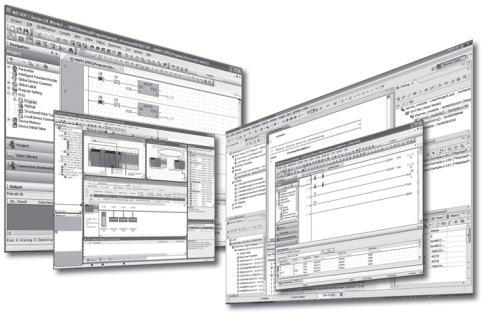
MELSOFT

MITSUBISHI ELECTRIC

Engineering Software

GX LogViewer Version 1
Operating Manual (Edgecross)

-SW1DNN-VIEWER-M



SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual carefully and pay full attention to safety to handle the product correctly. If products are used in a different way from that specified by manufacturers, the protection function of the products may not work properly.

The precautions given in this manual are concerned with this product only. For the safety precautions for the programmable controller system, refer to the user's manual for the module used and MELSEC iQ-R Module Configuration Manual.

For the safety precautions for a MELIPC, refer to the user's manual for the device used.

In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠ **WARNING**	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ **CAUTION**	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Security Precautions]

⚠ WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

CONDITIONS OF USE FOR THE PRODUCT

(1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi Electric representative in your region.

(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for your patronage. We appreciate your purchase of the engineering software, MELSOFT series.
This manual describes the operations of GX LogViewer to display the data of Edgecross Basic Software or Real-time Data Analyzer.
Before using the product, please read this manual carefully and develop familiarity with the functions and performance of GX LogViewer to handle the products correctly.
For the common functions available when displaying data of Edgecross Basic Software, Real-time Data Analyzer, and other devices/software/files, refer to the following manual.
📖GX LogViewer Version 1 Operating Manual

CONTENTS

RELEVANT MANUAL

Manual name [manual number]	Description	Available form
GX LogViewer Version 1 Operating Manual (Edgecross) [SH-082096ENG] (this manual)	System configurations, functions, and operation methods to display data collected in the following software in GX LogViewer • Edgecross Basic Software • Real-time Data Analyzer	e-Manual PDF
GX LogViewer Version 1 Operating Manual [SH-080915ENG]	Basic operations of GX LogViewer and system configurations, functions, and operation methods of devices, software, or files to display data in GX LogViewer	Print book e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- Hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Edgecross	A software platform that implements specifications and concepts for realizing manufacturing solutions by the FA-IT collaboration centering on the edge computing.
Edgecross Basic Software	Software that implements the Edgecross function.
Real-time Data Analyzer	An edge application that analyzes data in production sites offline and diagnoses data in real time.
Similar Waveform Recognition Tool	An AI-equipped edge application that calculates the similarity between the waveform to be referenced and an inspection waveform at high speed and detects the differences of the inspection waveform.

TARGETS FOR EXPLANATIONS

The following table shows the target software for explanations in this manual.

Ex.

○: Target, —: Not target

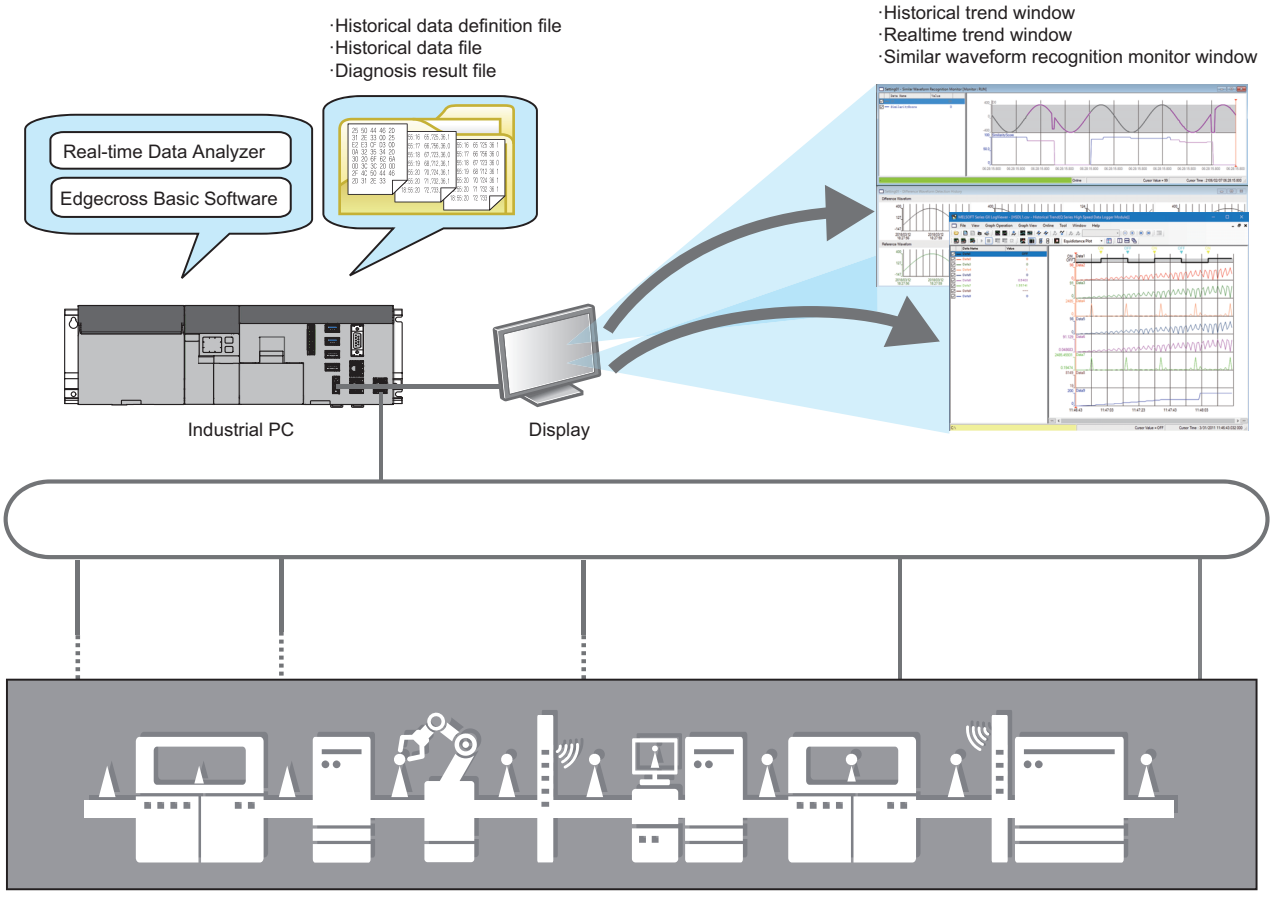
Edgecross Basic Software	Similar Waveform Recognition Tool
○	—

1 OVERVIEW

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

1.1 Overview of GX LogViewer

GX LogViewer is a tool to display data collected or diagnosed in Edgecross Basic Software or Real-time Data Analyzer in a graph format by linking with the software.



MEMO

2 SYSTEM CONFIGURATION

This chapter explains the operating environment and the system configuration of GX LogViewer.

2.1 Operating Environment

For details on the GX LogViewer operating environment, refer to the installation instruction stored in the "Manual" folder.

CPU Module Logging Configuration Tool/GX LogViewer Installation Instructions (BCN-P5999-0506)

2.2 System Configuration

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

This section shows the system configurations to display data of each software in GX LogViewer.

Item	Reference
System configuration	Page 11 Displaying data of Edgecross Basic Software
	Page 12 Displaying data diagnosed in Real-time Data Analyzer

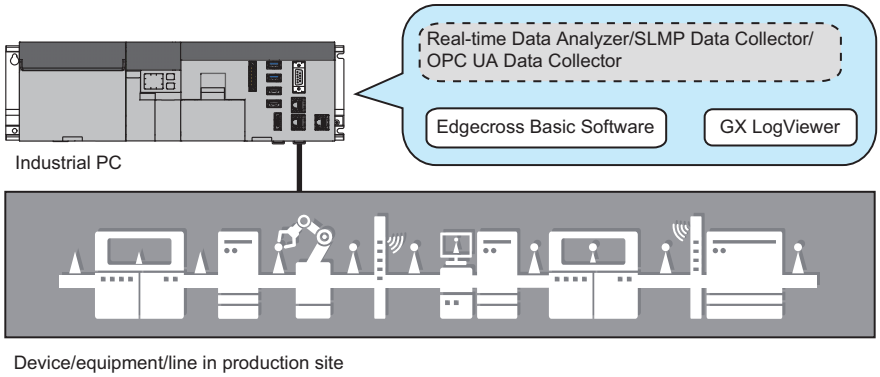
Displaying data of Edgecross Basic Software

Edgecross Basic Software	Similar Waveform Recognition Tool
○	—

The system configuration to display data, which was collected or modified in Edgecross Basic Software, in GX LogViewer is shown below.

The following products need to be installed in the same industrial PC as GX LogViewer.

Product		Required/optional
Edgecross Basic Software		Required
Edgecross compatible software (iQ Edgecross)	Real-time Data Analyzer	Any one of them is required.
	SLMP Data Collector	
	OPC UA Data Collector	

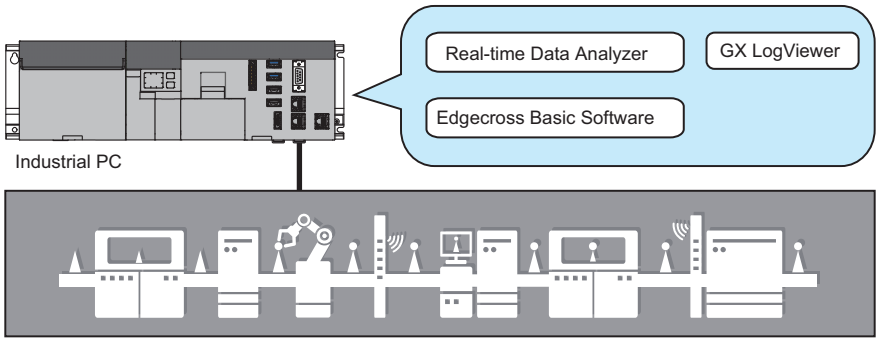


Displaying data diagnosed in Real-time Data Analyzer

Edgecross Basic Software	Similar Waveform Recognition Tool
—	○

The system configuration to display data, which was diagnosed in Real-time Data Analyzer, in GX LogViewer is shown below. The following products need to be installed in the same industrial PC as GX LogViewer.

Product		Required/optional
Edgecross Basic Software		Required
Edgecross compatible software (iQ Edgecross)	Real-time Data Analyzer	Required



Restriction

For the version compatibility between Real-time Data Analyzer and GX LogViewer, refer to the following section.

☞ Page 65 Version Compatibility

3 FUNCTION LIST

This chapter explains the major functions of GX LogViewer that are available when connecting to each software.

3.1 Edgecross Basic Software

Edgecross Basic Software	Similar Waveform Recognition Tool
○	—

○: Supported, ×: Not supported

Function		Availability	Reference
Assistant		○	Page 23 Assistant Window
Connection setup	Direct connection	×	—
	Searching modules		

Function			Availability	Reference
Trend graph	Displaying trend graph (Historical trend)		○	Page 38 Displaying the past data saved in an industrial PC (Historical trend)
	Displaying trend graph (Realtime trend)		○	Page 39 Displaying the current status of collected/modified data (Realtime trend)
	Displaying trend graph (Similar waveform recognition monitor)		×	—
	Displaying trend graph (Realtime monitor)		×	—
	Operating monitoring status		○	Page 42 Operating Monitoring Status
	Checking data	Checking and comparing data values/status	○	Page 43 Checking Data GX LogViewer Version 1 Operating Manual
		Adding/deleting data to/from graph legend area		
	Operating trend graph	Displaying/hiding graphs	○	GX LogViewer Version 1 Operating Manual
		Aligning graphs		
		Superimposing graphs		
		Moving cursor by specifying value/time/index		
		Specifying the upper and lower bounds/Y axis scale		
		Widening/narrowing the display scale		
		Moving graph up/down/left/right		
		Expanding/reducing the time scale		
		Displaying the previous or next trend graph consecutively	○	Page 45 Displaying the previous or next trend graph consecutively GX LogViewer Version 1 Operating Manual
	Changing display item in graph area	Displaying multiple cursors	○	GX LogViewer Version 1 Operating Manual
		Displaying cursor labels		
		Displaying data names		
		Switching data names		Page 47 Switching data names GX LogViewer Version 1 Operating Manual
		Displaying grid		GX LogViewer Version 1 Operating Manual
		Changing graph plot formats		
		Changing a display of time-scale label		
		Switching the display language of data names		
	Changing graph appearance	Changing color and type of graph	○	Page 48 Changing color and type of graph GX LogViewer Version 1 Operating Manual
		Highlighting graph		GX LogViewer Version 1 Operating Manual
		Thickening graph line		
	Registering/applying the graphical display setting		○	GX LogViewer Version 1 Operating Manual
	Applying the graphical display automatically		○	GX LogViewer Version 1 Operating Manual
	Displaying dump		○	Page 50 Displaying a Graph as Data Values GX LogViewer Version 1 Operating Manual
	Initializing graphical display		○	GX LogViewer Version 1 Operating Manual
Event monitoring	Displaying event list (Historical event)		×	—
	Displaying event list (Realtime event)			
	Operating event list			
	Changing display settings of event list			
Logging file save			×	—
Window/ folder restore	Adding/restoring frequently-used window configurations		○	GX LogViewer Version 1 Operating Manual
	Redisplaying recently-used windows/folders		○	

Function		Availability	Reference
Displayed data/event save	Saving displayed data	○	Page 52 Saving Displayed Data GX LogViewer Version 1 Operating Manual
	Saving displayed events	×	—
Trend graph print		○	GX LogViewer Version 1 Operating Manual

3.2 Real-time Data Analyzer

Edgecross Basic Software	Similar Waveform Recognition Tool
—	○

○: Supported, ×: Not supported

Function		Availability	Reference
Assistant		○	Page 23 Assistant Window
Connection setup	Direct connection	×	—
	Searching modules		

Function			Availability	Reference
Trend graph	Displaying trend graph (Historical trend)		○	Page 38 Displaying the past data saved in an industrial PC (Historical trend)
	Displaying trend graph (Realtime trend)		×	—
	Displaying trend graph (Similar waveform recognition monitor)		○	Page 41 Displaying the similarity between a reference waveform and an inspection waveform (Similar waveform recognition monitor)
	Displaying trend graph (Realtime monitor)		×	—
	Operating monitoring status		○	Page 42 Operating Monitoring Status
	Checking data	Checking and comparing data values/status	○	Page 43 Checking Data GX LogViewer Version 1 Operating Manual
		Adding/deleting data to/from graph legend area		
	Operating trend graph	Displaying/hiding graphs	○*1	GX LogViewer Version 1 Operating Manual
		Aligning graphs		
		Superimposing graphs		
		Moving cursor by specifying value/time/index		
		Specifying the upper and lower bounds/Y axis scale		
		Widening/narrowing the display scale		
		Moving graph up/down/left/right		
		Expanding/reducing the time scale		
		Displaying the previous or next trend graph consecutively	○	Page 45 Displaying the previous or next trend graph consecutively GX LogViewer Version 1 Operating Manual
	Changing display item in graph area	Displaying multiple cursors	○	GX LogViewer Version 1 Operating Manual
		Displaying cursor labels		
		Displaying data names		
		Switching data names		Page 47 Switching data names GX LogViewer Version 1 Operating Manual
		Displaying grid		GX LogViewer Version 1 Operating Manual
		Changing graph plot formats		
		Changing a display of time-scale label		
		Switching the display language of data names		
	Changing graph appearance	Changing color and type of graph	○	Page 48 Changing color and type of graph GX LogViewer Version 1 Operating Manual
		Highlighting graph		GX LogViewer Version 1 Operating Manual
		Thickening graph line		
	Registering/applying the graphical display setting		○	GX LogViewer Version 1 Operating Manual
	Applying the graphical display automatically		○	GX LogViewer Version 1 Operating Manual
	Displaying dump		○	Page 50 Displaying a Graph as Data Values GX LogViewer Version 1 Operating Manual
	Initializing graphical display		○	GX LogViewer Version 1 Operating Manual
Event monitoring	Displaying event list (Historical event)		×	—
	Displaying event list (Realtime event)			
	Operating event list			
	Changing display settings of event list			
Logging file save			×	—

Function		Availability	Reference
Window/ folder restore	Adding/restoring frequently-used window configurations	○*2	📖GX LogViewer Version 1 Operating Manual
	Redisplaying recently-used windows/folders	○*2	
Displayed data/event save	Saving displayed data	○	Page 52 Saving Displayed Data 📖GX LogViewer Version 1 Operating Manual
	Saving displayed events	×	—
Trend graph print		○*3	📖GX LogViewer Version 1 Operating Manual

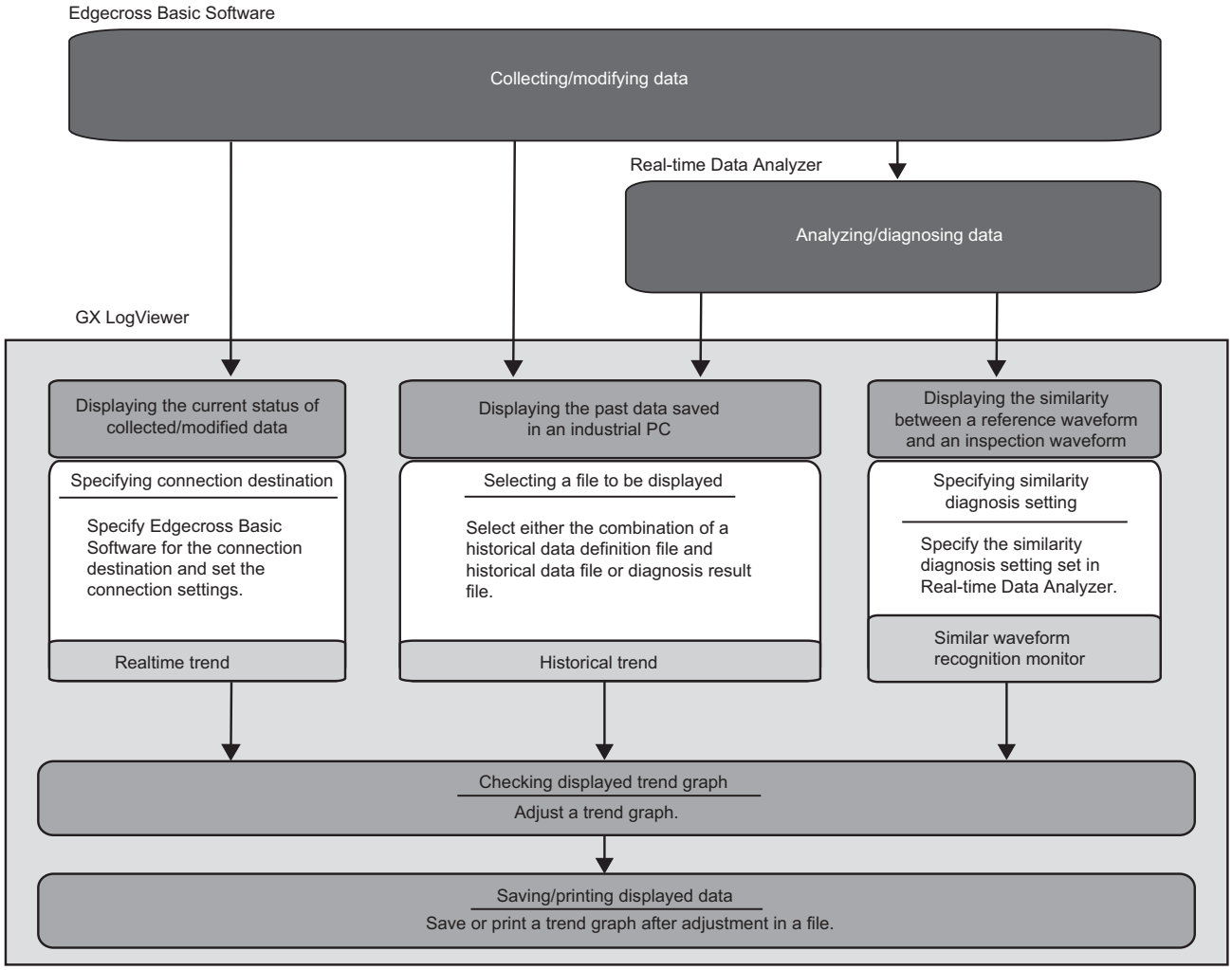
*1 In the "Difference Waveform Detection History" window, the display scale cannot be widened or narrowed.

*2 When opening a window using this function, the difference detection color set in the "Graph Properties" screen is not applied.

*3 The difference waveform detection history cannot be printed.

4 OPERATION FLOWS

This chapter explains the operation flows to acquire data from Edgecross Basic Software or Real-time Data Analyzer, and display the data in GX LogViewer.



For details on each item, refer to the following figure.

Item	Reference
Displaying the current status of collected/modified data	Page 39 Displaying the current status of collected/modified data (Realtime trend)
Displaying the past data saved in an industrial PC	Page 38 Displaying the past data saved in an industrial PC (Historical trend)
Displaying the similarity between a reference waveform and an inspection waveform	Page 41 Displaying the similarity between a reference waveform and an inspection waveform (Similar waveform recognition monitor)
Checking displayed trend graph	Page 42 Operating Monitoring Status Page 43 Checking Data Page 44 Operating Trend Graphs Page 46 Changing Display Items in Graph Area Page 48 Changing Graph Appearance Page 50 Displaying a Graph as Data Values
Saving/printing displayed data	Page 52 Saving Displayed Data GX LogViewer Version 1 Operating Manual

4.1 Displaying Data of Edgecross Basic Software

Edgecross Basic Software	Similar Waveform Recognition Tool
○	—

Operating procedure

■ Displaying data saved in an industrial PC

Read a historical data definition file and historical data file.

☞ Page 38 Displaying a historical data file saved with Edgecross Basic Software

■ Displaying current data

1. Select [Online] ⇨ [Realtime Monitor] ().
2. Select "Edgecross Basic Software" in the "Connection Destination" screen.
3. Enter the port No., user name, and password in the "Transfer Setup" screen.
4. Read a publishing data definition file in the "Publishing Data Setting" screen.

☞ Page 39 Displaying the current data of Edgecross Basic Software on a trend graph

4.2 Displaying Data of Real-time Data Analyzer

Edgecross Basic Software	Similar Waveform Recognition Tool
—	○

Operating procedure

■ Displaying data saved in an industrial PC

Read a diagnosis result file of the data to be displayed.

☞ Page 38 Displaying a diagnosis result file of Real-time Data Analyzer

■ Displaying the similarity between a reference waveform and an inspection waveform

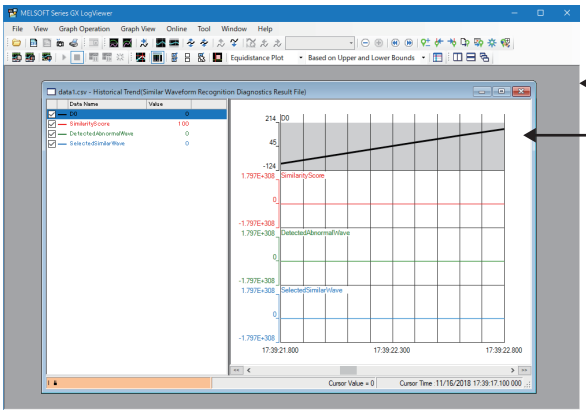
1. Select [Online] ⇨ [Similar Waveform Recognition Monitor].
2. In the "Select Similar Waveform Recognition Monitor" screen, select a setting to be displayed and click the [Open] button.

☞ Page 41 Displaying data, which was diagnosed in Real-time Data Analyzer, on a trend graph

5 SCREEN CONFIGURATION

5.1 Main Window and Child Windows

Child windows are displayed in a main window.



Restriction

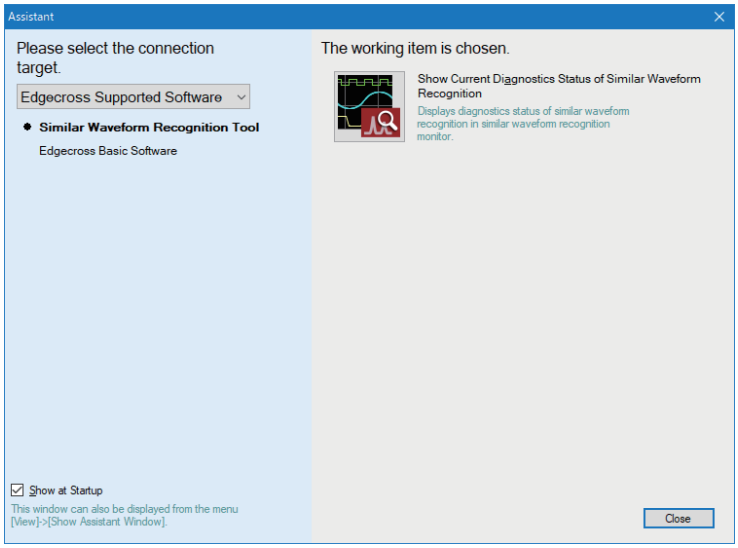
When connecting to a single data logger, BOX data logger, Edgecross Basic Software, or Real-time Data Analyzer, up to two windows can be displayed in any combination of realtime trend windows, similar waveform recognition monitor window, and/or realtime event windows.

Point

For the details on the main window and child windows, refer to the following manual.
GX LogViewer Version 1 Operating Manual

5.2 Assistant Window

The Assistant window guides users who are unfamiliar with the operation of GX LogViewer.
By selecting "Edgecross Supported Software" from the pull-down list, "Similar Waveform Recognition Tool" or "Edgecross Basic Software" can be selected.



To reopen the window, select [View] ⇨ [Show Assistant Window].

Restriction

"Similar Waveform Recognition Tool" and "Edgecross Basic Software" can be selected in the Assistant window only when any of the following Edgecross compatible software (iQ Edgecross) is installed:

- Real-time Data Analyzer
- SLMP Data Collector
- OPC UA Data Collector

When using Similar Waveform Recognition Tool, an error message appears if Real-time Data Analyzer is not installed.

5.3 Menu Configuration

The following tables show menus of GX LogViewer displayed when Real-time Data Analyzer, SLMP Data Collecot, or OPC UA Data Collector is installed.

[File]	Reference
⇨ [Open]	📖GX LogViewer Version 1 Operating Manual
⇨ [Recent Folders] ⇨ [(folder name)]	
⇨ [Close]	—
⇨ [Save As] ⇨ [Save CSV File]	Page 52 SAVING DISPLAYED DATA
⇨ [Save As] ⇨ [Save Unicode Text File]	
⇨ [Save As] ⇨ [Save Image File]	
⇨ [Print]	📖GX LogViewer Version 1 Operating Manual
⇨ [Import and Export]	
⇨ [Exit]	—

[View]	Reference
⇨ [Toolbar] ⇨ [Standard]	—
⇨ [Toolbar] ⇨ [Online]	
⇨ [Toolbar] ⇨ [Graph Operation]	
⇨ [Toolbar] ⇨ [Graph View]	
⇨ [Toolbar] ⇨ [Event]	
⇨ [Toolbar] ⇨ [Window]	
⇨ [Show Assistant Window]	Page 23 Assistant Window
⇨ [Switch Display Language]	📖GX LogViewer Version 1 Operating Manual

[Graph Operation]	Reference
⇨ [Graph Alignment]	📖GX LogViewer Version 1 Operating Manual
⇨ [Graph Superimpose]	
⇨ [Jump Cursor]	
⇨ [Auto Adjust Upper/Lower Bound] ⇨ [For Period on Window]	
⇨ [Auto Adjust Upper/Lower Bound] ⇨ [For All Period]	
⇨ [Edit Upper/Lower Bound]	
⇨ [Change Upper/Lower Bound/Y Axis Scale in Batch]	
⇨ [Adjust Scale] ⇨ [Widen Graph]	
⇨ [Adjust Scale] ⇨ [Narrow Graph]	
⇨ [Adjust Graph Location] ⇨ [Move Up Graph]	
⇨ [Adjust Graph Location] ⇨ [Move Down Graph]	
⇨ [Adjust Graph Location] ⇨ [Synchronize with Time of Head File]	
⇨ [Adjust Graph Location] ⇨ [Move Graph to Left]	
⇨ [Adjust Graph Location] ⇨ [Move Graph to Right]	
⇨ [Adjust Graph Location] ⇨ [Horizontal Moving Quantity]	
⇨ [Adjust Font Size of Graph Legends] ⇨ [Expansion Font Size]	
⇨ [Adjust Font Size of Graph Legends] ⇨ [Reduction Font Size]	
⇨ [Adjust Time Scale] ⇨ [Expansion Time Scale]	
⇨ [Adjust Time Scale] ⇨ [Reduction Time Scale]	
⇨ [Show Previous Graph]	Page 45 Displaying the previous or next trend graph consecutively 📖GX LogViewer Version 1 Operating Manual
⇨ [Show Next Graph]	

[Graph Operation]	Reference
⇨ [Change Waveform Display Range]	📖GX LogViewer Version 1 Operating Manual
⇨ [Add/Delete Log Marker to Red Cursor Location]	
⇨ [Move Red Cursor to Previous Log Marker Location]	
⇨ [Move Red Cursor to Next Log Marker Location]	
⇨ [Read Log Marker Information]	
⇨ [Read Log Marker Information from GX VideoViewer]	
⇨ [Delete All Log Markers]	
⇨ [Edit Comment/Color of Log Marker]	

[Graph View]	Reference
⇨ [Multiple Cursor]	📖GX LogViewer Version 1 Operating Manual
⇨ [Cursor Label]	
⇨ [Graph Highlight]	
⇨ [Bold Line]	
⇨ [Data Name]	
⇨ [Grid] ⇨ [Vertical Line]	
⇨ [Grid] ⇨ [Horizontal Line]	
⇨ [Plot Format] ⇨ [Equidistance Plot]	
⇨ [Plot Format] ⇨ [Time Interval Plot]	
⇨ [Time Label] ⇨ [Time]	
⇨ [Time Label] ⇨ [Date]	
⇨ [Time Label] ⇨ [Date and Time]	
⇨ [Time Label] ⇨ [Index]	
⇨ [Set Language] ⇨ [(data logging file name)] ⇨ [Chinese Simplified]	
⇨ [Set Language] ⇨ [(data logging file name)] ⇨ [Chinese Traditional]	
⇨ [Set Language] ⇨ [(data logging file name)] ⇨ [English]	
⇨ [Set Language] ⇨ [(data logging file name)] ⇨ [Japanese]	
⇨ [Set Language] ⇨ [(data logging file name)] ⇨ [Korean]	
⇨ [Set Language] ⇨ [(data logging file name)] ⇨ [Unicode (UTF-8)]	
⇨ [Switch Display Method] ⇨ [Based on Upper and Lower Bounds]	
⇨ [Switch Display Method] ⇨ [Based on Division Value of Grids]	
⇨ [Dump Window]	
⇨ [Graph Legends]	
⇨ [Show All Graphs]	
⇨ [Hide All Graphs]	
⇨ [Change the Data to Draw Graphs]	
⇨ [Switch Data Name]	Page 47 Switching data names
⇨ [Displays Device Comment Column in Graph Legends]	📖GX LogViewer Version 1 Operating Manual
⇨ [Displays Unit Column in Graph Legends]	
⇨ [Register Graphical Display Settings]	
⇨ [Operate Graphical Display Settings]	
⇨ [Recent Graphical Display Settings]	
⇨ [Set Graph View by the Auto Reflect Function]	
⇨ [Initialize Graph View]	
⇨ [Graph Properties]	

[Online]	Reference
⇨ [Open Logging File]	Page 38 Displaying the past data saved in an industrial PC (Historical trend)
⇨ [Realtime Monitor]	Page 39 Displaying the current status of collected/modified data (Realtime trend) Page 41 Displaying the similarity between a reference waveform and an inspection waveform (Similar waveform recognition monitor)
⇨ [Similar Waveform Recognition Monitor]	
⇨ [Recent Folders] ⇨ [(folder name)]	📖GX LogViewer Version 1 Operating Manual
⇨ [Save Logging File to PC]	

[Online]	Reference
⇨ [Begin Monitor]	Page 42 Operating Monitoring Status
⇨ [End Monitor]	
⇨ [Pause Monitor]	
⇨ [Restart Monitor]	
⇨ [Clear Graph]	

[Tool]	Reference
⇨ [Start Logging Configuration Tool]	—
⇨ [Start MELSEC iQ-R Series High Speed Data Logger Module Configuration Tool]	
⇨ [Start MELSEC iQ-R Series High Speed Data Communication Module Configuration Tool]	
⇨ [Start MELSEC-Q Series High Speed Data Logger Module Configuration Tool]	
⇨ [Start MELSEC-Q Series High Speed Data Communication Module Configuration Tool]	
⇨ [Start BOX Data Logger Configuration Tool]	
⇨ [Realtime Monitor Setting]	📖GX LogViewer Version 1 Operating Manual
⇨ [MotionSystem Logging]	
⇨ [Convert Logging Files]	
⇨ [Option] ⇨ [Use an OpenGL and Draw Graphs]	

[Window]	Reference
⇨ [Frequently-used Window Configuration] ⇨ [Add To Frequently-used Window Configuration]	📖GX LogViewer Version 1 Operating Manual
⇨ [Recent Windows] ⇨ [Historical Trend]	
⇨ [Recent Windows] ⇨ [Realtime Trend]	
⇨ [Recent Windows] ⇨ [Historical Event]	
⇨ [Recent Windows] ⇨ [Realtime Event]	
⇨ [Recent Windows] ⇨ [Realtime Monitor]	
⇨ [Tile Vertically]	
⇨ [Tile Horizontally]	
⇨ [Cascade]	
⇨ [Close All Windows]	—
⇨ [(name of child window)]	📖GX LogViewer Version 1 Operating Manual

[Help]	Reference
⇨ [Open Manual]	📖GX LogViewer Version 1 Operating Manual
⇨ [Connection to MITSUBISHI ELECTRIC FA Global Website]	
⇨ [About GX LogViewer]	

6 USING TREND GRAPH FUNCTION

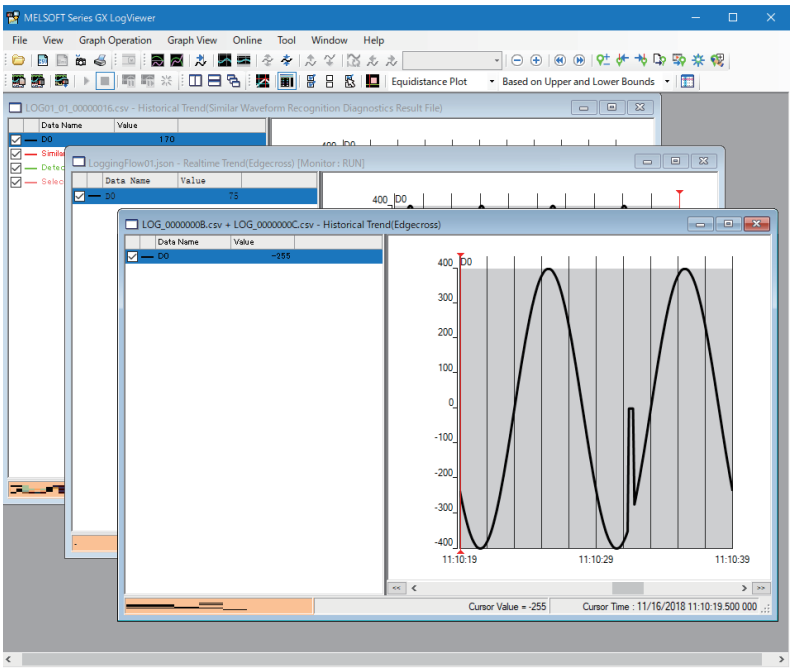
Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

6.1 Overview

This function acquires data of Edgecross Basic Software and Real-time Data Analyzer, and displays the data in a graph format.

The following three types of trend graph functions can be used.

- Historical trend
- Realtime trend
- Similar waveform recognition monitor



Software supporting the trend graph functions is shown below.

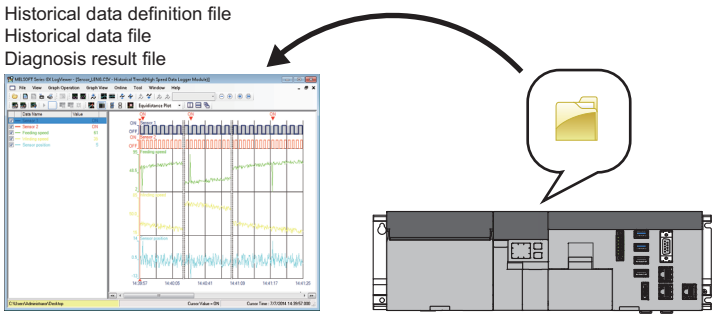
○: Supported, ×: Not supported

Software	Historical trend	Realtime trend	Similar waveform recognition monitor
Edgecross Basic Software	○	○	×
Real-time Data Analyzer	○	×	○

Historical trend

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

Data of a historical data definition file and historical data file saved with the file saving function of Edgecross Basic Software, or data of a diagnosis result file output with Real-time Data Analyzer can be displayed.
Saved or output past data can be confirmed anytime.

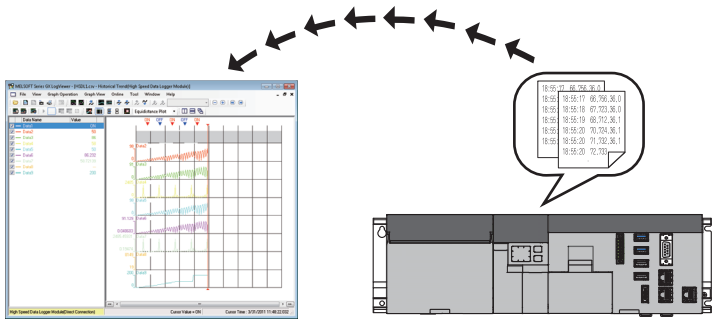


☞ Page 38 Displaying the past data saved in an industrial PC (Historical trend)

Realtime trend

Edgecross Basic Software	Similar Waveform Recognition Tool
○	—

The latest data can be displayed by acquiring publishing data from Edgecross Basic Software.
Data is constantly updated so that the data history from the start of monitoring to the present time can be checked.
To use the realtime trend function, GX LogViewer needs to be connected to Edgecross Basic Software.
For the considerations when displaying the data of Edgecross Basic Software, refer to the manual for Edgecross Basic Software.



☞ Page 39 Displaying the current status of collected/modified data (Realtime trend)

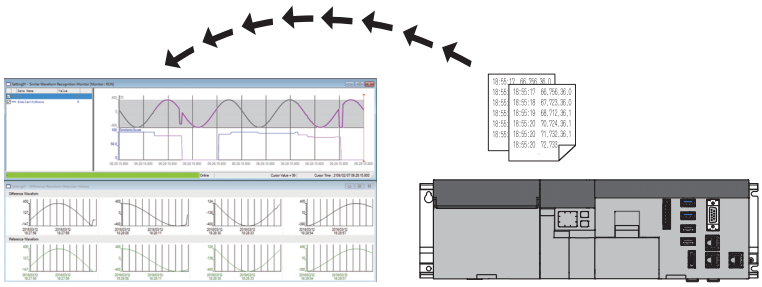
Similar waveform recognition monitor

Edgecross Basic Software	Similar Waveform Recognition Tool
—	○

The inspection waveform and the variation of the similarity score of data diagnosed in Real-time Data Analyzer can be displayed.

For details of Real-time Data Analyzer, refer to the following manual.

📖Real-time Data Analyzer User's Manual



Real-time Data Analyzer

☞ Page 41 Displaying the similarity between a reference waveform and an inspection waveform (Similar waveform recognition monitor)

Files that can be displayed

The following table shows files that can be displayed in GX LogViewer. (The format of the following files differs from a format of the file saved with the displayed data save function, explained in the after mentioned chapter "Saving displayed data".)

For details, refer to the manual for each software.

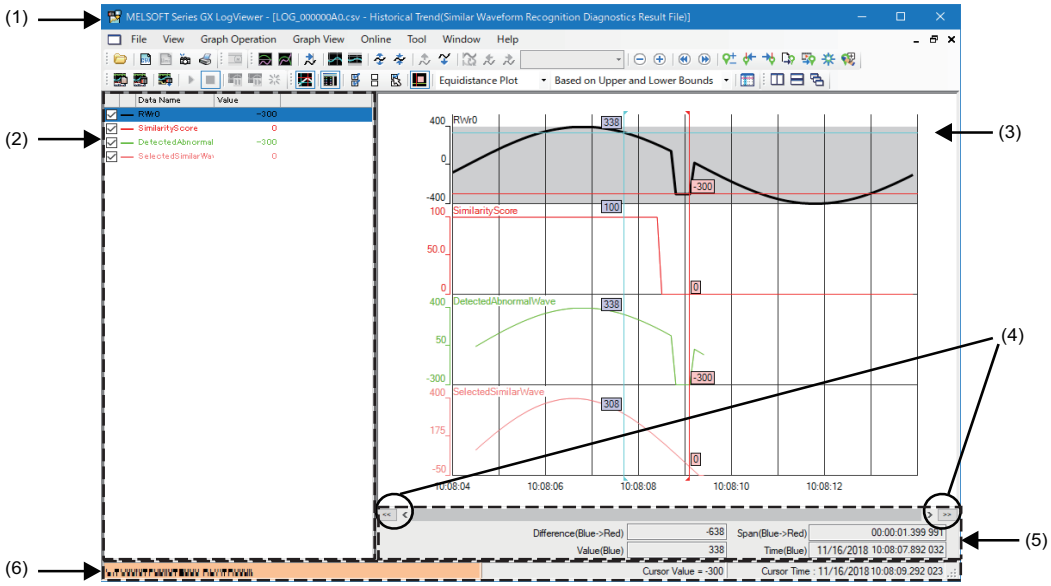
File type	Extension
Historical data definition file and historical data file that were saved with the file saving function of Edgecross Basic Software	.csv
Diagnosis result file that was output with Real-time Data Analyzer	.csv

6.2 Screen Configuration

This section explains the screen configuration of the trend window, the "Similar Waveform Recognition Monitor" window, and the "Difference Waveform Detection History" window.

Trend window/Similar Waveform Recognition Monitor window

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○



Displayed items

Item	Description	Reference
(1) Title bar	Trend graph functions to be used, software to be connected, and the display contents are shown in the following format. Trend graph function to be used (software to be connected): display content • Historical trend (Edgecross Basic Software): Historical data file name—Historical Trend (Edgecross) • Historical trend (Real-time Data Analyzer): Diagnosis result file name—Historical Trend (Similar Waveform Recognition Diagnostics Result File) • Realtime trend (Edgecross Basic Software): Publishing data definition file name—Realtime Trend (Edgecross) [monitoring status] • Similar waveform recognition monitor: Similarity diagnostics setting name — Similar Waveform Recognition Monitor [monitoring status]	—
(2) Graph legend area	Data names and their values that can be displayed in the graph area are displayed in a list. (Up to 32 legends)	GX LogViewer Version 1 Operating Manual
(3) Graph area	Data selected in the graph legend area is displayed.*1	Page 33 Trend window/Similar Waveform Recognition Monitor window
(4) [<<] button*2	The previous (old) graph is displayed.	Page 45 Displaying the previous or next trend graph consecutively GX LogViewer Version 1 Operating Manual
(4) [>>] button*2	The next (new) graph is displayed.	
(5) Difference information area	The difference information between two cursors is displayed while the multiple cursors are displayed.*3	GX LogViewer Version 1 Operating Manual
(6) Status bar	The basic status of the selected data is displayed.	Page 36 Status bar

*1 When a historical data file is not read, data is not displayed even if a historical data definition file has been read.

*2 When a historical data file is not read, this button is not displayed even if a historical data definition file has been read.

*3 When displaying the publishing data of Edgecross Basic Software, the adjusted local time is displayed in Span (Blue → Red) and Time (Blue) in this area even though the UTC time is distributed from Edgecross Basic Software.

Restriction

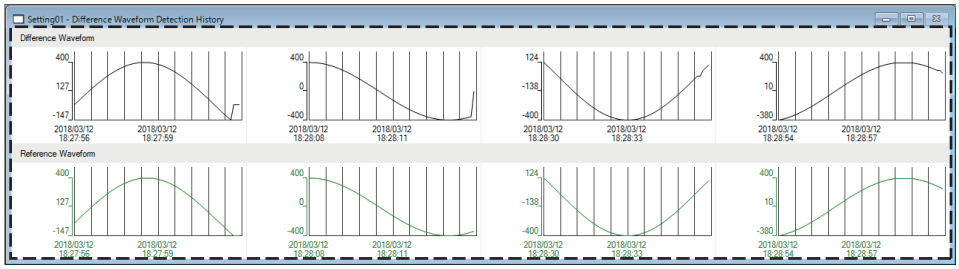
When displaying or printing data names including a surrogate pair character whose character category is Unicode (SMP) or Unicode (SIP), the data names in the graph area or the graph legend area may be garbled.

Difference Waveform Detection History window

Edgecross Basic Software	Similar Waveform Recognition Tool
—	○

(1)

(2)



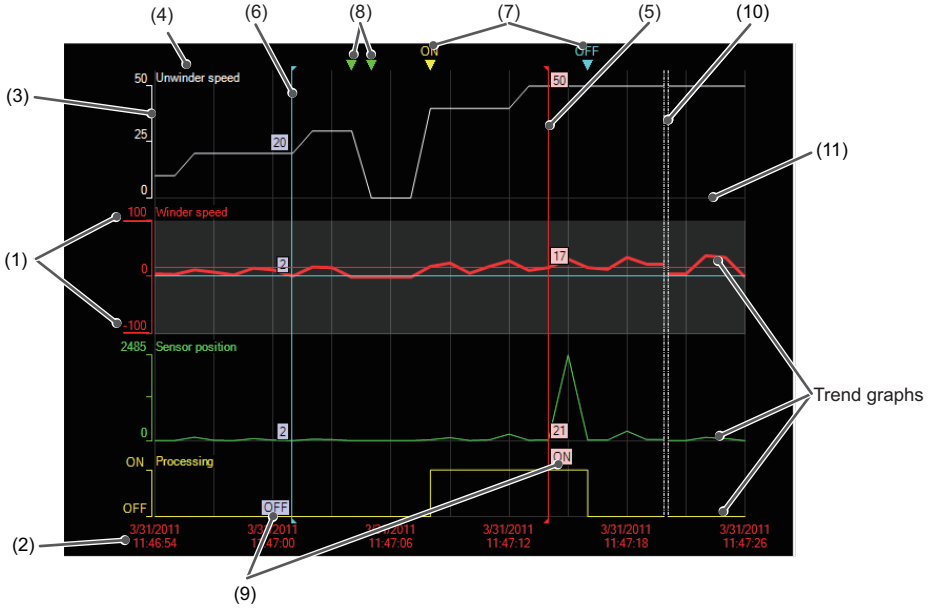
Displayed items

Item	Description	Reference
(1) Title bar	"(Similarity diagnostics setting name) — (Different Waveform Detection History)" is displayed.	—
(2) Graph area	Waveform data is displayed.	Page 35 Difference Waveform Detection History window

Graph area

Trend window/Similar Waveform Recognition Monitor window

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○



Displayed items

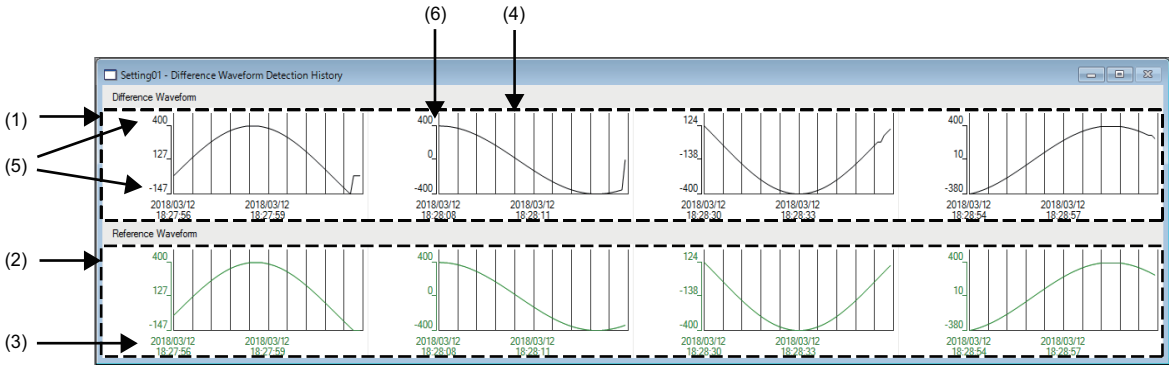
Item	Description	Reference
(1) Upper/lower bounds	A maximum value/minimum value in the display area of each trend graph is displayed. When scaling, the upper bound, lower bound, and intermediate value are underlined. When "Based on Division Value of Grids" is selected for the graph display method, a division value of grids in the display area of each trend graph is also displayed.	GX LogViewer Version 1 Operating Manual
(2) Time-scale label (X axis label)	Time scale is displayed. • Time/Date/Date and Time/Index	
(3) Y axis	The following scales are indicated. • Single line: linearity • Double line: logarithm	
(4) Data name	A name of data being displayed on a graph is displayed. The name will be the same as that in the data name column in the graph legend area. • A file name is also displayed when displaying data on a graph in the time interval plot display format. • When displaying a data logging file to which units are output on a graph, each unit is displayed at the start of data name.	
(5) Red cursor	A cursor that is displayed as standard. (Displayed at the left edge of the graph area every time the window is opened.)	
(6) Blue cursor	A cursor that is displayed for comparison. It is displayed only when the Multiple cursor function is activated. (Displayed at the left edge of the graph area every time the window is opened.)	
(7) Trigger mark	A mark to indicate the point where a trigger condition (ON/OFF) is satisfied.	
(8) Log marker	A point where a log marker is added. A comment that links to a log marker is displayed by placing the mouse cursor on the log marker. In addition, the color of a log marker can be changed.	
(9) Cursor label	The value at the point of intersection between the cursor and a graph is displayed.	
(10) Data missing line	Lines to separate the area where data could not be collected from the other area.	
(11) Grid	A vertical line and horizontal line to divide the graph drawing area.	

Point

- The background color, color and type of graph line, trigger mark color, and grid color can be changed. (GX LogViewer Version 1 Operating Manual)
- The data names displayed in the graph area can be switched to arbitrary character strings.(GX LogViewer Version 1 Operating Manual)
- Up to 32 trend graphs can be displayed in the graph area.
- For the "Similar Waveform Recognition Monitor" window, the area in which an error occurs will be highlighted in the difference detection color.

Difference Waveform Detection History window

Edgecross Basic Software	Similar Waveform Recognition Tool
—	○



Item	Description	Reference
(1) Different waveform drawing area	A waveform diagnosed as being different from the reference waveform is displayed in the unit waveform width. Up to four different waveforms can be displayed and waveforms are deleted in chronological order.	—
(2) Reference waveform drawing area	The snapshots of the reference waveform most similar to a different waveform being displayed are displayed for each the unit waveform width.	
(3) Time-scale label	Time scale is displayed.	GX LogViewer Version 1 Operating Manual
(4) Grid	A vertical line and horizontal line to divide the graph drawing area.	
(5) Upper/lower bounds	The maximum and minimum value in the display area of each graph are displayed.	
(6) Y axis	A linear scale is displayed.	—

Status bar

Ex.

When connecting to Edgecross Basic Software and displaying a historical trend window in the time display.

(1) (2) (3) (4)

Displayed items

Item	Description	
(1) Acquisition source of data	Displays the acquisition source of data being displayed in characters and colors.	
	Displayed characters	"-" is displayed.
	Background color	Data Source: Edgecross Basic Software, Real-time Data Analyzer — Background color: Pale orange
(2) Communication status	Displays "Online" or "Offline" according to the communication status. (For the realtime trend function or the similar waveform recognition monitor function only)	
(3) Cursor value	Displays the value at the point of intersection between the red cursor and a selected trend graph.*1	
(4) Cursor time/Index	Displays time or index at the red cursor.*1*2	

*1 When a historical data file is not read, data is not displayed even if a historical data definition file has been read.

*2 When displaying the publishing data of Edgecross Basic Software, the adjusted local time is displayed in Cursor time even though the UTC time is distributed from Edgecross Basic Software.

6.3 Displaying Trend Graph

This section explains how to display data acquired from Edgecross Basic Software or Real-time Data Analyzer on a trend graph.

The total number of records that can be displayed by the trend graph function is 1000001.

☞ Page 38 Displaying the past data saved in an industrial PC (Historical trend)
☞ Page 39 Displaying the current status of collected/modified data (Realtime trend)
☞ Page 41 Displaying the similarity between a reference waveform and an inspection waveform (Similar waveform recognition monitor)
☞ Page 42 Operating Monitoring Status

Displaying the past data saved in an industrial PC (Historical trend)

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

By specifying a following file saved in an industrial PC using the historical trend function, the data can be displayed on a trend graph.

- Historical data definition file and historical data file that were saved with the file saving function of Edgecross Basic Software
- Diagnosis result file that was output with Real-time Data Analyzer

Restriction

When a historical data file is not read, trend graphs cannot be operated and the display setting of graphs cannot be changed even if a historical data definition file has been read.
To display a historical data definition file and historical data file, any of the following Edgecross compatible software (iQ Edgecross) needs to be installed.

- Real-time Data Analyzer
- SLMP Data Collector
- OPC UA Data Collector

Operating procedure

■ Displaying a historical data file saved with Edgecross Basic Software

Drag and drop a historical data file onto the main window.*1

*1 When the "DATATYPE" folder does not include the historical data definition file corresponding to the historical data file, the window in which data names are displayed needs to be activated in advance by clicking the window after dragging and dropping the historical data definition file onto the main window.

■ Displaying a diagnosis result file of Real-time Data Analyzer

Drag and drop a diagnosis result file to be displayed onto the main window.

Point

The file saved in an industrial PC can also be displayed by the following operation.

- Select [File] ⇨ [Open](), and specify the file saved in an industrial PC.

Displaying the current status of collected/modified data (Realtime trend)

Edgecross Basic Software	Similar Waveform Recognition Tool
○	—

By acquiring the data collected or modified in Edgecross Basic Software using the realtime trend function, the data can be displayed on a trend graph.
Before performing operations, read the following restrictions to install and set each software.

Restriction

The following operations need to be performed in advance because this function may be unavailable due to the installation status and settings of Edgecross Basic Software, Real-time Data Analyzer, or MQTT broker.

• Installing a required product

Edgecross Basic Software and any of the following Edgecross compatible software (iQ Edgecross) need to be installed in the same industrial PC as GX LogViewer.

· Real-time Data Analyzer
· SLMP Data Collector
· OPC UA Data Collector

When the software is not installed, "Edgecross Basic Software" cannot be selected in the "Connection Destination" screen.

• Installing MQTT broker

MQTT broker needs to be installed in the same industrial PC as GX LogViewer.
When MQTT broker is not installed, data cannot be acquired from Edgecross Basic Software via MQTT broker.
For details, refer to the manual for Edgecross Basic Software.

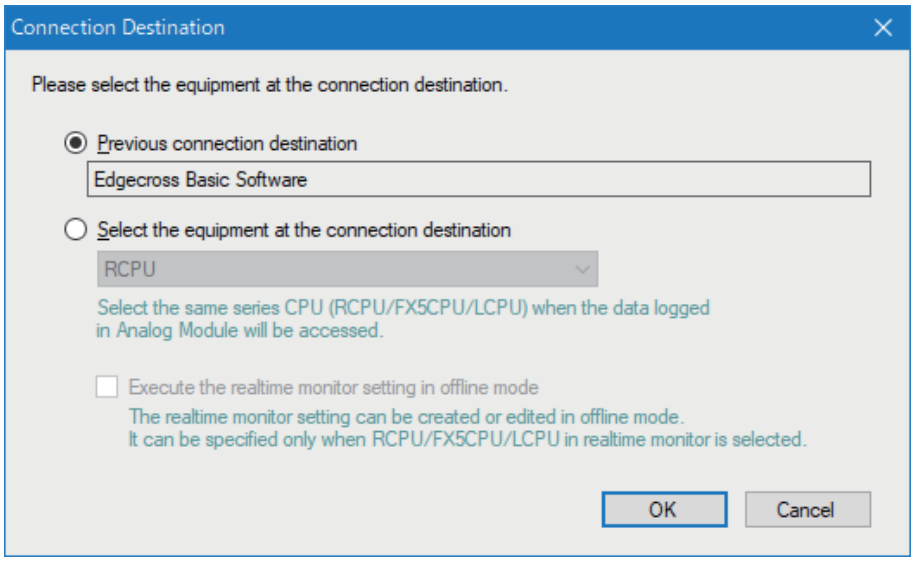
• Creating a publishing data definition file

A publishing data definition file needs to be created in Edgecross Basic Software.
When using a real-time data publishing I/F, this function only supports publishing data which includes index information. Create the publishing data definition file of publishing data which includes index information.

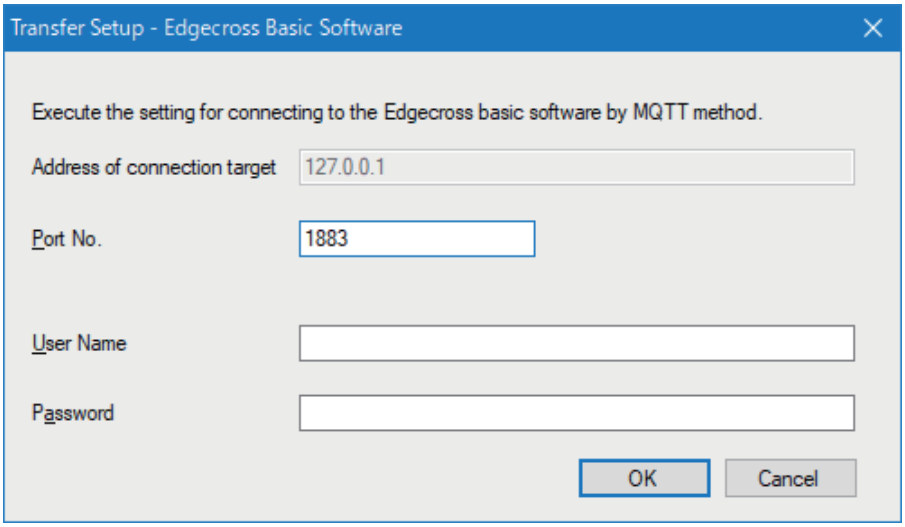
Operating procedure

■ Displaying the current data of Edgecross Basic Software on a trend graph

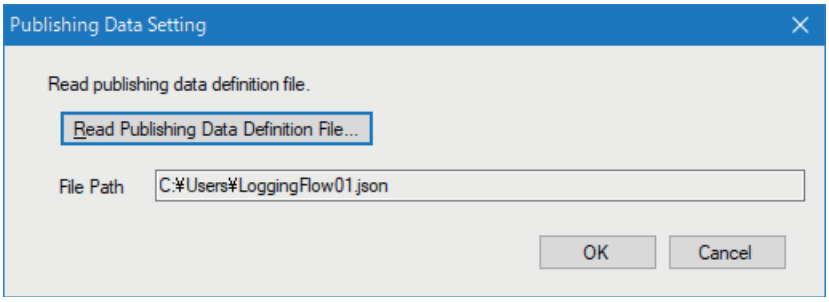
1. Select [Online] ⇨ [Realtime Monitor] ( ).
2. Select "Edgecross Basic Software" in the "Connection Destination" screen.



3. Enter the port No., user name, and password of the MQTT broker to be connected in the "Transfer Setup" screen.



4. Click the [Read Publishing Data Definition File] button in the "Publishing Data Setting" screen.



5. Select the publishing data definition file in the "Read Publishing Data Definition File" screen, and click the [Open] button.

6. Click the [OK] button in the "Publishing Data Setting" screen.

Point

When data is not being distributed from Edgecross Basic Software, graphs are not drawn even though monitoring can be started.
When graphs are not drawn after starting monitoring, check that the status of the target data logging flow is RUN by using Real-time Flow Manager Diagnostics.
For details, refer to the manual for Edgecross Basic Software.

Displaying the similarity between a reference waveform and an inspection waveform (Similar waveform recognition monitor)

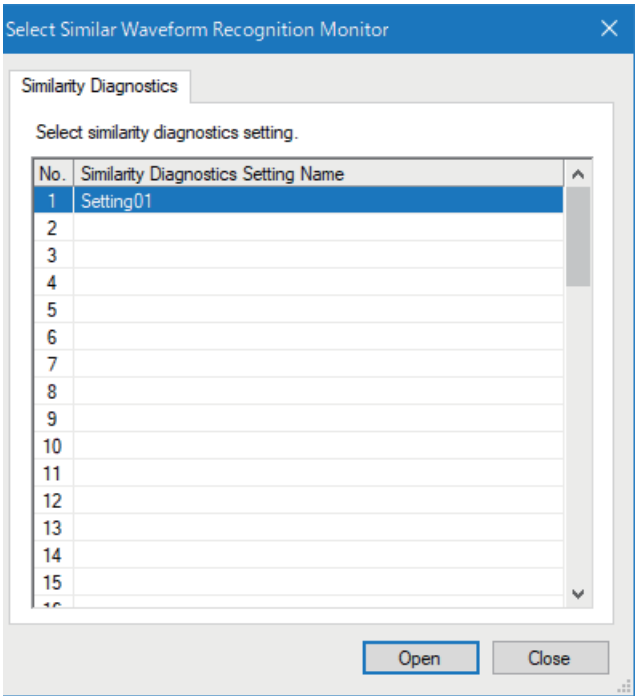
Edgecross Basic Software	Similar Waveform Recognition Tool
—	○

By specifying the similarity diagnosis setting set in Real-time Data Analyzer using the similar waveform recognition monitor function, the data can be displayed on a trend graph.

Operating procedure

■ Displaying data, which was diagnosed in Real-time Data Analyzer, on a trend graph

1. Select [Online] ⇨ [Similar Waveform Recognition Monitor].
2. In the "Select Similar Waveform Recognition Monitor" screen, select a setting to be displayed and click the [Open] button.



Restriction

Only data which was diagnosed in Real-time Data Analyzer installed in the same industrial PC as GX LogViewer can be displayed in the similar waveform recognition monitor window; therefore, the diagnosed data output from Real-time Data Analyzer installed in another industrial PC cannot be displayed.

6.4 Operating Monitoring Status

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

When displaying data by using the realtime trend function or similar waveform recognition monitor function, the monitoring status can be changed and the graph can be controlled.

Function name	Supporting software
Realtime trend	Edgecross Basic Software
Similar waveform recognition monitor	Real-time Data Analyzer

Operating procedure

■ Starting monitoring

• Select [Online] ⇨ [Begin Monitor] ( ).

This operation starts the communication with a module, and turns the monitoring status from Stop to Run.

■ Stopping monitoring

• Select [Online] ⇨ [End Monitor] ( ).

This operation disconnects the communication with a module, and stops a trend graph drawing.

■ Pausing graph update

• Select [Online] ⇨ [Pause Monitor] ( ).

This operation suspends a trend graph drawing with communication continued. (Data collection is continued.)

■ Restarting graph update

• Select [Online] ⇨ [Restart Monitor] ( ).

This operation restarts the trend graph drawing from the monitoring paused status.

The data collected while the monitoring had been paused is not displayed on the graph temporarily, but it is displayed on the trend graph after the monitoring is restarted.

■ Clearing graphs

• Select [Online] ⇨ [Clear Graph] ( ).

This operation clears trend graphs being drawn in the graph area.

Graph drawing for the data being collected is restarted immediately after clearing.

6.5 Checking Data

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

Data displayed in a trend window can be checked by using the following functions.

Function	Reference
Checking and comparing data values/status	GX LogViewer Version 1 Operating Manual
Adding/deleting data to/from graph legend area	
Adding a log marker to data	

The following shows the restriction when displaying the data acquired from Edgecross Basic Software in the graph legend area.

Restriction

When the "DATATYPE" folder does not include the historical data definition file corresponding to the historical data file, the data of the historical data file cannot be added to the list in the "Change the Data to Draw Graphs" screen.

Point

The CSV file saved the both data of historical data definition file and historical data file can be read by itself and be added to the list in the "Change the Data to Draw Graphs" screen.

6.6 Operating Trend Graphs

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

Trend graphs can be operated by using the following functions.

Function	Reference
Displaying/hiding graphs	📖GX LogViewer Version 1 Operating Manual
Aligning graphs	
Superimposing graphs	
Moving cursor by specifying value/time/index	
Switching the graph display method	
Specifying the upper and lower bounds/Y axis scale	
Specifying a division value of grids	
Widening/narrowing the display scale	
Moving graph up/down/left/right	
Synchronizing the time	
Expanding/reducing the time scale	
Displaying the previous or next trend graph consecutively	Page 45 Displaying the previous or next trend graph consecutively 📖GX LogViewer Version 1 Operating Manual

Displaying the previous or next trend graph consecutively

Normally, data in one file is displayed in a historical trend window; however, data in the previous or next file can be displayed at the same time by using this function.

This enables the consecutive view of the data of divided files.

Target	Display condition	Display order
Historical data file of Edgecross Basic Software	• Same file extension • Sequentially numbered suffix of file names*1	Sequential number order of the suffix of file names
Diagnosis result file of Real-time Data Analyzer	• Same file extension • Sequentially numbered suffix of file names*1	Sequential number order of the suffix of file names

*1 When the file name is 'LOG_00000001.TXT', only '00000001' is the information to judge the sequential number.

Restriction

Read a historical data file to display the data of the consecutive files (previous/next) saved with Edgecross Basic Software. When only a historical data definition file has been read, this function cannot be used.

Point

For details on this function, refer to the following manual.

GX LogViewer Version 1 Operating Manual

6.7 Changing Display Items in Graph Area

Display items in the graph area can be changed by using the following functions.

Function	Reference
Displaying multiple cursors	📖GX LogViewer Version 1 Operating Manual
Displaying cursor labels	
Displaying data names	
Switching data names	Page 47 Switching data names
Displaying grid	📖GX LogViewer Version 1 Operating Manual
Changing graph plot formats	
Moving graph up/down/left/right	
Changing a display of time-scale label	
Switching the display language of data names	

Switching data names

The data names of devices and labels displayed in the graph legend area and the graph area in the windows opened by the following functions can be switched to other names.

- Historical Trend
- Realtime Trend
- Similar Waveform Recognition Monitor

Point

For details on this function, refer to the following manual.

GX LogViewer Version 1 Operating Manual

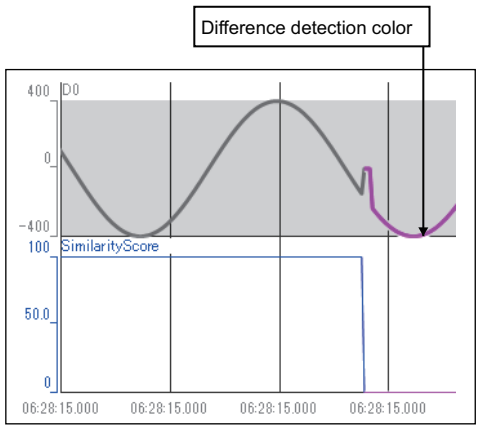
6.8 Changing Graph Appearance

Color, line type, or line thickness of graphs can be changed, or a display area can be highlighted by using the following functions.

Function	Reference
Changing color and type of graph	Page 48 Changing color and type of graph GX LogViewer Version 1 Operating Manual
Highlighting graph	GX LogViewer Version 1 Operating Manual
Thickening graph line	

Changing color and type of graph

Change the settings of graphs (color and type), background color, and graph area (grid color, trigger ON color, trigger OFF color, and difference detection color) displayed in the trend window.



The color settings for the background, grid, trigger ON and OFF, and difference detection are common to all trend windows, so any changes are applied to all the trend windows being displayed; however, the color settings does not support the 'Set Graph View by the Auto Reflect Function' function.

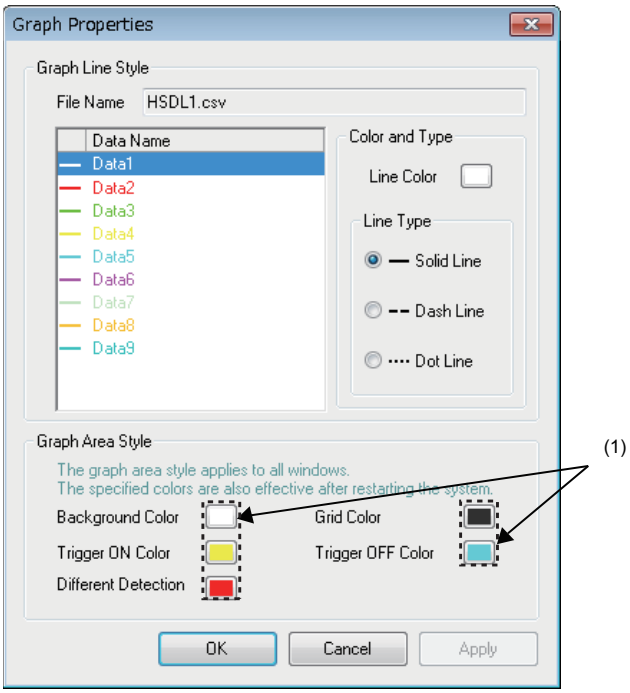
Point

For details on this function, refer to the following manual.
GX LogViewer Version 1 Operating Manual

Changing settings in the Graph Properties screen

Window

Select [Graph View] ⇨ [Graph Properties].



Operating procedure

■ Changing graph area setting (background color, grid color, trigger ON color, trigger OFF color, or difference detection color)

1. Click the color button (1) for the setting to be changed.
2. Select a color from "Basic colors" or "Custom colors" in the "Color" screen, and click the [OK] button.

6.9 Displaying a Graph as Data Values

Display a graph displayed in a historical trend window as the data values.

The display contents in the data name area when displaying the data of a historical data file in the historical trend window differ from the display contents when displaying the data of another file.

The following table shows the each display content when displaying the data.

Data type	Display content	
	When displaying historical data file	When displaying another file than historical data file
Bit	BOOL[1;0]	BIT[1;0]
Word [Signed]	INT[DEC.0]	SHORT[DEC.0]
Word [unsigned]	UINT[DEC.0]	USHORT[DEC.0]
	UINT[HEX]	USHORT[HEX]
Double word [signed]	DINT[DEC.0]	LONG[DEC.0]
Double word [unsigned]	UDINT[DEC.0]	ULONG[DEC.0]
	UDINT[HEX]	ULONG[HEX]
Single-precision real number	REAL[DEC.(number of digits after the decimal point)]*1	FLOAT[DEC.(number of digits after the decimal point)]*2
	REAL[EXP.(number of digits after the decimal point)]*1	FLOAT[EXP.(number of digits after the decimal point)]*2
Double-precision real number	LREAL[DEC.(number of digits after the decimal point)]*3	DOUBLE[DEC.(number of digits after the decimal point)]*4
	LREAL[EXP.(number of digits after the decimal point)]*3	DOUBLE[EXP.(number of digits after the decimal point)]*4

*1 In the bracket, the number between 0 and 8 is displayed.

*2 In the bracket, the number between 0 and 14 is displayed when displaying a CSV file or a Unicode text file; 7 is displayed when displaying a binary file.

*3 In the bracket, the number between 0 and 16 is displayed.

*4 In the bracket, the number between 0 and 14 is displayed when displaying a CSV file or a Unicode text file; 14 is displayed when displaying a binary file.

Point

- When the data type is INT, UINT, DINT, or UDINT, the output format of the data displayed in the data area can be switched between 'Decimal [unsigned]', 'Decimal [signed]', and 'Hexadecimal' in the menu displayed by right-clicking the data name column.
- For details on this function, refer to the following manual.

GX LogViewer Version 1 Operating Manual

6.10 Displaying Abnormal Graphs

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

An abnormal graph is displayed when "#" is included in the data row of a file saved by using the similar waveform recognition monitor function because "#" is recognized as an invalid value.

Point

For the display conditions and display contents of an abnormal graph, refer to the following manual.
GX LogViewer Version 1 Operating Manual

7 SAVING DISPLAYED DATA

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

This function saves data being displayed in a trend window to an industrial PC as a CSV file, Unicode test file, or image file (BMP/JPG/PNG).
The saved CSV file and Unicode text file can be displayed in the trend window.

7.1 Save Target Data

The data being displayed in the active trend window can be saved.
The data being displayed in the realtime trend window or the similar waveform recognition monitor window can be saved in CSV format or Unicode format only when the monitoring process is stopped or the graph drawing is suspended.

Point

When data in files is consecutively displayed, the data in two files can be saved to one file.

7.2 Saving Displayed Data

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

This section explains how to save data being displayed in the active trend window to any of the following files.

File format	Reference
CSV file	Page 53 Saving displayed data to CSV file
Unicode text file	Page 59 Saving displayed data to Unicode text file
Image file	GX LogViewer Version 1 Operating Manual

Saving displayed data to CSV file

Edgecross Basic Software	Similar Waveform Recognition Tool
○	○

Save data displayed in the graph legend area of active trend window to a CSV file.
When saving data displayed in the historical trend window, the data names are saved in the language specified with the language selection function.
The data to be saved is as shown below.

- Historical trend window: Data of a file being displayed
- Realtime trend window/Realtime monitor window: Data received from the start of monitoring to the pause/stop of graph drawing

Data removed from the graph legend area and difference waveform detection history are not saved.

Restriction

When data names are switched by using the switch data name function, the data cannot be saved to a CSV file.

Operating procedure

1. Select [File] ⇨ [Save As] ⇨ [Save CSV File] ( ).
2. Enter a file name, and click the [Save] button.

Format specification of CSV file

CSV file format may differ depending on the acquisition source of data. For details on the format, refer to the following sections:

Acquisition source of data	Reference
Edgecross Basic Software	Page 54 Edgecross Basic Software
Real-time Data Analyzer	Page 56 Real-time Data Analyzer

■ Edgecross Basic Software

The format of the CSV file to which the data being displayed by using the historical trend function or the realtime trend function was saved is shown below.

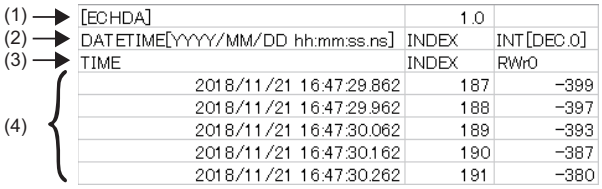
The CSV file format explained in this section differs from that acquired from Edgecross Basic Software.

For details on the CSV file format acquired from Edgecross Basic Software, refer to the manual for Edgecross Basic Software

Item	Description
Delimiter	Comma (,)
Line feed code	CRLF(0x0D, 0x0A)
Character code	Data of historical data definition file and historical data file: Unicode(UTF-8) Publishing data: Unicode (UTF-8)
Number of rows	Maximum number of rows: 36003 rows (data rows + 3)

Ex.

When opening a CSV file in spreadsheet software



Row name	Column number	Column name	Output content
(1) File information	1st column	File type	Fixed value: [ECHDA]
	2nd column	Specification version	Version number (Example) 1.0
(2) Data type information	1st column	Date and time column	■Historical data definition file and historical data file Fixed character: DATETIME[Date and time information*1] ■Publishing data Fixed character: DATETIME[YYYY/MM/DD hh:mm:ss.ns]
	2nd column	Index column*2	Fixed character: INDEX
	3rd column and later	Data column	Data type of collected data Output format: Output character for the data type [additional information] ☞Page 58 Edgecross Basic Software
(3) Data name	1st column	Date and time column	Fixed character: TIME
	2nd column	Index column*2	Fixed character: INDEX
	3rd column and later	Data column	Output format: Data name
(4) Data	1st column	Date and time column	Date and time information ■Historical data definition file and historical data file Output format: Depending on the contents of the historical data definition file that has been read. ■Publishing data Output format: YYYY/MM/DD hh:mm:ss.ns
	2nd column	Index column*2	Value of an index Output format: Integer value
	3rd column and later	Data column	Value of a collected device Output format: Value corresponding to the type in the data type information row

*1 The output format of date and time information depends on the contents of the historical data definition file that has been read.

*2 This column is not output when the read historical data definition file does not have the index column.

Restriction

Data needs to be saved after both a historical data definition file and historical data file were read.
Data cannot be saved as a CSV file when only historical data file has been read.

Point

By reading a historical data definition file and historical data file, and saving the data to a CSV file, the data of both files can be saved to one file.
The saved CSV file can be read by itself into GX LogViewer.

■ Real-time Data Analyzer

The format of the CSV file to which the data being displayed by using the historical trend function was saved is shown below.

The CSV file format explained in this section differs from that acquired from Real-time Data Analyzer.

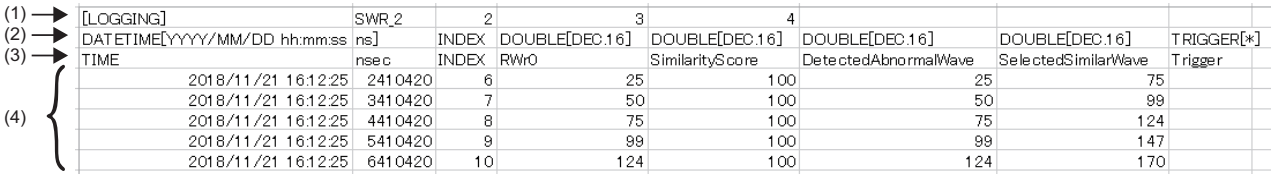
For details on the CSV file format acquired from Real-time Data Analyzer, refer to the following manual.

📖Real-time Data Analyzer User's Manual

Item	Description
Delimiter	Comma (,)
Line feed code	CRLF(0x0D, 0x0A)
Character code	Unicode (UTF-8)
Number of rows	Maximum number of rows: 36003 rows (data rows + 3)

Ex.

When opening a CSV file in spreadsheet software



(1) →	[LOGGING]	SWR_2	2	3	4			
(2) →	DATETIME[YYYY/MM/DD hh:mm:ss	ns]	INDEX	DOUBLE[DEC16]	DOUBLE[DEC16]	DOUBLE[DEC16]	DOUBLE[DEC16]	TRIGGER[*]
(3) →	TIME	nsec	INDEX	RWr0	SimilarityScore	DetectedAbnormalWave	SelectedSimilarWave	Trigger
(4)	2018/11/21 16:12:25	2410420	6	25	100	25	75	
	2018/11/21 16:12:25	3410420	7	50	100	50	99	
	2018/11/21 16:12:25	4410420	8	75	100	75	124	
	2018/11/21 16:12:25	5410420	9	99	100	99	147	
	2018/11/21 16:12:25	6410420	10	124	100	124	170	

Row name	Column number	Column name	Output content
(1) File information	1st column	File type	Fixed value: [LOGGING]
	2nd column	Type information_file version	Fixed value: • A case in which the version of Real-time Data Analyzer is 1.02C or earlier: ECBS_1 • A case in which the version of Real-time Data Analyzer is 1.03D or later: SWR_2
	3rd column	Number for data type information row	Fixed value: 2
	4th column	Number for data name row	Fixed value: 3
	5th column	Number for data starting row	Fixed value: 4
(2) Data type information	1st column	Date and time column	Fixed character: DATETIME[YYYY/MM/DD hh:mm:ss
	2nd column	Microsecond column/nanosecond column	Fixed character: • A case in which the version of Real-time Data Analyzer is 1.02C or earlier: us] • A case in which the version of Real-time Data Analyzer is 1.03D or later: ns]
	3rd column	Index column	Fixed character: INDEX
	4th column and later	Data column	Data type of collected data Output format: Output character for the data type [additional information] ☞ Page 58 Real-time Data Analyzer
	Last column	Trigger information column	Fixed character: TRIGGER[(trigger ON string)][*1]
(3) Data name	1st column	Date and time column	Fixed character: TIME
	2nd column	Microsecond column/nanosecond column	Fixed character: • A case in which the version of Real-time Data Analyzer is 1.02C or earlier: usec • A case in which the version of Real-time Data Analyzer is 1.03D or later: nsec
	3rd column	Index column	Fixed character: INDEX
	4th column and later	Data column	Output format: Data name
	Last column	Trigger information column	Fixed character: Trigger

Row name	Column number	Column name	Output content
(4) Data	1st column	Date and time column	Date and time information Output format: YYYY/MM/DD hh:mm:ss
	2nd column	Microsecond column/nanosecond column	• A case in which the version of Real-time Data Analyzer is 1.02C or earlier: Value of microseconds • A case in which the version of Real-time Data Analyzer is 1.03D or later: Value of nanoseconds
	3rd column	Index column*2	Value of an index Output format: Integer value
	4th column and later	Data column	Value of a collected device Output format: Value corresponding to the type in the data type information row
	Last column	Trigger information column	Information at the time when a trigger occurred

1 "" is output for 'trigger ON string'.

*2 Sequentially numbered indexes starting from one are automatically output.

Output character for the data type

■ Edgecross Basic Software

Data type	Output character for the data type	Output content
Binary (0 or 1)	BOOL	BOOL[1:0]
Unsigned 16-bit integer	UINT	UINT[DEC.0]*1
Signed 16-bit integer	INT	INT[DEC.0]*1
Unsigned 32-bit integer	UDINT	UDINT[DEC.0]*1
Signed 32-bit integer	DINT	DINT[DEC.0]*1
32-bit real number	REAL	REAL[DEC.8]*1*2
64-bit real number	LREAL	LREAL[DEC.16]*1*2

*1 [DEC.(number of digits after the decimal point)] is displayed. (DEC: decimal format)

*2 The number of digits after the decimal point is not always same as the specified one.
(Example) For 1.2345, '1.2345' is output, not '1.2345000'.

■ Real-time Data Analyzer

Data type	Output character for the data type	Output content
Bit	BIT	BIT[(ON string);(OFF string)]*1
Word [unsigned]	USHORT	USHORT[DEC.0]*2
Word [Signed]	SHORT	SHORT[DEC.0]*2
Double word [unsigned]	ULONG	ULONG[DEC.0]*2
Double word [signed]	LONG	LONG[DEC.0]*2
Single-precision real number	FLOAT	FLOAT[DEC.7]*2*3
Double-precision real number	DOUBLE	DOUBLE[DEC.14]*2*3
16bit BCD	BCD16	BCD16[DEC.0]*2
32bit BCD	BCD32	BCD32[DEC.0]*2

*1 In a historical trend window on which a CSV file is opened, a trigger ON string and trigger OFF string are displayed according to the information in the file.
In a realtime trend window on which a binary file is opened, "*" and "-" are displayed for 'trigger ON string' and 'trigger OFF string' respectively when a CSV file is output.

*2 [DEC.(number of digits after the decimal point)] is displayed. (DEC: decimal format)

*3 The number of digits after the decimal point is not always same as the specified one.
(Example) For 1.2345, '1.2345' is output, not '1.2345000'.

Saving displayed data to Unicode text file

Edgecross Basic Software	Similar Waveform Recognition Tool
—	○

Save data displayed in the graph area of active trend window to a Unicode text file.

The data to be saved is as shown below.

- Similar waveform recognition monitor window: Data received from the start of monitoring to the pause/stop of graph drawing

Data removed from the graph legend area and difference waveform detection history are not saved.

Restriction

When data names are switched by using the switch data name function, the data cannot be saved to a Unicode text file.

Operating procedure

1. Select [File] ⇨ [Save As] ⇨ [Save Unicode Text File] ().
2. Enter a file name, and click the [Save] button.

Format specification of Unicode text file

For details on the Unicode text file format, refer to the following section:

Acquisition source of data	Reference
Real-time Data Analyzer	Page 60 Real-time Data Analyzer

■ Real-time Data Analyzer

The format of the Unicode text file to which the data being displayed by using the similar waveform recognition monitor was saved is shown below.

The Unicode text file format explained in this section differs from that of a CSV file which was output in Real-time Data Analyzer.

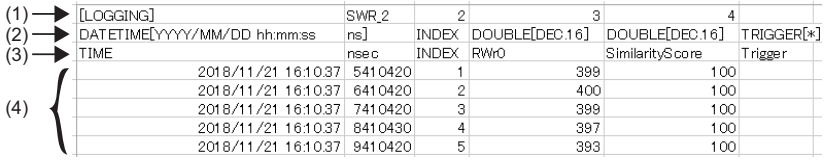
For details on the Unicode text file format acquired from Real-time Data Analyzer, refer to the following manual.

📖Real-time Data Analyzer User's Manual

Item	Description
Delimiter	Tab
Line feed code	CRLF(0x0D, 0x0A)
Character code	Unicode
Character encoding method	UTF-16 (little-endian)
Filed data	It is not enclosed with double quotes (""). A tab cannot be used for each unit of data.
Number of rows	Maximum number of rows: 36003 rows (data rows + 3)

Ex.

When opening a Unicode text file in spreadsheet software



Row name	Column number	Column name	Output content
(1) File information	1st column	File type	Fixed value: [LOGGING]
	2nd column	Type information_file version	Fixed value: • A case in which the version of Real-time Data Analyzer is 1.02C or earlier: ECBS_DSDT_1 • A case in which the version of Real-time Data Analyzer is 1.03D or later: SWR_2
	3rd column	Number for data type information row	Fixed value: 2
	4th column	Number for data name row	Fixed value: 3
	5th column	Number for data starting row	Fixed value: 4
(2) Data type information	1st column	Date and time column	Fixed character: DATETIME[YYYY/MM/DD hh:mm:ss
	2nd column	Microsecond column/nanosecond column	Fixed character: • A case in which the version of Real-time Data Analyzer is 1.02C or earlier: us] • A case in which the version of Real-time Data Analyzer is 1.03D or later: ns]
	3rd column	Index column	Fixed character: INDEX
	4th column and later	Data column	Data type of collected data Output format: Output character for the data type [additional information] ☞ Page 62 Output character for the data type
	Last column	Trigger information column	Fixed character: TRIGGER[(trigger ON string)]*1
(3) Data name	1st column	Date and time column	Fixed character: TIME
	2nd column	Microsecond column/nanosecond column	Fixed character: • A case in which the version of Real-time Data Analyzer is 1.02C or earlier: usec • A case in which the version of Real-time Data Analyzer is 1.03D or later: nsec
	3rd column	Index column	Fixed character: INDEX
	4th column and later	Data column	4th column (output format): Data name 5th column (fixed value): SimilarityScore
	Last column	Trigger information column	Fixed character: Trigger

Row name	Column number	Column name	Output content
(4) Data	1st column	Date and time column	Date and time information Output format: YYYY/MM/DD hh:mm:ss
	2nd column	Microsecond column/nanosecond column	• A case in which the version of Real-time Data Analyzer is 1.02C or earlier: Value of microseconds • A case in which the version of Real-time Data Analyzer is 1.03D or later: Value of nanoseconds
	3rd column	Index column*2	Value of an index Output format: Integer value
	4th column and later	Data column	Value of a collected device Output format: Value corresponding to the type in the data type information row
	Last column	Trigger information column	Information at the time when a trigger occurred

1 "" is output for 'trigger ON string'.

*2 Sequentially numbered indexes starting from one are automatically output.

Output character for the data type

■ Real-time Data Analyzer

Data type	Output character for the data type	Output content
Bit	BIT	BIT[(ON string);(OFF string)][*1]
Word [unsigned]	USHORT	USHORT[DEC.0][*2]
Word [Signed]	SHORT	SHORT[DEC.0][*2]
Double word [unsigned]	ULONG	ULONG[DEC.0][*2]
Double word [signed]	LONG	LONG[DEC.0][*2]
Single-precision real number	FLOAT	FLOAT[DEC.7][*2*3]
Double-precision real number	DOUBLE	DOUBLE[DEC.14][*2*3]
16bit BCD	BCD16	BCD16[DEC.0][*2]
32bit BCD	BCD32	BCD32[DEC.0][*2]

*1 In a historical trend window on which a CSV file is opened, a trigger ON string and trigger OFF string are displayed according to the information in the file.
In a realtime trend window on which a binary file is opened, "*" and "-" are displayed for 'trigger ON string' and 'trigger OFF string' respectively when a CSV file is output.

*2 [DEC.(number of digits after the decimal point)] is displayed. (DEC: decimal format)

*3 The number of digits after the decimal point is not always same as the specified one.
(Example) For 1.2345, '1.2345' is output, not '1.2345000'.

APPENDIX

Appendix 1 Added and Changed Functions

The following table shows the functions added and changed in GX LogViewer and the applicable software version.

- SW1DNN-VIEWER-M (Multiple languages)

Added/changed contents	Applicable software version
The time displayed in a trend window can be displayed in nanoseconds or more.	1.90U or later
A historical data definition file and historical data file saved with the file saving function of Edgecross Basic Software can be displayed by using the historical trend function.	
Publishing data of Edgecross Basic Software can be displayed by using the realtime trend function.	
Surrogate pair characters can be displayed for similarity diagnostics setting names and data names when using the similar waveform recognition monitor function.	
The data collected in Edgecross Basic Software can be displayed when either of the following products is installed. • SLMP Data Collector • OPC UA Data Collector	1.124E or later

MEMO

Appendix 2 Version Compatibility

Edgecross Basic Software

The following table shows the specification versions of I/Fs, which are used for displaying data of Edgecross Basic Software, and the supporting software version of GX LogViewer.

Historical data access I/F (file)	Real-time data publishing I/F*1	GX LogViewer
1.0 or later	1.00 or later	1.90U or later

*1 Only QoS2 is supported.

Real-time Data Analyzer

The following table shows the supporting software versions of Real-time Data Analyzer and that of GX LogViewer.

Real-time Data Analyzer	GX LogViewer
1.02C or earlier	1.82L or later
1.03D or later	1.90U or later

A

MEMO

Appendix 3 Open Source Software

This software consists of multiple software components. Each of them is copyrighted by Mitsubishi Electric and/or third parties.

This software contains the following open source software.

● Software licensed under the Eclipse Public License (EPL) and Eclipse Distribution License (EDL)

For the open source software of the EPL used in this software, it is allowed to obtain and redistribute the source codes according to the EPL conditions described in the following software information.

☞ Page 67 Software information

These source codes are stored under the OSS directory.

Source codes are not distributed for the software of Mitsubishi Electric and/or third parties.

Please refrain from inquiring about the source codes of this open source.

Software information

This product contains the following open source software.

❶JSON.NET(☞ Page 67 JSON.NET)

❷mosquitto(☞ Page 67 mosquitto)

JSON.NET

This product uses JSON.NET licensed under the MIT License.

The copyright and permission notices of JSON.NET are described below.

mosquitto

This product uses mosquitto licensed under the Eclipse Public License - v 1.0 and the Eclipse Distribution License - v 1.0.

The permission notice of the Eclipse Public License - v 1.0 and Eclipse Distribution License - v1.0 is described below.

ii) additions to the Program;
where such changes and/or additions to the Program originate from and are distributed by that particular Contributor. A Contribution 'originates' from a Contributor if it was added to the Program by such Contributor itself or anyone acting on such Contributor's behalf. Contributions do not include additions to the Program which: (i) are separate modules of software distributed in conjunction with the Program under their own license agreement, and (ii) are not derivative works of the Program.

"Contributor" means any person or entity that distributes the Program.

"Licensed Patents " mean patent claims licensable by a Contributor which are necessarily infringed by the use or sale of its Contribution alone or when combined with the Program.

"Program" means the Contributions distributed in accordance with this Agreement.

"Recipient" means anyone who receives the Program under this Agreement, including all Contributors.

2. GRANT OF RIGHTS

a) Subject to the terms of this Agreement, each Contributor hereby grants Recipient a non-exclusive, worldwide, royalty-free copyright license to reproduce, prepare derivative works of, publicly display, publicly perform, distribute and sublicense the Contribution of such Contributor, if any, and such derivative works, in source code and object code form.

b) Subject to the terms of this Agreement, each Contributor hereby grants Recipient a non-exclusive, worldwide, royalty-free patent license under Licensed Patents to make, use, sell, offer to sell, import and otherwise transfer the Contribution of such Contributor, if any, in source code and object code form. This patent license shall apply to the combination of the Contribution and the Program if, at the time the Contribution is added by the Contributor, such addition of the Contribution causes such combination to be covered by the Licensed Patents. The patent license shall not apply to any other combinations which include the Contribution. No hardware per se is licensed hereunder.

c) Recipient understands that although each Contributor grants the licenses to its Contributions set forth herein, no assurances are provided by any Contributor that the Program does not infringe the patent or other intellectual property rights of any other entity. Each Contributor disclaims any liability to Recipient for claims brought by any other entity based on infringement of intellectual property rights or otherwise. As a condition to exercising the rights and licenses granted hereunder, each Recipient hereby assumes sole responsibility to secure any other intellectual property rights needed, if any. For example, if a third party patent license is required to allow Recipient to distribute the Program, it is Recipient's responsibility to acquire that license before distributing the Program.

d) Each Contributor represents that to its knowledge it has sufficient copyright rights in its Contribution, if any, to grant the copyright license set forth in this Agreement.

3. REQUIREMENTS

A Contributor may choose to distribute the Program in object code form under its own license agreement, provided that:

a) it complies with the terms and conditions of this Agreement; and

b) its license agreement:

i) effectively disclaims on behalf of all Contributors all warranties and conditions, express and implied, including warranties or conditions of title and non-infringement, and implied warranties or conditions of merchantability and fitness for a particular purpose;

ii) effectively excludes on behalf of all Contributors all liability for damages, including direct, indirect, special, incidental and consequential damages, such as lost profits;

iii) states that any provisions which differ from this Agreement are offered by that Contributor alone and not by any other party; and

iv) states that source code for the Program is available from such Contributor, and informs licensees how to obtain it in a reasonable manner on or through a medium customarily used for software exchange.

When the Program is made available in source code form:

a) it must be made available under this Agreement; and

b) a copy of this Agreement must be included with each copy of the Program.

Contributors may not remove or alter any copyright notices contained within the Program.

Each Contributor must identify itself as the originator of its Contribution, if any, in a manner that reasonably allows subsequent Recipients to identify the originator of the Contribution.

4. COMMERCIAL DISTRIBUTION

Commercial distributors of software may accept certain responsibilities with respect to end users, business partners and the like. While this license is intended to facilitate the commercial use of the Program, the Contributor who includes the Program in a commercial product offering should do so in a manner which does not create potential liability for other Contributors. Therefore, if a Contributor includes the Program in a commercial product offering, such Contributor ("Commercial Contributor") hereby agrees to defend and indemnify every other Contributor ("Indemnified Contributor") against any losses, damages and costs (collectively "Losses") arising from claims, lawsuits and other legal actions brought by a third party against the Indemnified Contributor to the extent caused by the acts or omissions of such Commercial Contributor in connection with its distribution of the Program in a commercial product offering. The obligations in this section do not apply to any claims or Losses relating to any actual or alleged intellectual property infringement. In order to qualify, an Indemnified Contributor must: a) promptly notify the Commercial Contributor in writing of such claim, and b) allow the Commercial Contributor to control, and cooperate with the Commercial Contributor in, the defense and any related settlement negotiations. The Indemnified Contributor may participate in any such claim at its own expense.

For example, a Contributor might include the Program in a commercial product offering, Product X. That Contributor is then a Commercial Contributor. If that Commercial Contributor then makes performance claims, or offers warranties related to Product X, those performance claims and warranties are such Commercial Contributor's responsibility alone. Under this section, the Commercial Contributor would have to defend claims against the other Contributors related to those performance claims and warranties, and if a court requires any other Contributor to pay any damages as a result, the Commercial Contributor must pay those damages.

5. NO WARRANTY

EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, THE PROGRAM IS PROVIDED ON AN "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, EITHER EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OR CONDITIONS OF TITLE, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Each Recipient is solely responsible for determining the appropriateness of using and distributing the Program and assumes all risks associated with its exercise of rights under this Agreement , including but not limited to the risks and costs of program errors, compliance with applicable laws, damage to or loss of data, programs or equipment, and unavailability or interruption of operations.

6. DISCLAIMER OF LIABILITY

EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, NEITHER RECIPIENT NOR ANY CONTRIBUTORS SHALL HAVE ANY LIABILITY FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING WITHOUT LIMITATION LOST PROFITS), HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OR DISTRIBUTION OF THE PROGRAM OR THE EXERCISE OF ANY RIGHTS GRANTED HEREUNDER, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

7. GENERAL

If any provision of this Agreement is invalid or unenforceable under applicable law, it shall not affect the validity or enforceability of the remainder of the terms of this Agreement, and without further action by the parties hereto, such provision shall be reformed to the minimum extent necessary to make such provision valid and enforceable.

If Recipient institutes patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Program itself (excluding combinations of the Program with other software or hardware) infringes such Recipient's patent(s), then such Recipient's rights granted under Section 2(b) shall terminate as of the date such litigation is filed.

All Recipient's rights under this Agreement shall terminate if it fails to comply with any of the material terms or conditions of this Agreement and does not cure such failure in a reasonable period of time after becoming aware of such noncompliance. If all Recipient's rights under this Agreement terminate, Recipient agrees to cease use and distribution of the Program as soon as reasonably practicable. However, Recipient's obligations under this Agreement and any licenses granted by Recipient relating to the Program shall continue and survive.

Everyone is permitted to copy and distribute copies of this Agreement, but in order to avoid inconsistency the Agreement is copyrighted and may only be modified in the following manner. The Agreement Steward reserves the right to publish new versions (including revisions) of this Agreement from time to time. No one other than the Agreement Steward has the right to modify this Agreement. The Eclipse Foundation is the initial Agreement Steward. The Eclipse Foundation may assign the responsibility to serve as the Agreement Steward to a suitable separate entity. Each new version of the Agreement will be given a distinguishing version number. The Program (including Contributions) may always be distributed subject to the version of the Agreement under which it was received. In addition, after a new version of the Agreement is published, Contributor may elect to distribute the Program (including its Contributions) under the new version. Except as expressly stated in Sections 2(a) and 2(b) above, Recipient receives no rights or

licenses to the intellectual property of any Contributor under this Agreement, whether expressly, by implication, estoppel or otherwise. All rights in the Program not expressly granted under this Agreement are reserved.

This Agreement is governed by the laws of the State of New York and the intellectual property laws of the United States of America. No party to this Agreement will bring a legal action under this Agreement more than one year after the cause of action arose. Each party waives its rights to a jury trial in any resulting litigation.

Eclipse Distribution License - v 1.0

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

Neither the name of the Eclipse Foundation, Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

MEMO

INDEX

I

MEMO

REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
February 2019	SH(NA)-082096ENG-A	First edition
October 2019	SH(NA)-082096ENG-B	■Added or modified parts Appendix 2
October 2021	SH(NA)-082096ENG-C	■Added or modified parts SAFETY PRECAUTIONS, RELEVANT MANUALS, Section 2.2, Section 5.2, Section 5.3, Section 6.1, Section 6.2, Section 6.3, Section 6.5, Section 6.6, Appendix 1
October 2022	SH(NA)-082096ENG-D	■Added or modified parts SAFETY PRECAUTIONS, Section 2.2, Section 5.2, Section 6.3

Japanese manual number: SH-082095-D

TRADEMARKS

Unicode is either a registered trademark or a trademark of Unicode, Inc. in the United States and other countries.
The company names, system names and product names mentioned in this manual are either registered trademarks or trademarks of their respective companies.
In some cases, trademark symbols such as '™' or '®' are not specified in this manual.

COPYRIGHTS

For the open source software used in this product, refer to the following:
☞ Page 67 Open Source Software

SH(NA)-082096ENG-D(2210)
MODEL:SW1DNN-VIEWER-O-EC-E

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN