MITSUBISHI ELECTRIC

Changes for the Better

for a greener tomorrow eco Changes

iQ Platform Compatible Programmable Controller Engineering Software MELSOFT GX Works2

GX Works2

Integrated PLC Engineering Software

iQ Platform iQSS

Integrated PLC Engineering Software

Ultimate evolution of PLC engineering software

International Standard IEC 61131-3 compliant

Now an easy-to-use engineering software is no surprise.
In addition to its sophisticated usability, the engineering software GX Works2 deploys
the global mainstream concepts of "grouping" and "structuring"
for fundamental improvement of programming efficiency.
The world-standard engineering style begins with GX Works2.


Project
Program File
Program Parts
FunctionBlock
Project
Program File
Program Parts
FunctionBlock
Project
Program File
Program Parts
FunctionBlock
MITSUBISHI ELECTRIC
Integrated FA Software
MELSOFT
GX Works2
Version 1
Programming and Maintenance tool
MELSOFT
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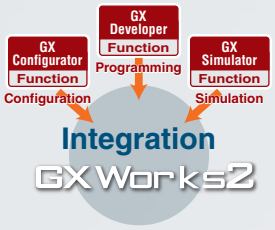
ks2

Concept

Concept.1

All-in-one package

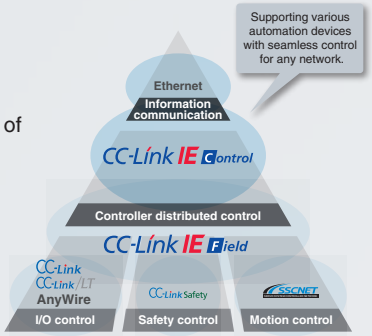
All capabilities required for PLC engineering including the configuration function of the intelligent function module and simulation function are integrated in a single package.
The all-in-one GX Works2 package supports entire engineering such as system design, programming, debug and maintenance.



Concept.2

Make full use of MELSEC PLC modules

GX Works2 enables you to easily make a full use of high-function and high-performance CPUs and modules.



Concept.3

Inherits customer assets

Your legacy GX Developer programs 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.

Concept.4

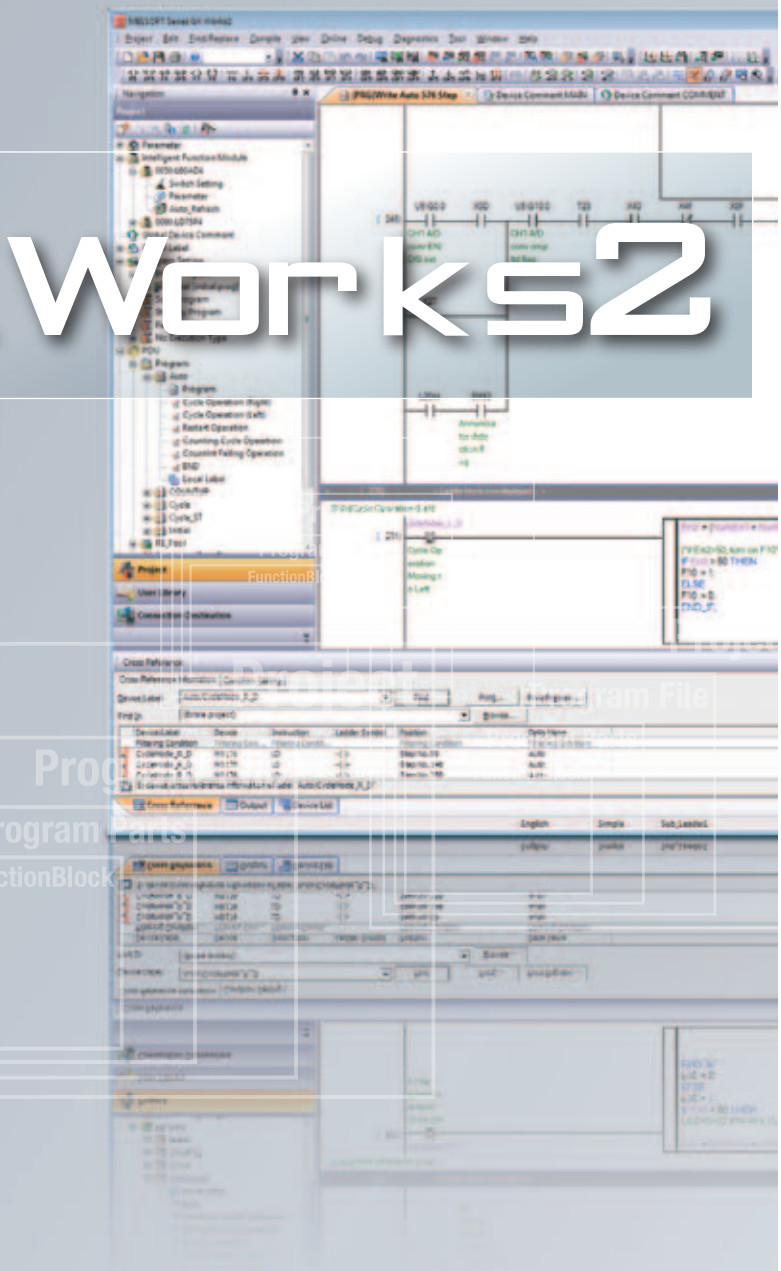
Sophisticated usability

The favorable GX Developer functions have been incorporated to GX Works2 and the usability furthermore improved.
The performance has also been refined thus improving each operation to perform smoothly with a high response.
The usability will continue to advance.

Concept.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.



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Improving design and debug efficiency

Providing maintenance that meet your needs

Facilitating project management

Promoting program standardization

Powerful collaboration and support of FA devices

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.

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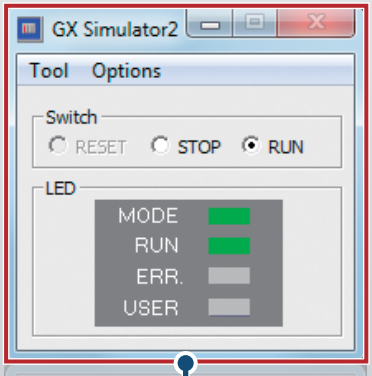

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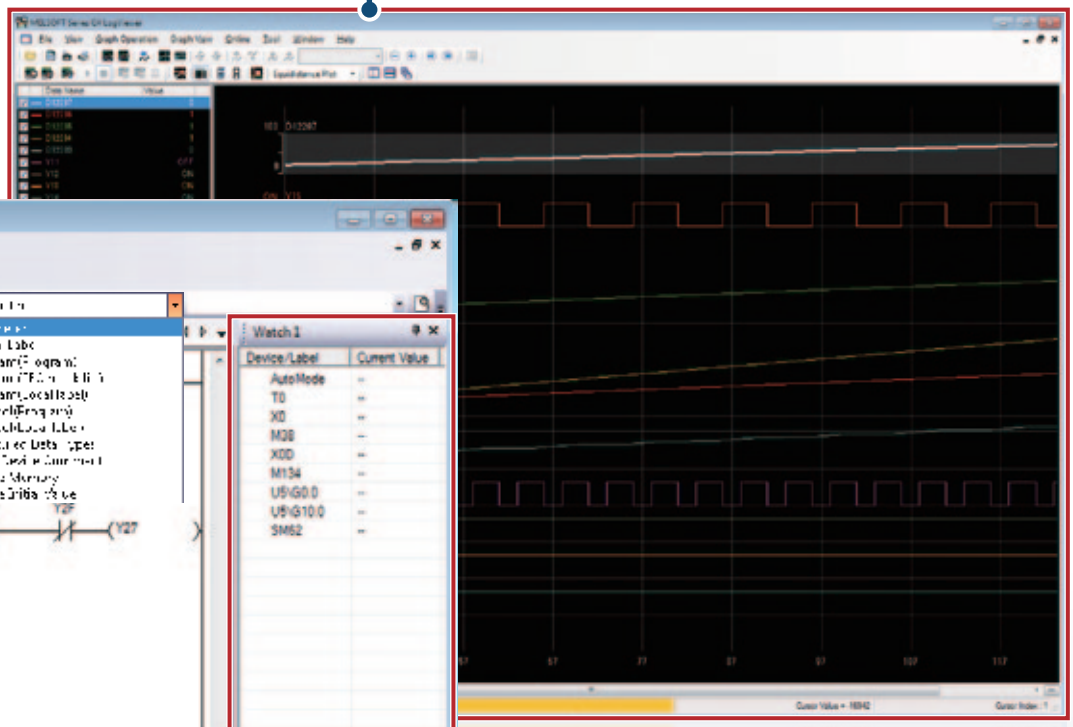

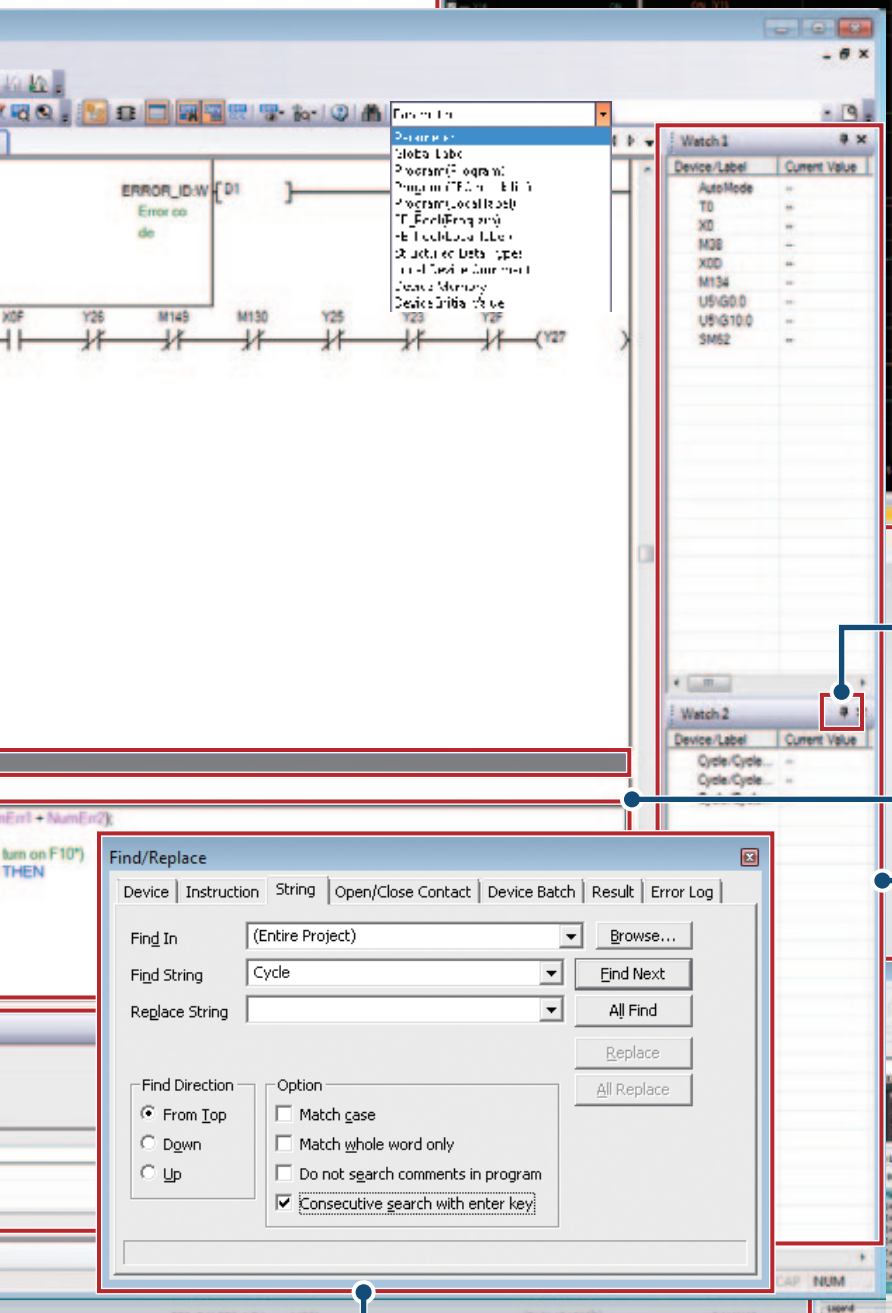

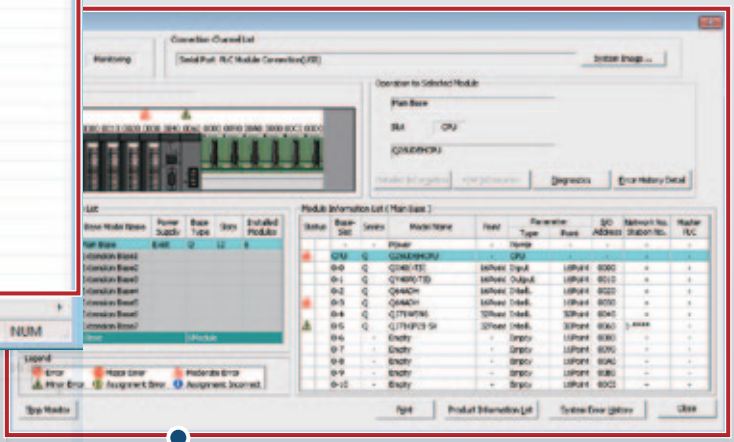

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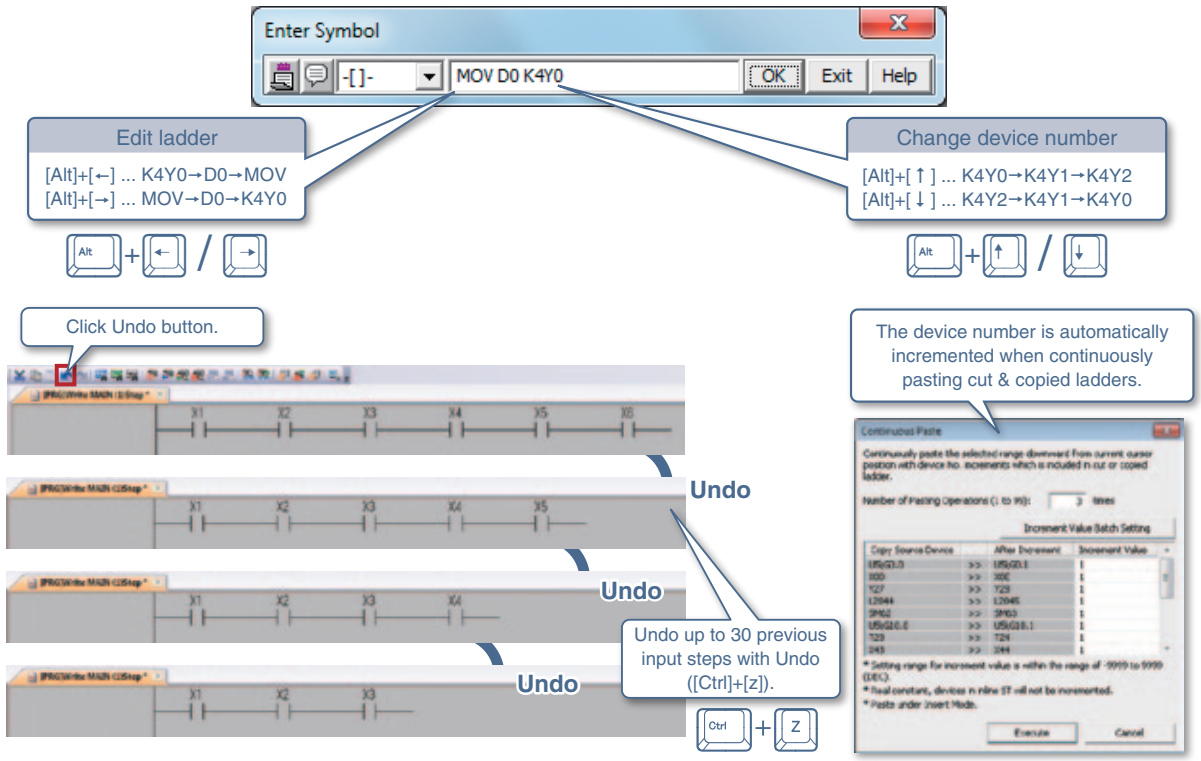
Easy continuous device search with familiar-to-use operation ·····P.8

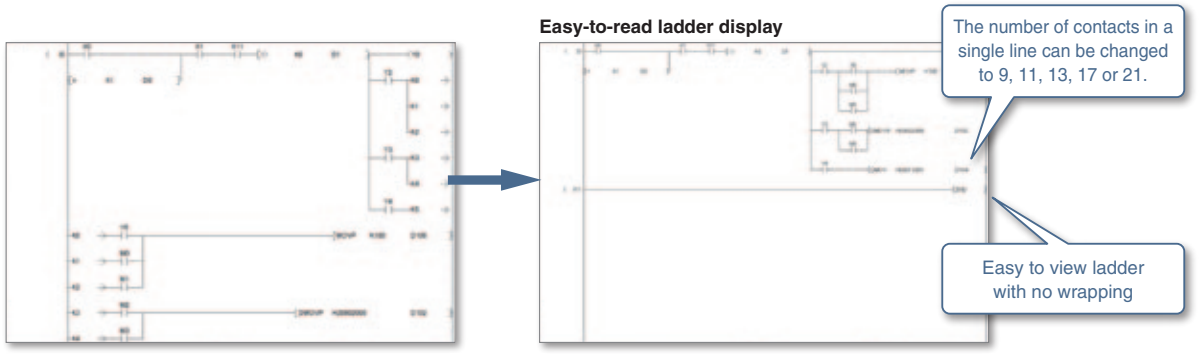
Visible System monitor function and PLC diagnostics ·····P.21

▶ Ladder input

1 Simple key operation makes an easy ladder programming

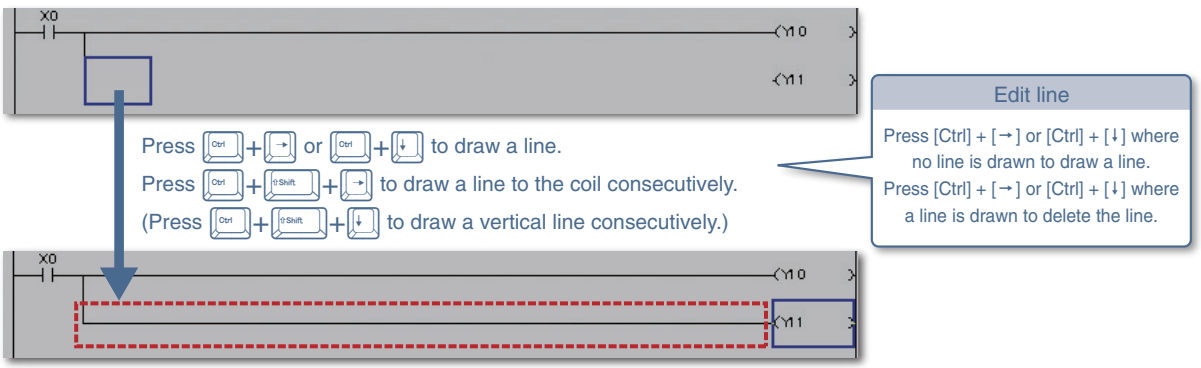
A ladder is easily modified and edited with convenient key combinations such as [Alt]+[←]/[→] or [Alt]+[↑]/[↓].





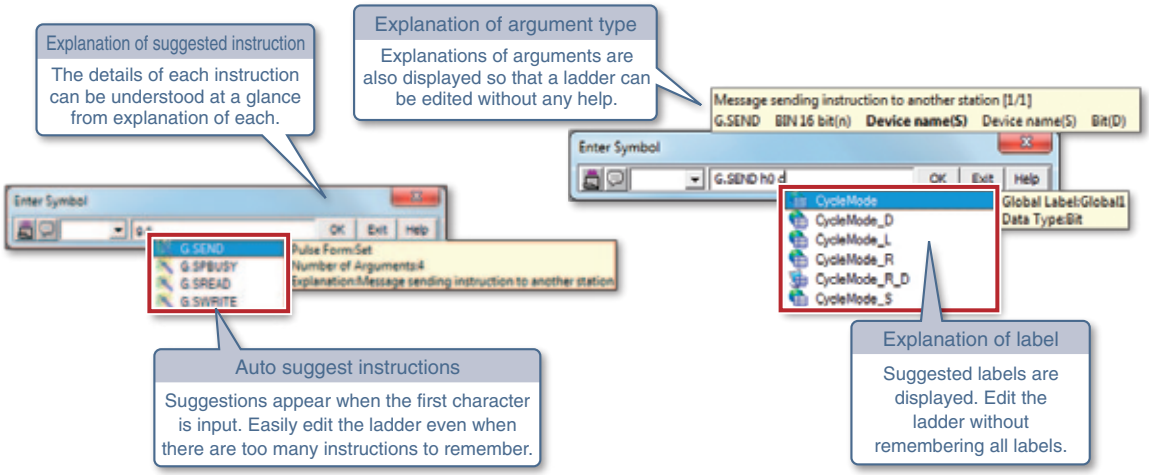
2 Edit lines with simple key operation

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



3 Easy ladder edit with command/label input support

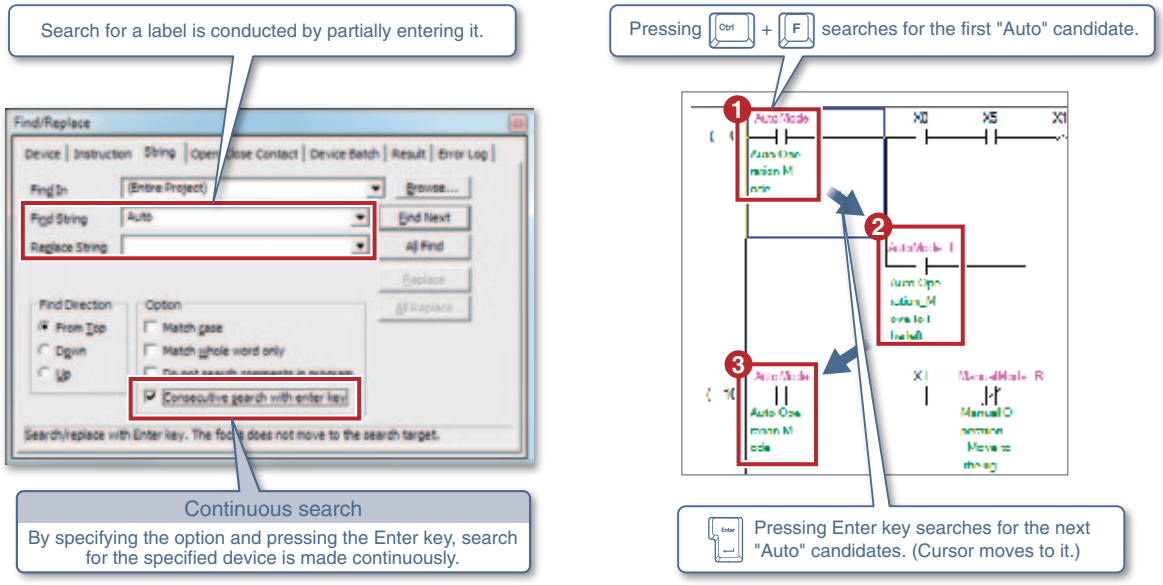
Ladders are easily edited just by choosing.
The information of arguments are also shown to reduce errors during ladder input.



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.

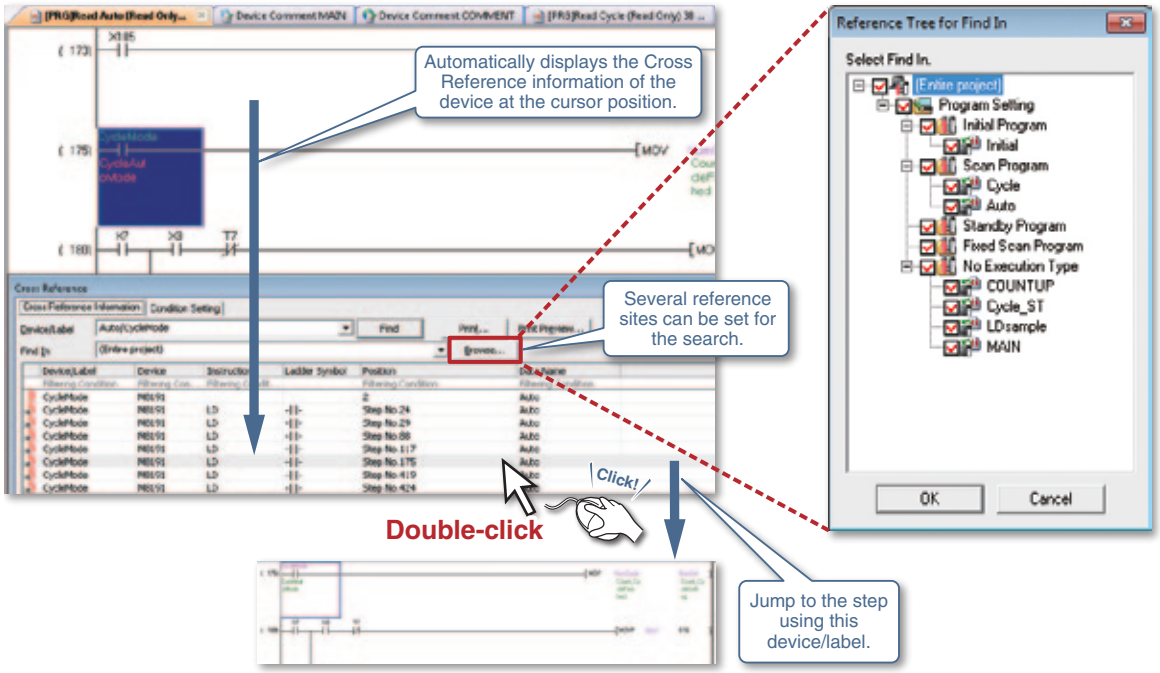


POINT **Search for devices can also be made in the similar manner by switching the ladder display to the device display.**

▶ 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.



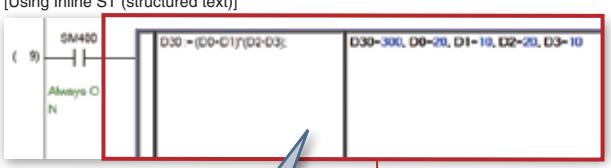
POINT The used locations of devices or labels in the program are confirmed with intuitive operation.

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.

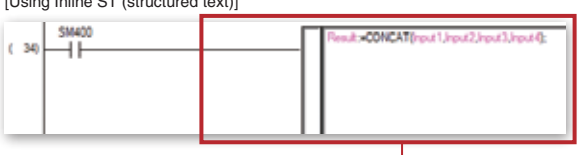
Example of numeric operation
[Using ladder only]

[Using Inline ST (structured text)]



Example of character string processing
[Using ladder only]

[Using Inline ST (structured text)]



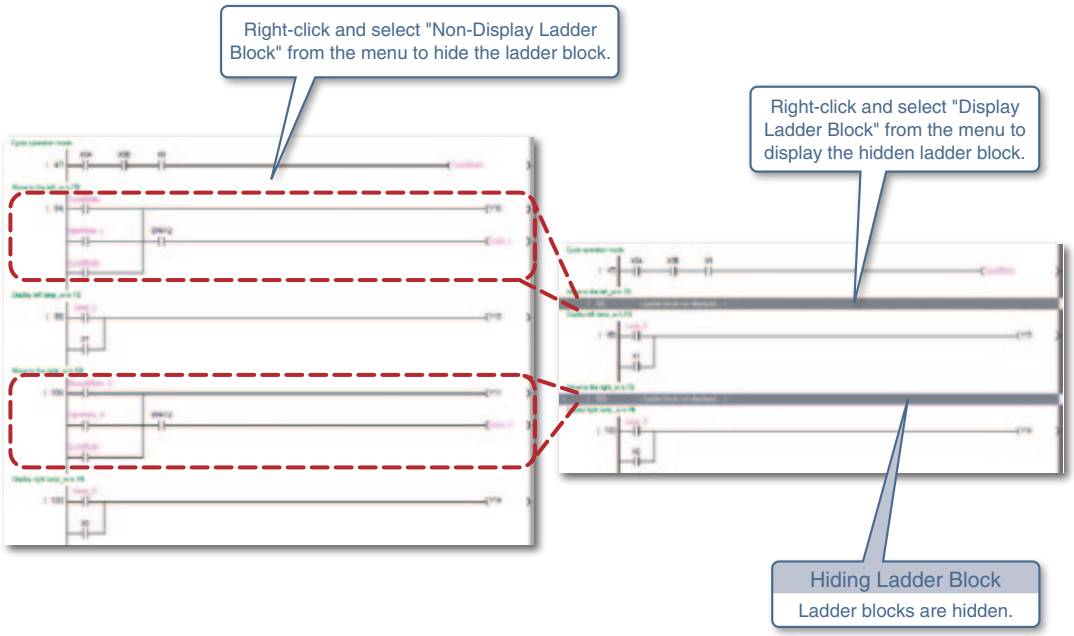
ST edit area
The current value can be monitored and changed.

Describe a program in one line using Inline ST.

POINT Troublesome numeric operations and character string processing are described easily.

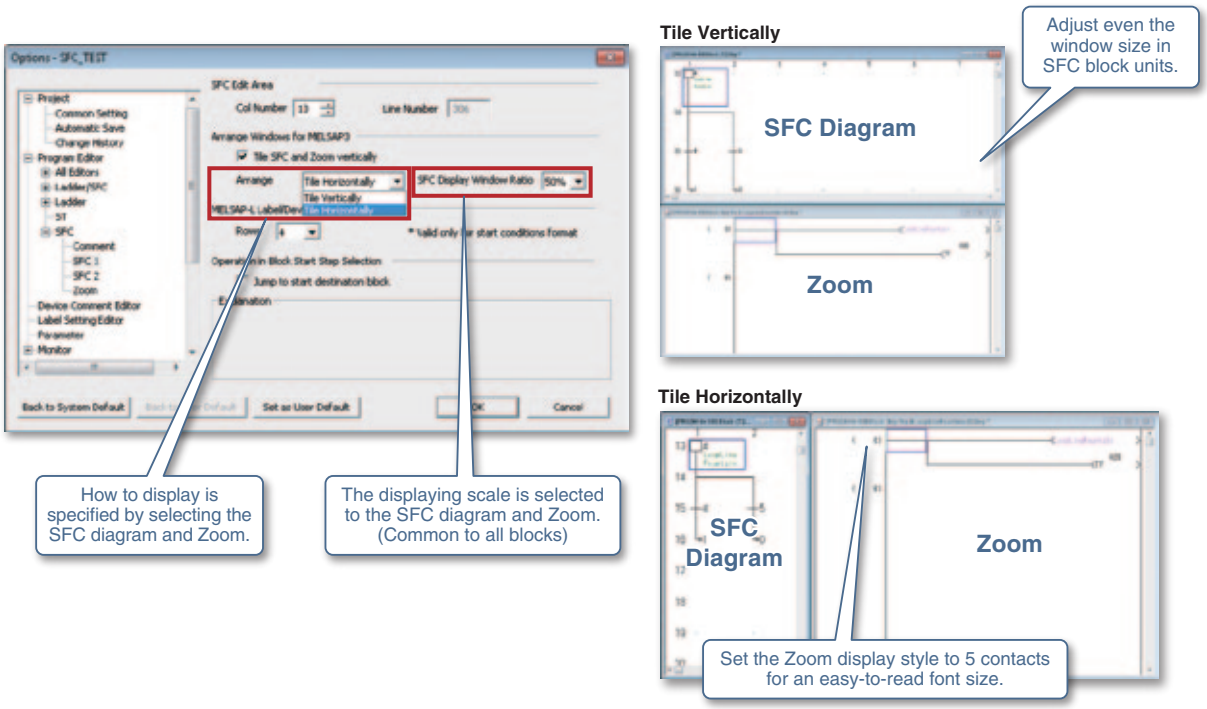
7 Enhancing program readability with wrapping ladder block

By wrapping 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

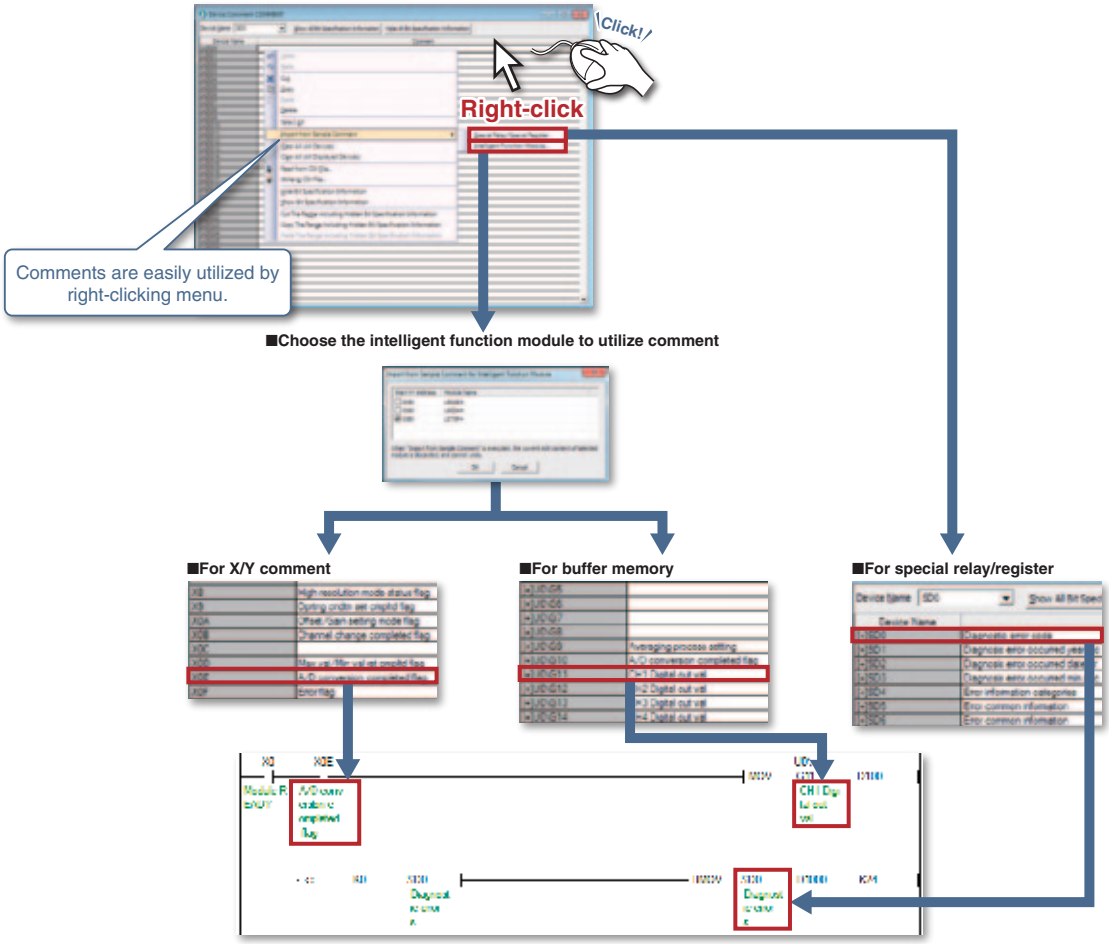
The scale of the window is changed to display the SFC diagram and Zoom.
Since the changed scale is retained, the windows are always displayed with the same layout.



▶ Comment

1 Utilizing sample comment saves time to input comments

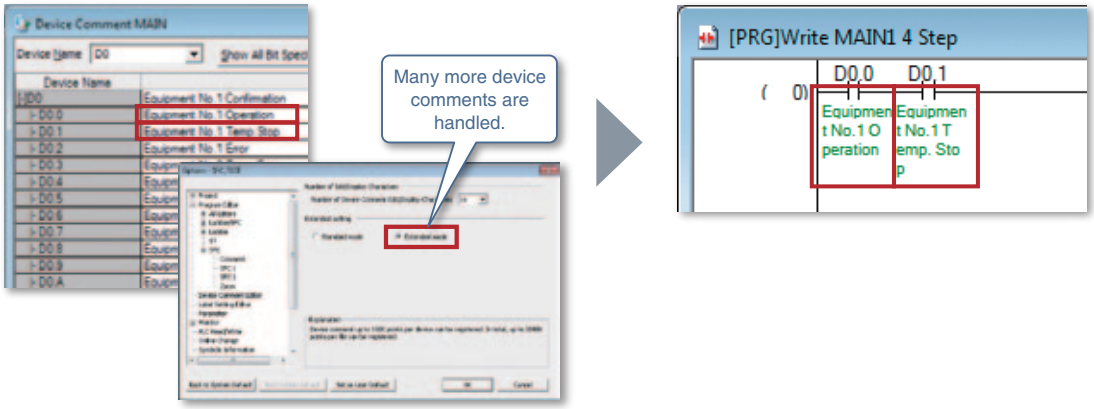
Pre-prepared special relays/registers of the CPU as well as the buffer memory/XY signal of the intelligent function module is copied as sample comments in the project comments.



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

2 Distinguish similar devices without bother

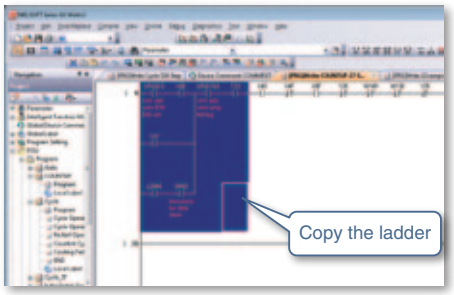
Set a word device comment for each bit to display the contents of the comment on the ladder.



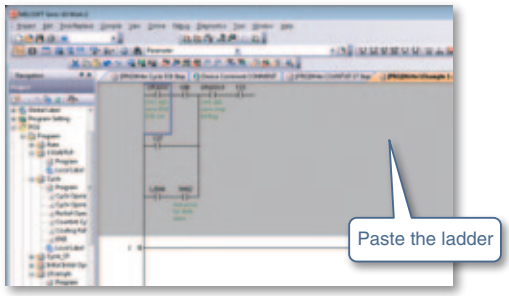
3 Easily copy and utilize device comments

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.

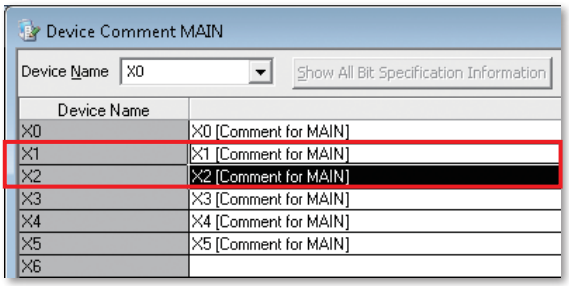
Program A ladder



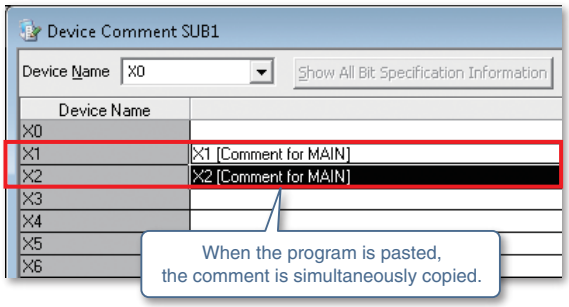
Program B ladder



Device comment in copy source program



Device comment in copy destination program

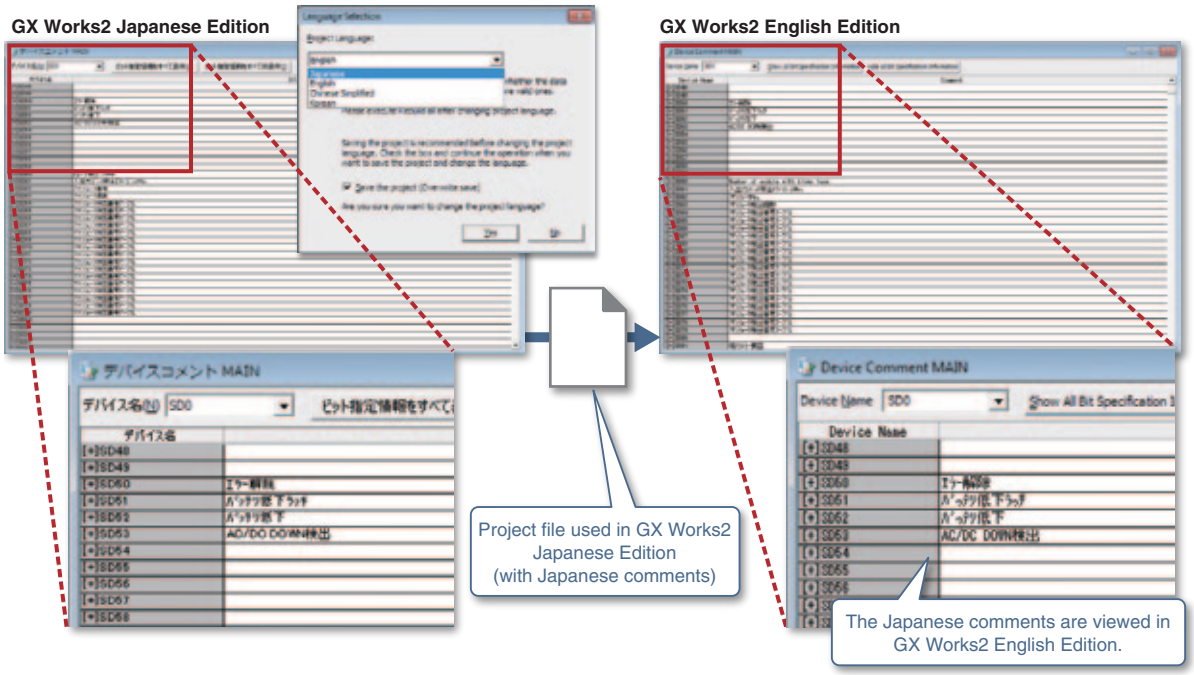


4 Utilize device comments created in other languages

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

GX Works2 English Edition

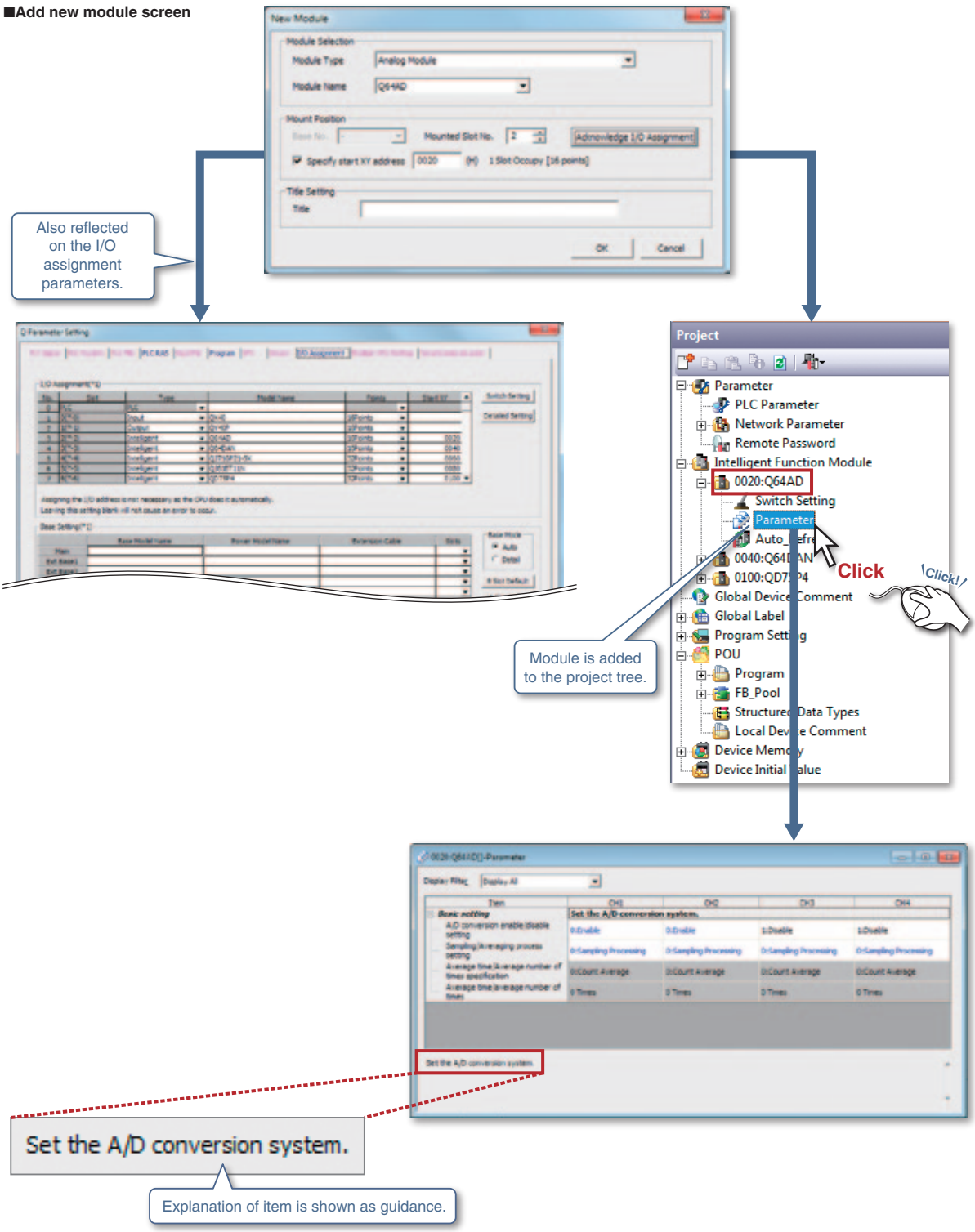


▶ Parameter setting

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.

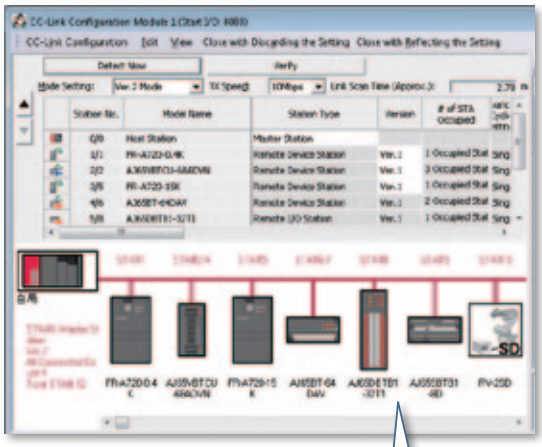
■Add new module screen



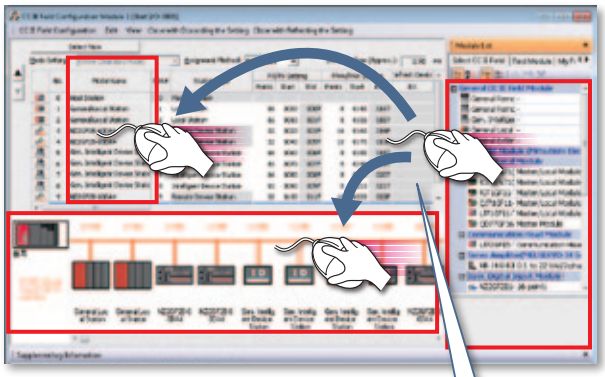
2 Displays device assignment of CC-Link

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.

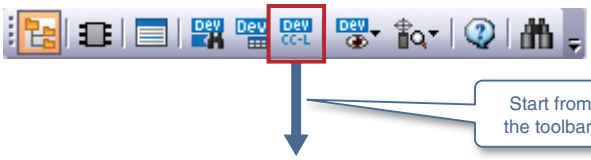
*1 Refer to the CC-Link Association website (http://www.cc-link.org) for information on CSP+.



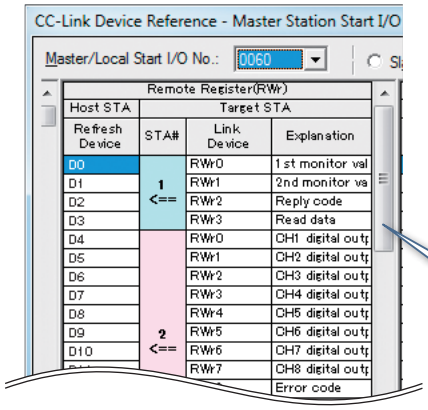
The equipment configuration diagram is created intuitively using CC-Link Configuration Window.



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



Start from the toolbar.



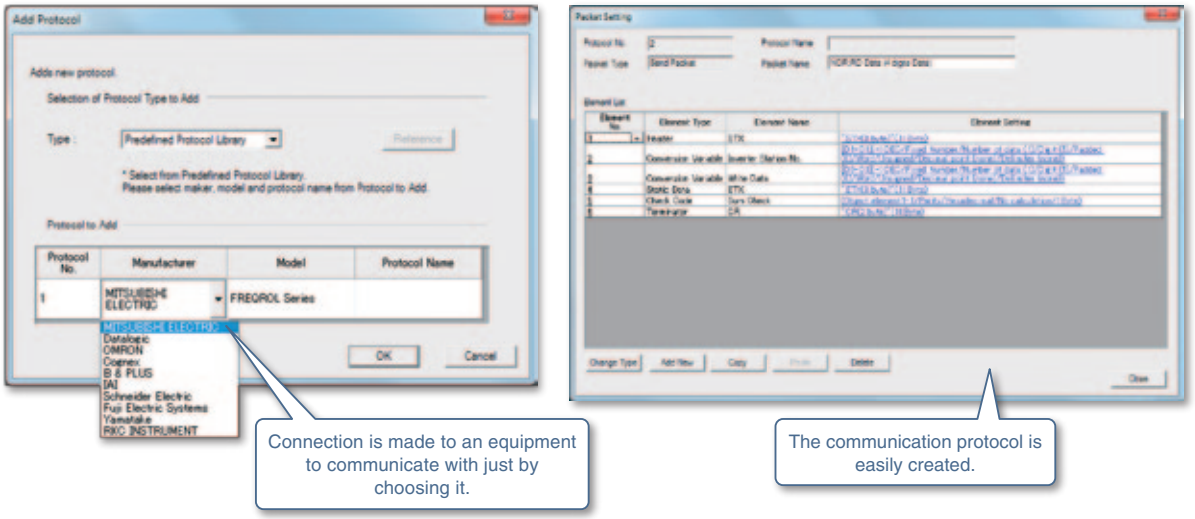
Display the device assignment list. Programming is made while viewing device assignment.

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.**

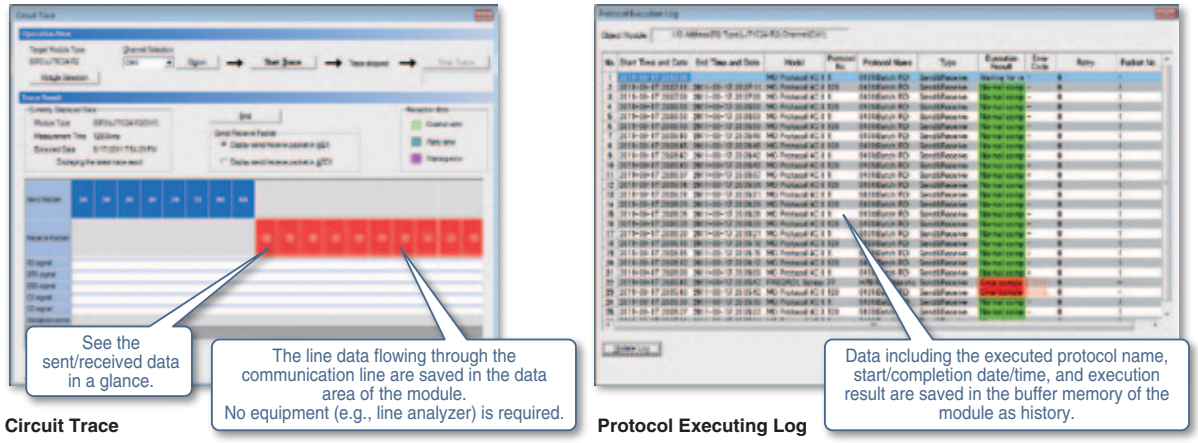
▶ Parameter setting

3 Easy connection via serial/Ethernet

Using the predefined protocol function of GX Works2, connection to a device you want to communicate with is quickly made just by choosing it from the predefined protocol library.
Even if the external devices are not registered in the predefined protocol library, the desired protocol is easily created.



During serial communication, transmitted data, communication signals, and communication statuses can be checked without a line analyzer, making debugging easier.



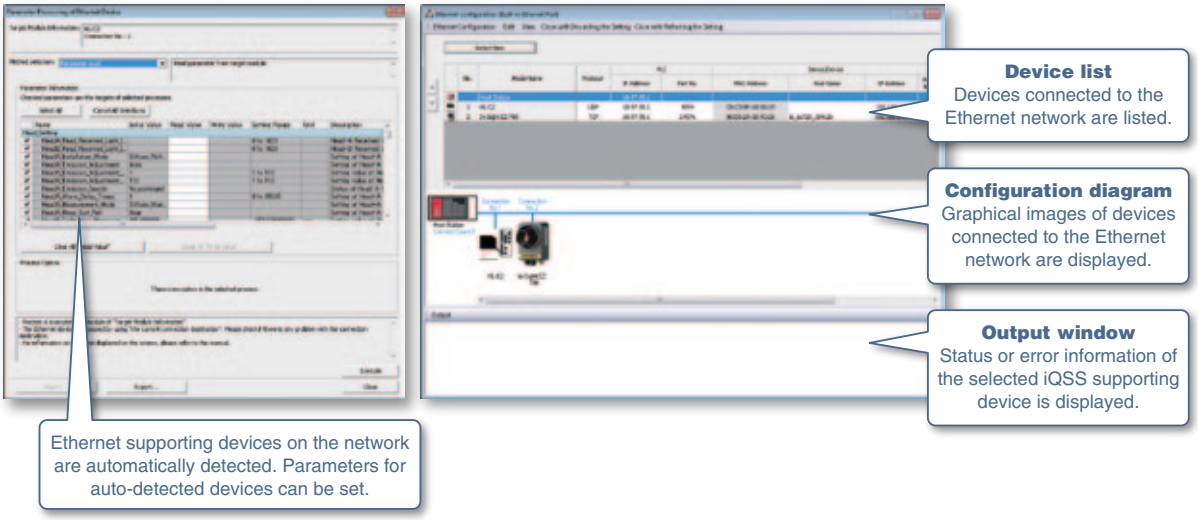
Circuit Trace **Protocol Executing Log**

4 Set and monitor iQSS supporting devices

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



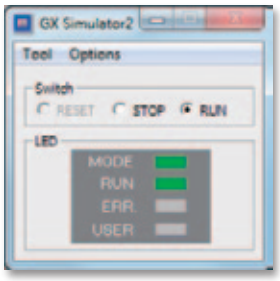
▶ Debugging

1 Offline debugging without PLC

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

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

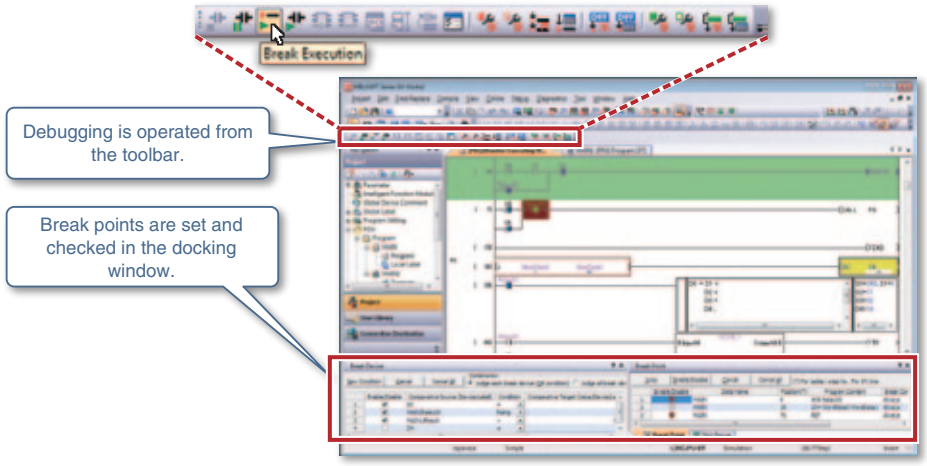
Checking operation while actually viewing it allows for design without rework.



POINT Up to four GX Works2 projects on a single pc are available to simulate concurrently.

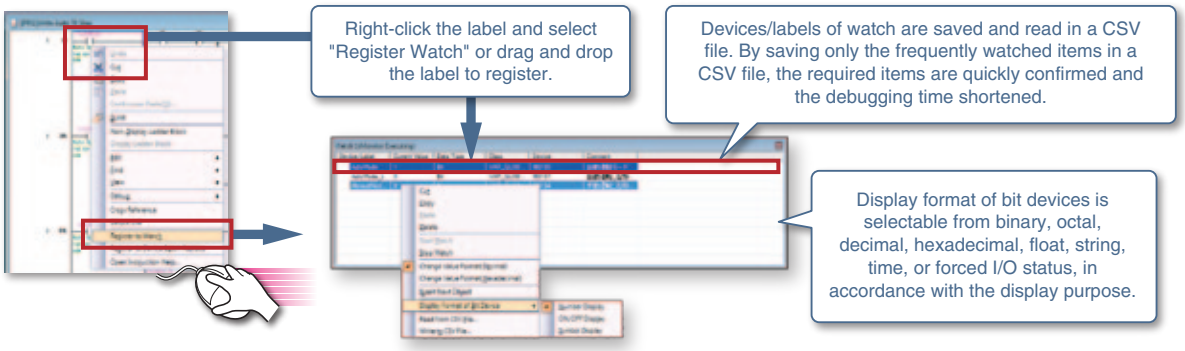
2 Simulation function helps program debugging

A program is executed in a step-by-step method using the simulation function, finding program errors more easily.



3 Watch windows for quick monitoring of device/label

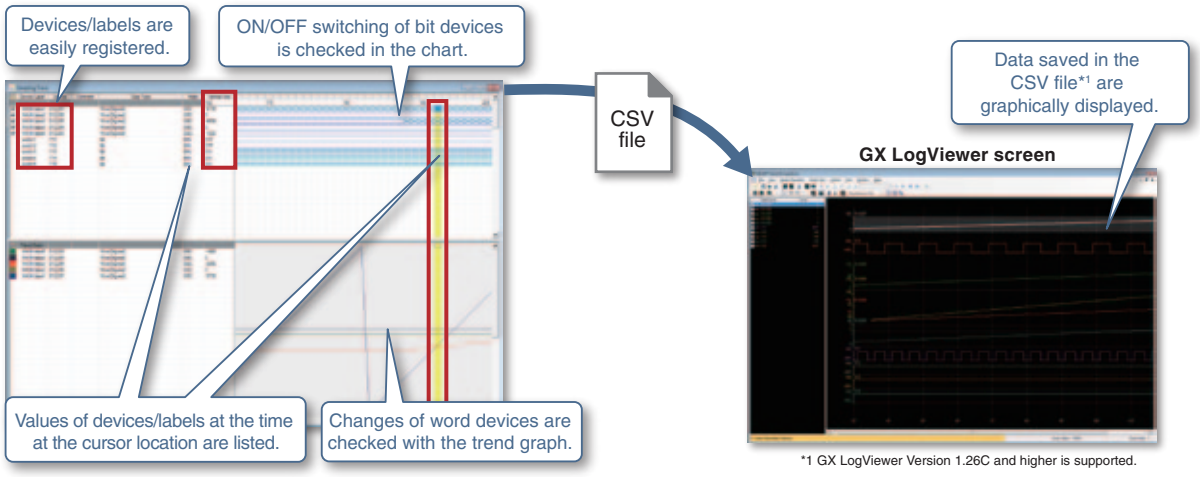
Arbitrary devices/labels are registered and monitored, allowing required sections to be confirmed quickly.



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.

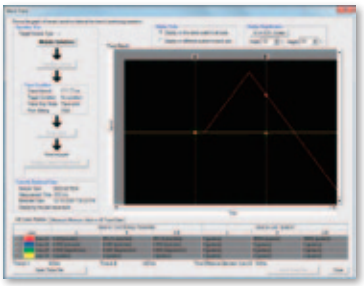


*1 GX LogViewer Version 1.26C and higher is supported.

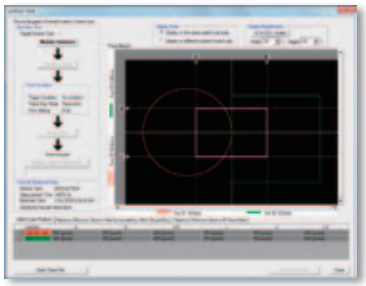
POINT **The sampling trace is also used in the simulation function.**

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.



Trace function screen (Wave trace)

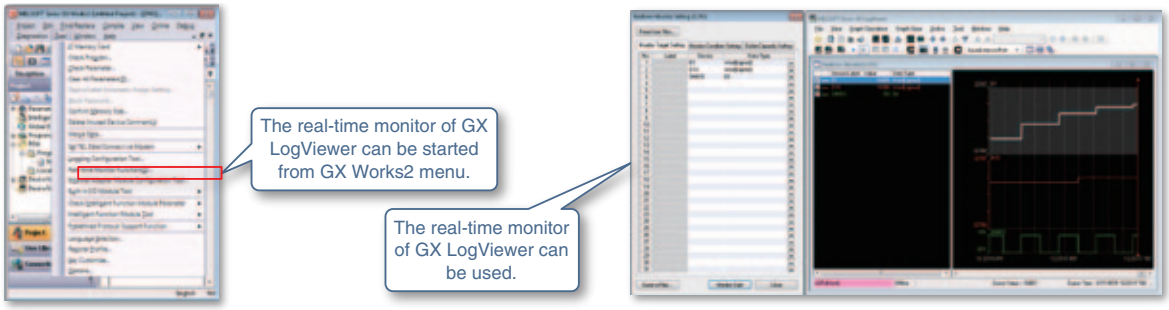


Trace function screen (Location trace)

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.

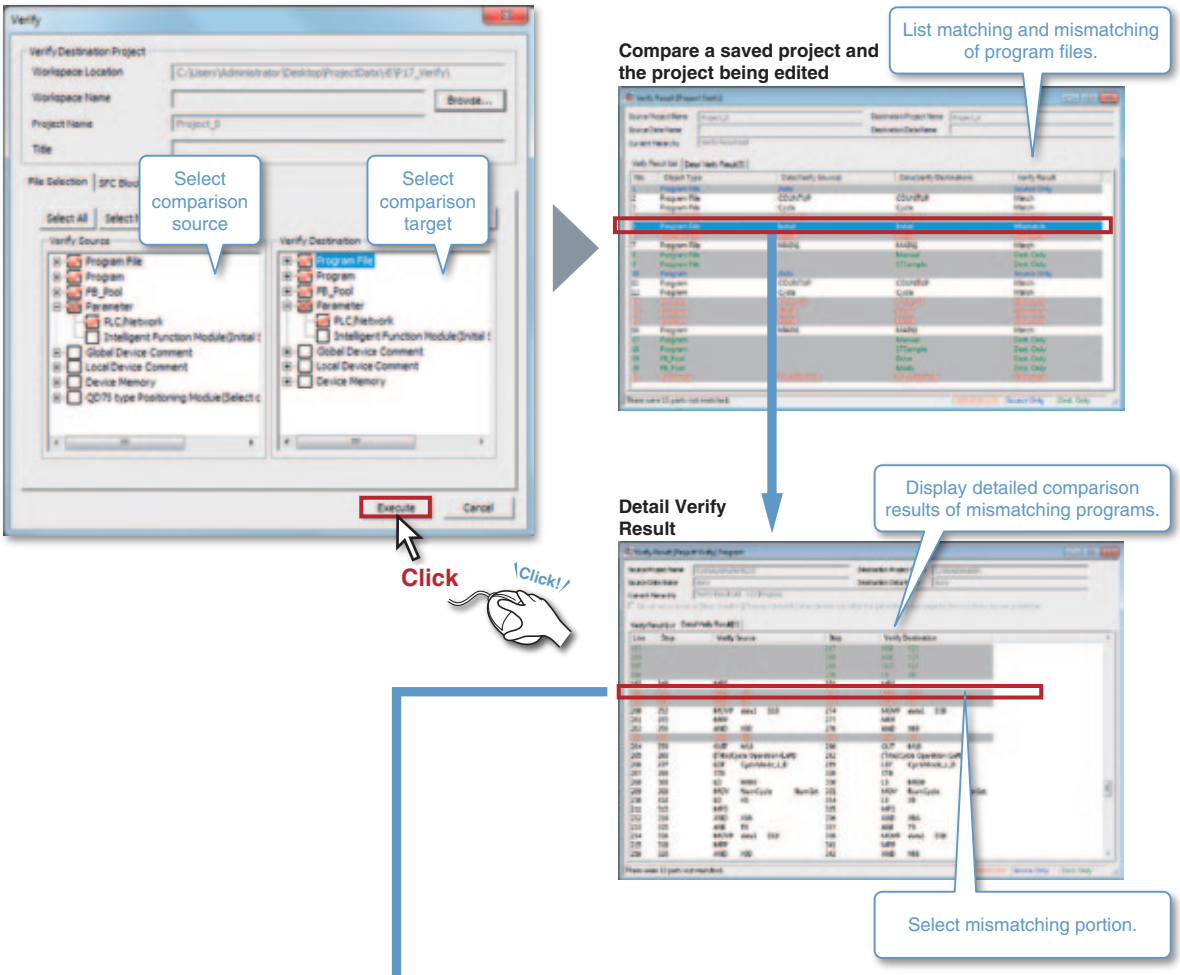
*2 GX LogViewer version 1.40S or later
*3 GX Works2 version 1.521T or later



▶ 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.



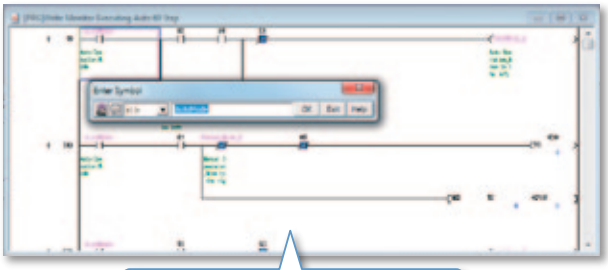
POINT The verification result is saved to a CSV file to facilitate revision of design documents.

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)

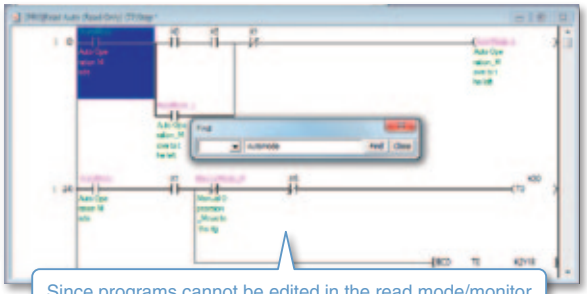
Enter Symbol screen opens by pressing Enter key.



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

Read mode/monitor mode

Find screen opens by pressing Enter key.



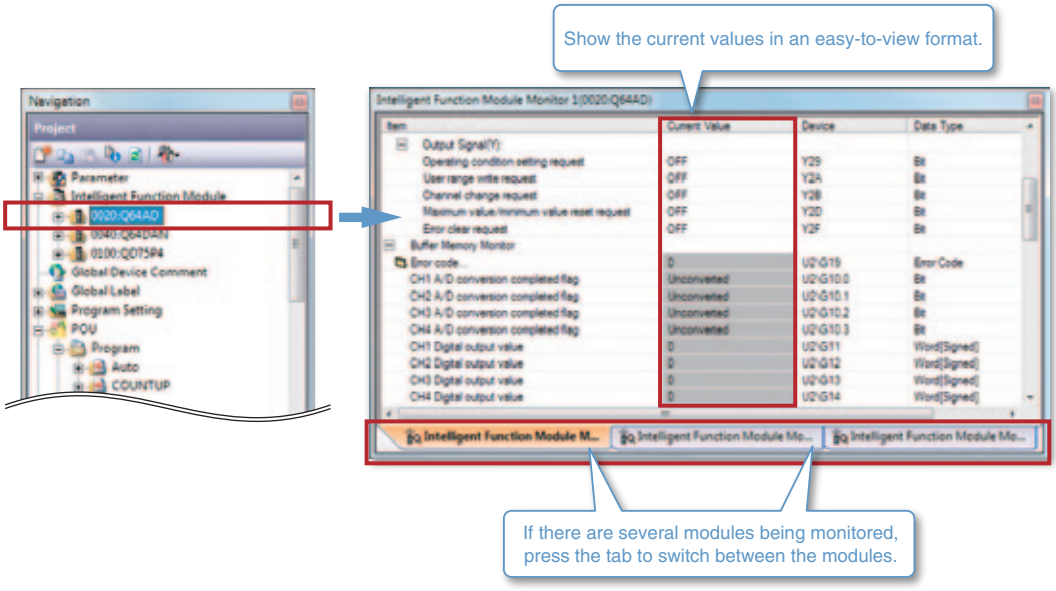
Since programs cannot be edited in the read mode/monitor mode, erroneous editing of the ladder is prevented. The display jumps to the next search candidate each time the Enter key is pressed.

POINT

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

3 Dedicated monitoring for intelligent function module

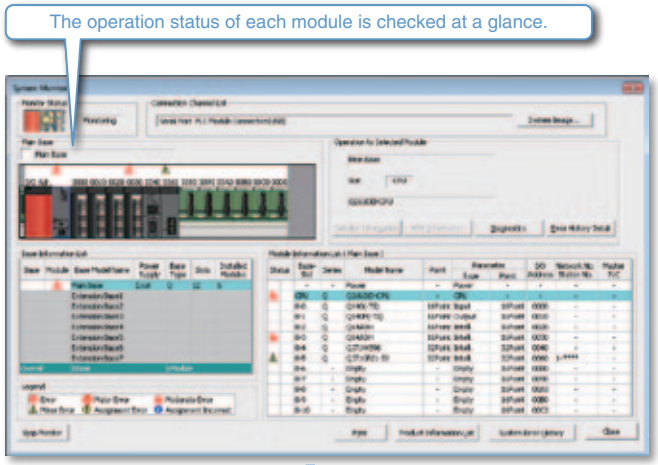
While watching the ladder program, the buffer memory/XY signal of the intelligent function module is monitored in the docking window. Since the name of each buffer memory address is displayed, so there's no need to refer to the manual to see for what the buffer memory is used.



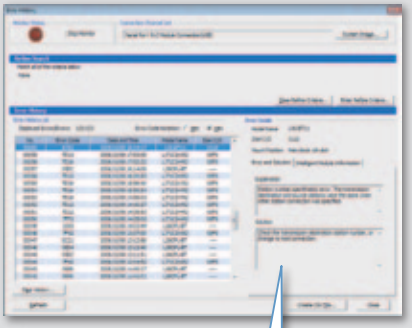
▶ Operation and maintenance

4 Visible System monitor function and PLC diagnostics

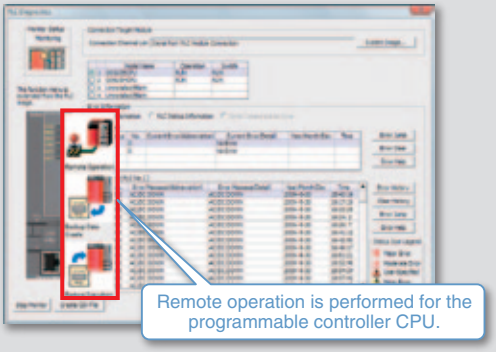
Operation status of the entire programmable controller system is clearly displayed.
Each module's diagnosis and detailed information is displayed on the monitor for the entire system allowing the problem point to be confirmed quickly.



[Module error history collection function]
Error history of PLC and intelligent function module is viewed in time series.



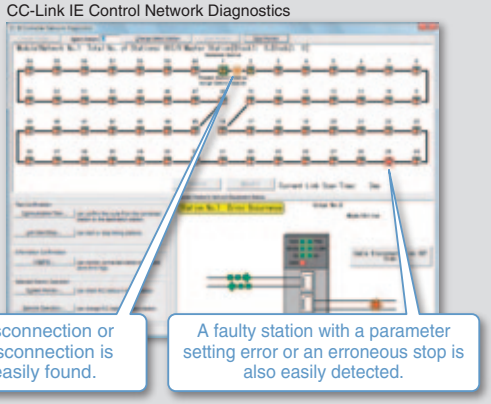
[PLC diagnostics]
Error history of PLC is quickly checked to respond to a failure immediately. Also remote operation is performed onto the programmable controller CPU to reset it or format its memory.



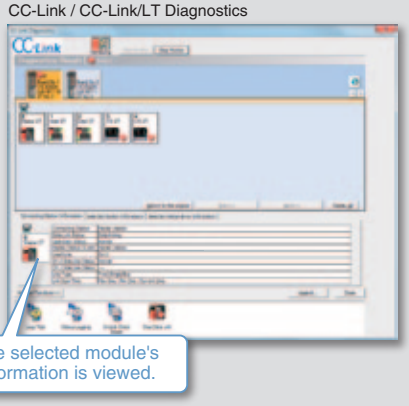
[Module's detailed information]
Display the module status, error details, and solution for the error. Immediate response is made to a module failure.

[Network diagnostics]
Display the status of the entire network visually so that a line trouble and module error are quickly found. Also, system monitoring of the PLC at another station is started via network.

CC-Link IE Control Network Diagnostics



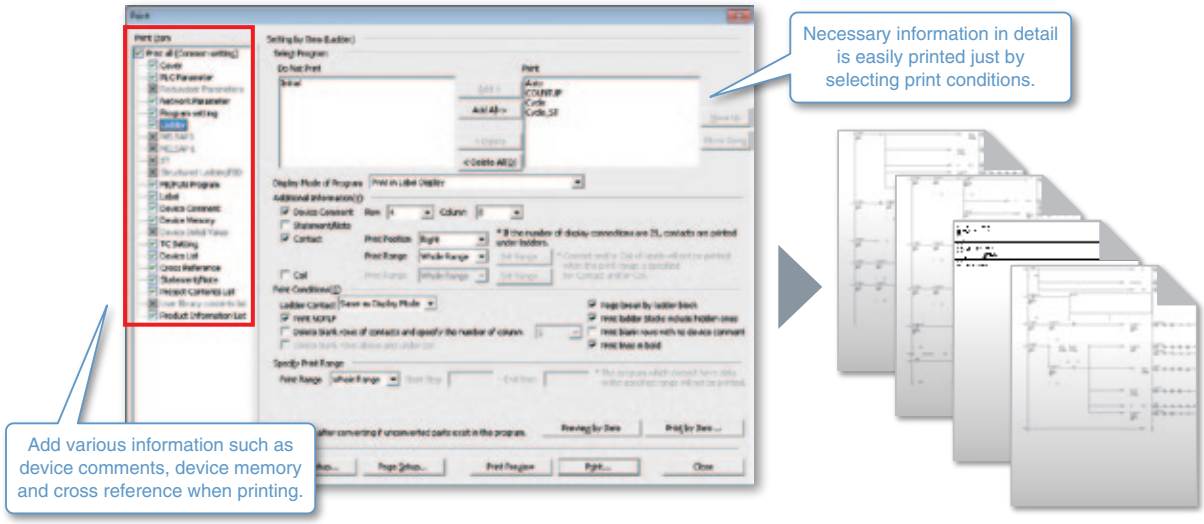
CC-Link / CC-Link/LT Diagnostics



POINT **The system is diagnosed on a graphical screen which gives a feeling as if you are watching actual system and equipment.**

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®

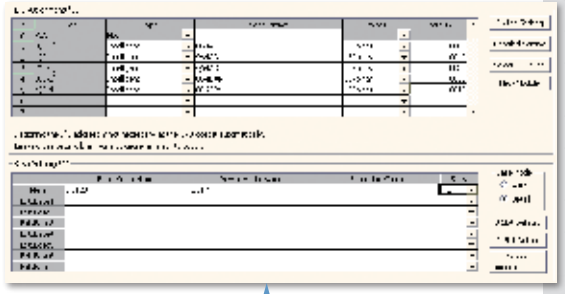
Various program data are exported as a CSV format file.

■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.

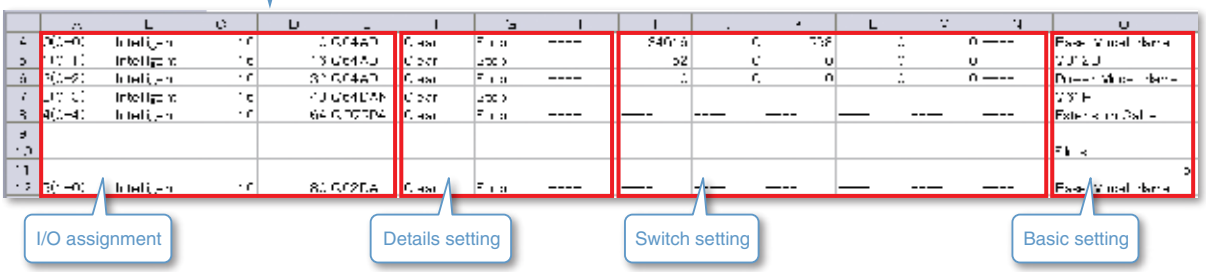
Example of I/O assignment setting CSV file

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



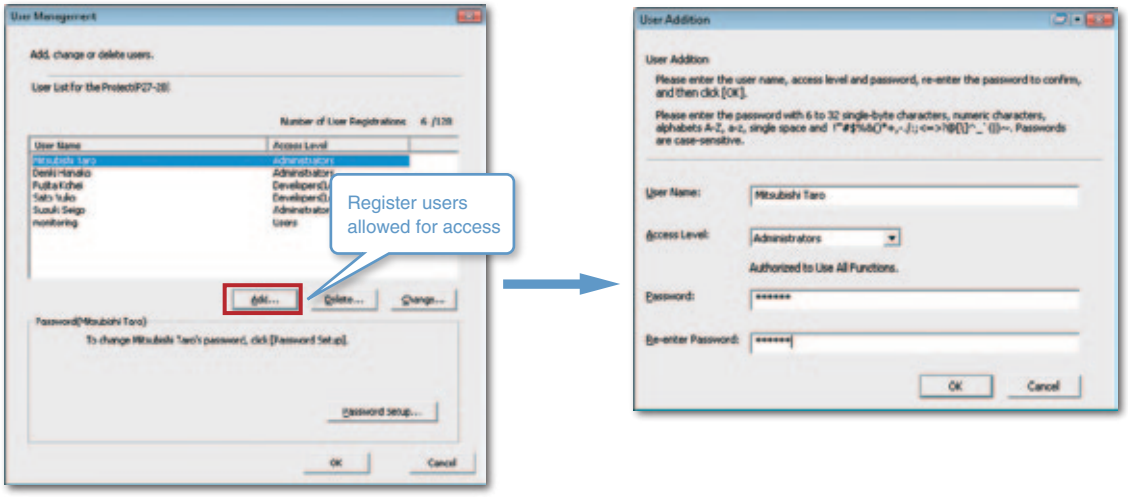
▶ Security

1 Detailed project security management

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

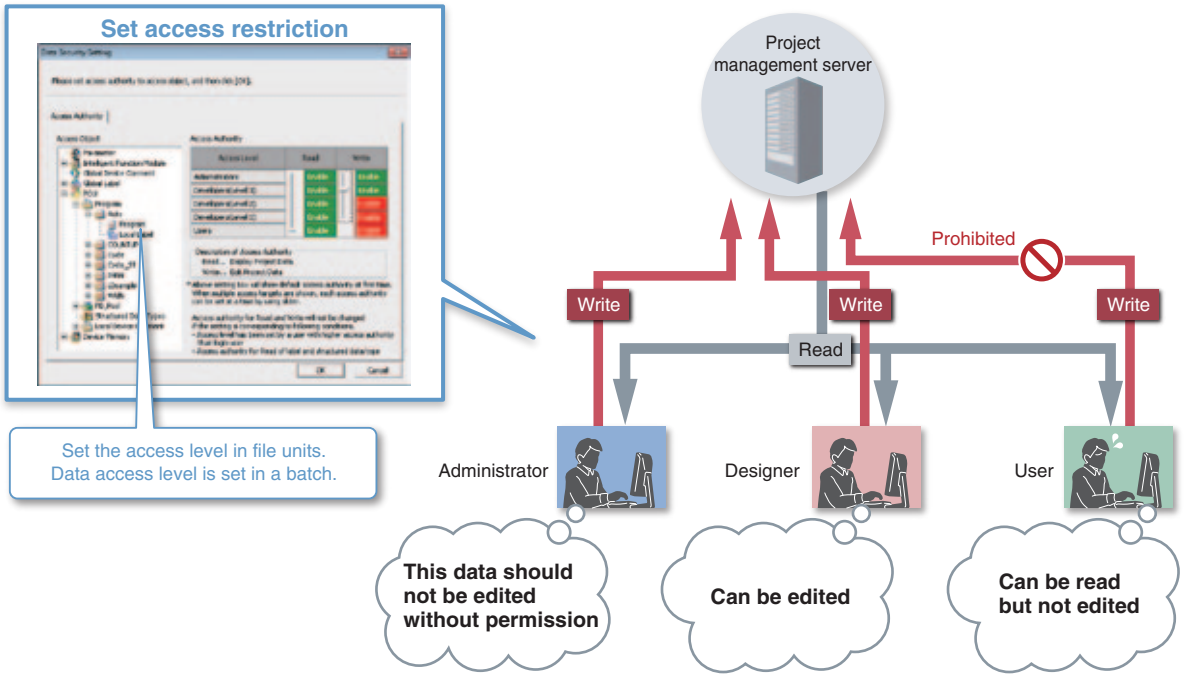
User registration (addition, change, and deletion)

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.

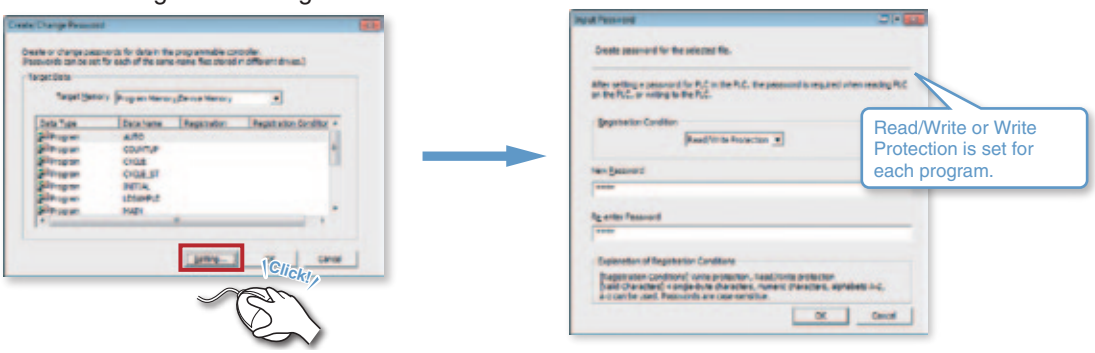


POINT When multiple persons take charge in the same project, unauthorized changes to the project data are prevented.

2 Protects the program

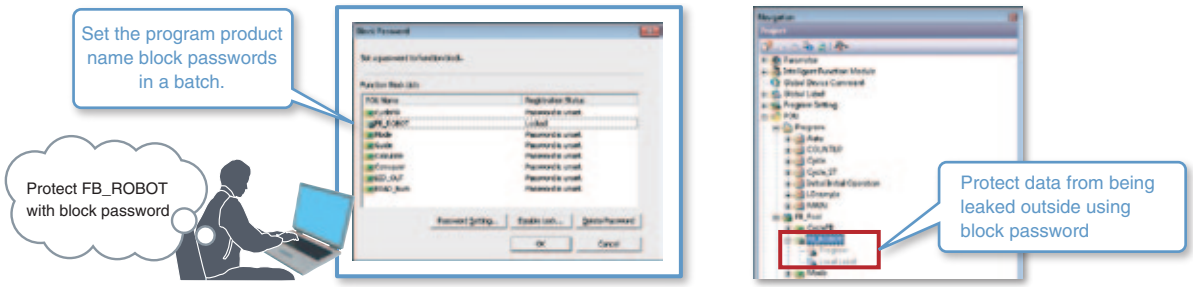
Password registration

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



Block password setting

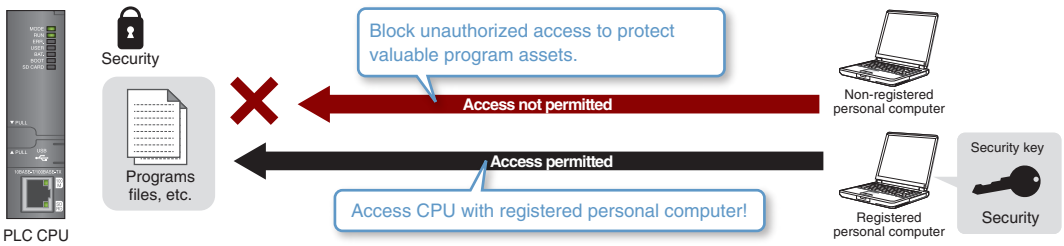
By setting a block password, the FBs in a project which contains in-house software expertise are protected from theft and leakage.



3 Prevents unauthorized access

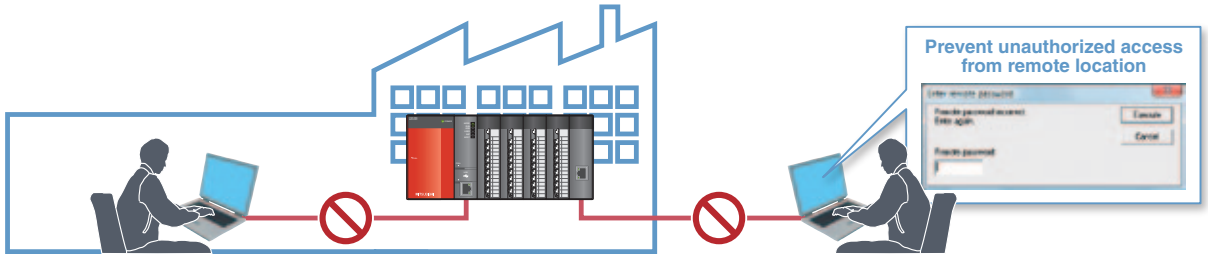
Security Key

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

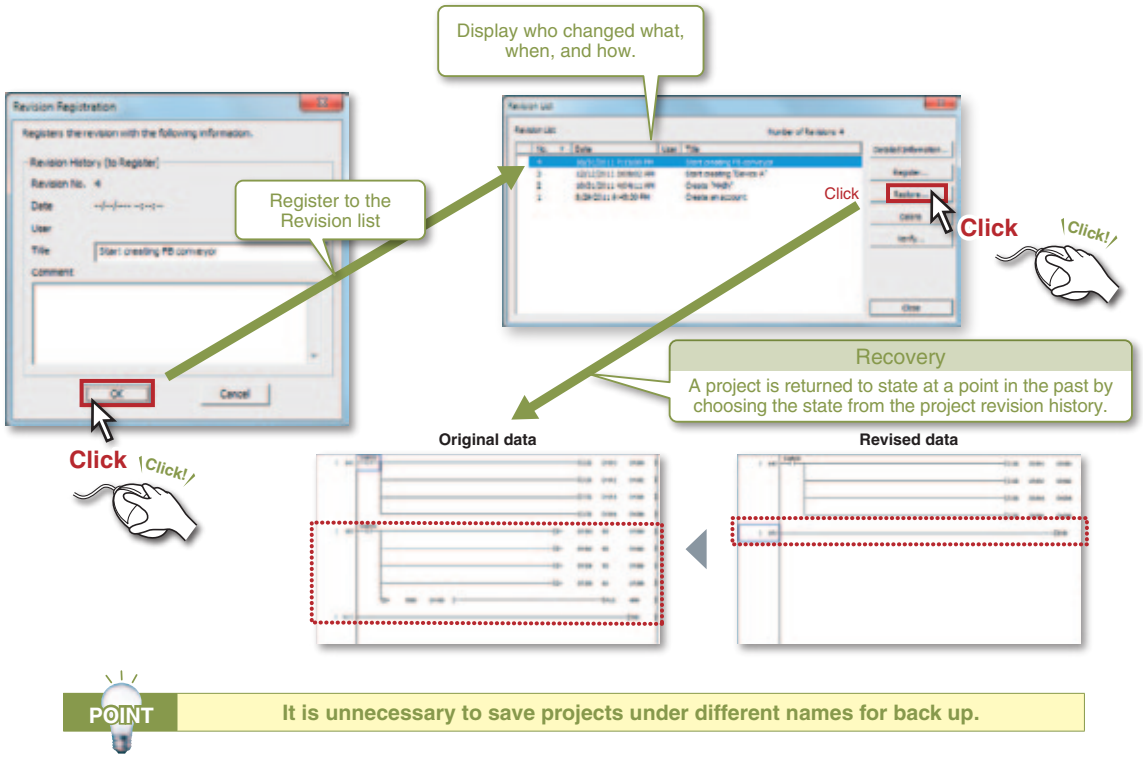
By setting a remote password, unauthorized access of the programmable controller from Ethernet or a public line is prevented.



▶ Project

1 Back up and restore a project easily

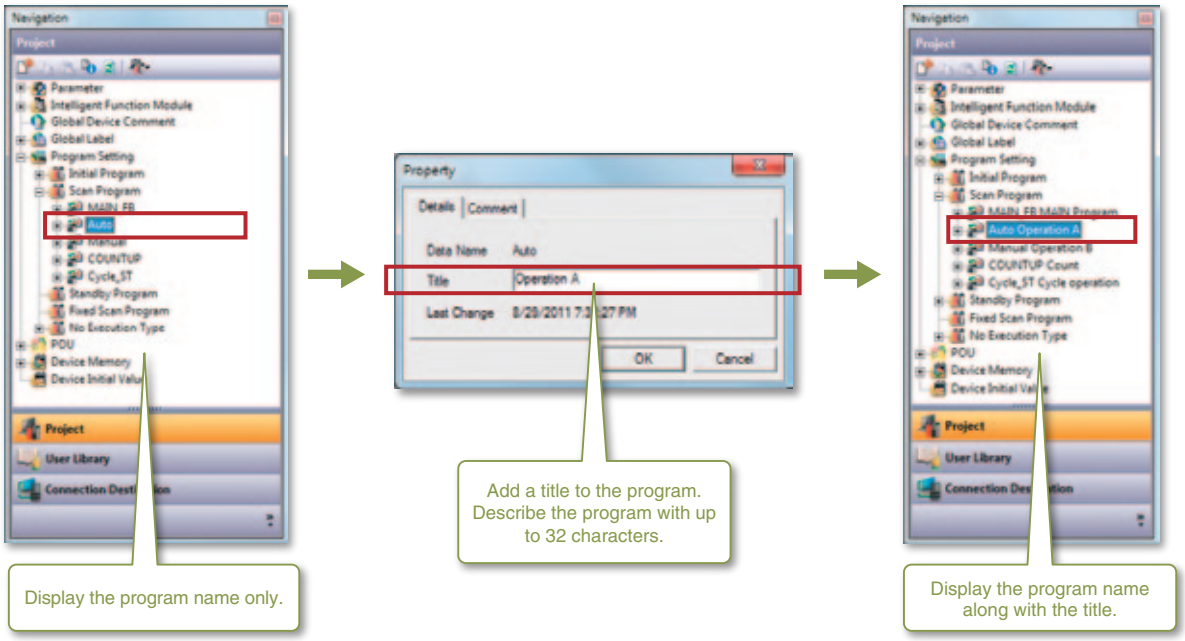
By registering the project revision history, the project is easily recovered to their original state.
Projects with a registered history are compared.



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

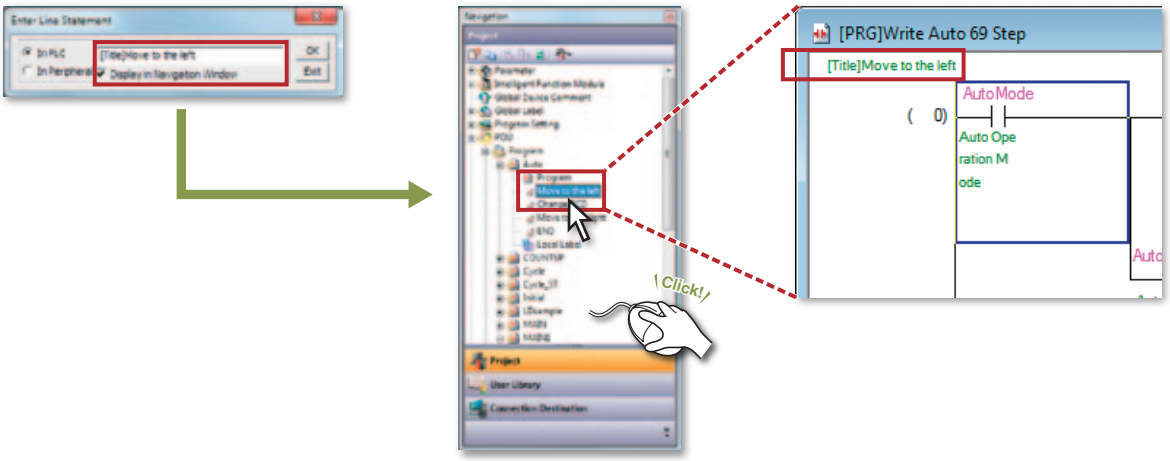
2 Program title display guides you

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



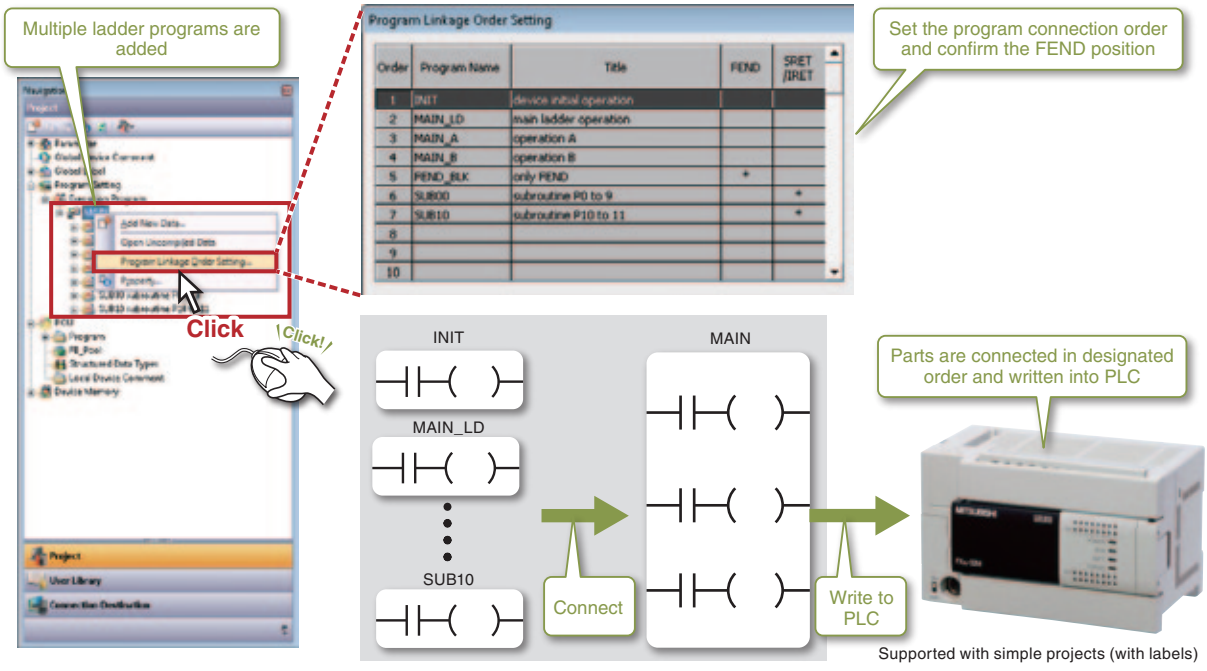
3 Tree view offers easy-to-understand processing flow

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.

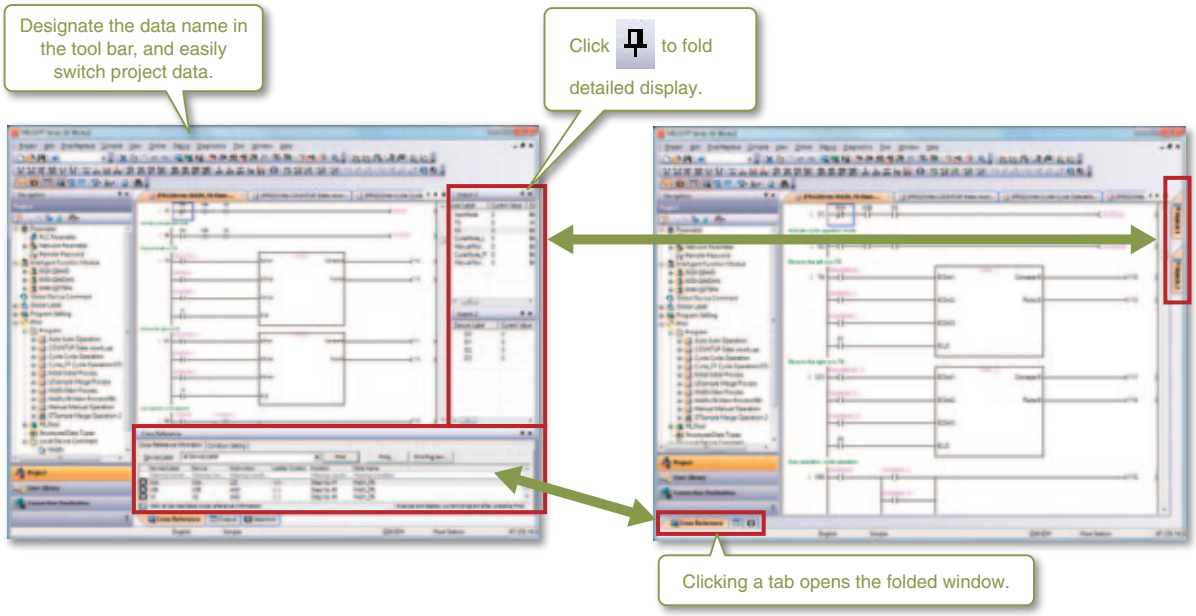


Supported with simple projects (with labels)

▶ Project

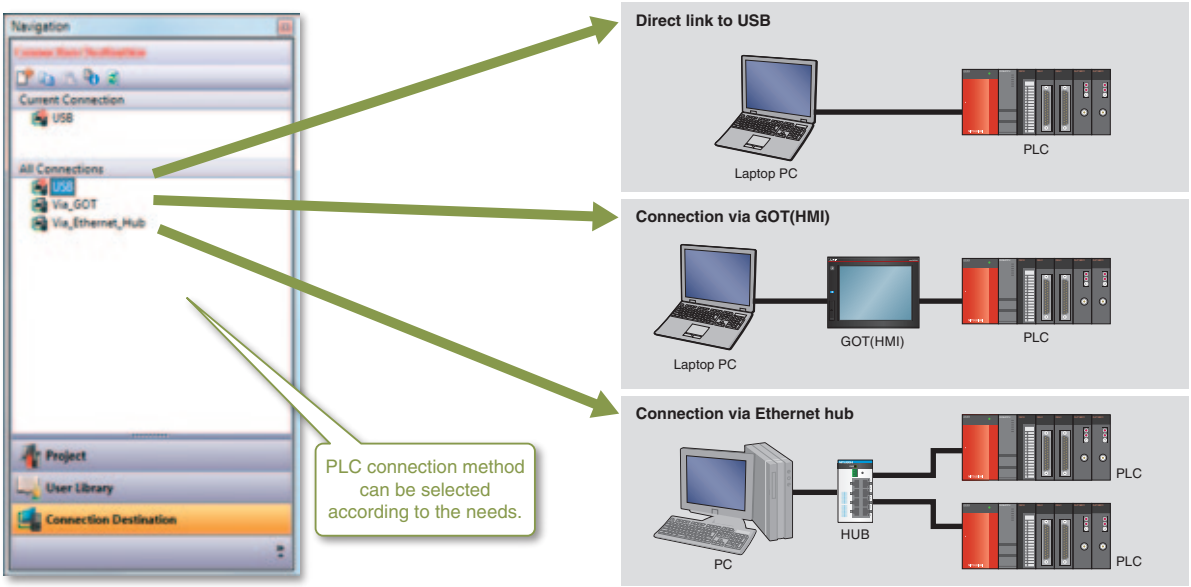
5 Fully utilize the wide and easy-to-read screen

The docking windows are hidden to use the screen efficiently.



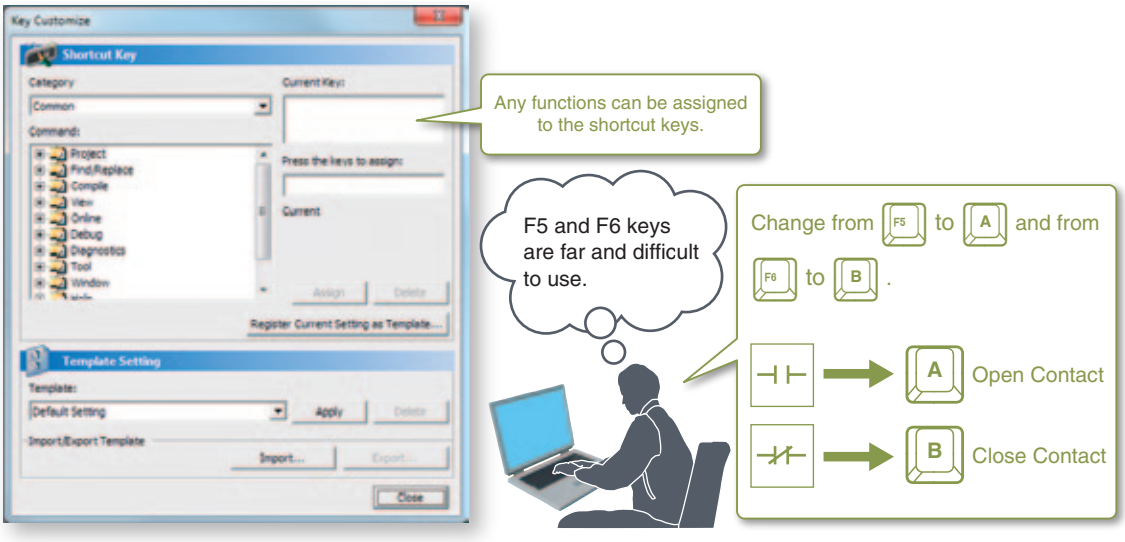
6 Easy connection destination setting

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.

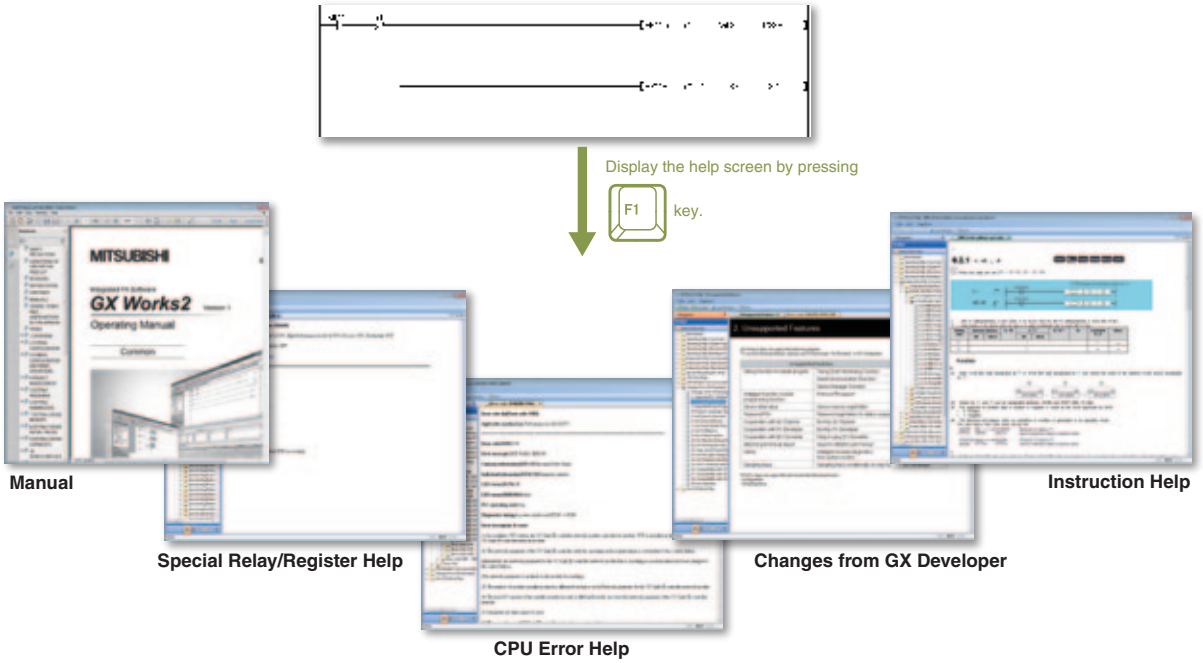


POINT

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.



POINT

Frequently used help screens are bookmarked.

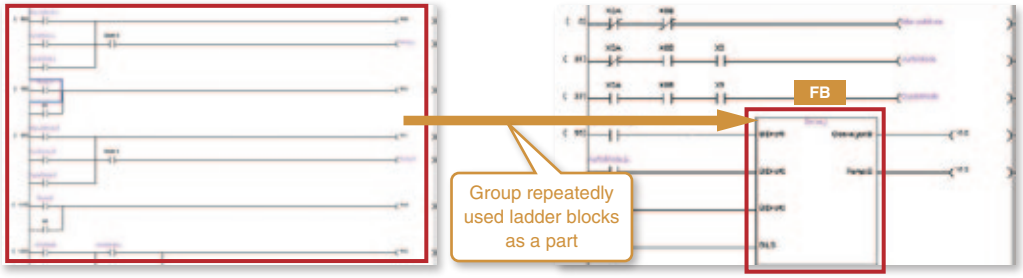
▶ Making parts in program

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.

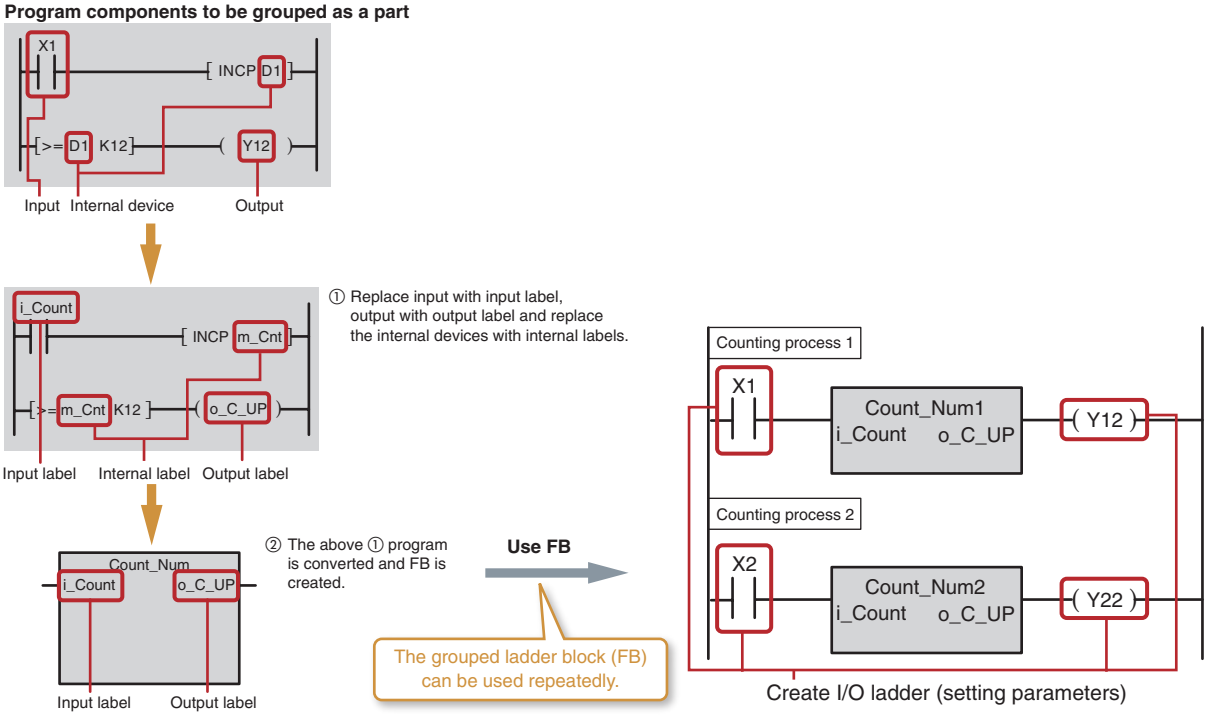
FB improves program development efficiency and reduces programming errors to ensure higher program quality.



Making parts

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

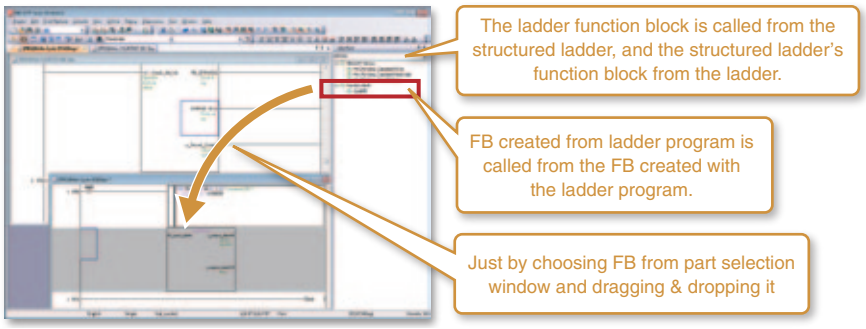
Program components to be grouped as a part



Advantages of using FB

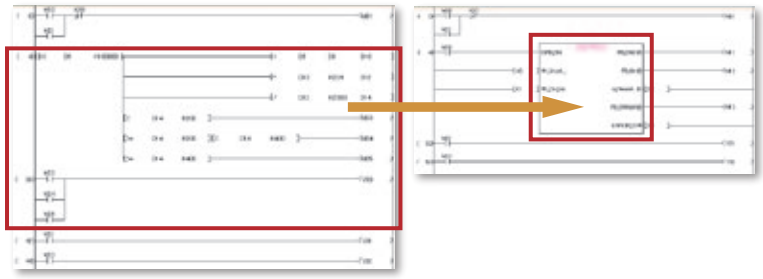
Advantage 1: Easier programming

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



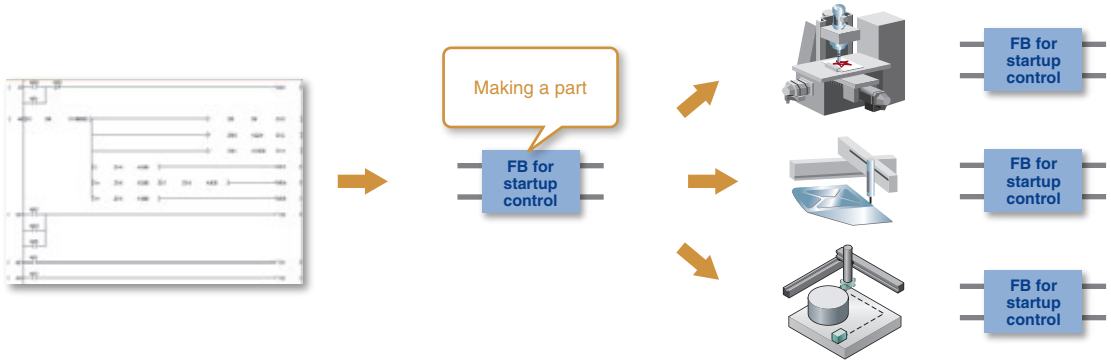
Advantage 2: Improved readability

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



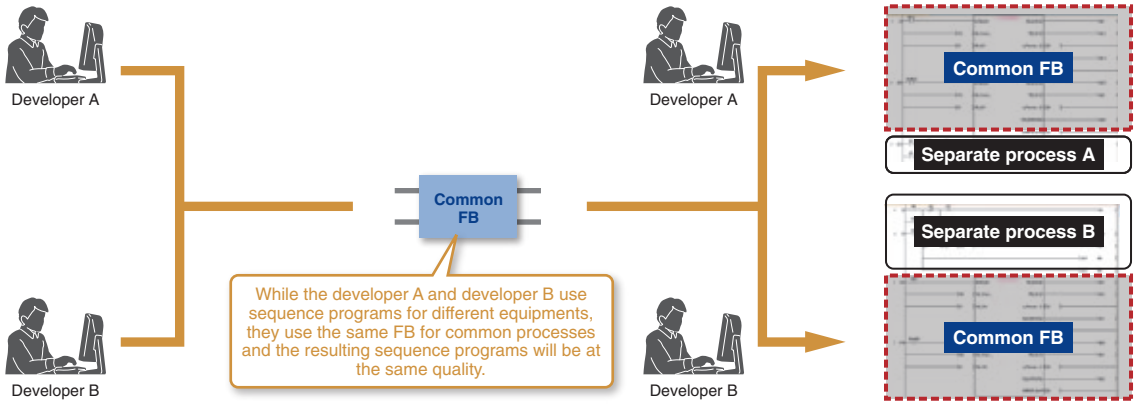
Advantage 3: Reusability

By grouping frequently used program components as parts, they are reused as many times as required. You are no longer required to copy an existing program and then modify devices.



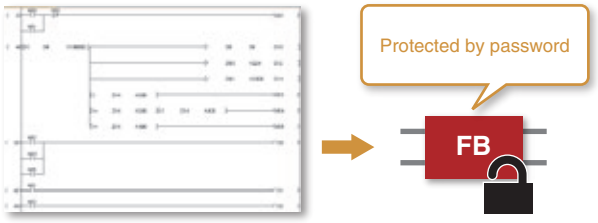
Advantage 4: Higher quality

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.



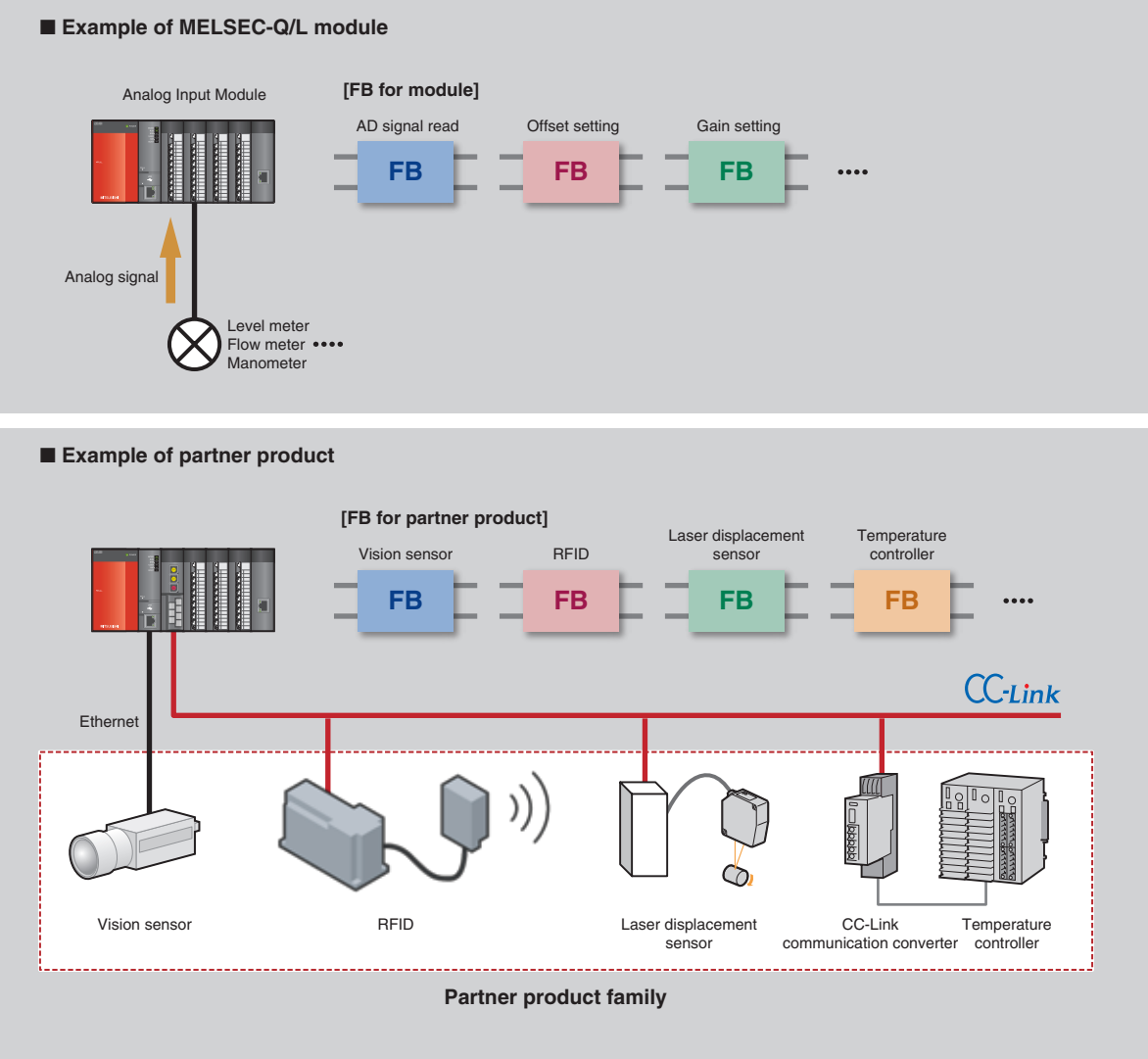
▶ Making parts in program

2 Useful FB libraries supplied by vendors

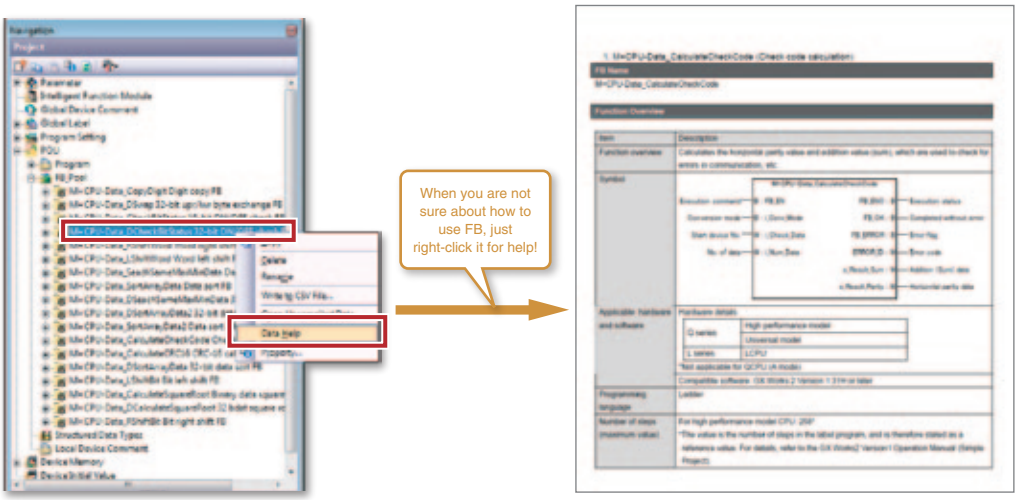
What is FB library?

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 thirteen companies, and is scheduled to continue expanding.



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

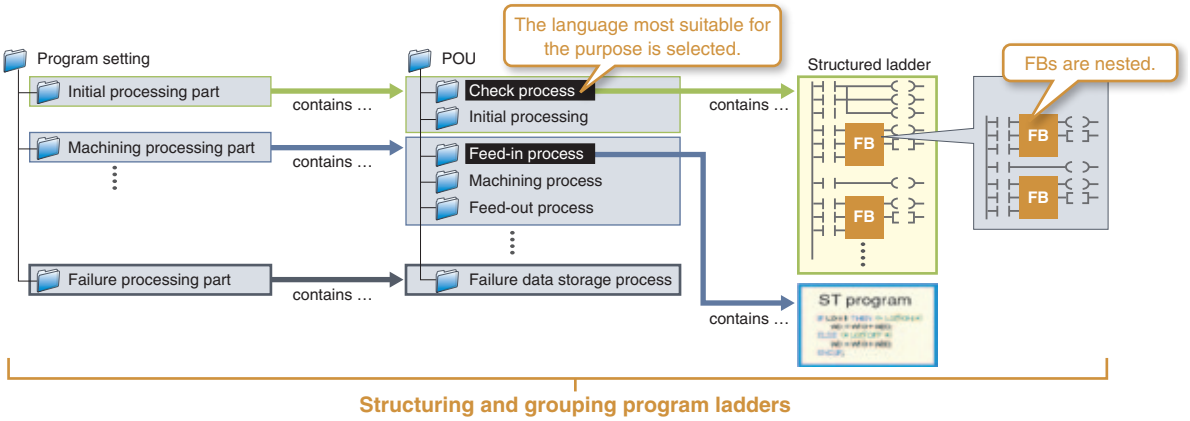


▶ Label programming/Structured programming

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.

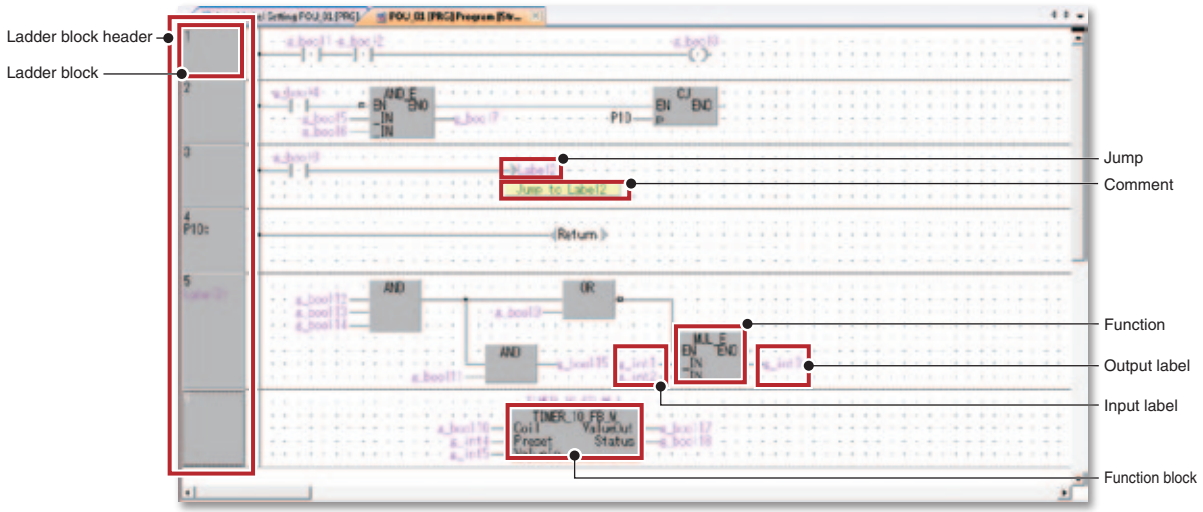
Graphical language

Ladder language

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

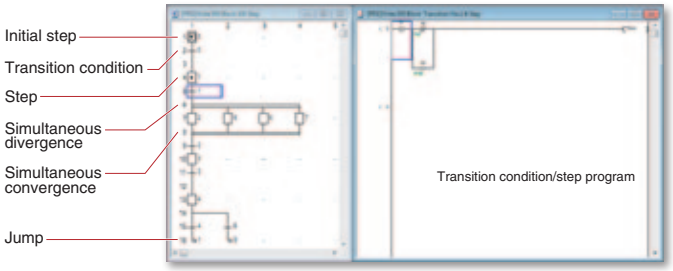
Structured ladder/FBD language

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

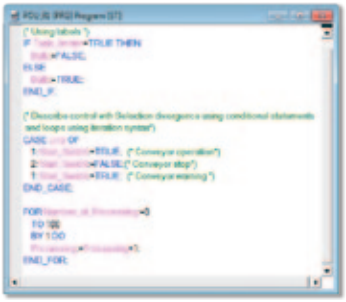
A graphical language for comprehensively describing sequence control.
This language pairs a step which describes a process with a transition condition to move to the next step.
The step and transition condition are described in the ladder language.



Text language

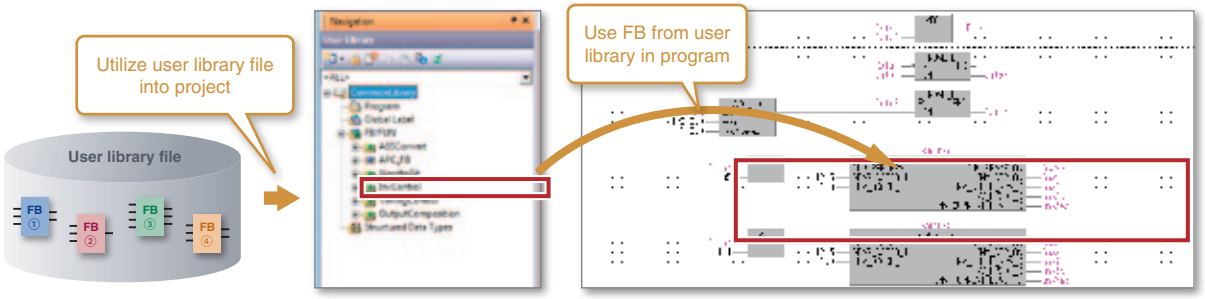
ST (structured text) language

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.



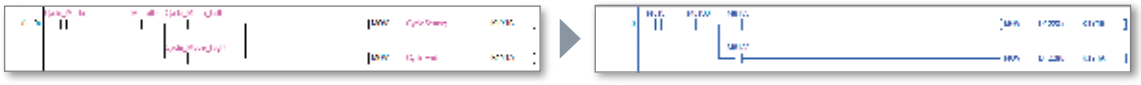
3 Improve development efficiency using user libraries

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.

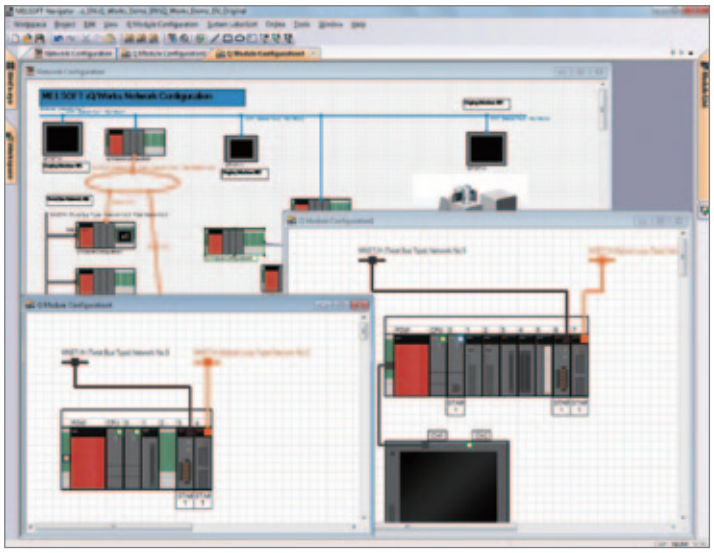
▶ Interaction with iQ Works

1 Implements a seamless engineering environment

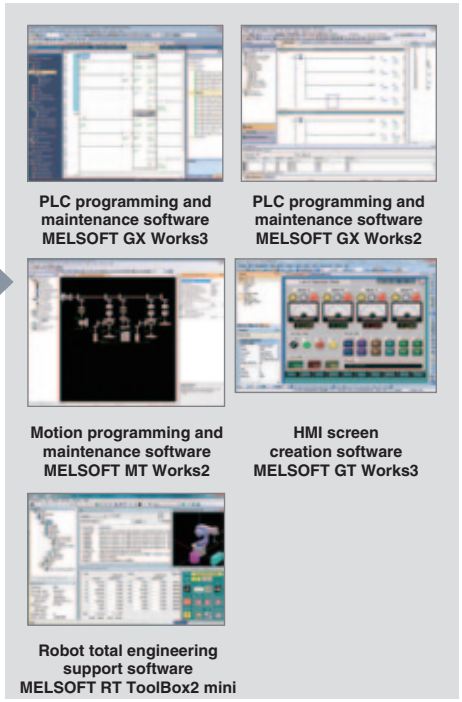
MELSOFT iQ Works is an integrated engineering software product, composing of GX Works3, GX Works2, MT Works2, GT Works3, RT ToolBox2 mini and FR Configurator2. By sharing information such as system designs and programming as the entire control system, the system design and programming efficiency are improved and total cost reduction is achieved.

MELSOFT Navigator

In combination with GX Works3, GX Works2, MT Works2, GT Works3, and RT ToolBox2 mini, 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 the GX Works3, GX Works2, MT Works2 and GT Works 3 projects. *1

There's no need to launch each software and check the integrity.

*1 You are still required to set detailed parameters in each tool.

Parameter setting information in system configuration diagram

Reflected on data of various development tools at once

Programmable controller CPU (GX Works3)

Programmable controller CPU (GX Works2)

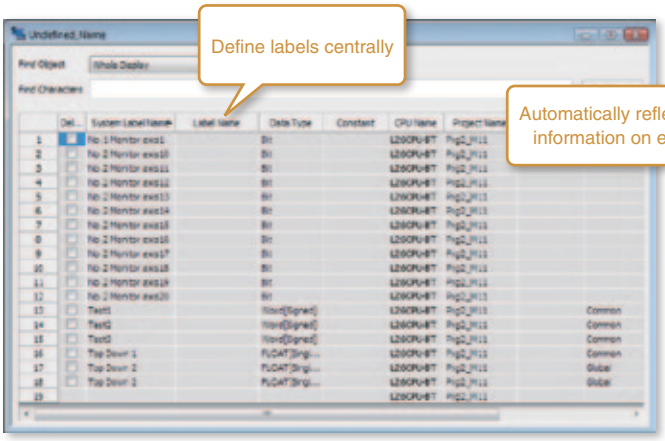
Motion controller (MT Works2)

GOT (GT Works3)

3 Shares labels and automatically changes all related projects

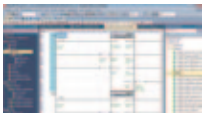
With MELSOFT Navigator, labels are shared by the PLC, motion controller and GOT.

For example, if a device assignment is changed in the PLC project, the changes are automatically reflected onto the motion controller and GOT projects.



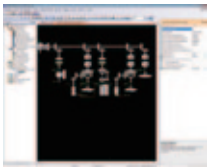
Define labels centrally

Automatically reflects changed information on each project



Programmable controller CPU (GX Works3)

Programmable controller CPU (GX Works2)



Motion controller (MT Works2)

GOT (GT Works3)

▶ Collaboration with FA devices

1 Supporting next-generation 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 tact-time with super fast processing.

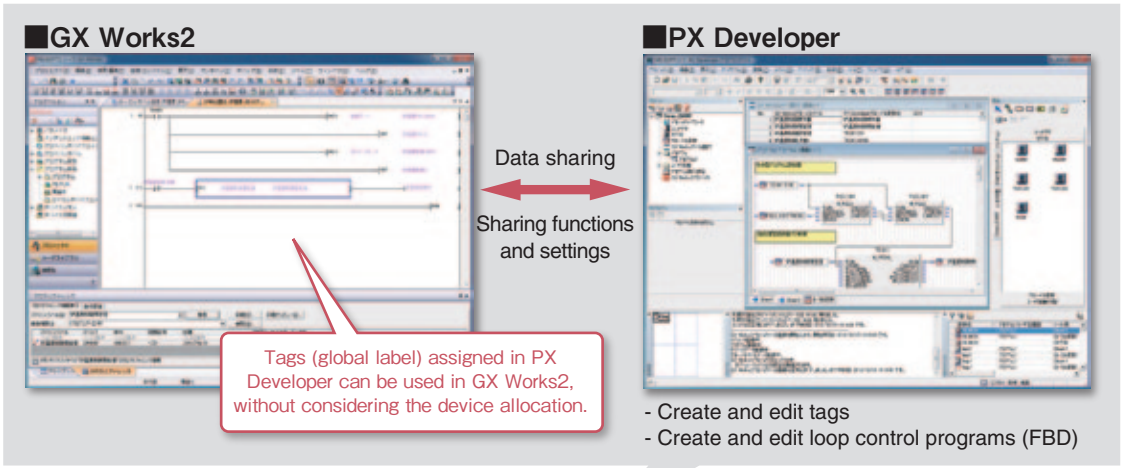
Basic operation processing speed (LD instruction) 1.9 ns

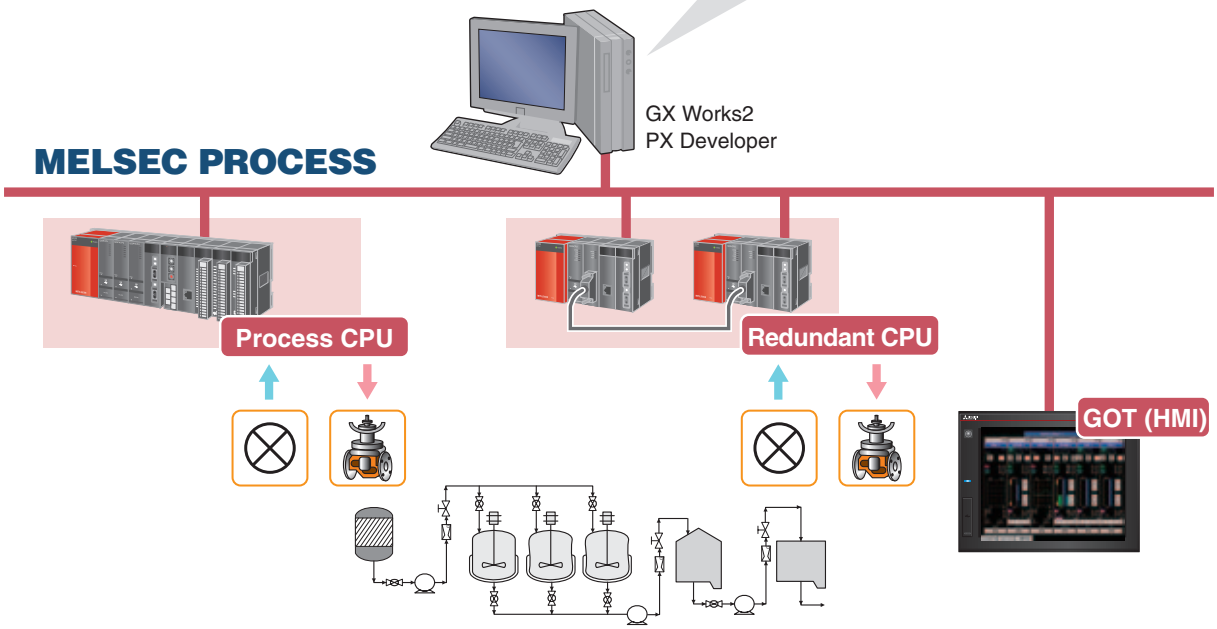
2 Coordination with PX Developer supports process applications

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





3 Batch control of various FA devices

Collaboration with various FA devices is now more powerful.
GX Works2 is used to set and monitor various FA devices on any platform.
Improve your product site's 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

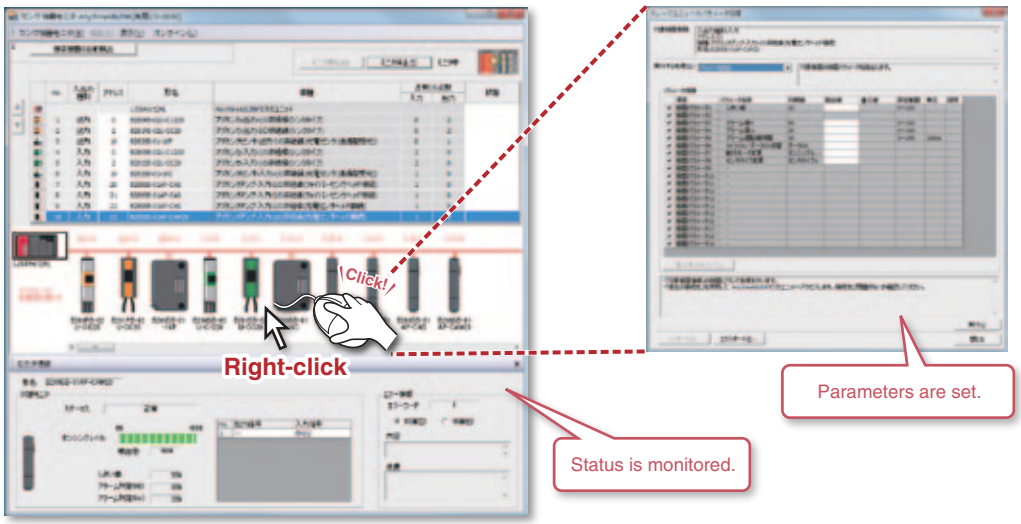
Energy-saving supported

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

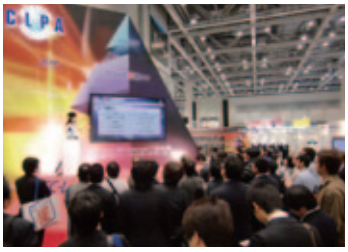


CC-Link Partner Association (CLPA) actively promotes the worldwide adoption of CC-Link networks

From promotion to specification development, CLPA actively supports CC-Link

CC-Link Partner Association (CLPA) was established to promote the worldwide adoption of the CC-Link open field network. By conducting promotional activities, such as organizing trade shows and seminars, implementing conformance tests, and providing catalogs, brochures, and website information, CLPA has been successfully increasing the number of CC-Link partner manufacturers and CC-Link compatible products. CLPA takes a major role in the globalization of CC-Link.

Seminar



Trade show

Conformance Testing Lab

The latest CC-Link information is posted on the website.

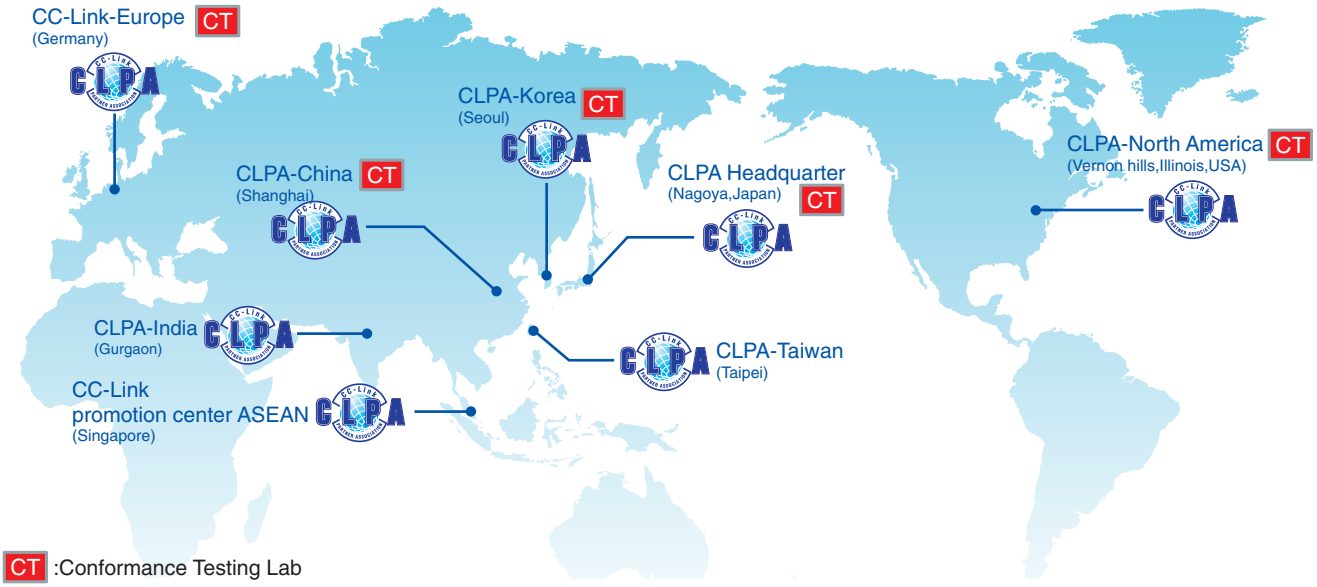
URL:http://www.cc-link.org

6F Ozone Front Bldg. 3-15-58 Ozone,
Kita-ku, Nagoya 462-0825 JAPAN
TEL: +81-52-919-1588 FAX: +81-52-916-8655
E-mail:info@cc-link.org

CC-Link
Partner Association

CC-Link continues to increase its global influence

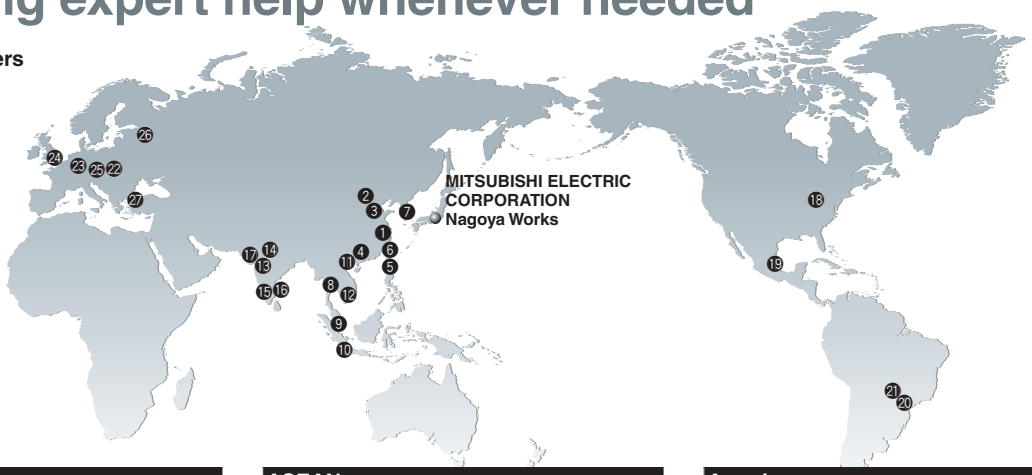
CC-Link is supported globally by CLPA. With offices throughout the world, support for partner companies can be found locally.
Each regional CLPA office undertakes various support and promotional activities to further the influence of the network in that part of the world. For companies looking to increase their presence in Asia, CLPA is well placed to assist these efforts through offices in all major Asian economies.



CT :Conformance Testing Lab

Extensive global support coverage providing expert help whenever needed

■ Global FA centers



China

❶ Shanghai FA Center
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❷ Beijing FA Center
MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Beijing Branch
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❹ Guangzhou FA Center
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Taiwan

❺ Taichung FA Center
MITSUBISHI ELECTRIC TAIWAN CO.,LTD.
No.8-1, Industrial 16th Road, Taichung Industrial Park, Taichung City 40768, Taiwan, R.O.C.
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❻ Taipei FA Center
SETSUYO ENTERPRISE CO., LTD.
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Korea

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7F-9F, Gangseo Hangang Xi-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 157-801, Korea
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Thailand

❽ Thailand FA Center
MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD.
12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangpongpang, Khet Yannawa, Bangkok 10120, Thailand
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ASEAN

❾ ASEAN FA Center
MITSUBISHI ELECTRIC ASIA PTE. LTD.
307, Alexandra Road, Mitsubishi Electric Building, Singapore 159943
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Indonesia

❿ Indonesia FA Center
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India

⓭ India Pune FA Center
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⓯ India Bangalore FA Center
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⓰ India Chennai FA Center
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⓱ India Ahmedabad FA Center
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Mexico

⓳ Mexico FA Center
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Mariano Escobedo #69, Col. Zona Industrial, Tlalnepantla Edo, C.P.54030, Mexico
Tel: +52-55-3067-7511

Brazil

⓴ Brazil FA Center
MITSUBISHI ELECTRIC DO BRASIL COMÉRCIO E SERVIÇOS LTDA.
Rua Jussara, 1750-Bloco B Anexo, Jardim Santa Cecilia, CEP 06465-070, Barueri-SP, Brasil
Tel: +55-11-4689-3000 / Fax: +55-11-4689-3016

㉑ Brazil Boituva FA Center
MELCO CNC DO BRASIL COMÉRCIO E SERVIÇOS S.A.
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㉓ Germany FA Center
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㉔ UK FA Center
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㉕ Czech Republic FA Center
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㉖ Russia FA Center
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Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027, St. Petersburg, Russia
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㉗ Turkey FA Center
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Tel: +90-216-526-3990 / Fax: +90-216-526-3995

▶ Specifications/Products

■ Operating Environment

Item		Details
Personal computer	OS	Microsoft® Windows® 8.1 Operating System *1 Microsoft® Windows® 8.1 Pro Operating System *1 Microsoft® Windows® 8.1 Enterprise Operating System *1 Microsoft® Windows® 8 Operating System *1 Microsoft® Windows® 8 Pro Operating System *1 Microsoft® Windows® 8 Enterprise Operating System *1 Microsoft® Windows® 7 Starter Operating System *1 Microsoft® Windows® 7 Home Premium Operating System *1 Microsoft® Windows® 7 Professional Operating System *1 Microsoft® Windows® 7 Ultimate Operating System *1 Microsoft® Windows® 7 Enterprise Operating System *1 Microsoft® Windows Vista® Home Basic Operating System Microsoft® Windows Vista® Home Premium Operating System Microsoft® Windows Vista® Business Operating System Microsoft® Windows Vista® Ultimate Operating System Microsoft® Windows Vista® Enterprise Operating System Microsoft® Windows® XP Professional, Service Pack2 or later Microsoft® Windows® XP Home Edition, Service Pack2 or later Microsoft® Windows® 2000 Professional, Service Pack4 or later
	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 2.5 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
LCPU		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 • System Management Software: MELSOFT Navigator • Controller Programming Software: MELSOFT GX Works3, GX Works2, GX Developer • Motion Programming Software: MELSOFT MT Works2 • HMI Programming Software: MELSOFT GT Works3 • Robot Programing Software: MELSOFT RT ToolBox2 mini • Inverter Setup Software: MELSOFT FR Configurator2 • MITSUBISHI ELECTRIC FA Library
MELSOFT GX Works3	SW1DND-GXW3-E	Controller Programming Software: MELSOFT GX Works3 MITSUBISHI ELECTRIC FA Library Comes with GX Works2 and GX Developer
MELSOFT GX Works2	SW1DNC-GXW2-E	Controller Programming Software Comes with GX Developer

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

■ 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*4]

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

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

■ Manuals

[Operating manual *5]

Manual name	Supply status	IB/SH No.
GX Works2 Version 1 Operating Manual (Common) Explains the system configuration of GX Works2 and the functions common to Simple project and Structured project such as parameter setting, operation method for the online function.	Sold separately	SH-080779ENG
GX Works2 Version 1 Operating Manual (Simple Project) Explains methods for such as creating and monitoring programs in Simple project of GX Works2.	Sold separately	SH-080780ENG
GX Works2 Version 1 Operating Manual (Simple Project, Function Block) Explains methods for such as creating function blocks, pasting function blocks to sequence programs, and operating FB library in Simple project of GX Works2.	Sold separately	SH-080984ENG
GX Works2 Version 1 Operating Manual (Structured Project) Explains methods for such as creating and monitoring programs in Structured project of GX Works2.	Sold separately	SH-080781ENG
GX Works2 Version 1 Operating Manual (Intelligent Function Module) Explains methods of intelligent function module for such as parameter setting, monitoring programs, and predefined protocol support function in GX Works2.	Sold separately	SH-080921ENG
GX Works2 Beginner's Manual (Simple Project) Explains fundamental methods for such as creating, editing, and monitoring programs in Simple project for users inexperienced with GX Works2.	Sold separately	SH-080787ENG
GX Works2 Beginner's Manual (Structured Project) Explains fundamental methods for such as creating, editing, and monitoring programs in Structured project for users inexperienced with GX Works2.	Sold separately	SH-080788ENG

*5 The operating manuals are included on the CD-ROM with the software package.
Manuals in printed form are sold separately for single purchase.
Order a manual by quoting the manual number (model code) listed in the upper table.

▶ FA Products

PLC | MELSEC-Q Series Universal Model

Introducing the high-speed QCPU (QnUDVCPU) for faster processing of large data volumes.

◎Realize high-speed, high-accuracy machine control with various iQ Platform compatible controllers and multiple CPUs.
◎Easily connect to GOTs and Programming tools using built-in Ethernet port.
◎25 models from 10K steps small capacity to 1000K steps large capacity, are available.
◎Seamless communication and flexible integration at any network level.

Product Specifications

Program capacity	10K steps to 1000K steps
Number of I/O points [X/Y], number of I/O device points [X/Y]	256 points to 4096 points/8192 points
Basic instruction processing speed (LD instruction)	120 ns to 1.9 ns
External connection interface	USB (all models equipped), Ethernet, RS-232, memory card, extended SRAM cassette
Function module	I/O, analog, high-speed counter, positioning, simple motion, temperature input, temperature control, network module
Module extension style	Building block type
Network	Ethernet, CC-Link IE controller network, CC-Link IE field network, CC-Link, CC-Link/LT, MELSECNET/H, SSCNETⅢ (/H), AnyWire, RS-232, RS-422

PLC | MELSEC-L Series

"Light & Flexible" condensing various functions easily and flexibly.

◎CPU equipped as a standard with various functions including counter, positioning and CC-Link.
◎The base-less structure with high degree of freedom saves space in the control panel.
◎Easily confirm the system status and change the settings with the display unit.
◎Ten models are available in program capacities from 20 k steps to 260 k steps.

Product specifications

Program capacity	20 k steps/60 k steps/260 k steps
Number of input/output points [X/Y]	1024 points/4096 points
Number of input/output device points [X/Y]	8192 points
Basic instruction processing speed (LD instruction)	60 ns/ 40 ns/ 9.5 ns
External connection interface	USB, Ethernet, RS-232, SD memory card, CC-Link (L26CPU-BT/PBT)
Function modules	I/O, analog, high-speed counter, positioning, simple motion, temperature control, network module
Unit expansion style	Base-less structure
Network	Ethernet, CC-Link IE Field network, CC-Link, CC-Link/LT, SSCNETIII(/H), RS-232, RS-422

HMI | Graphic Operation Terminal GOT2000 Series GT27 Model

GOOD DESIGN AWARD 2014

product design award 2014

To the top of HMIs with further user-friendly, satisfactory standard features.

◎Comfortable screen operation even if high-load processing (e.g. logging, device data transfer) is running. (Monitoring performance is twice faster than GT16)
◎Actual usable space without using a SD card is expanded to 128MB for more flexible screen design.
◎Multi-touch features, two-point press, and scroll operations for more user-friendliness.
◎Outline font and PNG images for clear, beautiful screen display.

Product Specifications

Screen size	15", 12.1", 10.4", 8.4"
Resolution	XGA, SVGA, VGA
Intensity adjustment	32-step adjustment
Touch panel type	Analog resistive film
Built-in interface	RS-232, RS-422/485, Ethernet, USB, SD card
Applicable software	GT Works3
Input power supply voltage	100 to 240VAC (+10%, −15%), 24VDC (+25%, −20%)

Inverter | FR-A800 Series

GOOD DESIGN AWARD 2014

High-functionality, high-performance inverter

◎Realize even higher responsiveness during real sensor-less vector control or vector control, and achieve faster operating frequencies.
◎The latest automatic tuning function supports various induction motors and also sensor-less PM motors.
◎The standard model is compatible with EU Safety Standards STO (PLd, SIL2). Add options to support higher level safety standards.
◎Control and monitor inverters via CC-Link/CC-Link IE Field Network (option interface).

Product Specifications

Inverter capacity	200V class: 0.4kW to 90kW, 400V class: 0.4kW to 500kW
Control method	High-carrier frequency PWM control (Select from V/F, advanced magnetic flux vector, real sensorless vector or PM sensorless vector control), vector control (when using options)
Output frequency range	0.2 to 590Hz (upper limit is 400Hz when using advanced magnetic flux vector control, real sensorless vector control, vector control or PM sensorless vector control)
Regenerative braking torque (Maximum allowable duty)	200V class: 0.4K to 1.5K (150% at 3%ED) 2.2K/3.7K (100% at 3%ED) 5.5K/7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous), 400V class: 0.4K to 7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous)
Starting torque	200% 0.3Hz (3.7K or less), 150% 0.3Hz (5.5K or more) (when using real sensorless vector, vector control)

Sensor-less Servo | FR-E700EX Series, MM-GKR Series

Compact and high-function drive unit, low-inertial small capacity sensor-less PM motor

◎Use PM sensor-less vector control to control dedicated PM motors with high accuracy without an encoder.
◎High-accuracy speed control (speed fluctuation rate ±0.05%) and positioning control are supported.
◎The dedicated PM motor (MM-GKR) is quiet as it has no cooling fan. The compact and lightweight unit also supports reduction gears.
◎The standard model supports RS-485 communication. CC-Link communication is supported with an additional option.

Product Specifications

Drive unit / motor capacity		200V class: 0.1kW to 0.75kW
Control method		PM sensor-less vector control (low speed range: high frequency superimposition control)
Rated speed		3000r/min
Speed fluctuation rate		±0.05% (at 0 to 100% load fluctuation)
Position control	Command input method	The point table method and zero point return enable position control with absolute position commands
	Positioning accuracy	±1.8° (machine angle: equivalent to 200 [pulses/rev] resolution, input voltage 200V, wiring length within 5m)
Starting torque		200% (default value)
Communication specifications		Built-in: RS-485 communication (Mitsubishi inverter protocol, Modbus-RTU protocol), option: CC-Link communication

AC Servo | Mitsubishi General-Purpose AC Servo MELSERVO-J4 Series

Industry-leading level of high performance servo

◎Industry-leading level of basic performance: Speed frequency response (2.5kHz), 4,000,000 (4,194,304p/rev) encoder
◎Advanced one-touch tuning function achieves the one-touch adjustment of advanced vibration suppression control Ⅱ, etc.
◎Equipped with large capacity drive recorder and machine diagnosis function for easy maintenance.
◎2-axis and 3-axis servo amplifiers are available for energy-conservative, space-saving, and low-cost machines.

Product Specifications

Power supply specifications	1-phase/3-phase 200V AC, 1-phase 100V AC, 3-phase 400V AC
Command interface	SSCNET Ⅲ/H, SSCNET Ⅲ (compatible in J3 compatibility mode), CC-Link IE Field Network interface with Motion, pulse train, analog
Control mode	Position/Speed/Torque/Positioning function/Fully closed loop
Speed frequency response	2.5kHz
Tuning function	Advanced one-touch tuning, advanced vibration suppression control Ⅱ, robust filter, etc.
Functional safety	Conforms to functions of IEC/EN 61800-5-2, STO: Category 3 PL d, SIL 2 Conforms to Category 4 PL e, SIL 3 by a combination with MR-D30 functional safety unit
Compatible servo motor	Rotary servo motor (rated output: 0.05 to 55kW), linear servo motor (continuous thrust 50 to 3000N), direct drive motor (rated torque: 2 to 240N・m)

Magnetic Starter | MS-T Series

Exceed your expectations.

◎10A frame model is over 16% smaller with a width of just 36mm!!
◎New integrated terminal covers.
◎Reduce your coil inventory by up to 50%.
◎Be certified to the highest international levels while work is ongoing to gain other country.

Product specifications

Frame	10 A to 32 A
Applicable standards	Certification to various standards including IEC, JIS, CE, UL, TÜV, CCC.
Terminal cover	Standard terminal cover improves safety, simplifies ordering, and reduces inventory, etc.
Improved wiring	Wiring and operability are improved with streamlining wiring terminal BC specifications.
Operation coil rating	Wide range of operation coil ratings reduces number of coil types from 14 (N Series) to 7 types and simplifies selection.
Option units	Diverse lineup includes Auxiliary Contact Block, Operation Coil Surge Absorber Unit, Mechanical Interlock Unit.

Robot | MELFA F Series

High speed, high precision and high reliability industrial robot

◎Compact body and slim arm design, allowing operating area to be expanded and load capacity increased.
◎The fastest in its class using high performance motors and unique driver control technology.
◎Improved flexibility for robot layout design considerations.
◎Optimal motor control tuning set automatically based on operating position, posture, and load conditions.

Product Specifications

Degrees of freedom	Vertical:6 Horizontal:4
Installation	Vertical:Floor-mount, ceiling mount, wall mount (Range of motion for J1 is limited) Horizontal:Floor-mount
Maximum load capacity	Vertical:2-20kg Horizontal:3-20kg
Maximum reach radius	Vertical:504-1503mm Horizontal:350-1,000mm

CNC | Mitsubishi Numerical Control Unit C70 Series

iQ Platform compatible CNC to provide TCO reduction effect.

◎A CNC structured in building block method on iQ Platform.
◎High performance CNC integrated with high-speed PLC offers high-speed control to reduce cycle time.
◎A wide variety of FA products helps construct flexible lines.

Product specifications

Maximum number of control axes (NC axis + spindle + PLC axis)	16 axes
Maximum number of part system	Machining center system: 7 systems, Lathe system: 3 systems
Maximum number of NC axes per part system	8 axes
Maximum program capacity	2,000 KB (5,120 m)
Maximum number of files to store	124 files/252 files
Number of input/output points	4,096 points
Safety observation function	Safety signal comparison function, speed monitoring function, duplexed emergency stop

Precautions before use

This publication explains the typical features and functions of the products herein and does not provide restrictions and 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; and to other duties.

⚠ For safe use

- To use the products given in this publication properly, always read the relevant manuals before use.
- The products have been manufactured as general-purpose parts for general industries, and have not been 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 movement vehicles, consult with Mitsubishi.
- 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.

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