

EQUO Series

Multi Data Viewer Light

Software Manual

Introduction

Thank you for purchasing our EQUO Series product.

This manual describes the information on the functions, performance and usage required to use Multi Data Viewer Light.

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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.

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1. Overview of Multi Data Viewer Light

1.1 Features

The EQUO system supports manufacturing facilities to achieve an optimal balance between the energy consumption and operation quality.

The PC Software Multi Data Viewer Light is a useful tool package for EQUO system settings, logging, as well as data summation and display required to plan improvement solutions.

The Utility comprises the following three tools:

(1) Summary/Display Tool: Multi Data Viewer

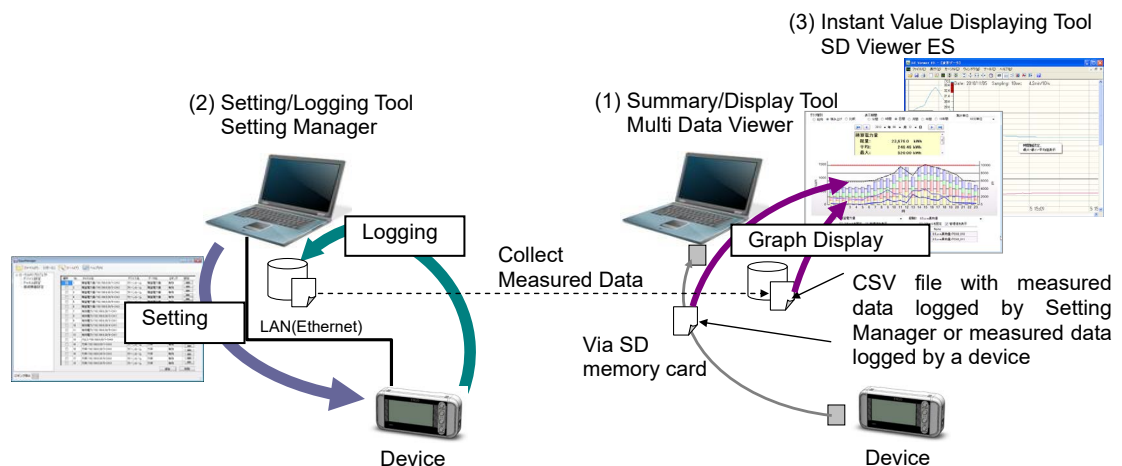
The Multi Data Viewer is the tool used to aggregate, display and analyze measurement data by the Setting Manager and measurement data of the SD memory card recorded by the devices.

(2) Setting/Logging Tool: Setting Manager

The Setting Manager is the tool to make settings on devices and their measurement channels. It can also communicate with the devices to directly collect the measured data for logging.

(3) Instant Value Displaying Tool: SD Viewer ES

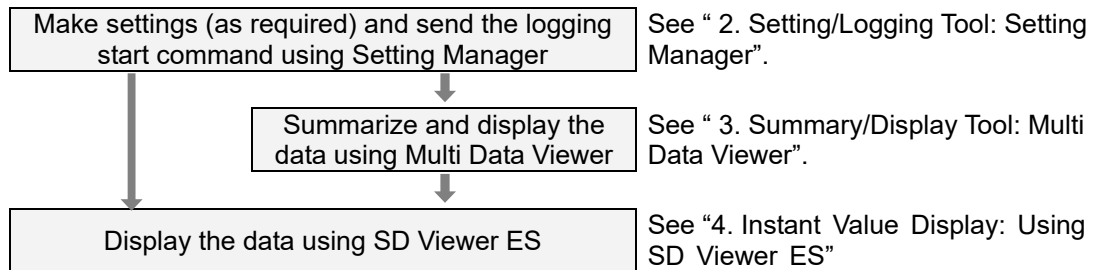
The SD Viewer ES provides the graph displays of the data acquired to the PC using the Setting Manager or data recorded to the SD memory card.



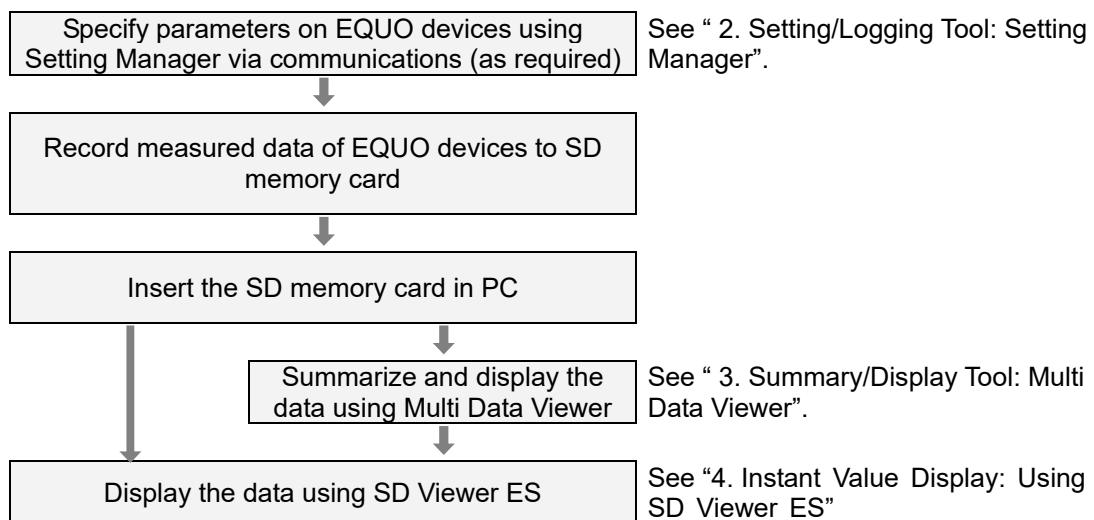
1.2 Procedure to Use

The following procedure is required to use Multi Data Viewer.

●Directly collecting data from devices and log it in PC via **com** communications



●Using data collected and logged by devices in SD memory card



1.3 Operating Environment

The following table shows the operating environment for Multi Data Viewer Light.

Compatible OS	Windows 7 (32-bit / 64-bit), Windows 10 (32-bit / 64-bit)
.NET Framework	.NET Framework 3.5 or higher
CPU	Intel x86 compatible CPU 1.5GHz or higher
Memory	2 GB (32-bit OS) / 3 GB (64-bit OS) (Recommended: 3 GB or more)
Display	Resolution: 1024 x 768 or higher; 65535 colors (16-bit color display) or higher
HDD	1 GB free space is required for installation
LAN Port	10BASE-T or 100BASE-TX compatible. Used by the logger in Setting Manager to collect the data for logging from devices via communications. Note: Not required when operating only with an SD memory card.
SD Card Reader or SD Card Slot	Used to read the logging data collected by devices (Supported SD / SDHC)

1.4 Compatible Device

The following table shows the devices that can be used with Multi Data Viewer Light.

Air Thermo Logger	ZN-THX11-S ^{*1}
Thermo-Humidity Station	ZN-THX21-S
Differential Pressure Station	ZN-DPX21-S
Portable Power Monitor	ZN-CTX21
Power Sensor Station	ZN-KMX21 ^{*2}
Air Flow Station	D6FZ-FGX21 ^{*3}
Air Flow Sensor	D6FZ-FGS1000, D6FZ-FGT□00
Air Particle Sensor ^{*4}	ZN-PD□□-S
Wireless Unit Slave (Pulse Sensor) ^{*5}	WZ-SP01
Wireless Thermo-Humidity Sensor ^{*5}	WZ-STH01
Wireless Thermo-Humidity Light Intensity Sensor ^{*5}	WZ-STHL01
Wireless Light Intensity Sensor ^{*5}	WZ-SL01
Wireless CO2 Sensor ^{*5}	WZ-SCD01
Power Monitor ^{*6}	KM-N1-FLK, KM-N2-FLK, KM-N3-FLK
Smart Power Monitor ^{*7}	KM50-C, KM50-E
Power Monitor ^{*7}	KM100
Small Power Sensor ^{*7}	KM20-B40-FLK
Multi-circuit Smart Power Monitor ^{*8}	KM1-PMU□A, KM1-EMU8A
Smart Measurement and Monitor Unit ^{*8}	KE1-CTD8E
Air Flow Sensor ^{*9}	D6FZ-FGS1000, D6FZ-FGT□00
Clamp Power Logger ^{*10}	ZN-CTC11
DC Clamp Logger ^{*10}	ZN-DCC11

*1 ZN-THX11-S cannot be connected with a LAN network. The operation of only SD memory card is available.

*2 Power sensor/monitor is required separately.

*3 Air flow sensor is required separately.

*4 When wireless communicating, wireless unit master WZ-MLAN01 and wireless unit slave (Compoway/F) WZ-SRS01 are needed.

*5 Wireless unit master WZ-MLAN01 is needed. Wireless unit is available only in Japan.

*6 Connection by ZN-KMX21.

*7 Connection by ZN-KMX21 or wireless unit master WZ-MLAN01 and wireless unit slave (Compoway/F) WZ-SRS01

*8 Connection by wireless unit master WZ-MLAN01 and wireless unit slave (Compoway/F) WZ-SRS01.

*9 Connection by D6FZ-FGX21.

*10 As there is no LAN function, the operation of only CSV data is available. (Clamp Logger Utility is required separately.)

Important

- ZN-KMX21 with firmware version 1.04.00 cannot be used. Be sure to update the firmware to 1.05.00.
- Wireless units / sensors can only be used in Japan.

1.5 Installation

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



<http://www.fa.omron.co.jp/multi-d-v-e>

- (2) Install .NET Framework 3.5.

Be sure to activate .NET Framework 3.5 before installing Multi Data Viewer Light. Please refer to "5. Appendix" for how to install .NET Framework 3.5.

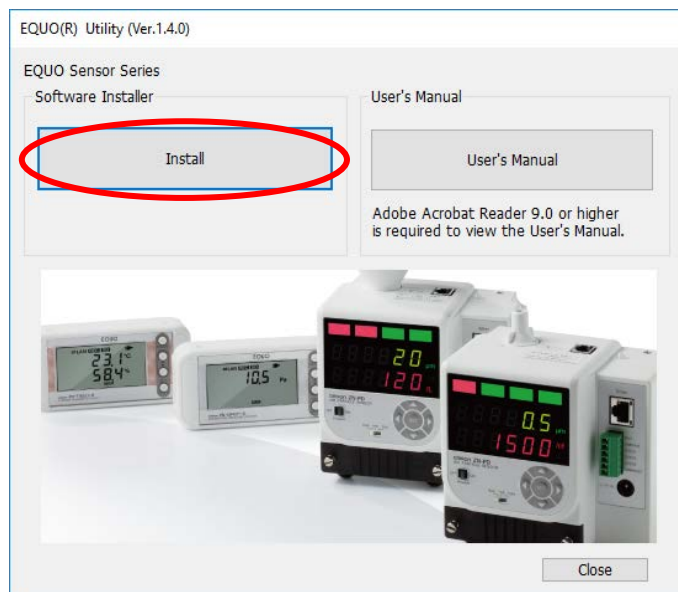
Important

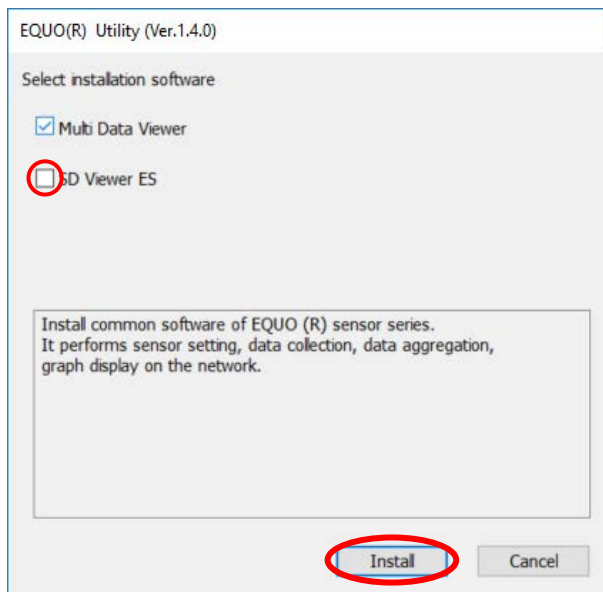
- Install Multi Data Viewer Light with a user account with administrator privileges..
- Multi Data Viewer Light cannot be installed on a PC on which .NET Framework 3.5 is not installed.

- (3) Execute Setup.exe in the installation package.

The following initial installation window appears.

When you click the "Install" button, the installation software selection window appears.

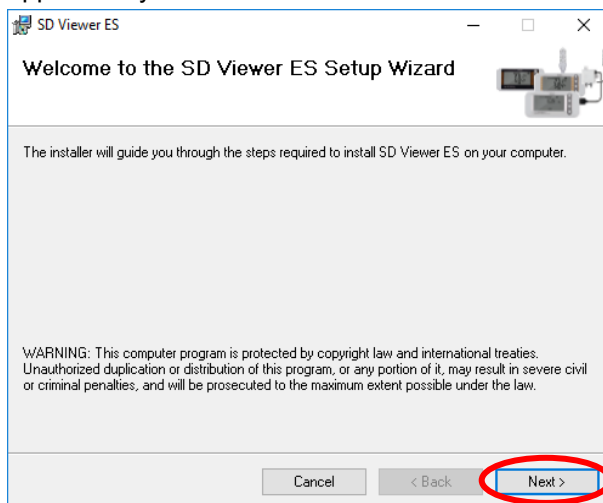




Please check (☑) when installing SD Viewer ES. (You cannot change the selection of Multi Data Viewer.)

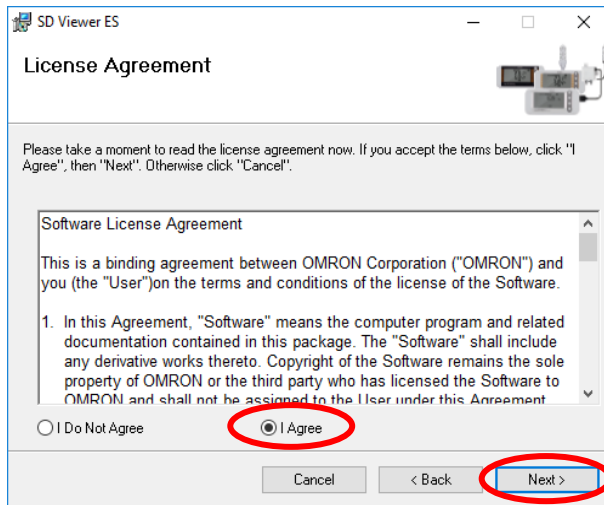
Click the "Install" button. Installation will be stopped if cancel is clicked during installation. (This cancel operation is performed in all installation process.)

- (4) If you select to install SD Viewer ES, the "Welcome to SD Viewer ES Setup Wizard" window appears. If you did not select to install SD Viewer ES, proceed to (9).

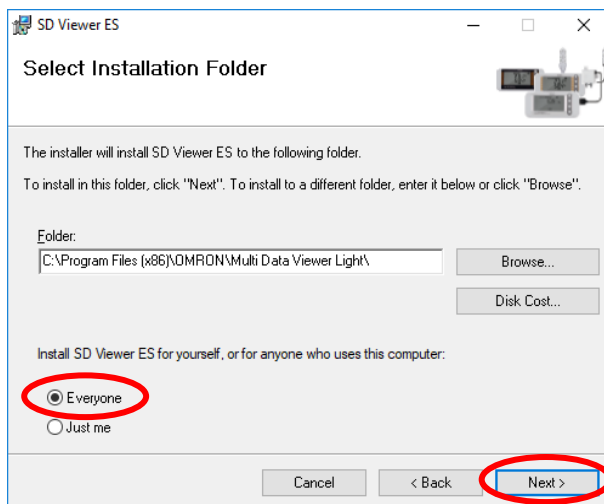


Click the "Next" button.

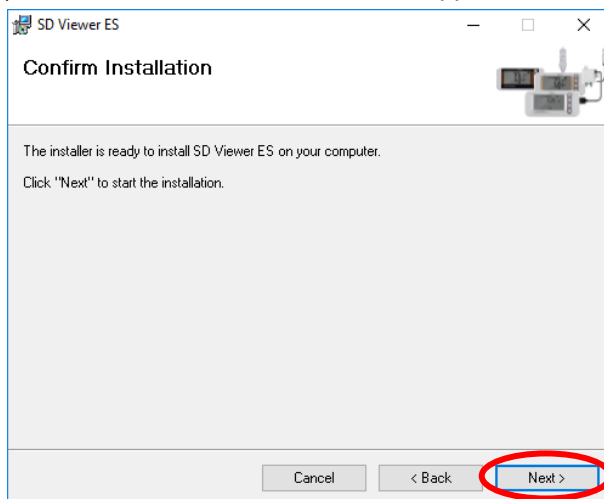
- (5) The "License Agreement" window appears. Read through the displayed "Software License Agreement" and select "I agree". Then click the "Next" button.



- (6) The "Select Installation Folder" window appears. Check the installation destination folder and select "Everyone", then click "Next". To change the installation folder, type in the "Folder" box or click the "Browse" button to select the folder.

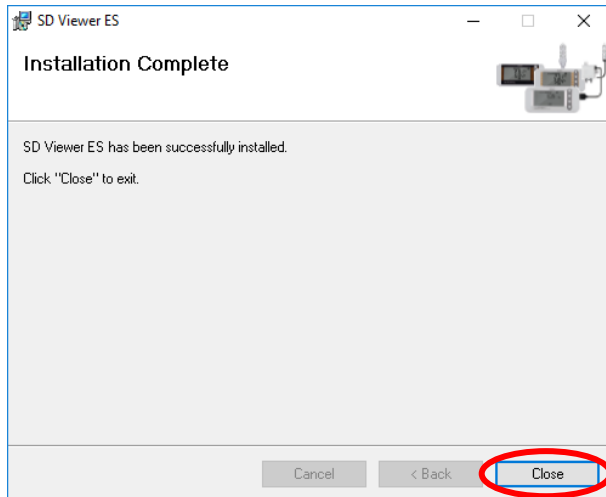


- (7) The "Confirm Installation" window appears. Click the "Next" button.

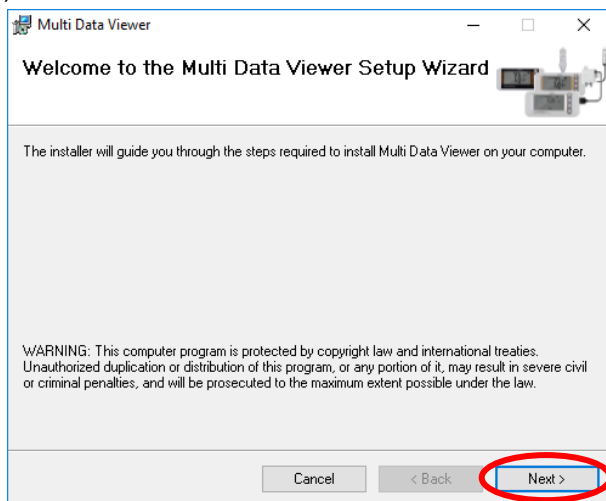


The message "Installing SD Viewer ES" appears.

(8) The "Installation Complete" window appears. Click "Close".

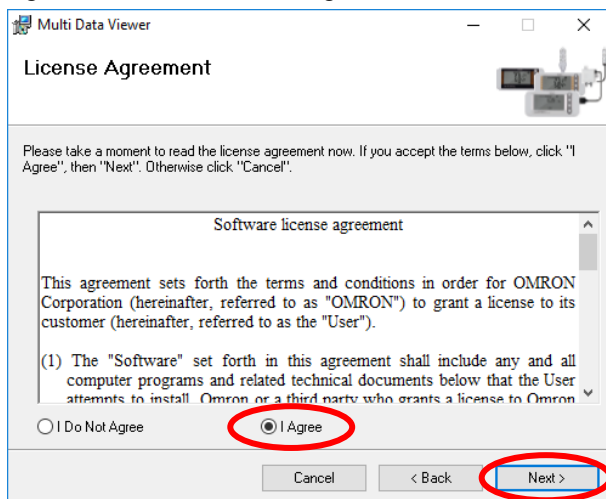


(9) The "Welcome to Multi Data Viewer" Wizard window appears.

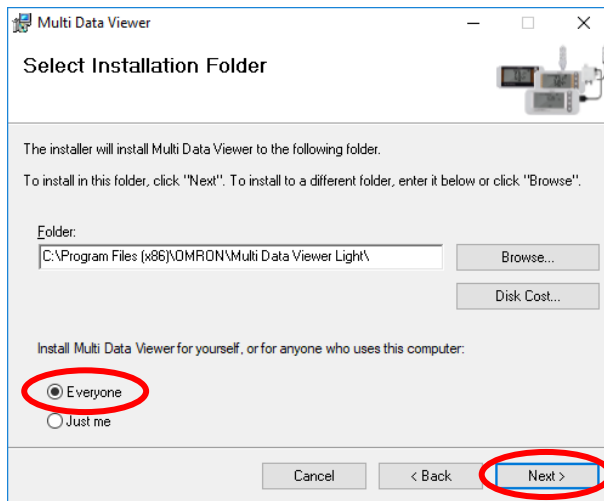


Click the "Next" button.

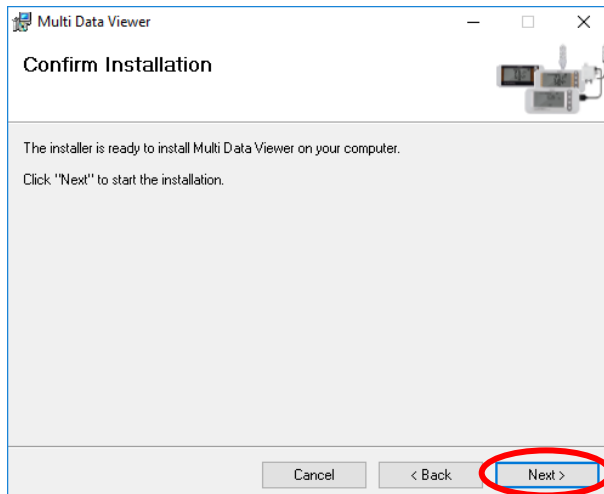
(10) The "License Agreement" window appears. Read through the displayed "Software License Agreement" and select "I agree". Then click the "Next" button.



- (11) The "Select Installation Folder" window appears. Check the installation destination folder and select "Everyone", then click "Next". To change the installation folder, type in the "Folder" box or click the "Browse" button to select the folder.

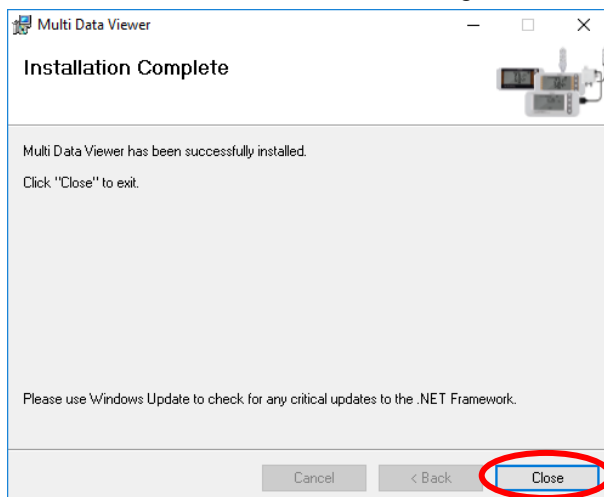


- (12) The "Confirm Installation" window appears. Click the "Next" button.



The message "Installing Multi Data Viewer" appears.

- (13) The "Installation Complete" window appears. Click "Close".
The installation of Multi Data Viewer Light is now completed.



1.6 Uninstallation

To uninstall Multi Data Viewer Light, click "Uninstall or Change Program" (Windows 7 / 10) in the Windows Control Panel or "Apps and Features" (Windows 10) in Windows settings.

The installer for SD Viewer ES is separate from Multi Data Viewer. If you have installed SD Viewer ES, please uninstall it separately.

2. Setting/Logging Tool: Setting Manager

2.1 Setting Manager

Setting Manager is a PC tool used for set and operate EQUO devices as well as collect/log measured values.

The user can use the tool for the following procedures:

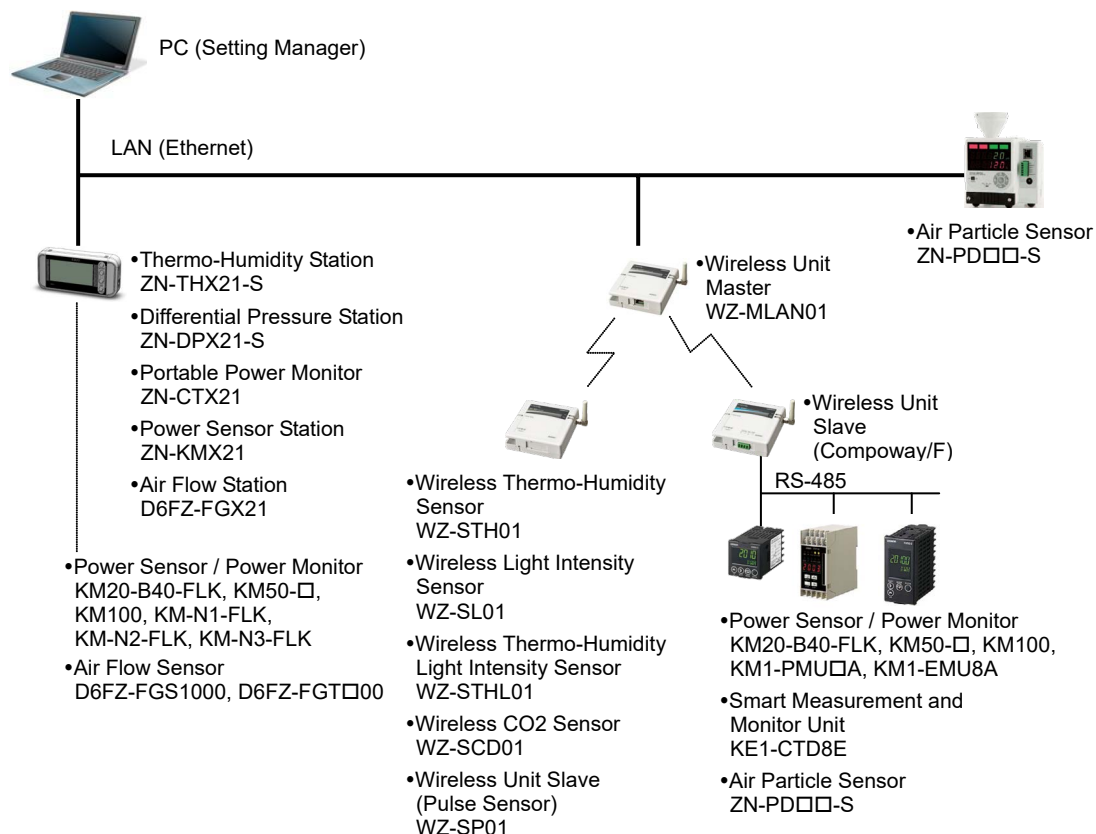
Setting	<ul style="list-style-type: none"> • Device parameter settings • Logging target channel setting in each device • Data type setting • Connected Device Settings when a wireless unit is used
Operation/Status Acquisition	<ul style="list-style-type: none"> • Operation of certain devices • Device status acquisition
Collection/Logging of Measured Values from Devices	<ul style="list-style-type: none"> • Collecting/logging measured values from devices and outputting them to CSV files

Definition

- "EQUO devices": The generic name for OMRON's environmental sensing devices to measure/quantify energy data and environmental data.
- The term "devices" in Setting Manager refers to EQUO devices.
- This manual also uses "devices" to designate the same in Setting Manager operation or other descriptions.

2.1.1 System Configuration

The following figure shows the Setting Manager system configuration.



2.2 Basic Operation Flow

The following shows the basic flow of Setting Manager operation.

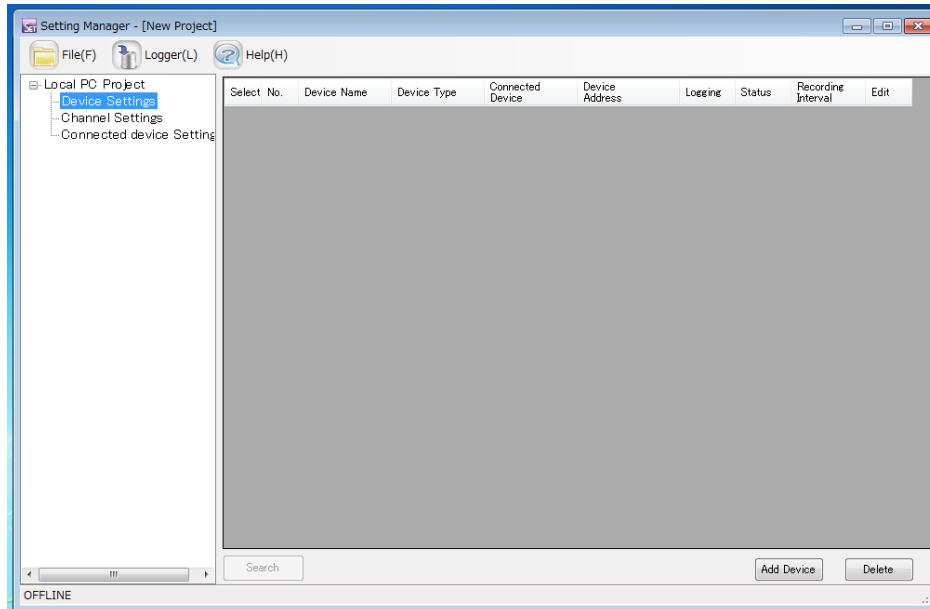
Procedure	Reference
Create a new project	2.6.1 Creating a New Project
↓	
Specify CSV file save destination	2.7.2 Making Project Settings
↓	
Make device settings Specify device parameters Make logging settings (e.g. logging interval)	2.7.3 Setting Devices
↓	
Register wireless communications units	2.7.5 Setting Connection Units (For Wireless Connection)
↓	
Specify measurement channels	2.7.4 Setting Channels
↓	
Specify data type	2.7.4 Setting Channels
↓	
Save the project	2.6.3 Saving a Project
↓	
Connect Setting Manager online	2.8.1 Connecting Setting Manager Online
↓	
Write the settings in the logger	2.8.2 Saving Settings in Loggers
↓	
Test connection (as required)	2.8.3 Starting/Ending Connection Test
↓	
Start Logging	2.8.4 Starting Logging
↓	
Stop logging	2.8.5 Stopping Logging
↓	
Use logging data	3.3.1 Logging Data Collected by Setting Manager Logger Function

2.3 Starting/Exiting

2.3.1 Starting Setting Manager

Select "Tool" - "Logging" on Multi Data Viewer or select "All Apps" – "OMRON" – "Multi Data Viewer" (Windows 10) or "All programs" - "OMRON" - "Multi Data Viewer Light" - "Setting Manager" (Windows 7) from the Windows start menu.

The Setting Manager main window appears.



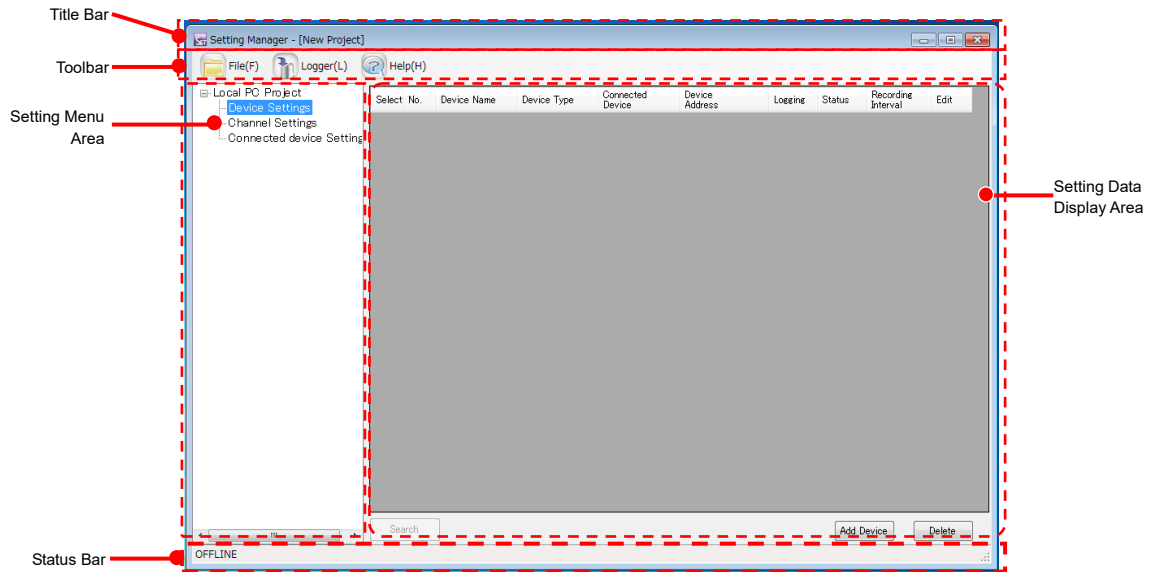
2.3.2 Exiting Setting Manager

Click the "Exit" button (🔌) in the File (F) menu to exit Setting Manager.

A confirmation message appears if changes added to the project loaded on the PC has not been saved in the project file.

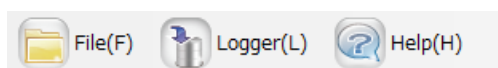
2.4 Window Configuration

The following shows the window.



Section name	Description
Title bar	Setting Manager - <Project file name>
Toolbar	Shows the icons to access individual functions. Click the icon to execute the corresponding function.
Setting menu area	The followings are shown under the project name. <ul style="list-style-type: none"> • Device Settings • Channel Settings • Connected Device Settings
Setting data display area	Select any of the setting items above to display the corresponding setting data.
Status bar	Shows the Setting Manager current status or process progress.

2.4.1 Toolbar Functions



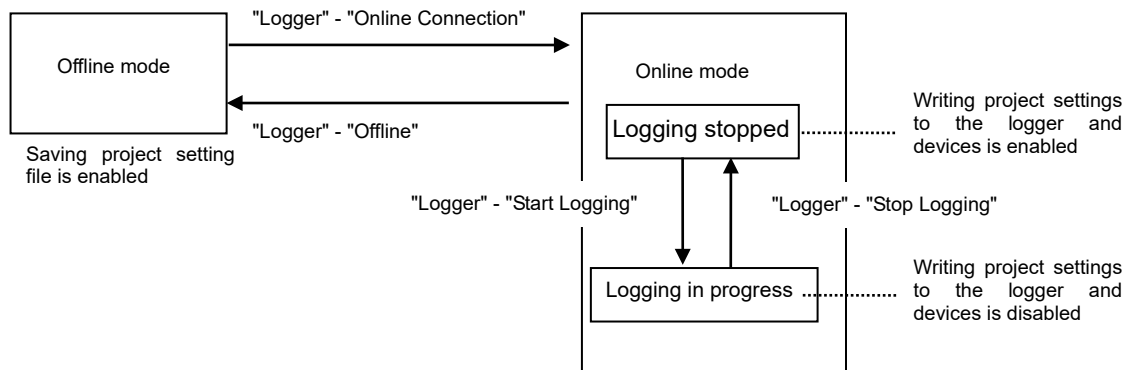
The Setting Manager toolbar comprises "File", "Logger" and "Help" items, which provides the following functions.

Menu Item	Function	Description
File	New Project	Creates a new project based on the settings.
	Open	Reads a saved project to Setting Manager.
	Close	Closes the project.
	Save as	Saves a project after settings in a file.
	Exit	Exits Setting Manager.
Logger	Online Connection	Switches Setting Manager from the offline to online mode. The logger function and communications with connected devices are enabled.
	Offline	Switches Setting Manager from the online to offline mode. The logger function and communications with connected devices are disabled.
	Start Logging	Starts logging by acquiring the measured values at the specified device channels.
	Stop Logging	Stops logging.
	Start Test	Starts the connection test between the logger and devices. The connection status is shown in "Status" in "Device Settings" in the setting menu area.
	End Test	Stops the connection test in progress.
	Save Settings	Saves the following settings made with Setting Manager: <ul style="list-style-type: none"> • Logger settings to the logger • Device parameter settings to the connected devices via communications
	Read Settings	Reads logger settings to a project loaded on Setting Manager.
Help	Version Information	Shows the version of Setting Manager.

2.5 Acquiring Device Status

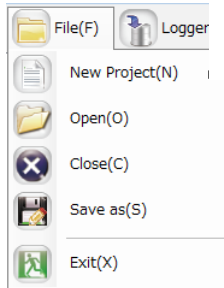
The following device status information can be acquired using Setting Manager:

Status	Logger function	Communications with device	Logging
Online mode	Enabled	Enabled	Stopped
			In progress
Offline mode	Disabled	Disabled	Disabled



2.6 Creating/Saving a Project

Click the corresponding icon in the "File (F)" menu to create a new project, save or read a created project file.



2.6.1 Creating a New Project

Click the "New Project(N)" icon in the "File (F)" menu on the toolbar , and select "Local PC Project" to create a new project.

"Equo-Box Project" and "Server PC Project" are not selectable.

2.6.2 Opening/Closing a Project

Click the "Open(O)" icon in the "File (F)" menu on the toolbar to read a saved project to Setting Manager.

2.6.3 Saving a Project

Click the "Save as(S)" icon in the "File (F)" menu on the toolbar to save a project in a file.

The save destination selection window appears. Specify the destination folder and file name, then click "OK".

2.6.4 Exiting Setting Manager

Click the "Exit(X)" button (🚪) in the File (F) menu on the toolbar to exit Setting Manager.

If select the "Yes" button on the confirmation message of the exiting, the project is saved as a new named file.

2.7 Settings (Setting Menu Area)

Setting Manager allows the user to make EQUO system settings such as various device setting, logging and wireless connection settings from the setting menu area.

*: Wireless Unit is available only in Japan.

2.7.1 Functions in Setting Menu Area

The setting menu area provides the access to the following setting functions.

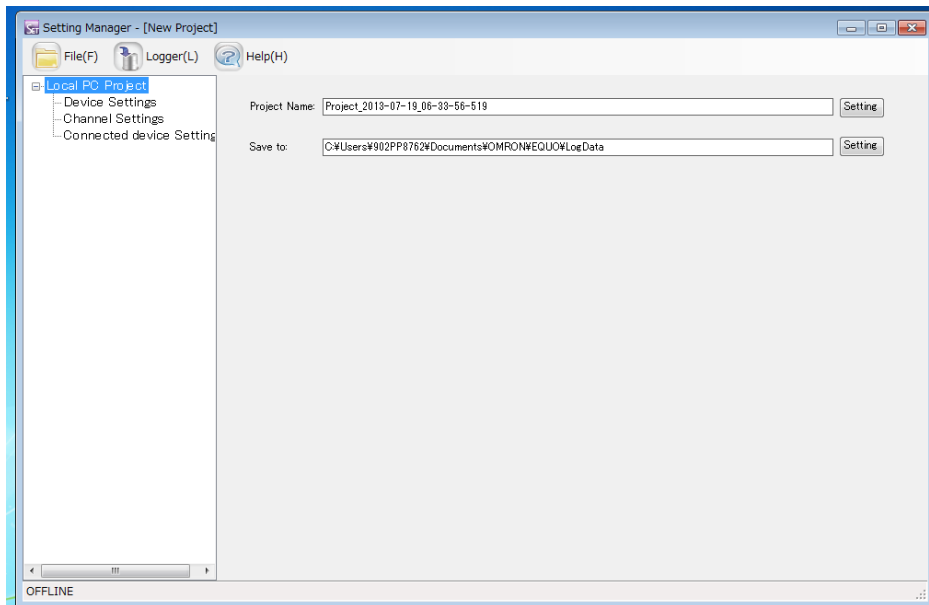


The setting data display area shows the corresponding setting data when a menu item is selected.

Project (Local PC project)	Make project settings here. Specify the project name and setting data (CSV file) save destination.	
Device Settings	Make settings for the devices connected to the Setting Manager logger function.	
	Device list	Lists the connected device information: device names, device types, connection types, device addresses, logging Valid/Invalid settings, connection statuses and logging intervals.
	Sensor setting	Use this to make the sensor parameter settings for devices or KM series units connected to the devices as well as operate the devices and units.
Channel Settings	Register device measurement channels as the logging targets and check their setting status.	
	Channel list	Lists the connected device channel information: channel names, device names, unit no., channel address, data names, and the logging target settings for individual channels of each connected device. The channel names can be edited.
Connected Device Settings	Make settings for the connection units (i.e. wireless unit master and slaves) configured in the communication path from the PC (with Setting Manager) to the devices, when using wireless connection.	
	Connected Device List	Lists the connection device names, device types, connection targets, device addresses, and port No..

2.7.2 Making Project Settings

Click a desired project name in the setting menu area to make settings for the project.



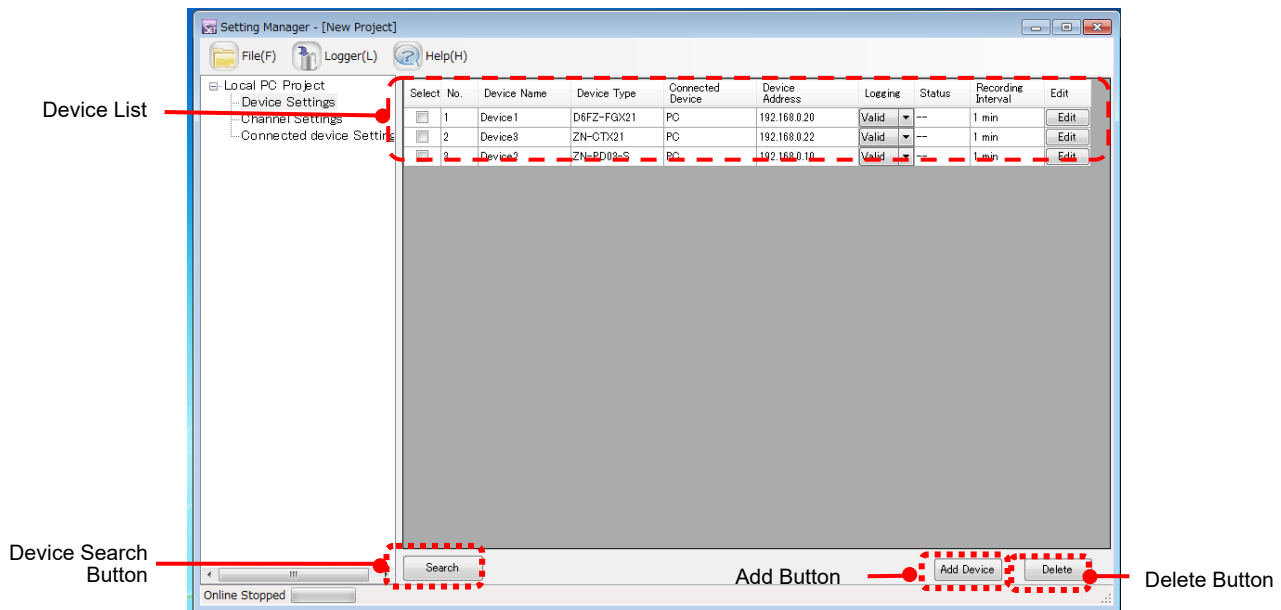
The project setting window provides the settings of two items: "Project Name" and "Save to".

Item	Description
Project Name:	When changing the project name for the currently open project., click the "Setting" .Edit the name and click the "OK" button. Setting Manager refers to this project name when writing data to the logger.
Save to:	Specify the CSV file save destination folder. The following data can be saved in CSV format: <ul style="list-style-type: none"> • Logging data • Data type settings • Device unit settings • Sensor settings (for data collection devices) Enter the data save destination folder name or click the [Setting] button to select the folder.

2.7.3 Setting Devices

Click "Device Settings" in the setting menu area to make device settings.

The settings for individual devices including those connected to the Setting Manager logger function are available with this menu item.



"Device List" displays the connected device information as shown below:

Item	Description
Select	The devices with the corresponding checkboxes selected (☑) can be deleted in batch.
No.	The number is assigned in the order the device is registered by the user.
Device Name	Shows the device label added by the user.
Device Type	Shows the device type name.
Connected Device	Shows the name of the unit the device is connected.
Device address	Shows the connection address of the connection unit the device is connected to. <ul style="list-style-type: none"> • LAN (Ethernet) connection: IP address • Wireless unit master connection: Slave unit ID • Wireless/RS-485 connection: Compoway/F unit ID • LAN/RS-485 connection: Compoway/F unit ID
Logging	Shows if logging is from the device is Valid/Invalid. <ul style="list-style-type: none"> • Valid: Logging target • Invalid: Not a logging target. Setting Manager does not log the data of the device with this setting. This setting cannot be changed during connection test or logging process.
Status	Shows the device connection status. Updates the status every minute while connection test or logging is in progress. The status is shown in any of the following indications: <ul style="list-style-type: none"> • "--": The setting tool has not acquired the status from the logger. • "OK": The device is ready for data acquisition. • "Error": Data can not be acquired due to an error occurring in the device unit, or its operation mode. • "Connection Error ": It is not connected with the device.
Recording Interval	Shows the interval in which measured values are collected from the device.
Edit	Use this to edit the device. Clicking the button displays the device editing window.

Click the "Search" button to search devices to connect to the logger, among those connected to the connection units.

Click the "Add Device" button to add a device to connect to the logger function.

Click the "Delete" button to delete the connected devices selected in the list.

(1) Adding a Device

[1] Adding a Device Offline

The user can add a device to the logger function by clicking the "Add Device" button.

Click the "OK" button to add the device with the settings made in the dialog box.

Clicking the "Cancel" button aborts the settings and closes the window.

The "Add Device" dialog box provides the following setting items:

Item	Description
Name	Enter a user-defined name for the device.
Device Type	Select the type of the device in the device type list displayed in the window.
Setting Items	The settable items vary depending on the device type selected in the device type selection box.
Simultaneous Channel Registration	Select this checkbox to register the channels specified for the device. Both the device and channels are registered at once.

The following table shows the setting items that can be specified for individual options in the device type selection box.

Device type selection box	Connection Device selection box	Setting items (Setting data display area)
ZN-PD03-S ZN-PD50-S	PC	IP address, Recording interval, Number of connections, and With/Without ZN-TH11-S
	Wireless unit slave (Compoway/F) name	Compoway/F unit ID, Recording interval, Number of connections, and With/Without ZN-TH11-S
ZN-THX21-S ZN-DPX21-S ZN-CTX21 ZN-KMX21 D6FZ-FGX21	PC	IP address, Recording interval, Number of connections ^{*1} , and Offset unit number ^{*2}
WZ-STH01 WZ-SL01 WZ-STHL01 WZ-SCD01 WZ-SP01	Wireless unit master name	Wireless unit ID, and Recording interval
KM20-B40-FLK ^{*3} KM50-E KM50-C KM-100 KM1-PMU2A KM1-PMU1A KE1-CTD8E KM1-EMU8A	Wireless unit slave (Compoway/F) name	Compoway/F unit ID, Recording interval, and Timeout

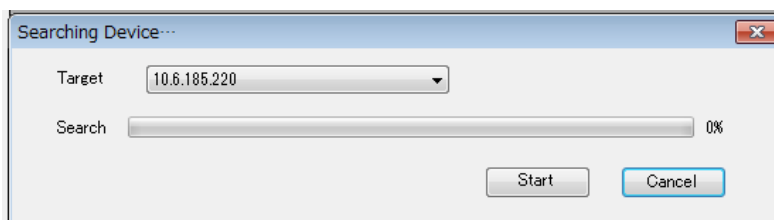
*1 For ZN-KMX21 and D6FZ-FGX21.

*2 For ZN-KMX21

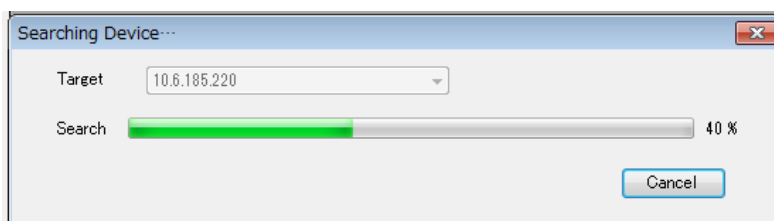
*3 "KM20" is displayed in the Device type selection box.

[2] Searching Devices Online

Setting Manager automatically searches devices to connect to the logger function at a click of the "Search" button. Currently, a search is only possible with sensors connected to the PC.

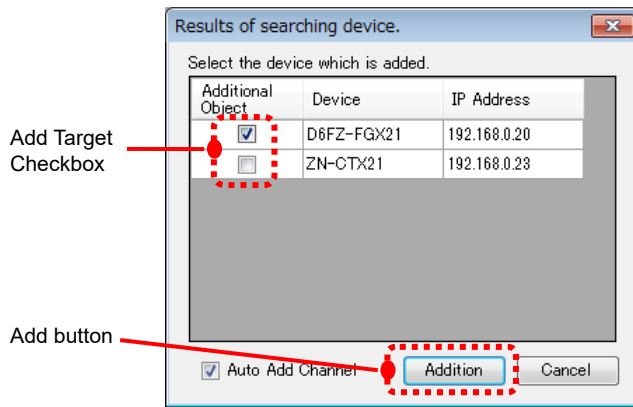


Check the search target and click the "Start" button.



The device search progress is shown at the progress bar. To cancel the search, click the "Cancel" button.

The found devices are listed in the "Device search result" dialog box when a device search is completed.



Select the corresponding "Add Target" checkboxes (☑) of the devices to add, and click the "Add" button. The selected devices are registered.

Select the "Simultaneous Channel Registration" checkbox (☑) to register the channels specified for the devices. Both the devices and channels are registered at once.

(2) Editing a Device

The user can edit a device by selecting the device in "Device List" and clicking the "Edit" button. The setting data of the device connected to the logger function can be modified.

The "Edit Device" window provides different tab configuration depending on the device type.

The following table shows the tab configurations for individual device types shown in the "Edit Device" window.

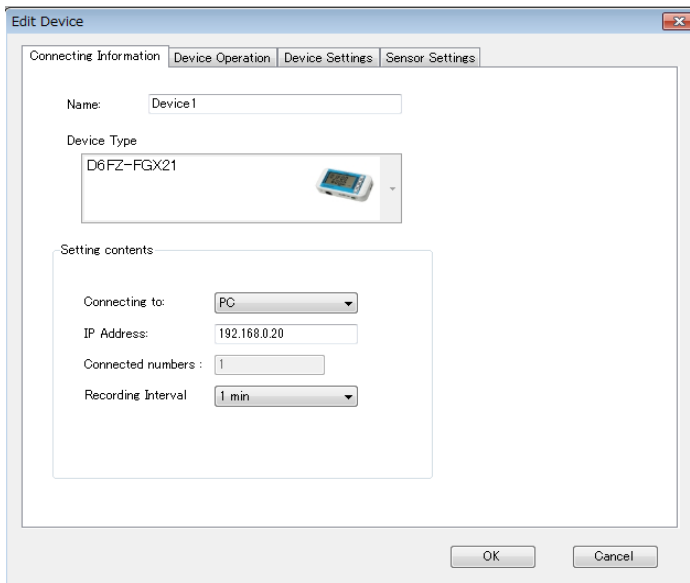
Device To Connect	Device Type	Connecting information	Device Operation	Device Settings	Sensor Setting
PC	ZN-PD03-S ZN-PD50-S	Yes	No	No	No
	ZN-THX21-S ZN-DPX21-S ZN-CTX21	Yes	Yes	Yes	No
	ZN-KMX21 ZN-FGX21	Yes	Yes	Yes	Yes
Wireless unit master	WZ-STH01 WZ-SL01 WZ-STHL01 WZ-SCD01 WZ-SP01 ^{*1}	Yes	No	No	No
Wireless unit slave (Compoway/F)	KM20-B40-FLK KM50-E KM50-C KM-100	Yes	No	Yes	No
	KM1-PMU2A KM1-PMU1A KE1-CTD8E KM1-EMU8A ZN-PD03-S ZN-PD50-S	Yes	No	Yes ^{*2}	No

^{*1} "KM20" is displayed in the Device type selection box.

^{*2} There is "Device Settings" tab in the "Edit Device" window, but "Device Settings" has no setting items.

[1] Connecting Information Tab

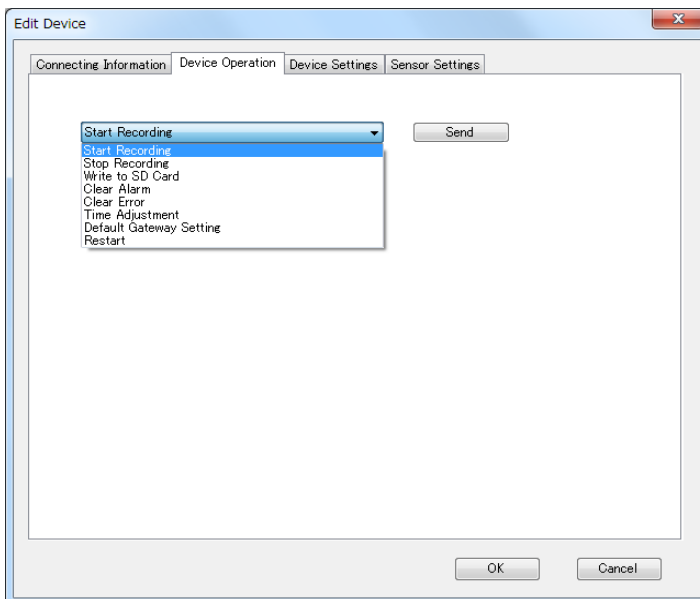
The tab displays the information on the connection between Setting Manager and devices.



Click the "OK" button to register the device with the settings made in the tab.
Clicking the "Cancel" button aborts the settings and closes the window.

[2] Device Operation Tab

Use this tab to send operation commands to the device.



The function of the operation commands are as follows.

Operation Command	Description
Start Recording	Start recording of the device.
Stop Recording	Stop recording of the device.
Write to SD Card ^{*1}	Write the measured data stored in the internal memory of the device to the SD memory card.
Clear Alarm	Clear the device alarm.
Clear Error	Clear the device error.
Time Adjustment	Set the device internal clock to the PC time.
Default Gateway Setting	Set default gateway of the device.
Restart	Restart the device.

^{*1} Insert an SD memory card into the device's SD card slot before operation.

Select the command and click the "Send" button to send the command to the device. Refer to the device manual for the details of device operation commands.

[3] Device Setting Tab

This tab provides the editing of the device unit parameters.

Item Name	Item Value
Recording Mode	CONT
Number of connected sensor	1
Measurement period	1 s
Conversion value	0.000
Conversion value unit setting	JPY
Display unit	L/min



button: Click this to update the parameters with the setting data read from a CSV file.



button: Click this to output the settings to a CSV file.

Click the "Read setting" button to read the set values to Setting Manager from the device to update them.

Click the "Save setting" button to save the settings to the device.

Click the "OK" button to register the device with the settings made in the tab.

Clicking the "Cancel" button aborts the settings and closes the window.

Important

- When saving the settings, stop recording the data by the connected device.
- If the device is in Recording, choose "Stop Recording" in the "Device Operating Tab" and stop recording.
- When failed to read / save settings, error message is displayed. In that case, make sure the following states: power supply, recording-operation, LAN access between PC and devices and LAN settings.

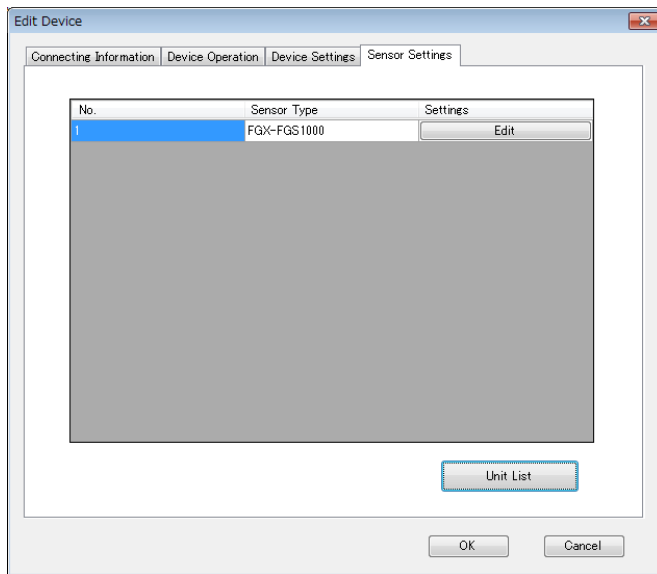
[4] Sensor Setting Tab

This tab allows the user to make setting the sensors connected to the data collection device.

The following are devices and sensors that can be set as sensors.

Data Collection Device	Sensor
ZN-KMX21	KM20-B40-FLK
	KM50-C
	KM50-E
	KM100
	KM-N1-FLK
	KM-N2-FLK
	KM-N3-FLK
D6FZ-FGX21	D6FZ-FGS1000
	D6FZ-FGT200
	D6FZ-FGT500

Click the "Unit List" button to display the sensor list for the setting.

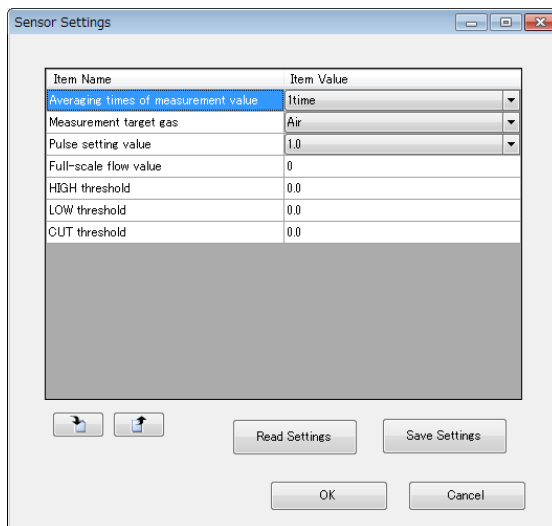


The Sensor setting tab provides the following setting items:

Item	Description
No.	The sensors are listed in the order from the smallest unit number (1, 2, 3...).
Sensor Type	Shows the sensor type or model.
Settings	The sensor setting dialog box appears when the "Edit" button is clicked.

At a click of the "Sensor List" button, Setting Manager communicates with devices to check and display the connected sensors.


The sensor setting dialog box appears when the "Edit" button is clicked.



Use the "Sensor Settings" window to make settings for the selected sensor.

The lower setting items vary depending on the sensor type.

 button: Click this to update the parameters with the setting data read from a CSV file.

 button: Click this to output the settings to a CSV file.

Click the "Read setting" button to read the set values to Setting Manager from the device to update them.

Click the "Save settings" button to save the settings to the device.

Click the "OK" button to register the device with the settings made in the tab.

Clicking the "Cancel" button aborts the settings and closes the window.

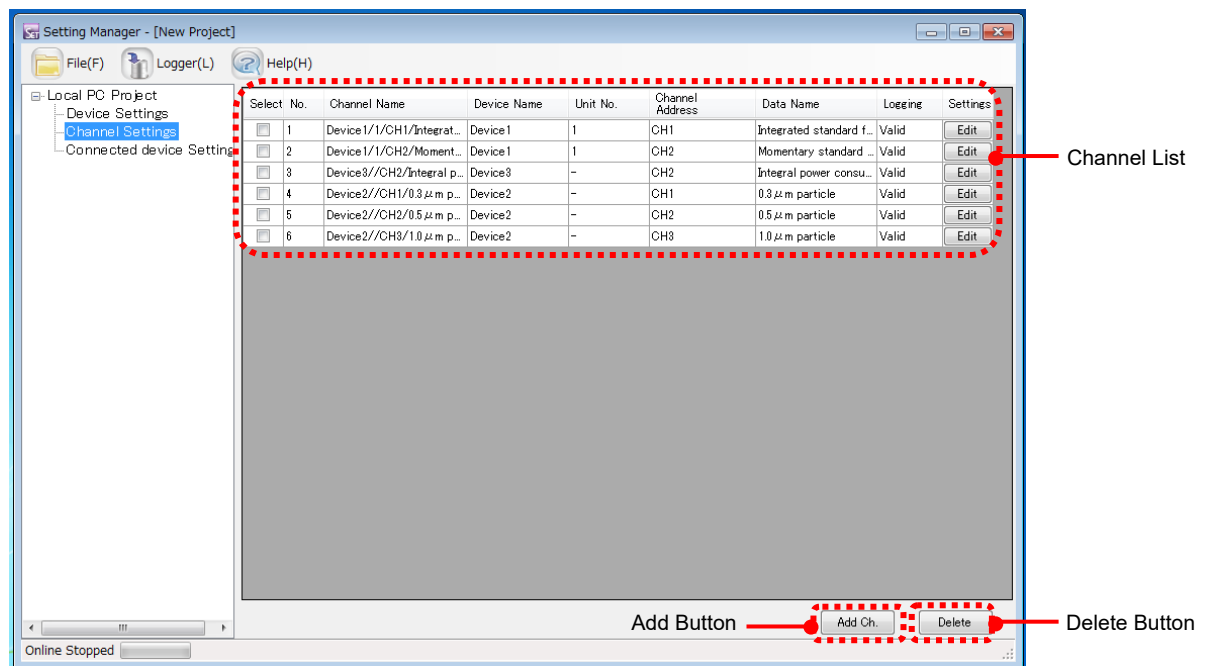
The device must not be in the recording process when reading or writing the setting from/to the device. Stop the recording in "Device operation" if the device is in the process of recording.

(3) Deleting Devices

Click the "Delete" button to delete the connected devices selected (☒) in the list.

2.7.4 Setting Channels

The user can add or delete individual device measurement channels to/from the logging target selection by clicking "Channel Settings" in the setting menu area. The displayed data also can be used to check the current settings made to each channel.



The Setting data display area shows the channel setting information.

The following items are displayed in the area.

Item	Description
Select	The devices with the corresponding checkboxes selected (<input checked="" type="checkbox"/>) can be deleted in batch.
No.	The number is assigned in the order the channel is created by the user.
Channel Name	Shows the label given to the channel by the user.
Device name	Shows the label given to the device by the user. A channel without the device information (e.g. when using a local file) is displayed as "--".
Unit No.	A channel without the unit number is displayed as "--".
Channel Address	Shows the channel to which the physical quantity values measured by the device have been assigned.
Data name	Shows the data type of the physical quantity values measured by the device.
Logging	Either of the following settings is displayed depending on if the device containing the channel is specified as a logging target. "Valid": Logging target "Invalid": Not a logging target Specify the above setting for each device in the "Logging" column in "Device Settings".
Setting	Shows the "Edit" button. Click this to edit the name of the corresponding channel.

Click the "Add Ch." button to display the "Add Channel" dialog box and add a channel retained by the device but not registered yet.

Click the "Delete" button to remove the selected channels from the logging target selection.

(1) Adding a Channel

At a click of the "Add Ch." button, the "Add Channel" dialog box appears.

The dialog box allows the user to register a channel retained by the device but not yet registered to Setting Manager.

The following shows the items available with the dialog box.

Item	Description
Ch. Name	Enter the name for the channel to register.
Device Name	Select the corresponding device in the pull-down list. The devices registered in "Device Settings" are shown in the list in the "Device name - Device address" format.
Ch. Address	Select the channel to register in the pull-down list. The channels contained in the device are shown in the list in the "CH number - Data type" format.

Click the "OK" button to register the channel with the settings made in the dialog box.

Clicking the "Cancel" button aborts the settings and closes the window.

(2) Deleting Channels

Select the checkboxes (☑) for the channels to delete in "Channel list" and click the "Delete" button. The selected channels are removed from the logging target selection.

(3) Editing a Channel

Click the "Edit" button shown in "Channel list". The "Edit channel" dialog box appears.

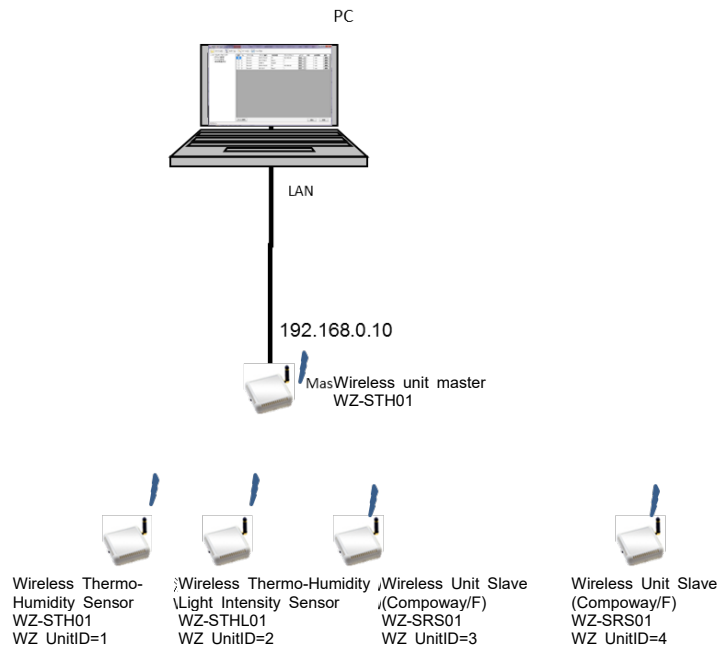
The dialog box allows the user to edit the name of registered channel.

The Edit channel dialog box can be operated in the same way as the "Add channel" dialog box. Refer to "(1) Adding a Channel" for details.

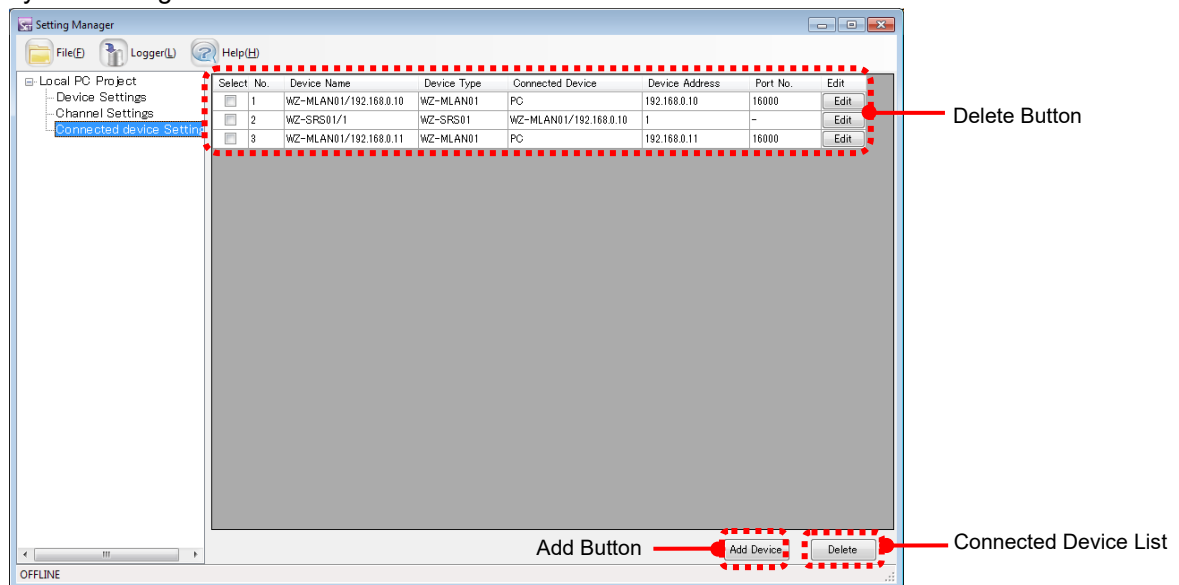
2.7.5 Setting Connection Units (For Wireless Connection)

The "Connected Device Settings" is enabled if Setting Manager is connected to devices via wireless unit. Click this button to make settings for the connection units (Wireless unit master and wireless unit slaves (Compoway/F)) configured in the communications path between the PC (Setting Manager) and devices.

*: Wireless Unit is available only in Japan.



For example, a wireless unit master and two Compoway/F slave units must be registered in the system configuration above.



The Setting data display area shows "Connected Device List".

The Connected Device List displays the settings related to the connection units.

The following items are displayed in the area.

Item	Description
Select	The column displays the "Select" checkboxes used to delete multiple connection units in batch. Select the checkboxes for the units to delete and click the "Delete" button.
No.	The number is assigned in the order the unit is registered by the user.
Device Name	Shows the label given to the connection unit by the user.
Device Type	Shows the type of the connection unit.
Connected Device	Shows the connected device name (PC / wireless unit master) the connection unit is connected to.
Connection Address	Shows the address of the upper connection unit each connection unit (in the Connection unit column) is connected to.
Edit	Clicking the "Edit" button displays the "Edit connection unit" dialog. The user can edit the unit name and type, connected unit and its address for the registered connection units.

Click the "Add Device" button to display the "Add Connector" dialog box, in which the user can register a new connection unit.

Click the "Delete" button to remove the selected connection units from the connection selection.

(1) Adding a Connection Unit

The user can add a connection unit to the EQUO system controlled by the logger.

Click the "Add" button. The "Add Connector" dialog box appears.

The dialog box provides the following items to specify for the connection unit to add:

Item	Description
Name	Enter a user-defined name for the connection device.
Device Type	Shows a list of connection unit types. Wireless unit master / wireless unit slave (Compoway/F)
Connecting to	Select the unit name the added connection unit is connected to. Wireless unit master : PC Wireless unit slave (Compoway/F) : Wireless unit master name
Connector Address	Enter the connector address of the connected device. Wireless unit master : IP address, port no. Wireless unit slave (Compoway/F) : Wireless unit ID

Click the "OK" button to add the connection unit with the settings made in the dialog box.

Clicking the "Cancel" button aborts the settings and closes the window.

(2) Editing Connected Device Settings

Select the unit in the "Connected Device List" and click the "Edit" button. The user can edit the registered upper connection unit and connection address for the selected connection unit.

The "Edit Connector" dialog box appears.

The dialog box allows the user to edit the following data registered for the connection unit.

Item	Description
Name	Enter the connected device name.
Connecting to	Select the unit name the added connection unit is connected to. Wireless unit master : PC Wireless unit slave (Compoway/F) : Wireless unit master name
Connector Address	Enter the connector address of the connected device. Wireless unit master : IP address, port no. Wireless unit slave (Compoway/F) : Wireless unit ID

Click the "OK" button to update the Connected Device Settings to those made in the dialog box.

Clicking the "Cancel" button aborts the settings and closes the window.

2.8 Logging (Logger Menu)

Setting Manager collects measured values from the registered devices and log them in a specified folder in CSV format.

2.8.1 Connecting Setting Manager Online

Make sure that a project is open and more than one device is registered in the project, then click "Online Connection" in the "Logger (L)" menu. Setting Manager changes from offline to online mode.

The logger function and communications with the connected devices are enabled once Setting Manager becomes online.

When failed to "Online Connection", the error message is displayed. In that case, restart the PC and Setting Manager.

2.8.2 Saving Settings in Loggers

Click "Save Settings" in the "Logger (L)" menu in the toolbar while Setting Manager is online. The project settings made with Setting Manager are written to the connected devices through communications.

Saving logger settings (device parameters) to the logger function (connected devices) through communications is required to enable the connection test based on the "logger settings" and logging. Setting Manager cannot start logging unless this process is completed.

2.8.3 Starting/Ending Connection Test

Click "Start Test" in the "Logger (L)" menu in the toolbar while Setting Manager is online. Setting Manager starts connection test while showing the progress in the status bar.

The test result is shown at the "Status" row in "Device Settings" in the setting menu area as the following:

"Status" row	Status
"--"	The setting tool has not acquired the status from the logger.
"Normal"	The device is ready for data acquisition.
"Connection Error"	It is not connected with the device.
"Error"	An error has occurred in the device unit. ^{*1} Or the unit is in either FUN mode, THR mode, through mode, or FTP mode.

^{*1} For ZN-DPX21-S and ZN-THX21-S, "Error" is not displayed even if the following error occurs in the device unit.

Error ID	Content
E1100	Failed to write measured data.
E3000	SD card not inserted.
E3001	Unable to access SD card.
E3002	SD card write prohibited.
E3003	SD card recognition error.

Setting Manager exits connection test anytime when "Stop Test" in the "Logger (L)" menu is clicked. The progress display in the status bar disappears and "--" is shown at the "Status" row in "Device Settings".

The connection test continues until "Stop Test" is clicked.

2.8.4 Starting Logging

Click "Start Logging" in the "Logger (L)" menu in the toolbar while Setting Manager is online. Setting Manager starts logging by using the logger function to collect measured values from the connected devices.

The logging data is saved in CSV files in the folder specified in "Save to" during the project setting procedure. Refer to "2.7.2 Making Project Settings" for the data save destination.

Important

- For ZN-CTX21, ZN-KMX21, and D6FZ-FGX21, turn on the Power Startup REC Restoration (REREC) of the device in order to prevent the unavailability of integrated data, if the device power off and restart occurs during logging.

2.8.5 Stopping Logging

Click "Stop Logging" in the "Logger (L)" menu to stop logging.

2.8.6 Reading Settings from Loggers

Click "Read Settings" in the "Logger (L)" menu while Setting Manager is online. The logger settings for the connected devices can be read to the project on Setting Manager.

2.8.7 Disconnecting Setting Manager (Offline)

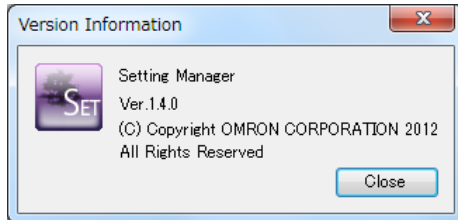
When Setting Manager is online, click "Offline" in the "Logger (L)" menu disables the logger function.

When disconnecting Setting Manager while performing connection test or logging, the connection test / logging operation will continue. Connecting Setting Manager online again, it will resume from the connection test / logging execution state.

2.9 Other Operation

2.9.1 Displaying Setting Manager Version and Copyright Information (Help Menu)

Click "Version" in the "Help" menu. The Setting Manager version and copyright information is displayed.



3. Summary/Display Tool: Multi Data Viewer

3.1 Multi Data Viewer

Multi Data Viewer is used to summarize and display the logged EQUO device measurement data for analysis.

The tool can support optimal operation by balancing the energy consumption and product quality through the integrated quantification of environmental data such as power consumption, flow rate, temperature and amount of foreign matter.

Multi Data Viewer provides the summary and integrated graph display of logging data collected at a specified period, summary unit and measurement time/date, which is obtained in either of the following methods:

- EQUO devices log the data, which is saved in a memory device (e.g. SD memory card)
- The logger function in Setting Manager directly collects the logging data from EQUO devices through communications

Note

- Multi Data Viewer can display momentary values if summary by the summary unit is not required. Previous environmental data or the data from different measurement points also can be compared and displayed.

Definition

- "Logging data" refers to any of the following data:
 - (1) Logging data collected by EQUO devices at specified logging intervals
 - (2) Logging data collected by the Setting Manager logger function directly from EQUO devices through communications at specified logging intervals

All the data above is output in CSV files and the output files are referred to as "collected files".
- "Summary" is a process to e.g. average, integrate and obtain the maximum value using logging data.
- "Summary data" refers to the data obtained through the "summary" process.
- "Summary unit" refers to the unit of time used to display "summary data".
- A "summary file" is a file containing "summary data" output in CSV format for the use on spreadsheet software.
- "Summary data" DB is the database storing "summary data".

3.2 Basic Operation Flow

The following shows the basic flow of Multi Data Viewer operation.

Procedure	Reference
Prepare logging data	3.3 Preparing Logging Data
↓	
Start Multi Data Viewer	3.4 Starting/Exiting
↓	
Create "summary data" DB or open an existing "summary data" DB	3.6.1 Creating "Summary Data" DB 3.6.4 Opening "Summary Data" DB
↓	
Import/summarize logging data from collected files	3.6.3 Adding Imported/Summarized Logging Data to "Summary Data" DB (CSV Import)
↓	
Select the displayed data type (vertical axis unit)	3.7.2 (1) Specifying Displayed Data Type (Vertical Axis Unit)
↓	
Specify the channels to display	3.7.2 (2) Specifying Channels to Display
↓	
Specify the display period	3.7.2 (3) Changing Display Period
↓	
Specify the summary unit	3.7.2 (4) Specifying Summary Unit (Time Unit to Display Summary in Graph)
↓	
Specify the display date and time	3.7.2 (3) Changing Display Period
↓	
Compare the data with previous data (as required)	3.8 Comparing with Data at Different Date/Time
↓	
Save the data to "summary data" DB	3.6.2 Saving newly created "Summary data" DB
↓	
Specify the following as required: Auto connection setting, summary display item setting, and CSV export character code setting	3.9.4 Setting Multi Data Viewer

3.3 Preparing Logging Data

Multi Data Viewer can read and summarize either of the following "logging data".

- (1) Logging data collected by the Setting Manager logger function directly from devices through communications at specified logging intervals
- (2) Logging data collected by EQUO devices at specified logging intervals

3.3.1 Logging Data Collected by Setting Manager Logger Function

- (1) Specify the logging conditions with Setting Manager. (Refer to 2.9 Settings (Setting Menu Area))
- (2) Start the logger function and collect the measured data at the specified interval from the devices connected via Ethernet. (Refer to 2.10 Logging (Logger Menu))
- (3) Save the collected logging data in a CSV file in the PC's memory.

3.3.2 Logging Data Collected by EQUO Devices

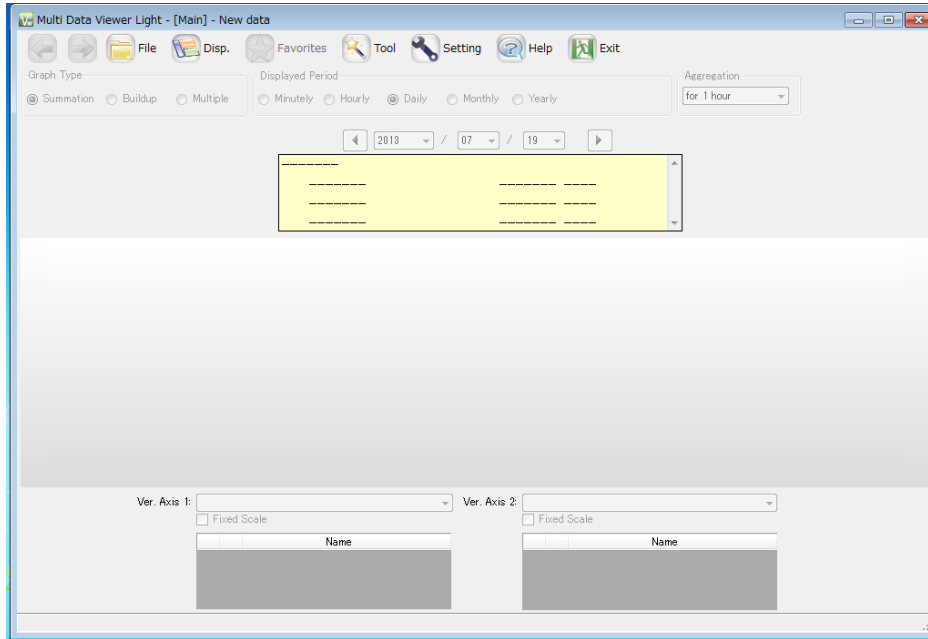
- (1) Prepare an SD memory card storing the logging data collected by EQUO devices in a CSV file.
- (2) Insert the SD memory card in the memory card slot of the PC or connected SD card reader/writer.

3.4 Starting/Exiting

3.4.1 Starting Multi Data Viewer

(1) Click the Multi Data Viewer shortcut on the Windows desktop or select "All Apps" - "OMRON" - "Multi Data Viewer" (Windows 10) or "All programs" - "OMRON" - "Multi Data Viewer Light" – "Multi Data Viewer" (Windows 7) from the Windows start menu.

(2) The Main Window appears.



3.4.2 Exiting Multi Data Viewer

Click "Exit" (Exit icon) in the Main Window toolbar to exit Multi Data Viewer.

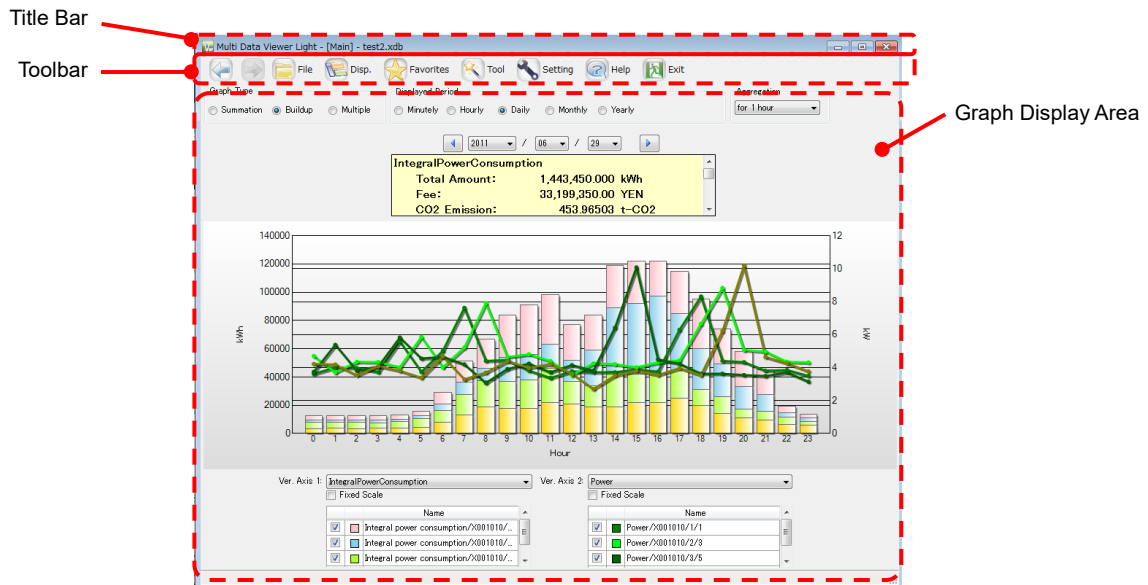
A confirmation message appears if Multi Data Viewer is accessing the "summary data" DB in the PC, and the data being summarized has not been saved yet.

If an SD memory card (used to write data to the PC) is still in the SD card slot, remove it following the instruction shown on the PC screen.

3.5 Main Window Configuration

The following shows the Multi Data Viewer Main Window configuration.

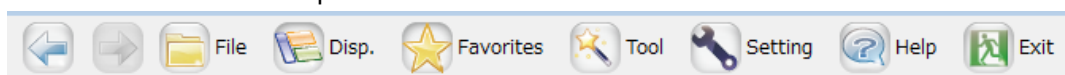
The image below include the entire configuration. However, some menu items or controls (e.g. summary functions) may not be displayed depending on the setting.



Section name	Description
Title bar	Multi Data Viewer - [Main Window] - <Connection target> <Connection target>: Displays the open XDB file name. "New data" is shown if the data is newly summarized and the file name is not defined yet.
Toolbar	Shows the icons to access individual functions. Click the corresponding icon to execute each function.
Graph display area	Shows the bar/line graphs of specified channels data included in the displayed "summary data" DB. The graph display can be changed by setting the parameters such as graph horizontal axis (time axis) span (display period), resolution (summary unit), vertical axis data type/unit, date/time of the data, and bar graph type. The numeric display of the total sum, average, and maximum value in the graph is also available.

3.5.1 Main Window Toolbar Functions

The Main Window toolbar provides icons for various functions.



Clicking the toolbar icons executes the following functions:

Icon	Function	
←	"Back": Returns to the previously displayed graph.	
→	"Forward": Shows the originally displayed graph again.	
File	Create New File	Creates an empty "summary data" DB in the PC and opens it.
	Open DB	Opens a "summary data" DB saved in the PC.
	Save to DB	Overwrites the original "summary data" DB saved in the PC.
	Save as...	Save the "summary data" DB with a name to the PC.
	CSV import (*)	Locates the relevant logging data among the CSV collected files saved in a specified folder, summarizes the data and add it to the currently open "summary data" DB.
	Import Energy Viewer's DB	Load the DB saved by Energy Viewer.
Disp.	Disp. Summary area	Switches to display or hide the summary area.
	Disp. Setting	Switches to display or hide data type setting area, 'fix scale' check box and display target setting area.
Favorites	Add to Favorites	The data is attached with a marking and can be viewed later at a single click.
	Organize Favorites	Displays the "Favorites" control menu.
	Favorites list	The data items added to "Favorites" are included in the menu item list.
Tool	Logging	Starts Setting Manager.
	Compare with Previous data	Integrates data obtained under different conditions with the currently open "summary data" DB into comparative graph representation.
	Graph Capture	Copies the displayed graph image to the clipboard.
	CSV Export (*)	Use this to output the data (extracted from the currently open "summary data" DB) for specified period, channels, and summary unit, in a CSV file with the "summary data" structure.
Setting	Displays the "Viewer setting" window for various Multi Data Viewer settings. The window provides the following settings: <ul style="list-style-type: none"> • Setting for the auto opening of the last displayed data when Multi Data Viewer starts next time • Summary area display item selection • Setting of character set used in CSV export • Data type setting • Channel Settings 	
Help	Multi Data Viewer Help	Displays the Multi Data Viewer Help files.
	Version Information	Displays the version information.
Exit	Exits Multi Data Viewer.	

*: When dealing with the integrated value on continuous multiple days, the data of the last of the day becomes zero.

When data needs to be collected continuously, using of the EQ100, network server model, is recommended.

3.6 Creating/Saving "Summary Data" DB in PC

The user can use Multi Data Viewer to create a "summary data" DB in the PC and summarize data for reference and analysis.

The created "summary data" DB can be saved as a file (XDB file), which can be opened on Multi Data Viewer for reference and analysis.

3.6.1 Creating "Summary Data" DB

Create a "summary data" DB.

Click "Create New File" in the "File" menu in the toolbar.

Multi Data Viewer creates and opens a new "summary data" DB.

On the created "summary data" DB, "summary data" in CSV files can be imported, which can be then summarized and displayed in graph for analysis.

If graphs are displayed in the Main Window when a new DB is created, Multi Data Viewer closes the displayed "summary data" and opens the new "summary data" DB.

The "Create New File" menu item only creates a DB on Multi Data Viewer and its file is not saved in the PC. To retain the DB for future use, save it before closing.

3.6.2 Saving newly created "Summary data" DB

A "summary data" DB created or opened on Multi Data Viewer using the "Create New File" or "Open DB" menu item can be saved in a file (XDB file).

Saved "summary data" DB files can be opened on Multi Data Viewer.

The following shows the steps to save a "summary data" DB.

- (1) Click the "Save as..." button in the "File" menu in the toolbar.
- (2) Enter the file name and click the "Save" button.

3.6.3 Adding Imported/Summarized Logging Data to "Summary Data" DB (CSV Import)

When using a newly created "summary data" DB, import/summarize "logging data" and feed it into the empty summary data area in the Main Window.

After this, repeat the same procedure of importing and summarizing additional logging data to fill the summary data input area in the Main Window.

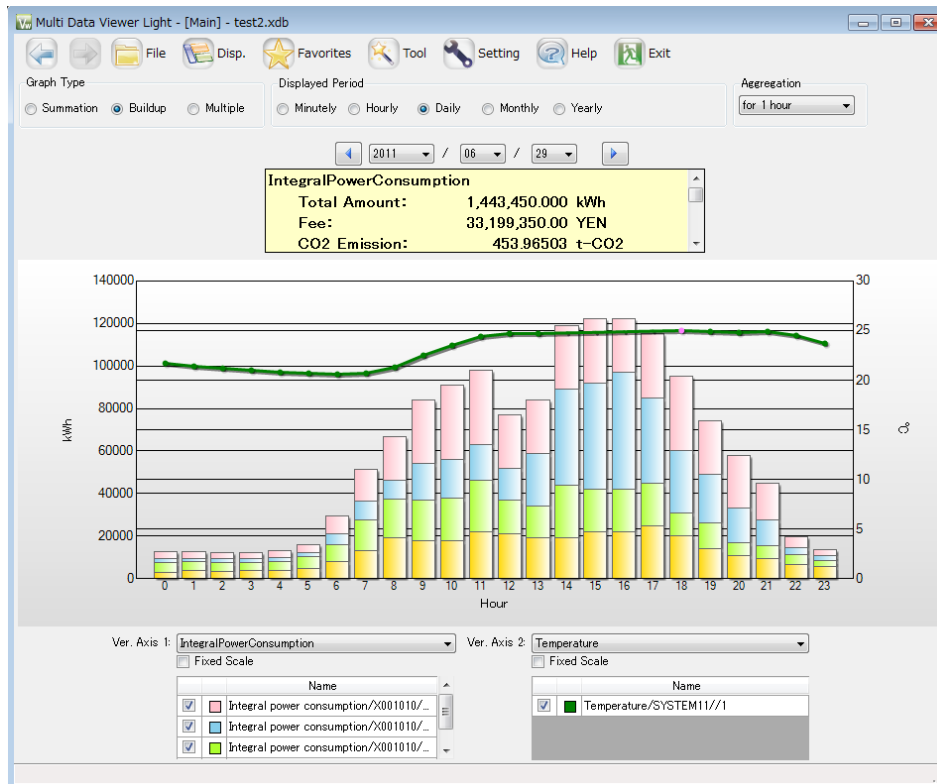
Important

- When dealing with the integrated value on continuous multiple days, the data of the last of the day becomes zero.
When data needs to be collected continuously, using of the EQ100, network server model, is recommended.

Note

- Multi Data Viewer can combine multiple "logging data" items from different EQUO devices into a single "summary data" DB for simultaneous viewing. For example, different types of "logging data" (e.g. temperature and power consumption) can be summarized in a single graph display for analysis.

Example: Integrated power consumption and temperature data combined in a single graph display

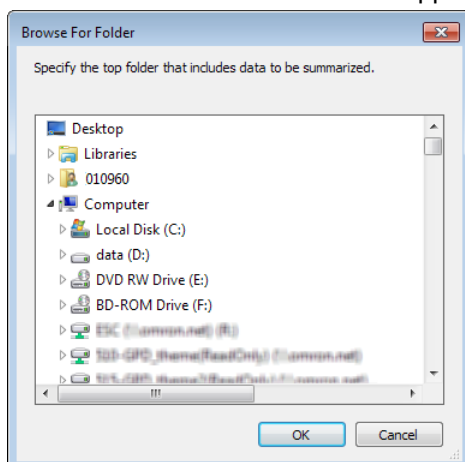


Make sure that the relevant "summary data" DB in the PC is opened. Summarize the "logging data" in "collected data" CSV files and add the summarized data to the open "summary data" DB.

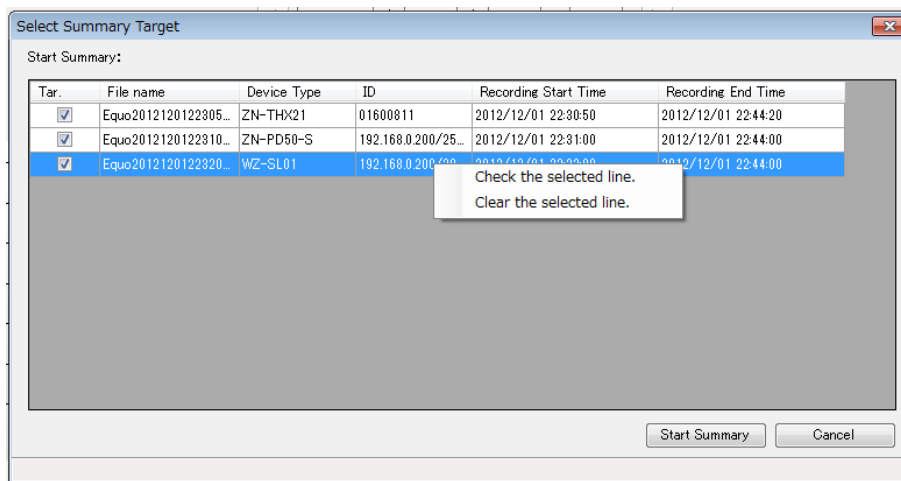
Follow the steps below to add data to the DB:

(1) Click "CSV Import" in the "File" menu in the toolbar.

The "Browse For Folder" window appears.



(2) Specify the folder containing "summary data" and click the "OK" button. Multi Data Viewer automatically searches through the specified folder or drive to locate "summary data" options for selection. The results are shown in the following "Select Summary Target" window.



Note: The search may take a while depending on the data quantity stored in a specified drive or folder. To cancel the search, click the "Cancel" button shown during the process at the left bottom of the window.

- (3) Select the corresponding checkboxes (☒) in the "Tar." column in "Start Summary:" and click the "Start Summary" button.

Note

- To select/deselect multiple summary data simultaneously, 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 the selected line." or "Clear the selected line."
- After CSV import, click "Save to DB" to save "Summary Data" DB.

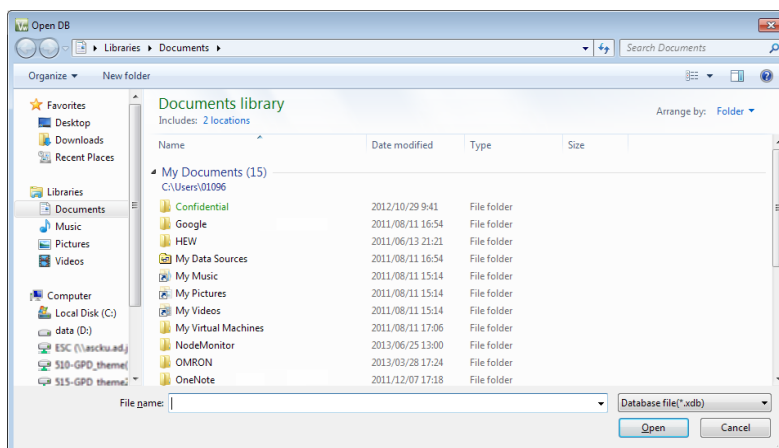
3.6.4 Opening "Summary Data" DB

The user can open a saved "summary data" DB to review and analyze the summary results.

Note: To open another "summary data" DB, close the currently open "summary data" DB before opening the other.

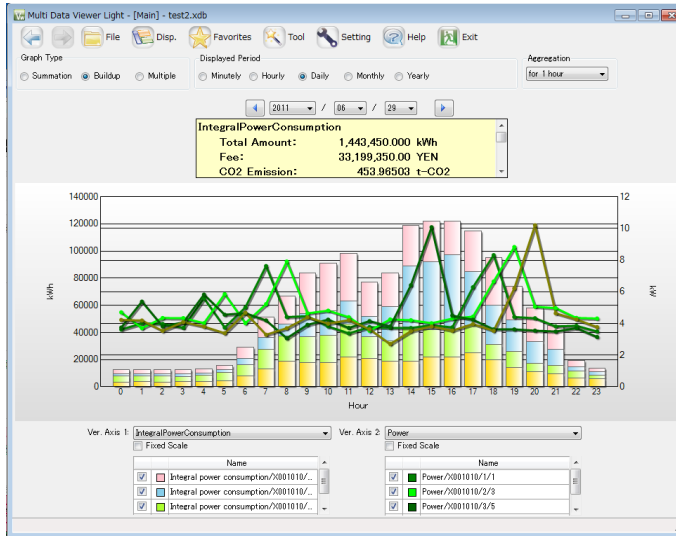
Follow the steps below to open a saved "summary data" DB.

- (1) Click "Open DB" in the "File" menu in the toolbar.



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

(3) The selected "summary data" DB is read into the Main Window.



3.6.5 Import Energy Viewer's DB

The user can load the DB saved in Energy Viewer into Multi Data Viewer.

- (1) Click "Import Energy Viewer's DB" in the "File" menu in the toolbar.
- (2) Specify the Energy Viewer's DB file and click the "Open" button.
- (3) After the conversion process of Energy Viewer's DB is completed, DB is read into the Main Window.

Important

- The conversion process takes time due to the size of the Energy Viewer's DB.
- The conversion process may fail depending on the size and contents of the Energy Viewer's DB.

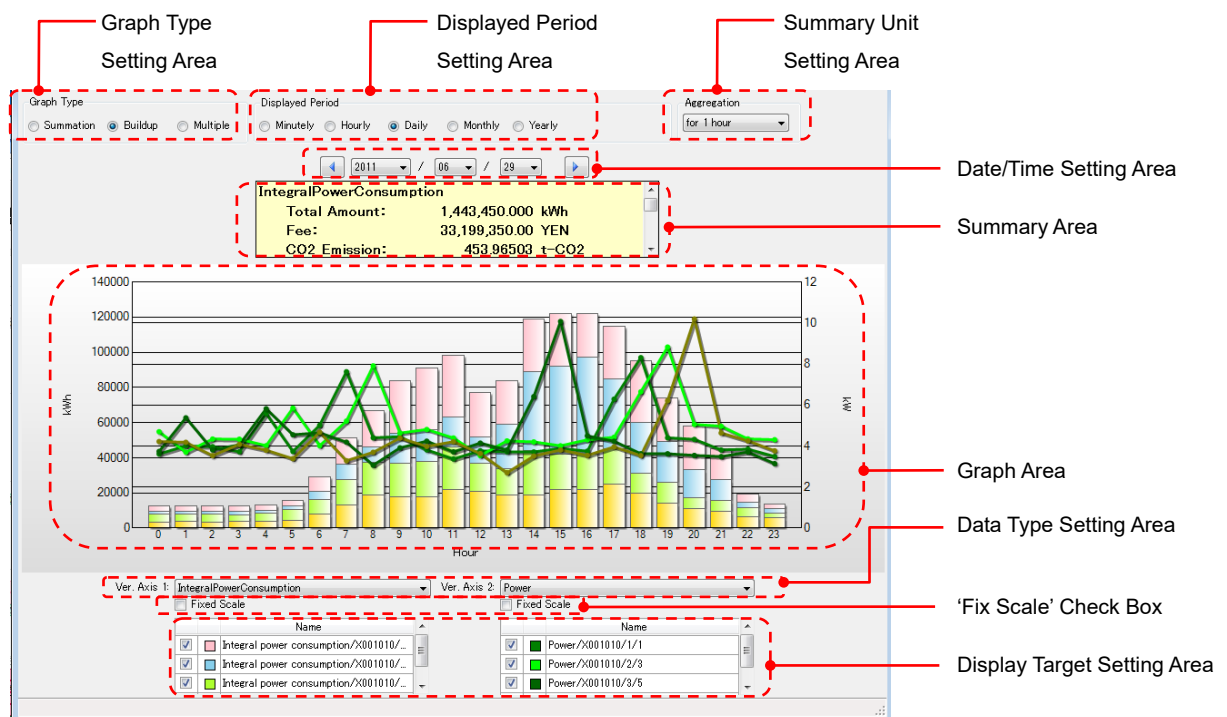
3.7 Displaying Graph

Multi Data Viewer provides the graph display of summary results (data of specified channels) supporting operational efficiency analysis.

Various functions are available with the Multi Data Viewer Main Window for efficient review and analysis of summary result graphs.

3.7.1 Multi Data Viewer Graph Display Area Functions

The Multi Data Viewer graph display area shows summary data in "summary data" DB in graph display. The area comprises the following sections:



Section name	Description
Graph type setting area	Specify the graph type to plot in the graph area.
Display period setting area	Specify the graph period to plot in the graph area.
Summary unit setting area	Specify the summary unit for the graph to plot in the graph area.
Date/time setting area	Specify the date/time for the graph to plot in the graph area.
Summary area	Shows a summary note of the displayed data.
Graph area	Displays summary graphs according to the settings shown below the graph area. The horizontal axis (time axis) and the scale can be enlarged or reduced by mouse operation.
Data type setting area	The data types to plot in the graph area can be individually specified for vertical axes 1 and 2. The same type cannot be specified for axes 1 and 1.
"Fixed Scale" Check Box	Specify if the scale intervals for vertical axes 1 and 2 automatically change according to the displayed data or remain unchanged (fixed).
Display target setting area	Displays a list of the channels in specific "summary data". Use this to specify the target channels to plot in the graph area.

3.7.2 Setting Graph Display

Various functions are available with the Multi Data Viewer graph display area for efficient review and analysis of summary result graphs.

This section describes the support functions available with graph operation.

(1) Specifying Displayed Data Type (Vertical Axis Unit)

Up to two data types can be displayed in a single graph display.

Specify the graph data type for "Ver. axis 1" and "Ver. Axis 2" in the data type setting area.

Graphs in the specified data types are displayed in the graph display area.



These settings automatically determine the value units for the individual axes.

The "units" specified with Setting Manager ("Data type setting") beforehand are selected.

The data type unit specified for "Ver. Axis 1" is shown at the left of the graph area, and the "Ver. Axis 2" data type unit, at the right of the graph area.

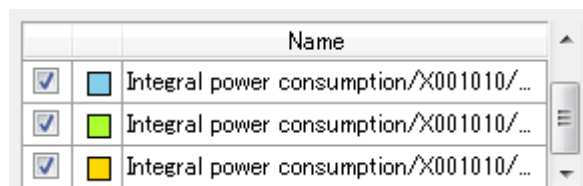
The same data type cannot be specified for "Ver. Axis 1" and "Ver. Axis 2".

(2) Specifying Channels to Display

Specify the channels to display in a graph in the display target setting area.

The channels of the data types specified in step (1) for "Ver. Axis 1" and "Ver. Axis 2" are displayed in individual lists.

Select the "Display" checkboxes (☑) for the channels to display.



The "display target setting area" provides the following information.

Item	Description
Checkbox	A channel with the checkbox selected (☑) is a summary target.
Color sample	The graph for the channel is displayed in this color.
Name	The name to identify each channel. By default, the string consisting of data type/serial no./unit no./data ID is entered.

The checkboxes can be hidden or displayed by switching the "Disp. Settings" selection in the "Disp." menu in the toolbar.

Changing the checkbox settings in the Display column updates the summary and shows the updated graph.

Important

- The maximum number of graphs that can be displayed at one time is 25 per axis.

(3) Changing Display Period

Change the display period setting on the graph's horizontal axis (time axis) in the "Display period setting area".

Five options: Minutely, Hourly, Daily, Monthly and Yearly are available. Upon selecting the option, the data summary is performed again.

Displayed Period

☐ Minutely
 ☐ Hourly
 ☒ Daily
 ☐ Monthly
 ☐ Yearly

The horizontal axis range and summary unit vary depending on the display period as follows:

Display period	Axis range	Summary unit
Minutely	1 minute	No summary
Hourly	1 hour	1 minute
Daily	1 day	1 minute/30 minutes/60 minutes (Selectable)
Monthly	1 month	30 minutes/60 minutes/1 day (Selectable)
Yearly	1 year	1 day/1 month (Selectable)

(4) Specifying Summary Unit (Time Unit to Display Summary in Graph)

Specify the time unit (summary unit) for graph display in the summary unit setting area.

Aggregation

for 30 minutes ▼

The following summary unit options are available depending on the display period specified in step (3):

Display period	Summary unit setting	Default setting
Minutely	No summary	No summary
Hourly	1 minute	1 minute
Daily	1 minute/30 minutes/1 hour	1 hour
Monthly	30 minutes/1 hour/1 day	1 day
Yearly	1 day/1 month	1 month

The following shows the summary procedure for each summary unit option:

Summary unit	Summary procedure for graph display
No summary	Plot all the momentary values
1 minute	"00": Plot the sum of the momentary values starting from 00 min. 00 sec. to immediately before 01 min. 00 sec.
30 minutes	"0": Plot the sum of the momentary values starting from 0 hour 00 min. 00 sec. to immediately before 0 hour 30 min. 00 sec. "30": Plot the sum of the momentary values starting from 0 hour 30 min. 00 sec. to immediately before 1 hour 00 min. 00 sec.
1 hour	"0": Plot the sum of the momentary values starting from 0 hour 00 min. 00 sec. to immediately before 1 hour 00 min. 00 sec.
1 day	"1": Plot the sum of the momentary values starting from 0 hour 00 min. 00 sec. of the day to immediately before 0 hour 00 min. 00 sec. of the next day.
1 month	"1": Plot the sum of the momentary values starting from 0 hour 00 min. 00 sec. of the first day of the month to immediately before 0 hour 00 min. 00 sec. of the first day of the next month.
1 year	"2011": Plot the sum of the momentary values starting from 0 hour 00 min. 00 sec. of the Jan. 1st of the year to immediately before 0 hour 00 min. 00 sec. of the Jan. 1st of 2012.

(5) Specifying Display Date and Time

To specify the date and time for the graph display, select "Date/time" in "Graph Setting". The shown button and combo box options vary depending on the selected display period.

●Minute:


 A UI element for selecting a specific minute. It consists of a left arrow button, a dropdown menu showing '2011', a slash separator, a dropdown menu showing '06', a slash separator, a dropdown menu showing '17', a dropdown menu showing '13', a colon separator, a dropdown menu showing '00', and a right arrow button.

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.

●Hour:


 A UI element for selecting a specific hour. It consists of a left arrow button, a dropdown menu showing '2011', a slash separator, a dropdown menu showing '06', a slash separator, a dropdown menu showing '17', a dropdown menu showing '13', and a right arrow button.

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

●Day:


 A UI element for selecting a specific day. It consists of a left arrow button, a dropdown menu showing '2011', a slash separator, a dropdown menu showing '06', a slash separator, a dropdown menu showing '17', and a right arrow button.

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

●Month:


 A UI element for selecting a specific month. It consists of a left arrow button, a dropdown menu showing '2011', a slash separator, a dropdown menu showing '06', and a right arrow button.

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

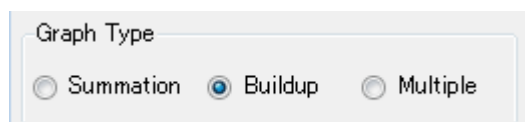
●Year:


 A UI element for selecting a specific year. It consists of a left arrow button, a dropdown menu showing '2011', and a right arrow button.

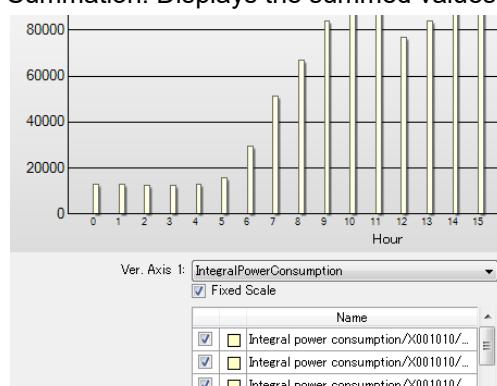
Select year in the combo box. The previous year and next year can be selected by using the buttons.

(6) Switching Bar Graph Type

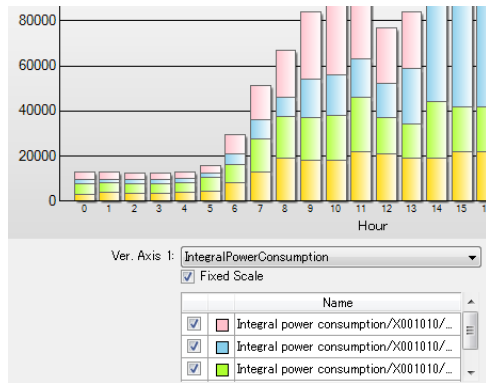
The graph type can be changed for energy data displayed in a bar graph. Select the type from three types: summation, stacked, and grouped bar graphs in the "Graph Type" area.


 A UI element for selecting the graph type. It is titled 'Graph Type' and contains three radio buttons: 'Summation', 'Buildup' (which is selected), and 'Multiple'.

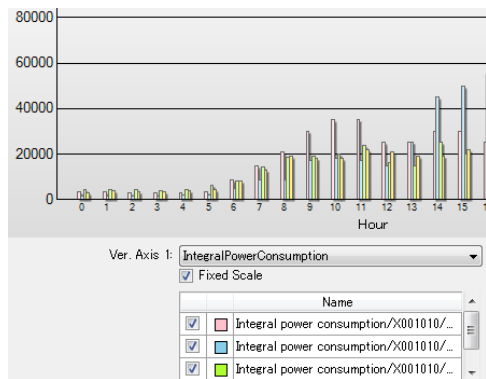
●Summation: Displays the summed values of selected channel values.



- **Buildup:** Stacks the summed values of selected channel values in different colors.



- **Compare:** Displays the selected channel values independently side-by-side.

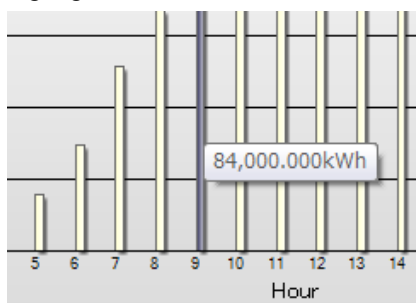


Note

- Temperature, particle, momentary 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.

(7) Switching to Detailed View

The graph display can be viewed in detail. Move the mouse over a specific measurement point on the displayed bar graph or line graph. The corresponding portion of the graph is highlighted and the value in the time range is shown in a tooltip.



Double-clicking the selected portion (while it is highlighted) displays a detailed graph image of the time range.(*) (Drill-down function)

The original window (recorded in the window history) can be accessed by clicking the "Back" button from the drilled-down graph window.

The drill-down function is only enabled when the default summary unit is specified for the selected display period. For example, since the default summary unit for the display period of "year" is "month", "month" must be selected to enable the drill-down function.

*: Not available for the "Hour" setting in "Display period".

(8) Fixing Scales

Specify whether the scale interval for each vertical axis automatically changes according to the displayed data, or fixed to the current representation. Select the "Fixed Scale" Checkbox to use the fixed scale.



Select the checkbox (☑) to fix the scale to intuitively check the amount of value variations when continuously changing the display date and time, or repeatedly displaying/hiding the channel display.

If the logarithmic representation is selected (☑) in "Data Type Setting" window, it is impossible to fix the scale.

(9) Hiding Areas from Display**[1] Hiding "Summary Area"**

Click the "Disp. Summary Area" in the "Disp." menu.

[2] Hiding "Display Target Selection Area"

Click the "Disp. Settings" in the "Disp." menu.

(10) Checking Window History

Multi Data Viewer provides the history of up to 16 windows previously displayed.


If any windows are recorded in the history, the "Previous" and "Next" buttons at the left end of the toolbar are enabled.



Use these buttons to access previously displayed windows.

(11) Mouse Operation of Graph Area

The following shows the graph operation in the graph area available by using the mouse:

Function	Operation	Description
Data display in tooltip	Point with the mouse	The color of the pointed graph changes. The pointed graph data value is shown.
Zoom in	Drag the area	The area is encircled in light gray. The area in the graph is magnified in the X-axis direction to include the points from the left drag start to the release, as well as their immediately preceding and following points in the view. Change the graph display setting to cancel the zoomed-in view.
Zoom out	Right-click on the zoomed-in view, or click the  button on the left of the scroll bar shown at the bottom of the graph area	Returns to the original magnification ratio before zoom-in.
Scroll	Scroll the scroll bar at the bottom of the graph area to the left or right	The graph area view shifts in the direction the scroll bar is moved.

3.7.3 Displaying Summary Note

The summary area shows a summary note of the displayed data in numerical values.

IntegralPowerConsumption	
Total Amount:	1,443,450.000 kWh
Fee:	33,199,350.00 YEN
CO2 Emission:	453.96503 t-CO2

The values specified in "Setting" are used as the coefficients to summarize "Rate" and "CO₂ emissions".

Specify if the following summary values are displayed for data other than energy data.

Display item	Description
Summary value	The value obtained by the "Summary method" specified in "Data Type Setting" with the Setting Tool. Example: When the data summary method for the "Temperature" data type is set to "Average", the average value is displayed.

Note

- Specify whether each data is "energy data" or not in "Data Type Setting" with Setting Manager beforehand.

3.8 Comparing with Data at Different Date/Time

Multi Data Viewer provides comparison display of different date and time data in the same DB.

3.8.1 Opening Comparison Window

Follow the steps below to open the Comparison Window.

- (1) Click the "Compare With Previous Data" button in the "Tool" menu in the Main Window toolbar.
- (2) The "Comparison Window" appears to show the currently displayed "summary data" as the "comparison source" and specific previous data in the same DB as the "comparison target". The window uses the same display settings (display period, summary unit, data type, and scale fixing) as used by the Main Window at the time the " Compare With Previous Data " button is clicked.

3.8.2 Closing Comparison Window

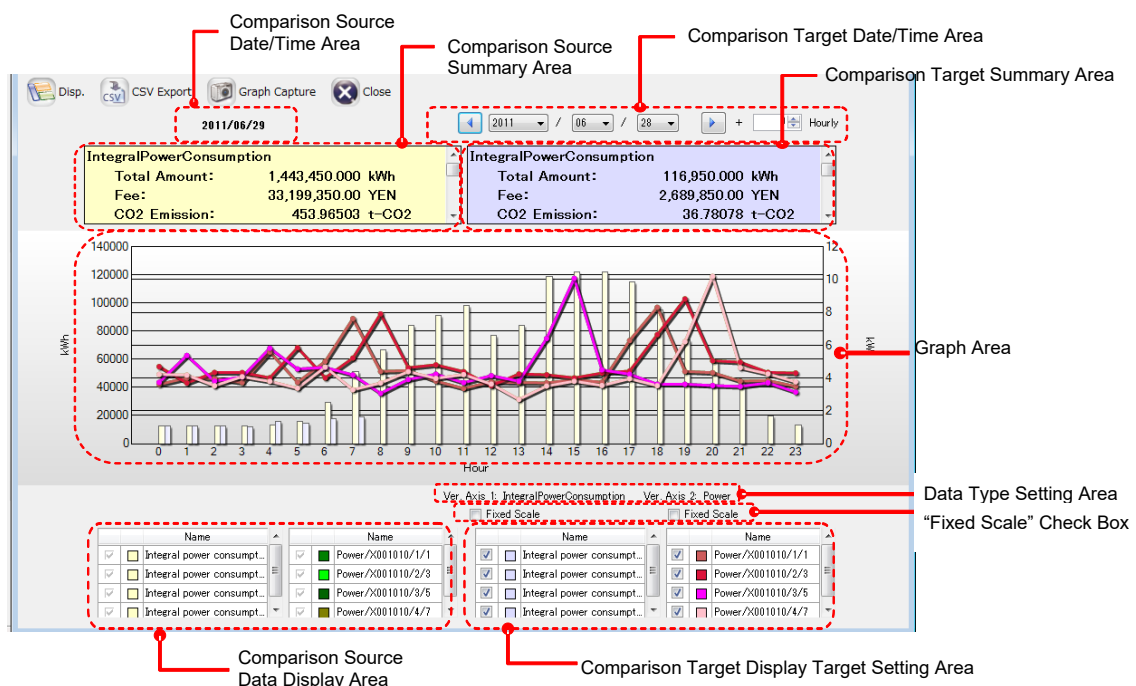
Follow the steps below to close the Comparison Window.

- (1) Click the "Close" button in the toolbar in the Comparison Window. The window closes and the Main Window returns.

3.8.3 Comparison Window Configuration

Use this window to compare the displayed data (comparison source) with another data (comparison target) of different date and time.

The window comprises the comparison source summary/data display area at the left and comparison target summary/display target setting area at the right, as shown below:



Section name	Description
Comparison source date/time display area	Shows the date/time of the comparison source graph.
Comparison source summary area	Shows the summary of the comparison source graph.
Comparison target date/time area	Shows the date/time of the comparison target graph.
Comparison target summary area	Shows the summary of the comparison target graph.
Graph area	Displays comparison source and target summary graphs according to the settings shown below the graph area. <ul style="list-style-type: none"> • The window does not display any comparison target graph if the comparison target data does not include the data type of the selected main screen. • The bar graphs in the Comparison Window are available only in the summation type.
Data type setting area	The data types to plot in the graph area can be individually specified for vertical axes 1 and 2. The same type cannot be specified for axes 1 and 1.
"Fixed Scale" Check Box	Specify if the scale intervals for vertical axes 1 and 2 automatically change according to the displayed data or remain unchanged (fixed).
Comparison source data display area	Shows the list of comparison source data, and the data of graph displayed.
Comparison target display target setting area	Shows the list of comparison target data, and select the data to plot in the graph area.

- The comparison source data date/time setting and display target setting are automatically fixed to the values specified for the Main Window at the time the "Compare with DB" button is clicked.
- The comparison target data date/time is automatically set to the value immediately preceding to the date/time of the data displayed in the Main Window. (If the display period is "Day" and the Main Window data is dated Dec. 20, the comparison target data date is Dec. 19; if the display period is "Hour" and Main Window shows the 13:00 data, the target data time is 12:00.)

(1) Displaying Comparison Source

The comparison source data display area shows the same information as the comparison source summary data displayed in the Main Window at the time the Comparison Window is started.

The Comparison Window does not provide display condition settings. To change the settings, return to the Main Window, and start the Comparison Window again after completing necessary settings.

(2) Selecting Comparison Target

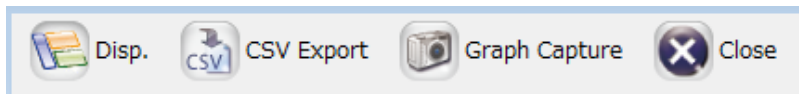
Specify the display conditions used to plot summary data with different conditions as the comparison target. The operation is similar as the display condition setting procedure in the Main Window.

The Comparison Window does not provide the graph type and display period settings. To change the settings, return to the Main Window, and start the Comparison Window again after completing necessary settings.

The comparison target can change the time to overlap the graph of comparison target and comparison source by adjusting the last offset value of comparison destination date and time setting area

3.8.4 Comparison Window Toolbar Functions

Some functions assigned to the Comparison Window toolbar are different from the Main Window toolbar.



Clicking the toolbar icons executes the following functions:

Icon		Function
Disp.	Disp. Summary Area	Switches to display or hide the summary area.
	Disp. Settings	Switches to display or hide data type setting area, 'fix scale' check box and display target setting area.
CSV Export		Use this to output the data (extracted from the currently open "summary data" DB) for specified period, channels, and summary unit, in a CSV file with the "summary data" structure.
Graph Capture		Copies the displayed graph image to the clipboard.
Close		Closes the Comparison Window and return to the Main Window.

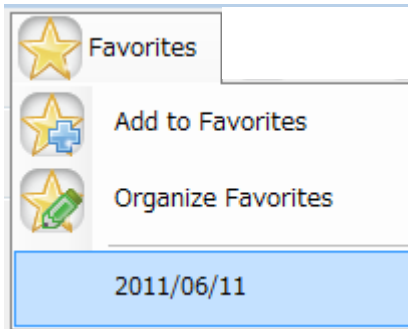
3.9 Other Operating Features

3.9.1 Saving Data in "Favorites"

Clicking "Add to Favorites" attaches a mark to a channel or channel folder enabling the user to access the data later at one click.

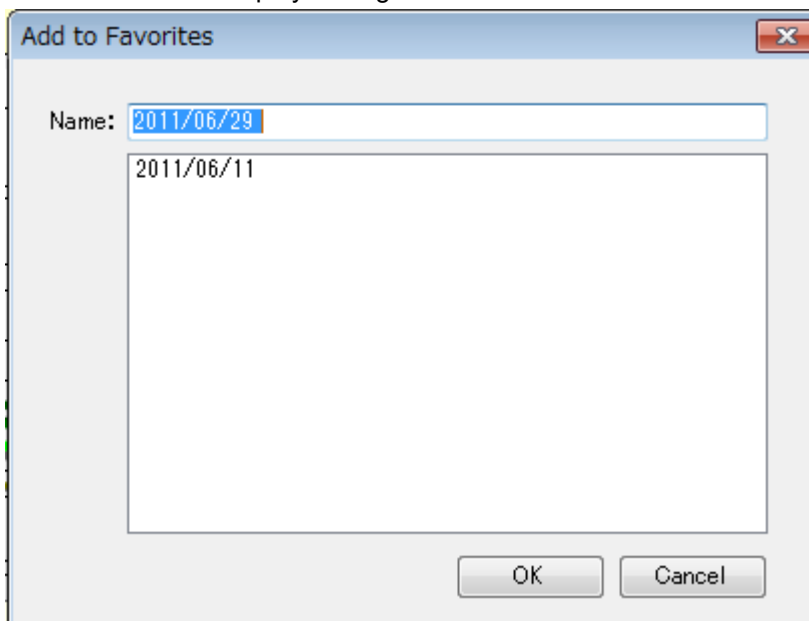
The channels added to "Favorites" are listed below the last "Favorites" menu item on the menu bar.

The "Favorites" data is saved in the PC and cannot be shared.



(1) Adding to Favorites

Click "Add to Favorites" in the "Favorites" menu. Multi Data Viewer saves the channel being accessed and the display settings in the PC.



Enter the name for the new "Favorites" data in the "Name" area.

The data names already registered are shown in the list area below the "Name" box.

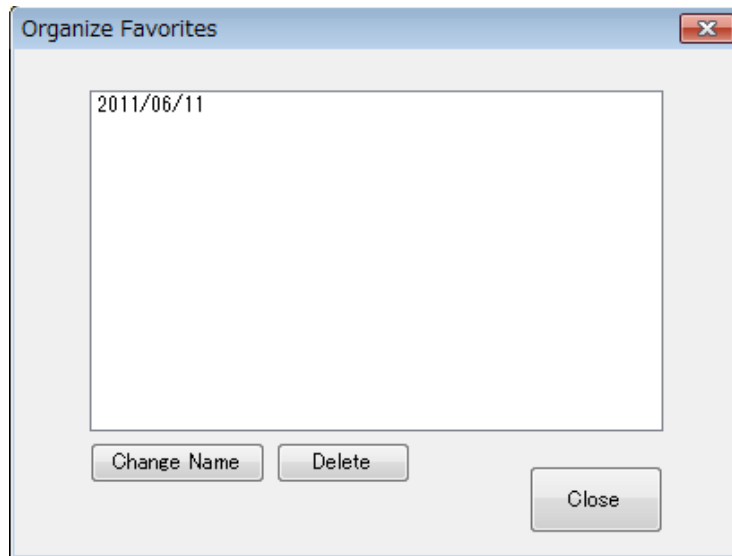
Click the "OK" button to add the data to registration. The added data name is shown below the last item in the list.

Important

- The "Favorites" data can be registered up to 10 items.

(2) Organizing Favorites

Click "Organize Favorites" in the "Favorites" menu. The "Organize Favorites" window appears.



Using this window, the user can edit the names of data items or delete data items registered in "Favorites".

To change the data name, select the data in the list and click the "Change Name" button, then enter a new name.

Select the data items to delete and click the "Delete" button. The selected data is removed from "Favorites".

3.9.2 Outputting Summary Data in CSV Format

The summary data currently viewed can be output in a CSV file with the same conditions and display settings (as those used in the current viewing). This facilitates analysis of the data using other spreadsheet software.

For "CSV Export", the user can specify not only the CSV file destination folder and file name, but also other items including the output type, output period, summary unit, and output channels.

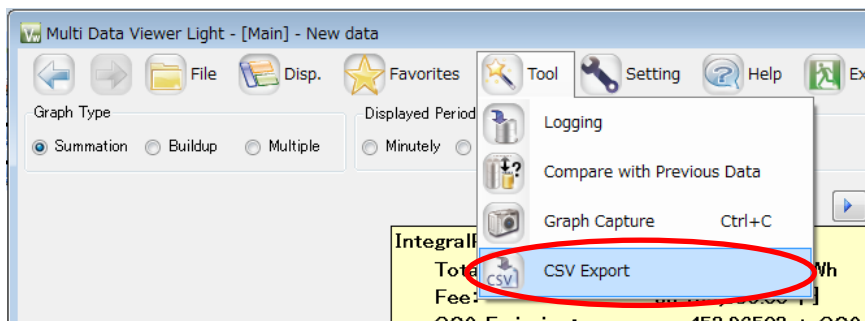
Important

- When reading the integrated values of multiple consecutive days with the CSV import function and outputting the data, the data before 0:00 is output as zero.

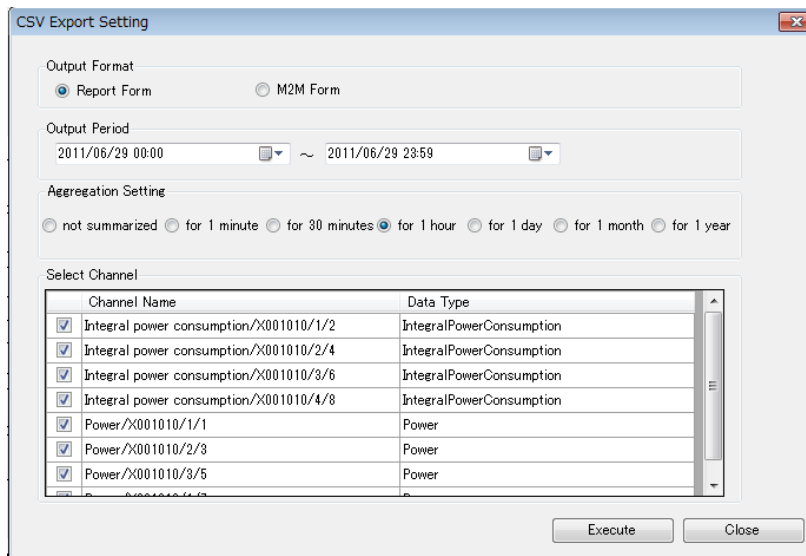
Note

- Please note that the CSV files output in "CSV Export" in the "Tool" menu and those imported in "CSV import" in the "File" menu are not compatible. The first files contain summary data ("summary files") and the latter, logging data ("collected files").

- (1) Click the "CSV Export" button in the "Tool" menu in the toolbar.



- (2) The "CSV Export Setting" window appears.



Item	Description
Output Format	Select the data format used to output a CSV file. Refer to the format description in a later section for the output data format in 3.12. Multi Data Viewer CSV Output Data Format.
Output Period	Specify the data period for CSV Export. Click the calendar icons in the date boxes to specify the period.
Aggregation setting	Specify the data summary unit for CSV Export.
Select Channel	Select the channels for CSV Export using the checkboxes. All the checkboxes are selected (<input checked="" type="checkbox"/>) by default.

- (3) Select the data to output and the save destination, then click the "Execute" button.

The summary data is output in a CSV file.

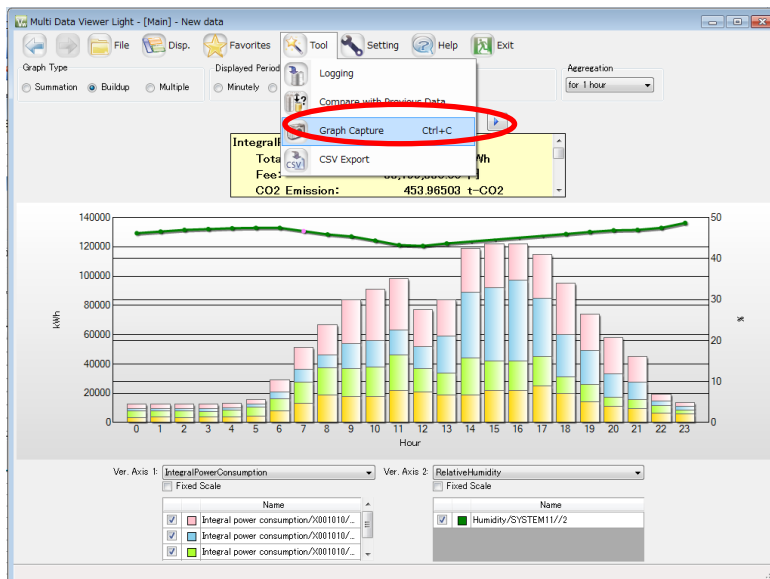
- (4) The save destination selection window appears. Specify the save destination folder and file name, then click "OK".

- (5) Click "Close" button in "CSV Export Setting" window, and the window is closed.

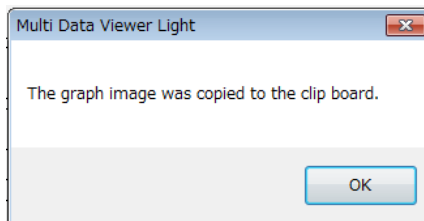
3.9.3 Outputting Graph Image to Clipboard

The user can copy the currently displayed graph image to the clipboard.

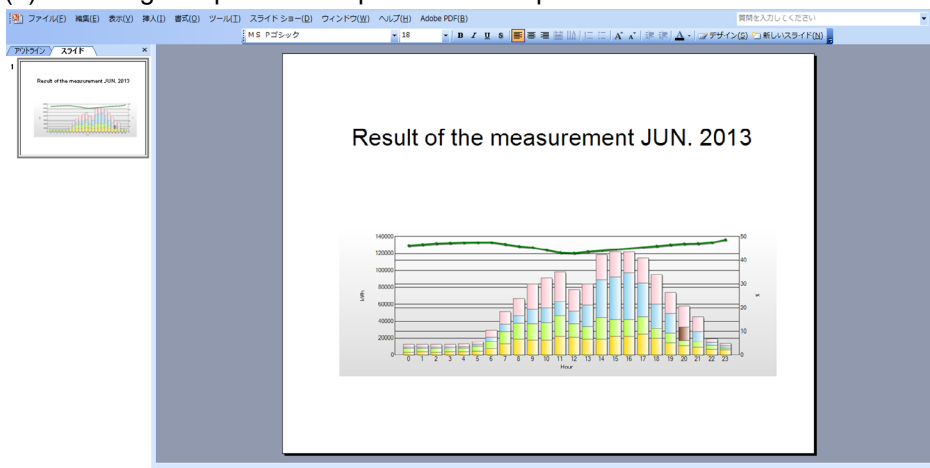
(1) Display the graph image to capture. Click "Graph Capture" in the "Tool" menu in the toolbar.



(2) Multi Data Viewer outputs the graph image to the clipboard and displays the confirmation window.



(3) The image output to the clipboard can be pasted in other software.



3.9.4 Setting Multi Data Viewer

(1) Viewer Setting

Click the "Setting"



button in the toolbar in the Main Window.

The "Viewer Setting" window appears.

Setting item	Description
Automatic connection Setting	Specify if Multi Data Viewer automatically opens the last displayed data next time it is started.
Graph display Setting Legend/data type	Specify if a legend for the graph is displayed. Also specify if the legend includes the "Data type" specified in the channel setting, when the legend is displayed.
CSV Export/Character Set setting	Specify the CSV file character encoding for CSV Export.
Fee Conversion Factor Setting	Specify the rate conversion coefficient. The sum of integrated powers is multiplied by this coefficient to obtain the rate value displayed in the summary area.
CO ₂ Conversion Factor Setting	Specify the CO ₂ conversion coefficient. The sum of integrated powers is multiplied by this coefficient to obtain the CO ₂ value displayed in the summary area.

Click the "OK" button after changing Viewer settings. The Main Window returns. Click the "Cancel" button to abort the settings.

(2) Data Type Setting

Click the "Setting" button in the data type setting area at the bottom of the "Viewer setting" window. The "Data type setting window" appears enabling the user to specify data types.

Data Type Name	Unit	Deci. Digits	Logarithm	Energy Data
IntegralPowerConsumption	kWh	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Temperature	°C	1	<input type="checkbox"/>	<input type="checkbox"/>
RelativeHumidity	%	1	<input type="checkbox"/>	<input type="checkbox"/>
DewPoint	°C	1	<input type="checkbox"/>	<input type="checkbox"/>
DifferentialPressure	Pa	1	<input type="checkbox"/>	<input type="checkbox"/>
Pressure	kPa	3	<input type="checkbox"/>	<input type="checkbox"/>
LargeParticle		0	<input type="checkbox"/>	<input type="checkbox"/>
MiddleParticle		0	<input type="checkbox"/>	<input type="checkbox"/>
SmallParticle		0	<input type="checkbox"/>	<input type="checkbox"/>
1.0umParticle		0	<input type="checkbox"/>	<input type="checkbox"/>
0.5umParticle		0	<input type="checkbox"/>	<input type="checkbox"/>
0.3umParticle		0	<input type="checkbox"/>	<input type="checkbox"/>
Illuminance	lx	0	<input type="checkbox"/>	<input type="checkbox"/>
CO2Density	ppm	0	<input type="checkbox"/>	<input type="checkbox"/>
EnergyConsumptionRate	kWh/	3	<input type="checkbox"/>	<input type="checkbox"/>
Power	kW	4	<input type="checkbox"/>	<input type="checkbox"/>

Item	Description
Data Type Name	Displays the data type description. System-defined names cannot 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 Digits	The significant digit for the data type. Values are rounded at this digit for graph and summary area displays.
Logarithm	Specifies if the vertical axis is represented in logarithm when displaying data of the data type. Select the checkbox (☑) for logarithmic representation.
Energy Data	Specifies if the rate and CO ₂ emission level are displayed in the summary area. If this is selected, the rate and CO ₂ emissions values are displayed. System-provided data cannot be edited or deleted.

To add a new data type, enter it below the last line of the list.

For data type editing, select the registered item and edit its data type.

Clicking the "OK" button returns the "Viewer setting" window.

Clicking the "Cancel" button aborts the settings and closes the window.

(3) Channel Setting

Click the "Setting" button in the channel setting area at the bottom of the "Viewer setting" window. The "Channel setting window" appears enabling the user to modify the contents of the channel settings.

Device ID	Channel Address	Measurement Type	Channel Name	Data Type	Conversion Factor
X001010	1/1	Power	Power/X001010/1/1	Power	1
X001010	1/2	Integral power co...	Integral power consumption/X001010/1/2	IntegralPowerCo...	1
X001010	2/3	Power	Power/X001010/2/3	Power	1
X001010	2/4	Integral power co...	Integral power consumption/X001010/2/4	IntegralPowerCo...	1
X001010	3/5	Power	Power/X001010/3/5	Power	1
X001010	3/6	Integral power co...	Integral power consumption/X001010/3/6	IntegralPowerCo...	1
X001010	4/7	Power	Power/X001010/4/7	Power	1
X001010	4/8	Integral power co...	Integral power consumption/X001010/4/8	IntegralPowerCo...	1
SYSTEM11	/1	Temperature	Temperature/SYSTEM11//1	Temperature	1
SYSTEM11	/2	Humidity	Humidity/SYSTEM11//2	RelativeHumidity	1

Item	Description
Device ID	Displays the measurement device name.
Channel Address	Displays the address to identify the channel.
Measurement Type	Displays the data type of the measured data.
Channel Name	Displays the channel name. Edit this item to change the displayed channel name.
Data Type	Select the type of the channel data in the list.
Conversion Factor	The specified factor is multiplied to measurement data. Measurement data is overwritten by the data after multiplication. If input a wrong factor, input a correct coefficient after importing CSV data again or backing up the data file (extension XDB) of DB.

Clicking the "OK" button returns the "Viewer Setting" window.

Clicking the "Cancel" button aborts the settings and closes the window.

3.10 Multi Data Viewer CSV Output Data Format

This section describes the data structure of CSV files output by executing "CSV Export" in the "Tool" menu in the Main Window. The following shows the summary data file (summary file) structure.

Item	Description
Extension	.csv (all files)
Character code	Uses the character code specified in "CSV export setting" in the "Viewer setting" window.
Measurement Type	Displays the data type of the measured data.
Default file name	<Start date/time> - <End date/time>.csv"
Data type	Select the type of the channel data in the list.

3.10.1 Report Type File Data Structure

The following shows the "Report type" CSV data structure output by executing "CSV Export" in the "Tool" menu in the Main Window. The file uses a commonly-used CSV format.

(1) Header Section

DATE, TIME, MSEC, <Channel Name> (<Unit 1>)(<Data type name 1>),...
--

Item	Description
DATE	Export the data of "DATE".
TIME	Export the data of "TIME".
MSEC	Export the data of "MSEC".
<Channel Name {n}>	The channel name specified by the user with the server.
<Unit {n}>	The unit of the data type (specified for each recording device) of the nth data displayed in the graph (The value specified for the "Unit row" in the data type setting window. "-" is output if the data has no unit.).
<Data type name {n}>	The value specified in the "Data type" row in the channel setting window, output for the nth data.
<SP>	A half-width space used as a character.

{n}: The number of recording devices.

(2) Data Section

<Year-Month-Day>,"<Time>","<Millisecond>","<Value 1>","...
.....

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. "00" is output for a time value smaller than the non-displayed period. For example, if the display period is "Day" (summary unit: 30 minutes), only "00" or "30" are output for the minute value. The second value is fixed to "00".
<Millisecond>	The millisecond value of the displayed graph. Output in the "000" format. "000" is fixed to the value if the graph does not display momentary values.
<Value {n}>	The value corresponding to the header of the displayed graph. Any of the following values: PI...Integrated value, AVE...Average value, MAX...Maximum value, and MIN...Minimum value "0" is output for PI, if SUMMARY_TYPE is other than INTEGRAL (Same as the graph area display).

{n}: The number of recording devices.

The following shows concrete examples:

```
[Example 1] Display period is "Day" (Summary unit: 30 minutes) in the Main Window
DATE,TIME,MSEC,Integrated power
consumption1(kWh)(INTEGRAL_POWER_CONSUMPTION),Integrated power
consumption2(kWh)(INTEGRAL_POWER_CONSUMPTION),Temperature (°C) (TEMP)
2011/06/06,00:00:00,000,22.43,12.01,18.4
2011/06/06,00:30:00,000,20.21,11.89,18.4
2011/06/06,01:00:00,000,22.12,10.73,18.3
2011/06/06,01:30:00,000,20.03,10.24,18.2
...
2011/06/06,23:30:00,000,21.48,11.96,18.5
```

```
[Example 2] Display period is "Hour" in the Main Window
DATE,TIME,MSEC, Integrated power
consumption1(kWh)(INTEGRAL_POWER_CONSUMPTION), Integrated power
consumption2(kWh)(INTEGRAL_POWER_CONSUMPTION),Temperature(°C)(TEMP)
2011/06/06,12:00:00,000,22.43,12.01,18.4
2011/06/06,12:01:00,000,20.21,11.89,18.4
2011/06/06,12:02:00,000,22.12,10.73,18.3
2011/06/06,12:03:00,000,20.03,10.24,18.2
...
2011/06/06,12:59:00,000,21.48,11.96,18.5
```

3.10.2 M2M Type File Data Structure

The following shows the CSV file data structure for "M2M type" output by executing "CSV Export" in the "Tool" menu in the Main Window. The M2M type is a standard data format used by OMRON's tools. Each line starts with a string representing the definition of the line.

(1) Header Section

The following shows the file data structure output in the "All data" mode:

Header Section (Line 1)

```
HEAD,DATE,TIME,"<Data type name 1>(<Unit 1>(<Recording device name 1>[_KM<Unit
No. 1>]<SP>< Summary type 1><Measurement target channel ID 1>),"...
```

The section enclosed by brackets ([]) is output only for the data recorded with KMX.

Item	Description
HEAD	The header line.
DATE	Export the data of "DATE".
TIME	Export the data of "TIME".
<Data type name {n}>	The data type of the nth data.
<Unit {n}>	The unit for the nth data.
< Recording device name {n}>	The channel name from which the nth data is output.
<Unit No. {n}>	The unit No. from which the nth data is output.
<Summary type {n}>	Outputs the summary method used to summarize the nth data. PI... Integrated Value, AVE... Average Value, MAX... Maximum Value, MIN... Minimum Value. Integrated values are only used for integrated power consumption or pulse data outputs.
<Measurement target channel ID{n}>	Data ID output by the nth sensor.
<SP>	A half-width space used as a character.

(2) Data Section

Data Section (Line 2 and thereafter)

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

Item	Description
DATA	The DATA line.
<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 sensor at that time.

[Example 3]

```
HEAD,DATE,TIME,"Integrated power consumptionN(kWh)(X001010_4/8 PI8)", "Integrated
power consumption(kWh)(X001010_3/6 PI6)", "Temperature(°C)(SYSTEM11_1 AI1)"
DATA,2011/06/29,00:00:00,3125,4575,21.7
DATA,2011/06/29,01:00:00,3650,4500,21.4
DATA,2011/06/29,02:00:00,3450,4250,21.2
DATA,2011/06/29,03:00:00,3600,4050,21
DATA,2011/06/29,04:00:00,3900,4350,20.8
```

3.10.3 Comparison Window CSV Output File Data Structure

The following shows the CSV file data structure output by executing "CSV Export" in the Comparison Window.

The user can output the data at a specified period, channel and summary unit in a CSV file from the currently open "summary data" DB.

(1) Header Section

```
DATE,TIME,MSEC,<Data type name (1) 1>(<Unit (1) 1>(<Channel Name (1) {n}>),...
DATE,TIME,MSEC,<Data type name (2) 1>(<Unit (2) 1>(<Channel Name (2) {n}>),...
.....
```

(1): Comparison source; (2): Comparison target

Item	Description
DATE	Export the data of "DATE".
TIME	Export the data of "TIME".
MSEC	Export the data of "MSEC".
<Data type name {n}>	The value specified in the "Data type" row in the channel setting window, output for the nth data.
<Unit {n}>	The unit of the data type (specified for each recording device) of the nth data displayed in the graph (The value specified for the "Unit row" in the data type setting window. "-" is output if the data has no unit.).
<Channel Name {n}>	The channel name specified by the user with the server.
<SP>	A half-width space used as a character.

{n}: The number of channels.

(2) Data Section

```
<Year-Month-Day>,<Time>,<Millisecond>,<Value (1) 1>,...
<Year-Month-Day>,<Time>,<Millisecond>,<Value (2) 1>,...
.....
```

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. "00" is output for a time value smaller than the non-displayed period. For example, if the display period is "Day" (summary unit: 30 minutes), only "00" or "30" are output for the minute value. The second value is fixed to "00".
<Millisecond>	The millisecond value of the displayed graph. Output in the "000" format. "000" is fixed to the value if the graph does not display momentary values.
<Value {n}>	The value corresponding to the header of the displayed graph. Any of the following values: PI...Integrated value, AVE...Average value, MAX...Maximum value, and MIN...Minimum value "0" is output for PI, if SUMMARY_TYPE is other than INTEGRAL (Same as the graph area display).

{n}: The number of channels.

Example 4] The display period is "Year" in the Comparison Window
DATE,TIME,MSEC,Integrated power consumption(kWh)(1F, No.2 Building),Temperature(°C)(2F, No.2 Building),DATE,TIME,MSEC, Integrated power consumption(kWh)(1F, No.2 Building Temperature),Temperature(°C)(2F, No.2 Building Temperature)
2011/01/01,00:00:00,000,22.43,18.4,2010/01/01,00:00:00,000,12.01,20.5
2011/02/01,00:00:00,000,20.21,18.4,2010/02/01,00:00:00,000,11.89,20.4
2011/03/01,00:00:00,000,22.12,18.3,2010/03/01,00:00:00,000,10.73,20.4
2011/04/01,00:00:00,000,20.03,18.2,2010/04/01,00:00:00,000,10.24,20.3
...

[Example 5] The display period is "Minute" in the Comparison Window
DATE,TIME,MSEC,Integrated power consumption(kWh)(1F, No.2 Building),Temperature(°C)(2F, No.2 Building),DATE,TIME,MSEC, Integrated power consumption(kWh)(1F, No.2 Building Temperature),Temperature(°C)(2F, No.2 Building Temperature)
2011/06/06,12:04:00,000,22.43,18.4,2011/08/24,06:01:00,000,12.01,20.5
2011/06/06,12:04:01,000,20.21,18.4,2011/08/24,06:01:01,000,11.89,20.4
2011/06/06,12:04:02,000,22.12,18.3,2011/08/24,06:01:02,000,10.73,20.4
2011/06/06,12:04:03,000,20.03,18.2,2011/08/24,06:01:03,000,10.24,20.3
...
2011/06/06,12:04:59,000,21.48,18.5,2011/08/24,06:01:59,000,11.96,20.7

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 Compatible Data

The following data is available in SD Viewer ES.

Device	Measured data to PC by Setting Manager	Measured data recorded on the SD memory card by the device	Measured data transferred to PC with Clamp Logger Utility
ZN-THX11-S	N/A	Yes	N/A
ZN-THX21-S ZN-DPX21-S ZN-CTX21 ZN-KMX21	Yes	Yes	N/A
ZN-PD03-S ZN-PD50-S	Yes	N/A	N/A
D6FZ-FGX21	No	No	N/A
WZ-STH01 WZ-SL01 WZ-STHL01 WZ-SCD01 WZ-SP01 KM20-B40-FLK KM50-C KM50-E KM100 KM1-PMU1A KM1-PMU2A KM1-EMU8A KE1-CTD8E	No	N/A	N/A
ZN-CTC11 ZN-DCC11	N/A	N/A	Yes

N/A : The device does not support the data acquisition method.

4.3 Startup and Exit

4.3.1 Starting SD Viewer ES

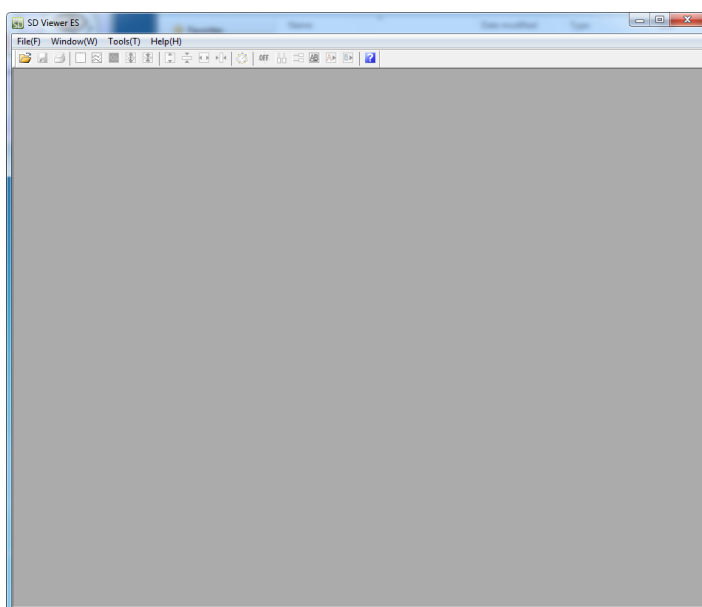
(1) Click the Multi Data Viewer shortcut on the Windows desktop or select "All Apps" - "OMRON" - "SD Viewer ES" (Windows 10) or "All programs" - "OMRON" - "Multi Data Viewer Light" - "SD Viewer ES" (Windows 7) from the Windows start menu.

(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 top-to-bottom displays.
	Save file	Saves acquisition data.. Multiple data items displayed in merged or top-to-bottom 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.

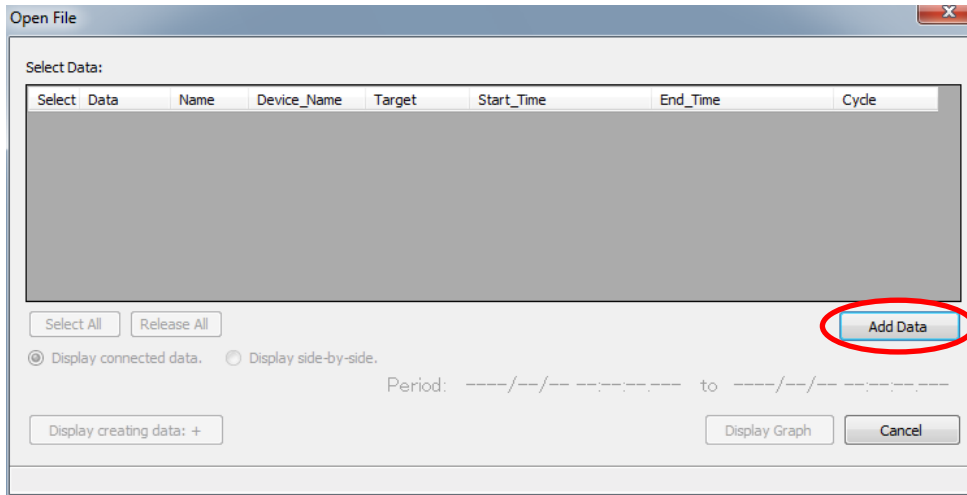
The exit confirmation window appears if any displayed data (e.g. merged display data) has not been saved.

To remove the SD memory card from the card slot, follow the removal procedure provided by the PC.

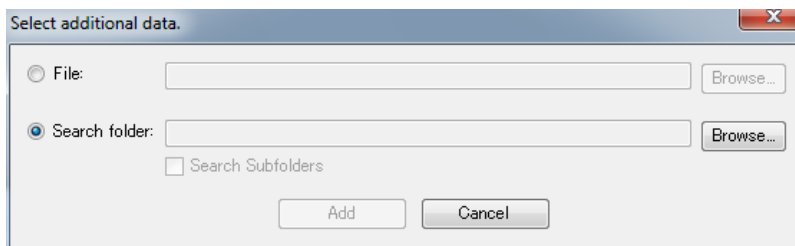
4.4 Open File and Save File

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.

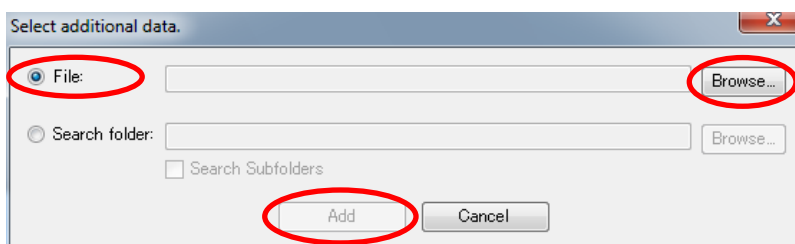


- (2) Specify the acquisition data in the "Additional Data Selection" window.



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.

● Main Window

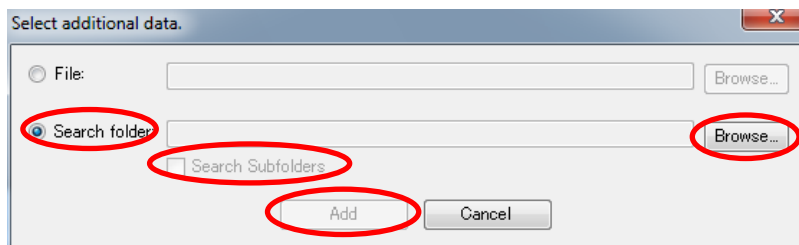


Select the "Specify File" option and click the "Browse" button to specify the file in the Logging Tool recording data folder, which is displayed by selecting "Detailed Settings" - "Save Destination Setting".

(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.



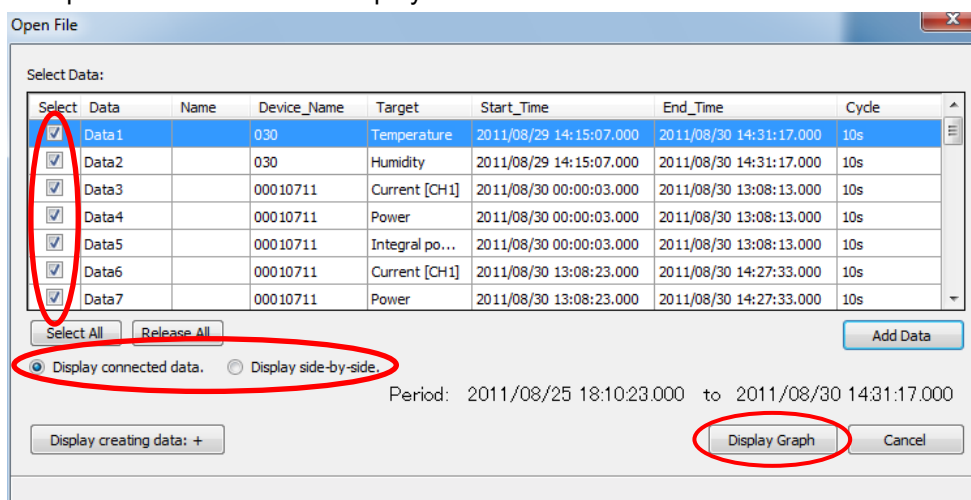
Select the "Search Folder" option and click the "Browse" button to specify the drive assigned to the SD memory card (e.g. E:). Make sure that the "Search Subfolders" option is selected and click the "Add" button.

(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 side-by-side when selecting multiple items.

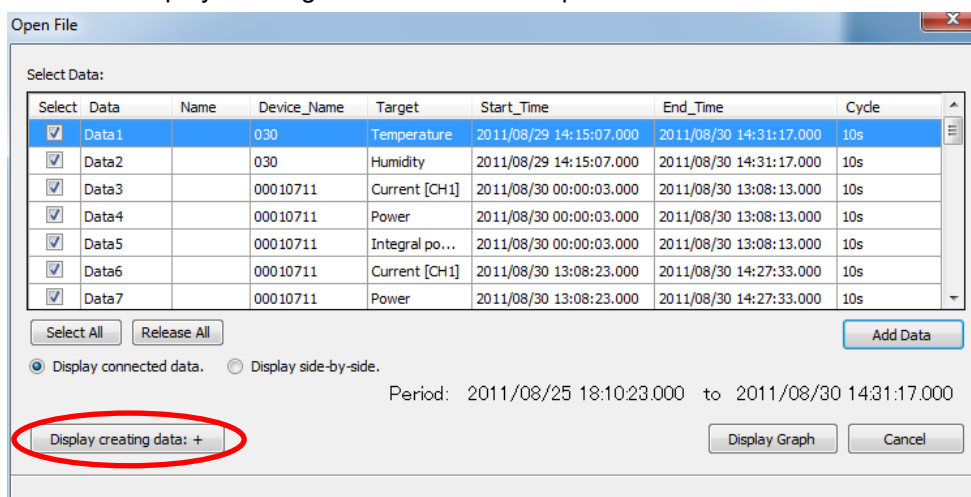
Click the "Display Graph" button to display the selected data in graph.

● Open File Window with "Display Created Waveform" item folded



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 side-by-side		Selected multiple data items can be displayed top-to-bottom 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.

Click the "Display creating data: +" button to expand the window.



● Open File Window with "Display Created Waveform" item unfolded

Open File

Select Data:

Select	Data	Name	Device_Name	Target	Start_Time	End_Time	Cycle
<input checked="" type="checkbox"/>	Data1		030	Temperature	2011/08/29 14:15:07.000	2011/08/30 14:31:17.000	10s
<input checked="" type="checkbox"/>	Data2		030	Humidity	2011/08/29 14:15:07.000	2011/08/30 14:31:17.000	10s
<input checked="" type="checkbox"/>	Data3		00010711	Current [CH1]	2011/08/30 00:00:03.000	2011/08/30 13:08:13.000	10s
<input checked="" type="checkbox"/>	Data4		00010711	Power	2011/08/30 00:00:03.000	2011/08/30 13:08:13.000	10s
<input checked="" type="checkbox"/>	Data5		00010711	Integral po...	2011/08/30 00:00:03.000	2011/08/30 13:08:13.000	10s
<input checked="" type="checkbox"/>	Data6		00010711	Current [CH1]	2011/08/30 13:08:23.000	2011/08/30 14:27:33.000	10s
<input checked="" type="checkbox"/>	Data7		00010711	Power	2011/08/30 13:08:23.000	2011/08/30 14:27:33.000	10s

Select All Release All Add Data

☒ Display connected data. ☐ Display side-by-side.

Period: 2011/08/25 18:10:23.000 to 2011/08/30 14:31:17.000

Hide creating data: - Display Graph Cancel

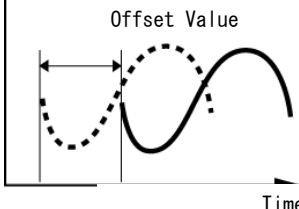
Waveforms to be created:

Waveform_Name	Device_Name	Target	Disp_Hi_Lmt	Disp_Lo_Lmt	Offset	Factor	Unit	Included_da
CH1	030	Temperature			00:00:00.0	1.0	°C	Data1
CH2	030	Humidity			00:00:00.0	1.0	%	Data2
CH3	00010711	Current [CH1]			00:00:00.0	1.0	A	Data3, Data6
CH4	00010711	Power			00:00:00.0	1.0	kW	Data4, Data7
CH5	00010711	Integral po...			00:00:00.0	1.0	kWh	Data5, Data8

Edit

Resampling cycle: 10s Number of waveforms after resampling: 209,430

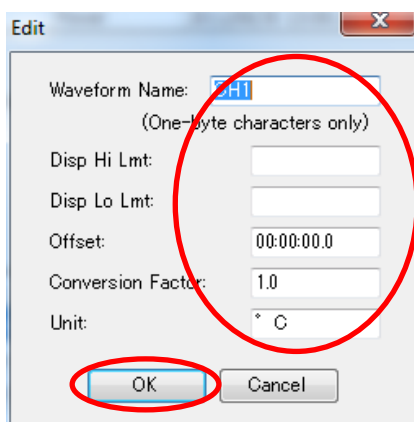
☐ Display integral power consumption channels.
☐ Sum all integral power consumption channels.

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	<p>The measurement time can be offset by incrementing or decrementing the time value to display acquisition data in a graph.</p>  <p>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</p>

Hide Created Waveform		Hides the "Created Waveform" list.
	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-resampling Display Items		Displays the number of data items after resampling.
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".

[1] 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.

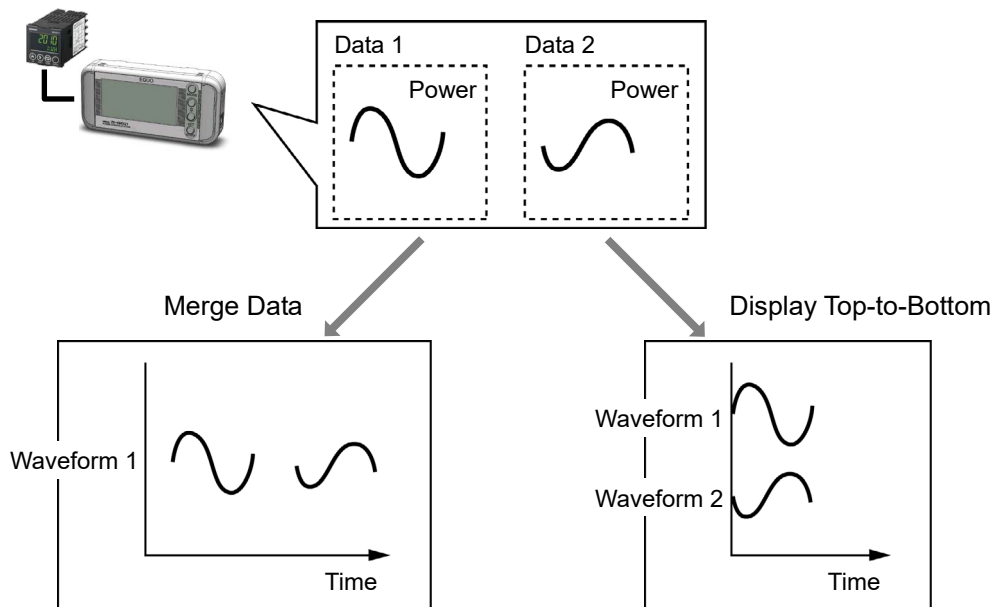
Data items for merge do not necessarily need to be consecutive. Blank periods are assigned with the "NO DATA" value.

[2] 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.

**[3] 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.

At this time, the waveform to be created is plotted at each resampling setting interval from the recording start time of the data which start time is old to the recording end time of the data which end time is new.

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.

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

Time	Measured Value
11:13:04	A1
11:13:14	A2
11:13:24	A3
11:13:34	A4

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

Time	Measured Value
11:14:12	B1
11:14:22	B2
11:14:32	B3

Automatically merge data
(Resampling interval: 10 sec.)

Created Waveform

Time	Measured Value
11:13:04	A1
11:13:14	A2
11:13:24	A3
11:13:34	A4
11:13:44	NO DATA
11:13:54	NO DATA
11:14:04	NO DATA
11:14:14	B1
11:14:24	B2

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

Time	Measured Value
11:13:04	A1
11:13:34	A2

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

Time	Measured Value
11:14:02	B1
11:14:22	B2
11:14:42	B3

Automatically merge data
(Resampling interval: 10 sec.)

Created Waveform

Time	Measured Value
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.

At this time, the waveform to be created is plotted at each resampling interval from 0:00:00 (relative time) to the long recording time.

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	Measured Value
11:13:04	A1
11:13:34	A2

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

Time	Measured Value
11:14:12	B1
11:14:32	B2
11:14:52	B3

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

Created Waveform A

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

Created Waveform B

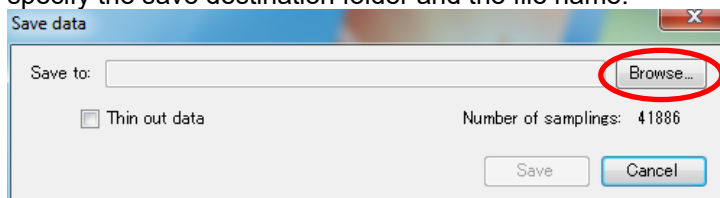
Time	Measured Value
0:00:00	B1
0:00:10	B1
0:00:20	B2
0:00:30	B2
0:00:40	B3

Figure: Top-to-Bottom Display Example

4.4.2 Saving Data

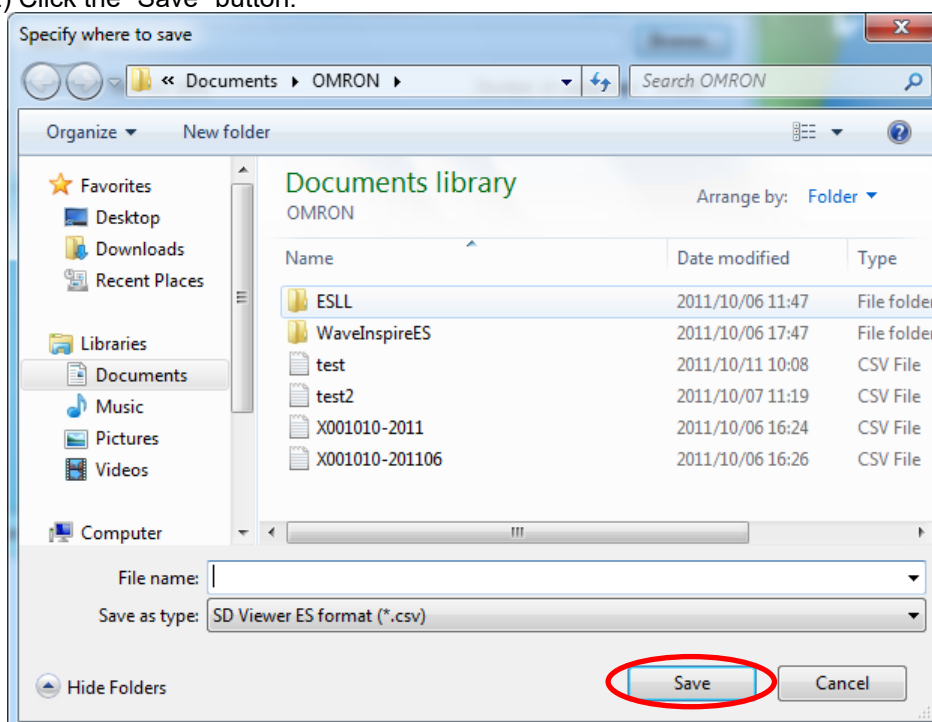
Multiple data items merged or displayed in a vertical arrangement can be saved as a single data file. Saved data files can be opened on SD Viewer ES.

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

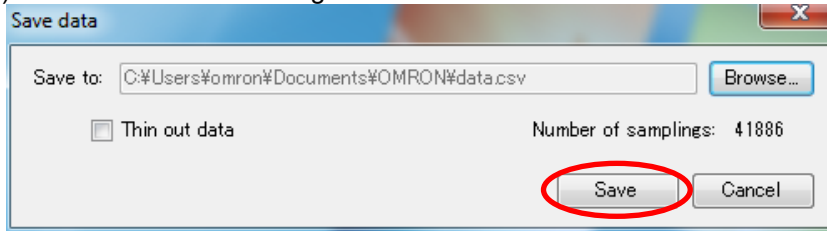


Item	Description
Save to	Browse the folder and the file name.
Browse	Browse the folder name and the file name.
Thin out Data	Select this to thin out the data for compression when saving.
Number of Samplings	Displays the number of data samples. If "Thin out Data" is selected, the number after thinning 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) Menu Bar
- (2) Acquisition Date
- (3) Sampling Interval
- (4) An Interval of Time for a Single Horizontal Scale
- (5) Waveform Name
- (6) Vertical Scales
- (7) Right-click Menu (Time scale setting and ON/OFF for max/min/average values display)

Menu Bar Item List

Item			Description
File	Open File		Opens acquisition data files. Multiple files can be specified for a merged or top-to-bottom display. The data already being displayed is closed.
	Save Data		Saves the acquisition data file. The data items in a merged or top-to-bottom 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.

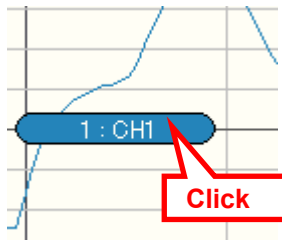
Item			Description
	Widen Spacing		Widens the spacing between waveforms.
	Vertical Enlargement		Enlarges all the waveforms or the selected waveforms in the vertical direction.
	Vertical Reduction		Reduces all the waveforms or the selected waveforms in the vertical direction.
	Horizontal Enlargement		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	- Changes 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
Time Scale Setting		 Used to set the graph time axis setting.
Display Max/Min/Ave		- 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.

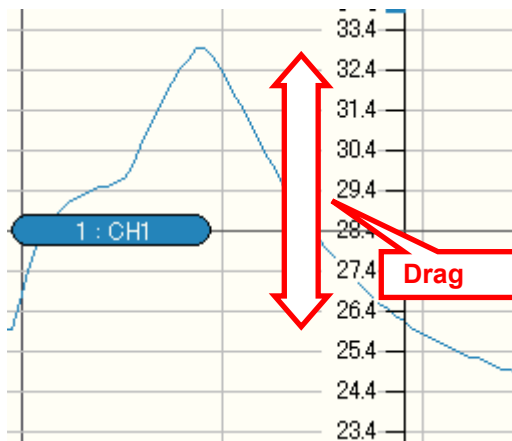
To cancel the selection, click anywhere off the waveform in the window.

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.

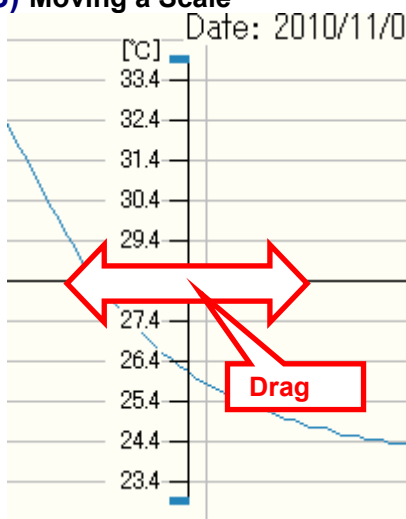
Use Tab key to select the next waveform.

(2) Moving Waveform

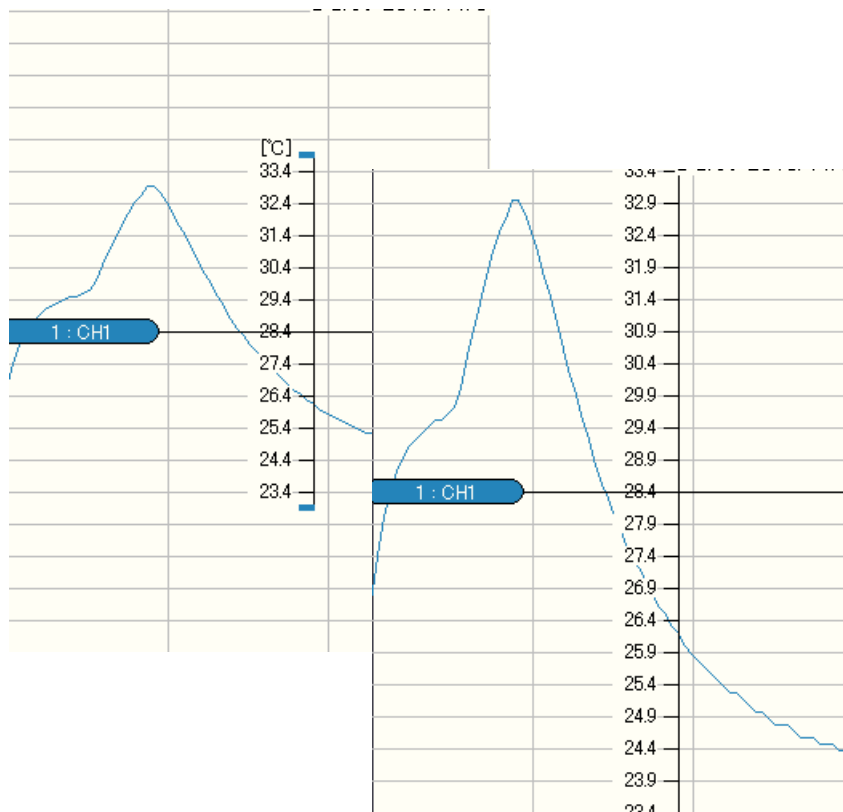


The selected waveform can be dragged to a desired location.

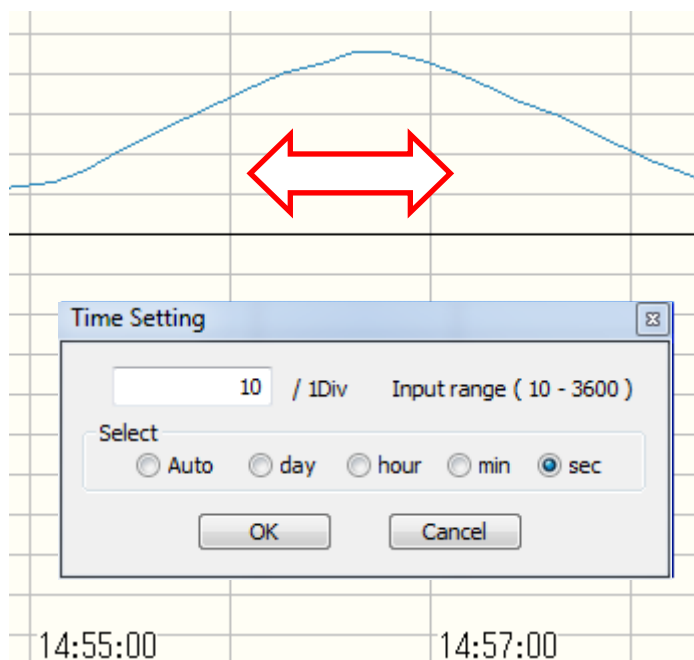
(3) Moving a Scale



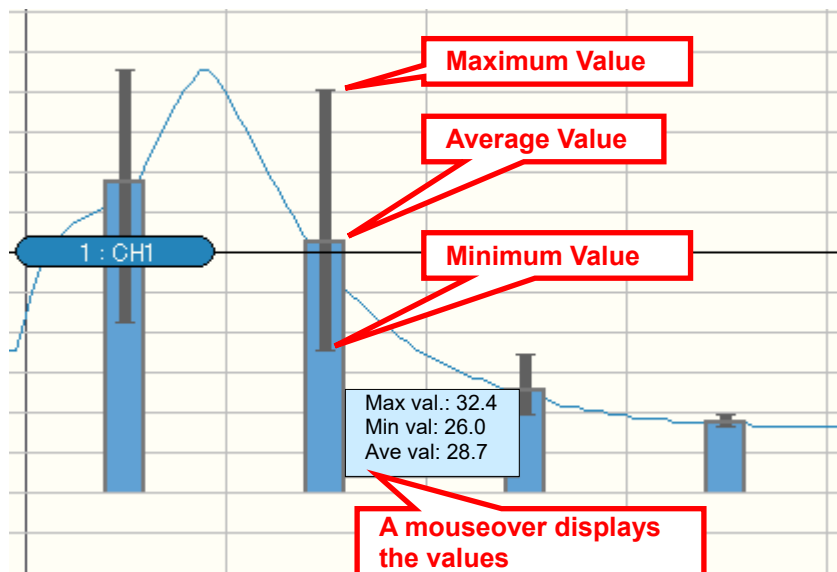
A scale can be dragged to a desired location to study the waveform.

(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

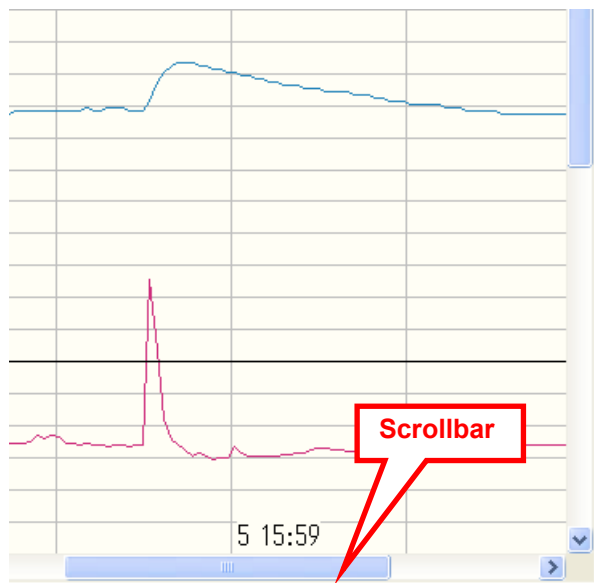
Select "Set Time Axis" in the context menu or click the "Set Time Axis" button in the toolbar. The time interval for horizontal grid lines can be specified.

(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

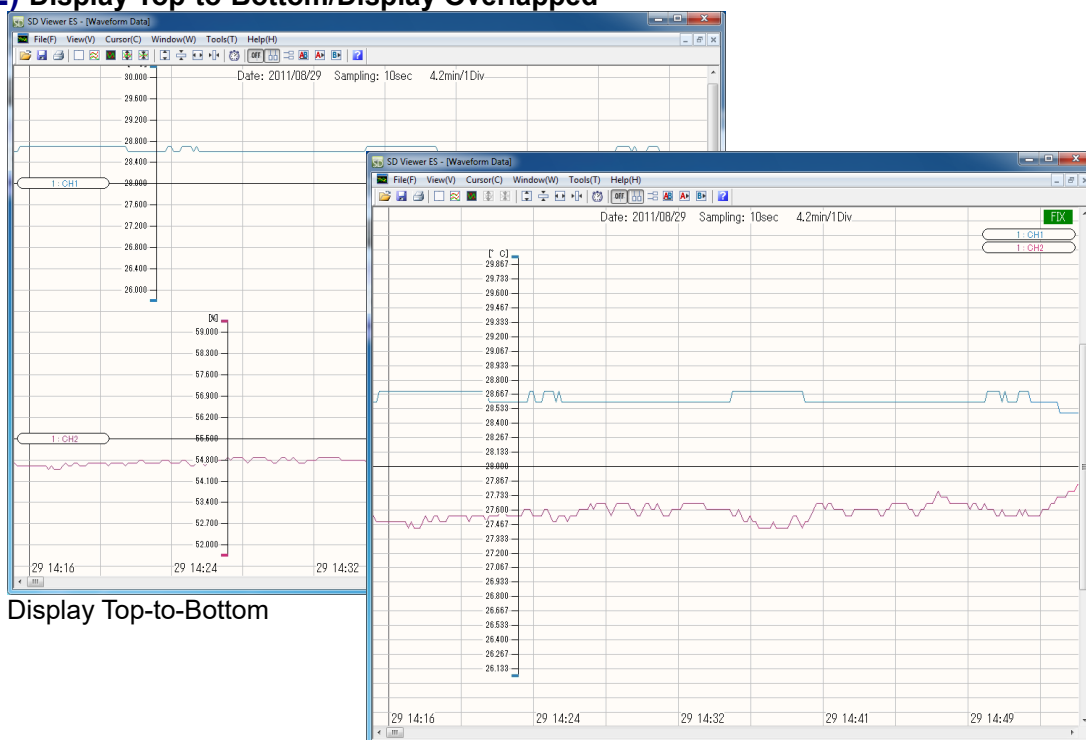
Exits SD Viewer ES.

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.

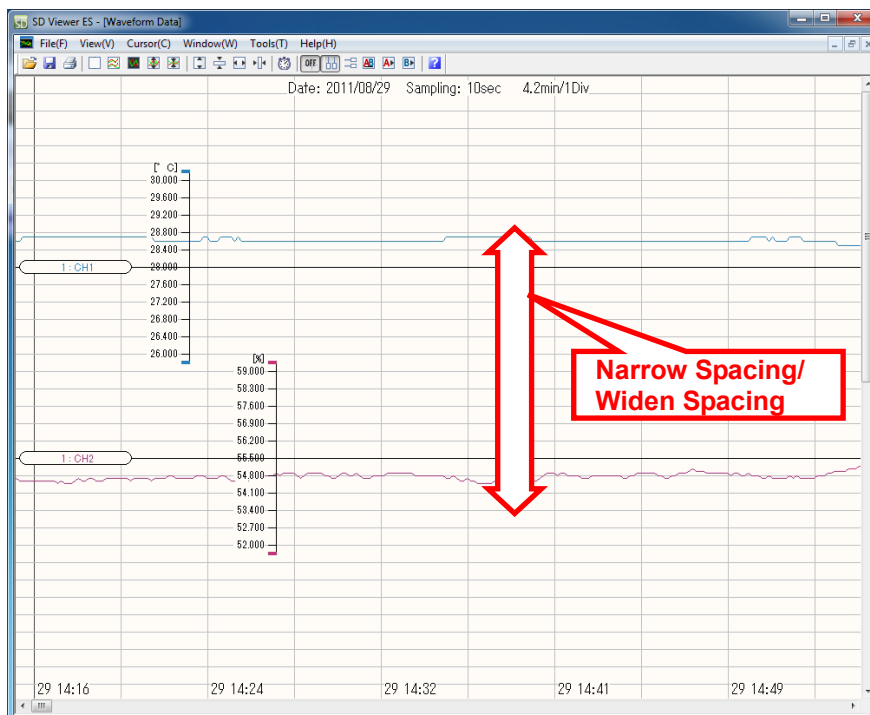
Select "View" - "Display Top-to-Bottom" in the menu bar to display the waveforms in a vertical arrangement.

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

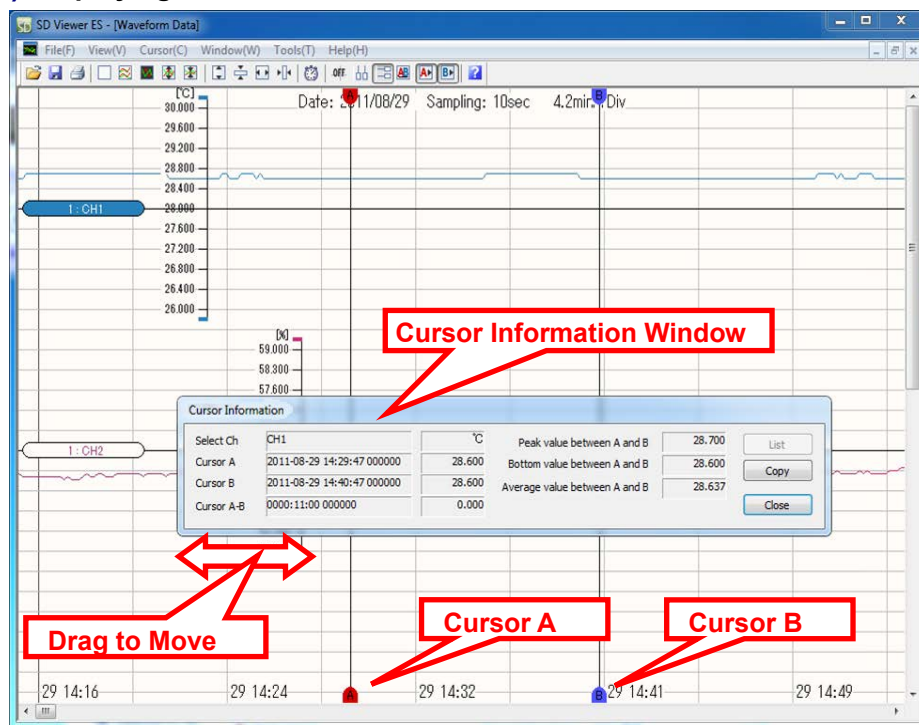
(5) Horizontal Enlargement/Reduction

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.

Cursor Information

Select Ch	CH1	°C	Peak value between A and B		List
Cursor A	2011-08-25 18:34:53 000000	-----	Bottom value between A and B		Copy
Cursor B	2011-08-25 18:42:53 000000	-----	Average value between A and B		Close
Cursor A-B	0000:08:00 000000				

Cursor Information

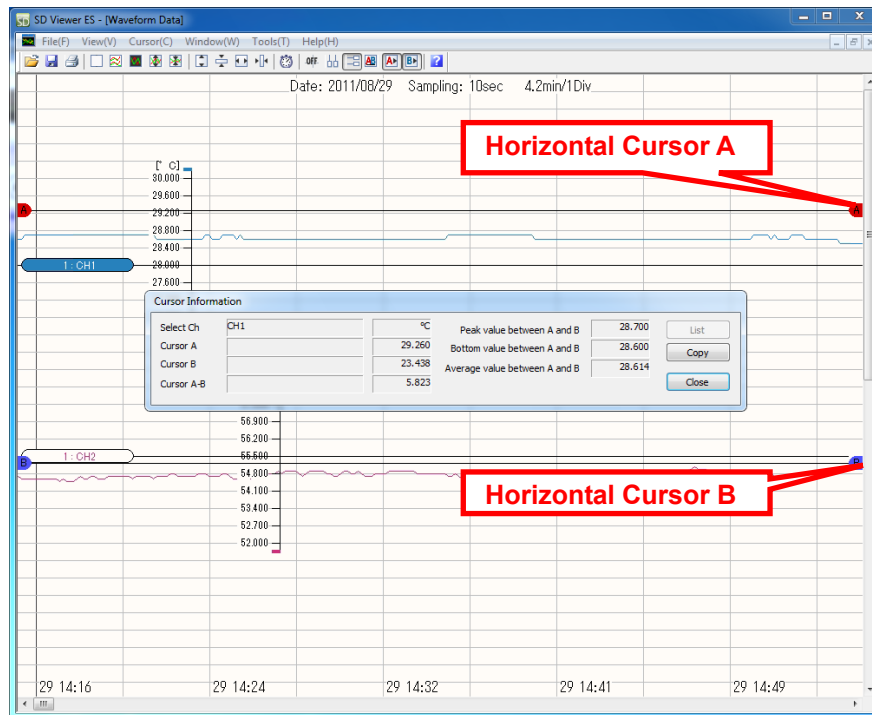
Select Ch	CH1	°C	Peak value between A and B		List
Cursor A	2011-08-25 18:34:53 000000	-----	Bottom value between A and B		Copy
Cursor B	2011-08-25 18:42:53 000000	-----	Average value between A and B		Close
Cursor A-B	0000:08:00 000000				

Wave	Cursor A	Cursor B	Cursor A-B	A-B Peak	A-B Bottom	A-B Average	Unit
CH1	-----	-----					°C
CH2	-----	-----					%
CH3	3.760	3.833	-0.073	4.198	3.760	3.914	A
CH4	1.146	1.168	-0.022	1.280	1.146	1.193	kW
CH5	0.607	0.766	-0.159	0.766	0.607	0.687	kWh

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. Appendix

.NET Framework 3.5 is included in the target operating system, but it is usually disabled, so please enable it as follows.

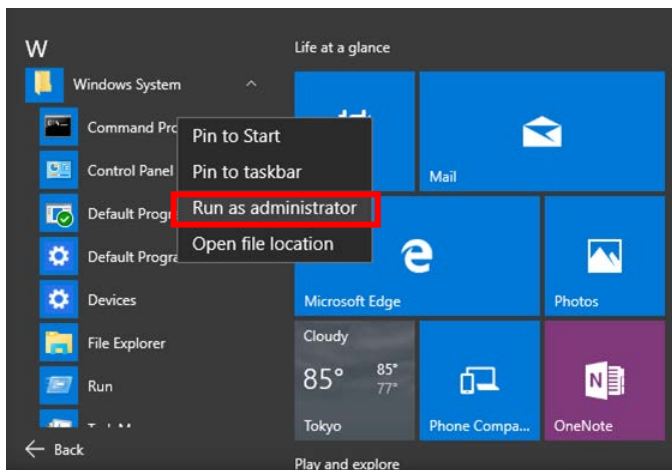
If .NET Framework 3.5 has already been activated, no further work is required.

5.1 For Windows 10

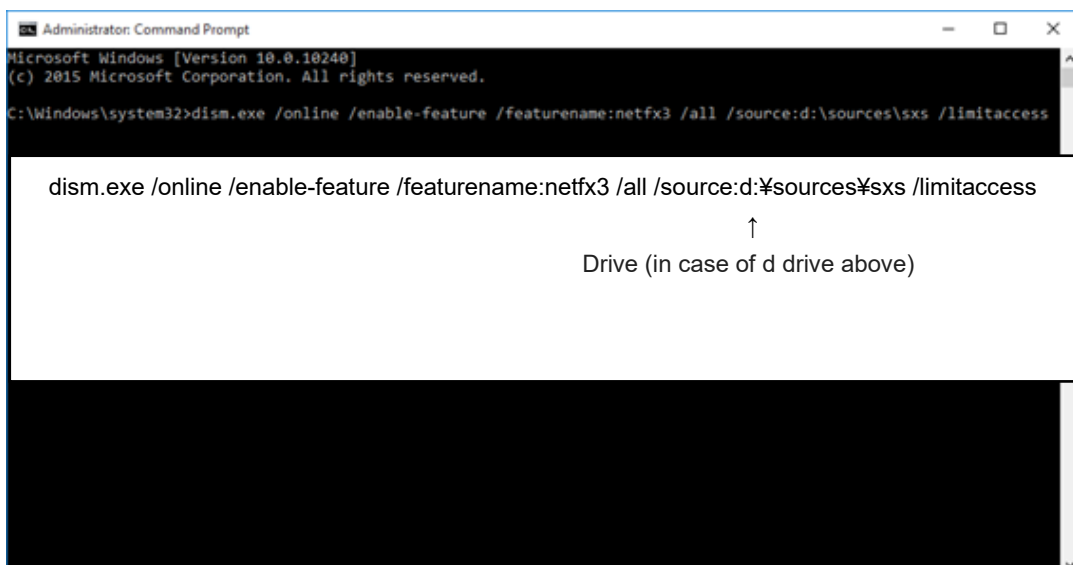
5.1.1 Install from Installation Media

By using the installation media to install the .NET Framework 3.5, you need the Windows 10 installation media and an optical drive connected to the PC.

- (1) Insert the Windows 10 installation media into the optical drive.
- (2) Run "Command Prompt" as an administrator.

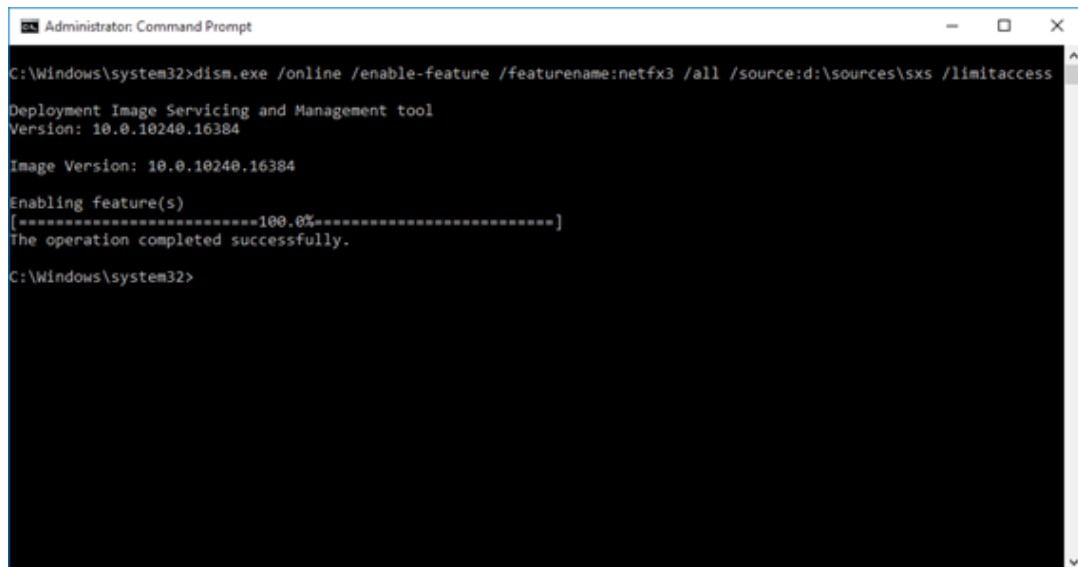


- (3) Enter the command in the red frame below and press the Enter key.
For the drive, enter the drive letter of the optical drive connected to the PC ("d" is the optical drive letter in the figure below).



Please wait until the installation is complete.

- (4) "The operation completed successfully. If it is displayed, please click the [×] on the window to finish.



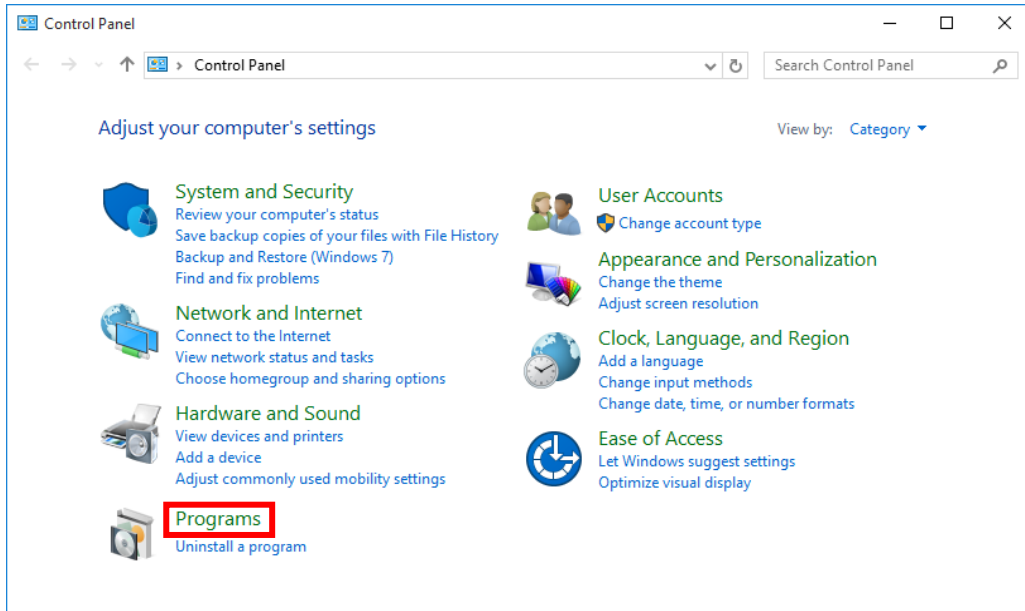
```
Administrator: Command Prompt
C:\Windows\system32>dism.exe /online /enable-feature /featurename:netfx3 /all /source:d:\sources\sxs /limitaccess
Deployment Image Servicing and Management tool
Version: 10.0.10240.16384
Image Version: 10.0.10240.16384
Enabling feature(s)
[=====100.0%=====]
The operation completed successfully.
C:\Windows\system32>
```

- (5) Please restart the PC.

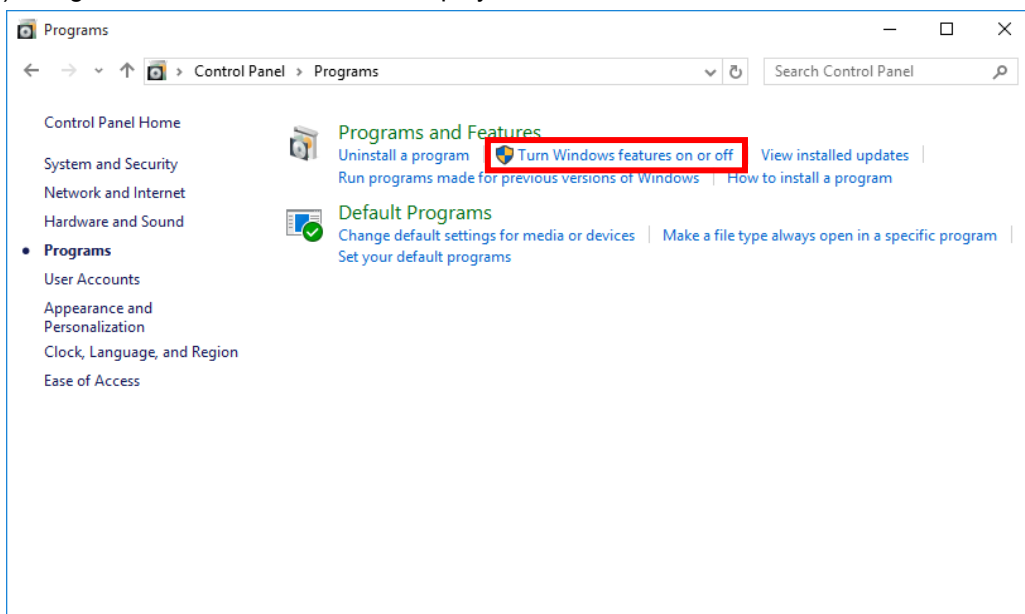
5.1.2 Installing from the Network

Steps to install .NET Framework 3.5 from the Internet. Confirm the PC is connected to the Internet.

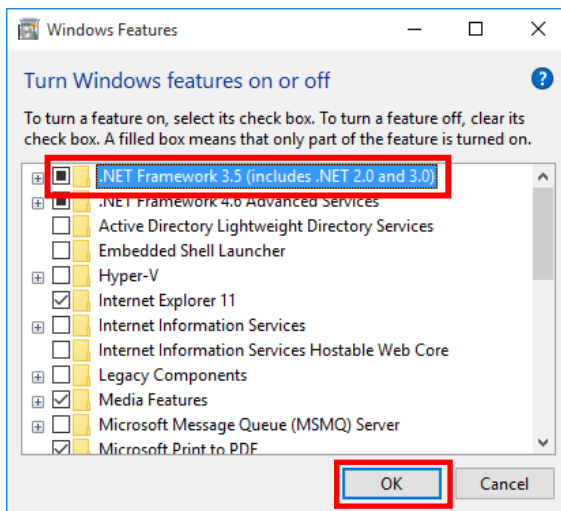
(1) Select "Program" in the control panel.



(2) "Programs and Features" will be displayed, click "Turn Windows features on or off".

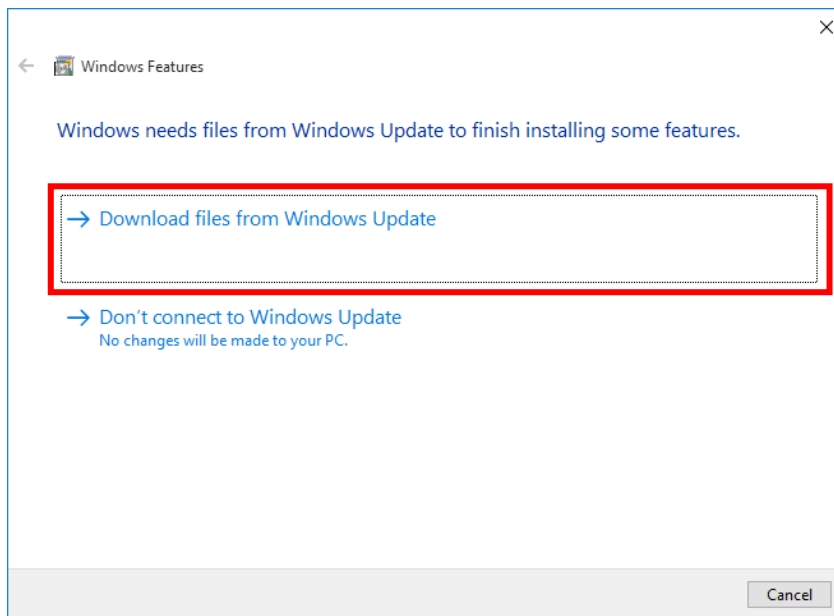


(3) Check ".NET Framework 3.5 (includes .NET 2.0 and 3.0)" and click the "OK" button.



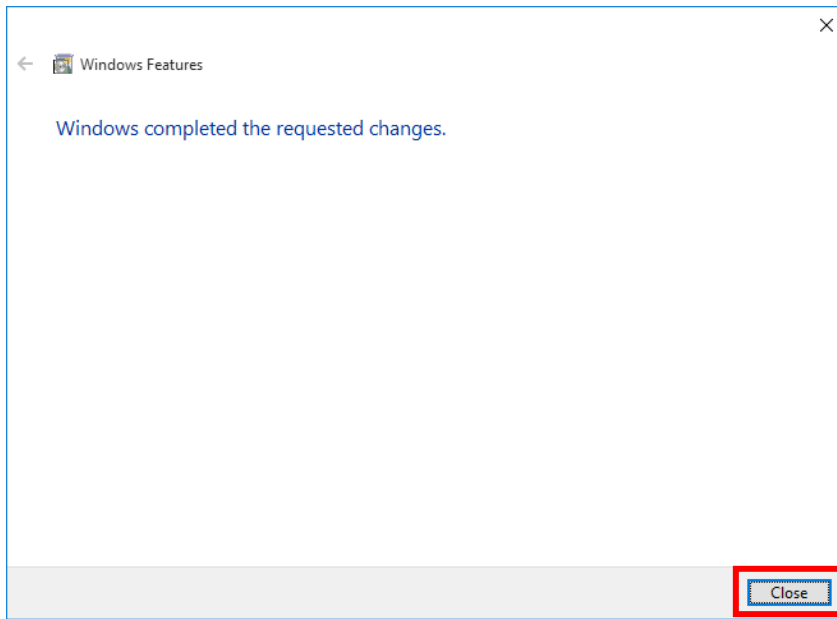
If .NET Framework 3.5 has already been activated, no further work is required.

(4) Click "Download files from Windows Update".



Please wait for the installation files download and installation to complete.

- (5) "The required change has been completed. When it is displayed, please click "Close" to finish.

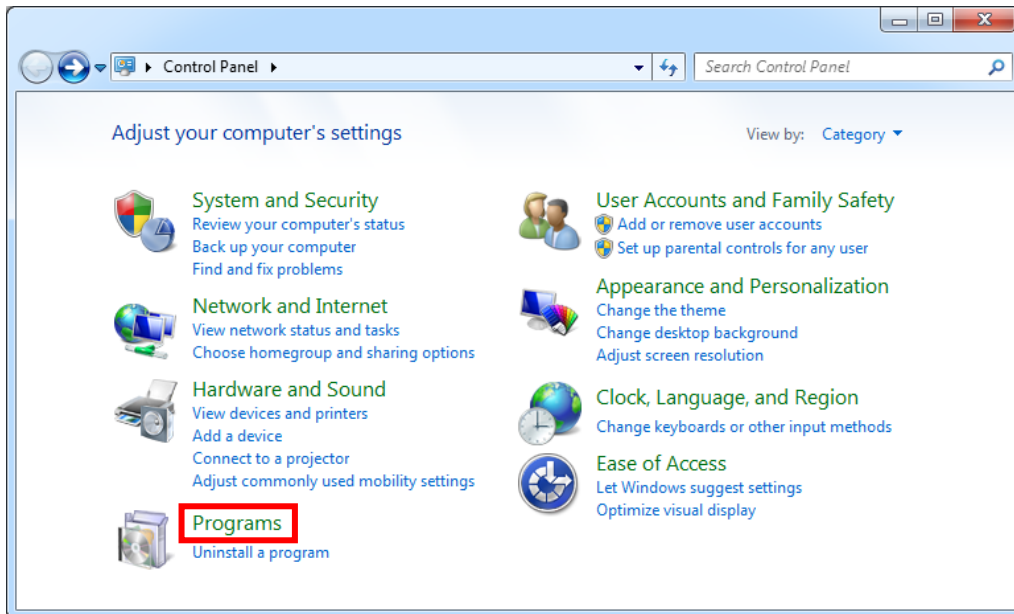


- (6) Please restart the PC.

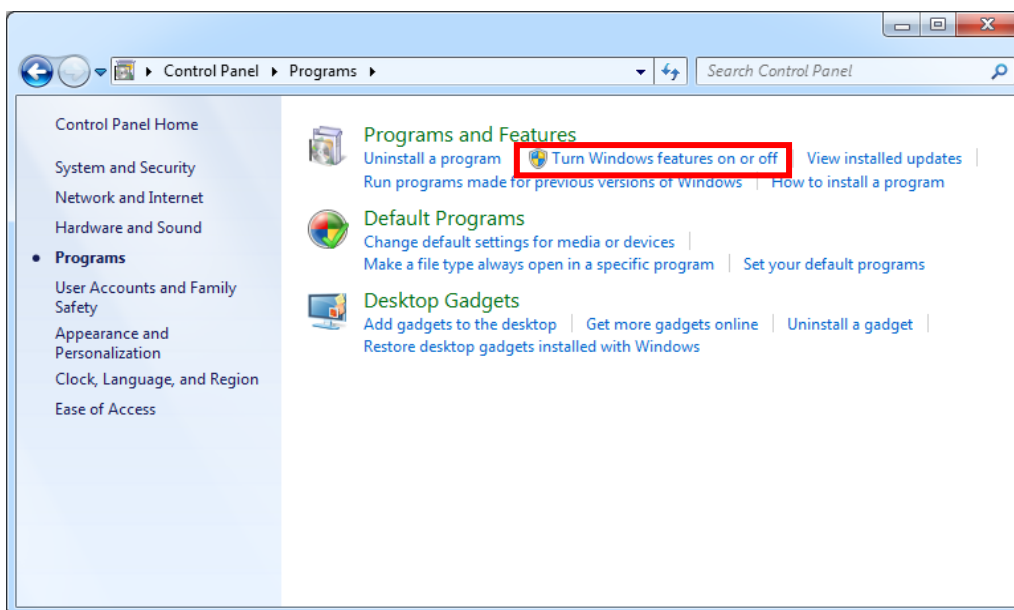
5.2 For Windows 7

By using the installation media to install the .NET Framework 3.5, you need the Windows 7 installation media and an optical drive connected to the PC.

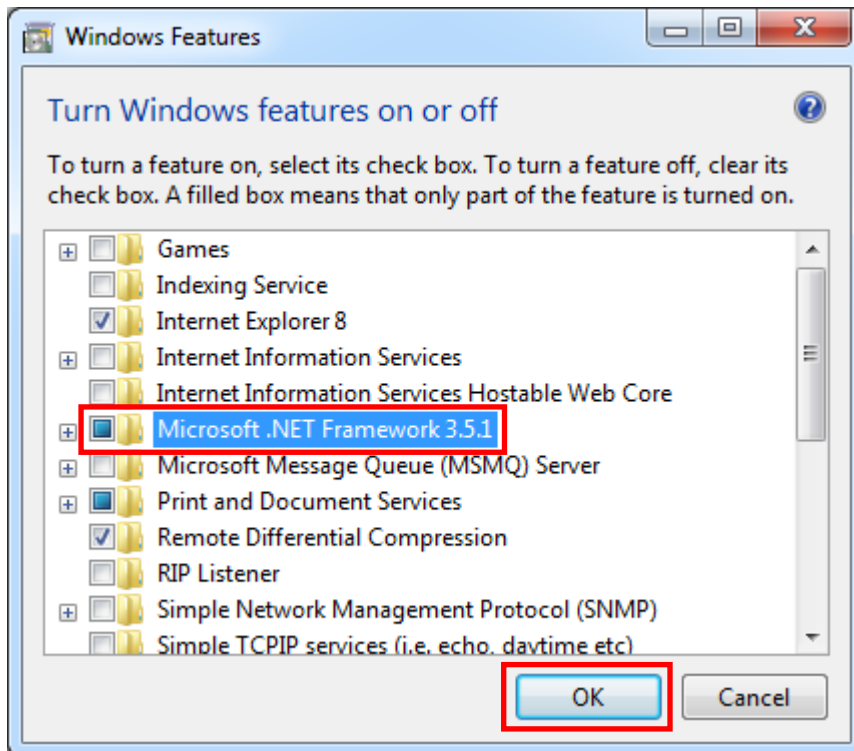
(1) Select "Program" in the control panel.



(2) Click "Turn Windows features on or off".

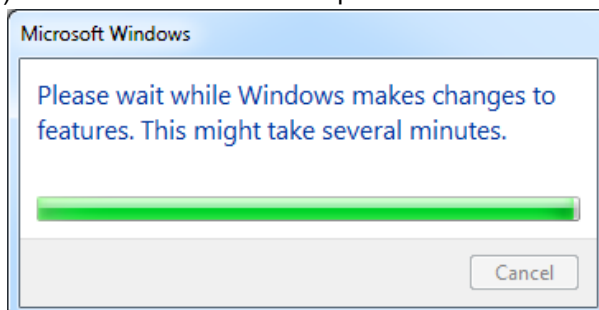


(3) Confirm that the check box of "Microsoft .NET Framework 3.5.1" is colored and click OK.



If .NET Framework 3.5.1 has already been activated, no further work is required.

(4) Wait for installation to complete.



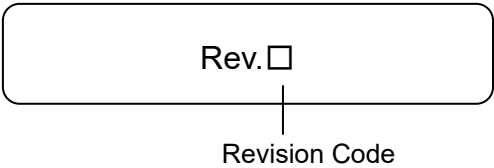
Revision History

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
01	June 2019	First edition

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Cat. No.Z418-E1-01

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