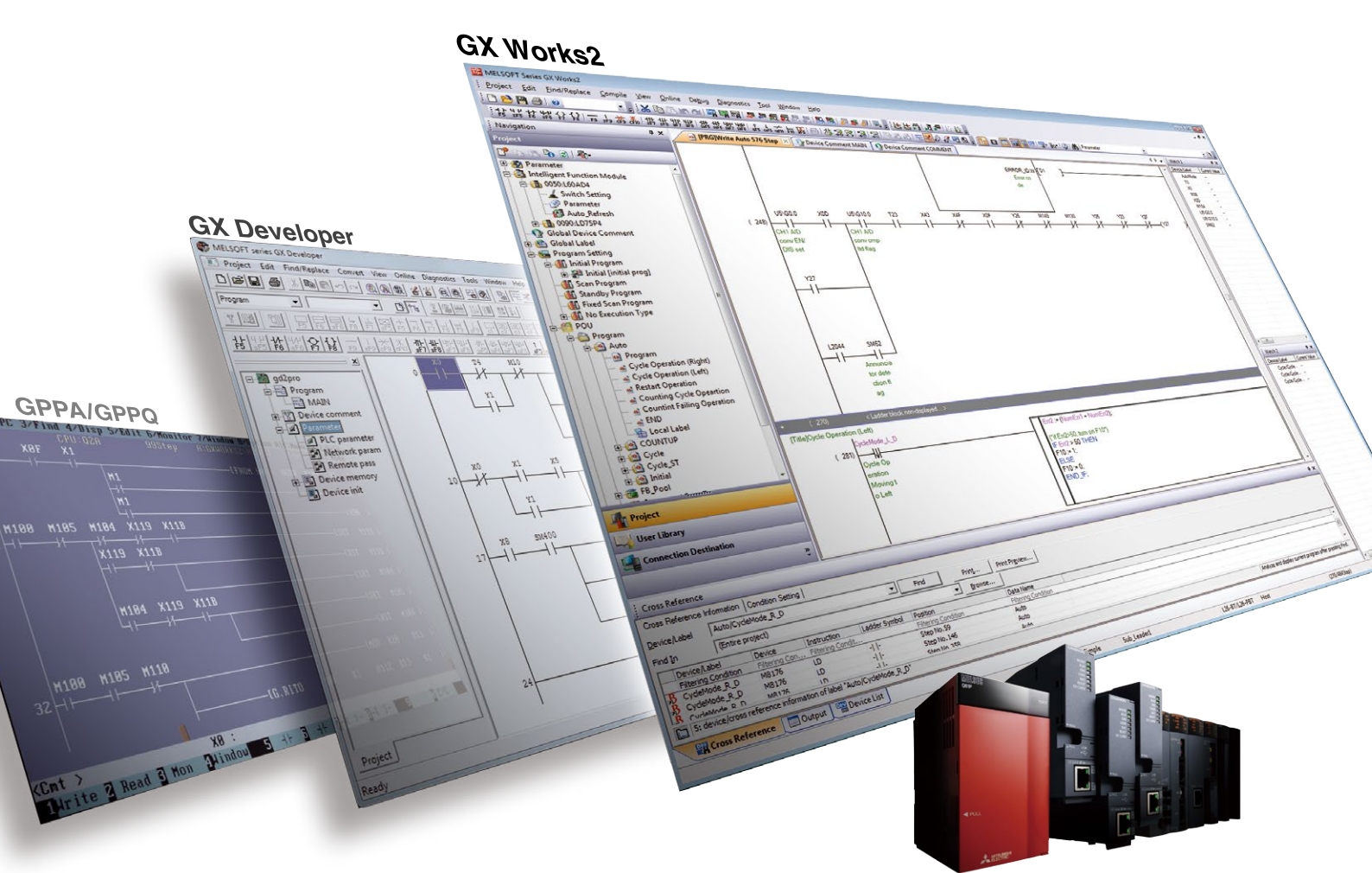


Programmable Controller Engineering Software
MELSOFT GX Works2



GX Works2

Proven and Trusted Programmable Controller
Engineering Software

GLOBAL IMPACT OF MITSUBISHI ELECTRIC



Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

Changes for the Better

"Changes for the Better" represents the Mitsubishi Electric Group's attitude to "always strive to achieve something better", as we continue to change and grow. Each one of us shares a strong will and passion to continuously aim for change, reinforcing our commitment to creating "an even better tomorrow".

Mitsubishi Electric is involved in many areas including the following:

Energy and Electric Systems

A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices

A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance

Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems

Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems

Maximizing productivity and efficiency with cutting-edge automation technology.

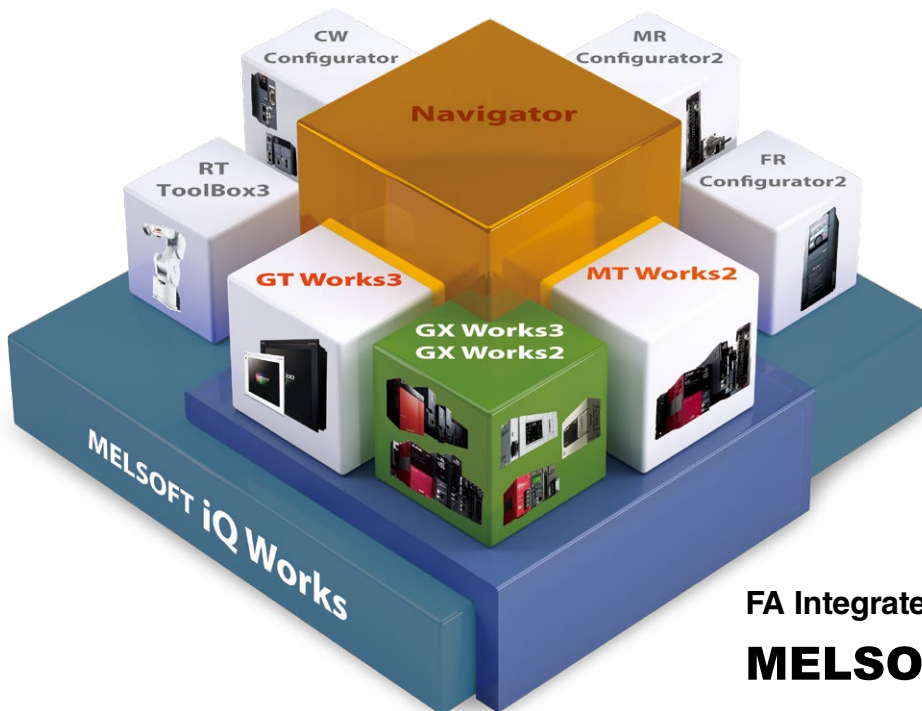
Our advances in AI and IoT are adding new value to society in diverse areas from automation to information systems. The creation of game-changing solutions is helping to transform the world, which is why we are honored to be recognized in the 2019 "Forbes Digital 100" as one of world's most influential digital corporations.



FA Integrated Engineering Software

MELSOFT iQ Works

MELSOFT iQ Works is an integrated software suite consisting of GX Works2, GX Works3, MT Works2, GT Works3, RT ToolBox3 and FR Configurator2, which are programming software for each respective product. Integration is further enhanced with MELSOFT Navigator as the central system configuration incorporating an easy-to-use, graphical user interface with additional project-sharing features such as system labels and parameters. The advantages of this powerful integrated software suite are that system design is made much easier with a substantial reduction in repetitious tasks, cutting down on errors while helping to reduce the overall TCO.



FA Integrated Engineering Software

MELSOFT iQ Works

System management software

MELSOFT Navigator

System level graphic-based configuration tool that simplifies the system design by providing a visual representation of the system. System management features such as system-wide parameterization, labels and block reading of project data are also included.

Programmable controller engineering software

MELSOFT GX Works2/GX Works3

GX Works2 and GX Works3 are programming and maintenance software offered by Mitsubishi Electric. Various intuitive features such as graphic-based system configuration and an extensive module library are included, providing an intuitive engineering environment solution. It includes many new features such as graphic-based system configuration, integrated motion control setup, multiple language support, providing an intuitive engineering environment solution.

HMI/GOT screen design software

MELSOFT GT Works3

This graphic operation terminal (GOT) screen creation software is designed with three main features—simplicity, graphics design and operation ease—that help to create graphic screens in fewer steps.

Motion controller engineering software

MELSOFT MT Works2

This motion control design and maintenance software includes intuitive graphic-based programming together with a digital oscilloscope simulator.

Robot engineering software

MELSOFT RT ToolBox3

Inverter setup software

MELSOFT FR Configurator2

C Controller setting and monitoring tool

MELSOFT CW Configurator

Servo setup software

MELSOFT MR Configurator2

Features

Feature 1

All-in-one package

All capabilities required for PLC engineering including the configuration function of the intelligent function module and simulation function are integrated in a single package.

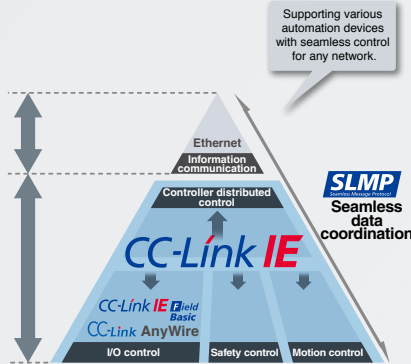
The all-in-one GX Works2 package supports entire engineering such as system design, programming, debug and maintenance.



Feature 2

Make full use of MELSEC PLC modules

GX Works2 enables full use of high-function and high-performance CPUs and modules.



Feature 3

Inherits customer assets

Existing GX Developer program assets can be used in GX Works2 without any modification. Also, programs written by GX Works2 to the programmable controller can be read using GX Developer. For example, even if GX Developer is installed in a production site's PC, the data created and read with GX Developer can be used with GX Works2 installed in a development office's PC.



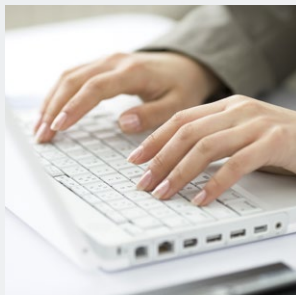
Feature 4

Sophisticated operability

The favorable GX Developer functions have been incorporated to GX Works2 and the operability further improved.

The performance has also been enhanced to operate smoothly with improved responsiveness.

Operability will continue to improve to respond to customer applications.



Feature 5

International Standard IEC 61131-3 compliant

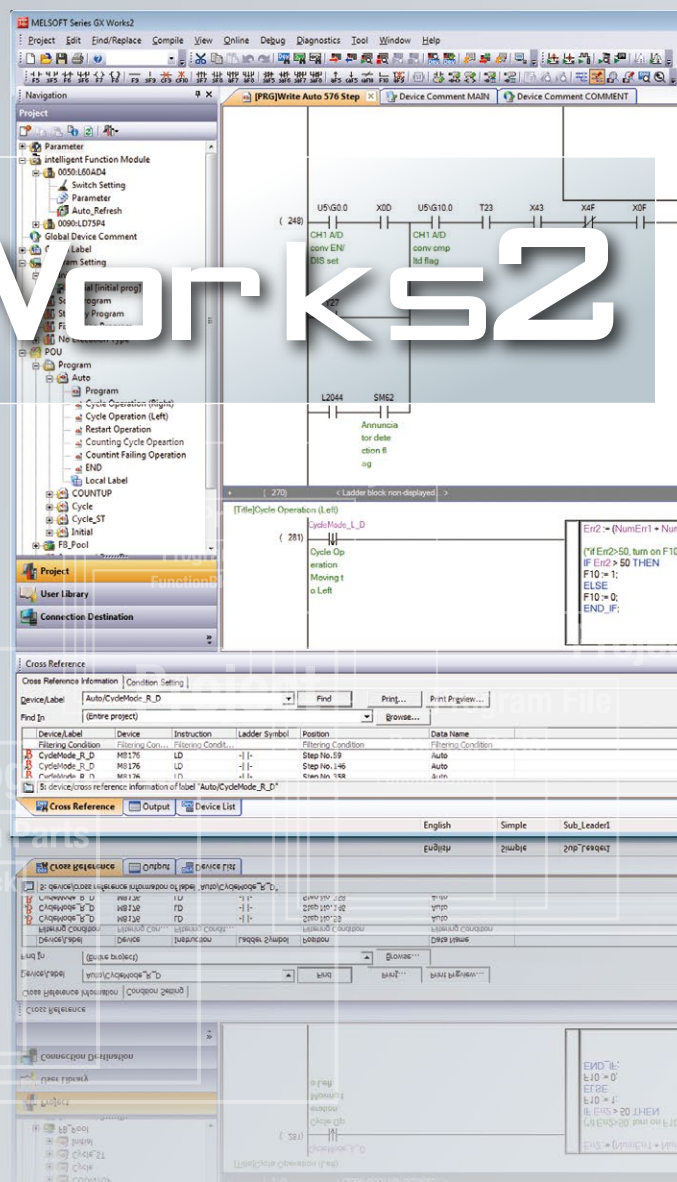
GX Works2 conforms to the engineering tool international standard IEC 61131-3, and supports structured programming with grouped parts.

Programming languages including SFC, ST and ladders, can be used according to each application.

In addition, several languages including SFC, ST and ladders can be used together in one program.



WORKS2



INDEX

Improving design and debug efficiency

- Ladder input.....P.8
- Comment..... P.12
- Parameter setting..... P.14
- Debugging..... P.18

Providing maintenance that meet your needs

- Operation and maintenance.....P.20
- Security.....P.24

Facilitating project management

- Project.....P.26

Promoting program standardization

- Making parts in program.....P.30
- Label programming/structured programming.....P.34
- Interaction with iQ Works.....P.36

Enhanced coordination with factory automation devices

- Coordination with factory automation devices.....P.38

- MELSOFT iQ AppPortal.....P.40
- Mitsubishi Electric FA site.....P.41
- Global support.....P.43
- Specifications/products.....P.44

Ultimate “Easy-to-use” user interface

The engineering software GX Works2 has been developed to allow programming, debugging and maintenance operations, etc., to be carried out easily by anyone with intuitive operations. Its comfortable operation environment further improves design efficiency.

Enhancing program readability with wrapping ladder blockP.11

Distinguish similar devices without bother P.12

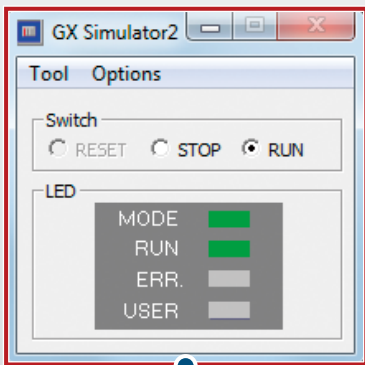
Utilizing sample comment saves time to input comments P.12

Incorporate a useful setting function from GX Configurator P.14

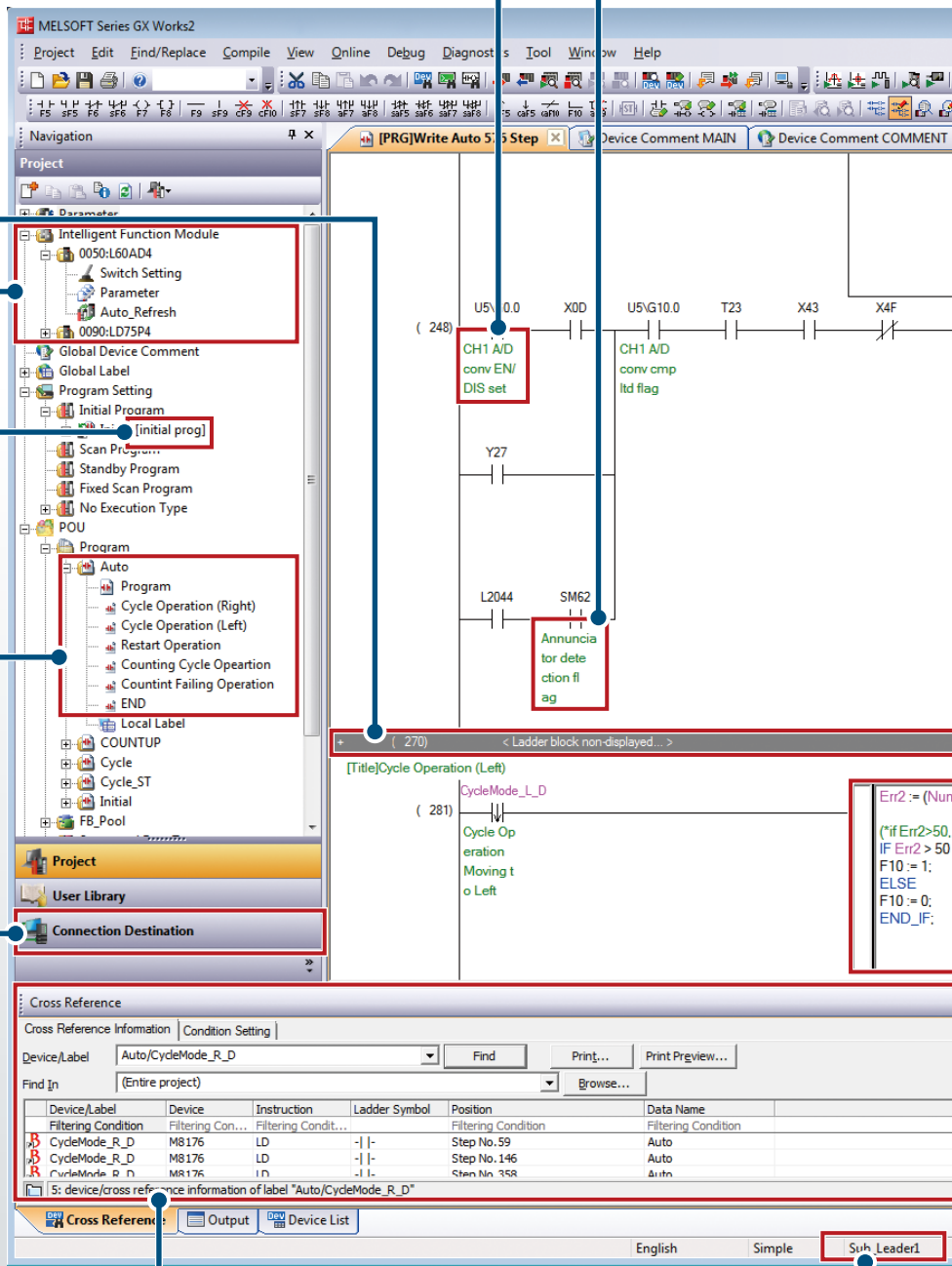
Program title display guides you P.26

Tree view offers easy-to-understand processing flow P.27

Easy connection destination setting P.28



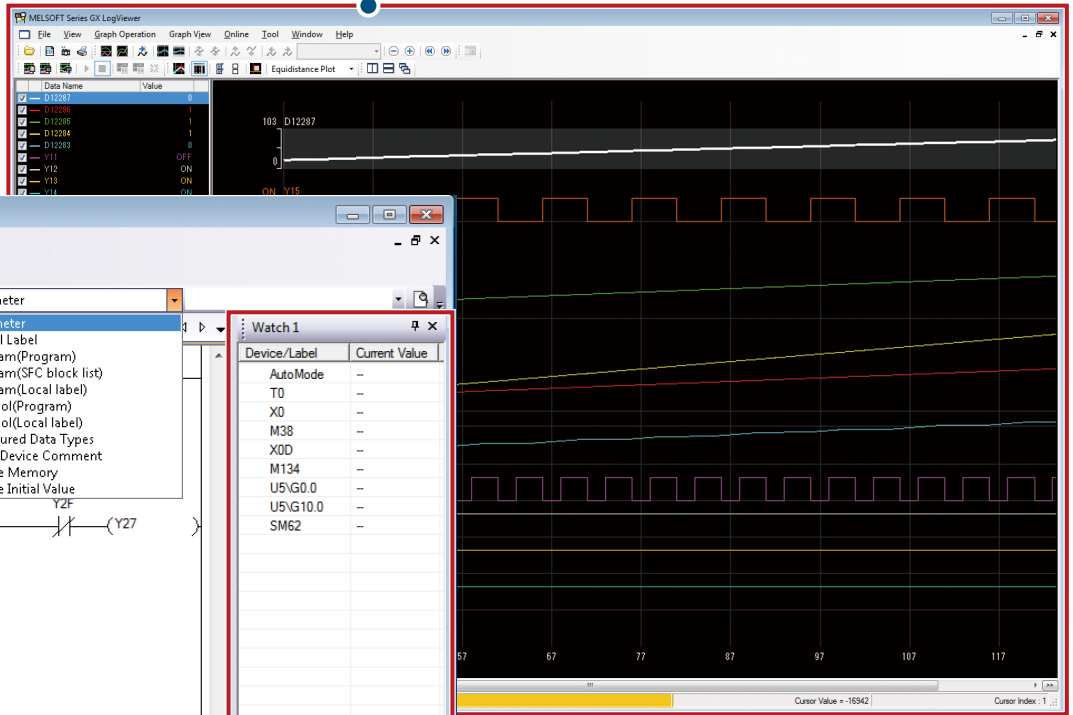
Offline debugging without PLCP.18



Cross Reference interacts with ladder display P.10

Detailed project security managementP.24

Easier-to-use sampling trace ... P.19



Software interface showing a ladder logic diagram with a coil labeled 'ERROR_ID_W Error code' and a 'Watch 1' window. The Watch window lists parameters such as AutoMode, T0, X0, M38, X0D, M134, U5\G0.0, U5\G10.0, and SM62.

Fully utilize the wide and easy-to-read screen P.28

Inline ST directly writes operation processing P.10

Watch windows for quick monitoring of device/label P.18

Find/Replace dialog box with fields for 'Find In', 'Find String', and 'Replace String'. It includes options for 'Find Direction' (From Top, Down, Up) and 'Option' (Match case, Match whole word only, Do not search comments in program, Consecutive search with enter key).

Easy continuous device search with familiar-to-use operation P.9

System Monitor function and PLC diagnostics window. It displays a connection channel list, a monitoring status, and a detailed module information list. The module information list includes columns for Base Model Name, Power Supply, Base Type, Slots, and Installed Modules.

Visible System monitor function and PLC diagnostics P.22

Ladder input

1 Simple key operation makes an easy ladder programming

A ladder is easily modified and edited with convenient key combinations such as [Alt]+[←]/[→] or [Alt]+[↑]/[↓].

Enter Symbol [X]

[-]- MOV D0 K4Y0 [OK] [Exit] [Help]

Edit ladder

[Alt]+[←] ... K4Y0→D0→MOV
[Alt]+[→] ... MOV→D0→K4Y0

Alt + ← / →

Change device number

[Alt]+[↑] ... K4Y0→K4Y1→K4Y2
[Alt]+[↓] ... K4Y2→K4Y1→K4Y0

Alt + ↑ / ↓

Click Undo button.

The device number is automatically incremented when continuously pasting cut & copied ladders.

Continuous Paste [X]

Continuously paste the selected range downward from current cursor position with device No. increments which is included in cut or copied ladder.

Number of Pasting Operations (1 to 99): times

Increment Value Batch Setting

Copy Source Device	After Increment	Increment Value
US1G0.0	>> US1G0.1	1
X00	>> X0E	1
X27	>> X2E	1
L2044	>> L2045	1
SM62	>> SM63	1
US1G10.0	>> US1G10.1	1
T23	>> T24	1
X43	>> X44	1

* Setting range for increment value is within the range of -9999 to 9999 (DEC).
* Real constant, devices in inline ST will not be incremented.
* Paste under Insert Mode.

[Execute] [Cancel]

Undo up to 30 previous input steps with Undo ((Ctrl)+[Z]).

Ctrl + Z

Easy-to-read ladder display

The number of contacts in a single line can be changed to 9, 11, 13, 17 or 21.

Easy to view ladder with no wrapping

2 Edit lines with simple key operation

Lines are edited only with the keyboard keys. There's no need to switch to the conventional line editing mode.

Edit line

Press [Ctrl] + [→] or [Ctrl] + [↓] to draw a line.

Press [Ctrl] + [Shift] + [→] to draw a line to the coil consecutively.
(Press [Ctrl] + [Shift] + [↓] to draw a vertical line consecutively.)

Press [Ctrl] + [→] or [Ctrl] + [↓] where no line is drawn to draw a line.
Press [Ctrl] + [→] or [Ctrl] + [↓] where a line is drawn to delete the line.

3 Easy ladder edit and search with command/label input support

Ladders are easily edited and searched just by choosing a command and label from suggestions. The information of arguments are also shown to reduce errors during ladder input.

Explanation of suggested instruction
The details of each instruction are easily recognized from each explanation.

Explanation of argument type*
Explanations of arguments are also displayed so that a ladder can be edited without any help.

Auto suggest instructions
Suggestions appear when the first character is input. Easily edit the ladder even when there are too many instructions to remember.

Explanation of label
Suggested labels are displayed. Edit the ladder without remembering all labels.

* "Explanation of argument type" is not displayed by simple search.

POINT This function saves time to display and confirm help information during command input. Pressing the [F1] key displays the instruction help screen.

4 Easy continuous device search

By specifying the search option and pressing the Enter key, the user can search for suggestions. This is particularly useful when a certain device is used many times in the program.

Search for a label is conducted by partially entering it.

Pressing **Ctrl** + **F** searches for the first "Auto" candidate.

Continuous search
By specifying the option and pressing the Enter key, search for the specified device is made continuously.

Pressing Enter key searches for the next "Auto" candidates. (Cursor moves to it.)

POINT Search for devices can also be made in the similar manner by switching the ladder display to the device display.

Ladder input

5 Cross Reference interacts with ladder display

Cross Reference function is used to search for devices/labels used in the project. The docking windows enable to display the Cross Reference window and program editor vertically.

Automatically displays the Cross Reference information of the device at the cursor position.

Several reference sites can be set for the search.

Double-click

Click!

Jump to the step using this device/label.

Device/Label	Device	Instruction	Ladder Symbol	Position	Device Name
CycleMode	M8191	LD	- -	Step No.24	Auto
CycleMode	M8191	LD	- -	Step No.29	Auto
CycleMode	M8191	LD	- -	Step No.88	Auto
CycleMode	M8191	LD	- -	Step No.117	Auto
CycleMode	M8191	LD	- -	Step No.175	Auto
CycleMode	M8191	LD	- -	Step No.419	Auto
CycleMode	M8191	LD	- -	Step No.424	Auto

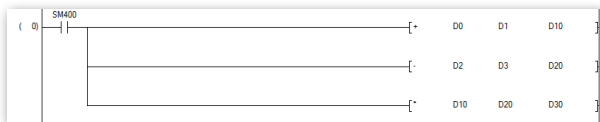


The used locations of devices or labels in the program are confirmed with intuitive operation.

6 Inline ST directly writes operation processing

Operation processing is written directly in a ladder with Inline ST (structured text). Creation of a multi-line ladder or FB (Function Block) in another program editor is not necessary anymore.

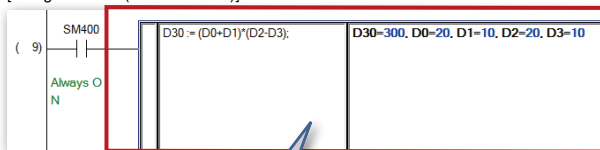
Example of numeric operation
[Using ladder only]



Example of character string processing
[Using ladder only]

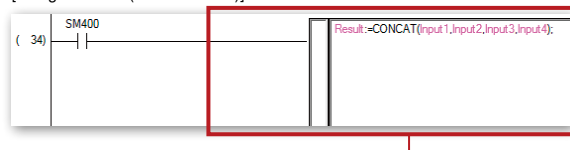


[Using Inline ST (structured text)]



ST edit area
The current value can be monitored and changed.

[Using Inline ST (structured text)]



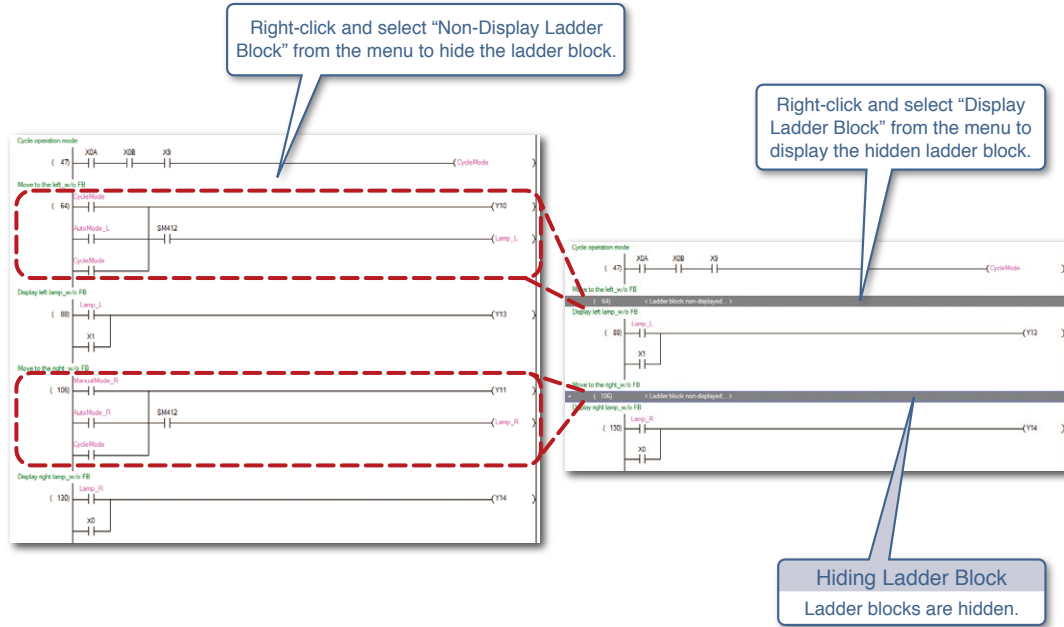
Describe a program in one line using Inline ST.



Troublesome numeric operations and character string processing are described easily.

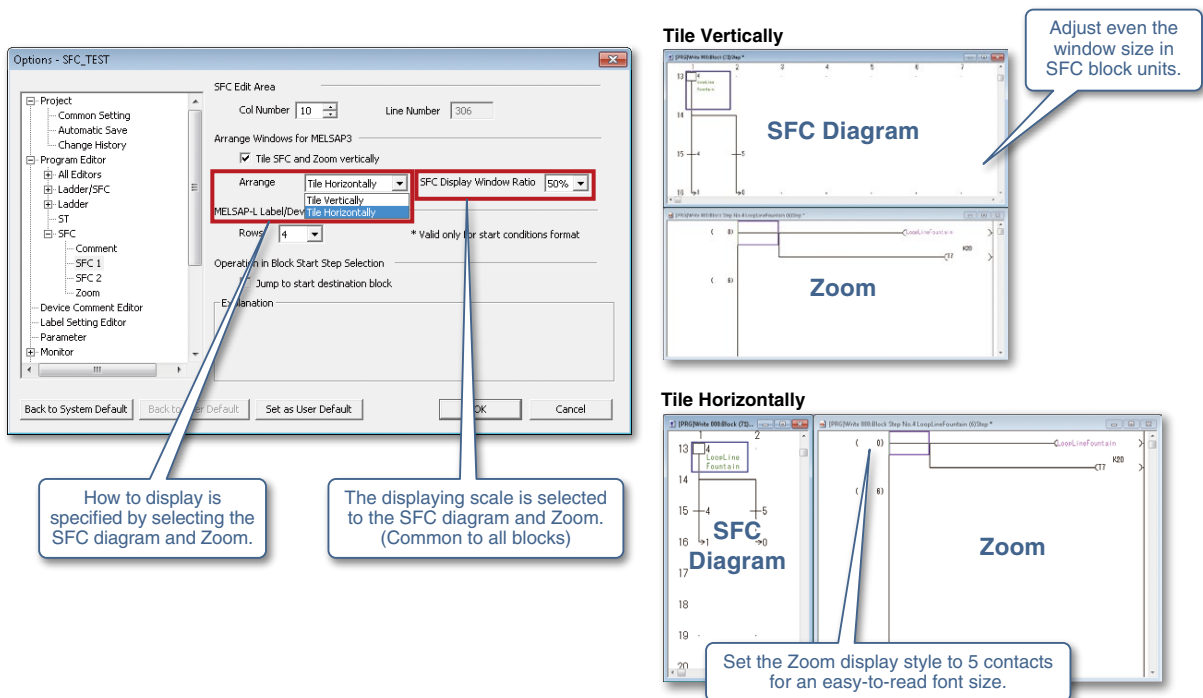
7 Enhancing program readability by hiding ladder block

By hiding a ladder block, a long and hard-to-read ladder program is displayed in a compact form.



8 Easier to view SFC diagram and Zoom

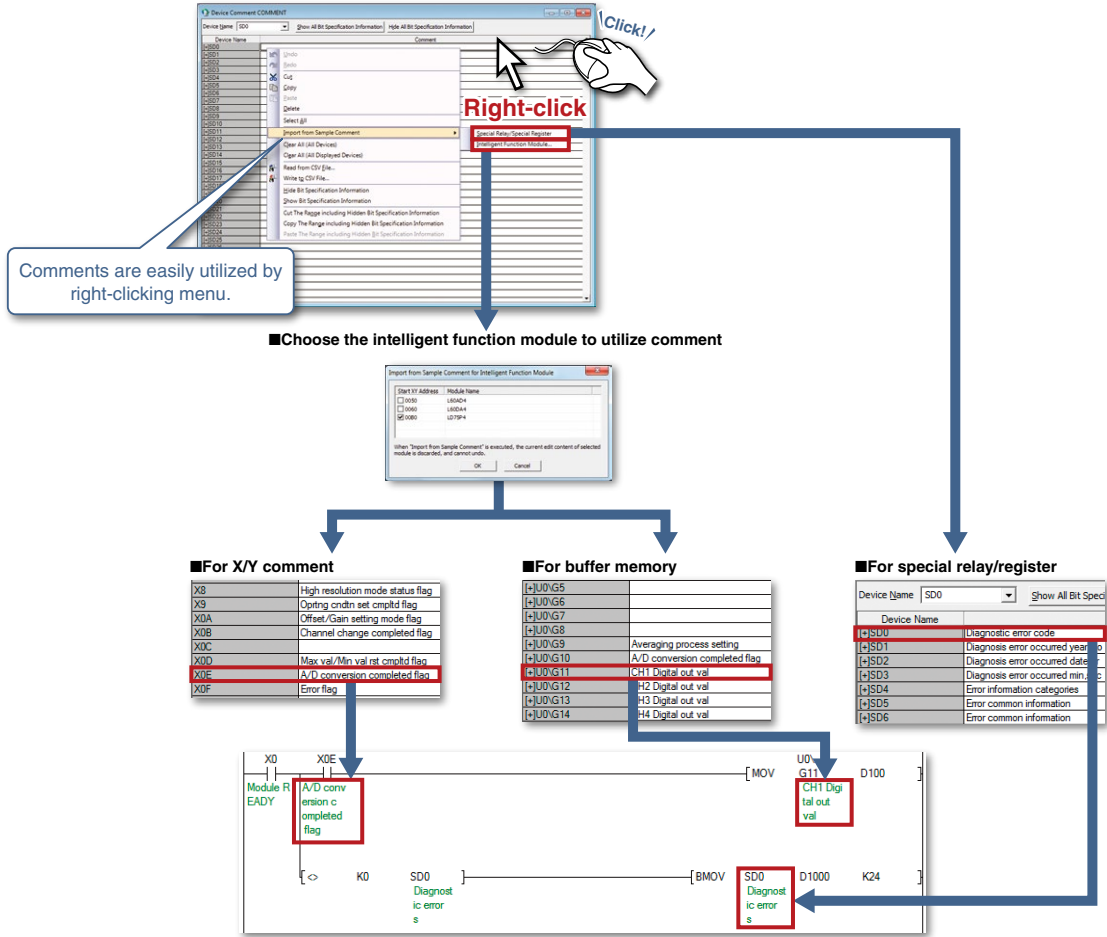
The scale of the window is changed to display the SFC diagram and Zoom. Since the changed scale is retained, the windows are always displayed with the same layout.



► Comment

1 Utilizing sample comment saves time to input comments

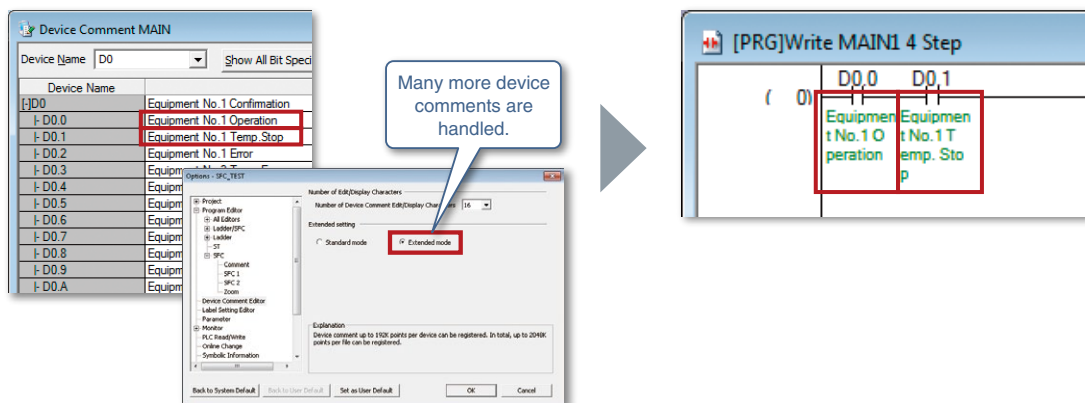
Provided sample comments can be utilized as comments in projects.



POINT Time for entering device comments are greatly saved by utilizing sample comments.

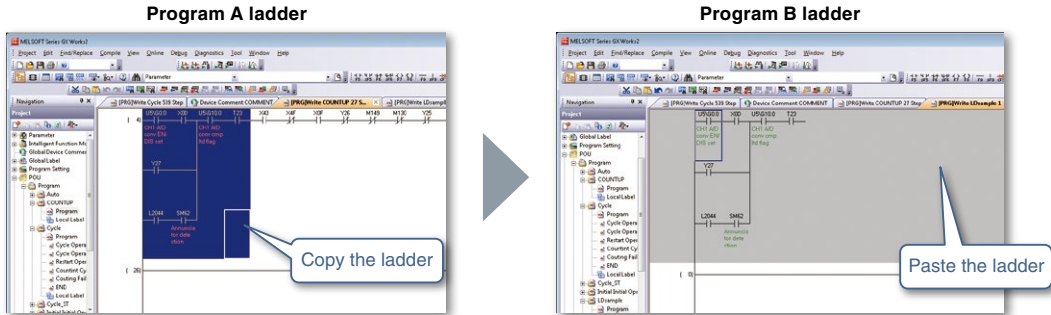
2 Distinguish similar devices without bother

Set a word device comment for each bit to display the contents of the comment on the ladder.



3 Easily copy and utilize device comments

Device comments are copied by copying the ladder of the ladder editor between projects. When copying a ladder onto another program, the device comments in the ladder are also copied.



Device comment in copy source program

Device Comment MAIN	
Device Name	X0
X0	X0 [Comment for MAIN]
X1	X1 [Comment for MAIN]
X2	X2 [Comment for MAIN]
X3	X3 [Comment for MAIN]
X4	X4 [Comment for MAIN]
X5	X5 [Comment for MAIN]
X6	

Device comment in copy destination program

Device Comment SUB1	
Device Name	X0
X0	X0 [Comment for MAIN]
X1	X1 [Comment for MAIN]
X2	X2 [Comment for MAIN]
X3	
X4	
X5	
X6	

When the program is pasted, the comment is simultaneously copied.

4 Utilize device comments created in other languages

Japanese, Chinese (Simplified and Traditional), and Korean comments can be displayed in GX Works2 English Edition. The function comes useful when working with offices abroad.

GX Works2 Japanese Edition

デバイス名	コメント
[+]SD48	
[+]SD49	
[+]SD50	エラー解除
[+]SD51	ハッチリ低下ラッチ
[+]SD52	ハッチリ低下
[+]SD53	AC/DC DOWN検出
[+]SD54	
[+]SD55	
[+]SD56	
[+]SD57	
[+]SD58	

GX Works2 English Edition

Device Name	Comment
[+]SD48	
[+]SD49	
[+]SD50	エラー解除
[+]SD51	ハッチリ低下ラッチ
[+]SD52	ハッチリ低下
[+]SD53	AC/DC DOWN検出
[+]SD54	
[+]SD55	
[+]SD56	
[+]SD57	
[+]SD58	

Project file used in GX Works2 Japanese Edition (with Japanese comments)

The Japanese comments are viewed in GX Works2 English Edition.

▶ Parameter setting

1 Incorporate a useful setting function from GX Configurator

The setting function of the intelligent function module is now integrated with GX Works2. The intelligent function module settings are managed in a GX Works2 project.

■ Add new module screen

Also reflected on the I/O assignment parameters.

Module is added to the project tree.

Click!

Set the A/D conversion system.

Explanation of item is shown as guidance.

New Module

Module Selection
 Module Type: Analog Module
 Module Name: Q64AD

Mount Position
 Base No.: -
 Mounted Slot No.: 2
 Acknowledge I/O Assignment

Specify start XY address 0020 (H) 1 Slot Occupy [16 points]

Title Setting
 Title: _____

OK Cancel

I/O Assignment

No.	PLC	Slot	PLC	Type	Model Name	Points	Start XY	Switch Setting
0	0(*-0)				QX40	16Points		
1	1(*-1)			Input	QY40P	16Points		
2	2(*-2)			Output	Q64AD	16Points	0020	
4	3(*-3)			Intelligent	Q64AH	16Points	0040	
5	4(*-4)			Intelligent	Q171GP21-SX	32Points	0060	
6	5(*-5)			Intelligent	Q161BT11N	32Points	0080	
7	6(*-6)			Intelligent	QD75P4	32Points	0100	

Assigning the I/O address is not necessary as the CPU does it automatically. Leaving this setting blank will not cause an error to occur.

Base Setting(*1)

Main	Base Model Name	Power Model Name	Extension Cable	Slots	Base Mode
Ext.Base1					Auto
Ext.Base2					Detail

8 Slot Default

Project

- Parameter
 - PLC Parameter
 - Network Parameter
 - Remote Password
 - Intelligent Function Module
 - 0020:Q64AD
 - Switch Setting
 - Parameter
 - Auto_Refresh
 - 0040:Q641 AN
 - 0100:QD75P4
 - Global Device Comment
 - Global Label
 - Program Setting
 - POU
 - Program
 - FB_Pool
 - Structured Data Types
 - Local Device Comment
 - Device Memory
 - Device Initial Value

0020:Q64AD[]-Parameter

Display Filter: Display All

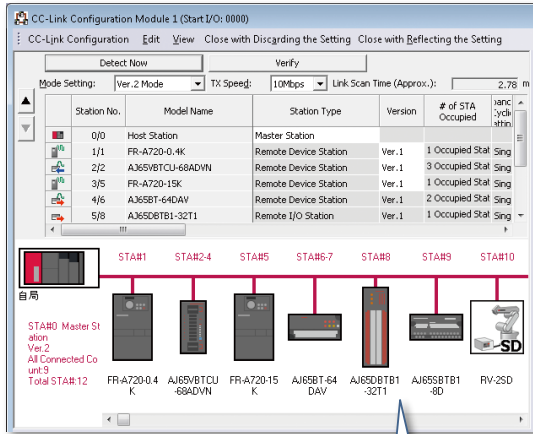
Item	CH1	CH2	CH3	CH4
Basic setting	Set the A/D conversion system.			
A/D conversion enable/disable setting	0:Enable	0:Enable	1:Disable	1:Disable
Sampling/Averaging process setting	0:Sampling Processing	0:Sampling Processing	0:Sampling Processing	0:Sampling Processing
Average time/Average number of times specification	0:Count Average	0:Count Average	0:Count Average	0:Count Average
Average time/average number of times	0 Times	0 Times	0 Times	0 Times

Set the A/D conversion system.

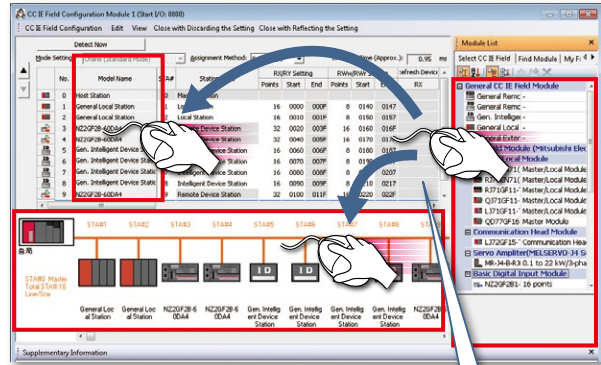
2 Displays device assignment of CC-Link

A network configuration diagram is created by arranging device images on the CC-Link Configuration window using a mouse. A list of refresh devices assigned to CC-Link modules are displayed. CSP+*1, which contains partner product information, can be additionally imported.

*1 Refer to the CC-Link Association website (<http://www.cc-link.org>) for information on CSP+.



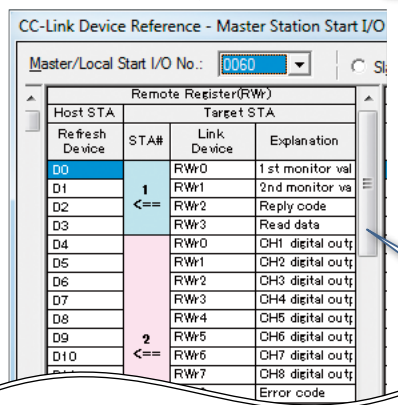
The equipment configuration diagram is created intuitively using CC-Link Configuration Window.



Drag & drop to add devices to connect. Operations are easy since parameters and link scan time are automatically set.



Start from the toolbar.



Display the device assignment list. Programming is made while viewing device assignment.

POINT The device assignment information can be exported to a CSV file and imported into the global label information, making it easy to utilize the information in label programming.

4 Set and monitor iQSS supporting devices

iQSS

GX Works2*1 enables setting and monitoring of iQSS supporting devices, represented by vision sensors.

*1 GX Works2 with version 1.492N or later.

■ Examples for Ethernet supporting devices

Parameter Processing of Ethernet Device

Target Module Information: HL-C2
Connection No.: 1

Method selection: Parameter read (Read parameter from target module)

Parameter Information: Checked parameters are the targets of selected processes.

Name	Initial Value	Read Value	Write Value	Setting Range	Unit	Description
Head Setting						
Head-A Read Parameter List 1	0	0	0	0 to 1023		Head-A Readout
Head-B Read Parameter List 2	0	0	0	0 to 1023		Head-B Readout
Head-A Emission Mode	Off					Setting of Head-A
Head-A Emission Adjustment	Auto					Setting of Head-A
Head-A Emission Adjustment 1	1			1 to 512		Setting value of Head-A
Head-A Emission Adjustment 2	1			1 to 512		Setting value of Head-A
Head-A Emission Search	0					Status of Head-A
Head-A Alarm Delay Time	0			0 to 65535		Setting of Head-A
Head-A Measurement Mode	Off					Setting of Head-A
Head-A Head Start Fall	None					Setting of Head-A

Ethernet Configuration (Built-in Ethernet Port)

Device list

No.	Model Name	Protocol	IP Address	Port No.	MAC Address	Host Name	IP Address
1	HL-C2	UDP	10.97.95.1	9094	00:08:0F:00:00:19		10.97.95.1
2	InLight E2-700	TCP	10.97.95.1	2474	00:00:24:10:9C:26	e_inLight_00A26	10.97.95.1

Configuration diagram

Graphical images of devices connected to the Ethernet network are displayed.

Output window

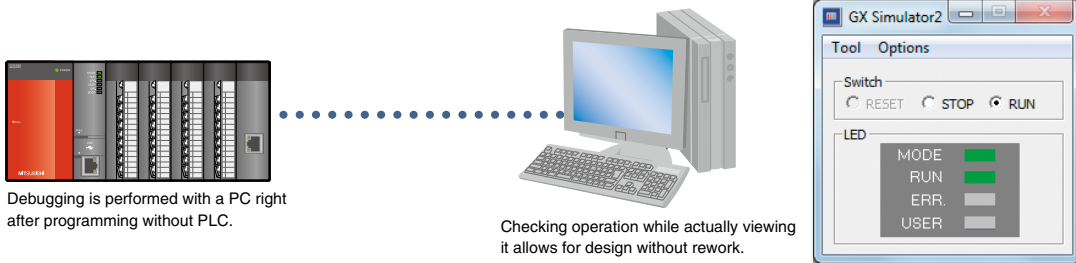
Status or error information of the selected iQSS supporting device is displayed.

Ethernet supporting devices on the network are automatically detected. Parameters for auto-detected devices can be set.

▶ Debugging

1 Offline debugging without PLC

The simulation function is now integrated with GX Works2. The program operation is easily checked on a computer.



Debugging is performed with a PC right after programming without PLC.

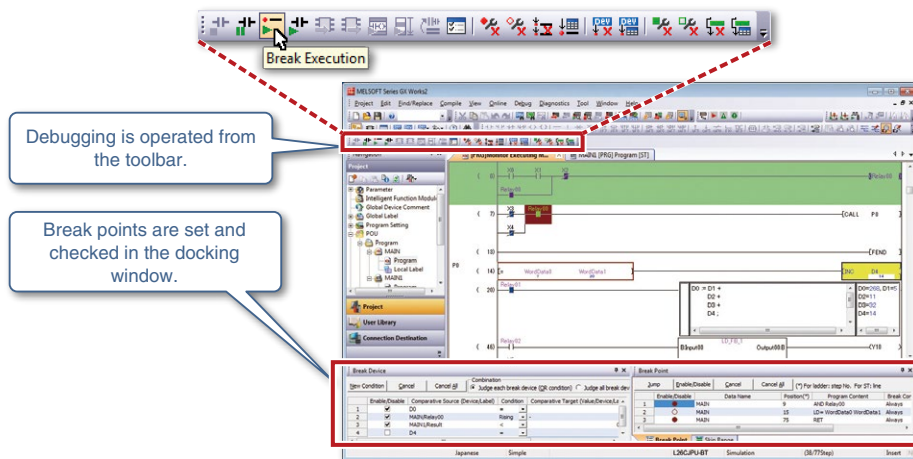
Checking operation while actually viewing it allows for design without rework.



POINT Simultaneous simulation of up to four GX Works2 projects is possible with one computer.

2 Simulation function helps program debugging

A program is executed in a step-by-step method using the simulation function, allowing program errors to be located more easily.

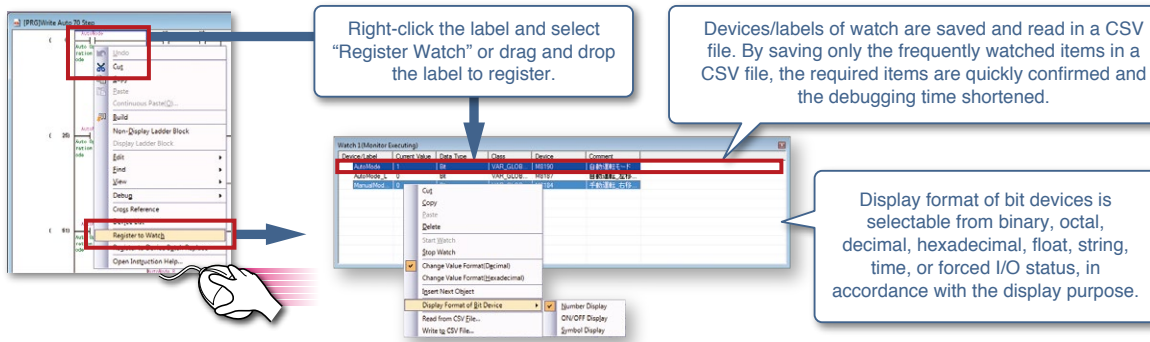


Debugging is operated from the toolbar.

Break points are set and checked in the docking window.

3 Watch windows for quick monitoring of device/label

Arbitrary devices/labels are registered and monitored, allowing required sections to be confirmed quickly.



Right-click the label and select "Register Watch" or drag and drop the label to register.

Devices/labels of watch are saved and read in a CSV file. By saving only the frequently watched items in a CSV file, the required items are quickly confirmed and the debugging time shortened.

Display format of bit devices is selectable from binary, octal, decimal, hexadecimal, float, string, time, or forced I/O status, in accordance with the display purpose.



POINT The current value of the device/label is changed from the watch window.

4 Easier-to-use sampling trace

The device values before and after the designated conditions are established can be sampled and displayed in a timing chart. The trace results are saved in a CSV file allowing the device changes to be saved easily.

Devices/labels are easily registered.

ON/OFF switching of bit devices is checked in the chart.

Values of devices/labels at the time at the cursor location are listed.

Changes of word devices are checked with the trend graph.

CSV file

Data saved in the CSV file*1 are graphically displayed.

GX LogViewer screen

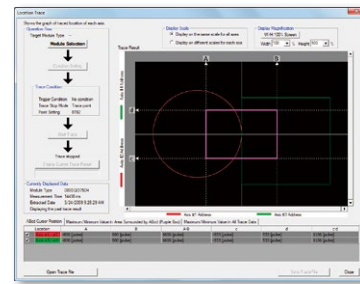
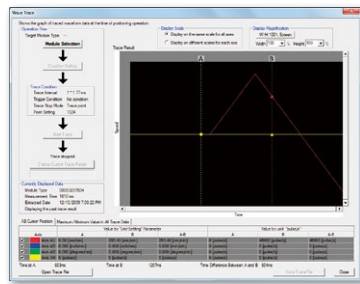
*1 GX LogViewer Version 1.26C and higher is supported.

POINT The sampling trace is also used in the simulation function.

5 Easier-to-view positioning trace function

Status of the speed command (axis speed), two-axis interpolation, and simultaneous start (two axes) are traced and displayed in a graph.

The value of each axis is visually checked during the online operation of the positioning module.



6 Supporting the real-time monitor of GX LogViewer

The real-time monitor of the MELSEC-L CPU can be used by starting up GX LogViewer*2 from GX Works2*3.

*2 GX LogViewer version 1.40S or later

*3 GX Works2 version 1.521T or later

The real-time monitor of GX LogViewer can be started from GX Works2 menu.

The real-time monitor of GX LogViewer can be used.

▶ Operation and maintenance

1 Improved verification function

Verify data of an open project against data of saved project to display the result in an easy-to-view format. The parameters and the programs in the PLC connected to a personal computer also are verified against the data of an open project.

Verify

Workspace Location: C:\Users\Administrator\Desktop\ProjectData\EIP_17_Verify\
 Workspace Name:
 Project Name: Project_B
 Title:
 File Selection: SFC Block
 Verify Source:
 Verify Destination:
 Execute Cancel

Verify Result (Project Verify)

No.	Object Type	Data\Verify Source	Data\Verify Destination	Verify Result
1	Program File	Auto	Auto	Source Only
2	Program File	COUNTUP	COUNTUP	Match
3	Program File	Cycle	Cycle	Match
4	Program File	Initial	Initial	Mismatch
5	Program File	MANI	MANI	Match
6	Program File	MANI	MANI	Match
7	Program File	MANI	MANI	Match
8	Program File	Manual	Manual	Dest. Only
9	Program File	STSample	STSample	Source Only
10	Program	Auto	Auto	Source Only
11	Program	COUNTUP	COUNTUP	Match
12	Program	Cycle	Cycle	Match
13	Program	Cycle ST	Cycle ST	Mismatch
14	Program	Initial	Initial	Mismatch
15	Program	MANI	MANI	Mismatch
16	Program	MANI	MANI	Match
17	Program	MANI	MANI	Match
18	Program	STSample	STSample	Dest. Only
19	FB Pool	Drive	Drive	Dest. Only
20	FB Pool	Mode	Mode	Dest. Only
21	Parameter	PLC/Network	PLC/Network	Mismatch

There were 13 parts not matched.

Detail Verify Result

Line	Step	Verify Source	Step	Verify Destination
183			267	AND Y23
184			268	AND Y27
185			269	OUT Y27
186			270	LD X0
187	186	MPS	333	MPS
188	187	AND X0	271	AND X0
189	188	AND X0	272	AND X0
190	189	AND X0	273	AND X0
191	190	AND X0	274	MOV data1 D18
192	191	MPP	277	MPP
193	192	AND X0	278	AND X0
194	193	AND X0	279	AND X0
195	194	AND X0	280	AND X0
196	195	AND X0	281	AND X0
197	196	AND X0	282	AND X0
198	197	AND X0	283	AND X0
199	198	AND X0	284	AND X0
200	199	AND X0	285	AND X0
201	200	AND X0	286	AND X0
202	201	AND X0	287	AND X0
203	202	AND X0	288	AND X0
204	203	AND X0	289	AND X0
205	204	AND X0	290	AND X0
206	205	AND X0	291	AND X0
207	206	AND X0	292	AND X0
208	207	AND X0	293	AND X0
209	208	AND X0	294	AND X0
210	209	AND X0	295	AND X0
211	210	AND X0	296	AND X0
212	211	AND X0	297	AND X0
213	212	AND X0	298	AND X0
214	213	AND X0	299	AND X0
215	214	AND X0	300	AND X0
216	215	AND X0	301	AND X0
217	216	AND X0	302	AND X0
218	217	AND X0	303	AND X0
219	218	AND X0	304	AND X0
220	219	AND X0	305	AND X0
221	220	AND X0	306	AND X0
222	221	AND X0	307	AND X0
223	222	AND X0	308	AND X0
224	223	AND X0	309	AND X0
225	224	AND X0	310	AND X0
226	225	AND X0	311	AND X0
227	226	AND X0	312	AND X0
228	227	AND X0	313	AND X0
229	228	AND X0	314	AND X0
230	229	AND X0	315	AND X0
231	230	AND X0	316	AND X0
232	231	AND X0	317	AND X0
233	232	AND X0	318	AND X0
234	233	AND X0	319	AND X0
235	234	AND X0	320	AND X0
236	235	AND X0	321	AND X0
237	236	AND X0	322	AND X0
238	237	AND X0	323	AND X0
239	238	AND X0	324	AND X0
240	239	AND X0	325	AND X0
241	240	AND X0	326	AND X0
242	241	AND X0	327	AND X0
243	242	AND X0	328	AND X0
244	243	AND X0	329	AND X0
245	244	AND X0	330	AND X0
246	245	AND X0	331	AND X0
247	246	AND X0	332	AND X0
248	247	AND X0	333	AND X0
249	248	AND X0	334	AND X0
250	249	AND X0	335	AND X0
251	250	AND X0	336	AND X0
252	251	AND X0	337	AND X0
253	252	AND X0	338	AND X0
254	253	AND X0	339	AND X0
255	254	AND X0	340	AND X0
256	255	AND X0	341	AND X0
257	256	AND X0	342	AND X0
258	257	AND X0	343	AND X0
259	258	AND X0	344	AND X0
260	259	AND X0	345	AND X0
261	260	AND X0	346	AND X0
262	261	AND X0	347	AND X0
263	262	AND X0	348	AND X0
264	263	AND X0	349	AND X0
265	264	AND X0	350	AND X0
266	265	AND X0	351	AND X0
267	266	AND X0	352	AND X0
268	267	AND X0	353	AND X0
269	268	AND X0	354	AND X0
270	269	AND X0	355	AND X0
271	270	AND X0	356	AND X0
272	271	AND X0	357	AND X0
273	272	AND X0	358	AND X0
274	273	AND X0	359	AND X0
275	274	AND X0	360	AND X0
276	275	AND X0	361	AND X0
277	276	AND X0	362	AND X0
278	277	AND X0	363	AND X0
279	278	AND X0	364	AND X0
280	279	AND X0	365	AND X0
281	280	AND X0	366	AND X0
282	281	AND X0	367	AND X0
283	282	AND X0	368	AND X0
284	283	AND X0	369	AND X0
285	284	AND X0	370	AND X0
286	285	AND X0	371	AND X0
287	286	AND X0	372	AND X0
288	287	AND X0	373	AND X0
289	288	AND X0	374	AND X0
290	289	AND X0	375	AND X0
291	290	AND X0	376	AND X0
292	291	AND X0	377	AND X0
293	292	AND X0	378	AND X0
294	293	AND X0	379	AND X0
295	294	AND X0	380	AND X0
296	295	AND X0	381	AND X0
297	296	AND X0	382	AND X0
298	297	AND X0	383	AND X0
299	298	AND X0	384	AND X0
300	299	AND X0	385	AND X0
301	300	AND X0	386	AND X0
302	301	AND X0	387	AND X0
303	302	AND X0	388	AND X0
304	303	AND X0	389	AND X0
305	304	AND X0	390	AND X0
306	305	AND X0	391	AND X0
307	306	AND X0	392	AND X0
308	307	AND X0	393	AND X0
309	308	AND X0	394	AND X0
310	309	AND X0	395	AND X0
311	310	AND X0	396	AND X0
312	311	AND X0	397	AND X0
313	312	AND X0	398	AND X0
314	313	AND X0	399	AND X0
315	314	AND X0	400	AND X0
316	315	AND X0	401	AND X0
317	316	AND X0	402	AND X0
318	317	AND X0	403	AND X0
319	318	AND X0	404	AND X0
320	319	AND X0	405	AND X0

There were 22 parts not matched.

Verification source (project being edited)

Verification target (saved project)

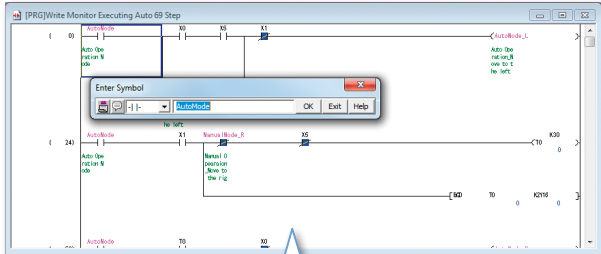
POINT The verification result is saved to a CSV file to facilitate revision of design documents.

2 Prevent edit error by Read and Monitor modes

Erroneous operations in monitoring and searching are eliminated by supporting the Read and Monitor modes similar to GX Developer.

Write mode/monitor (write mode)

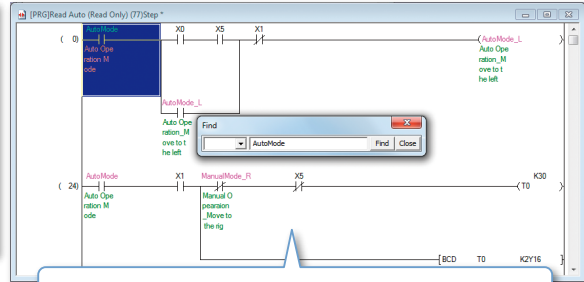
Enter Symbol screen opens by pressing Enter key.



In the Write mode/monitor (write mode), online program change during conversion/compile is prevented to accelerate work.

Read mode/monitor mode

Find screen opens by pressing Enter key.



Since programs cannot be edited in the read mode/monitor mode, erroneous editing of the ladder is prevented. The display jumps to the next search candidate each time the Enter key is pressed.



POINT

The same key operation as GX Developer is used to switch modes.

3 Dedicated monitoring for intelligent function module

While watching the ladder program, the buffer memory/XY signal of the intelligent function module is monitored in the docking window. Since the name of each buffer memory address is displayed, so there's no need to refer to the manual to see for what the buffer memory is used.

Show the current values in an easy-to-view format.

Item	Current Value	Device	Data Type
Output Signal(Y)			
Operating condition setting request	OFF	Y29	Bit
User range write request	OFF	Y2A	Bit
Channel change request	OFF	Y2B	Bit
Maximum value/minimum value reset request	OFF	Y2D	Bit
Error clear request	OFF	Y2F	Bit
Buffer Memory Monitor			
Error code...			
CH1 A/D conversion completed flag	Unconverted	U2:G10.0	Bit
CH2 A/D conversion completed flag	Unconverted	U2:G10.1	Bit
CH3 A/D conversion completed flag	Unconverted	U2:G10.2	Bit
CH4 A/D conversion completed flag	Unconverted	U2:G10.3	Bit
CH1 Digital output value	0	U2:G11	Word(Signed)
CH2 Digital output value	0	U2:G12	Word(Signed)
CH3 Digital output value	0	U2:G13	Word(Signed)
CH4 Digital output value	0	U2:G14	Word(Signed)

If there are several modules being monitored, press the tab to switch between the modules.

5 Rich print functions

Items to print are specified in details. Also, multiple programs are printed in a single operation.

6 Save and edit labels and parameters with Microsoft® Excel®

Various program data are exported as a CSV format file.

■ Exporting the program data as a CSV format file has the following advantages:

- Data are confirmed even on a personal computer that doesn't have GX Works2
- Data are saved in the personal computer
- Data are mailed to a remote location
- Secondary use of data, such as documentation and graphing, is possible using Microsoft® Excel®
- Collaborate with other software by handling data in CSV format

Example of I/O assignment setting CSV file

I/O assignment setting

- Ladder program Write/read
- Label setting Write/read
- Parameter (I/O assignment setting, X/Y assignment confirmation) Write
- Verification results Write
- Sampling trace function Read (CSV file format that can be read with GX LogViewer)
- Watch window device/label list Write/read
- Product information, PLC diagnosis, module error history of system monitor for diagnosis function Write
- Device memory Write/read

↕

CSV file

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
4	0(0-0)	Intelligent	16	0	Q64AD	Clear	Stop	----	34616	0	598	0	0	0	Base Model Name
5	1(0-1)	Intelligent	16	16	Q64AD	Clear	Stop	----	52	0	0	0	0	0	Q312B
6	2(0-2)	Intelligent	16	32	Q64AD	Clear	Stop	----	0	0	0	0	0	0	Power Model Name
7	3(0-3)	Intelligent	16	48	Q64DAN	Clear	Stop	----	----	----	----	----	----	----	Q61P
8	4(0-4)	Intelligent	16	64	QD75P4	Clear	Stop	----	----	----	----	----	----	----	Extension Cable
9															Slots
10															5
11															Base Model Name
12	5(1-0)	Intelligent	16	80	Q62DA	Clear	Stop	----	----	----	----	----	----	----	

I/O assignment

Details setting

Switch setting

Basic setting

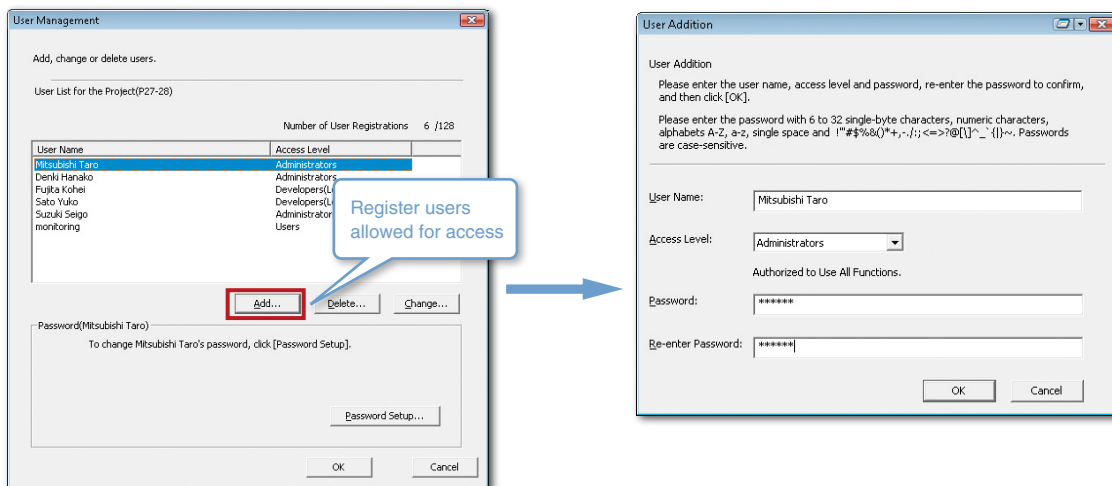
▶ Security

1 Detailed project security management

Project safety is maintained by limiting user access for each program and parameter.

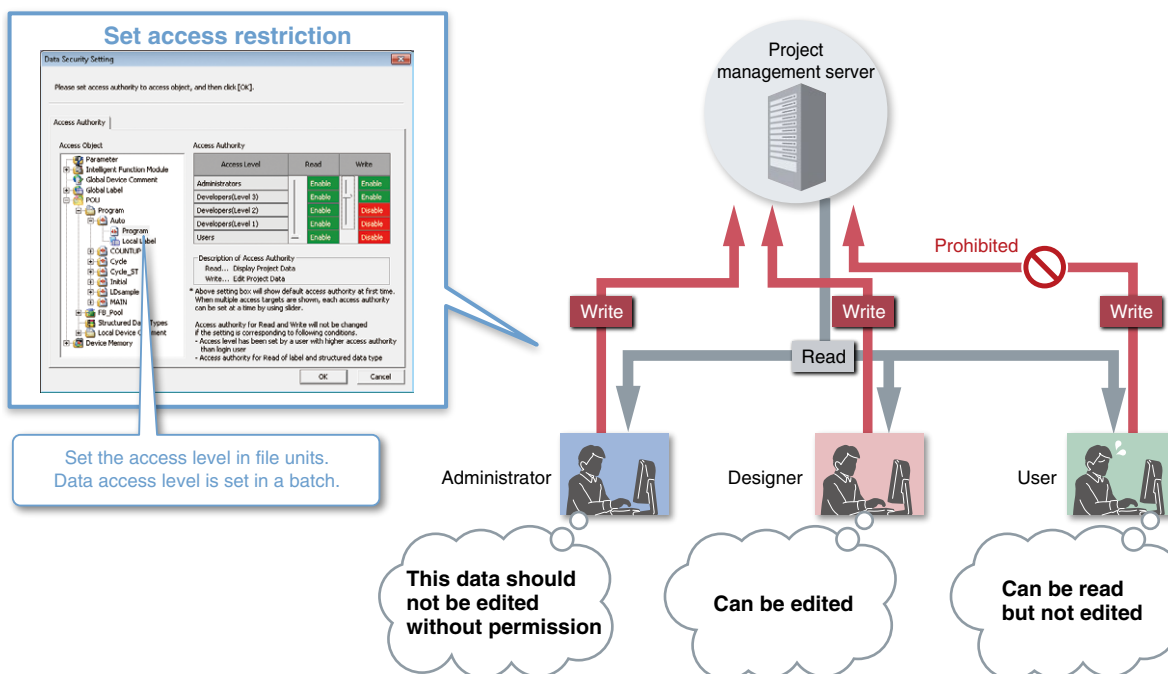
User registration (addition, change, and deletion)

The access level is managed for each user.



Access restriction

Setting security not only restricts an access to projects but also prevents the data created by the user from erroneous modification and/or disclosure to unauthorized users.

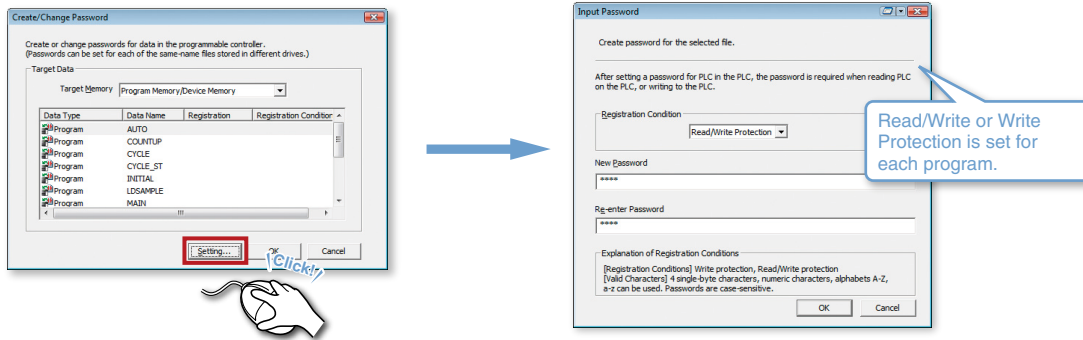


When multiple persons take charge in the same project, unauthorized changes to the project data are prevented.

2 Protects the program

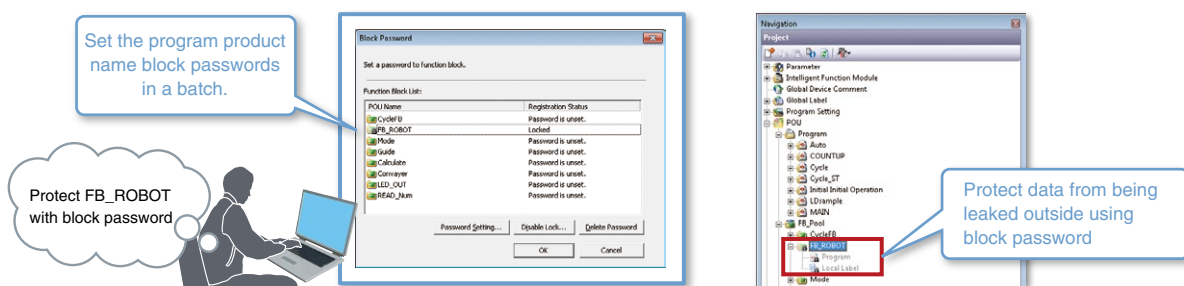
Password registration

By setting a password for a program in the programmable controller CPU, the program is protected from unauthorized change and leakage.



Block password setting

By setting a block password, the FBs in a project which contains in-house software expertise are protected from theft and leakage.

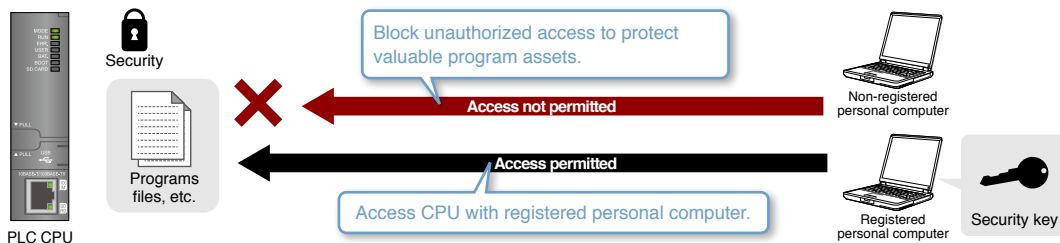


3 Prevents unauthorized access

Security Key

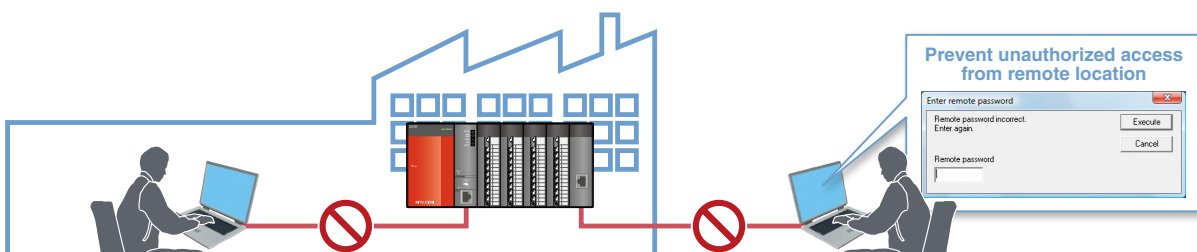
By registering the devices that access the CPU, unauthorized access from non-registered devices is prevented.

Avoid unnecessary accesses, and protect your valuable program assets.



Remote password

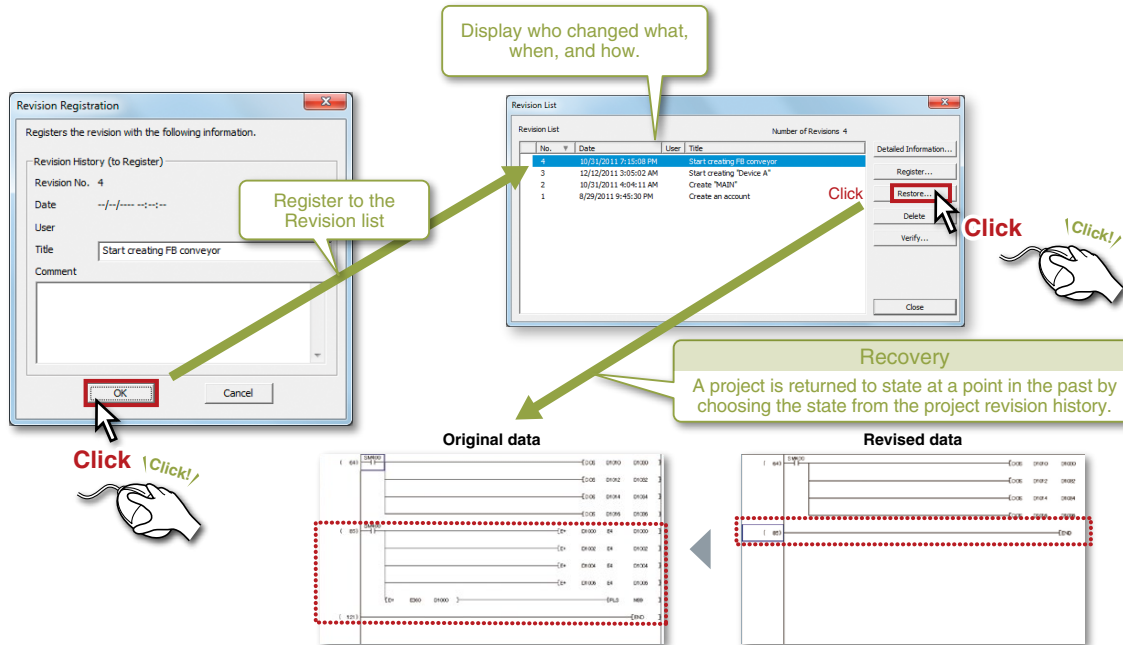
By setting a remote password, unauthorized access of the programmable controller from Ethernet or a public line is prevented.



► Project

1 Back up and restore a project easily

By registering the project revision history, the project is easily recovered to their original state. Projects with a registered history are compared.

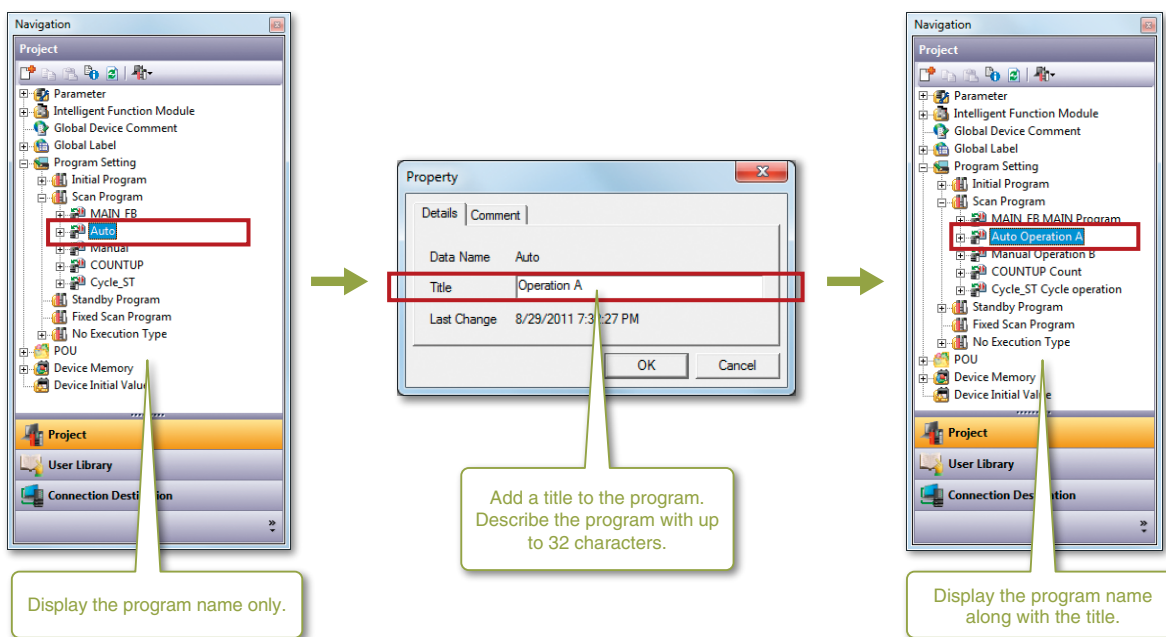


POINT

It is unnecessary to save projects under different names for back up.

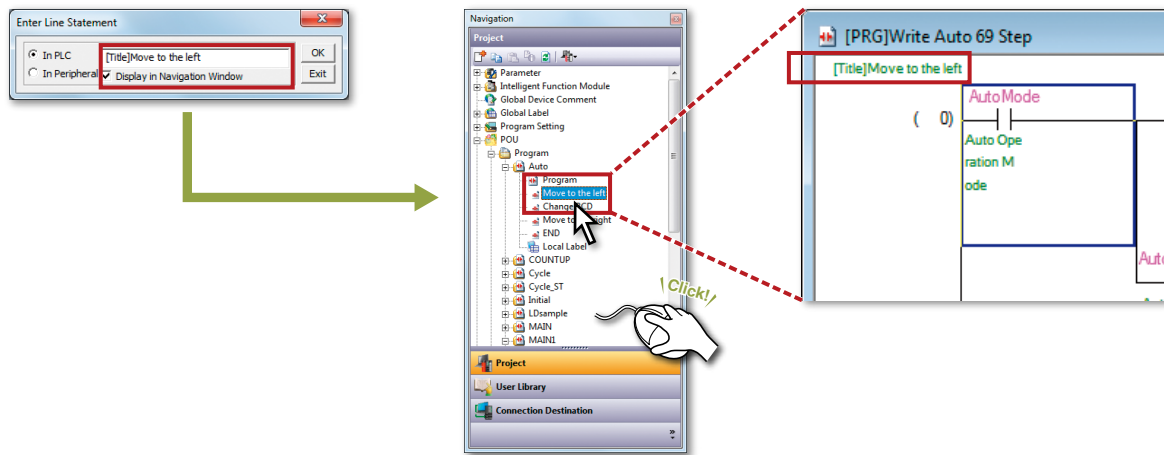
2 Program title display guides you

In addition to the program name, the program title is displayed, allowing the program contents to be understood at a glance.



3 Tree view offers easy-to-understand processing flow

The statements appended to program processes are displayed on a tree view for easy access to them. The processing flow and structure of the program are easily understood and jump to each process quickly.



4 Handle multiple program parts with FX Series

The PLC program can be created with multiple program parts so the program configuration can be seen and parts can be easily used in other projects.

Multiple ladder programs are added

Program Linkage Order Setting

Order	Program Name	Title	FEND	SRET /IRET
1	INIT	device initial operation		
2	MAIN_LD	main ladder operation		
3	MAIN_A	operation A		
4	MAIN_B	operation B		
5	FEND_BLK	only FEND	*	
6	SUB00	subroutine P0 to 9		*
7	SUB10	subroutine P10 to 11		*
8				
9				
10				

Set the program connection order and confirm the FEND position

Parts are connected in designated order and written into PLC


Supported with simple projects (with labels)

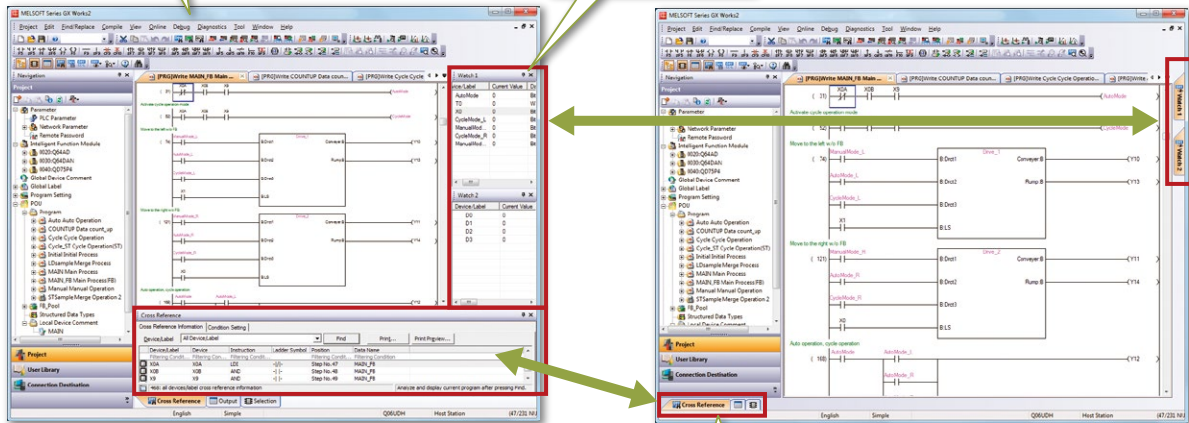
► Project

5 Fully utilize the wide and easy-to-read screen

The docking windows are hidden to use the screen efficiently.

Designate the data name in the tool bar, and easily switch project data.

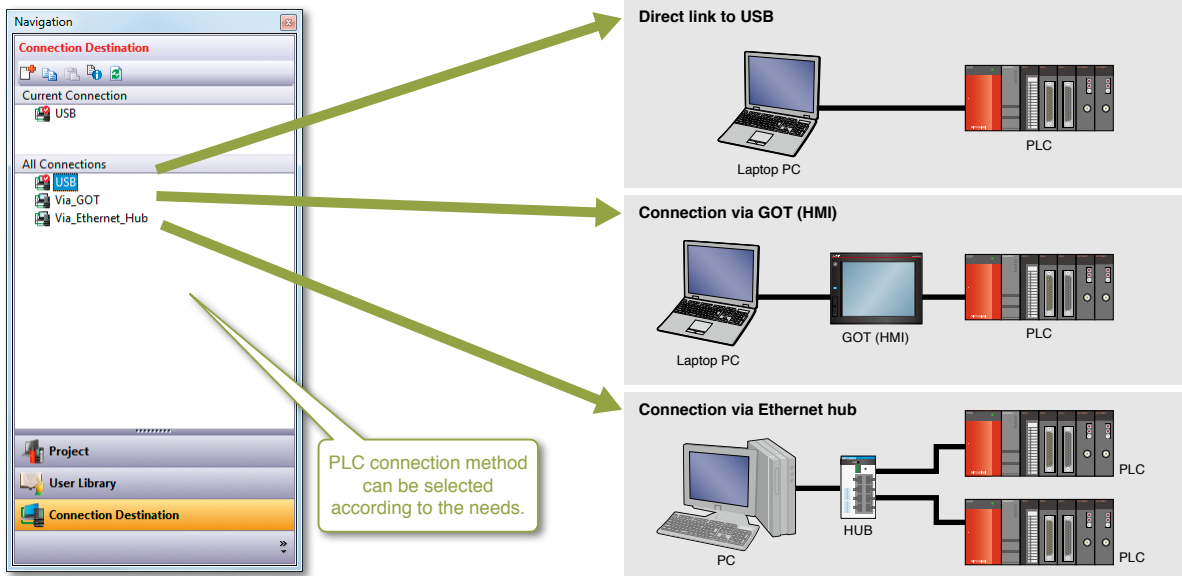
Click  to hide detailed display.



Clicking a tab shows the hidden window.

6 Easy connection destination setting

The settings for frequently connected devices can be saved and reused whenever necessary. This eliminates the need for copying and modifying projects for different connection targets.



7 Customize keyboard key arrangement

The user can customize keyboard shortcuts.
The customized setting can also be saved and exported as a file.

Any functions can be assigned to the shortcut keys.

F5 and F6 keys are far and difficult to use.

Change from F5 to A and from F6 to B.

Open Contact

Close Contact

POINT Shortcut keys can be assigned to the menus that have no shortcuts assigned by default.

8 Help information guides you operation method

Displaying Help information with a single keystroke makes it easier to confirm the operation.

Display the help screen by pressing F1 key.

Manual

Special Relay/Register Help

CPU Error Help

Changes from GX Developer

Instruction Help

POINT Frequently used help screens are bookmarked.

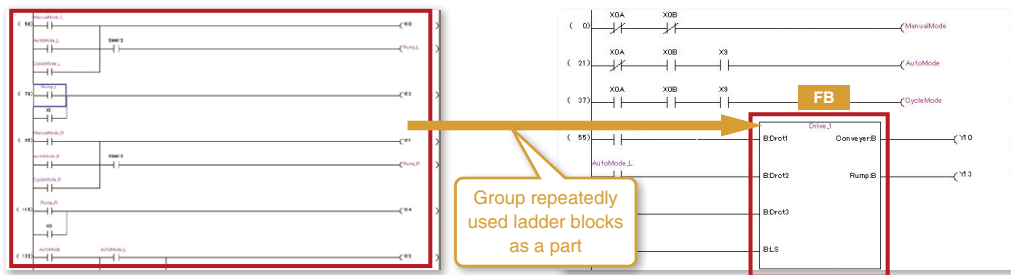
▶ Making parts in program

1 Make it easy using FB

What is a Function Block (FB)?

Function Block (FB) is a ladder block frequently used in a sequence program and grouped as a part for reuse within the program.

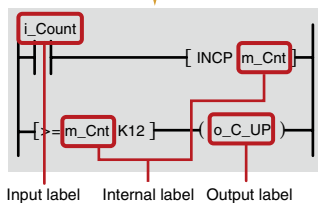
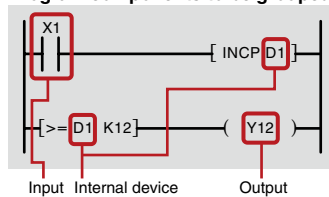
FB improves program development efficiency and reduces programming errors to ensure higher program quality.



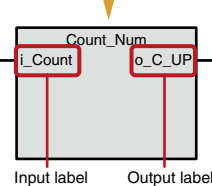
Making parts

Example) This count process program turns the output signal (Y12) ON after the input signal (X1) turns on for 12 times.

Program components to be grouped as a part



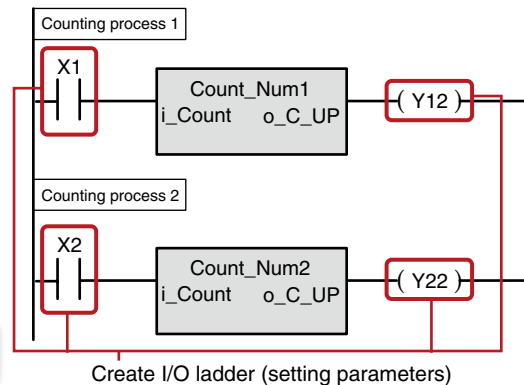
① Replace input with input label, output with output label and replace the internal devices with internal labels.



② The above ① program is converted and FB is created.

Use FB

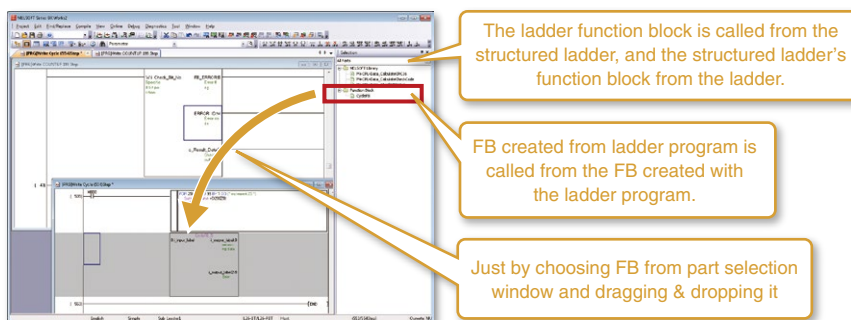
The grouped ladder block (FB) can be used repeatedly.



Advantages of using FB

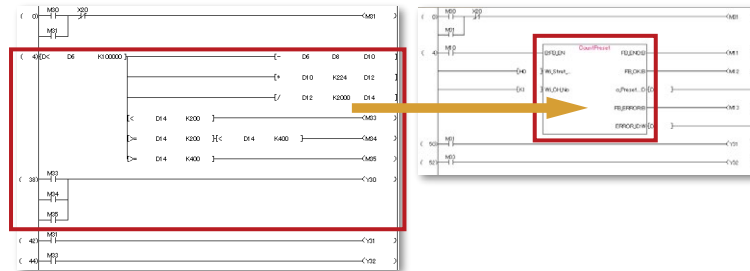
Advantage 1: Easier programming

A sequence program is created just by dragging and dropping FBs. This significantly reduces program development processes.



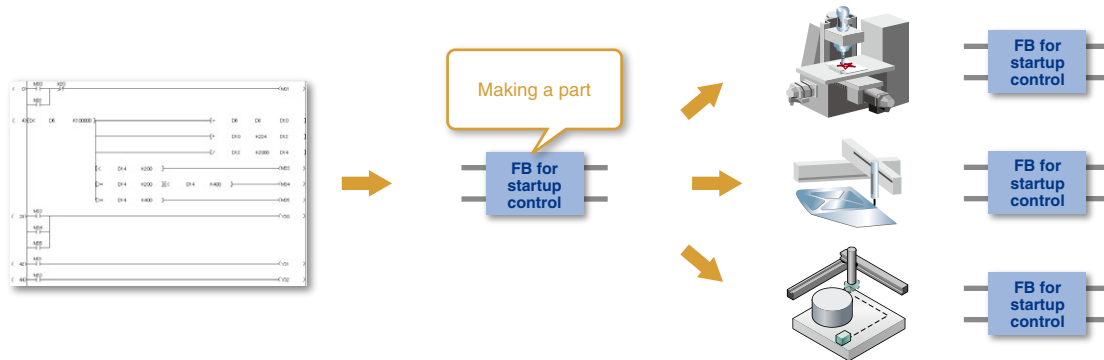
Advantage 2 : Improved readability

Using FBs in a sequence program improves its readability because the program only consists of “boxes” (FBs), inputs, and outputs.



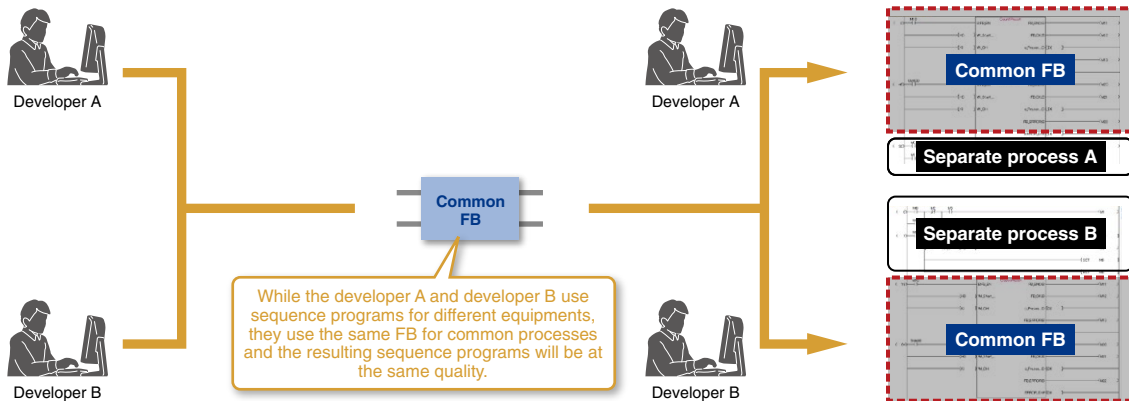
Advantage 3 : Reusability

By grouping frequently used program components as parts, they are reused as many times as required. Operations such as copying an existing program and modifying devices are no longer required.



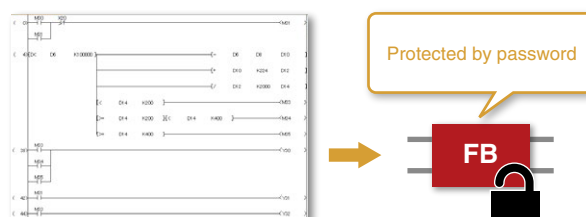
Advantage 4 : Higher quality

By grouping frequently used program components as parts (FBs) and reusing them, program quality will be uniform and independent from the skill levels of the developers.



Advantage 5 : Theft prevention

By grouping important sequence program components involving technology expertise as a part (FB) and protecting it with a password, information leak is prevented.



► Making parts in program

2

Useful FB libraries supplied by vendors



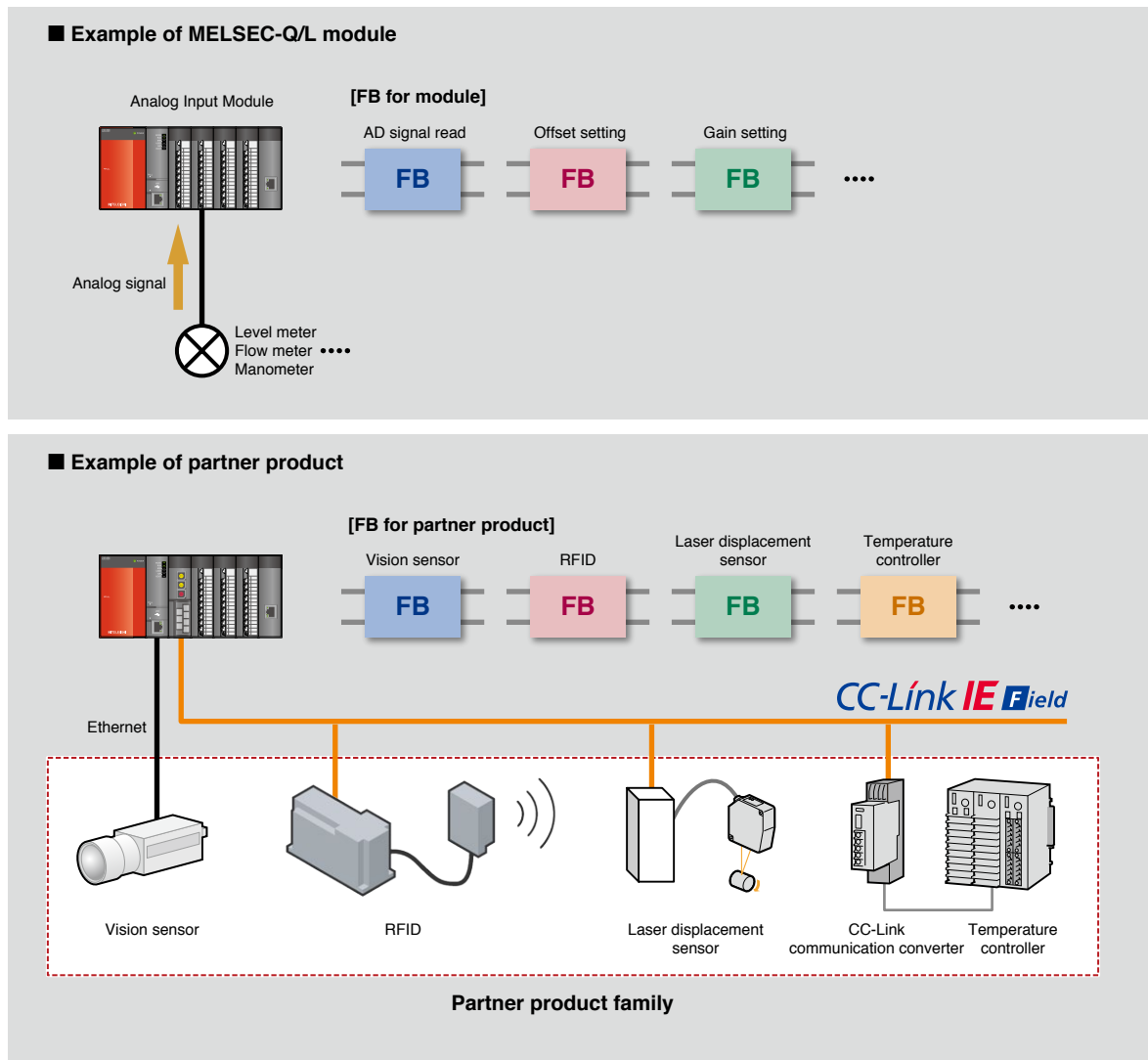
What is FB library?

An FB library is a collection of FB parts which is used in simple projects of GX Works2.

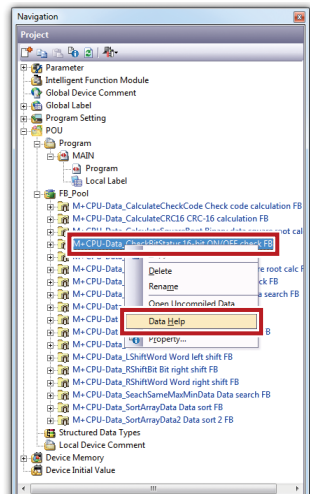
By using these FBs, settings and operation of the MELSEC-Q/L modules as well as partner products are configured.

In addition to the custom-made FBs, useful FB libraries supplied by our partners are available. FBs are also offered for iQSS partner products.

The MELSOFT Library has more than 1500 FBs from fourteen companies, and is scheduled to continue expanding.



When how to use an FB is not certain, right-click it on the Project List to display the help information.



When you are not sure about how to use FB, just right-click it for help!

2. M+CPU-Data_CalculateCRC16 (CRC-16 calculation)

FB Name
M+CPU-Data_CalculateCRC16

Function Overview

Item	Description												
Function overview	Calculates CRC-16 (Cyclic Redundancy Check) value, which is one of the error check methods used for communication.												
Symbol	<table border="1"> <thead> <tr> <th colspan="2">M+CPU-Data_CalculateCRC16</th> </tr> </thead> <tbody> <tr> <td>Execution command</td> <td>B : FB_EN FB_ENO : B — Execution status</td> </tr> <tr> <td>Conversion mode</td> <td>B : IConv_Mode FB_OK : B — Completed without error</td> </tr> <tr> <td>Start device No.</td> <td>W : ICheck_Data FB_ERROR : B — Error flag</td> </tr> <tr> <td>No. of data</td> <td>W : INum_Data ERROR_ID : W — Error code</td> </tr> <tr> <td></td> <td>o.Result_CRC : W — CRC data</td> </tr> </tbody> </table>	M+CPU-Data_CalculateCRC16		Execution command	B : FB_EN FB_ENO : B — Execution status	Conversion mode	B : IConv_Mode FB_OK : B — Completed without error	Start device No.	W : ICheck_Data FB_ERROR : B — Error flag	No. of data	W : INum_Data ERROR_ID : W — Error code		o.Result_CRC : W — CRC data
M+CPU-Data_CalculateCRC16													
Execution command	B : FB_EN FB_ENO : B — Execution status												
Conversion mode	B : IConv_Mode FB_OK : B — Completed without error												
Start device No.	W : ICheck_Data FB_ERROR : B — Error flag												
No. of data	W : INum_Data ERROR_ID : W — Error code												
	o.Result_CRC : W — CRC data												
Applicable hardware and software	<table border="1"> <thead> <tr> <th colspan="2">Hardware details</th> </tr> </thead> <tbody> <tr> <td>Q series</td> <td>High performance model</td> </tr> <tr> <td></td> <td>Universal model</td> </tr> <tr> <td>L series</td> <td>LCPU</td> </tr> </tbody> </table> <p>*Not applicable for QCPU (A mode)</p> <p>Compatible software: GX Works 2 Version 1.31H or later</p>	Hardware details		Q series	High performance model		Universal model	L series	LCPU				
Hardware details													
Q series	High performance model												
	Universal model												
L series	LCPU												
Programming language	Ladder												
Number of steps (maximum value)	For high performance model CPU: 279* *The value is the number of steps in the ladder program, and is therefore stated as a reference value. For details, refer to the GX Works2 Version 1 Operation Manual (Simple Project).												

▶ Label programming/structured programming

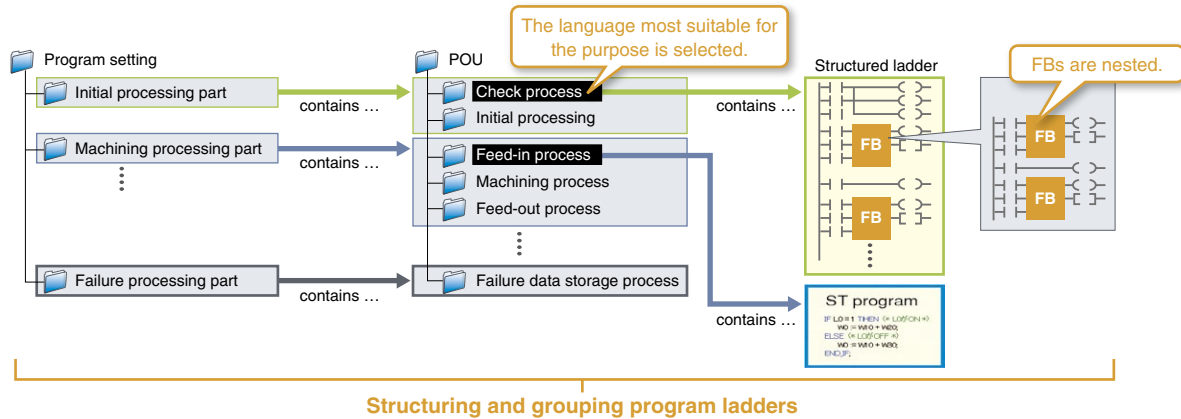
1 Structured programming

From a roll of ladder program to structured programming

By using a Structured project, a large and complicated program is structured and divided into parts according to the processing details, control details, and functionalities.

A “roll” of ladder program tends to be difficult to view the entire processing. On the contrary, by designing a compact program module for each process in structured programming, coding and debugging will be more efficient and the program quality will be also improved.

It also supports complicated structured programming by allowing for a nesting structure which puts a FB in another FB.



2 International Standard IEC 61131-3 compliant

GX Works2 conforms to the international standard IEC 61131-3.

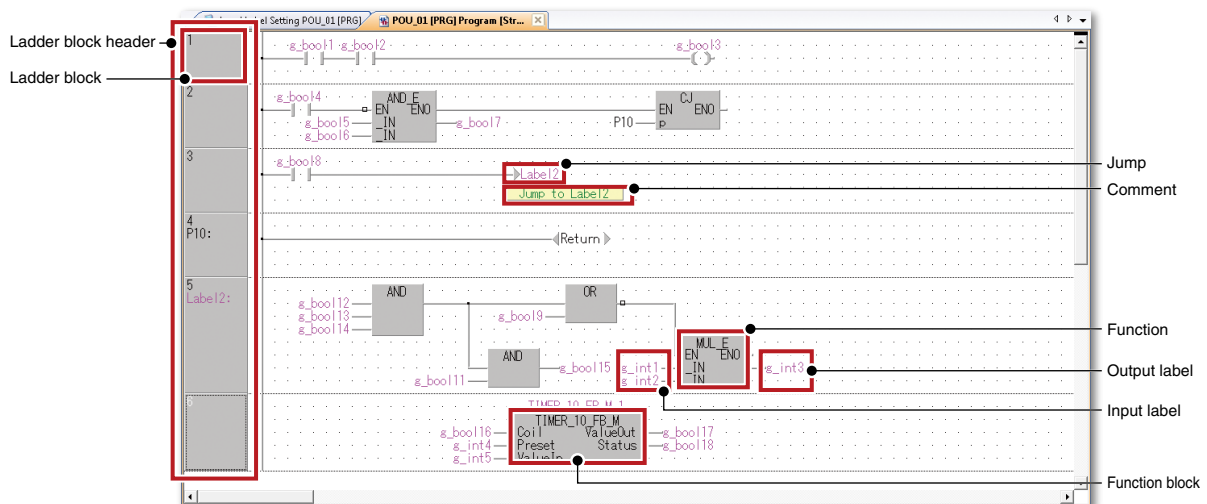
Graphical language

Ladder language

This graphical language represents a program as a ladder which consists of contact points and coils.

Structured ladder/FBD language

The structured ladder language is a graphical language used according to the design technique of the relay circuit. The structured ladder allows for nesting FBs. The FBD language graphically represents a ladder by connecting functions and/or FBs.

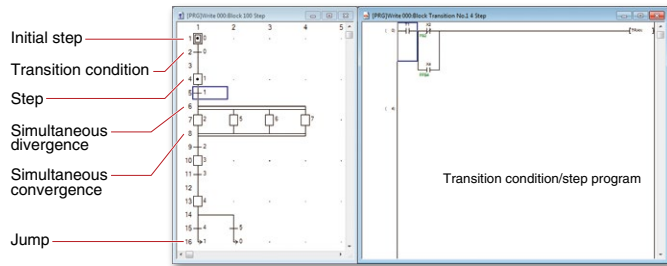


SFC language

A graphical language for comprehensively describing sequence control.

This language pairs a step which describes a process with a transition condition to move to the next step.

The step and transition condition are described in the ladder language.



Text language

ST (structured text) language

The ST language allows for describing control with selection divergence using conditional statements and loops using iteration syntax, similar to high-level languages such as C. This helps creating comprehensive and concise programs.

```

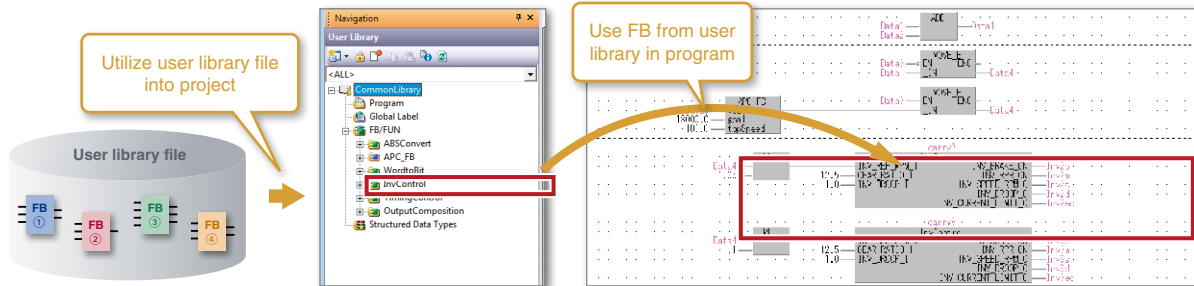
(* Using labels *)
IF Tank_limit=TRUE THEN
  Bulb=FALSE;
ELSE
  Bulb=TRUE;
END_IF;

(* Describe control with Selection divergence using conditional statements
and loops using iteration syntax*)
CASE Line OF
  1: Start_Switch=TRUE; (* Conveyor operation*)
  2: Start_Switch=FALSE;(* Conveyor stop*)
  1: Start_Switch=TRUE; (* Conveyor warning*)
END_CASE;

FOR Number_of_Processing=0
  TO 100
  BY 1 DO
    Processing=Processing+1;
  END_FOR;
  
```

3 Improve development efficiency using user libraries

With structured projects, frequently-used programs are saved in user library files separately from the project. By importing these user library files into a project, the program is developed efficiently without having to create it from scratch.



4 Label programming

Labels are used to give easily identifiable names such as “Production line start signal” or “Start parts supply” to devices.



POINT Using labels eliminates device assignment upon system changes.

► Interaction with iQ Works

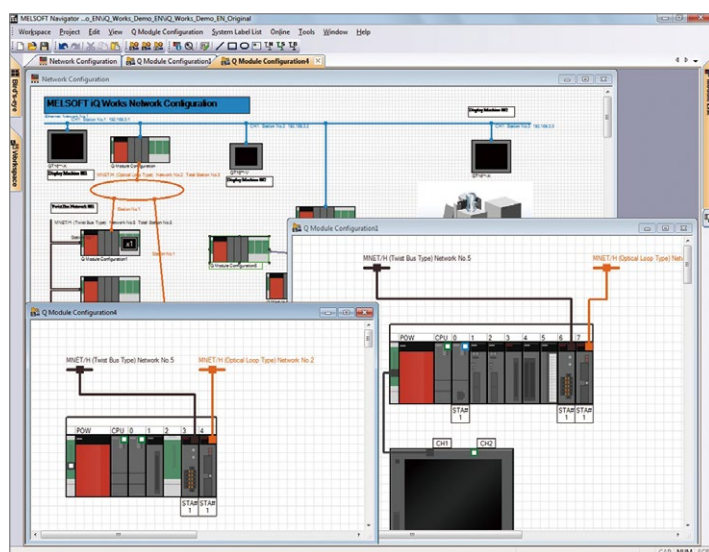
1 Implements a seamless engineering environment

MELSOFT iQ Works is an integrated engineering software product, composing of GX Works2, GX Works3, MT Works2, GT Works3, RT ToolBox3 and FR Configurator2. By sharing information such as system designs and programming as the entire control system, the system design and programming efficiency are improved and total cost reduction is achieved.

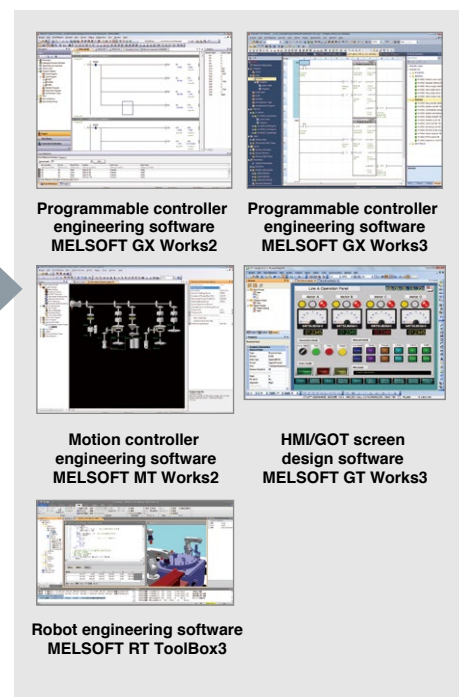
MELSOFT Navigator

In combination with GX Works2, GX Works3, MT Works2, GT Works3, and RT ToolBox3, this software performs upstream system design and inter-software operation.

It provides such convenient functions as system configuration design, batch setting of parameters, system labeling, and batch reading.



MELSOFT Navigator



■ Workspace management

Multiple project data (programmable controller projects, motion controller projects, GOT projects, and robot controller projects) are managed totally using a workspace.

• System configuration diagram

The overall system is represented graphically with the following configuration diagrams:

- “Network configuration diagram”
- “Module configuration diagrams” showing the placement of modules
- Field network configuration diagrams
 (“CC IE Field configurations,” “CC-Link configurations,” “Ethernet configurations,” “AnyWireASLINK configurations”)

The diagram is easily created by dragging and dropping the modules, and various checks such as power supply capacity check are also performed.

• System label

System labels are set in one place, reducing the number of processes and preventing setting errors.

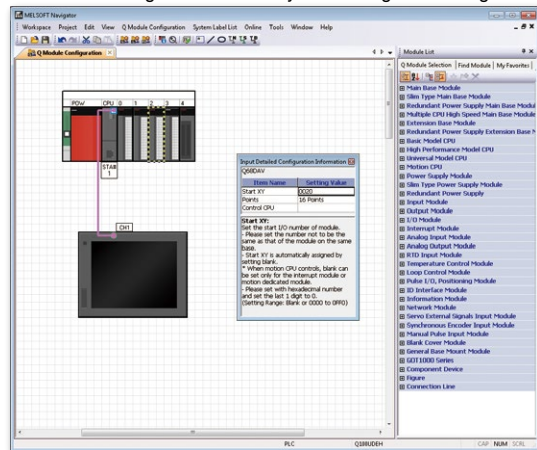
The set system labels are shared and used with all related projects.

2 Parameter settings for individual tools are no longer required

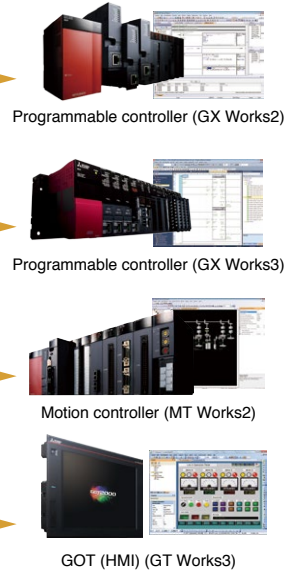
The information set into the system configuration drawing are reflected in a batch onto GX Works2, GX Works3, MT Works2 and GT Works 3 projects. *1
 There's no need to launch each software and check the integrity.

*1 It is required to set detailed parameters in each tool.

Parameter setting information in system configuration diagram

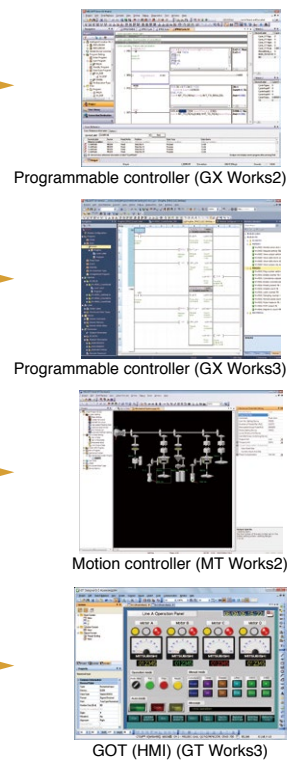
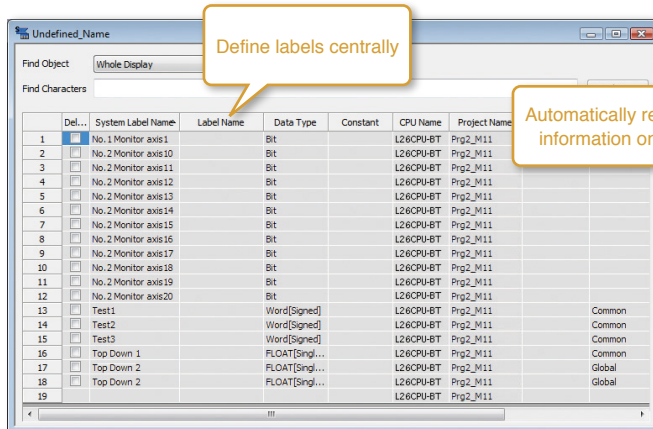


Reflected on data of various development tools at once



3 Shares labels and automatically changes all related projects

With MELSOFT Navigator, labels are shared by the PLC, motion controller and GOT (HMI).
 For example, if a device assignment is changed in the PLC project, the changes are automatically reflected onto the motion controller and GOT projects.



► Coordination with factory automation devices

1 Supporting Universal model high-speed CPUs

GX Works2 now supports the Universal model high-speed type QCPU module which has a greatly improved operation and processing speed for basic operations, structural instructions and FB call functions. Use GX Works2 to easily control the next-generation high-speed CPU equipped with advanced functions.

GX Works2 support

- Universal model high-speed type QCPU *1
Q03UDVCPU, Q04UDVCPU, Q06UDVCPU
Q13UDVCPU, Q26UDVCPU

*1 Supported by GX Works2 version 1.98C and higher.

MELSEC Q series
QnU

Reduce cycle time with
super fast processing

Basic operation processing
speed (LD instruction) 1.9 ns

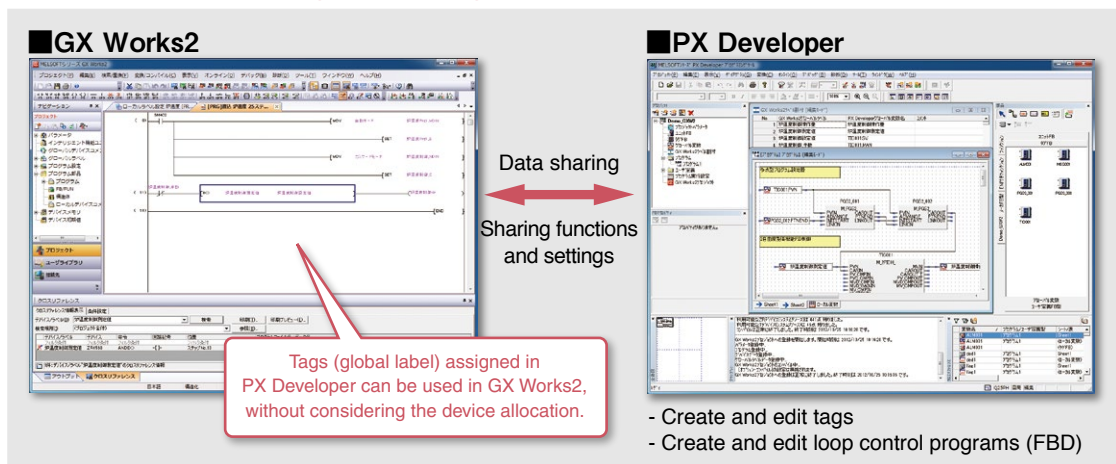


2 Coordination with PX Developer supports process applications

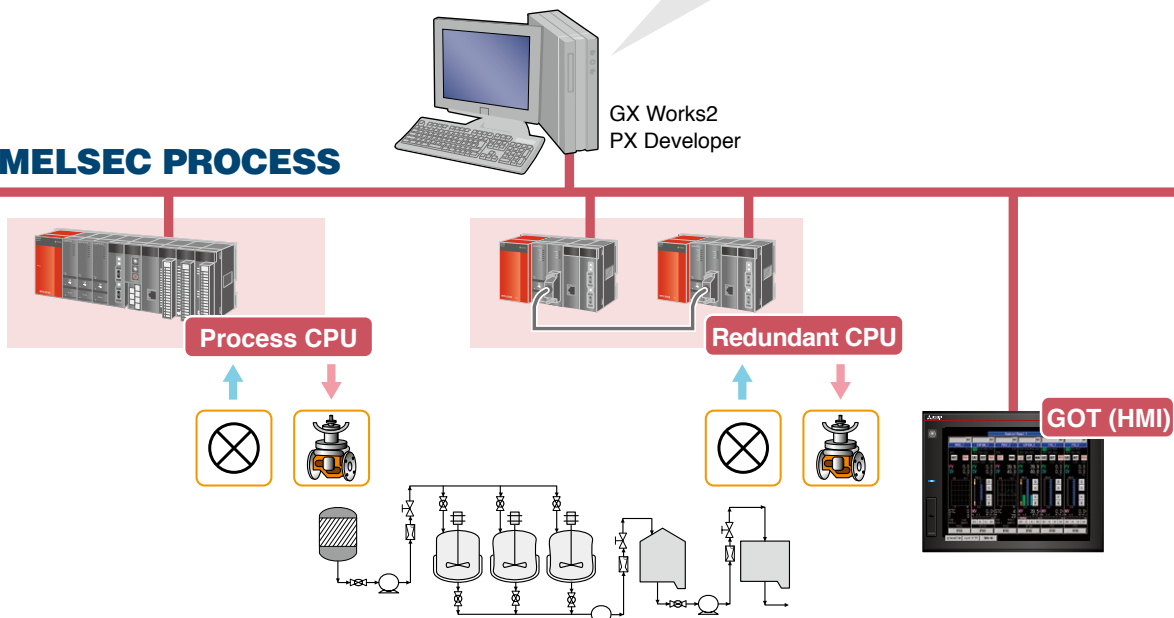
By coordinating with PX Developer*2, sequence and loop control programs can be created for process/redundant CPU.

*2 PX Developer with version 1.36N or later

Process system programming example



MELSEC PROCESS



3 Batch control of various factory automation devices

Coordination with various automation devices is now more powerful.
 GX Works2 is used to set and monitor various automation devices on any platform.
 Improve manufacturing site efficiency by integrating with high-performance and high-function devices.

Standard simple motion module setting tool

Configuration, start up and adjustment, operation and maintenance of the simple motion module are powerfully supported.



System configuration setting



Synchronous control parameter setting



Digital oscilloscope



Energy-saving supported

The power measurement module's parameters are set from GX Works2 without a manual.
 In addition, the parameter settings and measured value are confirmed easily. (Intelligent function module monitor supported)
 Swift startup using GX Works2 supports energy conservation of the system.

Supported modules

QE81WH, QE81WH4W, QE83WH4W, QE84WH, QE82LG



Sensor integration iQSS

Parameters for the iQ Sensor Solution (iQSS) compatible partner sensor products are set and monitored, and the sensor's connection state and current values are confirmed with graphically displays, allowing troubles to be handled quickly.

No.	入出力種別	入力/出力	形式名	機種名	入力	出力	状態
1	出力	0	L25AW12N	AnyWay&RPAで受取エドト	0	2	
2	出力	2	R389B-Q2U-CC20	アクリル板入りiQセンサー接続用シールドケーブル	0	2	
3	出力	80	R389B-Q1-SP	アクリル板入りiQセンサー接続用シールドケーブル(標準型)	0	1	
4	入力	0	R389B-Q2U-CC20	アクリル板入りiQセンサー接続用シールドケーブル	2	0	
5	入力	2	R389B-Q2U-CC20	アクリル板入りiQセンサー接続用シールドケーブル	2	0	
6	入力	80	R389B-Q1-SP	アクリル板入りiQセンサー接続用シールドケーブル(標準型)	1	0	
7	入力	20	R389B-Q1AF-CAS	アクリル板入りiQセンサー接続用ケーブル(標準型)	1	0	
8	入力	21	R389B-Q1AF-CAS	アクリル板入りiQセンサー接続用ケーブル(標準型)	1	0	
9	入力	22	R389B-Q1AF-CAS	アクリル板入りiQセンサー接続用ケーブル(標準型)	1	0	

Right-click → **Click!**

Status is monitored.

Parameters are set.

Centrally manage all assets such as projects and library for further workload reduction

MELSOFT iQ AppPortal



MELSOFT iQ AppPortal is application integrated management software used to centrally manage all assets*1 for configuring actual lines, facilities and equipment efficiently.

*1 Project files, design drawings/documents of Mitsubishi Electric products and partner products, custom made workspace, and so on.

Things that can be done using MELSOFT iQ AppPortal

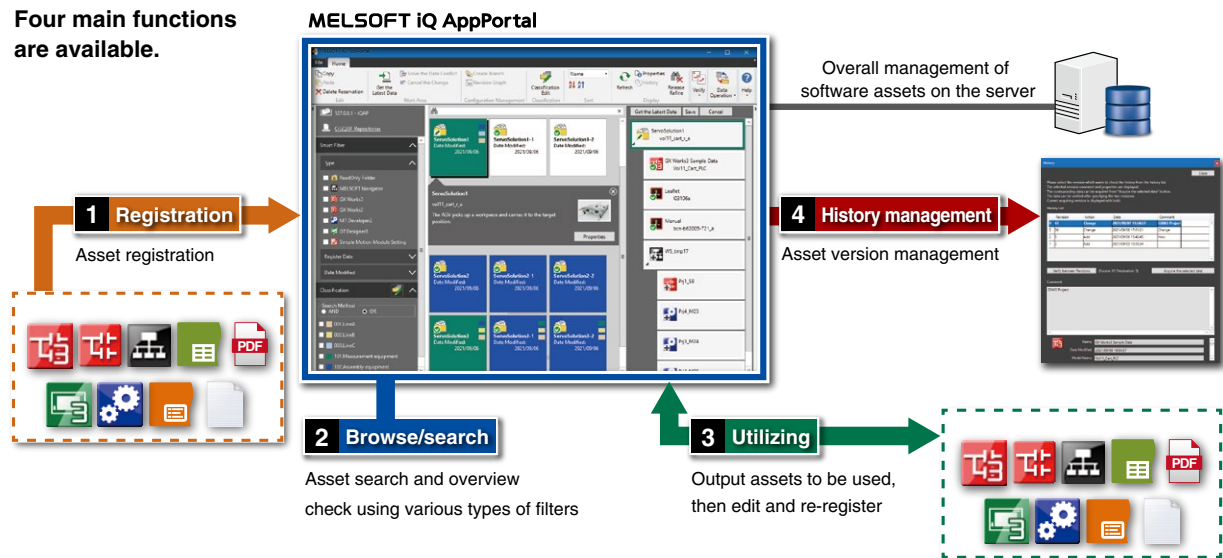
If you have these issues

- Unable to find files as file name and folder name are unknown
- Overwrote a file created by other persons or backup file in error
- Unable to identify which file is the latest
- Overwrote a file created by other persons or backup file in error
- Frequently forget to store files and keep history in spite of history management based on the file management rule

⇒ MELSOFT iQ AppPortal can easily solve these issues

Main functions of MELSOFT iQ AppPortal

Four main functions are available.

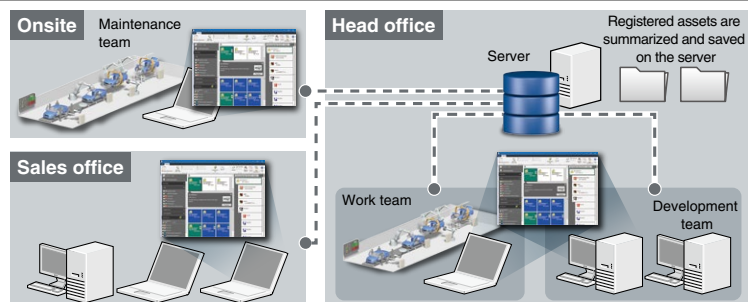


Benefits of overall management of software assets on the server

POINT

By storing assets on the internal server, the same assets can be referenced from any terminal.

Both client and server functions can be installed on one computer.



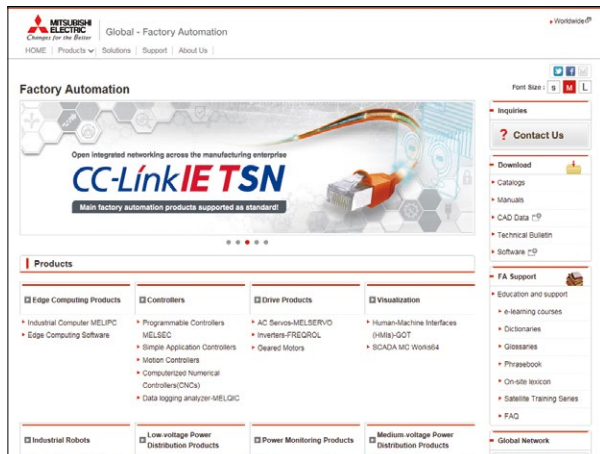
Factory Automation Global website

Mitsubishi Electric Factory Automation provides a mix of services to support its customers worldwide. A consolidated global website is the main portal, offering a selection of support tools and a window to its local Mitsubishi Electric sales and support network.

■ From here you can find:

- Overview of available factory automation products
- Library of downloadable literature
- Support tools such as online e-learning courses, terminology dictionary, etc.
- Global sales and service network portal
- Latest news related to Mitsubishi Electric factory automation

**Mitsubishi Electric Factory Automation
Global website:
www.MitsubishiElectric.com/fa**



Online e-learning

An extensive library of e-learning courses covering the factory automation product range has been prepared. Courses from beginner to advanced levels of difficulty are available in various languages.



■ Beginner level

Designed for newcomers to Mitsubishi Electric Factory Automation products gaining a background of the fundamentals and an overview of various products related to the course.

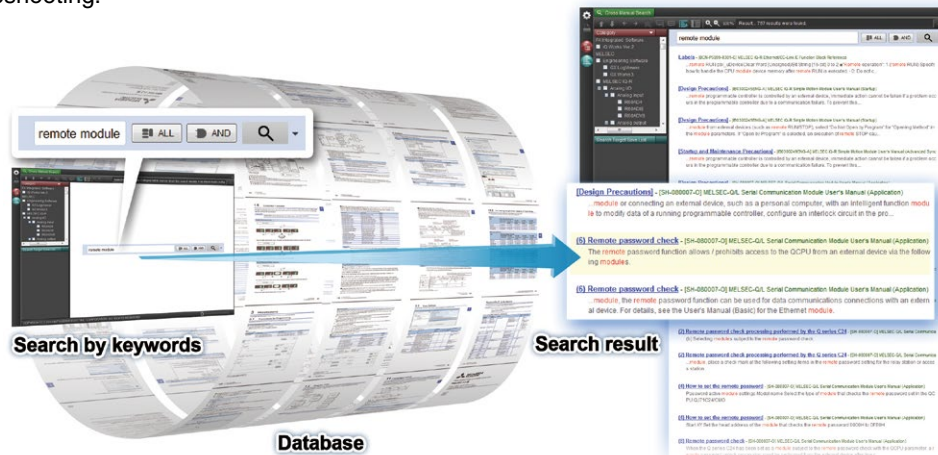
■ Basic to Advanced levels

These courses are designed to provide education at all levels. Various different features are explained with application examples providing an easy and informative resource for in-house company training.

Innovative next-generation, e-Manual

e-Manual Viewer

The e-Manual viewer is a next-generation digital manual offered by Mitsubishi Electric that consolidates factory automation products manuals into an easy-to-use package with various useful features integrated into the viewer. The e-Manual allows multiple manuals to be cross-searched at once, further reducing time for setting up products and troubleshooting.



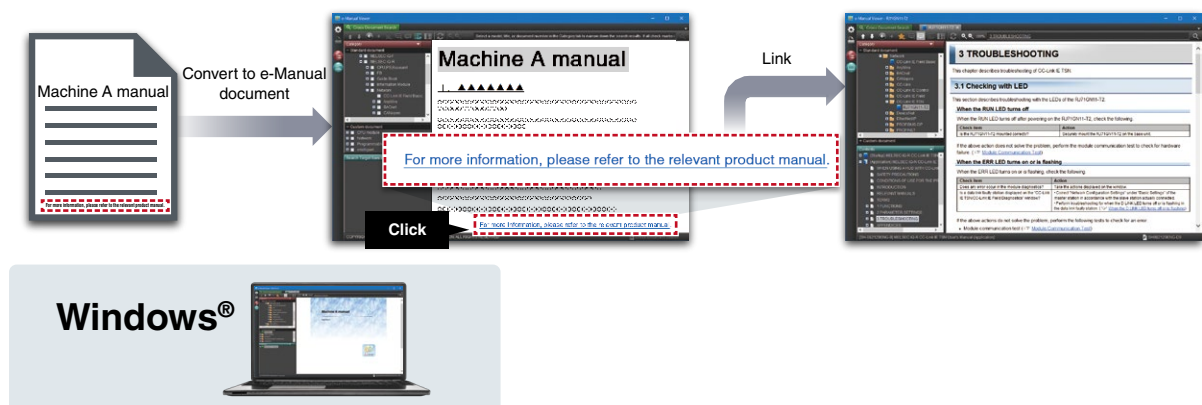
Key features included

- One-stop database containing all required manuals, with local file cache
- Included with GX Works3 engineering software
- Also available in tablet version
- Easily download manuals all at once
- Multiple users can share the latest manuals and knowhow with document sharing function
- Directly port sample programs within manuals to GX Works3
- Downloaded manuals are usable offline



e-Manual Create

e-Manual Create is software for converting word files and chm files to e-Manual documents. e-Manual Create allows users to directly refer to Mitsubishi Electric e-Manuals from user's customized device maintenance manuals and such, supporting quick troubleshooting and reduction in document creation process.



* To obtain the Windows® version of e-Manual Viewer and e-Manual Create, please contact your local Mitsubishi Electric sales office or representative.

Extensive global support coverage providing expert help whenever needed

■ Global FA centers

EMEA

Europe FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch
Tel: +48-12-347-65-81

Germany FA Center

MITSUBISHI ELECTRIC EUROPE B.V. German Branch
Tel: +49-2102-486-0 / Fax: +49-2102-486-1120

UK FA Center

MITSUBISHI ELECTRIC EUROPE B.V. UK Branch
Tel: +44-1707-27-8780 / Fax: +44-1707-27-8695

Czech Republic FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch
Tel: +420-255 719 200

Italy FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch
Tel: +39-039-60531 / Fax: +39-039-6053-312

Russia FA Center

MITSUBISHI ELECTRIC (RUSSIA) LLC ST.
Petersburg Branch
Tel: +7-812-633-3497 / Fax: +7-812-633-3499

Turkey FA Center

MITSUBISHI ELECTRIC TURKEY A.S. Umraniye Branch
Tel: +90-216-526-3990 / Fax: +90-216-526-3995

Asia-Pacific

China

Beijing FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD.
Beijing FA Center
Tel: +86-10-6518-8830 / Fax: +86-10-6518-2938

Guangzhou FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD.
Guangzhou FA Center
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Shanghai FA Center

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Shanghai FA Center
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MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD.
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Tel: +86-22-2813-1015 / Fax: +86-22-2813-1017

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Malaysia FA Center

Malaysia FA Center
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Indonesia

Indonesia FA Center

PT. MITSUBISHI ELECTRIC INDONESIA
Cikarang Office
Tel: +62-21-2961-7797 / Fax: +62-21-2961-7794

Vietnam

Hanoi FA Center

MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED
Hanoi Branch Office
Tel: +84-24-3937-8075 / Fax: +84-24-3937-8076

Ho Chi Minh FA Center

MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED
Tel: +84-28-3910-5945 / Fax: +84-28-3910-5947

Philippines

Philippines FA Center

MELCO Factory Automation Philippines Inc.
Tel: +63-(0)2-8256-8042

India

India Ahmedabad FA Center

MITSUBISHI ELECTRIC INDIA PVT. LTD.
Ahmedabad Branch
Tel: +91-7965120063

India Bangalore FA Center

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Bangalore Branch
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Chennai Branch
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Coimbatore Branch
Tel: +91-422-438-5606

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MITSUBISHI ELECTRIC INDIA PVT. LTD.
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Tel: +91-124-463-0300 / Fax: +91-124-463-0399

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MITSUBISHI ELECTRIC INDIA PVT. LTD.
Pune Branch
Tel: +91-20-2710-2000 / Fax: +91-20-2710-2100

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North America FA Center

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Mexico City FA Center

MITSUBISHI ELECTRIC AUTOMATION, INC.
Mexico Branch
Tel: +52-55-3067-7511

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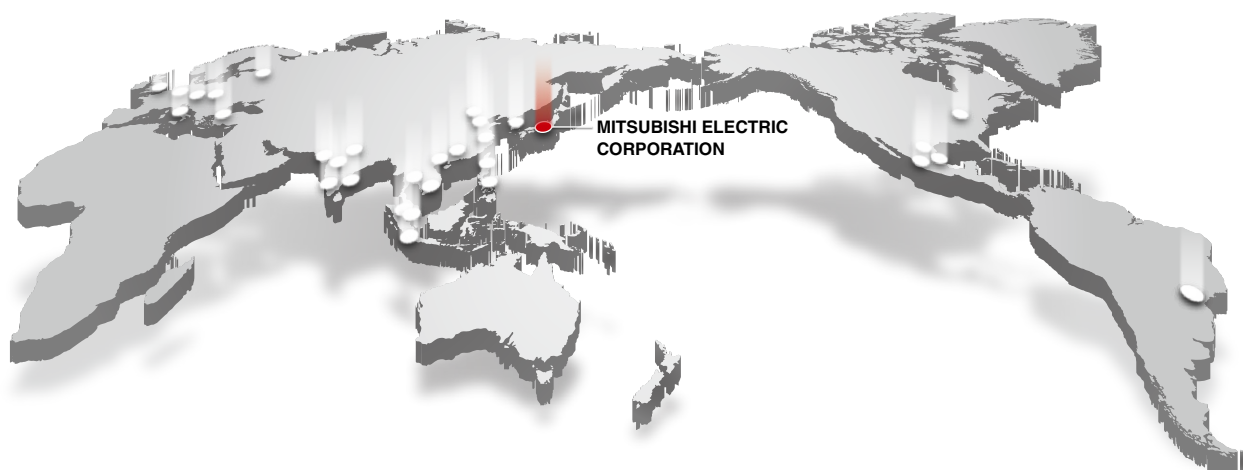
Mexico Monterrey FA Center

MITSUBISHI ELECTRIC AUTOMATION, INC.
Monterrey Office
Tel: +52-55-3067-7521

Brazil

Brazil FA Center

MITSUBISHI ELECTRIC DO BRASIL COMERCIO E
SERVICOS LTDA.
Tel: +55-11-4689-3000 / Fax: +55-11-4689-3016



► Specifications/products

■ Operating Environment

Item	Details	
Personal computer	OS	Windows® 10 (Home, Pro, Enterprise, Education, IoT Enterprise 2016 LTSPB ^{*1}) Windows® 8.1, Windows® 8.1 (Pro, Enterprise) Windows® 8, Windows® 8 (Pro, Enterprise) Windows® 7 (Starter, Home Premium, Professional, Ultimate, Enterprise)
	CPU	Intel® Core™ 2 Duo Processor 2 GHz or more
	Required memory	Recommended 1 GB or more
Available hard disk capacity	When installing GX Works2: HDD available capacity is 3 GB or more. When operating GX Works2: Virtual memory available capacity is 512 MB or more.	
Disk drive	CD-ROM supported disk drive	
Monitor	Resolution 1024 × 768 pixels or higher	

*1 64-bit edition supported

■ Supported Programmable Controller CPU

Series name	Model	
MELSEC-Q Series	Basic model	Q00JCPU, Q00CPU, Q01CPU
	High-performance model	Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU
	Universal model	Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q03UDECPU, Q04UDHCPU, Q04UDEHCPU, Q06UDHCPU, Q06UDEHCPU, Q10UDHCPU, Q10UDEHCPU, Q13UDHCPU, Q13UDEHCPU, Q20UDHCPU, Q20UDEHCPU, Q26UDHCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU, Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, Q26UDVCPU
	Remote I/O	QJ72LP25, QJ72BR15
	Process CPU	Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU
	Redundant CPU	Q12PRHCPU, Q25PRHCPU
LPCPU	L02SCPU, L02SCPU-P, L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT, LJ72GF15-T2, LJ72MS15	
FXCPU	FX0s, FX0, FX0N, FX1, FX1s, FX1N, FX1NC, FXU, FX2c, FX2N, FX2NC, FX3s, FX3G, FX3GC, FX3u, FX3UC	
QCPU (A mode) ^{*2}	All types	
QSCPU ^{*2}	All types	
QnACPU ^{*2}	All types	
ACPU ^{*2}	All types	
Motion controller (SCPU) ^{*2}	All types	
CNC (M6, M7) ^{*2}	All types	

*2 These modules are supported with using GX Developer.

■ Product Information

Type	Model	Outline
MELSOFT iQ Works	SW2DND-IQWK-E	FA engineering software ^{*3} <ul style="list-style-type: none"> System Management Software: MELSOFT Navigator Controller Programming Software: MELSOFT GX Works3^{*4}, GX Works2, GX Developer Motion Programming Software: MELSOFT MT Works2 HMI Programming Software: MELSOFT GT Works3 Robot Programming Software: MELSOFT RT ToolBox3^{*5} Inverter Setup Software: MELSOFT FR Configurator2 Servo setup software: MELSOFT MR Configurator2 C Controller setting and monitoring tool: MELSOFT CW Configurator mitsubishi electric fa library
MELSOFT GX Works2	SW1DND-GXW2-E	Controller Programming Software Comes with GX Developer
MELSOFT GX Works3	SW1DND-GXW3-E	Controller Programming Software: MELSOFT GX Works3 ^{*4} mitsubishi electric fa library Comes with GX Works2, GX Developer and PX Developer ^{*6}

*3 For detailed information about supported modules, refer to the manuals of the relevant software package.

*4 The MELSOFT GX Works3 menu is switchable between Japanese, English, and simplified Chinese.

*5 RT ToolBox3 mini (simplified version) will be installed if iQ Works product ID is used. When RT ToolBox3 (with simulation function) is required, please purchase RT ToolBox3 product ID.

*6 Includes both programming tool and monitor tool for process control.

■ Related Software Products

Type	Model	Outline
PX Developer	SW1D5C-FBDQ-E	FBD software package for process control
	SW1DNC-FBDQMON-E	Process control FBD software package monitoring tool
GX Developer	SW8D5C-GPPW-E	MELSEC programmable controller programming software
	SW8D5C-GPPW-EV	MELSEC programmable controller programming software (upgrade)

[Available for free*1]

Type	Model	Outline
GX LogViewer	SW1DNN-VIEWER-E	Logging data display and analysis tool

*1 To receive a copy of GX LogViewer, contact your local Mitsubishi Electric representative.

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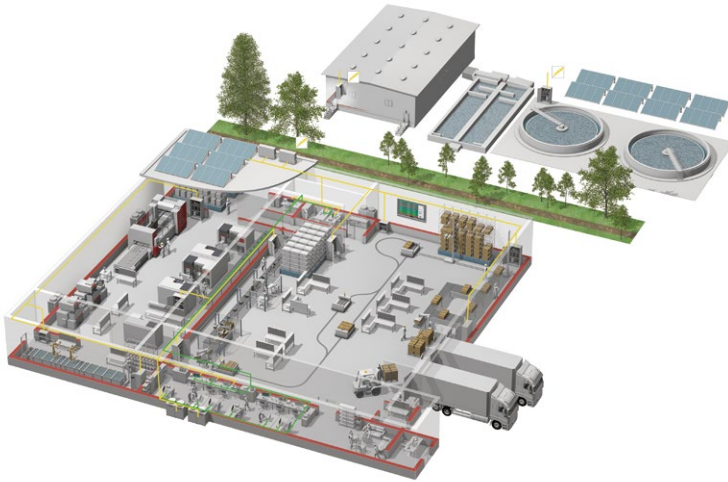
Precautions before use

This publication explains the typical features and functions of the products herein and does not provide restrictions or other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; or any other duties.

For safe use

- To use the products given in this publication properly, always read the relevant manuals before beginning operation.
- The products have been manufactured as general-purpose parts for general industries, and are not designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger-carrying vehicles, consult with Mitsubishi Electric.
- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or fail-safe functions in the system.

YOUR SOLUTION PARTNER



Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines.

A NAME TO TRUST

Since its beginnings in 1870, some 45 companies use the Mitsubishi name, covering a spectrum of finance, commerce and industry.

The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

Mitsubishi Electric Corporation, established in 1921, is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 183 factories, laboratories and offices worldwide in over 140 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over \$40 billion), employing over 146,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.



Low-voltage Power Distribution Products



Transformers, Med-voltage Distribution Products



Power Monitoring and Energy Saving Products



Power (UPS) and Environmental Products



Compact and Modular Controllers



Servos, Motors and Inverters



Visualization: HMIs



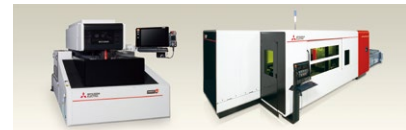
Edge Computing Products



Numerical Control (NC)



Collaborative and Industrial Robots



Processing machines: EDM, Lasers

* Not all products are available in all countries.

Country/Region	Sales office	Tel/Fax
USA	<p>MITSUBISHI ELECTRIC AUTOMATION, INC. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.</p>	<p>Tel : +1-847-478-2100 Fax : +1-847-478-2253</p>
Mexico	<p>MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch Boulevard Miguel de Cervantes Saavedra 301, Torre Norte Piso 5, Ampliacion Granada, Miguel Hidalgo, Ciudad de Mexico, Mexico, C.P.115200</p>	<p>Tel : +52-55-3067-7512</p>
Brazil	<p>MITSUBISHI ELECTRIC DO BRASIL COMERCIO E SERVICOS LTDA. Avenida Adelino Cardana, 293, 21 andar, Bethaville, Barueri SP, Brasil</p>	<p>Tel : +55-11-4689-3000 Fax : +55-11-4689-3016</p>
Germany	<p>MITSUBISHI ELECTRIC EUROPE B.V. German Branch Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany</p>	<p>Tel : +49-2102-486-0 Fax : +49-2102-486-7780</p>
UK	<p>MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane, UK-Hatfield, Hertfordshire, AL10 8XB, U.K.</p>	<p>Tel : +44-1707-28-8780 Fax : +44-1707-27-8695</p>
Ireland	<p>MITSUBISHI ELECTRIC EUROPE B.V. Irish Branch Westgate Business Park, Ballymount, Dublin 24, Ireland</p>	<p>Tel : +353-1-4198800 Fax : +353-1-4198890</p>
Italy	<p>MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch Centro Direzionale Colleoni - Palazzo Sirio, Viale Colleoni 7, 20864 Agrate Brianza (MB), Italy</p>	<p>Tel : +39-039-60531 Fax : +39-039-6053-312</p>
Spain	<p>MITSUBISHI ELECTRIC EUROPE, B.V. Spanish Branch Carretera de Rubi, 76-80-Apdo. 420, E-08190 Sant Cugat del Valles (Barcelona), Spain</p>	<p>Tel : +34-935-65-3131 Fax : +34-935-89-1579</p>
France	<p>MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets, 92741 Nanterre Cedex, France</p>	<p>Tel : +33-1-55-68-55-68 Fax : +33-1-55-68-57-57</p>
Czech Republic	<p>MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch, Prague Office Pekarska 621/7, 155 00 Praha 5, Czech Republic</p>	<p>Tel : +420-255-719-200</p>
Poland	<p>MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch ul. Krakowska 48, 32-083 Balice, Poland</p>	<p>Tel : +48-12-347-65-00</p>
Sweden	<p>MITSUBISHI ELECTRIC EUROPE B.V. (Scandinavia) Hedvig Mollersgata 6, 223 55 Lund, Sweden</p>	<p>Tel : +46-8-625-10-00 Fax : +46-46-39-70-18</p>
Russia	<p>MITSUBISHI ELECTRIC (RUSSIA) LLC St. Petersburg Branch Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027 St. Petersburg, Russia</p>	<p>Tel : +7-812-633-3497 Fax : +7-812-633-3499</p>
Turkey	<p>MITSUBISHI ELECTRIC TURKEY A.S. Umraniye Branch Serifali Mah. Kale Sok. No:41 34775 Umraniye - Istanbul, Turkey</p>	<p>Tel : +90-216-969-2500 Fax : +90-216-661-4447</p>
UAE	<p>MITSUBISHI ELECTRIC EUROPE B.V. Dubai Branch Dubai Silicon Oasis, P.O.BOX 341241, Dubai, U.A.E.</p>	<p>Tel : +971-4-3724716 Fax : +971-4-3724721</p>
South Africa	<p>ADROIT TECHNOLOGIES 20 Waterford Office Park, 189 Witkoppen Road, Fourways, South Africa</p>	<p>Tel : +27-11-658-8100 Fax : +27-11-658-8101</p>
China	<p>MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Mitsubishi Electric Automation Center, No.1386 Hongqiao Road, Shanghai, China</p>	<p>Tel : +86-21-2322-3030 Fax : +86-21-2322-3000</p>
Taiwan	<p>SETSUYO ENTERPRISE CO., LTD. 6F, No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan</p>	<p>Tel : +886-2-2299-2499 Fax : +886-2-2299-2509</p>
Korea	<p>MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. 7F to 9F, Gangseo Hangang Xi-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 07528, Korea</p>	<p>Tel : +82-2-3660-9569 Fax : +82-2-3664-8372</p>
Singapore	<p>MITSUBISHI ELECTRIC ASIA PTE. LTD. 307 Alexandra Road, Mitsubishi Electric Building, Singapore 159943</p>	<p>Tel : +65-6473-2308 Fax : +65-6476-7439</p>
Thailand	<p>MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD. 12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangpongpan, Khet Yannawa, Bangkok 10120, Thailand</p>	<p>Tel : +66-2682-6522-31 Fax : +66-2682-6020</p>
Vietnam	<p>MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Unit 01-04, 10th Floor, Vincom Center, 72 Le Thanh Ton Street, District 1, Ho Chi Minh City, Vietnam</p>	<p>Tel : +84-28-3910-5945 Fax : +84-28-3910-5947</p>
Indonesia	<p>PT. MITSUBISHI ELECTRIC INDONESIA Gedung Jaya 8th Floor, JL. MH. Thamrin No.12, Jakarta Pusat 10340, Indonesia</p>	<p>Tel : +62-21-31926461 Fax : +62-21-31923942</p>
India	<p>MITSUBISHI ELECTRIC INDIA PVT. LTD. Pune Branch Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune-411026, Maharashtra, India</p>	<p>Tel : +91-20-2710-2000 Fax : +91-20-2710-2100</p>
Australia	<p>MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD. 348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia</p>	<p>Tel : +61-2-9684-7777 Fax : +61-2-9684-7245</p>

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
www.MitsubishiElectric.com