User's Manual

WX1
GateWT

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YOKOGAWA
Yokogawa Electric Corporation

IM WX1-03E
9th Edition

This manual describes the functions and operations of GateWT. 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.
GateWT is a software program that acquires data from WT series instruments and transfers it to DAQLOGGER or Remote Monitor.

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End of document

Overview of This Manual

Structure of This Manual

This user's manual consists of the following chapters.

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

Scope of This 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.

Contents

1.1 Overview of GateWT Functions

GateWT is a software program that acquires data from WT series instruments and transfers it to DAQLOGGER or Remote Monitor. Using GateWT allows you to monitor data on DAQLOGGER or Remote Monitor that is measured on WT series instruments.
Yokogawa's DAQLOGGER is a software program that allows users to open a connection from their PC to various kinds of Yokogawa recorders (the mR, VR, DARWIN, DX, MV, and CX) and perform data logging and monitoring.
Yokogawa's Remote Monitor is a software program that enables monitoring of data logged by recorders or data logging software.

Note

When connecting the GateWT and WT1600 and acquiring data, you must set the WT1600's measurement range to Fixed Range since data communication is not possible if it is set to Auto Range.

Features

- Runs as a Windows application.
- Compatible with the following instruments: WT110, WT110E, WT130, WT200, WT210, WT230, WT1010, WT1030, WT2010, WT2030, WT1030M, WT1600, WT1800 and WT500.
- Up to 16 units of the WT100, WT200, WT1000, WT2000, WT1600, WT1800 or WT500 can be linked.
- Measurement can be performed at intervals of up to 0.5 seconds*.

  * However, DAQLOGGER's shortest interval is 1 second. Also, the maximum speed of 0.5 seconds may not be attainable depending on the amount of data being read, the response time of the device, and the communication speed.

1.2 System Overview

System

This software can connect with and download data from a WT series instrument having the following characteristics.
However, the harmonic option is not supported.

- A WT110, WT110E, WT200, or WT210 with RS-232 or GP-IB communication functions installed
- A WT230 or WT130 with RS-232 or GP-IB communication functions installed
- A WT1010, WT1030, WT1030M, WT2010, or WT2030 with RS-232 or GP-IB communication functions installed
- A WT1600 with RS-232, GP-IB, or Ethernet functionality.
- A WT1800 with GP-IB or Ethernet functionality.
- A WT500 with GP-IB or Ethernet functionality.

Required Operating Systems

Run DAQWORX under any of the following operating systems.

- 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)
- Windows 8 (32-bit and 64-bit) (Supports the desktop mode)
- Windows 8 Pro (32-bit and 64-bit) (Supports the desktop mode)

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

OS Language	Software Language
Japanese	Japanese
Other	English

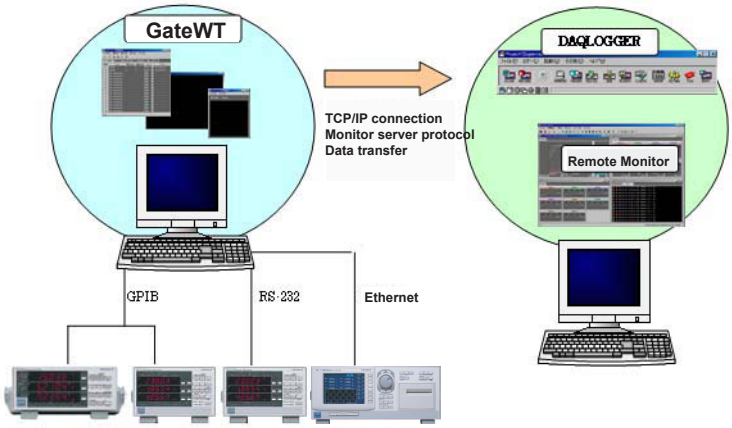
Hardware Requirements

The following hardware are required to use GateWT.

- PC: A PC that runs one of the OS above, and that meets the following CPU and memory requirements.
  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 or Windows 8
  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 device: An Ethernet (when connecting to DAQLOGGER, Remote Monitor, WT1600, WT1800 or WT500), RS-232, or GP-IB 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

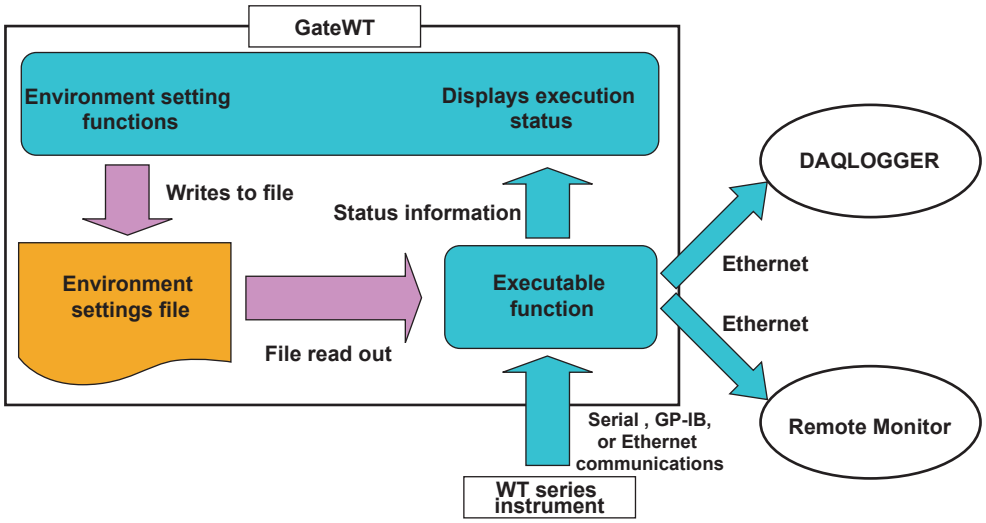
- GP-IB port: Required for GP-IB communications between the software and a WT series instrument
  Please use the PCI-GPIB or PCMCIA-GPIB by National Instruments.
- Monitor: A video card that is recommended for the OS and a display that is supported by the OS, has a resolution of 1024×768 or higher, and that can show 65,536 colors (16-bit, high color) or more.

System Configuration



It is recommended that you run GateWT and DAQLOGGER on separate PCs.

Software Configuration



GateWT Configurator consists of two separate software functions. The role of each function within the configurator is as follows:

- **Environment Setting Functions**
  These functions allow the user to enter various settings required by the executable function for communications with the WT series instrument, as well as those required for data transfers to and from DAQLOGGER and Remote Monitor. The user can also view the execution status.
- **Executable Function**
  The software reads data from the WT series instruments at fixed intervals. It also acts as a monitor server, transferring data to DAQLOGGER and Remote Monitor.

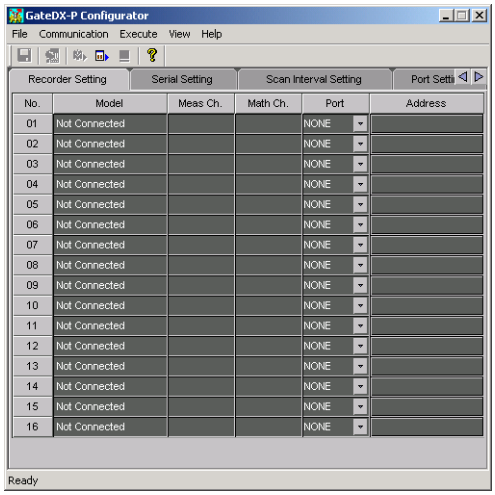
2.1 Running and Exiting Gate-WT

Running the Software

Procedure

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

   The GateWT Configurator opens, displaying the user interface.



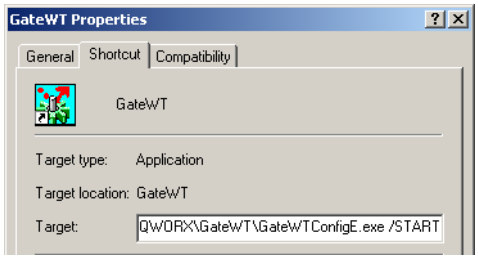
Note

- When you start GateWT, 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.

Starting GateWT in Acquisition Start Mode

Procedure

1. From the Windows Start menu, choose **Programs > YOKOGAWA DAQWORX > GateWT > GateWT**, then right-click GateWT and select Create Shortcut.
2. Right-click the shortcut icon and select Properties.
3. Choose the Shortcut tab, then add /START to the right of the path in the Target box and click OK.



4. Choose the shortcut from the Windows Start menu. The connection status of the previous session is restored, and acquisition begins.

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.

   GateWT closes.

2.2 Entering Environment Settings

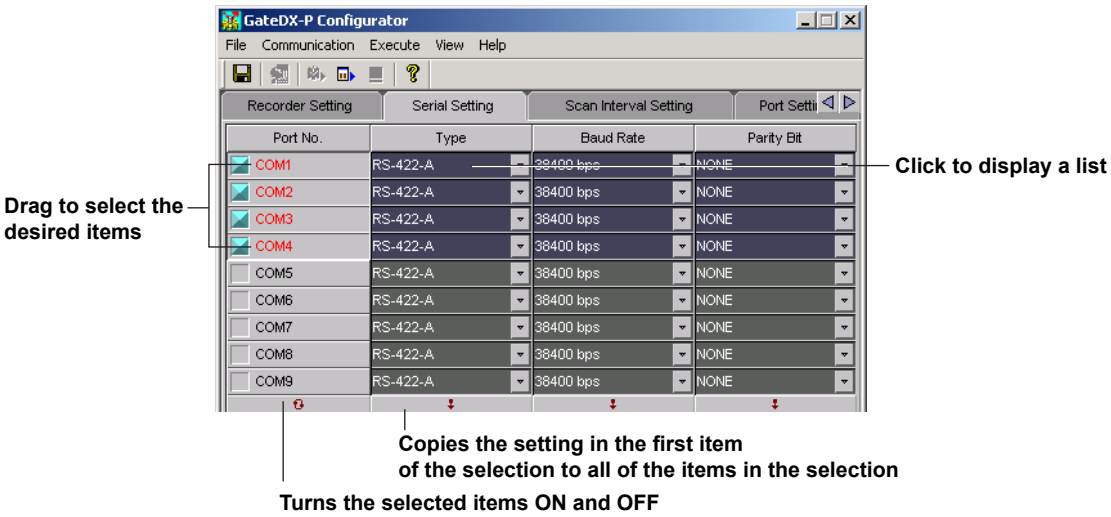
The following settings can be entered using the configurator.

- WT assignments, communications settings, and login settings
- Acquisition interval settings for each WT
- Port number settings (for the monitor server) as needed
- The settings can be saved.

Serial Port Settings

Procedure

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



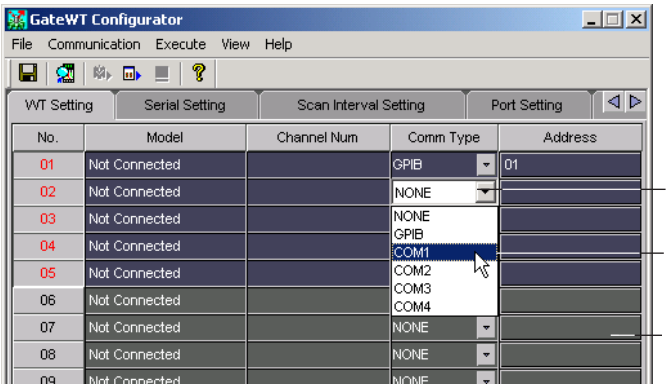
2. Enter settings for each item.

Port number :	ON (blue)/OFF (gray)
Baud rate :	4800, 9600, 19200
Data length :	Fixed at 8
Parity :	Fixed at NONE
Stop bit :	Fixed at 1

WT Settings

Procedure

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

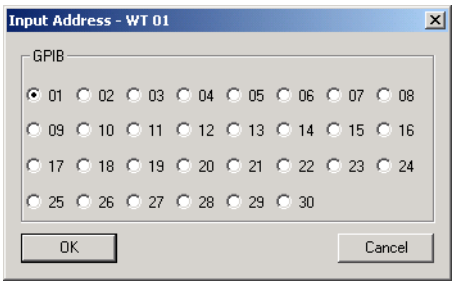


2. Enter the communication method and address.

Communication type : Select the port to be used for the connection. Only the numbered COM ports turned ON in the serial setting tab are displayed.

For GP-IB

Click a cell in the Address column to open the dialog box in the figure below.
Enter the GP-IB address.



For Ethernet (ETHER)

Click Address to display the following dialog box.
Enter the IP address or host name, user name (only WT1600), and password (only WT1600).

For Serial Ports Set to COM1–COM9 (RS-232 Ports)

An address is not entered.

Address : Only needed if the communication type is GP-IB.

Automatic Model Determination

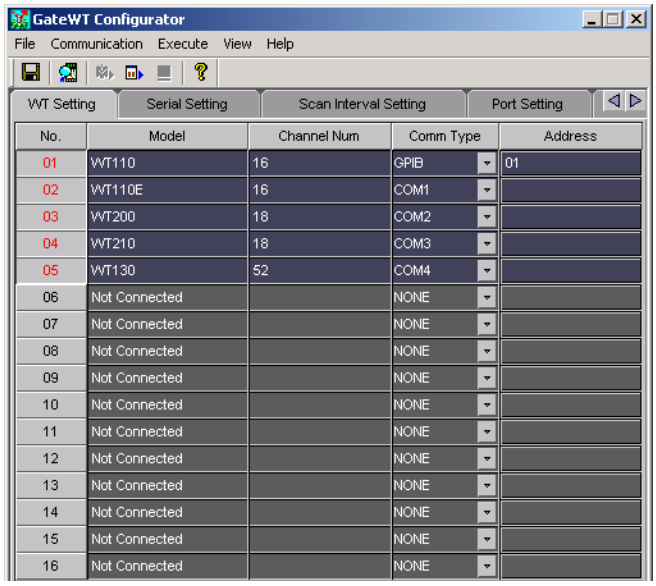
3. Click Auto determination on the toolbar or choose **Communication > Recorder Model Determination** from the menu bar.

Auto determination button

The following items are displayed.

Model : The specific WT models to be connected.

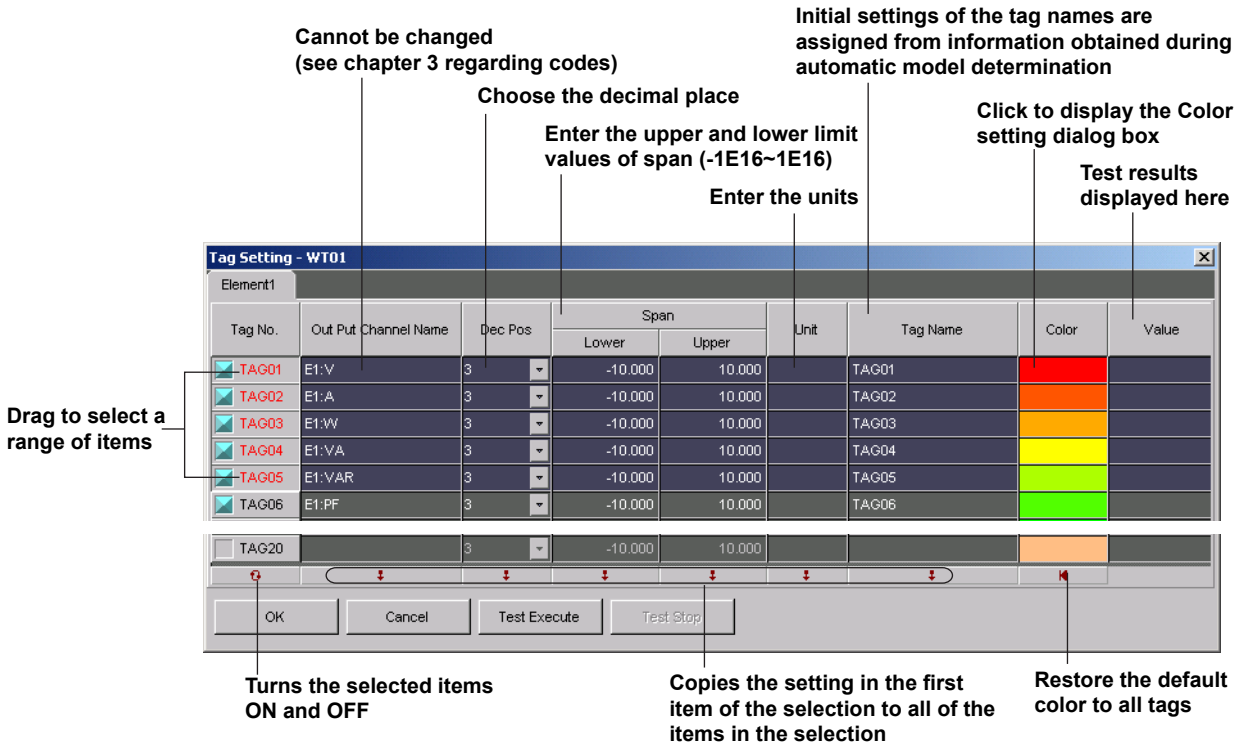
Channel : The number of channels on the WT to be connected.



Tag Settings

4. Double-click the tag number cell on the WT setting tab of the tag that you wish to set.

The Tag Setting dialog box opens.



Executing the Test

5. Click the Test Execution button in the Tag Setting dialog box.

The test result is displayed in the value column.

Stopping the Test

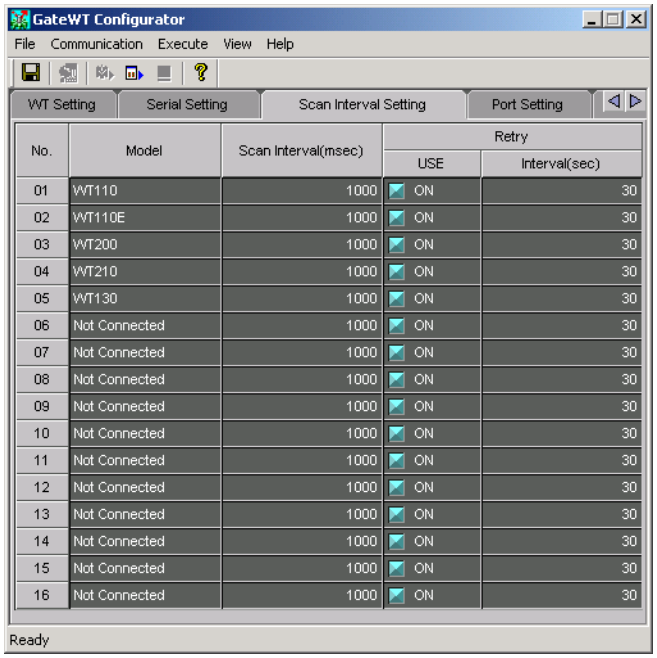
6. Click the Test Stop button.

Scan Interval and Retry Settings

Procedure

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

The Scan Interval Setting tab is displayed.



Scan Interval Settings

2. Specify a scan interval from 0.5 to 3600 seconds.

Setting the Number of Retries

3. Turn the communication retry setting ON or OFF.

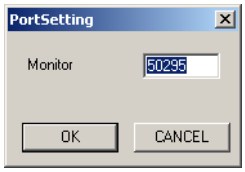
4. Enter the time interval between retries.

The available setting range is 30 to 3600 seconds.

Port Settings

Procedure

1. Choose **File > Port Number** from the menu bar.

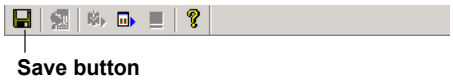


2. You can change the port number used by the monitor server.

Saving Environment Settings

Procedure

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

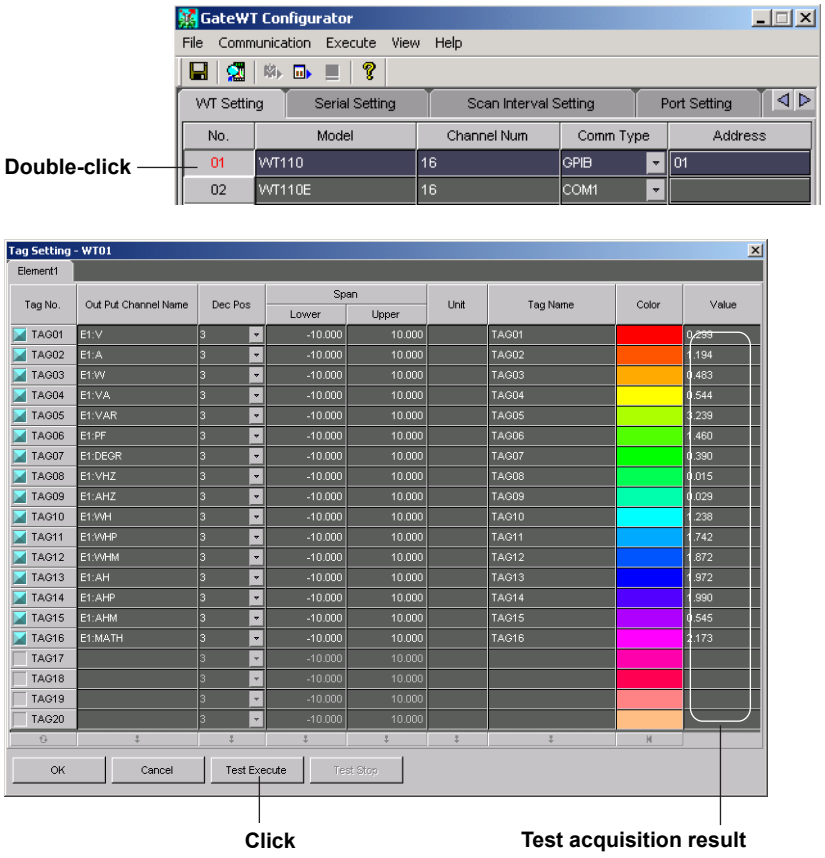


Test Acquisition

Procedure

1. Double-click a number in the GateWT Configurator.

The Tag Setting dialog box opens.



2. Click the Test Execute button.

The test acquisition result is displayed in the Value column.

2.3 Connecting from DAQLOGGER or Remote Monitor

While the executable function is running, DAQLOGGER or Remote Monitor works via Ethernet to log and monitor the data that the WT is acquiring. GateWT's executable function acts as the client of a DAQLOGGER or Remote Monitor that is running as the monitor server.

In this case, system numbers are assigned as follows:

WT assigned to WT01 : 0
WT assigned to WT02 : 1

Connecting from DAQLOGGER

Procedure

See section 2.6 of the WX101 DAQLOGGER WX81 DAQLOGGER Client Package User's Manual (IM WX101-01E).

Note

- If a connection is made with GateWT when DAQLOGGER's system server setting is set to No system number, the connected WTs are handled on the same system. For example, if a GateWT with two WTs connected is set to No system number on DAQLOGGER, DAQLOGGER handles both units channels as a single connected GateWT.
- When recorder model determination is performed by DAQLOGGER, models numbered 01 under GateWT's "WT Setting" are displayed as No. 00. To identify models numbered 02 or higher, specify the system number on DAQLOGGER. For example, for number 02, specify 01 under System No.

Connecting from Remote Monitor

Procedure

See section 8.1 of the WX101 DAQLOGGER WX81 DAQLOGGER Client Package User's Manual (IM WX101-01E), or section 9.2 of the WX102 DAQ32Plus WX82 DAQ32Plus Client Package User's Manual (IM WX102-01E).

2.4 Process Run/Stop and Service Run/Stop

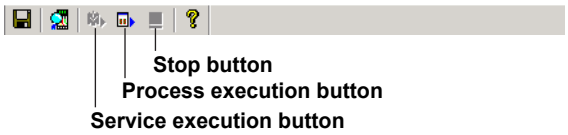
Running/Stopping from the Menu Bar

Procedure

Running as a Process or Service

1. Click the Service execution or Process execution button on the tool bar. Or, choose **Execute > Service** or **Execute > Process** from the menu bar.

   The executable function starts as a process or service. "Service" or "Process" is displayed under Practice Status on the Practice Status tab.



Note

- Service execution can only be specified by users with Administrator privileges.
- Services cannot be executed when using Windows Vista.

Stopping the Process or Service

1. Click the Stop button on the tool bar or choose **Execute > Stop** from the menu bar.

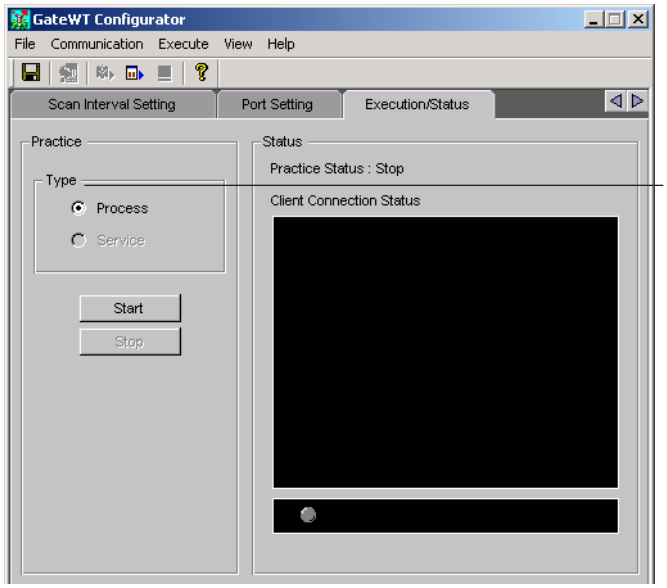
   The Practice Status item shown on the Practice/Status tab displays "Stop."

Running/Stopping the Executable Function from the Practice/Status Tab

Procedure

1. Click the Practice/Status tab or choose **View > Practice/Status** from the menu bar.

   The Practice/Status tab is displayed.



Running as a Process or Service

2. Select to execute the function as a process or service.
3. Click Practice.

   The executable function starts, and "Service" or "Process" is displayed under Practice Status.

Stopping the Process or Service

2. Click the Stop button.

   "Stop" is displayed for the practice status.

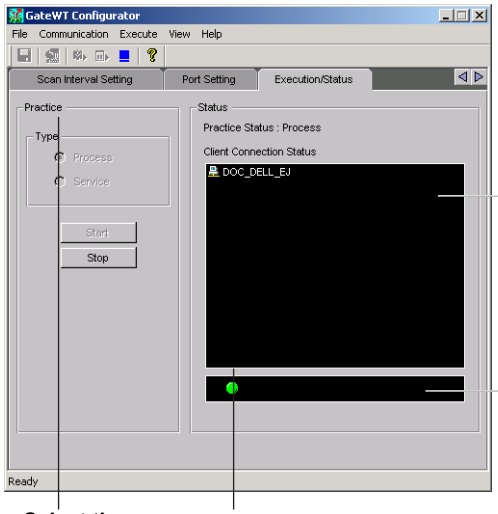
2.5 Viewing the Status of the Executable Function

Procedure

Displaying the Connection Status

1. Click the Execution/Status tab, or choose **View > Execution/Status** from the menu bar.

The Execution/Status tab is displayed, allowing you to see the method under which the executable function may be running (as a process or as a service), whether or not it is running, and with which PCs communications are open.



Displays the names of connected clients

Double-click to display the Error Indicator dialog box

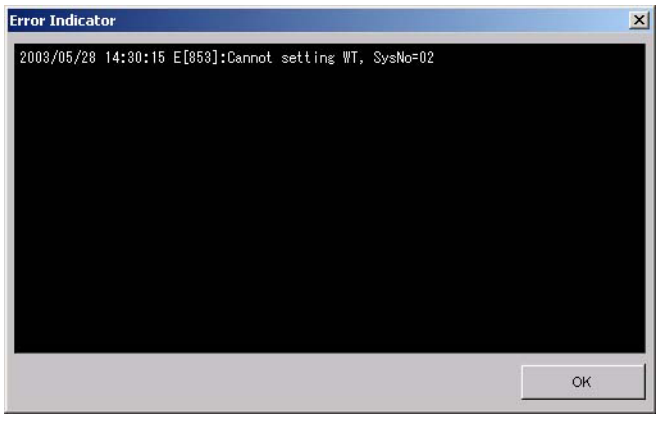
Select the practice type

Displays the communications status with the client
Gray: Stopped
Red: Error
Green: Normal

Viewing Error Detail

2. Double-click the box displaying the client communication status on the Execution/Status tab (shown above).

The Error Indicator dialog box opens.



See section 3.3 for error messages.

Note

- If a warning message is displayed (code Wxxxx), the lamp that displays the connection status by color does not blink red.
- When an error occurs and the lamp blinks red, the Error Indicator dialog box appears. If you close the dialog box, the lamp turns green.

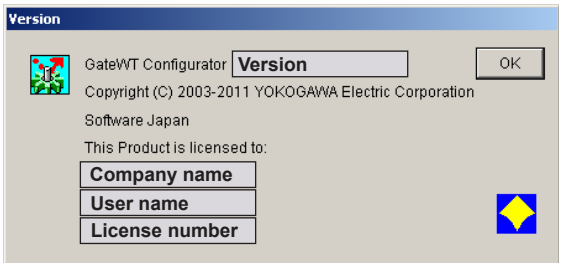
2.6 Viewing Version Information

Procedure

1. Click the About button on the tool bar or choose Help > About from the menu bar.

About button

The Version dialog box opens.



3.1 Overview

GateWT opens communications with WT series instruments and acquires data at regular intervals. Through the monitor server function, the acquired data is transferred to DAQLOGGER or Remote Monitor via Ethernet. GateWT Configurator consists of two separate software functions. The following is a list of the features of each software function.

Environment Setting Functions

Basically, the environment setting functions are used to enter all environment settings required to run the executable function. The environment setting functions include the following :

- Entry of parameters used for communications with up to 16 WTs.
  For GP-IB : Address
  For serial communications : Port, baud rate
  For Ethernet : IP address or host name, user name, password
- Display of information (model and number of channels) from the WTs to be connected
  The software can open communication with the WTs and obtain this information automatically.
- Tag settings for each WT
  - Use/Do not use (ON/OFF)
  - Upper/lower limit of span
  - Decimal place
  - Unit
  - Tag name
  - Color
- Entry of the acquisition interval and port numbers for the executable function
- Test execution
- The above communication parameters, information from the WT, acquisition interval, and port numbers can be saved
  Later, this information can be loaded by the executable function.
- Runs/stops the executable function as a process
  Two executable functions cannot be run at the same time.
  If the function is already running as a service, it cannot be run as a process.
- Registers/deletes the executable function as a process
  The function can run as a service while being registered.
  It can be registered as an automatically executable service.
- Displays the status of the executable function
  Stopped, running as a service, running as a process
- Displays a list of monitor clients connected with the executable function
- Displays errors from the executable function
  Sockets are used for communication with the executable function.

Executable Function

Features of the executable function are as follows:

- Runs as a service
- Multiple instances of the function may not be run simultaneously
- Reads the settings file and connects with up to 16 WTs
  Communication protocols: GP-IB, RS-232, Ethernet
- Reads instantaneous data from the WTs at fixed intervals and saves the data to internal memory
  Reading interval: 0.5 – 3600 seconds
  The internal memory holds the 1800 most recent data samples.
- Runs as a monitor server
  Compatible with the DAQLOGGER monitor server specifications.
- Provides a list of clients connected to the status display function

3.2 Detailed Description of Functions

Serial Port

The communications ports available to GateWT are the COM1–COM9 serial (RS-232) ports. The user must enter the following port settings.

- Use/Do not use (ON/OFF)
- Baud rate : Select 4800, 9600, or 19200
- Data length : Fixed at 8
- Parity : Fixed at NONE
- Stop bit : Fixed at 1

GP-IB Communication

GateWT can use GP-IB addresses 1–30.

Ethernet Communication

The WT1600, WT1800, and WT500 can perform Ethernet communications. Enter the IP address or host name, user name (only WT1600), and password (only WT1600).

WT Settings

GateWT allows simultaneous connection with any combination of 16 of the following instruments: WT110, WT110E, WT130, WT200, WT210, WT230, WT500, WT1010, WT1030, WT1030M, WT1600, WT1800, WT2010, or WT2030.

The user must enter the following on the WTs to be accessed.

- Choose a communication method (COMx , GP-IB, or Ethernet)

For GP-IB

Communications mode :	488.2
Address :	1–30

For RS-232 (for instruments other than the WT1600)

Communications mode :	488.2
Handshaking :	0
Format :	0
Delimiter :	Cr + Lf
Baud rate :	4800, 9600, 19200

For RS-232 (WT1600)

Communication mode :	488.2
Handshaking :	CTS-RTS
Format :	8-NO-1
Delimiter :	Cr+Lf
Baud rate :	4800, 9600, 19200

For Ethernet : Enter the following settings.

When Using DHCP

- Domain name
- Primary DNS server address
- Secondary DNS server address
- Primary domain suffix
- Secondary domain suffix

When Using DNS

- IP address
- Subnet mask
- Default gateway

Note

When connecting with DAQLOGGER to acquire data from the WT, if the number of channels set on the WT Setting tab exceeds 1600, 1600 channels of data is sent to DAQLOGGER, starting with the first channel of the instrument of the smallest system number. Also, if an error occurs on an instrument during the first communication and communication is restored by executing a communication retry, connection is possible with that instrument in 1 scan mode without any channels being cut out.

Automatic Model Determination

If you select a WT and perform automatic model determination, the model and number of channels are passed to the WT Setting tab on the configurator.
However, harmonic option output for WT1600 and harmonic mode for WT1600 are not supported.

Models and Number of Channels (Model Name in Brackets)

Model	Number of channels
WT110 [253401] WT110E [253451] WT200 [253421] WT210 [760401]	19
WT130 (2Elements) [253502] WT230 (2Elements) [760502]	53
WT230 (3Elements) [253503] WT230 (3Elements) [760503]	70
WT1010 [253610] WT2010 [253101]	18
WT1030 (2Elements) [253620] WT2030 (2Elements) [253102]	46
WT1030 (3Elements) [253630] WT2030 (3Elements) [253103]	61
WT1030M [253640]	68
WT1600 (1Elements) [760101-01/-10]	76
WT1600 (1Elements) [760101-02/-11/-20]	123
WT1600 (1Elements) [760101-03/-12/-21/-30]	170
WT1600 (1Elements) [760101-04/-13/-22/-31/-40]	197
WT1600 (1Elements) [760101-05/-14/-23/-32/-41/-50]	224
WT1600 (1Elements) [760101-06/-15/-24/-33/-42/-51/-60]	251
WT1800 (1Elements) [WT1801-01/-10]	55
WT1800 (2Elements) [WT1802-02/-11/-20]	104
WT1800 (3Elements) [WT1803-03/-12/-21/-30]	104
WT1800 (4Elements) [WT1804-04/-13/-22/-31/-40]	179
WT1800 (5Elements) [WT1805-05/-14/-23/-32/-41/-50]	205
WT1800 (6Elements) [WT1806-06/-15/-24/-33/-42/-51/-60]	254
WT500[1Elements] (760201)	99
WT500[2Elements] (760202)	156
WT500[3Elements] (760203)	213

* The number of WT500 channels given above is with the /G5 and /DS options. If an option is not installed, the number of channels is decreased by the number of channels related to that option. The number of WT1800 channels given above is with the /G5 or /G6, /DT, /MTR or /AUX options. If an option is not installed, the number of channels is decreased by the number of channels related to that option.

Scan Interval

A scan interval from 0.5 to 3600 seconds is selected for each of the 16 WTs.

Note

When connecting to DAQLOGGER and acquiring data from the WTs, if GateWT's scan interval is longer than that of DAQLOGGER, DAQLOGGER logs the same data repeatedly until the next GateWT scan interval. Therefore, it is recommended that GateWT's scan interval be set to a value smaller than DAQLOGGER's scan interval.

Setting the Number of Retries

The Retry function can be turned ON and OFF for each of the 16 WTs.
If Retry is turned ON, a retry interval of 30 to 3600 seconds can be specified.
Communication is reattempted each time the specified number of seconds elapses.
Retries are also performed on instruments with which a communication error occurred during the first communication.

Port Settings

GateWT uses the following ports.

- Monitor server port
  The port used for communications from DAQLOGGER and Remote Monitor.
- Status acquisition port
  The port from which the status display software acquires status from the executable software. Search for an empty port to use as the status acquisition port.

Running/Stopping the Executable Function

The user interface allows you to start and stop the executable function.
The executable function runs under one of the following two methods or “types.”

- **Process Run/Stop**
  The executable function is run/stopped as a process.
- **Service Run/Stop**
  The executable function is registered as an automatically executing service, then run. After an executable function running as a service is stopped, its registration as a service is deleted.

Note

As indicated by the service execution status, the executable function continues processing even when the user has logged off of Windows. Also, the software is automatically run as a service when the computer is turned ON. Service execution can only be specified by users with Administrator privileges. Services cannot be executed when using Windows Vista.

Monitor Server Function of the Executable Function

When the executable function is running, you can connect from DAQLOGGER or Remote Monitor via Ethernet using the remote monitor protocol, and acquire data. In this case, system numbers are assigned as follows:

WT assigned to WT01 : 0
WT assigned to WT02 : 1

If GateWT is connected without specifying a system number on DAQLOGGER, all WTs are regarded as being of the same system. For example, if a GateWT connected to two WTs is connected to DAQLOGGER without specifying a system number, it appears as though a single GateWT with two WTs worth of channels is connected.

Executable Function Status Display

The status display shows the status of the environment setting and executable functions.
The information from the executable function that can be displayed is as follows:

- Practice status (stopped, running as a service, running as a process)
- Connection status from the client
  Displays a list of PCs running DAQLOGGERS and Remote Monitors with which the executable software has opened a connection.
- Error display
  Shows the presence or absence of errors on the executable function.

Test Acquisition

You can perform a test acquisition on each tag using the configurator. During the test acquisition, data is read from WT output channels assigned to each tag and displayed as digital values. This allows you to determine whether the communication settings for each tag are correct. The test acquisition gets values from assigned tags at intervals of approximately 1 second. Up to 32 tags can be assigned to a group, and up to 4 groups can be displayed.
The number of tags that can be assigned to a group differs depending on the type of connected device, and only up to 4 groups can be displayed.

Group and Channel Assignments

If connected from the remote monitor, the initial group and channel assignments are as follows, and cannot be changed.

Note

If connected to GateWT using DAQLOGGER, the group and waveform assignments are ignored.

WT100, WT110E [17]

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01	V
		W02	A
		W03	W
		W04	VA
		W05	VAR
		W06	PF
		W07	DEGR
		W08	VHZ
		W09	AHZ
		W10	WH
		W11	WHP
		W12	WHM
		W13	AH
		W14	AHP
		W15	AHM
		W16	VPK
		W17	APK
		W18	MATH
		W19	TIME

WT200, WT210 [19]

	Group String	Waveform Number	Channel Assignment
2 group	Element1	W01	V
		W02	A
		W03	W
		W04	VA
		W05	VAR
		W06	PF
		W07	DEGR
		W08	VHZ
		W09	AHZ
		W10	WH
		W11	WHP
		W12	WHM
		W13	AH
		W14	AHP
		W15	AHM
		W16	VPK
		W17	APK
		W18	MATH
		W19	TIME

WT130 (Three-phase, three-wire), WT230(Three-phase, three-wire) [53]

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W19	V—TIME (same as WT200)
2 group	Element3	W01—W17	V—APK
3 group	Sigma	W01—W17	V—APK

WT130 (Three-phase, four-wire), WT230(Three-phase, four-wire) [70]

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W19	V—TIME (same as WT200)
2 group	Element2	W01—W17	V—APK
3 group	Element3	W01—W17	V—APK
4 group	Sigma	W01—W17	V—APK

WT1010, WT2010 [18]

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01	V
		W02	A
		W03	W
		W04	VA
		W05	VAR
		W06	PF
		W07	DEGR
		W08	VPK
		W09	APK
		W10	WH
		W11	WHP
		W12	WHM
		W13	AH
		W14	AHP
		W15	AHM
		W16	FREQ
		W17	MATH
		W18	TIME

WT1030 (Three-phase, three-wire), WT2030(Three-phase, three-wire) [46]

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W18	V—TIME (same as WT1010)
2 group	Element3	W01—W15	V—AHM
3 group	Sigma	W01—W15	V—AHM

WT1030(Three-phase, four-wire), WT2030(Three-phase, four-wire) [61]

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W18	V—TIME (same as WT1010)
2 group	Element2	W01—W15	V—AHM
3 group	Element3	W01—W15	V—AHM
4 group	Sigma	W01—W15	V—AHM

WT1030M(Three-phase, four-wire)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W18	V—TIME (same as WT1010)
2 group	Element2	W01—W15	V—AHM
3 group	Element3	W01—W15	V—AHM
4 group	Sigma	W01—W15	V—AHM
5 group	Motor	W01	TORQ
		W02	RPM
		W03	SRPM
		W04	SLIP
		W05	MPOW
		W06	MEFF
		W07	TEFF

WT1600(1Element model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01	URMS
		W02	UMN
		W03	UDC
		W04	UAC
		W05	IRMS
		W06	IMN
		W07	IDC
		W08	IAC
		W09	P
		W10	S
		W11	Q
		W12	LAMBda
		W13	PHI
		W14	FU
		W15	FI
		W16	PC
		W17	UPPeak
		W18	UMPeak
		W19	IPPeak
		W20	IMPeak
		W21	TIME
		W22	WH
		W23	WHP
		W24	WHM
		W25	AH
		W26	AHP
		W27	AHM
2 group	SigmaA	W01	URMS
		W02	UMN
		W03	UDC
		W04	UAC
		W05	IRMS
		W06	IMN
		W07	IDC
		W08	IAC
		W09	P
		W10	S
		W11	Q
		W12	LAMBda
		W13	PHI
		W14	PC
		W15	WH
		W16	WHP
		W17	WHM
		W18	AH
		W19	AHP
		W20	AHM

(Cont. on next page.)

	Group String	Waveform Number	Channel Assignment
3 group	Other	W01	ETA
		W02	SETA
		W03	F1
		W04	F2
		W05	F3
		W06	F4
		W07	DURMS1
		W08	DUMN1
		W09	DUDC1
		W10	DUAC1
		W11	DURMS2
		W12	DUMN2
		W13	DUDC2
		W14	DUAC2
		W15	DURMS3
		W16	DUMN3
		W17	DUDC3
		W18	DUAC3
		W19	DURMS4
		W20	DUMN4
		W21	DUDC4
		W22	DUAC4
4 group	Motor	W01	TORQue
		W02	SPEed
		W03	SYNC
		W04	SLIP
		W05	PM
		W06	MEATa
		W07	MBETa

WT1600(2Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W27	URMS—AHM
2 group	Element2	W01—W27	URMS—AHM
3 group	SigmaA	W01—W20	URMS—AHM
4 group	SigmaB	W01—W20	URMS—AHM
5 group	Other	W01—W22	ETA—DUAC4
6 group	Motor	W01—W07	TORQue—MBETa

WT1600(3Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W27	URMS—AHM
2 group	Element2	W01—W27	URMS—AHM
3 group	Element3	W01—W27	URMS—AHM
4 group	SigmaA	W01—W20	URMS—AHM
5 group	SigmaB	W01—W20	URMS—AHM
6 group	SigmaC	W01—W20	URMS—AHM
7 group	Other	W01—W22	ETA—DUAC4
8 group	Motor	W01—W07	TORQue—MBETa

WT1600(4Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W27	URMS—AHM
2 group	Element2	W01—W27	URMS—AHM
3 group	Element3	W01—W27	URMS—AHM
4 group	Element4	W01—W27	URMS—AHM
5 group	SigmaA	W01—W20	URMS—AHM
6 group	SigmaB	W01—W20	URMS—AHM
7 group	SigmaC	W01—W20	URMS—AHM
8 group	Other	W01—W22	ETA—DUAC4
9 group	Motor	W01—W07	TORQue—MBETa

WT1600(5Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W27	URMS—AHM
2 group	Element2	W01—W27	URMS—AHM
3 group	Element3	W01—W27	URMS—AHM
4 group	Element4	W01—W27	URMS—AHM
5 group	Element5	W01—W27	URMS—AHM
6 group	SigmaA	W01—W20	URMS—AHM
7 group	SigmaB	W01—W20	URMS—AHM
8 group	SigmaC	W01—W20	URMS—AHM
9 group	Other	W01—W22	ETA—DUAC4
10 group	Motor	W01—W07	TORQue—MBETa

WT1600(6Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W27	URMS—AHM
2 group	Element2	W01—W27	URMS—AHM
3 group	Element3	W01—W27	URMS—AHM
4 group	Element4	W01—W27	URMS—AHM
5 group	Element5	W01—W27	URMS—AHM
6 group	Element6	W01—W27	URMS—AHM
7 group	SigmaA	W01—W20	URMS—AHM
8 group	SigmaB	W01—W20	URMS—AHM
9 group	SigmaC	W01—W20	URMS—AHM
10 group	Other	W01—W22	ETA—DUAC4
11 group	Motor	W01—W07	TORQue—MBETa

WT1800(1Element model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01	URMS
		W02	UMN
		W03	UDC
		W04	IRMS
		W05	IMN
		W06	IDC
		W07	P
		W08	S
		W09	Q
		W10	LAMBDA
		W11	PHI
		W12	FU
		W13	FI
		W14	TIME
		W15	WH
		W16	WHP
		W17	WHM
		W18	AH
		W19	AHP
		W20	AHM
2 group	ElemHrm1	W01	UK_1
	(/G5, /G6)	W02	UK_T
		W03	IK_1
		W04	IK_T
		W05	UTHD
		W06	ITHD
3 group	Other	W01	ETA1
		W02	ETA2
		W03	ETA3
		W04	ETA4
		W05	F1
		W06	F2
		W07	F3
		W08	F4
		W09	F5
		W10	F6
		W11	F7
		W12	F8
		W13	F9
		W14	F10
		W15	F11
		W16	F12
		W17	F13
		W18	F14
		W19	F15
		W20	F16
		W21	F17
		W22	F18
		W23	F19
		W24	F20
4 group	Motor (/MTR)	W01	SPEED
		W02	TORQUE
		W03	SYNCSP
		W04	SLIP
		W05	PM
5 group	Aux (/AUX)	W01	AUX1
		W02	AUX2

Note

- Since the maximum number of parameters that can be acquired via communications on the WT1800 is 255, all functions cannot be acquired on GateWT. To acquire functions not in the table, you can set them in the WT1800's user-defined functions (F1 to F20).
- (/G5, /G6) can be selected on instruments with the harmonic measurement functions option, (/DT) can be selected on instruments with the delta computation functions option, (/MTR) can be selected on instruments with the motor evaluation functions option and (/AUX) can be selected on instruments with the auxiliary input measurement functions option. If an instrument without an option is selected, the group numbers shift to fill in the missing option. For example, groups are assigned as follows for a 2-element model with (/G5) and (/Aux) but without (/DT), (/MTR).

  Group 1: Element1
  Group 2: Element2
  Group 3: ElemHrm1
  Group 4: ElemHrm2
  Group 5: SigmaA
  Group 6: Other
  Group 7: Aux

WT1800(2Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W20	URMS—AHM
2 group	Element2	W01—W20	URMS—AHM
3 group	ElemHrm1	W01—W06	UK_1—ITHD
4 group	ElemHrm2	W01—W06	UK_1—ITHD
5 group	SigmaA	W01	URMS
		W02	UMN
		W03	IRMS
		W04	IMN
		W05	P
		W06	S
		W07	LAMBDA
		W08	PHI
		W09	WH
		W10	WHP
		W11	WHM
		W12	AH
		W13	AHP
		W14	AHM
6 group	Other	W01—W24	ETA1—F20
7 group	DeltaA (/DT)	W01	DU1
		W02	DU2
		W03	DU3
		W04	DUS
		W05	DI
		W06	DP1
		W07	DP2
		W08	DP3
		W09	DPS
8 group	Motor	W01—W05	SPEED—PM
9 group	Aux	W01—W02	

WT1800(3Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W20	URMS—AHM
2 group	Element2	W01—W20	URMS—AHM
3 group	Element3	W01—W20	URMS—AHM
4 group	ElemHrm1	W01—W06	UK_1—ITHD
5 group	ElemHrm2	W01—W06	UK_1—ITHD
6 group	ElemHrm3	W01—W06	UK_1—ITHD
7 group	SigmaA	W01—W14	URMS—AHM
8 group	Other	W01—W24	ETA1—F20
9 group	DeltaA	W01—W09	DU1—DPS
10 group	Motor	W01—W05	SPEED—PM
11 group	Aux	W01—W02	AUX1—AUX2

WT1800(4Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W20	URMS—AHM
2 group	Element2	W01—W20	URMS—AHM
3 group	Element3	W01—W20	URMS—AHM
4 group	Element4	W01—W20	URMS—AHM
5 group	ElemHrm1	W01—W06	UK_1—ITHD
6 group	ElemHrm2	W01—W06	UK_1—ITHD
7 group	ElemHrm3	W01—W06	UK_1—ITHD
8 group	ElemHrm4	W01—W06	UK_1—ITHD
9 group	SigmaA	W01—W14	URMS—AHM
10 group	SigmaB	W01—W14	URMS—AHM
11 group	Other	W01—W24	ETA1—F20
12 group	DeltaA	W01—W09	DU1—DPS
13 group	DeltaB	W01—W09	DU1—DPS
14 group	Motor	W01—W05	SPEED—PM
15 group	Aux	W01—W02	AUX1—AUX2

WT1800(5Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W20	URMS—AHM
2 group	Element2	W01—W20	URMS—AHM
3 group	Element3	W01—W20	URMS—AHM
4 group	Element4	W01—W20	URMS—AHM
5 group	Element5	W01—W20	URMS—AHM
6 group	ElemHrm1	W01—W06	UK_1—ITHD
7 group	ElemHrm2	W01—W06	UK_1—ITHD
8 group	ElemHrm3	W01—W06	UK_1—ITHD
9 group	ElemHrm4	W01—W06	UK_1—ITHD
10 group	ElemHrm5	W01—W06	UK_1—ITHD
11 group	SigmaA	W01—W14	URMS—AHM
12 group	SigmaB	W01—W14	URMS—AHM
13 group	Other	W01—W24	ETA1—F20
14 group	DeltaA	W01—W09	DU1—DPS
15 group	DeltaB	W01—W09	DU1—DPS
16 group	Motor	W01—W05	SPEED—PM
17 group	Aux	W01—W02	AUX1—AUX2

WT1800(6Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W20	URMS—AHM
2 group	Element2	W01—W20	URMS—AHM
3 group	Element3	W01—W20	URMS—AHM
4 group	Element4	W01—W20	URMS—AHM
5 group	Element5	W01—W20	URMS—AHM
6 group	Element6	W01—W20	URMS—AHM
7 group	ElemHrm1	W01—W06	UK_1—ITHD
8 group	ElemHrm2	W01—W06	UK_1—ITHD
9 group	ElemHrm3	W01—W06	UK_1—ITHD
10 group	ElemHrm4	W01—W06	UK_1—ITHD
11 group	ElemHrm5	W01—W06	UK_1—ITHD
12 group	ElemHrm6	W01—W06	UK_1—ITHD
13 group	SigmaA	W01—W14	URMS—AHM
14 group	SigmaB	W01—W14	URMS—AHM
15 group	SigmaC	W01—W14	URMS—AHM
16 group	Other	W01—W24	ETA1—F20
17 group	DeltaA	W01—W09	DU1—DPS
18 group	DeltaB	W01—W09	DU1—DPS
19 group	DeltaC	W01—W09	DU1—DPS
20 group	Motor	W01—W05	SPEED—PM
21 group	Aux	W01—W02	AUX1—AUX2

WT500(1Element model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01	URMS
		W02	UMN
		W03	UDC
		W04	URMN
		W05	UAC
		W06	IRMS
		W07	IMN
		W08	IDC
		W09	IRMN
		W10	IAC
		W11	P
		W12	S
		W13	Q
		W14	LAMBda
		W15	PHI
		W16	FU
		W17	FI
		W18	UPPeak
		W19	UMPeak
		W20	IPPeak
		W21	IMPeak
		W22	CFU
		W23	CFI
		W24	TIME
		W25	WH
		W26	WHP
		W27	WHM
		W28	AH
		W29	AHP
		W30	AHM
		W31	WS
		W32	WQ
2 group	ElemHrm1(G5)	W01	UK_0
		W02	UK_1
		W03	UK_T
		W04	IK_0
		W05	IK_1
		W06	IK_T
		W07	PK_0
		W08	PK_1
		W09	PK_T
		W10	SK_0
		W11	SK_1
		W12	SK_T
		W13	QK_0
		W14	QK_1
		W15	QK_T
		W16	LAMBDA0
		W17	LAMBDA1
		W18	LAMBDAT
		W19	PHIK_1
		W20	PHIK_T
		W21	PHIUk3
		W22	PHIIk3
		W23	UTHD
		W24	ITHD
		W25	PTHD

(Cont. on next page.)

	Group String	Waveform Number	Channel Assignment
3 group	Sigma	W01	URMS
		W02	UMN
		W03	UDC
		W04	URMN
		W05	UAC
		W06	IRMS
		W07	IMN
		W08	IDC
		W09	IRMN
		W10	IAC
		W11	P
		W12	S
		W13	Q
		W14	LAMBda
		W15	PHI
		W16	WH
		W17	WHP
		W18	WHM
		W19	AH
		W20	AHP
		W21	AHM
		W22	WS
		W23	WQ
4 group	Other	W01	ETA1
		W02	ETA2
		W03	F1
		W04	F2
		W05	F3
		W06	F4
		W07	F5
		W08	F6
		W09	F7
		W10	F8
5 group	Delta (DT)	W01	DELTA1
		W02	DELTA2
		W03	DELTA3
		W04	DELTA4
6 group	Phase (G5)	W01	P_U1U2
		W02	P_U1U3
		W03	P_U1I1
		W04	P_U1I2
		W05	P_U1I3

Note

- With the WT500, because the maximum number of parameters that can be acquired via communications is 255, the following cannot be acquired with the GateWT: 2nd through 50th orders of U/I/P/S/Q/LAMBda/PHI; 1st, 2nd, and 4th through 50th orders of PHIU/PHII; and UHDF, IHDF, and PHDF.
- (G5) can be selected on instruments with the harmonic option, and (DT) can be selected on instruments with the delta option. If an instrument without an option is selected, the group numbers shift to fill in the missing option. For example, groups are assigned as follows for a 1-element model with (G5) but without (DT).

  Group 1: Element1
  Group 2: ElemHrm1
  Group 3: Sigma
  Group 4: Other
  Group 5: Phase

WT500(2Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W32	URMS—WQ
2 group	Element2	W01—W32	URMS—WQ
3 group	ElemHrm1	W01—W25	UK_0—PTHD
4 group	ElemHrm2	W01—W25	UK_0—PTHD
5 group	Sigma	W01—W23	URMS—WQ
6 group	Other	W01—W10	ETA1—F8
7 group	Delta	W01—W04	DELTA1—DELTA4
8 group	Phase	W01—W05	P_U1U2—P_U1I3

WT500(3Elements model)

	Group String	Waveform Number	Channel Assignment
1 group	Element1	W01—W32	URMS—WQ
2 group	Element2	W01—W32	URMS—WQ
3 group	Element3	W01—W32	URMS—WQ
4 group	ElemHrm1	W01—W25	UK_0—PTHD
5 group	ElemHrm2	W01—W25	UK_0—PTHD
6 group	ElemHrm3	W01—W25	UK_0—PTHD
7 group	Sigma	W01—W23	URMS—WQ
8 group	Other	W01—W10	ETA1—F8
9 group	Delta	W01—W04	DELTA1—DELTA4
10 group	Phase	W01—W05	P_U1U2—P_U1I3

Tag Settings

Initial settings of the tags are assigned according to the model information obtained during automatic model determination.

WT100/WT200

WT110 WT110E WT200 WT210	Group 1 (Group name: Element1)	Element1(V, A, W, VA, VAR, PF, DEGR, VHZ, AHZ, WH, WHP, WHM, AH, AHP, AHM)+MATH+TIME
WT130(2Element) WT230(2Element)	Group 1 (Group name: Element1)	Element1(V–APK)+MATH+TIME
	Group 2 (Group name: Element3)	Element3(V–APK)
	Group 3 (Group name: Sigma)	Sigma(V–APK)
WT130(3Element) WT230(3Element)	Group 1 (Group name: Element1)	Element1(V–APK)+MATH+TIME
	Group 2 (Group name: Element2)	Element2(V–APK)
	Group 3 (Group name: Element3)	Element3(V–APK)
	Group 4 (Group name: Sigma)	Sigma(V–APK)

WT1000/WT2000

WT1010 WT2010	Group 1 (Group name: Element1)	Element1 (V, A, W, VA, PF, DEGR, VPK, APK, WH, WHP, WHM, AH, AHP, AHM)+FREQ+MATH+TIME
WT1030 WT2030	Group 1 (Group name: Element1)	Element1(V–AHM)+FREQ+MATH+TIME
	Group 2 (Group name: Element3)	Element3(V–AHM)
	Group 3 (Group name: Sigma)	Sigma(V~AHM)
WT1030(3Element) WT2030(3Element)	Group 1 (Group name: Element1)	Element1(V–AHM)+FREQ+MATH+TIME
	Group 2 (Group name: Element2)	Element2(V–AHM)
	Group 3 (Group name: Element3)	Sigma(V–AHM)
	Group 4 (Group name: Sigma)	Sigma(V–AHM)
WT1030M	Group 1 (Group name: Element1)	Element1(V–AHM)+FREQ+MATH+TIME
	Group 2 (Group name: Element2)	Element2(V–AHM)
	Group 3 (Group name: Element3)	Element3(V–AHM)
	Group 4 (Group name: Sigma)	Sigma(V–AHM)
	Group 5 (Group name: Sigma)	TORQ, RPM, SRPM, SLIP, MPOW, MEFF, TEFF

WT1600

Tags set to group ElementX are the same as those for Element1. Tags set to group SigmaX are the same as those for SigmaA.

Note

Since the maximum number of parameters that can be acquired via communications by the WT1600 is 255, GateWT cannot acquire Cfu, Chi, FfU, FfI, Z, Rs, Xs, Rp, or Xp.

WT1600 (1Element)	Groupe 1 (Groupe Name:Element1)	Element1(URMS, UMN, UDC, UAC, IRMS, IMN, IDC, IAC, P, S, Q, LAMBda, PHI, FU, FI, PC, UPPeak, UMPeak, IPPeak, IMPeak, TIME, WH, WHP, WHM, AH, AHP, AHM)
	Groupe 2 (SigmaA)	SigmaA(URMS, UMN, UDC, UAC, IRMS, IMN, IDC, IAC, P, S, Q, LAMBda, PHI, PC, WH, WHP, WHM, AH, AHP, AHM)
	Groupe 3 (Other)	Other(ETA, SETA, F1, F2, F3, F4, DURMS1, DUMN1, DUDC1, DUAC1, DURMS2, DUDC2, DUAC2, DUMN2, DURM3, DUMN3, DUDC3, DUAC3, DIRM, DIMN, DIDC, DIAC)
	Groupe 4 (Motor)	Motor(TORQue, SPEed, SYNC, SLIP, PM, MAETa, MBETa)
WT1600 (2Elements)	Groupe 1 (Element1)	Element1(URMS—AHM)
	Groupe 2 (Element2)	Element2(URMS—AHM)
	Groupe 3 (SigmaA)	SigmaA(URMS—AHM)
	Groupe 4 (SigmaB)	SigmaB(URMS—AHM)
	Groupe 5 (Other)	Other(ETA—DIAC)
	Groupe 6 (Motor)	Motor(TORQue—MBETa)
WT1600 (3Elements)	Groupe 1 (Element1)	Element1(URMS—AHM)
	Groupe 2 (Element2)	Element2(URMS—AHM)
	Groupe 3 (Element3)	Element3(URMS—AHM)
	Groupe 4 (SigmaA)	SigmaA(URMS—AHM)
	Groupe 5 (SigmaB)	SigmaB(URMS—AHM)
	Groupe 6 (SigmaC)	SigmaC(URMS—AHM)
	Groupe 7 (Other)	Other(ETA—DIAC)
	Groupe 8 (Motor)	Motor(TORQue—MBETa)
WT1600 (4Elements)	Groupe 1 (Element1)	Element1(URMS—AHM)
	Groupe 2 (Element2)	Element2(URMS—AHM)
	Groupe 3 (Element3)	Element3(URMS—AHM)
	Groupe 4 (Element4)	Element4(URMS—AHM)
	Groupe 5 (SigmaA)	SigmaA(URMS—AHM)
	Groupe 6 (SigmaB)	SigmaB(URMS—AHM)
	Groupe 7 (SigmaC)	SigmaC(URMS—AHM)
	Groupe 8 (Other)	Other(ETA—DIAC)
	Groupe 9 (Motor)	Motor(TORQUA—MBETa)
WT1600 (5Elements)	Groupe 1 (Element1)	Element1(URMS—AHM)
	Groupe 2 (Element2)	Element2(URMS—AHM)
	Groupe 3 (Element3)	Element3(URMS—AHM)
	Groupe 4 (Element4)	Element4(URMS—AHM)
	Groupe 5 (Element5)	Element5(URMS—AHM)
	Groupe 6 (SigmaA)	SigmaA(URMS—AHM)
	Groupe 7 (SigmaB)	SigmaB(URMS—AHM)
	Groupe 8 (SigmaC)	SigmaC(URMS—AHM)
	Groupe 9 (Other)	Other(ETA—DIAC)
	Groupe 10 (Motor)	Motor(TORQue—MBETa)
WT1600 (6Elements)	Groupe 1 (Element1)	Element1(URMS—AHM)
	Groupe 2 (Element2)	Element2(URMS—AHM)
	Groupe 3 (Element3)	Element3(URMS—AHM)
	Groupe 4 (Element4)	Element4(URMS—AHM)
	Groupe 5 (Element5)	Element5(URMS—AHM)
	Groupe 6 (Element6)	Element6(URMS—AHM)
	Groupe 7 (SigmaA)	SigmaA(URMS—AHM)
	Groupe 8 (SigmaB)	SigmaB(URMS—AHM)
	Groupe 9 (SigmaC)	SigmaC(URMS—AHM)
	Groupe 10 (Other)	Other(ETA—DIAC)
	Groupe 11 (Motor)	Motor(TORQue—MBETa)

WT1800

Tags set to group ElementX are the same as those for Element1. Tags set to group ElemHrmX are the same as those for ElemHrm1. Tags set to group SigmaX are the same as those for SigmaA. Tags set to group DeltaX are the same as those for DeltaA.

WT1800 (1Element)	Groupe 1 (Groupe Name:Element1)	Element1 (URMS, UMN, UDC, IRMS, IMN, IDC, P, S, Q, LAMBDA, PHI, FU, FI, TIME, WH, WHP, WHM, AH, AHP, AHM)
	Groupe 2 (ElemHrm1)	ElemHrm1 (UK_1, UK_T, IK_1, IK_T, UTHD, ITHD)
	Groupe 3 (Other)	Other (ETA1, ETA2, ,ETA3, ETA4, F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17, F18, F19, F20)
	Groupe 4 (Motor)	Motor (SPEED, TORQUE, SYNCSP, SLIP, PM)
	Groupe 5 (Aux)	Aux (AUX1, AUX2)
WT1800 (2Elements)	Groupe 1 (Element1)	Element1 (URMS—AHM)
	Groupe 2 (Element2)	Element2 (URMS—AHM)
	Groupe 3 (ElemHrm1)	ElemHrm1 (UK_1—ITHD)
	Groupe 4 (ElemHrm2)	ElemHrm2 (UK_1—ITHD)
	Groupe 5 (SigmaA)	SigmaA (URMS, UMN, IRMS, IMN, P, S, LAMBDA, PHI, WH, WHP, WHM, AH, AHP, AHM)
	Groupe 6 (Other)	Other (ETA1—F20)
	Groupe 7 (DeltaA)	DeltaA (DU1, DU2, DU3, DUS, DI, DP1, DP2, DP3, DPS)
	Groupe 8 (Motor)	Motor (SPEED—PM)
	Groupe 5 (Aux)	Aux (AUX1—AUX2)
WT1800 (3Elements)	Groupe 1 (Element1)	Element1 (URMS—AHM)
	Groupe 2 (Element2)	Element2 (URMS—AHM)
	Groupe 3 (Element3)	Element3 (URMS—AHM)
	Groupe 4 (ElemHrm1)	ElemHrm1 (UK_1—ITHD)
	Groupe 5 (ElemHrm2)	ElemHrm2 (UK_1—ITHD)
	Groupe 6 (ElemHrm3)	ElemHrm3 (UK_1—ITHD)
	Groupe 7 (SigmaA)	SigmaA (URMS—AHM)
	Groupe 8 (Other)	Other (ETA1—F20)
	Groupe 9 (DeltaA)	DeltaA (DU1—DPS)
	Groupe 10 (Motor)	Motor (SPEED—PM)
	Groupe 11 (Aux)	Aux (AUX1—AUX2)
WT1800 (4Elements)	Groupe 1 (Element1)	Element1 (URMS—AHM)
	Groupe 2 (Element2)	Element2 (URMS—AHM)
	Groupe 3 (Element3)	Element3 (URMS—AHM)
	Groupe 4 (Element4)	Element4 (URMS—AHM)
	Groupe 5 (ElemHrm1)	ElemHrm1 (UK_1—ITHD)
	Groupe 6 (ElemHrm2)	ElemHrm2 (UK_1—ITHD)
	Groupe 7 (ElemHrm3)	ElemHrm3 (UK_1—ITHD)
	Groupe 8 (ElemHrm4)	ElemHrm4 (UK_1—ITHD)
	Groupe 9 (SigmaA)	SigmaA (URMS—AHM)
	Groupe 10 (SigmaB)	SigmaB (URMS—AHM)
	Groupe 11 (Other)	Other (ETA1—F20)
	Groupe 12 (DeltaA)	DeltaA (DU1—DPS)
	Groupe 13 (DeltaB)	DeltaB (DU1—DPS)
	Groupe 14 (Motor)	Motor (SPEED—PM)
	Groupe 15 (Aux)	Aux (AUX1—AUX2)

(Cont. on next page.)

WT1800 (5Elements)	Groupe 1 (Element1)	Element1 (URMS—AHM)
	Groupe 2 (Element2)	Element2 (URMS—AHM)
	Groupe 3 (Element3)	Element3 (URMS—AHM)
	Groupe 4 (Element4)	Element4 (URMS—AHM)
	Groupe 5 (Element5)	Element5 (URMS—AHM)
	Groupe 6 (ElemHrm1)	ElemHrm1 (UK_1—ITHD)
	Groupe 7 (ElemHrm2)	ElemHrm2 (UK_1—ITHD)
	Groupe 8 (ElemHrm3)	ElemHrm3 (UK_1—ITHD)
	Groupe 9 (ElemHrm4)	ElemHrm4 (UK_1—ITHD)
	Groupe 10 (ElemHrm5)	ElemHrm5 (UK_1—ITHD)
	Groupe 11 (SigmaA)	SigmaA (URMS—AHM)
	Groupe 12 (SigmaB)	SigmaB (URMS—AHM)
	Groupe 13 (Other)	Other (ETA1—F20)
	Groupe 14 (DeltaA)	DeltaA (DU1—DPS)
	Groupe 15 (DeltaB)	DeltaB (DU1—DPS)
	Groupe 16 (Motor)	Motor (SPEED—PM)
	Groupe 17 (Aux)	Aux (AUX1—AUX2)
WT1800 (6Elements)	Groupe 1 (Element1)	Element1 (URMS—AHM)
	Groupe 2 (Element2)	Element2 (URMS—AHM)
	Groupe 3 (Element3)	Element3 (URMS—AHM)
	Groupe 4 (Element4)	Element4 (URMS—AHM)
	Groupe 5 (Element5)	Element5 (URMS—AHM)
	Groupe 6 (Element6)	Element6 (URMS—AHM)
	Groupe 7 (ElemHrm1)	ElemHrm1 (UK_1—ITHD)
	Groupe 8 (ElemHrm2)	ElemHrm2 (UK_1—ITHD)
	Groupe 9 (ElemHrm3)	ElemHrm3 (UK_1—ITHD)
	Groupe 10 (ElemHrm4)	ElemHrm4 (UK_1—ITHD)
	Groupe 11 (ElemHrm5)	ElemHrm5 (UK_1—ITHD)
	Groupe 12 (ElemHrm6)	ElemHrm6 (UK_1—ITHD)
	Groupe 13 (SigmaA)	SigmaA (URMS—AHM)
	Groupe 14 (SigmaB)	SigmaB (URMS—AHM)
	Groupe 15 (SigmaC)	SigmaC (URMS—AHM)
	Groupe 16 (Other)	Other (ETA1—F20)
	Groupe 17 (DeltaA)	DeltaA (DU1—DPS)
	Groupe 18 (DeltaB)	DeltaB (DU1—DPS)
	Groupe 19 (DeltaC)	DeltaC (DU1—DPS)
	Groupe 20 (Motor)	Motor (SPEED—PM)
	Groupe 21 (Aux)	Aux (AUX1—AUX2)

WT500

Tags set to group ElementX are the same as those for Element1.

Note

- With the WT500, because the maximum number of parameters that can be acquired via communications is 255, the following cannot be acquired with the GateWT: 2nd through 50th orders of U/I/P/S/Q/LAMBda/PHI; 1st, 2nd, and 4th through 50th orders of PHIU/PHII; and UHDF, IHDF, and PHDF.
- (G5) can be selected on instruments with the harmonic option, and (DT) can be selected on instruments with the delta option. If an instrument without an option is selected, the group numbers shift to fill in the missing option. For example, groups are assigned as follows for a 1-element model with (G5) but without (DT).

  Group 1: Element1
  Group 2: ElemHrm1
  Group 3: Sigma
  Group 4: Other
  Group 5: Phase

WT500 (1Element)	Group 1 (Group name:Element1)	Element1(URMS, UMN, UDC, URMN, UAC, IRMS, IMN, IDC, IRMN, IAC, P, S, Q, LAMBda, PHI, FU, FI, UPPeak, UMPeak, IPPeak, IMPeak, CFU, CFI, TIME, WH, WHP, WHM, AH, AHP, AHM, WS, WQ)
	Group 2 (ElemHrm1) (G5)	Element1(UK_0, UK_1, UK_T, IK_0, IK_1, IK_T, PK_0, PK_1, PK_T, SK_0, SK_1, SK_T, QK_0, QK_1, QK_T, LAMBD0, LAMBD1, LAMBDT, PHIK_1, PHIK_T, PHIUk3, PHIIk3, UTHD, ITHD, PTHD)
	Group 3 (Sigma)	SigmaA(URMS, UMN, UDC, URMN, UAC, IRMS, IMN, IDC, IRMN, IAC, P, S, Q, LAMBda, PHI, WH, WHP, WHM, AH, AHP, AHM, WS, WQ)
	Group 4 (Other)	Other(ETA1, ETA2, F1, F2, F3, F4, F5, F6, F7, F8)
	Group 5 (Delta) (DT)	Delta(DELTA1, DELTA2, DELTA3, DELTA4)
	Group 6 (Phase) (G5)	Phase(P_U1U2, P_U1U3, P_U1I1, P_U1I2, P_U1I3)
WT500 (2Elements)	Group 1 (Element1)	Element1(URMS—WQ)
	Group 2 (Element2)	Element2(URMS—WQ)
	Group 3 (ElemHrm1) (G5)	Element1(UK_0—PTHD)
	Group 4 (ElemHrm2) (G5)	Element2(UK_0—PTHD)
	Group 5 (Sigma)	Sigma(URMS—WQ)
	Group 6 (Other)	Other(ETA—F8)
	Group 7 (Delta) (DT)	Delta(DELTA1—DELTA4)
	Group 8 (Phase) (G5)	Phase(P_U1U2—P_U1I3)
WT500 (3Elements)	Group 1 (Element1)	Element1(URMS—WQ)
	Group 2 (Element2)	Element2(URMS—WQ)
	Group 3 (Element3)	Element3(URMS—WQ)
	Group 4 (ElemHrm1) (G5)	Element1(UK_0—PTHD)
	Group 5 (ElemHrm2) (G5)	Element2(UK_0—PTHD)
	Group 6 (ElemHrm3) (G5)	Element3(UK_0—PTHD)
	Group 7 (Sigma)	Sigma(URMS—WQ)
	Group 8 (Other)	Other(ETA—F8)
	Group 9 (Delta) (DT)	Delta (DELTA1—DELTA4)
	Group 10 (Phase) (G5)	Phase (P_U1U2—P_U1I3)

A list of function names used in this manual and function names used on the WT1600 (Numerical display header name)

Function names used in this manual	: Function names used on the WT1600 (Numerical display header name)
URMS	: Urms
UMN	: Umean
UDC	: Udc
UAC	: Uac
IRMS	: Irms
IMN	: Imean
IDC	: Idc
IAC	: Iac
P	: P
S	: S
Q	: Q
LAMBda	: λ
PHI	: φ
FU	: FreqU (fU)
FI	: FreqI (fI)
UPPeak	: U+peak (U+pk)
UMPeak	: U-peak (U-pk)
IPPeak	: I+peak (I+pk)
IMPeak	: I-peak (I-pk)
CFU	: CfU
CFI	: CfI
FFU	: FfU
FFI	: FfI
Z	: Z
RS	: Rs
XS	: Xs
RP	: Rp
XP	: Xp

Function names used in this manual	: Function names used on the WT1600 (Numerical display header name)
PC	: Pc
TIME	: I-Time
WH	: Wp
WHP	: Wp+
WHM	: Wp-
AH	: q
AHP	: q+
AHM	: q-
ETA	: η
SETA	: 1/η
F1	: F1
F2	: F2
F3	: F3
F4	: F4
DURMS	: ΔUrms
DUMN	: ΔUmean
DUDC	: ΔUdc
DUAC	: ΔUac
DIRMS	: ΔIrms
DIMN	: ΔImean
DIDC	: ΔIdc
DIAC	: ΔIac
SPEed	: Speed
TORQue	: Torque
SYNC	: SyncSpd
SLIP	: Slip
PM	: Pm
MAETa	: ηmA

A list of function names used in this manual and function names used on the WT1800 (Numerical display header name)

Function names used in this manual	: Function names used on the WT1800 (Numerical display header name)
URMS	: Urms
UMN	: Umn
UDC	: Udc
IRMS	: Irms
IMN	: Imn
IDC	: Idc
P	: P
S	: S
Q	: Q
LAMBDA	: λ
PHI	: φ
FU	: fU (FreqU)
FI	: fI (FreqI)
TIME	: Time
WH	: WP
WHP	: Wp+
WHM	: Wp-
AH	: q
AHP	: q+
AHM	: q-
UK_1	: U(1)
UK_T	: U(Total)
IK_1	: I(1)
IK_T	: I(Total)
UTHD	: Uthd
ITHD	: Ithd
ETA1	: η1
ETA2	: η2
ETA3	: η3
ETA4	: η4
F1	: F1
F2	: F2
F3	: F3

Function names used in this manual	: Function names used on the WT1800 (Numerical display header name)
F4	: F4
F5	: F5
F6	: F6
F7	: F7
F8	: F8
F9	: F9
F10	: F10
F11	: F11
F12	: F12
F13	: F13
F14	: F14
F15	: F15
F16	: F16
F17	: F17
F18	: F18
F19	: F19
F20	: F20
DU1	: ΔU1
DU2	: ΔU2
DU3	: ΔU3
DUS	: ΔUΣ
DI	: ΔI
DP1	: ΔP1
DP2	: ΔP2
DP3	: ΔP3
DPS	: ΔPΣ
TORQUE	: Torque
SPEED	: Speed
SYNCSP	: Syncsp
SLIP	: Slip
PM	: Pm
AUX1	: Aux1
AUX2	: Aux2

A list of function names used in this manual and function names used on the WT500 (Numerical display header name)

Function names used in this manual	:	Function names used on the WT500 (Numerical display header name)
URMS	:	Urms
UMN	:	Umn
UDC	:	Udc
URMN	:	Urmn
UAC	:	Uac
IRMS	:	Irms
IMN	:	Imn
IDC	:	Idc
IRMN	:	Irmn
IAC	:	Iac
P	:	P
S	:	S
Q	:	Q
LAMBda	:	λ
PHI	:	φ
FU	:	FreqU(fU)
FI	:	FreqI(fI)
UPPeak	:	U+peak(U+pk)
UMPeak	:	U-peak(U-pk)
IPPeak	:	I+peak(I+pk)
IMPeak	:	I-peak(I-pk)
CFU	:	CfU
CFI	:	CfI
TIME	:	Time
WH	:	WP
WHP	:	WP+
WHM	:	WP–
AH	:	q
AHP	:	q+
AHM	:	q–
WS	:	WS
WQ	:	WQ
UK_0	:	U(k) k=0
UK_1	:	U(k) k=1
UK_T	:	U(k) k=Total
IK_0	:	I(k) k=0
IK_1	:	I(k) k=1
IK_T	:	I(k) k=Total
PK_0	:	P(k) k=0
PK_1	:	P(k) k=1
PK_T	:	P(k) k=Total
SK_0	:	S(k) k=0
SK_1	:	S(k) k=1
SK_T	:	S(k) k=Total
QK_0	:	Q(k) k=0
QK_1	:	Q(k) k=1
QK_T	:	Q(k) k=Total
LAMBD0	:	λ(k) k=0
LAMBD1	:	λ(k) k=1
LAMBDT	:	λ(k) k=Total
PHIK_1	:	φ(k) k=1
PHIK_T	:	φ(k) k=Total
PHIUk3	:	φU(k) k=3
PHIIk3	:	φI(k) k=3
UTHD	:	Uthd
ITHD	:	Ithd
PTHD	:	Pthd

Function names used in this manual	:	Function names used on the WT500 (Numerical display header name)
ETA1	:	η1
ETA2	:	η2
F1	:	F1
F2	:	F2
F3	:	F3
F4	:	F4
F5	:	F5
F6	:	F6
F7	:	F7
F8	:	F8
DELTA1	:	ΔF1
DELTA2	:	ΔF2
DELTA3	:	ΔF3
DELTA4	:	ΔF4
P_U1U2	:	φUi-Uj
P_U1U3	:	φUi-Uk
P_U1I1	:	φUi-Ii
P_U1I2	:	φUi-Ij
P_U1I3	:	φUi-Ik

Channel Names, Tag IDs, and Tag Names

GateWT's default channel names and tag IDs are the same: EI:V, EI:A, … etc.
The tag names are the names of the output items on the connected WT: TAG01, TAG02, …etc. These can be changed.

Note

When connecting DAQLOGGER to GateWT, channel names and tag IDs are ignored. You can download tag names using tag setting software.

Channel Colors

The default channel colors on GateWT are the following 16 colors.

Red, Green, Blue, Magenta, Orange, Cyan, Brown, LightGray, Purple, Pink, Yellow, White, CaditBlue, LightPink, LightGreen, Salmon

These can be changed.

GateWT is started and the data of a possible data collection from WT1600

GateWT doesn't correspond to "Harmonic component mode." Therefore, the data collection of the parameter in the harmonic component mode is not made.

	Element 1	Element 2	Element 3	Element 4	Element 5	Element 6	ΣA	ΣB	ΣC	motor
Voltage RMS	URMS	URMS	URMS	URMS	URMS	URMS	URMS	URMS	URMS	TORQue
Voltage MEAN	UMN	UMN	UMN	UMN	UMN	UMN	UMN	UMN	UMN	SPEed
										Revolution sped
Voltage DC	UDC	UDC	UDC	UDC	UDC	UDC	UDC	UDC	UDC	SYNC
										Synchronization speed
Voltage AC	UAC	UAC	UAC	UAC	UAC	UAC	UAC	UAC	UAC	SLIP
Current RMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	PM
										Motor output
Current MEAN	IMN	IMN	IMN	IMN	IMN	IMN	IMN	IMN	IMN	MAETa
										Motor efficiency
Current DC	IDC	IDC	IDC	IDC	IDC	IDC	IDC	IDC	IDC	MBETa
										total efficiency
Current AC	IAC	IAC	IAC	IAC	IAC	IAC	IAC	IAC	IAC	
Active power	P	P	P	P	P	P	P	P	P	
Apparent power	S	S	S	S	S	S	S	S	S	
Reactive power	Q	Q	Q	Q	Q	Q	Q	Q	Q	
Power factor	LAMBda	LAMBda	LAMBda	LAMBda	LAMBda	LAMBda	LAMBda	LAMBda	LAMBda	
Phase difference	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	
Voltage frequency	FU	FU	FU	FU	FU	FU				
Current frequency	FI	FI	FI	FI	FI	FI				
Corrected Power Pc	PC	PC	PC	PC	PC	PC	PC	PC	PC	
Voltage + peak	UPPeak	UPPeak	UPPeak	UPPeak	UPPeak	UPPeak				
Voltage – peak	UMPeak	UMPeak	UMPeak	UMPeak	UMPeak	UMPeak				
Current + peak	IPPeak	IPPeak	IPPeak	IPPeak	IPPeak	IPPeak				
Current – peak	IMPeak	IMPeak	IMPeak	IMPeak	IMPeak	IMPeak				
Integration time	TI	TI	TI	TI	TI	TI				
Watt hour (positive and negative)	WH	WH	WH	WH	WH	WH	WH	WH	WH	
Watt hour (positive)	WHP	WHP	WHP	WHP	WHP	WHP	WHP	WHP	WHP	
Watt hour (negative)	WHM	WHM	WHM	WHM	WHM	WHM	WHM	WHM	WHM	
Current hour (positive and negative)	AH	AH	AH	AH	AH	AH	AH	AH	AH	
Current hour (positive)	AHP	AHP	AHP	AHP	AHP	AHP	AHP	AHP	AHP	
Current hour (negative)	AHM	AHM	AHM	AHM	AHM	AHM	AHM	AHM	AHM	
	DURM	DURM	DURM							
Delta computation voltage MEAN	DUMN	DUMN	DUMN							
Delta computation voltage DC	DUDC	DUDC	DUDC							
Delta computation current AC	DUAC	DUAC	DUAC							
Delta computation current AC IRMS				DIRMS						
Delta computation current AC IMN				DIMN						
Delta computation current AC IDC				DIDC						
Delta computation current AC IAC				DIAC						
Efficiency 1	ETA									
Efficiency 2	SETA									
User-defined function 1	F1									
User-defined function 2	F2									
User-defined function 3	F3									
User-defined function 4	F4									

GateWT is started and the data of a possible data collection from WT1800

	Element 1	Element 2	Element 3	Element 4	Element 5	Element 6	ΣA	ΣB	ΣC	motor
Voltage RMS	URMS	URMS	URMS	URMS	URMS	URMS	URMS	URMS	URMS	SPEED Revolution speed
Voltage MEAN	UMN	UMN	UMN	UMN	UMN	UMN	UMN	UMN	UMN	TORQUE
Voltage DC	UDC	UDC	UDC	UDC	UDC	UDC				SYNCSP Synchronization speed
Current RMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	IRMS	SLIP
Current MEAN	IMN	IMN	IMN	IMN	IMN	IMN	IMN	IMN	IMN	PM Motor output
Current DC	IDC	IDC	IDC	IDC	IDC	IDC				
Active power	P	P	P	P	P	P	P	P	P	
Apparent power	S	S	S	S	S	S	S	S	S	
Reactive power	Q	Q	Q	Q	Q	Q				
Power factor	LAMBDA	LAMBDA	LAMBDA	LAMBDA	LAMBDA	LAMBDA	LAMBDA	LAMBDA	LAMBDA	
Phase difference	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	
Voltage frequency	FU	FU	FU	FU	FU	FU				
Current frequency	FI	FI	FI	FI	FI	FI				
Integration time	TIME	TIME	TIME	TIME	TIME	TIME				
Watt hour (positive and negative)	WH	WH	WH	WH	WH	WH	WH	WH	WH	
Watt hour (positive)	WHP	WHP	WHP	WHP	WHP	WHP	WHP	WHP	WHP	
Watt hour (negative)	WHM	WHM	WHM	WHM	WHM	WHM	WHM	WHM	WHM	
Current hour (positive and negative)	AH	AH	AH	AH	AH	AH	AH	AH	AH	
Current hour (positive)	AHP	AHP	AHP	AHP	AHP	AHP	AHP	AHP	AHP	
Current hour (negative)	AHM	AHM	AHM	AHM	AHM	AHM	AHM	AHM	AHM	
Rms voltage value of harmonic order 1	UK_1	UK_1	UK_1	UK_1	UK_1	UK_1				
Total harmonic voltage	UK_T	UK_T	UK_T	UK_T	UK_T	UK_T				
Rms current value of harmonic order 1	IK_1	IK_1	IK_1	IK_1	IK_1	IK_1				
Total harmonic current	IK_T	IK_T	IK_T	IK_T	IK_T	IK_T				
Total harmonic voltage distortion	UTHD	UTHD	UTHD	UTHD	UTHD	UTHD				
Total harmonic current distortion	ITHD	ITHD	ITHD	ITHD	ITHD	ITHD				

Equation for efficiency 1	ETA1
Equation for efficiency 2	ETA2
Equation for efficiency 3	ETA3
Equation for efficiency 4	ETA4
User-defined function 1	F1
User-defined function 2	F2
User-defined function 3	F3
User-defined function 4	F4
User-defined function 5	F5
User-defined function 6	F6
User-defined function 7	F7
User-defined function 8	F8
User-defined function 9	F9
User-defined function 10	F10
User-defined function 11	F11
User-defined function 12	F12
User-defined function 13	F13
User-defined function 14	F14

(Cont. on next page.)

User-defined function 15	F15
User-defined function 16	F16
User-defined function 17	F17
User-defined function 18	F18
User-defined function 19	F19
User-defined function 20	F20
Delta computation voltage 1	DU1
Delta computation voltage 2	DU2
Delta computation voltage 3	DU3
Delta computation voltage sigma	DUS
Delta computation current	DI
Delta computation power 1	DP1
Delta computation power 2	DP2
Delta computation power 3	DP3
Delta computation power sigma	DPS
Aux1	AUX1
Aux2	AUX2

GateWT is started and the data of a possible data collection from WT500

	Element1	Element2	Element3	Σ
Voltage RMS	URMS	URMS	URMS	URMS
Voltage MEAN	UMN	UMN	UMN	UMN
Voltage DC	UDC	UDC	UDC	UDC
Voltage RMEAN	URMN	URMN	URMN	URMN
Voltage AC	UAC	UAC	UAC	UAC
Current RMS	IRMS	IRMS	IRMS	IRMS
Current MEAN	IMN	IMN	IMN	IMN
Current DC	IDC	IDC	IDC	IDC
Current RMEAN	IRMN	IRMN	IRMN	IRMN
Current AC	IAC	IAC	IAC	IAC
Active power	P	P	P	P
Apparent power	S	S	S	S
Reactive power	Q	Q	Q	Q
Power factor	LAMBda	LAMBda	LAMBda	LAMBda
Phase difference	PHI	PHI	PHI	PHI
Voltage frequency	FU	FU	FU	
Current frequency	FI	FI	FI	
Voltage + peak	UPPeak	UPPeak	UPPeak	
Voltage – peak	UMPeak	UMPeak	UMPeak	
Current + peak	IPPeak	IPPeak	IPPeak	
Current – peak	IMPeak	IMPeak	IMPeak	
Voltage crest factor	CFU	CFU	CFU	
Current crest factor	CFI	CFI	CFI	
Integration time	TIME	TIME	TIME	
Watt hour (positive and negative)	WH	WH	WH	WH
Watt hour (positive)	WHP	WHP	WHP	WHP
Watt hour (negative)	WHM	WHM	WHM	WHM
Current hour (positive and negative)	AH	AH	AH	AH
Current hour (positive)	AHP	AHP	AHP	AHP
Current hour (negative)	AHM	AHM	AHM	AHM
Volt-ampare hours	WS	WS	WS	WS
Var hours	WQ	WQ	WQ	WQ
Rms voltage value of harmonic order 0	UK_0	UK_0	UK_0	
Rms voltage value of harmonic order 1	UK_1	UK_1	UK_1	
Total harmonic voltage	UK_T	UK_T	UK_T	
Rms current value of harmonic order 0	IK_0	IK_0	IK_0	
Rms current value of harmonic order 1	IK_1	IK_1	IK_1	
Total harmonic current	IK_T	IK_T	IK_T	
Active power of harmonic order 0	PK_0	PK_0	PK_0	
Active power of harmonic order 1	PK_1	PK_1	PK_1	
Total harmonic active power	PK_T	PK_T	PK_T	
Apparent power of harmonic order 0	SK_0	SK_0	SK_0	
Apparent power of harmonic order 1	SK_1	SK_1	SK_1	
Total harmonic apparent power	SK_T	SK_T	SK_T	
Reactive power of harmonic order 0	QK_0	QK_0	QK_0	
Reactive power of harmonic order 1	QK_1	QK_1	QK_1	
Total harmonic reactive power	QK_T	QK_T	QK_T	
Power factor of harmonic order 0	LAMBD0	LAMBD0	LAMBD0	
Power factor of harmonic order 1	LAMBD1	LAMBD1	LAMBD1	
Total harmonic power factor	LAMBDT	LAMBDT	LAMBDT	
Phase difference of harmonic order 1	PHIK_1	PHIK_1	PHIK_1	
Total harmonic phase difference	PHIK_T	PHIK_T	PHIK_T	
Phase difference between fundamental signal voltage and harmonic order 3	PHIUk3	PHIUk3	PHIUk3	
Phase difference between fundamental signal current and harmonic order 3	PHIIk3	PHIIk3	PHIIk3	
Total harmonic voltage distortion	UTHD	UTHD	UTHD	
Total harmonic current distortion	ITHD	ITHD	ITHD	
Total harmonic active power distortion	PTHD	PTHD	PTHD	

(Cont. on next page.)

	Element1	Element2	Element3	Σ
Equation for efficiency 1	ETA1			
Equation for efficiency 2	ETA2			
User-defined function 1	F1			
User-defined function 2	F2			
User-defined function 3	F3			
User-defined function 4	F4			
User-defined function 5	F5			
User-defined function 6	F6			
User-defined function 7	F7			
User-defined function 8	F8			
Delta computation 1	DELTA1			
Delta computation 2	DELTA2			
Delta computation 3	DELTA3			
Delta computation 4	DELTA4			
Phase difference UIU2	P_U1U2			
Phase difference UIU3	P_U1U3			
Phase difference UII1	P_U1I1			
Phase difference UII2	P_U1I2			
Phase difference UII3	P_U1I3			

3.3 Error Messages and Corrective Actions

Error

No.	Message	Corrective Actions
E211	Cannot write to file.	Check if the disk capacity is sufficient or if the file systems is normal.
E212	Cannot read file.	Check if the file exists and is supported by the software or if the file system is normal.
E213	Cannot open file.	Check if the file exists and is supported by the software or if the file system is normal
E401	Communication error.	Check if the recorder connected for communication is powered on and if the cable is properly connected. Also check the following items according the the communication type. • For Ethernet Check if address settings are correct; the TCP/IP protocol is installed in Windows; the Ethernet card is properly installed. • For RS-232 and RS-422-A Check if the baud rate settings match; the port (COM1 to COM9) settings match, the address settings are correct (RS-422-A); the serial port of the PC is active and the appropriate cable is being used.
E402	Communication timeout.	-
E403	Cannot open a communication port.	Same as E401.
E501	Invalid license number. Please reinstall the software.	Install the software again.
E1010	Execution of aprocess failed.	Check whether an executable function exists, or whether its files are damaged. If this error appears frequently, reinstall the software.
E1011	Execuition of a service failed.	Check whether an executable function exists, or whether its files are damaged. If this error appears frequently, reinstall the software.
E1600	The WT1000/WT2000 does not support	With WT1000/WT2000 series instruments, model determination can

Message

No.	Message
M1201	Model determination was successful.
M1210	Setting changes saved before execution.

Executable Function Messages

No.	Message	Corrective Actions
W[631]	Data Lack	Reduce the number of acquired data points or connected instruments, or lengthen the scan interval.
E[673]	Cannot open communication	Same as E401.
E[674]	Communication error	Same as E401.
E[675]	Communication time out	Same as E401.
E[850]	Command Error	An error was received from the WT. Check the status of the WT.
E[851]	Cannot setting WT	Check whether the communication status and connected instruments matches those specified in the software. If they do not, perform model determination again.
E[852]	Recive Continued	Check the communication status.
E[853]	Recieve data error	Check the communication status.
I[606]	Recovery Communication	Connection recovered.

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