

# Magnescale®

CC-Link Interface unit Main module

# MG50-CL

Distribution module

# MG51

Read all the instructions in the manual carefully before use and strictly follow them.  
Keep the manual for future references.

Instruction Manual

**NOTICE**

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# Introduction

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Thank you for purchasing the MG50-CL CC-Link Interface unit Main module.

This manual contains information required to use the MG50-CL.

Please read this manual carefully and be sure you understand the information provided before attempting to use the MG50-CL.

After reading this manual, keep it in a safe and convenient location for future reference.

## Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of installing FA systems.
- Personnel in charge of designing FA systems.
- Personnel in charge of managing FA facilities.

# Reading This Manual

## Page Structure

The following page structure is used in this manual.

Level-1 heading → 4 Mounting and Wiring

Level-2 heading → **4-2 Wiring the CC-Link Network**  
Gives the current level-2 heading.

Level-3 heading → **4-2-1 General Wiring Precautions**

4-4

MG50-CL / MG51 ← Manual name

4 Mounting and Wiring

**4-2-2 Preparing for Wiring**

- **FANC-110SBH CC-Link Cable (Kuramo Electric Co.)**  
Refer to documentation for the CC-Link master unit and the CC-Link Installation Guide for specifications and processing methods (including stripping methods) for the special CC-Link cable.
- **35505-6000-80MGF Power Clamp Connector**

Manufacturer	Model number
3M	35505-6000-80MGF

**Wiring the Connector**

- 1 Strip 4 cm of the insulating sheath from the CC-Link Version 1.10-compliant cable.
- 2 Separate the braided shield and drain wires, and then twist the drain wire with your fingers at least 10 times.  
Be careful not to sever the drain wire.
- 3 Cut off the braided shield, ALPET shield tape, and filler.
- 4 Separate the wires so that they are in the following order: blue, white, yellow, and drain wire.  
Blue wire, pin 1 (cover label: DA B)  
White wire, pin 2 (cover label: DB W)  
Yellow wire, pin 3 (cover label: DC Y)  
Drain wire, pin 5 (cover label: SL D)
- 5 Insert the cable all the way into the power clamp.  
Check to confirm that the wire has been inserted all the way by looking through the top of the cover.
- 6 Use pliers to push the cover into the body and crimp the cable.
- 7 Check to confirm that the cover is level with the body and that there is no space between the body and the cover.

\* We recommend using heat-shrinking tubing to protect the drain wire and other wiring.

**Reference**  
For details, refer to the 3M Power Clamp Connector Wiring Procedures.

4 ← Page tab  
Gives the number of the level-1 section.

Level-2 heading → **4-2-2 Preparing for Wiring**  
Gives the current level-2 heading.

Level-3 heading → **Wiring the Connector**  
Gives the current level-3 heading.

Numbered step in procedure → 1 Strip 4 cm of the insulating sheath from the CC-Link Version 1.10-compliant cable.  
These numbers indicate a procedure.

Icons → Reference  
(See next page.)

MG50-CL / MG51

4-5

## Icons

The following icons are used in this manual.



### **Precautions for Safe Use**

Precautions on what to do and what not to do to ensure using the product safely.



### **Precautions for Correct Use**

Precautions on what to do and what not to do to ensure proper operation and performance.



### **Additional Information**

Convenient information or information for reference in product application.

# Structure of This Manual

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This manual consists of the following sections.

Section		Description
Section 1	CC-Link Configuration Elements	Describes the features of CC-Link and the configuration elements in a network.
Section 2	About the MG50-CL	Provides an overview of the MG50-CL.
Section 3	Basic Application Procedures	Describes how to set up and use a Main module based on a simple system setting example.
Section 4	Mounting and Wiring	Describes how to mount the MG50-CL and how to connect the CC-Link network, connect the power supply, and wire the MG50-CL.
Section 5	MG50-CL Hardware Specifications	Provides the hardware specifications of the MG50-CL.
Section 6	MG50-CL Function Specifications	Describes the functions of the MG50-CL.
Section 7	Troubleshooting and Maintenance	Describes troubleshooting and inspections for the person that will perform troubleshooting and routine inspections.
Appendices	Appendices	Give an overview of the objects and precautions on their use, and describes the specifications of the MG51 Distribution module.

# Terms and Conditions Agreement

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## General precautions

When using Magnescale Co., Ltd. products, observe the following general precautions along with those given specifically in this manual to ensure proper use of the products.

- Before and during operations, be sure to check that our products function properly.
- Provide adequate safety measures to prevent damages in case our products should develop malfunctions.
- Use outside indicated specifications or purposes and modification of our products will void any warranty of the functions and performance as specified of our products.
- When using our products in combination with other equipment, the functions and performances as noted in this manual may not be attained, depending on operating and environmental conditions.

## For foreign customers

**Note:** This product (or technology) may be restricted by the government in your country. Please make sure that end-use, end user and country of destination of this product do not violate your local government regulation.

# Safety Precautions

## Definition of Precautionary Information

This manual uses the following signs and symbols to ensure safe operation of this product. These signs and symbols are important for avoiding personal injury or damage to the product. Make sure that they are observed.



Indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

## Symbols



The circle and slash symbol indicates operations that you must not do.  
The specific operation is shown in the circle and explained in text.  
This example indicates prohibiting disassembly.



The triangle symbol indicates precautions (including warnings).  
The specific operation is shown in the triangle and explained in text.  
This example indicates a general precaution.



The filled circle symbol indicates operations that you must do.  
The specific operation is shown in the circle and explained in text.  
This example shows a general precaution for something that you must do.

# Caution

Do not touch the terminals or disassemble the Unit and touch any internal components while power is being supplied. Doing so may result in electric shock.



Do not attempt to disassemble, repair, or modify any Units. Any attempt to do so may result in electric shock.



Provide safety measures in external circuits, i.e., not in the Interface unit, in order to ensure safety in the system if an abnormality occurs due to malfunction of the PLC or another external factor affecting the PLC operation. Not doing so may result in serious accidents.



- (1) Emergency stop circuits, interlock circuits, limit circuits, and similar safety measures must be provided in external control circuits.
- (2) The outputs from the Interface unit may remain ON or OFF due to deposition or burning of the output relays or destruction of the output transistors. As a countermeasure for such problems, external safety measures must be provided to ensure safety in the system.

# Precautions for Safe Use

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Observe the following precautions when using the Interface unit:

## ● Power Supply

- Take appropriate measures to ensure that the specified power with the rated voltage and frequency is supplied. Be particularly careful in places where the power supply is unstable.
- Always turn OFF the power supply to the PLC, Slave Units, and other Units before attempting any of the following.
  - Assembling the Units
  - Mounting or dismounting terminal blocks
  - Setting DIP switches or node address switches
  - Connecting or wiring the cables

## ● Installation

- Before touching the Unit, be sure to first touch a grounded metallic object in order to discharge any static buildup.
- Be sure that the terminal blocks, communications cables, and other items with locking devices are properly locked into place.
- Always use the enclosed DIN rail Fixing brackets to securely mount the Units to the DIN rail.
- Be sure that all the terminal screws and cable connector screws of the product are tightened to the torque specified in the relevant manuals.
- Be sure that the screws of the terminal block are tightened to the torque specified in the relevant manuals. Insufficient tightening torque may result in fire, malfunction, or failure.
- Always use specified communications cables and connectors.
- Abide by the specifications for the communications distance and the number of Units to be connected.
- When using cables in multiple systems, be sure to keep the distance of 5 mm or more between any two cables to avoid operational instability due to interference.

## ● Wiring

- Confirm that the wiring and switch settings are correct before supplying power.
- Use the correct wiring tools to perform wiring.
- Confirm terminal polarity before wiring.
- Do not let a piece of metal enter the Units when wiring or installing.
- Be careful of the following when wiring communications cables.
  - Keep communications cables away from power lines and high-voltage lines.
  - Do not fold over communications cables.
  - Abide by the specifications for the communications cable distance.
  - Do not place objects on top of communications cables.
  - Always wire communications cables through a duct.

## ● Handling

- Use the special packing box to transport the Unit. Also, protect the Unit from being exposed to excessive vibration or impact during transportation.
- Do not forcibly bend or pull the cables.
- Check the user program for proper execution before actually running it on the Unit.
- Confirm that no adverse effect will occur in the system before attempting any of the following.
  - Changing the operating mode of the PLC
  - Force-setting/force-resetting bits in memory
  - Changing the present value or any set value of any word from the user program
- Do not use thinner or similar solvent for cleaning. Use commercial alcohol.

## ● External Circuits

- Install external breakers and take other safety measures against short-circuiting in external wiring.

# Precautions for Correct Use

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- Install the Unit properly as shown in this manual. Not doing so may result in a failure of the Unit.
- Do not install the Interface unit in locations subject to the following conditions:
  - Locations subject to direct sunlight
  - Locations subject to temperatures or humidity outside the range specified in the specifications
  - Locations subject to condensation as the result of severe changes in temperature
  - Locations subject to corrosive or flammable gases
  - Locations subject to dust (especially iron dust) or salts
  - Locations subject to exposure to water, acid, oil, or chemicals
  - Locations subject to shock or vibration
- When you wire the power supply cable, always connect the frame ground (FG).
- Be sure to observe the voltage specifications when performing wiring between communications path and power supply, or at I/O crossovers. Wrong wiring may cause a failure of the Unit.
- Wire the Unit properly as indicated in this manual.
- Use the correct wiring parts to perform wiring.
- Take appropriate and sufficient countermeasures when using the Unit in the following locations:
  - Locations subject to static electricity or other forms of noise
  - Locations subject to strong electromagnetic fields
  - Locations subject to possible exposure to radioactivity
  - Locations close to power lines
- Do not drop the Interface unit or expose it to any excessive vibration or shock. Doing so may result in damage to the Interface unit or malfunction.
- The Interface unit provides power to the connected measuring units. Therefore, the operation of the measuring units may become unstable if there are abnormalities in the power supply, such as a drop in the power supply voltage at startup. If measuring unit operation is unstable, check the voltage specifications and wiring, and then cycle the power supply.

# Conformance to EC Directives

## Applicable Directives

- EMC Directive

## Concepts

### ● EMC Directive

The Interface unit is an electrical device that is built into other machines. To enable more easily building it into other machines, it has been checked for conformity to EMC standards.\*

EMC-related performance of the Unit will vary depending on the configuration, wiring, and other conditions of the equipment or control panel on which it is installed.

The customer must, therefore, perform the final check to confirm that devices and the overall machine conform to EMC standards.

\* Applicable EMC (Electromagnetic Compatibility) standards are as follows: EMS (Electromagnetic Susceptibility): EN 61000-6-2, EMI (Electromagnetic Interference): EN 61000-6-4 (Radiated emission: 10 m regulations).

## Conformance to EC Directives

The Interface unit complies with EC Directives. To ensure that the machine in which the Unit is used complies with EC Directives, the Unit must be installed as follows:

- The Unit must be installed within a control panel.
- You must use reinforced insulation or double insulation for the DC power supplies for communications, internal power, and I/O. The DC power supplies must provide stable power even when a momentary power interruption of 10 ms occurs in the input.
- Products complying with EC Directives also conform to the emission standards (EN 61000-6-4). Radiated emission characteristics (10 m regulations) may vary depending on the configuration of the control panel used, other devices connected to the control panel, wiring, and other conditions. You must therefore confirm that the overall machine or equipment complies with EC Directives.
- Compliance was confirmed for I/O wiring of less than 30 m.
- Attach a ferrite core (TDK ZCAT1730-0730 or equivalent) to the power supply cable of the device.
- Attach a ferrite core (TDK ZCAT2035-0930 or equivalent) to the CC-Link cable.



# 1

## CC-Link Configuration Elements

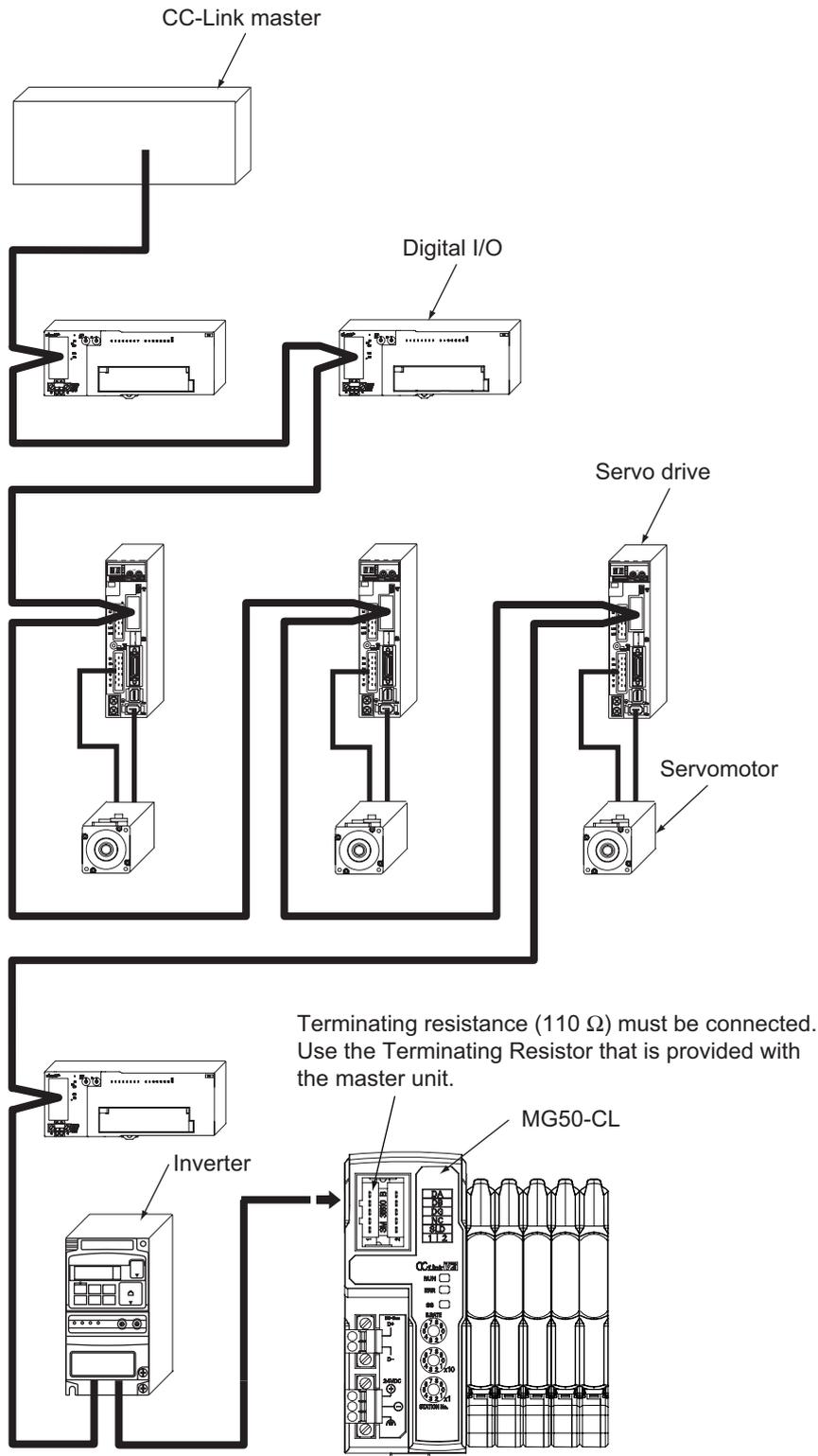
This section provides an overview of a CC-Link network.

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# 1-1 CC-Link Connection Example

The following figure shows a CC-Link network connection example.

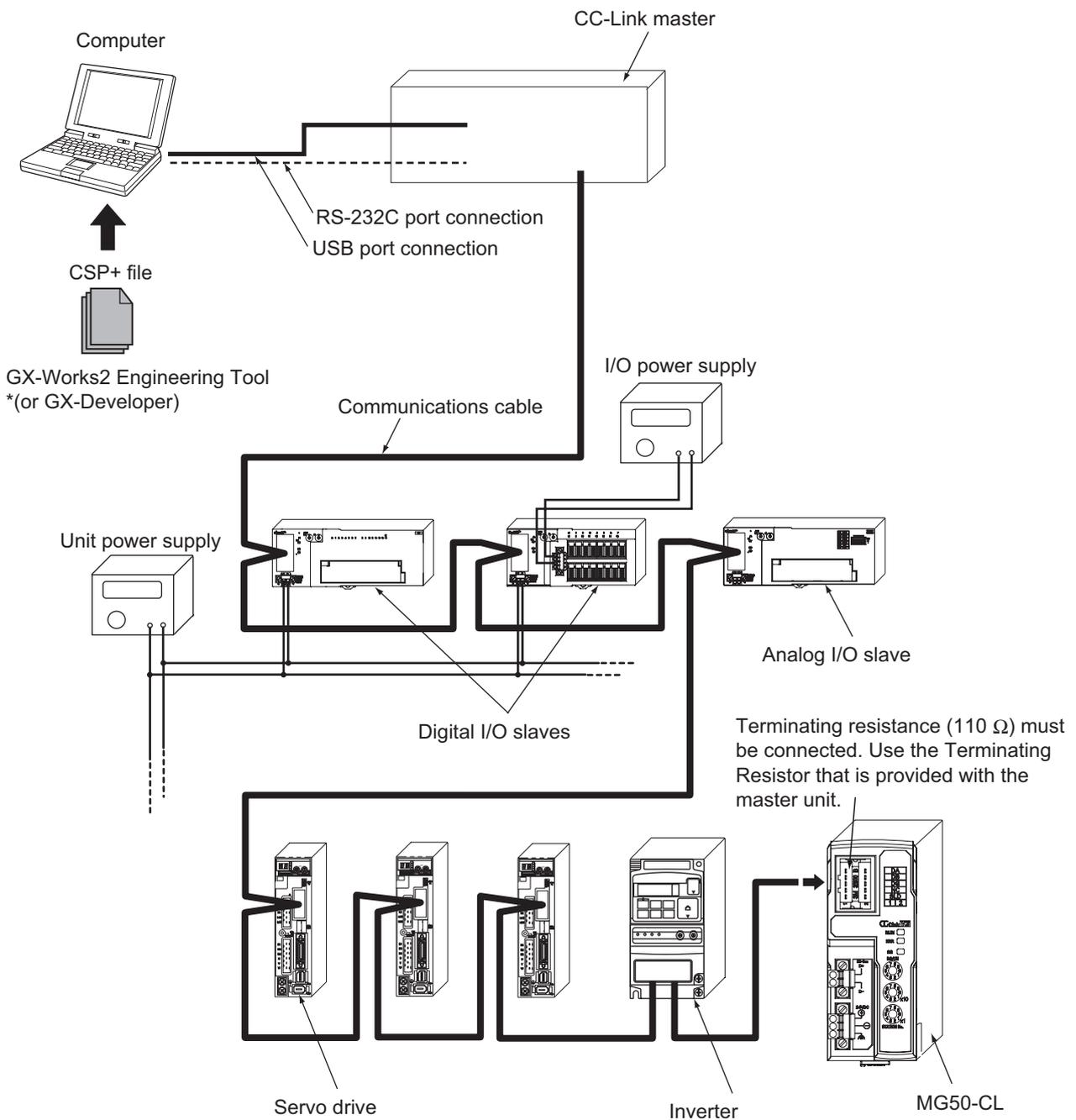


# 1-2 CC-Link Network Configuration Elements

This section describes the configuration devices that make up a CC-Link network and their uses.

## 1-2-1 CC-Link Network Configuration Devices

The devices that make up a CC-Link network are shown in the following figure.



## 1-3 Outline of Configuration Devices

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This section describes each of the devices in a CC-Link network.

### CC-Link Master

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The CC-Link master manages the CC-Link network, monitors the status of the slave units, and exchanges I/O data with slave units. Refer to CC-Link documentation from Mitsubishi Electric Corporation or other sources for details on CC-Link.

### CC-Link Slaves

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CC-Link slave units output data received from the CC-Link master unit over the CC-Link network, and send input data to the CC-Link master unit through the CC-Link network.

There are different types of slaves, such as digital I/O slaves and analog I/O slaves. The MG50-CL is also classified as a CC-Link slave unit.

### Communications Cable

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Refer to documentation for the CC-Link master unit and the *CC-Link Installation Guide* for the specifications and processing methods (including stripping methods) for CC-Link cable.

### CSP+ (CC-Link System Profile Plus) File

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CSP+ is an abbreviation for CC-Link Family System Profile. A CSP+ file contains a profile of all the information required to start, operate, and maintain a device compatible with CC-Link and CC-Link IE Field, such as network parameter and memory mapping information.

CC-Link Family users can use CSP+ files to easily set parameters from the same Engineering Tool. However, CSP+ can be used only when GX-Works2 is used for the Engineering Tool. The GX-Developer cannot be used.

### Unit Power Supply

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This is the power supply for slave communications and internal operations.  
Separate the unit power supply from the I/O power supply.

### I/O Power Supply

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This is the power supply for I/O operations with external devices connected to the slave units.  
Separate the I/O power supply from the Unit power supply.  
The MG50-CL does not require an I/O power supply.

# 2

## About the MG50-CL

This section provides an overview of the MG50-CL CC-Link Interface unit Main module.

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2-1-2 MG50-CL Operating Modes .....	2-2
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2-2-2 Number of Connected Counter Modules .....	2-3

## 2-1 MG50-CL Overview

This section provides an overview of the MG50-CL Main module.

### 2-1-1 Features of the Main Module

The Main module is used to monitor measurement value, write parameters, and perform operations between measuring units and a PLC with a CC-Link communications interface.

### 2-1-2 MG50-CL Operating Modes

The MG50-CL has two operating modes. The operating mode is selected via the baud rate/operating mode setting switch.

**Reduced I/O Mode:** This mode allows for many devices to be connected by limiting the number of allocated stations and allocated points.

**Monitor Mode:** This mode allows for realtime monitoring and control to utilize Counter module settings and the monitoring.

Operating mode		Reduced I/O Mode	Monitor Mode
CC-Link mode		Remote Network Version 1 Mode Remote Network Version 2 Mode Remote Network Addition Mode	Remote Network Version 2 Mode Remote Network Addition Mode
Allocated station numbers		2	3
Number of allocated nodes	RX/RX	64	320
	RWr/RWw	8	48
Expanded cyclic setting		---	Quadruple setting
Maximum connectable Main modules in one CC-Link system		32	21
Number of connectable measuring units*1		16	16
Maximum connectable Distribution modules		8	8
Measuring unit ON/OFF status transfer		OK	OK
Simultaneous writing of the same threshold value to more than one Counter module		OK	OK
Batch transfer of Counter module detection values		NA	OK
Counter module detection value peak value and bottom value switching		NA	OK
Baud rate/operating mode setting switch		0: 156 kbps	5: 156 kbps
		1: 625 kbps	6: 625 kbps
		2: 2.5 Mbps	7: 2.5 Mbps
		3: 5 Mbps	8: 5 Mbps
		4: 10 Mbps	9: 10 Mbps

\*1 This is the total number of Counter modules that can be connected to the MG50-CL and Distribution modules. Symbols: OK: Supported, NA: Not supported.

## 2-2 Connectable Counter Modules

This section describes the models and features of the Counter modules that can be connected to the MG50-CL.

### 2-2-1 List of Counter Modules

Type	Model number
Counter module	MF10-CM

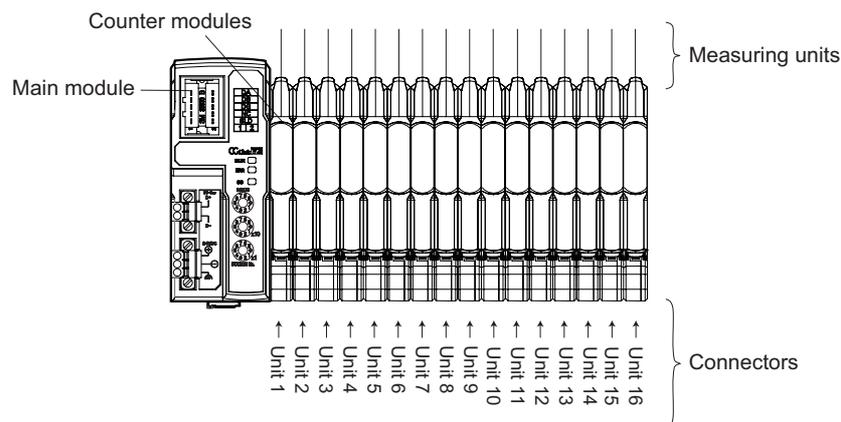
### 2-2-2 Number of Connected Counter Modules

You can connect the Main module to up to 16 Counter modules, including any Counter modules connected to Distribution modules.

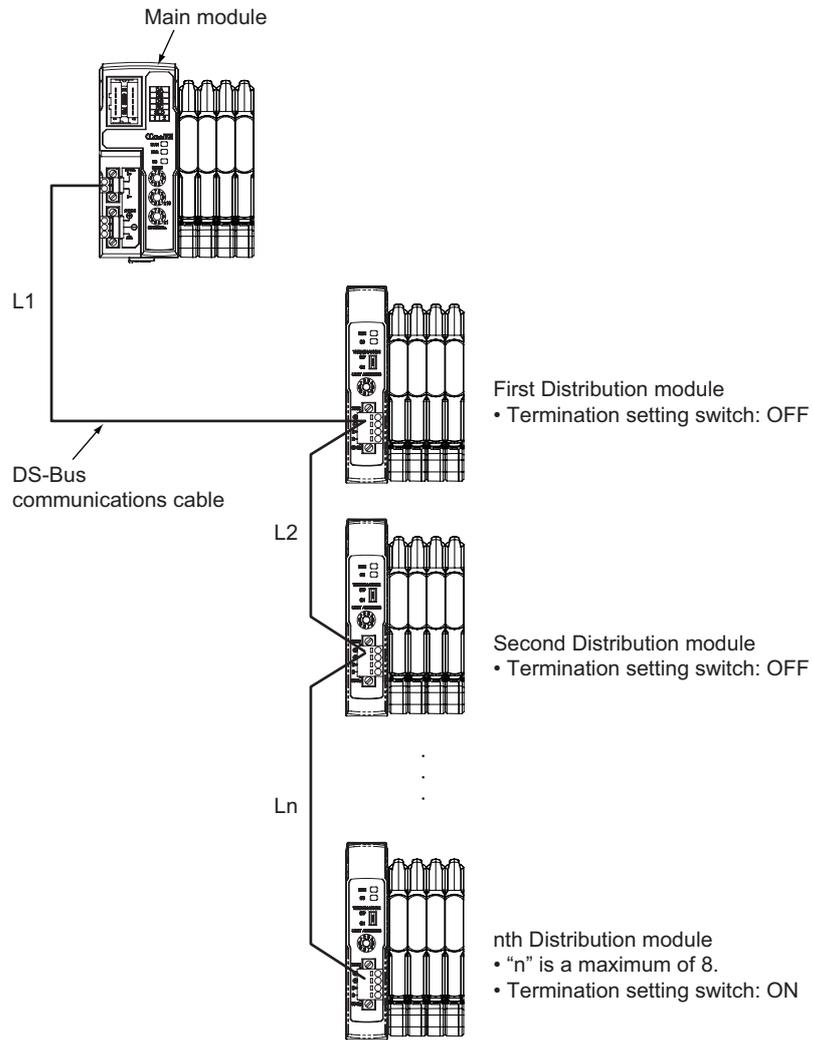
Up to 10 Counter modules can be connected to a Distribution module.

The following are some connection examples.

Example 1: Main module only



Example 2: Connecting a Main module and Distribution modules



# 3

## Basic Application Procedures

This section explains how to use MG50-CL CC-Link Interface unit Main module based on basic setting examples.

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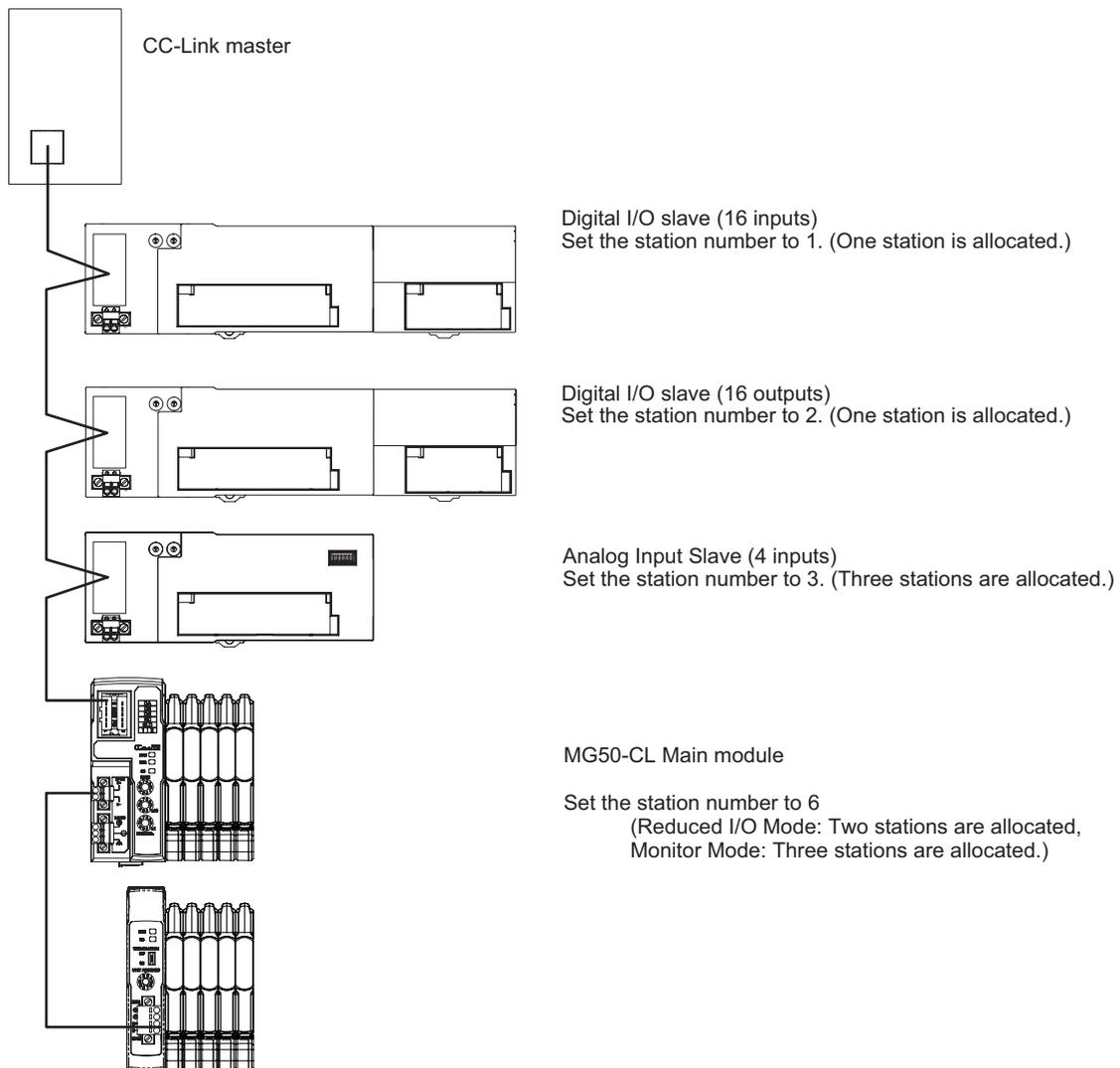
<b>3-1</b>	<b>Setting Examples and Basic Procedures</b>	<b>3-2</b>
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## 3-1 Setting Examples and Basic Procedures

This section describes how to set up a Main module based on a simple system setting example.

### 3-1-1 System Setting Example

Connect each of the following slaves to the CC-Link master and configure the settings.



The Unit power supply and I/O power supply are not shown in the above figure. They must be provided separately.

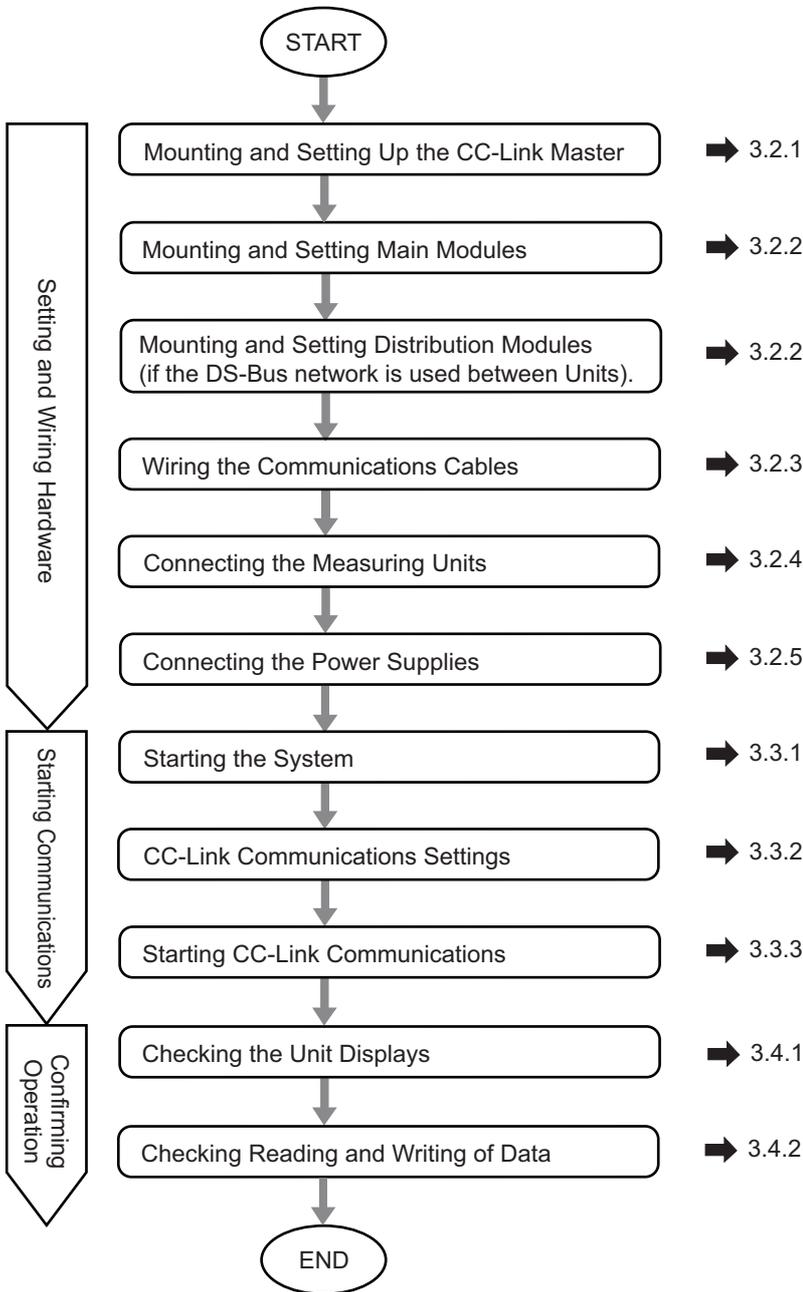


#### Reference

The setting example provided here demonstrates the basic settings for the Interface Unit. If more detailed settings are required for actual operations, refer to the manual for your CC-Link master. Or, if you are using any slaves other than the MG50-CL in your system configuration, refer to the manuals for those slaves before setting up the system.

### 3-1-2 Basic Procedures

The following figure shows the flow of procedures for this section.



## 3-2 Setting and Wiring Hardware

---

This section describes how to set up and wire the CC-Link master, Main modules, and power supplies.

### 3-2-1 Mounting and Setting Up the CC-Link Master

Mount the CC-Link master at the specified location and set the unit number and other settings. For details, refer to the manual for your CC-Link master.

### 3-2-2 Mounting and Setting Main Modules

Mount each Main module and Distribution module in the designated locations, then set the station numbers and other settings. For details, refer to the following items.

- **Installation**

*4-1 Mounting and Removal.*

- **Settings**

Specifications and detailed descriptions in *Section 5* and *Section 6*.

### 3-2-3 Wiring the Communications Cables

Connect communications cables to the CC-Link master, Main modules, and Distribution modules. Refer to *4-2 Wiring the CC-Link Network* for wiring procedures.

### 3-2-4 Connecting the Measuring Units

After connecting the Counter modules to the Main module, connect the measuring units. For connection methods, refer to your Counter module manual.

### 3-2-5 Connecting the Power Supplies

Connect the Unit power supply to the CC-Link master, slaves, and the Distribution modules. Connect the I/O power supply unit to each slave as required.

For connection method details, refer to *4-3 Connecting the Unit Power Supply* or refer to the wiring diagrams for each slave.

## 3-3 Starting Communications

Start the system, assign the MG50-CL I/O data, and then start CC-Link communications.

### 3-3-1 Starting the System

Turn ON the power supply to the Units in the following order.

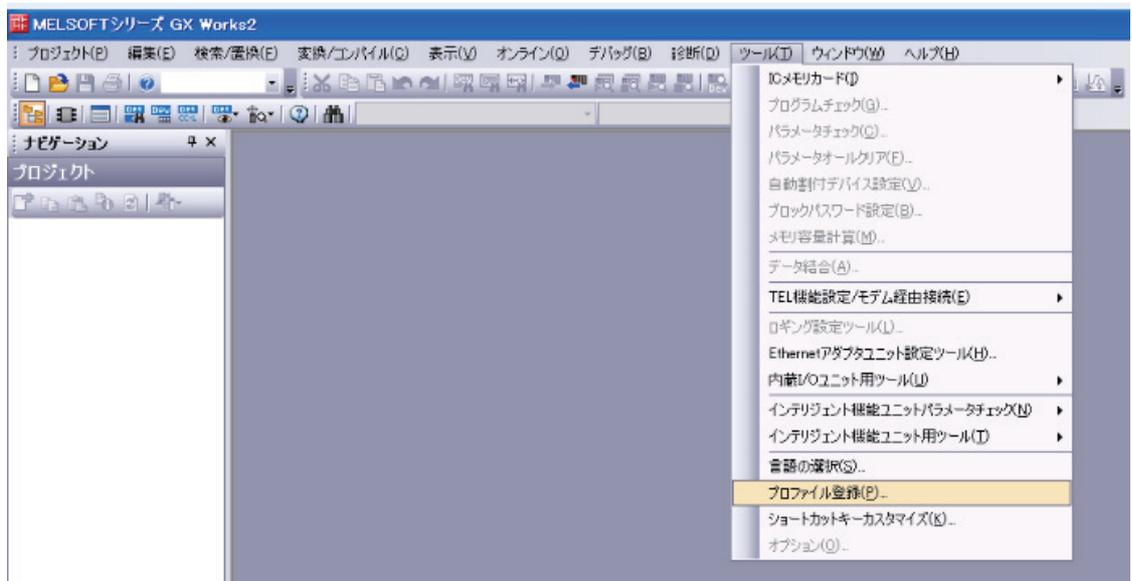
1. MG50-CL Unit Power Supply
  - If you are using Distribution modules, turn ON the power supply to the Distribution modules as well.
2. CC-Link Master Unit Power Supply

### 3-3-2 CC-Link Communications Settings

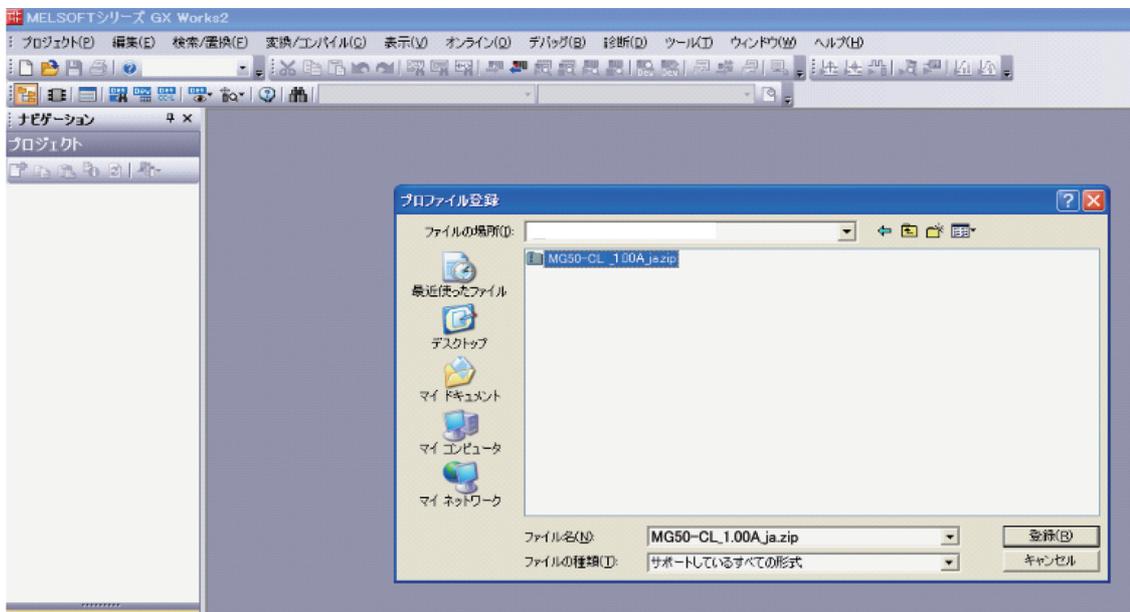
#### Using CSP+ to Configure Settings in GX-Works2

You can easily set up CC-Link communications for the Main module by using CSP+ in GX-Works2. This section describes how to configure settings in GX-Works2 with CSP+.

- 1 Start GX-Works2 on your computer.
- 2 Register the CSP+ profile in GX-Works2.
  - 2-1. Select **Tool – Register Profile** プロフィール登録(P)....

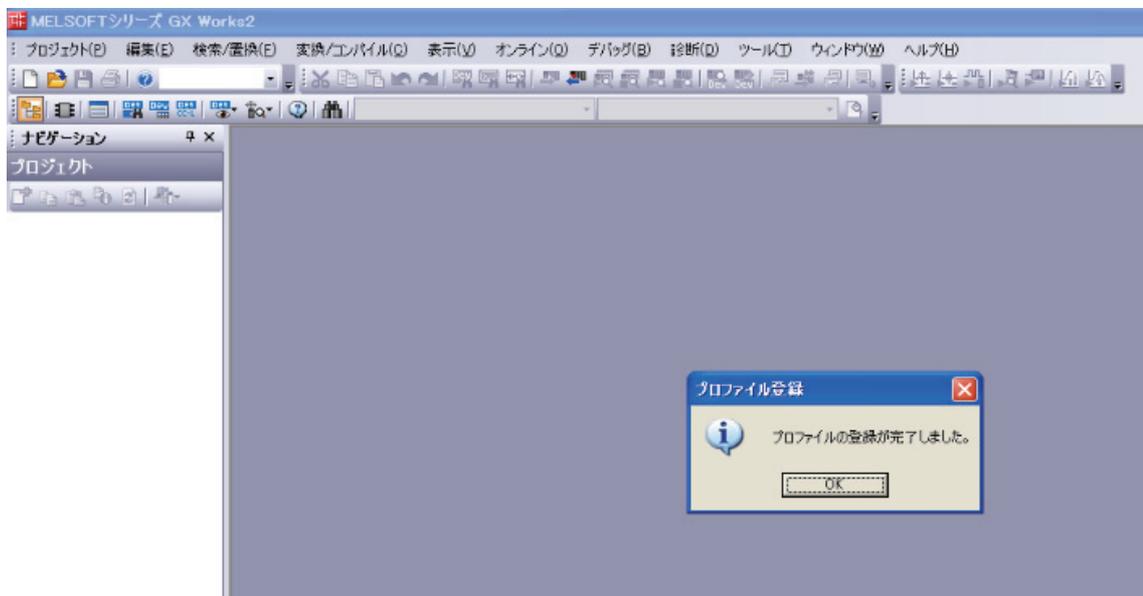


- 2-2. Register the CSP+ file that you have saved on your computer.  
CSP+ can be downloaded from Magnescale website.  
Magnescale website: <http://www.magnescale.com/mgs/language/english/product/>  
Under “Digital Gauge”



- 2-3. The registration process is finished when “Profile registration completed”

 プロファイルの登録が完了しました。 is displayed.

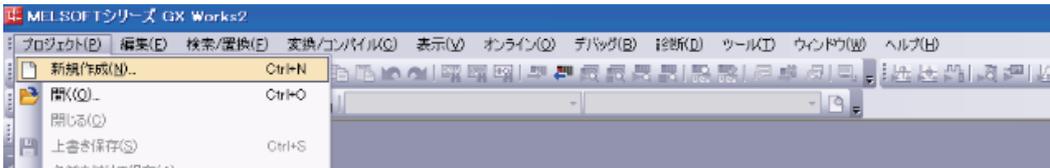


#### Reference

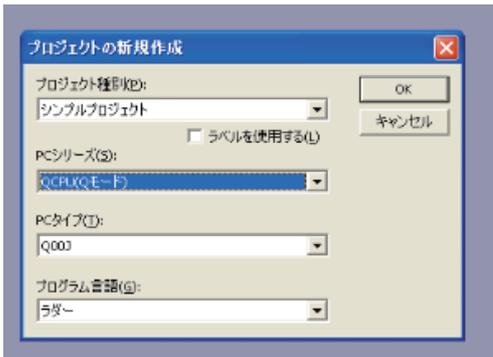
You need to register the CSP+ profile only once.

### 3 Create a new project.

3-1. Select **Project – New**  **新規作成(N)..**.

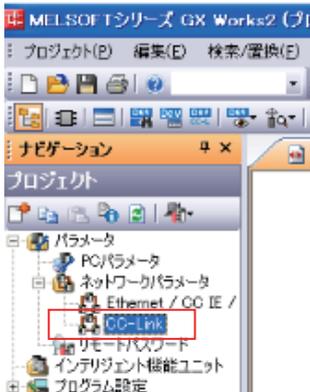


3-2. Set the computer series and type settings for your computer.

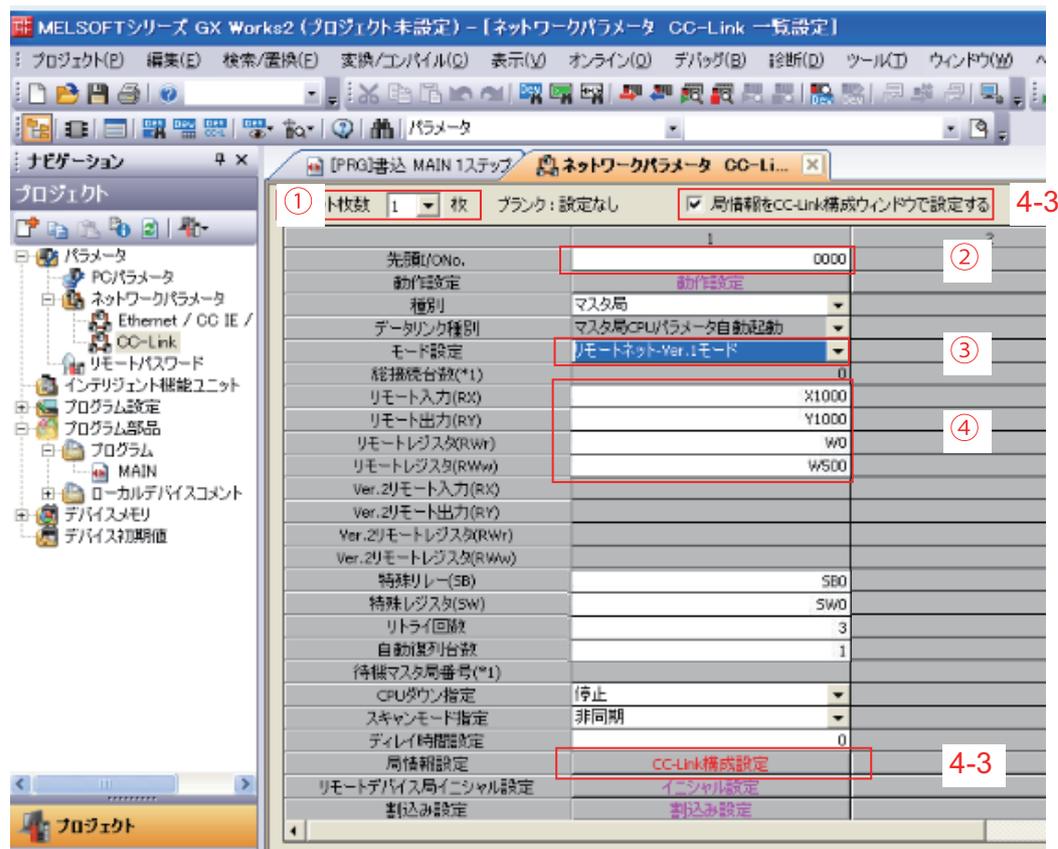


### 4 Set the CC-Link network parameters.

4-1. Select **Parameters – Network Parameters – CC-Link**  under **Project** to display the parameters.



4-2. Set the parameters.



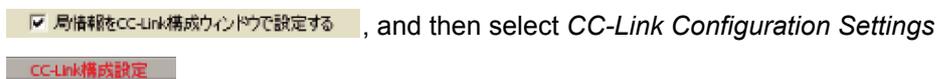
- (1) Set the number of Units to 1 .
- (2) Set the first address for I/O .
- (3) Set the mode for the operating mode you want to use .
  - To use Reduced I/O Mode, set the mode to Remote Network Version 1 Mode.
  - To use Monitor Mode, set the mode to Remote Network Version 2 Mode.

- (4) Set the first address for the remote I/O registers
 

リモート入力(RX)
リモート出力(RY)
リモートレジスタ(RWr)
リモートレジスタ(RWw)

.

4-3. Select the Set station information in the CC-Link Configuration Window Check Box



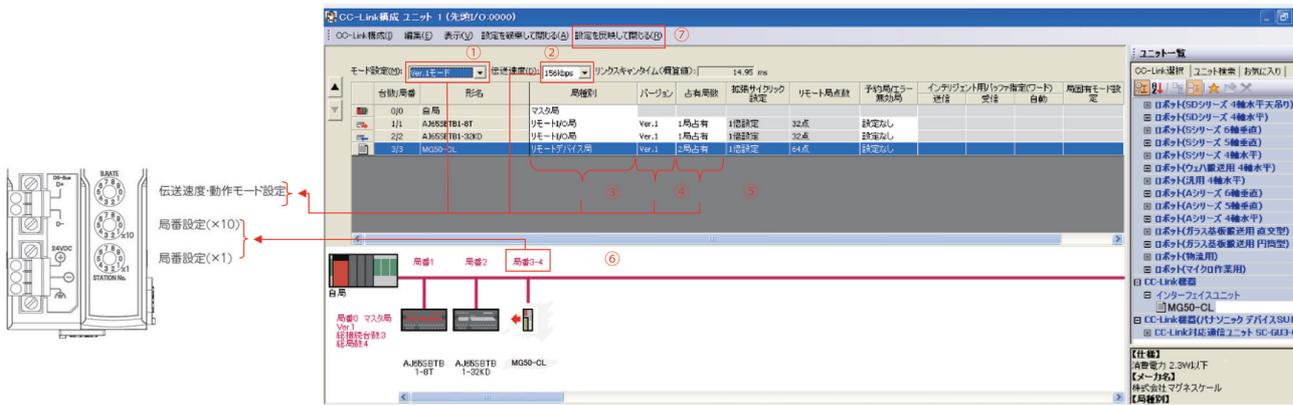
**5 Set the CC-Link configuration.**

5-1. Select the settings based on your CC-Link system configuration.

You can select and drag Units from the Unit List to make the settings.

5-2. Set the following settings based on the baud rate and operating mode settings for the MG50-CL.

5-2-1. Match the conditions shown in the following locations (in GX-Works2 and the MG50-CL setting switches).



5-2-2. Set the GX-Works2 settings ((1) to (5)) based on the mode you want to use.

**Using Reduced I/O Mode**

- (1) Select the same mode that you selected for (3) in 4-2 Wiring the CC-Link Network.
- (2) Set the baud rate based on the baud rate set with the baud rate/operating mode switch on the MG50-CL.
- (3) Set the station type to *Remote device station* **リモートデバイス局**.
- (4) Set to *Ver. 1* **Ver.1**.
- (5) Set the exclusive station count to *Exclusive station 2* **2局占有**.

**Using Monitor Mode**

- (1) Set to *Ver. 2 Mode*.
- (2) Set the baud rate based on the baud rate set with the baud rate/operating mode switch on the MG50-CL.
- (3) Set the station type to *Remote device station* **リモートデバイス局**.
- (4) Set to *Ver. 2*.
- (5) Set the exclusive station count to *Exclusive station 3*.

5-2-3. Set the baud rate/operating mode switch based on the settings made for (1) and (2) in GX-Works2 above.

\* The baud rate must also be the same as the baud rate set on the master station's rotary switch.

### Baud Rate/Operating Mode Setting Switch

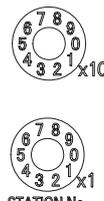
This switch sets the CC-Link baud rate and operating mode.  
The following table describes the settings.

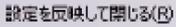
Switch	Appearance/Display	Setting		
Baud rate/operating mode setting switch		This switch sets the CC-Link baud rate and operating mode.		
		Switch setting	Baud rate	Operating mode
		0	156k	Reduced I/O Mode (Ver. 1 Mode)
		1	625k	
		2	2.5M	
		3	5M	
		4	10M	
		5	156k	Monitor Mode (Ver. 2 Mode)
		6	625k	
		7	2.5M	
		8	5M	
9	10M			
An error will occur if the operating mode does not match the CC-Link mode set in the master station's CC-Link parameters and the ERR LED indicator will light up.				

5-2-4. Set the station number setting switches on the MG50-CL to match the station number displayed in (6) in GX-Works2.

### Station Number Switch

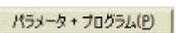
Sets the station number (decimal value) of the MG50-CL on the CC-Link network.  
Use the middle station number setting switch to set the tens digit, and use the bottom station number setting switch to set the ones digit.  
The following table gives the setting ranges.

Switch	Appearance/Display	Setting		
Station number switch		Sets the CC-Link station number.		
		Operating mode	Reduced I/O Mode (Ver. 1 Mode)	Monitor Mode (Ver. 2 Mode)
		Setting range	1 to 63	1 to 62
If a value outside of the valid setting range is set, a Station Number Setting Error will occur and the ERR indicator will light. The number of connectable Units depends on the types of devices connected to the CC-Link system. * Refer to the manual for your master station for details about the maximum number of connections.				

5-2-5. Click the Apply Settings and Close Button  at (7).

5-2-6. Write the settings to the master. Select *Online - Write to Computer* .



Click the **Parameters + Programs** Button , and then click the **Execute** Button .

Settings are applied when the power supply to the master unit is cycled or when the master unit is reset.



 **Reference**

The setting method described here using CSP+ and GX-Works2 demonstrates the basic settings for the MG50-CL Main module.  
 If more detailed settings are required for actual operation, refer to the manual for your CC-Link master and the manual for GX-Works2.

### ● Troubleshooting Communications Problems

If the following message is displayed on the computer, the selected Mode Setting **モード設定(M):** does not match the version **バージョン** of the MG50-CL.

Correct the setting.



If the above error message is not displayed but communications are still not working (i.e., the RUN indicator on the MG50-CL does not light up), check to confirm that the switches for the baud rate, operating mode, and station number are all set correctly based on the parameters set for the master station.

If communications still do not work after checking all of the above settings, refer to the troubleshooting section in the manual for your CC-Link master to determine the cause of the problem.

### 3-3-3 Starting CC-Link Communications

Enable CC-Link communications to start CC-Link communications.

Section 6 contains details on the data that can be obtained through communications.

## 3-4 Confirming Operation

If the CC-Link master and MG50-CL indicators are all normal, I/O data can be read and written normally.

If required, set the MG50-CL parameter settings.

### 3-4-1 Checking the Unit Displays

- **CC-Link Master**

Refer to the manual for your CC-Link master.

- **Main Module**

Make sure the status indicators on each Main module are as described in the following table.

Indicator	State
RUN	Lit.
ERR	Not lit.
SS	Lit green. (The number of actual connections agrees with the number of connections that were detected when the Unit was started.) Lit red. (The number of actual connections does not agree with the number of connections that were detected when the Unit was started.)

- **Distribution Module**

Make sure the status indicators on each Distribution module are as described in the following table.

Indicator	State
RUN	Lit.
SS	Lit green. (The number of actual connections agrees with the number of connections that were detected when the Unit was started.) Lit red. (The number of actual connections does not agree with the number of connections that were detected when the Unit was started.)

### 3-4-2 Checking Reading and Writing of Data

Read the input and output data of the CC-Link master to make sure the I/O data is being read and written correctly.



# 4

## Mounting and Wiring

This section describes how to mount and wire the MG50-CL.

---

<b>4-1</b>	<b>Mounting and Removal</b> .....	<b>4-2</b>
4-1-1	Mounting Procedure .....	4-2
4-1-2	Removal Procedure .....	4-3
<b>4-2</b>	<b>Wiring the CC-Link Network</b> .....	<b>4-4</b>
4-2-1	General Wiring Precautions .....	4-4
4-2-2	Preparing for Wiring .....	4-5
4-2-3	Connecting the Communications Cables .....	4-6
4-2-4	Connecting the Distribution Module .....	4-7
<b>4-3</b>	<b>Connecting the Unit Power Supply</b> .....	<b>4-8</b>
4-3-1	Precautions on Supplying Unit Power .....	4-8
4-3-2	Unit Power Supply Specifications .....	4-8
4-3-3	Connecting the Unit Power Supply .....	4-9

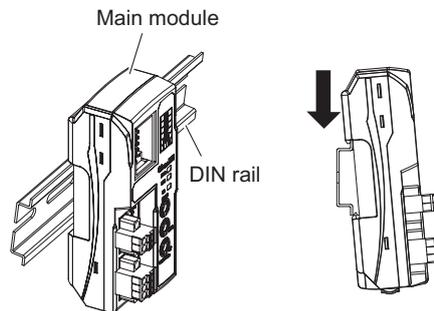
# 4-1 Mounting and Removal

This section describes how to mount the MG50-CL and Counter modules to a DIN rail and how to remove them.

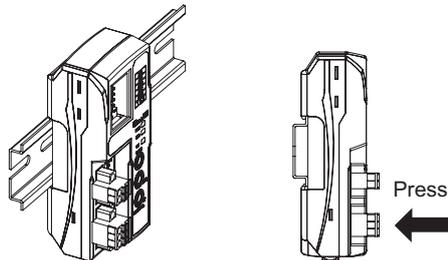
## 4-1-1 Mounting Procedure

Use the following procedure to mount the modules.

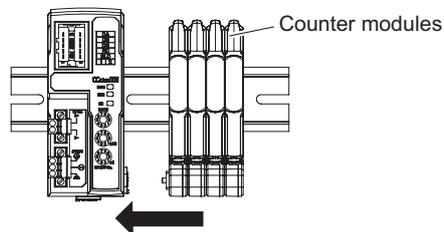
- 1 Place the top part of the module onto the DIN rail.**



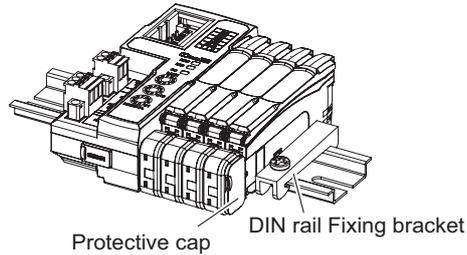
- 2 Press the bottom part of the module onto the DIN rail.**



- 3 Remove the protective cap from the right side of the Main module. Then, slide the Counter module, align the connector with the Main module, and press the modules together until you hear them lock into place.**

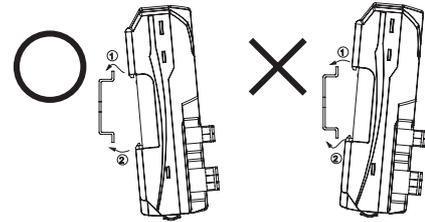


- 4** Secure the enclosed DIN rail Fixing brackets onto the ends so that there is no space between them and the modules. Finally, attach the protective cap you removed in step 3 to the Counter module on the far right end.



Do not reverse the order of steps 1 and 2, above. Doing so may reduce the mounting strength on the DIN rail.

CHECK!



Do in order: step 1 and then step 2.

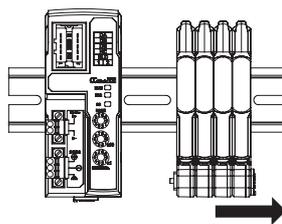
Do not perform step 2 first.

After you have completed the above procedure, check to make sure that the MG50-CL is mounted securely into place.

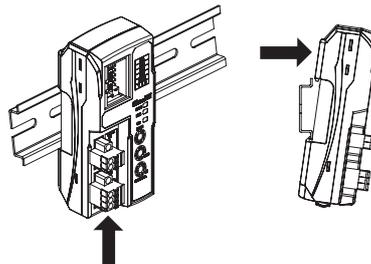
## 4-1-2 Removal Procedure

Use the following procedure to remove the module.

- 1** Slide the Counter modules to separate them from the Main module.



- 2** Press in on the Main module toward the DIN rail and lift up to remove it.



## 4-2 Wiring the CC-Link Network

---

To connect the Main module to the CC-Link network, refer to documentation for the CC-Link master unit and the *CC-Link Installation Guide*.

### 4-2-1 General Wiring Precautions

- Always turn OFF the power supply before performing any wiring operations on the Main module. The external devices that are connected to the MG50-CL may operate in an unexpected manner if the MG50-CL is wired while the power supply is ON.
- Be careful not to pinch your fingers when attaching connectors.
- Incorrect wiring will reduce safety functions. Perform all wiring correctly and confirm operation before using the Main module.

## 4-2-2 Preparing for Wiring

- **FANC-110SBH CC-Link Cable (Kuramo Electric Co.)**  
Refer to documentation for the CC-Link master unit and the *CC-Link Installation Guide* for specifications and processing methods (including stripping methods) for the special CC-Link cable.
- **35505-6000-B0MGF Power Clamp Connector**

Manufacturer	Model number
3M	35505-6000-B0MGF

### Wiring the Connector

- 1 Strip 4 cm of the insulating sheath from the CC-Link Version 1.10-compliant cable.**
- 2 Separate the braided shield and drain wires, and then twist the drain wire with your fingers at least 10 times.**  
Be careful not to sever the drain wire.
- 3 Cut off the braided shield, ALPET shield tape, and filler.**
- 4 Separate the wires so that they are in the following order: blue, white, yellow, and drain wire.**  
Blue wire, pin 1 (cover label: DA B)  
White wire, pin 2 (cover label: DB W)  
Yellow wire, pin 3 (cover label: DG Y)  
Drain wire, pin 5 (cover label: SL D)
- 5 Insert the cable all the way into the power clamp.**  
Check to confirm that the wire has been inserted all the way by looking through the top of the cover.
- 6 Use pliers to push the cover into the body and crimp the cable.**
- 7 Check to confirm that the cover is level with the body and that there is no space between the body and the cover.**

\* We recommend using heat-shrinking tubing to protect the drain wire and other wiring.



#### Reference

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For details, refer to the *3M Power Clamp Connector Wiring Procedures*.

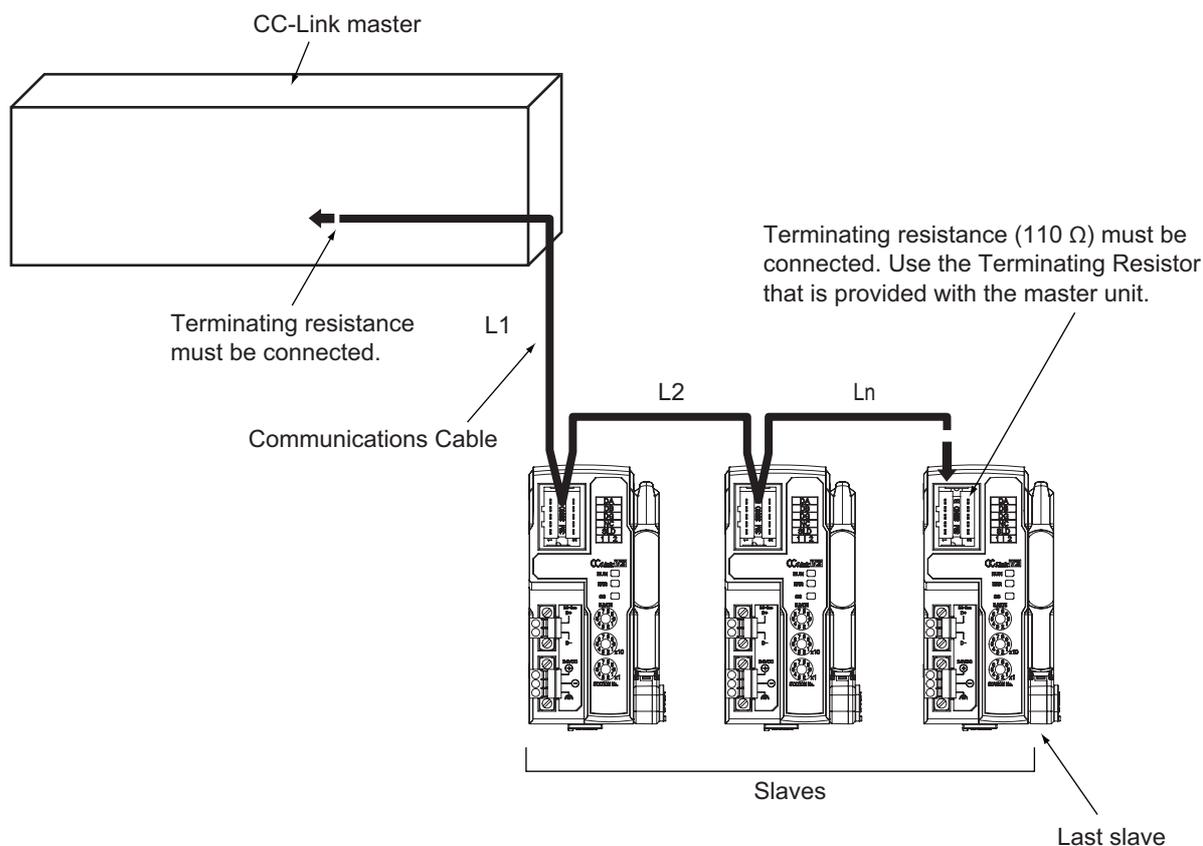
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### 4-2-3 Connecting the Communications Cables

- For CC-Link system cable lengths and wiring methods, refer to the *CC-Link Installation Guide* published by the CC-Link Partner Association or the manual for your CC-Link master unit.

CC-Link networks can use any network topology, but the connections before and after a MG50-CL Main module CC-Link Slave Unit must be daisy chain connections.

Connect the communications cables from the CC-Link master to the first slave communications connector, and then from each slave to the next slave.

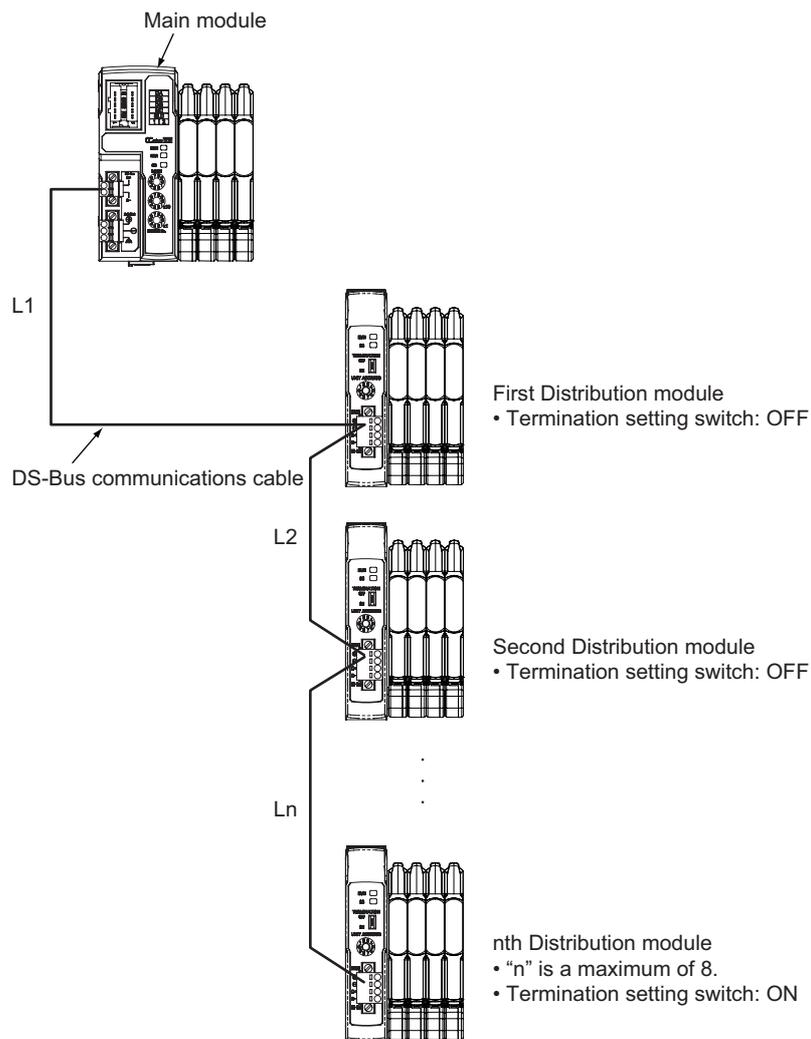


#### Precautions for Correct Use

- Keep the total length of cables between all slaves (L1, L2, ... Ln in the figure) to within 100 m.
- Connect the communications cable connectors until they click firmly into place.
- Refer to the specifications of the manufacturer of your cables for specifications, such as the allowed bending radius.

#### 4-2-4 Connecting the Distribution Module

The Main module and Distribution modules are connected by a DS-Bus network. Connect the communications cable to the DS-Bus communications connector on the Main module. Connect the Distribution modules with multidrop connections, i.e., connect the D+ and D- terminals between consecutive Units. Supply power to the Distribution modules from a Unit Power Supply (24 VDC). (Refer to 4-3 *Connecting the Unit Power Supply*.)



#### Precautions for Correct Use

- You can connect up to eight Distribution modules to one Main module.
- Keep the total length of DS-Bus communications cables ( $L1 + L2 + \dots + Ln$ ) to within 30 m.
- Turn ON the DS-Bus termination setting switch for the last Distribution module on the DS-Bus network. Turn this switch OFF for all other Distribution modules.

## 4-3 Connecting the Unit Power Supply

The following power supplies are required to operate the CC-Link network.

- Unit Power Supply: For communications between slaves and for internal slave operations  
This section describes how to provide the unit power supply.

### 4-3-1 Precautions on Supplying Unit Power

Consider the following points on the allowable current and voltage drop on cables and connectors and the placement of the power supply used to supply power to the Units.

- **Precaution on Cable Voltage Drop**  
Make sure that the power supply voltage to the slave farthest from the power supply is within the allowable fluctuation range.
- **Supplying Power to Units from Multiple Power Supplies**  
Using multiple power supplies to supply power can allow you to reduce the line current, reduce voltage drop, and decrease cable size.  
It also helps to maintain system stability in the event of a power supply problems.
- **Power Supply Problems**  
You must decide how to place your power supplies and how to group them depending on whether you want to stop the entire system when a power supply problem occurs or if you want to avoid stopping the entire system when possible.  
If you want to avoid stopping the entire system, install power supplies in multiple locations and divide the slaves into groups.  
This will also help to reduce voltage drop and enable you to use smaller cables.

### 4-3-2 Unit Power Supply Specifications

Use a standard power supply that meets the following specifications.

Item	Specification
Output voltage	24 VDC $\pm 10\%$
Output ripple	600 mVp-p
Output current	Must be able to supply current that is higher than the total sum of the current consumed by all slaves.
Isolation	Between output and AC power supply and between output and frame ground

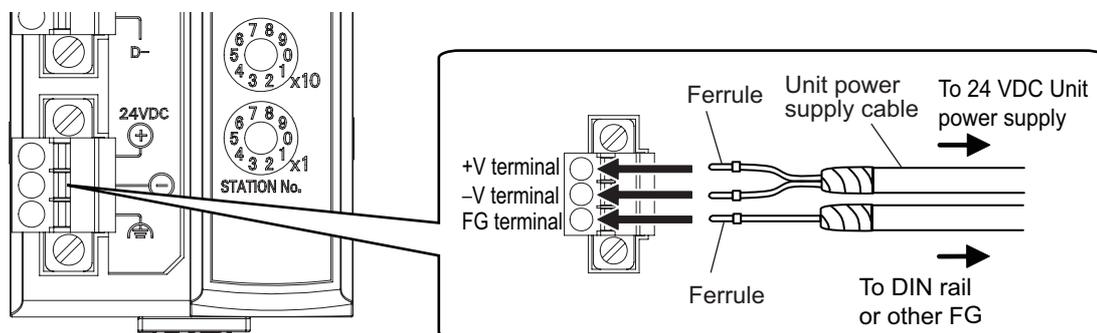


#### Precautions for Correct Use

- The Unit power supply also provides the I/O power for the inputs on slaves with e-CON connectors.  
When calculating the output current for the Unit power supply, always include the current consumption of the MG50 and the current consumption of all Counter modules and measuring units in the Unit power supply consumption current.
- Make sure that the power supply has sufficient capacity to handle the inrush current when the system is started.

### 4-3-3 Connecting the Unit Power Supply

Connect a cable from the Unit power supply (24 VDC) to the power supply connectors on each slave.



Securely attach ferrules to the Unit power supply cable wires. Do not wire a power supply to the communications path of the Distribution modules. The modules may be damaged.

#### ● Recommended Parts

We recommend using the following ferrules for the Unit power supply cable.

Model number	Applicable wire size	Crimp tool	Manufacturer
AI0,5-10WH	0.5mm <sup>2</sup> /AWG20	CRIMPFOX UD6 (product No. 1204436) or CRIMPFOX ZA3 Series	Phoenix Contact GmbH & Co. KG
H0.5/16 orange	0.5mm <sup>2</sup> /AWG20	Crimper PZ1.5 (product No. 900599)	Weidmueller Interface GmbH & Co. KG



# 5

## MG50-CL Hardware Specifications

This section gives the CC-Link communications specifications, general specifications, and hardware specifications.

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<b>5-1</b>	<b>CC-Link Communications Specifications</b>	<b>5-2</b>
<b>5-2</b>	<b>General Specifications</b>	<b>5-3</b>
<b>5-3</b>	<b>Hardware Specifications</b>	<b>5-4</b>
5-3-1	Status Indicators	5-4
5-3-2	Setting Switches	5-5
5-3-3	Communications Connectors	5-6
5-3-4	Unit Power Supply Connector	5-7

## 5-1 CC-Link Communications Specifications

This section gives the communications specifications of the MG50-CL Main module.

Item	Specification
Communications protocol	CC-Link protocol
Communications method	Broadcast polling
Baud rate	156 Kbps, 625 kbps, 2.5 Mbps, 5 Mbps, 10 Mbps
Physical layer	Bus (Conforms to EIA RS-485.)
Topology	Daisy chain (T-junctions are allowed.)
Communications media	CC-Link cable
Communications distance	Distance between stations: 20 cm min. Maximum cable length With baud rate of 156 Kbps: 1200 m With baud rate of 625 Kbps: 900 m With baud rate of 2.5 Mbps: 400 m With baud rate of 5 Mbps: 160 m With baud rate 10 Mbps: 100 m
Noise immunity	Conforms to IEC 61000-4-4, 1 kV or higher.
Address setting method	Decimal rotary address switch
Address range	64 max., must meet the following conditions: 1) Total Number of Stations $(a+a2+a4+a8)+(b+b2+b4+b8)\times 2+(c+c2+c4+c8)\times 3+(d+d2+d4+d8)\times 4\leq 64$ 2) Total Number of Remote I/O $(a\times 32+a2\times 32+a4\times 64+a8\times 128)+(b\times 64+b2\times 96+b4\times 192+b8\times 384)+\dots$ 3) Total Number of Remote Registers $(a\times 4+a2\times 8+a4\times 16+a8\times 32)+(b\times 8+b2\times 16+b4\times 32+b8\times 64)+\dots$ a: Number of single-setting units allocated one station b: Number of single-setting units allocated two stations c: Number of single-setting units allocated three stations d: Number of single-setting units allocated four stations a2: Number of double-setting units allocated one station b2: Number of double-setting units allocated two stations c2: Number of double-setting units allocated three stations d2: Number of double-setting units allocated four stations a4: Number of quadruple-setting units allocated one station b4: Number of quadruple-setting units allocated two stations c4: Number of quadruple-setting units allocated three stations d4: Number of quadruple-setting units allocated four stations a8: Number of octal-setting units allocated one station b8: Number of octal-setting units allocated two stations c8: Number of octal-setting units allocated three stations d8: Number of octal-setting units allocated four stations 4) Number of Connected Nodes $16\times A+54\times B+88\times C\leq 2304$ A: Number of remote I/O stations (64 max.) B: Number of remote device stations (42 max.) C: Number of local stations and intelligent device stations (26 max.)
Synchronous mode	Cyclic transmissions (synchronized)

\* The range depends on the CC-Link master that is used. Refer to 5-3-2 *Setting Switches* in this manual.

## 5-2 General Specifications

This section gives the general specifications of the CC-Link Main module.

Item	Specification and performance
Unit power supply voltage	24 VDC (20.4 to 26.4 V)
Power and current consumption	2.4 W max. (Does not include power supplied to measuring units.) 100 mA max. at 24 VDC (Does not include current supplied to measuring units.)
Indicators	RUN indicator (green), ERROR indicator (red), and SS (Sensor Status) indicator (green/red)
Maximum connectable measuring units	16*1
Maximum connectable Distribution modules	8
Vibration resistance (destruction)	10 to 60 Hz with a 0.7 mm double amplitude, 50 m/s <sup>2</sup> at 60 to 150 Hz, for 1.5 hours each in X, Y, and Z directions
Shock resistance (destruction)	150 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions
Dielectric strength	500 VAC at 50/60 Hz for 1 min
Insulation resistance	20 MΩ min. (at 500 VDC)
Ambient temperature range	Operating: 0 to 55°C*2 Storage: -30 to 70°C (with no condensation or icing)
Ambient humidity range	Operating and storage: 25% to 85% (with no condensation)
Installation method	35 mm DIN rail-mounting
Mass (packed state/Unit only)	Approx. 180 g/approx. 80 g
Materials	Polycarbonate
Accessories	Power Supply Connector, MG51 Connector, DIN rail Fixing brackets (2), and Safety Precautions

\*1 You can connect up to 16 Counter modules total to the Main module and Distribution modules.

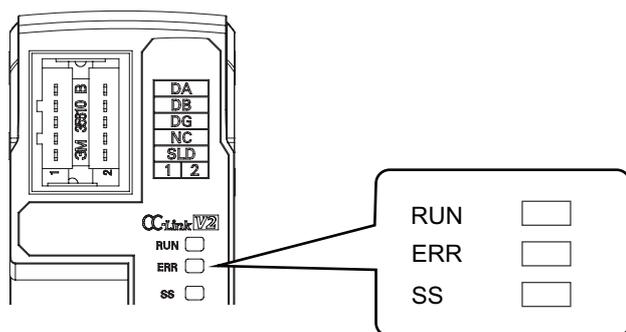
\*2 Temperature limitations based on number of connected Counter modules:

Groups of 1 or 2 Counter modules: 0 to 55°C, Groups of 3 to 10 Counter modules: 0 to 50°C, Groups of 11 to 16 Counter modules: 0 to 45°C

## 5-3 Hardware Specifications

### 5-3-1 Status Indicators

These indicators show the current status of the MG50-CL.



#### RUN Indicator

This indicator shows the operating status.

Color	State	Description
Green	Not lit.	CC-Link communications are disconnected or the Unit is being reset.
	Lit.	CC-Link communications are in progress.

#### ERR Indicator

This indicator displays errors.

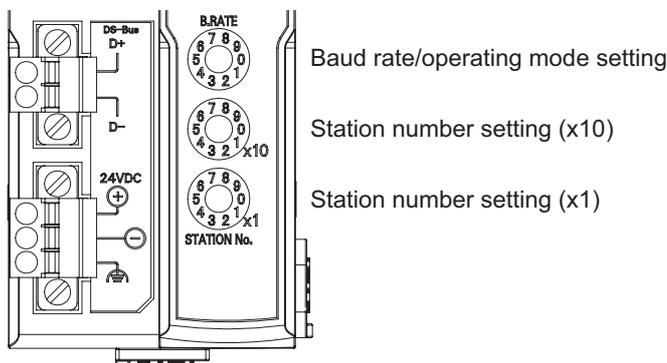
Color	State	Description
Red	Not lit.	Normal transmission
	Flashing	The station setting switch or baud rate setting/operating mode setting switch was changed during communications.
	Lit.	Communications error or station number setting out of range

#### SS Indicator

This indicator compares the number of measuring units connected when power was turned ON to the number of measuring units actually connected and indicates the measuring unit connection status.

Color	State	Description
	Not lit.	No Counter modules are connected or initialization is being performed after the power supply was turned ON.
Green	Lit.	Normal: The number of connected measuring units when power was turned ON matches the actual number of connected measuring units
Red	Lit.	Error: The number of connected measuring units when power was turned ON does not match the actual number of connected measuring units

### 5-3-2 Setting Switches



#### Baud Rate/Operating Mode Setting Switch

This switch sets the CC-Link baud rate and operating mode.  
The following table describes the settings.

Switch	Appearance /Display	Setting		
Baud rate/operating mode setting switch		This switch sets the CC-Link baud rate and operating mode.		
		Switch setting	Baud rate	Operating mode
		0	156k	Reduced I/O Mode (Ver. 1 Mode)
		1	625k	
		2	2.5M	
		3	5M	
		4	10M	Monitor Mode (Ver. 2 Mode)
		5	156k	
		6	625k	
		7	2.5M	
8	5M			
9	10M			
An error will occur if the operating mode does not match the CC-Link mode set in the master station's CC-Link parameters and the ERR indicator will light up.				



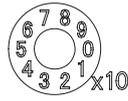
#### Precautions for Correct Use

- The settings of the setting switches are read only once when the power is turned ON. Changing this setting after the power is turned ON will have no effect until after the next time the power is turned ON.
- If these switches are changed after the power is turned ON, the ERR indicator will light.

## Station Number Switch

Sets the station number (decimal value) of the MG50-CL on the CC-Link network.

Use the middle station number setting switch to set the tens digit, and use the bottom station number setting switch to set the ones digit. The following table gives the setting ranges.

Switch	Appearance/ Display	Setting		
Station number switch		Sets the CC-Link station number.		
		Operating mode	Reduced I/O Mode (Ver. 1 Mode)	Monitor Mode (Ver. 2 Mode)
	Setting range	1 to 63	1 to 62	
		If the valid setting range is exceeded, a station number setting error will occur and the ERR indicator will light. The maximum number of connectable Units depends on the types of devices that are connected to the CC-Link network. *Refer to the manual for your master station for details about the maximum number of connections.		

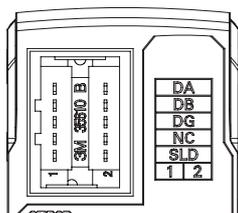


### Precautions for Correct Use

- The settings of the setting switches are read only once when the power is turned ON. Changing this setting after the power is turned ON will have no effect until after the next time the power is turned ON.
- An error will occur if the same station number is used more than once and operation will stop.
- If these switches are changed after the power is turned ON, the ERR indicator will light.

## 5-3-3 Communications Connectors

Connect the communications cables.



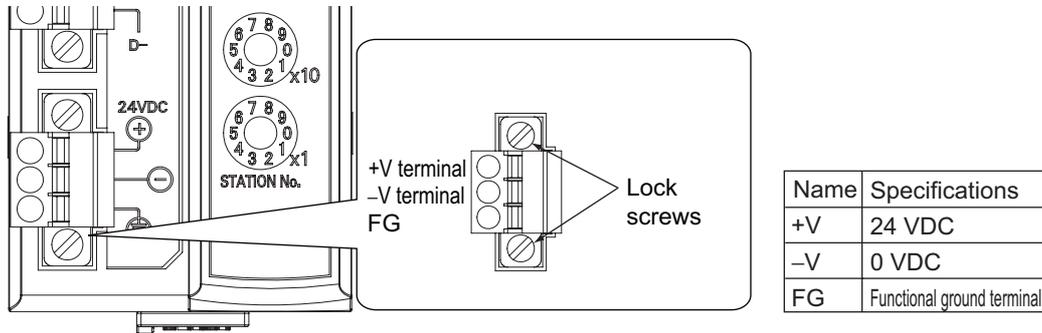
Use a CC-Link Power Clamp connector made by 3M company.

- Terminal Arrangement

Name	Function
DA	Communications signal
DB	Communications signal
DG	Communications signal
NC	Not used.
SLD	Connect the CC-Link connection cable's shield wire.

### 5-3-4 Unit Power Supply Connector

Connect the Unit power supply (24 VDC).



- Connector type: Two-pin spring cage connector with lock screws
- Applicable ferrule diameter: 0.25 to 0.5 mm<sup>2</sup> (AWG24 to AWG20) (Using ferrules with insulating sleeves)

Refer to 4-3-3 *Connecting the Unit Power Supply* for the recommended ferrules.



# 6

## MG50-CL Function Specifications

This section describes the functions of the MG50-CL CC-Link Interface unit Main module.

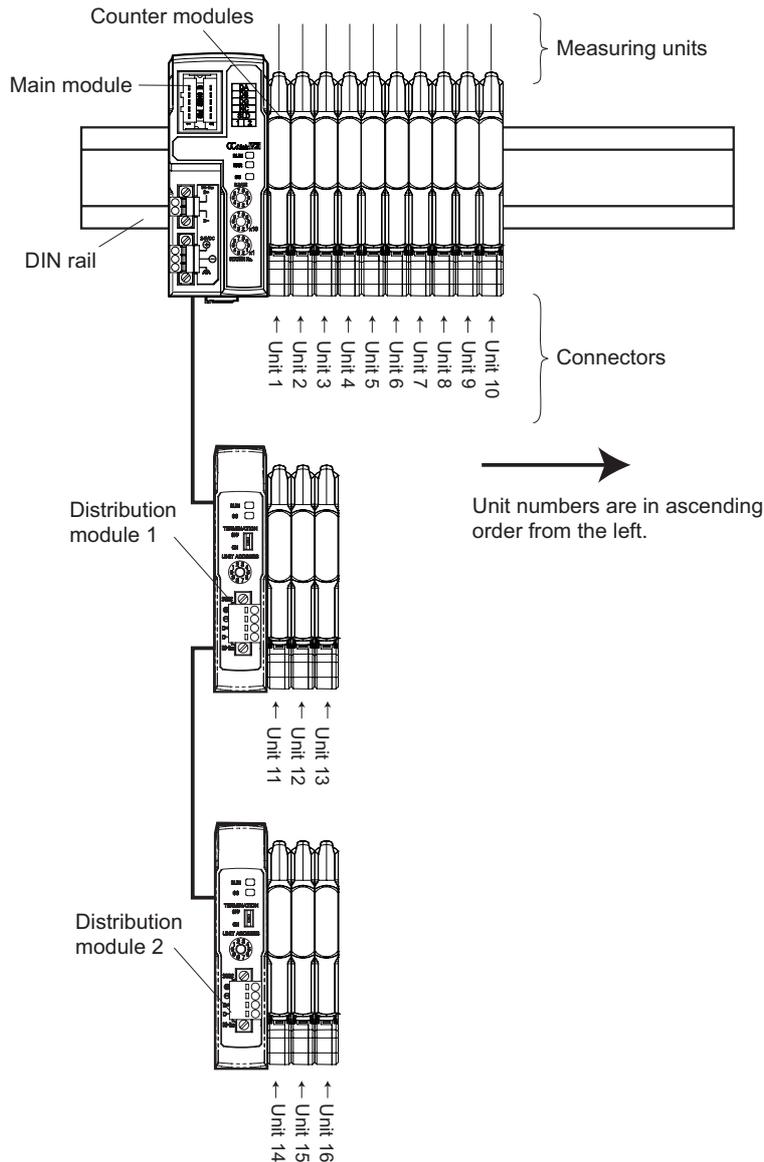
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<b>6-1</b>	<b>I/O Data Assignments</b> .....	<b>6-2</b>
6-1-1	Input Data Assignments .....	6-2
<b>6-2</b>	<b>MG50-CL Functions</b> .....	<b>6-9</b>
6-2-1	Dummy Registration .....	6-9
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# 6-1 I/O Data Assignments

## 6-1-1 Input Data Assignments

### Measuring Unit Numbers



The Main module identifies the connected Counter modules according to their unit numbers. Unit numbers of Counter modules are assigned to the units from unit number 1 starting from the Main module.

Each Counter module that is assigned a unit number has an input 1 (measuring unit output 1) and input 2 (measuring unit output 2).

The unit numbers of the Counter modules that are connected to a Distribution module are numbered sequentially, in the order shown below, following the unit numbers of the Counter modules that are connected to the Main module.

Main module -> Distribution module 1 -> Distribution module 2 -> ... -> Distribution module 8

You can connect a maximum of 16 Counter modules.

(Refer to 2-2-2 *Number of Connected Counter Modules*.)

You can connect a maximum of eight Distribution modules to the MG50-CL.

## I/O Data Assignments

Use the link devices shown in the following tables to send and receive data between the MG50-CL and the CC-Link master station.

### ● Reduced I/O Mode

I/O signal assignments		
Bit data		
Signal direction	Signal direction: MG50-CL to master Example: Measuring unit output ON/OFF data	Signal direction: Master to MG50-CL Example: Error Reset Request Flag
Link devices	RX (input link relays)	RY (output link relays)
Number of assigned bits	64	64
Number of used bits	38	3

Read/write register assignments		
Word data		
Signal direction	Read area: MG50-CL to master Example: Measuring unit status monitor	Write area: Master to MG50-CL Example: Command settings
Link devices	RWr (input link registers)	RWw (output link registers)
Number of assigned words	8	8
Number of used words	5	5

### ● Monitor Mode

I/O signal assignments		
Bit data		
Signal direction	Signal direction: MG50-CL to master Example: Measuring unit output ON/OFF data	Signal direction: Master to MG50-CL Example: Error Reset Request Flag
Link devices	RX (input link relays)	RY (output link relays)
Number of assigned bits	320	320
Number of used bits	38	3

Read/write register assignments		
Word data		
Signal direction	Read area: MG50-CL to master Example: Measuring unit status monitor	Write area: Master to MG50-CL Example: Command settings
Link devices	RWr (input link registers)	RWw (output link registers)
Number of assigned words	48	48
Number of used words	40	8

The following tables list the items that you can assign to the MG50-CL. Refer to the specific manual for your master for information on changing the mappings.

This section describes the data that can be exchanged through cyclic transmissions.

### ● I/O Signal Assignments in Reduced I/O Mode

Signal direction: MG50-CL to master		Signal direction: Master to MG50-CL	
Device No.	Signal name	Device No.	Signal name
RXn0	Measuring Unit No. 1 ON/OFF Output Data 1	RYn0	
RXn1	Measuring Unit No. 1 ON/OFF Output Data 2	RYn1	
RXn2	Measuring Unit No. 2 ON/OFF Output Data 1	RYn2	
RXn3	Measuring Unit No. 2 ON/OFF Output Data 2	RYn3	
RXn4	Measuring Unit No. 3 ON/OFF Output Data 1	RYn4	
RXn5	Measuring Unit No. 3 ON/OFF Output Data 2	RYn5	
RXn6	Measuring Unit No. 4 ON/OFF Output Data 1	RYn6	
RXn7	Measuring Unit No. 4 ON/OFF Output Data 2	RYn7	
RXn8	Measuring Unit No. 5 ON/OFF Output Data 1	RYn8	
RXn9	Measuring Unit No. 5 ON/OFF Output Data 2	RYn9	
RXnA	Measuring Unit No. 6 ON/OFF Output Data 1	RYnA	
RXnB	Measuring Unit No. 6 ON/OFF Output Data 2	RYnB	
RXnC	Measuring Unit No. 7 ON/OFF Output Data 1	RYnC	
RXnD	Measuring Unit No. 7 ON/OFF Output Data 2	RYnD	
RXnE	Measuring Unit No. 8 ON/OFF Output Data 1	RYnE	
RXnF	Measuring Unit No. 8 ON/OFF Output Data 2	RYnF	
RX(n+1)0	Measuring Unit No. 9 ON/OFF Output Data 1	RY(n+1)0	Do not use.
RX(n+1)1	Measuring Unit No. 9 ON/OFF Output Data 2	RY(n+1)1	
RX(n+1)2	Measuring Unit No. 10 ON/OFF Output Data 1	RY(n+1)2	
RX(n+1)3	Measuring Unit No. 10 ON/OFF Output Data 2	RY(n+1)3	
RX(n+1)4	Measuring Unit No. 11 ON/OFF Output Data 1	RY(n+1)4	
RX(n+1)5	Measuring Unit No. 11 ON/OFF Output Data 2	RY(n+1)5	
RX(n+1)6	Measuring Unit No. 12 ON/OFF Output Data 1	RY(n+1)6	
RX(n+1)7	Measuring Unit No. 12 ON/OFF Output Data 2	RY(n+1)7	
RX(n+1)8	Measuring Unit No. 13 ON/OFF Output Data 1	RY(n+1)8	
RX(n+1)9	Measuring Unit No. 13 ON/OFF Output Data 2	RY(n+1)9	
RX(n+1)A	Measuring Unit No. 14 ON/OFF Output Data 1	RY(n+1)A	
RX(n+1)B	Measuring Unit No. 14 ON/OFF Output Data 2	RY(n+1)B	
RX(n+1)C	Measuring Unit No. 15 ON/OFF Output Data 1	RY(n+1)C	
RX(n+1)D	Measuring Unit No. 15 ON/OFF Output Data 2	RY(n+1)D	
RX(n+1)E	Measuring Unit No. 16 ON/OFF Output Data 1	RY(n+1)E	
RX(n+1)F	Measuring Unit No. 16 ON/OFF Output Data 2	RY(n+1)F	
RX(n+2)0	Command Normal Completion Flags	RY(n+2)0	Trigger Request Flags
RX(n+2)1	Command Error Completion Flags	RY(n+2)1	
RX(n+2)2	Busy Flag	RY(n+2)2	Do not use.
RX(n+2)3	Measuring Unit Error Flags	RY(n+2)3	
RX(n+2)4	Do not use.	RY(n+2)4	
RX(n+2)5	Warning Reset Completed Flags	RY(n+2)5	Warning Reset Flags
RX(n+2)6	Do not use.	RY(n+2)6	Do not use.
⋮		⋮	
RX(n+3)9		RY(n+3)9	
RX(n+3)A	Error Status Flags	RY(n+3)A	Error Reset Request Flags
RX(n+3)B	Remote Ready Flags	RY(n+3)B	Do not use.
RX(n+3)C	Do not use.	RY(n+3)C	
RX(n+3)D		RY(n+3)D	
RX(n+3)E		RY(n+3)E	
RX(n+3)F		RY(n+3)F	

n: The address assigned to the master station in the station number settings

● **Read/Write Register Assignments in Reduced I/O Mode**

Read area: MG50-CL to master		
Device No.	Description	Remarks
RWrm	Measuring Unit Warning Flags (1 to 16)	
RWrm+1	Do not use.	
RWrm+2	Received Data 1 Area	
RWrm+3	Received Data 2 Area	
RWrm+4	Number of Mounted Measuring Units (including Dummy Slaves)	
RWrm+5	Error Information Storage Area	Error type Refer to 6-2-3 <i>Error History</i> .
RWrm+6 and 7	Do not use.	

m: The address assigned to the master station in the station number settings

Write area: Master to MG50-CL		
Device No.	Description	Remarks
RWwn	Command Unit Number Setting Area	
RWwn+1	Command Measuring Unit Channel Setting Area	
RWwn+2	Command Type Setting Area	Refer to A-1 <i>Using Commands for Communications</i> .
RWwn+3	Do not use.	
RWwn+4	Command data 1	
RWwn+5	Command data 2	
RWwn+6 and 7	Do not use.	

n: The address assigned to the master station in the station number settings

### ● I/O Signal Assignments in Monitor Mode

Signal direction: MG50-CL to master		Signal direction: Master to MG50-CL	
Device No.	Signal name	Device No.	Signal name
RXn0	Measuring Unit No. 1 ON/OFF Output Data 1	RYn0	Do not use.
RXn1	Measuring Unit No. 1 ON/OFF Output Data 2	RYn1	
RXn2	Measuring Unit No. 2 ON/OFF Output Data 1	RYn2	
RXn3	Measuring Unit No. 2 ON/OFF Output Data 2	RYn3	
RXn4	Measuring Unit No. 3 ON/OFF Output Data 1	RYn4	
RXn5	Measuring Unit No. 3 ON/OFF Output Data 2	RYn5	
RXn6	Measuring Unit No. 4 ON/OFF Output Data 1	RYn6	
RXn7	Measuring Unit No. 4 ON/OFF Output Data 2	RYn7	
RXn8	Measuring Unit No. 5 ON/OFF Output Data 1	RYn8	
RXn9	Measuring Unit No. 5 ON/OFF Output Data 2	RYn9	
RXnA	Measuring Unit No. 6 ON/OFF Output Data 1	RYnA	
RXnB	Measuring Unit No. 6 ON/OFF Output Data 2	RYnB	
RXnC	Measuring Unit No. 7 ON/OFF Output Data 1	RYnC	
RXnD	Measuring Unit No. 7 ON/OFF Output Data 2	RYnD	
RXnE	Measuring Unit No. 8 ON/OFF Output Data 1	RYnE	
RXnF	Measuring Unit No. 8 ON/OFF Output Data 2	RYnF	
RX(n+1)0	Measuring Unit No. 9 ON/OFF Output Data 1	RY(n+1)0	
RX(n+1)1	Measuring Unit No. 9 ON/OFF Output Data 2	RY(n+1)1	
RX(n+1)2	Measuring Unit No. 10 ON/OFF Output Data 1	RY(n+1)2	
RX(n+1)3	Measuring Unit No. 10 ON/OFF Output Data 2	RY(n+1)3	
RX(n+1)4	Measuring Unit No. 11 ON/OFF Output Data 1	RY(n+1)4	
RX(n+1)5	Measuring Unit No. 11 ON/OFF Output Data 2	RY(n+1)5	
RX(n+1)6	Measuring Unit No. 12 ON/OFF Output Data 1	RY(n+1)6	
RX(n+1)7	Measuring Unit No. 12 ON/OFF Output Data 2	RY(n+1)7	
RX(n+1)8	Measuring Unit No. 13 ON/OFF Output Data 1	RY(n+1)8	
RX(n+1)9	Measuring Unit No. 13 ON/OFF Output Data 2	RY(n+1)9	
RX(n+1)A	Measuring Unit No. 14 ON/OFF Output Data 1	RY(n+1)A	
RX(n+1)B	Measuring Unit No. 14 ON/OFF Output Data 2	RY(n+1)B	
RX(n+1)C	Measuring Unit No. 15 ON/OFF Output Data 1	RY(n+1)C	
RX(n+1)D	Measuring Unit No. 15 ON/OFF Output Data 2	RY(n+1)D	
RX(n+1)E	Measuring Unit No. 16 ON/OFF Output Data 1	RY(n+1)E	
RX(n+1)F	Measuring Unit No. 16 ON/OFF Output Data 2	RY(n+1)F	
RX(n+2)0	Command Normal Completion Flags	RY(n+2)0	Trigger Request Flags
RX(n+2)1	Command Error Completion Flags	RY(n+2)1	Do not use.
RX(n+2)2	Busy Flag	RY(n+2)2	
RX(n+2)3	Measuring Unit Error Flags	RY(n+2)3	
RX(n+2)4	Do not use.	RY(n+2)4	Warning Reset Flags
RX(n+2)5	Warning Reset Completed Flags	RY(n+2)5	
RX(n+2)6	Do not use.	RY(n+2)6	Do not use.
⋮		⋮	
RX(n+13)9		RY(n+13)9	
RX(n+13)A	Error Status Flags	RY(n+13)A	Error Reset Request Flags
RX(n+13)B	Remote Ready Flags	RY(n+13)B	Do not use.
RX(n+13)C to F	Do not use.	RY(n+13)C to F	

n: The address assigned to the master station in the station number settings

## ● Read/Write Register Assignments in Monitor Mode

Read area: MG50-CL to master		
Device No.	Description	Remarks
RWrm	Measuring Unit Warning Flags (1 to 16)	
RWrm+1	Do not use.	
RWrm+2	Received Data 1 Area	
RWrm+3	Received Data 2 Area	
RWrm+4	Number of Mounted Measuring Units (including Dummy Slaves)	
RWrm+5	Error Information Storage Area	Error type Refer to 6-2-3 <i>Error History</i> .
RWrm+6 to 7	Do not use.	
RWrm+8	Measuring Unit No. 1 IN1/IN2 Detection Value/Threshold Value Area 1*	
RWrm+9	Measuring Unit No. 1 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+A	Measuring Unit No. 2 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+B	Measuring Unit No. 2 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+C	Measuring Unit No. 3 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+D	Measuring Unit No. 3 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+E	Measuring Unit No. 4 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+F	Measuring Unit No. 4 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 0	Measuring Unit No. 5 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 1	Measuring Unit No. 5 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 2	Measuring Unit No. 6 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 3	Measuring Unit No. 6 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 4	Measuring Unit No. 7 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 5	Measuring Unit No. 7 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 6	Measuring Unit No. 8 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 7	Measuring Unit No. 8 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 8	Measuring Unit No. 9 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 9	Measuring Unit No. 9 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 A	Measuring Unit No. 10 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 B	Measuring Unit No. 10 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 C	Measuring Unit No. 11 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 D	Measuring Unit No. 11 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+1 E	Measuring Unit No. 12 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+1 F	Measuring Unit No. 12 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+2 0	Measuring Unit No. 13 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+2 1	Measuring Unit No. 13 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+2 2	Measuring Unit No. 14 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+2 3	Measuring Unit No. 14 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+2 4	Measuring Unit No. 15 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+2 5	Measuring Unit No. 15 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+2 6	Measuring Unit No. 16 IN1/IN2 Detection Value/Threshold Value Area 1	
RWrm+2 7	Measuring Unit No. 16 IN1/IN2 Detection Value/Threshold Value Area 2	
RWrm+2 8	Detection Value/Threshold Value Switch Confirmation Area	ON = Threshold value, OFF = Detection value
RWrm+2 9	IN1/IN2 Switch Confirmation Area	ON = IN2, OFF = IN1
RWrm+2 A	Detection Value Confirmation Area	0 = Current value
RWrm+2 B to 2F	Do not use.	

m: The address assigned to the master station in the station number settings

\* The MF10-CM uses 32 bits at the same time for measuring unit No. □□ IN1/IN2 Detection Value/Threshold Value Areas 1 and 2.

**Precautions for Correct Use**

The detection value obtained above is the actual detection value used for judgement. It may not match the detection value displayed on the digital display of the Counter module.

Write area: Master to MG50-CL		
Device No.	Description	Remarks
RWwn	Command Unit Number Setting Area	
RWwn+1	Command Measuring Unit Channel Setting Area	
RWwn+2	Command Type Setting Area	Refer to A-1 Using Commands for Communications.
RWwn+3	Do not use.	
RWwn+4	Command data 1	
RWwn+5	Command data 2	
RWwn+6 to 7	Do not use.	
RWwn+8	Detection Value/Threshold Value Switch Setting Area	ON = Threshold value, OFF = Detection value
RWwn+9	IN1/IN2 Switch Setting Area	ON = IN2, OFF = IN1
RWwn+A	Detection Value Setting Area	0 = Detection value/Threshold value
RWwn+B to 2F	Do not use.	

n: The address assigned to the master station in the station number settings

# 6-2 MG50-CL Functions

## 6-2-1 Dummy Registration

### Outline of Function

● **Application**

If the number of used measuring units or measuring unit numbers are changed (e.g., when device options are changed), the I/O assignments for the host device would also change, which requires modifications to host programming.

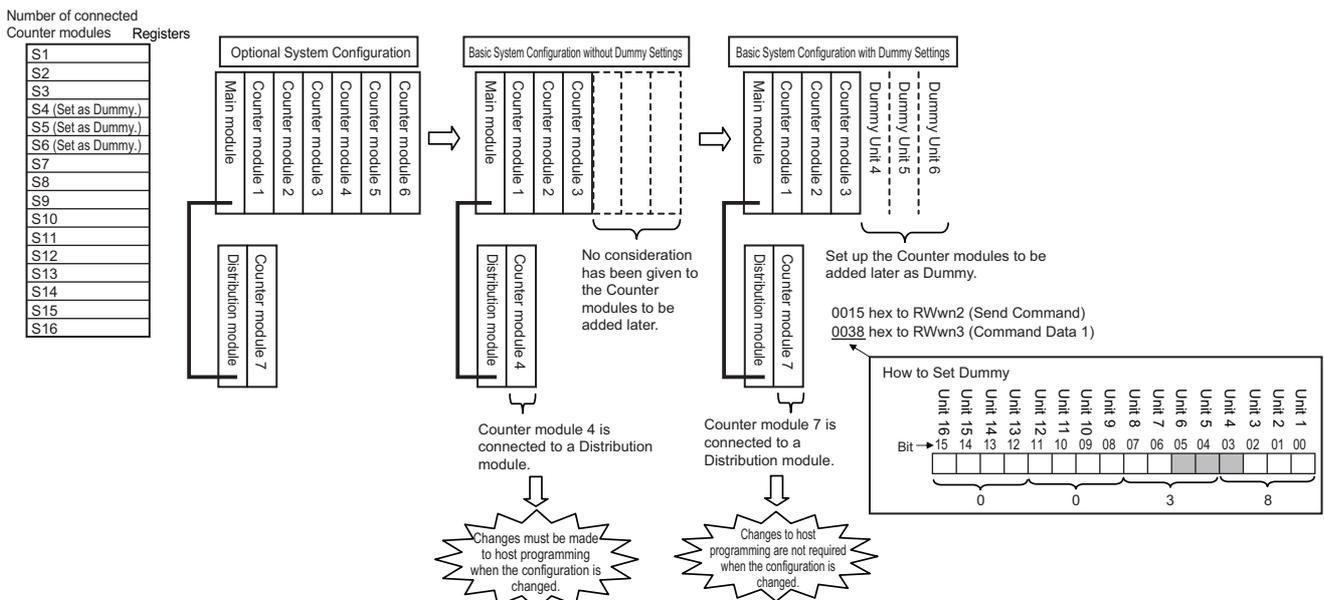
By registering Dummy you can prevent these changes in I/O assignments and eliminate the effect changing measuring unit numbers might have on host programming.

The following is an application example.

1. Registers are always allocated to detect 16 connected Counter modules.
2. If this function is not used and there are no Counter module reservations, the data for Counter modules 1 to 3 are assigned to registers S1 to S3.
3. If Counter modules 4, 5, and 6 (temporary names) are added next to Counter module 2, the register assignments will change. (The data for Counter module 3 will no longer be stored in register S3, but in register S7 instead.)

You can use Dummy to prevent the location of existing Counter module data from being moved when Counter modules are added as shown in the above example.

If you want to add Counter modules in the future as shown in the figure below, you can set Dummy to registers S4 to S6 to eliminate the need for any changes to host device programming when the additional Counter modules are actually installed.



## Setting Method

---

Dummy are set using commands.

- **Dummy Position Setting**

This sets the position of the Dummy. After the position is set, the Dummy is enabled.

To execute the command, set the Command Type Setting Area write register (RWwn+2) to 15 hex (as shown in *List of Write Commands*).

Set the Command Data 1 write register (RWwn+3) to n (the unit number you want to set for the Dummy).

- **How to Set Dummy**

Set the bit that corresponds to the required unit number to 1.

To set the Dummy as units 4 to 6, as shown in the usage example above, set the Command Data 1 write register (RWwn+3) to 0000 0000 0011 1000 binary or 38 hex.

To cancel a Dummy setting, set the corresponding bit to 0. To cancel all set Dummy, set the Command Data 1 write register (RWwn+3) to 0000 0000 0000 0000 binary or 00 hex.

For detailed setting instructions, refer to *6-1-1 Input Data Assignments*.

## 6-2-2 Command Communications with the MG51

The MG50-CL Main module can be connected to a MG51 with a MG51 Connector.

Counter modules can be connected to a MG51 and the PV, ON/OFF information, and command response information from those Counter modules can be sent to the MG50-CL.

Up to 8 MG51 Units can be connected, and up to 10 Counter modules can be connected to each MG51. However, the maximum number of connectable Counter modules in the entire system configuration is still 16, even when MG51 Units are used.

You must set the unit number for any connected MG51 through the unit number setting switches on the MG51.

In the I/O map for the MG50-CL, the order for output values will be mapped as follows: Counter modules connected to the MG50-CL followed by Counter modules connected to MG51 Units in ascending order of MG51 unit numbers.

### 6-2-3 Error History

When an error occurs in the Main module, information is stored in the error history in the EEPROM. Information for up to eight errors can be saved in the error history. When more errors occur, the oldest entry in the error history is overwritten by the latest error information.

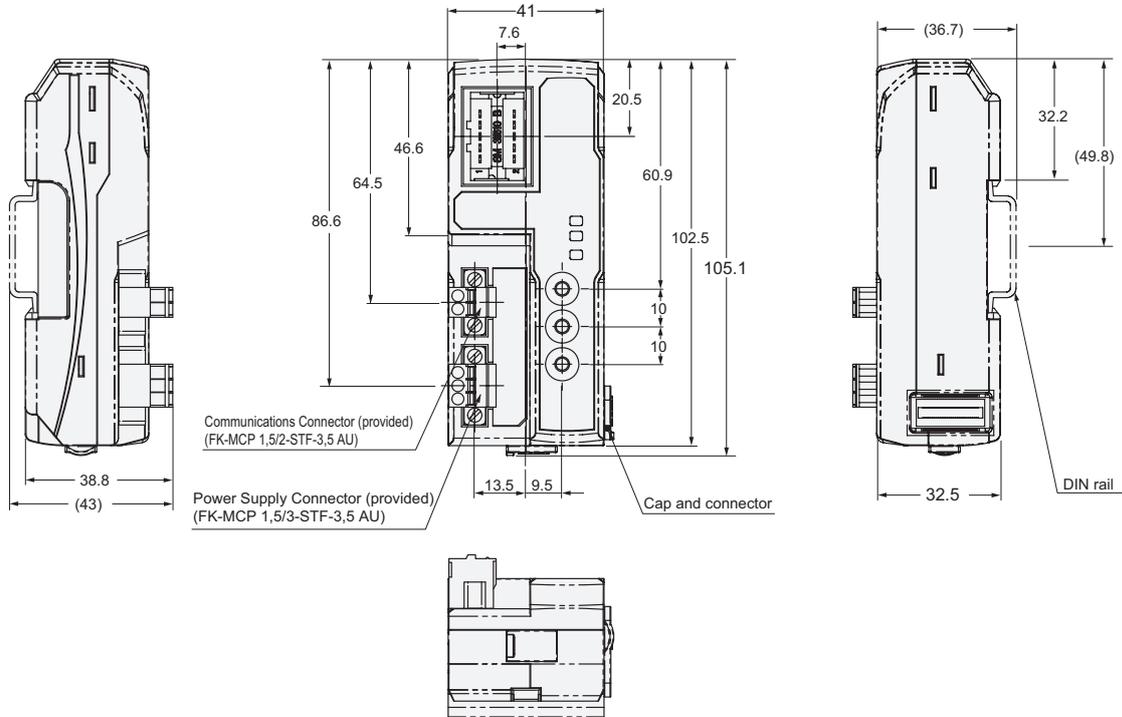
You can read the error history with a read command or clear the error history with a clear command. If multiple errors occur at the same time, the priorities at which errors are stored in the error history are listed in the following table.

Priority	Error type	Description	Meaning	Solution	Response from Counter module	Judged at Main module
Low  High	00	No error	Initial status	---	OK	OK
	0×01	Communications Error	Checksum error, timeout error, etc.	<ul style="list-style-type: none"> <li>• Retry.</li> <li>• Check communications with the measuring unit.</li> </ul>	OK	OK
	0×02	Set Value Error	Invalid command data value (e.g., out of range) <ul style="list-style-type: none"> <li>• Tolerance Judgement failed.</li> <li>• Hysteresis width setting value is out of range.</li> </ul>	Set the correct data.	OK	---
	0×04	Status Error	The Counter module is currently not in a state that can accept the command. <ul style="list-style-type: none"> <li>• Command was received in Setting Mode.</li> <li>• A command for the second point for 2 point area setting was received, but not for the first point.</li> </ul>	Send the commands at the correct time.	OK	---
	0×08	Command Error	An unsupported command was sent to the Counter module. <ul style="list-style-type: none"> <li>• A command that could not be executed was sent.</li> <li>• A channel that does not exist was specified.</li> <li>• A read command was executed at the same time for more than one measuring unit.</li> </ul>	Set the correct command.	OK	---
	0×10	TRG Error	TRG was turned OFF before processing was finished.	Keep TRG ON until processing is finished.	---	OK

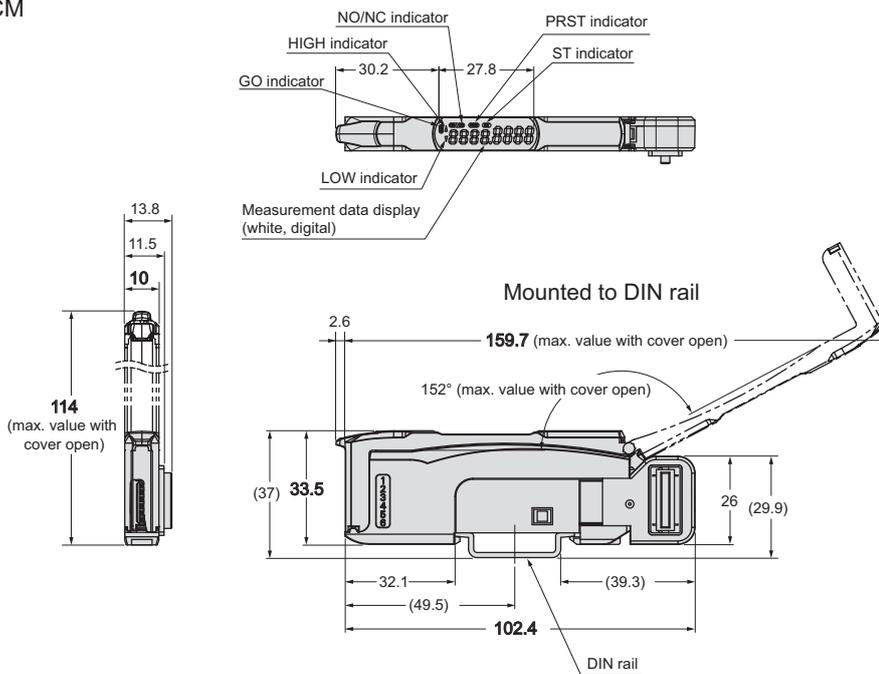
# 6-3 Dimensional Diagrams

The following figures show the product dimensions.

MG50-CL



MF10-CM







# Troubleshooting and Maintenance

This section describes troubleshooting and maintenance.

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<b>7-1</b>	<b>Troubleshooting</b> .....	<b>7-2</b>
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# 7-1 Troubleshooting

## 7-1-1 Troubleshooting Errors with the Status Indicators

You can check for errors by looking at the status indicators on the MG50-CL. For detailed status definitions, refer to *5-3-1 Status Indicators*.

### ● Errors Related to the MG50-CL

RUN Indicator	ERR Indicator	SS Indicator *1	Description	Cause	Solution		
Not lit.	Lit (red)	Lit (green or red)	Communications Error	CC-Link communications were interrupted during communications.	Check the following items for all CC-Link communications cables. <ul style="list-style-type: none"> <li>• Are the signal wires connected properly?</li> <li>• Are there any disconnections?</li> <li>• Are you using only CC-Link-authorized products?</li> <li>• Is there any noise?</li> </ul>		
			Switch Setting Error (Station number setting is out of range.)	There is an error in a station number setting.	Set the station number to within the valid range.		
	Flashing (red)		Switch Setting Error	A switch setting was changed during operation.	The settings of the setting switches are read only once when the power is turned ON. Changing this setting after the power is turned ON will have no effect until after the next time the power is turned ON. To change switch settings, cycle the power supply.		
	Not lit.		Not lit.	Communications Error	The CC-Link cable is not connected.	Check the following items for all CC-Link communications cables. <ul style="list-style-type: none"> <li>• Are the signal wires connected properly?</li> <li>• Are there any disconnections?</li> <li>• Are you using only CC-Link-authorized products?</li> <li>• Is there any noise?</li> </ul>	
					The parameters do not match those set in the CC-Link master station.	<ul style="list-style-type: none"> <li>• Set the baud rate/operating mode setting switch to match the parameter set in the CPU of the master station.</li> <li>• Set the station number setting switch to match the parameter set in the CPU of the master station.</li> <li>• Set the operating mode to match the CC-Link version in the parameter set in the CPU of the master station.</li> </ul>	
			Not lit.	Power Supply Error	Power Supply Error	The power supply is not connected properly to the MG50-CL.	Eliminate the following causes of power interruption and then restart the MG50-CL according to the specifications of the CC-Link master that the MG50-CL is connected to. <ul style="list-style-type: none"> <li>• Are the power supply cables wired properly?</li> <li>• Are the power supply cables disconnected?</li> <li>• Is the power supply voltage within the specifications?</li> <li>• Is the power supply capacity sufficient?</li> <li>• Is the power supply malfunctioning?</li> </ul>

RUN Indicator	ERR Indicator	SS Indicator *1	Description	Cause	Solution
Not lit.	Not lit.	Not lit.	The Unit is malfunctioning.	Unit hardware malfunction	<p>Check the following items for CC-Link communications cables. If none of these resolves the problem, the Unit has malfunctioned. Replace the MG50-CL Unit.</p> <ul style="list-style-type: none"> <li>• Are the signal wires connected properly?</li> <li>• Are there any disconnections?</li> <li>• Are you using only CC-Link-authorized products?</li> <li>• Is there any noise?</li> <li>• Is the Counter module connected?</li> </ul>

\* You can determine if it is a power supply error/Unit malfunction or communications error/switch settings error by checking the indicators on the Main module when a Counter module is connected to the Main module. The SS indicator is either green, red, or OFF based on the connection status of the Counter module, regardless of any communications problems. For details on this indicator and how it relates to the Counter module connection status, refer to the section on the SS indicator in 5-3-1 *Status Indicators*.

## 7-1-2 Troubleshooting Errors Specific to the MG50-CL

### Troubleshooting Parameter Setting Mistakes

Parameter	Method for checking on the master station	Solution													
CC-Link mode setting	<ul style="list-style-type: none"> <li>Error station detection in the CC-Link diagnostics</li> <li>CC-Link error code: B823 (Remote Control Mode Error)</li> <li>Determining the station where the error occurred: SW0144 to SW0147 (CC-Link Version Mounting/Parameter Matching Status)</li> </ul>	Set the CC-Link mode based on the operating mode of the Main module as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Reduced I/O Mode</th> <th style="width: 50%;">Monitor Mode</th> </tr> </thead> <tbody> <tr> <td>Select one of the following: (1) Remote network version 1 mode (2) Remote network version 2 mode (3) Remote network addition mode</td> <td>Select one of the following: (1) Remote network version 2 mode (2) Remote network addition mode</td> </tr> </tbody> </table>		Reduced I/O Mode	Monitor Mode	Select one of the following: (1) Remote network version 1 mode (2) Remote network version 2 mode (3) Remote network addition mode	Select one of the following: (1) Remote network version 2 mode (2) Remote network addition mode								
Reduced I/O Mode	Monitor Mode														
Select one of the following: (1) Remote network version 1 mode (2) Remote network version 2 mode (3) Remote network addition mode	Select one of the following: (1) Remote network version 2 mode (2) Remote network addition mode														
Station type Allocated station number Expanded cyclic setting	<ul style="list-style-type: none"> <li>Error station detection in the CC-Link diagnostics</li> <li>CC-Link error code: B30A</li> <li>Determining the station where the error occurred: SW009C to SW009F (Mounting/Parameter Matching Status)</li> </ul>	Set the CC-Link mode based on the operating mode of the Main module as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Operating mode</th> <th style="width: 33%;">Reduced I/O Mode</th> <th style="width: 33%;">Monitor Mode</th> </tr> </thead> <tbody> <tr> <td>Station type</td> <td>Remote device station or version 1 remote device station</td> <td>Version 2 remote device station</td> </tr> <tr> <td>Allocated station number</td> <td>2</td> <td>3</td> </tr> <tr> <td>Expanded cyclic setting</td> <td>---</td> <td>Quadruple</td> </tr> </tbody> </table>		Operating mode	Reduced I/O Mode	Monitor Mode	Station type	Remote device station or version 1 remote device station	Version 2 remote device station	Allocated station number	2	3	Expanded cyclic setting	---	Quadruple
Operating mode	Reduced I/O Mode	Monitor Mode													
Station type	Remote device station or version 1 remote device station	Version 2 remote device station													
Allocated station number	2	3													
Expanded cyclic setting	---	Quadruple													

Refer to the manual for your CC-Link master for details on parameter setting errors other than those listed above.

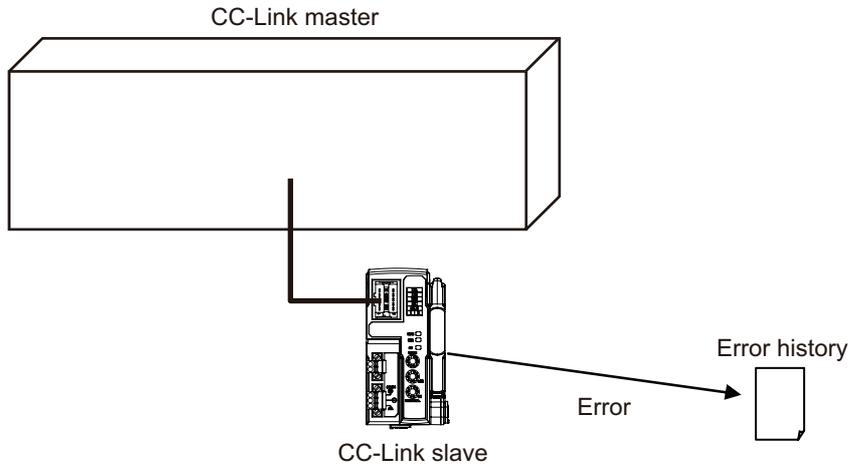
### Troubleshooting CC-Link Switch Setting Mistakes

Switch	Cause	Checking method		Solution
		Communications Unit	Master station	
Setting the station number	Station number setting is out of range.	ERR indicator lit.	CC-Link diagnostics <ul style="list-style-type: none"> <li>CC-Link error code: B308</li> <li>Determining the location of the error: SW0080 to SW0083</li> </ul>	Change the station number setting to be within the setting range.
	Duplicate station number	---	CC-Link diagnostics <ul style="list-style-type: none"> <li>CC-Link error code: B309</li> <li>Determining the location of the error: SW0098 to SW009B</li> </ul>	Change the station number to a unique one.
	Station number changed during communications.	ERR indicator flashing.	CC-Link diagnostics <ul style="list-style-type: none"> <li>Determining the location of the change: SW008C to SW008F</li> </ul>	Return to the previous setting.
Baud rate/operating mode setting	The set baud rate does not match the baud rate of the master station.	ERR indicator lit.	CC-Link diagnostics <ul style="list-style-type: none"> <li>CC-Link error code: B308</li> <li>Determining the location of the error: SW0080 to SW0083</li> </ul>	Match the baud rate setting of the master station.
	Station number changed during communications.	ERR indicator flashing.	CC-Link diagnostics <ul style="list-style-type: none"> <li>Determining the location of the change: SW008C to SW008F</li> </ul>	Return to the previous setting.
	Operating mode setting	---	CC-Link diagnostics <ul style="list-style-type: none"> <li>Check the CC-Link version: SW0144 to SW0147</li> </ul>	Match with the operating mode you want to use.

Refer to the manual for your CC-Link master for the CC-Link diagnostics and CC-Link special registers (SW) used to troubleshoot problems on the master.

### 7-1-3 Error Notification Methods

This section describes the notification methods for errors that occur on the MG50-CL.



External cause	Location of problem		Detection method	Notification method	Solution
Noise	Communications	CC-Link	CRC error	<ul style="list-style-type: none"> <li>ERR indicator lit.</li> <li>Error station detection in the CC-Link diagnostics on the master station</li> </ul>	Stop and restart CC-Link communications.
		Serial connection with Counter module	PV Error (Checksum Error)	SS indicator lit red. RX(n+2)3 turns ON.	Cycle the power supply.
	Serial connection with Distribution module				
	Power supply		---	SS indicator not lit.	Cycle the power supply.
Dis-connection	Communications	CC-Link	MFP3N communications error detection	<ul style="list-style-type: none"> <li>ERR indicator lit.</li> <li>Error station detection in the CC-Link diagnostics on the master station</li> </ul>	Check the cable connections at the location where the error occurred.
		Serial connection with Counter module	PV Error (Checksum Error)	SS indicator lit red. RX(n+2)3 turns ON.	Check the connections for communications interfaces and communications cables.
	Serial connection with Distribution module				
	Power supply		---	SS indicator not lit.	Check the power supply cable.

 **Reference**

Refer to the CC-Link master station for error codes that can be checked on the CC-Link master unit.

## 7-1-4 Emergency Error Codes

The following tables gives the meanings of the emergency error codes used by the MG50-CL Main module.

### MG50-CL Error Codes

Error code	Error name in error history	Error details	Notification to CC-Link master	Solution
01	Communications Error	Checksum error, timeout error, etc.	The error code is stored in the Error Information Storage Area remote register (RWrm+5) and the Error Status Flag remote input relay (RX(n+3)A in Reduced I/O Mode and RX(n+13)A in Monitor Mode) turns ON.	<ul style="list-style-type: none"> <li>• Retry.</li> <li>• Check communications with the measuring unit.</li> </ul>
02	Set Value Error	The command data value is invalid. (For example, it is out of range.) <ul style="list-style-type: none"> <li>• Tolerance Judgement failed.</li> <li>• Hysteresis width setting value is out of range.</li> </ul>		Set the correct data.
04	Status Error	The Counter module is currently not in a state that can accept the command. <ul style="list-style-type: none"> <li>• Command was received in Setting Mode.</li> <li>• A command for the second point for 2 point area setting was received, but not for the first point.</li> </ul>		Send the commands at the correct time.
08	Command Error	An unsupported command was sent to the Counter module. <ul style="list-style-type: none"> <li>• A command that could not be executed was sent.</li> <li>• A channel that does not exist was specified.</li> <li>• Multiple measuring units were specified in a read command.</li> </ul>		Set the correct command.
10	TRG Error	TRG was turned OFF before processing was finished.		Keep TRG ON until processing is finished.

## 7-2 Device Maintenance

This section describes cleaning methods, inspection methods, and the MG50-CL replacement procedure for regular device maintenance.

### 7-2-1 Cleaning Methods

Clean the Main module regularly to keep it in optimum operating condition.

- For daily cleaning, use a soft, dry cloth.
- If dry wiping does not remove all of the dirt, use a diluted mild detergent (2%) and wring out the cloth thoroughly before wiping.
- Leaving rubber items, plastic items, or tape on the Unit for an extended period of time may leave stains. Remove any such items from the Unit when cleaning.



#### Precautions for Correct Use

Never use benzine, paint thinner, or any other volatile cleaning solutions or chemical wash cloths for cleaning. These products can damage the coating on the Unit.

### 7-2-2 Inspection Methods

Perform regular inspections to keep the Main modules in optimal working condition.

Inspections are best performed once every 6 months to 1 year.

However, in extremely humid environments, high-temperature environments, dusty environments, or other extreme environments, more frequent inspections are recommended.

#### Inspection Items

Check that the following items are within the criteria.

If they do not meet the criteria, improve the surrounding environment so that the affected items are within the acceptable standard range or adjust the Main module as required.

Inspection Items	Inspection details	Criteria	Inspection method
Environmental status	Are the ambient and internal panel temperatures normal?	0 to 55°C	Thermometer
	Are the ambient and internal panel humidity normal?	25% to 85% (with no condensation or icing)	Hygrometer
	Is there any build-up of dust?	There must be no dust.	Visual inspection
Installation status	Is the MG50-CL securely mounted into place?	The Main module must not be loose.	Phillips screwdriver
	Are the communications cable connectors completely inserted?	The communications cable connectors must not be loose.	Visual inspection
	Are there any loose screws on external wiring?	The screws on external wiring must not be loose.	Phillips screwdriver
	Are any connection cables loose or about to be disconnected?	There must be no visual anomalies.	Visual inspection

### 7-2-3 Handling Main Modules for Replacement

Every Unit (the CC-Link master and MG50-CL Units) is part of the network.

If a Unit malfunctions, this can affect the entire network and therefore must be repaired as soon as possible.

We recommend keeping replacement Units available in order to minimize the time needed to restore network functionality if required.

#### Precautions when Replacing Units

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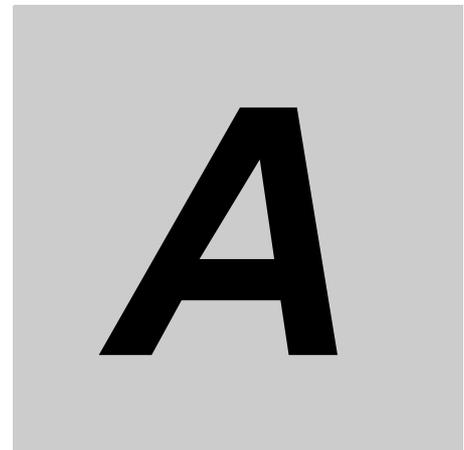
Be aware of the following points when replacing a malfunctioning Main module.

- After replacement, check to confirm that there are no problems with the new Unit.
- If you are returning a defective Unit for repair, be sure to write down any details of the problem and send the information along with the defective Unit to your nearest Magnescale representative.
- For poor contacts, wipe down the contacts with a clean 100% cotton cloth soaked in industrial alcohol.

#### Settings after Replacing Units

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After replacing a Unit, be sure to set all switches and other settings to be the same those in the previous Unit.



# Appendices

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# A-1 Using Commands for Communications

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The Main module can use read and write registers to perform communications with commands to perform more detailed data exchange. Using commands for communications allows you to read and write the status of a Counter module or change its settings.

## **1** Reading the Counter Module Data

- (1) Store the parameters for the data you want to read into the Data Category/Command Number Word and Data Number Word, and then turn ON the Command Request Bit.
- (2) After communicating with the Counter module, the Command Completed Bit turns ON and the results of the communications are stored in Command Response Word. Read data is stored in the Read Data Words.
- (3) When the Command Request Bit is turned OFF, the Command Completed Bit also turns OFF.

## **2** Writing Data to the Counter Module

- (1) Store the parameters for the data you want to write into the Data Category/Command Number Word, Data Number Word, and Write Data Words, and then turn ON the Command Request Bit.
- (2) After communicating with the Counter module, the Command Completed Bit turns ON and the results of the communications are stored in the Command Response Word. The Read Data Words will be reset to 0.
- (3) When the Command Request Bit is turned OFF, the Command Completed Bit also turns OFF.

## ● Commands

The following table lists the commands.

### List of Read Commands

Command type RWwn+2	Name	Read values RWrm+2: Received Data 1 Area RWrm+3: Received Data 2 Area	MF10-CM
0	Read Status	0: Normal (waiting for command) 1 = Busy 2 = Error	-
2	Read Number of Mounted Measuring Units	Number of connected nodes	
3	Read Error History	Received Data 1: Type of error Received Data 2: Number of stored history items	-
5	Read Dummy Setting	0: Not set as dummy. 1 = Set as dummy.	-
6	Read Dummy Response Setting	0: Abort response 1: Normal response	-
8	Counter Module Warning Status	The bits for the Counter modules where an error occurred will be 1.	-
B	Check Main Module Software Version	The value is read as a binary number.	-
20	Read Detection Value	-19999999 to 99999999	○
28	Read Measuring Unit Status (setting status, mutual interference status, etc.)	The bits listed below will turn ON when the conditions for an alarm are met. Bit 00: Normal operation (This bit is normally set to 1, and changes to 0 if any bit 08 or higher changes to 1.) Bit 01: DPC Status (This bit is set to 1 when DPC is ON.) Bit 02: Tolerance Setting Status (This bit is set to 1 when ST is ON.) Bits 03 to 07: Not used.  Bit 09: EEPROM Error (response or checksum) Bit 0A: Load Short Error	○
29	Measuring Unit Model	0460	○
40	Threshold Setting 1	-19999999 to 99999999 * This is the threshold value in Normal Detection Mode or the low threshold value in Area Detection Mode.	○
41	Threshold Setting 2	-19999999 to 99999999 * This is the high threshold value in Area Detection Mode.	○
42	Output Mode Setting	Received Data 1 Output 1 0: Normal Detection Mode 1: Area Detection Mode Received Data 2 Output 2 0: Normal Detection Mode 2: Error Output Mode	○
44	Operating Mode	0: - 1: -	○
45	Detection	0: SHS 1: HS 2: STND 3: GIGA	○

Command type RWwn+2	Name	Read values RWrm+2: Received Data 1 Area RWrm+3: Received Data 2 Area	MF10-CM
4A	Display Digits	0: Four decimal digits displayed. 1: Three decimal digits displayed. 2: Two decimal digits displayed. 3: One decimal digit displayed.	<input type="radio"/>
53	Eco Mode	0: Eco Mode OFF 1: Eco Mode ON 2: Eco Mode LO	<input type="radio"/>
54	Key Lock Setting	0: Lock OFF 1: Lock ON	<input type="radio"/>
60	Hysteresis Width Setting	0: Standard 1: User setting	<input type="radio"/>
62	Hysteresis Width	0 to 99999999 * This value is used as the hysteresis width for output 1 in Normal Detection Mode and the hysteresis width for Area Detection Mode.	<input type="radio"/>
6E	Reference Point Use Setting	0: Origin point use setting ON 1: Origin point use setting OFF	<input type="radio"/>
6F	Preset Value	-19999999 to 99999999	<input type="radio"/>
71	Tolerance Setting High	-19999999 to 99999999	<input type="radio"/>
72	Tolerance Setting Low	-19999999 to 99999999	<input type="radio"/>
91	Direction Selection	0: Normal 1: Reversed	<input type="radio"/>
92	Output Selection	0: Normal 1: Hybrid	<input type="radio"/>
95	Preset	0: Cleared 1: Executed	<input type="radio"/>

## List of Write Commands

Command type RWwn+2	Name	Write values RWwm + 4: Command data 1 RWwm + 5: Command data 2	MF10-CM
13	Clear Error History	1: Execute	-
15	Dummy Setting	0: Clear Dummy setting n: Set Dummy (For n, enter the number of the Unit you want to set as a Dummy.)	-
16	Dummy Response Setting	0: Abort response 1: Normal response	-
A0	Threshold Setting 1	-1999999 to 9999999 * This is the threshold value in Normal Detection Mode or the low threshold value in Area Detection Mode.	○
A1	Threshold Setting 2	-1999999 to 9999999 * This is the high threshold value in Area Detection Mode.	○
A2	Output Mode Setting	Received Data 1 Output 1 0: Normal Detection Mode 1: Area Detection Mode * If a measurement error occurs in Hold Mode, the previous value is retained. Received Data 2 Output 2 0: Normal Detection Mode 2: Error Output Mode	○
A4	Operating Mode	0: NO 1: NC	○
A5	Detection	0: SHS 1: HS 2: STND 3: GIGA	○
AA	Display Digits	0: Four decimal digits displayed. 1: Three decimal digits displayed. 2: Two decimal digits displayed. 3: One decimal digit displayed.	○
B3	Eco Mode	0: Eco Mode OFF 1: Eco Mode ON 2: Eco Mode LO	○
B4	Key Lock Setting	0: Lock OFF 1: Lock ON	○
B5	Flash Display Setting	0: Clear the setting 1: Execute	○
C0	Hysteresis Width Setting	0: Standard 1: User setting	○
C2	Hysteresis Width	0 to 99999999 * This value is used as the hysteresis width for output 1 in Normal Detection Mode and the hysteresis width for Area Detection Mode.	○
C9	Two-point Setting First Point	0: Clear the setting 1: Execute	○
CA	Two-point Setting Second Point	1: Execute * The Two-point Setting First Point command must be executed before this command is sent.	○
CC	Full Auto Tolerance Judgement Setup	0: Clear the setting 1: Execute	○
CE	Reference Point Use Setting	0: Origin point use setting ON 1: Origin point use setting OFF	○

Command type RWwn+2	Name	Write values RWwm + 4: Command data 1 RWwm + 5: Command data 2	MF10-CM
CF	Preset Value	-19999999 to 99999999	<input type="radio"/>
D1	Tolerance Setting High	-19999999 to 99999999	<input type="radio"/>
D2	Tolerance Setting Low	-19999999 to 99999999	<input type="radio"/>
D4	± Tolerance Judgement	1: Execute * The Full Auto Tolerance Judgement Setup command must be executed before this command is sent.	<input type="radio"/>
D8	Initialize	1: Execute	<input type="radio"/>
F1	Direction Selection	0: Normal 1: Reversed	<input type="radio"/>
F2	Output Selection	0: Normal 1: Hybrid	<input type="radio"/>
F5	Preset	0: Cleared 1: Executed	<input type="radio"/>

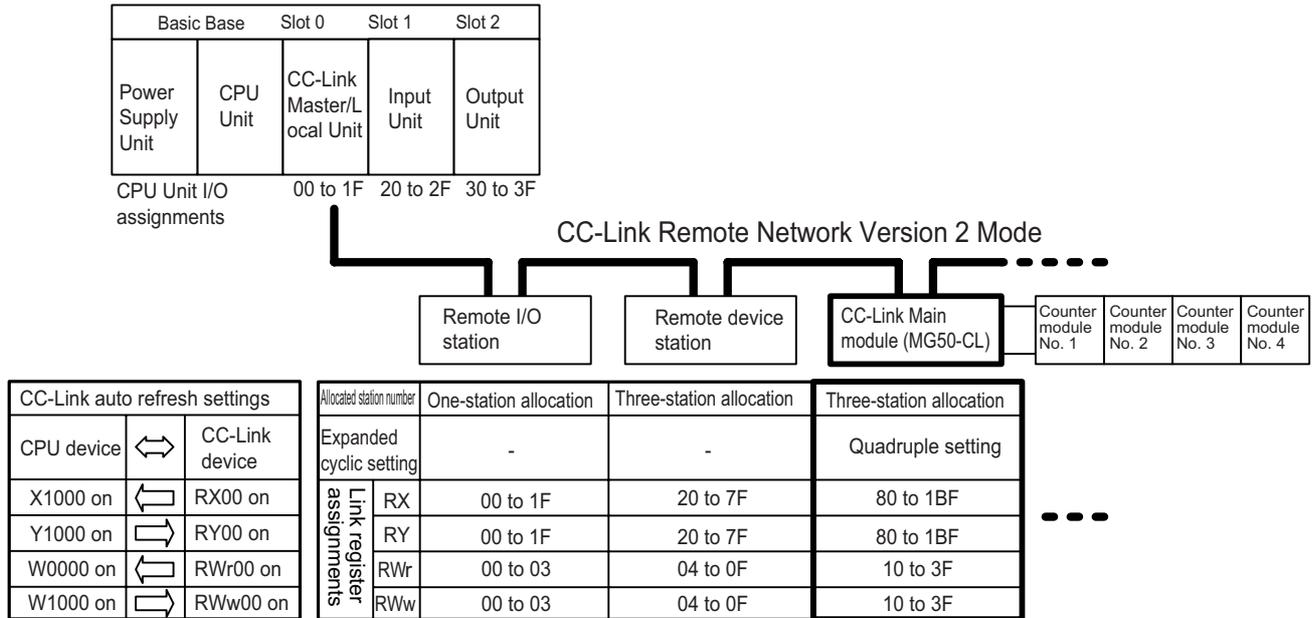


**Precautions for Correct Use**

The Counter module bank cannot be changed when using the MG50-CL. Leave the Counter module in bank 1 (default).

# A-2 Sequence Programming Examples

This section provides example programs for when a Mitsubishi Electronics MELSEC-Q-series or MELSEC-L-series general-purpose sequencer is used as the master station. These programming examples assume the following system configuration. Perform thorough testing in your own environment before use.



The sequencer devices used in the programming example are as follows:

■ **Input Switches**

- X0020: Requests sending a command to a Counter module.
- X0021: Sets the read status for the threshold value or detection value.
- X0022: Error reset switch
- X0023: Warning reset switch

■ **Output Indicators**

- Y0030: Send command normal completion indicator
- Y0031: Send command error completion indicator

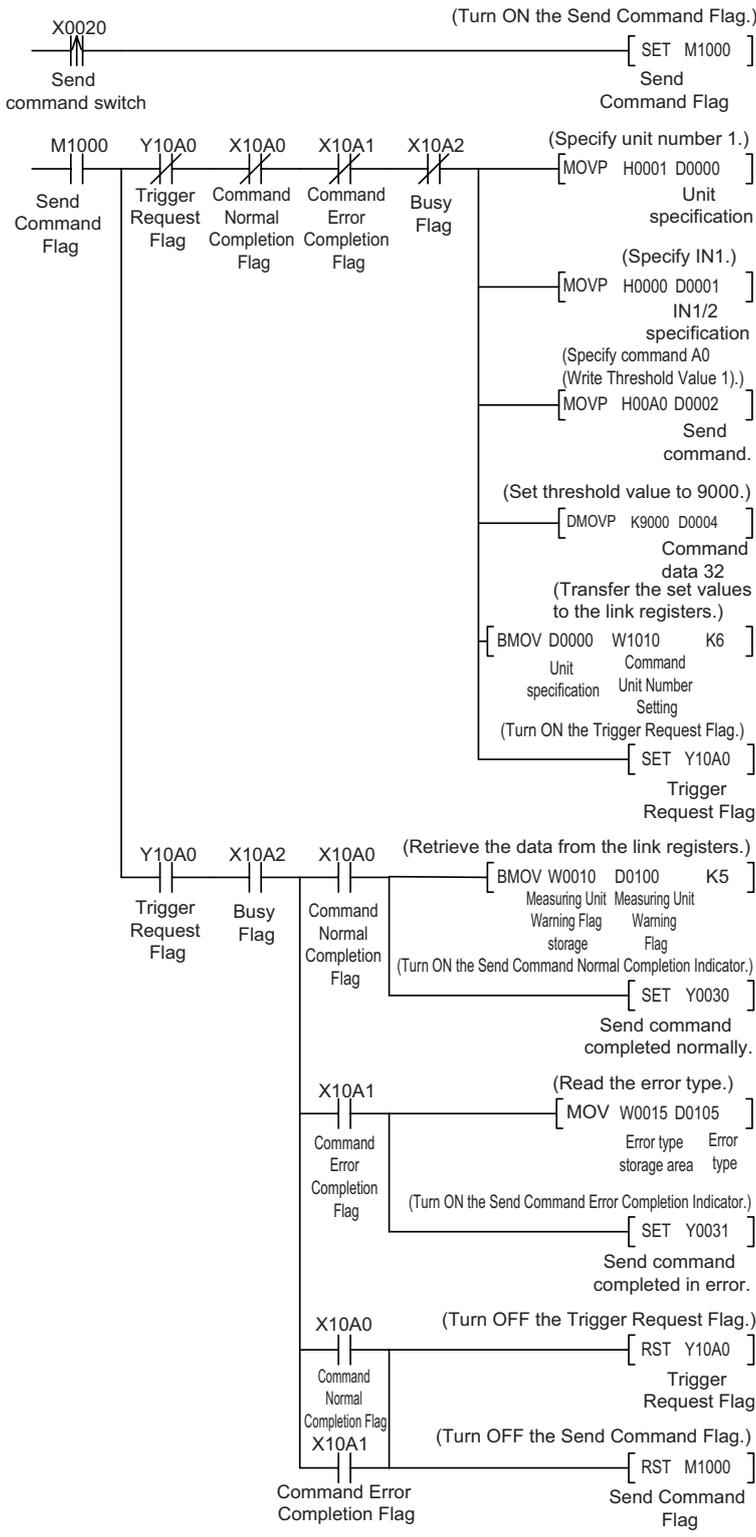
■ **Data Setting Devices**

- D0000: CPU internal device that specifies the unit number
- D0001: CPU internal device that sets IN1/IN2.
- D0002: CPU internal device that sets the command.
- D0004: CPU internal device that sets command data 1.
- D0005: CPU internal device that sets command data 2.
- D0006: CPU internal device that sets the threshold value or detection value read data.
- D0007: CPU internal device that sets the threshold value or detection value IN1/IN2.
- D0008: CPU internal device that sets the detection value, peak value, or bottom value.

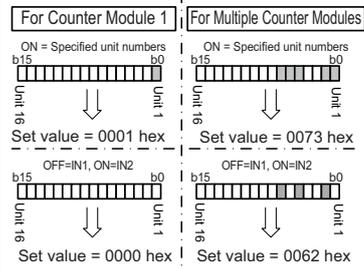
■ **Data Storage Devices**

- D0100: Measuring Unit Warning Flag
- D0102: Received Data 1
- D0103: Received Data 2
- D0104: Number of Mounted Measuring Units
- D0105: Error Type

● Sending Commands to the Counter Module



The Send Command Flag (internal processing flag) is turned ON.



A0 (Write Threshold Value 1) is set as the command to send.

The threshold value is set to 9000.

\* Setting Range  
-1999999 to 9999999

The 6 words of data set in D0000 to D0005 are transferred to W1010 to W1015 (RWw0 to RWw5).

The Trigger Request Flag for the Main module is turned ON.

The read data is obtained after the command is completed normally.

The Send Command Normal Completion Indicator is turned ON.

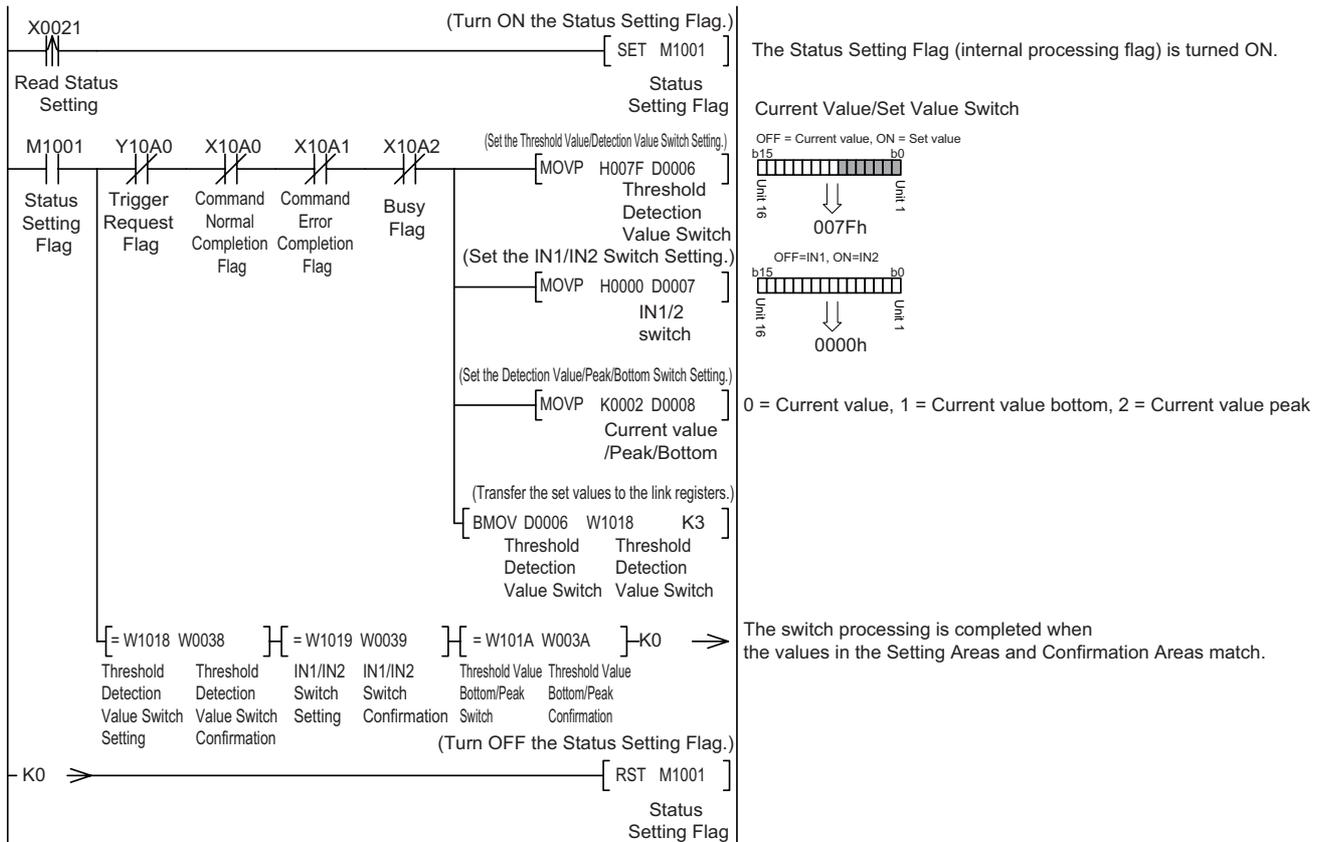
If the command is completed in an error, the error type is obtained.

The Send Command Error Completion Indicator is turned ON.

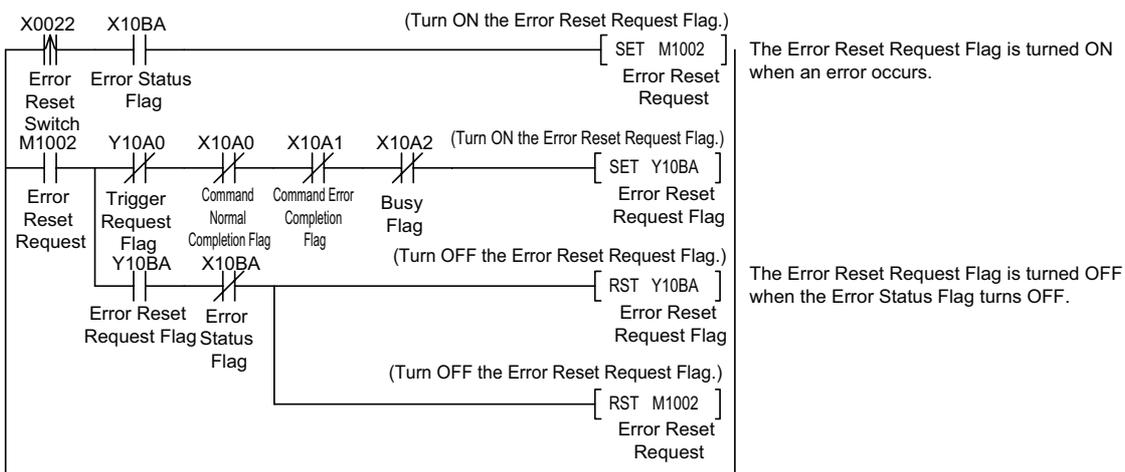
The Trigger Request Flag for the Main module is turned OFF.

The Send Command Flag (internal processing flag) is turned OFF.

### ● Switching the Threshold Value or Detection Value Read Status

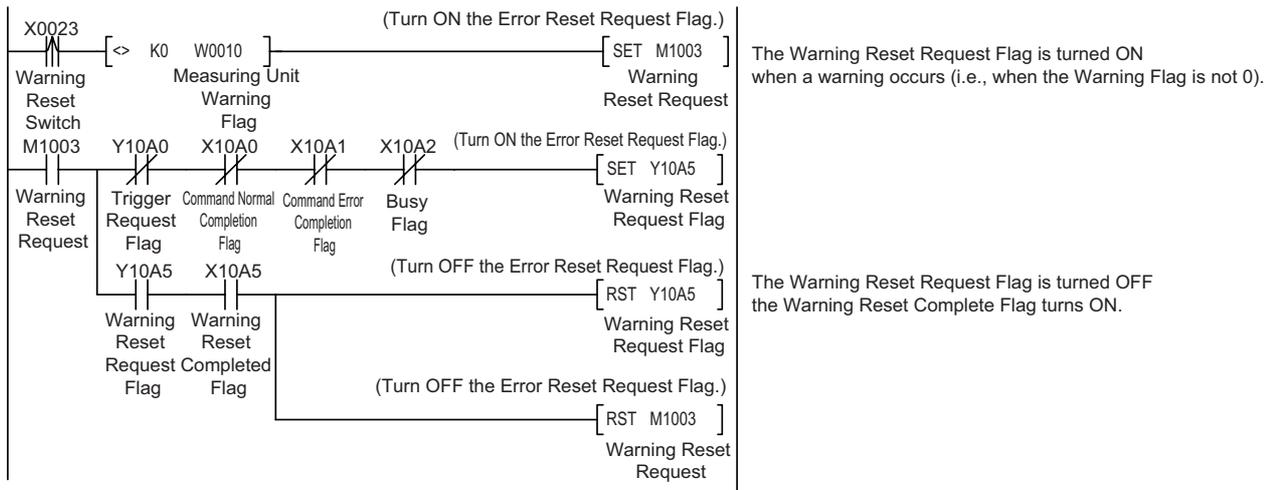


### ● Resetting Errors



\*In Monitor Mode, replace the Error Status Flag and Error Reset Request Flag as follows:  
 Error Status Flag: Change X10BA to X11BA. Error Reset Request Flag: Change Y10BA to Y11BA.

● Resetting Warning Flags



# A-3 Command Response Time (Reference Values)

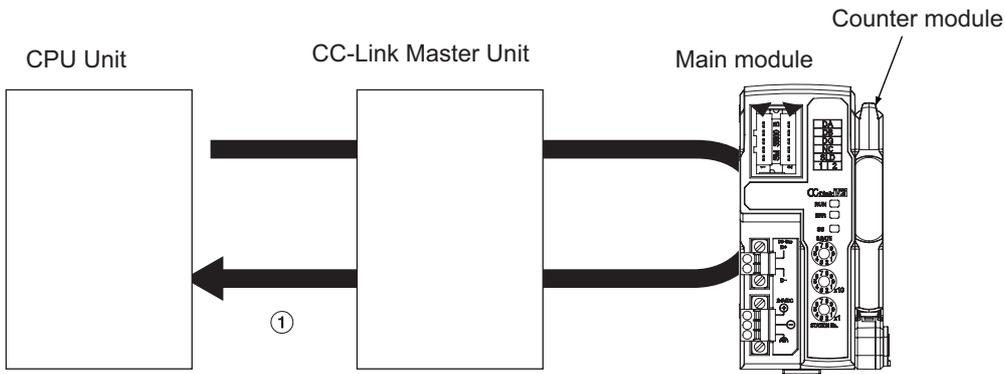
The time required from when a command is sent to obtain the detection value of input 1 of Counter module 1 connected to a MG50-CL Main module until a response is received is approximately 12 ms in Reduced I/O Mode, and approximately 18 ms in Monitor Mode.

\* The command response time is a reference value only. Perform thorough testing in your own environment before use. In Monitor Mode, you can read the detection values in approx. 6 ms each if you use read/write registers.

Command response time = (1)

Test Conditions

- Baud rate: 10 Mbps
- CPU Unit cycle time: 1 ms
- Number of CC-Link Slave Units: 1
- CC-Link version: Version 1 for Reduced I/O Mode  
Version 2 for Monitor Mode



## ● Communications Configuration

Item	Model number	Manufacturer
CPU Unit	Q02UCPU	Mitsubishi Electric Corporation
CC-Link Master Unit	QJ61BT11N	Mitsubishi Electric Corporation
Main module	MG50-CL	Magnescale Co. Ltd.
Counter module	MF10-CM	Magnescale Co. Ltd.

## ● Executed Command: Read Detection Value

Command number	20
Unit No.	01

# A-4 Using the Distribution Module

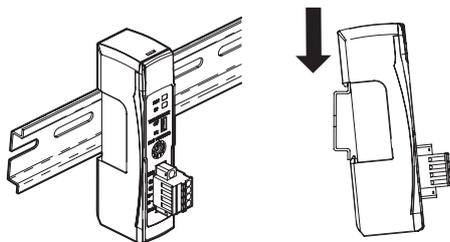
## A-4-1 Mounting and Removing Distribution Modules

This section describes how to mount a MG51 Distribution module and Counter modules to a DIN rail and how to remove them.

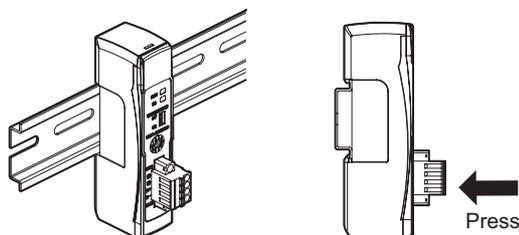
### Mounting Procedure

Use the following procedure to install the modules.

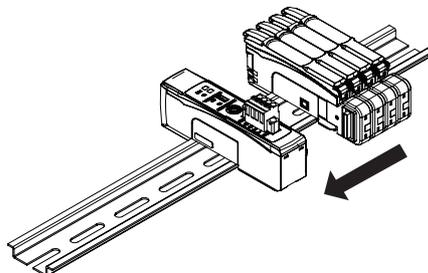
- 1** Place the top part of the module onto the DIN rail.



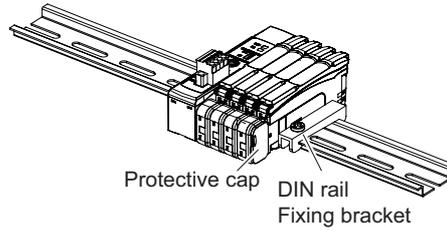
- 2** Press the bottom part of the module onto the DIN rail.



- 3** Remove the protective cap from the right side of the Distribution module. Then, slide the Counter module, align the hooks on the connector with the Distribution module, and press the modules together until you hear them lock into place.



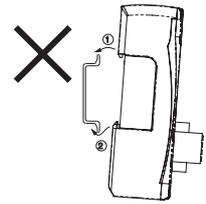
- Secure the enclosed DIN rail Fixing brackets onto the ends so that there is no space between them and the modules. Finally, attach the protective cap you removed in step 3 to the Counter module on the far right end.



Do not reverse the order of steps 1 and 2, above. Doing so may reduce the mounting strength on the DIN rail.



Do in order: step 1 and then step 2.



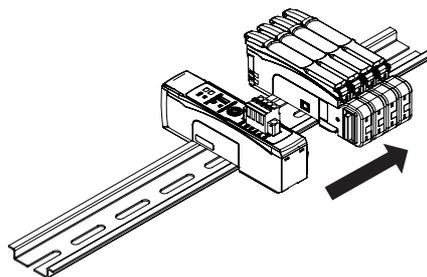
Do not perform step 2 first.

After you have completed the above procedure, check to make sure that the MG51 is mounted securely into place.

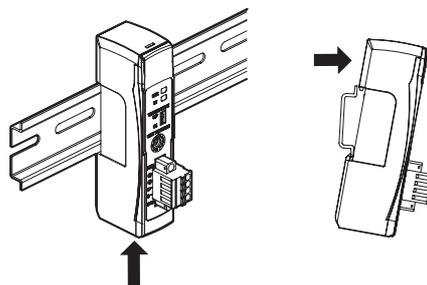
## Removal Procedure

Use the following procedure to remove the module.

- Slide the Counter modules to separate them from the Distribution module.



- Press in on the Distribution module toward the DIN rail and lift up to remove it.



## A-4-2 Installing a DS-Bus Network

This section describes how to install a DS-Bus network.

### Precautions for Installing a DS-Bus Network

This section provides basic precautions for installing a DS-Bus network.

#### ● Precautions for Installing a Network

- When installing a DS-Bus network, observe proper safety measures and follow all applicable standards.  
We recommend that you request installation from a specialist who is qualified in safety measures and standards.
- Do not place any DS-Bus network devices near any devices that generate noise.  
If no other suitable location is available, place the device or devices in a metal case or take other measures to reduce ambient noise.

#### ● Precautions for Installing Communications Cables

- Check the following conditions for the communications cables in the network.
  - Are there any disconnections?
  - Are there any short circuits?
  - Are there any problems with connector connections?
- When connecting to the communications connector on each device, be sure to insert the wires until they lock into place in the communications cable connector.
- Separate communications cables from high-voltage power lines and install them in ducts.
- Do not wire communications cables near devices that generate noise.
- Do not wire communications cables in high-temperature, high-humidity environments.
- Use in locations free of dirt, oil mist, and other foreign matter.
- There is a limit to the bending radius of communications cables. Refer to the specifications for your communications cables for information on allowable bending radii.
- You can connect up to eight Distribution modules to one Main module.
- Keep the total length of DS-Bus communications cables ( $L1 + L2 + \dots + Ln$ ) to within 30 m.
- Turn ON the DS-Bus termination setting switch for the last Distribution module on the DS-Bus network. Turn this switch OFF for all other Distribution modules.

### Preparing to Install the Network

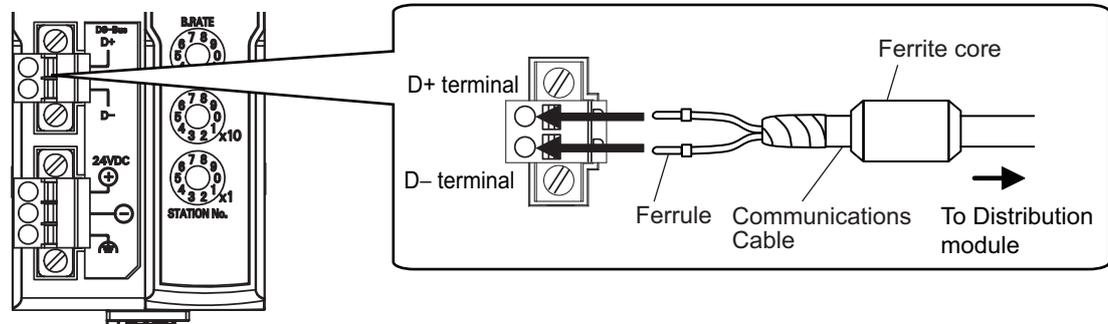
Prepare the following equipment.

Item	Remarks
DS-Bus communications cable	Please contact our company.
Main module DS-Bus communication connector	Enclosed with the MG50 Series Main module.
Distribution module DS-Bus communication connector	Enclosed with the MG51 Distribution module.
Ferrite cores	Two are required. Enclosed with the MG51 Distribution module.

## Connecting the Communications Cables and Connectors

### ● MG50 series Main Module

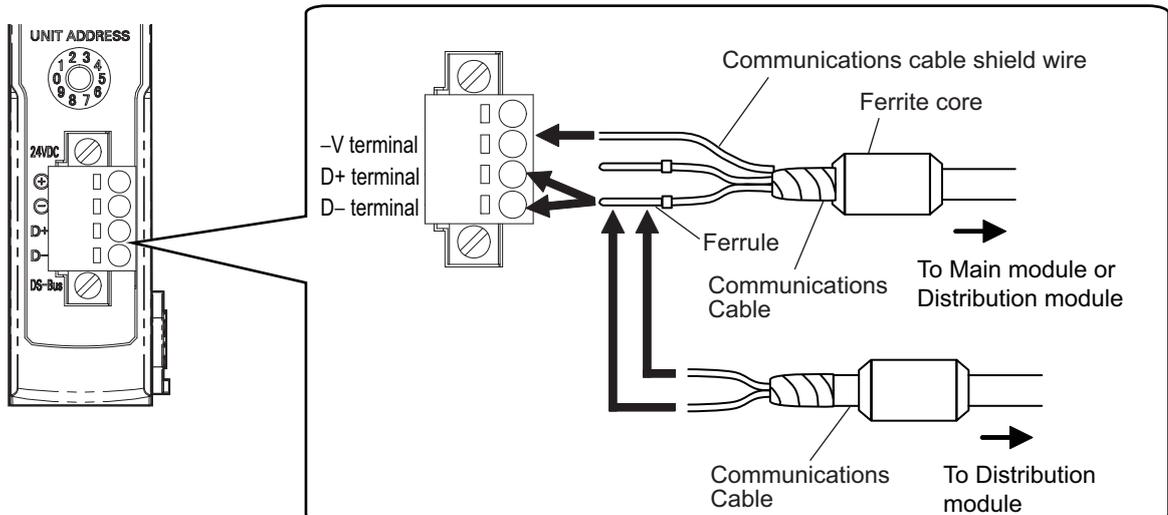
Connect the communications cable to the DS-Bus communications connector on the Main module. Clamp a ferrite core (enclosed with the Distribution module) on the communications cable.



### ● MG51 Distribution Module

Connect the D+ and D- signal lines and shield wire of the communications cable to the power supply/communications connector on the Main module. Clamp a ferrite core (enclosed with the Distribution module) on the communications cable.

Connect the shield wire on the communications cable between Distribution modules to the -V terminal on only one of the Distribution modules. Do not connect the shield wire to both Units.



### A-4-3 Distribution Module Power Supply Specifications and Connections

#### Precautions on Supplying Unit Power

Consider the following points on the allowable current and voltage drop on cables and connectors and the placement of the power supply used to supply power to the Units.

- **Precaution on Cable Voltage Drop**

Make sure that the power supply voltage to the Distribution module farthest from the power supply is within the allowable fluctuation range.

- **Supplying Power to Units from Multiple Power Supplies**

Using multiple power supplies to supply power can allow you to reduce the line current, reduce voltage drop, and decrease cable size. It also helps to maintain system stability in the event of a power supply problems.

- **Power Supply Problems**

You must decide how to place your power supplies and how to group them depending on whether you want to stop the entire system when a power supply problem occurs or if you want to avoid stopping the entire system when possible.

If you want to avoid stopping the entire system, install power supplies in multiple locations and divide the Distribution modules into groups.

This will also help to reduce voltage drop and enable you to use smaller cables.

#### Unit Power Supply Specifications

Use a standard power supply that meets the following specifications.

Item	Specification
Output voltage	24 VDC $\pm$ 10%
Output ripple	600 mVp-p
Output current	Must be able to supply current that is higher than the total sum of the current consumed by all Slave Units.
Isolation	Between output and AC power supply and between output and frame ground

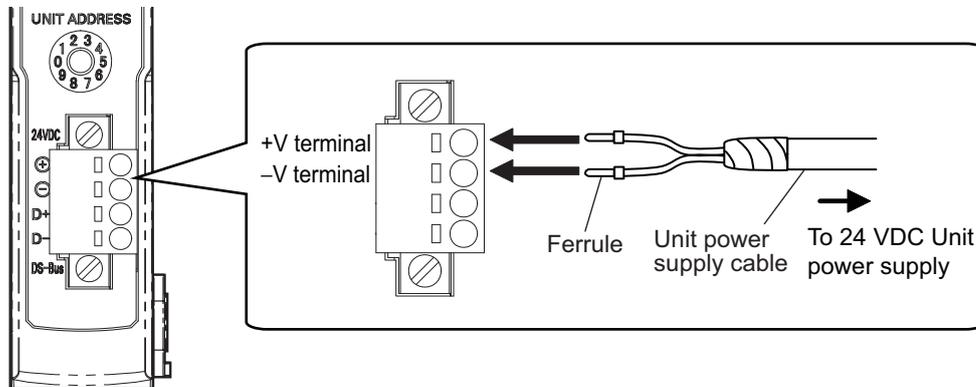


#### Precautions for Correct Use

- When calculating the output current for the Unit power supply, always include the current consumption of the MG51 and the current consumption of all Counter modules and measuring units in the Unit power supply consumption current.
- Make sure that the power supply has sufficient capacity to handle the inrush current when the system is started.

## Connecting the Unit Power Supply

Connect a cable from the Unit power supply (24 VDC) to the power supply connectors on each Distribution module.



Securely attach ferrules to the Unit power supply cable wires.

### ● Recommended Parts

We recommend using the following ferrules for the Unit power supply cable.

Model number	Applicable wire size	Crimp tool	Manufacturer
AI0,5-10WH	0.5mm <sup>2</sup> /AWG20	CRIMPFOX UD6 (product No. 1204436) or CRIMPFOX ZA3 Series	Phoenix Contact Co., Ltd.
H0.5/16 orange	0.5mm <sup>2</sup> /AWG20	Crimper PZ1.5 (product No. 900599)	Weidmueller Japan Co., Ltd.

### A-4-4 General Specifications of the Distribution Module

The following table gives the general specifications of the MG51 Distribution module.

Item	Specifications and Performances
Unit power supply voltage	24 VDC (20.4 to 26.4 V)
Maximum connectable measuring units	10
Power and current consumption	2 W max. (Not including the power supplied to measuring units.), 80 mA max. at 24 VDC (Not including the current supplied to measuring units.)
Noise immunity	Conforms to IEC 61000-4-4, 1 kV (power supply line).
Vibration resistance	10 to 60 Hz with a 0.7 mm double amplitude, 50 m/s <sup>2</sup> at 60 to 150 Hz, for 1.5 hours each in X, Y, and Z directions
Shock resistance	150 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions
Dielectric strength	500 VAC at 50/60 Hz for 1 min
Insulation resistance	20 MΩ min. (at 500 VDC)
Ambient operating temperature	0 to 55°C *1
Operating ambient humidity	25% to 85% (with no condensation or icing)
Operating ambient environment	No corrosive gases.
Storage temperature	-30 to 70°C (with no condensation or icing)
Storage humidity	25% to 85% (with no condensation or icing)
Installation procedure	35 mm DIN rail-mounting

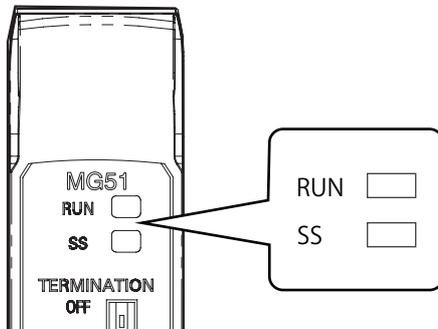
\*1 Temperature Limitations Based on Number of Connected Counter modules:

Groups of 1 or 2 Counter modules: 0 to 55°C, Groups of 3 to 10 Counter modules: 0 to 50°C

## A-4-5 Hardware Specifications of the Distribution Module

### Status Indicators

These indicators show the current status of the MG51.



#### ● RUN Indicator

This indicator shows the operating status.

Color	State	Description
Green	Not lit.	Power OFF, or one of the following errors has occurred: Rotary switch setting error, watchdog timer timeout error, hardware error, RAM check error
	Flashing	No access from the Main module (for 3 seconds or longer).
	Lit	Normal status, or measuring unit not connected error

#### ● SS Indicator

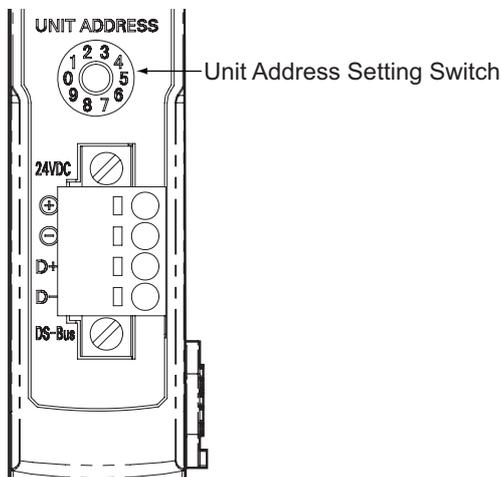
This indicator shows the measuring unit connection status and various error information.

Color	State	Description
	Not lit.	Initial checks are in progress or a hardware error or measuring unit disconnected error occurred after turning the power supply OFF and ON.
Green	Lit	The number of connected measuring units does not match the number of connected measuring units setting or there was a RAM check error.
Red	Lit	One of the following errors occurred: Number of connected measuring units verification error, too many measuring units connected error, RAM check error, or rotary switch setting error

## Unit Address Setting Switch

This switch sets the Unit address (as a decimal number) of the MG51 on the DS-Bus network. The setting range is 1 to 8. (Factory setting: 1)

If multiple Distribution modules are connected to the Main module, set the addresses of the Distribution modules in order starting from 1.

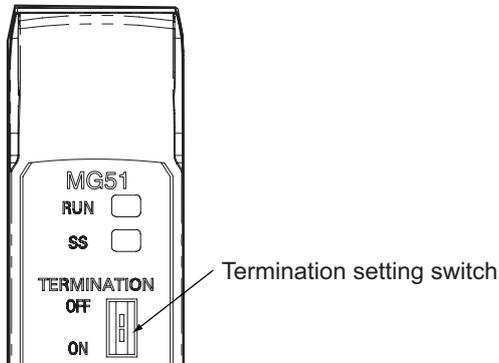


### Precautions for Correct Use

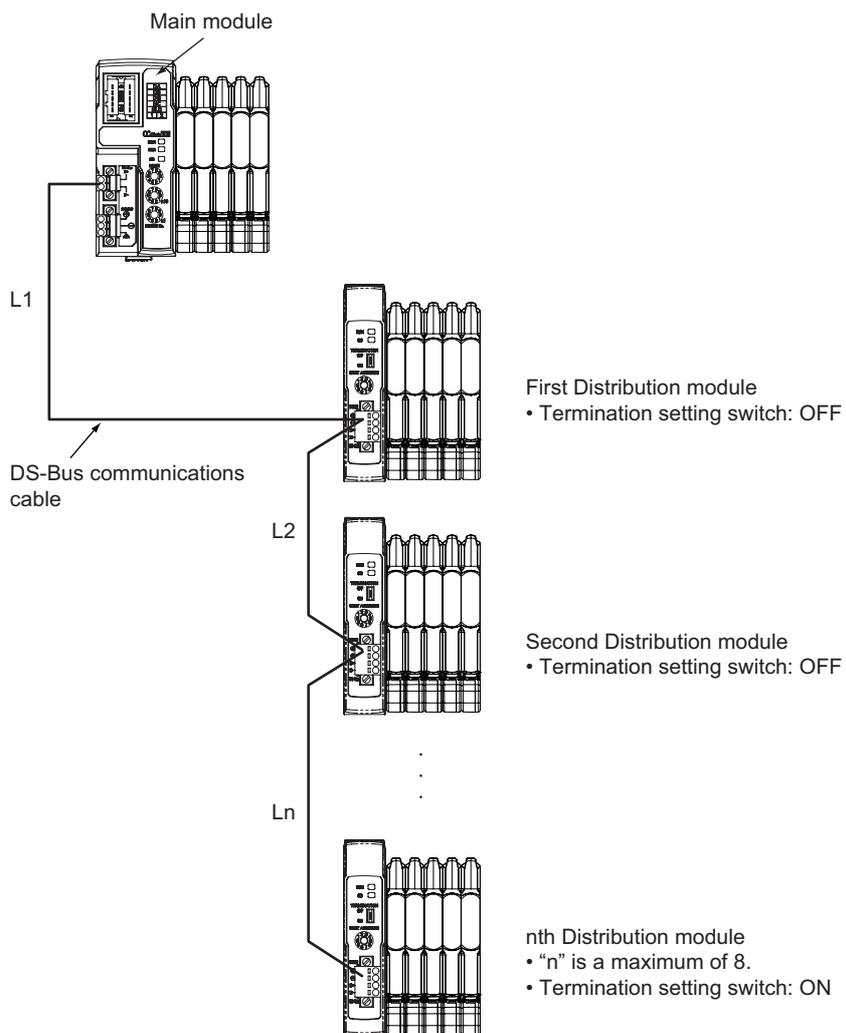
- The setting of the unit address switch is read only once when the power is turned ON. Changing this setting after the power is turned ON will have no effect until after the next time the power is turned ON.
- An error will occur and operation will not continue normally if the same Unit address is assigned to more than one Unit.

## DS-Bus Network Termination Setting Switch

This switch turns the communications terminating resistance ON or OFF on the DS-Bus network.

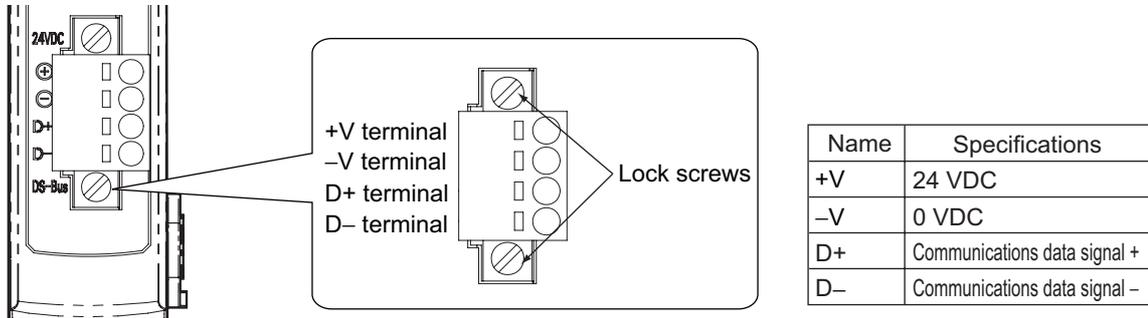


Turn ON the DS-Bus termination setting switch for the last Distribution module on the DS-Bus network. Turn this switch OFF for all other Distribution modules. This is shown in the following figure.



## Communications and Power Supply Connector

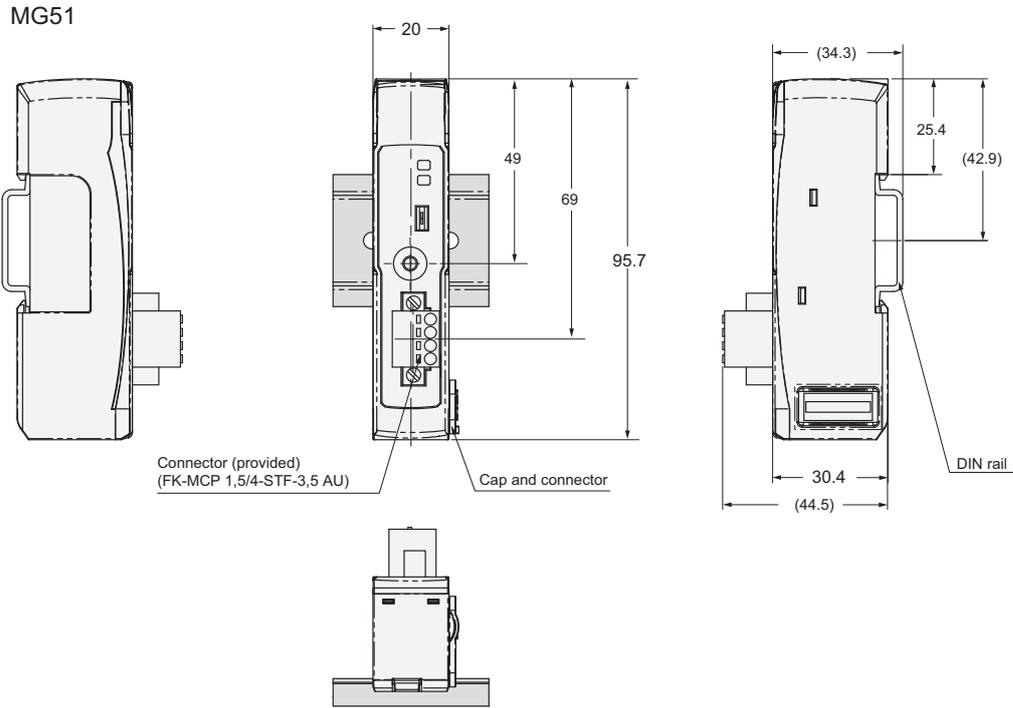
Connect the power supply cable from the Unit power supply and the DS-Bus communications cable to this connector.



- Connector type: Four-pin spring cage connector with lock screws
- Applicable ferrule diameter: 0.25 to 0.5 mm<sup>2</sup> (AWG24 to AWG20) (Using ferrules with insulating sleeves)

Refer to *Connecting the Unit Power Supply* on page A-17 for the recommended ferrules.

**A-4-6 External Dimensions of the Distribution Module**





# B-1 Glossary

This appendix contains a glossary of terms related to the CC-Link Interface unit Main module.

Term	Abbreviation	Description
CC-Link Partner Association	CLPA	The organization that opened the CC-Link technology and promotes its use.
remote I/O	-	A slave unit that handles DIO.
remote device	-	A slave unit that handles DIO and data.
intelligent device	-	A slave unit that handles DIO and data and supports transient transmissions.
master station	-	The unit that controls the CC-Link.
standby master station	-	The unit that takes over control of the CC-Link if a problem occurs with the master station.
local station	-	A unit that is connected to a PLC and communicates with master and slave stations.
Remote network version 1 mode	-	A network that consists of only slave stations compatible with CC-Link version 1 specifications.
Remote network version 2 mode	-	A network that consists of slave stations compatible with both CC-Link version 1 and version 2 specifications.
Remote Network Addition Mode	-	A network to which a slave station that is compatible with CC-Link version 2 specifications is added to an existing network consisting of slave stations compatible with CC-Link version 1 specifications.
Remote I/O Mode	-	A network that consists of only slave units that support remote I/O.
expanded cyclic	-	An expansion function added to CC-Link Version 2 Mode that separates data to more efficiently use limited network resources.
link relays (RX/Ry)	-	The name for signals that handle ON/OFF information for the CC-Link.
link registers (RWw/RWr)	-	The name for devices that handle data for the CC-Link.
special link relays (SB)	-	The name for signals that monitor and control the operation status of the CC-Link.
special link registers (SW)	-	The name for devices that monitor and set the operation status of the CC-Link.



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