EQUO Series

Station Utility

User's Manual

ASC-DE-111020-4B

Introduction

Thank you for purchasing our EQUO Series product.

This manual describes the information on the functions, performance and usage required to use Station Utility, PC software for OMRON's EQUO Series product.

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How to Read This Manual

■Symbols Used in this Manual

Menu items that are displayed on the screen, and windows, dialog boxes and other GUI elements displayed on the PC are indicated enclosed by brackets "[ ]".

■Marks Used in this Manual

Important: Indicates essential information on the product operation and functions, which requires special attention or caution.

Note: Shows operational tips or related useful information.

Table of Contents

1. Product Overview and Preparation

1.1 Overview

Station Utility is PC software, which consists of four major functions.

(1) Setting Tool

This function provides remote operations including measurement condition settings (except for some settings), recording start and stop from the PC for remotely located EQUO series units.

(2) Logging Tool

The function acquires the measured data from EQUO series units to the PC via network.

(3) Instant Value Display (SD Viewer ES)

The tool provides the graph displays offline of the data acquired to the PC using the logging tool or data recorded to the SD memory card. It can also consolidate multiple data items recorded in different periods or provide a concurrent display of multiple data items recorded in different periods or with different EQUO series units.

(4) Integration and Summation Tool (Energy Viewer)

The tool provides summations of data acquired to the PC using the logging tool or data recorded to the SD memory card. The unit of summation periods can be changed and pre-selected summation items on multiple Portable Power Monitor units can be displayed in graphs with this tool. It also provides the comparison of the current data with summation data in the past or data recorded on other EQUO series units.

1.2 EQUO Series Unit Compatibility

The list below shows the Station Utility function compatibility with EQUO series products.

Product Name	Type	Instant Value Display	Integration/ Summation	Monitoring	Logging	Setting
Air Thermo Station	ZN-THX21-S	Yes	Yes	Yes	Yes	Yes
Differential Pressure Station	ZN-DPX21-S	Yes	Yes	Yes	Yes	Yes
Air Particle Sensor	ZN-PD□□-S	Yes	Yes	Yes	Yes	Not supported
Portable Power Monitor	ZN-CTX21	Yes	Yes	Yes	Yes	Yes
Power Management Station	ZN-KMX21	Yes	Yes	Yes	Yes	Yes
Air Thermo Logger	ZN-THX11-S	Yes	Not supported	Not supported	Not supported	Not supported

1.3 Operating Environment

The following table shows the Station Utility PC software operating environment.

Station Utility PC Software Operating Environment

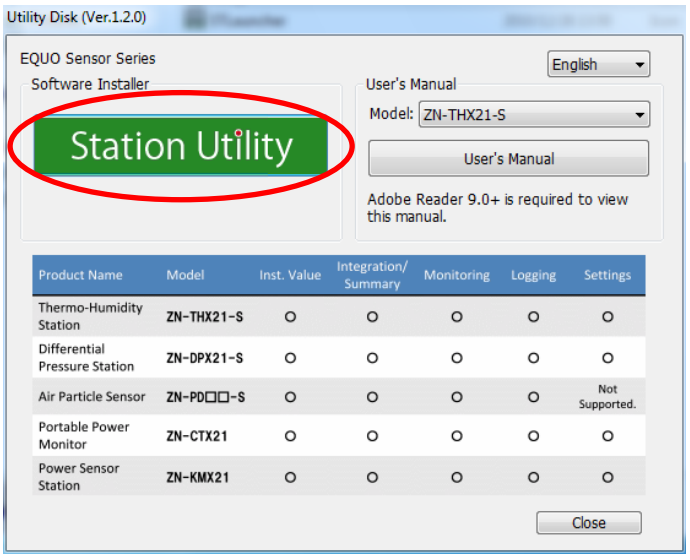
Compatible OS	Windows XP (32-bit) / Windows Vista (32-bit) / Windows 7 (32-bit/64-bit)
CPU	Intel-compatible processor 1.5GHz or higher
Memory	1 GB or more (Recommended: 2 GB or more)
Display	Resolution: 1024 x 768 or higher; 65535 colors (16-bit color display) or higher
HDD	Minimum 30 MB free space required for installing Station Utility
CD-ROM Drive	Required for Station Utility installation
LAN Port (10BASE-T or 100BASE-TX compatible)	Required for network connection
SD Card Reader/Writer and SD Card Slot	Required for reading data recorded on EQUO series product units.

1.4 Installation

(1) Installation data is downloaded in a PC from following URL.

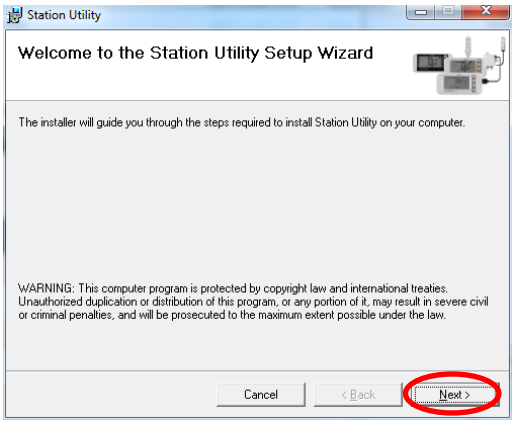
http://www.fa.omron.co.jp/station-u-e

Please carry out Setup.exe of installation data.

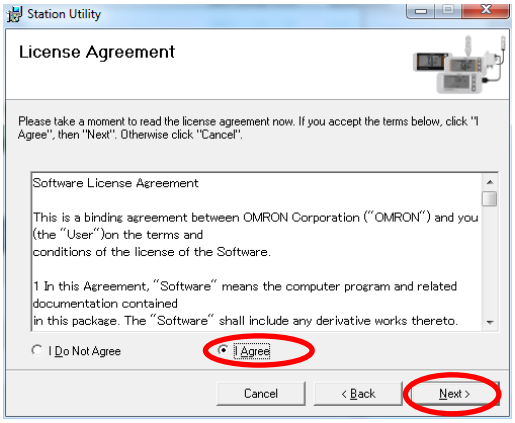


Click "Station Utility".
The "User Account Control" window is displayed. Click "Allow".

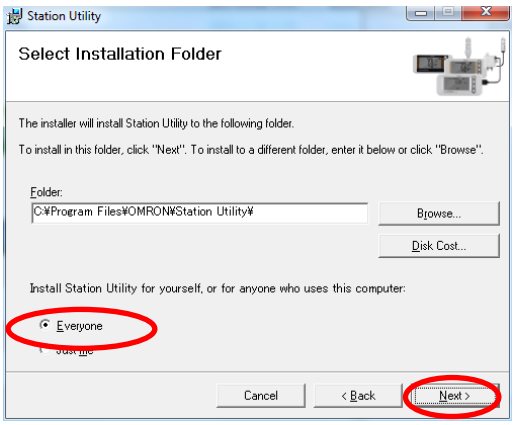
(2) The window entitled "Welcome to the Station Utility Setup Wizard" appears. Click "Next".



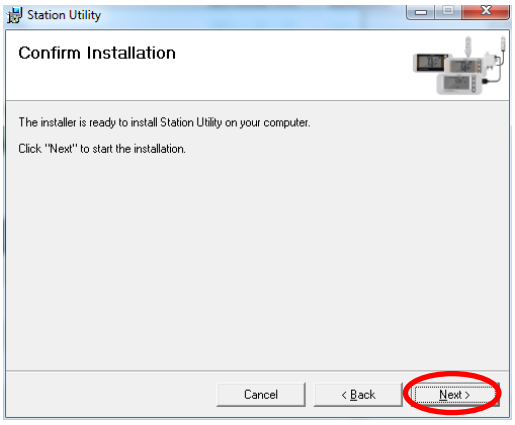
(3) Read the displayed Software License Agreement, select "I Agree" and click "Next".



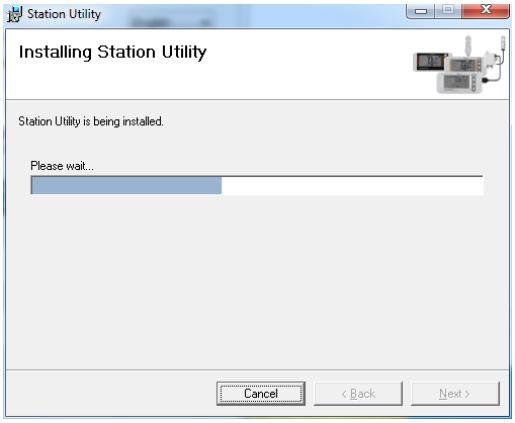
(4) Check the installation destination folder in the “Select Installation Folder” window. Select "Everyone" and click "Next".



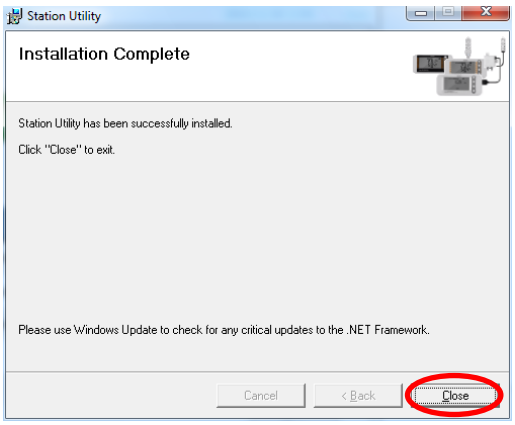
(5) Click "Next" in the “Confirm Installation” window.



(6) The message "Installing Station Utility" appears.



(7) The “Installation Complete” window appears. Click "Close". The installation of the Station Utility is now completed.



(8) Individual Station Utility tools can be started from the startup tool select window. To open the startup tool select window, click the shortcut icon on the Windows desktop or select "Start menu" - "All programs" - "OMRON" - "Station Utility" - "Station Utility Ver.1.*.*".

Station Utility Shortcut Icon

Startup Tool Select Window

1.5 Uninstallation

To uninstall the Station Utility, click “Add or Remove Programs” (Windows XP) or “Uninstall or Change Program” (Windows Vista or 7).

2. Remote Setting and Operation from PC: Using the Setting Tool

2.1 Setting Tool Overview

The Station Utility Setting Tool provides remote operations including measurement condition settings, recording start and stop from the PC for remotely located EQUO series units.

Items that can be Remotely Set
- Recording Interval (CYCLE)
- Integrated Power Upper Limit Threshold (INT H)
- Recording Mode (REC)

Commands than can be Remotely Controlled
- Start Acquisition
- Stop Acquisition
- Write to SD Memory Card
- Release Alarm
- Release Error
- Time Adjustment
- Restart
- KMX Mode Change

Note

IP address settings in FUN mode are not possible with the Setting Tool. Direct settings on individual units are required.

Important

Do not use the Setting Tool when the Station Utility Logging Tool is used. Communication errors frequently occur if the tools are used at the same time.

2.2 Operating Environment / Installation / Uninstallation

The Setting Tool is installed simultaneously with Station Utility.
Refer to "1.3 Operating Environment", "1.4 Installation" and "1.5 Uninstallation" for the tool's operating environment and installation/uninstallation procedures.

2.3 Startup and Exit

2.3.1 Startup

(1) Connection to EQUO Unit

EQUO units must be connected to the PC via network to conduct settings and operation using the Setting Tool.

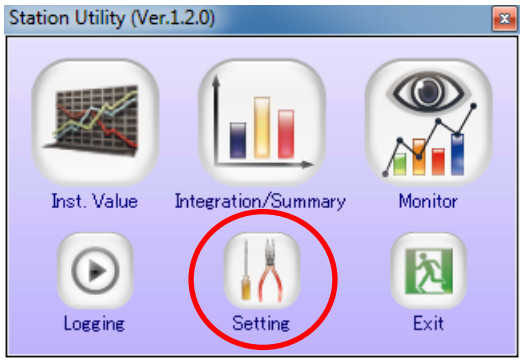
Refer to the individual EQUO unit operation manuals for the connection procedure.

Note

The Setting Tool does not provide IP address (IP) settings in FUN mode. Direct settings on individual units are required.

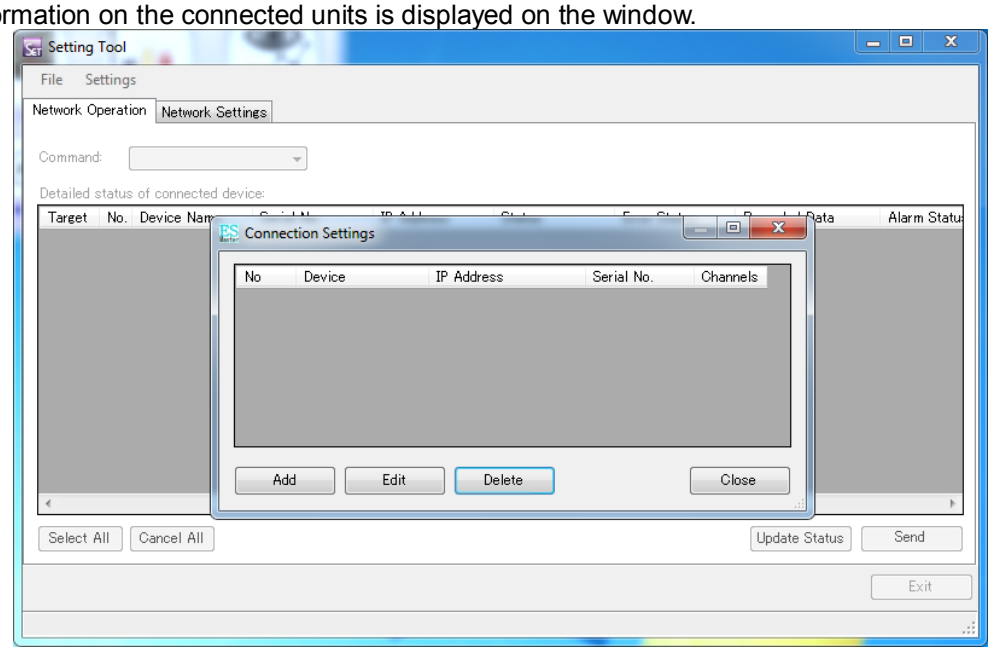
(2) Starting Setting Tool

Click "Setting" on the Station Utility startup tool select window.



Startup Tool Select Window

To display the Startup Tool Select Window, click the Station Utility shortcut on the Windows desktop or select "All programs" - "OMRON" - "Station Utility" - "Station Utility Ver.1.*.*" from the Windows start button. If no network connection settings are made, the following window containing no connection information appears. If connection settings are made, the information on the connected units is displayed on the window.



Startup Window (When no connection settings are made)

(3) Exiting Setting Tool

To exit the Setting Tool, select "File" - "Exit Application" on the Main Window menu bar. The tool also can be exited by clicking the "Exit" button on the "Network Operation" or "Network Settings" tab.

2.4 Connection Settings

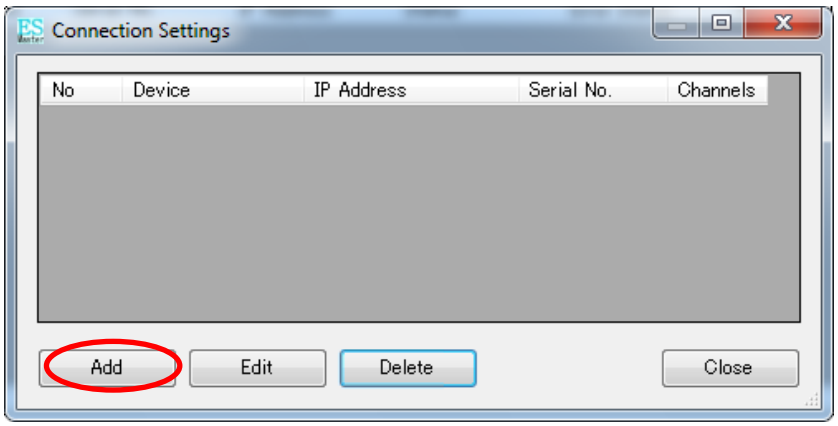
Register the units for connection to the Station Utility.

Note

The Setting Tool does not provide IP address (IP) settings in FUN mode. Direct settings on individual units are required.

The following pages show the setting procedure.

(1) Select "Connection" - "Connection Settings" in the Main Window menu bar. The "Connection Settings" window appears (This window also appears when the Setting Tool is started).



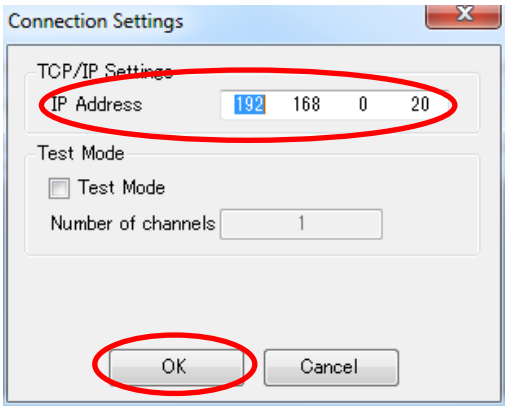
Connection Settings Window

Item	Description
No.	Refers to the order in which the units have been registered.*1
Device Name	Refers to the name assigned to individual connected units. The name is automatically assigned to the units using part of unit type code and the fourth segment of their IP addresses.*1
IP Address	Displays the IP address of the connected units.
Serial No.	Displays the serial No. of the connected units.*1
Number of Channels	Displays the number of channels used by the connected units. For example, an Thermo-Humidity Station uses two channels (for temperature and humidity); a Power Sensor Station connected to four Compact Power Sensors (KM20-B40) requires 12 channels in total comprising three (instant power, integral power consumption and power factor) for four individual sensor units.*1
Add	Used to register a new unit for connection.
Edit	The connection settings for the selected unit can be changed.
Delete	Removes the selected unit from registration.
Close	Closes the "Connection Settings" window.

*1: There may be some registered units after connection settings whose connections cannot be established. The "No.", "Device Name", "Serial No." and "Number of Channels" areas for such units are filled with "--".

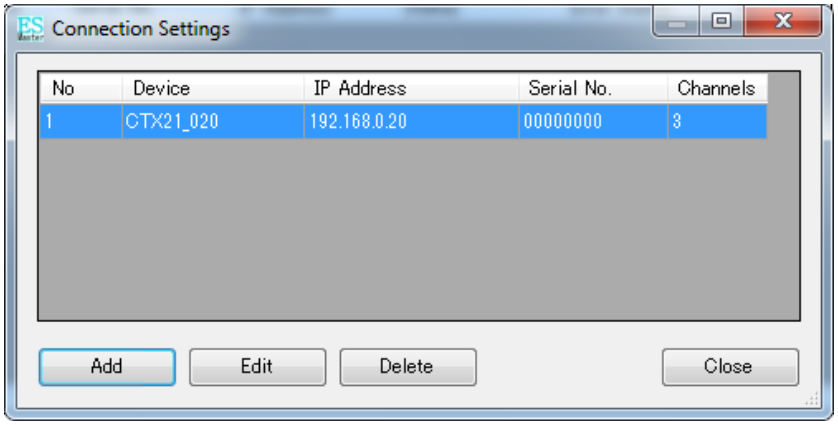
Click “Add” to display the “Connection Settings" window.

(2) Specify the IP address of the unit to connect and click "OK". The unit information is displayed on the "Connection Settings" window if the connection is established.



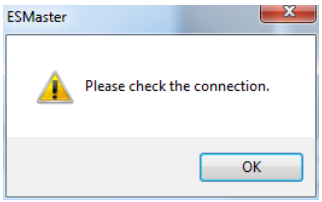
Device Connection Settings Window

Item	Description
IP Address	Specify the IP address of the unit to connect.
Test Mode	Check this to register the unit as a connected device regardless of its physical connection state.
Number of Channels	Specify the number of channels used by the unit to connect in Test Mode. The number of channels the connected unit uses is displayed.
OK	Click this to communicate to the specified IP address and acquire the information.
Cancel	Cancels the setting attempt.



Connection Settings Window (Connection succeeds after Add Connection setting)

The message "Check the connection" is displayed if the connection fails.

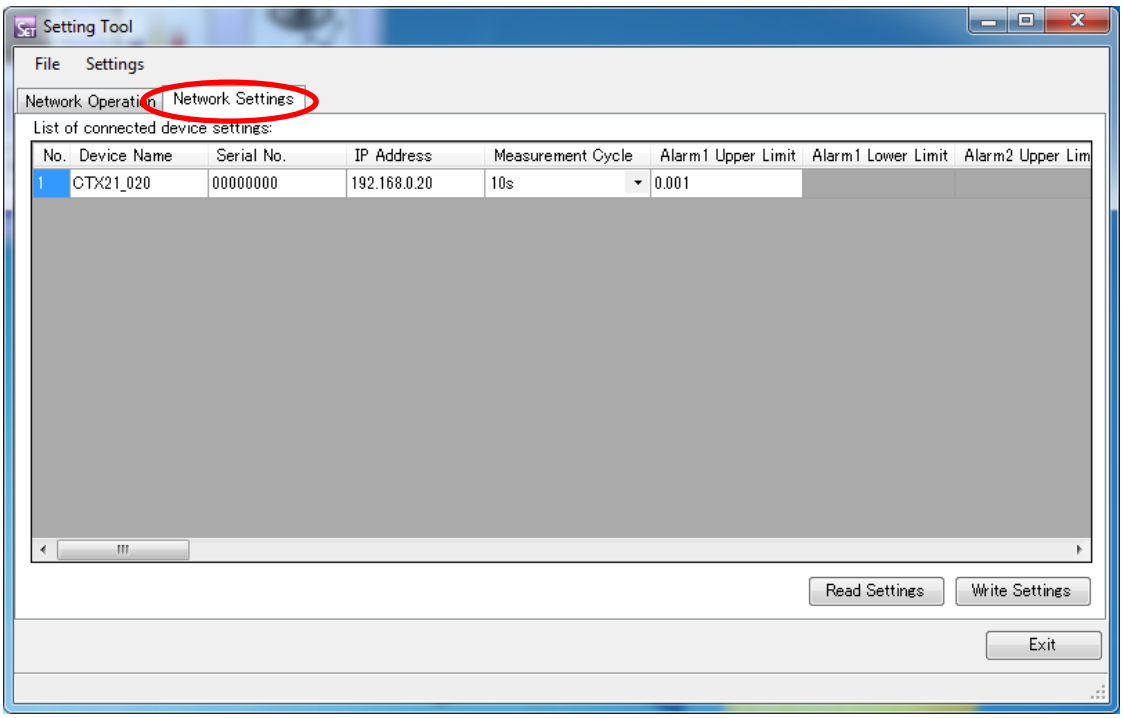


Connection fails after Add connection setting

To connect multiple units, repeat the procedure from clicking "Add Connection" and making device connection settings. When connection settings for all the units to be connected are completed, click "Close" to close the "Connection Settings" window.

2.5 Network Settings

Click the "Network Settings" tab in Main Window. The settings for the units connected via network can be checked or changed.



Network Settings Window

Item		Description
List of Connected Device Settings	No.	The order in which the unit has been registered in the Setting Tool.
	Device Name	The name assigned to the connected unit. The name cannot be changed.
	Serial No.	The serial number of the connected unit. The number cannot be changed.
	IP Address	The IP address of the connected unit. It cannot be changed.
	Measurement Cycle	Displays the specified recording interval (CYCLE). To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Alarm 1 Upper Limit	Displays the specified upper threshold value for an alarm output. To change the set value, directly enter a new value.
	Alarm 1 Lower Limit	Displays the specified lower threshold value for an alarm output. To change the set value, directly enter a new value.
	Alarm 2 Upper Limit	Displays the specified upper threshold value for an alarm output. To change the set value, directly enter a new value.
	Alarm 2 Lower Limit	Displays the specified lower threshold value for an alarm output. To change the set value, directly enter a new value.
	Recording Mode	Displays the specified recording mode (REC). To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Arithmetic Processing Mode	Displays the specified arithmetic processing mode (MEAS). To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Alarm Hold	Displays the specified alarm hold (HOLD) value (ON/OFF). To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.

	Sleep Screen Display	Displays the specified sleep display mode (SDISP). To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Power Failure REC Restoration	Displays the specified power failure REC restoration value. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Integrated Power Reset Interval	Displays the specified integrated power reset interval. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Rate/CO_2 Conversion Value	Displays the specified rate/CO_2 conversion value. To change the set value, directly enter a new value.
	Conversion Unit	Displays the specified conversion unit. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Number of Power Sensors/Monitors Connected	Displays the specified number of the connected Power Sensor/Monitor units. To change the set value, directly enter a new value.
	Unit No. Offset	Displays the specified unit No. offset value. To change the set value, directly enter a new value.
	Number of Channels to Use	Displays the specified number of channels to use. To change the set value, directly enter a new value.
	Measurement Target Circuit	Displays the specified measurement target circuit type. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Dedicated CT Type	Displays the specified dedicated CT type. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Voltage of Measurement Target	Displays the specified voltage of measurement target. To change the set value, directly enter a new value.
	Power Factor	Displays the specified power factor value. To change the set value, directly enter a new value.
	Frequency	Displays the specified power frequency value. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Rated Primary Side Current Value	Displays the specified rated primary side current value. To change the set value, directly enter a new value.
	Low Current Zero-out Rate	Displays the specified low current zero-out rate. To change the set value, directly enter a new value.
	Measurement Range	Displays the specified measurement range. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Start Trigger	Displays the specified start trigger value. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	End Trigger	Displays the specified end trigger value. To change the set value, select the option in the pull down list or context menu displayed at a right-click of the item.
	Start Time	Displays the specified start time. To change the set value, directly enter a new value.
	End Time	Displays the specified end time. To change the set value, directly enter a new value.
	Elapsed Time	Displays the specified elapsed time. To change the set value, directly enter a new value.
Read the Setting Value		Reads the setting values from the connected units.
Write the Setting Value		Writes the setting values to the connected units.
Exit		Exits the Setting Tool.

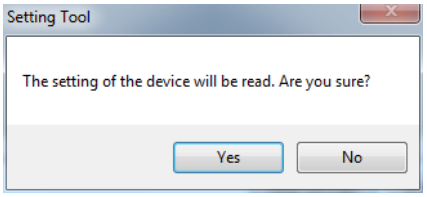
Note

The Setting Tool does not provide IP address (IP) settings in FUN mode. Direct settings on individual units are required.

2.5.1 Read the Setting Value / Write the Setting Value

(1) Read the Setting Value

Clicking "Read the Setting Value" reads the setting values of all the registered units.
If setting values have been changed and "Read the Setting Value" is clicked without writing the changed values to the units (i.e. without clicking "Write the Setting Value"), the following window appears to warn against the attempt.



Read the Setting Value Confirmation Window
(Appears when the changed values have not been written)

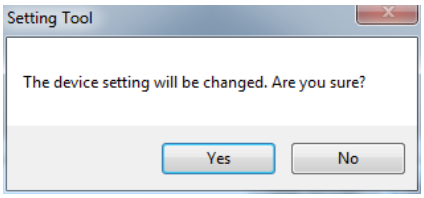
This item can update the "List of connected device settings" with the latest information.

(2) Write the Setting Value

When a setting value is changed, its cell color on the "List of connected device settings" turns to orange.

Click "Write the Setting Value". The new setting value on the "List of connected device settings" is written to the relevant connected unit.

Click "OK" when the following window appears.



Write the Setting Value Confirmation Window

If the "Write the Setting Value" operation has succeeded, the unit automatically restarts.

Note

The setting of the units whose cell backgrounds are in gray in the "List of connected device settings" cannot be changed with the Setting Tool. These gray-out units refer to the ones which are in the process of "Acquiring Data" by the Setting Tool command or whose status has been changed to the "Acquiring Data" or "Changing Settings" state by the Setting Tool "Update Status" command.

2.5.2 Save to the File / Read from the File

(1) Save to the File

The data displayed on the "List of connected device settings" can be saved in a file.
Select the "Network Settings" tab and "File" - "Save to the File" from the menu bar.

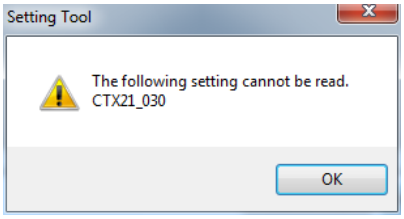
(2) Read from the File

The data saved in a file using the "Save to the File" function can be read and displayed on the "List of connected device settings".
Select the "Network Settings" tab and "File" - "Read from the File" from the menu bar.

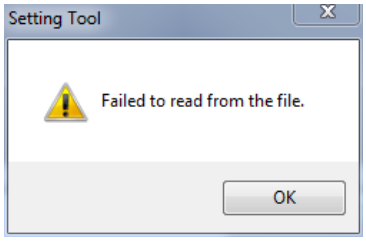
Note

- Data cannot be read from the file while recording is in progress on the connected units.
- The Device Name and IP address settings registered in the Setting Tool must be identical with those of the units connected at the time of data saving to a file.

If a file containing wrong Device Name and IP address settings is read, the following error message is displayed.



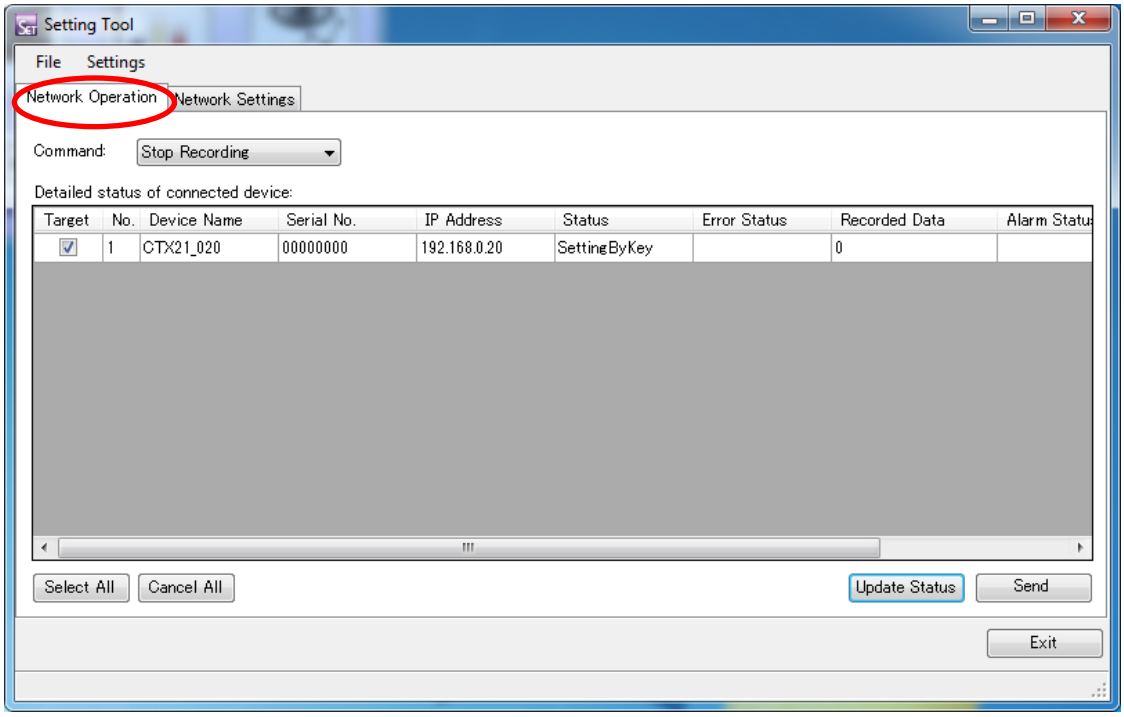
The following error appears if an attempt is made to read a file saved by the "Save to the File" function in a wrong format.



2.6 Network Operation

Click the "Network Operation" tab in Main Window to perform network operations for the units connected via network. The following operation items are available.

Start Recording
Stop Recording
Write to SD Memory Card
Release Alarm
Release Error
Time Adjustment
Restart
Update Status
KMX Mode Change



Network Operation Window

Item		Description	
Select Command		Select the command for the target unit from the pull down menu.	
Detailed Status of Connected Device	Target	Select the target unit of the selected command (operation command).	
	No.	The order in which the unit has been registered in the Setting Tool.	
	Device Name	The name assigned to the unit.	
	Rec. Device	The serial No. of the connected unit.	
	IP Address	The IP address of the connected unit.	
	Status	Displays the status of the connected unit.	
		Monitor Operating	The unit is in RUN mode but it is not in recording process.
		Recording Data	The unit is in RUN mode and in the process of recording.
		Changing Settings	The unit is in other mode than RUN mode.
		KM Setting Mode	The unit is in KM Setting mode.
	Error Status	Displays an error indication if the unit is in error status.	

	Recorded Data	Displays the number of write operations to the internal memory at every measurement interval during data recording.
	Alarm Status	Shows the alarm status of the unit.
	Check Time Lag	Indicates the time lag when the time difference between the main unit and PC exceeds the specified limit.
Select All		Selects all the units as the command (operation command) targets.
Release All		Clears all the command (operation command) target selections.
Update Status		Acquires the status of the selected units in the "Target" column and updates "Connection Device Status Details".
Send Command		Sends the command selected in "Select Command" to the connected units selected in "Target".
Exit		Exits the Setting Tool.

2.6.1 Send Command (Operation Command)

(1) Command Type

The following table shows the correspondence between the commands (operation commands) available with the Setting Tool and Portable Power Monitor and Power Sensor Station operations.

Command (Operation Command)	Compatible Unit Status for Command Send	Corresponding Unit Operation
Start Recording	Monitor Operating	A long press (at least for 3 seconds) of the SET/REC/STOP key in RUN mode
Stop Recording	Acquiring Data	A long press (at least for 3 seconds) of the SET/REC/STOP key in RUN mode
Write to SD Memory Card	Monitor Operating Acquiring Data	A press (for less than 3 seconds) of the SET/REC/STOP key in RUN mode
Clear Alarm	Monitor Operating Acquiring Data	A long press (at least for 3 seconds) of the MODE key during alarm indication display
Clear Error	Error Status*1	A long press (at least for 3 seconds) of the MODE key during error indication display
Time Adjustment	Monitor Operating Changing Settings	Time Setting in FUN mode
Restart	Monitor Operating Changing Settings Error Status*1	A press of the Reset switch
Change KMX Mode	Monitor Operating KM Setting Mode	No corresponding unit operation

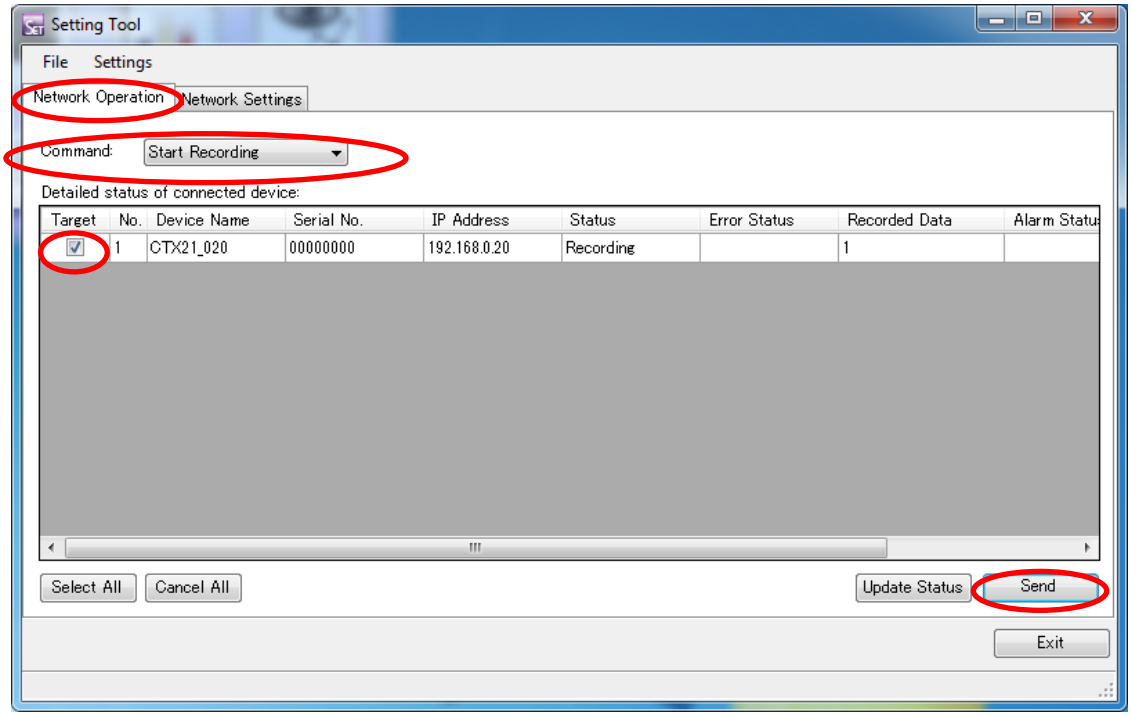
*1: Refers to the case that an error is indicated in the connected device "Error Status" area in the "Detailed status of connected device", regardless of the "Status" area indication.

Note

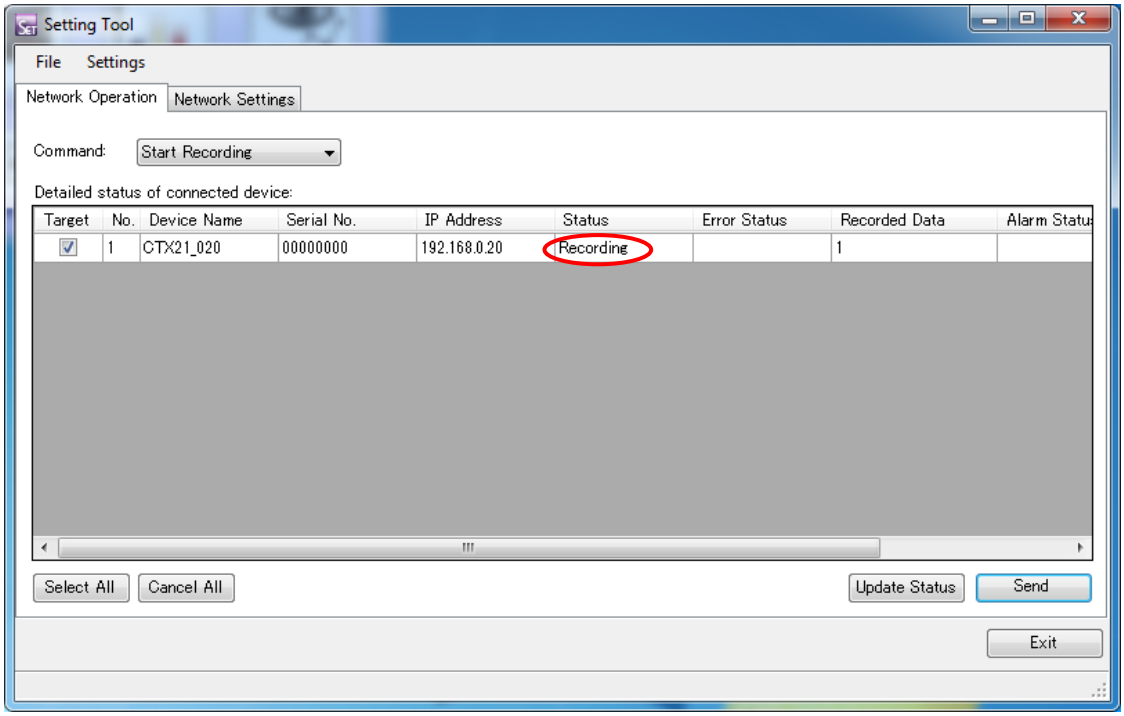
- An SD memory card must be inserted in the target device when sending the "Start Acquisition" or "Write to SD Memory Card" command.
- The "Time Adjustment" command matches the target unit clock to the PC clock.
- Refer to "2.8 Power Sensor/Monitor (KM Series) Remote Setting" for the "KMX Mode Change" command details.

(2) Send Command Procedure

The procedure to send a command is explained here by showing the example of sending the recording start command.

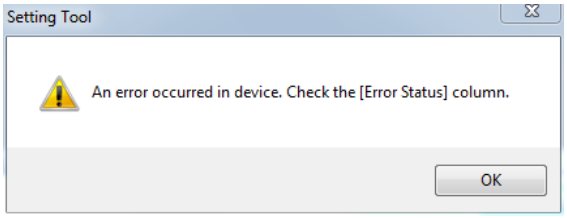


(1) Select the "Network Operation" tab in the Setting Tool.
(2) Select the command to send in "Select ".
(3) Select the target unit in "Target".
(4) Click the "Send " button.
(5) The message "Execute the command." is displayed. Click "OK".
(6) The "Executing…" indication appears on the status bar. When the command is sent to the unit and the unit starts normally, the status bar indication disappears and the status changes to "Recording Data".



"Status" displays "Acquiring Data"

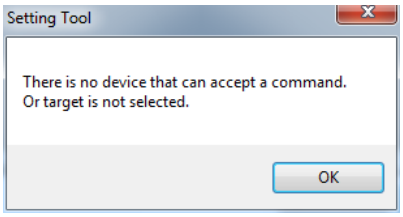
The following message appears if a command sending attempt fails due to communication error or other reason.



Command Execution Error Display

Click "Update Status" after checking the relevant connection settings and cables.

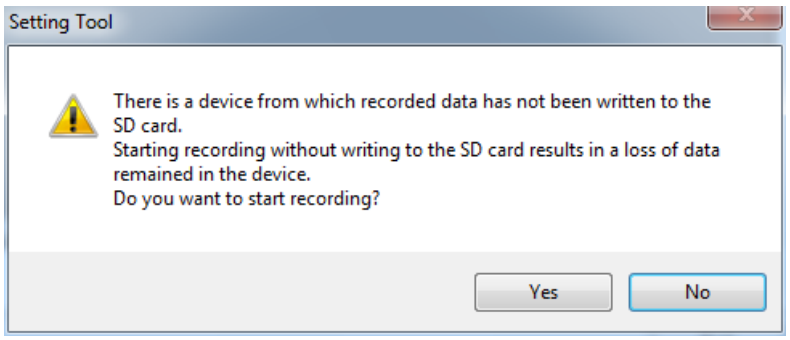
The following message appears if a command is being sent when the target unit is in an incompatible status.



Command Send Incompatible Status Warning Display

Note

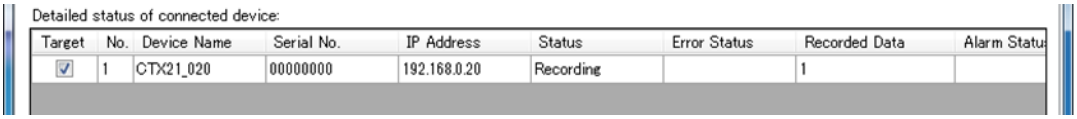
- Caution is required when the following warning appears ("Acquisition data of some devices have not been written in SD memory card…"). If "OK" is clicked on the dialog, the target EQUO series unit starts recording without writing its data to an SD memory card. This means the unwritten data remaining in the unit's internal memory is lost.
  To solve this situation, insert an SD memory card in the target unit and hold the unit's MODE key at least for 3 seconds to cancel the error display. Then, press the SET/REC/STOP key on the unit for less than 3 seconds. The recorded data in the unit's internal memory is written to the SD memory card.
  Or click "No" on the dialog after inserting an SD memory card in the target unit. Send the "Release Error" command and then, the "Write to SD Memory Card" command. The recorded data is written to the SD memory card.



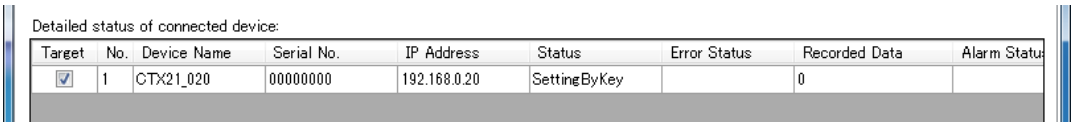
- The target unit stops recording without writing its data to an SD memory card, if the card is not inserted in it. The data is lost when the unit starts recording anew unless it is output in the card beforehand. Make sure that the target unit has an SD memory card inserted and the recorded data is output to the card before starting next recording.

2.6.2 Update Status

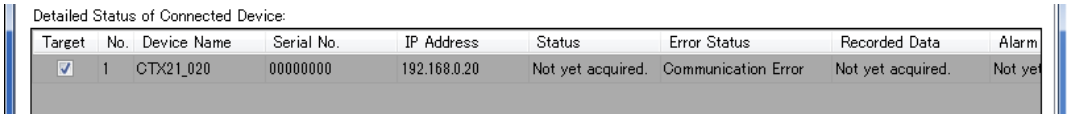
Click "Update Status" in the "Network Operation" window. The detailed status of the connected EQUO series units selected in "Target" is updated.
The entire unit area turns to gray if updating the target unit status has failed.



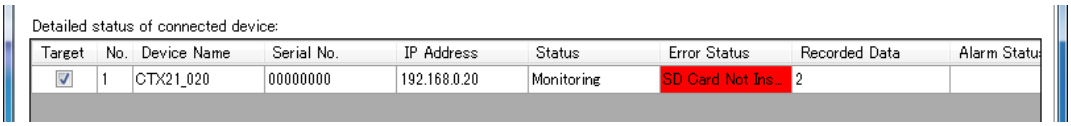
"Monitor Operating" Display



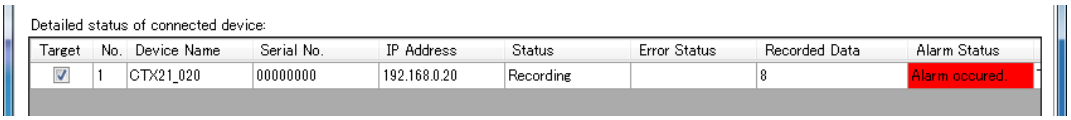
"Changing Settings" Display



"Update Status" Failure



Error Display Example



Alarm Display Example

Note

"Alarm occurred" is displayed on the "Alarm Status" area if the target unit has output an alarm. The unit's measured values can be checked using the Logging Tool.

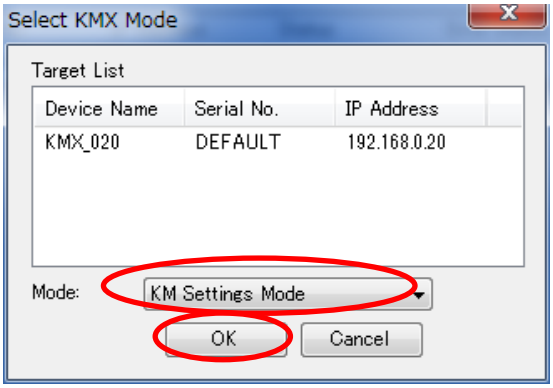
2.7 Auto Time Adjustment

The clock in the units selected in "Target" can be automatically adjusted. Select "Settings" - "Auto Time Adjustment" to enable this function.
The Setting Tool checks the target unit's clock when "Update Status" or "Read the Setting Value" is clicked as well as when the "Connection Settings" is closed, if "Detailed Settings" - "Auto Time Adjustment" is selected.
The clock of all the units selected in "Target" is aligned to the PC clock, if any of the clocks has a deviation of 2 seconds or more.

2.8 Power Sensor/Monitor (KM Series) Remote Setting

Use EasyKM-Manager to remotely make settings on the connected Power Sensor/Monitor (KM series) units.
Execute the " Change KMX Mode" command. Remote settings on the Power Sensor/Monitor (KM series) units connected to the Power Sensor Stations can be conducted by using the EasyKM-Manager PC software.

(1) The "KMX Mode Selection" window appears when the "Change KMX Mode" command is executed.
(2) Select "KM Setting Mode" in "Select Mode" and click "OK".



KMX Mode Selection Window

(3) After the command execution is completed, start EasyKM-Manager to make KM settings. After using EasyKM-Manager, select "RUN Mode" on the Select KMX Mode screen, and then click “OK”. The ZN-KMX Power Sensor Station returns to RUN Mode.

Important

Set the network type in the EasyKM-Manager communication setting to "Ethernet". If it is set to "RS-232C", communication with Power Sensor/Monitor units is not possible.

Perform the following setting for Ethernet of EasyKM-Manager:

IP address: The same IP address set to ZN-KMX21

Port No.: 10000 (fixed.)

Refer to the EasyKM-Manager Instruction Sheet for the EasyKM-Manager setting procedure.

3. Recording Data in PC: Using the Logging Tool

Important

- Turn OFF the PC hibernation setting for long-hour data acquisition using the Logging Tool.
- Do not let the PC enter suspend mode during data acquisition using the Logging Tool.

3.1 Overview

Measured values can be acquired in two ways: acquiring them from the target unit to the PC via network or recording in the target unit's internal memory. The former procedure is explained in this section.
The values measured by the target unit also can be displayed using the Logging Tool.

3.2 Operating Environment/Installation/Uninstallation

The Logging Tool is installed simultaneously with Station Utility.
Refer to "1.3 Operating Environment", "1.4 Installation" and "1.5 Uninstallation" for the tool's operating environment and installation/uninstallation procedures.

3.3 Startup and Exit

(1) Settings on Target Unit

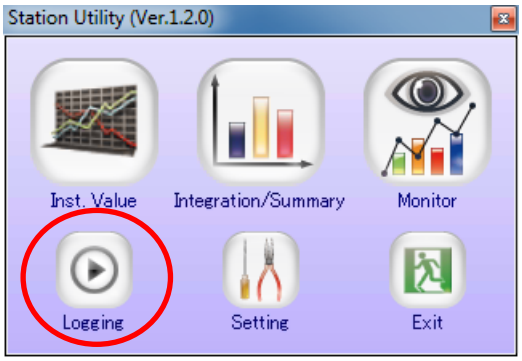
The target unit must be in RUN mode when its measured data is being logged in the PC by the Logging Tool. Press the MODE key on the unit to turn ON the "RUN" indication. If it is already turned ON, pressing the MODE key or any other additional operation on the unit side is not required.

Note

- Measured values cannot be correctly acquired if the target unit mode is changed from RUN mode during data acquisition by the Logging Tool.
- Both recording in the unit's internal memory and acquiring by the Logging Tool to the PC can be performed concurrently; however, at a different timing.
- Recording in the unit's internal memory requires direct operation on the unit or the command from the Setting Tool to enable the unit start recording. However, if recording is performed in this way, the data recorded in the unit's internal memory cannot be acquired in the PC via network. An SD memory card is required to transfer the data from the unit to the PC.
- If data acquisition by the Logging Tool from the target unit is performed for long hours (which means that the unit stays in recording mode for the same period of time), logging stops, according to the default setting, when the unit's internal memory becomes full. Either of the following procedures can be taken to avoid this:
  Use an SD memory card with sufficient free space.
  Set the unit's recording operation mode to "RING" and select the "Do not stop the unit's recording" option when stopping recording with the tool.

(2) Starting Logging Tool

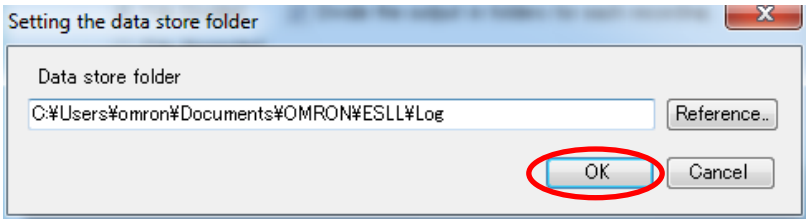
Click "Logging" in the Station Utility startup tool select window.



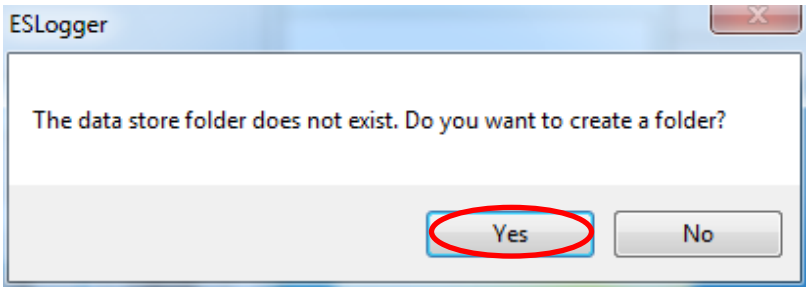
Startup Tool Select Window

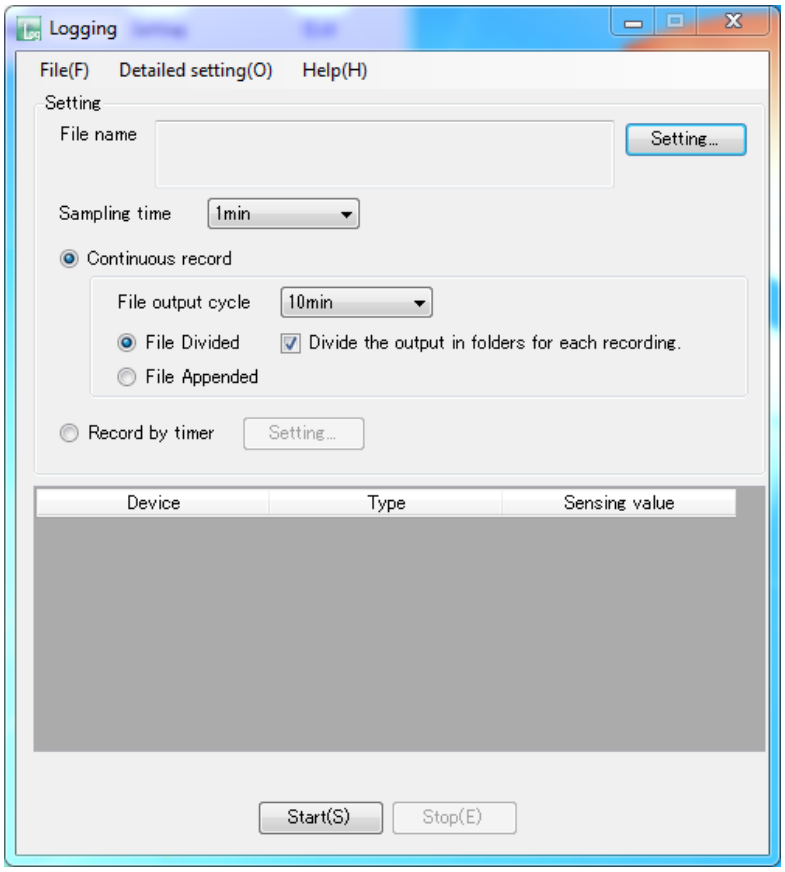
To display the startup tool select window, click the Station Utility shortcut on the Windows desktop or select "All programs" - "OMRON" - "Station Utility" - "Station Utility Ver.1.*.*" from the Windows start button.

The save destination folder setting window appears. Check the save destination folder and click "OK". The folder is usually created under the login user's "My Documents" directory. To change this setting, click "Browse" and specify the folder path.



If the save destination folder does not exist in the specified path, the following dialog appears. Click "Yes". The Logging Tool Main Window is displayed.





Main Window

Item			Description
Menu Bar	File	Exit	Exits the Logging Tool. Data recording must be stopped before exiting.
	Detailed Settings	Connection Setting	Registers the target EQUO series units for data logging.
		Save Destination Setting	Specifies the logging file save destination folder.
	Help	Version Information	Displays the Logging Tool version information.
Setting	File Name		Displays the name of a new logging file whenever it is output. Click the "Setting" button on the right to specify the file naming rule.
	Sampling Time		Specifies the interval in which the Logging Tool acquires measured data from the target unit. 1 minute or longer is recommended. 1 sec./2 sec./5 sec./10 sec./20 sec./30 sec./1 min./2 min./5 min /10 min./20 min./30 min./1 hour
	Continuous Record		Acquired data is output into a file at every interval specified in "File Output Interval". Click "Start" to start data recording and "Stop" to stop it.
		File output cycle	Specifies the interval for creating logging files. 30 sec./1 min./3 min./5 min./10 min./30 min./1 hour/6 hour/1 day
		File Divided/File Appended	"Split File": Data is output into separate logging files by the unit of output interval. "Merge File": Data is output to the same single logging file and added to other data.

		Divide the output in folders for each recording	If this option is selected, data acquired through individual recording sessions (from a click of the "Start" button to "Stop" button) is output in separate logging files under the folder named with the "yyyyMMdd.xxx" rule (yyyyMMdd: Date of logging; xxx: serial recording session No. of the day, which starts from 001). If recording continues over the next day, a new folder is created in which files are continuously output. To use this option, "Split Folder" must be selected.
	Record by timer		If this option is selected, the "Setting" button on the right becomes effective. Click this button and specify the recording start time and duration time. Data recording starts at the specified time every day and stops when the specified duration time has elapsed, outputting the data into a logging file.
Start			"Continuous record" must be selected to use this option. Clicking "Start" immediately starts recording. However, "Record by timer" (if it is selected) is prioritized over this option. If the time of clicking this button is outside the specified time period (i.e. from the recording start time to the assumed stop time specified in " Record by timer "), the target unit is in standby status. If the time is within the specified period, data recording starts immediately.
Stop			Clicking "Stop" stops recording and outputs the logging file. This option is prioritized over " Record by timer ". Recording stops even if the specified duration time has not elapsed. In this case, the data acquired up until the time of clicking is output into a logging file.

Note

"Sampling Interval" refers to the time interval in which the Logging Tool acquires measured data from the target unit. It does not refer to the interval for the unit's updating measured data.
The target unit's recording interval (factory default: 10 seconds) can be changed via direct setting on the unit or using the "Network Settings"- "Write the Setting Value" function available in the Station Utility Setting Tool.

(3) Exiting Logging Tool

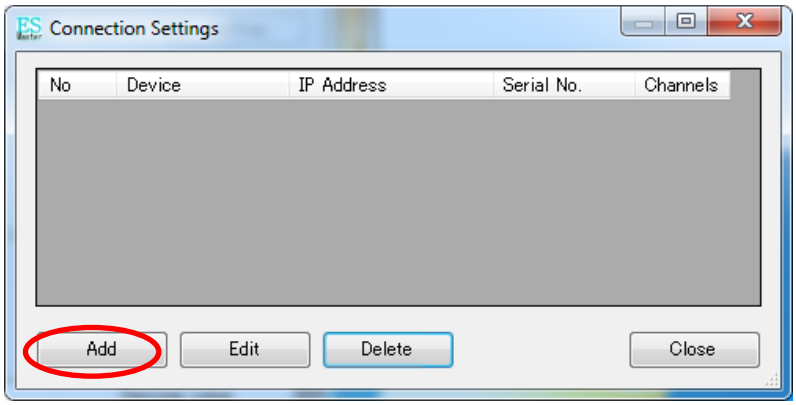
To exit the Logging Tool, select "File" - "Quit" in the Main Window menu bar.

3.4 Connection Settings

Select "Detailed Settings" - "Connection Settings" from the Main Window menu bar. The EQUO series units to be connected can be registered to Station Utility.

The following description shows the registration procedure.

(1) Select "Add" on "Connection Settings" on the Main Window menu bar. The "Connection Settings" window appears (This window also appears when the Setting Tool is started).



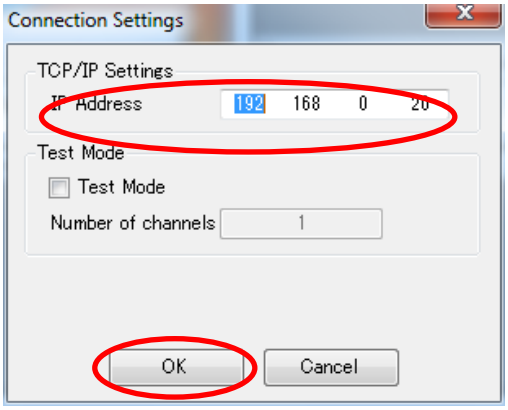
Connection Settings Window

Item	Description
No.	Refers to the order in which the units have been registered.*1
Device	Refers to the name assigned to individual connected units. The name is automatically assigned to the units using part of unit type code and the fourth segment of their IP addresses.*1
IP Address	Displays the IP address of the connected units.
Serial No.	Displays the serial No. of the connected units.*1
Channels	Displays the number of channels used by the connected units. For example, an Thermo-Humidity Station uses two channels (for temperature and humidity); a Power Sensor Station connected to four Compact Power Sensors (KM20-B40) requires 12 channels in total comprising three (instant power, integral power consumption and power factor) for four individual sensor units.*1
Add	Used to register a new unit for connection.
Edit	The connection settings for the selected unit can be changed.
Delete	Removes the selected unit from registration.
Close	Closes the "Connection Settings" window.

*1: There may be some registered units after connection settings whose connections cannot be established. The "No.", "Device", "Serial No." and "Channels" areas for such units are filled with "--".

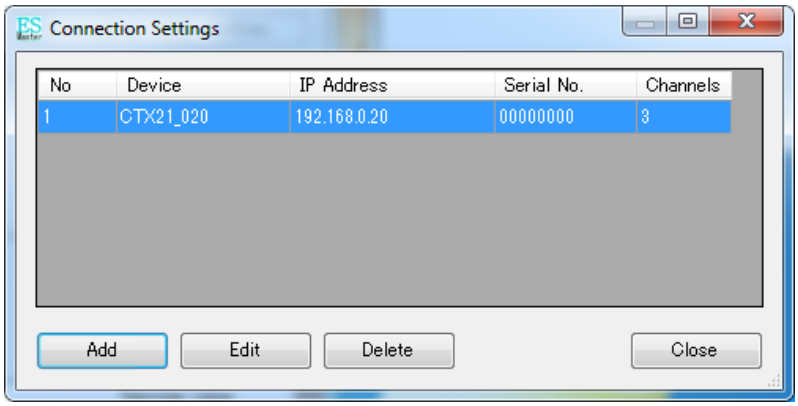
The "Connection Settings" window appears when the "Add" button is clicked.

(2) Specify the IP address of the unit to connect and click "OK". The unit information is displayed on the "Connection Settings" window if the connection is established.



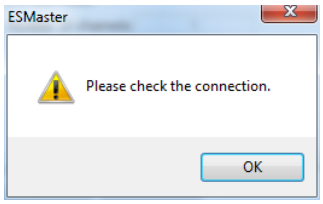
Connection Settings Window

Item	Description
IP Address	Specify the IP address of the unit to connect.
Test Mode	Check this to register the unit as a connected device regardless of its physical connection state.
Number of channels	Specify the number of channels used by the unit to connect in Test Mode.
OK	Click this to communicate to the specified IP address and acquire the information.
Cancel	Cancels the setting attempt.



Connection Settings Window (Connection succeeds after Add setting)

The message "Please check the connection" is displayed if the connection fails.

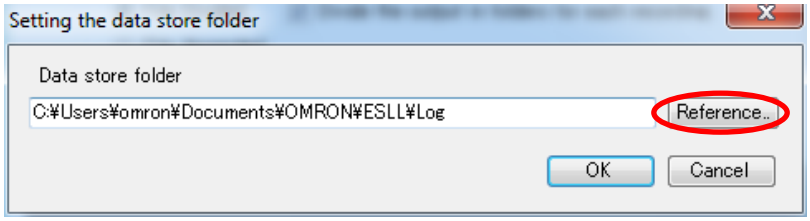


Connection fails after Add setting

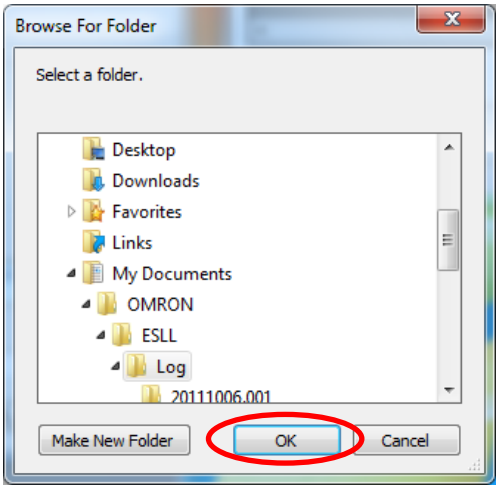
To connect multiple units, repeat the procedure from clicking "Add and making device connection settings. When connection settings for all the units to be connected are completed, click "Close" to close the "Connection Settings" window.

3.5 Save Destination Setting

Select "Detailed Settings" - "Save Destination Setting" from the Main Window menu bar. The logging file destination folder path can be specified.



Click "Reference" to change the save destination folder.

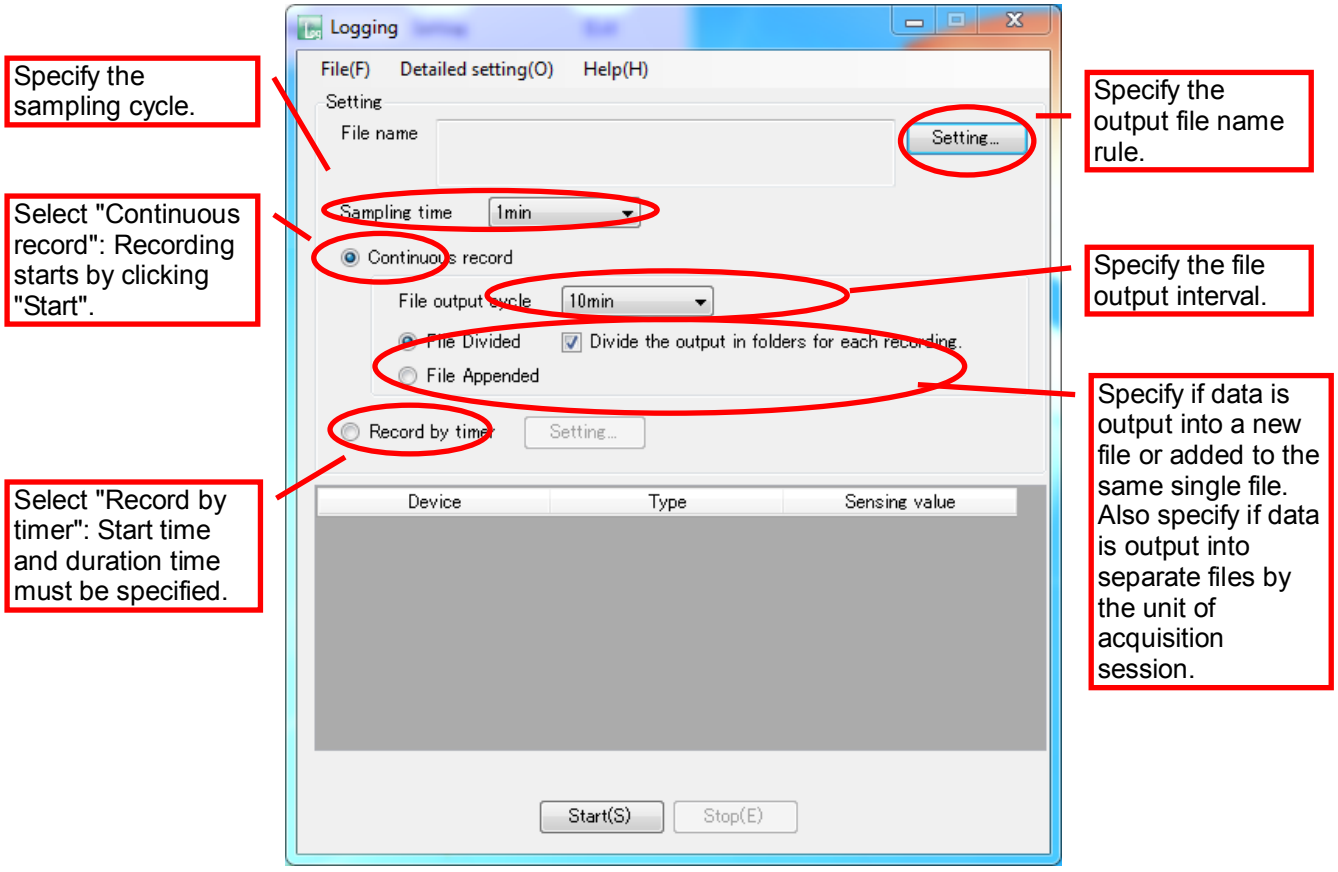


Browsing Folder Tree

Select the folder and click "OK". The save destination folder selection is applied.
The default save destination folder is "OMRON¥ESLL¥Log" under the "My Documents" directory of the first Logging Tool startup user after Station Utility installation.

3.6 Recording Setting

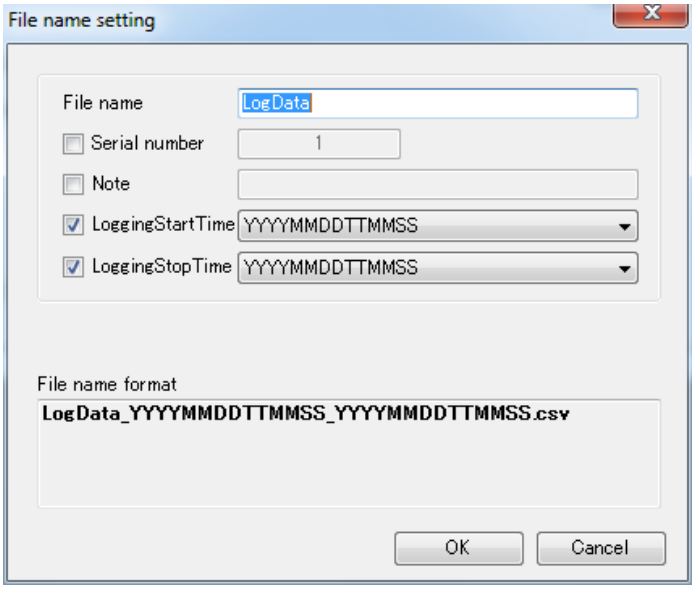
Set the acquisition conditions in the Main Window.



Setting Window (Settings for Continuous reccord)

3.6.1 File Name Setting

Click the "Setting" button next to "File Name" on the Main Window. The naming rule for log files can be specified.



File Name Setting Window

Item	Description
File Name	Specify the prefix character string attached to the beginning of all log file names; e.g. unit name or process name.
Serial No.	Specify if the file names use suffix serial numbers. Also specify the starting number if the serial numbers are used. A number incrementing by 1 (i.e. 1, 2, 3…) is attached automatically every time a new log file is created. The numbers are not reset after one recording session is completed and the succeeding numbers are used for the succeeding sessions. To reset the numbers, specify the starting number again using this setting item.
Note	Specify if the file names use a character string inserted in middle of the names; e.g. operation name or project name.
Logging Start Time	Specify if the file names are suffixed with recording start date and time information. Select the format from the following five options: (1) YYYYMMDDhhmmss (year: 4 digit, month, day, hour, minute, second) (2) YYMMDDhhmm (year: 2 digit, month, day, hour, minute) (3) YYMMDDhhmmss (year: 2 digit, month, day, hour, minute, second) (4) MMDDhhmm (month, day, hour, minute) (5) MMDDhhmmss (month, day, hour, minute, second)
Logging Stop Time	Specify if the file names are suffixed with recording stop date and time information. This item cannot be used if "Continuous recording" - "Merge File" is selected. Select the format from the following five options: (1) YYYYMMDDhhmmss (year: 4 digit, month, day, hour, minute, second) (2) YYMMDDhhmm (year: 2 digit, month, day, hour,

	minute) (3) YYMMDDhhmmss (year: 2 digit, month, day, hour, minute, second) (4) MMDDhhmm (month, day, hour, minute) (5) MMDDhhmmss (month, day, hour, minute, second)
OK	Applies the file name setting and closes the File Setting Window.
Cancel	Cancels the file name setting attempt.

Example:

LogData_000001_ConditionA_20110123091500_20110123175030.csv

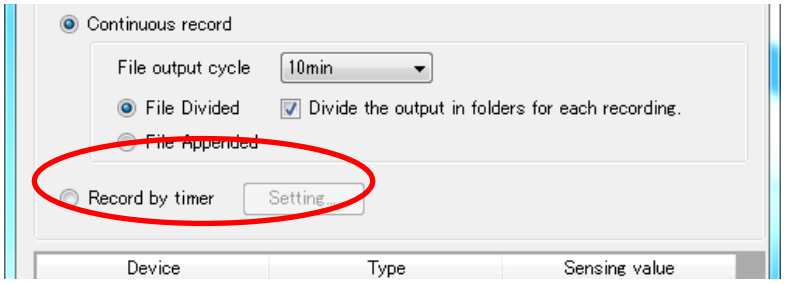
File Name (Prefix String) | Serial No. | Middle Name | Start Date and Time | Stop Date and Time | File Name

Important

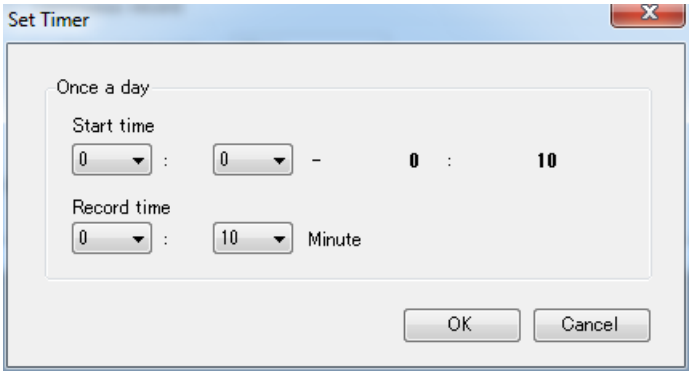
The maximum log file name length is 218 characters including the path description.

3.6.2 Record by Timer

Select "Record by timer" on the Main Window and click the "Setting" button.
The Recording Setting Window appears, in which recording start time and recording duration time can be specified.



"Record by timer" setting



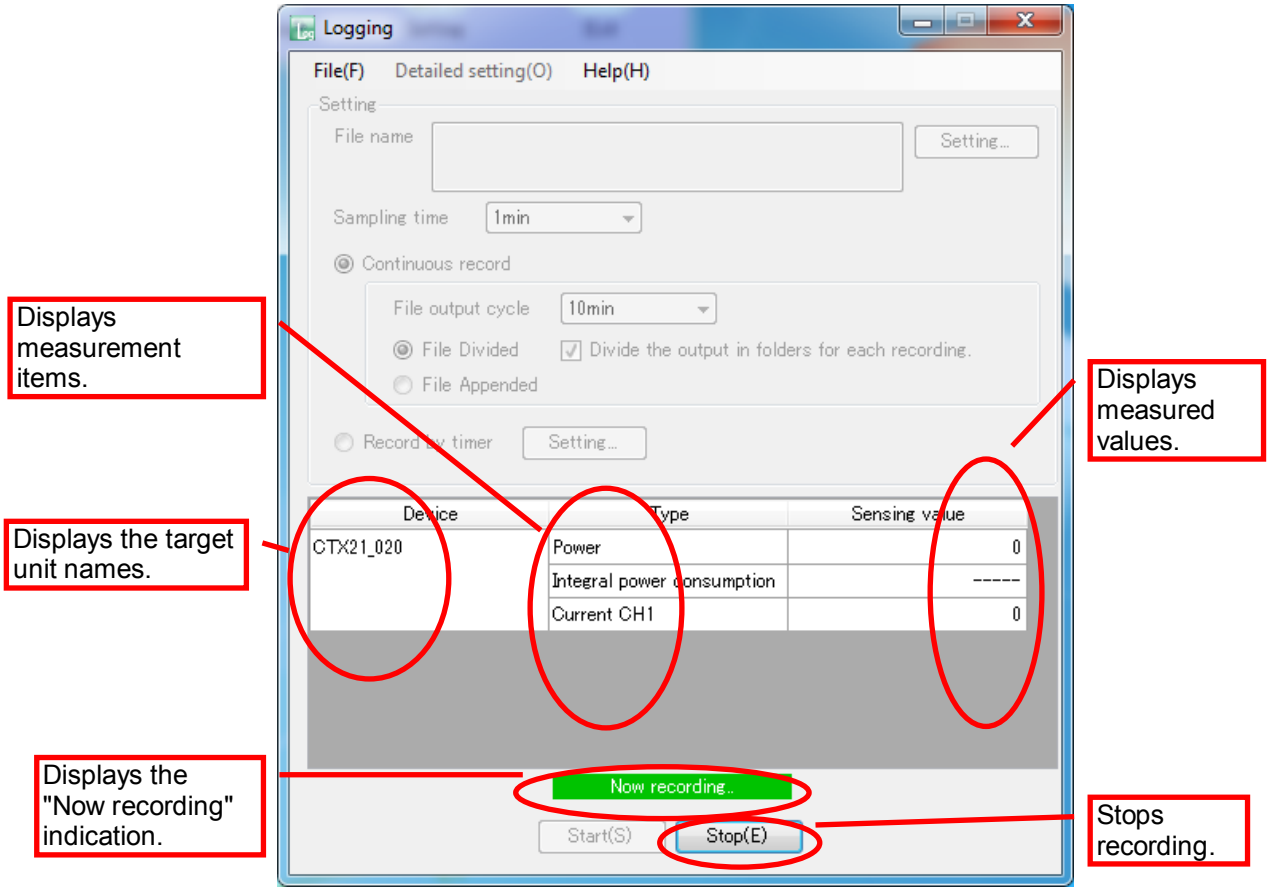
Set Timer Window

Item	Description
Start Time	Specify the acquisition start time. 0 hour 0 min. to 23 hour 50 min. (Unit of setting: 10 minutes)
Record Time	Specify the recording duration time. 0 hour 0 min. to 24 hour 0 min. (Unit of setting: 10 minutes)
OK	Applies the recording time setting.
Cancel	Cancels the recording time setting attempt.

3.7 Acquisition Start and Stop

(1) Starting Acquisition

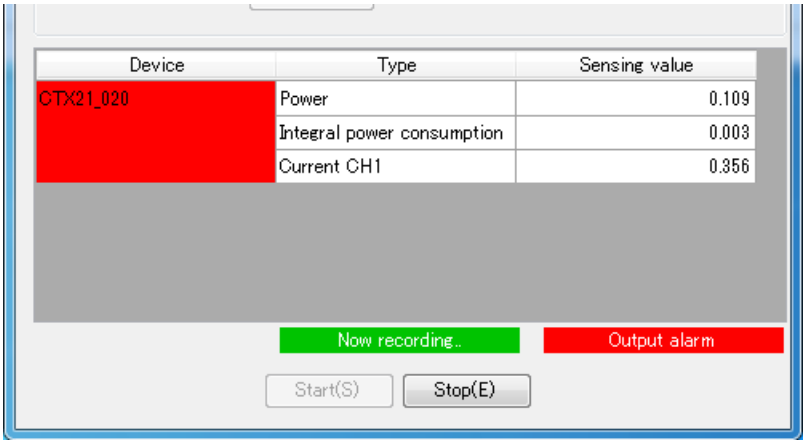
Click "Start" in Main Window. Data acquisition to the PC starts. The "Acquiring Data" indication appears at the bottom and the connected target units and measured values are displayed.



Acquiring Data to PC

Note

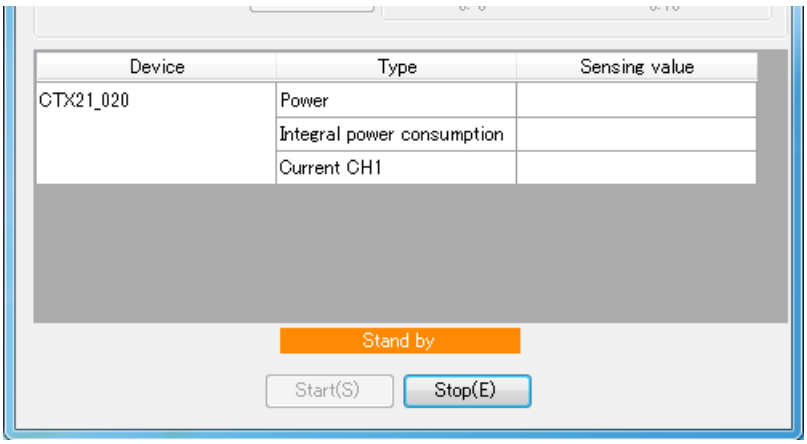
If a threshold exceeding alarm is output, the relevant unit turns to red in its cell background. The "Alarm occurred" indication in red also appears at the bottom of the window.
Alarms are output when the units are in "RUN" operation mode.



Acquiring Data to PC (An alarm is generated)

Note

The "Recording Standby" indication appears if "Record by timer" is selected and the current time is outside the specified acquisition time range.



(2) Stopping Recording

Click "Stop" in Main Window to stop acquisition.

When stopping recording with the presence of CTX/KMX, recording of the main unit can also be stopped.

Stopping recording of the main unit resets the integrated power to 0.

4. Instant Value Display: Using SD Viewer ES

4.1 SD Viewer ES Overview

The SD Viewer ES provides the graph displays offline of the data acquired to the PC using the Logging Tool or data recorded to the SD memory card. It can also merge multiple data items acquired in different periods or provide a concurrent display of multiple data items acquired in different periods or with different EQUO series units.

4.2 Preparation

4.2.1 Operating Environment / Installation / Uninstallation

The SD Viewer ES is installed simultaneously with the Station Utility.
Refer to "1.3 Operating Environment", "1.4 Installation" and "1.5 Uninstallation" for the tool's operating environment and installation/uninstallation procedures.

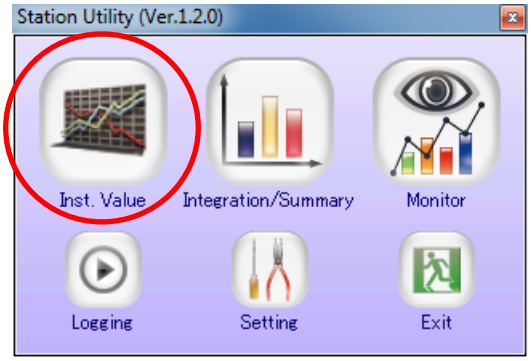
4.2.2 Loading Acquisition Data to PC

Connect a commercially available SD memory card reader/writer to the PC. It is not required if an SD memory card slot is provided on the PC.
Insert an SD memory card with recorded data retrieved from the connected unit in the SD card reader/writer device or the PC's SD memory card slot.

4.3 Startup and Exit

4.3.1 Starting SD Viewer ES

(1) Click "Inst. Value" on the Station Utility startup tool select window.

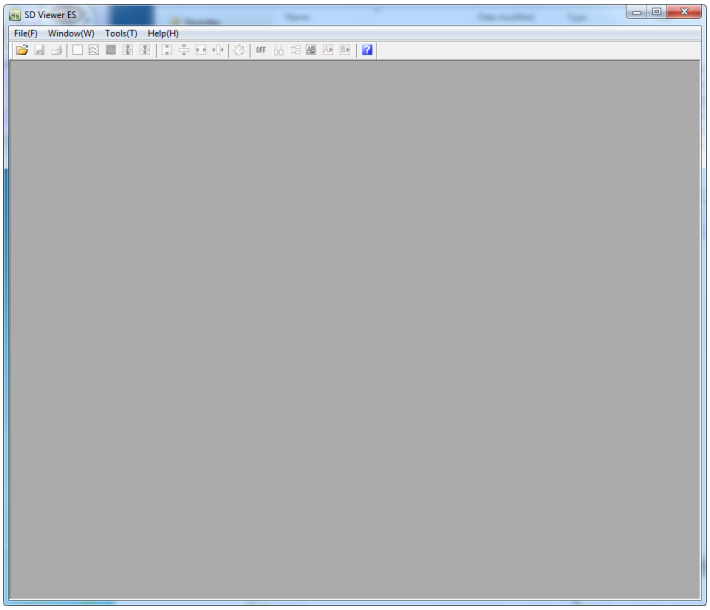


Startup Tool Select Window

To display the startup tool select window, click the Station Utility shortcut on the Windows desktop or select "All programs" - "OMRON" - "Station Utility" - "Station Utility Ver.1.*.*" from the Windows start button.

(2) Main Window appears after the startup window is displayed for a while.

Startup Window



Main Window

Menu Item		Description
File	Open File	Opens acquisition data files. Multiple data items can be selected and the display mode can be selected between merged and overlapped displays.
	Save file	Saves acquisition data.. Multiple data items displayed in merged or overlapped form are saved as a single data item.
	Exit	Exits SD Viewer ES.
Window	Toolbar	Specify if the toolbar is displayed or hidden.
Tool	Initialize	Setting information e.g. window size or time axis setting retained by individual users can be initialized.
Help	Show Help and About	The SD Viewer ES help information and version are displayed.

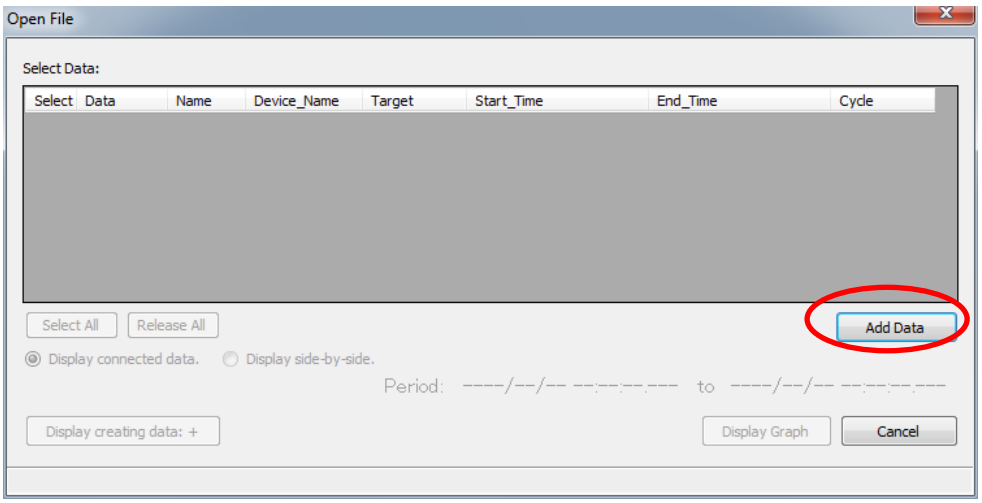
4.3.2 Exiting SD Viewer ES

To exit SD Viewer ES, select "File" - "Exit Application" in the Main Window menu bar.
The exit confirmation window appears if any displayed data (e.g. merged display data) has not been saved.
To remove the SD memory card from the card slot, follow the removal procedure provided by the PC.

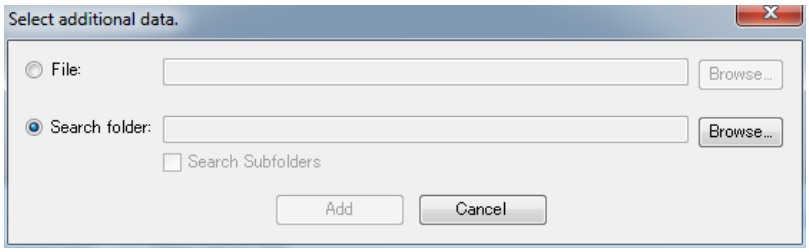
4.4 Open File and Save File

4.4.1 Open File

(1) Select "File" - "Open File" from the Main Window menu bar. Click "Add Data" on the "Open File" window displayed.

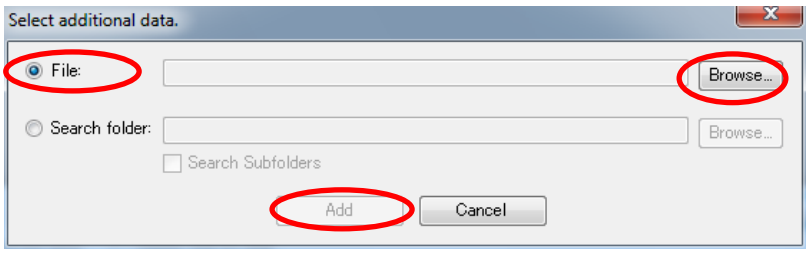


(2) Specify the acquisition data in the "Additional Data Selection" window.



Item	Description
File	Specifies the data to display.
Search Folder	Selects all the acquisition data files in the folder if the folder is specified.
Browse	Click this to specify the acquisition data folder name and the file name.
Search Subfolders	Check this to specify if the subfolders are also searched when "Search Folder" is selected. All the recorded files in the SD memory card can be searched by specifying the SD memory card root folder in "Search Folder" and selecting the "Search Subfolders" option.
Add	Adds the selected data files to "Select Data" window display.
Cancel	Cancels the data addition attempt.

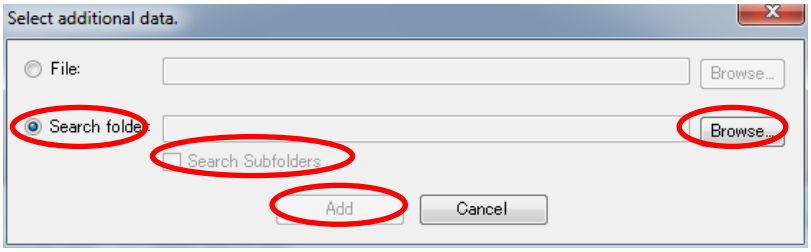
<Specifying Data Recorded by Logging Tool>



Select the "Specify File" option and click the "Browse" button to specify the file in the Logging Tool recording data folder, which is displayed by selecting "Detailed Settings" - "Save Destination Setting".
(Example: C:¥Documents and Settings¥omron¥My Documents¥OMRON¥ESLL¥Log¥LogData_201011051452_20101106161927.csv)
Click the "Add" button.

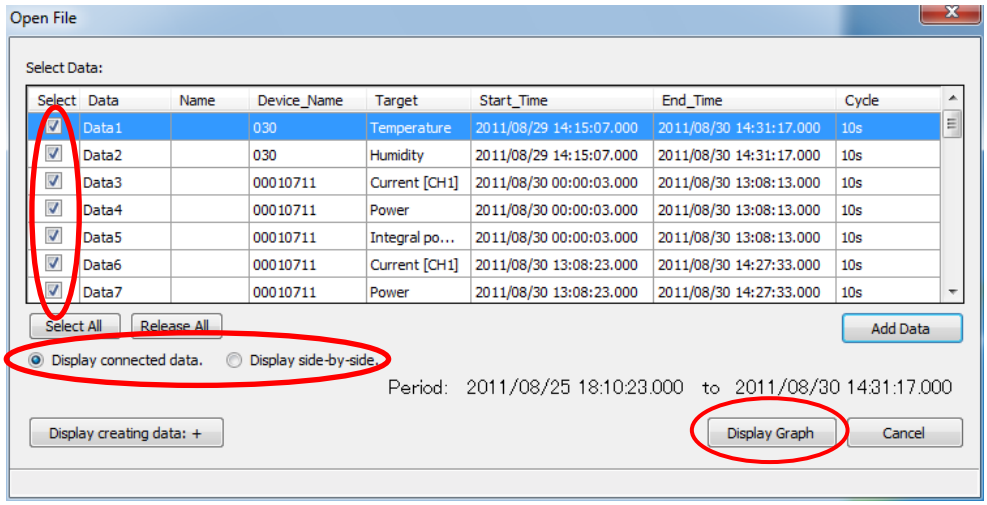
<Specifying SD Memory Card Retrieved from Connected Unit>

Remove the SD memory card containing recorded data from the connected unit and insert it into the PC's SD card slot.

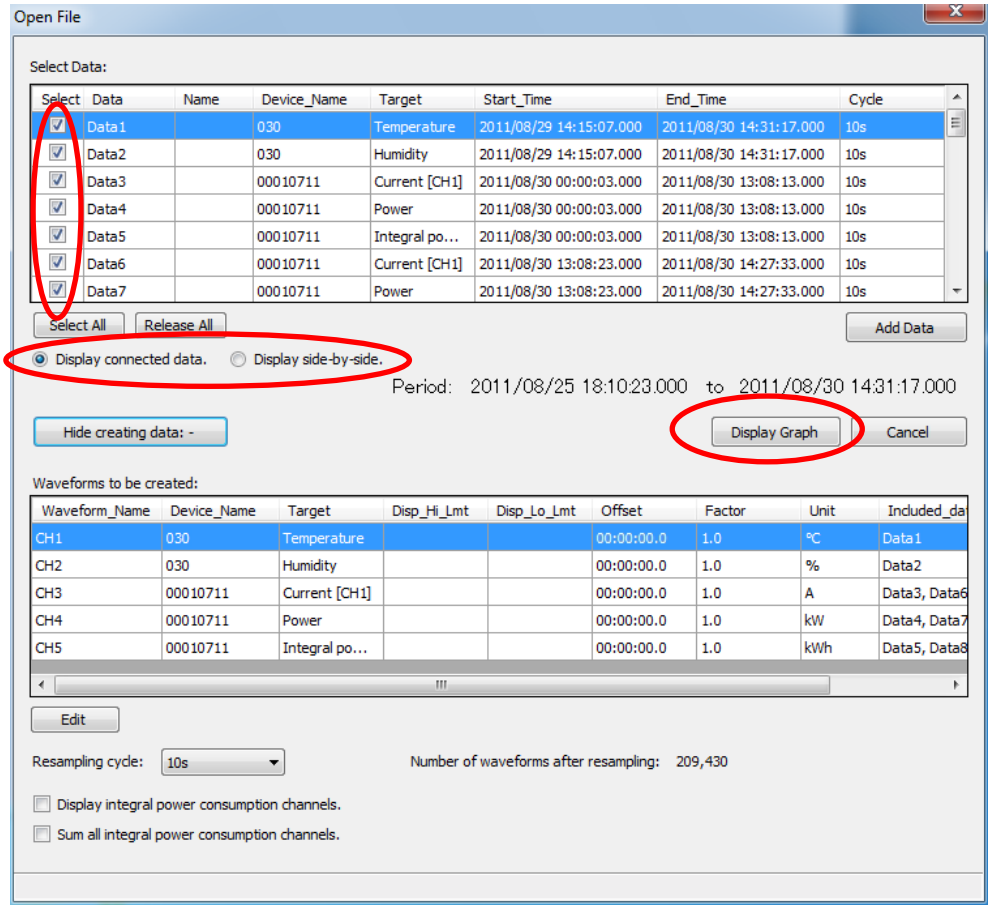


Select the "Search Folder" option and click the "Browse" button to specify the drive assigned to the SD memory card (e.g. E:¥). Make sure that the "Search Subfolders" option is selected and click the "Add" button.

(3) Select the data items to display in the "Open File" window.
Multiple data items can be selected. Also specify if the data items are merged or overlapped when selecting multiple items.
Click the "Display Graph" button to display the selected data in graph.

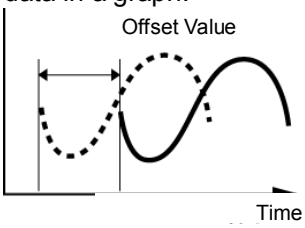


Open File Window with "Display Created Waveform" item folded



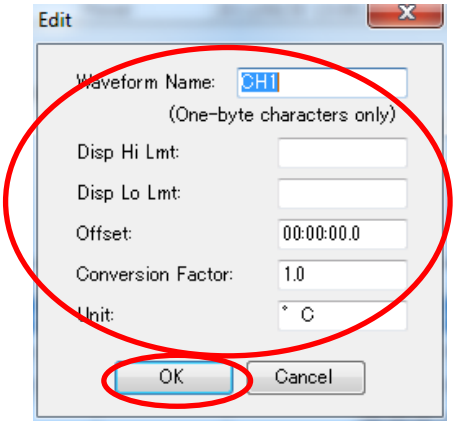
Open File Window with "Display Created Waveform" item unfolded

Item		Description
Select Data	Select	Select the data item to add to the graph display.
	Data	An identifier is automatically assigned to uniquely distinguish individual data items among the combined sets of a device name, measurement item, acquisition start time and acquisition stop time.
	Name	The files recorded with the connected units are displayed with this area left blank. The files containing data acquired to the PC by the Logging Tool are displayed with a waveform name automatically assigned by the tool. The data saved on SD Viewer ES is displayed with the waveform name assigned at the time of saving.
	Device_Name	The files recorded with the connected units are displayed with the unit serial No. contained in the file as the device name. The files containing data acquired to the PC by the Logging Tool are displayed with the "Device Name" displayed on the "Connection Settings" window.
	Target	Displays the measurement target item.
	Start_Time	Displays the data start time written in the file.
	End_Time	Displays the data end time written in the file.
	Cycle	Displays the data measurement interval written in the file.
Select All		Selects all the data items displayed on the "Select Data" list.
Release All		Clears the selection of all the data items selected in the "Select Data" list.
Add Data		Displays the window for specifying the data to add.
Display connected data		Selected multiple data items can be merged into a single graph display. Only data of the same type and measurement target can be merged.
Display data side-by-side		Selected multiple data items can be overlapped into a single graph display.
Period		Displays the data start time and data end time of the selected data. If multiple data items are selected, the earliest start time and latest end time are displayed.
Display creating data		Displays the "Created Waveform" list. Clicking the "Edit" button allows for editing the "Waveform Name", "Upper Display Limit", "Lower Display Limit", "Offset", "Conversion Coefficient" and "Unit" items.
Display Graph		Opens the selected data.
Cancel		Cancels the selection of the data to open.

作 Display Created Waveform	Hide Created Waveform		Hides the "Created Waveform" list.
	Created Waveform	Waveform Name	The channel No. is used for waveforms created from the data recorded with the connected units. Waveforms created from the data acquired to the PC by the Logging Tool are assigned with the waveform name by the Logging Tool. The waveform name can be changed. Click the "Edit" button.
		Device Name	Displays the unit name recorded with the created waveform.
		Target	Displays the measurement target item recorded with the created waveform.
		Upper Display Limit	Displays the upper limit of graph display. Can be changed after clicking the "Edit" button.
		Lower Display Limit	Displays the lower limit of graph display. Can be changed after clicking the "Edit" button.
		Offset	The measurement time can be offset by incrementing or decrementing the time value to display acquisition data in a graph.  The offset values can be specified after clicking the "Edit" button. The setting range (hour:minute:second:millisecond): -23:59:59.999 to 23:59:59.999 Initial value: 00:00:00.0
		Conversion Coefficient	The coefficient to convert a instant power value to electricity power price or CO_2 emission level. Can be changed after clicking the "Edit" button. The initial value is 1.0.
		Unit	Displays the unit of the acquisition data. Can be changed after clicking the "Edit" button. Up to five characters can be used.
		Included Data	Displays the identifier of merged data items.
	Edit		The "Waveform Name", "Upper Display Limit", "Lower Display Limit", "Offset", "Conversion Coefficient" and "Unit" items can be changed after clicking this.
	Resampling Interval		Specifies the new sampling interval used to plot multiple data measured in different sampling periods into simulated graphs in merged or vertical arrangement form. Usually the computed value is automatically selected.
	Number of Post-sampling Display Items		Displays the number of data items after sampling.
	Integrated Power Reset Display		Select this to reflect the integrated power reset status to the graph according to the specified reset interval. For example, if the specified reset value is "30m", "0" is displayed after every 30 minutes (0:30:00, 1:00:00, 1:30:00…) in the graph.
	Display Integrated Power Total Sum Channel		Select this to sum up all the integrated power values in the data. The "Total Integrated Power" data is added to the "Created Waveform" list.

Note

・The "Waveform Name", "Upper Display Limit", "Lower Display Limit", "Offset", "Conversion Coefficient" and "Unit" items can be changed.
Enter a new value in the items to change and click "OK".



・Up to 1 000 000 data items can be opened in the "Open File" window. The number of samples per waveform decreases as the number of waveforms increases.

・The maximum number of waveforms that can be displayed is 1024.

(1) "Merge Data" and "Display Top-to-Bottom"

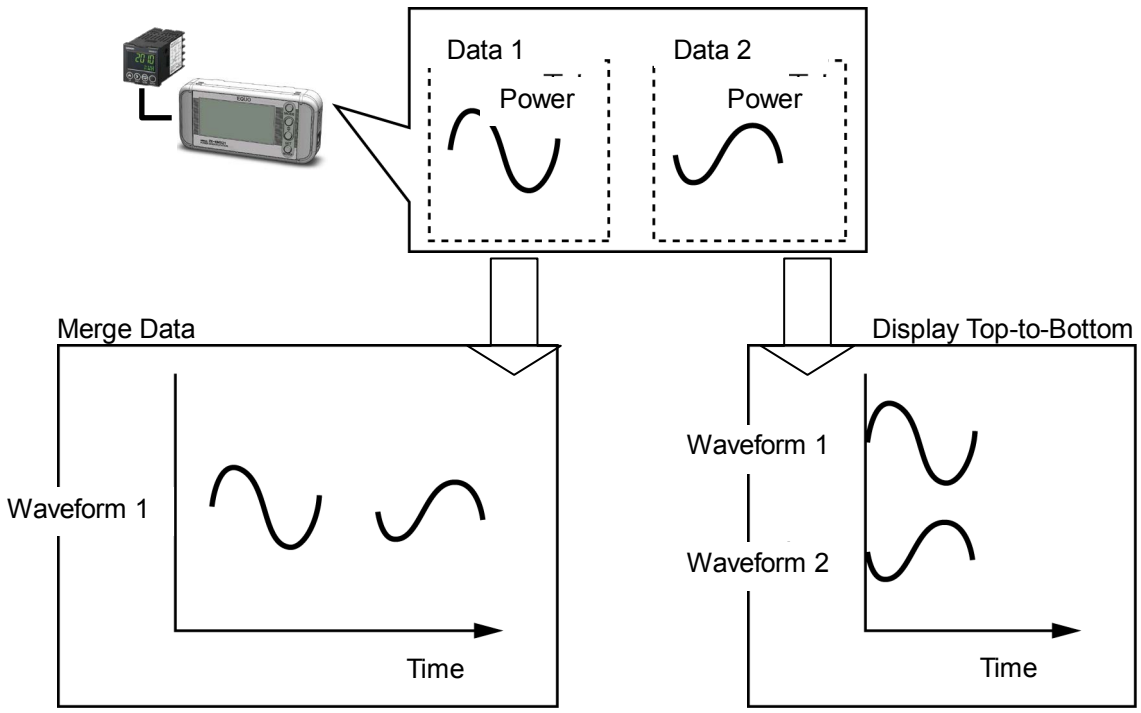
The way to display multiple data items recorded with the same unit can be selected between "Merge Data" and "Display Top-to-Bottom".

Merge Data:

Merges multiple data items in chronological order and displays them in a single waveform.
Only data items recorded with the same unit (Device Name) containing the same type of measured values can be merged.
If items derived from different units or containing different types of values are selected for merge, they are displayed separately top-to-bottom in the graph.
Merged data can be saved as a single data file.
Data items for merge do not necessarily need to be consecutive. Blank periods are assigned with the "NO DATA" value.

Display Top-to-Bottom:

Multiple data items are displayed top-to-bottom in the graph.
Data displayed in a vertical arrangement can be saved as a single data file.
The time scales on the horizontal axis are represented in relative time.



(2) Resampling Cycle

Resampling refers to the technique of plotting multiple data items using a new sampling cycle common to them and displaying them in simulated graphs. Resampling is usually automatically performed. However, the user can select the interval from the options.

Note

Example 1: Merging Data A and Data B recorded at the measure value update interval of 10 seconds

Data A is recorded for 30 seconds from 11:13:04 at a 10 second interval of measured value update; and Data B, for 20 seconds from 11:14:12 at a 10 second interval of measured value update. These two data items are merged in this example.

The created waveform in this example is plotted in the time range starting from the earlier start time (i.e. 11:13:04) to the later end time (i.e. 11:14:32) at every 10 second interval, which is the resampling interval.

The intervals with no available data are valued as "NO DATA". The intervals with no available data are valued as "NO DATA". If no data is available for the specific interval time and the immediate previous interval time has data, the immediate previous value is plotted.

In this example, since there is no data during the period of 11:13:35 to 11:14:11 (namely, intervals 11:13:44, 11:13:54, and 11:14:04), "NO DATA" values are used for these intervals. Resampling intervals 11:14:14 and 11:14:24 are not Data B's interval start times. Therefore, the values "B1" and "B2" of the immediate previous times: 11:14:12 and 11:14:22 are used instead.

Value "B3" of Data B seems to be the value for resampling interval 11:14:34. However, since the time axis range is set from 11:13:04 to 11:14:32, this value is not plotted in the graph.

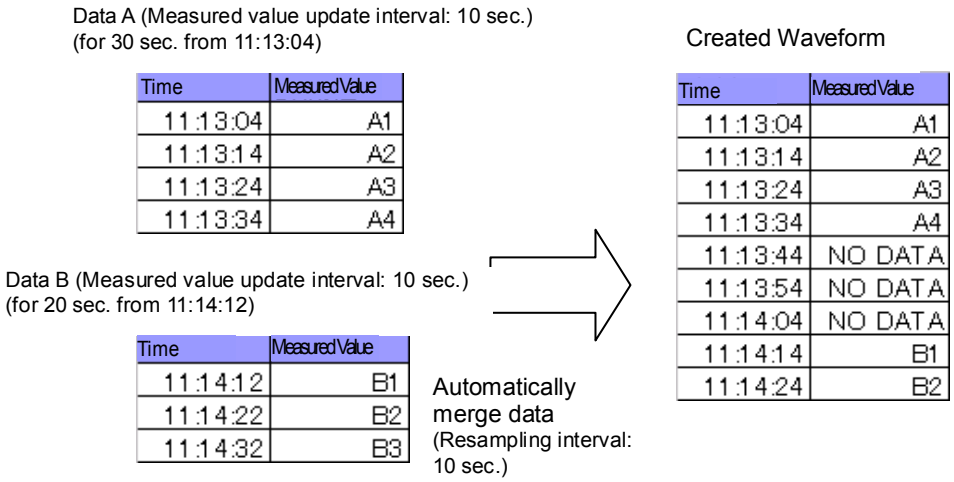


Figure: Automatically Merge Data Display Example

Example 2: Merging Data A recorded at the measure value update interval of 30 seconds and Data B recorded at the measure value update interval of 20 seconds

Data A is recorded for 30 seconds from 11:13:04 at a 30 second interval of measured value update; and Data B, for 40 seconds from 11:14:02 at a 20 second interval of measured value update. These two data items are merged in this example.

The created waveform in this example is plotted in the time range starting from the earlier start time (i.e. 11:13:04) to the later end time (i.e. 11:14:42) at every 10 second interval, which is the specified resampling interval. Intervals 11:13:44 and 11:13:54, which have no available data are represented in "NO DATA". Some intervals with no data (e.g. 11:13:14) can be plotted with the immediate previous values (e.g. "A1" of 11:13:04 is used for interval 11:13:14).

Data A (Measured value update interval: 30 sec.)
(for 30 sec. from 11:13:04)

Time	MeasuredValue
11:13:04	A1
11:13:34	A2

Data B (Measured value update interval: 20 sec.)
(for 40 sec. from 11:14:02)

時刻	計測値
11:14:02	B1
11:14:22	B2
11:14:42	B3

Automatically Merge Data
(Resampling interval: 10 sec.)

Created Waveform

Time	MeasuredValue
11:13:04	A1
11:13:14	A1
11:13:24	A1
11:13:34	A2
11:13:44	NO DATA
11:13:54	NO DATA
11:14:04	B1
11:14:14	B1
11:14:24	B2
11:14:34	B2

Example 3: Top-to-Bottom display of Data A recorded at the measure value update interval of 30 seconds and Data B recorded at the measure value update interval of 20 seconds

Data A is recorded for 30 seconds from 11:13:04 at a 30 second interval of measured value update; and Data B, for 40 seconds from 11:14:12 at a 20 second interval of measured value update. These two data items are displayed in a vertical arrangement in this example.

The created waveforms in this example are plotted in relative time starting from 0:00:00 for longer acquisition duration period, namely for 40 seconds, at the specified resampling interval, i.e. 10 seconds.

Since Data A's acquisition duration time is shorter (30 seconds), it has no data for resampling interval 0:00:40, and the "NO DATA" value is plotted for this interval in Waveform A.

Data A (Measured value update interval: 30 sec.)
(for 30 sec. from 11:13:04)

Time	MeasuredValue
11:13:04	A1
11:13:34	A2

Data B (Measured value update interval: 20 sec.)
(for 40 sec. from 11:14:12)

Time	MeasuredValue
11:14:12	B1
11:14:32	B2
11:14:52	B3

Display Top-to-Bottom
(Resampling interval: 10 sec.)

Created Waveform A

Time	MeasuredValue
0:00:00	A1
0:00:10	A1
0:00:20	A1
0:00:30	A2
0:00:40	NO DATA

Created Waveform B

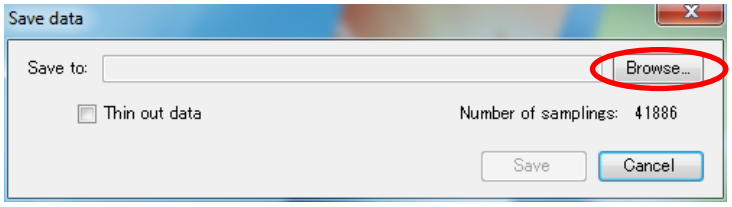
Time	MeasuredValue
0:00:00	B1
0:00:10	B1
0:00:20	B2
0:00:30	B2
0:00:40	B3

Figure: Top-to-Bottom Display Example

4.4.2 Saving Data

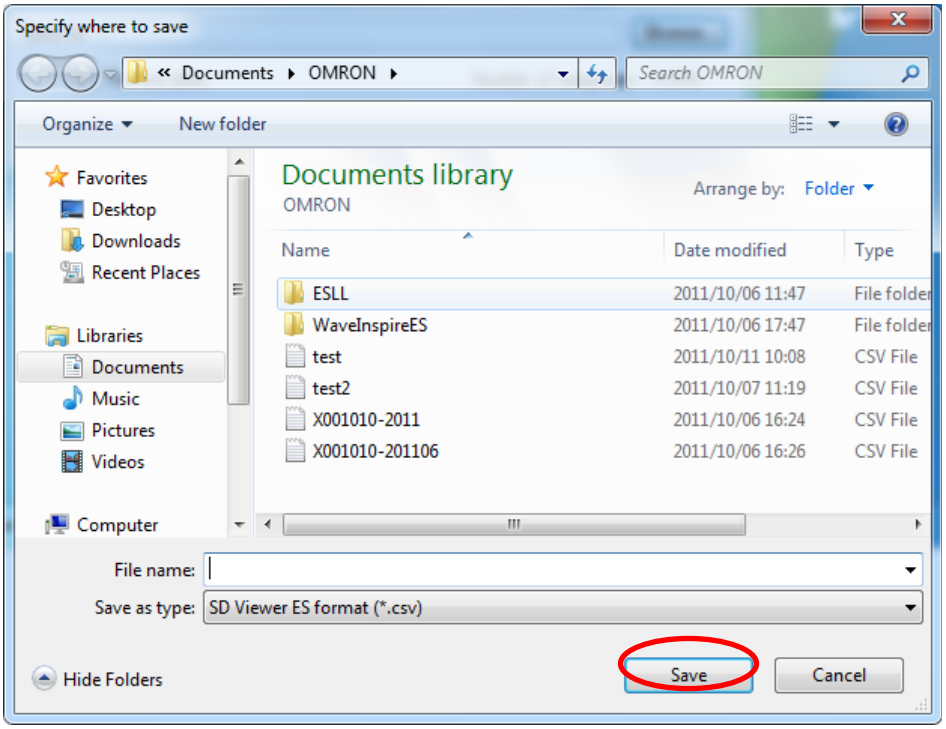
Multiple data items merged or displayed in a vertical arrangement can be saved as a single data file. Saved data files can be opened on SD Viewer ES.

(1) Select "File" - "Save data". The "Save data" window appears. Click the "Browse" button and specify the save destination folder and the file name.

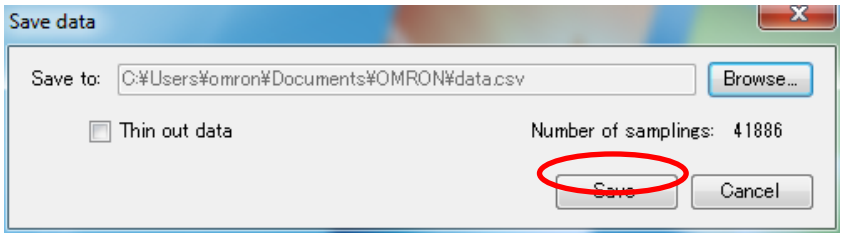


Item	Description
Save to	Browse the folder and the file name.
Browse	Browse the folder name and the file name.
Thin out Data	Select this to thin out the data for compression when saving.
Number of Samplings	Displays the number of data samples. If "Thin out Data" is selected, the number after thinning out the data is displayed.
Save	Saves the data.
Cancel	Cancels the selection of the data to be saved.

(2) Click the "Save" button.



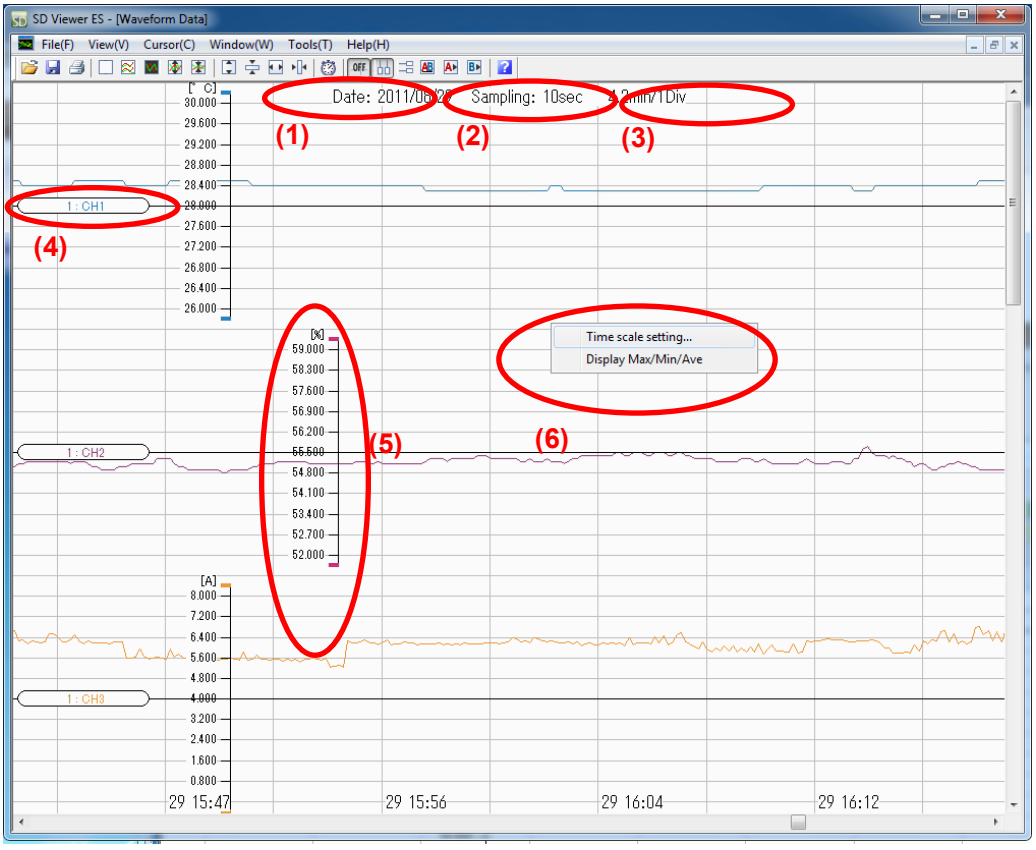
(3) Click the "Save" button again on the "Save Data" window. The data is saved.



If the data needs to be thinned out to reduce the file size when saving, select the "Thin out Data" option and specify the thinning rate.

4.5 Graph Display

4.5.1 Window Section Name and Function



(1) Acquisition Date
(2) Sampling Interval
(3) An Interval of Time for a Single Horizontal Scale
(4) Waveform Name
(5) Vertical Scales
(6) Right-click Menu (Time axis change and max/min/average values display ON/OFF)

Menu Bar Item List

Item			Description
File	Open File		Opens acquisition data files. Multiple files can be specified for a merged or overlapped display. The data already being displayed is closed.
	Save Data		Saves the acquisition data file. The data items in a merged or overlapped display are saved as a single file.
	Print		Prints the displayed graph.
	Print Preview	-	Displays a print preview of the data.
	Exit Application	-	Exits SD Viewer ES. The exit confirmation message appears if the displayed data has not been saved.

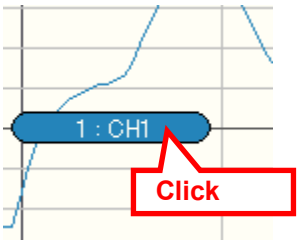
View	Reset Graph			Resets the graph to its initial state.
	Display Top-to-Bottom			Displays a reduced view of all the waveforms in a vertical arrangement in the Graph Window.
	Display Overlapped			Displays a magnified view of all the waveforms overlapped in the Graph Window.
	Narrow Spacing			Narrows the spacing between waveforms.
	Widen Spacing			Widens the spacing between waveforms.
	Vertical Enlargement			Enlarges all the waveforms or the selected waveforms in the vertical direction.
	Vertical Reduction			Reduces all the waveforms or the selected waveforms in the vertical direction.
	Horizontal Enlargement			Enlarges all the waveforms in the horizontal direction.
	Horizontal Reduction			Reduces all the waveforms in the horizontal direction.
	Full Horizontal View		-	Horizontally shrinks all the waveforms for a single complete view on the display.
Cursor	Cursor Select	OFF		Hides the cursor on the Graph Window.
		Vertical Cursor		Displays a vertical cursor on the Graph Window. Also displays the cursor information.
		Horizontal Cursor		Displays a horizontal cursor on the Graph Window. Also displays the cursor information.
	Cursor A&B in Sync.			Synchronizes Cursors A and B.
	Cursor A			Calls Cursor A.
	Cursor B			Calls Cursor B.
Window	Toolbar		-	Enables/disables the toolbar display.
Tool	Option	Relative Time	-	Switches to the relative time display.
		Fix Horizontal Grid Line	-	Enables/disables the horizontal grid line fixing.
		Display Scale	-	Enables/disables the scale display.
		Reverse Background Color	-	Reverses the Graph Window background color.
Help	Display Help			Displays the Help document.
	Version Information		-	Displays the version information.

Right-click Menu Item List

Item		Description
Set Time Axis		Used to set the graph time axis setting.
Display Max/Min/Average Values	-	Displays the maximum, minimum and average values in the Graph Window.

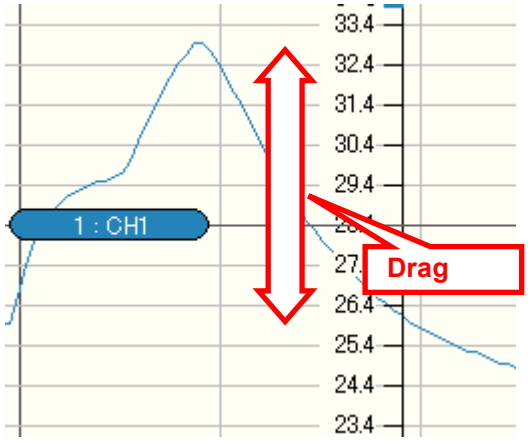
4.5.2 Basic Graph Operation

(1) Selecting Waveform



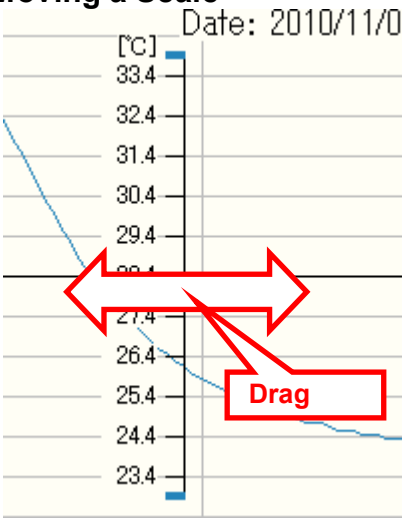
Click the tag attached to the waveform to select.
The tag highlights and the selected waveform becomes active.
To cancel the selection, click anywhere off the waveform in the window.
To select multiple waveforms, hold Ctrl key while clicking their tags.
To select all the waveforms, hold Shift key while clicking one of the waveforms.
Use Tab key to select the next waveform.

(2) Moving Waveform



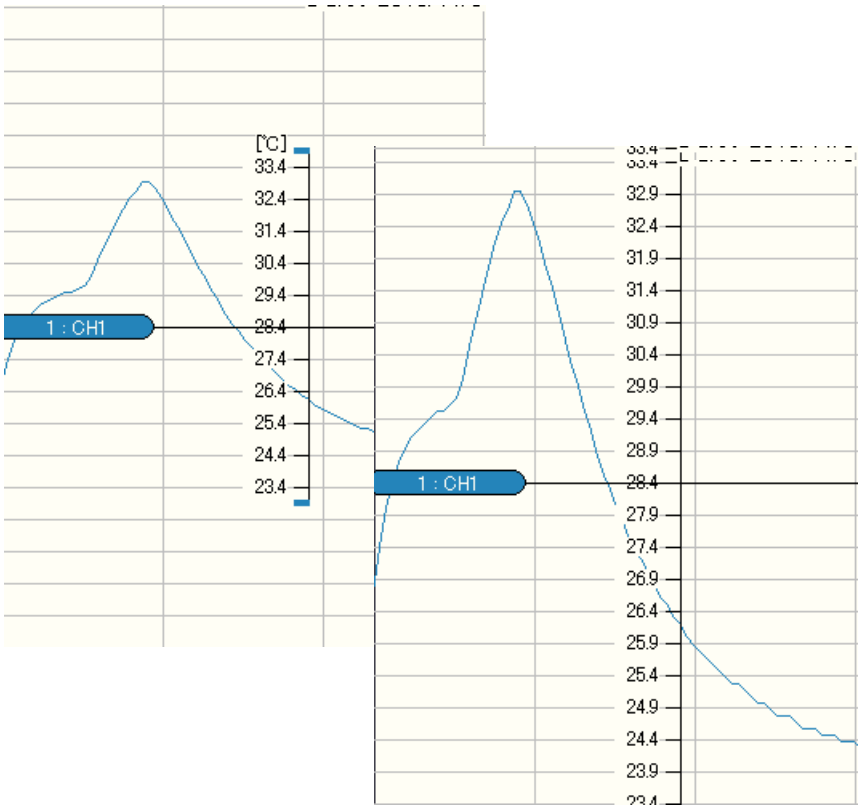
The selected waveform can be dragged to a desired location.

(3) Moving a Scale



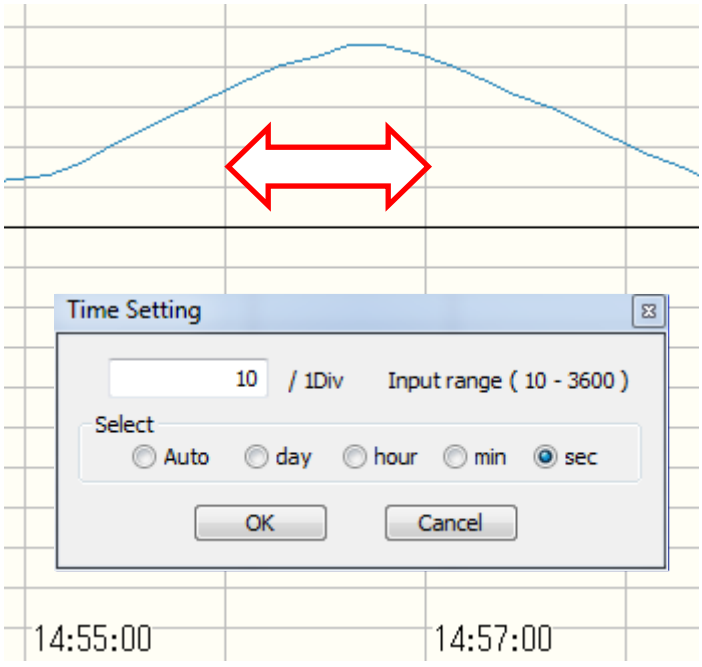
A scale can be dragged to a desired location to study the waveform.

(4) Enlarging and Reducing Waveform Size



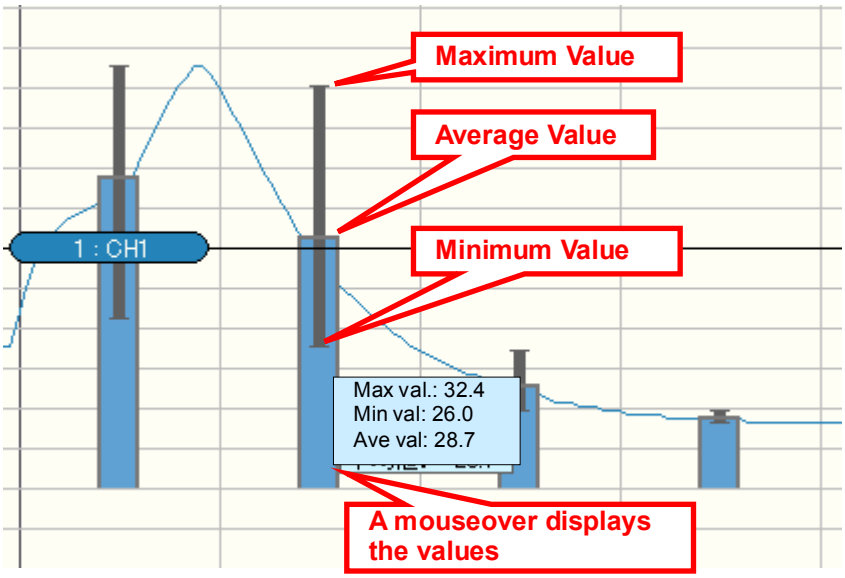
The waveform can be enlarged or reduced by using the mouse wheel while holding Ctrl key.

(5) Setting Time Axis



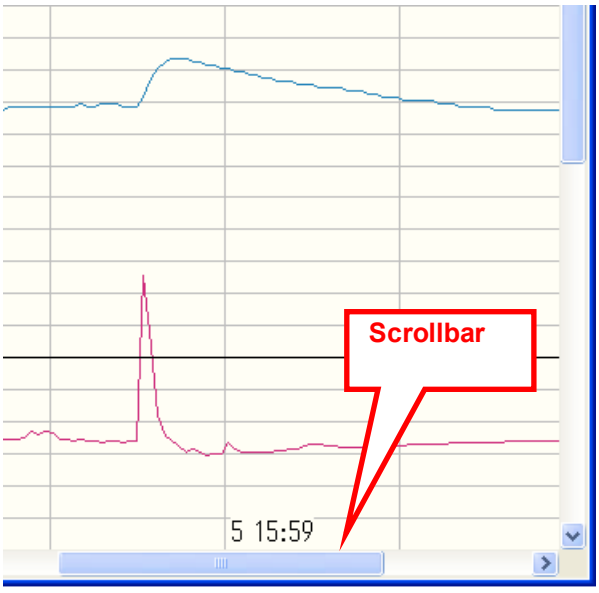
Select "Set Time Axis" in the context menu or click the "Set Time Axis" button in the toolbar.
The time interval for vertical grid lines can be specified.

(6) Displaying Max./Min./Average Values



The maximum, minimum and average measured values can be displayed by the unit of vertical grid line.
Select "Display Max/Min/Average Values" in the context menu.
A mouseover also can display the maximum, minimum and average values.

(7) Scrolling Waveform



Move the horizontal scroll bar to view the entire waveform for the acquisition start to end.

(8) Initializing Display Settings

Select "View" - "Reset Graph" in the menu bar or click the "Reset Graph" button in the toolbar. All settings such as the enlarged or reduced waveform and moved scale can be returned to the initial state.

4.5.3 File Menu

(1) Open File

Opens recorded data on the connected unit or data saved in the SD Viewer ES.

(2) Save Data

Saves the displayed graph.

(3) Print Preview

Provides a print preview of the data.

(4) Print

Prints the displayed graph.

(5) Exit Application

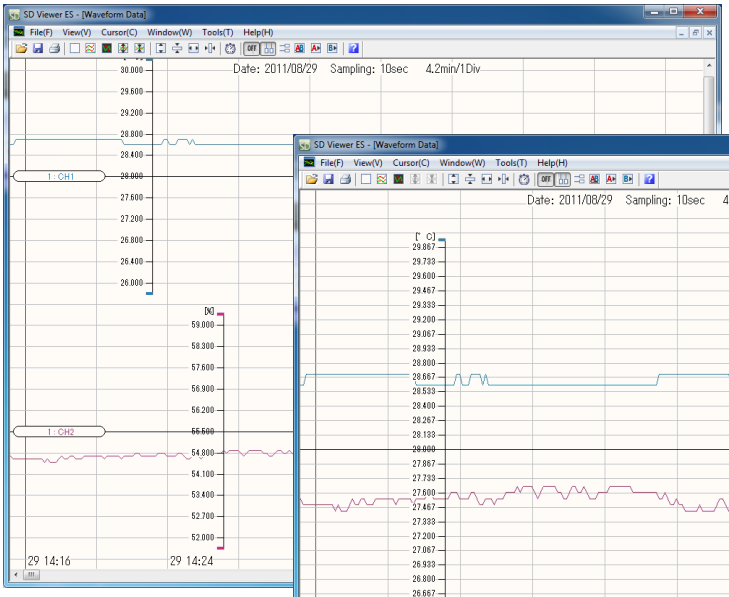
Exits SD Viewer ES.

4.5.4 View Menu

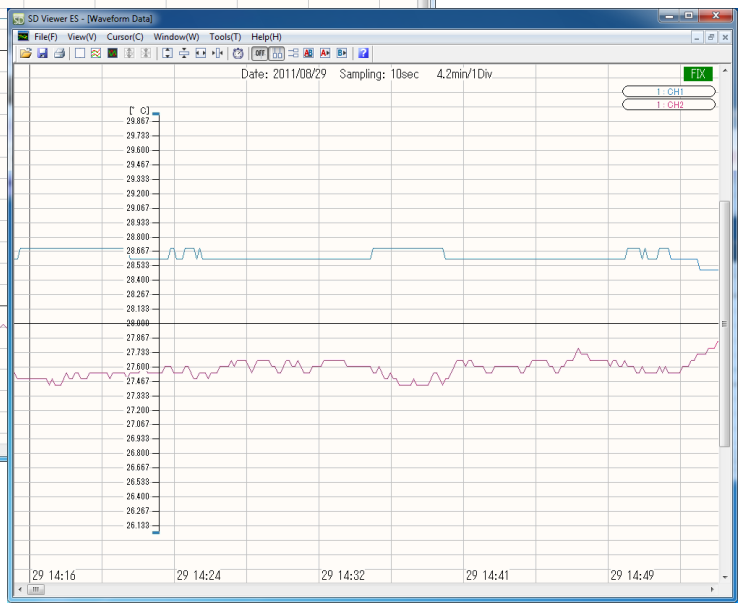
(1) Reset Graph

Cancels the enlargement or reduction, scale movement or other settings added to the graph returning it to the initial state.

(2) Display Top-to-Bottom/Display Overlapped



Display Top-to-Bottom



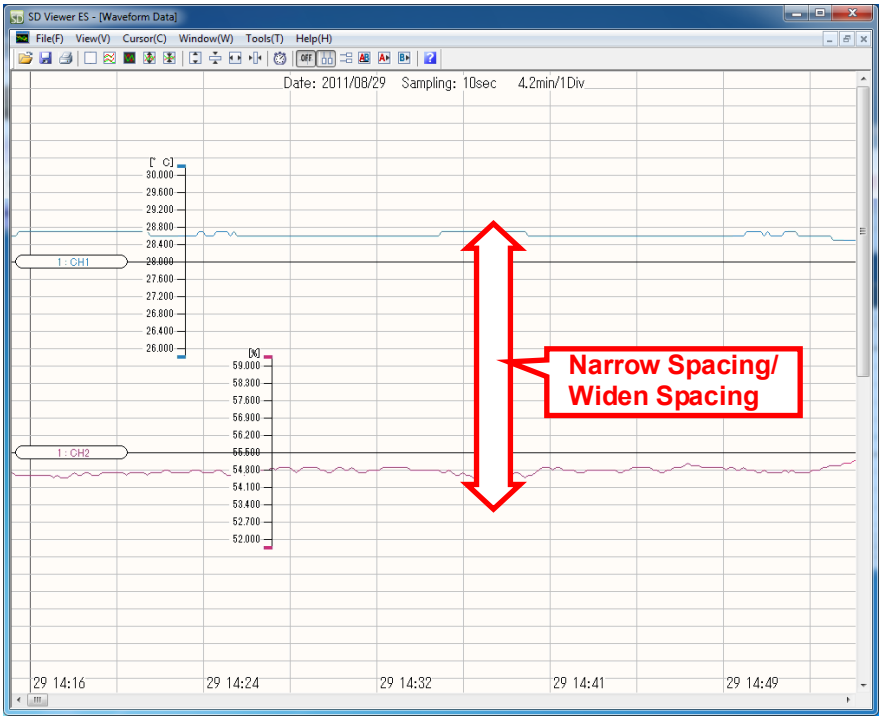
Display Overlapped

Multiple waveforms can be displayed in a vertical arrangement or overlapped in the same graph area.
Select "View" - "Display Top-to-Bottom" in the menu bar to display the waveforms in a vertical arrangement.
By selecting "View" - "Display Overlapped", the waveforms can be overlapped in the same graph area.
The scale of the selected waveform is displayed in an overlapped display.

Note

The "Narrow Spacing" and "Widen Spacing" items are disabled when waveforms are overlapped. The "FIX" description appears at the top right of the window.

(3) Narrow Spacing/Widen Spacing



The spacing between two waveforms can be narrowed or widened in the display.
Select "View" - "Narrow Spacing" in the menu bar to narrow the spacing between waveforms.
To widen the spacing, select "View" - "Widen Spacing" in the menu bar.
Key or mouse operation also can provide the same functions.

Narrow Spacing: The Up arrow (↑) key (or mouse wheel) while holding Shift key

Widen Spacing: The Down arrow (↓) key (or mouse wheel) while holding Shift key

Note

The "Narrow Spacing" and "Widen Spacing" items are disabled when waveforms are overlapped.

(4) Vertical Enlargement/Reduction

The entire graph area or waveforms can be enlarged or reduced in the vertical direction.
Select "View" - "Vertical Enlargement" in the menu bar for vertical enlargement and "View" - "Vertical Reduction" for vertical reduction.

- Any waveform is not selected: The entire graph area is enlarged/reduced.
- Waveforms are selected: The selected waveforms are enlarged/reduced vertically.

Key or mouse operation also can provide the same functions.

Vertical Reduction: The Down arrow (↓) key (or mouse wheel) while holding Ctrl key

Vertical Enlargement: The Up arrow (↑) key (or mouse wheel) while holding Ctrl key

(5) Horizontal Enlargement/Reduction

The entire graph area can be enlarged or reduced in the horizontal direction.
Select "View" - "Horizontal Enlargement" in the menu bar for horizontal enlargement.
For horizontal reduction, select "View" - "Horizontal Reduction".
To display all the waveforms in a single screen view, select "View" - "Full Horizontal View".
Key or mouse operation also can be used.

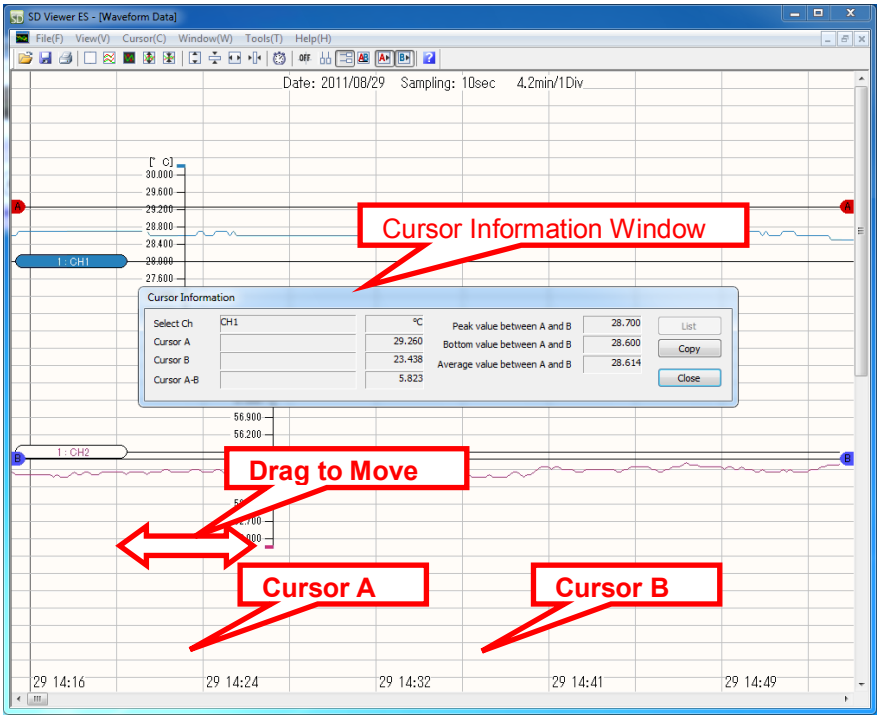
Horizontal Reduction: The Left arrow (←) key while holding Ctrl key
Horizontal Enlargement: The Right arrow (→) key while holding Ctrl key

Note

- Fixed/Variable "Horizontal Grid Lines" can be switched by selecting "Tool" - "Option".
  If "Fix Horizontal Grid Line" is selected:
  Horizontal enlargement/reduction operation does not change the horizontal grid size.
  If "Fix Horizontal Grid Line" is not selected:
  Horizontal enlargement/reduction operation changes the horizontal grid size.
- The horizontal grid time interval can be specified with "Set Time Axis" in the context menu.
  If "Fix Horizontal Grid Line" is not selected and the time interval is specified:
  Horizontal enlargement/reduction operation does not change the horizontal grid time interval.
  If "Fix Horizontal Grid Line" is selected and the time interval is specified:
  The horizontal fix is canceled by specifying the time axis. Horizontal enlargement/reduction operation does not change the horizontal grid size.
- If "Full Horizontal View" is applied to data recorded for a long period of time, the grid becomes so dense that the graph is displayed as a gray image. If this happens, apply a wider time interval to the horizontal grid in "Set Time Axis".

4.5.5 Cursor Menu

(1) Displaying Cursor



Select "Cursor" - "Cursor A" in the menu bar. Cursor A appears in the window.
Select "Cursor" - "Cursor B" in the menu bar. Cursor B is displayed.

The "Cursor Information" window appears when a cursor is displayed, showing the cursor position and value on the selected waveform.

To change the cursor position, place the mouse pointer on the cursor and drag it.

Note

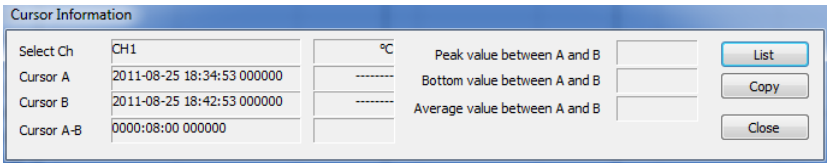
If the cursor information window is blank, it indicates that no waveform is selected. Values are displayed when a waveform is selected.

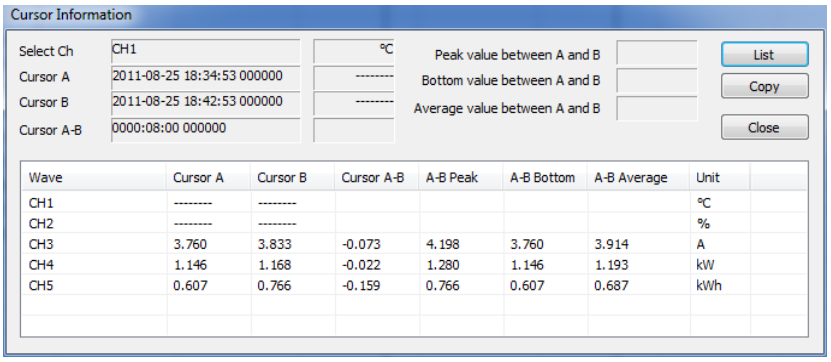
(2) Hiding Cursor from Display

Select "Cursor" - "Cursor Select" - "OFF" in the menu bar. Cursors can be hidden from display.

(3) Cursor Information

The cursor information is displayed when a cursor is called up on the window.



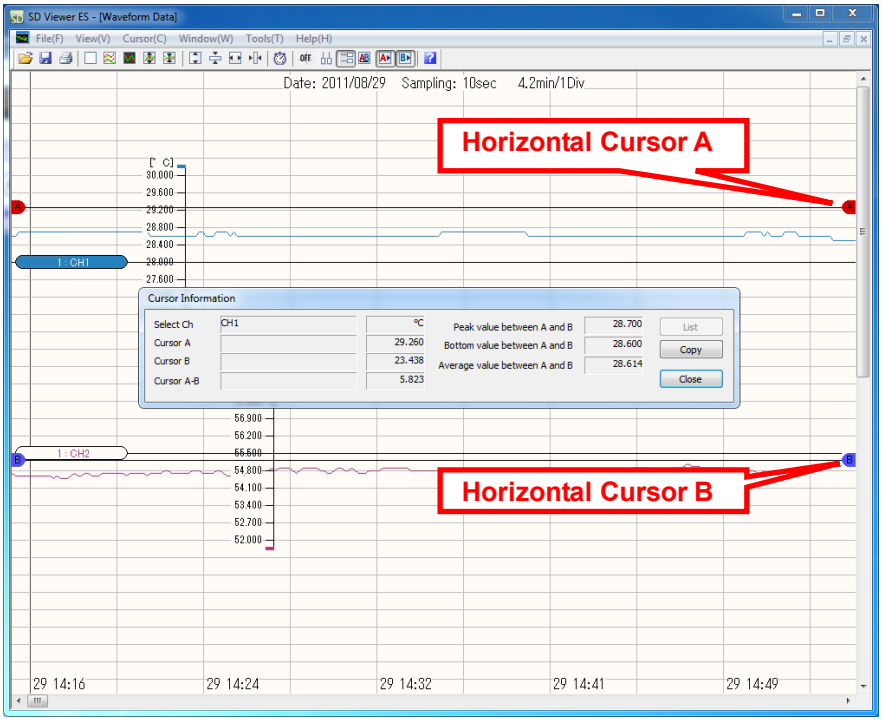


Name	Description
Select Ch	Shows the selected waveform name. The waveform name uses the following format: ・"Connection Name" + Waveform Name
Cursor A	Shows the Cursor A position on the waveforms. ・Year-Month-Day Hour:Minute:Second (Vertical cursor only) ・Value
Cursor B	Shows the Cursor B position on the waveforms. ・Year-Month-Day Hour:Minute:Second (Vertical cursor only) ・Value
Cursor A - B	Shows the difference between Cursor A and Cursor B.
Peak value between A and B	Shows the maximum value between Cursor A and Cursor B positions.
Bottom value between A and B	Shows the minimum value between Cursor A and Cursor B positions.
Average value between A and B	Shows the average value between Cursor A and Cursor B positions.
List	Displays a list of the Waveform Name/Cursor A/Cursor B/Cursor A - B Difference/Cursor A - B Maximum Value/Cursor A - B Minimum Value/Cursor A - B Average Value/Unit for all the selected waveforms.
"List" button (Vertical cursor only)	Switches Display/Hide of the waveform list.
"Copy" button	Copies the "Cursor Information" data to the clipboard in the csv format.
"Close" button	Closes the "Cursor Information" window.

(4) Cursor Synchronization

Cursor A and Cursor B can be synchronized for simultaneous movement.
Select "Cursor" - "Cursor A&B in Sync." in the menu bar. If the selection of the item is removed, the cursors can be moved independently.

(5) Selecting Vertical Cursor/Horizontal Cursor



Vertical cursor or horizontal cursor display can be selected.
Select "Cursor" - "Cursor Select" - "Vertical Cursor" in the menu bar. Vertical cursors are displayed.
To display horizontal cursors, select "Cursor" - "Cursor Select" - "Horizontal Cursor".

Note

Vertical and horizontal cursors cannot be displayed simultaneously.

4.5.6 Other

(1) Relative Time Display

Select this to display the time descriptions in the graph in relative time. Absolute time is displayed when this is not selected.
Select "Tool" - "Option" - "Relative Time" to enable this option.

(2) Fix Horizontal Grid Line

Select this to fix the horizontal grid when horizontally enlarging/reducing the waveform. The grid is variable when this is not selected.
Select "Tool" - "Option" - "Fix Horizontal Grid Line" to enable this option.

(3) Scale Display

Select this to display the scales for all the waveforms in the window.
Select "Tool" - "Option" - "Display Scale" to enable this option.

(4) Reverse Background Color

Reverses the graph background color.
Select "Tool" - "Option" - "Reverse Background Color" to enable this option.

5. Integration and Summation: Using Energy Viewer

5.1 Energy Viewer Overview

The Energy Viewer provides the integration and summation of values e.g. power level values using data recorded in the connected unit's SD memory card.
Processed data can be displayed on the Energy Viewer for analysis. The period of summation can be changed and multiple summation targets can be selected for graph representation using the tool.
Energy Viewer allows for display of different types of data such as temperature and power level in the same graph area.
Comparison with summation data in the past is also possible with Energy Viewer.

5.2 Preparation

5.2.1 Operating Environment / Installation / Uninstallation

Energy Viewer is installed simultaneously with Station Utility.
Refer to "1.3 Operating Environment", "1.4 Installation" and "1.5 Uninstallation" for the tool's operating environment and installation/uninstallation procedures.

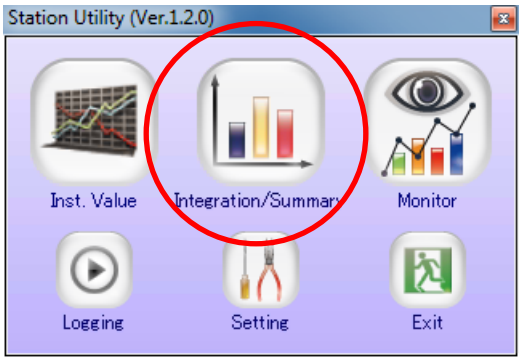
5.2.2 Loading Recorded Data to PC

Connect a commercially available SD memory card reader/writer to the PC. It is not required if an SD memory card slot is provided on the PC.
Insert an SD memory card with recorded data retrieved from the connected unit in the SD card reader/writer device or the PC's SD memory card slot.

5.3 Startup and Exit

5.3.1 Starting Energy Viewer

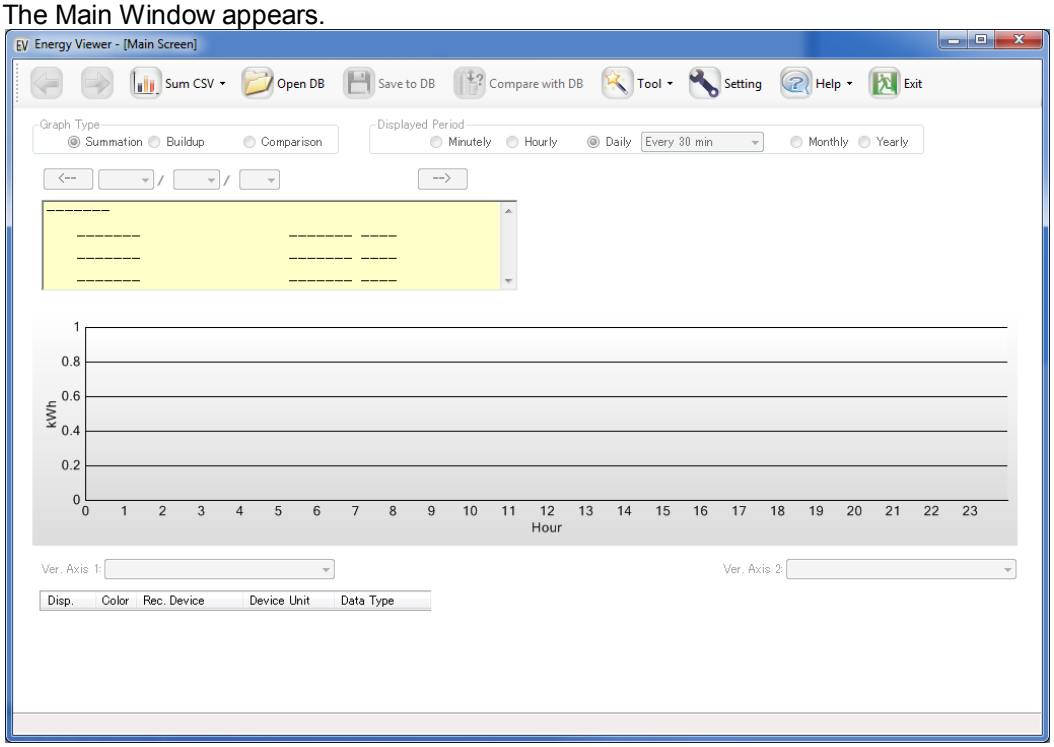
(1) Click "Integration/Summation" in the Station Utility startup tool select window.



Startup Tool Select Window

To display the Startup Tool Select Window, click the Station Utility shortcut on the Windows desktop or select "All programs" - "OMRON" - "Station Utility" - "Station Utility Ver.1.*.*" from the Windows start button.

(2) The Main Window appears.



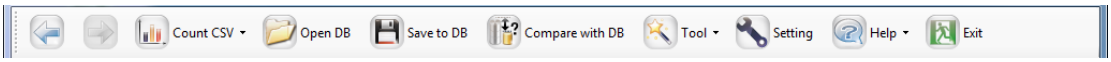
Main Window

5.3.2 Exiting Energy Viewer

To exit Energy Viewer, select "Exit" in the Main Window toolbar.
The exit confirmation window appears if any summation data has not been saved.
To remove the SD memory card from the card slot, follow the removal procedure provided by the PC.

5.4 Menu Overview

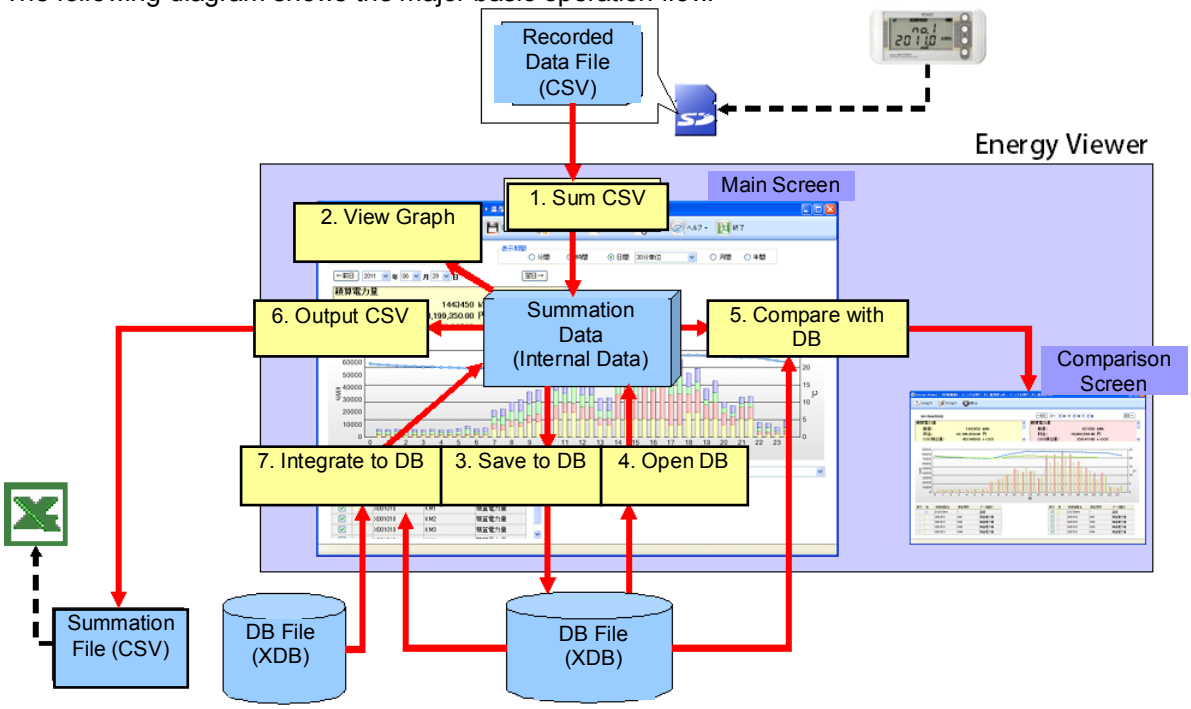
Basic operation is assigned to individual icons in the Main Window toolbar.



The following table shows basic operation available by clicking icons:

Sum CSV	Select the acquisition data and sum the values in the data. Two options are available: Summing the values into a new result or add them to the data displayed on Main Window.
Open DB	Open summation data saved in the past.
Save to DB	Saves summation data.
Compare with DB	Compare the summation data currently being viewed with summation data saved in the past.
Tool	Some convenient functions are provided under this item. Merging of multiple summation data items in the past; outputting summation data in the CSV format; and copying displayed graphs to clipboard are supported.
Setting	The rate conversion, CO_2 conversion coefficient, data type and channel settings can be made.
Help	Displays the version information and Help document.

The following diagram shows the major basic operation flow.



5.5 Basic Operation Procedures

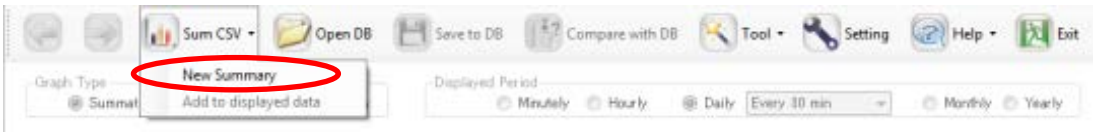
5.5.1 Acquisition Data Summation

(1) New Summation Data

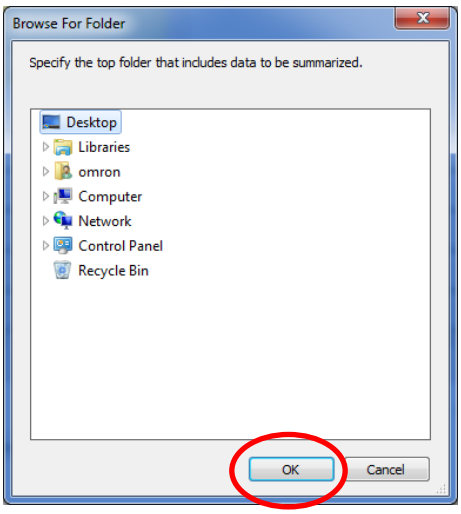
This menu item sums the values in the specified acquisition data into a new summation result.

If a graph is displayed on Main Window, the displayed summation data is closed for summation operation for the new data, which is then displayed in graph.

(1) Click "Sum CSV" - "New Summary" on the Main Window toolbar.



(2) Select the SD memory card drive or folder containing acquisition data in the "View Folder" window and click "OK".

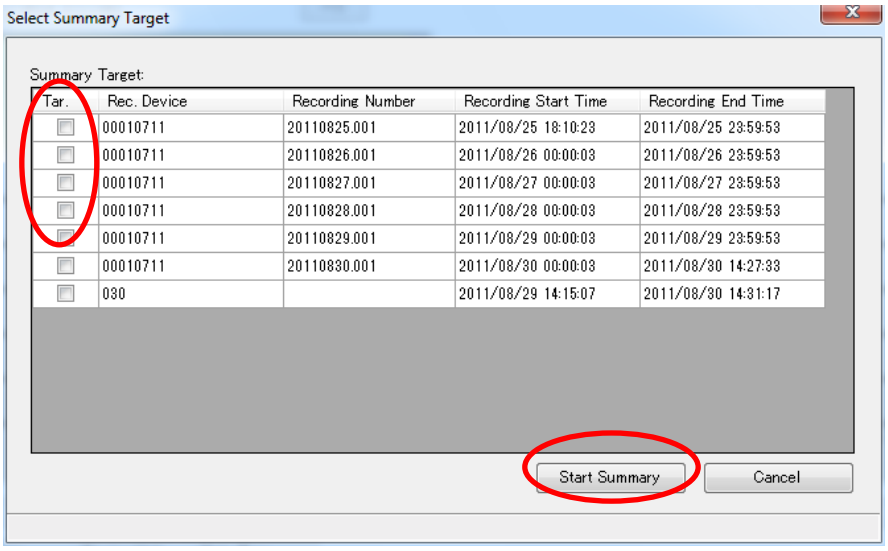


View Folder Window

Acquisition data options for summation are automatically searched in the selected drive or folder. If possible data item candidates are found, they are listed in the "Select Data for Summation" window.

(The search may require some minutes if a large number of acquisition data items are contained in the selected drive or folder. To suspend the search, click the Cancel button displayed during the search at the left bottom of the window.)

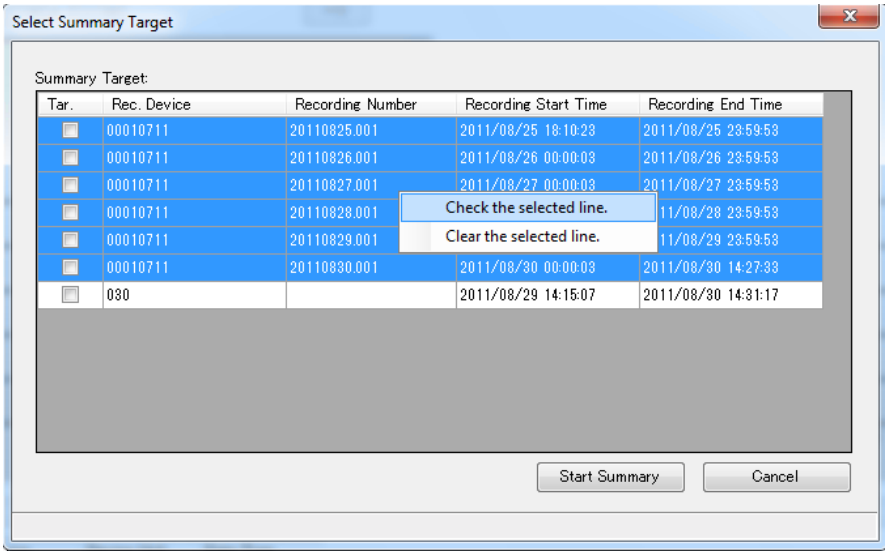
(3) Select the acquisition data to sum in the "Select Data for Summation" window and click the "Summation Start" button.



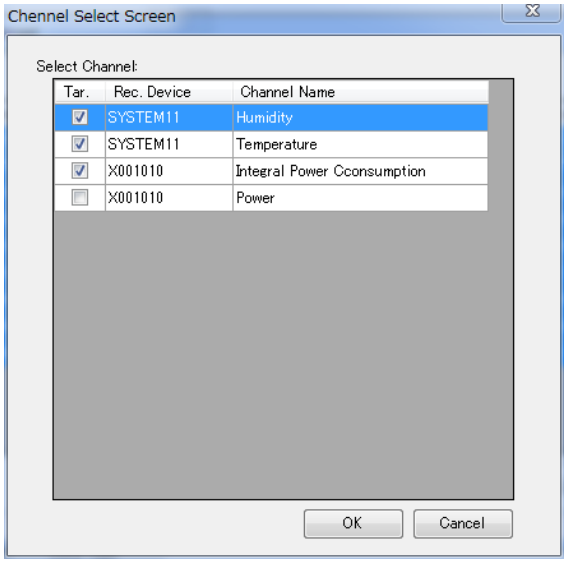
Select Data for Summation Window

Note

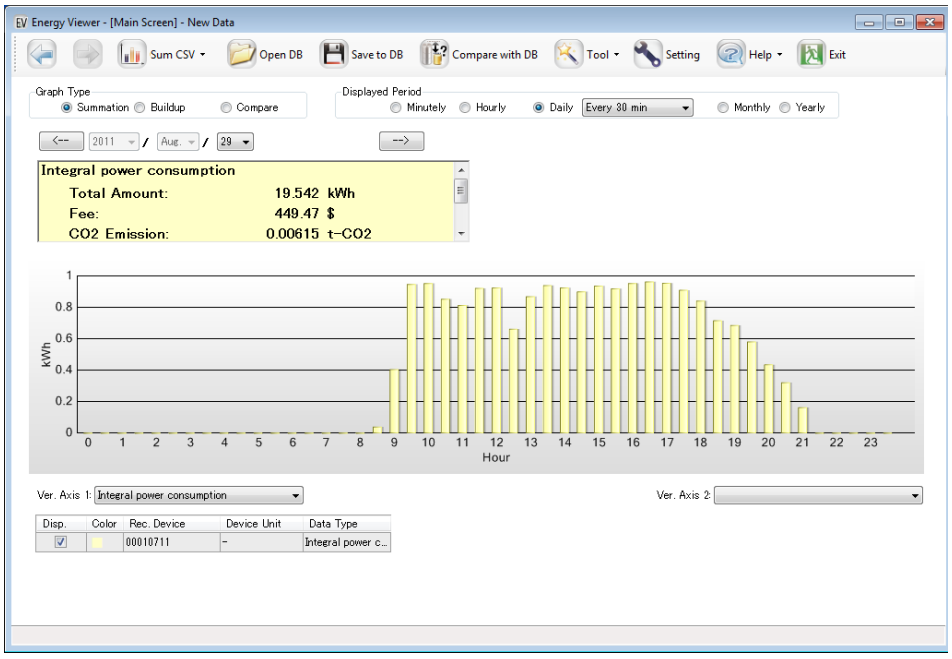
To check/uncheck multiple acquisition data checkboxes simultaneously in the "Select Data for Summation" window, hold Ctrl or Shift key while left-clicking the data items to select. When the items are selected, right-click to display the context menu and select the check/uncheck option.



(4) Click [Start Summary] to show the summary target channel. Select a channel for summation.



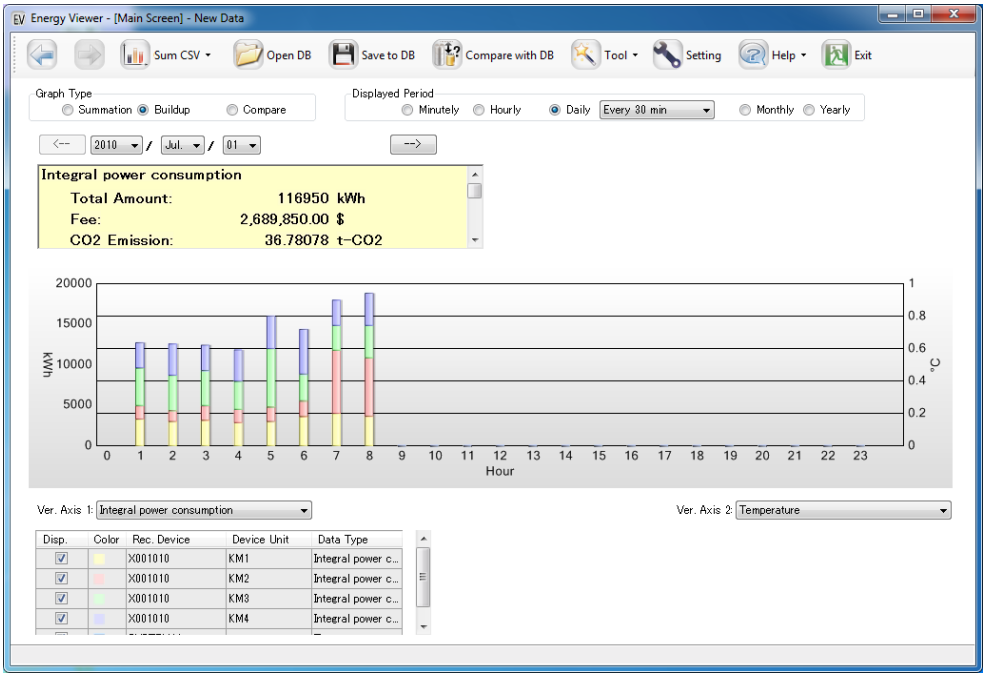
(5) The summation result is shown on the Main Window after summation operation. The summation process may require some minutes depending on the data volume. (The process can be canceled by using the Cancel button shown during summation at the left bottom of the window.).



(2) Add to Displayed Data

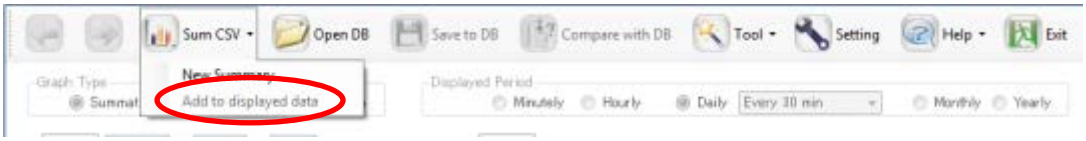
The result of summing the specified acquisition data values can be added to the summation data currently displayed on the Main Window.

This menu function can sum different types of values such as temperature and power level data recorded with multiple units and saved in multiple SD memory cards into the same summation data and display them simultaneously in the same graph area.



Integrated Power and Temperature Data Displayed in a Single Graph Area

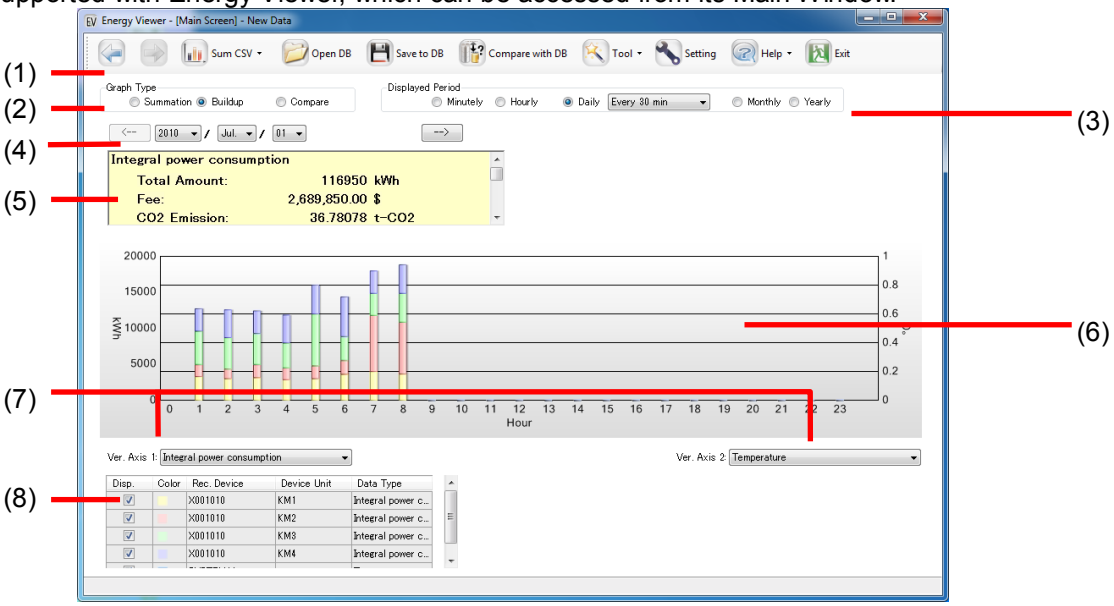
(1) Click "Sum CSV" - "Add to displayed data" to add summation data to the data currently displayed.



The procedure hereafter is the same as Step 2 and the following steps in the "New Summation Data" procedure.

5.5.2 Viewing Graph

Various functions for efficiently viewing and analyzing summation results and graphs are supported with Energy Viewer, which can be accessed from its Main Window.



Main viewing functions (1) to (7) are described in the following paragraphs. The numbers (1) to (7) correspond to those in the image above, which show the location where individual functions are provided.

(1) Window History

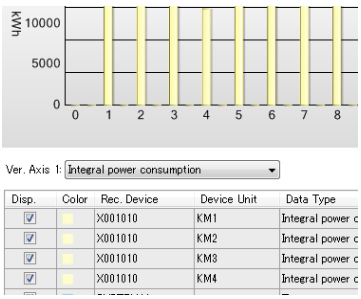
This menu item provides the history of up to 15 windows previously displayed when using the functions (2) to (8) below. The recorded windows remaining in the history can be accessed back and forth by using the two buttons (Previous and Next) displayed to the left in the toolbar (numbered by "1" in the image above).

"Previous" "Next"

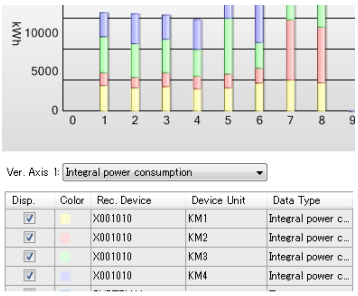
(2) Graph Type Switching

Displaying summation data in other type of graph sometimes may provide easier analysis, especially when the data includes integrated power or measured pulse values in multiple channels. This function can be accessed from the (2) location in the image above and provides a graph type switch among three types: Summation, Accumulative, and Comparison graphs. The channels included in the summation data are listed at the location (8) in the Main Window image.

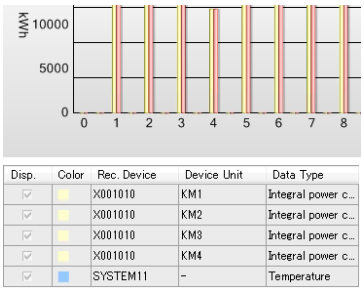
Summation Graph: Displays the summed values of the selected channel values.



Accumulative Graph: Displays the summed values of the selected channel values in different colors according to the channels.



Comparison Graph: Displays the selected channel values independently side-by-side.

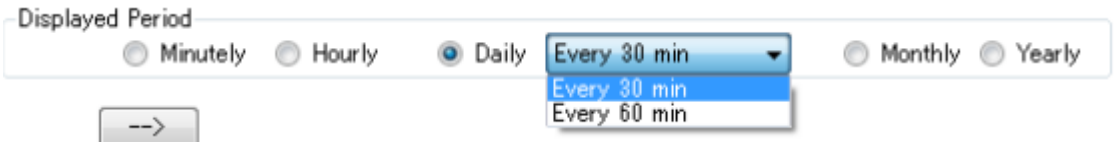


Note

Temperature, particle, instant current level and other value graphs, which are displayed in line graphs are not influenced by switching the graph type. The graph type does not change.

(3) Display Period Switching

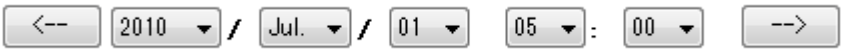
The display period represented in the graph's horizontal axis range can be switched for easier analysis. Select the display period at the (3) location indicated in the Main Window image from the five options: Minute, Hour, Day, Month and Year. Upon selecting the option, the data summation is computed again.
"Minutely" is selected: The graph horizontal axis range is 1 minute and the raw values in acquisition data are displayed.
"Hour" is selected: The graph horizontal axis range is 1 hour and the summation unit is 1 minute.
"Daily" is selected: The graph horizontal axis range is 1 day and the summation unit can be selected between 30 or 60 minutes.
"Monthly" is selected: The graph horizontal axis range is 1 month and the summation unit is 1 day.
"Yearly" is selected: The graph horizontal axis range is 1 year and the summation unit is 1 month.



(4) Time and Date Setting

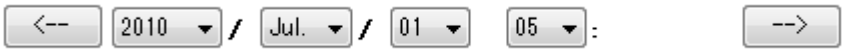
The graph for specific date and time can be displayed by specifying the date and time using the buttons/combo boxes at the location (4) in the Main Window image. The buttons or options in the combo boxes vary depending on the display period setting.

"Minutely" is selected for the display period:



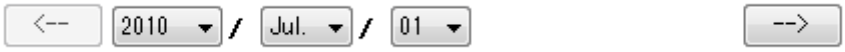
Select year, month, day, hour and minute values in the combo boxes. The previous minute and next minute can be selected by using the buttons.

"Hourly" is selected for the display period:



Select year, month, day and hour values in the combo boxes. The previous hour and next hour can be selected by using the buttons.

"Daily" is selected for the display period:



Select year, month and day in the combo boxes. The previous day and next day can be selected by using the buttons.

"Monthly" is selected for the display period:

Select year and month in the combo boxes. The previous month and next month can be selected by using the buttons.

"Yearly" is selected for the display period:

Select year in the combo box. The previous year and next year can be selected by using the buttons.

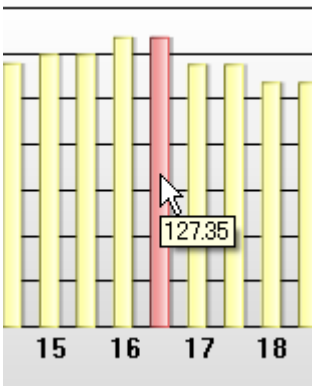
(5) Total Sum Display

The current display period and channel information can be summarized as the average, maximum and minimum values.
The total sums of the integrated power and pulse data are also displayed.
The rate conversion and CO2 conversion values are also displayed for the data if the energy data option is selected in the Data Type Setting window pertaining to the data. The conversion coefficients specified in the setting window beforehand are used for data conversion.

Total Sum	The total sum of the summation values displayed in the graph.
Rate	Electric power rate (Total sum x Rate conversion coefficient)
CO_2 Emission Level	Total sum × CO_2 conversion coefficient
Average	The average value of the summation values displayed in the graph.
Maximum	The maximum value of the summation values displayed in the graph.
Minimum	The minimum value of the summation values displayed in the graph.

(6) Period Value Display

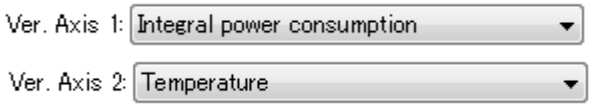
A graph bar changes its color and its value is displayed in a tooltip when the mouse is moved over the bar.



Left-click at a position where the bar graph color changes. The graph bar at the specific summation period can be drilled down to its detailed graph representation. (This function is not available if the display period is set to "Hour".)
The drilled-down graph window is recorded in the window history and can be accessed later by clicking of the "Back" button.

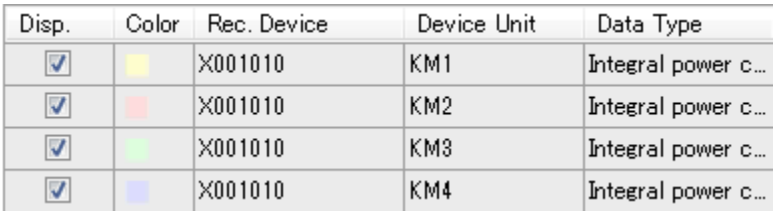
(7) Data Type Setting

Use this item to specify the types of data displayed in graph. The types specified in "Vertical Axis 1" and "Vertical Axis 2" are displayed in graph in Main Window. The "Vertical Axis 1" type is shown at the left and "Vertical Axis 2" type at the right, under the graph area.



(8) Channel Display Setting

Specify the channels for graph representation in the list shown at the (8) location in the Main Window image.
Data items of the types specified in "Vertical Axis 1" and "Vertical Axis 2" (Data Type Setting) are displayed in a list.



Disp.	Color	Rec. Device	Device Unit	Data Type
☑		X001010	KM1	Integral power c...
☑		X001010	KM2	Integral power c...
☑		X001010	KM3	Integral power c...
☑		X001010	KM4	Integral power c...

The table above includes the following information:

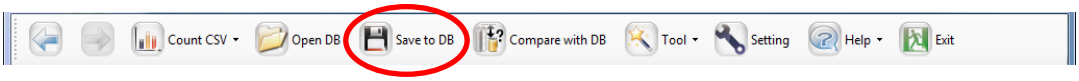
Disp.	The values of this channel are summed when the checkbox is selected.
Color	The color assigned to each selected channel.
Rec. Device	The serial No. of the EQUO unit from which data is derived.
Device Unit	The ID of a sub unit connected to the EQUO unit. Example: KM series Power Sensor/Monitor units connected to a Power Sensor Station are represented as "KM + the Unit No. of individual units". For a Thermo-Humidity Station, which does not connect to any sub units, "-" is displayed in this area in the list.
Data Type	The data type of the channel.

Re-summation immediately starts when the "Display" checkbox selections are changed and the graph is updated.

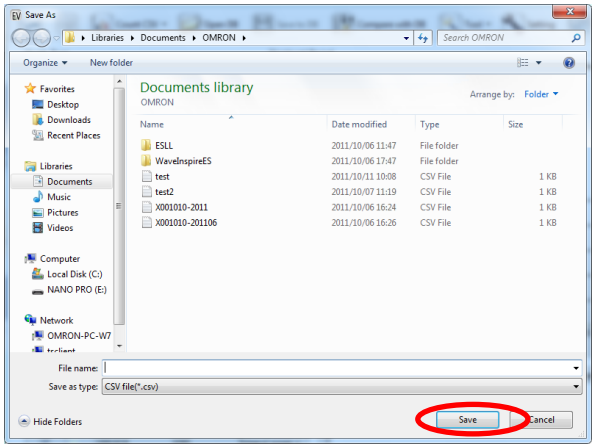
5.5.3 Saving Summation Data to Database

Summation data can be saved as database files, which can be opened in Energy Viewer after being saved.

(1) Click the "Save to DB" button in the Main Window toolbar after acquisition data summation.



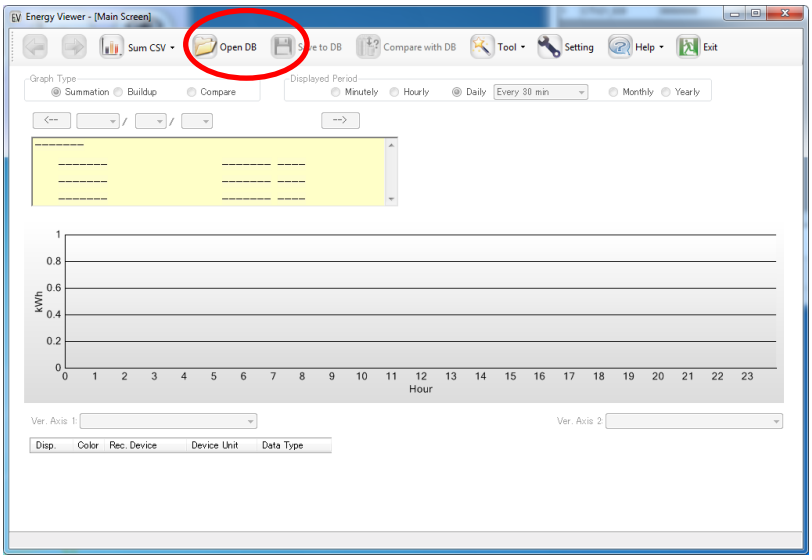
(2) Input the file name and click the "Save" button.



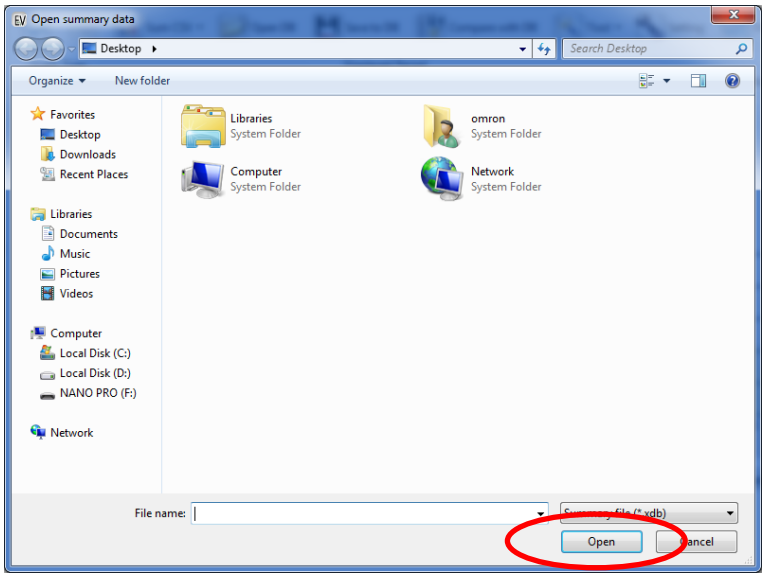
5.5.4 Opening Summation Database File

Summation data saved in database can be opened for viewing its summation results.

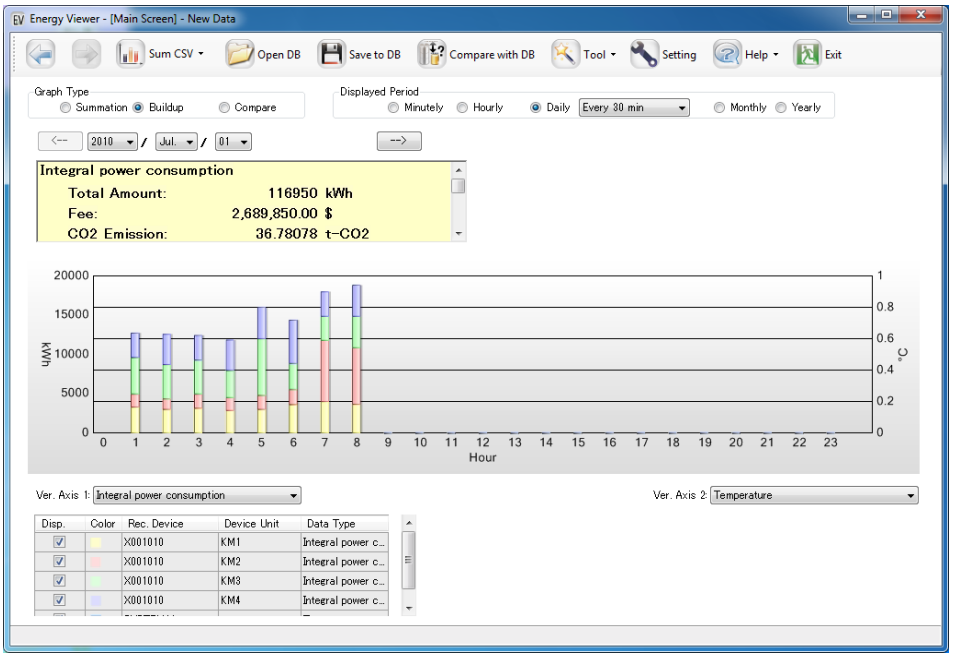
(1) Click the "Open DB" button in the toolbar.



(2) Specify the file and click the "Open" button.



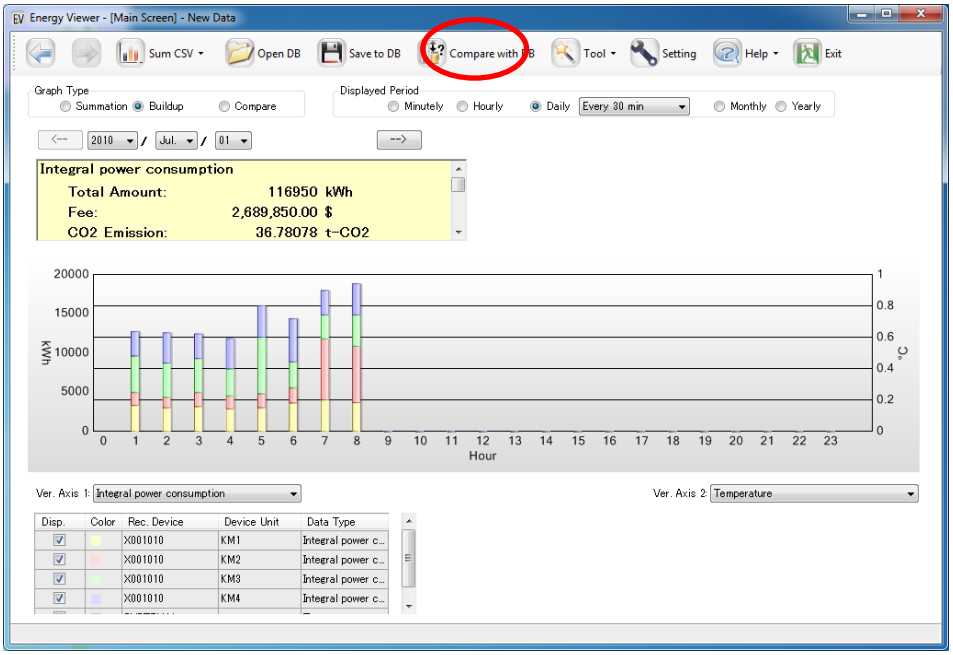
(3) The summation database data is displayed in Main Window.



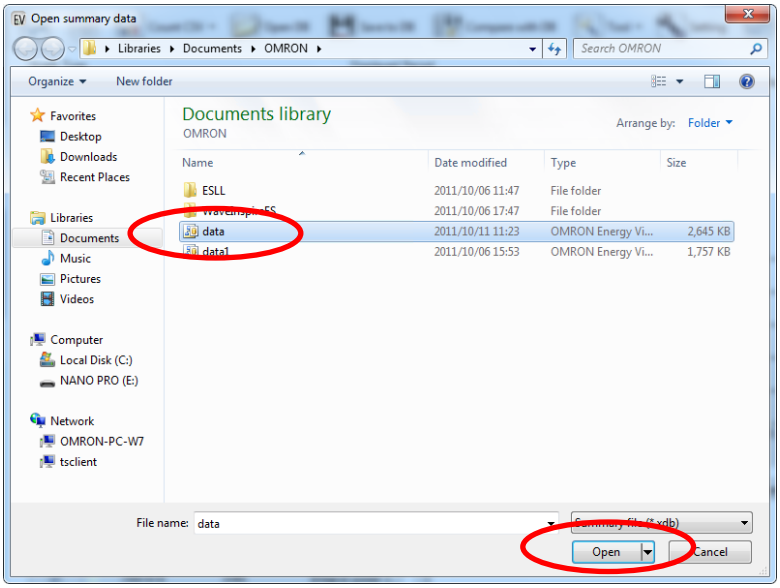
5.5.5 Comparing Currently Viewed Data with Other Database Data

The summation data currently displayed on the window can be compared with other summation data previously saved in database.

(1) Make sure that the comparison source summation data is displayed. Click the "Compare with DB" button in the toolbar.

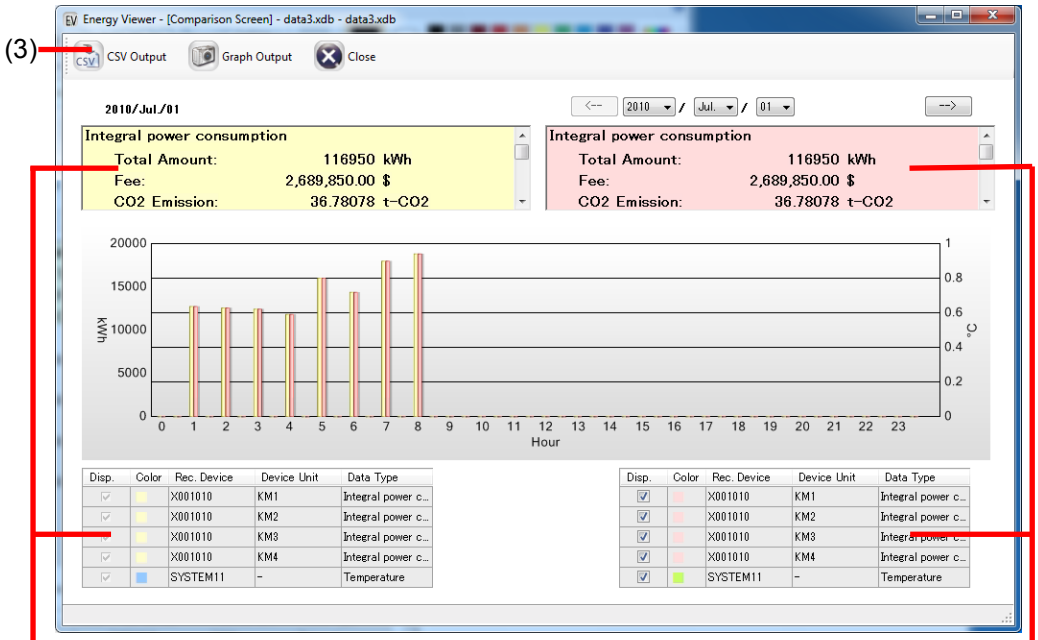


(2) Specify the file and click the "Open" button.



Open the File

(3) Two summation data items are displayed simultaneously in the same graph area. The new data is shown at the right top of the window.



Comparison Window

Note

The comparison target graphs are not displayed if its data does not include the data types specified in the Data Type Setting menu available in Main Window.

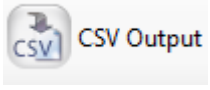
(1) Comparison Source Display

These areas display the comparison source summation data information displayed on Main Window at the time the Comparison Window was activated. Unlike Main Window, the display conditions for the comparison source data cannot be changed. To change the conditions, return to Main Window and restart the Comparison Window after changing them.

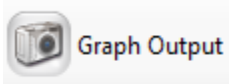
(2) Comparison Target Setting

Specify the display conditions for the summation database data opened as the comparison target. The setting procedures are the same as the display condition settings available in Main Window. (However, the graph type and display period cannot be changed. To change them, return to Main Window.)

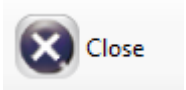
(3) Comparison Support Functions



..... Outputs a CSV file in accordance with the conditions displayed on the Comparison Window.



..... Outputs the Comparison Window graph image to the clipboard.

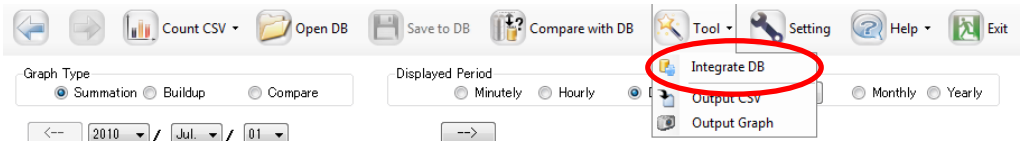


..... Closes the Comparison Window currently viewed.

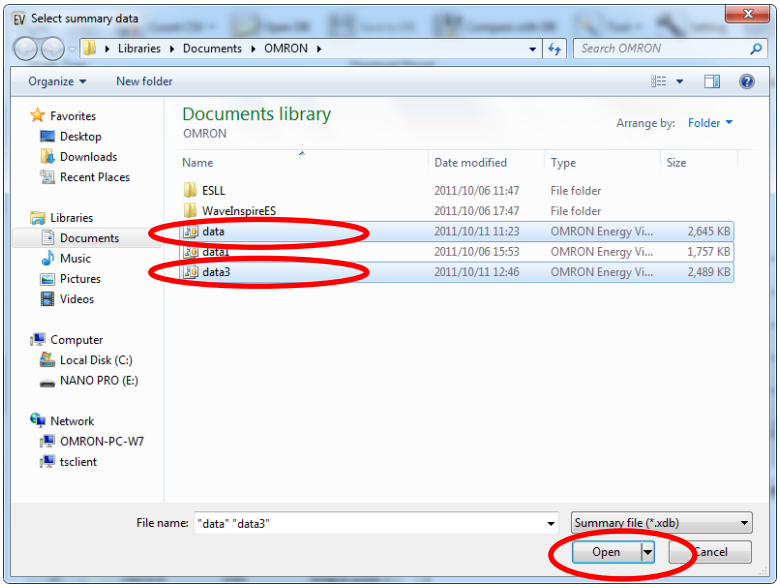
5.5.6 Integrating Database Files

Previously saved summation database files can be integrated in a single database file.

(1) Select "Tool" - "DB Merge" in the Main Window toolbar.

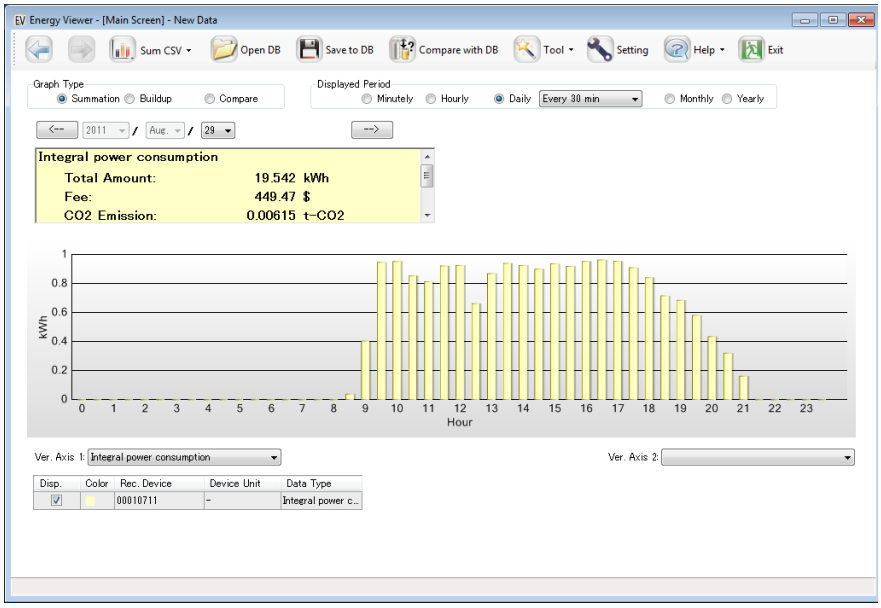


(2) Specify summation data items to integrate and click the "Open" button.



* To select multiple data items simultaneously, left-click the items while holding Ctrl key.

(3) The Main Window status bar shows the progress during merging is in process. After the selected database files are integrated, the integrated file data is displayed on Main Window.



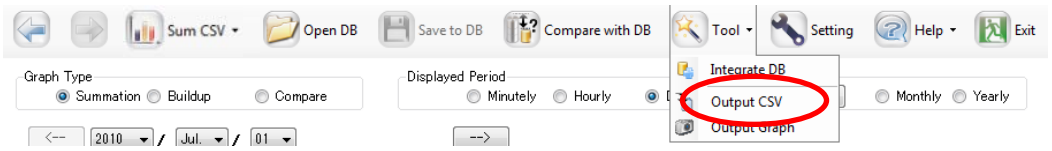
Database File Merge is Completed

5.5.7 Outputting Summation Data in CSV File

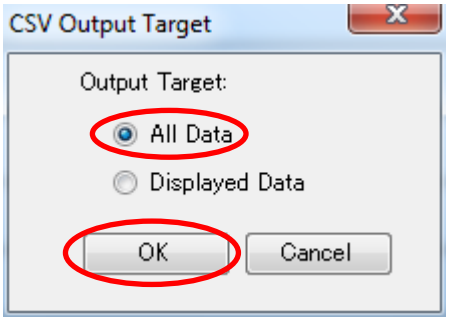
The summation data can be output to a CSV file with the same setting information effective with the current view such as the graph type, display period, date and time, channel selection.

(1) All Data

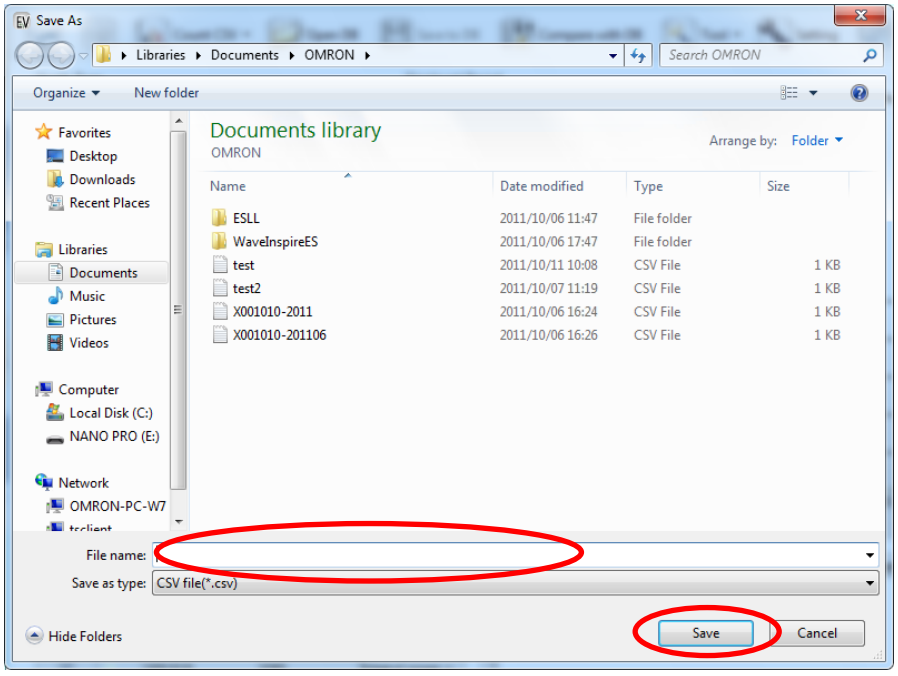
(1) Click "Tool" - "CSV Output" in the toolbar.



(2) Select "All Data" and click the "OK" button.



(3) Specify the save destination path and the file name. Click the "Save" button.



The CSV file is now output to the specified folder, under the specified file name.

A CSV file output in the "All Data" format is structured as shown below:

Header Section (Line 1)

"HEAD,DATE,TIME,"<">><Data Type Name 1>"("<Unit 1>")("<Recording Device Name 1>["_"<Unit No. 1>]<SP>< Summation Type 1><Measurement Target Channel ID1>"),"…

Sections enclosed by brackets ([ ]) are output only for the data recorded with KMX.

Item	Description
< Data Type Name {n}>	The data type of the n-th data.
<Unit {n}>	The unit of the n-th data.
<Recording Device Name {n}>	The serial No. of the unit that has output the n-th data.
<Unit No. {n}>	The Unit No. of the KM series unit that has measured the n-th data. Only used for KM unit data.
<Summation Type {n}>	Outputs the summation method used for the n-th data. PI… Integrated Value; AVE… Average Value, MAX… Maximum Value, MIN… Minimum Value. * Integrated values are only used for integrated power level or pulse data outputs.
<Measurement Target Channel ID {n}>	Outputs the ordinal number in which the relevant unit outputs the n-th data.
<">	(") is part of a character string.
<SP>	A half-width space used as a character.

Data Section (Line 2 and thereafter)

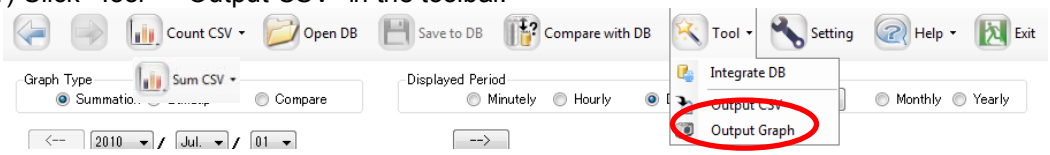
"DATA"<Year-Month-Day>","<Time>","<Value 1>","<Value 2>,"…

Item	Description
<Year-Month-Day>	The year, month and day of the displayed graph. Output in the YYYY/MM/DD format.
<Time>	The hour, minute and second of the displayed graph. Output in the hh:mm:ss format.
<Value {n}>	The value recorded by the relevant unit at the specified time.

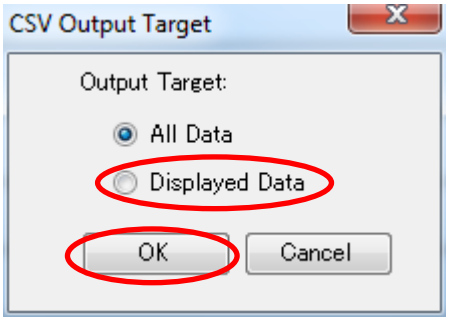
(2) Displayed Data

Only the graph data currently displayed on Main Window is output when this option is selected. The summation unit varies depending on the display period.

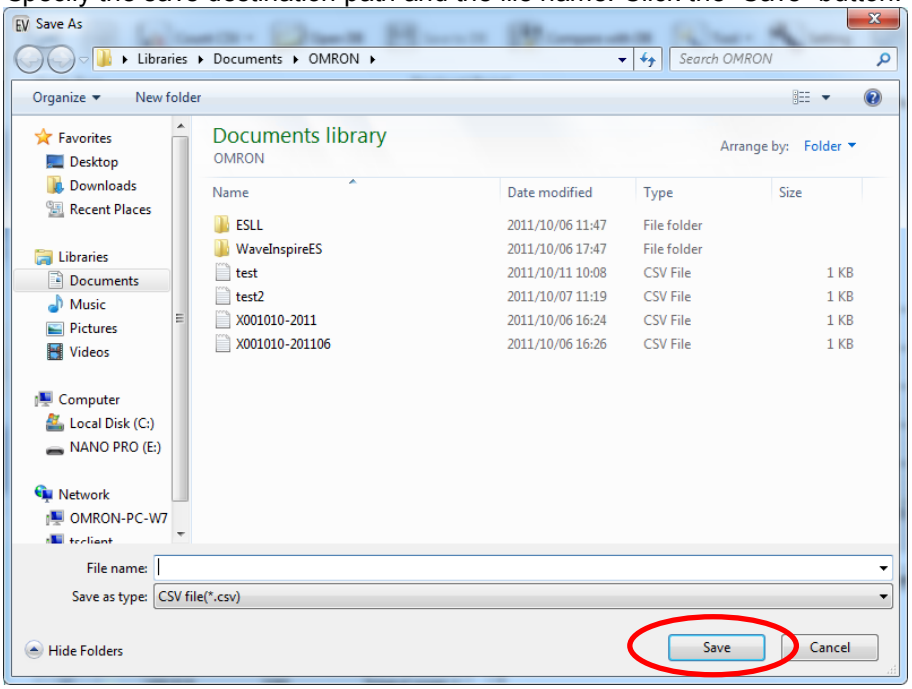
(1) Click "Tool" - "Output CSV" in the toolbar.



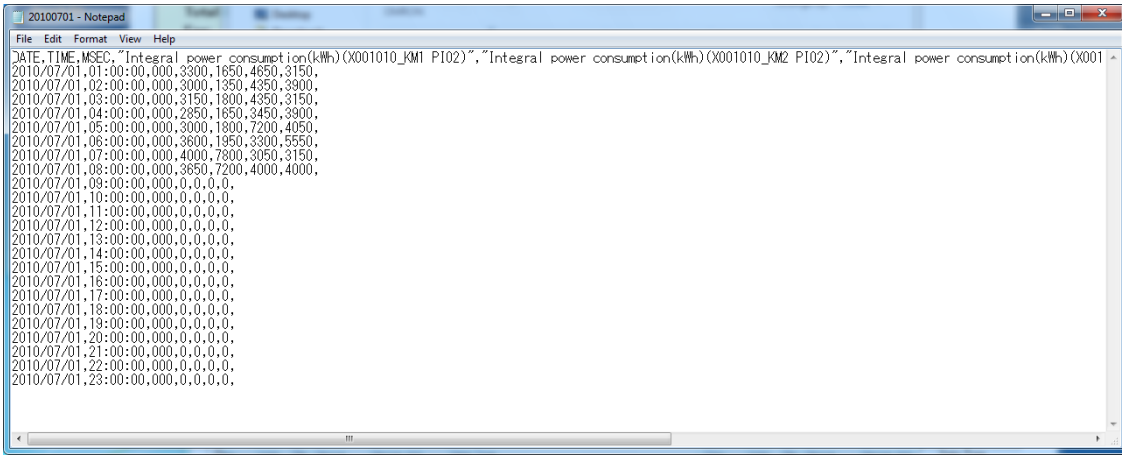
(2) Select "Displayed Data" and click the "OK" button.



(3) Specify the save destination path and the file name. Click the "Save" button.



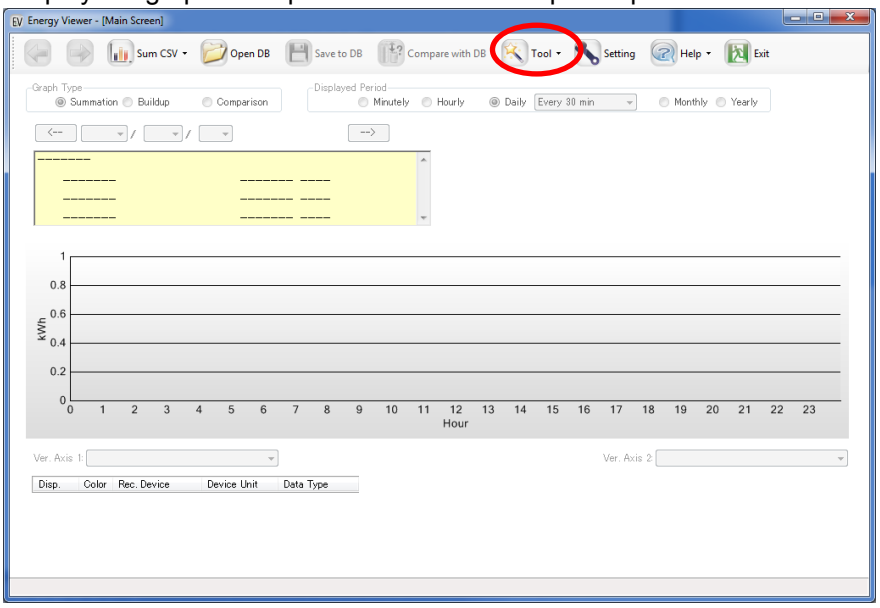
(4) The CSV file is output. The following shows an output example with the same display conditions described in the previous page.
(The number of columns and records vary depending on the display conditions.)



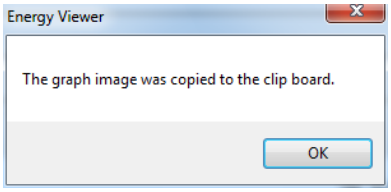
5.5.8 Outputting Graph to Clipboard

The graph image displayed on the window can be output to the clipboard.

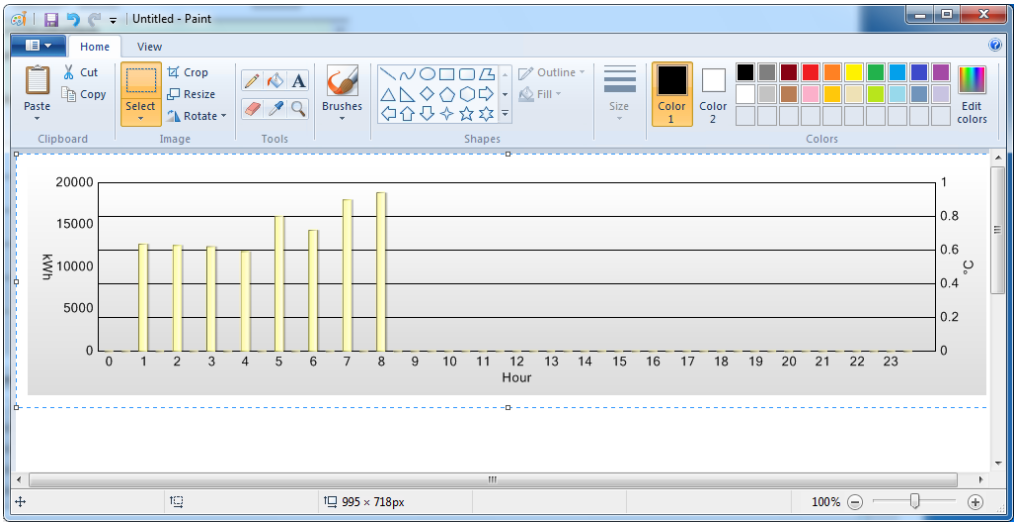
(1) Display the graph to output. Click "Tool" - "Graph Output" in the toolbar.



(2) The graph is output to the clipboard and the confirmation window appears.



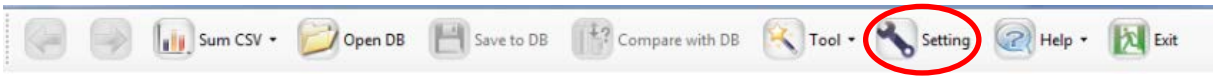
(3) The image output to the clipboard can be used in other application by simply pasting it.



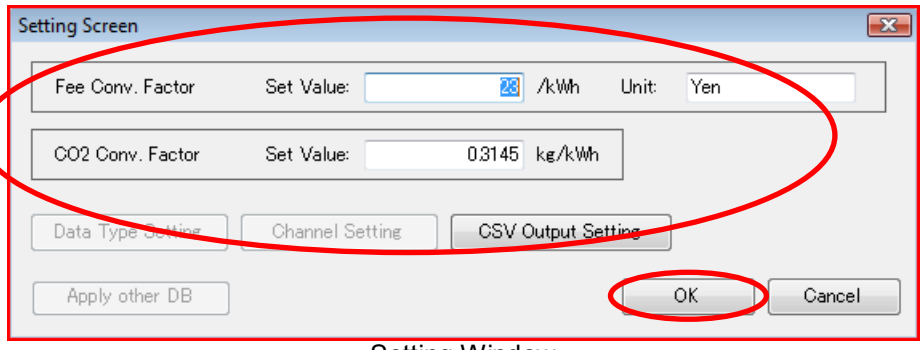
5.5.9 Adjusting Graph Display

The graph display in Main Window can be optimized by adjusting the rate or CO2 emission description or changing the data types displayed in graph representation. To enable this function, specify the rate conversion coefficients, CO2 conversion coefficient, data types and channels beforehand.

(1) Click the "Setting" button in the Main Window toolbar.



(2) Input the rate conversion coefficient and CO_2 conversion coefficient.

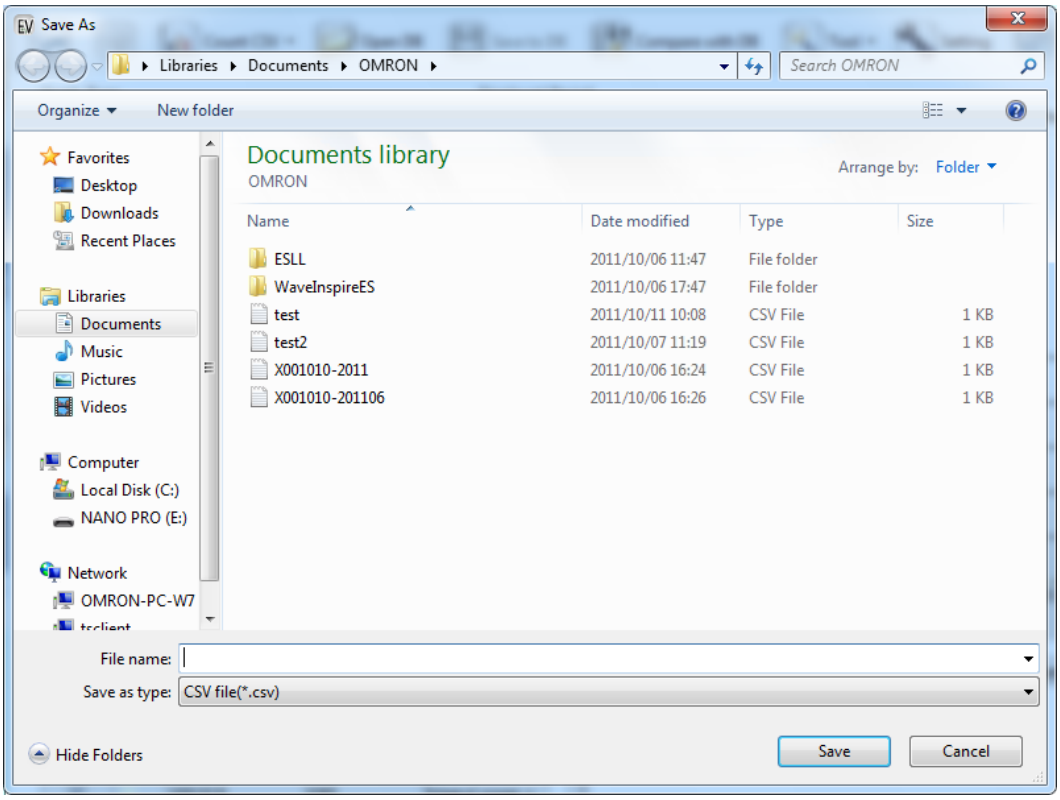


Setting Window

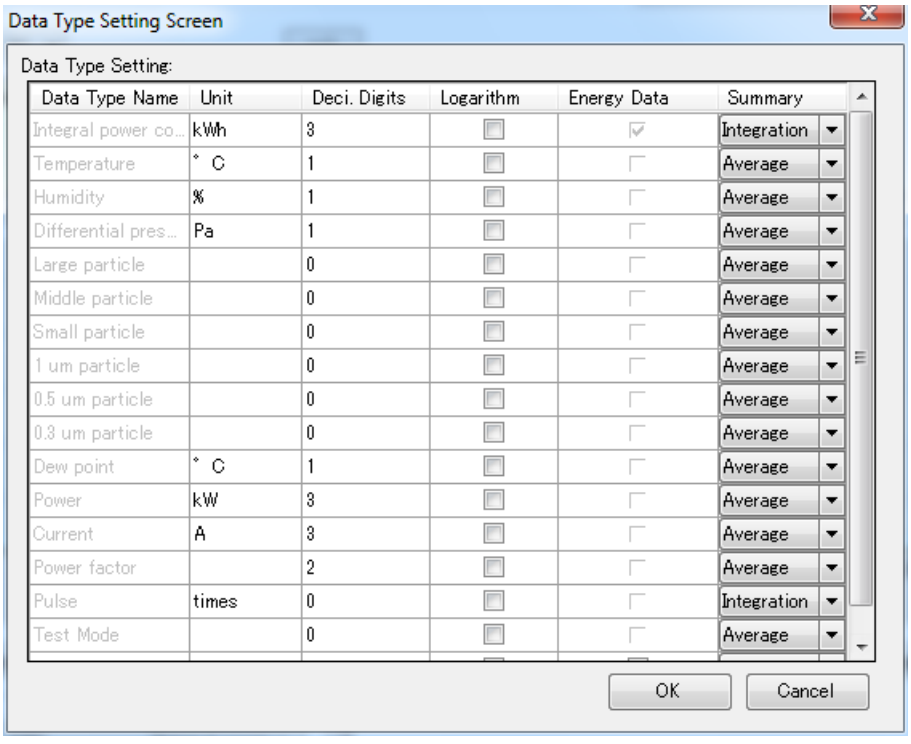
Item	Description
Rate Conversion Coefficient Setting	Specify the power rate per the specified unit of conversion. Any character string can be used for the unit.
CO_2 Conversion Coefficient Setting	Specify the coefficient used to convert an integrated power value to the CO_2 emission value. (Initial value: 0.3145 kg/kWh)
Data Type Setting	Detailed data type setting is possible in the data type setting window displayed by clicking the "Data Type Setting" button.
Channel Setting	The data type and conversion coefficient can be specified for individual channels. Click the "Channel Setting" button to display the setting window.
Apply Other DB File Setting	The settings of the previously saved summation data can be applied to the currently displayed summation data. The "Select Summation Data" window is displayed by clicking the "Apply Other DB File Setting" button.

(3) To apply the data type and channel settings used in a file previously saved, click the "Apply Other DB File Setting" button.

(4) Select the summation file previously saved in the summation data selection window.



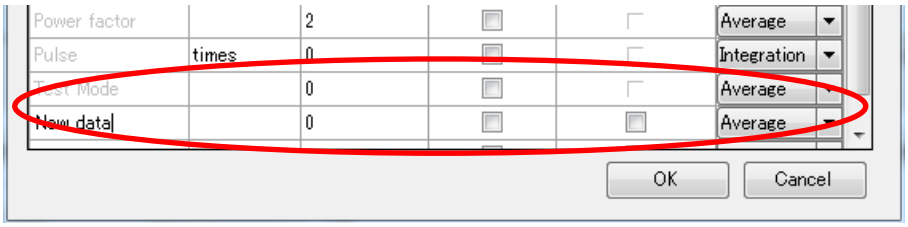
(5) Click the "Data Type Setting" button for a new data type setting.



Data Type Setting Window

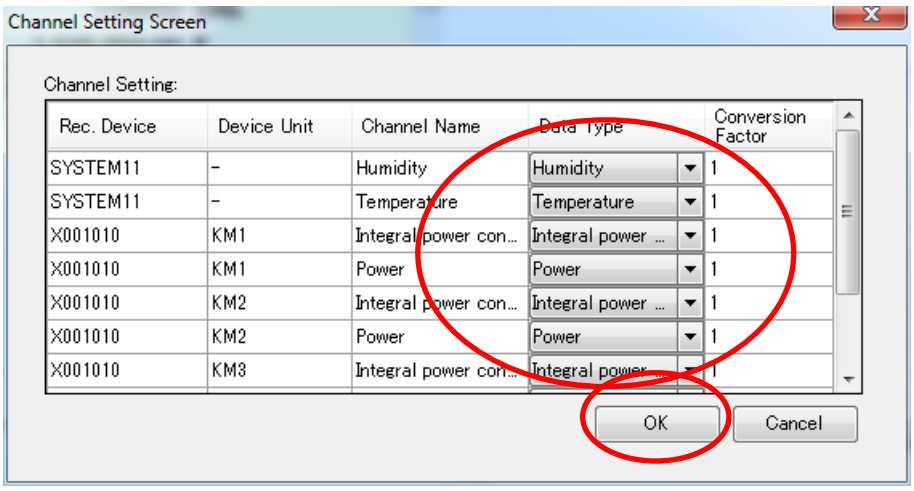
Item	Description
Data Type Name	Displays the data type description. Only user-specified data type names can be edited or deleted.
Unit	The unit for the data type. The unit specified here is displayed at the side of the vertical axis of the graph.
Decimal Digit	The significant digit for the data type. Values are rounded at this digit for graph and summary area display.
Logarithmic Representation	Specifies if the vertical axis is represented in logarithm when displaying data of the data type.
Energy Data	Specifies if the rate and CO_2 emission level are displayed in the summary area for the data type. If this is selected, the rate and CO_2 emission level are displayed. Only effective for user-defined data types.
Summation Type	Specifies the summation method to represent data of the data type in graph. If "Integration (PI)" is selected for other data types than integrated power and pulse, the graph is not displayed.

The "Data Type Setting" window provides pre-defined data type options so that users can edit them. New data types can also be created by directly entering description in blank rows at the bottom of the list.



(6) Click the "Channel Setting" button for channel settings.

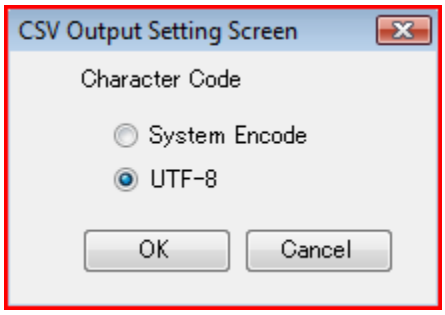
(7) Input the channel name and conversion coefficient in channel setting and click the "OK" button.



Channel Setting Window

Item	Description
Rec. Device	Displays the serial No. of the connected EQUO unit.
Device Unit	The ID of the sensor heads (sub units) connected to the EQUO unit. Example: KM series Power Sensor/Monitor units connected to a Power Sensor Station are represented as "KM + the Unit No. of individual units".
Target	The data type of the channel.
Data Type	Displays the data type specified in the "Data Type Setting" window. The data items of the same data type can be displayed simultaneously by using the data type setting function available in Main Window.
Conversion Coefficient	Can be specified independently for individual channels. "1.0" is set as the factory default.

(8) To change the CSV character code from the default, click the "CSV Output Setting" button. You can change the character code from system encode to UTF-8.



(9) After the setting, click “OK” on the setting screen. The setting screen closes and setting is complete.

6. Ratings and Performance

(1) PC Software: Station Utility

(Setting Tool, Logging Tool, SD Viewer ES and Energy Viewer)

Item		Description
Compatible Device		Precision Thermo-Humidity Logger (ZN-THX11-S) Thermo-Humidity Station (ZN-THX21-S) Differential Pressure Station (ZN-DPX21-S) Portable Power Monitor (ZN-CTX21) Power Sensor Station (ZN-KMX21)
Compatible OS		Windows XP (32-bit) / Windows Vista (32-bit) / Windows 7 (32-bit/64-bit)
CPU		Intel-compatible processor 1.5GHz or higher
Memory		1 GB or more (Recommended: 2 GB or more)
Display		Resolution: 1024 x 768 or higher; 65535 colors (16-bit color display) or higher
HDD		30 MB free space is required for Station Utility installation
CD-ROM Drive		Required for Station Utility installation
SD Card Reader/Writer SD Card Slot		Required for reading acquisition data
LAN Port (10BASE-T or 100BASE-TX compatible)		Required for network connection
Setting Tool	Standard Functions	Setting, monitoring and remote operation of Thermo-Humidity Station, Differential Pressure Station, Portable Power Monitor and Power Sensor Station units
	Max. Number of Connected Units	100
	Used Port Number	9025
Logging Tool	Standard Functions	Measured value remote display and alarm status monitoring of Thermo-Humidity Station, Differential Pressure Station, Portable Power Monitor and Power Sensor Station units; as well as ordinary acquisition and time-specified acquisition of their data to PC
	Max. Number of Connected Units	100 (Up to 1024 channels)
	Recommended Sampling Period	1 minute The sampling period can be reduced according to the number of connected units.
	Used Port Number	9024
SD Viewer ES	Standard Functions	Waveform display of data recorded on Thermo-Humidity Station, Differential Pressure Station, Portable Power Monitor and Power Sensor Station units Display of multiple acquisition data items in merged/vertically arranged manner Saving of multiple data items displayed in merged/vertically arranged manner as a single file
	Max. Number of Data Items	The total number of all the waveform data items: Up to 1 000 000 (The number of data items displayed in a single waveform decreases in accordance with the increase in the number of waveforms.)
	Number of Displayed Waveforms	Max. 1024

Energy Viewer	Standard Functions	Display of integrated power values, pulse integration and value display and summation data comparison using data acquired from Portable Power Monitor and Power Sensor Station units Summation data output in CSV files

Appendix

Error Display List

・PC Software Station Utility: Setting Tool

Message	Troubleshooting
An error occurred in the device. Check the [Error Status] column.	An error has occurred in the relevant unit (where the error indication is displayed) or during communication with the unit. Place the mouse pointer over the "Error Status" in the unit row in the "Network Operation" tab. The error detail and troubleshooting procedure are shown in a tooltip.
Recorded data of some devices have not been written in an SD memory card.. Starting acquisition without writing to the SD card results in a loss of data remained in the device. Do you want to start acquisition?	The message is displayed when data remains in the unit's internal memory when the acquisition start command is sent. To save the data remaining in the internal memory, insert a write-enabled SD memory card into the unit and write the data to the card. The data stored in the internal memory is deleted if the acquisition start command is executed before writing the data to an SD memory card.
Some devices are in recording status. Executing restart exits recording. Do you want to restart the device?	This message is displayed when data acquisition is in process on some connected units when the Restart command is being sent. If acquisition must be terminated without inserting an SD memory card, click "Yes" in the dialog and send the Restart command.
Failed to save the data to the file.	The message appears when saving data fails when "Save to File" in the “File” menu is executed. Possible reasons for this error are that the save destination file is opened in other application and data cannot be written, or the disk is full and the file cannot be saved. Save the data under other file name or change the save destination and retry.
The following setting cannot be read. Device Name 1 Device Name 2 …	The message appears when setting data of some units cannot be read when "Read from the File" in the “File” menu is executed. The unit device names are also included in the message. This error occurs if the unit's IP address is changed after "Save to the File" operation is executed. Check the specified target file and make sure the IP address of individual units written in the file are correct.
Failed to read the data from the file.	The message is displayed when the format of the specified target file is not valid when "Read from the File" in the "File" menu is executed. Check the target file and make sure that it is created in the "Save to the File" operation.
ESMaster.exe has not started.	Exit the Setting Tool. Click the "Setting" button in the startup tool select window and restart the tool.
Failed to display ESMaster.exe within a specified time period.	Exit the Setting Tool. Click the "Setting" button in the startup tool select window and restart the tool.
Filed to start the server. Use other port.	Exit the Setting Tool. Right-click the "ES Master" icon displayed on the windows taskbar and select "Exit". Then, click the "Setting" button in the startup tool select window and restart the Setting Tool.
Unable to read data from the transport connection. A connection attempt failed because the connected party did not properly respond after a period of time,	Network settings may not be correct. Make sure that the same IP address is not used for multiple units or the network cables are not disconnected.

or established connection failed because connected host has failed to respond.	

・PC Software Station Utility: Logging Tool

Message	Troubleshooting
Failed to call the connection window.	Exit the Logging Tool. Click the "Logging" button in the startup tool select window and restart the tool.
Failed to read the initial setting file. Exit the application.	The setting file is damaged or the setting file is not found. Reinstall Station Utility or recover the application from the Station Utility installer.
No device is connected. Unable to start logging.	Settings for the connected units have not been completed. Complete settings for connected units in "Detailed Settings" - "Connection Settings" in the menu.
The drive does not exist. Unable to create a folder.	The drive specified as the save destination for the logged data does not exist. Specify other drive.
Specify the save destination folder.	The save destination for the logged data is not specified. Select "Detailed Settings" - "Save Destination Setting" in the menu and specify the save destination for the logged data.
ESMaster.exe has not started.	Exit the Logging Tool. Click the "Logging" button in the startup tool select window and restart the tool.
Failed to display ESMaster.exe within a specified time period.	Exit the Logging Tool. Click the "Logging" button in the startup tool select window and restart the tool.
Filed to start the server. Use other port.	Exit the Logging Tool. Right-click the "ES Master" icon displayed on the windows taskbar and select "Exit". Then, click the "Logging" button in the startup tool select window and restart the Logging Tool.

・PC Software Station Utility: SD Viewer ES

Message	Troubleshooting
The number of data items exceeding 10000 cannot be added.	The number of data items selected for addition in "Open File" is too large. Select "Open File" again, and specify only the files containing the data to display.
The number of waveforms exceeding 1024 cannot be displayed.	The maximum number of displayed waveforms in a single graph is 1024. Reduce the number of data items and display the waveforms again.
The number of data items is too large and all the waveforms cannot be displayed. Do you want to display the waveforms within the following period?	The number of data items exceeds 1 000 000 samples. The waveforms may be displayed by if the resampling interval is extended.
	The number of samples can be reduced by minimizing the number of "NO DATA", an empty value assigned to an period where no data is available, which is also counted as a sample. Select only required data items in the "Select" checkboxes in the "Select Data:" list in the "Open File" window to minimize the selection of items containing periods with no data.
The required data is corrupt or may have been deleted and cannot be found.	The data required for saving does not exist and the save operation cannot be continued. Restart the operation from opening the acquisition data.
Failed to read the following files:	The files do not contain the acquisition data required for displaying a graph. Make sure that the acquisition data has not edited and specify the data again.
	The acquisition data cannot be open when it is opened in other application (e.g. MS Excel). Exit the other application and retry the reading.

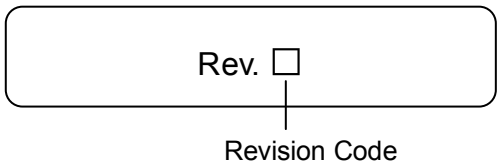
▪ PC Software Station Utility: Energy Viewer

Message	Troubleshooting
No summable data is available.	The message appears when there is no data that can be summed. The folder data structure may be different from the SD memory card folder data (acquisition data) structure. Energy Viewer basically does not support reading data of different folder structure. Select a folder with the same structure as acquisition data as a summation target.
Failed to read the following files:	The message is displayed when the data format is changed (e.g. the data has been edited by a user) and the data cannot be read. Specify the pre-editing data as the summation target.
Failed to read display settings. The data is opened with the initial settings.	The message refers to when the display settings for the saved data such as the type of graph, display period and date cannot be read. The summation data except for the display settings is intact and therefore can be used.
Unable to open the summation data.	The saved data is corrupt and the summation data cannot be read. Sorry for the trouble, but please start from summation again.
The values are too large. The graph cannot be displayed.	The values exceed the maximum control value of the summation tool. Change the conversion coefficient to 0.001 in the channel setting window and specify a smaller measurement unit in the setting window, or make other relevant setting changes.
This data type cannot be deleted, since the data type is already used in the channel setting window.	Open the channel setting window and remove the selection of the data type. Delete the data type in the data type setting window.
The selected data type cannot be specified. Select a data type of the same summation type.	The same data type cannot be specified for channels with integrated power or pulse measured values and channels with temperature or instant current, or other type of measured values. If the selected data type must be used for the relevant channel, change the data type of other channels and specify the selected data type for the channel.

Revision History

The specifications of this product are subject to changes without prior notice due to the addition of new functions or modification for improvement. These changes will be reflected in relevant manuals whenever such changes are made.
The revised manual contains the revision history with the manual revision codes and the revision descriptions.

Manual Revision Code
The manual revision code is provided at the lower right corner of the manual.



Revision History

Revision Code	Date	Description
Rev. A	November 2011	First edition
Rev. B	December 2016	Revised due to change of PC software distribution method.

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