MITSUBISHI ELECTRIC
Changes for the Better

Programmable Controllers
MELSEC-L series

Little on size, Large on performance

The new L series has a small footprint and is loaded with features.

Simple!

MELSEC L series

Simple

Convenience that fits in the palm of your hand.

The L series is the latest in a long line of MELSEC products renowned for
exceptional performance and rock solid reliability.
Get the performance, functions, and capabilities required for today's most
demanding applications in an incredibly small package.
MELSEC-L series greatly expands the range of functionality traditionally associated
with compact programmable controllers and through user-centric design, pushes the limits of ease of use.

USB

Display unit*1

SD Memory Card Slot
- Data Logging
- Backup & Restore

Built-in I/O functions
- Positioning
- High-speed Counter
- Pulse Catch
- Interrupt Input
- General Purpose I/O

Ethernet
- Time setting function
- Simple PLC communication function

Built-in CC-Link connectivity*2

Maximum Functionality

The CPU module contains a diverse range of control functions.

A large variety of I/O types and features are built-in for convenience.
Due to an abundance of advanced functionality, L series CPUs are flexible enough to meet a wide variety of needs.

Maximum Performance

High speed, large memory capacity CPU

The CPU has a basic operation processing speed of 9.5ns*3 and 260k steps*4 of program capacity are available for complex programs and equipment control.

Maximum Capabilities

Advanced capabilities focused on improving efficiency

The user-friendly display unit enables routine operations to be made without a computer. An SD memory card slot is included as standard for data logging and program storage. Write programs and manage L series controllers using GX Works2 and iQ Works, the most advanced and effective software for Mitsubishi controllers yet.

*1: Option (sold separately)
*2: Included with L26CPU-(P)BT
*3: For L06CPU, L26CPU, L26CPU-(P)BT
*4: For L26CPU, L26CPU-(P)BT

■ Built-in I/O Features ➡ P.5

Positioning	**High-speed Counter**	**Pulse Catch**
Interrupt Input	**General Purpose I/O**	

Every L series CPU module comes with 24 points of built-in I/O that support advanced features to meet challenges head on.

■ Built-in Connectivity ➡ P.7

Ethernet	**USB**	**SD Memory Card**
CC-Link Ver.2.0*²		

Convenient communication options and memory card storage are included with every CPU.

■ High-speed CPU ➡ P.8

Program Memory	Maximum number of I/O points	
260 k steps*⁴	**8192 points**	
Basic operation processing speed	Floating-point operation	MOV instruction
9.5 ns*³	**0.057 μs**	**19 ns**

L series raises the bar for performance specifications in a compact programmable controller with 260k steps of program memory and a basic operation processing time of just 9.5 nanoseconds.

■ Display unit ➡ P.13

Multi-lingual Display
English / Japanese

Display Size	Multi-color Backlight
16 characters x 4 lines	**Green**(Normal), **Red**(Error)

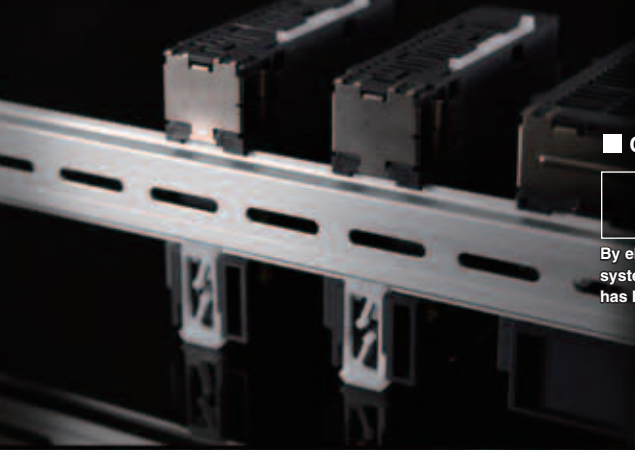The display unit allows for quick troubleshooting and diagnostic operations of the CPU and connected modules.

■ Software ➡ P.65

GX Works2	**iQ Works**	**GX LogViewer**
MX Component	**MX Sheet**	

L series is compatible with the latest and most advanced programmable controller engineering software from Mitsubishi.
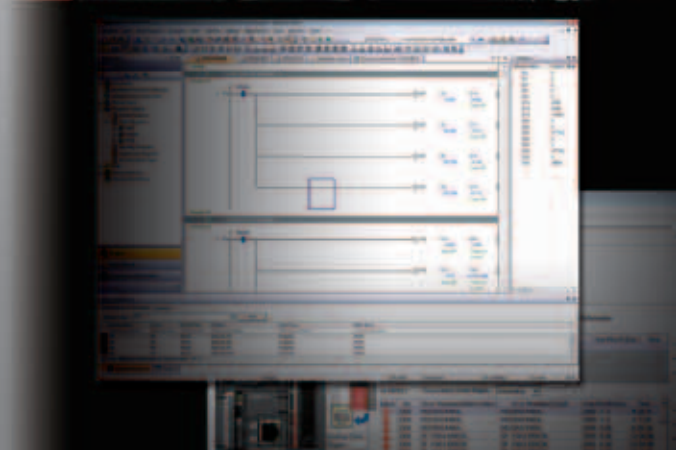
■ Compact Design ➡ P.9

Integrated backplane	Mount on standard DIN rail	For extension system

By eliminating the need for a separate backplane base unit, system design flexibility has been improved and overall size has been reduced.

■ Simple Motion Modules ➡P.43

Positioning	Speed Control	Torque Control
16-Axis Interpolation	Synchronous Control	Auto cam generation function

Control sophisticated motion applications with ease using proven and innovative features.

■ Analog Modules ➡P.31

Conversion Speed	Precision
20 µs/ch	±0.05%

Shorten cyde times using high-speed analog conversion modules that operate at 20µs per channel.

■ Temperature Control Modules ➡P.39

Heating-cooling control	Peak current suppression function	Self-tuning function
Simultaneous temperature rise function	Selectable sampling cycle	Temperature input mode

Temperature control module with highly stable regulation performance.

CC-Línk IE Field
CC-Link V2
CC-Link /LT
Ethernet
Serial communication

■ Network Modules ➡P.53

CC-Link IE Field	CC-Link Ver.2.0	CC-Link/LT
Ethernet	Serial communication	

Supports the FA network standard.
*The L26CPU-BT, L26CPU-PBT has CC-Link built-in.

GRAPHIC OPERATION TERMINAL
GOT1000

■ GOT1000 Series ➡P.77

MELSEC-L Troubleshooting Function	Intelligent Module Monitor	Backup and Restore
Log viewer function	Ladder Monitor	System Monitor

New GOT models have been designed with connection to L series in mind. When used together, several template screens are available to enhance their combined operational functionality.

Flexible

The L series has the ability to flex to meet your application's requirements.

MELSEC L series has been designed with three key concepts in mind.

The first key is reliability.

Mitsubishi Electric products are world renowned for quality.

The second is ease of use.

We are committed enabling engineers and programmers to do their job as efficiently as possible to reduce costs.

The third key is flexibility.

L series systems expand to meet the application requirements without wasting money or space.

Save on total costs by designing the system that is a perfect fit.

L series Built-in I/O Features

Every L series CPU comes with 24 points of built-in I/O standard. These I/O points are capable of many functions usually reserved for separate modules. Save on system costs by using the built-in functions rather than relying exclusively on additional modules.

The built-in I/O[1] comes in sink or source type format and may be chosen based on the application.

■ **L series CPU Built-in I/O Functions**

Positioning (Built-in control of 2 axes)	High-Speed Counter (Two channels built-in)	Pulse Catch	Interrupt Input	General Input / Output

Function		Features
Positioning[2]	Number of axes: Maximum 2 axes	Maximum speed: 200kpulse/s High-speed activation: 30µs (Shortest activation time) S-curve acceleration and deceleration are supported.
High-Speed Counter[2]	Number of channels: Maximum 2 channels	Maximum counting speed: 200kpulse/s Open collector, Differential line driver input High accuracy ON/OFF measurements with a resolution of 5µs High precision PWM control up to 200kHz (High speed pulse output)
Pulse Catch	Number of input points: 16 points	Minimum input response time: 10µs Pulse signals whose ON time is shorter than the scan time can be detected.
Interrupt Input	Number of interrupt points: 16 points	Built-in CPU provides high-speed processing. All input points support interrupt inputs.
General Input	Number of high-speed inputs: 6 points Number of standard inputs: 10 points	Minimum input response time of high-speed input: 10µs Minimum input response time of standard input: 100µs
General Output	Number of output points: 8 points	Output response time: 1µs or less

*1 The L02SCPU, L02CPU L06CPU, L26CPU and L26CPU-BT are sink type, and the L02CPU-P and L26CPU-PBT are source type.
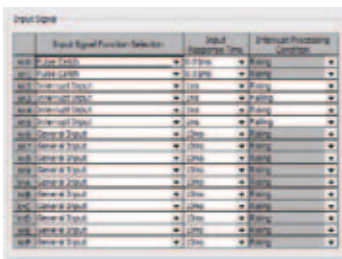*2 Points used by the positioning and high speed counting functions are fixed (as in A phase, B phase, near-point dog).
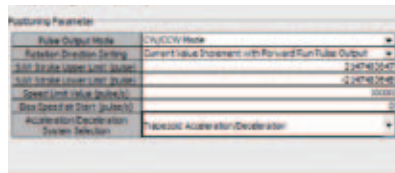　　Custom points for these functions may not be assigned.

Easy setup of built-in I/O functions

Configuring built-in I/O functions can be done easily by setting parameters using the programming tool.

[Built-in I/O function example parameter settings]
Pulse Catch: 0.01ms (response time)
Interrupt Input: 1ms (response time)

[Positioning function example parameter settings]
Pulse Output Mode: CW/CCW mode
Rotation Direction Setting:
Current Value Increment with Forward Run Pulse Output
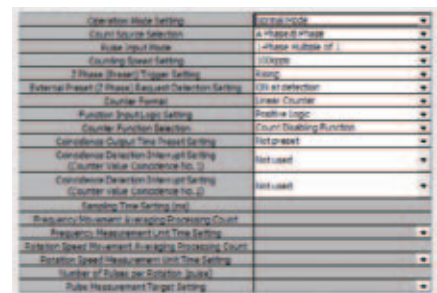
[High-speed counter function example parameter settings]
Pulse Input Mode: 1-Phase Multiple of 1
Counting Speed Setting: 100kpps

Built-in CPU positioning control function

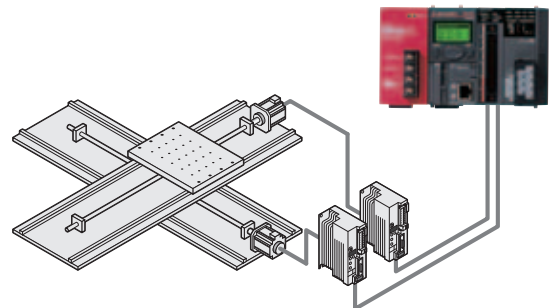| Positioning	High-Speed Counter

[Positioning Function]
The built-in positioning function has a start time of just 30µs with a maximum high speed output of 200k pulses per second.
Furthermore, it supports S-curve acceleration and deceleration for applications that require minimal machine vibration.

[High-Speed Counter Function]
Two channels support the high speed counting function. The differential line driver inputs support counting speeds up to 200k pulses per second.

L series Features

CPU

I/O

Analog /
Temperature Control

Simple Motion /
Positioning

High-Speed
Counter

Network

Software

Related Products
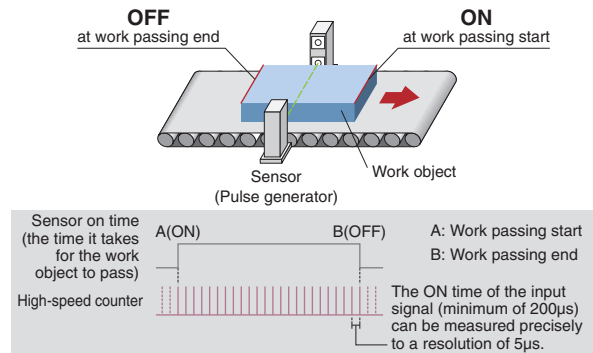
Make highly accurate measurements with a resolution of 5μs

Using pulse measurement mode, where the input signal ON/OFF time is 200μs or greater, highly accurate measurements in units of 5μs or greater are possible.
For example it is possible to calculate length by knowing the "work object passing speed" and measuring the ON time of the sensor.
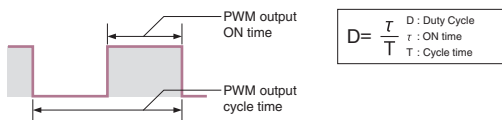
OFF at work passing end

ON at work passing start

Sensor (Pulse generator)

Work object

Sensor on time (the time it takes for the work object to pass)

A(ON)   B(OFF)

A: Work passing start

B: Work passing end

High-speed counter

The ON time of the input signal (minimum of 200μs) can be measured precisely to a resolution of 5μs.

High precision PWM control up to 200 kHz

Using the pulse width modulation control function of the high speed outputs, cycle times as fast as 5μs can be created. Simply input the ON time and cycle time to drive a wide range of devices from lighting dimmer control, motors, and heaters to precision inspection equipment requiring high resolution performance.

■ Lighting dimmer control using PWM output

Overhead lighting dimmer control, maximum load **250mA**[2]

Setting item	Setting Range	Description
PWM output ON time[1]	0 or 10 to 10000000[1] (0.1μs)	Set the ON time of output pulse
PWM output cycle time[1]	50 to 10000000[1] (0.1μs)	Set the cycle time of output pulse

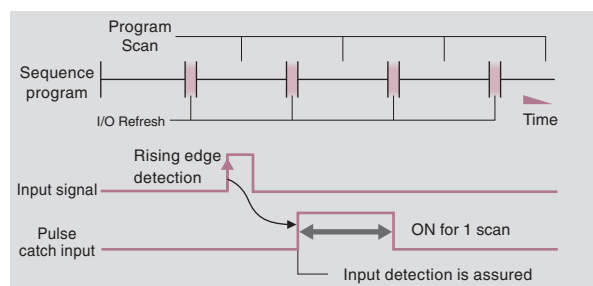[1] The PWM output ON time must be ≤ the PWM output cycle time.
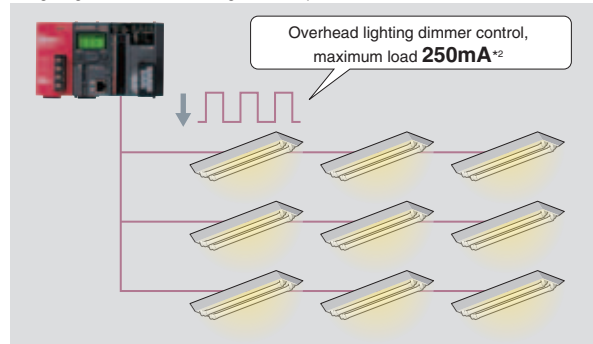
[2] In cases where the first six digits of the serial number are "120722" or later. Previous serial numbers of the CPU module are applied to 100mA.

PWM output ON time

PWM output cycle time

$$D= \frac{\tau}{T} \quad \begin{matrix} D : \text{Duty Cycle} \\ \tau : \text{ON time} \\ T : \text{Cycle time} \end{matrix}$$

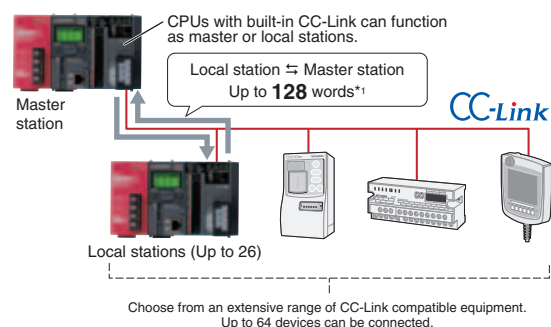## Guaranteed input pulse detection

Typical programmable controller input devices are unable to detect pulse signals whose ON time is shorter than the scan time or do not occur during I/O refresh periods. The pulse catch function allows these signals to be reliably detected and passed to the sequence program. This function is different from the interrupt input function in that it does not require any special programming. Pulse catch inputs may be used in programs exactly the same as traditional input (X) signals.

Program Scan

Sequence program

I/O Refresh

Time

Input signal

Rising edge detection

Pulse catch input

ON for 1 scan

Input detection is assured

CPU with built-in CC-Link network connectivity

L series CC-Link ready CPUs are compatible with the latest generation of CC-Link devices and support connections with over 1,000 different product types. Without adding a module, these CPUs can perform high-speed communication with a maximum of 128 words[1] between a master station and a local station. CC-Link is the dominate FA network standard in Asia and continues to gain support worldwide.

CC-Link V2

CPUs with built-in CC-Link can function as master or local stations.

Master station

Local station ⇆ Master station Up to **128** words[1]

CC-Link

Local stations (Up to 26)

Choose from an extensive range of CC-Link compatible equipment. Up to 64 devices can be connected.

[1] When the number of occupied stations is 4 and the extended cyclic setting is octuple in the Remote net Ver.2 mode.

USB port
(Mini-B type)

Ethernet port
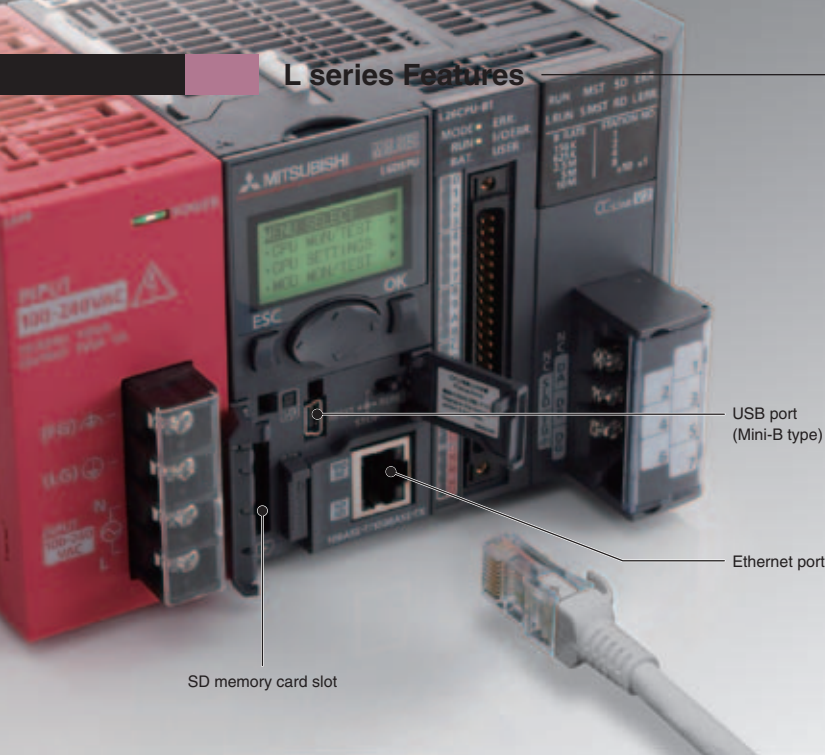
SD memory card slot

## Convenient communication and storage options come as standard

Program, configure, and perform diagnostics on L series systems using either the USB 2.0 or Ethernet connections. The SD Memory Card slot has many uses including the easy backup and restore of programs and parameters.

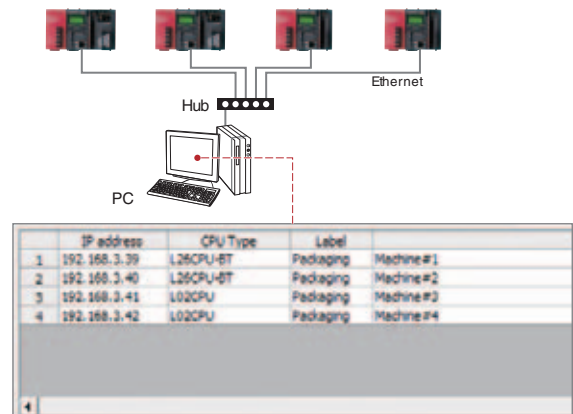| L02CPU(-P) | L06CPU | L26CPU | L26CPU-(P)BT |

USB and Ethernet connections standard

Use the USB 2.0 interface or Ethernet to connect directly at the instillation site. The Ethernet interface supports direct connection with either a cross or straight LAN cable and does not require any configuration of the programmable controller or PC to operate (patent pending).

IP address setting not required!

PC

Ethernet

Direct connection with straight or cross cable.
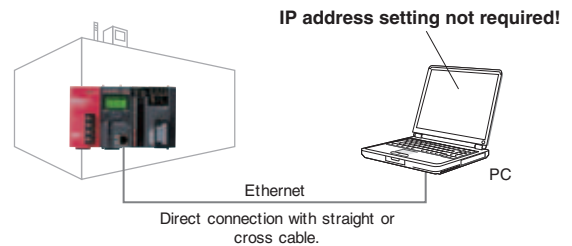
Easy connection through hub

All CPUs connected to the same hub can be searched and displayed in a list.
By selecting the access target CPU from the list, it can be connected to even if the IP address is unknown.

Ethernet

Hub

PC

	IP address	CPU Type	Label	
1	192.168.3.39	L26CPU-BT	Packaging	Machine #1
2	192.168.3.40	L26CPU-BT	Packaging	Machine #2
3	192.168.3.41	L02CPU	Packaging	Machine #3
4	192.168.3.42	L02CPU	Packaging	Machine #4

Use GX Works2 to retrieve a list of all CPUs connected to the network.
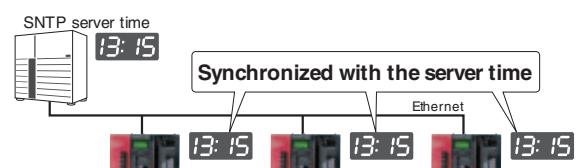
Precise time synchronization

Synchronize systems on an Ethernet network using an SNTP[1] server. Highly precise time synchronization can be achieved to enable simultaneous operations, quality control, or error tracking.

*1 SNTP: Simple Network Time Protocol

SNTP server time
13:15

Synchronized with the server time

Ethernet

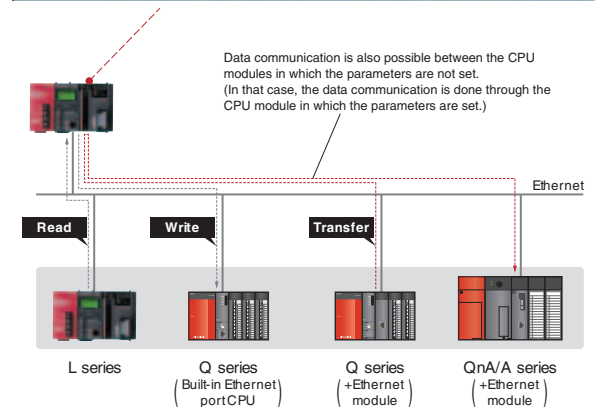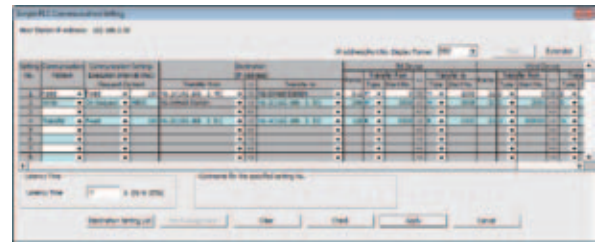13:15   13:15   13:15

Program-less device data transfer

[Simple PLC communication function*1]
Using the programming tool, a simple parameter setting is all that is needed to transfer device data such as production information with no programming required.
This function makes it possible to easily establish communications not only with L series, but also Q series and QnA/A series controllers.

*1 CPU module whose first five serial number digits are "13042" or later is required.

Item		Description
Communication Pattern	Read	Read the data of the specified destination device (transmission source) to the specified device of the host station (transmission destination).
	Write	Write the data of the specified device of the host station (transmission source) to the specified destination device (transmission destination).
	Transfer	Read the data of the specified destination device (transmission source) and write it to another specified destination device (transmission destination).
Communication Setting:	Execution Interval	Set between 10ms and 65535ms (1ms unit)
	Request Contact	Data send/receive is executed at the rising edge (OFF to ON) of the specified device (X, M, B).
Available devices	Setting No.	Set between 1 and 64.
	Device points	The maximum number that can be set for each setting No. is 512 words. (Maximum points of a word device: 256 points + Maximum points of a bit device: 4096 points) The total of setting No. 1 to 64 is maximum 4096 words.

■ Simple PLC Communication Setting

Data communication is also possible between the CPU modules in which the parameters are not set.
(In that case, the data communication is done through the CPU module in which the parameters are set.)

Ethernet

Read   Write   Transfer

L series

Q series (Built-in Ethernet port CPU)

Q series (+Ethernet module)

QnA/A series (+Ethernet module)

SD Memory Card special features

Use the SD/SDHC compatible memory card to quickly and easily back-up the CPU programs and parameters.
The backups can then be just as easily restored or used to program other CPUs. The memory card can also be used to hold data captured with the data logging function*1.

*1 For details about the data logging function, refer to page 11.

Save/load programs directly into the Programmable Controller

[Multiple project save/load function*1]
Parameters, program files, etc., can be saved/read onto a SD memory card by simply using the onboard display unit, without having to connect to a separate PC. Once saved on the SD memory card, files can be sent via e-mail, for example, when requiring off-site editing of the files.

*1 Supported by CPU module whose first five serial number digits are "14042" or later.

❶ Save onto SD memory card
Using the display save program files onto the SD memory card

MENU SELECT
-MOD SETTINGS ▶
-USER MESSAGE ▶
-MEM CARD OP ▶

Save
Load

❺ Load from SD memory card
Load edited program files from the SD memory card to the CPU just by using the display

❷ Send saved files

Send program file by email.

Internet

Site supervisor

❹ Return edited file   ❸ Edit the program

Edit and return the file.

System supervisor (off-site location)

Incredible performance in a compact design

L06CPU   L26CPU   L26CPU-(P)BT

With a program capacity of 260k steps*1 and basic operation (LD instruction) speed of 9.5ns, L series CPUs have the performance necessary for highly demanding applications.
Furthermore, the double-precision real number operation instruction is also available to reduce operation errors in complicated mathematical formulas.

*1 60K steps for L06CPU.

CPU Modules		L26CPU, L26CPU-BT, L26CPU-PBT	L06CPU
Basic operation processing speed		9.5ns	
Floating point operation speed Addition instruction (E+)	Single precision	0.057μs	
	Double precision*2	4.3μs	
MOV instruction		19ns	
Program capacity		260k Steps	60k Steps
Total device capacity		413k Words	

*2 Minimum value

8

Gain more flexibility with an integrated system bus structure

Save space in control panels by utilizing the integrated system bus structure. Flexibility in system design is made possible by choosing only the required expansion modules for the application.

Expand L series systems with no base unit restrictions

L series modules do not require a base unit. The installation space is not restricted by base size, and the system can be installed with minimal required space.

Furthermore, the addition of modules to the system is not restricted by the number of available base unit slots and costs may be reduced due to the elimination of expansion base units.

Control panel

Base unit not required!

Installation space is reduced in the control panel

Identify important information easily

Every L series module has the serial number printed on the front surface of the module to allow viewing even during system operation (modules do not need to be removed).

*Serial numbers can also be checked using GX Works2.

1234500000000000 A

Function version

A serial number is printed on the front surface.

MELSEC **L** series

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

System expandable according to production equipment scale

Up to three extension blocks connectable to the main block using branch and extension modules. A maximum of 40 modules*1 caters a wide range of production equipment and line scale.

CPU module*2	Number of extension blocks	Number of connectable modules*3
L02SCPU L02CPU(-P)	Up to 2 blocks	Main block: 10 modules Extension block: 11 modules
L06CPU L26CPU L26CPU-(P)BT	Up to 3 blocks	

*1 In the case of L06CPU, L26CPU, and L26CPU-(P)BT.

*2 CPU modules whose first five serial number digits are 13072 or later.

*3 Total number of I/O modules, intelligent function modules, network modules and branch modules.
The power supply modules, CPU modules, display units, extension modules, RS-232 adapters and END covers are not included.

When adding a branch module to a fully occupied block, shift one of the other modules to a new block to give way to the branch module.

■ Example of largest system configuration of L26CPU-BT

[Main block] 10 modules — END cover

Extension module

Branch module

[Extension block 1] 11 modules

Extension cable — Branch module

[Extension block 2] 11 modules

When the main block and 3 extension blocks are used, 40 modules can be connected in all.*4

[Extension block 3] 11 modules
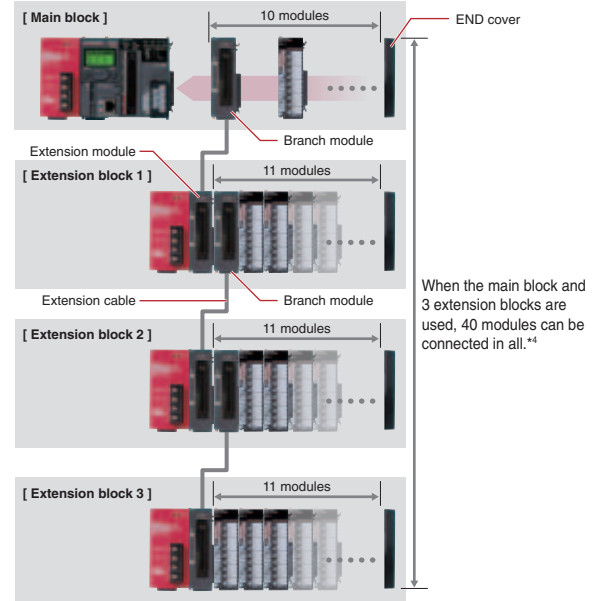
*4 Total number of I/O modules, intelligent function modules and network modules, excluding branch modules.
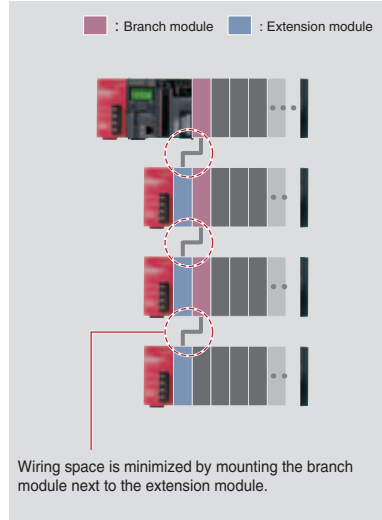
Well-organized control panel with minimum wiring

Branch module can be strategically placed in a block to minimize wiring space. Extension cables are available in 0.6-, 1.0- and 3.0-m. The maximum extension length is 3.0 m*1.
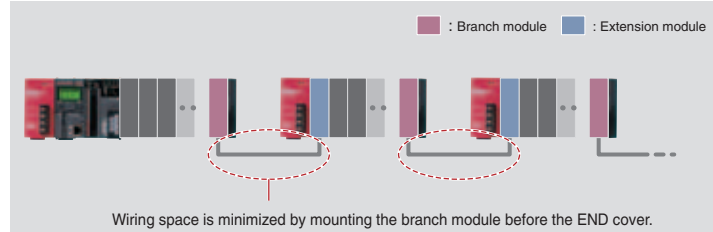The extension cable is a one-touch type which can be easily connected and disconnected.

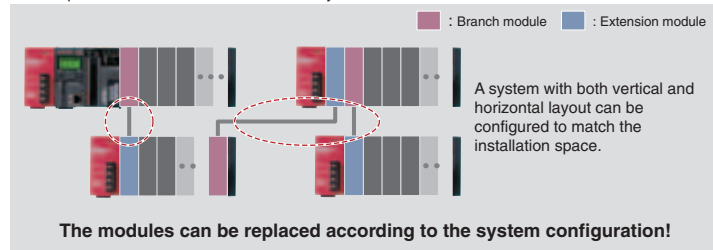*1 The total length of extension cables should be within 3.0 m.

■ Example of vertical system configuration

■ : Branch module ■ : Extension module

Wiring space is minimized by mounting the branch module next to the extension module.

Matching marks on the slot and the cable

■ Example of horizontal system configuration

■ : Branch module ■ : Extension module

Wiring space is minimized by mounting the branch module before the END cover.

■ Example of vertical and horizontal mixed system

■ : Branch module ■ : Extension module

A system with both vertical and horizontal layout can be configured to match the installation space.

The modules can be replaced according to the system configuration!

■ Mounting position when branch or extension module is used

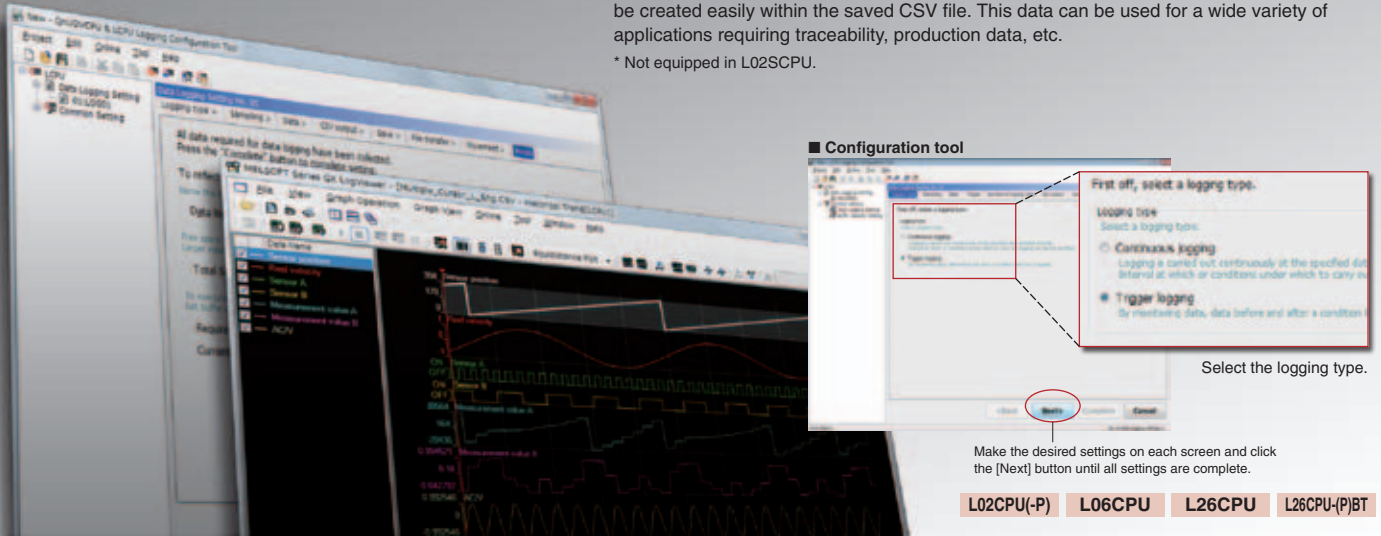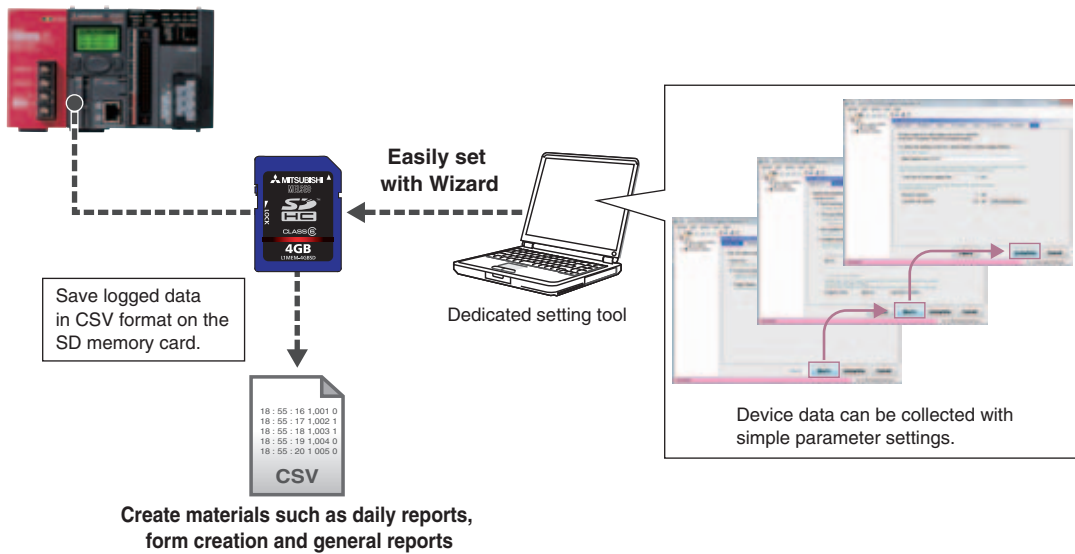| Modules	Mounted block	Possible mounting position
Branch module	Main block	Right side of CPU module or left side of END cover
	Extension block	Right side of extension module or left side of END cover
Extension module	Main block	Impossible
	Extension block	Right side of power supply module

Data logging function[1]

The data logging function embedded in the CPU module allows collected data to be saved in CSV format on a SD memory card simply by using the dedicated setting tool wizard. Various reference materials including daily reports, form creation and general reports can be created easily within the saved CSV file. This data can be used for a wide variety of applications requiring traceability, production data, etc.
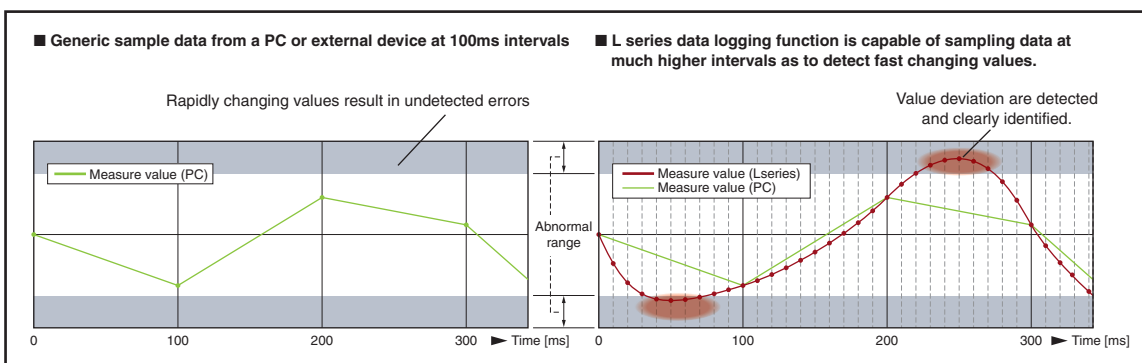
* Not equipped in L02SCPU.

■ **Configuration tool**

Select the logging type.

Make the desired settings on each screen and click the [Next] button until all settings are complete.

| L02CPU(-P) | L06CPU | L26CPU | L26CPU-(P)BT |

Easy logging without a program

Logging of device data just by configuring the parameters.
The results can be saved in CSV format on a SD memory card.

Save logged data in CSV format on the SD memory card.

Easily set with Wizard

Dedicated setting tool

Device data can be collected with simple parameter settings.

18 : 55 : 16 1,001 0
18 : 55 : 17 1,002 1
18 : 55 : 18 1,003 1
18 : 55 : 19 1,004 0
18 : 55 : 20 1 005 0

CSV

Create materials such as daily reports, form creation and general reports

Logging of control data variances

Data is collected during each scan or within millisecond intervals allowing detection of control deviation even at very high speeds. Therefore, identification of errors can be conducted faster and in more detail.

■ **Generic sample data from a PC or external device at 100ms intervals**

Rapidly changing values result in undetected errors

Measure value (PC)

■ **L series data logging function is capable of sampling data at much higher intervals as to detect fast changing values.**

Value deviation are detected and clearly identified.

Abnormal range

Measure value (Lseries)
Measure value (PC)

0   100   200   300 ► Time [ms]   0   100   200   300 ► Time [ms]

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

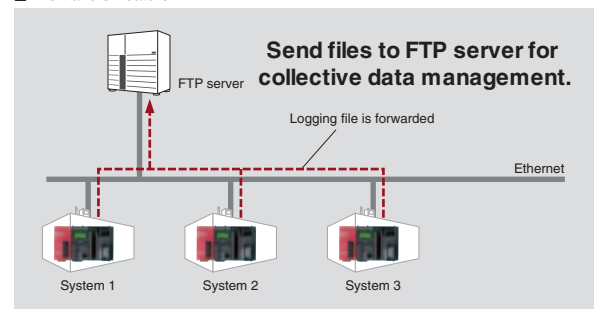Related Products

Auto logging function

Automatic data logging realized just by inserting the SD memory card into the CPU, which is achieved as the memory card includes the logging configuration file. Instructing data logging remotely is also realized just by sending the configuration file by e-mail and copying onto the SD memory card (Patent pending).

Example: Quickly setup for automatic data logging on-site

I'll send you the logging setting file.

Thank you.

❶ Send the file

System manager

Internet

On-site manager

❸ Begin data logging

Automatic data logging is started just by inserting the SD memory card.

❷ Copy the file to SD Memory Card
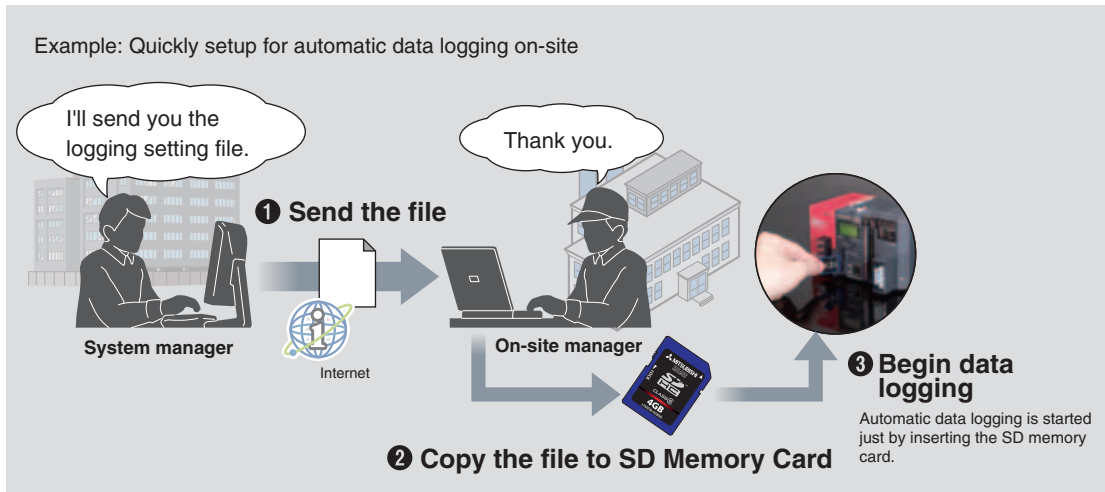
Automatically send logging files to FTP server

Data logging files saved on the SD memory card can be sent to the FTP server just by making a simple setting with the logging configuration tool. As the logging server can handle multiple files, management and maintenance tasks can be reduced.

■ File transfer feature[1]

FTP server

Send files to FTP server for collective data management.

Logging file is forwarded

Ethernet

System 1   System 2   System 3

*1 Using a CPU module with the first 5 digits of the serial number "12112" or later.

Trigger logging function

Error causes and solutions can be quickly done as only the required data related to the problem is extracted, without having to spend time on filtering large volumes of diagnostic data.

Data (Condition of equipment)

Trigger occurrence

Time

Only logging data just before and after the trigger occurrence is saved.

Efficient use of SD memory card space.

Only saving data necessary for analysis enables quick identification of the root cause and restoration of normal operation.

Before trigger occurrence   **Trigger occurrence**   After trigger occurrence

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

Device monitor

```
X10FF        IT16
              4145
FEDCBA9876543210
```

Built-in I/O monitor

```
p        32569pls
v       128000pps
DATA No.    ABSENT
ERR CODE  ABSENT
```
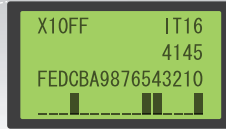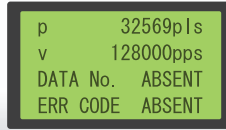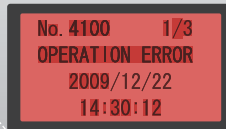
**Error message display
(Red backlight)**

```
No. 4100     1/3
OPERATION ERROR
    2009/12/22
      14:30:12
```
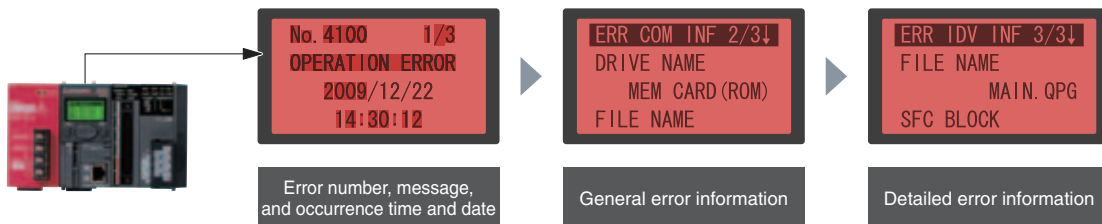
Feature rich and easy to use display

Check the system status and make setting changes directly from the display. Error status is clearly identified and troubleshooting and error investigation can be performed all without the need for any connections or engineering software.

*1 Not available for L02SCPU.

| L02CPU(-P) | L06CPU | L26CPU | L26CPU-(P)BT |

Instant error information check

Error history and detailed error information is available directly from the display unit.

```
No. 4100     1/3
OPERATION ERROR
    2009/12/22
      14:30:12
```
Error number, message, and occurrence time and date

```
ERR COM INF 2/3↓
DRIVE NAME
    MEM CARD(ROM)
FILE NAME
```
General error information

```
ERR IDV INF 3/3↓
FILE NAME
        MAIN.QPG
SFC BLOCK
```
Detailed error information

Intuitive menu navigation

The menu navigation guide shows the current menu tree location and an arrow to indicate the scroll direction at the top of the display.

Parent menu
Current menu
Level navigation
When vertical scrolling is possible, (↑, ↓, ↕) arrows are displayed

```
MENU SELECT
·CPU MON/TEST  ▶
·CPU SETTINGS  ▶
·MOD MON/TEST  ▶
```

```
MENU>CPU MON/TES
·DEV MON/TEST  ▶
·DEVICE CLEAR  ▶
·FORCED ON/OFF ▶
```

```
MENU>CPU>ON/OFF
·SET ON/OFF
·CLR FORCE
·CLR ALL FORCES
```

```
ERROR MESSAGE ↓
Cannot execute
in RUN.
Please execute
```

Selected item flashes
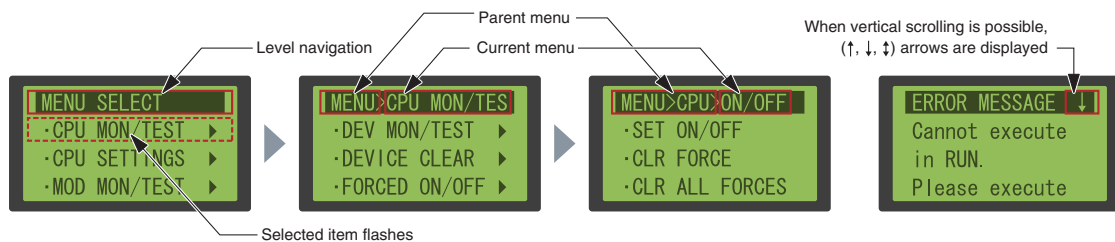
Multilingual operation

The display unit language can be selected (Japanese or English).

```
·日本語
·ENGLISH
```
Choose the desired language

```
メニュー選択
·CPUモニタ/テスト   ▶
·CPU設定          ▶
·ユニットモニタ/テスト  ▶
```
Japanese display

```
MENU SELECT
·CPU MON/TEST  ▶
·CPU SETTINGS  ▶
·MOD MON/TEST  ▶
```
English display

Universal Design
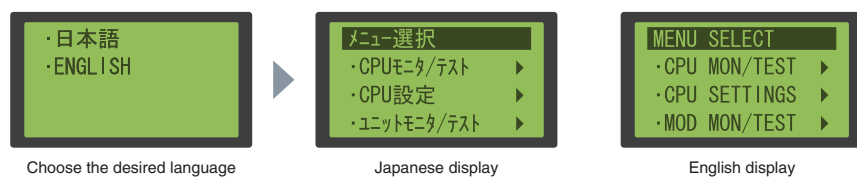
The L series has been designed from the ground up to be easy to use

The L series module labeling design has been created to ensure clear legibility and identification of information at glance to avoid mistakes.

Universal design

[Adopting a universal font]
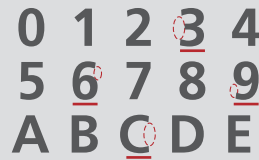A high visibility font has been chosen for characters printed on system modules.
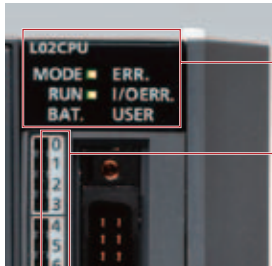
■ Regular Gothic font

0 1 2 3 4
5 6 7 8 9
A B C D E
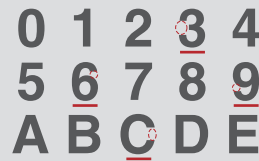
The characters are thick enough, however the numbers "3, 6, 8, 9" and the alphabet "C" are not clearly distinguishable because the spacing indicated with a red circle is not large enough.

■ Font for L series

0 1 2 3 4
5 6 7 8 9
A B C D E

The space indicated with a red circle has been enlarged.
The numbers "3, 6, 8, 9" and the alphabet "C" are clearly distinguishable. Characters are legible even in small print.

[Module design]
White and red are used to distinguish inputs from outputs respectively to allow for easy identification of terminal connection type.
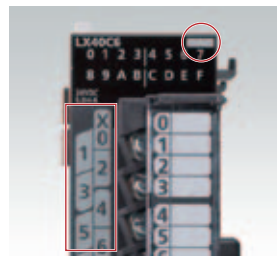
White for input module
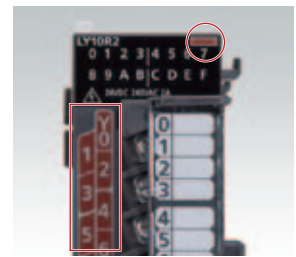
Red for output module

Easily identify module status

LEDs display the current status of modules including run and error states.

LEDs are located on the top front surface of the modules.

Analog /
Temperature Control

Simple Motion /
Positioning

High-Speed
Counter

Network

Software

Related Products

CPU Modules

■ L02SCPU
NEW

Program capacity **20ksteps**	Number of I/O points **1024points**	Basic operation processing speed **60ns**	
RS-232	**USB**		
General Output **Sink type**	Built-in I/O **16 inputs / 8 outputs**	Built-in I/O Positioning **2 axes**	Built-in I/O High-Speed Counter **2 ch**

*End cover is enclosed.
Cannot be mounted on display unit (L6DSPU).

■ L02CPU

Program capacity **20ksteps**	Number of I/O points **1024points**	Basic operation processing speed **40ns**	
Ethernet	**USB**		
General Output **Sink type**	Built-in I/O **16 inputs / 8 outputs**	Built-in I/O Positioning **2 axes**	Built-in I/O High-Speed Counter **2 ch**

*END cover is included.

■ L02CPU-P

Program capacity **20ksteps**	Number of I/O points **1024points**	Basic operation processing speed **40ns**	
Ethernet	**USB**		
General Output **Source type**	Built-in I/O **16 inputs / 8 outputs**	Built-in I/O Positioning **2 axes**	Built-in I/O High-Speed Counter **2 ch**

*END cover is included.

■ L06CPU
NEW

Program capacity **60ksteps**	Number of I/O points **4096points**	Basic operation processing speed **9.5ns**	
Ethernet	**USB**		
General Output **Sink type**	Built-in I/O **16 inputs / 8 outputs**	Built-in I/O Positioning **2 axes**	Built-in I/O High-Speed Counter **2 ch**

*END cover is included.

■ L26CPU
NEW

Program capacity **260ksteps**	Number of I/O points **4096points**	Basic operation processing speed **9.5ns**	
Ethernet	**USB**		
General Output **Sink type**	Built-in I/O **16 inputs / 8 outputs**	Built-in I/O Positioning **2 axes**	Built-in I/O High-Speed Counter **2 ch**

*END cover is included.

■ L26CPU-BT

Program capacity **260ksteps**	Number of I/O points **4096points**	Basic operation processing speed **9.5ns**	
Ethernet	**USB**	**CC-Link Ver.2.0**	
General Output **Sink type**	Built-in I/O **16 inputs / 8 outputs**	Built-in I/O Positioning **2 axes**	Built-in I/O High-Speed Counter **2 ch**

*END cover is included.

■ L26CPU-PBT

Program capacity **260ksteps**	Number of I/O points **4096points**	Basic operation processing speed **9.5ns**	
Ethernet	**USB**	**CC-Link Ver.2.0**	
General Output **Source type**	Built-in I/O **16 inputs / 8 outputs**	Built-in I/O Positioning **2 axes**	Built-in I/O High-Speed Counter **2 ch**

*END cover is included.

CPU packages

■ L02CPU-SET
Includes CPU (L02CPU), power supply module (L61P), and display unit (L6DSPU).

■ L02CPU-P-SET
Includes CPU (L02CPU-P), power supply module (L61P), and display unit (L6DSPU).

■ L06CPU-SET NEW
Includes CPU (L06CPU), power supply module (L61P), and display unit (L6DSPU).

■ L26CPU-SET NEW
Includes CPU (L26CPU), power supply module (L61P), and display unit (L6DSPU).

■ L26CPU-BT-SET
Includes CPU (L26CPU-BT), power supply module (L61P), and display unit (L6DSPU).
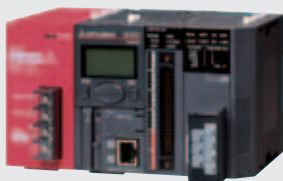
■ L26CPU-PBT-SET
Includes CPU (L26CPU-PBT), power supply module (L61P), and display unit (L6DSPU).

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

■ General specifications

General specifications indicate the environmental specifications in which this product can be installed and operated. Unless otherwise specified, these general specifications apply to all L series products.
*General specifications of jointly developed products are different from those of MELSEC products. For more information, please refer to the product manuals or contact your local Mitsubishi Electric representative.

Item	Specification				
Operating ambient temperature	0 to 55°C				
Storage ambient temperature	-25 to 75°C				
Ambient humidity (operating)	5 to 95%RH, non-condensing				
Ambient humidity (storage)					
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		Frequency	Constant accelration	Half amplitude	Sweep count
		Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y, and Z directions
			8.4 to 150Hz	9.8m/s²	—	
		Under continuous vibration	5 to 8.4Hz	—	1.75mm	—
			8.4 to 150Hz	4.9m/s²	—	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s², 3 times each in X, Y, and Z directions)				
Operating atmosphere	No corrosive gases				
Operating altitude*¹	0 to 2000m				
Installation location	Inside a control panel				
Overvoltage category*²	II or less				
Pollution degree*³	2 or less				
Equipment class	Class I				

*1: Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m.
    Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.
*2: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
    Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
*3: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
    Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

■ CPU module specifications

Item			L02SCPU NEW	L02CPU L02CPU-P	L06CPU NEW	L26CPU NEW	L26CPU-BT L26CPU-PBT
Control method			Stored program repeat operation				
I/O control mode			Refresh mode (Direct mode is available by specifying the direct access input/output (DX, DY).)				
Programming language (sequence control language)			Function block, relay symbol language, MELSAP3 (SFC), MELSAP-L, structured text (ST), logic symbolic language				
Processing speed*¹ (sequence instruction)	LD X0		60ns	40ns	9.5ns		
	MOV D0 D1		120ns	80ns	19ns		
Constant scan			0.5 to 2000ms (Setting is available in increments of 0.5ms by parameter.)				
Program size			20k steps (80k bytes)		60k steps (240k bytes)	260k steps (1040k bytes)	
Memory capacity	Program memory (drive 0)		80k bytes		240k bytes	1040k bytes	
	Memory card (RAM) (drive 1)		—				
	Memory card (ROM) (drive 2)		—		Depends on the SD/SDHC memory card used.*²		
	Standard RAM (drive 3)		128k bytes		768k bytes		
	Standard ROM (drive 4)		512k bytes		1024k bytes	2048k bytes	
Maximum number of files stored	Program memory		64 files		124 files	252 files	
	Memory card (RAM)		—				
	Memory card (ROM)	SD	—		Root directory: 511 files (maximum) Subdirectory: 65533 files (maximum)		
		SDHC	—		Root directory: 65534 files (maximum) Subdirectory: 65533 files (maximum)		
	Standard RAM		4 files (each one of the following files: file register file, local device file, sampling trace file, and module error collection file)				
	Standard ROM		128 files		256 files		
Maximum number of intelligent function module parameters	Initial setting		2048 parameters		4096 parameters		
	Refresh		1024 parameters		2048 parameters		
Maximum number of modules specification*³			30		40		
Built-in I/O function			Refer to the built-in I/O specifications ➡ P.19 to P.21				
Data Logging function			—		Refer to the Data Logging function specifications ➡ P.21		
Built-in Ethernet function			—		Refer to the built-in Ethernet specifications ➡ P.22		
Built-in Serial Communication function			Refer to the Built-in Serial Communication specifications ➡ P.22	—			
Built-in CC-Link function			—				Refer to the CC-Link Master/Local Module specifications. ➡ P.57
Clock function	Displayed information		Year, month, date, hour, minute, second, and day of the week (automatic leap year detection)				
	Accuracy		0°C: -2.96 to +3.74s (TYP. +1.42s) per day 25°C: -3.18 to +3.74s (TYP. +1.50s) per day 55°C: -13.20 to +2.12s (TYP. -3.54s) per day				
5VDC internal current consumption	CPU	With display unit	—	1.00A	1.06A		1.43A
		Without display unit	0.75A	0.94A	1.00A		1.37A
	END cover (Accessory)*⁴		0.04A				
Weight	CPU	With display unit	—	0.40kg			0.50kg
		Without display unit	0.32kg	0.37kg			0.47kg
	END cover (Accessory)*⁴		0.06kg				

*1: Indexing devices does not delay processing time.
*2: Mitsubishi Electric shall not guarantee the operation of any non-Mitsubishi Electric products.
*3: The total number of modules that can be mounted to a CPU. Refer to the "Maximum number of modules specification" for each module.
    (Power supply modules, CPU module, Display unit, Extension module, RS-232 adapter, END cover, and END cover with error terminal are not included. Note that only one CPU or head module per system is possible.)
*4: The END cover is included with the CPU module and must be placed on the right end of the last module in the system.

■ CPU module device specifications

Item		L02SCPU NEW	L02CPU L02CPU-P	L06CPU NEW	L26CPU NEW	L26CPU-BT L26CPU-PBT
Number of I/O device points (number of points available on a program)		8192 points (X/Y0 to X/Y1FFF)				
Number of I/O points		1024 points (X/Y0 to X/Y3FF)		4096 points (X/Y0 to X/YFFF)		
Internal relay (M)		8192 points (M0 to M8191) by default (changeable)				
Latch relay (L)		8192 points (L0 to L8191) by default (changeable)				
Link relay (B)		8192 points (B0 to B1FFF) by default (changeable)				
Timer (T)		2048 points (T0 to T2047) by default (changeable) (Low-speed and high-speed timers available) Low-speed or high-speed is specified by an instruction. The measurement unit is set by parameter. (Low-speed timer: 1 to 1000ms (in increments of 1ms), default: 100ms) (High-speed timer: 0.1 to 100ms (in increments of 0.1ms), default: 10ms)				
Retentive timer (ST)		0 points by default (changeable)(Low-speed and high-speed retentive timers available) Low-speed or high-speed is specified by an instruction. The measurement unit is set by parameter. (Low-speed retentive timer: 1 to 1000ms (in increments of 1ms), default: 100ms) (High-speed retentive timer: 0.1 to 100ms (in increments of 0.1ms), default: 10ms)				
Counter (C)		Normal counter 1024 points (C0 to C1023) by default (changeable)				
Data register (D)		12288 points (D0 to D12287) by default (changeable)				
Extended data register (D)		32768 points (D12288 to D45055) by default (changeable)		131072 points (D12288 to D143359) by default (changeable)		
Link register (W)		8192 points (W0 to W1FFF) by default (changeable)				
Extended link register (W)		0 points by default (changeable)				
Annunciator (F)		2048 points (F0 to F2047) by default (changeable)				
Edge relay (V)		2048 points (V0 to V2047) by default (changeable)				
Link special relay (SB)		2048 points (SB0 to SB7FF) by default (changeable)				
Link special register (SW)		2048 points (SW0 to SW7FF) by default (changeable)				
File register	(R)	32768 points (R0 to R32767) (Maximum 65536 points are available by switching blocks.)		32768 points (R0 to R32767) (Maximum 393216 points are available by switching blocks.)		
	(ZR)	65536 points (ZR0 to ZR65535) (Blocks do not need to be switched.)		393216 points (ZR0 to ZR393215) (Blocks do not need to be switched.)		
Step relay (S)		8192 points (S0 to S8191) by default (The points can be changed to 0.)				
Index register/standard device register (Z)		20 points (Z0 to Z19) (maximum)				
Index register (Z) (32-bit index modification of ZR device)		10 points (Z0 to Z18) (maximum) (The index register is used as a double-word device.)				
Pointer (P)		4096 points (P0 to P4095) (The local pointer range and the common pointer range can be set by parameter.)				
Interrupt pointer (I)		256 points (I0 to I255) (The fixed scan interval for the system interrupt pointer I28 to I31 can be set by parameter.) 0.5 to 1000ms (in increments of 0.5ms) Default I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms				
Special relay (SM)		2048 points (SM0 to SM2047) (The number of device points is fixed.)				
Special register (SD)		2048 points (SD0 to SD2047) (The number of device points is fixed.)				
Function input (FX)		16 points (FX0 to FX F) (The number of device points is fixed.)				
Function output (FY)		16 points (FY0 to FY F) (The number of device points is fixed.)				
Function register (FD)		5 points (FD0 to FD4) (The number of device points is fixed.)				
Intelligent function module device		Device that directly accesses the buffer memory of an intelligent function module Specification format: U□□/G□□				
Latch (data retention during power failure) range		8192 points (L0 to L8191) by default (The latch range can be set for the devices, B, F, V, T, ST, C, D, W, and R by parameter.)				

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

■ CPU built-in I/O - Input signal assignment

○: Selectable   ✕: No combination

External input signal	Function				
	General-purpose input	Interrupt input	Pulse catch	High-speed counter	Positioning
X0(high-speed)	○	○*1	○	Counter CH1 A phase*1	✕*3
X1(high-speed)	○	○*1	○	Counter CH1 B phase*1	✕*3
X2(high-speed)	○	○*1	○	Counter CH2 A phase*1	✕*3
X3(high-speed)	○	○*1	○	Counter CH2 B phase*1	✕*3
X4(high-speed)	○	○	○	Counter CH1 Z phase*2	Axis #1 Zero signal*2
X5(high-speed)	○	○	○	Counter CH2 Z phase*2	Axis #2 Zero signal*2
X6(standard)	○	○	○	Counter CH1 Function input*2	Axis #1 External command signal*2
X7(standard)	○	○	○	Counter CH2 Function input*2	Axis #2 External command signal*2
X8(standard)	○	○	○	Counter CH1 latch counter*2	Axis #1 Drive module READY signal*2
X9(standard)	○	○	○	Counter CH2 latch counter*2	Axis #2 Drive module READY signal*2
XA(standard)	○	○	○	✕*3	Axis #1 Near-point dog dignal*2
XB(standard)	○	○	○	✕*3	Axis #2 Near-point dog dignal*2
XC(standard)	○	○	○	✕*3	Axis #1 Upper limit signal*2
XD(standard)	○	○	○	✕*3	Axis #2 Upper limit signal*2
XE(standard)	○	○	○	✕*3	Axis #1 Lower limit signal*2
XF(standard)	○	○	○	✕*3	Axis #2 Lower limit signal*2

*1: When using CH1 for the high-speed counter function, X0 and X1 cannot be used as interrupt inputs. Also, when using CH2 for the high-speed counter function, X2 and X3 cannot be used as interrupt inputs.
    Other functions such as the general-purpose input can be used.
*2: When this signal is not required, the input signal can be used for other functions such as the general-purpose input.
*3: When the high-speed counter function or positioning function is selected, this signal is not used for that function. This input signal may be used for another function such as a general-purpose input.

■ CPU built-in I/O - Output signal assignment

○: Selectable   ✕: No combination

External input signal	Function		
	General-purpose output	High-speed counter	Positioning
Y0	○	CH1 Coincidence output No.1*1	✕*3
Y1	○	CH2 Coincidence output No.1*1	✕*3
Y2	○	CH1 Coincidence output No.2*2	Axis #1 Deviation counter clear*1
Y3	○	CH2 Coincidence output No.2*2	Axis #2 Deviation counter clear*1
Y4	○	✕*3	Axis #1 CW/PULSE/A phase output*1
Y5	○	✕*3	Axis #2 CW/PULSE/A phase output*1
Y6	○	✕*3	Axis #1 CCW/SIGN/B phase output*1
Y7	○	✕*3	Axis #2 CCW/SIGN/B phase output*1

*1: This signal must be used depending on parameter settings.
    When this signal is not used, the output signal can be used for the general-purpose output function.
*2: When this signal is not used, the output signal can be used for the general-purpose output function.
*3: When the high-speed counter function or positioning function is selected, this signal is not used for that function.
    This input signal may be used for another function such as a general-purpose output.

■ CPU built-in I/O function - input specifications (general input/interrupt input/pulse catch function)

Item			Description
Standard input	Points		10
	Input voltage/current		24VDC 4.1mA (TYP.)
	The minimum input response time		100μs
	Input response time setting		0.1ms/1ms/5ms/10ms/20ms/70ms
	Common terminal arrangement		10 points/common (Positive or negative common)
High-speed input	Points		6
	Input voltage/current	DC input	24VDC 6.0mA (TYP.)
		Differential input	EIA Standard RS-422-A Differential line driver level AM26L31 (manufactured by Texas Instruments Incorporated) or equivalent
	The minimum input response time		10μs
	Input response time setting		0.01ms/0.1ms/0.2ms/0.4ms/0.6ms/1ms
	Common terminal arrangement		Independent

■ CPU built-in I/O function - output specifications (general output function)

Item		Description
Points		8
Output voltage/current		5 to 24VDC 0.1A
Response time	OFF to ON	1μs or less (rated load, resistance load)
	ON to OFF	
Common terminal arrangement		L02SCPU NEW, L02CPU, L06CPU NEW, L26CPU NEW, L26CPU-BT: 8 points/common (Sink type) L02CPU-P, L26CPU-PBT: 8 points/common (Source type)

■ CPU built-in I/O function - positioning function specifications

Item			Description
Number of controlled axes			2
Control unit			pulse
Operation pattern	PTP*¹ control		Available
	Path control		Not usable
Number of positioning data			10 data/axis
Positioning control	Positioning control method	PTP*¹ control	ABS/INC
		Speed/position switching control	INC
	Positioning range	PTP*¹ control	-2147483648 to 2147483647 pulses
		Speed/position switching control	0 to 2147483647 pulses
	Speed command		0 to 200 kpulses/s
	Acceleration/deceleration system selection		Automatic trapezoid acceleration/deceleration and S-curve acceleration/deceleration
	Acceleration/deceleration time		0 to 32767 ms
OPR method			6 types
Starting time (1-axis linear control)			Trapezoid acceleration/deceleration (single-axis start): 30 μs/axis S-curve acceleration/deceleration (single-axis start): 35 μs/axis
Command pulse output	Pulse output method		L02SCPU NEW, L02CPU, L06CPU NEW, L26CPU NEW, L26CPU-BT: 5 to 24VDC (Sink type) L02CPU-P, L26CPU-PBT: 5 to 24VDC (Source type)
	Pulse output mode		4 types
	Maximum output pulse		200 kpulses/s
	Maximum connection distance with drive unit		2 m
External input	Zero signal	DC input	24VDC 6.0 mA (TYP.)
		Differential input	EIA RS-422-A differential line driver level (AM26LS31 (by Texas Instruments Japan Limited.) or equivalent)
	Speed/position switching signal		24VDC 4.1 mA (TYP.)
	Near-point dog signal		
	Upper and lower limit signal		
	Drive unit ready signal		
	Input response time		Zero signal: 10 μs Speed/position switching control, near-point dog signal: 100 μs Upper and lower limit signal, drive unit ready signal: 2 ms
External output	Deviation counter clear signal		L02SCPU NEW, L02CPU, L06CPU NEW, L26CPU NEW, L26CPU-BT: 5 to 24VDC 0.1A (Sink type) L02CPU-P, L26CPU-PBT: 5 to 24VDC 0.1A (Source type)
	Response time	OFF to ON	1 μs or less (rated load, resistive load)
		ON to OFF	

*1: Abbreviation for "Point to Point." This is a type of position control.

L series Features

CPU

I/O

Analog /
Temperature Control

Simple Motion /
Positioning

High-Speed
Counter

Network

Software

Related Products

■ CPU built-in I/O function - high-speed counter specifications

Item			Description
Number of channels			2
Count input signal	Phase		1-phase input (1 multiple/2 multiples) CW/CCW, 2-phase input (1 multiple/2 multiples/4 multiples)
	Signal level	DC input	24VDC 6.0mA (TYP.)
		Differential input	EIA Standard RS-422-A Differential line driver level (AM26L31(manufactured by Texas Instruments Incorporated) or equivalent)
Counter	Maximum counting speed		200k pulse/s (for 2 multiples of 1 phase and 4 multiples of 2 phases)
	Counting range		-2147483648 to 2147483647
	Model		UP/DOWN preset counter (with ring counter function)
	Minimum count pulse width (Duty ratio 50%)	1 phase	5µs
		2 phases	10µs
	Min. phase differential for 2-phase input		5µs
External input	Phase Z (preset)	DC input	24VDC 6.0mA (TYP.)
		Differential input	EIA Standard RS-422-A Differential line driver level (AM26L31(manufactured by Texas Instruments Incorporated) or equivalent)
	Function start		24VDC 4.1mA (TYP.)
	Latch		
	Input response time		Phase Z: 10µs Function start, latch: 100µs
External output	Output format		L02SCPU NEW , L02CPU, L06CPU NEW , L26CPU NEW , L26CPU-BT: Sink type L02CPU-P, L26CPU-PBT: Source type
	Output voltage / current	Coincidence output No. 1 / PWM output	5 to 24 VDC / 0.25 A*[1]
		Coincidence output No. 2	5 to 24 VDC / 0.1 A
	Response time	OFF to ON	1µs or less (Rated load, resistance load)
		ON to OFF	
Coincidence output	Comparison range		-2147483648 to 2147483647
	Comparison result		Set value < Counted value Set value = Counted value Set value > Counted value
	I/O points		2 points / channel
PWM output	Output frequency range		DC to 200kHz
	ON width		1µs
	Duty ratio		On width can be set in increments of 0.1µs.
	I/O points		1 point / channel
Pulse width measurement	Measurement item		Pulse width (On width: 200µs or more, Off width: 200µs or more)
	Measurement resolution		5µs
	Measurement points		1 point/channel

*1: For units where the first six digits of the serial number are "120722" or later. The specification for previous serial numbers is 5 to 24 VDC / 0.1 A.

■ CPU Data logging function specifications

Item			L02CPU L02CPU-P	L06CPU NEW	L26CPU NEW	L26CPU-BT L26CPU-PBT
Number of data logging settings			10			
Data logging buffer capacity			For each setting, any of 32 to 4832 k bytes (in units of 1 k byte) can be specified. The total value of settings No.1 to No.10 is up to 5120 k bytes.			
Data storage location			Standard ROM (configuration files only), SD Memory Card			
Logging type			• Continuous logging • Trigger logging			
Data sampling	Sampling interval		• Each scanning cycle • Time specification • Condition specification (Device specification, Step No. specification)			
	No. of data sampling points		Up to 1280 (128 points per setting)			
	AND conjunction		In the Sampling interval setting, Device and Step No. under "Condition specification" can be specified in combination (AND conjunction).			
Data processing	Trigger logging	Trigger condition	• Condition specification (Device change specification, Step No. specification) • When trigger instruction executed • When data logging trigger activated			
		AND conjunction	In the Trigger setting, Device data change and Step No. under "Condition specification" can be specified in combination (AND conjunction).			
		Trigger logging range	Data of the specified number of records are logged before and after a trigger.			
		Number of triggers	1			
		Number of trigger logging records	Up to 1000000			
File output	File Name		Up to 48 one-byte characters can be used for the following. • File number (serial number)*[1] • Character string (name)*[2] • Date and time*[2]			
	File format		CSV file			
	Data type		• Bit • Word (unsigned) • Word (signed) • Double word (unsigned) • Double word (signed) • FLOAT [single precision] • FLOAT [double precision] • Character string: 1 to 256 • Numeric string: 1 to 256 characters bytes			
	Data output format (CSV file)		• Decimal format • Hexadecimal format • Exponential format			
Handling of output files	File switching	File switching timing	• No. of records • File size			
		Number of saved files	1 to 65535			

*1: Part of the saved file name, this number is automatically assigned.
*2: Optional data to be appended to the saved file name.

■ CPU built-in Ethernet function specifications

Item		L02CPU L02CPU-P	L06CPU NEW	L26CPU NEW	L26CPU-BT L26CPU-PBT
Transmission specifications	Data transfer speed	100 or 10 Mbps			
	Communication mode	Full-duplex or half-duplex			
	Transmission method	Base band			
	Maximum distance between hub and node	100 m			
	Maximum number of nodes/connection 10BASE-T	Cascade connection: Up to four			
	100BASE-TX	Cascade connection: Up to two			
Number of connections	TCP/IP	Total of 16 for socket communications, MELSOFT connections, and MC protocol.[1]			
	UDP/IP	One for FTP			
Connection cable[2]	10BASE-T	Ethernet cable of category 3 or higher (STP/UTP cable)[3]			
	100BASE-TX	Ethernet cable of category 5 or higher (STP cable)			

*1: Only the QnA-compatible 3E frame may be used.
*2: Straight through cable. Also, when the CPU is connected directly with a GOT, a cross cable (category 5e or less) may be used.
*3: The use of STP (Shielded Twisted Pair) cables is recommended in noisy environments.

■ CPU built-in serial communication function specifications

Item	L02SCPU NEW
Communication mode	Full duplex
Synchronization method	Start-stop synchronization method
Transmission speed	9.6kbps, 19.2kbps, 38.4kbps, 57.6kbps, 115.2kbps
Data format	• Start bits: 1 • Data bits: 8 • Parity bits: Odd number • Stop bits: 1
MC protocol format [1] (automatic judgment)	• Formats 4 (ASCII) • Formats 5 (Binary)
Frame [1]	• QnA compatible 3C frame • QnA compatible 4C frame
Transmission control	DTR/DSR control
Transmission distance (Overall distance)	Maximum 15m

*1: Information relevant to the MC protocol format and frame are shown below.

○: Supported　×: Not supported

Function		Formats 4	Formats 5
Communication with ASCII code	QnA compatible 3C frame	○	×
	QnA compatible 4C frame	○	×
Communication with binary code	QnA compatible 4C frame	○	○

■ How to read the product code

L 26 □ CPU - P BT - SET
① ② ③ ④ ⑤ ⑥

Number	Item	Code	Specification
①	Program memory capacity	02	20k steps
		06	60k steps
		26	260k steps

Number	Item	Code	Specification
②	Communication interface	Blank	Built-in Ethernet model
		S	Built-in RS-232 model

Number	Item	Code	Specification
③	Type of module	CPU	CPU module

Number	Item	Code	Specification
④	Built-in I/O output format	Blank	Sink type
		P	Source type

Number	Item	Code	Specification
⑤	Built-in CC-Link function	Blank	—
		BT	✓

Number	Item	Code	Specification
⑥	Product set	Blank	—
		SET	Set includes a power supply module (L61P) and display unit (L6DSPU)

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Branch / Extension Module

■ **L6EXB**

| For extension system (branch) |

■ **L6EXE**

| For extension system (extension) |

■ **Specifications for branch and extension modules**

Item	L6EXB [Branch module]	L6EXE [Extension module]
5VDC internal current consumption	0.08A	0.08A
Weight	0.12kg	0.13kg

■ **Specifications for extension cables**

Item	LC06E	LC10E	LC30E
Cable length	0.6m	1.0m	3.0m
Weight	0.19kg	0.23kg	0.45kg

Power Supply Modules

■ **L61P**

| Input **100 to 240VAC** | Output **5VDC, 5A** |

■ **L63P**

| Input **24VDC** | Output **5VDC, 5A** |

■ **Power supply module specifications**

Item	L61P	L63P
Input power supply	100 to 240VAC (-15% to +10%)	24VDC (-35% to +30%)
Input frequency	50/60Hz (-5% to +5%)	—
Input voltage distortion	Within 5%	—
Maximum input apparent power	130VA	—
Maximum input power	—	45W
Inrush current	20A, within 8ms	100A, within 1ms (24VDC input)
Rated output current (5VDC)	5A	
Overcurrent protection (5VDC)	5.5A or more	
Overvoltage protection	5.5 to 6.5V	
Efficiency	70% or more	
Allowable momentary power failure time	Within 10ms	Within 10ms (24VDC input)
Weight	0.32kg	0.29kg

L series Features

CPU

I/O

Analog /
Temperature Control

Simple Motion /
Positioning

High-Speed
Counter

Network

Software

Related Products

RS-232 Adapter

■ L6ADP-R2

| RS-232 | Transmission speed **115.2kbps** |
| For GOT connection | MELSOFT *1 connectable |

*1: Refer to each MELSOFT product manual for details on the supported software.

■ RS-232 adapter specifications

Item	Specification
Maximum data transmission speed	115.2kbps
5VDC internal current consumption	0.02A
Weight	0.10kg

END Cover with Error Terminal

■ L6EC-ET

Error output Relay
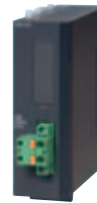
■ END cover with error terminal specifications

Item			Specification
ERR. terminal	Rated switching voltage, current		24VDC 0.5A
	Minimum switching load		5VDC, 1mA
	Response time	OFF to ON	10ms or less
		ON to OFF	12ms or less
	Life	Mechanical	20 million times or more
		Electrical	Rated switching voltage/current: 10 million times or more
	Surge suppressor		—
	Fuse		—
Applicable wire size			0.3 to 2.0mm² (AWG22 to 14) (Twisted wire/Solid wire)
External connections			Spring clamp terminal block
5VDC internal current consumption			0.06A
Weight			0.11kg

Display Unit

■ L6DSPU

| Number of display characters **16** characters x **4 lines** | Language selection **Japanese or English** | Backlight display **Green or Red** |

■ Display Unit specifications

Item	Specification
Number of displayed characters	16 one-byte characters × 4 lines
Displayed characters	• Alphanumeric (two-byte/one-byte character) • Katakana (two-byte/one-byte character) • Hiragana (two-byte character) • Chinese character (two-byte character) • Symbol (two-byte/one-byte character)
Language	Japanese/English
Backlight	Green (normal), red (error)
Weight	0.03kg

Input Modules

■ **LX10**
  AC input

Number of inputs	Rated input voltage
16points	**100 to 120VAC**

Response time	External connections
20ms or less	**18-point terminal block**

■ **LX28**
  AC input

Number of inputs	Rated input voltage
8points	**100 to 240VAC**

Response time	External connections
20ms or less	**18-point terminal block**

■ **LX40C6**
  DC input

Number of inputs	Rated input voltage	Positive/Negative common
16points	**24VDC**	

Response time	External connections	
1 to 70ms or less	**18-point terminal block**	

■ **LX41C4**
  DC input

Number of inputs	Rated input voltage	Positive/Negative common
32points	**24VDC**	

Response time	External connections	
1 to 70ms or less	**40-pin connector**	

■ **LX42C4**
  DC input

Number of inputs	Rated input voltage	Positive/Negative common
64points	**24VDC**	

Response time	External connections	
1 to 70ms or less	**40-pin connector ×2**	

L series Features

CPU

► I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Positive or negative common

LX40C6 LX41C4 LX42C4

All DC input modules are capable of using both positive or negative common connections; separate modules are not necessary.

Adjustable sensing speed

LX40C6 LX41C4 LX42C4

For all DC input modules, match the response speed to the connected devices. Choose from 1, 5, 10, 20 or 70ms.

■ Input module specifications

[AC input module]

Item		LX10	LX28
Number of input points		16 points	8 points
Rated input voltage, frequency		100 to 120VAC (+10%/-15%), 50/60Hz (±3Hz)	100 to 240VAC (+10%/-15%), 50/60Hz(±3Hz)
Input voltage distortion		Within 5%	
Rated input current		8.2mA (100VAC, 60Hz), 6.8mA (100VAC, 50Hz)	16.4mA (200VAC, 60Hz), 13.7mA (200VAC, 50Hz), 8.2mA (100VAC, 60Hz), 6.8mA (100VAC, 50Hz)
Inrush current		Max. 200mA within 1ms	Max. 950mA within 1ms
ON voltage/ON current		80VAC or higher/5mA or higher (50Hz, 60Hz)	
OFF voltage/OFF current		30VAC or lower/1.7mA or lower (50Hz, 60Hz)	
Input impedance		12.2kΩ (60Hz), 14.6kΩ (50Hz)	
Response time	OFF to ON	15ms or less (100VAC 50Hz, 60Hz)	15ms or less (100VAC 50Hz, 60Hz) 10ms or less (200VAC 50Hz, 60Hz)
	ON to OFF	20ms or less (100VAC 50Hz, 60Hz)	20ms or less (100/200VAC 50Hz, 60Hz)
Common terminal arrangement		16 points/common	8 points/common
Maximum number of modules specification		Counts as 1 module	
Number of occupied I/O points		16 points (I/O assignment: input 16 points)	
External connections		18-point screw terminal block	
5VDC internal current consumption		90mA (TYP. all points ON)	80mA (TYP. all points ON)
Weight		0.17kg	0.15kg

[DC input module]

Item		LX40C6	LX41C4	LX42C4
Number of input points		16 points	32 points	64 points
Rated input voltage		24VDC (+20%/-15%, ripple ratio within 5%)		
Rated input current		6.0mA TYP. (at 24VDC)	4.0mA TYP. (at 24VDC)	
ON voltage/ON current		15V or higher/4mA or higher	19V or higher/3mA or higher	
OFF voltage/OFF current		8V or lower/2mA or lower	9V or lower/1.7mA or lower	
Input impedance		3.8kΩ	5.7kΩ	
Response time	OFF to ON	1ms/5ms/10ms/20ms/70ms or less Initial setting is 10ms.		
	ON to OFF			
Common terminal arrangement		16 points/common	32 points/common	
Maximum number of modules specification		Counts as 1 module		
Number of occupied I/O points		16 points (I/O allocation: input 16 points)	32 points (I/O assignment: input 32 points)	64 points (I/O allocation: input 64 points)
External connections		18-point screw terminal block	40-pin connector	40-pin connector ×2
5VDC internal current consumption		90mA (TYP. all points ON)	100mA (TYP. all points ON)	120mA (TYP. all points ON)
Weight		0.15kg	0.11kg	0.12kg

Output Modules

■ LY10R2
Contact output

Number of outputs **16points**	Max. switching load **264VAC/125VDC**
Rated switching current **2A/point**	Response time **12ms or less**
External connections **18-point terminal block**	

■ LY20S6
Triac output

Number of outputs **16points**	Rated load voltage **100 to 240VAC**
Max. load current **0.6A/point**	Response time **1ms + 0.5cycles or less**
External connections **18-point terminal block**	

■ LY40NT5P
Transistor output

Number of outputs **16points**	Rated load voltage **12 to 24VDC**
Max. load current **0.5A/point**	Response time **1ms or less**
Sink type	**Protection Function**
External connections **18-point terminal block**	

■ LY41NT1P
Transistor output

Number of outputs **32points**	Rated load voltage **12 to 24VDC**
Max. load current **0.1A/point**	Response time **1ms or less**
Sink type	**Protection Function**
External connections **40-pin connector**	

■ LY42NT1P
Transistor output

Number of outputs **64points**	Rated load voltage **12 to 24VDC**
Max. load current **0.1A/point**	Response time **1ms or less**
Sink type	**Protection Function**
External connections **40-pin connector ×2**	

■ LY40PT5P
Transistor output

Number of outputs **16points**	Rated load voltage **12 to 24VDC**
Max. load current **0.5A/point**	Response time **1ms or less**
Source type	**Protection Function**
External connections **18-point terminal block**	

■ LY41PT1P
Transistor output

Number of outputs **32points**	Rated load voltage **12 to 24VDC**
Max. load current **0.1A/point**	Response time **1ms or less**
Source type	**Protection Function**
External connections **40-pin connector**	

■ LY42PT1P
Transistor output

Number of outputs **64points**	Rated load voltage **12 to 24VDC**
Max. load current **0.1A/point**	Response time **1ms or less**
Source type	**Protection Function**
External connections **40-pin connector ×2**	

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products
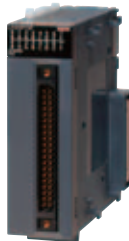
Module protection features

| LY40NT5P | LY41NT1P | LY42NT1P | LY40PT5P | LY41PT1P | LY42PT1P |

Modules are built with countermeasures in case of external load short-circuits to protect against over-current and over-heating.

Direct drive of magnetic contactors

The SD-Q series (DC interface contactor) includes a small VA coil which can be directly driven from the programmable controller without requiring an amplifying relay.

The MS-N series (magnetic contactor) is suitable for a wide range of motor capacities by adding the DC interface module.

Transistor output — DC control
Triac output Relay output — AC control

DC interface contactor SD-Q
DC interface module
Magnetic Contactor S-N
Inverter
Motor starter MSO-N
Motor / Motor / Motor
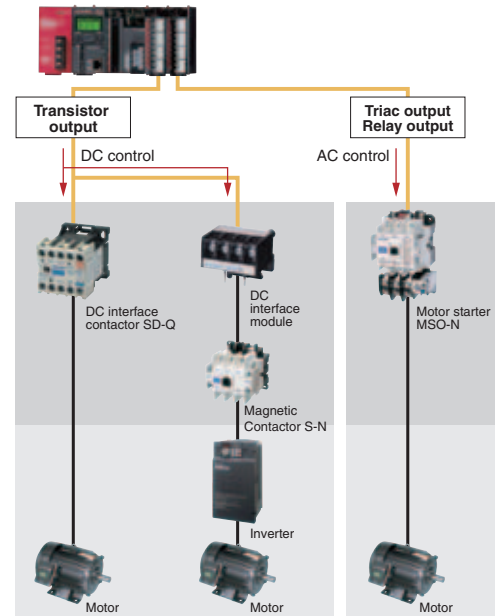
		Programmable controller output module type		
		Transistor output	Relay output	Triac output
DC interface contactor SD-Q series	DC control	○	○	—
Magnetic contactor MS-N series	AC control	○ (Using DC/AC interface module)	○	○
	DC control	○	×	—

* This table shows information relative to the programmable controller output module type and operation interface. There may be restrictions according to the type of frame size, etc., that can be used.
　Refer to the MS-N series catalog and MS-T series leaflet for the types of magnetic Contactor and models that can be used.

■ Output module specifications
[Contact output module]

Item		LY10R2
Number of output points		16 points
Rated switching voltage, current		24VDC 2A (resistive load)/point, 8A/common 240VAC 2A (COSϕ=1)/point, 8A/common
Minimum switching load		5VDC 1mA
Maximum switching load		264VAC 125VDC
Response time	OFF to ON	10ms or less
	ON to OFF	12ms or less
Life	Mechanical	20 million times or more
	Electrical	

Usage environment	Switching life
Rated switching voltage/current, rated load	100 thousand times
200VAC 1.5A, 240VAC 1A (COSϕ = 0.7)	100 thousand times
200VAC 0.4A, 240VAC 0.3A (COSϕ = 0.7)	300 thousand times
200VAC 1A, 240VAC 0.5A (COSϕ = 0.35)	100 thousand times
200VAC 0.3A, 240VAC 0.15A (COSϕ = 0.35)	300 thousand times
24VDC 1A, 100VDC 0.1A (L/R = 7ms)	100 thousand times
24VDC 0.3A, 100VDC 0.03A (L/R = 7ms)	300 thousand times

Item		LY10R2
Maximum switching frequency		3600 times/hour
Surge suppressor		—
Fuse		—
Common terminal arrangement		16 points/common
Maximum number of modules specification		Counts as 1 module
Number of occupied I/O points		16 points (I/O assignment: 16 input points)
External connections		18-point terminal block
5VDC internal current consumption		460mA (TYP. all points ON)
Weight		0.21kg

[Triac output module]

Item	LY20S6
Number of output points	16 points
Rated load voltage, frequency	100 to 240VAC (+10%/-15%), 50/60Hz(±3Hz)
Maximum load current	0.6A/point, 4.8A/common
Load voltage distortion ratio	Within 5%
Maximum load voltage	264VAC
Minimum load voltage/current	24VAC/100mA, 100VAC/25mA, 240VAC/25mA
Maximum inrush current	20A/cycle or less
Leakage current at OFF	3mA or lower (at 240V, 60Hz), 1.5mA or lower (at 120V, 60Hz)
Maximum voltage drop at ON	1.5V or lower (at load current of 0.6A)
Response time OFF to ON	Total of 1ms and 0.5 cycles or less
Response time ON to OFF	Total of 1ms and 0.5 cycles or less (rated load, resistive load)
Surge suppressor	CR absorber
Fuse	None (Attaching a fuse to each external wiring is recommended.)
Common terminal arrangement	16 points/common
Maximum number of modules specification	Counts as 1 module
Number of occupied I/O points	16 points (I/O assignment: output 16 points)
External connections	18-point terminal block
5VDC internal current consumption	300mA (TYP. all points ON)
Weight	0.22kg

[Transistor output module (Sink type)]

Item		LY40NT5P	LY41NT1P	LY42NT1P
Number of output points		16 points	32 points	64 points
Rated load voltage		12 to 24VDC (+20%/-15%)		
Maximum load current		0.5A/point, 5A/common	0.1A/point, 2A/common	
Maximum inrush current		Current is limited by the overload protection function.		
Leakage current at OFF		0.1mA or less		
Maximum voltage drop at ON		0.2VDC(TYP.)0.5A, 0.3VDC(MAX.)0.5A	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	
Response time	OFF to ON	0.5ms or less		
Response time	ON to OFF	1ms or less (rated load, resistance load)		
Surge suppressor		Zener diode		
Fuse		—		
Protection function	Overload protection	Limited current when detecting overcurrent (overload protection): 1.5 to 3.5A/point. Activated in increments of 1 point.	Overcurrent detection/overload protection limit current: 1 to 3A/point, Activated in increments of 1 point	
Protection function	Overheat protection	Activated in increments of 1 point		
External power supply	Voltage	12 to 24VDC (+20%/-15%, ripple ratio within 5%)		
External power supply	Current	9mA (at 24VDC)/common	13mA (at 24VDC)/common	9mA (at 24VDC)/common
Common terminal arrangement		16 points/common	32 points/common	
Maximum number of modules specification		Counts as 1 module		
Number of occupied I/O points		16 points (I/O assignment: 16 output points)	32 points (I/O assignment: 32 output points)	64 points (I/O assignment: 64 output points)
External connections		18-point terminal block	40-pin connector	40-pin connector ×2
5VDC internal current consumption		100mA (TYP. all points ON)	140mA (TYP. all points ON)	190mA (TYP. all points ON)
Weight		0.15kg	0.11kg	0.12kg

[Transistor output module (Source type)]

Item		LY40PT5P	LY41PT1P	LY42PT1P
Number of output points		16 points	32 points	64 points
Rated load voltage		12 to 24VDC (+20%/-15%)		
Maximum load current		0.5A/point, 5A/common	0.1A/point, 2A/common	
Maximum inrush current		Current is limited by the overload protection function.		
Leakage current at OFF		0.1mA or less		
Maximum voltage drop at ON		0.2VDC(TYP.)0.5A, 0.3VDC(MAX.)0.5A	0.1VDC (TYP.) 0.1A, 0.2VDC (MAX.) 0.1A	
Response time	OFF to ON	0.5ms or less		
Response time	ON to OFF	1ms or less (rated load, resistance load)		
Surge suppressor		Zener diode		
Fuse		—		
Protection function	Overload protection	Overcurrent detection: 1.5A or more/point. Activated in increments of 1 point.	Limited current when detecting overcurrent (overload protection): 1 to 3A/point. Activated in increments of 1 point.	
Protection function	Overheat protection	Activated in increments of 1 point.	Activated in increments of 2 point.	
External power supply	Voltage	12 to 24VDC (+20%/-15%, ripple ratio within 5%)		
External power supply	Current	17mA (at 24VDC)/common	20mA (at 24VDC)/common	
Common terminal arrangement		16 points/common	32 points/common	
Maximum number of modules specification		Counts as 1 module		
Number of occupied I/O points		16 points (I/O assignment: 16 output points)	32 points (I/O assignment: 32 output points)	64 points (I/O assignment: 64 output points)
External connections		18-point terminal block	40-pin connector	40-pin connector ×2
5VDC internal current consumption		100mA (TYP. all points ON)	140mA (TYP. all points ON)	190mA (TYP. all points ON)
Weight		0.15kg	0.11kg	0.12kg

■ How to read the product code

L Y 4 0 NT 5 P
① ② ③ ④ ⑤ ⑥

Number	Item	Code	Specification				
①	Module type	X	Input				
		Y	Output				

Number	Item	Code	Specification				
			Input module		Output module		
			AC input	DC input	Contact output	Triac output	Transistor output
②	Voltage specification	1	100 to 120VAC	—	24VDC/240VAC	—	—
		2	100 to 240VAC	—	—	100 to 240VAC	—
		4	—	24VDC	—	—	12 to 24VDC

Number	Item	Code	Specification
③	I/O points	0	16 points
		1	32 points
		2	64 points
		8	8 points

Number	Item	Code	Specification
④	I/O type	Blank	AC input
		C	DC input (positive / negative shared common)
		NT	Transistor output module (Sink type)
		PT	Transistor output module (Source type)
		R	Contact output
		S	Triac output

Number	Item	Code	Specification				
			Input module		Output module		
			AC input	DC input	Contact output	Triac output	Transistor output
⑤	Current specification	1	—	—	—	—	0.1A
		2	—	—	2A	—	—
		4	—	4mA	—	—	—
		5	—	—	—	—	0.5A
		6	—	6mA	—	0.6A	—

Number	Item	Code	Specification
⑥	Extra Specifications	P	Includes protection function

L series Features

CPU

► I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Analog Input Module

■ L60AD4

Number of inputs **4 points** (channels)	Input voltage **-10 to 10VDC**	Input current **0 to 20mADC**
Conversion speed **20μs/ch**	Resolution **1/20000**	Accuracy **±0.1%**
Scaling function	**Shift function**	**Logging function**
Difference conversion function	**Input signal error detection extension function**	**Input range extended mode function**
Flow amount integration function	**Conversion speed switch function**	**Warning output function** Process alarm
GX Works2 **Error history**		

Dual channel Isolation Analog Input Module

■ L60AD4-2GH

NEW

Number of inputs **4 points** (channels)	Input voltage **-10 to 10VDC**	Input current **0 to 20mADC**
Conversion speed **40μs/2ch**	Resolution **1/32000**	Accuracy **±0.05%**
Scaling function	**Digital filter function**	**Primary delay function**
Shift function	**Logging function**	**Difference conversion function**
Input signal error detection extension function	**Input range extended mode function**	**Warning output function** Process alarm/rate alarm
Dual channel isolation	**Trigger conversion function**	**Flow amount integration function**
GX Works2 **Error history**		

Analog Output Module

■ L60DA4

Number of outputs **4 points** (channels)	output voltage **-10 to 10VDC**	output current **0 to 20mADC**
Conversion speed **20μs/ch**	Resolution **1/20000**	Accuracy **±0.1%**
Scaling function	**Warning output function**	**Analog output HOLD/CLEAR function**
Wave Output Function	GX Works2 **Error history**	

Reduce programming man-hours using the scaling function

L60AD4   L60AD4-2GH   L60DA4

[Scaling function]

The scaling function converts values directly to easy-to-understand units without requiring any programming.

Since a separate conversion program is not required, the number of overall programming steps can be reduced.

Scaling settings example (L60AD4)

Normally an analog input of 4 to 20mA is converted to a digital value from 0 to 20000. Using the scaling feature, the same input can result in a digital value of ±20000.

[Before scaling]
Digital output value

Scaling: Valid

Scaling upper limit value
"20000"

Scaling lower limit value
"-20000"

Scaling upper/lower limit values can be set within the range from -32000 to 32000.

[After scaling]
Scaling value
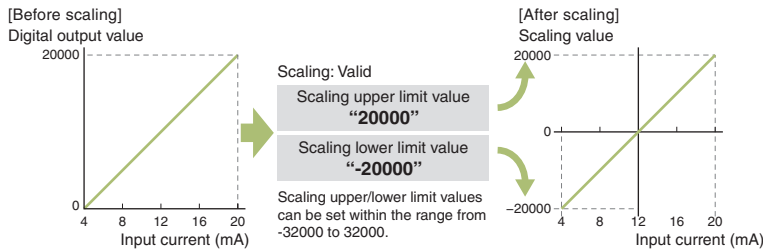
Input current (mA)

Input current (mA)	Digital output value	Scaling value
4	0	−20000
8	5000	−10000
12	10000	0
16	15000	10000
20	20000	20000

[Digital filtering function[1] NEW]

This function eliminates unnecessary frequency elements with simple parameter settings. Select from low pass filter, high pass filter or band pass filter.

Programming steps can be further reduced as extra ladder code is not required to achieve the filter processing.

The filtered A/D conversion program is available at the same time as conversion completion, reducing the overall conversion to filter process time.

Direct current

Low frequency

Medium frequency

High frequency

Wave containing direct current, low/medium/high frequencies

After low pass filter

After band pass filter

After high pass filter

Measurement of flatness
Eliminate parts with different flatness.

Sensor

Workpiece

■ **When low pass is processed with ladder**
When requiring a filter processing program, more than 300 lines are necessary.

Not required when using digital filter function

■ **Total time when processing digital filter with ladder**

Processing time is reduced by using the digital filter function

A/D conversion time

Program processing time (filter process)

[Time lag filter function[1] NEW]

The primary delay filter constant outputs a digital value which filters out (smooths) the excessive noise.

[1] Supported only with L60AD4-2GH.

Easily and finely adjust the system startup time with the shift function.

L60AD4   L60AD4-2GH

[Shift function[1]]

Using this function, the set shifting amount to conversion value can be added (shifted) to the digital output value.

When the shifting amount to conversion value is changed, it is reflected to the scaling value (digital operation value) in real time. Therefore, fine adjustment can be easily performed when the system starts.

[1] Compatible with L60AD4 analog input modules starting with serial No. "13041" or higher.

For L60AD4

■ Before adjustment

Input voltage (V)	Digital output value
0	-10
5	19990

Shifting amount to conversion value: +10

■ After adjustment

Input voltage (V)	Scaling value (digital operation value)
0	0
5	20000

Digital output value

+

Shifting amount to conversion value   +10

↓

Scaling value (digital operation value)

Scaling value (digital operation value)

Digital output value (before adjustment)

Analog input voltage (V)

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products
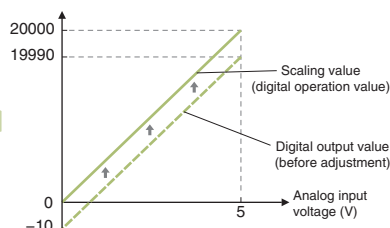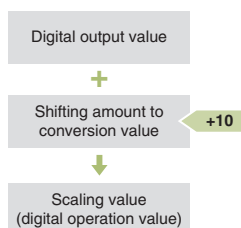
Log data for up to 10,000 points

[Logging function*1]

Data is continuously collected at the set cycle and stored in the buffer memory.

Data stored in the buffer memory can be used for debugging, and to periodically confirm data variations.

Item	Description	
	L60AD4	L60AD4-2GH
Collectable points	10000 points (ch)	
Collectable data	Digital output value or scaling value (digital operation value)	
Logging cycle*2	80 to 32767µs 1 to 32767ms 1 to 3600s	40 to 32767µs 1 to 32767ms 1 to 3600s
Conversion speed	80µs, or 1ms	40µs / 2ch
Level trigger condition	Above, Below, Pass Through	
Logging points after trigger	1 to 10000	

The logging data can be analyzed with the GX LogViewer or MX Sheet.

*1 Compatible with L60AD4 analog input modules starting with serial No. "13041" or higher.

*2 The actual logging cycle is "an integral multiple of the conversion cycle of each A/D conversion method".
Ex.) When using the sampling processing: Conversion cycle = conversion speed × number of channels in use.

When an error is detected in the digital value:

Start the logging facility	Store data to the buffer memory	Trigger occurred	Stop logging
	A large amount of data can be logged at high speed.	Conditions for the level trigger can be set.	Logging points after the trigger can be set.

Display and analyze data with GX LogViewer or MX Sheet

Logging data can be transferred to the CPU device memory while still logging.

Logging and data transmission can be executed simultaneously so the next logging session can be started right away.

[Logging for 10,000 points and greater]

When logging of 1001 - 2000 points of data commences, the first 1000 points (1 - 1000) are stored into the CPU device memory. By storing every 1000 points of data in the CPU, overall logging of total data larger than 1000 points can be logged.

Collected data

Buffer memory (L60AD4)

1st data
2nd data
3rd data
4th data
5th data
6th data
⋮
9999th data
10000th data

When data for 10,000 points has been stored, the data is overwritten from the 1st point data.

Logging completed area

Logging area

Logging standby area

Buffer memory (L60AD4)

1st to 1000th data
1001st to 2000th data
2001st to 3000th data
3001st to 4000th data
4001st to 5000th data
5001st to 6000th data
6001st to 7000th data
7001st to 8000th data
8001st to 9000th data
9001st to 10000th data

Transfer

Log data for more than 10,000 points!

[For L60AD]
Write to Ladder program from CPU.

[For L60AD4-2GH]
L60AD4-2GH requests interrupt from CPU by setting the parameters.

CPU device memory

1st to 1000th data

Easily measure part thicknesses!

[Difference conversion function*1]

When the difference conversion starts, the scaling value (digital operation value) at that time is determined as the difference conversion reference value. The value acquired by subtracting the difference conversion reference value from the scaling value (digital operation value) is stored as the scaling value (digital operation value) after difference conversion.

For L60AD4

Scaling value (digital operation value)

20000
10000
7500
2500
0
−2500

Difference conversion reference value

Scaling value (digital operation value)

Time

Difference conversion trigger

| No request (0) | Trigger request (1) | No request (0) |
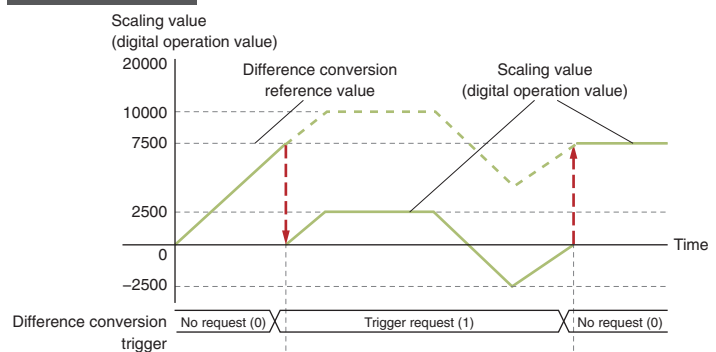
$$\text{Scaling value (digital operation value) after difference conversion} = \text{Scaling value (digital operation value)} - \text{Difference conversion reference value}$$

*1 Compatible with L60AD4 analog input modules starting with serial No. "13041" or higher.

Extend the detection method according to applications

[Input signal error detection extension function*1]
Using this function, the detection method of the input signal error detection function can be extended. Use this function to detect an input signal error only at the lower or upper limit, or to execute the disconnection detection.

[Input range extended mode function*1]
The input range can be extended. By combining this function with the input signal error detection function, simple disconnection detection can be executed.

*1 This function is compatible with analog input modules starting with serial No. "13041" or higher.

[Warning Output function]
■ Process Alarm*1
Outputs an alarm when the digital output value exceeds a preset range.
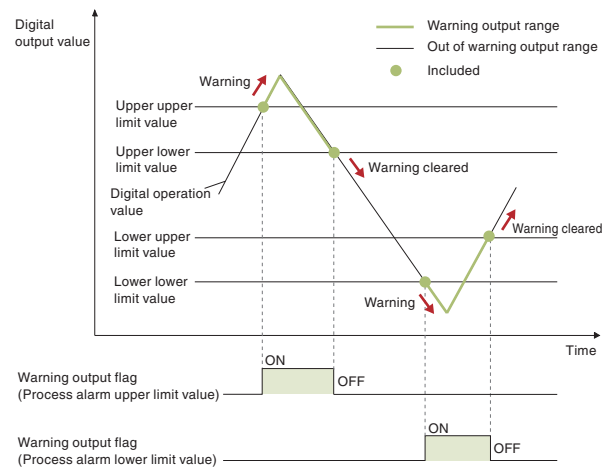
■ Rate alarm*2 **NEW**
An alarm is generated if the digital output value's variation rate is larger than the rate alarm upper limit value, or if it is smaller than the rate alarm lower limit value.
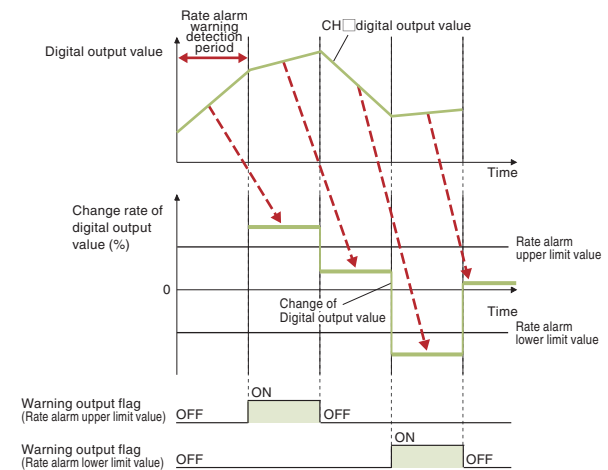
*1 Compatible with L60AD4 analog input modules starting with serial No. "13041" or higher.
*2 Supported only with L60AD4-2GH.

Noise isolation for smoother system operation

[Dual channel isolation **NEW**]
Noise interference is prevented by isolating every two channels resulting in far more stable measurements.

Dual channel isolation
IsolateIsolate between CH1/CH2 and CH3/CH4 to prevent the effects of noise.
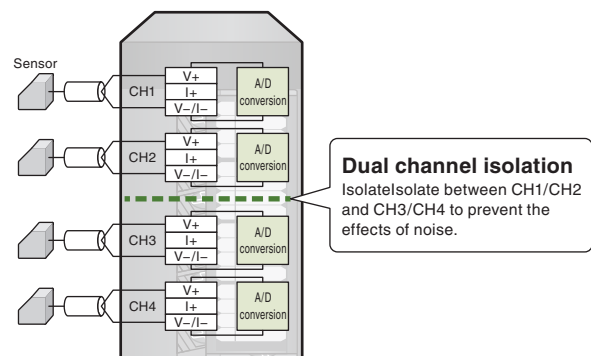
A/D variable conversion timing

[Trigger conversion function NEW]

A/D conversion is processed at the rising edge of the trigger position timing.

This function enables easier use of the converter and enhances the overall program performance.

There are two types of trigger conversion request: "External trigger conversion request (external input terminal)" or "internal trigger conversion request (buffer memory)".

Analog input signal

Displacement sensor

Trigger conversion request from external input terminal

The time from when Trigger conversion request is turned on until when Trigger conversion completed flag is turned on

- - → Controlled by the A/D converter module
— → Controlled by the program

Trigger conversion request

A/D conversion*

Digital operation value*

Trigger conversion completion flag

Trigger conversion complete clear request

* Carried out in order with combination of CH1, CH3 and CH2, CH4.

Quickly calculate and record flow amount

[Flow amount integration function*1]

This function performs the A/D conversion of analog input value (voltage or current) from a flow meter and others, and integrates the scaling value (digital operation value) by every integration cycle. In this function, integral processing is performed regarding the scaling value (digital operation value) as the instantaneous flow amount.

■ Concept of integral processing

With this function, integral processing is performed using the following formula.

$$\text{Integrated flow amount} = \left(\text{Instantaneous flow amount} \times \frac{\Delta T}{T} \times \text{Unit scaling} \right) + \text{Previous amount}$$

*1 This function is compatible with analog input modules starting with serial No. "13041" or higher.

Analog input value

Time

Integrated flow amount

Integration cycle
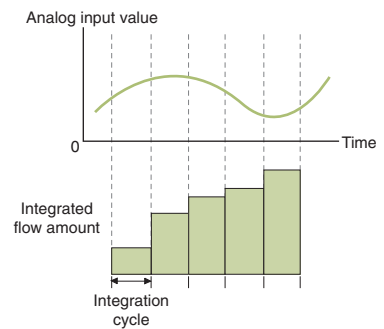
Item	Description
Integrated flow amount	Result of integral processing
Instantaneous flow amount	Instantaneous flow amount value output in analog from flow meter
ΔT	Integration cycle (ms)
T	Conversion value to convert time unit of instantaneous flow amount to ms unit

Range of flow meter	Setting value to specify flow amount time unit	T (ms)
/s	0	1000
/min	1	60000
/h	2	3600000

Unit scaling for integrated flow amount
This is used when the value of instantaneous flow amount × ΔT/T is 0 to 1.

Setting value to specify unit scaling	Unit scaling
0	1
1	10
2	100
3	1000
4	10000

Item	Description
Previous amount	Stored integrated flow amount value before integral processing

Realize fast and smooth continuous analog output L60DA4

[Wave Output function[1]]

The industry's first[2] waveform output function is included. (Patent pending)

This function enables control wave data that is faster than the program control to be directly registered in the D/A converter module and output the data at a set conversion cycle.

Therefore, the analog output value is not affected by the scan time of the CPU module resulting in faster and smoother analog control.

[1] Supported by CPU module whose first five serial number digits are "14041" or later.

[2] Mitsubishi Electric survey dated April 2012.

Analog output from sequence program.

Analog values are output at each scan time.
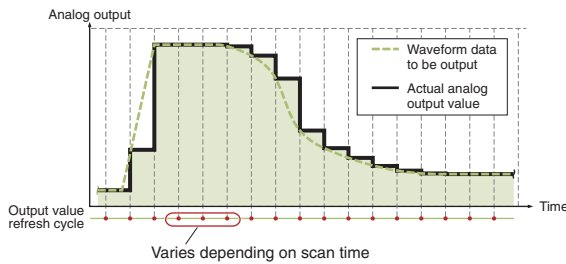
The actual waveform and the output waveform deviate.

Analog output with waveform output function

Analog values are output at set interval.
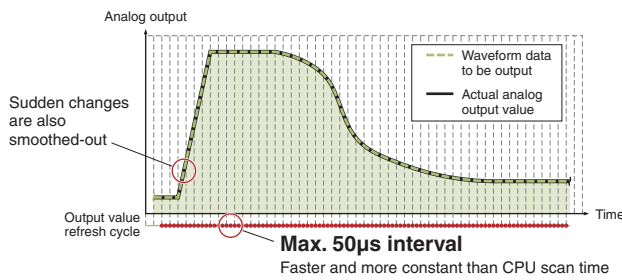
The output waveform is closer to the actual waveform (less deviation).

Register up to 50000 points of waveform output data

① **Using GX Works2 to create the waveform output data to be analog output**

Designate waveform

Circular arc

(Do not specify)
Circular arc
Straight line
Exponential function
Logarithmic function
Sine function
Cosine function
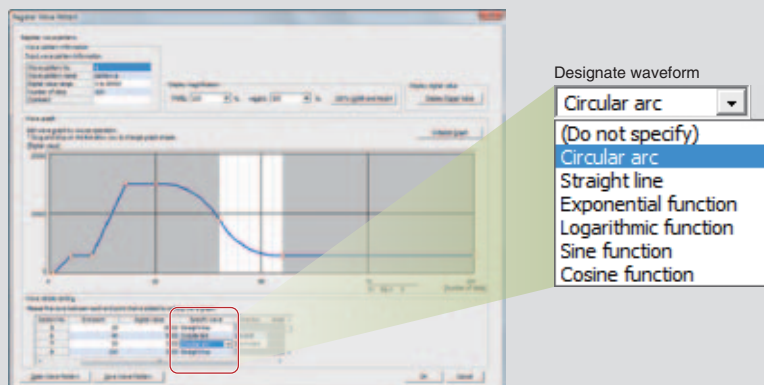
By registering the waveform patterns (multiple), they can be combined freely with the tool.

② **Save waveform output data into CPU module's file resister (or SD memory card)**

Save by direct connection via Ethernet or USB

Save waveform output data onto SD memory card in situations with no access to a PC.
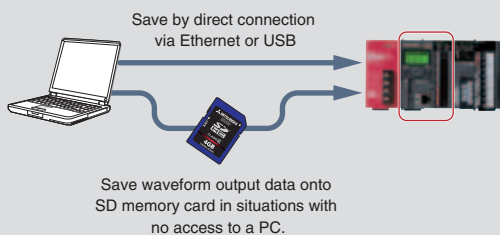
③ **Execute the function block (FB)[3] and register into analog output module**
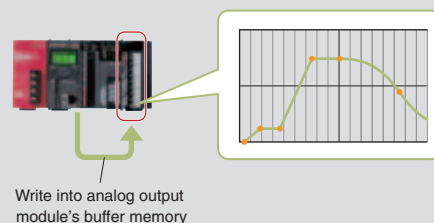
Write into analog output module's buffer memory

[3] Contact your local Mitsubishi Electric sales office or representative.

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Easily adjust waveform output data `L60AD4`

[Wave output step action function[*1]]

The waveform output data can be changed even when the analog output module is in conversion This provides a good way of adjusting the waveform output while in operation. (Patent pending)

*1 Supported by CPU module with first five serial number digits are "14041" or later.

Analog output a designated buffer memory's address value

If current address is "14990" (Ⓐ) the output range is set to -10 to 10V range and receives "waveform output step execution request", the address 15000 (Ⓑ) and address 14995 (Ⓒ) data is executed.

Address	Waveform output data (digital value)
14986	−10000
14987	−8000
14988	−6000
14989	−2000
14990	0
14991	2000
14992	4000
14993	6000
14994	8000
14995	10000
14996	12000
14997	14000
14998	16000
14999	18000
15000	20000

①Waveform output step execution request turns ON

②Module receives request

③Movement amount is set to "10"

④Module receives movement amount

⑤Movement amount is set to "-5"

⑥Module receives movement amount

The designated address value can be changed, so the waveform output data can also be adjusted.

Address	Waveform output data (digital value)
14992	4000
14993	6000
14994	8000 → 8200
14995	10000
	12000
	14000

Analog output

Address 15000 data is analog output
Address 14990 data is held
Address 14995 data is analog output

Address can be moved to data to be output and the output value can be output

---

High-speed conversion `L60AD4` `L60AD4-2GH` `L60DA4`

High performance analog processing fully utilizing the CPU capability is possible with the 40µs/2ch (L60AD4-2GH) and 20µs/ch (L60AD4, L60DA4) high-speed conversion.

High resolution `L60AD4` `L60AD4-2GH` `L60DA4`

The 1/32000 (L60AD4-2GH) or 1/2000 (L60AD4, L60DA4) resolution can be realized in all ranges. Ideal for high-end control.

High conversion accuracy `L60AD4` `L60AD4-2GH` `L60DA4`

The conversion accuracy is high at ±0.05% (L60AD4-2CH) and ±0.1% (L60AD4, L60DA4). Realize very accurate control.

Ensure stability with variable conversion speed `L60AD4`

The conversion speed can be switched between 20µs/ch, 80µs/ch, and 1ms/ch. By selecting the appropriate conversion speed according the connected device's specifications, stable analog input signals can be obtained even in noisy environments.

■ Specifications

Item		L60AD4 [Analog input module]	L60AD4-2GH NEW [Dual channel isolation analog input module]	L60DA4 [Analog output module]
Number of analog input/output points		4 points (ch)		
Analog input	Voltage	-10 to 10VDC (Input resistance value 1MΩ)		—
	Current	0 to 20mADC (Input resistance value 250Ω)		—
Digital output		-20480 to 20479	-32000 to 32000	—
	When using the scaling function	-32768 to 32767		—
Digital input		—		-20480 to 20479
	When using the scaling function	—		-32768 to 32767
Analog output	Voltage	—		-10 to 10VDC (External load resistance value 1kΩ to 1MΩ)
	Current	—		0 to 20mADC (External load resistance value 0Ω to 600Ω)

I/O characteristics, resolution

L60AD4

	Analog input range	Digital output value	Resolution
Voltage	0 to 10V	0 to 20000	500µV
	0 to 5V		250µV
	1 to 5V		200µV
	-10 to 10V	-20000 to 20000	500µV
	1 to 5V (Extended mode)	-5000 to 22500	200µV
	Users range setting	-20000 to 20000	307µV[*1]
Current	0 to 20mA	0 to 20000	1000nA
	4 to 20mA		800nA
	4 to 20mA (Extended mode)	-5000 to 22500	800nA
	Users range setting	-20000 to 20000	1230nA[*1]

L60AD4-2GH

	Analog input range	Digital output value	Resolution
Voltage	0 to 10V	0 to 32000	312.5µV
	0 to 5V		156µV
	1 to 5V		125µV
	-10 to 10V	-32000 to 32000	312.5µV
	1 to 5V (Extended mode)	-8000 to 32000	125µV
	Users range setting	-32000 to 32000	200µV[*1]
Current	0 to 20mA	0 to 32000	625nA
	4 to 20mA		500nA
	4 to 20mA (Extended mode)	-8000 to 32000	500nA
	Users range setting	0 to 32000	400nA[*1]

L60DA4

	Analog output range	Digital value	Resolution
Voltage	0 to 5V	0 to 20000	250µV
	1 to 5V		200µV
	-10 to 10V	-20000 to 20000	500µV
	Users range setting		333µV[*1]
Current	0 to 20mA	0 to 20000	1000nA
	4 to 20mA		800nA
	Users range setting	-20000 to 20000	700nA[*1]

Accuracy, Conversion speed, etc.

Item		L60AD4	L60AD4-2GH	L60DA4
Accuracy	Ambient temperature 25±5°C	Within ±0.1% (±20digit)[*2]	—	Within ±0.1% (voltage: ±10mV, current: ±20µA)[*3]
	Ambient temperature 0 to 55°C	Within ±0.2% (±40digit)[*2]	—	Within ±0.3% (voltage: ±30mV, current: ±60µA)[*3]
	Reference accuracy	—	Within ±0.05% (±16digit)[*4]	—
	Temperature coefficient	—	±40.1ppm/°C or less[*5]	—
Conversion speed		High speed: 20µs/ch Medium speed: 80µs/ch[*6*7] Low speed: 1ms/ch[*7*8]	40µs/2ch	20µs/ch
Absolute maximum input		Voltage: ±15V, Current: 30mA[*9]		—
Offset/gain setting count		Up to 50000 counts	Up to 100000 counts	Up to 50000 counts
Output short protection		—		Available
Isolation method		Between I/O terminals and programmable controller power supply: photocoupler isolation Between input channels: no isolation	Between I/O terminals and programmable controller power supply: photocoupler isolation Between analog input channels: dual channel transformer isolation	Between I/O terminals and programmable controller power supply: photocoupler isolation Between output channels: no insulation Between external power supply and analog output: transformer insulation
Dielectric withstand voltage		Between I/O terminals and programmable controller power supply: 500VACrms for 1 minute	Between I/O terminals and programmable controller power supply: 500VAC for minute Between analog input channels: 1000VAC for 1 minute	Between I/O terminals and programmable controller power supply: 500VACrms for 1 minute Between external power supply and analog output: 500VACrms for 1 minute
Insulation resistance		Between I/O terminals and programmable controller power supply: 500VDC 10MΩ or higher	Between I/O terminals and programmable controller power supply: 500VDC 10MΩ or higher	Between I/O terminals and programmable controller power supply: 500VDC 10MΩ or higher
Maximum number of modules specification		Counts as 1 module		
Number of occupied I/O points		16 points (I/O assignment: 16 points for intelligent)		
External power supply		—	—	24VDC (+20%/-15%)
		—	—	Ripple, spike 500mV(P-P) or lower
		—	—	Inrush current: 4.3A, 1000µs or shorter
		—	—	Current consumption: 0.18A
External connections		18-point terminal block		
5VDC internal current consumption		0.52A	0.76A	0.16A
Weight		0.19kg	0.20kg	0.20kg
External trigger input	Input points	—	1 point	—
	Rated input voltage	—	24VDC (+20%/-15%, ripple ratio: within 5%)	—
	Rated input current	—	6mA	—
	ON voltage/ON current	—	13V or more, 3mA or more	—
	OFF voltage/OFF current	—	8V or less, 1.6mA or less	—
	Input resistance	—	3.9kΩ	—
	Response time OFF→ON	—	40µs	—
	Response time ON→OFF	—	40µs	—

*1: Maximum resolution in users range settings.
*2: Accuracy for the maximum digital output value. Except when influenced by noise.
*3: Accuracy for the maximum analog output value. Except when influenced by noise. Power on (warm-up) the module for 30 minutes to satisfy the accuracy shown in the table.
*4: Accuracy under the ambient temperature when the offset/gain setting is performed.
*5: Accuracy when the temperature changes 1°C.
　　Example: Accuracy when the temperature changes from 25°C to 30°C
　　　　　　0.05% + 0.00401%/°C (temperature coefficient) × 5°C (temperature change) = 0.070%
*6: The default value is 80µs/channel.
*7: The logging function can be used only in the middle speed (80µs/channel) or low speed (1ms/channel).
*8: The flow amount integration function can be used only in the low speed (1ms/channel).
*9: Maximum instantaneous current value that will not cause destruction of the internal components. The maximum constant input current value is 24mA.

Temperature Control Modules

■ **L60TCTT4**
Thermocouple

Temperature input points **4 points** (channels)	**Standard control**	**Heating-cooling control**
Self-tuning function	**Peak current suppression function**	**Simultaneous temperature rise function**	**Selectable sampling cycle**
Temperature input mode	**Temperature control mode**
GX Works2 **Error history**

■ **L60TCTT4BW**
Thermocouple

Temperature input points **4 points** (channels)	**Standard control**	**Heating-cooling control**
Self-tuning function	**Peak current suppression function**	**Simultaneous temperature rise function**	**Selectable sampling cycle**
Temperature input mode	**Temperature control mode**	**Heater disconnection detection function**
GX Works2 **Error history**

■ **L60TCRT4**
Platinum RTD

Temperature input points **4 points** (channels)	**Standard control**	**Heating-cooling control**
Self-tuning function	**Peak current suppression function**	**Simultaneous temperature rise function**	**Selectable sampling cycle**
Temperature input mode	**Temperature control mode**
GX Works2 **Error history**

■ **L60TCRT4BW**
Platinum RTD

Temperature input points **4 points** (channels)	**Standard control**	**Heating-cooling control**
Self-tuning function	**Peak current suppression function**	**Simultaneous temperature rise function**	**Selectable sampling cycle**
Temperature input mode	**Temperature control mode**	**Heater disconnection detection function**
GX Works2 **Error history**

Highly stable temperature control

[Standard control/heating and cooling control]
Prevent overheating and overcooling in devices that require a high level of temperature stability, such as in an extrusion molding machine.
The following control methods can be selected according to the target device.
• Standard control (heating or cooling)
• Heating/cooling control (heating and cooling)
• Mix control (combination of standard control and heating-cooling control)

■ **Example: Standard control** (heating only)
The temperature of the object is controlled by adjusting the heater output based on the PID calculations resulting from the temperature sensor input.

Temperature sensor input

Control output (heating)
Heater coil
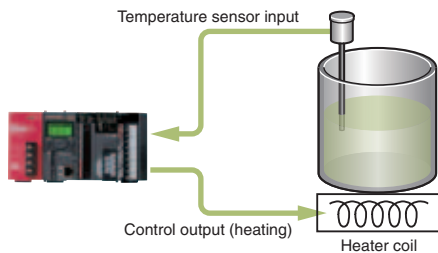
■ **Example: Heating-cooling control**
(heating and cooling elements controlled simultaneously)
Heating is performed when the control object's temperature is lower than the target temperature, and cooling is performed when it is hotter or the humidity needs to be reduced.

Temperature sensor input

Refrigeration unit

Control output (cooling)

Control output (heating)
Heater coil
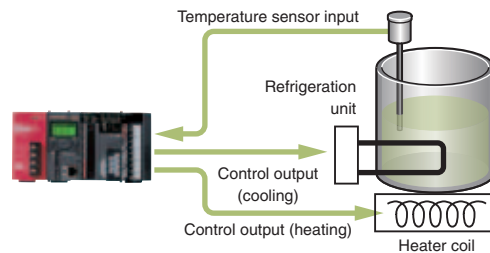
Reduce running costs by taking advantage of the energy-saving effect

[Peak current control function]
The peak current control function reduces the peak current by automatically changing the upper limit output limiter value for each channel, while dividing the transistor output timing[1]. The energy conserved by reducing the peak current, such as a reduction in system power capacity and reduction in contracted power, can help to reduce running costs.

*1. The timing can be split between two to four outputs.

The maximum power supply capacity requirement is lowered. We can save money on our electricity contract!

Power control unit (conditioning)

Switch gear   Switch gear   Switch gear   Switch gear

Channel CH1 - CH4   Channel CH1 - CH4   Channel CH1 - CH4   Channel CH1 - CH4
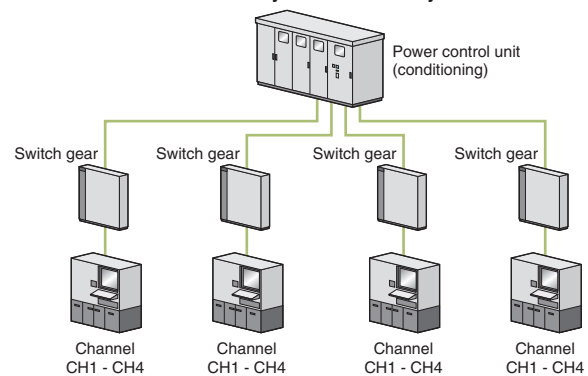
When two or more loads are being controlled, the peak current can be minimized by spreading the total load out over time.

■ **Without peak current control function**

20s

CH1 Transistor output
CH2 Transistor output
CH3 Transistor output
CH4 Transistor output

Because all transistor outputs are turned on at the same time, the peak current is high.

Peak current

It is possible to space the outputs out over a longer period of time.

■ **With peak current control function**

20s

5s   5s   5s   5s

The output timing is offset

By controlling the output timing, the peak current can be reduced by 75%.

The peak current is reduced.

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Ensures uniform temperature control

[Simultaneous temperature rise function]

Ensures uniform temperature control by synchronizing the temperature arrival times from multiple loops.

Perform a uniform temperature rise using two or more control loops without going over temperature or resulting in unexpected thermal expansion.

A "no idling" format increases energy efficiency and reduces running costs.

■ **Example: Temperature control of injection molding machine**

Heating coils

Part mold   Heating cylinder
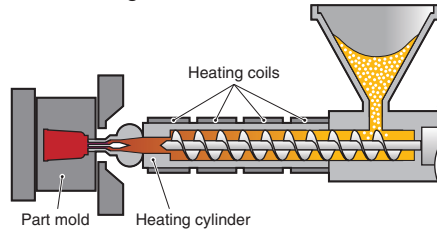
■ **Example: Wafer heating process for semiconductor manufacturing**

Wafer

Hot plate

| Setting value 1 | Setting value 2 |
| Setting value 3 | Setting value 4 |
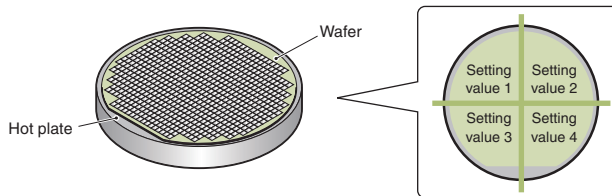
The running costs is reduced!

■ **Without the simultaneous temperature rise function**

■ **With the simultaneous temperature rise function**

The time it takes each channel to reach it's set value is matched to the slowest time of CH4.
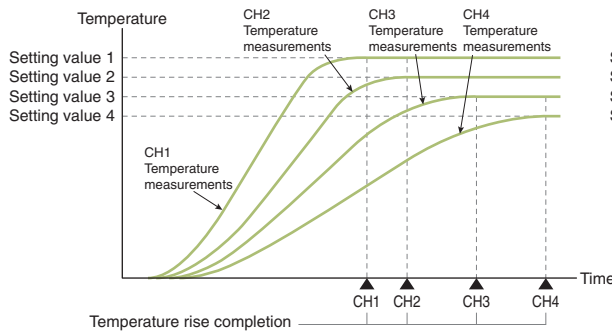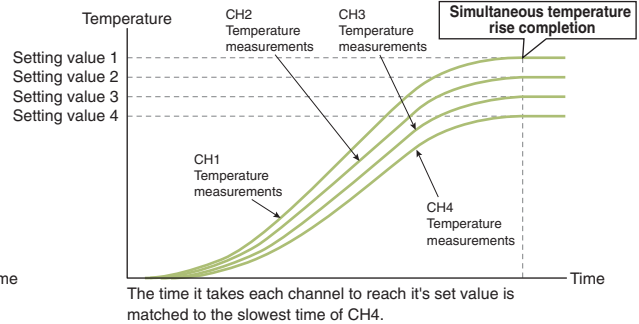
Using this function, it is possible to coordinate the control of two or more loops to reach their target values (SV) at the same time. Control the simultaneous rise in temperature of separate loops by setting a channel group (Max. 2 groups). This is an effective way to control applications where differing target temperature arrival times can result in undesirable temperature differentials.

Support a range of system requirements

[Sampling cycle change function]

Choose a sampling cycle of 250 ms/4 channels or 500 ms/4 channels.

CH1 PID operation	CH2 PID operation	CH3 PID operation	CH4 PID operation	CH1 PID operation	CH2 PID operation
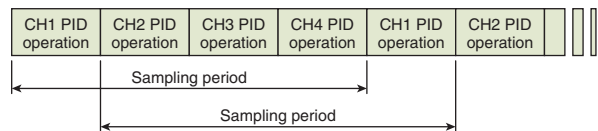
Sampling period: The time it takes to execute a PID operation for all channels (CHn) before beginning the PID operation of the present channel (CHn) again is called a sampling period.

Temperature input mode

This function allows the temperature control module to be used as a standard temperature input module.

Using the switch setting, it is possible to easily change the input mode.

Temperature sensor input
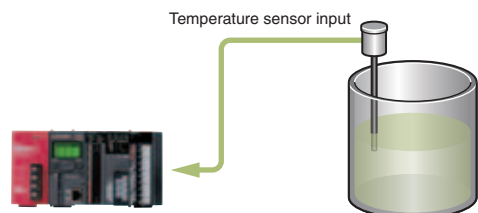
■ Specifications

Item			L60TCTT4	L60TCTT4BW	L60TCRT4	L60TCRT4BW
Control output			Transistor output			
Number of temperature input points			4 points (ch)			
Applicable temperature sensors			Thermocouple		Resistive thermal device	
Accuracy*1	Indication accuracy	Ambient temperature: 25 ± 5°C	Full scale × (±0.3%)			
		Ambient temperature: 0 to 55°C	Full scale × (±0.7%)			
	Cold junction temperature compensation accuracy: (ambient temperature: 0 to 55°C)	Temperature process value (PV): -100°C or more	Within ± 1.0°C		—	
		Temperature process value (PV): -150 to -100°C	Within ± 2.0°C			
		Temperature process value (PV): -200 to -150°C	Within ± 3.0°C			
Sampling cycle			250ms/4 channels 500ms/4 channels			
Control output cycle			0.5 to 100.0s			
Input impedance			1MΩ			
Input filter			0 to 100s (0: Input filter OFF)			
Sensor correction value setting			-50.00 to 50.00%			
Operation at sensor input disconnection			Upscale processing			
Temperature control method			PID ON/OFF pulse or two-position control			
PID constants range	PID constants setting		Can be set by auto tuning.			
	Proportional band (P)		0.0 to 1000.0% (0: Two-position control)			
	Integral time (I)		0 to 3600s (set 0 for P control and PD control.)			
	Derivative time (D)		0 to 3600s (set 0 for P control and PI control.)			
Set value (SV) setting range			Within the temperature range set in the thermocouple/platinum resistance thermometer to be used			
Dead band setting range			0.1 to 10.0%			
Transistor output	Output signal		ON/OFF pulse			
	Rated load voltage		10 to 30VDC			
	Max. load current		0.1A/point, 0.4A/common			
	Max. inrush current		0.4A 10ms			
	Leakage current at OFF		0.1mA or less			
	Max. voltage drop at ON		1.0VDC (TYP) at 0.1A 2.5VDC (MAX) at 0.1A			
	Response time		OFF→ON: 2ms or less, ON→OFF: 2ms or less			
Number of accesses to non-volatile memory			Max. 10^{12} times			
Insulation method			Between input terminal and programmable controller power supply: Transformer insulation Between input channels: Transformer insulation			
Dielectric withstand voltage			Between input terminal and programmable controller power supply: 500VAC for 1 minute Between input channels: 500VAC for 1 minute			
Insulation resistance			Between input terminal and programmable controller power supply: 500VDC 20MΩ or more Between input channels: 500VDC 20MΩ or more			
Heater disconnection detection specifications	Current sensor		—	• CTL-12-S36-8 (0.0 to 100.0A)*2 *3 • CTL-12-S36-10 (0.0 to 100.0A)*2 • CTL-12-S56-10 (0.0 to 100.0A)*2 • CTL-6-P (0.00 to 20.00A)*2 *3 • CTL-6-P-H (0.00 to 20.00A)*2	—	• CTL-12-S36-8 (0.0 to 100.0A)*2 *3 • CTL-12-S36-10 (0.0 to 100.0A)*2 • CTL-12-S56-10 (0.0 to 100.0A)*2 • CTL-6-P (0.00 to 20.00A)*2 *3 • CTL-6-P-H (0.00 to 20.00A)*2
	Input accuracy			Full scale × (±1.0%)		Full scale × (±1.0%)
	Number of alert delay			3 to 255		3 to 255
Maximum number of modules specification			Counts as 1 module	Counts as 2 modules	Counts as 1 module	Counts as 2 modules
Number of occupied I/O points			16 points (I/O assignment: Intelligent 16 points)			
External connections			18-point terminal block	18-point terminal block × 2	18-point terminal block	18-point terminal block × 2
5VDC internal current consumption			0.30A	0.33A	0.31A	0.35A
Weight			0.18kg	0.33kg	0.18kg	0.33kg

*1: Calculate the accuracy in the following method (only when it is not affected by noise).
Accuracy (°C) = full scale × indication accuracy + cold junction temperature compensation accuracy
Ex.) Accuracy at the input range of 38 (-200.0 to 400.0°C), the operating ambient temperature of 35°C, and the temperature process value (PV) of 300°C
   (Full scale) × (indication accuracy) + cold junction temperature compensation accuracy
   = (400.0°C - (-200.0°C)) × (±0.007) + (±1.0°C)
   = ± 5.2°C
*2: U.R.D.Co., LTD. For more information, visit http://www.u-rd.com/
*3: The CTL-12-S36-8 and CTL-6-P can be used although they have been discontinued.

■ Control mode

Control mode	Contents	Number of controllable loops
Standard control	Performs the standard control of four channels.	Standard control 4 loops
Heating-cooling control (normal mode)	Performs the heating-cooling control. CH3 and CH4 cannot be used.	Heating-cooling control 2 loops
Heating-cooling control (expanded mode)	Performs the heating-cooling control. The number of loops is expanded using an output module and others in the system.	Heating-cooling control 4 loops
Mix control (normal mode)	Performs the standard control and the heating-cooling control. CH2 cannot be used.	Standard control 2 loops Heating-cooling control 1 loop
Mix control (expanded mode)	Performs the standard control and the heating-cooling control. The number of loops is expanded using an output module and others in the system.	Standard control 2 loops Heating-cooling control 2 loops

Control for each channel is as follows.

Channel	Standard control	Heating-cooling control		Mix control	
		Normal mode	Expanded mode	Normal mode	Expanded mode
CH1	Standard control	Heating-cooling control	Heating-cooling control	Heating-cooling control	Heating-cooling control
CH2	Standard control	Heating-cooling control	Heating-cooling control	—*1	Heating-cooling control*2
CH3	Standard control	—*1	Heating-cooling control*2	Standard control	Standard control
CH4	Standard control	—*1	Heating-cooling control*2	Standard control	Standard control

*1: Only temperature measurement using a temperature input terminal can be performed.
*2: Heating-cooling control is performed using an output module in the system.

High

Servo function and performance

Stand-alone
motion controller

iQ Platform
compatible
motion
controller

Simple
motion module
LD77MH4

Simple
motion module
LD77MH16

Positioning module
**LD75D4
LD75D2
LD75D1**

**LD75P4
LD75P2
LD75P1**

Introducing simple motion control, evolved

The MELSEC-L series includes simple motion and general positioning modules.
When used together, various possibilities become available such as synchronous control which was previously only possible using motion controllers.

Low

1 axis   4 axes   8 axes   16 axes   32 axes

Number of control axes

Simple Motion Modules

■ **LD77MH4**

Number of control axes **4 axes**	Connection system **SSCNET Ⅲ -compatible**	Positioning data **600 data/axis**	
Positioning control function	**Speed/torque control function**	**4-axis interpolation** (Linear interpolation)	**2-axis interpolation** (Circular interpolation)
Synchronous control function **External encoder**	Synchronous control function **Cam**	Synchronous control function **Phase compensation**	
Manual pulse generator operation function	**OPR control function**		

SSCNETⅢ
SERVO SYSTEM CONTROLLER NETWORK

■ **LD77MH16**

Number of control axes **16 axes**	Connection system **SSCNET Ⅲ -compatible**	Positioning data **600 data/axis**	
Positioning control function	**Speed/torque control function**	**4-axis interpolation** (Linear interpolation)	**2-axis interpolation** (Circular interpolation)
Synchronous control function **External encoder**	Synchronous control function **Cam**	Synchronous control function **Phase compensation**	
Manual pulse generator operation function	**OPR control function**		

SSCNETⅢ
SERVO SYSTEM CONTROLLER NETWORK

*SSCNET(Servo System Controller NETwork)

Countless applications are possible

A variety of control types including positioning control, speed control, torque control, cam control and synchronous control can be implemented easily with simple parameter settings and a sequence program.

[Positioning control]
- Support for a multitude of applications thanks to a wide variety of control formats including linear interpolation control (up to 4 axes), 2-axis circular interpolation control, fixed feed control and continuous orbit control.
- Use a sequence program to set the positioning address, speed, etc. for easy automatic operation.
- Quickly implement powerful auxiliary functions such as step operation, target position change, M codes, and the skip function.

XY table	Sealant application
• 2-axis linear interpolation • 2-axis circular interpolation • 3-axis linear interpolation • Continuous orbit control	• Continuous orbit control • High-speed, high-accuracy orbit calculation • Linear/circular interpolation
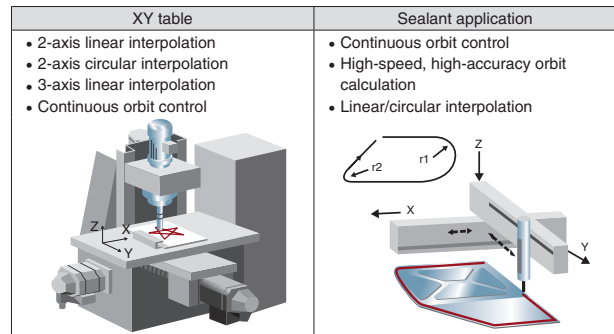
[Speed control and torque control]
- Tension control applications such as winding and rewinding are supported.
- Switch from positioning control, to speed and torque control, and back to positioning control.
  Because the present location is tracked even in speed and torque control mode, it is possible to maintain the current absolute position when returning to positioning control.
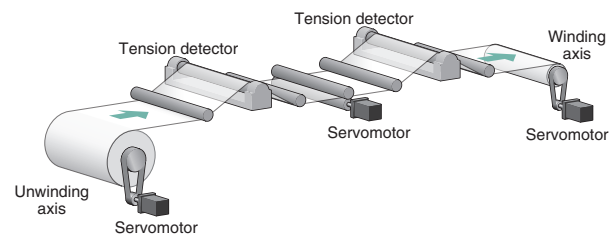
[Cam control]
- Cam control may be used alone or combined with synchronous control.

Example application for cam control:
To create a movement path around a workpiece using positioning control, axis 2 waits for axis 1 to complete the move from P1 to P2 before it begins moving from P2 to P3. By using cam control, axis 2 does not need to wait for axis 1 to complete its movement and the in position time can be shortened.
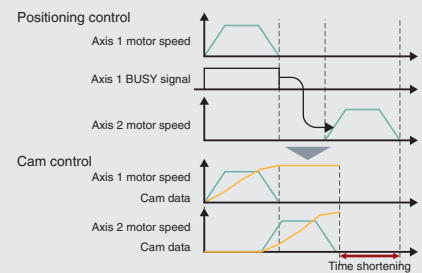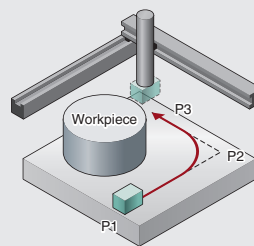
Many functions in a compact design

[Use a synchronous encoder with synchronous control]
- Input pulses from a synchronous encoder can be used to perform synchronous control and cam control.
- The incremental synchronous encoder can be used by using the LD77MH built-in interface. An option unit is not required.
- To Further improve the synchronization accuracy, the phase compensation function, designed to compensate for synchronous encoder delays, can be used.
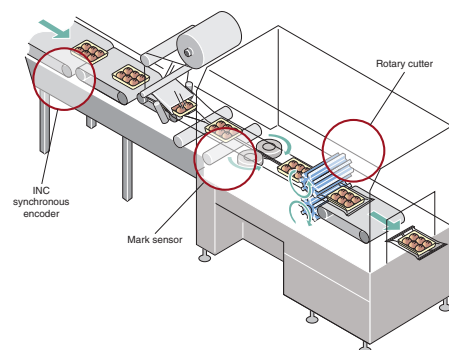
[Standard mark detection function]
- The built-in mark detection signal interface allows these units to be used in packaging systems for example, without additional option modules.

[Automatic cam data generation for rotary cutter]
- Complicated cam data for rotary cutters can be automatically generated just by specifying a few parameters like the sheet length and synchronization width.
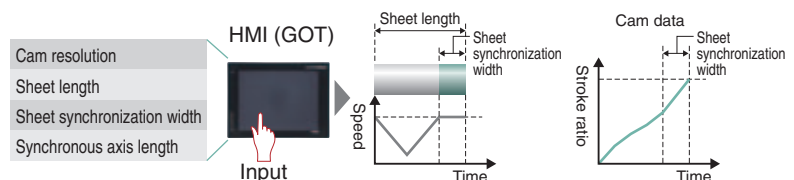
Perfect synchronous control is easy to achieve

Replace mechanical gears, shafts, speed change gears, cams, etc. and generate synchronous control operations using software.

- Complicated programs are unnecessary for synchronous control because it can be implemented easily using parameter settings.
- Start and stop synchronous control for each axis. Use the synchronous control axis and positioning control axis together.
- Convey the travel value of main shaft to the output axis via the clutch.
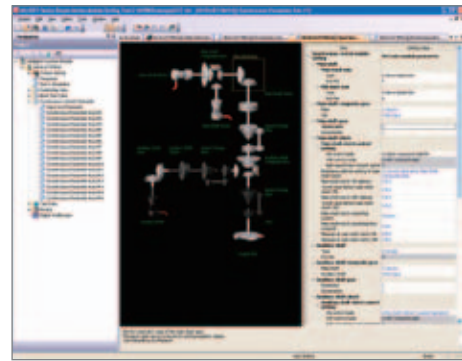
Synchronous Control Parameter Settings

Cam control made simple

Create cam data patterns easily.

- Create cam profiles unrestricted by existing concepts of electronic cam control.
- Change the acceleration, speed, stroke, and jerk while simultaneously seeing how it effects the profile.
- Easily check created cam data by viewing them as thumbnails.
- Import and export cam data in CSV format.
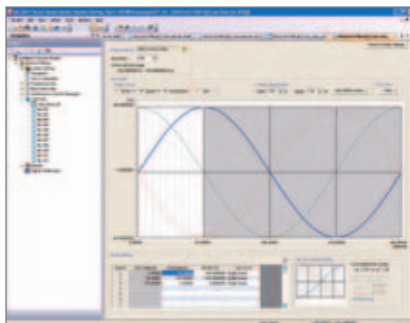
Cam Data
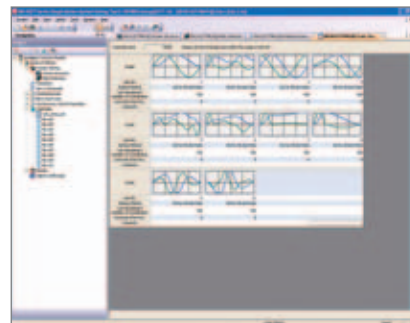
Cam Data List

Simplified debugging and commissioning

[Digital oscilloscope function]
- Collection of data from the Simple Motion Module is synchronized with the operation cycle and waveform displays to facilitate an efficient start up.
- The assistant function explains each step.
- Use the purpose-based probe setting to easily set frequently-viewed data.
- Sample 16CH word and 16CH bit data and display 8CH words and 8CH bits in real time.

[Monitor and test functions]
- Complete the system installation and perform operational checks easily using powerful monitor and test functions.
- Select items to be displayed on the monitor using a wealth of information monitoring options.
- The test function can be used to check basic operations without a sequence program.

Digital Oscilloscope

Axis Monitor

Positioning Test

■ Specifications

Item				LD77MH4	LD77MH16[NEW]
Number of control axes				4 axes	16 axes
Operation cycle				0.88ms	0.88ms/1.77ms*1
Interpolation function				Linear interpolation(Up to 4 axes),Circular interpolation(2 axes)	
Control system				PTP (Point To Point) control, path control (both linear and arc can be set), speed control, torque control, speed-position switching control, position-speed switching control	
Acceleration/deceleration process				Trapezoidal acceleration/deceleration, S-pattern acceleration/deceleration	
Compensation function				Backlash compensation, Electronic gear, Near pass function	
Synchronous control				External encoder, Cam, Phase Compensation, Cam generated automatically	
Control unit				mm, inch, degree, pulse	
Positioning data				600 data (positioning data No. 1 to 600)/ axis (Can be set with GX Works2 or programmable controller program.)	
Backup				Parameters, positioning data, and block start data can be saved on flash ROM (battery-less backup)	
OPR control	Machine OPR control			Near-point dog method, Count method 1), Count method 2), Data set method, scale origin signal detection method	
	Fast OPR control			Provided	
	Sub functions			OPR retry, OP shift	
Position control	Position control	Linear control		1-axis linear control, 2-axis linear interpolation control, 3-axis linear interpolation control, 4-axis linear interpolation control (Composite speed, Reference axis speed)	
		Fixed-feed control		1-axis fixed-feed control, 2-axis fixed-feed control, 3-axis fixed-feed control, 4-axis fixed-feed control	
		2-axis circular interpolation control		sub point designation, center point designation	
	Speed control			1-axis speed control, 2-axis speed control, 3-axis speed control, 4-axis speed control	
	Speed-position switching control			INC mode, ABS mode	
	Position-speed switching control			INC mode	
	Other control	Current value changing		Changing to a new current value using the positioning data , Changing to a new current value using the start No.	
		NOP instruction		Provided	
		JUMP instruction		Unconditional JUMP, Conditional JUMP	
		LOOP,LEND		Provided	
High-level positioning control				Block start, Condition start, Wait start, Simultaneous start, Repeated start	
Manual control	JOG operation			Provided	
	Inching operation			Provided	
	Manual pulse generator operation			Possible to connect 1 module (Incremental) Unit magnification (1 to 10000times)	
Expansion control	Speed-torque control			Speed control without positioning loops, Torque control without positioning loops	
Absolute position system				Connect a battery to the servo amplifier to ensure compatibility	
Synchronous encoder interface				Up to 4 channel (total of internal interface and interface via the CPU)	
	Internal interface			1channel (Incremental)	
Functions that limit control	Speed limit function			Speed limit value, JOG speed limit value	
	Torque limit function			Torque limit value_same setting, torque limit value_individual setting	
	Forced stop function			valid/invalid setting	
	Software stroke limit function			Movable range check with current feed value, movable range check with machine feed value	
	Hardware stroke limit function			Provided	
Functions that change control details	Speed change function			Provided	
	Override function			Provided	
	Acceleration/deceleration time change function			Provided	
	Torque change function			Provided	
	Target position change function			Target position address and target position speed are changeable	
Other functions	M code output function			Provided	
	Step function			Deceleration unit step, Data No. unit step	
	Skip function			Via sequence CPU, Via external command signal	
	Teaching function			Provided	
Mark detection function	Mark detection mode (Continuous Detection mode, Specified Number of Detections mode, Ring Buffer mode)				
	Mark detection signal			4points	
	Mark detection setting			4	16
Optional data monitor function				4points/axis	
Master-slave operation function				Provided	
Amplifier-less operation function				Provided	
Digital oscilloscope function				bit data :8channels, word data: 4channels	bit data :16channels, word data: 16channels *2
Starting time*3		1-axis linear control			
		1-axis speed control			
		2-axis linear interpolation control (Composite speed)			
		2-axis linear control (Reference axis speed)			
		2-axis circular interpolation control			
		2-axis speed control		0.88ms	
		3-axis linear interpolation control (Composite speed)			
		3-axis linear interpolation control (Reference axis speed)			
		3-axis speed control			
		4-axis linear interpolation control			
		4-axis speed control			
Maximum connection distance between drive units				50m	
Maximum number of modules specification				Counts as 2 modules	
Number of occupied I/O points				32 points (I/O assignment: Intelligent 32 points)	
Servo amplifier connection system				SSCNET III-compatible (50Mbps)	
5VDC internal current consumption				0.55A	0.70A
Weight				0.22kg	

*1: Default value is 1.77 ms. If necessary, check the operation time and change to 0.88 ms.
*2: 8CH word data and 8CH bit data can be displayed in real time.
*3: The starting time varies with conditions. For details, refer to the manual.

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Positioning Modules

■ **LD75P1**
Open collector

Number of control axes **1 axis**	Max. output pulse **200kpulse/s**
Positioning data **600 data/axis**	Max. connection distance **2m**
Positioning control function	**Speed control function**
OPR control function	GX Works2 **Error history**

■ **LD75D1**
Differential driver

Number of control axes **1 axis**	Max. output pulse **4Mpulse/s**
Positioning data **600 data/axis**	Max. connection distance **10m**
Positioning control function	**Speed control function**
OPR control function	GX Works2 **Error history**

■ **LD75P2**
Open collector

Number of control axes **2 axes**	Max. output pulse **200kpulse/s**
Positioning data **600 data/axis**	Max. connection distance **2m**
Positioning control function	**Speed control function**
OPR control function	GX Works2 **Error history**

■ **LD75D2**
Differential driver

Number of control axes **2 axes**	Max. output pulse **4Mpulse/s**
Positioning data **600 data/axis**	Max. connection distance **10m**
Positioning control function	**Speed control function**
OPR control function	GX Works2 **Error history**

■ **LD75P4**
Open collector

Number of control axes **4 axes**	Max. output pulse **200kpulse/s**
Positioning data **600 data/axis**	Max. connection distance **2m**
Positioning control function	**Speed control function**
OPR control function	GX Works2 **Error history**

■ **LD75D4**
Differential driver

Number of control axes **4 axes**	Max. output pulse **4Mpulse/s**
Positioning data **600 data/axis**	Max. connection distance **10m**
Positioning control function	**Speed control function**
OPR control function	GX Works2 **Error history**

High-speed control of high resolution devices

LD75D1   LD75D2   LD75D4

Control high resolution devices such as linear servos and direct drive motors without compromising speed.

	Max. output pulse	Max. connection distance
LD75D1, LD75D2, LD75D4	4Mpulse/s	10m
LD75P1, LD75P2, LD75P4	200kpulse/s	2m

Reduce machine vibration by using the optimal acceleration/deceleration system

Chosen between trapezoidal acceleration/deceleration or S-curve acceleration/deceleration in accordance with machine characteristics such as the amount of load or vibration characteristics.

*S-curve acceleration/deceleration cannot be used with stepping motors.
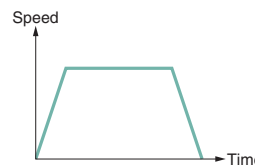
Trapezoidal acceleration/deceleration
Is a system in which the acceleration and deceleration changes linearly based on acceleration/deceleration time and the speed-limit value set by users.
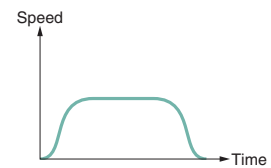
S-curve acceleration/deceleration
Is a system in which acceleration/ deceleration changes gradually based on acceleration/deceleration time, speed-limit, and the S-curve ration value (1 to 100%).

Visualize positioning module buffer data

Monitor online or save and review command data such as speed, simultaneous start, and dual axis interpolation routines using customizable graphs.
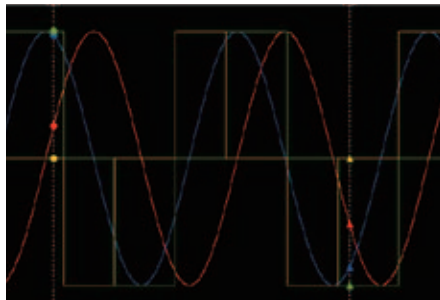
Trace function - waveform display
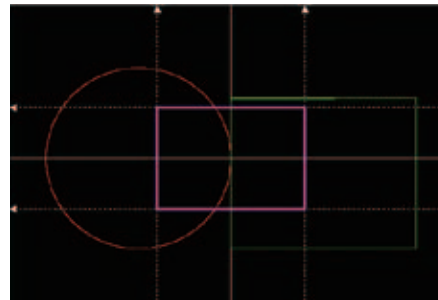
Trace function - location trace display

Configure modules without the need to reference a manual

GX Works2 contains support tools to help configure intelligent function modules. All of the required information to configure and revise complicated parameter settings is included so it is not necessary to reference a manual.

Set according to the machine and applicable motor when system is started up.
(This parameter become valid when the PLC READY signal [Y0] turns from OFF to ON)

Configure modules easily and with no manual thanks to the included settings information.

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products
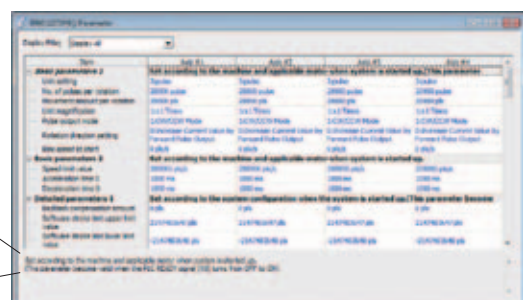
■ Specifications
[Open collector]

Item			LD75P1	LD75P2	LD75P4
Number of control axes			1 axis	2 axes	4 axes
Interpolation function			—	2-axis linear interpolation 2-axis circular interpolation	2-axis/3-axis/4-axis linear interpolation, 2-axis circular interpolation
Control system			PTP (Point To Point) control, path control (both linear and arc can be set), speed control, speed-position switching control, position-speed switching control		
Control unit			mm, inch, degree, pulse		
Positioning data			600 data (positioning data No.1 to 600)/axis (Can be set with peripheral device or sequence program.)		
Backup			Parameters, positioning data, and block start data can be saved on flash ROM (battery-less backup)		
Positioning control	Positioning control system	PTP*1 control	INC system, ABS system		
		Speed-position switching control	INC system, ABS system*2		
		Position-speed switching control	INC system		
		Path control	INC system, ABS system		
	Positioning control range	In ABS system	-214748364.8 to 214748364.7 (µm) -21474.83648 to 21474.83647 (inch) 0 to 359.99999 (degree) -2147483648 to 2147483647 (pulse)		
		In INC system	-214748364.8 to 214748364.7 (µm) -21474.83648 to 21474.83647 (inch) -21474.83648 to 21474.83647 (degree) -2147483648 to 2147483647 (pulse)		
		In speed-position switching control (INC mode)/ position-speed switching control	0 to 214748364.7 (µm) 0 to 21474.83647 (inch) 0 to 21474.83647 (degree) 0 to 2147483647 (pulse)		
		In speed-position switching control (ABS mode)*2	0 to 359.99999 (degree)		
	Speed command		0.01 to 20000000.00 (mm/min) 0.001 to 2000000.000 (inch/min) 0.001 to 2000000.000 (degree/min) 1 to 4000000 (pulse/s)		
	Acceleration/deceleration system selection		Trapezoidal acceleration/deceleration, S-curve acceleration/deceleration		
	Acceleration/deceleration time		1 to 8388608ms Four patterns can be set for each of acceleration time and deceleration time		
	Sudden stop deceleration time		1 to 8388608ms		
OPR method			6 types		
Starting time*3			1-axis linear control	1.5ms	
			1-axis speed control	1.5ms	
			2-axis linear interpolation control (Composite speed)	1.5ms	
			2-axis linear control (Reference axis speed)	1.5ms	
			2-axis circular interpolation control	2.0ms	
			2-axis speed control	1.5ms	
			3-axis linear interpolation control (Composite speed)	1.7ms	
			3-axis linear interpolation control (Reference axis speed)	1.7ms	
			3-axis speed control	1.7ms	
			4-axis linear interpolation control	1.8ms	
			4-axis speed control	1.8ms	
Pulse output method			Open collector output		
Maximum output pulse			200k pulse/s		
Maximum connection distance between drive units			2m		
Maximum number of modules specification			Counts as 2 modules		
Number of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)		
External connections			40-pin connector		40-pin connector ×2
5VDC internal current consumption			0.44A	0.48A	0.55A
Weight			0.18kg		

*1: The abbreviation for Point To Point, referring to position control.
*2: In speed-position switching control (ABS mode), "degree" is the only control unit available.
*3: Starting times may vary depending on conditions. For details, refer to the manual.

■ Specifications
[Differential driver]

Item		LD75D1	LD75D2	LD75D4
Number of control axes		1 axis	2 axes	4 axes
Interpolation function		—	2-axis linear interpolation 2-axis circular interpolation	2-axis/3-axis/4-axis linear interpolation, 2-axis circular interpolation
Control system		PTP (Point To Point) control, path control (both linear and arc can be set), speed control, speed-position switching control, position-speed switching control		
Control unit		mm, inch, degree, pulse		
Positioning data		600 data (positioning data No.1 to 600)/axis (Can be set with peripheral device or sequence program.)		
Backup		Parameters, positioning data, and block start data can be saved on flash ROM (battery-less backup)		
Positioning control	Positioning control system	PTP*1 control	INC system, ABS system		
		Speed-position switching control	INC system, ABS system*2		
		Position-speed switching control	INC system		
		Path control	INC system, ABS system		
	Positioning control range	In ABS system	-214748364.8 to 214748364.7 (µm) -21474.83648 to 21474.83647 (inch) 0 to 359.99999 (degree) -2147483648 to 2147483647 (pulse)		
		In INC system	-214748364.8 to 214748364.7 (µm) -21474.83648 to 21474.83647 (inch) -21474.83648 to 21474.83647 (degree) -2147483648 to 2147483647 (pulse)		
		In speed-position switching control (INC mode)/ position-speed switching control	0 to 214748364.7 (µm) 0 to 21474.83647 (inch) 0 to 21474.83647 (degree) 0 to 2147483647 (pulse)		
		In speed-position switching control (ABS mode)*2	0 to 359.99999 (degree)		
	Speed command		0.01 to 20000000.00 (mm/min) 0.001 to 2000000.000 (inch/min) 0.001 to 2000000.000 (degree/min) 1 to 4000000 (pulse/s)		
	Acceleration/deceleration system selection		Trapezoidal acceleration/deceleration, S-curve acceleration/deceleration		
	Acceleration/deceleration time		1 to 8388608ms Four patterns can be set for each of acceleration time and deceleration time		
	Sudden stop deceleration time		1 to 8388608ms		
OPR method		6 types		
Starting time*3		1-axis linear control	1.5ms		
		1-axis speed control	1.5ms		
		2-axis linear interpolation control (Composite speed)	1.5ms		
		2-axis linear control (Reference axis speed)	1.5ms		
		2-axis circular interpolation control	2.0ms		
		2-axis speed control	1.5ms		
		3-axis linear interpolation control (Composite speed)	1.7ms		
		3-axis linear interpolation control (Reference axis speed)	1.7ms		
		3-axis speed control	1.7ms		
		4-axis linear interpolation control	1.8ms		
		4-axis speed control	1.8ms		
Pulse output method		Differential driver output		
Maximum output pulse		4M pulse/s		
Maximum connection distance between drive units		10m		
Maximum number of modules specification		Counts as 2 modules		
Number of occupied I/O points		32 points (I/O assignment: Intelligent 32 points)		
External connections		40-pin connector		40-pin connector ×2
5VDC internal current consumption		0.51A	0.62A	0.76A
Weight		0.18kg		

*1: The abbreviation for Point To Point, referring to position control.
*2: In speed-position switching control (ABS mode), "degree" is the only control unit available.
*3: Starting times may vary depending on conditions. For details, refer to the manual.

L series Features

CPU

I/O

Analog /
Temperature Control

▶ Simple Motion /
Positioning

High-Speed
Counter

Network

Software

Related Products

High-Speed Counter Modules

■ LD62
DC input

Number of channels **2ch**	**5/12/24vDC input**	Max. counting speed **200kpulse/s**	
Linear counter function	**Ring counter function**	**Coincidence output function**	**Preset function**
Disable count function	**Latch counter function**	**Sampling counter function**	**Periodic pulse counter function**

■ LD62D
Differential input

Number of channels **2ch**	**Differential driver input**	Max. counting speed **500kpulse/s**	
Linear counter function	**Ring counter function**	**Coincidence output function**	**Preset function**
Disable count function	**Latch counter function**	**Sampling counter function**	**Periodic pulse counter function**

High-speed pulse measurement of 500kpulse/s

LD62D

It is easy to achieve accurate measurement of high speed pulses using the LD62D.
Due to the wide range of supported pulse speeds, the module is capable of supporting many different applications including various conveyor systems, work piece length measurement, and processing speed measurement.

Fixed feeding (drilling holes)

Drill

Pulse

Temporary stop (coincidence output)
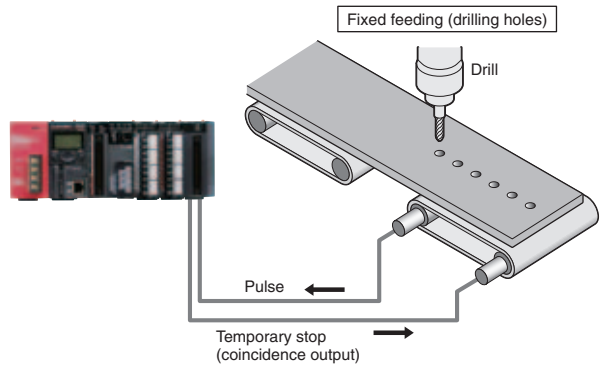
Configure modules without the need to reference a manual

LD62D   **LD62**

GX Works2 contains support tools to help configure intelligent function modules. All of the required information to configure and revise complicated parameter settings is included so it is not necessary to reference a manual.
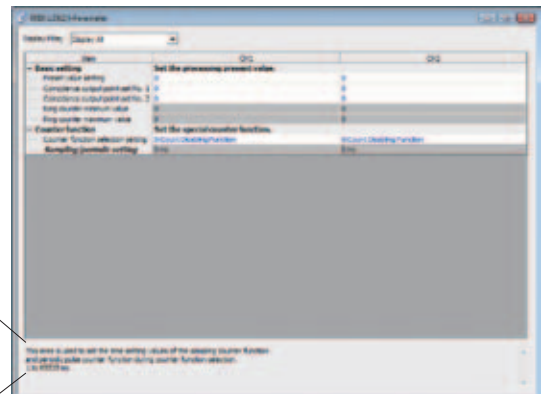
This area is used to set the time setting values of the sampling counter function and periodic pulse counter function during counter function selection.
1 to 65535 ms

Configure modules easily and with no manual thanks to the included settings information.

■ Specifications

Item			LD62 [DC input]		LD62D [Differential input]	
Number of channels			2ch			
Counting speed switch setting			10kpulse/s, 100kpulse/s, 200kpulse/s		10kpulse/s, 100kpulse/s, 200kpulse/s, 500kpulse/s	
Count input signal	Phase		1-phase input (multiple of 1/2), CW/CCW, 2-phase input (multiple of 1/2/4)			
	Signal level (A, B)		5/12/24VDC 2 to 5mA		EIA Standard RS-422-A differential type line driver level (Equivalent with AM26LS31 (manufactured by Texas Instruments Japan Limited))	
Counter	Maximum counting speed*1		200kpulse/s		500kpulse/s	
	Counting range		-2147483648 to 2147483647			
	Type		UP/DOWN preset counter and ring counter functions			
	Minimum count pulse width (Duty ratio 50%)		10kpulse/s	50μs	10kpulse/s	50μs
			100kpulse/s	5μs	100kpulse/s	5μs
			200kpulse/s	2.5μs	200kpulse/s	2.5μs
					500kpulse/s	1μs
	Minimum phase differential for 2-phase input		10kpulse/s	25μs	10kpulse/s	25μs
			100kpulse/s	2.5μs	100kpulse/s	2.5μs
			200kpulse/s	1.25μs	200kpulse/s	1.25μs
					500kpulse/s	0.5μs
Coincidence output	Comparison range		Binary with 32-bit code (-2147483648 to 2147483647)			
	Comparison result		Set value < Count value Set value = Count value Set value > Count value			
External input	Preset		5/12/24VDC 2 to 5mA		5/12/24VDC 2 to 5mA (Differential type line drivers conforming to EIA standard RS-422-A are also applicable.)	
	Function start					
	Minimum input response time	OFF to ON	Function start: 0.5ms			
		ON to OFF	Function start: 1ms			
External output	Coincidence output		2 points/channel			
	Output voltage/current		12 to 24VDC 0.5A			
	Output response time	OFF to ON	0.1ms or less (rated load, resistive load)			
		ON to OFF				
Maximum number of modules specification			Counts as 1 module			
Number of occupied I/O points			16 points (I/O assignment: Intelligent 16 points)			
External connections			40-pin connector			
5VDC internal current consumption			0.31A		0.36A	
Weight			0.13kg			

*1: The counting speed is affected by the rising/falling pulse speed. For details, refer to the corresponding manual.

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

▶ High-Speed Counter

Network

Software

Related Products

Seamless integration of multiple networks

Today there is an increasing demand from production facilities for high speed control, effective management of data, flexible wiring, easy parameter settings, and predictive maintenance. To answer these demands, Mitsubishi Electric has teamed up with the CC-Link Partner Association to provide reliable, open-standards networks that operate seamlessly with one another. Together, These and other Mitsubishi networks allow for flexible integration at any network level. The latest addition to the CC-Link portfolio is IE Field; an Ethernet based gigabit network designed to provide cost-effective, reliable connectivity to field devices.
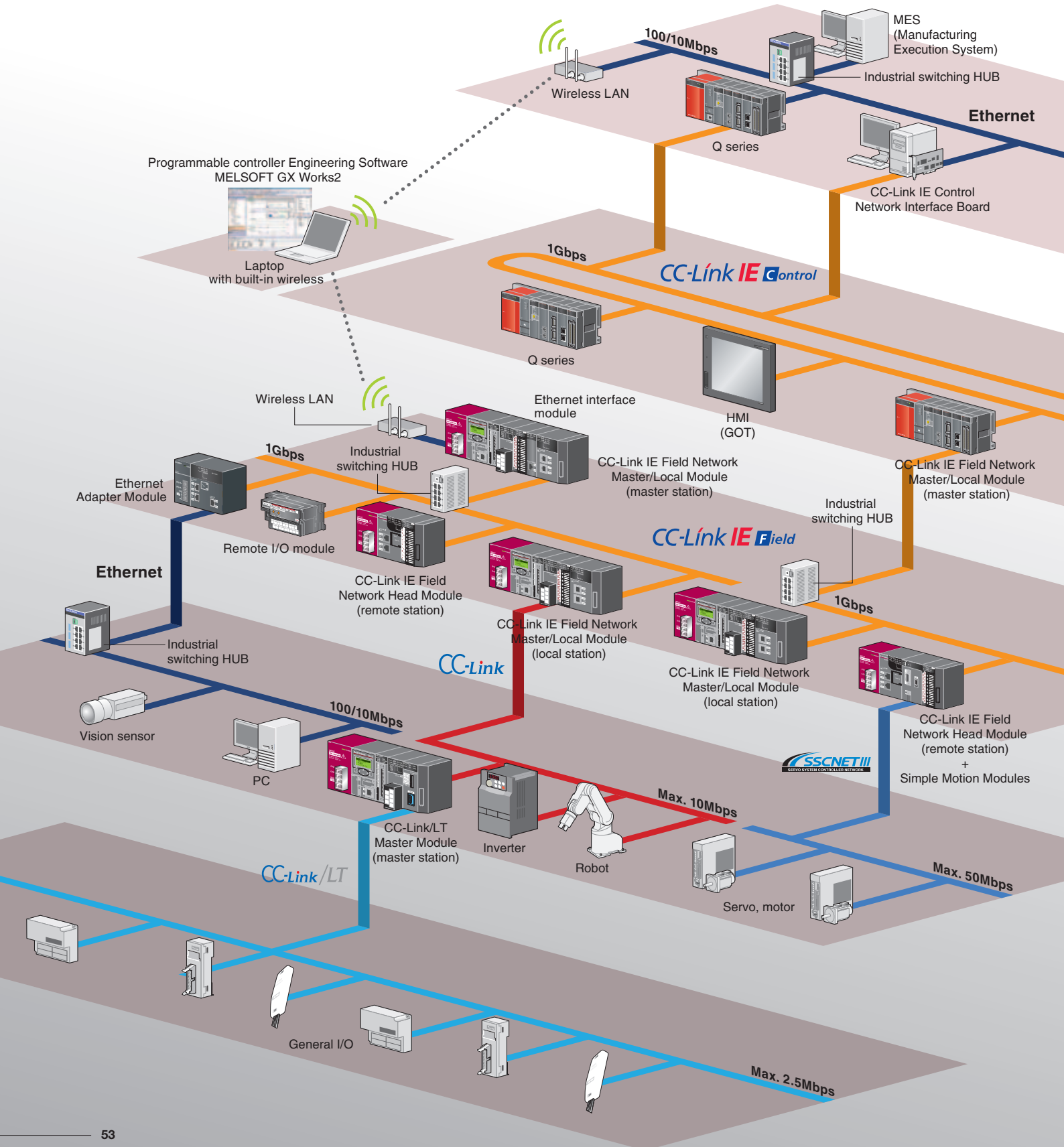
Seamless communication

L series combines enterprise, control, and device level networks together through Ethernet, MELSECNET/H, and CC-Link networks to allow easy access to information, no matter where it resides on the network. It is possible to "drill down" from the top Ethernet layer, through multiple networks, and access programmable controllers using GX Works2 or other engineering tools.

In addition, many devices supporting SLMP* such as vision sensors and RFID controllers may be connected to the CC-Link IE Field Network.

*SLMP (SeamLess Message Protocol) is a protocol advocated by the CC-Link Partner Association.

Between factories and departments
Enterprise level network — Ethernet

Within the factory
Control level network — CC-Link IE Control

Within the production line
Device level network — CC-Link IE Field

Within the machine or panel
Device level network — CC-Link /LT
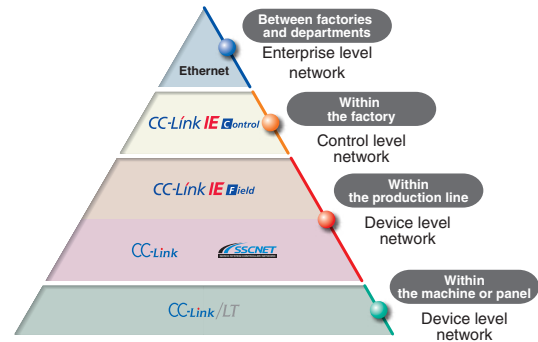
CC-Link IE Control

This highly-reliable control network is designed to transfer large amounts of data at real-time speeds between programmable controllers. The CC-Link IE Control Network includes a variety of functions and allows seamless communications among other CC-Link networks.

- 1 Gbps high-speed communication
- Maximum number of link points per network:
  Link relays (LB): 32768 points
  Link registers (LW): 131072 points
  Link inputs/outputs (LX, LY): 8192 points each
- Maximum number of connected stations per network:
  max. 120 units
- Maximum overall distance: 66km
*L series does not support the CC-Link IE Controller Network.

CC-Link IE Field

This versatile field network integrates distributed control, I/O control, and motion control. Its flexible wiring design allows for star, line, star and line mixed, or ring topology to ensure the network can meet the needs of any production line or equipment layout.

- 1 Gbps high-speed communication
- Maximum link points per network:
  Remote inputs/outputs (RX, RY): 16384 points
  Remote registers (RWw): 8192 points, (RWr): 8192 points
- Maximum overall distance: 12km

CC-Link

CC-Link is Semiconductor Equipment and Materials International (SEMI®) certified and provides an open device level network that allows great flexibility in system design and configuration. CC-Link provides the means to link controllers to numerous devices while reducing wiring costs and adding additional benefits such as improved diagnostic capabilities.

- Communication speeds up to 10 Mbps
- 8192 link device remote I/O points and 2048+2048 remote register points
- Connect with over 1,000 different 3rd party CC-Link compatible products
- Maximum overall distance: 100m(10mbps)

SSCNET III
SERVO SYSTEM CONTROLLER NETWORK

This high-speed, high-performance servo system controller network incorporates optical fiber cables. Long-distance wiring can be handled flexibly.

- Communication cycle: 0.88ms
- Connect up to 16 axes per system

CC-Link/LT

At the bottom of the network hierarchy, sensor level networks can reduce wiring costs inside panels between simple discrete devices such as push-buttons and sensors. CC-Link/LT accomplishes this and is fully supported by L series. Achieve tremendous flexibility and cost savings through innovative connection technology, which does not require cutting/stripping of the network cable to make connections.

- Make connections quickly and easily using dedicated connectors
- Use I/O points efficiently by using 'number of points mode' (4 points, 8 points, 16 points).
- Connect up to 1024 link points in 16-point mode.
- Up to 39m from master station(2.5Mbps)

CC-Link IE Field Network Master/Local Module

■ LJ71GF11-T2

| Master/ local station | Transmission speed **1Gbps** | Remote I/O **16384** points | Remote register **8192** words |

| CC-Link IE Field |

CC-Link IE Field

*Sequence CPUs whose first five serial number digits are "13012" or later are required.

Easy to configure settings

Network parameters are configured using the engineering tool, GX Works2. Only the master station needs to be configured, thereby greatly simplifying the network setup. Updating the system configuration is a breeze.

Master station settings are all that is required!

Master station

Transfered   CC-Link IE Field

master station parameters

Station #1   Station #2   Station #3
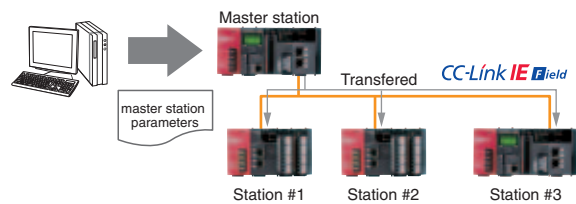
Flexible network topology

Various network topologies are supported including star, line, star and line combination, and ring. When hubs*1 are used, new equipment can be added and machine layouts can be changed easily.

*1 Hubs cannot be used in a ring configuration.

■ **Examples of network topologies**

[Line topology]

| Master station | Local station | Remote station | Remote station |

[Ring topology]

| Master station | Local station | Remote station | Remote station |

[Star and line combination topology]

Master station

HUB

| Local station | Remote station | HUB |

| Local station | Remote station | Remote station |
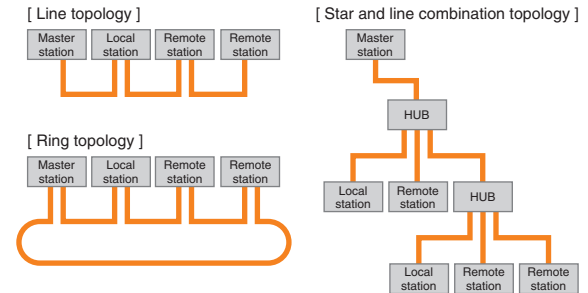
■ Specifications

Item		LJ71GF11-T2
Transmission speed		1Gbps
Maximum overall cable distance (Maximum transmission distance)	Line topology	12000m (when cables are connected to 1 master station and 120 slave stations)
	Star topology	Depends on the system configuration
	Ring topology	12100m (when cables are connected to 1 master station and 120 slave stations)
Maximum number of connected stations	Master station	1 station (Up to 120 slave stations can be connected to the master station)
	Local station	120 stations
Maximum link points per station	Remote register (RWw)	8192 points, 16KB
	Remote register (RWr)	8192 points, 16KB
	Remote input (RX)	16384 points, 2KB
	Remote output (RY)	16384 points, 2KB
Maximum link points per station	Master station	Remote register (RWw)	8192 points, 16KB
		Remote register (RWr)	8192 points, 16KB
		Remote input (RX)	16384 points, 2KB
		Remote output (RY)	16384 points, 2KB
	Local station	Remote register (RWw)	8192 points, 16KB (also including the send range of own station)
		Remote register (RWr)	8192 points, 16KB
		Remote input (RX)	16384 points, 2KB
		Remote output (RY)	16384 points, 2KB (also including the send range of own station)
Network topology		Line topology, star topology (Coexistence of line topology and star topology is possible.), and ring topology
Communication method		Token passing method
Communication port		CC-Link IE Field Network port x 2
RAS function		Automatic return, Slave station disconnection, Loopback function
Connection cable*1		Ethernet cable of category 5e or higher (Double shielded cable) which satisfies 1000BASE-T standard
Maximum number of modules specification		Counts as 2 modules
Number of occupied I/O points		32 points (I/O assignment: Intelligent 32 points)
5VDC internal current consumption		0.89A
Weight		0.27kg

*1: Straight through cable

CC-Link IE Field Network Head Module

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

■ LJ72GF15-T2

Intelligent device station	Transmission speed **1**Gbps	Remote I/O **2048** points
Remote register **1024** words	Max. number of connected modules **120**	
RAS function **System monitor**	RAS function **Remote RESET**	RAS function **Self-diagnosis**
CC-Link IE Field		

CC-Link IE Field

*END cover is included.

CC-Link IE Field Network remote I/O station

L series I/O and intelligent function modules can be connected to the remote I/O head module without a dedicated CPU. There are many benefits to using intelligent device stations including reduced CPU and wiring costs, great flexibility in selecting I/O and intelligent function modules, and compact unit size.

Universal model QCPU
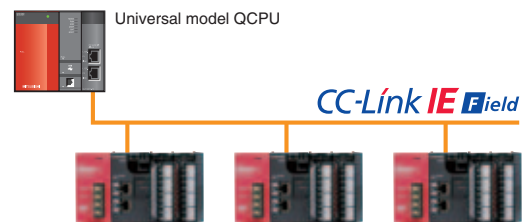
CC-Link IE Field

Modules compatible with the CC-Link IE Field Network head module

Item	
I/O module	Input
	Output
Analog module	Analog input
	Analog output
Temperature Control module	
Simple Motion Module	
Positioning Module	
High-speed counter module	
Network module	CC-Link
	CC-Link/LT
	Serial communication

RAS (Reliability, Availability, Serviceability) functions

One feature of RAS is to store all remote station error histories in the master station's latched memory. This preserves the error information in one place in the event of power loss and allows for easy troubleshooting. Other RAS features include network event logging, unit error logging, and testing and monitoring capabilities.

Universal model QCPU

CC-Link IE Field

CPU module error log area < latch area >

Error occurrence in a remote station

Error occurrence in analog module

Remote station

Head module error log area < latch area >

Analog module error log area < non latch area >

Notify

ch1 Alarm generation

Register

Error code ****
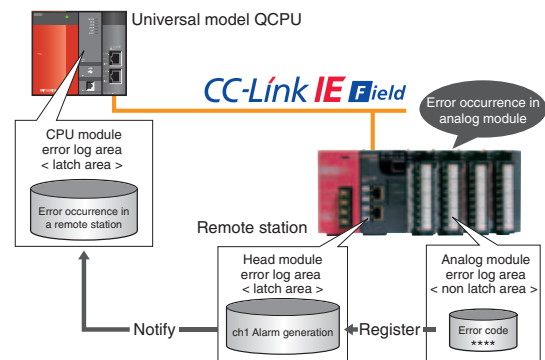
■ Specifications

Item		LJ72GF15-T2
Transmission speed		1Gbps
Maximum overall cable distance (Maximum transmission distance)	Line network topology	12000m (with 1 master and 120 slaves connected)
	Star network topology	Depends on the system configuration
	Ring network topology	12100m (with 1 master and 120 slaves connected)
Transmission path		Line, star, line and star mixed, or ring topology
Communication method		Deterministic (token passing)
Maximum number of modules specification[*1]		10
Communication port		CC-Link IE Field Network port x 2
RAS function		Network event logging, unit error logging, testing, monitoring, and error history preservation function
Connection cable[*2]		Ethernet cable of category 5e or higher (Double shielded cable) which satisfies 1000BASE-T standard
5VDC internal current consumption		1.00A
Weight		0.23kg

*1: The total number of modules that can be mounted to a CC-Link IE Field Network head module. (END cover and power supply module are not included.)
*2: Straight through cable

CC-Link Master/Local Module

■ LJ61BT11

| Master/ local station | Max. transmission speed **10Mbps** | Remote I/O **8192 points*** | Remote register **2048 words*** |
| CC-Link Ver.2.0 | Standby master station function | Local station **Transmission speed auto-tracking function** | |

*Link points for CC-Link Ver.2.0 master station

CC-Link V2

Connect with a huge selection of device types using CC-Link

With such a large selection of CC-Link open network compatible devices, constructing a control system is easy.
Even applications requiring vast amounts of data transmissions can be satisfied because CC-Link Ver.2.0 is supported.

CC-Link
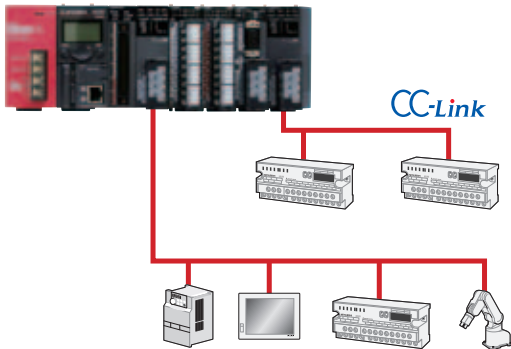
Local stations do not require transmission speed settings

[Transmission speed auto-tracking function]
When used as a local station, no transmission speed setting is required; the setting is made through automatic detection of the master station setting.
The current transmission speed in is indicated by an LED on the front surface of the module.

Master station

CC-Link

Local stations automatically track the transmission-speed setting of the master station.

Local station   Local station
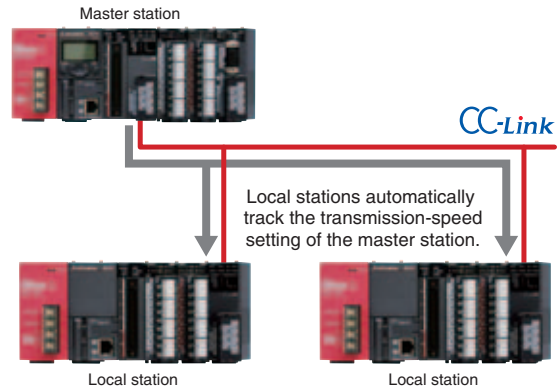
■ Specifications

Item		LJ61BT11
Transmission speed		156kbps/625kbps/2.5Mbps/5Mbps/10Mbps
Maximum overall cable distance (Maximum transmission distance)		1200m (without repeater, varies according to the transmission speed)
Maximum number of connected stations (master station)		64
Number of occupied stations (local station)		1 to 4 stations (The number of stations can be switched using the GX Works2 parameter setting)
Maximum number of link points per system*[1]	Remote I/O (RX, RY)	2048 points
	Remote register (RWw)	256 points (master station → remote device station/local station/intelligent device station/standby master station)
	Remote register (RWr)	256 points (remote device station/local station/intelligent device station/standby master station → master station)
Number of link points per station*[1]	Remote I/O (RX, RY)	32 points (local station is 30 points)
	Remote register (RWw)	4 points (master station → remote device station/local station/intelligent device station/standby master station)
	Remote register (RWr)	4 points (remote device station/local station/intelligent device station/standby master station → master station)
Communication method		Broadcast polling method
Synchronous method		Frame synchronization method
Encoding method		NRZI method
Transmission path		Bus (RS-485)
Transmission format		Conforms to HDLC
Error control system		CRC ($X^{16}+X^{12}+X^5+1$)
RAS function		Automatic return function
		Slave station cut-off function
		Error detection via link special relay/register
Connection cable		CC-Link dedicated cables compatible with Ver.1.10
Maximum number of modules specification		Counts as 1 module
Number of occupied I/O points		32 points (I/O assignment: Intelligent 32 points)
5VDC internal current consumption		0.46A
Weight		0.15kg

*1: Indicates the number of link points for Remote net Ver.1 mode.

CC-Link/LT Master Module

■ **LJ61CL12**

Master station	Max. transmission speed **2.5Mbps**	Remote I/O **1024 points***
CC-Link/LT	**No parameter settings**	Remote station **Transmission speed auto-tracking function**

*In the 16-point mode

CC-Link/LT

High speed equipment response

CC-Link/LT has an excellent response time. With 64 stations and a transmission speed of 2.5Mbps, the maximum link scan time is just 1.2ms. According to the transmission distance required, it is possible to select speeds of 2.5Mbps, 625kbps, or 156kbps.

■ CC-Link/LT link scan time (using a transmission speed of 2.5Mbps)
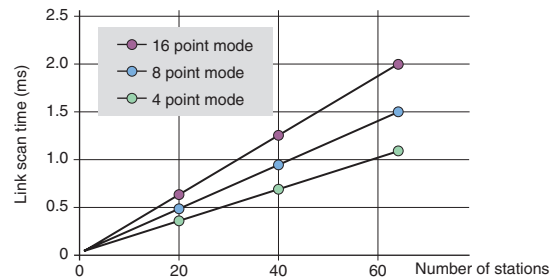
Simple networking that 'just works'

There are no confusing parameters settings to make, and with remote I/O, only the master station needs to set the transmission speed.

■ Specifications

Item				4-point mode	8-point mode	16-point mode
Point mode						
				LJ61CL12		
Control specifications	Maximum link points (the same I/O address used)			256 points (512 points)	512 points (1024 points)	1024 points (2048 points)
	Link points per station (the same I/O address used)			4 points (8 points)	8 points (16 points)	16 points (32 points)
	Link scan time	32 stations connected	Points	128 points	256 points	512 points
			2.5Mbps	0.7ms	0.8ms	1.0ms
			625kbps	2.2ms	2.7ms	3.8ms
			156kbps	8.0ms	10.0ms	14.1ms
		64 stations connected	Points	256 points	512 points	1024 points
			2.5Mbps	1.2ms	1.5ms	2.0ms
			625kbps	4.3ms	5.4ms	7.4ms
			156kbps	15.6ms	20.0ms	27.8ms
Communication specifications	Transmission speed			2.5Mbps/625kbps/156kbps		
	Communication method			BITR method (Broadcastpolling + Interval Timed Response)		
	Network topology			T-branch type		
	Error control system			CRC		
	Number of connectable modules			64		
	Remote station number			1 to 64		
	Installation position of master station			End of a trunk line		
	RAS function			Network diagnostics, internal loopback diagnostics, slave station cutoff function, automatic return function		
	Connection cable*1			Dedicated flat cable (0.75mm² × 4)*², VCTFcable*3, flexible cable*²		
Maximum number of modules specification				Counts as 1 module		
Number of occupied I/O points*4				16, 32, 48, 64, 128, 256, 512, or 1024 points (I/O assignment: Intelli.)		
5VDC internal current consumption				0.16A		
24VDC power supply*5	Voltage			20.4 to 28.8VDC		
	Current consumption			0.03A		
	Current on startup			0.07A		
Weight				0.12kg		

*1: When the cables other than dedicated flat cables, VCTF cables, and flexible cables are used, performance of CCLink/LT is not guaranteed.
*2: Use the dedicated flat cables and flexible cables accredited by CC-Link Partner Association. CC-Link Partner Association website: http://www.cc-link.org/
*3: Refer to the manual for details regarding VCTF cable specifications.
*4: Set the number of occupied I/O points using the operation setting switch. Refer to the manual for details.
*5: 24VDC power supply is supplied through the dedicated power supply or power supply adapter.

Ethernet Interface Module

■ LJ71E71-100
NEW

Transmission speed 100Mbps / 10Mbps	**MELSOFT connection**	**MC protocol communications**
Fixed buffer communications	Random access buffer communications	**E-mail function**
Web function		

Connection with MELSOFT and GOT

With the MELSOFT Ethernet connection, it is possible to monitor/program/test the sequence program (MELSOFT connection), and monitor the programmable controller from the GOT.
Remote operations making full use of the Ethernet capability of long-distance connectivity and high-speed communications.

Ethernet

Programming tool

GOT

Modify/collect CPU data from other devices

[MC protocol communications]
MC Protocol enables other devices connected on Ethernet to gain access to the control system. The Ethernet module can communicate with a PC and HMI (Human Machine Interface), for example, as long as the connected devices can receive/send messages in the MC protocol communication format. In addition to this, by using the separate tool, MX Component, communication with the control system can be achieved without requiring detailed knowledge of the communication protocol.

MC protocol **Command**

Ethernet

Response MC protocol

Other device

MELSEC *L* series

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

► Network

Software

Related Products
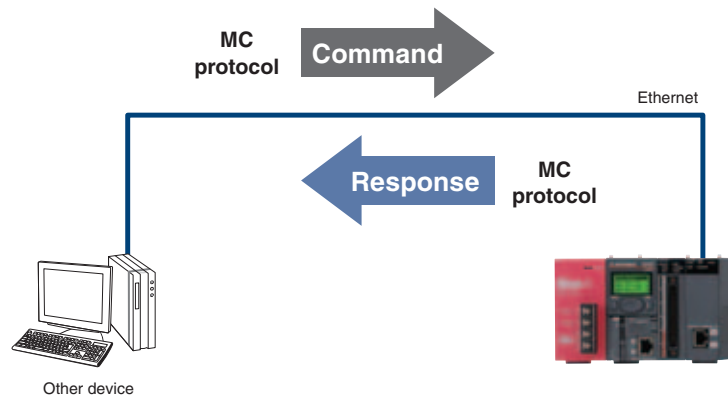
Exchange of data with connected devices

[Communications using a fixed buffer]

Up to 1K-word data can be exchanged between programmable controllers or between programmable controller and the host system. While MC protocol communications are passive, fixed buffer communications are an active protocol. If an error occurs in equipment or certain conditions are met, the programmable controller can send data to the host system. Using an interrupt program allows the CPU module to quickly retrieve data.

Ethernet

Send/receive   **Send/receive**

Other station   Local station   Other device
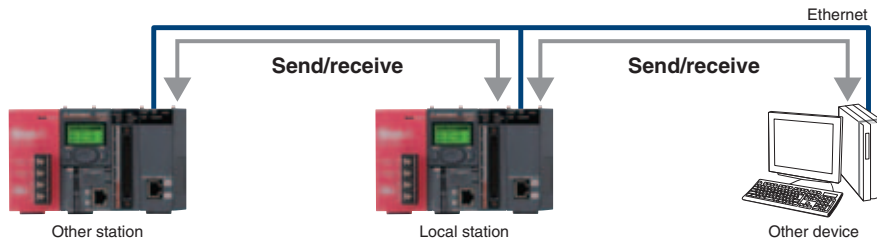
[Communications using a random access buffer]

Up to 6K-word of communication data is possible. This is useful when the data size is too large for communications using fixed buffer communication (capacity: 1K word).

Ethernet

Read/write   **Read/write**

Other device   Other device
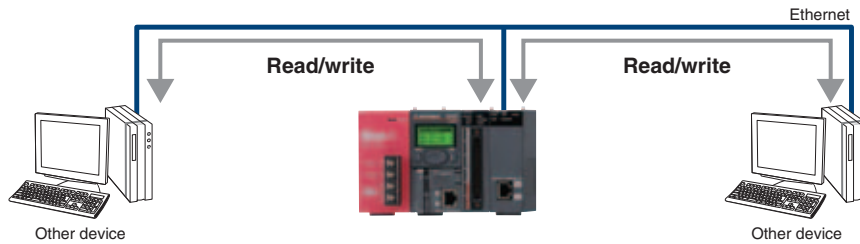
E-mail send/receive

[E-mail function]

This function enables sending/receiving of e-mails to a connected device via the Internet.

Exchanging data by e-mail

[Web function]

The system administrator can monitor a CPU module remotely via the Internet using a commercially available Web browser.

■ **Specifications**

Item			LJ71E71-100 NEW	
Standard			100BASE-TX	10BASE-T
Transmission specifications	Data transmission speed		100Mbps	10Mbps
	Interface		RJ45 (AUTO MDI/MDI-X)	
	Communication mode		Full duplex / Half duplex	Half duplex
	Transmission method		Base band	
	Maximum segment length		100m (length between a hub and node)[1]	
	Maximum number of cascade connections		Cascade connection (maximum of 2 levels)[2]	Cascade connection (maximum of 4 levels)[2]
Sending/ receiving data storage memory	Number of simultaneous open connections		16 connections (Connections usable on a program)	
	Fixed buffer		1k word × 16	
	Random access buffer		6k words × 1	
	E-mail	Attachment	6k words × 1	
		Main text	960k words × 1	
Maximum number of modules specification			Counts as 1 module	
Number of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)	
5VDC internal current consumption			0.60A	
Weight			0.18kg	

[1] For the maximum segment length (a length between hubs), consult with the manufacturer of the switching hub used.
[2] This applies when a repeater hub is used. For the number of levels that can be constructed when a switching hub is used, consult with the manufacturer of the switching hub used.

Serial Communication Modules

■ **LJ71C24**

Interface RS-232	Interface RS-422/485	Max. transmission speed 230.4kbps*

Communication system MC protocol	Communication system Pre-defined protocol	Communication system Nonprocedural protocol	Communication system Bidirectional protocol

GX Works2 Error history

*Available for only channel 1

■ **LJ71C24-R2**

Interface RS-232 x 2	Max. transmission speed 230.4kbps*

Communication system MC protocol	Communication system Pre-defined protocol	Communication system Nonprocedural protocol	Communication system Bidirectional protocol

GX Works2 Error history

*Available for only channel 1

Quick connection using pre-defined protocols

Establish communication with devices quickly by simply selecting a device from the pre-defined protocol library included in GX Works2.

① **Select the manufacturer and model (series) of the device to be connected.**
There is no need for complicated predefined protocol setting for the device. Simply select the device from the prepared predefined protocol library.
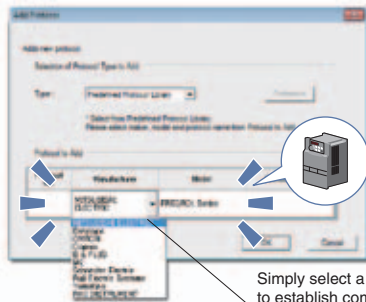
Simply select a device you want to establish communication with

② **Write the predefined protocol to the module.**
Write the set predefined protocol to Serial communication module. Up to 128 protocols can be set in one module.

Write predefined protocol.

GX Works2

Connected device
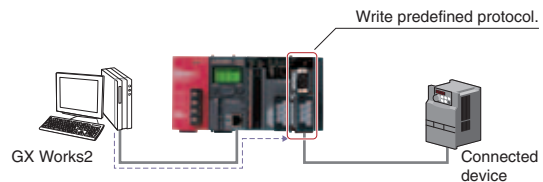
③ **Execute the protocol with ladder program.**
With ladder program, communication with any external device can be made only by executing a dedicated predefined protocol starting instruction.

Execute dedicated instruction.

Communication starts.
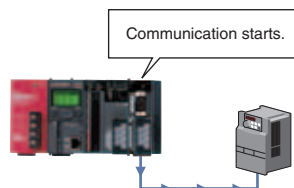
Easy to prepare and edit predefined protocol

Even if the device to be connected is not contained in the predefined protocol library, the device can be added easily.

Click "Add button."   Select "Add New."   Item has been added.

The contents of the prepared predefined protocol can be displayed in a list form. The protocol can be edited easily.

The data can be edited as needed.

■ Specifications

Item		LJ71C24	LJ71C24-R2
Interface	ch1	RS-232 compliant (D-Sub 9P female)	RS-232 compliant (D-Sub 9P female)
	ch2	RS-422/485 compliant (2-piece terminal block)	RS-232 compliant (D-Sub 9P female)
Communication system	Line	Full-duplex/half-duplex communications	
	MC protocol	Half-duplex communications	
	Pre-defined protocol	Full-duplex/half-duplex communications	
	Nonprocedural protocol		
	Bidirectional protocol		
Synchronization method		Start-stop synchronization method	
Transmission speed		50bps/300bps/600bps/1200bps/2400bps/4800bps/9600bps/14.4kbps/ 19.2kbps/28.8kbps/38.4kbps/57.6kbps/115.2kbps/230.4kbps Transmission speed 230.4kbps is only available for channel 1. Total transmission speed of two interfaces is available up to 230.4kbps. Total transmission speed of two interfaces is available up to 115.2kbps when the communication data monitoring function is used.	
Data foramat	Start bits	1	
	Data bits	7 or 8	
	Parity bits	1 (vertical parity) or none	
	Stop bits	1 or 2	
Access cycle	MC protocol	Processes one request during installed C24 CPU module END processing. (Number of scans that must be processed/number of link scans depends on the contents of the request.)	
	Pre-defined protocol	Sends or receives data when requested with the dedicated instruction (CPRTCL).	
	Nonprocedural protocol	Sends each time a send request is issued. Can receive at any time.	
	Bidirectional protocol		
Error detection	Parity check	All protocols and when ODD/EVEN is selected by parameter.	
	Sum check code	MC protocol/bidirectional protocol selected by parameter. For the pre-defined protocol, whether or not a sum check code is needed depends on the selected protocol. Nonprocedural protocol selected by user frame.	

		RS-232	RS-422/485
Transmission control	DTR/DSR (ER/DR) control	Enabled	Disabled
	RS/CS control	Enabled	Disabled
	CD signal control	Enabled	Disabled
	DC1/DC3 (Xon/Xoff) control DC2/DC4 control	Enabled	Enabled

• DTR/DSR signal control and DC code control are selected by the user.

		LJ71C24	LJ71C24-R2
Transmission distance (Overall distance)	RS-232	Maximum 15m	
	RS-422/485	Maximum 1200m (overall distance)	—
Maximum number of modules specification		Counts as 1 module	
Number of occupied I/O points		32 points (I/O assignment: Intelligent 32 points)	
5VDC internal current consumption		0.39A	0.26A
Weight		0.17kg	0.14kg

Ethernet and CC-Link IE Field related products

■ Wireless LAN Adapter   `Ethernet`

NZ2WL-US (U.S.A)*1*2, NZ2WL-EU (Europe)*1*2, NZ2WL-CN (China)*1*2, NZ2WL-KR (Korea)*1*2, NZ2WL-TW (Taiwan)*1*2

`Features`

- Wireless LAN (Ethernet) in the factory provides flexibility in installing new line or alteration layouts.Wireless saves your wiring costs.
- Simply installing wireless LAN adapters makes existing FA equipment wireless.
- Compatible with the latest security standards of WPA2/WPA.
  The security prevents unauthorized access from outside.

*1 Each product can be used only in the respective countries.
*2 Supported both Access point and Station. They can be used by changing the setting.

> The wireless LAN adapters were developed and are produced with CONTEC Co., ltd.
> Please note that the general specifications and guarantee conditions of these products are different from those of programmable controllers (such as MELSEC series) and CONTEC products.
> Refer to the manual for details on the product.

Wireless LAN needs no cables!

● Easy to work without being bothered by cable routing.
  Factory layouts can be easily changed, and costs for wiring can be substantially reduced.

Helpful as radio signals reach the confined place where cable installation is troublesome!

Enables to communicate production data with a distant office!

Office

ST

Need to streamline the shop cables but re-layout seems not very easy ...

Provides a free space for a new line!
Easy to re-layout with wireless!

AP:Access point
ST:Station

Easily adapt existing FA devices to wireless connections!

● Programmable controllers, displays and PCs can be easily added to an existing Ethernet network just by attaching wireless LAN adapters.

[Note] Ethernet data communication through wireless LAN could be unstable compared to wired one due to packet loss depending on peripheral conditions and place of installation.Be sure to confirm it works as intended.

Ethernet

HMI (GOT)

Industrial switching hub

PLC

PC
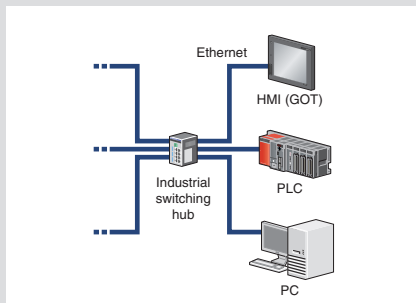
"Wireless" offers you:

→

Connect wireless LAN adapters to respective Ethernet ports!

Industrial switching hub

AP

ST   HMI (GOT)

ST   PLC

ST

PC
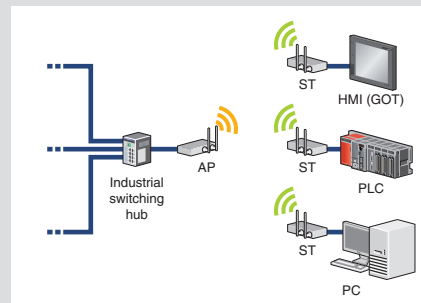
AP:Access point
ST:Station

Trustworthy security

● Compatible with the latest security standards of WPA2/WPA.
  The security prevents unauthorized access such as bugging and falsification of data from outside.

L series Features

CPU

I/O

Analog /
Temperature Control

Simple Motion /
Positioning

High-Speed
Counter

Network

Software

Related Products

■ Industrial Switching HUB `CC-Link IE Field` `Ethernet`
NZ2EHG-T8 / NZ2EHF-T8*[1]

Features

- NZ2EHG-T8 is compatible with transmission rates of 10 Mbps, 100 Mbps, and 1 Gbps.

- NZ2EHF-T8 is compatible with transmission rates of 10 Mbps and 100 Mbps.

- These switching hubs comply with IEEE802.3ab (1000 BASE-T), IEEE802.3u(100 BASE-TX), IEEE802.3 (10 BASE-T) standards.

- AutoMDI/MDI-X and auto-negotiation are available.

- The automatic power adjustment function can reduce power consumption by up to 80 percent.*[2]

- These hubs do not use cooling fans, and yet a wide ambient-temperature operating range is permissible (0 to 50°C).

- Quick detach mechanism allows easy DIN rail attachment and detachment.

*[1] This model may not be connected directly to the CC-Link IE Field Network (1 Gbps). An Ethernet adapter module NZ2GF-ETB is required. For direct use with the CC-Link IE Field Network, please use NZ2EHG-T8.
*[2] For comparison, power consumption was measured when all 8 ports were used and when none of them were used. This function is only available for NZ2EHG-T8.

[1Gbps]   [100Mbps]

> This series was developed and is produced with Contec Co. Ltd. Please note that the specifications and guarantee conditions of these products are different from those of MELSEC products.
> Please refer to the product manual for details.

■ CC-Link IE Field Network Ethernet Adapter Module `CC-Link IE Field` `Ethernet`
NZ2GF-ETB

Features

- Using Seamless Message Protocol (SLMP*[1]), a variety of Ethernet devices such as vision sensors and RFID controllers can be connected to the CC-Link IE Field Network.

- Use a web browser to set station numbers, Ethernet options, and view error history.

- This Ethernet adapter module is compatible with transmission rates of 100 Mbps and 1 Gbps.

*[1] SLMP (SeamLess Message Protocol) is a protocol advocated by the CC-Link Partner Association.

Increase productivity and lower the total cost of ownership.

Introducing the next generation of IA programming software:

GX Works2

GX Works2 focuses on driving down total cost by including features that speed up commissioning, reduce downtime, improve programming productivity, and provide strong security.
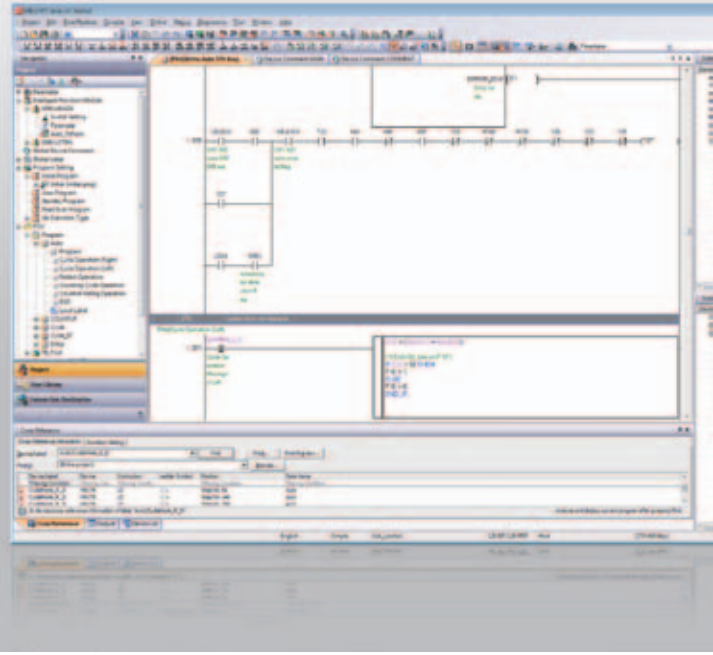
User interface that is "easy to use" by design

The programming tool GX Works2 has been developed from the ground up to be intuitive for all users and allow anyone to begin programming easily. The user interface and other functions provide a comfortable programming environment that enables improvements in design efficiency.

Fully integrated intelligent function module management tools.

Use tabs to easily switch between programs, parameters, and other screens.

Improve readability by hiding ladder rungs not relevant to the current operation.

Use "Watch windows" to conveniently monitor pertinent values.

Project tree gives compressive look at flow of information in program and structure.

Program titles help to identify the content of each program.

Cross reference devices and labels with ease.

Use the Inline-ST[*1] feature to quickly write complex expressions in ladder programs.

*1 In-line ST can be only be created in projects that use labels.

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Easily create circuits with few key inputs

The program can be easily modified using the keyboard shortcut [Alt] + [←] / [→] or [Alt] + [↑] / [↓] keys.

Enter Symbol

-[ ]-   MOV D0 K4Y0   OK   Exit   Help
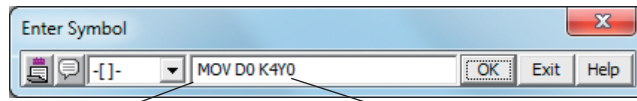
■ Editing the circuit
[Alt]+[→] ... MOV→D0→K4Y0
[Alt]+[←] ... K4Y0→D0→MOV

[Alt] + [←] / [→]

■ Changing the device No.
[Alt]+[↑] ... K4Y0→K4Y1→K4Y2
[Alt]+[↓] ... K4Y2→K4Y1→K4Y0

[Alt] + [↑] / [↓]
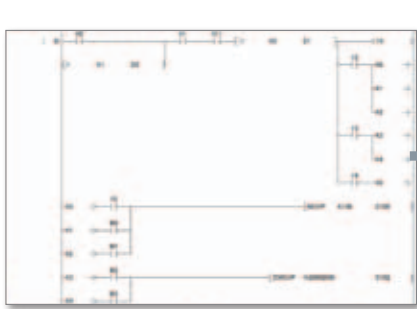
Easy-to-read display
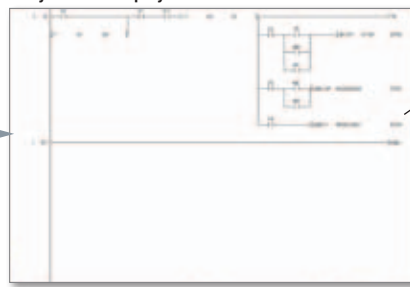
The number of contacts on one line can be changed to 9, 11, 13, 17 or 21 contacts.

The circuit line doesn't wrap, easier to read.

Click the Undo button.

The device number is automatically incremented when repeatedly pasting a cut/copied ladder rung.

Undo

Undo

Undo

Use Undo ([Ctrl] + [z]) to go back to up to 30 previous input steps.

[Ctrl] + [Z]
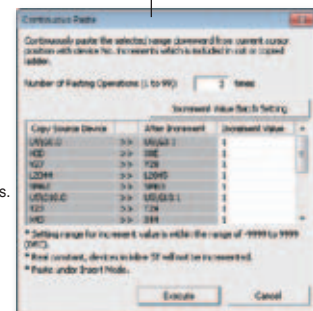
Efficiently edit lines with keyboard

Ladder rungs can be easily modified just by using the various keyboard shortcut keys, eliminating the need to switch to editing mode.

Input line with [Ctrl] + [→] or [Ctrl] + [↓]

Input lines up to coil in batch with [Ctrl] + [⇧Shift] + [→]

(Batch input lines in a vertical direction with [Ctrl] + [⇧Shift] + [↓]
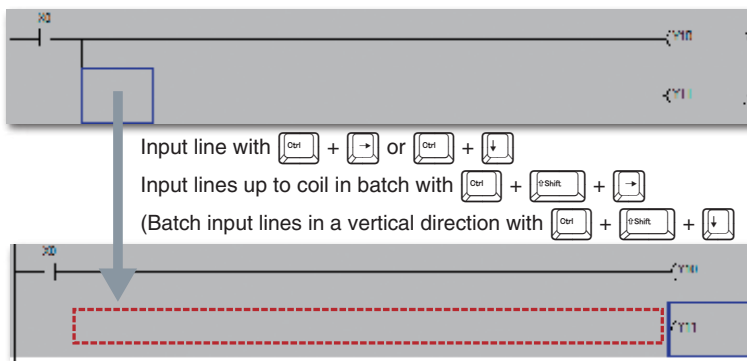
■ How to input a line
Press [Ctrl] + [→] or [Ctrl] + [↓] at an empty spot.
Press [Ctrl] + [→] or [Ctrl] + [↓] on top of a line to delete it.

Use function blocks for common operations

Function blocks allow selections of commonly used code to be easily reused and shared among projects. Shared or created function blocks can be added to a program using simple drag and drop operation. Using function blocks effectively results in faster development times with fewer programming mistakes.

Use the function block selection window to find and import function blocks to the program.

Drag and drop
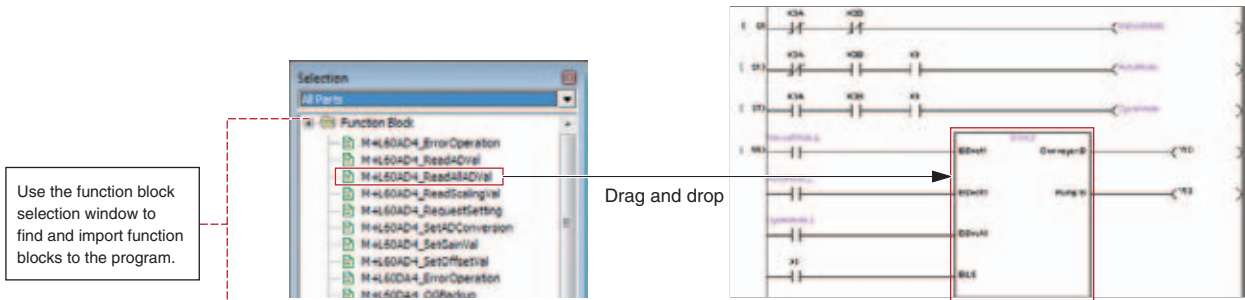
Use sample comments to eliminate the need to input comments

Sample comments are provided for the CPU's special relays/registers and the intelligent function module's buffer memory/XY signals. These can be copied into the project's comments thus greatly reducing the time required for entering device comments.

Comments can be easily used with the right-click menu.

Right-click

Click

■Screen for selecting intelligent function module to be copied

■For X/Y comments   ■For buffer memory   ■For special relays/ special resisters
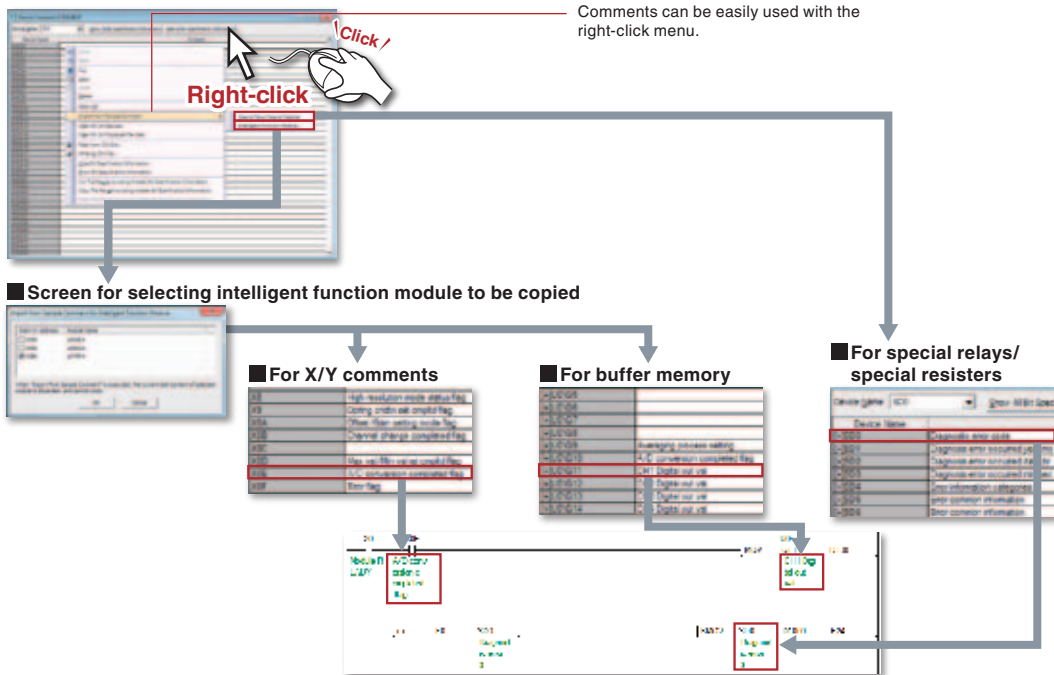
Quickly identify similar devices

Word device comments can be registered per bit with the contents displayed directly on the ladder rung.

More device comments can be handled.

[PRG]Write MAIN1 4 Step

Cross referencing interlinked with circuit displays

Relevant devices and labels can be searched within the contents of the program by using the cross reference tool. The results are immediately displayed in the cross reference dialog box conveniently besides the actual program view screen. It is then very easy to check where the relevant device is actually used within the program, just by double clicking on the target device.

The cross reference information for the device at the cursor location is automatically displayed.

Set multiple reference destinations to search.

Double-click

Click Click

Jump to the step using this device/label.
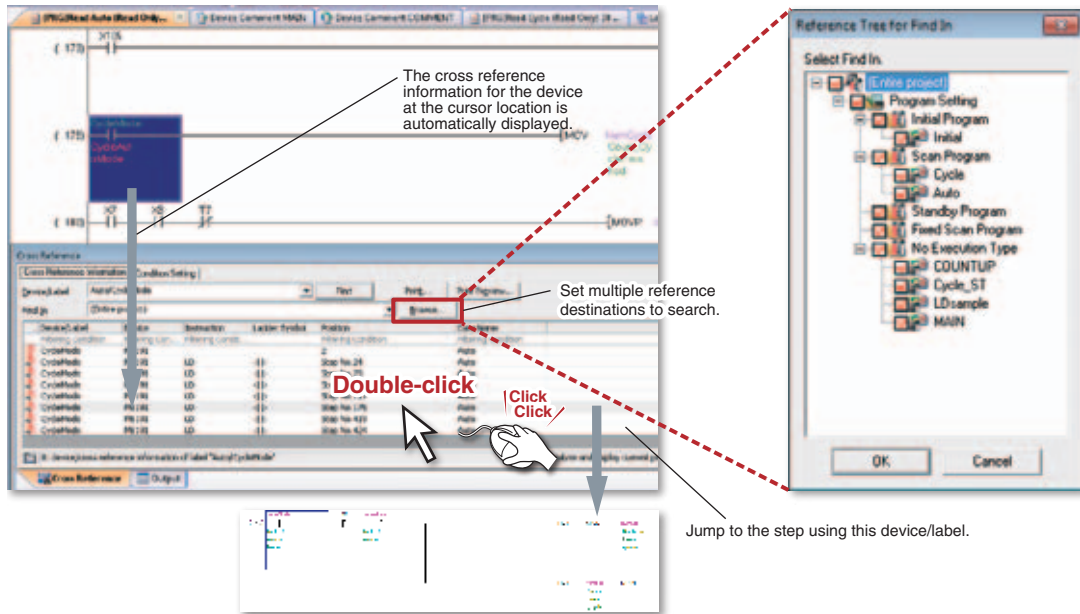
Offline debug without physical hardware

GX Simulator Function

The simulation function is now integrated. The program can be executed in a step-by-step method, finding program errors more easily.

Debugging features can be accessed using the toolbar.

It's easy to begin debugging

Set breakpoints and confirm them in the docking window

Debug programs using only a PC, no connection to the actual hardware is necessary.
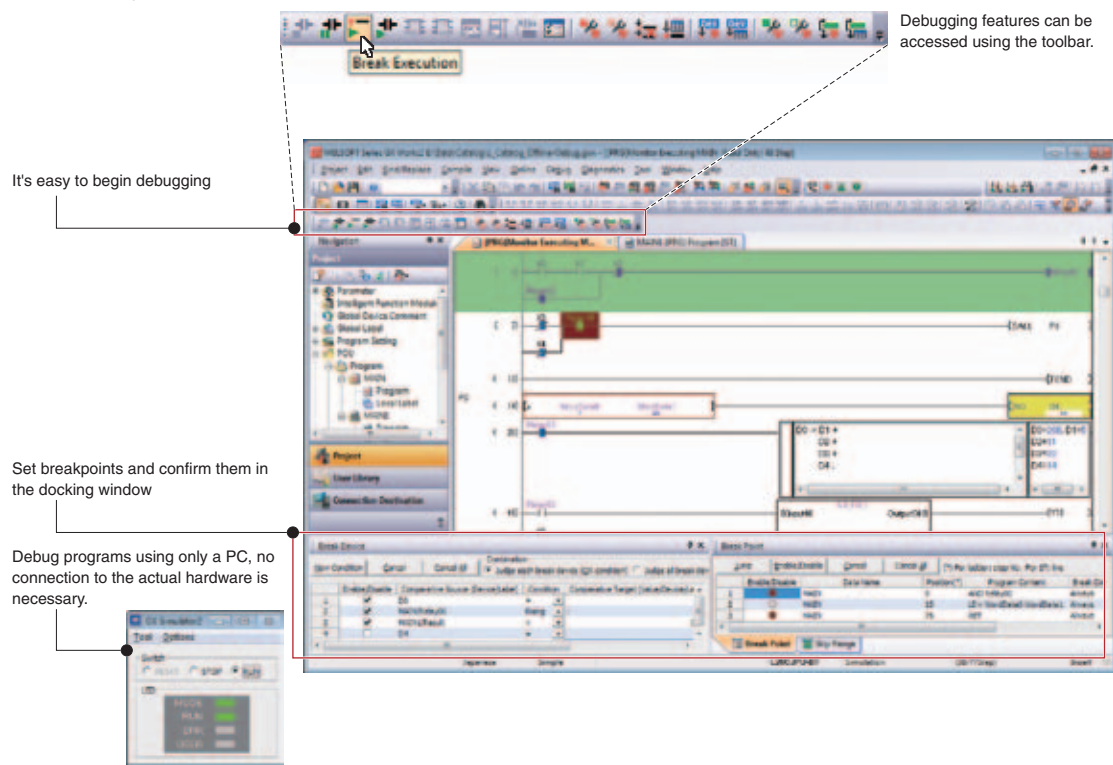
Integrating the intelligent function module setting tool (GX Configurator)

The intelligent function module's setting functions have been unified with GX Works2.
Manage the intelligent function module's setting with a GX Works2 project.

■ **New module addition screen**

Settings are also applied on the I/O assignment parameters.

Module is added to project tree.

Click

Set the A/D conversion system.

Explanations on setting items appear as guidance.
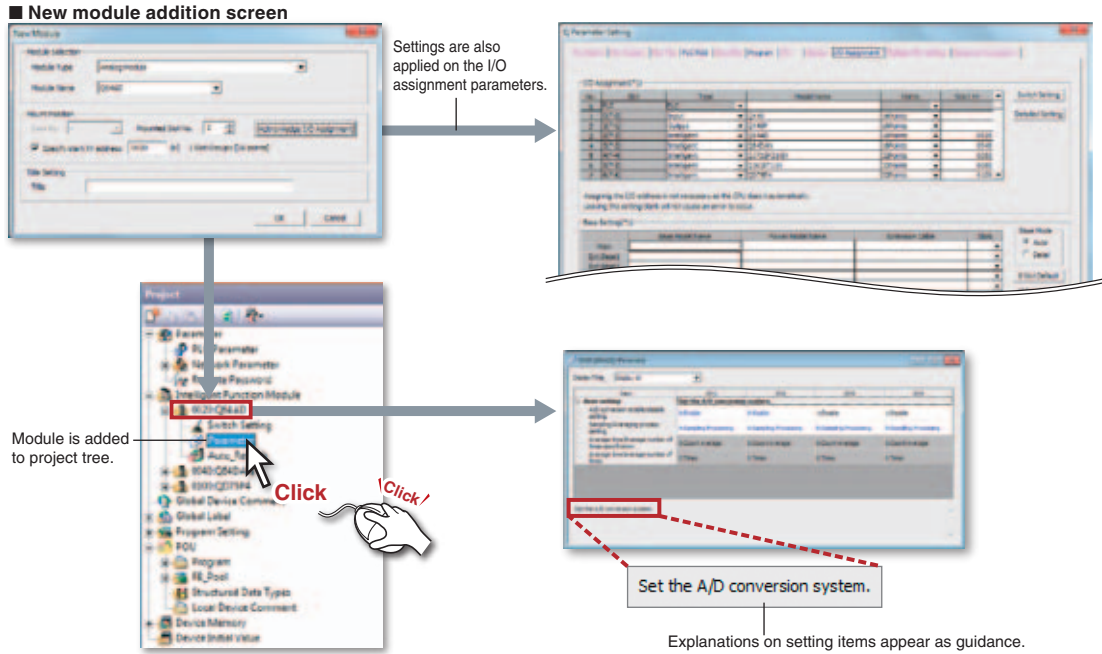
Advanced PLC diagnostics

The diagnostics screen provides a wealth of information about the currently connected controller. The main screen allows the operational status of the entire programmable controller to be seen at a glance, allowing the immediate identification of problems. Additional detailed information is available to help with routine maintenance and problem resolution.

Jump to the module information screen   Jump to the PLC diagnostics screen

[PLC diagnostics]   [Module information]   [Built-in I/O monitor]

Jump to the error history screen
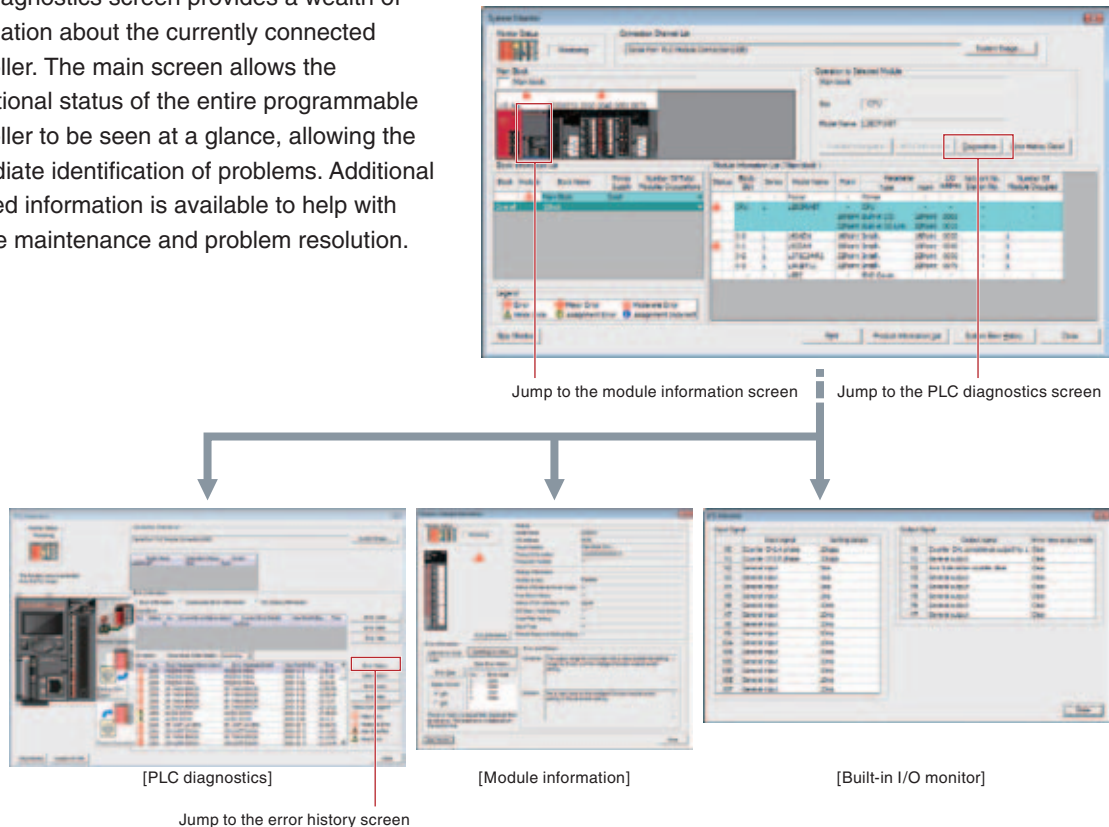
Time-stamped error history list

Simplify troubleshooting with a combined, time-stamped, error history list for the CPU and all expansion modules.
The details section provides explanations of error codes and suggested solutions.
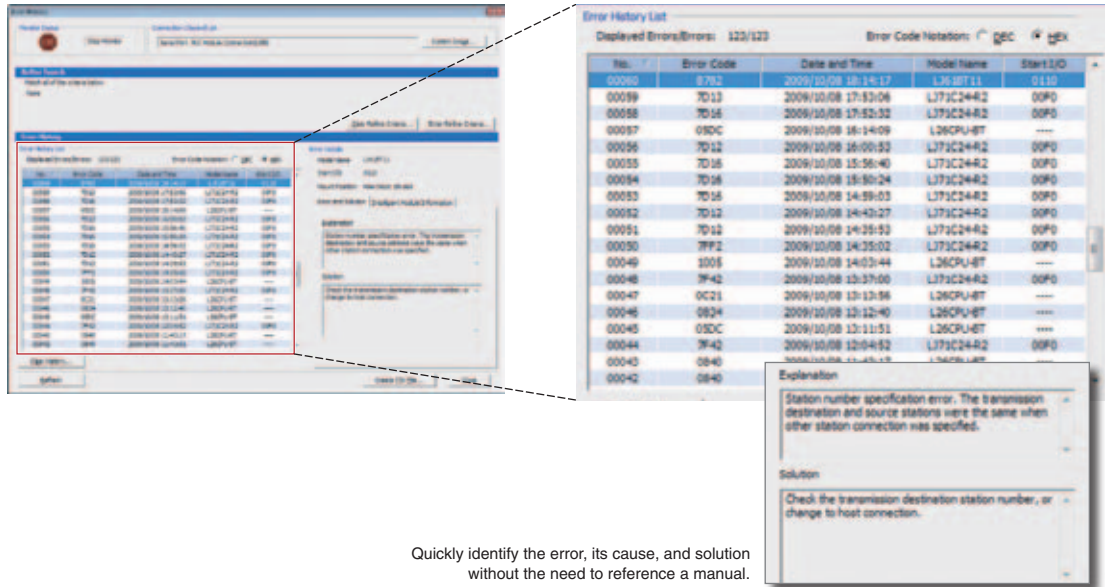
Quickly identify the error, its cause, and solution
without the need to reference a manual.

Save and edit labels and parameters with Excel®

Various program data can be exported in CSV file format.
Exporting to CSV format has various advantages, as shown below:

- Data can be utilized on a PC even if GX Works2 is not installed
- Data can be saved directly on the PC
- Data can be sent and utilized off-site
- Utilization of data for creating documents and graphs are possible using Excel®
- Can use in other software that support CSV format

■ **Example of I/O assignment setting CSV file**

I/O assignment setting
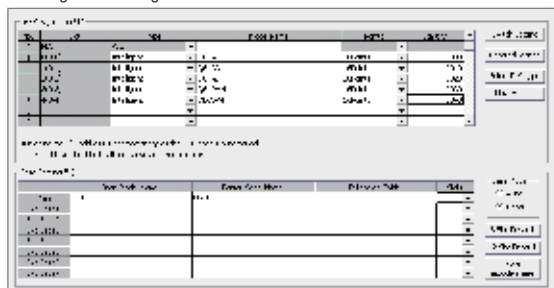
» Ladder program ·· Write/Read
» Label setting ··· Write/Read
» Parameter (I/O assignment setting,
　　　　　　　X/Y assignment confirmation) ··· Write
» Verification results ·· Write
» Sampling trace function ································ Read
　　　　　　　(CSV file format that can be read with GX LogViewer)
» Watch window device/label list ····················· Write/Read
» System monitor diagnostics,
　product information, PC diagnostics,
　Module error history ······································· Write
» Device memory ··· Write/Read

CSV file
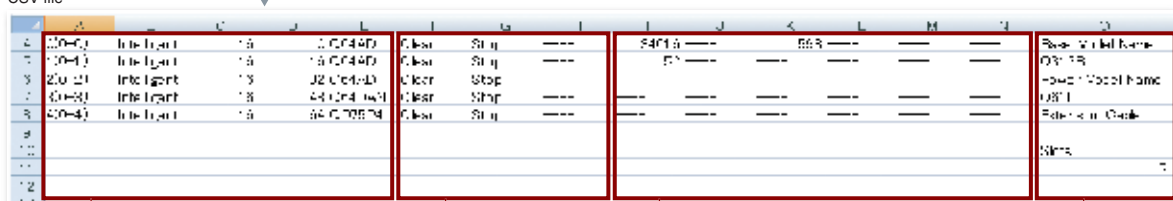
I/O assignment　　　　　　　　Advanced setting　　　　　　　Switch setting　　　　　　　　　Basic setting

L series Features
CPU
I/O
Analog /
Temperature Control
Simple Motion /
Positioning
High-Speed
Counter
Network
Software
Related Products

Programmable controller
Engineering Software
MELSOFT GX Works2

Motion Controller
Engineering Software
MELSOFT MT Works2

HMI Screen Creation Software
MELSOFT GT Works3

System Management Software
MELSOFT Navigator

Robot Programing Software
MELSOFT RT ToolBox2

MELSOFT iQ Works

Next Generation Seamless Engineering Environment

iQ Works is the combination of Mitsubishi engineering software (GX Works2, MT Works2, GT Works 3, RT ToolBox2) that allows for the sharing of design information to improve programming efficiency and reduce TCO.

Graphical Project Management

The entire control system is represented using the "Network Configuration" and "Module Configuration" windows.
System components are easily added using a drag & drop interface and the validity of the system can be confirmed using the check function to ensure parameters are configured correctly, the power supply is sufficient, etc.
Different project types can be grouped together (for example by factory, line, and cell) for central management.
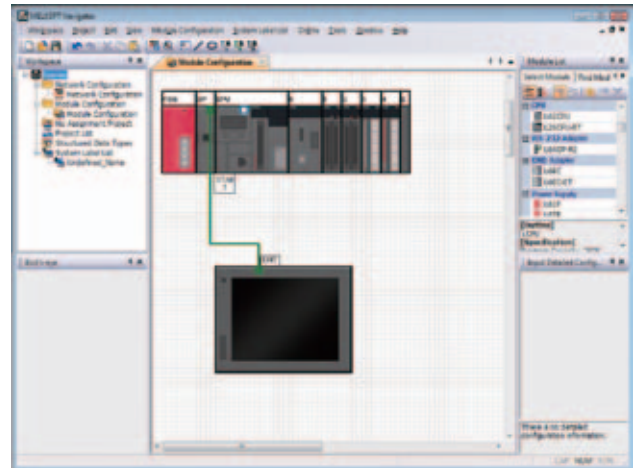
Read project data for multiple devices in a batch

Multiple projects can be read as a block just by having one connection to the programmable controller. If there are multiple devices such as other CPU or GOT on the same network as the target master programmable controller, it is possible to upload all projects to each target device without having to individually connect to each device.

Upload all projects at once

MELSOFT Navigator

MELSEC-L series   MELSEC-Q series   Motion controller   HMI (GOT)
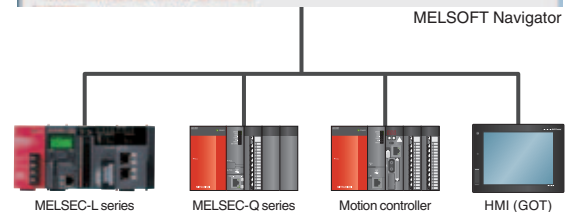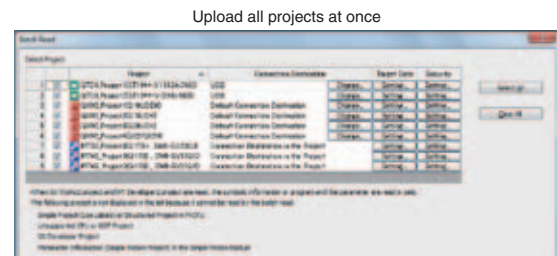
Automatically startup the relevant maintenance software with a single click

Just click on the corresponding project in the system configuration diagram or workspace tree to automatically startup the software relevant for that device. Maintenance can be efficiently performed without having to know and startup each relevant software manually.

Click on corresponding project in workspace tree

Click on corresponding device in system configuration diagram

Software for corresponding device automatically startup

GX Works2

MT Works2

GT Works3

RT ToolBox2
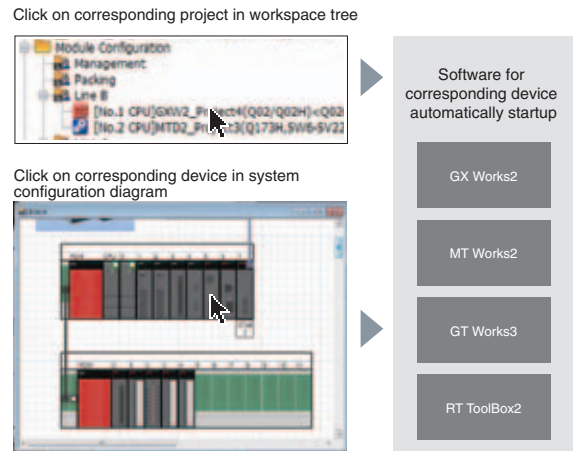
Setup CC-Link slave stations

There's no need to prepare a dedicated tool to check or change the parameter settings for the CC-Link slave station on-site.
The latest version of iQ Works includes CC-Link slave station setting utility. Therefore, it is possible to directly confirm the inverter parameters or change the settings for changing the speed directly from the CC-Link configuration window, for example.
In addition, error information can also be read easily.

USB, etc.

CC-Link master station

Slave station (inverter)

Right-click the slave station illustration and select the "slave station parameter process"

Directly open slave station's setting screen from CC-Link configuration window.

Display

Slave station's parameter setting window opens

Set slave station parameters with GX Works2 and Navigator.

Get error information!

Prepare a device from the system configuration diagram with no manual inputs

A list of modules used can be exported as a CSV file from the system configuration diagram.
This is particularly useful when utilizing data for creating a bill of materials (BOM) in Excel®, etc.

Export CSV file from list of modules

Create device list with Excel®
▼
Print list of devices
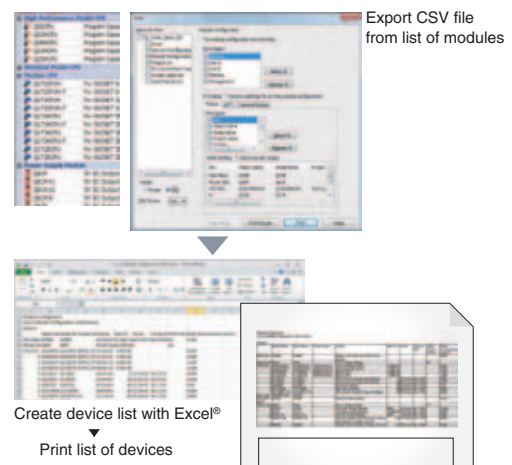
GX LogViewer

Visualizing the production process

Within modern manufacturing needs, data collection has become more important for fully optimizing the production process.
GX LogVewer is a software tool that realizes visualization of large amounts of production data in a simple to use format.
Utilizing this functionality to identify root error causes and improving the production rate.

Easily display and analyze large amounts of collected logging data

This tool is used when large amounts of data need to be visualized and collected from the MELSEC-Q series or MELSEC-L series.
The connection settings and checking of log files are the same as GX Works2 enabling individual connections to each module.

Display logging results in a graph or list

Logging file

Open a data logging file

Open an event logging file

Ethernet

Trend graph display

Event monitor display[1]

L series CPU

L series
analog input module

Q series
High-speed
Universal model QCPU

Q series
High-speed
data logger module

Q series
analog input module
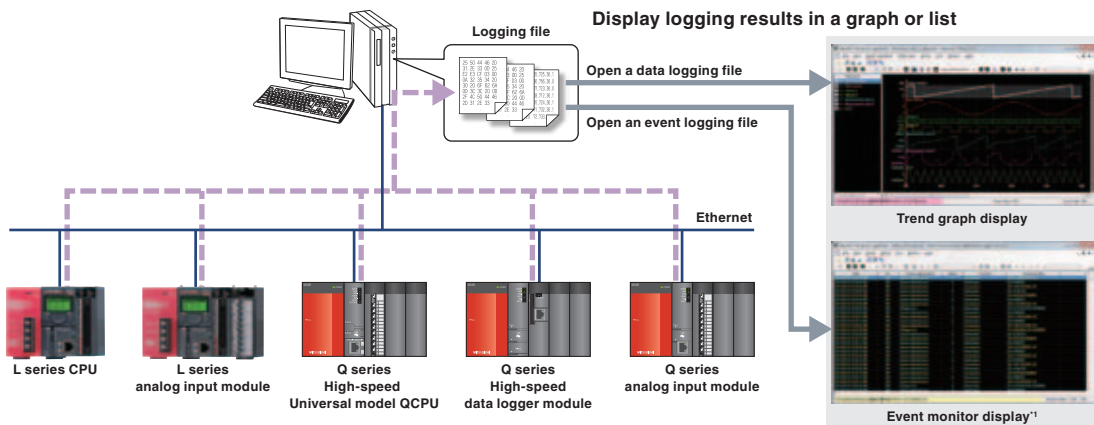
[1] The event monitor display is supported only with the Q series high-speed logger module.

Easily adjust graphs without referring to the setup manual

[Arranging graphs]
Able to arrange each graph so as not to overlap each other. It is easier to display the graphs as each graph is evenly spaced out.
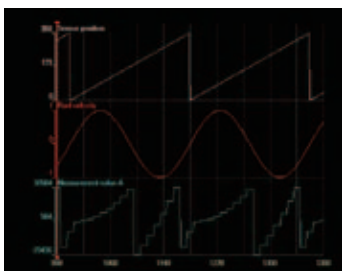
[Overlapping graphs]
With this it is possible to overlap each graph over one another. 0Multiple graphs can be compared enabling easier data analysis and comparison.
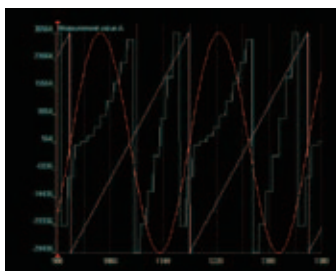
[Automatically adjusting graphs]
Various attributes of the graph are automatically adjusted (max/min values) as to display the upper and lower limit values better.
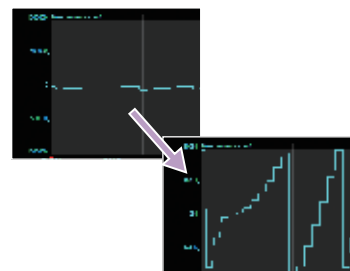
Easily confirm changes in data with dual cursors

Data changes within a designated time frame can be quickly checked with user-friendly dual cursors (multi-cursors). When the cursors are moved to the point at which changes are to be confirmed, the difference in time and value between those points will appear.

▼ Blue cursor ▼ Red cursor

| Difference(Blue->Red) | 137 | Span(Blue->Red) | 00:00:35.500 |
| Value(Blue) | 61 | Time(Blue) | 20XX/09/16 12:09:54.030 |
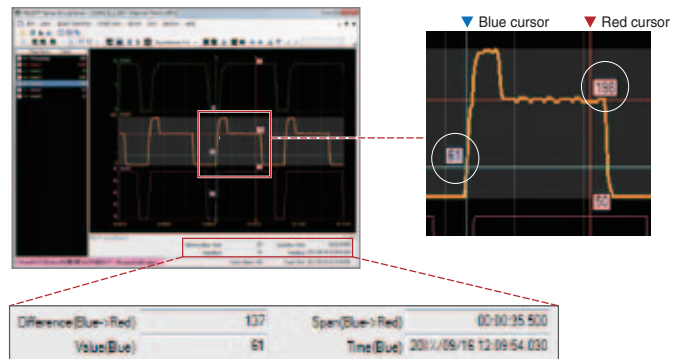
The difference in time and value between the cursors is automatically calculated and displayed.

Display data for multiple files within one graph area for easy comparison

Data for multiple files are displayed with the same time units in the same graph area. The display position within a file can be moved easily. This allows the differences of data within multiple files to be confirmed easily.

Display data for multiple files in same window

Overlap graphs with cursor for easy comparison

[Ctrl] +
Move graph
up/down/left/right

Easily compare the normal and abnormal data
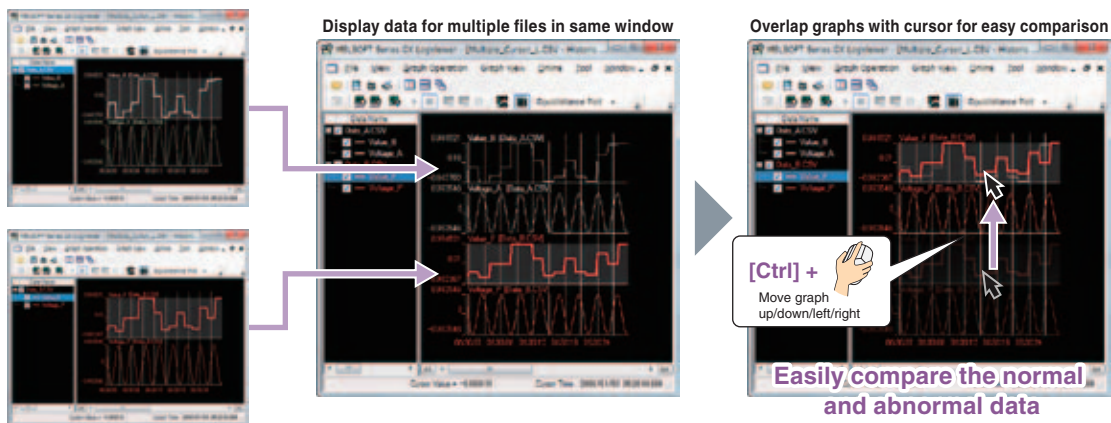
Quickly jump cursor to designated position

[Cursor jump]
Confirm data values by quickly moving the cursor to a designated value, time or index position in the trend graph.

Jump to position where conditions match

[Value search]

[Index designation]
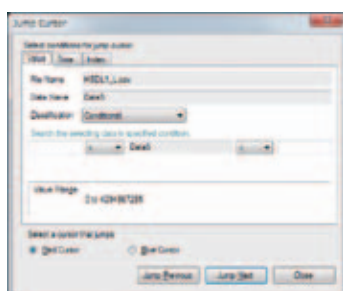
[Time designation]

[Value search]
Values are searched, and the cursor jumps to the position where the conditions match.
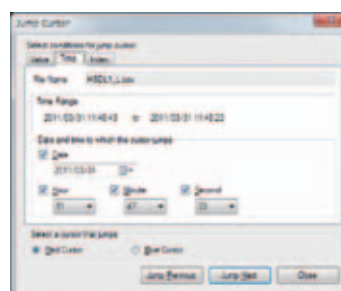
[Time designation]
The cursor jumps to the designated time.
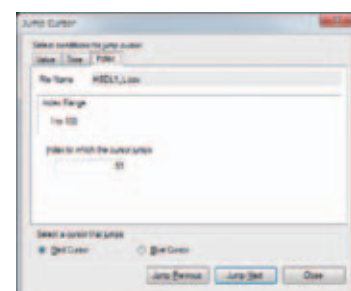
[Index designation]
The cursor jumps to the designated index.

MX Component Ver. UP

Easily connect PC to Programmable Controller

MX Component is the Active X® control/.NET control library enabling communication from a PC to a programmable controller and motion controller regardless of communication protocol. Complicated programs for serial and Ethernet communication can be developed with simple steps.

Easily set communication conditions with Wizard

The Wizard style communication configuration utility facilitates access to the programmable controller's CPU. The communication configuration utilities saves the set programmable controller CPU's logic station number, making it simple to access the programmable controller's CPU just by setting the station number.

Follow the Wizard's instructions to set the communication.
(Control for configuration with only a program is available.)

Paste the MX Component control icon into the form.
The set communication path No. is set in the pasted control's properties.
After setting the communication path No., write the program for reading the device.
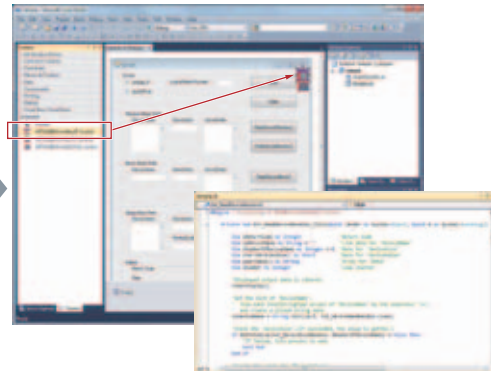
Data collection by VBA

Real time graph display applications can be created using VBA programming in Excel® and Access®. Logged programmable controller device data can be collected and saved in real-time.
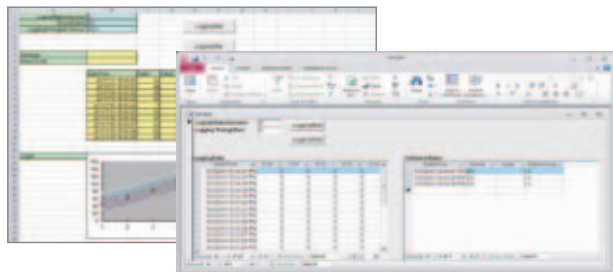
Reduce man-hours by developing programs with labels

Devices can be set according to the assigned label.
Labels enable intuitive configuration of the program within MX Sheet or directly in the program itself. Therefore, if changes are made to the devices, there is no need to further change the program or MX Sheet file.

MX Sheet Ver. UP

Easy data collection using Excel®

Enables monitoring of the programmable controller or motion controller, log data, collect alarm information, and changing setting values, etc., using familiar Excel® software.

Simple and program-less setting

MX Sheet operation conditions can be set from Excel®. Therefore, a communication program is not required to communicate between programmable controller and Excel®.

[Step1]
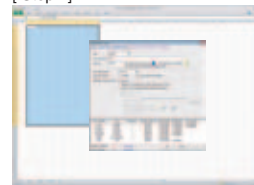
Start the configuration utility, select a function, and set the device conditions.

[Step2]
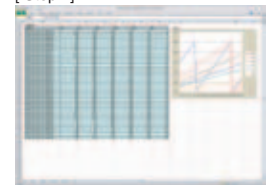
Then, data collection will be started only by arranging the screen and executing the function.

Direct connection between office and field

The device data in the programmable controller is monitored and logged real time before being written to Excel®. Recipe data can also be transferred to programmable controller directly from Excel®.

PLC

HMI (GOT)
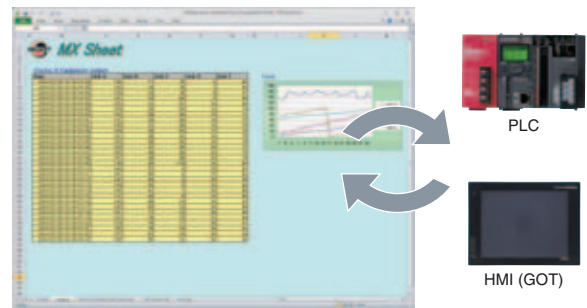
Auto-generate periodic reports

The data displayed on Excel® is automatically saved or printed at the specified time or as requested by the programmable controller. Periodic reports and test result lists are generated automatically.

M0 turns on

MX Sheet

Automatic saving to Excel® file, HTML file and CSV file

Automatic printing of Excel® file (easy preparation of daily, weekly and monthly reports)
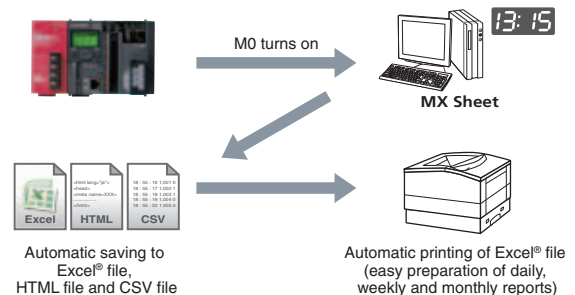
Daily reports and monthly reports can be automatically saved and printed according to various conditions.

GRAPHIC OPERATION TERMINAL

GOT1000

HMI

Combination with GOT for all scenes from startup to maintenance

To start the equipment more quickly and minimize the downtime.
To create the value of time, GOT1000 has successively realized solutions as more than just an HMI.
Now the cooperation with programmable controller is strengthened through the quick operability and functionality of the HMI.
Enhanced functions required on site are reflected on its clear screen to realize advanced productivity and workability.

For details, refer to the "Mitsubishi Graphic Operation Terminal GOT1000 Series Catalog" catalog.

Harness the power of L series and GOT combined

When connected to an L series system, Mitsubishi Graphic Operation Terminals are capable of advanced system maintenance and diagnostic functions that can reduce downtime.

Dedicated MELSEC-L series maintenance screen*
(Troubleshooting functions for L series)
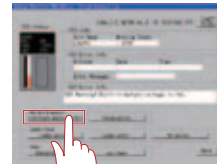
Jump from the L series maintenance screen to the intelligent function module monitor screen

*GT16 only.

Save time by performing system maintenance functions directly from the GOT

Graphic Operation Terminals include maintenance screens dedicated for the L series that let the user check CPU status and error information. No PC is required and no special screens need to be created for the GOT. Jump directly from the L series maintenance screen to other maintenance screens such as the intelligent function module monitor.

GT16

Intelligent module monitor, System monitor
Ladder monitor, Ladder editor, SFC monitor
Backup / restoration, Log viewer
General system information and combined error history
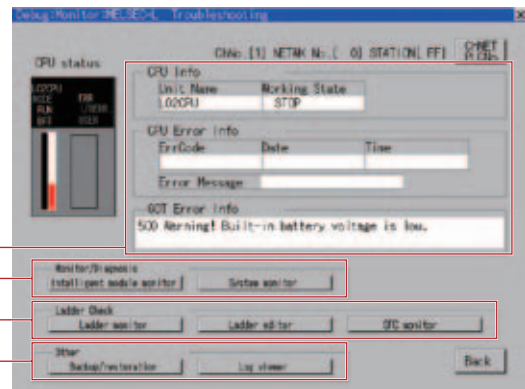
[Backup / Restore]
Using this feature, it's easy to create backups of sequence programs and other CPU data. It can even be configured for automatic operation. Create backups after programs are updated and restore programs in case of trouble. Because the data are stored on the GOT, no PC is required.

GT16   GT15   GT14

Copy saved program files to a new CPU...
CPU exchange
Sequence programs
Restore
Memory card, etc.
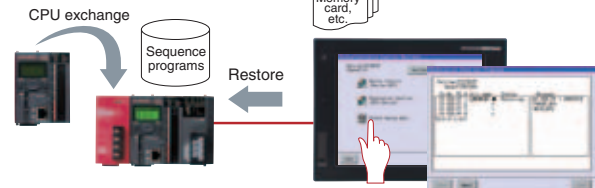
[Intelligent Module Monitor]
Monitor and test built-in I/O and expansion modules.
This feature works with nearly all expansion module types from analog I/O to high speed counters and positioning.

GT16   GT15

Use GT Works3 templates to easily create screens

Select a template from the library and put it on the editor screen, and you can easily create a simple motion module*1 operation monitor or error history screen, etc.

GT16   GT15

*1 LD77MH4 only

L series Features

CPU

I/O

Analog /
Temperature Control

Simple Motion /
Positioning

High-Speed
Counter

Network

Software

Related Products

Make simple corrections to ladder programs using a GOT

GOTs enable ladder programs to be edited without the need for a PC. Furthermore, because it is possible to perform write during run operations using the GOT, ladder programs may be corrected without stopping the machine, even if it is in operation. (Ladder editing function) **GT16** **GT15**
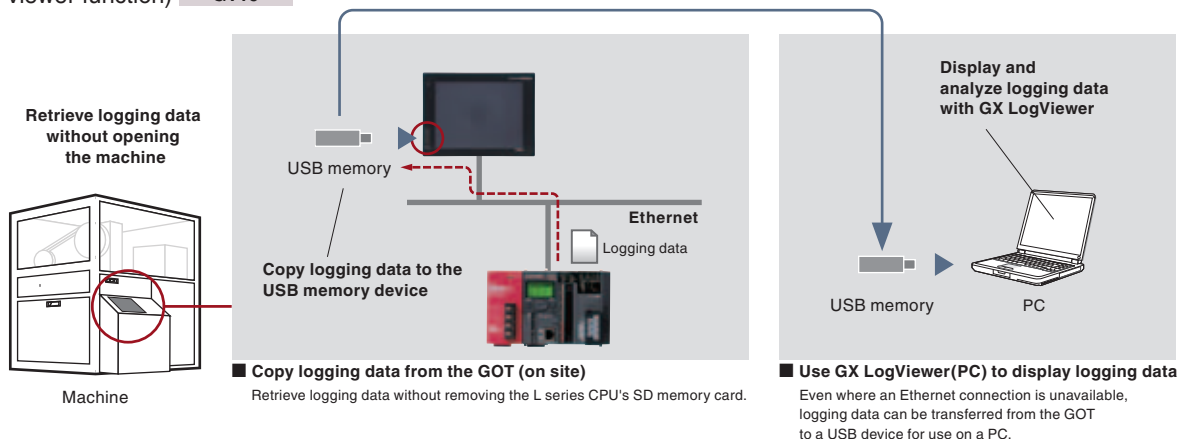

Touch the area you wish to edit and the ladder input window appears.

Ladder symbol: Change from normally closed contact to normally open contact.
Device: Change from M422 to M200

Changes to M200, normally open contact!
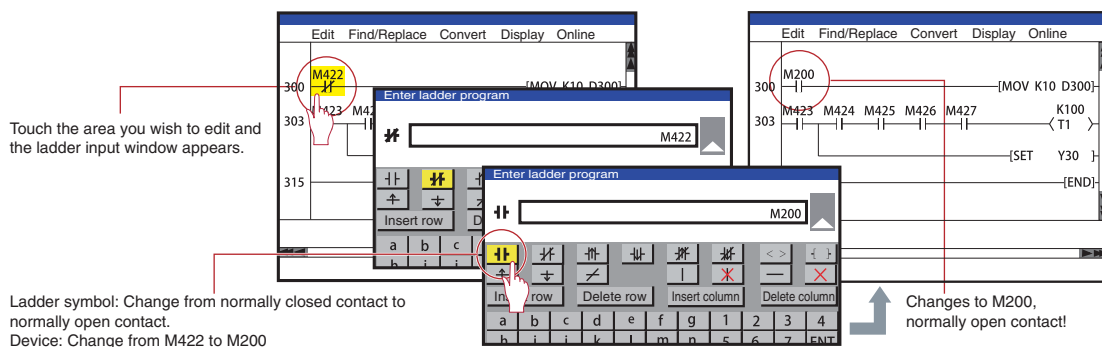
View logging data without a PC

Logging data can be confirmed with the GOT (GT16) even if a PC is not available on-site, allowing problems to be troubleshooted quickly. Changes in the data can be quickly confirmed with the dual cursors (multi-cursors) that are displayed similar to GX LogViewer. (Log viewer function) **GT16**

GOT (GT16)

Blue cursor

Red cursor

Quickly see the difference in time and value between cursors

▲25.000	(MAIN	,	0 Step)
	Blue cursor	Red cursor	Difference (blue->red)
Time	01/31/2011 10:22:36.061	01/31/2011 10:22:16.061	-0:00:00:20.000
Value	25.000	-3700.000	-3725.000
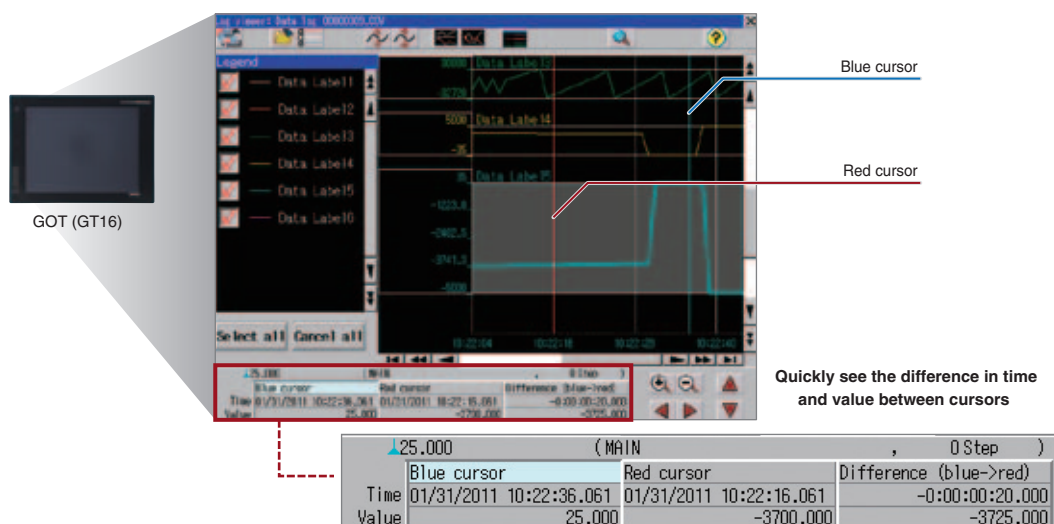
Retrieve logging data without opening any panels

Using the front mounted USB port on the GT16 Series, L series users can easily copy logging data from the LCPU to a USB memory device.
Logging data can be retrieved easily without opening any control panels or removing the SD memory card from the CPU. (Log viewer function) **GT16**

Retrieve logging data without opening the machine

Machine

USB memory

Copy logging data to the USB memory device

Ethernet

Logging data

■ **Copy logging data from the GOT (on site)**
Retrieve logging data without removing the L series CPU's SD memory card.

Display and analyze logging data with GX LogViewer

USB memory   PC

■ **Use GX LogViewer(PC) to display logging data**
Even where an Ethernet connection is unavailable, logging data can be transferred from the GOT to a USB device for use on a PC.

Man, machine and environment in perfect harmony

MELSERVO-J4 — trusted technology makes an evolutionary leap forward.

Introducing the MELSERVO-J4 series. Offering more than just improved performance, these servos are designed to drive the industries of tomorrow. Backed by Mitsubishi leadership in all-digital technology, MELSERVO has become one of the most globally respected names in factory automation. And now — with the safety, ease of use, and energy-efficient design of the new MELSERVO-J4 series — man, machine and environment can at last work together in perfect harmony.

For details, refer to the "MELSERVO-J4" catalog.

A C   S e r v o

MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-J4

■ Servo amplifier

SSCNET Ⅲ/H compatible, CC-Link IE Field Network interface with Motion compatible, and general-purpose interface compatible servo amplifiers are available. MR-J4W2-B/MR-J4W3-B multi-axis servo amplifiers achieve energy conservation, space-saving and reduced wiring. MR-J4-B(-RJ)/MR-J4W2-B/MR-J4-A(-RJ) servo amplifiers are compatible with fully closed loop control system.

SSCNET Ⅲ/H compatible servo amplifier
MR-J4-B(-RJ)

SSCNET Ⅲ/H compatible 2-axis servo amplifierr
MR-J4W2-B

SSCNET Ⅲ/H compatible 3-axis servo amplifier
MR-J4W3-B

CC-Link IE Field Network servo amplifier with Motion
MR-J4-B-RJ010* + MR-J3-T10

General-purpose interface compatible servo amplifier
MR-J4-A(-RJ)

* MR-J4-B-RJ010 servo amplifier is compatible only with the rotary servo motor.

■ Servo motor

A variety of models are available to match various applications. These include rotary servo motors for high-torque output during high speed, linear servo motors for highly accurate tandem synchronous control, and direct drive motors for compact and rigid machine, and high-torque operations.

■ Rotary servo motor

Small capacity, low inertia **HG-KR** Series Capacity: 50 to 750W	Small capacity, ultra-low inertia **HG-MR** Series Capacity: 50 to 750W	Medium capacity, medium inertia **HG-SR** Series Capacity: 0.5 to 7kW	Medium/large capacity, low inertia **HG-JR** Series Capacity: 0.5 to 22kW	Medium capacity, ultra-low inertia **HG-RR** Series Capacity: 1 to 5kW	Medium capacity, flat type **HG-UR** Series Capacity: 0.75 to 5kW

■ Linear servo motor
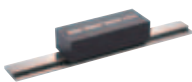
Core type **LM-H3** Series Rating: 70 to 960N	Core type with magnetic attraction counter-force **LM-K2** Series Rating: 120 to 2400N	Core type (natural/liquid cooling) **LM-F** Series Rating: 300 to 3000N (natural cooling) Rating: 600 to 6000N (liquid cooling)	Coreless type **LM-U2** Series Rating: 50 to 800N

■ Direct drive motor

Core type **TM-RFM** Series Rating: 2 to 240N·m

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

Machine

The leading edge in drive control

Advanced one-touch tuning

Servo gains including machine resonance suppression filter, advanced vibration suppression control Ⅱ*, and robust filter are adjusted just by turning on the one-touch tuning function. Machine performance is utilized to the fullest using the advanced vibration suppression control function.

*1 The advanced vibration suppression control Ⅱ automatically adjusts one frequency.

Exactly matched. High-speed positioning

Rotation speed

Settling time

Time

— : Command — : Actual operation

■ One-touch tuning window

One-touch tuning
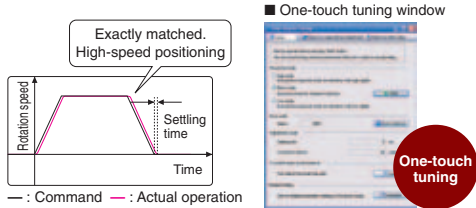
Motion network SSCNET Ⅲ/H triples communication speeds

In the high-speed optical communication SSCNET Ⅲ/H, communication speed is increased to 150 Mbps full duplex (equivalent to 300 Mbps half duplex), three times faster than the conventional speed. System response is dramatically improved.

■ Network communication speed

3 times faster

Baud rate [Mbps]

SSCNET Ⅲ/H MR-J4

SSCNET Ⅲ MR-J3

50   100   150
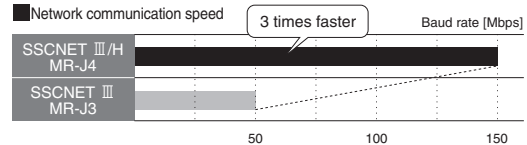
Man

The leading edge in safety and convenience

Safety function according to IEC/EN 61800-5-2

MELSERVO-J4 series servo amplifiers have integrated STO (Safe Torque Off) and SS1*1 (Safe Stop 1) functions as standard.
Safety system is easily configured in the machine. (SIL 2)
• Turning off the control power of servo amplifier is not required, cutting out the time for restart. Additionally, home position return is not required.
• Magnetic contactor for preventing unexpected motor start is not required.*2

*1 Safety equipment (MR-J3-D05, safety programmable controller MELSEC QS/WS series, etc.) is required.
*2 Two magnetic contactors are not required when STO function is used. However, in this diagram, one magnetic contactor is used to shut off the power at alarm occurrence.

[Shut-off by STO function]

Shut-off

Safety relay circuit

Molded-case circuit breaker (MCCB)

Magnetic contactor for preventing unexpected start is no longer required.

Magnetic contactor (MC) for servo alarm*2

MR-J4 MR-J4W_

Servo motor   Stops motor

[Shut-off by STO and SS1 functions]

Molded-case circuit breaker (MCCB)

Magnetic contactor for preventing unexpected start is no longer required.

Magnetic contactor (MC) for servo alarm*2

Safety equipment (MR-J3-D05, safety programmable controller, etc.)

SS1 signal

MR-J4 MR-J4W_

Servo motor   Stops motor

The environment

An evolution in eco-friendly design that's winning acclaim worldwide

Space-saving with industry's smallest* 3-axis type

2-axis servo amplifier MR-J4W2-B requires 26% less installation space than two units of MR-J4-B. 3-axis servo amplifier MR-J4W3-B requires 30% less installation space than three units of MR-J4-B.

* This is when two units of 100W, 200W, 400W, and 750W each are used.
* Based on Mitsubishi Electric research as of January 2013.

<Installation space>

MR-J4W3-B
(3-axis type)   168mm

85
100W×2 200W×1 | 200W×1 400W×2 | 750W×2

(Depth 195mm)

Installation space reduced by **30**%

Industry's smallest*

255mm = 85mm (unit width) × 3

MR-J4W2-B
(2-axis type)   168mm

60   85
100W ×2 | 200W ×2 | 400W ×2 | 750W ×2

(Depth 195mm)

Installation space reduced by **26**%

265mm = 60mm (unit width) × 3 + 85mm (unit width) × 1

MR-J4-B   168mm

40   60
100W 100W 200W 200W 400W 400W 750W 750W

(Depth 135, 170 185mm)

360mm = 40mm (unit width) × 6 + 60mm (unit width) × 2

Inverter

Achieving higher drive performance and energy conservation with inverters

The inverter is a variable frequency power device that can easily and freely change the speed of a 3-phase induction motor.
The Mitsubishi inverter is high-performance and environment-conscious, and complies with global standards. Select a model from our diverse lineup to match your needs.

For details, refer to the "INVERTER FAMILY" catalog.

Answering various needs with the best choices
Frequency Inverter

FR-700 Series inverter

Functions and Performance

FR-A700
Advanced functionality and high-performance inverter

FR-F700P
Energy-saving premium inverter for fans and pumps

FR-E700
Simple, powerful, and compact inverter

FR-F700PJ
Air conditioning inverter

FR-D700
Simple and compact inverter

0.1   0.4 0.75   15   500 560
Capacity (kW)
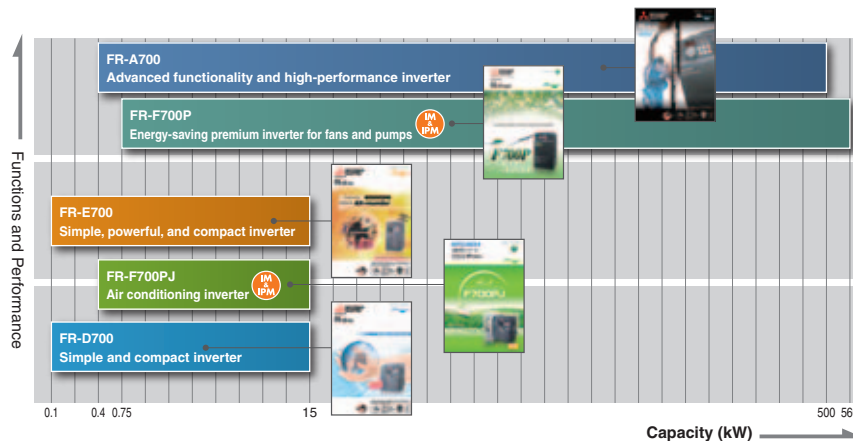
Control inverter with CC-Link communication

The inverter can be controlled to a programmable controller with CC-Link.[*1]
This function is supported with CC-Link Ver. 1.1 and Ver. 2.0.
The inverter can be operated and monitored, and the parameters set from the programmable controller.

*1 The inverter operation part (FR-A7NC) is required.
   Please refer to the relevant catalog for additional information.

Power supply unit
Programmable controller
Master station
Inverter
Connect up to 42 units
(For inverter-only connection)
Inverter
Option part: FR-A7NC
Option part: FR-A7NC
Terminator
CC-Link dedicated cable
Terminator
CC-Link
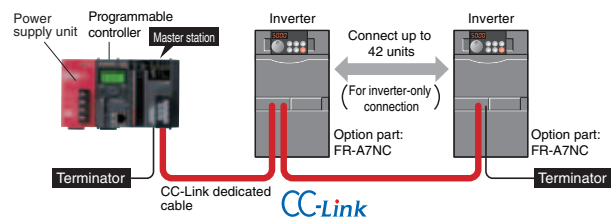
Easy synchronous operation with SSCNET Ⅲ connection

Connect to a motion controller with SSCNET Ⅲ [*2].
SSCNET Ⅲ uses the high-speed synchronous serial communication method (high-speed, high-accuracy, high-reliability optical communication), and is perfect for synchronous operation.

(SSCNET: Servo System Controller Network)

*2 Supported only with MELSEC-Q series.
   The inverter operation part (FR-A7NS) is required.
   Please refer to the relevant catalog for additional information.

Q series Motion controller
Servo amplifier
Inverter
Option part FR-A7NS
SSCNET Ⅲ
SERVO SYSTEM CONTROLLER NETWORK

L series Features
CPU
I/O
Analog / Temperature Control
Simple Motion / Positioning
High-Speed Counter
Network
Software
Related Products
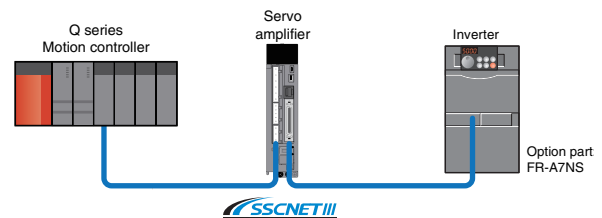
Contactors and Motor Starters

Diverse variations to respond to all situations

The Mitsubishi Electric Contactors and Motor Starters MS-N series and DC interface contactor SD-Q series products are equipped with an environment and global compliance, compact size, ease-of-use and safety. Certification to various international standards, this highly reliable magnetic contactor is suitable for a variety of applications from panels to systems.

For details, refer to the "Contactors and Motor Starters MS-N series" catalog.
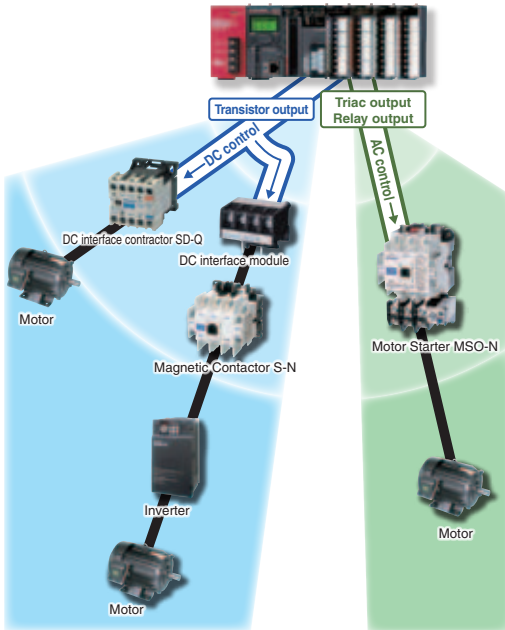
Direct drive with Programmable Controller

The SD-Q series has a small coil VA and can be driven by the programmable controller without adding an amplifying relay.
By adding the DC interface module, the MS-N series can be used with a wide range of motor capacities.

		Programmable controller output module type		
		Transistor output	Contact output	Triac output
DC interface contactor SD-Q series	DC operation	○	○	—
Magnetic contactor MS-N series	AC operation	○ (Using DC interface module)	○	○
	DC operation	○	×	—

* This table shows the relation of the programmable controller output module type and operation interface. There may be restrictions according to the type of frame size, etc., that can be used.
Refer to the MS-N series catalog for the types of magnetic contactor and models that can be used.

Transistor output
Triac output Relay output
DC control
AC control
DC interface contactor SD-Q
DC interface module
Motor
Magnetic Contactor S-N
Motor Starter MSO-N
Inverter
Motor
Motor

SD-Q series

Direct drive is possible with the programmable controller's transistor output. Since a relay and interface module are not required, the number of parts can be reduced, and space can be saved.

Standard surge absorber

Prevent adverse effects onto the peripheral equipment.

Standard terminal cover

A terminal cover with finger protection function is mounted as a standard.
This cover answers to user's needs for safety.

MS-N series

Environment-friendly Mitsubishi MS-N series ensures safety and conforms to various global standards.
Its compact size contributes to space-saving in a machine. The MS-N series is suitable for MELSEC-L series as well as other Mitsubishi FA equipment and can be used globally.

Mitsubishi's original CAN terminal structure for simple wiring (optional)

Mitsubishi MS-N series adopts the CAN terminal structure for simple wiring. Thus, wiring is reduced by approximately 35% compared to the conventional screw terminal wiring. (Based on Mitsubishi Electric research.) The CAN terminal structure also provides finger protection that complies with DIN VDE standard.

Wiring example

Wiring completed.

(1) Pull up the CAN terminal.
(2) Insert the round/ Y crimps.
(3) Pull down the CAN terminal and tighten the screw.
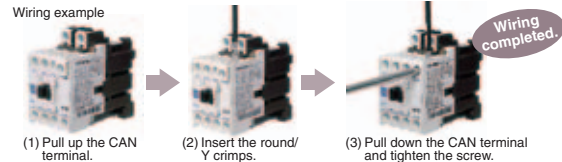
Mirror contact (auxiliary contact off at main contact welding)

The MS-N series meets requirements of "Control functions in the event of failure" described in EN 60204-1 "Safety of machinery-Electrical equipment of machines-", being suitable as interlock circuit contact. The MS-N series is applicable for category 4 safety circuit. We ensure safety for our customers.

Conforms to various global standards

▯: Compliant as standard

Model	Standard				Certification		EC directive	Authority	CCC
	JIS/JEM	IEC	DIN/VDE	BS/EN	UL	CSA	CE	TÜV	GB
	Japan	International	Germany	England Europe	U.S.A	Canada	Europe	Germany	China
S-N10 to S-N400 MSO-N10 to MSO-N400 TH-N12KP to TH-N400KP	▯	▯	▯	▯	▯	▯	▯	▯*	▯

* The Motor Starters are certified under each type name of the Magnetic contactors and the Thermal Overload Relays on the condition that the Magnetic contactors and the Thermal Overload Relays are used in combination.

COGNEX® machine vision system and Mitsubishi Electric FA Devices

Innovating your production with this integral power.

Vision Solution

Functioning as devices that "watch" instead of human eyes, COGNEX machine vision systems have continued to reform automation of production lines. Mitsubishi Electric FA devices, such as programmable controllers, lead the tomorrow of FA control.

The possibilities of vision system solutions, created in the integration of this spirit of innovation, have continued to increase. "In-Sight EZ", developed exclusively for use with Mitsubishi Electric FA devices, enhances functions.

Affinity, including connectivity and ease of program development, has also been refined.

The key solution for enhancing efficiency of inspections and identification, etc., for improving product quality and for reducing total costs lies within the integrated power of COGNEX + MITSUBISHI.

For details, refer to the "Vision System & Factory Automation Solution" catalog.

FA Integral Solutions

e-F@ctory + COGNEX Vision

"e-F@ctory" is an assimilation of solutions that integrate the "MES interface" enabling "visualization" with seamless information sharing and "iQPlatform" realizing flexible sharing within the production site.

Mitsubishi Electric collaborates with partners from various fields to supports general factory optimization through the "e-F@ctory" concept.

The latest achievement is the partnership of COGNEX Vision products and Mitsubishi Electric FA Devices.

L series Features

CPU

I/O

Analog / Temperature Control

Simple Motion / Positioning

High-Speed Counter

Network

Software

Related Products

COGNEX In-Sight EZ Series
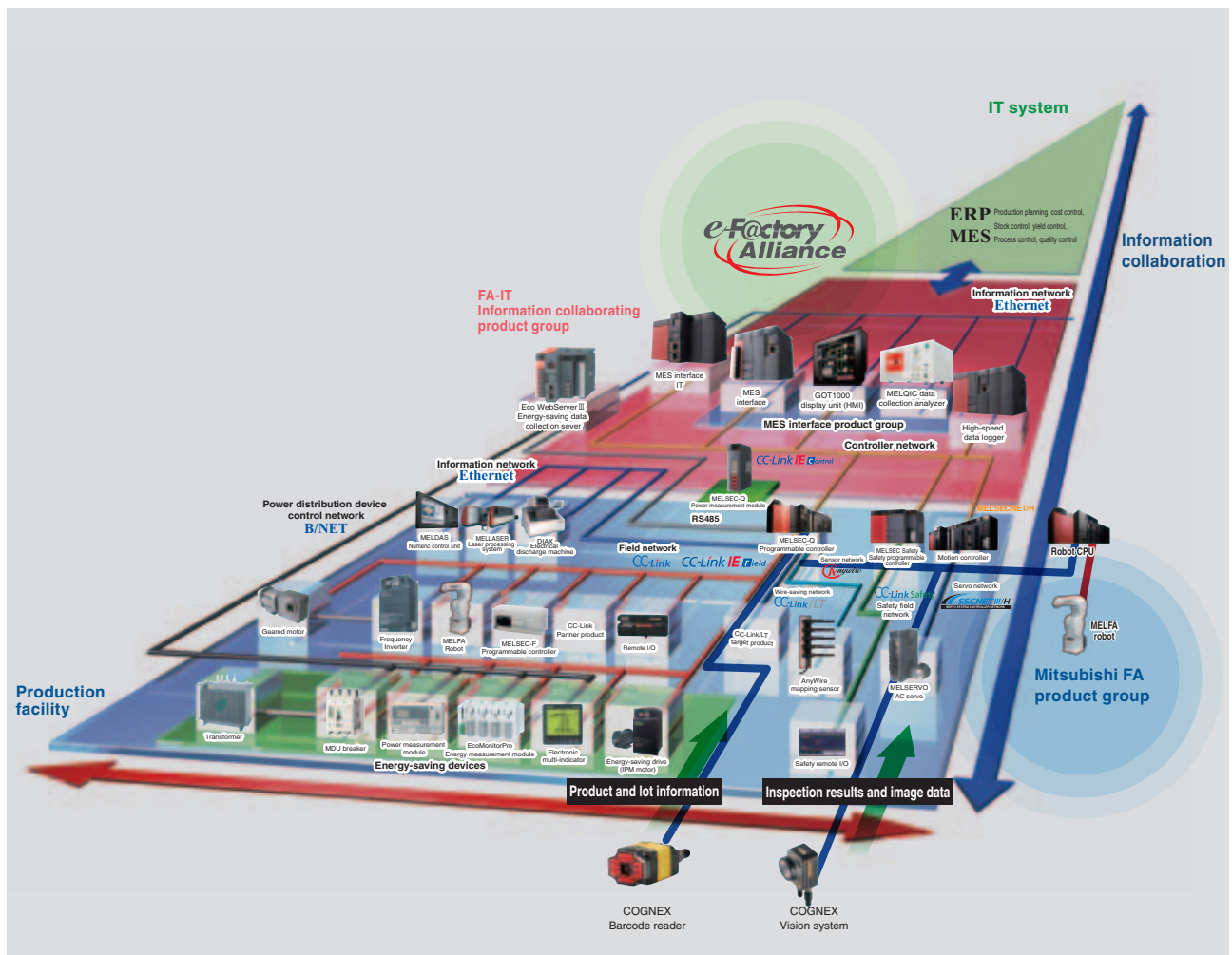
Simple connection

[Directly connect with Ethernet]

The "In-Sight EZ" can be directly connected to the Ethernet port provided on the "MELSEC-Q series universal model" and "MELSEC-L " programmable controller, and to the Ethernet module on the MELSEC-F . By using a switching hub, a multi-unit vision system having units installed as far as 100m away can be created.
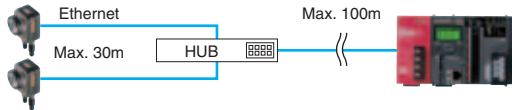
[Connect with CC-Link]

The expansion module option (CIO-MICRO-CC) supports the reliable open field network "CC-Link". The impressive high-speed response, reaching up to 10Mbps, high reliability and max. 1.2km long distant transmission allows a highly reliable system to be designed freely. CC-Link settings can be completed easily with EasyBuilder.

Simple communication with MC protocol

Now that "In-Sight EZ" supports MC protocol (communication protocol for programmable controller), data can be easily written from the vision system to the programmable controller. Communication is easily configured with "EasyBuilder". Just select the connected device and MC protocol, set the programmable controller device used for communication and select the communication data from the list. With the MC protocol scanner mode, a trigger can be applied on the vision system via MC protocol.
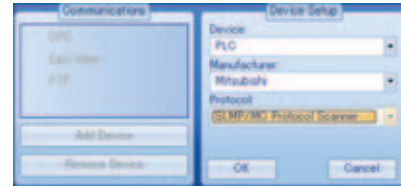
Simple control with control dedicated function blocks (FB)

The vision system control program can be created in a short time using the programmable controller programming tool "GX Works2" and rearranging labels by dragging and dropping the vision system control FB.

COGNEX DataMan® Barcode Reader

Supporting a variety of barcode reading

[Industrial Ethernet compatible barcode reader]

This barcode reader with Ethernet can easily be connected to the programmable controller with MC protocol, and can be used in a system with In-Sight EZ in the same Ethernet line. With the Ethernet compatible DataMan, the read code can be adjusted with VisionView® in the same manner as In-Sight EZ.

In collaboration with e-F@ctory, the code reading results and images can be sent to the MES interface unit.

[Reading various codes with simple adjustments]

DataMan automatically optimizes the brightness of the image. The automatic focusing model adjusts the focal distance from the barcode reader and workpiece simultaneously, and greatly reduces the man-hours required from installation to operation.

The DataMan common setup tool is available for more detailed settings.

[Amazing code reading algorithms IDMax®]

1DMax+™: Provides an amazing two-dimensional code reading performance when directly marking parts with a laser or dot peen.

2DMax+™: The new HOTBARS™ technology allows weak codes and damaged large codes to be read at a high speed. Various situations not supported with conventional laser scanning methods are not supported.

[DataMan - active in various industries]

In automobile part industries

At the US Department of Defense (DoD)

In aerospace industries

In medical device industries

In electronic part industries

●Fixed DataMan 300 Series
▶Equipped with latest reading algorithm 1DMax+, 2DMax+
▶Powerful in reading extra small markings with a high resolution of 1,300,000 pixels
▶Reduce installation and maintenance man-hours with liquid lens (option) for automatic focus adjustment and the tuning function
▶Support for MC protocol scanner simplifies communication settings

DataMan 300
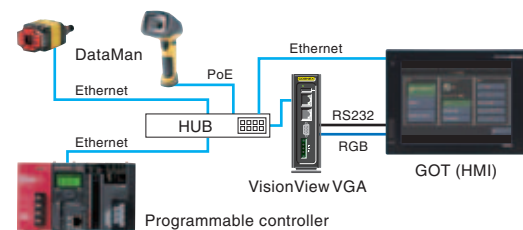
●Hand-held DataMan 8100/8500 Series
▶Newly developed body enhances sturdiness
▶UltraLight®: Two types of lightning enable optimum reading[*1]
▶Standard automatic focus adjustment function
▶Wireless model (communication range: max. 30m) available
 *1: Equipped on DataMan 8500

DataMan 8500

CPU Modules

L02SCPU NEW

END cover (accessory)

L02CPU, L02CPU-P, L06CPU NEW , L26CPU NEW

END cover (accessory)

L26CPU-BT, L26CPU-PBT

END cover (accessory)
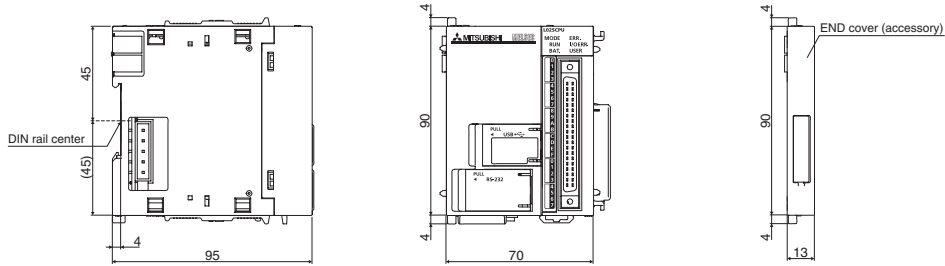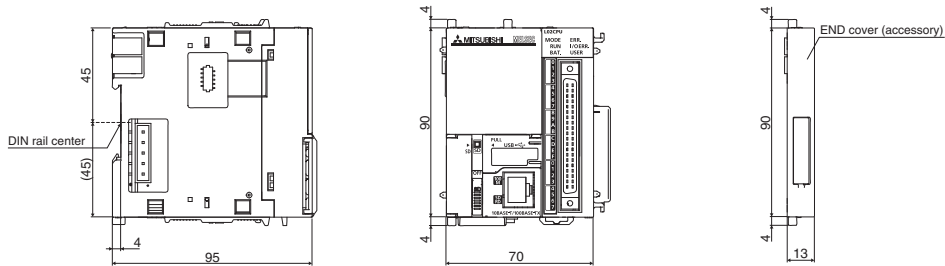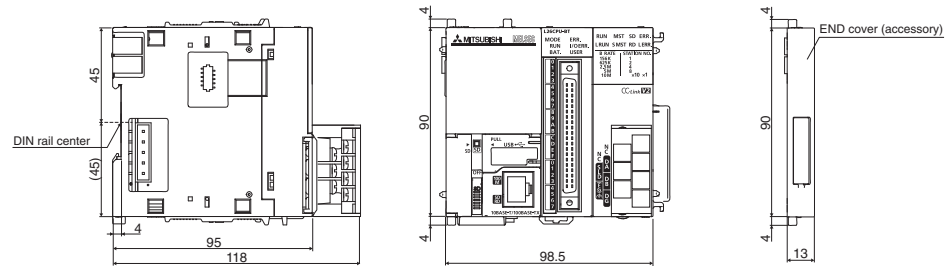
Branch Module

L6EXB
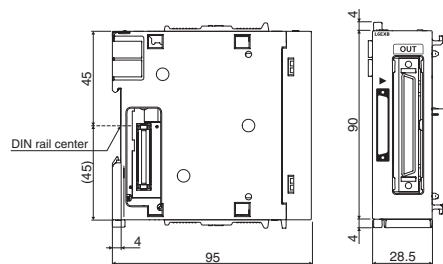
Extension Module

L6EXE

END cover (accessory)
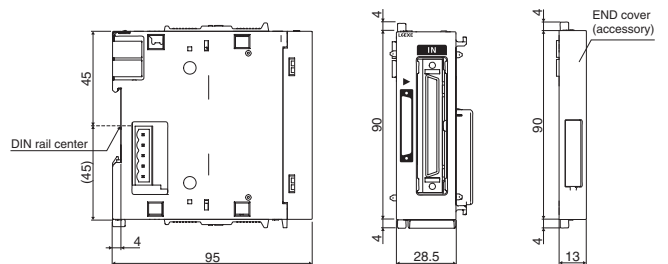
Unit: mm

Extension Cable

LC06E, LC10E, LC30E
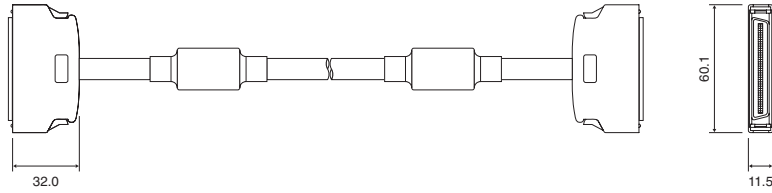
32.0　60.1　11.5

Power Supply Modules

L61P, L63P
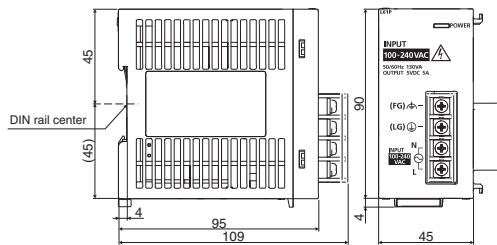
INPUT
100-240VAC
50/60Hz 130VA
OUTPUT 5VDC 5A

(FG)　(LG)

INPUT
100-240
VAC

45　90　(45)　4　95　109　45

DIN rail center

RS-232 adapter

L6ADP-R2

RS-232

45　90　(45)　4　95　28.5

DIN rail center

END cover with error terminal

L6EC-ET

45　90　(45)　4　95　112.5　28.5

DIN rail center

Display Unit

L6DSPU

MITSUBISHI MELSEC L6DSPU

ESC　OK

50　10　15　(2.3)　45
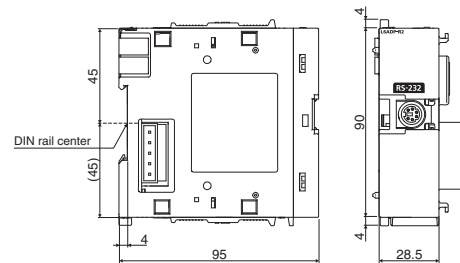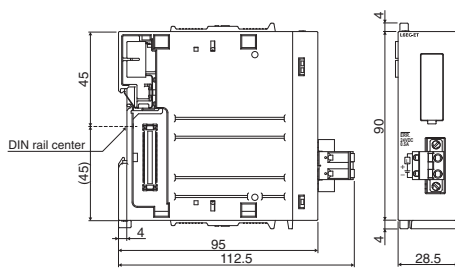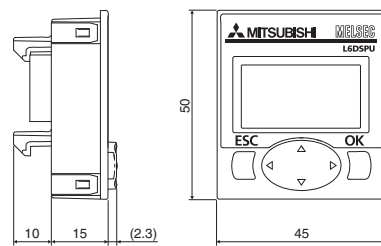
Unit: mm

I/O Modules

LX10, LX28, LX40C6,
LY10R2, LY20S6, LY40NT5P, LY40PT5P
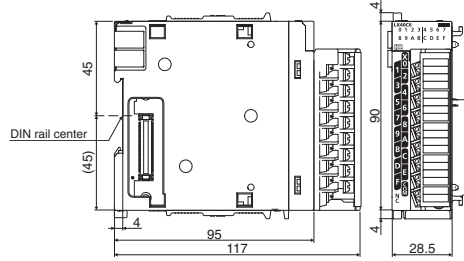
LX41C4, LY41NT1P, LY41PT1P
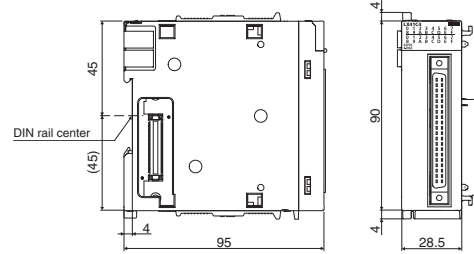
LX42C4, LY42NT1P, LY42PT1P
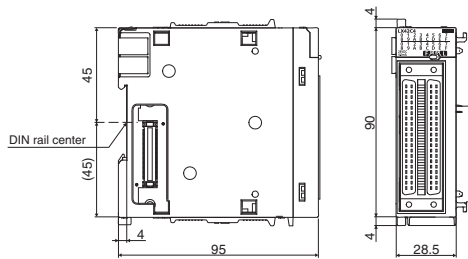
Analog I/O Modules

L60AD4, L60DA4
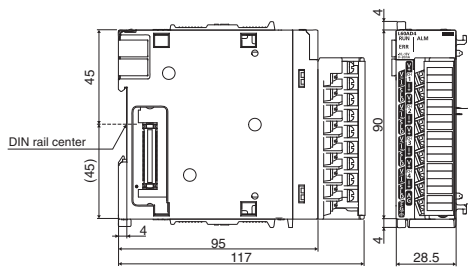
L60AD4-2GH NEW
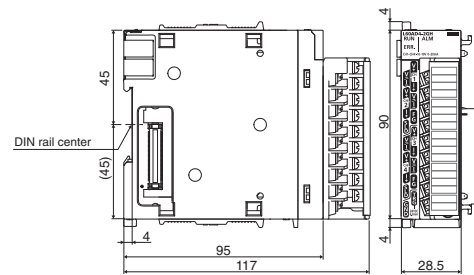
Temperature Control Modules

L60TCTT4, L60TCRT4
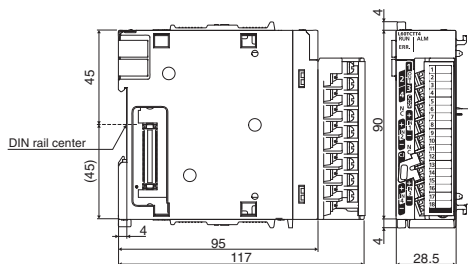
L60TCTT4BW, L60TCRT4BW
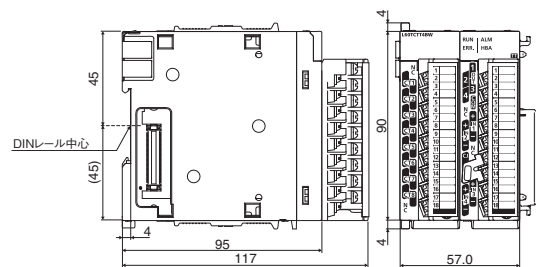
Unit: mm

Simple Motion Module

LD77MH4, LD77MH16
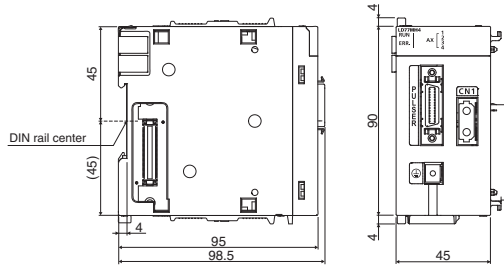
Positioning Modules

LD75P1, LD75P2
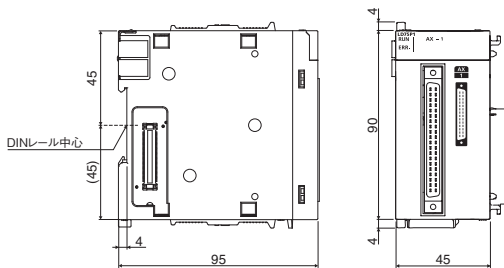
LD75D1, LD75D2
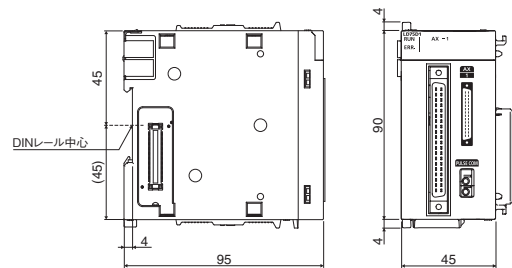
LD75P4
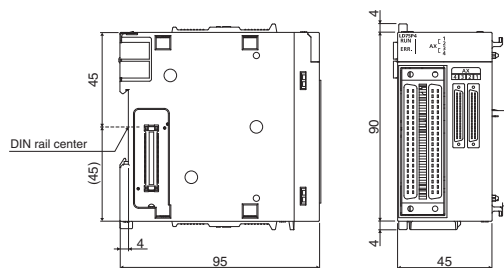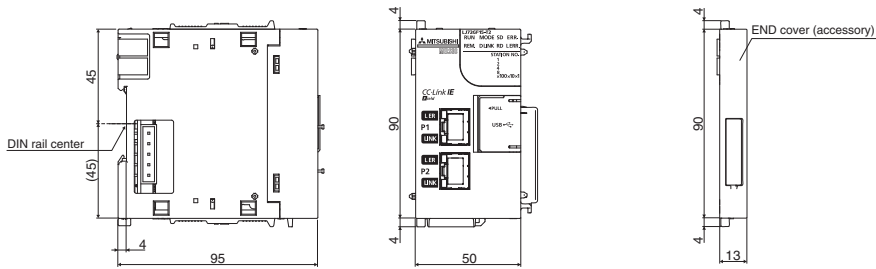

LD75D4
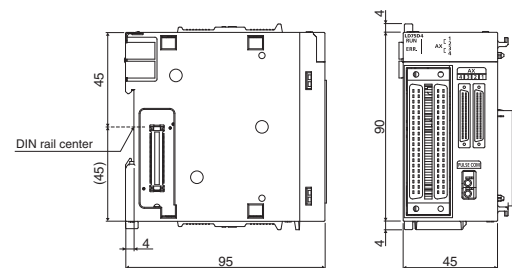
Unit: mm

High-Speed Counter Modules

LD62, LD62D
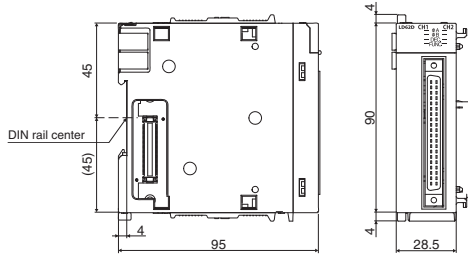
CC-Link IE Field Network Master/Local Module

LJ71GF11-T2
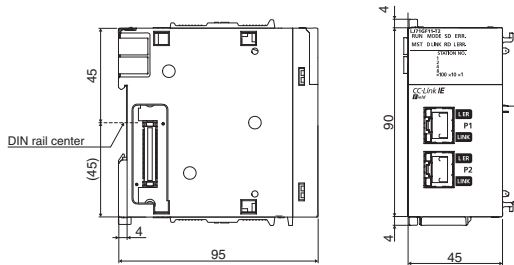
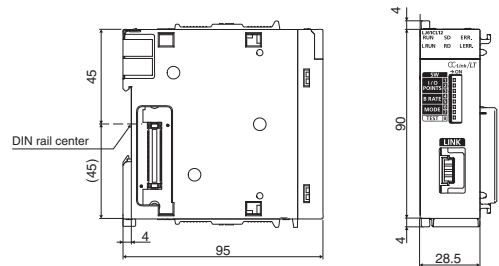## CC-Link IE Field Network Head Module

LJ72GF15-T2

CC-Link Master/Local Module
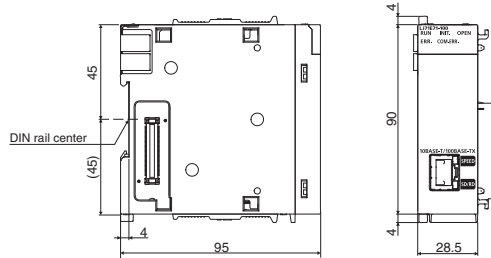
LJ61BT11
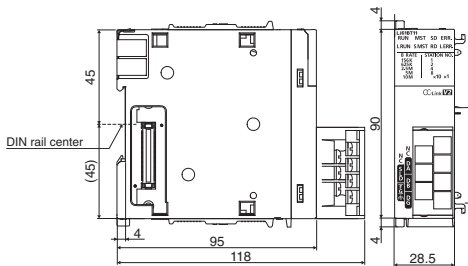
CC-Link/LT Master Module

LJ61CL12

Unit: mm

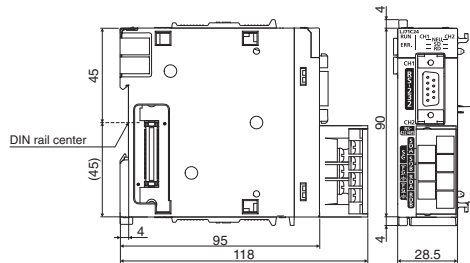## Ethernet interface module
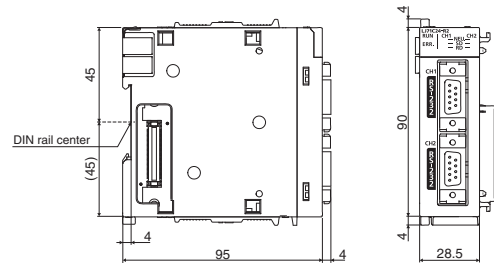
LJ71E71-100 NEW

Serial Communication Modules

LJ71C24

LJ71C24-R2

Unit: mm

Extensive global support coverage providing expert

Global FA centers

"Mitsubishi Electric Global FA centers" have been established in various countries around the world to cover the Americas, Europe, and Asia. FA centers help to ensure compliance with the certifications and regulations of different regions, initiate product development in response to local demands, and provide full-time, professional customer service.

UK FA Center

Mitsubishi Electric Europe B.V. UK Branch
Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, UK.
Tel: +44-1707-28-8780 / Fax: +44-1707-27-8695
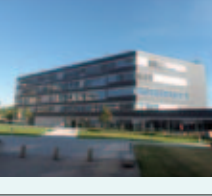Area covered: UK, Ireland

German FA Center

Mitsubishi Electric Europe B.V. German Branch
Gothaer Strasse 8, D-40880 Ratingen, Germany
Tel: +49-2102-486-0 / Fax: +49-2102-486-1120
Area covered: Mainly Western Europe

Czech republic FA Center

Mitsubishi Electric Europe B.V. Czech Branch
Avenir Business Park, Radicka 751/113e, 158 00 Praha5, Czech Republic
Tel: +420-251-551-470 / Fax: +420-251-551-471
Area covered: Czech, Slovakia

India FA Center

Mitsubishi Electric India Pvt. Ltd.
India Factory Automation Centre
Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune, 411026, Maharastra State, India
Tel: +91-20-2710-2000 / Fax: +91-20-2710-2100
Area covered: India

European FA Center

Mitsubishi Electric Europe B.V. Polish Branch
32-083 Balice ul. Krakowska 50, Poland
Tel: +48-12-630-47-00 / Fax: +48-12-630-47-01
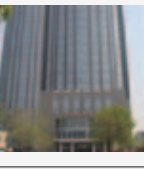Area covered: Central and Eastern Europe

Nagoya,Japan

China (including Hong Kong area)

Beijing FA Center

Mitsubishi Electric Automation (CHINA) Ltd.
Beijing Office
Unit 908, Office Tower 1, Henderson Centre, 18 Jianguomennei Avenue, Dongcheng District, Beijing, China
Tel: +86-10-6518-8830 / Fax: +86-10-6518-3907
Area covered: China

Tianjin FA Center

Mitsubishi Electric Automation (CHINA) Ltd.
Tianjin Office
Unit 2003, Tianjin City Tower, No.35, You Yi Road, Hexi District, Tianjin, China
Tel: +86-22-2813-1015 / Fax: +86-22-2813-1017
Area covered: China

Guangzhou FA Center

Mitsubishi Electric Automation (CHINA) Ltd.
Guangzhou Office
Rm.1609, North Tower, The Hub Center, No.1068, Xin Gang East Road, Haizhu District, Guangzhou, China
Tel: +86-20-8923-6730 / Fax: +86-20-8923-6715
Area covered: China

Local factory in China

Mitsubishi Electric Dalian
Industrial Products Co., Ltd.

Local factory in China

Mitsubishi Electric Automation Manufacturing (Changshu) Co.,Ltd.
No.706 Southeast Building,Chengahu Southeast Economic Development Zone of Jiangsu,215500 China
Tel: 86-512-5213-3077 / Fax: 86-512-5213-3088

Shanghai FA Center

Mitsubishi Electric Automaiton (China) Ltd.
10F, Mitsubishi Electric Automation Center, No.1386 Hongqiao Road, Changning District, Shanghai, China
Tel: 86-21-2322-3030 / Fax: 86-21-2322-3000
Area covered: China

Changchun
Shenyang
Beijing
Tianjin
Dalian
Qingdao
Xiangfan
Chengdu
Wuhang
Chongqing
Shanghai
Fuzhou
Taipei
Guangzhou
Taichung
Shenzhen
Hong Kong

help whenever needed.

Russian FA Center

Mitsubishi Electric Europe B.V. Russian Branch St.Petersburg office
Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027, St. Petersburg, Russia
Tel: +7-812-633-3497 / Fax: +7-812-633-3499
Area covered: Russia

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Area covered: Brazil

Complying with international quality assurance standards.

All of Mitsubishi Electric's FA component products have acquired the international quality assurance "ISO9001" and environment management system standard "ISO14001" certification. Mitsubishi Electric's products also comply with various safety standards, including UL standards.
*For jointly developed and partner products, guaranteed quality standards may differ. Please refer to the product manuals for details.

Safety Standards

CE	**CE : Council Directive of the European Communities**
c(UL)us	**UL : Underwriters Laboratories Listing**

Product List

*Refer to the product user manuals for information about compatible modules, restrictions, etc., before using the products.
*Contact your local Mitsubishi Electric sales office or representative for the latest information about MELSOFT software versions and compatible operating systems.

MELSEC-L series [Legend] **DB** : Double brand product (Note) **NEW** : Recently released product **SOON** : Product available soon

Product		Model	Outline
CPU		L02SCPU **NEW**	Number of I/O points: 1024 points, Number of I/O device points: 8192 points, Program capacity: 20k steps, Basic operation processing speed (LD instruction): 60ns, Program memory capacity: 80KB, Peripheral connection ports: USB and RS-232, Memory card I/F: None, Built-in I/O functions (General input:16 points, General output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L02CPU	Number of I/O points: 1024 points, Number of I/O device points: 8192 points, Program capacity: 20k steps, Basic operation processing speed (LD instruction): 40ns, Program memory capacity: 80KB, Peripheral connection ports: USB and Ethernet, Memory card I/F: SD Memory Card, Built-in I/O functions (General input:16 points, General output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L02CPU-P	Number of I/O points: 1024 points, Number of I/O device points: 8192 points, Program capacity: 20k steps, Basic operation processing speed (LD instruction): 40ns, Program memory capacity: 80KB, Peripheral connection ports: USB and Ethernet, Memory card I/F: SD Memory Card, Built-in I/O functions (General input:16 points, General output (Source type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L06CPU **NEW**	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 60k steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 240KB, Peripheral connection ports: USB and Ethernet, Memory card I/F: SD Memory Card, Built-in I/O functions (General input:16 points, General output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L26CPU **NEW**	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 260k steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 1040KB, Peripheral connection ports: USB and Ethernet, Memory card I/F: SD Memory Card, Built-in I/O functions (General input:16 points, General output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L26CPU-BT	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 260k steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 1040KB, Peripheral connection ports: USB and Ethernet, Memory card I/F: SD Memory Card, Built-in I/O functions (General input:16 points, General output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), CC-Link master/local station function, END cover included
		L26CPU-PBT	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 260k steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 1040KB, Peripheral connection ports: USB and Ethernet, Memory card I/F: SD Memory Card, Built-in I/O functions (General input:16 points, General output (Source type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), CC-Link master/local station function, END cover included
CPU packages		L02CPU-SET	CPU module (L02CPU), Display unit (L6DSPU), and Power supply module (L61P) set
		L02CPU-P-SET	CPU module (L02CPU-P), Display unit (L6DSPU), and Power supply module (L61P) set
		L06CPU-SET **NEW**	CPU module (L06CPU), Display unit (L6DSPU), and Power supply module (L61P) set
		L26CPU-SET **NEW**	CPU module (L26CPU), Display unit (L6DSPU), and Power supply module (L61P) set
		L26CPU-BT-SET	CPU module (L26CPU-BT), Display unit (L6DSPU), and Power supply module (L61P) set
		L26CPU-PBT-SET	CPU module (L26CPU-PBT), Display unit (L6DSPU), and Power supply module (L61P) set
Branch / Extension module		L6EXB	Branch module
		L6EXE	Extension module with END cover
	Extension cable	LC06E	0.6-m cable for connecting branch and extension modules
		LC10E	1.0-m cable for connecting branch and extension modules
		LC30E	3.0-m cable for connecting branch and extension modules
Power supply		L61P	Input voltage: 100 to 240VAC, Output voltage: 5VDC, Output current: 5A
		L63P	Input voltage: 24VAC, Output voltage: 5VDC, Output current: 5A
RS-232 adapter		L6ADP-R2	For GOT connection, 1 x RS-232 channel, maximum transmission speed: 115.2Kpbs, MELSOFT connectable
END cover with error terminal		L6EC-ET	END cover with error terminal
CPU options	Display unit	L6DSPU	STN black-and-white LCD, 16 characters x 4 lines
	Battery	Q6BAT	Replacement battery
		Q7BAT-SET	High capacity battery with a battery holder for CPU installation
		Q7BAT	High capacity replacement battery
	SD Memory Card	L1MEM-2GBSD*1	2GB SD Memory Card
		L1MEM-4GBSD*1	4GB SD Memory Card

*1: Mitsubishi Electric does not guarantee the operation of non-Mitsubishi Electric products.

Note: General specifications and product guarantee conditions of jointly developed products are different from those of MELSEC products.
For more information, please refer to the product manuals or contact your local Mitsubishi representative for details.

MELSEC-L series

[Legend] **DB** : Double brand product **NEW** : Recently released product **SOON** : Product available soon

Product			Model	Outline
I/O module	Input	AC	LX10 **NEW**	16 points, 100 to 120VAC, Response time:20ms or less, 16 points/common, 18-point terminal block
			LX28 **NEW**	8 points, 100 to 240VAC, Response time:20ms or less, 8 points/common, 18-point terminal block
		DC (Positiv e or negative common)	LX40C6	16 points, 24VDC, Response time: 1/5/10/20/70ms or less, 16 points/common, Positive/Negative common, 18-point terminal block
			LX41C4	32 points, 24VDC, Response time: 1/5/10/20/70ms or less, 32 points/common, Positive/Negative common, 40-pin connector
			LX42C4	64 points, 24VDC, Response time: 1/5/10/20/70ms or less, 32 points/common, Positive/Negative common, 40-pin connector x 2
	Output	Relay	LY10R2	16 points, 24VDC/240VAC, 2A/point, 8A/common, Response time: 12ms or less, 16 points/common, 18-point terminal block
		Triac	LY20S6	16 points, 100 to 240VAC, 0.6A/point, 4.8A/common, Response time:1ms + 0.5 cycles or less, 16 points/common, 18-point terminal block
		Transistor (Sink)	LY40NT5P	16 points, 12 to 24VDC, 0.5A/point, 5A/common, Response time: 1ms or less, 16 points/common, 18-point terminal block, overload protection function, overheat protection function, surge suppression
			LY41NT1P	32 points, 12 to 24VDC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, Sink type, 40-pin connector, overload protection function, overheat protection function, surge suppression
			LY42NT1P	64 points, 12 to 24VDC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, Sink type, 40-pin connector x 2, overload protection function, overheat protection function, surge suppression
		Transistor (Source)	LY40PT5P	16 points, 12 to 24VDC, 0.5A/point, 5A/common, Response time: 1ms or less, 16 points/common, 18-point terminal block, overload protection function, overheat protection function, surge suppression
			LY41PT1P	32 points, 12 to 24VDC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, 40-pin connector, overload protection function, overheat protection function, surge suppression
			LY42PT1P	64 points, 12 to 24VDC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, 40-pin connector x 2, overload protection function, overheat protection function, surge suppression
Analog I/O module	Analog input		L60AD4	4 channels, Input: -10 to 10VDC, 0 to 20mADC, Output (resolution): 0 to 20000, -20000 to 20000, Conversion speed: 20µs, 1ms/ch, 18-point terminal block
			L60AD4-2GH **NEW**	4 channels, Input: -10 to 10VDC, 0 to 20mADC, Output (resolution): 0 to 32000, -32000 to 32000, Conversion speed: 401µs/2ch, 18-point terminal block, Dual channel isolation
	Analog output		L60DA4	4 channels, Input (resolution): 0 to 20000, -20000 to 20000, Output: -10 to 10VDC, 0 to 20mADC, Conversion speed: 20µs/ch, 18-point terminal block
Temperature Control module	Thermocouple		L60TCTT4	4 channels (normal mode) / 2 channels (heating-cooling control), Thermocouple (K,J,T,B,S,E,R,N,U,L,PL II ,W5Re/W26Re), No Heater disconnection detection function, sampling cycle: 250ms/4CH, 500ms/4CH, Channel isolated, 18 point terminal block
			L60TCTT4BW	4 channels (normal mode) / 2 channels (heating-cooling control), Thermocouple (K,J,T,B,S,E,R,N,U,L,PL II ,W5Re/W26Re), Heater disconnection detection function, sampling cycle: 250ms/4CH,500ms/4CH, Channel isolated, 18 point terminal block x 2
	RTD		L60TCRT4	4 channels (normal mode) / 2 channels (heating-cooling control), Platinum type resistive temperature device(Pt100, JPt100), No Heater disconnection detection function, Sampling cycle: 250ms/4CH,500ms/4CH, Channel isolated, 18 point terminal block
			L60TCRT4BW	4 channels (normal mode) / 2 channels (heating-cooling control), Platinum type resistive temperature device(Pt100, JPt100), Heater disconnection detection function, Sampling cycle: 250ms/4CH,500ms/4CH, Channel isolated, 18 point terminal block x 2
Simple motion module			LD77MH4	4 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, synchronous control, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, SSCNET III connectivity
			LD77MH16	16 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, synchronous control, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, SSCNET III connectivity
Positioning module	Open collector		LD75P1	1 axis, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 200kpps, 40-pin connector
			LD75P2	2 axes, 2-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 200kpps, 40-pin connector
			LD75P4	4 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 200kpps, 40-pin connector x 2
	Differential driver		LD75D1	1 axis, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 4Mpps, 40-pin connector
			LD75D2	2 axes, 2-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 4Mpps, 40-pin connector
			LD75D4	4 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 4Mpps, 40-pin connector x 2
High-speed counter module			LD62	2 channels, 200/100/10kpps, Count input signal: 5/12/24VDC, External input: 5/12/24VDC, Coincidence output: transistor (sink), 12/24VDC, 0.5A/point, 2A/common, 40-pin connector
			LD62D	2 channels, 500/200/100/10kpps, Count input signal: EIA standards RS-422-A (Differential line driver level), External input: 5/12/24VDC, Coincidence output: transistor (sink), 12/24VDC, 0.5A/point, 2A/common, 40-pin connector
Network module	CC-Link IE Field Network		LJ71GF11-T2	Master/Local station
			LJ72GF15-T2*²	Remote station (Head module with END cover)
	CC-Link		LJ61BT11	Master/Local station, CC-Link Ver.2.0 compatible
	CC-Link/LT		LJ61CL12	Master station, CC-Link/LT system compatible
	Ethernet interface		LJ71E71-100 **NEW**	10BASE-T/100BASE-TX
	Serial communication		LJ71C24	RS-232: 1 channel, RS-422/485: 1 channel, Total transmission speed of 2 channels: 230.4kbps
			LJ71C24-R2	RS-232: 2 channels, Total transmission speed of 2 channels: 230.4kbps

*2: The CPU module, branch and extension module, display unit, RS-232 adaptor, CC-Link IE Field Network master/local module and Ethernet interface module cannot be mounted on a system using LJ72GF-T2.

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Options

Product	Model	Outline
Connector	A6CON1*1 *2	Soldering type 32-point connector (40-pin connector)
	A6CON2*1 *2	Crimp contact type 32-point connector (40-pin connector)
	A6CON3*1 *3	Flat cable pressure welding type 32-point connector (40-pin connector)
	A6CON4*1 *2	Soldering type 32-point connector (40-pin connector, cable connectable in bidirection)
Connector/terminal block converter module	A6TBXY36*4 *5	For positive common type input module and sink type output module (Standard type)
	A6TBXY54*4 *5	For positive common type input module and sink type output module (2-wire type)
	A6TBX70*4	For positive common type input module (3-wire type)

*1: Available for L02CPU, L02CPU-P, L26CPU-BT, L26CPU-PBT, LX41C4, LX42C4, LY41NT1P, LY42NT1P, LY41PT1P and LY42PT1P.
*2: Available for LD75P1, LD75P2, LD75P4, LD75D1, LD75D2, LD75D4, LD62 and LD62D.
*3: When used with L02CPU, L02CPU-P, L26CPU-BT, L26CPU-PBT, only when all points are general I/O.
*4: Available for LX41C4 and LX42C4. (Positive common only)
*5: Available for LY41NT1P, LY42NT1P, LY41PT1P and LY42PT1P.

Ethernet related products

Product		Model	Outline
Wireless LAN Adapter	U.S.A.	NZ2WL-US*1*2 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	Europe	NZ2WL-EU*1*2 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	China	NZ2WL-CN*1*2 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	Korea	NZ2WL-KR*1*2 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	Taiwan	NZ2WL-TW*1*2 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
Industrial switching HUB		NZ2EHG-T8 DB	10Mbps/100Mbps/1Gbps AUTO-MDIX, DIN rail mountable, 8 ports
		NZ2EHF-T8 DB	10Mbps/100Mbps AUTO-MDIX, DIN rail mountable, 8 ports
CC-Link IE Field Network Ethernet Adapter		NZ2GF-ETB	100Mbps/1Gbps compatible station for expanding CC-Link IE Field Networks

*1: Each product is usable only in the respective country.
*2: Both access points and stations are supported, and can be switched with the settings.

MELSOFT*1 — Programming Tool

Product	Model	Outline
GX Works2	SW1DNC-GXW2-E	Programmable controller engineering software (Functions integrated software: Programming, simulation, module settings, and monitoring)
GX Developer*2	SW8D5C-GPPW-E	Programmable controller programming software
	SW8D5C-GPPW-EV	Programmable controller programming software (upgrade)

MELSOFT iQ Works	SW1DNC-IQWK-E (CD-ROM edition) SW1DND-IQWK-E (DVD-ROM edition)	FA engineering software*3
		• System Management Software: MELSOFT Navigator
		  MELSOFT Navigator is a comprehensive system configuration solution that serves as a launching pad for the other software packages.
		• Controller Programming Software: MELSOFT GX Works2
		  The next generation configuration, programming, and simulation software for FX, L, and Q series controllers.
		• Motion Programming Software: MELSOFT MT Works2
		  Design and maintenance tool for motion controllers.
		• HMI Programming Software: MELSOFT GT Works3
		  GOT configuration, screen design, and maintenance tool.
		• Robot Programing Software: MELSOFT RT ToolBox2 mini
		  Programming and total engineering tool for robots

MX Component NEW	SW4DNC-ACT-E	ActiveX® library for communication
MX Sheet *4 NEW	SW2DNC-SHEET-E	Excel® communication support tool

*1: For details on the software versions compatible with each module, refer to the manual for each product.
   Please contact your local Mitsubishi Electric sales office or representative for the latest information about MELSOFT software versions and compatible operating systems.
*2: Some functions have restrictions. For details, refer to "Precautions on L series Modules" in the appendix of the GX Developer Version 8 Operating Manual.
*3: For detailed information about supported modules, refer to the manuals of the relevant software package.
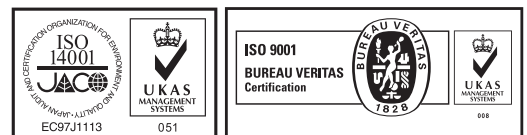*4: To use MX Sheet, MX Component is required.

MEMO

MEMO

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001(standards for quality assurance management systems)

Mitsubishi Electric
Programmable Controllers

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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