User's Manual

WX1 GateCONTROL

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YOKOGAWA
Yokogawa Electric Corporation

IM WX1-07E
8th Edition

This manual describes the functions and operating procedures of GateCONTROL. To ensure correct use, please read this manual thoroughly before beginning operation. After reading the manual, keep it in a convenient location for quick reference in the event a question arises.
GateCONTROL is a software driver that uses the Modbus/RTU or Modbus/TCP protocol to acquire data from Yokogawa temperature controllers, signal conditioners, and other instruments, and then transfer that data to DAQLOGGER or Remote Monitor.

Note

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End of document

Overview of This Manual

Structure of The Manual

This user's manual consists of the following chapters.

Chapter	Title	Description
1	**Overview**	Gives an overview of the GateCONTROL software. Lists the PC requirements for running GateCONTROL and gives information about system configuration.
2	**Operating**	Gives procedures for entering environment and data acquisition. Procedures interval settings, and how to monitor the operational status of the software.
3	**Functions**	Provides a detailed description of the functions of GateCONTROL. Lists error messages, their causes, and their corrective actions.
Index		An alphabetical index of the manual's contents.

Scope of the Manual

This manual does not explain the basic operations of your PC's operating system (OS). For information regarding the basic operations of Windows, see the Windows user's manual.

Conventions Used in This Manual

- Units
  K Denotes 1024. Example: 10 KB
  M Denotes 1024K. Example: 10 MB
  G Denotes 1024M. Example: 2 GB

- Boldface Type
  Hardware and software controls that the user manipulates such as dialog boxes, buttons, and menu commands are often set in boldface type.

- Subheadings
  On pages in chapters 1 through 3 that describe operating procedures, the following subheadings are used to distinguish the procedure from their explanations.

Procedure This subsection contains the operating procedure used to carry out the function described in the current section. All procedures are written with inexperienced users in mind; experienced users may not need to carry out all the steps.

Note Calls attention to information that is important for proper operation of the instrument.

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1.1 Overview of GateCONTROL Functions

GateCONTROL is a software driver that acquires data from temperature controllers and signal conditioners that support data input/output via the Modbus/RTU and Modbus/TCP protocols, and in addition to transferring the data to Yokogawa's DAQLOGGER or Remote Monitor software, can write output requests from AddObserver to temperature controllers. Using GateCONTROL allows you to easily monitor data on DAQLOGGER or Remote Monitor that is input for measurement on temperature controllers and signal conditioners. Also, it is now possible to operate a controller from AddObserver through GateCONTROL.

DAQLOGGER is application software for the PC that enables communication between the PC and various types of recorders as well as monitoring of data logged by those recorders. A direct connection can be made for communications between DAQLOGGER and the µR1000/µR1800, VR, DARWIN, DX, MV, and CX recorders by Yokogawa.
Remote Monitor is application software that enables monitoring of data logged by recorders or data logging software.
AddObserver is a software program that allows the user to create original screens for displaying measured data, and for operating instruments.

Features

- Up to thirty-two temperature controllers and signal conditioners can be connected.
- The main registers of each instrument are automatically assigned as tag information using the Automatic Model Determination function.
- Arbitrary registers can be registered as tags.

1.2 System Overview

System

This software can open communication with Yokogawa temperature controllers and signal conditioners, perform data acquisition, and write the data.
The supported temperature controllers and signal conditioners are the ones below that support the Modbus/RTU or Modbus/TCP protocol. The product may not support GateCONTROL depending on its firmware revision number. For information on how to check the firmware revision number of your MODBUS instrument, and whether or not a connection with GateCONTROL can be made, please contact the dealer from which you purchased the instrument.

Temperature controllers	UT130, UT150, UT152, UT155, UP150
Digital indicating controllers	UT320, UT321, UT350, UT351, UT420, UT450, UT520, UT550, UT551, UT750, US1000, UT55A*, UT52A*, UT35A*, UT32A*
Program controllers	UP350, UP351, UP550, UP750, UP55A*, UP35A*
Digital indicators with alarms	UM330, UM331, UM350, UM351, UM33A*
Signal conditioners and conditioners	VJA7, VJH7, VJP8, VJQ7, VJQ8, VJS7, VJU7, VJX7
Digital alarm configurators	MVHK, MVRK, MVTK

* Can only be connected when C.GRN=ON on the UT55A ,UT52A, UT35A, UT32A, UP55A, UP35A or UM33A. For information on the C.GRN setting, see the respective user's manuals.

Supported Operating Systems

Run DAQWORX under any of the following operating systems.

- Windows 2000 Professional SP4
- Windows XP Home Edition SP3
- Windows XP Professional SP3 (excluding Windows XP Professional x64 Editions)
- Windows Vista Home Premium SP2 (excluding the 64-bit editions)
- Windows Vista Business SP2 (excluding the 64-bit editions)
- Windows 7 Home Premium, SP1 (32-bit and 64-bit editions)
- Windows 7 Professional, SP1 (32-bit and 64-bit editions)

The language displayed by the software under different language versions of the OS are as follows.

OS Language	Software Language
Japanese	Japanese
Other	English

Hardware Requirements

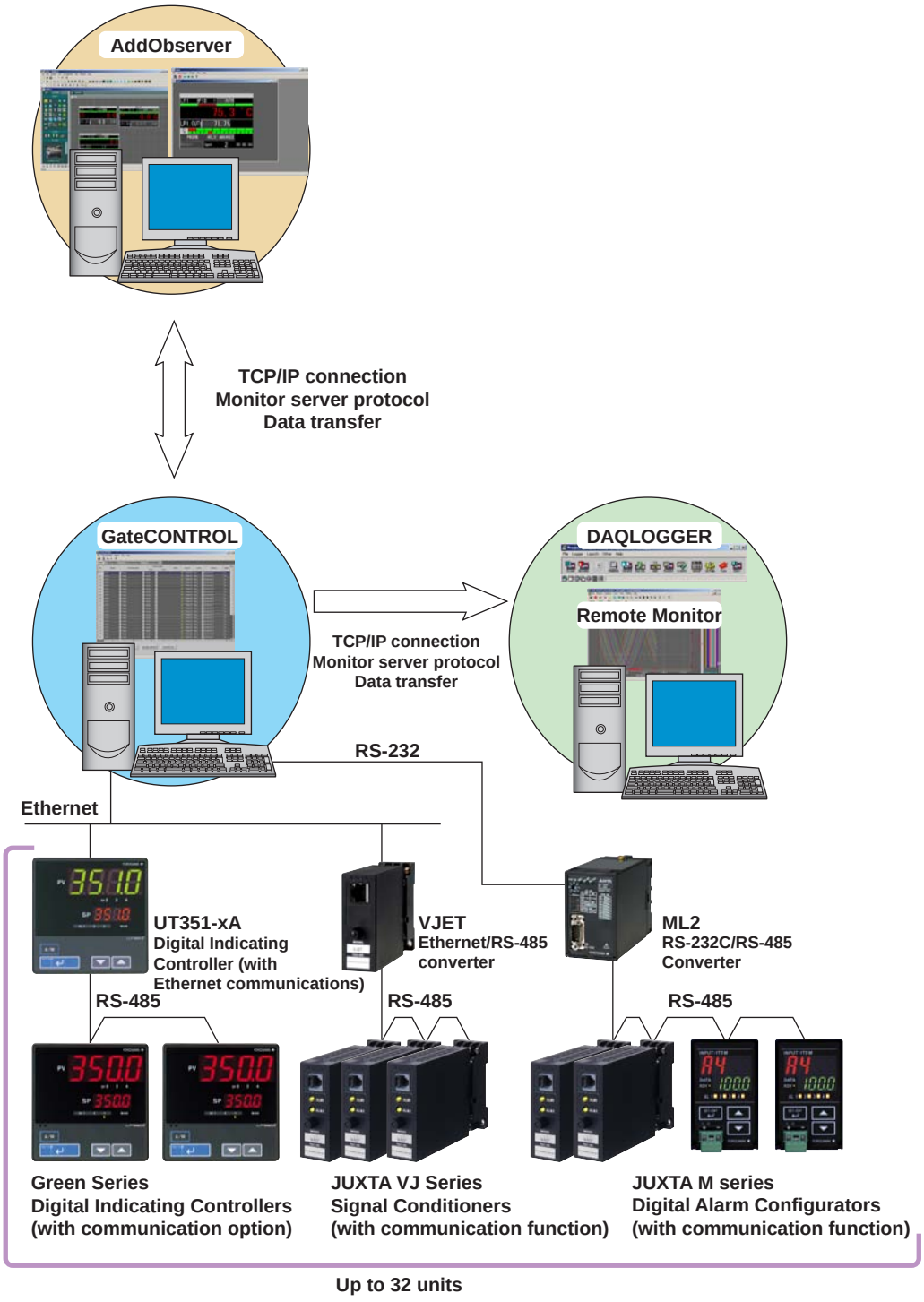
The following hardware and software are required to use GateCONTROL.

- PC: A PC that runs one of the OS above, and that meets the following CPU and memory requirements.
  When Using Windows 2000 or Windows XP
  Pentium 4, 1.6 GHz or faster Intel x64 or x86 processor; 512 MB or more of memory
  When Using Windows Vista
  Pentium 4, 3 GHz or faster Intel x64 or x86 processor; 2 GB or more of memory
  When Using Windows 7
  32-bit edition: Intel Pentium 4, 3 GHz or faster x64 or x86 processor; 2 GB or more of memory
  64-bit edition: Intel x64 processor that is equivalent to Intel Pentium 4, 3 GHz or faster; 2 GB or more of memory
- Free disk space: 200 MB or more
- Communication interface:
  An Ethernet (when connecting to DAQLOGGER or Remote Monitor) or RS-232 port that is recognized by the operating system.
- CD-ROM drive: Used to install the software.
- Peripheral devices: A mouse supported by the operating system.
- Monitor: A video card that is recommended for the OS and a display that is supported by the OS, has a resolution of 1024×768 or higher, and that can show 65,536 colors (16-bit, high color) or more.

Note

An RS-232 to RS-485 converter is required to perform communications between the software and another Modbus/RTU (RS-485) device (Yokogawa ML2 RS232C/RS485 converter recommended).

System Configuration



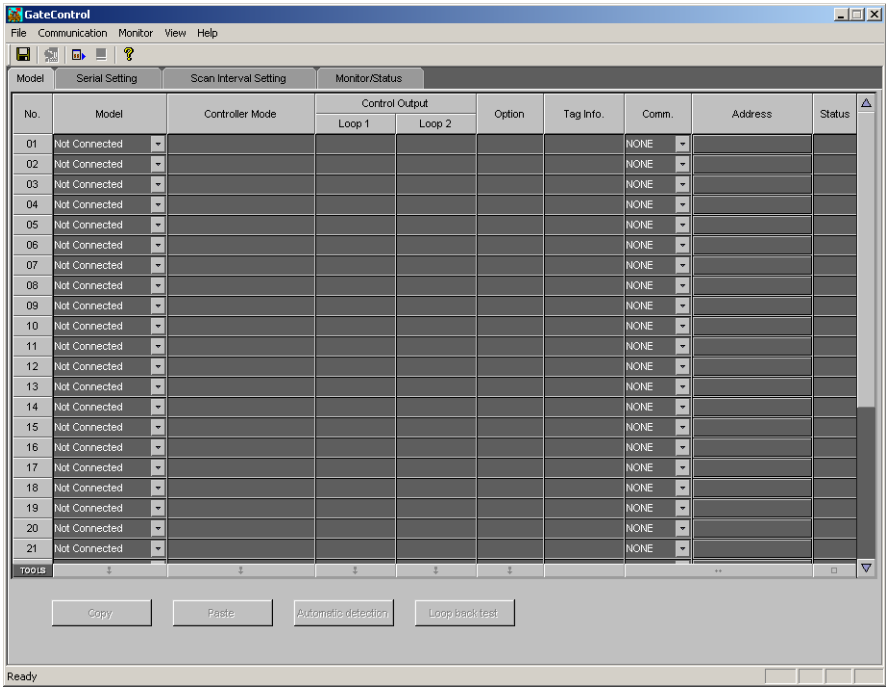
2.1 Running and Exiting GateCONTROL

Running the Software

Procedure

1. From the Windows Start menu, choose **Programs > YOKOGAWA DAQWORX > GateCONTROL > GateCONTROL**.

   GateCONTROL starts.



Note

- When you start GateCONTROL it is restored to the same status that was active during the previous session.
- If the program is closed while a process or service is running, the license will be considered to be “in use.” If the message, “Invalid license number. Please reinstall.” appears when restarting the program, it may indicate that the user is attempting to run a Gate program in excess of the number of available licenses.

Exiting the Software

Procedure

1. Choose **File > Exit** from the menu bar, or click the **X** button at the right end of the title bar.

   GateCONTROL closes.

2.2 Entering Environment Settings

This software includes an automatic model determination function, enabling automatic acquisition of the connected devices' (temperature controllers and signal conditioners) model names, tag information, and Modbus address when you enter the appropriate serial port settings, IP addresses, and/or port numbers.
The following environment settings are entered.

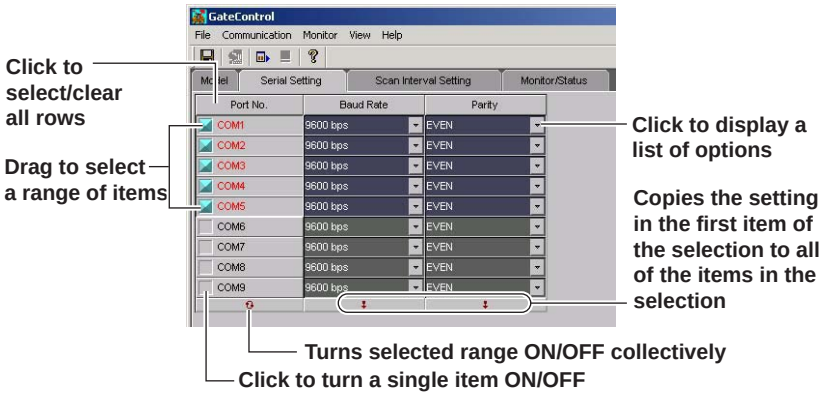
- Serial port settings (when the communication mode is COM)
- Settings for the connected devices
- Data acquisition condition
- TCP/IP port settings for the monitor server
- Tag settings (enter the tag name and decimal place as needed)

Serial Port Settings (When the Communication Mode is COM)

Procedure

1. Click the **Serial Setting** tab or choose **View > Serial Setting** from the menu bar.

The Serial Setting page in displayed.



2. Turn ON the port numbers to be used, and set the baud rate, and parity.

Port number:	ON (blue)/OFF (gray)
Baud rate:	4800, 9600, 19200, 38400
Parity:	NONE, ODD, EVEN

Settings for the Connected Devices

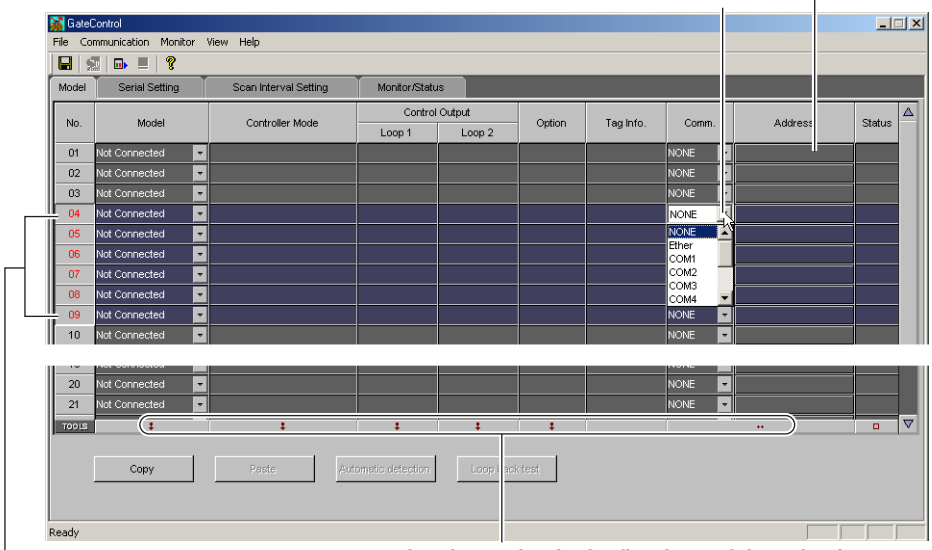
Register all devices that you will operate and from which you will acquire data.

Procedure

1. Click the **Model** tab or choose **View > Model** from the menu bar. The **Model Setting** tab is displayed.

When Ether communication is selected, clicking here displays a dialog box for setting the IP address, port number, and Modbus address.
If COM1-COM9 is selected, a dialog box for setting the Modbus address appears.

Click to display a list box for selecting a communication port
Only enabled COM ports (specified in serial port settings) are displayed



Drag to select a range of items

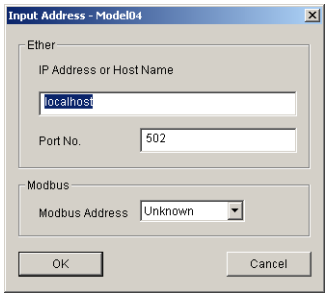
Copies the setting in the first item of the selection to all of the items in the selection

2. Select the port to be used from the Communication Method list box.

If using an Ethernet port: Ether
If using a COM port: COM1–COM9

IP Address and Port Number (If Ethernet Is Selected for the Port)

3. Click an address. The **Address Setting** dialog box opens.



4. Enter the IP address (or host name) and port number.

IP address: Enter the IP address or host name set on the device to which you wish to connect.
Port no.: 502
Modbus address: 1–9

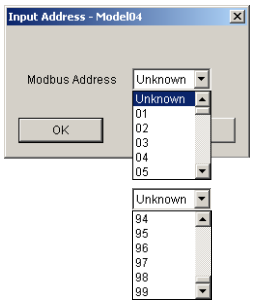
(If you will perform automatic model determination, including for the Modbus address, select Unknown.)

Note

The default port number for Modbus/TCP is 502. If no particular specification has been made on the device, use this number.

Modbus Address (for Ports Set to COM)

3. Click an address. The **Address Selection** dialog box opens.



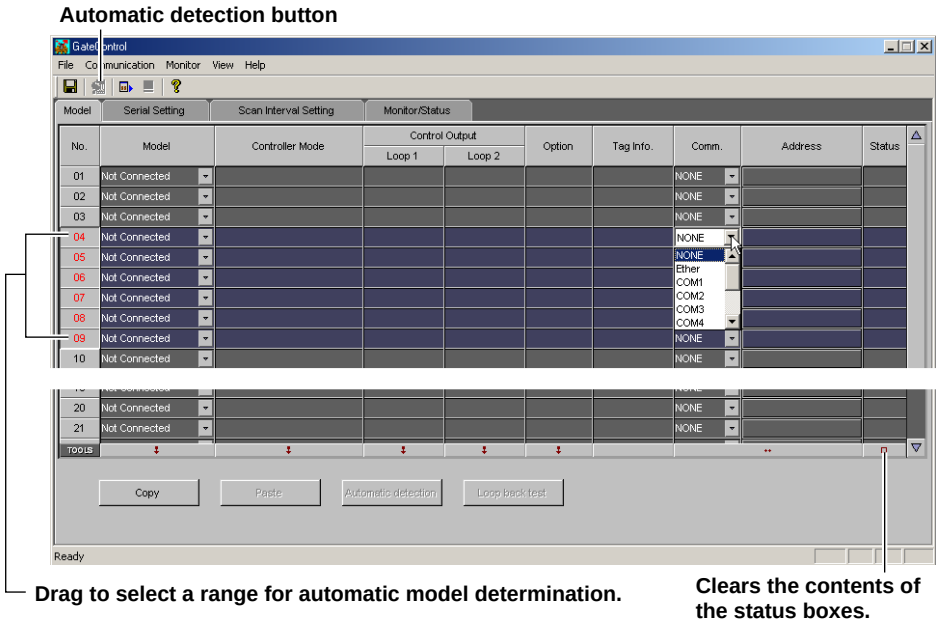
4. Enter the Modbus address.

Modbus address: 1–99

If you will perform automatic model determination including for the Modbus address, choose Unknown.

Automatic Model Determination

5. After specifying the communication methods and addresses, drag numbers to specify the range for automatic model determination.



6. Click the **Automatic detection** button at the bottom of the screen, click the **Automatic determination** button in the toolbar, or choose **Communication > Automatic detection** from the menu bar.

Model name, control mode, control output, option functions, and tag information is automatically acquired. A loop back test is also executed at the same time. If the test concludes without errors, a status of “OK” is displayed. (“Not OK” is displayed if an abnormality occurred.)

Note

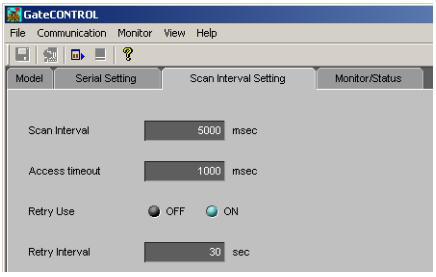
- If you connect to an unsupported devices, “Unknown” is displayed for the model.
- It is not supported in the UP55A’s remote-mode operation. If the operation mode is REMOTE, it is handled as LOCAL.
- If the result, model name, control mode, control output or option functions found by automatic model determination differ, the tag list in the tag settings dialog box is initialized. If the tag list was modified from the initial condition, the message, “OK to initialize tag list?” is displayed. Click the Yes button to implement the search results and initialize the tag list. Click the Cancel button to quit without applying the results of automatic model determination to the model settings page.
- The automatic model determination function registers the UT55A as the UT551, the UT52A as the UT520, the UT35A as the UT351, the UT32A as the UT321, UP55A as the UP550 and the UM33A as the UM331. The position proportional type UT35A, UT32A, UP55A and UP35A are registered as the standard type UT351, UT321, UP550 and UP35A, respectively. Heating / cooling type UT52A are registered as the Heating / cooling type UT551.
  From the above, the one actually connected may differ from the one displayed on screen, as follows.

Displayed	Actually connected model
UT551	UT55A, UT52A
UT520	UT52A
UT351	UT35A
UT321	UT32A
UP550	UP55A
UM331	UM33A

Data Acquisition Conditions

Procedure

1. Click the **Scan Interval Setting** tab or choose **View > Scan Interval Setting** from the menu bar.



2. Set the scan interval, access timeout, retray use, and retry interval.

Scan interval:	0.5–60 s (or 500–60000 ms: initial value is 1000 ms)
Access timeout:	1–10 sec (or 1000–10000 ms: initial value is 5000 ms)
Retry Use:	Select whether or not to retry communications (ON/OFF).
Retry interval:	The interval between communication retries (30–3600 sec).

Note

- Retries are performed every scan interval at the specified retry interval until communication is restored. Retries are also performed on instruments with which a communication error occurred during the first communication. At the point that communication is restored, alarm values and other information are retrieved from the connected temperature controllers or signal conditioners and data is acquired.
- If Retry is turned OFF, you can retry the connection manually by clicking the Retry Connection button on the Monitor/Status tab.

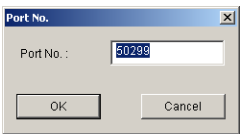
TCP/IP Settings for the Monitor Server Port

The port number need not be changed unless desired.

Procedure

1. Choose **File > Port No.** from the menu bar.

The **Port No.** for the internal communication dialog box opens.

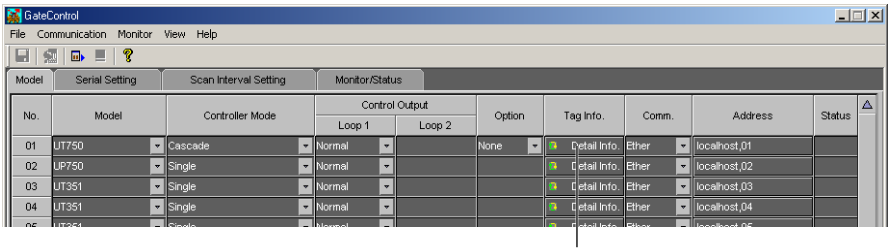


2. Enter the port number used to transfer data loaded from a connected device to DAQLOGGER, Remote Monitor or AddObserver.

Tag Settings

Procedure

1. Click the Detail Settings in the tag information column of the model you wish to set in the Model Settings page.

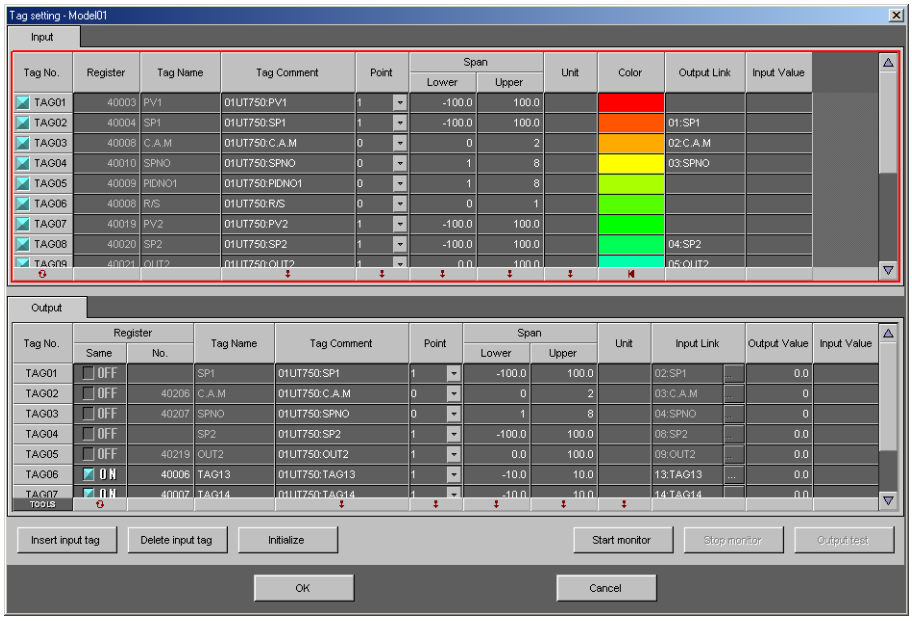


Click to Tag Setting dialog box

The Tag Setting dialog box opens.

One of the following tag names that was reserved is displayed.

PV1	A/M1	R/P1/P2	TME1	TME11	C.A.M1
PV2	A/M2	HOLD	TME2	TME12	C.A.M2
SP1	C.A.M	PVE1	TME3	TME13	O/C
SP2	R/L1	PVE2	TME4	TME14	INPUT
OUT1	R/L2	PVE3	TME5	TME15	ADVANCE
OUT2	SPNO	PVE4	TME6	TME16	RUN
HOUT1	PIDNO1	PVE5	TME7	PTNO	
HOUT2	PIDNO2	PVE6	TME8	SEGNO	
COUT1	R/S	PVE7	TME9	TIME	
COUT2	R/P/L	PVE8	TME10	LSP/CAS	



The tag settings include an input tab page and an output tab page.

Maximum number of input tags: 48

Maximum number of output tags: 32

The active page is surrounded by a red frame. You can click anywhere on an input/output tab page to move the red frame.

The list of registered tags is determined by the model, control mode, control output, and option functions. Default tag list items displayed in gray cannot be changed. Also, the default tag list cannot be deleted.

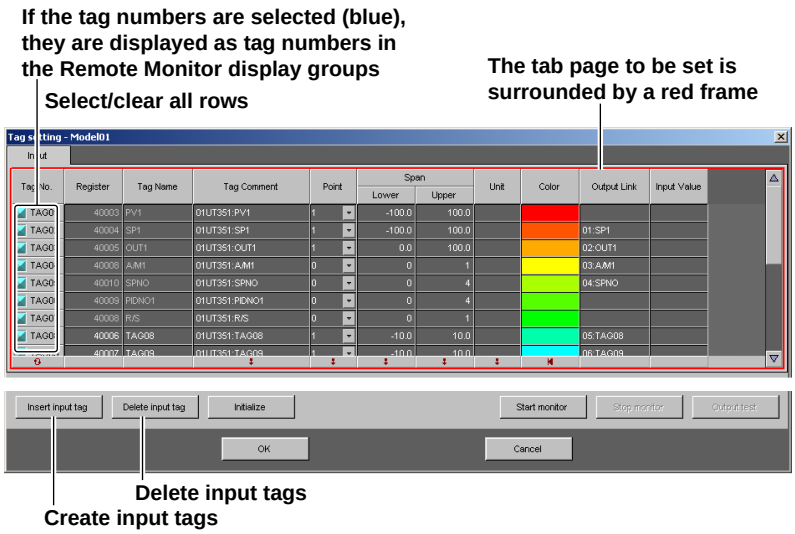
2. If you performed automatic model determination, the tag information acquired from the connected devices is displayed.

If links are set, the edited contents are reflected on the linked channels.

Note

The UT55A, UT52A, UT35A, UT32A, UP55A and UP35A's numbers of PID and SP groups correspond to GateCONTROL's PIDNO and SPNO span maximum values, respectively.
The numbers of PID and SP groups can be set separately on the UT55A and UT52A, but in GateCONTROL's Tag setting dialog box, the same SP group is used as the PIDNO and SPNO span maximum.
On the UT35A and UT32A, you can set the number of PID groups and SP groups to a number from 1 to 4, but the SPNO and PIDNO span maximum values are set to 4.
On the UP55A, you can set the number of PID groups to a number from 1 to 8, but the PIDNO1 and PIDNO2 span maximum values are set to 8. On the UP35A, you can set the number of PID groups to a number from 1 to 4, but the PIDNO1 span maximum values are set to 4.

Editing the Input Tag Page



Tag No.: Select to use (blue) or not use (gray) the selected tag numbers.

Register number: Shows the reference location of each register.
Setting range: 40001 to 49999
When Same on the Output tab page is ON (blue), the edited results are reflected on the output tab page. Register numbers cannot be duplicated (duplicate register numbers are allowed for the default tags because the bit position of the referenced value is different).

Tag name: Specify using eight alphanumeric characters or fewer. In the Remote Monitor, this is displayed as a channel name.
Tag names cannot be duplicated. Also, tags to which reserved tag names have been added cannot be used.

Tag comment: Specify using sixteen alphanumeric characters or fewer.
In the Remote Monitor, this is displayed as a tag comment.

Decimal point: Set the decimal place to offset the register value. Select 0, 1, 2, 3, 4, or 5. The initial values vary depending on the type of tag. If automatic model determination is performed, the decimal point of the connected device is displayed.

Span minimum/maximum:
Setting range: –1E16 to 1E16
The initial values vary depending on the type of tag. If automatic model determination is performed, the setting value of the connected device is displayed.
On the client side this is handled as the minimum/maximum of scale.

Units: Specify using six alphanumeric characters or fewer. The initial values vary depending on the type of tag. If automatic model determination is performed, the units set on the connected device are displayed.

Color: Click the colored part to open the Color Settings dialog box. An arbitrary color can be entered.

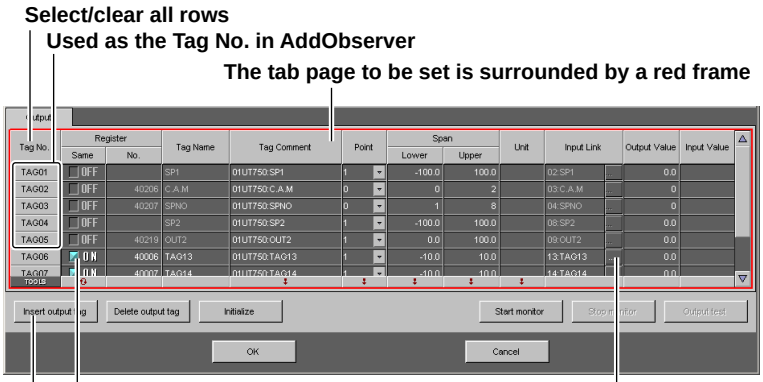
Output link: Displayed in the format xx:tag name where xx is the output tag number. Displays the tag for output that is linked to the input tag. This cannot be changed.

Loaded value: Displays the tag name value loaded from the connected device when the monitor is executed. "Error" is displayed if a communication error occurs.

Note

The tag number use/do not use settings are those of the ON/OFF display conditions of the Remote Monitor.
The color setting is the display color of the Remote Monitor.

Editing the Output Tab Page



Tag No.: Used as Tag No. in AddObserver

Registers: Same:When selected (ON), the output register number is applied to the input register number.
No.:Shows the location of the tag write register. However, since in the case of SP there are multiple registers to be written, a register number is not displayed. Register numbers cannot be duplicated.

Tag name: Specify using eight alphanumeric characters.
Used as Channel Name in AddObserver.
Tag names cannot be duplicated. Also, tags to which reserved tag names have been added cannot be used.

Tag comment: Specify using sixteen alphanumeric characters or fewer.
In AddObserver, this is displayed as a tag comment.

Decimal point: Set the offsetting decimal place for writing to registers. Select 0, 1, 2, 3, 4, or 5.

Span minimum/maximum:

Setting range: –1E9 to 1E9

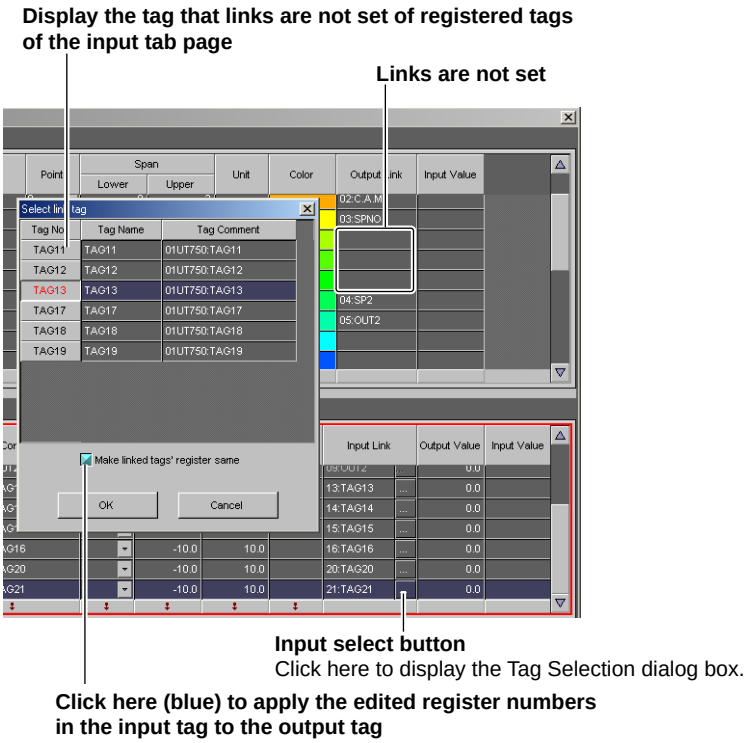
If the value requested by AddObserver is outside of the span range, it is not output.

Units: Specify using six alphanumeric characters or fewer.

Note

Registers 41280 (UTM, USM, UPM) and 41281 (SMP) of the UT520, UT550, UT551, UT750, US1000, UP550, and UP750 cannot be written using the Modbus/RTU, Modbus/TCP protocol. Please make note of this.

Input link: Displays and selects the tag for intput that is linked to the output tag. Displayed in the format xx:tag name where xx is the input tag name. When you click an input select button, the tag selection dialog box is displayed.



Output value: Specifies an output value for the output test.

Range: –1E9 to 1E9

Loaded value: The output register value is displayed after the output test.

If the output value is outside of the output span, “Out range” is displayed. If a communication error occurs during output, “Com error” is displayed.

Tag Setting Execution Button

Insert input tags, insert output tags:

Insert a tag in the last line of the tag numbers.

Cannot be performed during testing.

Delete input tags, delete output tags:

Deletes the selected tag. If a tag is deleted, the tag numbers are refreshed.

With deletion of input tags, the linked output tags are also deleted.

With deletion of output tags, the linked input tags are not deleted but the link is cleared.

Default tags cannot be deleted.

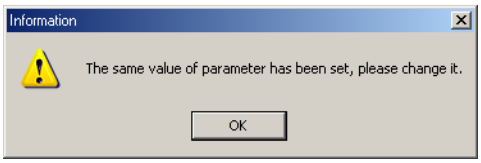
Cannot be performed during testing.

Initialization: Added tags are all deleted, and the tag list returns to the default condition.

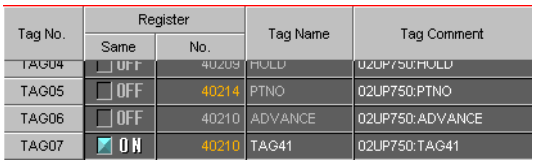
OK: The settings in the tag settings dialog box are saved, and the dialog box closes.

When testing, the settings are saved after the test is completed, and the dialog box closes.

If register or tag names are duplicated, the dialog box below is displayed.



Duplicate register numbers and tag names are displayed in yellow.



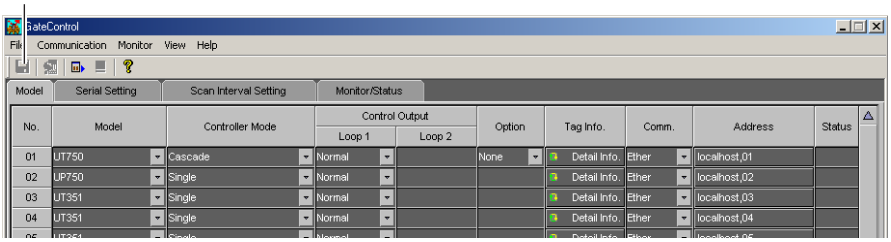
2.3 Saving and Restoring Environment Settings

Saving Environment Settings

Procedure

1. Click the **Save** button or choose **File > Save** from the menu bar.

Save button



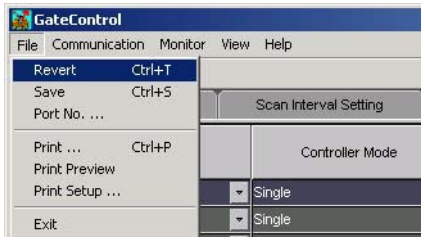
The current settings are saved.

Restoring Environment Settings

This procedure clears all settings currently being entered and restores the most recently saved settings.

Procedure

1. Choose **File > Revert** from the menu bar.



2.4 Starting/Stopping Data Acquisition

When you start data acquisition using this software, data from connected devices (temperature controllers and signal conditioners) is loaded, transferred to DAQLOGGER or Remote Monitor, and output requests from AddObserver are written to connected devices.

Note

The maximum number of DAQLOGGERs, Remote Monitors, or AddObservers that can be connected at once is sixteen.

Starting Data Acquisition

Procedure

1. Enter environment settings. (See section 2.2, “Entering Environment Settings.”)

Running from the Toolbar/Menu Bar

2. Click the **Start** button or choose **Monitor > Start** from the menu bar.

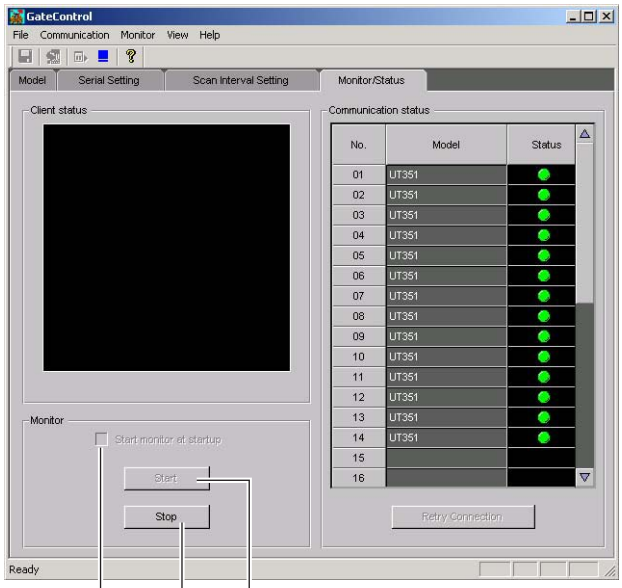
The status of communication with the device is displayed in the **Monitor/Status** tab under Communication status. Under Client status, the name of the connected client, connection status, and the address of any disconnected DAQLOGGERs, Remote Monitors, and AddObserver is displayed.

Starting (Executing) from the Monitor/Status Tab

2. Click the **Start** button on the **Monitor/Status** tab.

The name of connected clients and their communication statuses are displayed.

Maximum number of display of clients communication statuses is 48.



Starting the Software and Data Acquisition at the Same Time

3. When you turn ON “Start monitor at startup” in the **Monitor/Status** tab, data acquisition starts at the same time that the software is started.

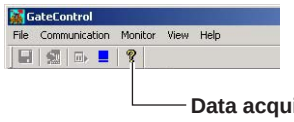
Stop data acquisition

Procedure

Stopping Acquisition from the Toolbar/Menu Bar

1. Click the **Stop** button or choose **Monitor > Stop** from the menu bar.

Nothing is displayed for the communication of connected devices.



Stopping Acquisition from the Monitor/Status Tab

1. Click the **Stop** button on the **Monitor/Status** tab.

Nothing is displayed for the communication of connected devices.

2.5 Performing Communication Tests of Connected Devices

Before starting data acquisition, you can perform a loop back test, read test, and write test between connected devices.

Performing the Loop Back Test

Using the loop back test you can check the specified communication method and connection status with the device at the specified address.

Note

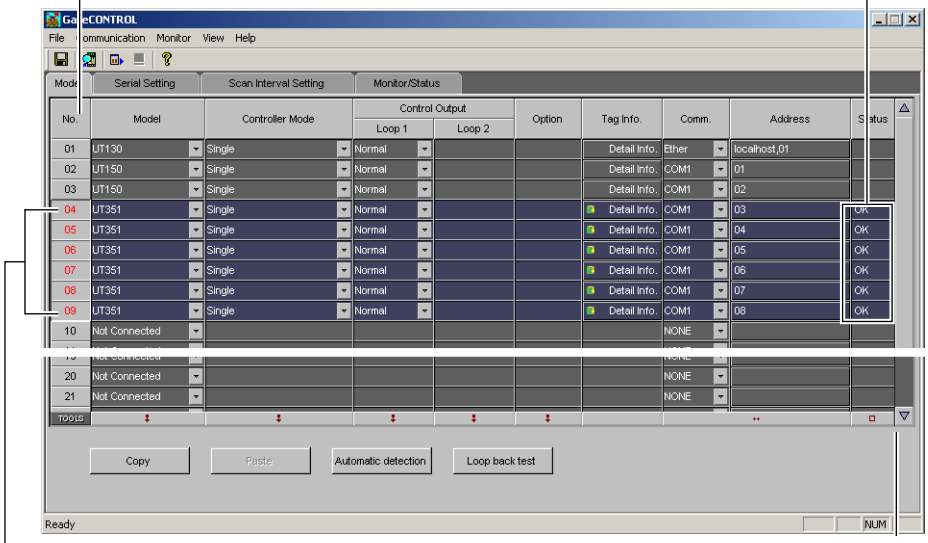
The loop back test can not be performed during data acquisition.

Procedure

1. Click the **Model** tab or choose **View > Model** from the menu bar.
The **Model** tab is displayed.

Result appears
OK: Normal
Not OK: No response

Select/clear all items



Drag to select a range for collective setting or the loop back test

Click to clear the contents of the status

2. Drag to select the numbers on which you wish to perform the loop back test.

3. Click the Loop Back Test button.
The result appears in the status column.
OK: Normal
Not OK: No response

Note

- If the result is Not OK, check whether the communication settings of the software and target device match.
- If the loop back test will be performed on multiple devices, individual tests are performed even if a communication error occurs part way through.

Performing Read and Write Tests

You can check the data of the registers specified in the input tab page (monitor execution) by performing a read test.
Also, you can perform a write test to the registers specified in the output tab page during monitor execution.

Note

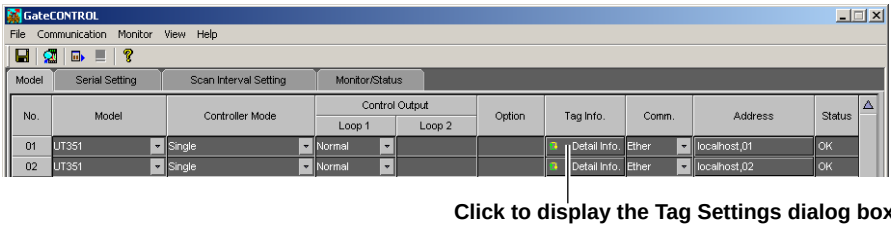
The Read and Write tests cannot be performed during data acquisition.

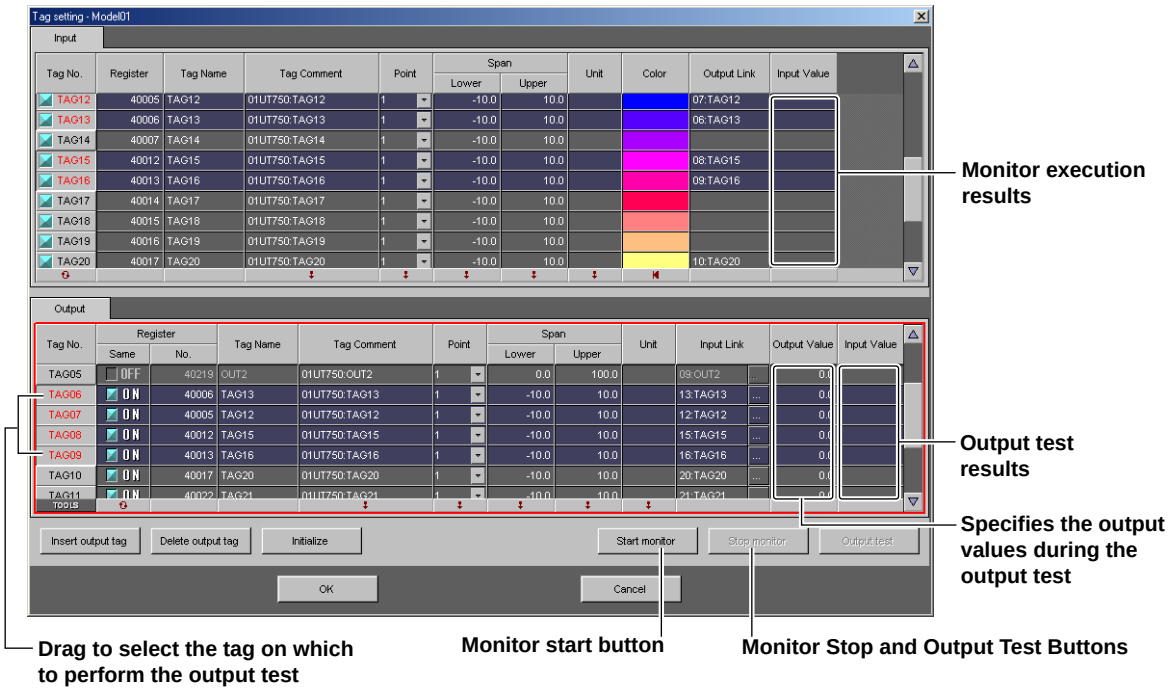
Procedure

Performing a Read Test

1. Click the Detail Settings button in the **Model** Settings tab page of the model on whicih you wish to perform the read test.

The **Tag Setting** dialog box opens.





2. Click the **Start monitor** button.

The value of each tag from the instrument is loaded, and displayed in the loaded value column of the input tab sheet.

To quit monitor execution, proceed to step 6.

Performing a Write Test

3. Specify the **Output Values** of the tags on which you wish to perform the **output test** in the output tab page.
4. Select the tags on which to perform the **output test**
5. Click the **Output Test** button.

   The output values are written to registers, then the values are acquired from the write registers and the loaded results are displayed in the loaded value column in the output tab page.

Stopping the Read Test

6. Click the **Stop monitor** button.

   The Read Test is concluded.

2.6 Checking the Client Connection Status and Communication Status of Connected Instruments, and Reconnecting Connected Instruments

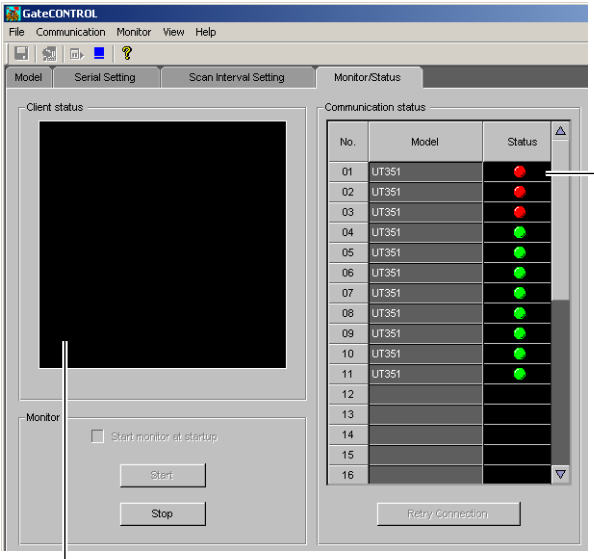
Checking the Client Connection Status and Communication Status of Connected Instruments

Procedure

Checking the Connection Status

1. Click the **Monitor/Status** tab or choose **View > Monitor/Status** from the menu bar. The Monitor/Status tab is displayed.

The client connection status and communication status of connected devices is displayed.



Indicator for the communication status with the connected device
Green: Normal (comm. open)
Red: Communication error
Yellow: Data dropout occurred and communication is retried (communication paused)
No display: Communication error (comm. paused)
Double-click to display the Error Indicator dialog box

Displays the names of connected clients

Note

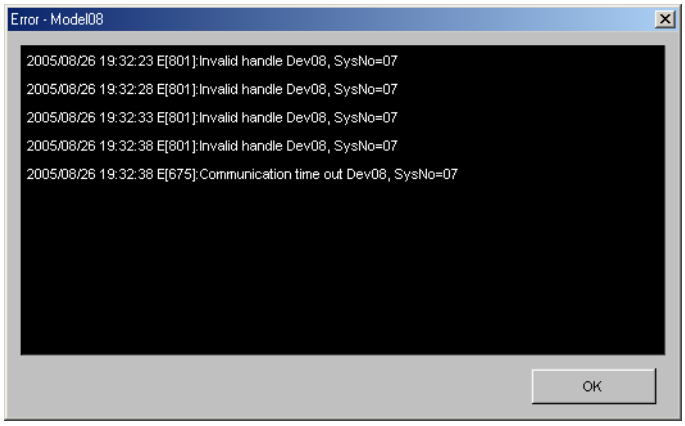
- If the communication status of a connected device is red, check whether a model, control mode, control output, or option in the Model Setting tab have the same settings as the connected device, and whether the communication method is correct.
- Data acquisition cannot be performed when the status is red.

Viewing Error Detail

2. Double-click the status indicator under Communication Status. The **Error Indicator** dialog box opens.

Up to 100 of the most recent errors are displayed for each connection.

Errors are displayed in the order date/time of occurrence, error number, error contents, affected number, and affected system number.



See section 3.4 for error messages.

Note

If a connected instrument experiences an error during communications, attempts are made to restore communications at the specified retry interval. If communication cannot be restored, the status indicator turns red. Retries are performed until communication is restored. To start communication manually, click the Retry Connection button.

Reconnecting Connected Instruments

1. Select the instrument to reconnect.

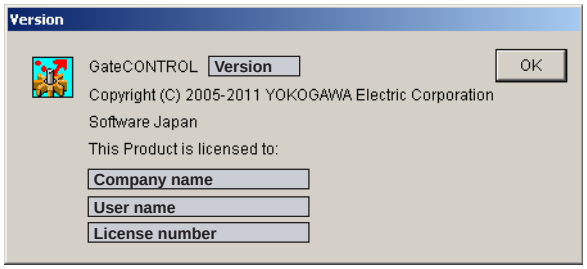
2. Click the **Retry Connection** button.

Communication with the selected device is reopened.

2.7 Viewing Version Information

Procedure

1. Click the **About** button or choose **Help > About** from the menu bar.
The **Version** dialog box opens.



3.1 Modbus Communication Device Settings

The default tag list in the Tag Settings dialog box that is displayed when you click the detail settings in the Model Settings tab determines the model, control mode, control output, and option function contents of the Model Settings tab.
The following describes the meanings of each tag that may appear in the Tag Settings dialog box.
Also, the tag names listed here are reserved. Arbitrarily added tags cannot be used. therefore the same serial and model settings as the connected device must be set on GateCONTROL.

- **Serial Port Settings (as Needed)**
  Port number
  Baud rate
  Parity
- **Settings for the Connected Devices (Temperature Controllers and Signal conditioners)**
  Serial Communications
  - Communication protocol
  - Baud rate
  - Parity
  - Stop bit
  - Data length
  - Communication Address

  Ethernet Communications
  - IP address
  - Subnet mask
  - Default gateway

Enter communication parameters on devices connected to GateCONTROL in advance. For instructions, see the user's manual of the connected device.

Note

The PC is connected to the instrument via an RS-232C/RS-485 converter. The connection can be made using a 4-wire or 2-method. When using the 2-wire method, disable echo back on the Converter.

Settings for Connected Modbus Devices

Enter settings on the connected devices as follows.

Setting	Green Series UTAdvanced Series	UT1000 Series	US100	VJ Series	M Series
Baud rate	4800, 9600, 19200 or 38400				
Parity	ODD, EVEN, or NONE				
Stop bit	1	1	1	1	1
Data length	8	8	8	8	8
Communication protocol	8	4	1	MODBUS, RTU mode	4

3.2 Meanings of Tags of Connected Devices

The default tag list in the Tag Settings dialog box that is displayed when you click the detail settings in the Model Settings tab determines the model, control mode, control output, and option function contents of the Model Settings tab.
The following describes the meanings of each tag that may appear in the Tag Settings dialog box.
Also, the tag names listed here are reserved. Arbitrarily added tags cannot be used.

Tag Name	Meaning
PV1	Measurement input value on loop 1, or the measurement input value. The error status and alarm status of PV1 or the measurement input value is added. (See section 3.3 for information on handling error and alarm statuses.)
PV2	Measurement input value on loop 2. The error status and alarm status of PV2 is added.
SP1	Target setting value used on loop 1. SP1 related alarm statuses are added.
SP2	Target setting value used on loop 2. SP2 related alarm statuses are added.
OUT1	Control output value on loop 1. Control output value on loop 1. OUT1 related alarm statuses are added.
OUT2	Control output value on loop 2. Control output value on loop 2. OUT2 related alarm statuses are added.
HOUT1	For heating/cooling control on loop 1, or the control output value for heating. HOUT1 related alarm statuses are added.
HOUT2	For heating/cooling control on loop 2, or the control output value for heating. HOUT2 related alarm statuses are added.
COUT1	For heating/cooling control on loop 1, or the control output value for cooling. COUT1 related alarm statuses are added.
COUT2	For heating/cooling control on loop 2, or the control output value for cooling. COUT2 related alarm statuses are added.
A/M1	Auto/manual mode for loop 1 0: AUTO (automatic) mode, 1: MAN (manual) mode
A/M2	Auto/manual mode for loop 2 0: AUTO (automatic) mode, 1: MAN (manual) mode
C.A.M	Switch between manual/automatic/cascade 0: AUTO (automatic) mode, 1: MAN (manual) mode, 2: CAS (cascade) mode
R/L1	Remote/local mode on loop 1. 0: Local, 1: Remote
R/L2	Remote/local mode on loop 2. 0: Local, 1: Remote
SPNO	Target setting value number currently used
PIDNO1	PID number used on loop 1
PIDNO2	PID number used on loop 2
R/S	Running/Stopped status 0: Running, 1: Stopped
R/P/L	Program run reset/program mode 0: Program operation reset, 1: Program operation, 2: Local operation
R/P1/P2	Program run reset/program mode 1: Program operation reset, 2: Program 1 operation, 3: Program 2 operation
HOLD	Program operation pause mode 0: Program operation, 1: Program operation pause
PVEx	PV event status. x is the event number 0: Event OFF, 1: Event ON
TMEx	Time event status. x is the event number 0: Event OFF, 1: Event ON
PTNO	Number of currently operating program pattern
SEGNO	Number of currently operating segment

(Cont. on next page.)

Tag Name	Meaning
TIME	Remaining time of currently operating segment, or time elapsed during WAIT The units are seconds.
LSP/CAS	Local/Cascade mode 0: CAS (cascade) mode, 1: LSP (local) mode
C.A.M1	Cascade/auto/manual mode for loop 1 0: AUTO (automatic) mode, 1: MAN (manual) mode, 2: CAS (cascade) mode
C.A.M2	Cascade/auto/manual mode for loop 2 0: AUTO (automatic) mode, 1: MAN (manual) mode, 2: CAS (cascade) mode
O/C	CLOSE/OPEN mode 0: CLOSE mode, 1: OPEN mode
INPUT	Input value. The error status and alarm status are added. (See specific items for information on handling error and alarm statuses.)
ADVANCE	Segment forced transition 0: End of forced transition or not executed, 1: Segment forced transition
RUN	Program run/stop status 0: Stopped, 1: Running

3.3 Details on Functions

Time Out Operation

When reading tag data, after sending a register value request message to the Modbus device, if the message is not received within the specified time out time that tag is considered to have timed out. If Use Retry is set to ON, for tags on which a timeout occurred, retries are attempted starting from the next acquisition interval at the specified retry interval until communication is restored.
If Retry is turned OFF, a retry is not performed on the tag on which a timeout occurred, and data reading is not performed for that tag thereafter.

To reopen communications after loading stops, choose the target device for communication in the Acquisition/Status tab, then click the Reconnect button.

Note

Using GateCONTROL, data can be acquired concurrently on each COM port. Therefore data is logged more efficiently when connecting each device to a separate port rather than connecting several devices to a single port.

Error Status

The following shows the error statuses supported by each model. Also, the statuses are modified as shown before transfer to DAQLOGGER and Remote Monitor.

UTAdvanced Series, Green Series, UT100 Series, US1000

Device Data Status	Data Display after Change
PV1 A/D converter error	ILLEGAL
PV1 RJC error	ILLEGAL
PV1 overscale	+OVER
PV1 underscale	-OVER
PV2 A/D converter error	ILLEGAL
PV2 RJC error	ILLEGAL
PV2 overscale	+OVER
PV2 underscale	-OVER

VJ Series

Device Data Status	Data Display after Change
EEP error	ILLEGAL
EEP sum error	ILLEGAL
Low cut status	-OVER
A/D burnout	ILLEGAL
RJC error	ILLEGAL

M Series

Device Data Status	Data Display after Change
Low cut status	-OVER
Input over	+OVER
Input under	-OVER
EEP sum error	ILLEGAL
Parameter error	ILLEGAL
RJC error	ILLEGAL
EEP error	ILLEGAL

Note

- When connected to a UT52A or UT55A, if a PV1 A/D converter error occurs, the PV1 value is displayed instead of ILLEGAL.
- When connected to a UT52A or UT55A, if a PV2 A/D converter error or a PV2 RJC error occurs, the PV2 value is displayed instead of ILLEGAL.
- When connected to a UT32A, UT35A, UT52A, or UT55A, if a PV1 RJC error occurs, the PV1 value is displayed instead of ILLEGAL.
- A/D converter and RJC errors (PV1 and PV2) of the UP55A are not supported.

Processing Alarm Statuses

Each model's alarm types are changed as follows before being sent to DAQLOGGER and Remote Monitor.

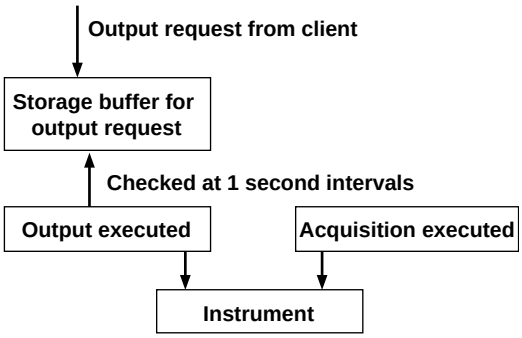
Alarm Type on Device Side	Alarm Type after Change		
	PV	SP	OUT, HOUT, COUT
PV high limit	PV high limit [H]	—	—
PV low limit	PV low limit [L]	—	—
Deviation high limit	Deviation high limit [DH]	—	—
Deviation how limit	Deviation low limit [DL]	—	—
De-energized on deviation high limit alarm	Deviation high limit [DH]	—	—
De-energized on deviation low limit alarm	Deviation low limit [DL]	—	—
Deviation high and low limit	Other [ETC]	—	—
Deviation within high and low limit	Other [ETC]	—	—
De-energized on PV high limit	PV high limit [H]	—	—
De-energized on PV low limit	PV low limit [L]	—	—
PV high limit (with idle mode)	PV high limit [H]	—	—
PV low limit (with idle mode)	PV low limit [L]	—	—
Deviation high limit (with idle mode)	Deviation high limit [DH]	—	—
Deviation low limit (with idle mode)	Deviation low limit [DL]	—	—
De-energize on deviation high limit alarm (with idle mode)	Deviation high limit [DH]	—	—
De-energize on deviation low limit alarm (with idle mode)	Deviation low limit [DL]	—	—
Deviation high and low limit (with idle mode)	Other [ETC]	—	—
Deviation within high and low limit (with idle mode)	Other [ETC]	—	—
De-energized on PV high limit (with idle mode)	PV high limit [H]	—	—
De-energized on PV low limit (with idle mode)	PV low limit [L]	—	—
Timer function upward (hour/minute)	Other [ETC]	—	—
Timer function downward (hour/minute)	Other [ETC]	—	—
Timer function upward (minute/second)	Other [ETC]	—	—
Timer function downward (minute/second)	Other [ETC]	—	—
Sensor grounding alarm	Other [ETC]	—	—
Fault diagnosis output	Other [ETC]	—	—
FAIL output	Other [ETC]	—	—
Timer function	Other [ETC]	—	—
De-energized on timer function	Other [ETC]	—	—
Heater burnout alarm 1	Other [ETC]	—	—
Heater burnout alarm 2	Other [ETC]	—	—
Heater burnout	Other [ETC]	—	—
SP high limit	Other [ETC]	SP high limit [H]	
SP low limit	Other [ETC]	SP low limit [L]	
Output high limit	Other [ETC]	—	Output high limit [H]
Output low limit	Other [ETC]	—	Output low limit [L]
PV velocity alarm	Other [ETC]	—	—
PV velocity alarm passive	Other [ETC]	—	—
Self-diagnostic alarm	Other [ETC]	—	—
Self-diagnostic alarm passive	Other [ETC]	—	—
FAIL passive	Other [ETC]	—	—
Deviation high limit for target setpoint	Other [ETC]	Deviation high limit [DH]	—
Deviation low limit for target setpoint	Other [ETC]	Deviation low limit [DL]	—

(cont. on next page)

Alarm Type on Device Side	Alarm Type after Change		
	PV	SP	OUT, HOUT, COUT
De-energized on deviation high limit alarm for target setpoint	Other [ETC]	Deviation high limit [DH]	—
De-energized on deviation low limit alarm for target setpoint	Other [ETC]	Deviation low limit [DL]	—
De-energized on deviation high and low limits for target setpoint	Other [ETC]	Other [ETC]	—
Deviation within high and low limits for target setpoint	Other [ETC]	Other [ETC]	—
Deviation high limit with stand-by actions for setpoint	Other [ETC]	Deviation high limit [DH]	—
Deviation low limit with stand-by actions for setpoint	Other [ETC]	Deviation low limit [DL]	—
De-energized on deviation high limit alarm with stand-by actions for target setpoint	Other [ETC]	Deviation high limit [DH]	—
De-energized on deviation low limit alarm with stand-by actions for target setpoint	Other [ETC]	Deviation low limit [DL]	—
Deviation high or low limit with stand-by actions for setpoint	Other [ETC]	Other [ETC]	—
Deviation within high and low limits with stand-by actions for target setpoint	Other [ETC]	Other [ETC]	—
Target SP high limit	Other [ETC]	SP high limit [H]	—
Target SP low limit	Other [ETC]	SP low limit [L]	—
Cooling-side control output high limit	Other [ETC]	—	Output high limit [H]
Cooling-side control output low limit	Other [ETC]	—	Output low limit [L]
Analog input PV high limit	Other [ETC]	—	—
Analog input PV low limit	Other [ETC]	—	—
Analog input RSP high limit	Other [ETC]	—	—
Analog input RSP low limit	Other [ETC]	—	—
Analog input AIN2 high limit	Other [ETC]	—	—
Analog input AIN2 low limit	Other [ETC]	—	—
Analog input AIN4 high limit	Other [ETC]	—	—
Analog input AIN4 low limit	Other [ETC]	—	—
Feedback input high limit	Other [ETC]	—	—
Feedback input low limit	Other [ETC]	—	—

Displayed in brackets ([ ]) on DAQLOGGER and Remote Monitor.
Furthermore, for the VJ series, all alarm types are Other [ETC].
Alarm types are loaded from each connected device upon start of acquisition by GateCONTROL. Even if alarm types are changed on the connected device after acquisition starts, the alarm types valid upon start of acquisition are used.
The number of UT551 and UT520 alarms is four (fixed). To ensure compatibility, also set the number of UT55A and UT52A alarms to four.
The number of UT351 and UT321 alarms is three (fixed). To ensure compatibility, also set the number of UT35A and UT32A alarms to three.
The number of UP550 and UM331 alarms is four (fixed). To ensure compatibility, also set the number of UP55A and UM33A alarms to four.
The number of UP35A alarms is two (fixed).

Output Processing



Function

- The output request from the client is stored in the output request storage buffer.
- The output request storage buffer is checked for an output execution every second, and output is executed on the instrument if an output request is found. Then, the output request storage buffer is cleared.
- Output request storage buffer is set to hold the most recent value, so if multiple writings to the same tag occur during the confirmation interval, the written value becomes the most recent one.
- An instrument is either outputting or acquiring, and acquisition execution is put on hold until output execution is finished, and vice versa. Therefore, acquisition or output execution may be delayed.
  Also, time may be required for output execution. If so, it can occur more slowly than the one-second confirmation interval.

Writing of the SP Value

During output execution, SPNO is acquired from the instrument. SP value output is executed on the register corresponding to this SPNO.

3.4 Notes When Performing Communications with Software on Other PCs

Communications with DAQLOGGER

- When performing communications with DAQLOGGER, set the IP address of the device with which DAQLOGGER will connect on the address of the PC that GateCONTROL is operating, then execute automatic model determination.
- On DAQLOGGER, all devices connected to GateCONTROL (temperature controllers and signal conditioners) are considered a single system. Therefore, the following should be noted.
  - DAQLOGGER's automatic model determination determines only the lowest-numbered device if multiple devices are connected to GateCONTROL (temperature controllers and signal conditioners). For determination of the other devices, specify the port number and system number (a number that is 1 less than the number in the GateCONTROL's Model Settings tab) in the DAQLOGGER settings, then execute the automatic model determination function.
  - When connecting all devices connected to GateCONTROL to DAQLOGGER as one system, specify "No system number" in the address setting screen, then execute automatic model determination.

Communications with DAQLOGGER Client Package

Check the port number (initial value is 50299) and system number set in GateCONTROL, then reconnect. The logic behind the system numbers is the same as that for DAQLOGGER.

GateCONTROL Settings

Set the same serial and model settings as the connected device on GateCONTROL.

3.5 Error Messages and Corrective Actions

A message (such as an error message) may appear during operation. The following describes the meanings of the messages and their corrective actions.

Error

Code	Description	Corrective Action
E211	Cannot write to the file.	Confirm that the disc capacity and file system are correct.
E212	Cannot read file.	Confirm that a file exists, that the software supports it, and whether the file system is correct.
E213	Cannot open the file.	Confirm that a file exists, that the software supports it, and whether the file system is correct.
E501	Invalid license number. Please reinstall.	With the Gate series, the number of licenses purchased is the limit for the number of programs run at the same time. Reinstall the software.
E1010	Execution failed.	Confirm that the file is not corrupt. If this error appears repeatedly, reinstall the software.

Message

Code	Description
M1210	Save the setting changes and try again.

Messages during (When Executing) Data Acquisition

Code	Description	Cause/Corrective Actions
W[631]	Data Lack	Data was unexpectedly lost. Reduce the number of acquired data points or connected instruments, or lengthen the scan interval.
E[674]	Communication error	Communication Errors Check whether the power to the connected measuring instruments with which you wish to open communications is ON, and whether the cables are connected correctly. Also check the following. • For Ethernet Is the address correct, is the TCP/IP protocol installed in Windows, and is the Ethernet card installed correctly? • For RS-232 and RS-422-A Are the baud rate, port numbers (COM1–COM9), and addresses (RS422) correct? Is the PC serial port valid? Is the cable type correct?
E[675]	Communication time out	Communication timeout Same as E[674].
E[800]	CRC check error	CRC check error A CRC error was detected. Check the communication status.
E[801]	Invalid handle	Failed to get communication handle. Check the communication status.
E[802]	Error respond	Invalid data received. Check the communication status.
W[880]	Do not specify communication port	Specify the communication parameters.
W[881]	Current connecting model configuration is mismatch! The model is:	Change the parameters for the main unit.
W[884]	Retry connection	Connection recovered.

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