="ALM1" Mask="0x0002"></Value>
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```

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      </Alarm>
      <Alarm>
        <Type Register="AL41" Trans="alarmTypesOUT"></Type>
        <Value Register="ALM1" Mask="0x0010"></Value>
        <SetValue Register="A41"></SetValue>
      </Alarm>
    </Alarms>
  </Channel>
  <Channel Name="C_MCOUT1" DecimalPos="1" Min="0" Max="100" Unit="%">
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    <Write Register="MOUTCL1W">
    </Write>
    </Value>
    <Alarms>
      <Alarm>
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      </Alarm>
      <Alarm>
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      </Alarm>
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      </Alarm>
    </Alarms>
  </Channel>
  <Channel Name="C_MOUT2" DecimalPos="1" Min="0" Max="100" Unit="%">
    <Value Register="MOUTL2R">
    <Write Register="MOUTL2W">
    </Write>
    </Value>
    <Alarms>
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```

```
      <SetValue Register="A12"></SetValue>
    </Alarm>
    <Alarm>
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      <SetValue Register="A22"></SetValue>
    </Alarm>
    <Alarm>
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    </Alarm>
    <Alarm>
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      <Value Register="ALM2" Mask="0x0010"></Value>
      <SetValue Register="A42"></SetValue>
    </Alarm>
   </Alarms>
  </Channel>
 <Channel Name="C_MCOUT2" DecimalPos="1" Min="0" Max="100" Unit="%">
   <Value Register="MOUTCL2R">
   <Write Register="MOUTCL2W">
   </Write>
   </Value>
   <Alarms>
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      <SetValue Register="A12"></SetValue>
    </Alarm>
    <Alarm>
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      <Value Register="ALM2" Mask="0x0002"></Value>
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    </Alarm>
    <Alarm>
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   </Alarms>
  </Channel>
</Channels>
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    <Value From="0x0040" To="1"></Value>
    <Value From="0x0010" To="2"></Value>
  </Table>
  <Table Name="temperature" ToDataType="String">
    <Value From="0" To=" "></Value>
    <Value From="1" To="°C"></Value>
    <Value From="2" To=" "></Value>
    <Value From="3" To=" "></Value>
    <Value From="4" To=" "></Value>
    <Value From="5" To="°F"></Value>
  </Table>
  <Table Name="alarmTypesPV" ToDataType="String">
    <Value From="0" To="OFF"></Value>
    <Value From="1" To="H"></Value>
    <Value From="2" To="L"></Value>
    <Value From="3" To="ETC"></Value>
    <Value From="4" To="ETC"></Value>
    <Value From="5" To="ETC"></Value>
    <Value From="6" To="ETC"></Value>
    <Value From="7" To="ETC"></Value>
    <Value From="8" To="ETC"></Value>
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    <Value From="17" To="ETC"></Value>
    <Value From="18" To="ETC"></Value>
    <Value From="19" To="ETC"></Value>
    <Value From="20" To="ETC"></Value>
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    <Value From="22" To="ETC"></Value>
    <Value From="23" To="ETC"></Value>
    <Value From="24" To="ETC"></Value>
    <Value From="25" To="ETC"></Value>
    <Value From="26" To="ETC"></Value>
    <Value From="27" To="ETC"></Value>
    <Value From="28" To="ETC"></Value>
    <Value From="29" To="ETC"></Value>
    <Value From="30" To="ETC"></Value>
    <Value From="31" To="ETC"></Value>
  </Table>
```

```
  <Table Name="alarmTypesSP" ToDataType="String">
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    <Value From="4" To="L"></Value>
    <Value From="9" To="H"></Value>
    <Value From="10" To="L"></Value>
    <Value From="11" To="ETC"></Value>
    <Value From="12" To="ETC"></Value>
    <Value From="13" To="ETC"></Value>
    <Value From="14" To="ETC"></Value>
  </Table>
 <Table Name="alarmTypesOUT" ToDataType="String">
    <Value From="15" To="H"></Value>
    <Value From="16" To="L"></Value>
  </Table>
  <Table Name="alarmTypesCOUT" ToDataType="String">
    <Value From="17" To="H"></Value>
    <Value From="18" To="L"></Value>
  </Table>
 </TransTables>
</ModbusDevice>[EOF]
```

Appendix 3 GA10 Storage Data Size

The following table shows a guideline of the GA10's record file sizes.
Note that using the report/print function (/RP option) to perform printing will consume a free hard disk space twice the total file size shown in the following table.

Calculation of Each Block Size in Files

Block	Size (Byte)
Common	2568
Group information	24 + (208 + 216 x the number of channels assigned to each display group) x the number of groups
Channel information	24 + 408 × the number of channels
Message information	72 + 200 × the number of messages
Recorded data	424 + 16 × the number of channels + (16 + data size × the number of channels) × the number of data points.

- Substitute the following for the "data size" and "number of data points" of recorded data.
  Data size: Up to 6 bytes
  Number of data points: Recording time/recording interval.
- Use the calculated file size as a rough guide.

Calculation Example

The file size will be calculated for 500 channels, 1 s recording interval, 10 display groups, 50 channels which are assigned to each display group, 10 messages, and 1 hour recording.

Block	Size (Byte)
Common	2568
Group information	24 + (208 + 216 x 50) x 10 = 110104
Channel information	24 + 408 x 500 = 204024
Message information	72 + 200 × 10 (the number of messages) = 2072
Recorded data	424 + 16 x 500 + (16 + 6 x 500) x 3600 = 10866024

File sizes = Common + Group information + Channel information + Message information + Recorded data = 11184792 bytes
11184792 (byte) /1024/1024 =10.66665 (MB) = Approximately 11 MB.

Size of the file created will be about 11 MB. Using the report/print function will consume about 21 MB of hard disk space.

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