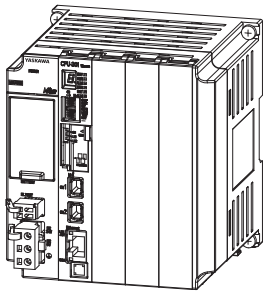
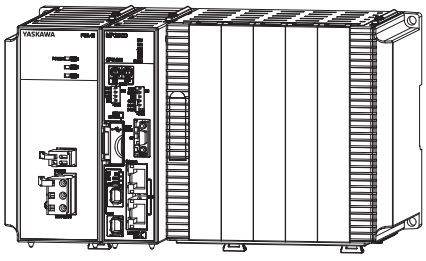
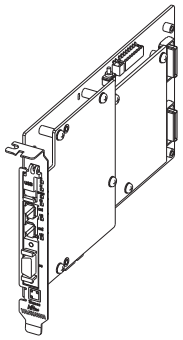
YASKAWA

Machine Controller MP3000 Series

Machine Controller System TROUBLESHOOTING MANUAL







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About this Manual

This manual describes the troubleshooting of the MP3100, MP3200, and MP3300.

For information on troubleshooting Optional Modules, refer to the manual for your Optional Modules.

Read this manual carefully to ensure the correct usage of the Machine Controller in the control of your manufacturing system.

Keep this manual in a safe place so that it can be referred to whenever necessary.

Outline of Manual

The contents of the chapters of this manual are described in the following table. Refer to the chapters of this manual as required for your application.

Chapter	Chapter Title	Contents
1	Overview of Troubleshooting	Describes the basic troubleshooting and error confirmation procedures.
2	Troubleshooting with Indicators and Displays	Describes troubleshooting procedures with the indicators and the display on the Machine Controller.
3	Troubleshooting Using the System Monitor	Describes the procedure for checking errors by using the System Monitor.
4	Troubleshooting Communications and Motion Control	Describes how to troubleshoot errors that can occur in communications or in motion control.
5	Troubleshooting Programming and Debugging	Describes how to troubleshoot errors that can occur when programming or debugging.
6	Troubleshooting Connections with the MPE720	Describes how to troubleshoot problems if the MP3200 or MP3300 cannot be connected with the MPE720.
7	Troubleshooting System Errors	Describes how to troubleshoot system errors.
8	MP3200/MP3300 Battery Replacement	Describes how to replace the Battery in the MP3200 or MP3300.
9	Fan Replacement	Describes how to replace the MP3200 Fan.
10	EDLC Life Estimation	Describes the life estimation of the EDLC in the CPU-203 and -203F Unit.

Related Manuals

The following table lists the related manuals.

Be aware of all product specifications and restrictions to product application before you attempt to use any product.

Category	Manual Name	Manual Number	Contents
Basic functionality	Machine Controller MP2000/MP3000 Series Machine Controller System Setup Manual	SIEP C880725 00	Describes the functions of the MP2000/MP3000-series Machine Controllers and the procedures that are required to use the Machine Controller, from installation and connections to settings, programming, trial operation, and debugging.
	Machine Controller MP3000 Series MP3100 Product Manual	SIEP C880725 24	Describes the specifications and system configuration of an MP3000-series MP3100 Machine Controller and the functions of the CPU.
	Machine Controller MP3000 Series MP3200 Product Manual	SIEP C880725 10	Describes the specifications and system configuration of an MP3000-series MP3200 Machine Controller and the functions of the CPU Unit.
	Machine Controller MP3000 Series MP3300 Product Manual	SIEP C880725 21	Describes the specifications and system configuration of an MP3000-series MP3300 Machine Controller and the functions of the CPU Module.
	Machine Controller MP2000 Series MPU-01 Multi-CPU Module User's Manual	SIEP C880781 05	Describes the functions, specifications, operating methods, maintenance, inspections, and troubleshooting of the MP2000-series MPU-01 Multi-CPU Module.
Communications functionality	Machine Controller MP3000 Series Communications User's Manual	SIEP C880725 12	Describes the specifications, system configuration, and communications connection methods for the Ethernet communications that are used with an MP3000-series Machine Controller.
	Machine Controller MP3000 Series EtherNet/IP Communications User's Manual	SIEP C880725 06	Describes the specifications, system configuration, and communications connection methods for the EtherNet/IP communications that are used with an MP3000-series Machine Controller.
Motion control functionality	Machine Controller MP3000 Series Motion Control User's Manual	SIEP C880725 11	Describes the specifications, system configuration, and operating methods for the SVC, SVC32, SVC64, SVR, and SVR32 Motion Function Modules that are used in an MP3000-series Machine Controller.
	Machine Controller MP2000 Series Pulse Output Motion Module PO-01 User's Manual	SIEP C880700 28	Describes the functions, specifications, and operating methods of the MP2000-series PO-01 Motion Module.
	Machine Controller MP2000 Series SVA-01 Motion Module User's Manual	SIEP C880700 32	Describes the functions, specifications, and operating methods of the MP2000-series SVA-01 Motion Module.
	Machine Controller MP2000 Series Built-in SVB/SVB-01 Motion Module User's Manual	SIEP C880700 33	Describes the functions, specifications, and operating methods of the MP2000-series Motion Module (built-in Function Modules: SVB, SVB-01, and SVR).
	Machine Controller MP2000 Series SVC-01 Motion Module User's Manual	SIEP C880700 41	Describes the functions, specifications, and operating methods of the MP2000-series SVC-01 Motion Module.

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Category	Manual Name	Manual Number	Contents
Programming	Machine Controller MP3000 Series Ladder Programming Manual	SIEP C880725 13	Describes the ladder programming specifications and instructions of MP3000-series Machine Controller.
	Machine Controller MP3000 Series Motion Programming Manual	SIEP C880725 14	Describes the motion programming and sequence programming specifications and instructions of MP3000-series Machine Controller.
Engineering Tools	System Integrated Engineering Tool MPE720 Ver.7 User's Manual	SIEP C880761 03	Describes the operating for MPE720 Ver.7, which is used as the engineering tool for controllers.

Using this Manual

◆ Technical Terms Used in This Manual

The following terms are used in this manual.

Terms	Meaning
MP3100	CPU Board
MP3200	A generic name for the Power Supply Unit, CPU Unit, Base Unit, and Rack Expansion Interface Unit
MP3300	A generic name for the CPU Module and Base Unit
MPE720	The Engineering Tool or a personal computer running the Engineering Tool
PLC	A Programmable Logic Controller
Machine Controller	An Machine Controller in the MP3000 Series
CPU Unit/CPU Module	A generic name for the MP3100 CPU Board, the MP3200 CPU Unit, and MP3300 CPU Module
Motion Control Function Modules	The Function Modules in the Motion Modules and the Function Modules in the SVC/SVR, SVC 32/SVR 32, SVC 64/SVF 64 built into the CPU Units/CPU Modules.
218IFD/218IFG	Ethernet Communications Function Module
218IFG	Ethernet Communications / EtherNet/IP Communications Function Module
MECHATROLINK	A generic name for MECHATROLINK-III and MECHATROLINK-4

◆ Manual Configuration

This manual consists of the chapters listed in the following table. Read the chapters of this manual as required for your application.

Chapter Title		Troubleshooting
Chapter 1	Overview of Troubleshooting	√
Chapter 2	Troubleshooting Errors with LED Indicators and Displays	√
Chapter 3	Troubleshooting using the System Monitor	√
Chapter 4	Troubleshooting Communications and Motion Control	√
Chapter 5	Troubleshooting Programming and Debugging	√
Chapter 6	Troubleshooting Connections with the MPE720	√
Chapter 7	Troubleshooting System Errors	√
Chapter 8	MP3200/MP3300 Battery Replacement	√
Chapter 9	Fan Replacement	√
Chapter 10	EDLC Life Estimation	√

◆ MPE720 Engineering Tool Version Number

In this manual, the operation of MPE720 is described using screen captures of MPE720 Ver.7.

◆ Copyrights

- EtherNet/IP and DeviceNet are a registered trademark of the ODVA (Open DeviceNet Vendor Association).
- Ethernet is a registered trademark of the Xerox Corporation.
- MPLINK is a registered trademark of Yaskawa Electric Corporation.
- Microsoft, Windows, Windows NT, and Internet Explorer are trademarks or registered trademarks of the Microsoft Corporation.
- PROFIBUS is a trademark of the PROFIBUS User Organization.
- MECHATROLINK is a trademark of the MECHATROLINK Members Association.
- Other product names and company names are the trademarks or registered trademarks of the respective company. “TM” and the ® mark do not appear with product or company names in this manual.

◆ Visual Aids

The following aids are used to indicate certain types of information for easier reference.

Indicates precautions or restrictions that must be observed.
Indicates alarm displays and other precautions that will not result in machine damage.

Indicates definitions of difficult terms or terms that have not been previously explained in this manual.

Example Indicates operating or setting examples.

Information Indicates supplemental information to deepen understanding or useful information.

Safety Precautions

◆ Safety Information

To prevent personal injury and equipment damage in advance, the following signal words are used to indicate safety precautions in this document. The signal words are used to classify the hazards and the degree of damage or injury that may occur if a product is used incorrectly. Information marked as shown below is important for safety. Always read this information and heed the precautions that are provided.

⚠ DANGER

- Indicates precautions that, if not heeded, are likely to result in loss of life, serious injury, or fire.

⚠ WARNING

- Indicates precautions that, if not heeded, could result in loss of life, serious injury, or fire.

⚠ CAUTION

- Indicates precautions that, if not heeded, could result in relatively serious or minor injury, or in fire.

NOTICE

- Indicates precautions that, if not heeded, could result in property damage.

◆ Safety Precautions That Must Always Be Observed

■ General Precautions

⚠ WARNING

- The installation must be suitable and it must be performed only by an experienced technician.
  There is a risk of electrical shock or injury.
- Before connecting the machine and starting operation, make sure that an emergency stop procedure has been provided and is working correctly.
  There is a risk of injury.
- Do not approach the machine after a momentary interruption to the power supply. When power is restored, the product and the device connected to it may start operation suddenly. Provide safety measures in advance to ensure human safety when operation restarts.
  There is a risk of injury.
- Do not touch anything inside the product.
  There is a risk of electrical shock.
- Do not remove the front cover, cables, connector, or options while power is being supplied.
  There is a risk of electrical shock, malfunction, or damage.
- Do not damage, pull on, apply excessive force to, place heavy objects on, or pinch the cables.
  There is a risk of electrical shock, operational failure of the product, or burning.
- Do not attempt to modify the product in any way.
  There is a risk of injury or device damage.

■ Storage and Transportation Precautions

⚠ CAUTION

- Hold onto the main body of the product when transporting it.
  Holding the cables or connectors may damage them or result in injury.
- Do not overload the product during transportation. (Follow all instructions.)
  There is a risk of injury or an accident.
- Never subject the product to an atmosphere containing halogen (fluorine, chlorine, bromine, or iodine) during transportation.
  There is a risk of malfunction or damage.
- If disinfectants or insecticides must be used to treat packing materials such as wooden frames, pallets, or plywood, the packing materials must be treated before the product is packaged, and methods other than fumigation must be used.
  Example: Heat treatment, where materials are kiln-dried to a core temperature of 56°C for 30 minutes or more.
  If the electronic products, which include stand-alone products and products installed in machines, are packed with fumigated wooden materials, the electrical components may be greatly damaged by the gases or fumes resulting from the fumigation process. In particular, disinfectants containing halogen, which includes chlorine, fluorine, bromine, or iodine can contribute to the erosion of the capacitors.

NOTICE

- Do not store the product in any of the following locations.
  - Locations that are subject to direct sunlight
  - Locations that are subject to ambient temperatures that exceed product specifications
  - Locations that are subject to relative humidities that exceed product specifications
  - Locations that are subject to condensation as the result of extreme changes in temperature
  - Locations that are subject to corrosive or flammable gases
  - Locations that are near flammable materials
  - Locations that are subject to dust, salts, or iron powder
  - Locations that are subject to water, oil, or chemicals
  - Locations that are subject to vibration or shock that exceeds product specifications

  If you store the product in any of the above locations, the product may fail or be damaged.

■ Installation Precautions

⚠ CAUTION

- Never install the product in an atmosphere containing halogen (fluorine, chlorine, bromine, or iodine).
  There is a risk of malfunction or damage.
- Do not step on the product or place heavy objects on the product.
  There is a risk of injury or an accident.
- Do not block the air exhaust ports on the product. Do not allow foreign objects to enter the product.
  There is a risk of internal element deterioration, malfunction, or fire.
- Always mount the product in the specified orientation.
  There is a risk of malfunction.
- Leave the specified amount of space between the product, and the interior surface of the control panel and other devices.
  There is a risk of fire or malfunction.
- Do not subject the product to strong shock.
  There is a risk of malfunction.
- Suitable battery installation must be performed and it must be performed only by an experienced technician.
  There is a risk of electrical shock, injury, or device damage.
- Do not touch the electrodes when installing the Battery.
  Static electricity may damage the electrodes.

NOTICE

- Do not install the product in any of the following locations.
  - Locations that are subject to direct sunlight
  - Locations that are subject to ambient temperatures that exceed product specifications
  - Locations that are subject to relative humidities that exceed product specifications
  - Locations that are subject to condensation as the result of extreme changes in temperature
  - Locations that are subject to corrosive or flammable gases
  - Locations that are near flammable materials
  - Locations that are subject to dust, salts, or iron powder
  - Locations that are subject to water, oil, or chemicals
  - Locations that are subject to vibration or shock that exceeds product specifications
  - Locations near devices that generate strong magnetic fields
  - Locations that are subject to radiation

  If you install the product in any of the above locations, the product may fail or be damaged.

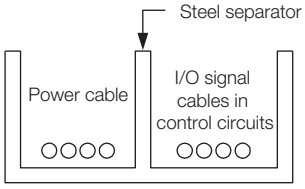
■ Wiring Precautions

⚠ CAUTION

- Do not change any wiring while power is being supplied.
  There is a risk of electric shock or injury.
- Check the wiring to be sure it has been performed correctly.
  There is a risk of motor run-away, injury, or accidents.
- Always use a power supply of the specified voltage.
  There is a risk of fire or accident.
- In places with poor power supply conditions, ensure that the input power is supplied within the specified voltage range.
  There is a risk of device damage.
- Install breakers and other safety measures to provide protection against shorts in external wiring.
  There is a risk of fire.
- Provide sufficient shielding when using the product in the following locations.
  - Locations that are subject to noise, such as from static electricity
  - Locations that are subject to strong electromagnetic or magnetic fields
  - Locations that are subject to radiation
  - Locations that are near power lines

  There is a risk of device damage.
- Configure the circuits to turn ON the power supply to the CPU Unit/CPU Module before the 24-V I/O power supply.
  If the power supply to the CPU Unit/CPU Module is turned ON after the external power supply, e.g., the 24-V I/O power supply, the outputs from the CPU Unit/CPU Module may momentarily turn ON when the power supply to the CPU Unit/CPU Module turns ON. This can result in unexpected operation that may cause injury or device damage.
- Provide emergency stop circuits, interlock circuits, limit circuits, and any other required safety measures in control circuits outside of the product.
  There is a risk of injury or device damage.
- If you use MECHATROLINK I/O Modules, use the establishment of MECHATROLINK communications as an interlock output condition.
  There is a risk of device damage.
- Connect the Battery with the correct polarity.
  There is a risk of battery damage or explosion.
- Select the I/O signal wires for external wiring to connect the product to external devices based on the following criteria:
  - Mechanical strength
  - Noise interference
  - Wiring distance
  - Signal voltage
- Separate the I/O signal cables for control circuits from the power cables both inside and outside the control panel to reduce the influence of noise from the power cables.
  If the I/O signal lines and power lines are not separated properly, malfunction may occur.

Example of Separated Cables



■ Operation Precautions

⚠ CAUTION

- **Follow the procedures and instructions in the user's manuals for the relevant products to perform normal operation and trial operation.**
  Operating mistakes while the Servomotor and machine are connected may damage the machine or even cause accidents resulting in injury or death.
- **Implement interlock signals and other safety circuits external to the product to ensure safety in the overall system even if the following conditions occur.**
  - product failure or errors caused by external factors
  - Shutdown of operation due to product detection of an error in self-diagnosis and the subsequent turning OFF or holding of output signals
  - Holding of the ON or OFF status of outputs from the product due to fusing or burning of output relays or damage to output transistors
  - Voltage drops from overloads or short-circuits in the 24-V output from the product and the subsequent inability to output signals
  - Unexpected outputs due to errors in the power supply, I/O, or memory that cannot be detected by the product through self-diagnosis.

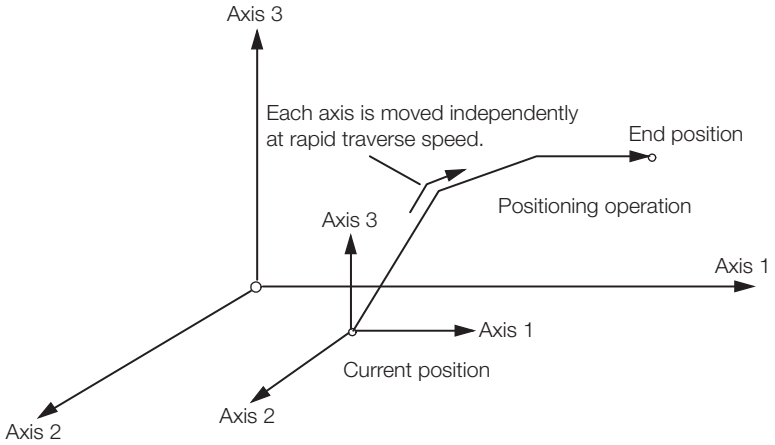
  There is a risk of injury, device damage, or burning.
- **Observe the setting methods that are given in the manual of the Motion Control Function Modules to be used for the following parameters.**
  - Parameters for absolute position detection when the axis type is set to a finite-length axis
  - Parameters for simple absolute infinite-length position control when the axis type is set to an infinite-length axis

  If any other methods are used, offset in the current position when the power supply is turned OFF and ON again may result in device damage.
- **OL□□□48 (Zero Point Position Offset in Machine Coordinate System) is always valid when the axis type is set to a finite-length axis. Do not change the setting of OL□□□48 while the product is operating.**
  There is a risk of machine damage or an accident.

⚠ CAUTION

- Always check to confirm the paths of axes when any of the following axis movement instructions are used in programs to ensure that the system operates safely.
  - Positioning (MOV)
  - Linear Interpolation (MVS)
  - Circular Interpolation (MCC or MCW)
  - Helical Interpolation (MCC or MCW)
  - Set-time Positioning (MVT)
  - Linear Interpolation with Skip Function (SKP)
  - Zero Point Return (ZRN)
  - External Positioning (EXM)

Example



Example of Basic Path for Positioning (MOV) Instructions

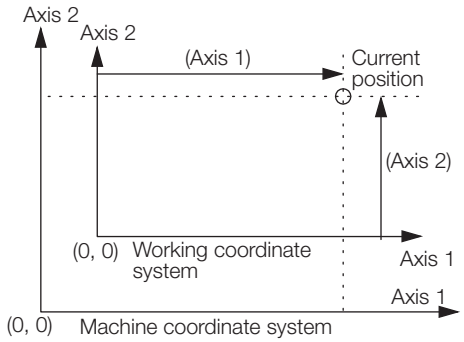
There is a risk of injury or device damage.

- The same coordinate word will create a completely different travel operation in Absolute Mode and in Incremental Mode. Make sure that the ABS and INC instructions are used correctly before you start operation.
  There is a risk of injury or device damage.
- The travel path for the Positioning (MOV) instructions will not necessarily be a straight line. Check to confirm the paths of the axis when this instruction is used in programs to ensure that the system operates safely.
  There is a risk of injury or device damage.
- The Linear Interpolation (MVS) instruction can be used on both linear axes and rotary axes. However, if a rotary axis is included, the linear interpolation path will not necessarily be a straight line. Check to confirm the paths of the axis when this instruction is used in programs to ensure that the system operates safely.
  There is a risk of injury or device damage.
- The linear interpolation for the Helical Interpolation (MCW and MCC) instructions can be used for both linear axes and rotary axes. However, depending on how the linear axis is taken, the path of helical interpolation will not be a helix. Check to confirm the paths of the axis when this instruction is used in programs to ensure that the system operates safely.
  There is a risk of injury or device damage.

⚠ CAUTION

- Unexpected operation may occur if the following coordinate instructions are specified incorrectly: Always confirm that the following instructions are specified correctly before you begin operation.
  - Absolute Mode (ABS)
  - Incremental Mode (INC)
  - Current Position Set (POS)

Example



Example of Working Coordinate System Created with Current Position Set (POS) Instruction

There is a risk of injury or device damage.

- The Current Position Set (POS) Instruction creates a new working coordinate system. Therefore, unexpected operation may occur if the POS instruction is specified incorrectly. When you use the POS instruction, always confirm that the working coordinate system is in the correct position before you begin operation.
  There is a risk of injury or device damage.
- The Move on Machine Coordinates (MVM) instruction temporarily performs positioning to a coordinate position in the machine coordinate system. Therefore, unexpected operation may occur if the instruction is executed without confirming the zero point position in the machine coordinate system first. When you use the MVM instruction, always confirm that the machine zero point is in the correct position before you begin operation.
  There is a risk of injury or device damage.

◆ Maintenance and Inspection Precautions

⚠ CAUTION

- Do not attempt to disassemble or repair the product.
  There is a risk of electrical shock, injury, or device damage.
- Do not change any wiring while power is being supplied.
  There is a risk of electrical shock, injury, or device damage.
- Suitable battery replacement must be performed and it must be performed only by an experienced technician.
  There is a risk of electrical shock, injury, or device damage.
- Replace the Battery only while power is supplied to the product.
  Replacing the Battery while the power supply to the product is turned OFF may result in loss of the data stored in memory in the product.
- Do not touch the electrodes when replacing the Battery.
  Static electricity may damage the electrodes.
- Do not forget to perform the following tasks when you replace the CPU Unit/CPU Module:
  • Back up all programs and parameters from the CPU Unit/CPU Module that is being replaced.
  • Transfer all saved programs and parameters to the new CPU Unit/CPU Module.
  If you operate the CPU Unit/CPU Module without transferring this data, unexpected operation may occur. There is a risk of injury or device damage.
- Do not touch the heat sink on the CPU Unit/CPU Module while the power supply is turned ON or for a sufficient period of time after the power supply is turned OFF.
  The heat sink may be very hot, and there is a risk of burn injury.

■ Disposal Precautions

- Correctly discard the product and used batteries as stipulated by regional, local, and municipal laws and regulations. Be sure to include these contents in all labelling and warning notifications on the final product as necessary.

■ Other General Precautions

- Figures provided in this manual are typical examples or conceptual representations. There may be differences between them and actual wiring, circuits, and products.
- The products shown in illustrations in this manual are sometimes shown with their covers or protective guards removed to illustrate detail. Always replace all covers and protective guards before you use the product.
- If you need a new copy of this document because it has been lost or damaged, contact your nearest Yaskawa representative or one of the offices listed on the back of this manual.
- This manual is subject to change without notice for product improvements, specifications changes, and improvements to the manual itself.
  We will update the document number of the manual and issue revisions when changes are made.
- Any and all quality guarantees provided by Yaskawa are null and void if the customer modifies the product in any way. Yaskawa disavows any responsibility for damages or losses that are caused by modified products.

Warranty

◆ Details of Warranty

■ Warranty Period

The warranty period for a product that was purchased (hereinafter called “delivered product”) is one year from the time of delivery to the location specified by the customer or 18 months from the time of shipment from the Yaskawa factory, whichever is sooner.

■ Warranty Scope

Yaskawa shall replace or repair a defective product free of charge if a defect attributable to Yaskawa occurs during the warranty period above. This warranty does not cover defects caused by the delivered product reaching the end of its service life and replacement of parts that require replacement or that have a limited service life.

This warranty does not cover failures that result from any of the following causes.

- Improper handling, abuse, or use in unsuitable conditions or in environments not described in product catalogs or manuals, or in any separately agreed-upon specifications
- Causes not attributable to the delivered product itself
- Modifications or repairs not performed by Yaskawa
- Abuse of the delivered product in a manner in which it was not originally intended
- Causes that were not foreseeable with the scientific and technological understanding at the time of shipment from Yaskawa
- Events for which Yaskawa is not responsible, such as natural or human-made disasters

◆ Limitations of Liability

- Yaskawa shall in no event be responsible for any damage or loss of opportunity to the customer that arises due to failure of the delivered product.
- Yaskawa shall not be responsible for any programs (including parameter settings) or the results of program execution of the programs provided by the user or by a third party for use with programmable Yaskawa products.
- The information described in product catalogs or manuals is provided for the purpose of the customer purchasing the appropriate product for the intended application. The use thereof does not guarantee that there are no infringements of intellectual property rights or other proprietary rights of Yaskawa or third parties, nor does it construe a license.
- Yaskawa shall not be responsible for any damage arising from infringements of intellectual property rights or other proprietary rights of third parties as a result of using the information described in catalogs or manuals.

◆ Suitability for Use

- It is the customer’s responsibility to confirm conformity with any standards, codes, or regulations that apply if the Yaskawa product is used in combination with any other products.
- The customer must confirm that the Yaskawa product is suitable for the systems, machines, and equipment used by the customer.
- Consult with Yaskawa to determine whether use in the following applications is acceptable. If use in the application is acceptable, use the product with extra allowance in ratings and specifications, and provide safety measures to minimize hazards in the event of failure.
  - Outdoor use, use involving potential chemical contamination or electrical interference, or use in conditions or environments not described in product catalogs or manuals
  - Nuclear energy control systems, combustion systems, railroad systems, aviation systems, vehicle systems, medical equipment, amusement machines, and installations subject to separate industry or government regulations
  - Systems, machines, and equipment that may present a risk to life or property
  - Systems that require a high degree of reliability, such as systems that supply gas, water, or electricity, or systems that operate continuously 24 hours a day
  - Other systems that require a similar high degree of safety

- Never use the product for an application involving serious risk to life or property without first ensuring that the system is designed to secure the required level of safety with risk warnings and redundancy, and that the Yaskawa product is properly rated and installed.
- The circuit examples and other application examples described in product catalogs and manuals are for reference. Check the functionality and safety of the actual devices and equipment to be used before using the product.
- Read and understand all use prohibitions and precautions, and operate the Yaskawa product correctly to prevent accidental harm to third parties.

◆ Specifications Change

The names, specifications, appearance, and accessories of products in product catalogs and manuals may be changed at any time based on improvements and other reasons. The next editions of the revised catalogs or manuals will be published with updated code numbers. Consult with your Yaskawa representative to confirm the actual specifications before purchasing a product.

Contents

Overview of Troubleshooting

1

This chapter describes the basic troubleshooting and error confirmation procedures.

1.1 Basic Troubleshooting Procedure

When a problem occurs, it is important to recover normal system operation as soon as possible by finding the cause of the problem and taking the necessary measures. The basic troubleshooting procedure is outlined below.

Step 1

Check the following items visually.
- Machine movement, or status if stopped
- Power supply status
- I/O device status
- Wiring conditions
- Status of indicators and display on Units or Modules
- Switch settings (e.g., DIP switches)
- Parameter settings and program contents

↓

Step 2

See if the problem changes when the following operations are performed.
- Stop the Machine Controller.
- Reset the alarms.
- Turn the power supply OFF and ON again.

↓

Step 3

Isolate the location of the problem from the results of steps 1 and 2.
- Inside or outside of the Machine Controller?
- Software or hardware?
- Sequence control or motion control?
- Ethernet communications or MECHATROLINK communications?

1.2 Checking for Errors

This section describes the errors that can occur when using the Machine Controller, and how to troubleshoot them.

Follow the troubleshooting procedures outlined below if a problem occurs with the Machine Controller.

1. Check the status of the indicators on the Machine Controller.

Information Refer to the following sections for details on checking the status of indicators on the Machine Controller.

☞ *Chapter 2 Troubleshooting with Indicators and Displays*

2. Connect the MPE720 to the Machine Controller to check the error information.

If the CPU Unit/CPU Module is not functioning properly, check the status of the indicators on the CPU Unit/CPU Module. Then use the MPE720 to check for errors.

- If a system error and a scan time exceeded error have occurred:
  ☞ *Chapter 3 Troubleshooting Using the System Monitor*
- If an Ethernet communications error or a motion control error has occurred:
  ☞ *Chapter 4 Troubleshooting Communications and Motion Control*
- If an error occurred in a motion program or during message communications:
  ☞ *Chapter 5 Troubleshooting Programming and Debugging*
- If you cannot go online with the MPE720:
  ☞ *Chapter 6 Troubleshooting Connections with the MPE720*
- If you want to investigate a system error:
  ☞ *Chapter 7 Troubleshooting System Errors*

Troubleshooting with Indicators and Displays

2

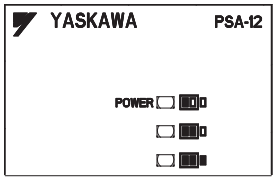
This chapter describes troubleshooting procedures with the indicators and the display on the Machine Controller.

2.1 Power Indicators

You can check the power supply loading status with the power indicators on the MP3000. With the MP3200, the indicators are on the Power Supply Unit, and with the MP3300, there is an indicator on the Base Unit.
There is no indicator on the MP3100 to enable users to check the power supply loading status. This section describes the power indicators for the MP3200 and MP3300.

2.1.1 Power Supply Unit Indicators (MP3200)

This section describes how to check the load on the Power Supply Unit.



The following table gives the relation between the indicators on the Power Supply Unit and the load on the Power Supply Unit.

Load			Normal		Error	
Indicators	POWER	Green	●	●	●	○
		Yellow	○	●	●	○
		Red	○	○	●	○

Note: 1. ●: Lit, ○: Not lit.
2. The indicators show the status when the Power Supply Unit is turned ON.

Check the status in the above table and perform the actions given below if the power loading status indicates an error.

Load	Cause	Correction
Error	The load exceeds the capacity of the Power Supply Unit.	• Reduce the number of Optional Modules installed on the Base Unit. • Reduce the number of Units.

2.1.2 Base Unit Indicators (MP3300)

With the MP3300, you can check the power supply loading status on the Base Unit.

The following table shows the relation between the load status of the Rack power supply and the indicator on the Power Supply Unit.

Load			Normal	Error
LED	POWER ◯	Green	●	○

Check the status in the above table and perform the actions given below if the power loading status indicates an error.

Load	Cause	Correction
Error	The load exceeds the capacity of the Power Supply Unit.	Reduce the number of Optional Modules installed on the Base Unit.

2.2 Indicators for Machine Controller Status

The location of the error indicators of the Machine Controller varies with the model as shown below.

- MP3100: The CPU Board is provided with indicators.
- MP3200: The CPU Unit is provided with indicators.
- MP3300: The CPU Module is provided with indicators.

The presence or absence of displays and indicators varies with the Machine Controller model.

Indicator	Indicator			Reference
	MP3100	MP3200 (CPU-201, -202), MP3300	MP3200 (CPU-203, -203F)	
Display	×	○	○	*2.2.1 Display* on page 2-4
Status Indicators	○	○	○	*2.2.2 Status Indicators* on page 2-12
USB Status Indicators	×	○	×	*2.2.3 USB Status Indicator* on page 2-16
SD Card Status Indicators	×	×	○	*2.2.4 SD Card Status Indicator* on page 2-16
MECHATROLINK Status Indicators	○	○	○	*2.2.5 MECHATROLINK Status Indicators* on page 2-17
Ethernet Status Indicators	×	○	○	*2.2.6 Ethernet Status Indicators* on page 2-18
EtherNet/IP Status Indicators	×	×	○	*2.2.7 EtherNet/IP Status Indicators* on page 2-19

Note: ○: Yes, ×: No

After you check the error status, the system (S) registers will help you isolate the program location that needs to be corrected.

Refer to the following chapter for details on system registers.

☞ *Chapter 7 Troubleshooting System Errors*

2.2.1 Display

If an error or alarm occurs, details will be displayed on the display. This section describes the display patterns and corresponding errors.

Information The MP3100 has no indicators.

Display	Category	Description
 followed by error code	System error	A 3-digit error code is displayed after E, like this: E001: Watchdog timer error E051: Module synchronization error E052: Main CPU Unit system down detected E061: Unit configuration error on Rack 1 E062: Unit configuration error on Rack 2 E063: Unit configuration error on Rack 3 E064: Unit configuration error on Rack 4 E065: Unit configuration error on Rack 5 E066: Unit configuration error on Rack 6 E067: Unit configuration error on Rack 7 E070: Unsupported Sub CPU mode E071: Unsupported Module detected E080: CPU mode mismatch E081: CPU stopped for internal temperature error 1 E082: CPU stopped for internal temperature error 2 E083: Fan stopped E090: Hardware error 1 E091: Hardware error 2 E092: Hardware error 3

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Display	Category	Description
 followed by error code	Alarm	A 3-digit error code is displayed after A, like this: A001: Operation error in DWG.A A002: Operation error in DWG.I A003: Operation error in DWG.H A005: Operation error in DWG.L A101: I/O error on Rack 1 A102: I/O error on Rack 2 A103: I/O error on Rack 3 A104: I/O error on Rack 4 A105: I/O error on Rack 5 A106: I/O error on Rack 6 A107: I/O error on Rack 7 A201: Insufficient power supply capacity warning 1 for Rack 1 A205: Insufficient power supply capacity warning 1 for Rack 5 A206: Insufficient power supply capacity warning 1 for Rack 6 A207: Insufficient power supply capacity warning 1 for Rack 7 A211: Insufficient power supply capacity warning 2 for Rack 1 A215: Insufficient power supply capacity warning 2 for Rack 5 A216: Insufficient power supply capacity warning 2 for Rack 6 A217: Insufficient power supply capacity warning 2 for Rack 7 A221: Power interruption detected on Expansion Rack 1 A225: Power interruption detected on Expansion Rack 5 A226: Power interruption detected on Expansion Rack 6 A227: Power interruption detected on Expansion Rack 7 A230: Hardware error 4 A240: Fan stopped A241: Internal temperature rise detected A301: USB memory/SD card write error A302: USB memory/SD card read error A303: Security error A304: User memory code check error A305: Folder for batch loading does not exist. A306: Load file model mismatch error A307: Loading error due to program write protection A308: Load file write error A309: Save to flash memory error A30A: Save file read error A30B: No USB memory device/SD card A30D: EDLC backup error A310: User memory data corrupted error A370: Log folder creation error A371: Log file creation error A372: Log file writing error A373: Log file overwriting error A374: Writing to FTP server error A401: MECHATROLINK restrictions error A402: Error in MPU-01 A403: Error in Sub CPU A404: MECHATROLINK station address duplication
 followed by error code	–	h: CPU stopped by failsafe function

Troubleshooting Alarms

The following table describes the causes and corrections of alarms that are displayed on the display.
Checkmarks (○) indicate when the alarm codes are displayed by the MP3200 or MP3300.

Alarm Code Alarm Name	MP3200	MP3300	Cause	Confirmation Method	Correction
E001: Watchdog timer error	○	○	There is an infinite loop in a user program.	Check the FOR and WHILE instructions for the possibility of infinite loops. Turn ON the STOP switch and turn the power supply OFF and ON again.	Correct the ladder program.
			The maximum value of the scan time does not meet the following conditions. • The scan times for the high-speed (H) scan/ low-speed (L) scan must be set to values that are higher than the maximum scan times. • The set values must be 1.25 times the maximum values.	Check the set values of the scan times for the high-speed (H) scan/low-speed (L) scan in relation to the maximum values of the scan times. You can check the set values and maximum values of the high-speed (H) scan and the low-speed (L) scan in SW00004 to SW00012.	Correct the set values of the scan times.
			The main CPU failed.	Turn the power supply OFF and ON again to see if an alarm occurs. If an alarm occurs even after the power supply is turned OFF and ON again several times, the CPU may be faulty.	Replace the CPU.
E051: Module synchronization error	○	○	A synchronization error occurred for an Optional Module.	Turn the power supply OFF and ON again to see if an alarm occurs. If an alarm occurs even after the power supply is turned OFF and ON again several times, the Optional Module may be faulty.	Check the SW00076 system register to identify the Optional Module with the error and replace the Optional Module.
E052: Main CPU Unit system down detected	○	○	A watchdog error occurred in the Main CPU.	Check the indicators or system registers for the Main CPU.	Clear the cause of the watchdog error from the Main CPU.
E061: Unit configuration error	○	–	There is a configuration error on Rack □. □: 1 to 7	Check the following conditions. • There are more than three MP3000 Units. • There is more than one MP2000 Unit. • There is more than one Sub CPU. • There are more than two Base Units. • An MP2000 Unit is mounted to Rack 5 to 7 (excluding to the right of a Sub CPU). • More than one EXIOIF Module is mounted. • An EXIOIF Module is mounted under a Sub CPU.	Correct the Unit configuration.
E062: Unit configuration error	○	–			
E063: Unit configuration error	○	–			
E064: Unit configuration error	○	–			
E065: Unit configuration error	○	–			
E066: Unit configuration error	○	–			
E067: Unit configuration error	○	–			

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Alarm Code Alarm Name	MP3200	MP3300	Cause	Confirmation Method	Correction
E070: Unsupported Sub CPU mode	○	–	A CPU version that does not support operation as a Sub CPU was mounted as a Sub CPU.	Check the system software version.	Use a version of the CPU that supports operation as a Sub CPU.
E071: Unsupported Module detected	○	○	A Module that cannot be used was mounted.	Check to see if the Modules are supported.	Remove any Modules that are not supported.
E080: CPU mode mismatch	○	–	The Main CPU contains a Sub CPU project. Or a Sub CPU contains a Main CPU project.	Log on from the MPE720 and check the Module configuration definitions.	Transfer a Main CPU project to the Main CPU. Transfer a Sub CPU project to the Sub CPU.
E081: CPU stopped for internal temperature error 1	○	○	The temperature continued to increase even further after A241 was detected and is approaching the permissible temperature of the internal parts.	Check SB00041F (temperature warning).	Change the installation environment to lower the temperature around the CPU. If the CPU temperature increases and an error occurs, turn OFF the power supply to the Controller and change the installation environment.
E082: CPU stopped for internal temperature error 2	○	○	The temperature continued to increase even after E081 was detected and has reached the permissible temperature of the internal parts.		
E083: Fan stopped (1 minute)	○	–	The Fan stopped continuously for 1 minute.	Check to see if the Fan is operating. Or, check SB00041E (Fan error).	Check the Fan operation. If the Fan is not operating, turn OFF the power supply to the Controller and replace the Fan.
E090: Hardware error 1	○	○	A hardware error occurred.	Turn the power supply OFF and ON again.	If the error persists even when you turn the power supply OFF and ON again a few times, there is a hardware failure. Replace the Unit.
E091: Hardware error 2	○	○			
E092: Hardware error 3	○	○			
A001: Operation error in DWG.A	○	○	There is an operation error in DWG.A.	Check the error code in SW00081.	Correct the ladder program.
A002: Operation error in DWG.I	○	○	There is an operation error in DWG.I.	Check the error code in SW00083.	
A003: Operation error in DWG.H	○	○	There is an operation error in DWG.H.	Check the error code in SW00085.	
A005: Operation error in DWG.L	○	○	There is an operation error in DWG.L.	Check the error code in SW00089.	

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Alarm Code Alarm Name	MP3200	MP3300	Cause	Confirmation Method	Correction
A101: I/O error on Rack 1	○	○	There is an I/O error on a Main Rack (Rack □). □: 1 to 7	Check the error in SW09560 to SW13699 (System I/O Error Status) to identify the Module with the error.	Remove the cause of the I/O error based on the error status.
A102: I/O error on Rack 2	○	–			
A103: I/O error on Rack 3	○	–			
A104: I/O error on Rack 4	○	–			
A105: I/O error on Rack 5	○	–			
A106: I/O error on Rack 6	○	–			
A107: I/O error on Rack 7	○	–			
A201: Insufficient power supply capacity warning 1 for Rack 1	○	○	An Insufficient Power Supply Capacity 1 Warning was detected on the Main Rack (Rack □). □: 1 or 5 to 7	Check the indicators on the Power Supply Unit.	• Check the configuration of the Optional Modules and either reduce the number of Optional Modules or replace the Power Supply Unit. • Change the installation environment to lower the temperature around the CPU.
A205: Insufficient power supply capacity warning 1 for Rack 5	○	–			
A206: Insufficient power supply capacity warning 1 for Rack 6	○	–			
A207: Insufficient power supply capacity warning 1 for Rack 7	○	–			
A211: Insufficient power supply capacity warning 2 for Rack 1	○	○	An Insufficient Power Supply Capacity 2 Warning was detected on the Main Rack (Rack □). □: 1 or 5 to 7		
A215: Insufficient power supply capacity warning 2 for Rack 5	○	–			
A216: Insufficient power supply capacity warning 2 for Rack 6	○	–			
A217: Insufficient power supply capacity warning 2 for Rack 7	○	–			
A230: Hardware error 4	○	○	A hardware error occurred.	Turn the power supply OFF and ON again.	If the error persists even when you turn the power supply OFF and ON again a few times, there is a hardware failure. Replace the Unit with the hardware failure.
A240: Fan stopped	○	–	The fan stopped.	Check to see if the Fan is operating. Or, check SB00041E (Fan error).	• Connect the Fan correctly. • If the Fan is not operating, turn OFF the power supply to the Controller and replace the Fan.

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Alarm Code Alarm Name	MP3200	MP3300	Cause	Confirmation Method	Correction
A241: Internal temperature rise detected	○	○	The CPU temperature is close to the operating limit.	Check SB00041F (temperature warning).	Change the installation environment to lower the temperature around the CPU. If the CPU temperature increases and an error occurs, turn OFF the power supply to the Controller and change the installation environment.
A301: USB memory/SD card write error	○	○	An error occurred while writing data to a file on the USB memory device/SD card.	Make sure that the USB memory device/SD card is inserted properly.	Reinsert the USB memory device/SD card.
				Check the USB memory device/SD card.	Make sure that there is space available on the USB memory device/SD card.
A302: USB memory/SD card read error	○	○	An error occurred while reading data from a file on the USB memory device/SD card.	Make sure that the USB memory device/SD card is inserted properly.	Reinsert the USB memory device/SD card.
				Check the USB memory device/SD card.	Make sure that there is space available on the USB memory device/SD card.
A303: Security error	○	○	User attempted to load data while online security was enabled.	Check the status of the online security setting.	Disable online security.
A304: User memory code check error	○	○	User program could not be loaded properly.	Turn ON the INIT switch, turn the power supply OFF and ON again, and save the data to flash memory again. If an alarm occurs even after the power supply is turned OFF and ON again several times, the flash memory may be faulty.	Replace the CPU.
A305: Folder for batch loading does not exist	○	○	There is no data for batch loading on the USB memory device/SD card.	Check the USB memory device/SD card.	Retry execution of a project transfer from the MPE720 to the USB memory/SD card.
A306: Load file model mismatch error	○	○	The model in the batch loading file on the USB memory/SD card does not match.	Check the USB memory device/SD card.	Retry execution of a project transfer from the MPE720 to the USB memory/SD card.
A307: Loading error due to program write protection	○	○	A batch load operation was performed with program write protection enabled.	Check the **Write Protect** setting under **Environment Setting** – **System Setting**.	Set **Write Protect** to **Writable**, and execute the batch load again.
A308: Load file write error	○	○	Data could not be written to the Controller during batch loading.	Check the available space in the Controller.	Double-check the batch transfer data.
A309: Save to flash memory error	○	○	Data could not be saved to the flash memory in the Controller during batch loading.	Turn the power supply OFF and ON again, and then execute the batch load again. If the data cannot be saved to flash memory even after several tries, the CPU may be faulty.	Replace the CPU.

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Alarm Code Alarm Name	MP3200	MP3300	Cause	Confirmation Method	Correction
A30A: Save file read error	○	○	Data could not be read from the Controller during batch saving.	Turn the power supply OFF and ON again, and then execute the batch save again. (Check by turning ON the INIT switch.) If the data cannot be read even after several tries, the CPU may be faulty.	Replace the CPU.
A30B: No USB memory device/SD card	○	○	• The USB memory device/SD card was not inserted in the Controller when executing a batch load. • The USB memory device/SD card was not inserted in the Controller when executing a batch save.	Make sure that the USB memory device/SD card is inserted properly.	Reinsert the USB memory device/SD card.
A30D: EDLC backup error	○	×	The EDLC capacitance is not high enough.	Check the EDLC capacitance. Refer to the following section for details. ☞ *Chapter 10 EDLC Life Estimation*	Replace the CPU (EDLC).
A310: User memory data corrupted error	○	○	Corruption of the user memory data was detected.	Turn ON the INIT switch, turn the power supply OFF and ON again, and execute the program transfer process. If an alarm occurs even after the power supply is turned OFF and ON again several times, the memory may be faulty.	Replace the CPU.
A370: Log folder creation error	○	○	A folder could not be created in the saving destination.	Make sure that the USB memory device/SD card is inserted properly.	Reinsert the USB memory device/SD card.
				Check the memory capacity in the saving destination.	Make sure there is sufficient free space in the saving destination.
A371: Log file creation error	○	○	A file could not be created in the saving destination.	Make sure that the USB memory device/SD card is inserted properly.	Reinsert the USB memory device/SD card.
				Check the memory capacity in the saving destination.	Make sure there is sufficient free space in the saving destination.
A372: Log file writing error	○	○	Data could not be written to the file in the saving destination.	Make sure that the USB memory device/SD card is inserted properly.	Reinsert the USB memory device/SD card.
				Check the memory capacity in the saving destination.	Make sure there is sufficient free space in the saving destination.

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Alarm Code Alarm Name	MP3200	MP3300	Cause	Confirmation Method	Correction
A373: Log file overwriting error	○	○	Logging was started when there was a log file with the same name in the saving destination.	Check if there is file with the same name in the saving destination.	• Make sure that there is no file with the same name in the saving destination. • Set the logging file so that it will be overwritten.
A374: Writing to FTP server error	○	○	A file could not be stored on the FTP server.	Check the settings of the FTP client.	In the settings of the FTP client, set the IP address, user name, password, and directory path of the saving destination FTP server to the correct values.
				Check to see if the FTP server is running.	Start the FTP server if it is not running.
				Check to see if the cables are wired correctly.	Wire the cables correctly.
A401: MECHATROLINK restrictions error	○	○	The high-speed scan time does not meet the restrictions and conditions.	Check the SVC/SVC32/SVC64/SVF64 MECHATROLINK communications cycle and high-speed scan time.	Make the settings to meet the restrictions and conditions.
A402: Error in MPU-01	○	○	An alarm occurred for the MPU-01.	Check the SW01411 to SW01442 system registers (MPU-01 System Status).	Determine the MPU-01 that has an error, and reset the alarm.
A403: Error in Sub CPU	○	–	An alarm occurred in the Sub CPU.	Check system register SB00041B.	Determine the Sub CPU that has an error, and reset the error in the Sub CPU.
A404: MECHATROLINK station address duplication	○	○	The same station address was set for more than one of the slave devices connected to SVC/SVC32/SVC64/SVF64.	Check system register SB00041C.	Reset the slave device station addresses so that they are correct.
h: CPU stopped by failsafe function	○	○	The failsafe function was activated for E.083 (Fan Alarm) or E.082 (Temperature Warning).	Check to see if the Fan is operating.	If the Fan is not operating, replace the Fan. If the Fan is operating normally, change the installation environment to reduce the temperature around the Controller.

2.2.2 Status Indicators

The following indicators show the status of the Machine Controller.
The indicators of the MP3100 vary with those of the MP3200 and MP3300.

MP3100

Indicator Name	Color	Status When Lit
S1	Green	Operation is normal (RDY).
	Red	An error occurred (ERR).
S2	Not lit	Execution of the user program is stopped.
	Green	Operation is normal (RUN).
	Red	An alarm occurred (ALM).
M-ALM	Red	The following error occurred with one of the servo axes: • Warning • Alarm • Command Error End

The patterns of the status indicators are described in the following table.

chapter	Indicator Status					MP3100 Status	Description
	S1 (Green)	S2 (Green)	S1 (Red)	S2 (Red)	M_ALM (Red)		
Normal	○	○	●	●	○	Hardware reset	Normally, the CPU Unit will start within 10 seconds. If more than 10 seconds is required, there is an error in a user program or a hardware error. Refer to the following section for information on system errors and implement corrections. ☞ *Chapter 7 Troubleshooting System Errors*
	○	○	○	○	○	Initialization	
	○	●	○	○	○	Drawing A is being executed.	
	●	○	○	○	○	The user programs are stopped (offline stop mode).	• The stop operation was performed from the MPE720. • This is the status after the STOP switch is turned ON. It is not an error.
	●	●	○	○	○	The user programs are being executed normally.	Normal operation is in progress.

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chapter	Indicator Status					MP3100 Status	Description
	S1 (Green)	S2 (Green)	S1 (Red)	S2 (Red)	M_ALM (Red)		
Error	○	○	●	○	○	A serious failure error occurred.	If the ERR indicator is lit, there is a hardware failure or a user program error. Refer to the following section for the corrective actions to take when the ERR indicator is lit. ☞ *7.3 Troubleshooting for the ERR Indicator* on page 7-6
	○	○	★	○	○	Software Errors: Number of Flashes 2: Machine check exception 3: DSI (writing) exception 4: ISI exception 5: Alignment exception 6: DDR DRAM memory error exception 7: DTLB exception 8: ITLB exception 9: Timeout for obtaining time data from host computer	A hardware failure has occurred. Replace the Unit or Module. If a timeout for obtaining time data from host computer occurs, check the following: • Is the driver for the MP3100 installed? • Is the driver for the MP3100 operating correctly? • Was the power supply for the host computer turned ON and OFF correctly?
	○	○	★	★	○	Hardware Errors: Number of Flashes 2: RAM diagnostic error 3: ROM diagnostic error 4: CPU Function Module diagnostic error 5: FPU Function Module diagnostic error	
	○	○	○	○	●	Motion error	If the M_ALM indicator is lit, there is an error in the Motion Control Function Module. Refer to the following section for details on motion errors. ☞ *4.3 Troubleshooting Motion Errors* on page 4-8
	●	○	○	●	–	Operation error I/O error MECHATROLINK station address duplication	If the ALM indicator is lit, there is an operation error, an I/O error, or an error for a MECHATROLINK station address duplication. Refer to the following section for the corrective actions to take when the ALM indicator is lit. ☞ *7.4 Troubleshooting for the ALM Indicator* on page 7-7

Note: ○: Not lit, ●: Lit, ★: Flashing, –: Any status

MP3200/MP3300

RDY □
RUN □
ALM □
ERR □
BAT □
M-ALM □

The patterns of the status indicators are described in the following table.

chapter	Indicator Status						CPU Unit/CPU Module Status	Description
	RDY (Green)	RUN (Green)	ALM (Red)	ERR (Red)	BAT (Red)	M_ALM (Red)		
Normal	○	○	●	●	–	○	Hardware reset	Normally, the CPU Unit will start within 10 seconds. If more than 10 seconds is required, there is an error in a user program or a hardware error. Refer to the following section for information on system errors and implement corrections. ☞ *Chapter 7 Troubleshooting System Errors*
	○	○	○	○	–	○	Initialization	
	○	●	○	○	–	○	Drawing A is being executed.	
	●	○	○	○	–	○	The user programs are stopped (offline stop mode).	• The stop operation was performed from the MPE720. • This is the status after the STOP switch is turned ON. It is not an error.
	●	●	○	○	–	○	The user programs are being executed normally.	Normal operation is in progress.

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chapter	Indicator Status						CPU Unit/CPU Module Status	Description
	RDY (Green)	RUN (Green)	ALM (Red)	ERR (Red)	BAT (Red)	M_ALM (Red)		
Error	○	○	○	●	○	○	A serious failure error occurred.	If the ERR indicator is lit, there is a hardware failure or a user program error. Refer to the following section for the corrective actions to take when the ERR indicator is lit. ☞ *7.3 Troubleshooting for the ERR Indicator* on page 7-6
	○	○	○	★	–	○	Software Errors: Number of Flashes 2: Machine check exception 3: DSI (writing) exception 4: ISI exception 5: Alignment exception 6: DDR DRAM memory error exception 7: DTLB exception 8: ITLB exception	A hardware failure has occurred. Replace the Unit or Module.
	○	○	★	★	–	○	Hardware Errors: Number of Flashes 2: RAM diagnostic error 3: ROM diagnostic error 4: CPU Function Module diagnostic error 5: FPU Function Module diagnostic error	
	–	–	–	–	–	●	Motion error	If the M_ALM indicator is lit, there is an error in the Motion Control Function Module. Refer to the following section for details on motion errors. ☞ *4.3 Troubleshooting Motion Errors* on page 4-8
Alarms	–	–	–	–	●	–	Battery alarm	If the BAT indicator is lit, the Battery must be replaced. Refer to the following section for the Battery replacement procedure. ☞ *Chapter 8 MP3200/MP3300 Battery Replacement*
	●	●	●	○	–	–	Operation error I/O error MECHATROLINK station address duplication	If the ALM indicator is lit, there is an operation error, an I/O error, or an error for a MECHATROLINK station address duplication. Refer to the following section for the corrective actions to take when the ALM indicator is lit. ☞ *7.4 Troubleshooting for the ALM Indicator* on page 7-7

Note: ○: Not lit, ●: Lit, ★: Flashing, –: Any status

2.2.3 USB Status Indicator

This indicator shows the status of the USB memory.

Information The MP3100 and MP3200 (CPU-203 and -203F) have no USB status indicators.

Indicator Name	Indicator Status	Meaning	Status
USB ACTIVE	(Not lit.)	No USB memory device	No USB memory device has been inserted.
	(Lit.)	USB memory device inserted	A USB memory device is inserted.
	(Flashing)	Accessing USB memory	The USB memory is being accessed.

Check the USB status indicator using the above table. If the indicator is not lit, there may be an error in the communications status with the USB memory device.

Indicator Status	Cause	Correction
Not lit.	The USB memory device is not properly seated in the USB connector.	Remove the USB memory device and insert it into the USB connector again.
	The USB memory device failed.	Replace the USB memory device.
	The USB connector is faulty.	Replace the CPU Unit/CPU Module.

2.2.4 SD Card Status Indicator

This indicator shows the status of the SD card.

Information Only the MP3200 (CPU-203 and -203F) has SD card status indicators.

Indicator Name	Indicator Status	Meaning	Status
SD ACTIVE	(Not lit.)	No SD card	No SD card has been inserted.
	(Lit.)	SD card inserted	An SD card is inserted.
	(Flashing)	Accessing SD card	The SD card is being accessed.

Check the SD card indicator using the above table. If the indicator is not lit, there may be an error in the communications status with the SD card.

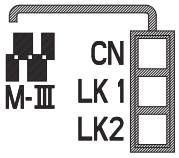
Indicator Status	Cause	Correction
Not lit.	The SD card is not properly seated in the SD card connector.	Remove the SD card and insert it into the SD card connector again.
	The SD card failed.	Replace the SD card.
	The SD card connector is faulty.	Replace the CPU Unit.

2.2.5 MECHATROLINK Status Indicators

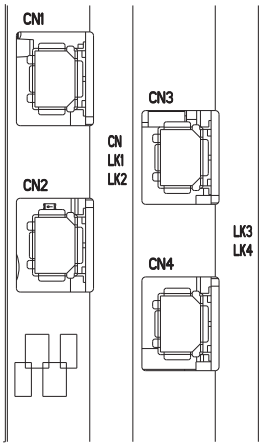
These indicators show the status of the MECHATROLINK communications.

• MP3100

• MP3200 (CPU-201, -202)/MP3300



• MP3200 (CPU-203, -203F)



Indicator Name	Color	Indicator Status	Description
CN	Green	Lit.	MECHATROLINK communications is established with the CPU Unit as a slave (i.e., the Connect command is ON).
		Not lit.	The connection has not been established.
LK1	Green	Lit.	MECHATROLINK communications are active on port 1.
		Not lit.	No MECHATROLINK communications are connected on port 1.
LK2	Green	Lit.	MECHATROLINK communications are active on port 2.
		Not lit.	No MECHATROLINK communications are connected on port 2.
LK3*	Green	Lit.	MECHATROLINK communications are active on port 3.
		Not lit.	No MECHATROLINK communications are connected on port 3.
LK4*	Green	Lit.	MECHATROLINK communications are active on port 4.
		Not lit.	No MECHATROLINK communications are connected on port 4.

* Only for MP3200(CPU-203 and -203F).

If either of status indicators LK1 to LK4 is not lit, there may be an error in the communications with MECHATROLINK.

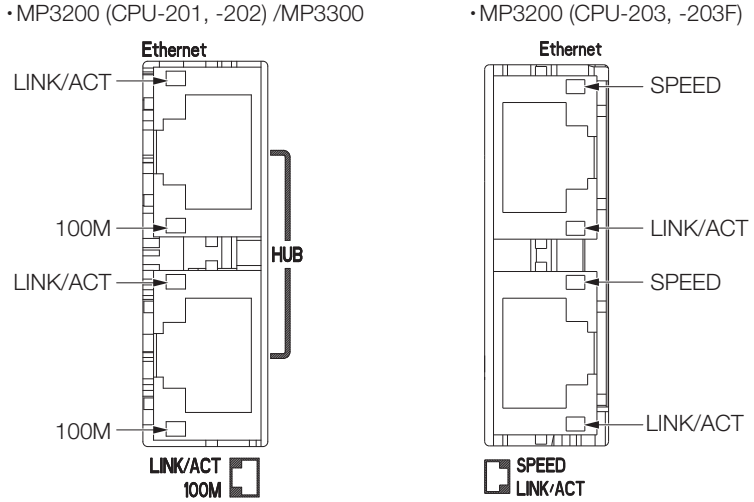
LK1 to LK4 Status Indicators	Cause	Correction
Not lit.	The MECHATROLINK cable is not connected properly.	Disconnect the MECHATROLINK cable and insert it again.
	The MECHATROLINK cable has a broken wire.	Replace the MECHATROLINK cable.

2.2.6 Ethernet Status Indicators

You can check the error status of Ethernet communications.

Information The MP3100 has no Ethernet connector indicators.

This section describes the indicator lighting patterns.



Indicator Name	Color	Indicator Status	Description
LINK/ACT	Yellow	Not lit.	There is no Ethernet connection.
		Lit.	An Ethernet link is established.
		Flashing	Ethernet communications are in progress.*
100M	Green	Not lit.	There is a 10M connection.
		Lit.	There is a 100M connection.
SPEED	–	Not lit.	There is a 10M connection.
	Green	Lit.	There is a 100M connection.
	Orange	Lit.	There is a 1000M connection.

* If a communications error occurs when message communications are used with a UDP connection type, communications data may be lost or communications may stop when the LINK/ACT indicator for the Ethernet connector lights or flashes because UDP does not use connections. If this occurs, use the following corrections.
  • Use straight or crossover 100Base-TX (category 5 or higher) Ethernet cables.
  • Separate the Ethernet cables from power cables.
  If the above corrections do not solve the problem, use a TCP connection type. If you use a UDP connection type, write the program to retry Send Message Execute Commands with the MSG-SNDE message function. Refer to the following section for information on resend programming for the MSG-SNDE message function of the MP Series.
  ☞ *4.1.3 Troubleshooting Quick Reference* on page 4-4

If the LINK/ACT status indicator is not lit, there may be an error in the communications with the Ethernet.

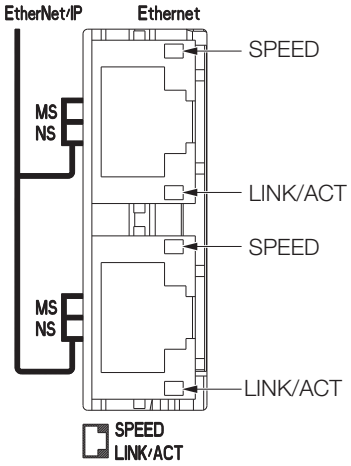
LINK/ACT Status Indicator	Cause	Correction
Not lit.	The Ethernet cable is not connected properly.	Remove the Ethernet cable and insert it into the Ethernet connector again.
	The Ethernet cable has a broken wire.	Replace the Ethernet cable.
	The power to the hub or other Ethernet device that is connected to the Controller with an Ethernet cable is not turned ON.	Turn ON the power to the hub or Ethernet device to which the Ethernet cable is connected to.

2.2.7 EtherNet/IP Status Indicators

You can check the error status of EtherNet/IP communications.

Information Only the MP3200 (CPU-203, -203F) has this indicators.

This section describes the indicator lighting patterns.



Indicator Name	Color	Meaning When Lit	Meaning When Flashing	Meaning When Not Lit
MS	Green	Operating normally	Device not set	Module power supply disconnected/Startup failure
	Red	Module error (Unrecoverable)	Module error (Recoverable)	
	Alternately flashing green/ red	–	Self-testing	
NS	Green	Operating normally	No I/O allocations or connection being established	Communication power supply disconnected/No IP address
	Red	Error (Duplicated IP address)	Communication error (Timeout)	
	Alternately flashing green/ red	–	Self-testing	

The LINK/ACT and SPEED indicators are the same as the Ethernet status indicator.

Refer to the following section for details.

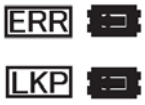
☞ *2.2.6 Ethernet Status Indicators* on page 2-18

2.3 Rack Expansion Interface Board/Unit Indicators

The indicators of the Rack Expansion Interface Board/Unit show the operating status, cable communications status, and error status.

Information The MP3100 uses the Rack Expansion Interface Board and the Rack Expansion Interface Unit.
The MP3200 uses the Rack Expansion Interface Unit.
The MP3300 cannot use the Rack Expansion Interface Board/Unit for rack expansion. Use the EXIOIF Module for rack expansion. The EXIOIF Module has no indicators.

MP3100

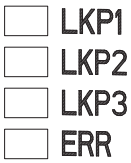


Indicator	Color	Status When Lit
ERR	Not lit	Operation is normal.
	Red	Hardware error
LKP*	Not lit	Rack Expansion Interface Board/Unit not connected
	Green	Rack Expansion Interface Board/Unit connected

* MP3100EX only.

MP3200

For Main Rack



For Expansion Rack

Indicator	Color	Status When Lit, Flashing, or Not Lit	
LKP1	Green	Lit	Communications are active with the Rack Expansion Interface Unit connected to PORT1.
		Not lit.	• Communications errors occurred consecutively and communications cannot be recovered automatically. • The cable was disconnected or was not connected to the port. • The current Rack Expansion Interface Unit or another Rack Expansion Interface Unit connected to it has a hardware failure.
LKP2	Green	Lit	Communications are active with the Rack Expansion Interface Unit connected to PORT2.
		Not lit.	Same as LKP1.
LKP3	Green	Lit	Communications are active with the Rack Expansion Interface Unit connected to PORT3.
		Not lit.	Same as LKP1.
ERR	Red	Lit	• Consecutive communications errors occurred on one of the ports and communications cannot be recovered automatically. • The cable was disconnected or was not connected. These errors are not shown on the Main Rack Expansion Interface Unit before the connection is established. • The current Rack Expansion Interface Unit or another Rack Expansion Interface Unit connected to it has a hardware failure.


Important

If communications errors occur consecutively during operation, communications between the Main Rack and Expansion Rack will stop.

Troubleshooting Using the System Monitor

3

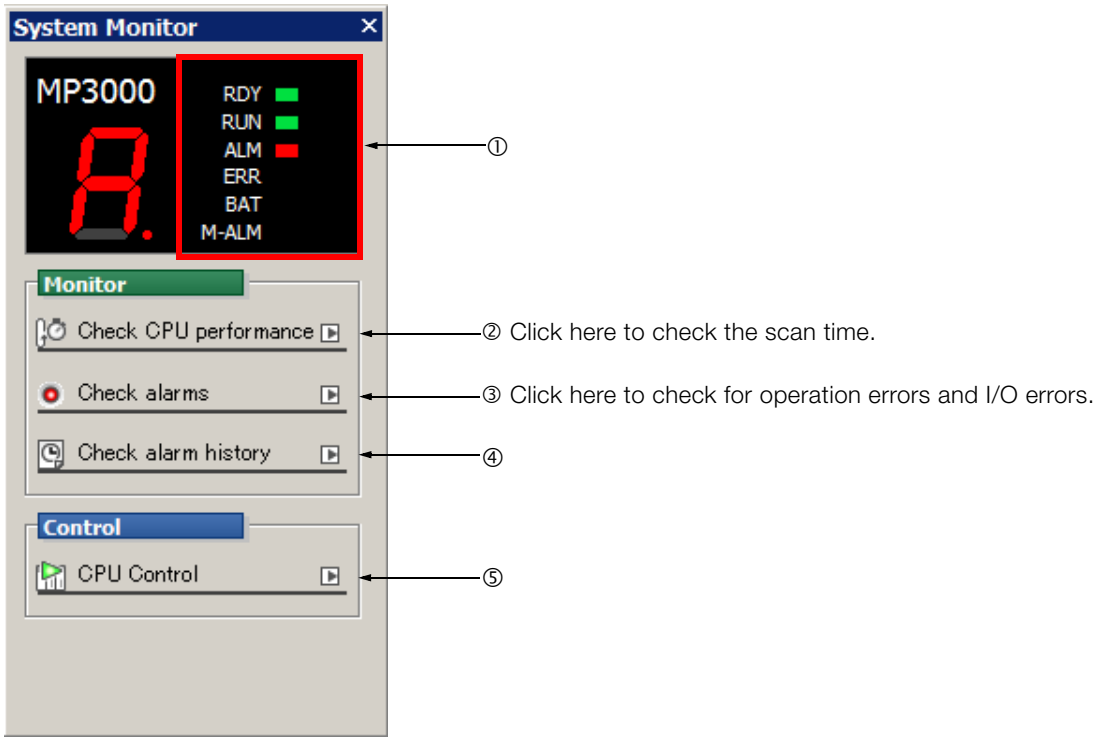
This chapter describes the procedure for checking errors by using the System Monitor.

3.1 Overview of the System Monitor

The System Monitor allows you to monitor the status of the indicators, CPU Unit, and scan time values of the Machine Controller by going online with the Machine Controller from the MPE720. The System Monitor Dialog Box is displayed if an error exists in the Machine Controller when you go online with the Machine Controller from the MPE720. The System Monitor can detect the following errors.

- RUN status of the Machine Controller
- Scan time errors
- Operation errors
- I/O errors

The System Monitor Dialog Box displays the following information.



①Run status
This area shows the run status of the Machine Controller. The ALM or ERR indicator will be lit if a system error or alarm exists.

②Scan time
Normally, this area shows the scan times. If the current or maximum values exceed the set values, the values will be displayed in red.

③Operation errors and I/O errors
This area shows the operation errors that occur in ladder programs, motion programs, and sequence programs, and the I/O errors that occur with the Input Modules and Output Modules. This information will allow you to analyze operation errors and I/O errors.

④Check alarm history
You can check a history of the errors and alarms that have occurred on the Machine Controller.

⑤CPU Control
You can start and stop the CPU and save data to flash memory.

3.2 Troubleshooting Errors with the System Monitor

This section describes how to troubleshoot errors caused by the Machine Controller system, as well as scan time exceeded errors, operation errors, and I/O errors.

3.2.1 System Errors

If one or more of the following errors appear in the System Monitor Dialog Box, a system error has occurred in the Machine Controller.

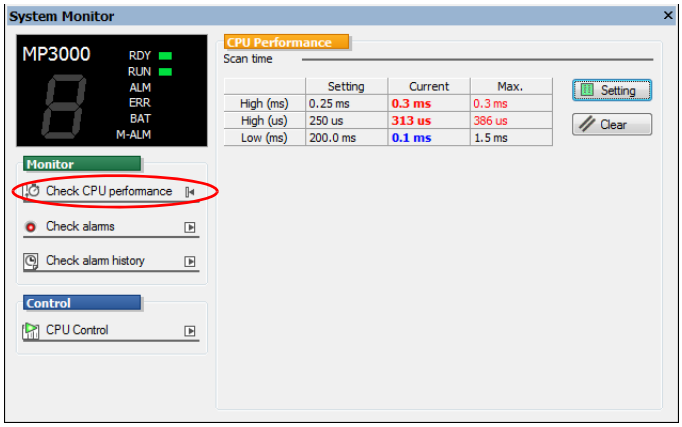
Error Displayed in System Monitor Dialog Box	Meaning of Error	Correction
The ALM indicator is lit red.	An operation error or I/O error has occurred.	Check SB000402 to identify and correct the source of the error.
The ERR indicator is lit red.	The Machine Controller has a system error and cannot enter Run Mode.	Check SB000403 to identify and correct the source of the error.
The BAT indicator is lit red.	The Battery replacement period has come.	Replace the Battery. Refer to the following chapter for Battery replacement procedures. ☞ *Chapter 8 MP3200/MP3300 Battery Replacements*

3.2.2 Scan Time Exceeded

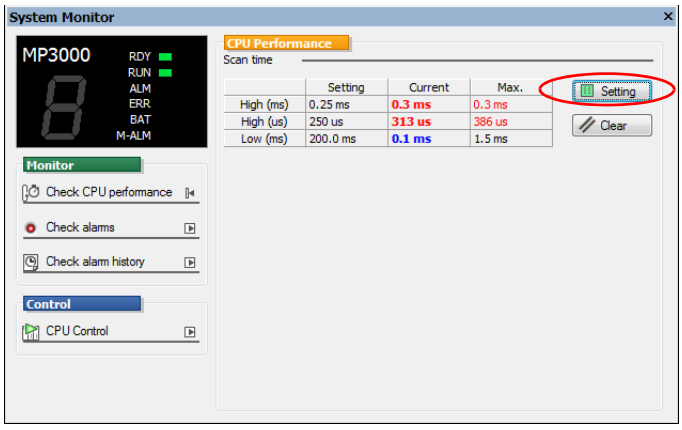
The scan time exceeded error occurs when the current value or maximum value exceeds the set value.

If a scan time exceeded error occurs, check the meaning of the error in the System Monitor Dialog Box and change the scan time setting as necessary.

1. Click **Check CPU performance** in the System Monitor Dialog Box.

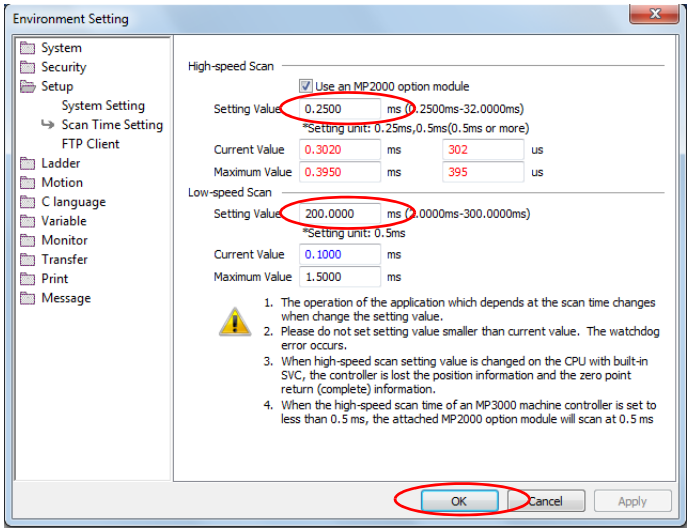


2. Click the **Setting** Button.



The Environment Setting Dialog Box will be displayed.

3. Input a value greater than **Current Value** and **Maximum Value**, and click the **OK** Button.



Information When a scan time exceeded error occurs, the current or maximum values will be displayed in red characters.

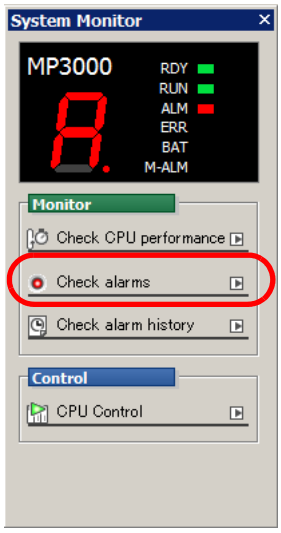
Error Displayed in Environment Setting Dialog Box	Meaning of Error	Correction
The current value is red.	The current scan time has exceeded the scan time setting.	Review the set values.
The maximum value is red.	The maximum scan time has exceeded the scan time setting.	

3.2.3 Investigating Operation Errors

An Operation Error occurs when there is an operational error in a ladder program or motion program. When an Operation Error occurs, the System Monitor Dialog Box will be displayed. The following procedure will outline the corrective action to take using the following example: an Operation Error caused by a divisor that is set to 0 in a Divide instruction.

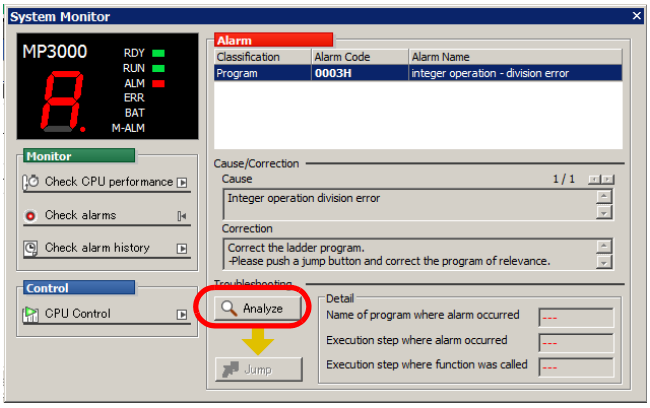
Note If there are Operation Errors in multiple programs at the same time, correcting the error displayed in the System Monitor Dialog Box will not clear the error information. This may cause the dialog box to show outdated information about the error. Click the **Reset** Button to clear the information from previous errors.

1. Click **Check alarms** in the System Monitor Dialog Box.



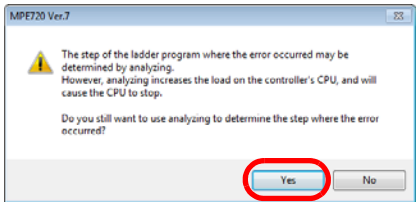
Information on current alarms will be displayed.

2. Click the **Analyze** Button.



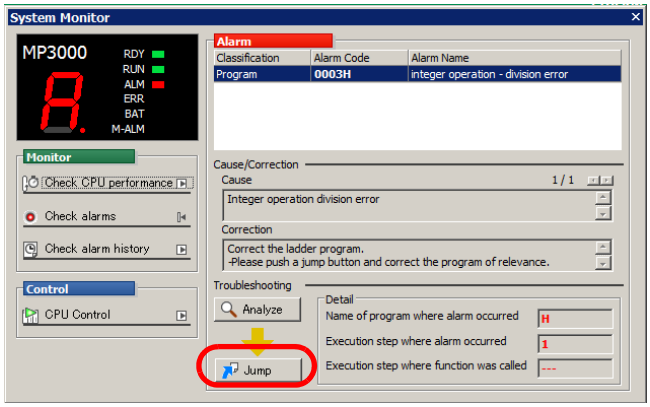
The MPE720 Ver. 7 Dialog Box will be displayed.

3. Click the **Yes** Button.



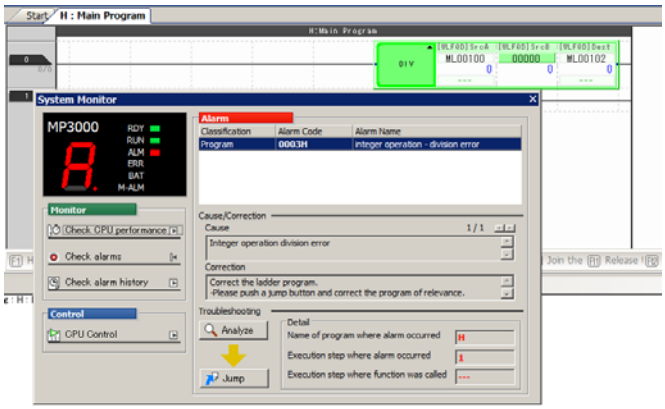
The location of the alarm will be displayed in the **Name of program where alarm occurred** and **Execution step where alarm occurred** Boxes in the **Detail** Area.

4. Click the **Jump** Button.

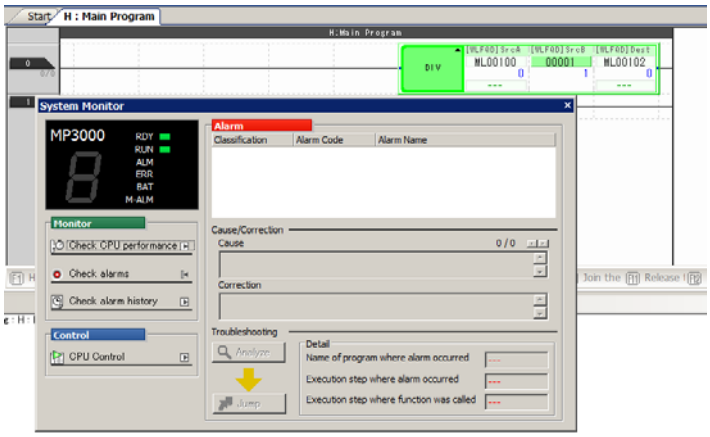


The relevant location on the drawing where the alarm occurred will be displayed.

5. Change the divisor from 0 to 1 where the operation error exists.



6. Make the Ladder Editor Tab Page the active view and press the **F4** Key.

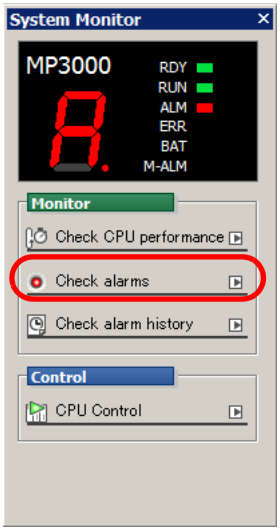


This will compile the program and clear the operation error.

3.2.4 Investigating I/O Errors

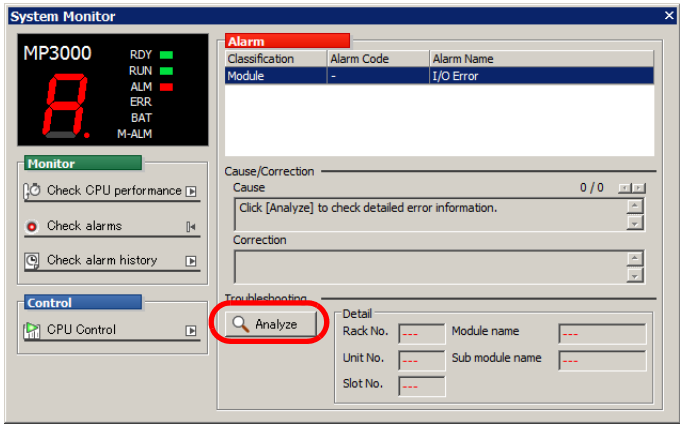
I/O errors are errors that occur in the Input and Output Modules.
If an I/O error occurs, check the meaning of the I/O error in the System Monitor Dialog Box.

1. Click **Check alarms** in the System Monitor Dialog Box.

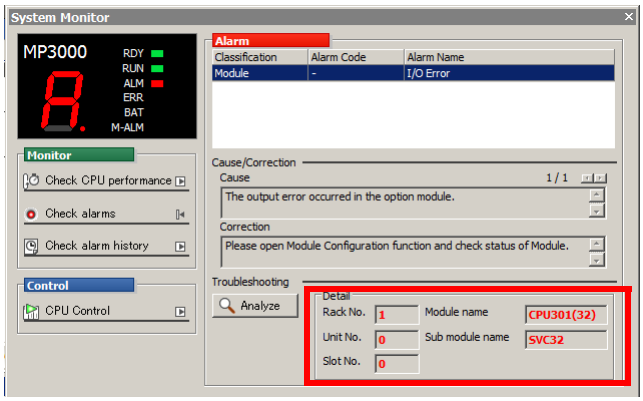


Information on current alarms will be displayed.

2. Click the **Analyze** Button.



3. Check the detailed information.



4. Check the register address where I/O errors are stored.
Refer to the following section for details on the register address.
☞ *7.5.5 System I/O Error Status* on page 7-15

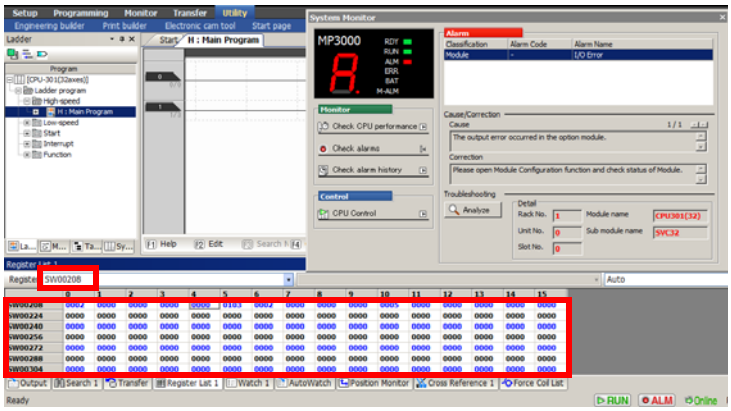
Example

In this window, the Rack number is 1 and the Module name is CPU 301 (32). Therefore, the device where the I/O error has occurred can be identified as the CPU module on Rack 1.
Next, refer to the following section.
☞ *7.5.5 System I/O Error Status* on page 7-15
Then, you will know the register addresses that store I/O errors of the CPU Module are SW00208 to SW00223 or SW09572 to SW09603.
CPU-203: SW29900 to SW29979
CPU-203F: SW09577 to SW09600

Information

In this window, the register addresses that store I/O errors are identified to be SW00213 to SW00217 or SW09577 to SW09581 because the Sub module name is SVC32.
SVC64: SW29948 to SW29979
SVF64: SW09577 to SW09600
Refer to the following section for details on the register addresses of the CPU Module.
☞ *CPU Unit/CPU Module Error Status* on page 7-17

5. Input the register address where I/O errors are stored into the **Register** Field of the register list.
The contents of the register address that has been entered and the succeeding register addresses are displayed.



6. Use the contents of the register list to determine the status of the error.

Example In this window, SW00214 is 0002. Therefore, you will know that a communication error occurred in ST#1.

(SVC/SVC32)	F	8	7	0
SW00213	Error code (station error = 1)			Subslot (function) number (= 3)

	F	2	1	0
SW00214	ST#15	•••••••••••••••••••	ST#2	ST#1	Not used.

	F	E	D			
SW00215	Not used.	ST#30	ST#29	•••••••••••••••••••	ST#17	ST#16

SW00216	Not used.
SW00217	Not used.

Table 3.1 SVC/SVC32 Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

7. Resolve the communications error status of the station.

This completes the troubleshooting procedure for I/O errors.

Troubleshooting Communications and Motion Control

4

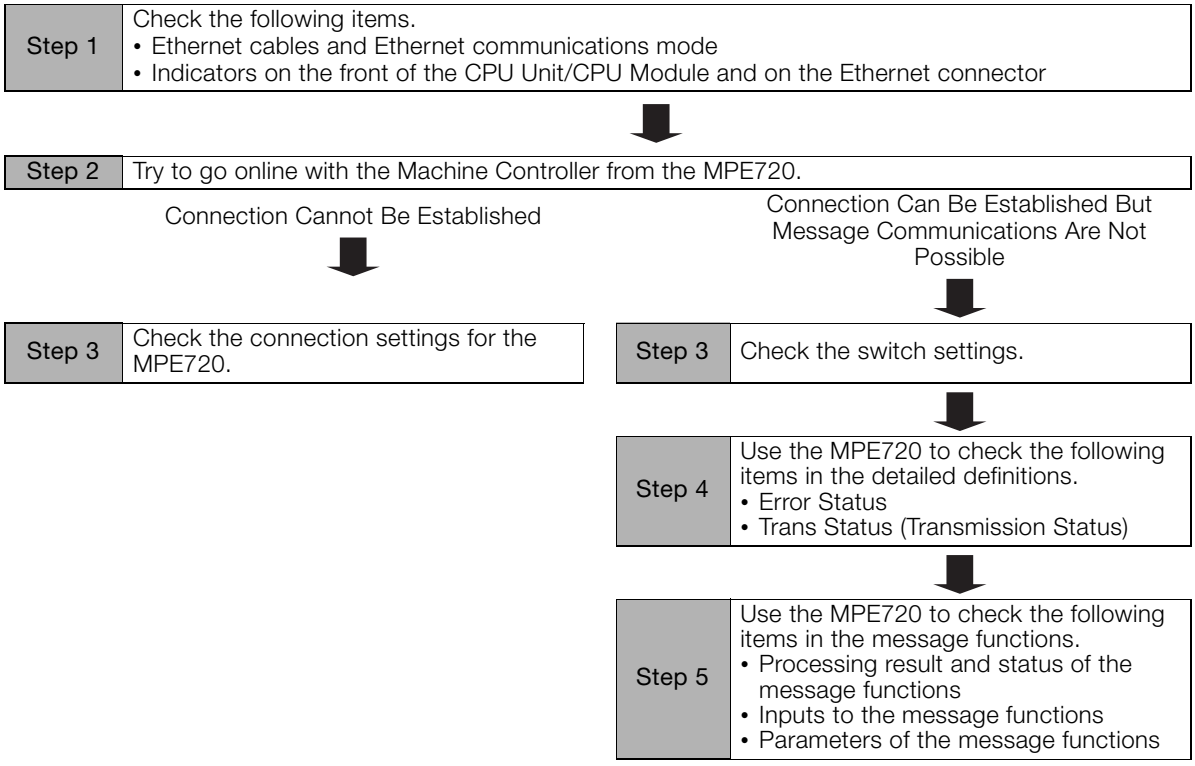
This chapter describes how to troubleshoot errors that can occur in communications or in motion control.

4.1 Troubleshooting Ethernet Communications

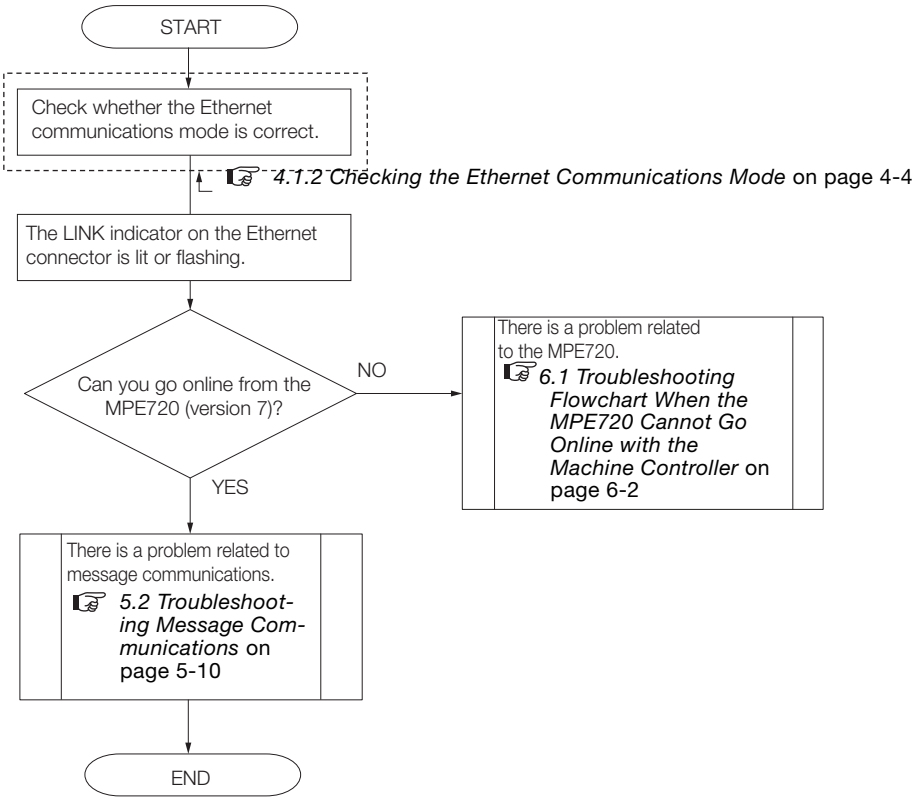
When a problem occurs in Ethernet communications, it is important to recover normal system operation as soon as possible by finding the cause of the problem and taking the necessary measures.

The basic troubleshooting procedure is outlined below.

Information The MP3100 does not have an Ethernet communications function. Therefore, problems of Ethernet communications do not occur.



Use the following flowchart to troubleshoot any problems that occur in Ethernet communications.



4.1.1 Checking Ethernet Cables

The use of incorrect Ethernet cables may interfere with connecting from the MPE720 or with message communications. For Ethernet cables, use the following twisted-pair cable with RJ-45 connectors.

Communications Function Module	Ethernet Standard	Category	Remarks
218 IFD	100Base-TX	Category 5 or higher	Use a straight or crossover cable.
218 IFG	1000Base-T	Category 5e or higher STP cable	

Note: Some commercially available devices, such as switching hubs, support automatic MDI/MDI-X configuration, which enables the use of either straight or crossover cables.

4.1.2 Checking the Ethernet Communications Mode

The following table lists the communications modes of the remote device (a directly connected hub or non-Yaskawa controller) for which communications are possible.

Communications Function Module	Communications Mode of Local Station	Communications Mode of Remote Station						
		Auto-negotiation	10Base-T Half-duplex	10Base-T Full-duplex	100Base-TX Half-duplex	100Base-TX Full-duplex	1000Base-T Half-duplex	1000Base-T Full-duplex
218 IFD	Auto-negotiation*	Depends on the remote device.	Communicates only in 10Base-T half-duplex mode.	Communications are not possible.	Communicates only in 100Base-TX half-duplex mode.	Communications are not possible.	Communications are not possible.	Communications are not possible.
218 IFG							Communicates only in 1000Base-T half-duplex mode.	Communications are not possible.

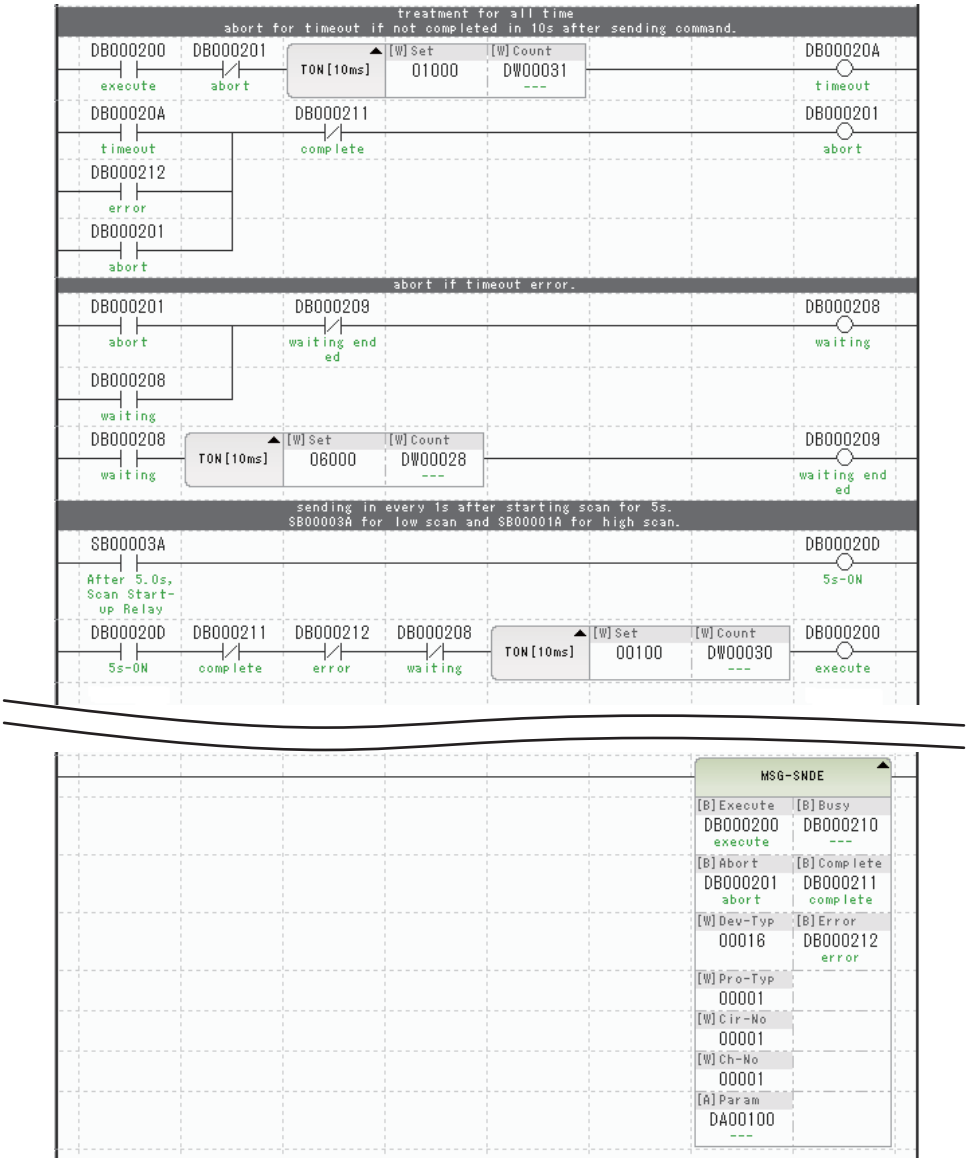
* Auto-negotiation automatically detects the Ethernet communications mode (including the baud rate and duplex mode (half/full)).

4.1.3 Troubleshooting Quick Reference

The following table provides examples of problems in Ethernet communications that occur frequently and can be corrected relatively simply.
If you cannot eliminate the error with the following table, refer to the following section.
☞ *4.1 Troubleshooting Ethernet Communications* on page 4-2

Problem	Cause	Correction
Cannot go online from the MPE720.	The IP address of the PC is set to be automatically assigned.	Set the IP address of the PC manually as shown in the following example. 218IFD: 192.168.1.1 PC: 192.168.1.10
Message communications do not start.	The E-INIT switch on the CPU Unit/CPU Module is set to ON. (The local IP address that is set in the Module's detailed definition is different from the actual local IP address.)	Set the E-INIT switch on the front of the CPU Unit/CPU Module to OFF and then turn the power supply OFF and ON again. This switch does not necessarily have to be set to OFF to perform message communications. However, always set unique IP addresses for the local IP address that is set on the rotary switches and the IP address of the remote station that is set in the connection parameters.
	The data was not saved to the flash memory or the power supply was not turned OFF and ON again after changing the transmission definition or connection parameters.	Save the data to the flash memory and then turn the power supply OFF and ON again. You must turn the power supply OFF and ON again after making changes or additions to the IP addresses or connection parameters to enable the new settings.
	No message function was created or executed in the ladder program.	Create a message function in the ladder program. No message function is required for automatic data reception or I/O message communications with the 218IFD.
	The *Dev-Typ* (Transmission Device Type) setting in the message function is not correct.	Set *Dev-Typ* to 16 for the 218IFD.
	The remote device does not have a communications function or setting for communicating with the Machine Controller.	Check the communications function or setting of the remote device.
Message communications are not completed.	UDP communications stopped.	Write the program* to retry Send Message Execute Commands with the MSG-SNDE message function.

* Use the programming shown on the next page to retry Send Message Execute Commands.


treatment for all time
abort for timeout if not completed in 10s after sending command.
DB000200
execute
DB000201
abort
TON[10ms]
[W]Set
01000
[W]Count
DW00031

DB00020A
timeout
DB00020A
timeout
DB000211
complete
DB000201
abort
DB000212
error
DB000201
abort
abort if timeout error.
DB000201
abort
DB000209
waiting end ed
DB000208
waiting
DB000208
waiting
DB000208
waiting
TON[10ms]
[W]Set
06000
[W]Count
DW00028

DB000209
waiting end ed
sending in every 1s after starting scan for 5s.
SB00003A for low scan and SB00001A for high scan.
SB00003A
After 5.0s, Scan Start-up Relay
DB00020D
5s-ON
DB00020D
5s-ON
DB000211
complete
DB000212
error
DB000208
waiting
TON[10ms]
[W]Set
00100
[W]Count
DW00030

DB000200
execute
MSG-SNDE
[B]Execute
DB000200
execute
[B]Busy
DB000210

[B]Abort
DB000201
abort
[B]Complete
DB000211
complete
[W]Dev-Typ
00016
[B]Error
DB000212
error
[W]Pro-Typ
00001
[W]Cir-No
00001
[W]Ch-No
00001
[A]Param
DA00100

4.2 Troubleshooting EtherNet/IP Communications

When a problem occurs in EtherNet/IP communications, it is important to recover normal system operation as soon as possible by finding the cause of the problem and taking the necessary measures.

The basic troubleshooting procedure is outlined below.

Information Problems in EtherNet/IP communications only occur with the MP3200 (CPU-203 and 203F).

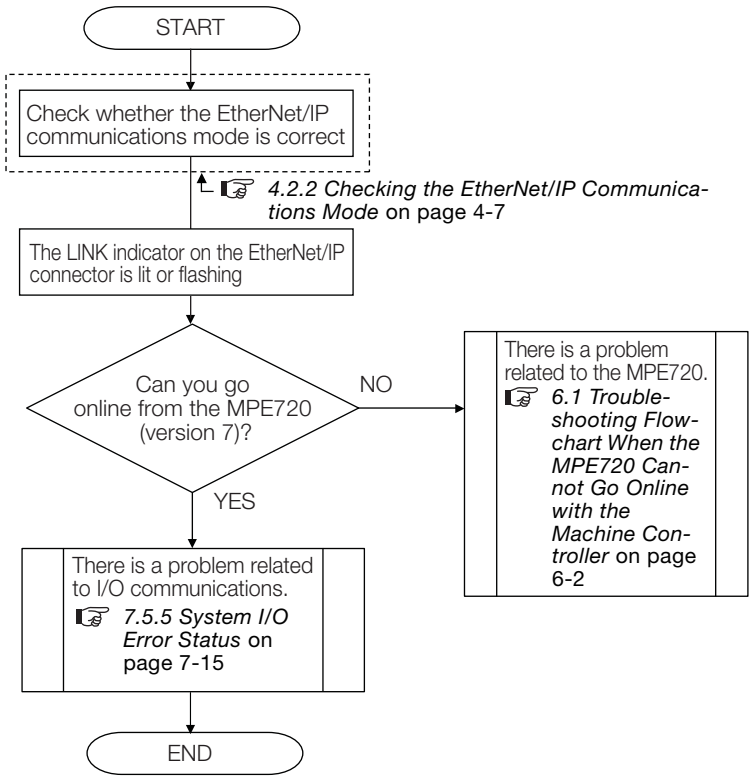
Step 1	Check the following items. • EtherNet/IP cables and EtherNet/IP communications mode • Indicators on the front of the CPU Unit and on the EtherNet/IP connector

↓

Step 2	Try to go online with the Machine Controller from the MPE720.

Connection Cannot Be Established	Connection Can Be Established But Message Communications Are Not Possible
↓	↓
Step 3: Check the connection settings for the MPE720.	Step 3: Check the switch settings.
	↓
	Step 4: Use the MPE720 system registers to check the I/O error status.

Use the following flowchart to troubleshoot any problems that occur in EtherNet/IP communications.



4.2.1 Checking EtherNet/IP Cables

The use of incorrect EtherNet/IP cables may interfere with connecting from the MPE720 or with message communications. For EtherNet/IP cables, use the following twisted-pair cable with RJ-45 connectors.

Communications Function Module	EtherNet/IP Type	Category	Remarks
218 IFG	100Base-TX, 1000Base-T	Category 5e or higher STP cable	Use a straight or crossover cable.

Note: Some commercially available devices, such as switching hubs, support automatic MDI/MDI-X configuration, which enables the use of either straight or crossover cables.

4.2.2 Checking the EtherNet/IP Communications Mode

The following table lists the communications modes of the remote device (a directly connected hub or non-Yaskawa controller) for which communications are possible.

Communications Function Module	Communications Mode of Local Station	Communications Mode of Remote Station						
		Auto-negotiation	10Base-T Half-duplex	10Base-T Full-duplex	100Base-TX Half-duplex	100Base-TX Full-duplex	1000Base-T Half-duplex	1000Base-T Full-duplex
218 IFG	Auto-negotiation*	Depends on the remote device.	Communicates only in 10Base-T half-duplex mode.	Communications are not possible.	Communicates only in 100Base-TX half-duplex mode.	Communications are not possible.	Communicates only in 1000Base-T half-duplex mode.	Communications are not possible.

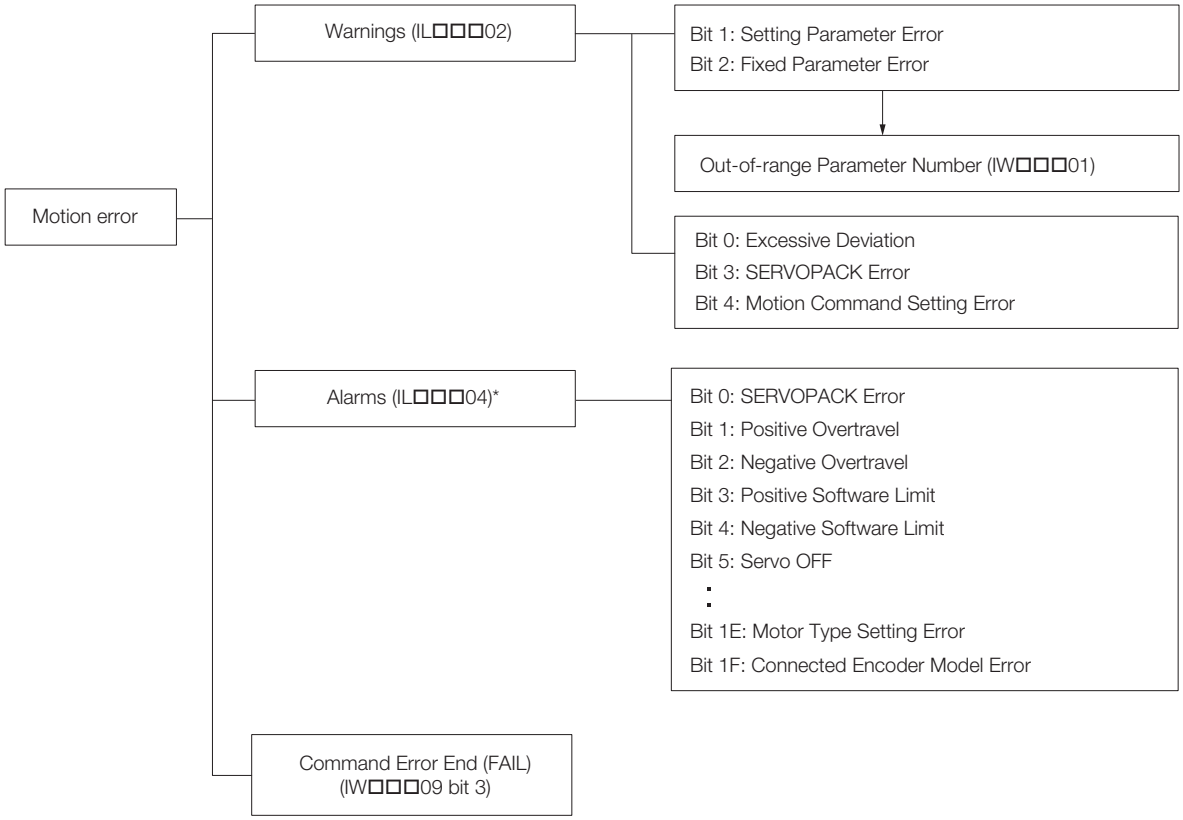
* Auto-negotiation automatically detects the EtherNet/IP communications mode (including the baud rate and duplex mode (half/full)).

4.3 Troubleshooting Motion Errors

Motion errors are errors that are detected in motion control. If a motion error occurs in the SVC/SVC32/SVC64/SVF64, the M_ALM indicator on the CPU Unit/CPU Module will light red.

You can check motion errors in the following motion parameters: Warnings (IL□□□02), Alarms (IL□□□04), and Command Error End (IW□□□09 bit 3).

The following figure illustrates motion errors.



* Refer to the following section for details on the Alarms (IL□□□04) parameter.
☞ *Alarms (IL□□□04) and Corrections* on page 4-12

4.3.1 Troubleshooting Motion Errors

This section describes the details of and corrections for motion errors.

Warnings (IL□□□02)

The following table lists the bits in the Warnings (IL□□□02) parameter.

Register Address	Name	Contents
IL□□□02	Warnings	Bit 0: Excessive Deviation
		Bit 1: Setting Parameter Error
		Bit 2: Fixed Parameter Error
		Bit 3: SERVOPACK Error
		Bit 4: Motion Command Setting Error
		Bit 5: Reserved for system.
		Bit 6: Positive Overtravel
		Bit 7: Negative Overtravel
		Bit 8: Servo ON Incomplete
		Bit 9: SERVOPACK Communications Warning
		Bit A: SERVOPACK Stop Signal Active
		Bits B to 1F: Reserved for system.

Note: "IW□□□00" indicates the first input register address plus 00.

◆ Troubleshooting Warnings (IL□□□02)

■ Bit 0: Excessive Deviation

Detection Timing	Anytime except during speed or torque control. This warning is detected only when bit 0 (Excessive Deviation Error Level Setting) in the OW□□□01 setting parameter is set to 1 (Warning).
Processing When Warning Occurs	The current movement command is continued. Movement commands can be executed.
Details and Cause	The position deviation exceeded the OL□□□22 setting parameter (Excessive Deviation Detection Value). Any of the following is possible. • Response was poor because the position loop or speed loop gain is not suitable. • The value of OL□□□22 (Excessive Deviation Detection Value) is too small. • The capacity of the motor is too small for the load. • The SERVOPACK malfunctioned.
Correction	Check the following and make suitable corrections where necessary. • Check the position loop or speed loop gain. • Check the OL□□□22 (Excessive Deviation Detection Value) parameter. • Check the capacity of the motor.

Note: The deviation is not checked if the OL□□□22 (Excessive Deviation Detection Value) parameter is set to 0.

■ Bit 1: Setting Parameter Error

Detection Timing	At execution of a motion command.
Processing When Warning Occurs	The number of the setting parameter in which an error was detected is reported in the IW□□□01 monitor parameter (Out-of-range Parameter Number).
Details and Cause	Any of the following is possible. • The set value of the setting parameter exceeds the setting range. • The value of the setting parameter that was specified when a motion command was executed was not correct.
Correction	Check the set value of the setting parameter that was reported in the IW□□□01 monitor parameter (Out-of-range Parameter Number).

■ Bit 2: Fixed Parameter Error

Detection Timing	When saving the fixed parameters.
Processing When Warning Occurs	The number of the fixed parameter in which an error was detected is reported in the IW□□□01 monitor parameter (Out-of-range Parameter Number). Bit 0 (Motion Operation Ready) in the IW□□□00 monitor parameter changes to 0 (Motion operation not ready).
Details and Cause	A setting range error or operation error occurred in internal processing that used more than one fixed parameter.
Correction	Check the set value of the fixed parameter that was reported in the IW□□□01 monitor parameter (Out-of-range Parameter Number).

Note: The following fixed parameters are related to a fixed parameter error for the electronic gear. Check the settings of these parameters.
Bit 0 (Axis Selection) and bit 9 (Simple Absolute Infinite Axis Position Management) in the Function Selection Flags 1 parameter, and the Reference Unit Selection, Travel Distance per Machine Rotation, Servomotor Gear Ratio Term, Machine Gear Ratio Term, Infinite-length Axis Reset Position, Encoder Selection, Number of Pulses per Motor Rotation, and Maximum Number of Absolute Encoder Rotations parameters

■ Bit 3: SERVOPACK Error

Detection Timing	Anytime
Processing When Warning Occurs	The current movement command is continued. Movement commands can be executed.
Details and Cause	This warning indicates that a warning occurred in the SERVOPACK. Check the nature of the warning in bits 8 to B (Command Error Status) and bits C to F (Communications Error Status) of the IW□□□2C monitor parameter, and the IW□□□2D monitor parameter (SERVOPACK Alarm Code).
Correction	Check the nature of the SERVOPACK warning and eliminate the cause.

■ Bit 4: Motion Command Setting Error

Detection Timing	At start of motion command execution.
Processing When Warning Occurs	The motion command is disabled.
Details and Cause	An unsupported motion command code was set.
Correction	Correct the motion command code.

■ Bit 6: Positive Overtravel and Bit 7: Negative Overtravel

Detection Timing	During execution of a movement motion command. Overtravel detection is enabled while the OT signal in travel direction is OFF.
Processing When Warning Occurs	• Stop processing is performed in the SERVOPACK. The stop method and the operation after stopping depend on the SERVOPACK parameter settings. • Controller Processing The current movement command is continued.
Details and Cause	Any of the following is possible. • A command was issued that caused a travel limit of the machine to be exceeded for one of the following: A command from a user program Manual operation that exceeds the travel limit • An error in the overtravel signal
Correction	• Check the following items: Check the overtravel signal. Check programmed and manual operation. • After completing the above checks, return the axis to eliminate the overtravel condition.

■ Bit 8: Servo ON Incomplete

Detection Timing	Anytime
Processing When Warning Occurs	Movement commands cannot be executed.
Details and Cause	The power to the Servomotor was not turned ON even though bit 0 (Servo ON) of the OW□□□00 setting parameter was turned ON. Any of the following is possible. • The change in the Servo ON command from OFF to ON was not detected. • There is an alarm in the SERVOPACK. • The main circuit power supply to the SERVOPACK is OFF.
Correction	Turn ON the Servo ON command again. Check the SERVOPACK for alarms and check the power supply status and stop signal status.

■ Bit 9: SERVOPACK Communications Warning

Detection Timing	Anytime
Processing When Warning Occurs	The current movement command is continued. Movement commands can be executed.
Details and Cause	This bit shows individual errors in MECHATROLINK communications.
Correction	When the communications error stops, normal status is recovered automatically. If warnings occur frequently, reroute the MECHATROLINK cable, change the ground, or implement other noise countermeasures.

Note: If communications errors occur consecutively, an alarm will be shown in IL□□□04 bit 11 (SERVOPACK Communications Error).

■ Bit A: SERVOPACK Stop Signal Active

Detection Timing	Anytime
Processing When Warning Occurs	The power supply to the Servomotor is turned OFF and movement commands are not executed.
Details and Cause	The stop signal (or an HWBB for Σ-V/Σ-7 SERVOPACKs) was received by the SERVOPACK.
Correction	Confirm safety, and then disable the stop signal.

Alarms (IL□□□04) and Corrections

This section describes the alarms that are given in IL□□□04 and the corrections for them.

◆ Alarms in IL□□□04

The following table lists the bits in the Alarms (IL□□□04) parameter.

IL□□□04	Alarm	IL□□□04	Alarm
Bit 0	SERVOPACK Error	Bit 10	SERVOPACK Synchronized Communications Error
Bit 1	Positive Overtravel	Bit 11	SERVOPACK Communications Error
Bit 2	Negative Overtravel	Bit 12	SERVOPACK Communications Timeout Error
Bit 3	Positive Software Limit	Bit 13	Excessive Absolute Encoder Rotations
Bit 4	Negative Software Limit	Bit 14	Reserved for system.
Bit 5	Servo OFF	Bit 15	Reserved for system.
Bit 6	Positioning Time Exceeded	Bit 16	Not used.
Bit 7	Excessive Positioning Travel Distance	Bit 17	Not used.
Bit 8	Excessive Speed	Bit 18	Not used.
Bit 9	Excessive Deviation	Bit 19	Not used.
Bit A	Filter Type Change Error	Bit 1A	Not used.
Bit B	Filter Time Constant Change Error	Bit 1B	Not used.
Bit C	Not used.	Bit 1C	Not used.
Bit D	Zero Point Unset	Bit 1D	Not used.
Bit E	Not used.	Bit 1E	Motor Type Setting Error
Bit F	Not used.	Bit 1F	Connected Encoder Model Error

◆ Corrections for Alarms (IL□□□04)

■ Bit 0: SERVOPACK Error

Detection Timing	SERVOPACK alarms are detected in the alarm control section (always).
Processing When Alarm Occurs	The current command is canceled. If a SERVOPACK Error alarm occurs during execution of a POSING command, the POSING operation is canceled and the axis decelerates to a stop. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	The cause depends on the specific alarm. The specific alarm is given in IW□□□2D (SERVOPACK Alarm Code).
Correction	• Check the specific SERVOPACK alarm and eliminate the cause. • Reset the alarm.

Note: This bit changes to 1 when an alarm that is classified as a SERVOPACK alarm occurs in MECHATROLINK communications.

■ Bit 1: Positive Overtravel and Bit 2: Negative Overtravel

Detection Timing	These alarms are detected by the position control section during execution of a motion command (always). Overtravel detection is enabled while the OT signal in travel direction is OFF.
Processing When Alarm Occurs	• Stop processing is performed in the SERVOPACK. The stop method and the operation after stopping depend on the SERVOPACK parameter settings. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON. • Controller Processing The command is canceled and the axis decelerates to a stop. Followup processing to align the command position with the current machine position is performed.
Details and Cause	Any of the following is possible. • A command was issued that caused a travel limit of the machine to be exceeded for one of the following: A command from a user program Manual operation that exceeds the travel limit • An error in the overtravel signal
Correction	• Check the following items: Check the overtravel signal. Check programmed and manual operation. • After checking the above items, clear the motion command code and reset the alarm. Then return the axis to eliminate the overtravel condition. (Commands in the overtravel direction will be disabled. If you attempt to execute one, the alarm will occur again.)

Note: For a vertical axis, we recommend that you make the following settings in the SERVOPACK to prevent falling or oscillation at the overtravel boundary.
- Using an emergency stop to decelerate to a stop
- Implementing a zero clamp after decelerating to a stop

■ Bit 3: Positive Software Limit and Bit 4: Negative Software Limit

Detection Timing	Detection is enabled when a motion command is used. These alarms are detected by the position control section. Detection is enabled after completion of a Zero Point Return or a Set Zero Point command.
Processing When Alarm Occurs	The axis decelerates to a stop at the software limit. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	A command was issued that caused a software limit to be exceeded for one of the following: • A command from a user program that exceeds the travel limit • Manual operation that exceeds the travel limit
Correction	• Check programmed and manual operation. • After checking the above item, clear the motion command code and reset the alarm. Then return the axis to within the software limit. (Commands in the direction of the software limit will be disabled. If you attempt to execute one, the alarm will occur again.)

■ Bit 5: Servo OFF

Detection Timing	This alarm is detected when a movement command is attempted when the power to the Servomotor is OFF.
Processing When Alarm Occurs	The movement command is not executed. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	A movement command (Positioning, External Positioning, Jog, or STEP Operation) was issued when the power to the Servomotor was OFF.
Correction	Clear the motion command code, reset the alarm, and then turn ON the power to the Servomotor.

■ Bit 6: Positioning Time Exceeded

Detection Timing	Positioning was not completed within the time set in OW□□□26 (Positioning Completion Check Time) after the completion of pulse distribution.
Processing When Alarm Occurs	The current command is aborted. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	Any of the following is possible. • Response was poor or oscillation occurred because the position loop or speed loop gain is not suitable. • The time in OW□□□26 (Positioning Completion Check Time) is too short. • The capacity of the Servomotor is too small for the load. • The SERVOPACK and Servomotor are not connected correctly.
Correction	Check the following items. • Check the parameters that are related to the characteristics (gains) of the SERVOPACK. • Check the connection between the SERVOPACK and Servomotor. • See if the capacity of the Servomotor is sufficient. • Check the time in OW□□□26 (Positioning Completion Check Time).

Note: The positioning time is not checked if the OW□□□26 (Positioning Completion Check Time) parameter is set to 0.

■ Bit 7: Excessive Positioning Travel Distance

Detection Timing	This alarm is detected when a positioning command is executed.
Processing When Alarm Occurs	Movement commands are not executed. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	A movement command (Positioning, STEP Operation, or External Positioning) that exceeded the positioning travel limit was issued.
Correction	Check the axis travel distance specification in the positioning command.

The positioning travel limits depend on the setting of fixed parameter No. 4 (Reference Unit Selection) as given below.

Setting of Fixed Parameter No. 4	0	1	2	3	4
Reference unit	Pulses	mm	Degrees	Inches	μm
Positioning travel limit	2,147,483,647	$2{,}147{,}483{,}647 \times \frac{\text{No. 6 (Travel Distance per Machine Rotation)} \times \text{No. 9 (Machine Gear Ratio Term)}}{\text{No. 36 (Numbers of Pulses Per Motor Rotation)} \times \text{No. 8 (Servomotor Gear Ratio Term)}}$			

■ Bit 8: Excessive Speed

Detection Timing	This alarm is detected when a movement command is executed.
Processing When Alarm Occurs	Movement commands are not executed. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	The command speed (or, for interpolation, the distributed travel distance for one scan) that was sent to the SERVOPACK with MECHATROLINK communications exceeded the allowed upper limit.
Correction	Check the speed reference, travel distance per scan for the interpolation reference, and the speed compensation setting.

■ Bit 9: Excessive Deviation

Detection Timing	Anytime except during speed or torque control.
Processing When Alarm Occurs	Movement commands are not executed. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	Any of the following is possible. • Response was poor because the position loop or speed loop gain is not suitable. • The value of OL□□□22 (Excessive Deviation Detection Value) is too small. • The capacity of the motor is too small for the load. • The SERVOPACK malfunctioned.
Correction	Check the following and make suitable corrections where necessary. If recovery is not possible, contact the maintenance division. • Check the position loop or speed loop gain. • Check the OL□□□22 (Excessive Deviation Detection Value) parameter. • Check the capacity of the motor.

Note: The deviation is not checked if the OL□□□22 (Excessive Deviation Detection Value) parameter is set to 0.

■ Bit A: Filter Type Change Error

Detection Timing	Always detected (This alarm is detected by the motion command processing section.)
Processing When Alarm Occurs	The Change Filter Type command is not executed. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	An error will occur if the Change Filter Type command is specified when pulse distribution has not been completed for a command (i.e., when bit 0 in IW□□□0C is OFF).
Correction	Correct the program so that the Change Filter Type command is executed only after pulse distribution is completed (i.e., only when bit 0 in IW□□□0C is ON).

Note: The current command will not stop even if this error occurs. To stop the current command, program stop processing in a user program.

■ Bit B: Filter Time Constant Change Error

Detection Timing	Always detected (This alarm is detected by the motion command processing section.)
Processing When Alarm Occurs	Commands are not executed. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	An error will occur if the Change Filter Time Constant command is specified when pulse distribution has not been completed for a command (i.e., when bit 0 in IW□□□0C is OFF).
Correction	Correct the program so that the Change Filter Time Constant command is executed only after pulse distribution is completed (i.e., only when bit 0 in IW□□□0C is ON).

Note: The current command will not stop even if this error occurs. To stop the current command, program stop processing in a user program.

■ Bit D: Zero Point Unset

Detection Timing	Detection of this alarm is enabled only when an absolute encoder and an infinite-length axis are used. The alarm is detected when the following command is set in OW□□□08 (Motion Commands). Commands: Positioning, External Positioning, Interpolation, Latch, or Issue Phase Reference
Processing When Alarm Occurs	The command that was set is not executed. Bit 3 (Command Error End) in IW□□□09 (Motion Command Status) turns ON.
Details and Cause	A movement command was set when the zero point was not set (i.e., when bit 5 of IW□□□0C was OFF).
Correction	Clear the motion command, reset the alarm, and then perform an operation to set the zero point.

■ Bit 10: SERVOPACK Synchronized Communications Error

Detection Timing	This alarm is detected by the communications control section when MECHATROLINK communications are synchronized between the Machine Controller and the SERVOPACK.
Processing When Alarm Occurs	The current command is canceled.
Details and Cause	Data was not updated properly on either the Machine Controller or the SERVOPACK.
Correction	Check the connection of the MECHATROLINK cable, and then reset the alarm.

■ Bit 11: SERVOPACK Communications Error

Detection Timing	This alarm is detected by the communications control section when MECHATROLINK communications is being performed between the Machine Controller and the SERVOPACK.
Processing When Alarm Occurs	• The current command is canceled. • The SERVOPACK turns OFF the power to the Servomotor.
Details and Cause	MECHATROLINK communications stopped because the cable was disconnected, there is an error in MECHATROLINK communications (e.g., noise entered the communications path), the power supply to the SERVOPACK was interrupted, etc.
Correction	Check the connection of the MECHATROLINK cable, and then reset the alarm.

■ Bit 12: SERVOPACK Communications Timeout Error

Detection Timing	This alarm is detected during execution of a motion command. This alarm is detected by the MECHATROLINK communications control section when the servo command/response check is performed in the processing sections.
Processing When Alarm Occurs	The current command is canceled.
Details and Cause	The servo command in MECHATROLINK communications was not completed within the specified time (5 seconds).
Correction	Check for alarms in the SERVOPACK with MECHATROLINK Communications.

Note: This alarm occurs in the SERVOPACK with MECHATROLINK Communications when Module assignment is completed but the power supply to the SERVOPACK is not turned ON.

■ Bit 13: Excessive Absolute Encoder Rotations

Detection Timing	Detection of this alarm is enabled only when an absolute encoder, finite-length axis, and electronic gear are used. This alarm is detected by the position control section when the power supply is turned ON.
Processing When Alarm Occurs	The absolute position information that is read from the absolute encoder when the SEN signal turns ON is ignored.
Details and Cause	An operation error occurred when converting the absolute position information that was read from the absolute encoder when the power supply was turned ON from pulses to reference units.
Correction	Correct the settings of the gear ratio, encoder pulses, and other related fixed parameters.

■ Bit 16: Scan Setting Error

Detection Timing	This alarm is detected when the Machine Controller is started, when the high-speed scan setting is changed or saved, or when the MECHATROLINK communications settings are changed or saved.
Processing When Alarm Occurs	A communications alarm will occur for all SERVOPACKs and I/O stations connected to the MECHATROLINK.
Details and Cause	The high-speed scan setting and the MECHATROLINK communications cycle setting are not an integer multiple of 1, or an integer fraction of 1.
Correction	Check the settings for the high-speed scan or the MECHATROLINK communications cycle.

■ Bit 1C: Cyclic Communications Initialization Incomplete

Detection Timing	This alarm is detected by the MECHATROLINK communications control section when MECHATROLINK communications are in progress.
Processing When Alarm Occurs	Communications cannot be performed with the slave station where this error occurred.
Details and Cause	The slave station was assigned for MECHATROLINK communications but was not actually connected, or was connected while communications were in progress but failed to join in the communications.
Correction	Turn the power supply to the Controller OFF and ON again, or execute a network reset (0W□□□00 = Bit C).

■ Bit 1D: Detected SERVOPACK Model Error

Detection Timing	This alarm is detected when trying to establish MECHATROLINK communications with a SERVOPACK.
Processing When Alarm Occurs	Communications cannot be performed with the SERVOPACK where this error occurred.
Details and Cause	The SERVOPACK model assigned in the Module configuration definitions does not match the actual SERVOPACK model that is connected.
Correction	• Change the model selected for the SERVOPACK to match the one that is actually connected. • If the model is not supported by the latest version of the MPE720, assign it as a wildcard SERVOPACK.

■ Bit 1E: Motor Type Setting Error

Detection Timing	This alarm is detected when communications is established with the SERVOPACK.
Processing When Alarm Occurs	No special processing is performed.
Details and Cause	The setting (rotary/linear) of the Motor Type fixed parameter does not agree with the setting in the SERVOPACK (Pn000.3 (Startup Selection Settings) for an SGDH SERVOPACK or Rotary/Linear for an SGDS SERVOPACK).
Correction	Check the settings and model number of the SERVOPACK.

■ Bit 1F: Connected Encoder Model Error

Detection Timing	This alarm is detected when communications is established with the SERVOPACK.
Processing When Alarm Occurs	No special processing is performed.
Details and Cause	The setting (rotary/linear) of the Motor Type fixed parameter does not agree with the Servomotor that is connected to the SERVOPACK.
Correction	Check the Servomotor.

Causes of Command Error End Alarms (IW□□□09 Bit 3)

Bit 3 (Command Error End) of the IW□□□09 monitor parameter will turn ON when a motion command cannot be executed for some reason or if execution does not end normally. The reasons that cause this bit to turn ON depend on the motion command.

The following table gives the reasons that cause this bit to turn ON for each motion command.

Motion Command Code		Reason for Command Error End	Warnings (W) and Alarms (A) That Occur at the Same Time
1	POSING (Positioning)	The positioning travel distance exceeded the allowed value.	A: Excessive Positioning Travel Distance
		An absolute infinite-length axis is being used but the zero point is not set.	A: Zero Point Unset
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
2	EX_POSING (External Positioning)	The positioning travel distance exceeded the allowed value.	A: Excessive Positioning Travel Distance
		An absolute infinite-length axis is being used but the zero point is not set.	A: Zero Point Unset
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		Writing the SERVOPACK parameters was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error
		An external signal selection is not within the setting range.	W: Setting Parameter Error
3	Zero Point Return (ZRET)	The machine is locked.	–
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		Reading or writing the SERVOPACK parameters was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error
		The zero point return method is not set within the setting range.	W: Setting Parameter Error
		The zero point return method is set to P-OT, but the approach speed is negative.	W: Setting Parameter Error
		The zero point return method is set to N-OT, but the approach speed is positive.	W: Setting Parameter Error
		The zero point return method is set to DEC1 + phase-C pulse, ZERO signal, DEC1 + ZERO signal, or Phase-C pulse, but the OT signal in the zero point return direction is ON.	OT alarm or OT warning in the zero point return direction

Continued on next page.

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Motion Command Code		Reason for Command Error End	Warnings (W) and Alarms (A) That Occur at the Same Time
4 or 5	INTERPOLATE (Interpolation) END_OF_INTERPOLATE (Last Interpolation Segment)	The travel distance for one scan exceeded the allowable segment for a SERVOPACK with MECHATROLINK Communications or the speed feedforward value exceeded the maximum speed.	A: Excessive Speed
		An absolute infinite-length axis is being used but the zero point is not set.	A: Zero Point Unset
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
6	LATCH (Latch)	The travel distance for one scan exceeded the allowable segment for a SERVOPACK with MECHATROLINK Communications or the speed feedforward value exceeded the maximum speed.	A: Excessive Speed
		An absolute infinite-length axis is being used but the zero point is not set.	A: Zero Point Unset
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		The latch signal is set outside of the setting range.	W: Setting Parameter Error
7	FEED (Jog)	The machine is locked.	–
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
8	STEP (STEP Operation)	The positioning travel distance exceeded the allowed value.	A: Excessive Positioning Travel Distance
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
9	ZSET (Set Zero Point)	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
10 or 11	ACC (Change Linear Acceleration Time Constant) DCC (Change Linear Deceleration Time Constant)	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		The command was executed when pulse distribution was not completed (i.e., when DEN was OFF).	–
		Writing the SERVOPACK parameters was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error

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Motion Command Code		Reason for Command Error End	Warnings (W) and Alarms (A) That Occur at the Same Time
12	SCC (Change Filter Time Constant)	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		The command was executed when pulse distribution was not completed (i.e., when DEN was OFF).	A: Filter Time Constant Change Error
		Writing the SERVOPACK parameters was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error
13	CHG_FILTER (Change Filter Type)	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		The command was executed when pulse distribution was not completed (i.e., when DEN was OFF).	A: Filter Time Constant Change Error
		The filter type is set outside of the setting range.	W: Setting Parameter Error
14, 15, or 16	KVS (Change Speed Loop Gain) KPS (Change Position Loop Gain) KFS (Change Feedforward)	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		Writing the SERVOPACK parameters was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error
17 or 18	PRM_RD (Read Parameter) PRM_WR (Write Parameter)	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		Reading the SERVOPACK parameter was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error
		The SERVOPACK parameter number or parameter size is set outside of the setting range.	W: Setting Parameter Error
19 or 20	ALM_MON (Monitor Alarms) ALM_HIST (Monitor Alarm History)	The command to the SERVOPACK was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		The SERVOPACK alarm monitor number was set outside of the setting range.	W: Setting Parameter Error
21	ALMHIST_CLR (Clear Alarm History)	The command to the SERVOPACK was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
22	ABS_RST (Reset Absolute Encoder)	The command was issued when the power to the Servomotor was ON.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		The command to the SERVOPACK was not completed within the specified time.	A: SERVOPACK Communications Timeout Error

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Motion Command Code		Reason for Command Error End	Warnings (W) and Alarms (A) That Occur at the Same Time
23	VELO (Issue Speed Reference)	The command was issued for a MECHATROLINK connection.	–
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
24	TRQ (Issue Torque Reference)	The command was issued for a MECHATROLINK connection.	–
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
25	PHASE (Issue Phase Reference)	An absolute infinite-length axis is being used but the zero point is not set.	A: Zero Point Unset
		The power to the Servomotor is OFF.	A: Servo OFF
		An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
26	KIS (Change Position Loop Integral Time)	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		Writing the SERVOPACK parameters was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error
–	SERVOPACK parameter auto-write when other movement commands are executed*	An alarm has occurred.	–
		Communications are not synchronized.	A: SERVOPACK Synchronized Communications Error
		Writing the SERVOPACK parameters was not completed within the specified time.	A: SERVOPACK Communications Timeout Error
		An A.94 or A.95 warning occurred in the SERVOPACK.	W: SERVOPACK Error
		Pulse distribution is not completed (i.e., DEN is OFF).	–

* This applies when the SERVOPACK Parameter Auto-Write fixed parameter is set to 0 (Enabled) and the set value of the Filter Time Constant, Acceleration Rate/Acceleration Time Constant, or Deceleration Rate/Deceleration Time Constant parameter is changed at the same time as the movement command is set.

4.3.2 Checking Status and Alarms of a Reference-type SERVOPACK with MECHATROLINK Communications

Use the MPE720 to check the status and alarms of a Reference-type SERVOPACK with MECHATROLINK Communications.

This section gives the items that can be checked in the SERVOPACK status and alarm information.

SERVOPACK Status Monitor (IW□□□2C) Table

The status of a Reference-type SERVOPACK with MECHATROLINK Communications can be monitored in the SERVOPACK Status Monitor parameter (IW□□□2C).

Bit	Status	Meaning
Bit 0	Drive Alarm (D_ALM)	0: No drive alarm. 1: Drive alarm occurred.
Bit 1	Drive Warning (D_WAR)	0: No drive warning. 1: Drive warning occurred.
Bit 2	Command Ready (CMDRDY)	0: Commands cannot be received. 1: Commands can be received.
Bit 3	Alarm Clear Execution Completed (ALM_CLR_CMP)	0: Servo OFF (base lock) 1: Servo ON (no base lock)
Bit 6 and Bit 7	Echo-back of Command ID (RCMD_ID)	This parameter reports the echo-back value of the command ID of a MECHATROLINK command.
Bit 8 to Bit B	Command Error (CMD_ALM)	This parameter reports the alarm status of a MECHATROLINK command.
Bit C to Bit F	Communications Error (COMM_ALM)	This parameter reports the communications alarm status of a MECHATROLINK command.

SERVOPACK Alarm Code (IW□□□2D) Tables

If bit 0 (SERVOPACK Error) in IL□□□04 (Alarms) is ON, an alarm has occurred in the Reference-type SERVOPACK with MECHATROLINK Communications. If bit 0 (SERVOPACK Error) in IL□□□04 (Alarms) is ON, an alarm has occurred in the SERVOPACK with MECHATROLINK Communications. You can check the specific alarm in IW□□□2D (SERVOPACK Alarm Code). The alarm codes are listed in the following tables. Refer to the relevant SERVOPACK manual for corrective measures.

◆ Σ-X-series SERVOPACKs

Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	020	Parameter Checksum Error
		021	Parameter Format Error
		022	System Checksum Error
		024	System Alarm
		025	System Alarm
		030	Main Circuit Detector Error
		040	Parameter Setting Error
		041	Encoder Output Pulse Setting Error
		042	Parameter Combination Error
		044	Semi-closed/Fully-closed Loop Control Parameter Setting Error
		046	SigmaLINK II Command/Response Parameter Setting Error
		04A	Parameter Setting Error 2
		050	Combination Error
		051	Unsupported Device Alarm
		070	Detected Motor Type Change
		080	Linear Encoder Scale Pitch Setting Error
		0b0	Canceled Servo ON Command Alarm
		100	Overcurrent Detected
		101	Motor Overcurrent Detected
		102	Motor Overcurrent Detected 2
		300	Regeneration Error
		320	Regeneration Overload
		330	Main Circuit Power Supply Wiring Error
		331	Power Monitor Input Signal Error
		400	Overvoltage
		410	Undervoltage
		450	Main Circuit Capacitor Overvoltage
		510	Overspeed
		511	Overspeed of Encoder Output Pulse Rate
		520	Vibration Alarm
		521	Autotuning Alarm
		550	Maximum Speed Setting Error
		710	Maximum Momentary Overload
		720	Maximum Continuous Overload
		730, 731	Dynamic Brake Overload
		740	Overload of Surge Current Limit Resistor
		7A1	Internal Temperature Error 1 (Control Board Temperature Error)
		7A2	Internal Temperature Error 2 (Power Board Temperature Error)
		7A3	Internal Temperature Detector Error
		7Ab	Built-in Fan in SERVOPACK Stopped
		810	Encoder Backup Alarm
		820	Encoder Checksum Alarm
		830	Encoder Battery Alarm
		840	Encoder Data Alarm
		850	Encoder Overspeed
		860	Encoder Overheated
		861	Motor Overheated
		862	Overheat Alarm
		890	Encoder Scale Error

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Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	891	Encoder Module Error
		8A0	External Encoder Error
		8A1	External Encoder Module Error
		8A2	External Incremental Encoder Sensor Error
		8A3	External Absolute Encoder Position Error
		8A5	External Encoder Overspeed Error
		8A6	External Encoder Overheat Error
		b33	Current Detection Error 3
		b6A	MECHATROLINK Communications ASIC Error 1
		b6b	MECHATROLINK Communications ASIC Error 2
		bE2	Firmware error
		bF0	System Alarm 0
		bF1	System Alarm 1
		bF2	System Alarm 2
		bF3	System Alarm 3
		bF4	System Alarm 4
		bF5	System Alarm 5
		bF6	System Alarm 6
		bF7	System Alarm 7
		bF8	System Alarm 8
		bFd	System Alarm D
		C10	Runaway Detected
		C20	Phase Detection Error
		C21	Polarity Sensor Error
		C22	Phase Information Disagreement
		C50	Magnetic Pole Detection Failed
		C51	Overtravel Detected during Magnetic Pole Detection
		C52	Magnetic Pole Detection Incomplete
		C53	Magnetic Pole Detection Variable Range Exceeded
		C54	Magnetic Pole Detection Failed 2
		C80	Absolute Encoder Clear Error and Multiturn Limit Setting Error
		C90	Encoder Communications Error
		C91	Encoder Communications Position Data Acceleration Rate Error
		C92	Encoder Communications Timer Error
		CA0	Encoder Parameter Error
		Cb0	Encoder Echoback Error
		CC0	Multiturn Limit Disagreement
		Cd1	SigmaLINK II Node Configuration Error
		Cd2	SigmaLINK II Power Supply Short-Circuit Detected
		Cd3	SigmaLINK II Configuration Data Checksum Error
		Cd4	SigmaLINK II Node Change Detected
		Cd7	SigmaLINK II I/O Device Communications Error
		Cd8	SigmaLINK II I/O Device Status Error
		CF1	Feedback Optional Module Communications Error, Reception Failed
		CF2	Feedback Optional Module Communications Error, Timer Stopped
		d00	Position Error Overflow
		d01	Position Error Overflow Alarm at Servo ON

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Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	d02	Position Error Overflow Alarm by Speed Limit at Servo ON
		d10	Motor-load Position Error Overflow
		d30	Position Data Overflow
		E02	MECHATROLINK Internal Synchronization Error 1
		E40	MECHATROLINK Transmission Cycle Setting Error
		E41	MECHATROLINK Communications Data Size Setting Error (This alarm can occur when using MECHATROLINK-III communications.)
		E42	MECHATROLINK Station Address Setting Error (This alarm can occur when using MECHATROLINK-III communications.)
		E43	MECHATROLINK Communications Setting Error (This alarm can occur when using MECHATROLINK-4 communications.)
		E50*	MECHATROLINK Synchronization Error
		E51	MECHATROLINK Synchronization Failed
		E60*	Reception Error in MECHATROLINK Communications
		E61	Synchronization Interval Error in MECHATROLINK Transmission Cycle
		E63	MECHATROLINK Synchronization Frame Not Received
		E72	Feedback Optional Module Detection Failure Alarm
		Eb1	Safety Function Signal Input Timing Error
		EC8	Gate Drive Error 1
		EC9	Gate Drive Error 2
		Ed1	Command Execution Timeout
		F10	Main Circuit Cable Open Phase
		FL-1*	System Alarm
		FL-2*	System Alarm
		FL-3*	System Alarm
		FL-4*	System Alarm
		FL-5*	System Alarm
		FL-6*	System Alarm
		CPF00	Digital Operator Transmission Error 1
		CPF01	Digital Operator Transmission Error 2

* These alarms are not stored in the alarm history. They are only displayed on the panel display.

◆ Σ-7-series SERVOPACKs

Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	020	Parameter Checksum Error
		021	Parameter Format Error
		022	System Checksum Error
		024	System Alarm
		025	System Alarm
		030	Main Circuit Detector Error
		040	Parameter Setting Error
		041	Encoder Output Pulse Setting Error
		042	Parameter Combination Error
		044	Semi-closed/Fully-closed Loop Control Parameter Setting Error
		04A	Parameter Setting Error 2
		050	Combination Error
		051	Unsupported Device Alarm
		070	Detected Motor Type Change
		080	Linear Encoder Scale Pitch Setting Error
		0b0	Canceled Servo ON Command Alarm
		100	Overcurrent Detected
		101	Motor Overcurrent Detected
		102	Motor Overcurrent Detected 2
		300	Regeneration Error
		320	Regeneration Overload
		330	Main Circuit Power Supply Wiring Error
		400	Overvoltage
		410	Undervoltage
		450	Main Circuit Capacitor Overvoltage
		510	Overspeed
		511	Overspeed of Encoder Output Pulse Rate
		520	Vibration Alarm
		521	Autotuning Alarm
		550	Maximum Speed Setting Error
		710	Maximum Momentary Overload
		720	Maximum Continuous Overload
		730, 731	Dynamic Brake Overload
		740	Overload of Surge Current Limit Resistor
		7A1	Internal Temperature Error 1 (Control Board Temperature Error)
		7A2	Internal Temperature Error 2 (Power Board Temperature Error)
		7A3	Internal Temperature Detector Error
		7Ab	Built-in Fan in SERVOPACK Stopped
		810	Encoder Backup Alarm
		820	Encoder Checksum Alarm
		830	Encoder Battery Alarm
		840	Encoder Data Alarm
		850	Encoder Overspeed
		860	Encoder Overheated
		861	Motor Overheat
		862	Overheat Alarm
		890	Encoder Scale Error
		891	Encoder Module Error
		8A0	External Encoder Error

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Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	8A1	External Encoder Module Error
		8A2	External Incremental Encoder Sensor Error
		8A3	External Absolute Encoder Position Error
		8A5	External Encoder Overspeed Error
		8A6	External Encoder Overheat Error
		b33	Current Detection Error 3
		b6A	MECHATROLINK Communications ASIC Error 1
		b6b	MECHATROLINK Communications ASIC Error 2
		bF0	System Alarm 0
		bF1	System Alarm 1
		bF2	System Alarm 2
		bF3	System Alarm 3
		bF4	System Alarm 4
		bF5	System Alarm 5
		bF6	System Alarm 6
		bF7	System Alarm 7
		bF8	System Alarm 8
		C10	Runaway Detected
		C20	Phase Detection Error
		C21	Polarity Sensor Error
		C22	Phase Information Disagreement
		C50	Magnetic Pole Detection Failed
		C51	Overtravel Detected during Magnetic Pole Detection
		C52	Magnetic Pole Detection Incomplete
		C53	Magnetic Pole Detection Variable Range Exceeded
		C54	Magnetic Pole Detection Failed 2
		C80	Absolute Encoder Clear Error and Multiturn Limit Setting Error
		C90	Encoder Communications Error
		C91	Encoder Communications Position Data Acceleration Rate Error
		C92	Encoder Communications Timer Error
		CA0	Encoder Parameter Error
		Cb0	Encoder Echoback Error
		CC0	Multiturn Limit Disagreement
		CF1	Feedback Optional Module Communications Error, Reception Failed
		CF2	Feedback Optional Module Communications Error, Timer Stopped
		d00	Position Error Overflow
		d01	Position Error Overflow Alarm at Servo ON
		d02	Position Error Overflow Alarm by Speed Limit at Servo ON
		d10	Motor-load Position Error Overflow
		d30	Position Data Overflow
		E02	MECHATROLINK Internal Synchronization Error 1
		E40	MECHATROLINK Transmission Cycle Setting Error
		E41	MECHATROLINK Communications Data Size Setting Error (This alarm can occur when using MECHATROLINK-III communications.)
		E42	MECHATROLINK Station Address Setting Error (This alarm can occur when using MECHATROLINK-III communications.)

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Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	E43	MECHATROLINK Communications Setting Error (This alarm can occur when using MECHATROLINK-4 communications.)
		E50*	MECHATROLINK Synchronization Error
		E51	MECHATROLINK Synchronization Failed
		E60*	Reception Error in MECHATROLINK Communications
		E61	Synchronization Interval Error in MECHATROLINK Transmission Cycle
		E63	MECHATROLINK Synchronization Frame Not Received
		E71	Feedback Optional Module Detection Failure
		E72	Feedback Optional Module Detection Failure Alarm
		Eb1	Safety Function Signal Input Timing Error
		EC8	Gate Drive Error 1
		EC9	Gate Drive Error 2
		Ed1	Command Execution Timeout
		F10	Main Circuit Cable Open Phase
		FL-1*	System Alarm
		FL-2*	System Alarm
		FL-3*	System Alarm
		FL-4*	System Alarm
		FL-5*	System Alarm
		FL-6*	System Alarm
		CPF00	Digital Operator Transmission Error 1
		CPF01	Digital Operator Transmission Error 2

* These alarms are not stored in the alarm history. They are only displayed on the panel display.

Note: The following alarms are detected when the Safety Module is connected: A.Eb0, A.Eb2 to A.Eb9, and A.EC0 to A.EC2. Refer to the following manual for details.

AC Servo Drives Σ-V Series/Σ-V Series for Large-Capacity Models/Σ-7 Series USER'S MANUAL Safety Module (Manual No.: SIEP C720829 06)

◆ Σ-V-series SERVOPACKs

Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	020	Parameter Checksum Error
		021	Parameter Format Error
		022	System Checksum Error
		023	Parameter Password Error
		030	Main Circuit Detector Error
		040	Parameter Setting Error
		041	Encoder Output Pulse Setting Error
		042	Parameter Combination Error
		044	Semi-closed/Fully-closed Loop Control Parameter Setting Error
		050	Combination Error
		051	Unsupported Device Alarm
		0b0	Canceled Servo ON Command Alarm
		100	Overcurrent Detected
		300	Regeneration Error
		320	Regeneration Overload
		330	Main Circuit Power Supply Wiring Error
		400	Overvoltage
		410	Undervoltage
		510	Overspeed
		511	Overspeed of Encoder Output Pulse Rate
		520	Vibration Alarm
		521	Autotuning Alarm
		710	Maximum Momentary Overload
		720	Maximum Continuous Overload
		730 731	Dynamic Brake Overload
		740	Overload of Surge Current Limit Resistor
		7A0	Heat Sink Overheated
		7Ab	Built-in Fan in SERVOPACK Stopped
		810	Encoder Backup Alarm
		820	Encoder Checksum Alarm
		830	Encoder Battery Alarm
		840	Encoder Data Alarm
		850	Encoder Overspeed
		860	Encoder Overheated
		891	Encoder Module Error
		8A0	External Encoder Scaling Error
		8A1	External Encoder Module Error
		8A2	External Incremental Encoder Sensor Error
		8A3	External Absolute Encoder Position Error
		b10	Speed Reference A/D Error
		b11	Speed Reference A/D Conversion Data Error
		b20	Torque Reference A/D Error
		b31	Current Detection Error 1
		b32	Current Detection Error 2
		b33	Current Detection Error 3
		bF0	System Alarm 0 (Scan C Error)

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Register Address	Name	Code	Meaning
IW□□□2D	SERVOPACK Alarm Code	bF1	System Alarm 1 (CPU Stack Memory Error)
		bF2	System Alarm 2 (Current Control Processing Section Program Error)
		bF3	System Alarm 3 (Scan A Error)
		bF4	System Alarm 4 (CPU WDT Error)
		C10	Runaway Prevention Detected
		C20	Phase Detection Error*1
		C21	Hole Sensor Error*1
		C22	Phase Information Disagreement*1
		C50	Magnetic Pole Detection Failed*1
		C51	Overtravel Detected during Magnetic Pole Detection*1
		C52	Magnetic Pole Detection Incomplete*1
		C53	Magnetic Pole Detection Variable Range Exceeded
		C54	Magnetic Pole Detection Failed 2
		C80	Absolute Encoder Clear Error and Multiturn Limit Setting Error
		C90	Encoder Communications Error
		C91	Encoder Communications Position Data Acceleration Rate Error
		C92	Encoder Communications Timer Error
		CA0	Encoder Parameter Error
		Cb0	Encoder Echoback Error
		CC0	Multiturn Limit Disagreement
		CF1	Fully-closed Serial Conversion Unit Communications Error*1
		CF2	Fully-closed Serial Conversion Unit Communications Error*1
		d00	Position Error Overflow
		d01	Position Error Overflow Alarm at Servo ON
		d02	Position Error Overflow Alarm by Speed Limit at Servo ON
		d10	Motor-load Position Error Overflow
		Eb0	Safety Function Drive Monitor Circuit Error*2
		Eb1	Safety Function Signal Input Timing Error
		Eb2	Safety Function Drive Internal Signal Error*2
		Eb3	Safety Function Drive Communications Error 1*2
		Eb4	Safety Function Drive Communications Error 2*2
		Eb5	Safety Function Drive Communications Error 3*2
		Eb6	Safety Function Drive Communications Data Error*2
		EC7	Safety Option Card Stop Command Error*2
		F10	Main Circuit Cable Open Phase
		CPF00	Digital Operator Transmission Error 1
		CPF01	Digital Operator Transmission Error 2
		- -	Not an error.

*1. These alarm codes are possible only when the feedback option is used.
*2. These alarm codes are possible only when the safety function is used.

Troubleshooting Programming and Debugging

5

This chapter describes how to troubleshoot errors that can occur when programming or debugging.

5.1 Troubleshooting Motion Program Alarms

This section describes how to troubleshoot alarms that can occur for motion programs.

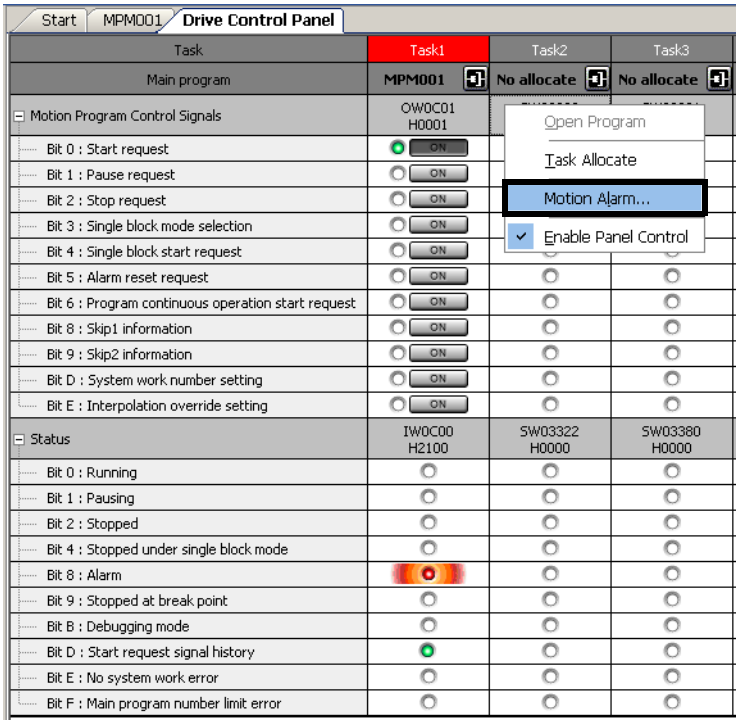
5.1.1 Checking for Motion Program Alarms

You can check the alarm codes, alarm names, and corrections for any alarms in motion programs in the Motion Alarm Dialog Box.

There are two ways to display the Motion Alarm Dialog Box.

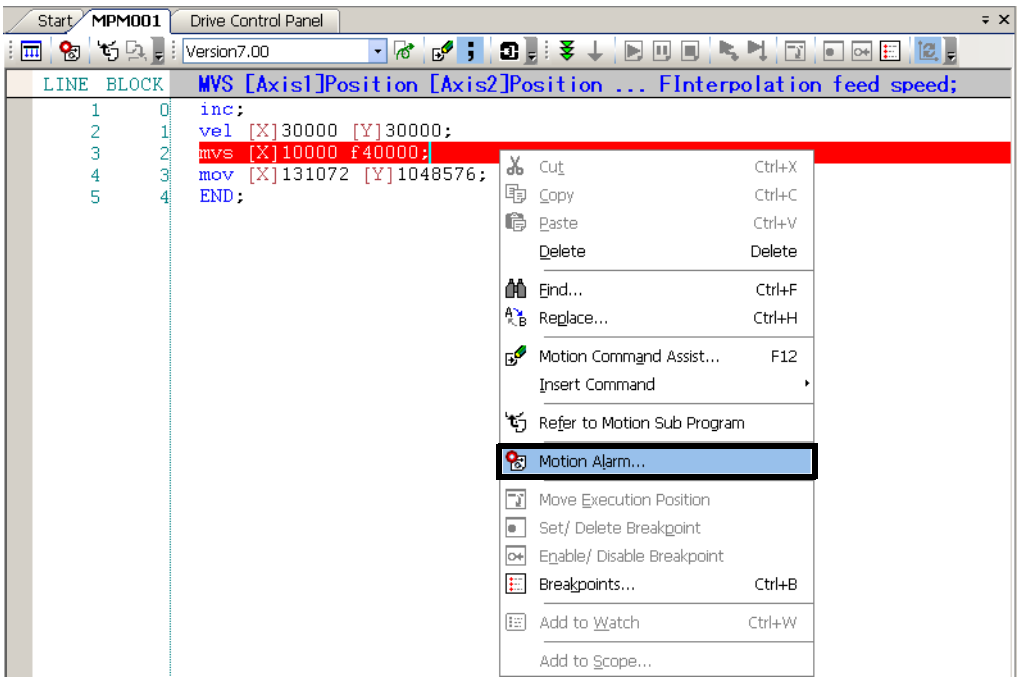
Using the Drive Control Panel

Right-click in the Drive Control Panel Tab Page and select **Motion Alarm** from the pop-up menu.



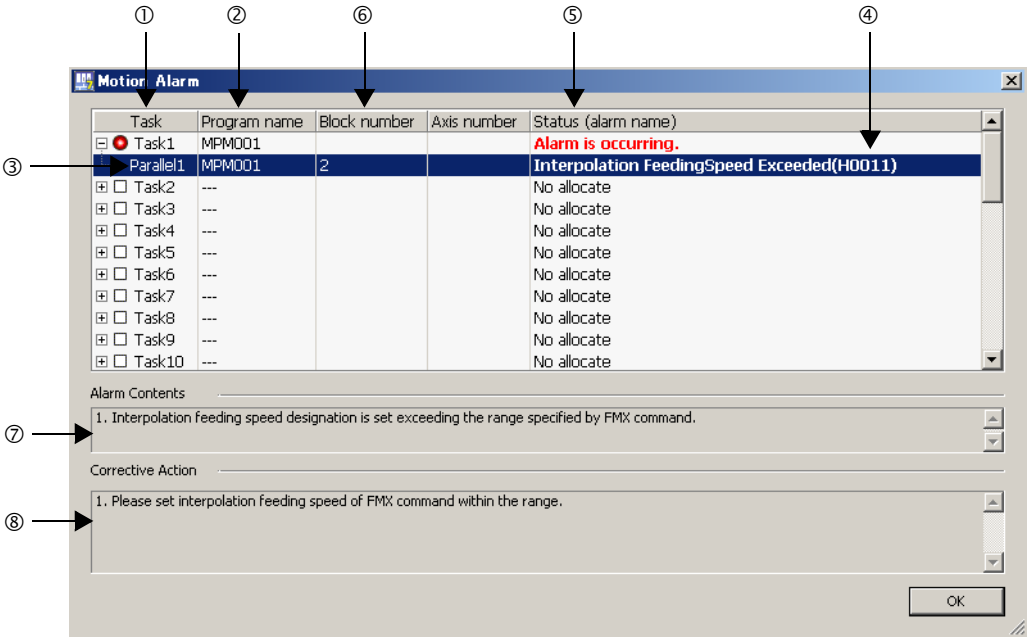
Using the Motion Editor

Right-click in the Motion Editor Tab Page and select **Motion Alarm** from the pop-up menu.



◆ Motion Alarm Dialog Box Details

This section describes the Motion Alarm Dialog Box.



① Task

If the alarm occurred in a motion program that was registered for execution in the M-EXECUTOR, then this column will show the M-EXECUTOR task.

If the alarm occurred in a motion program that was called from a ladder program with an MSEE instruction, then this box will show ---.

② Program Name

If the alarm occurred in a motion program that was registered for execution in the M-EXECUTOR, then this box will show the name of the program registered in the M-EXECUTOR.

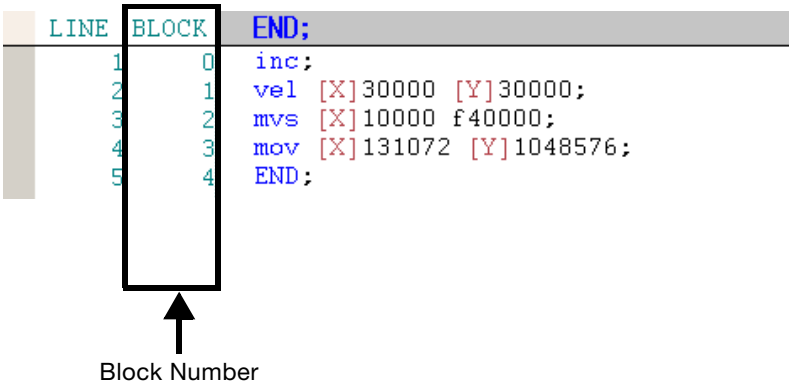
If the alarm occurred in a motion program that was called from a ladder program with an MSEE instruction, then this box will show ---.

③ Fork
When parallel execution (PFORK) is used in a motion program, sometimes more than one alarm will occur at the same time. Refer to the following manual for details on parallel execution instructions.
MP3000 Series Motion Programming Manual (Manual No. SIEP C880725 14)

④ Alarm Code
The alarm code is displayed here.

⑤ Status (Alarm Name)
This column displays the status and the names of the alarms.

⑥ Block Number
This column displays the numbers of the blocks where the errors occurred.
Double-click the block number to jump to the program where the error occurred.
The block numbers are displayed in the Motion Editor Tab Page.

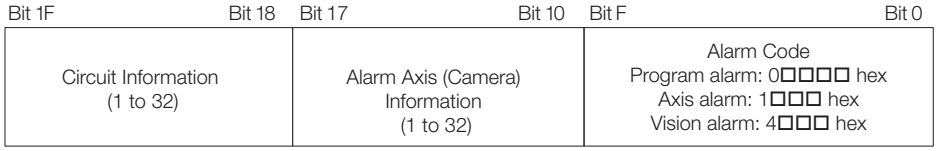


⑦ Alarm Contents
This box displays a description of the alarm.

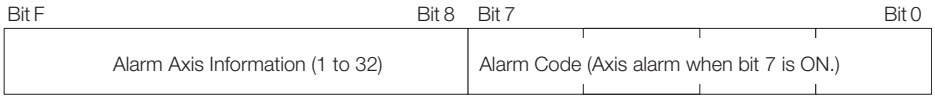
⑧ Correction
This box displays instructions to correct the error that caused the alarm to occur.
If an alarm occurs in motion program, use the alarm code to isolate the cause.

5.1.2 Structure of Motion Program Alarms

You can monitor for motion program alarms in the SL26000 to SL26510 system registers.
The structure of the motion program alarm data stored in the system registers is shown below.



Information You can also monitor for motion program alarms in the SW03268 system registers.
The structure of the motion program alarm data stored in the SW03268 system register is shown below.



Note: The system register addresses depend on the system work number. Refer to the following section for details.
☞ *System Registers Used for System Work Numbers 1 to 32* on page 7-58

Example Alarm Indications

Alarm (Example)	Expansion Motion Program Alarm	Motion Program Alarm
Program Alarm	000000□□ hex	00□□ hex
Circuit 2 Axis 3 Axis Alarm	020310□□ hex	03□□ hex
Circuit 2 Camera 3 Vision Alarm	02034□□□ hex	037F hex
Circuit 2 Vision Alarm	02004□□□ hex	007F hex

5.1.3 Motion Program Alarm Codes

The following table lists the alarm codes for motion programs.

Alarm Code		Alarm Name	Alarm	Correction
Program Alarms	0002 hex	Division error	The data was divided by 0.	Correct the motion program.
	0010 hex	Turn specified instead of radius	A number of turns (T) was specified instead of a radius for a circular or helical interpolation instruction.	• Convert the radius setting to a center point coordinate setting to execute the circular or helical interpolation instruction. • Do not specify a number of turns.
	0011 hex	Interpolation feed speed over limit	The interpolation feed speed exceeded the setting range of the FMX instruction.	Correct the feed speed of the interpolation instruction.
	0012 hex	No interpolation feed speed setting	The interpolation feed speed has never been set. (If you set it once, further settings can be omitted within the same program.)	Set the feed speed of the interpolation instruction.
	0013 hex	Range exceeded after acceleration parameter conversion	The indirectly designated acceleration parameter exceeded the setting range.	Change the value of the register that is used for the indirect designation.
	0014 hex	Circular arc length exceeded LONG_MAX	The circular arc length that was specified for a circular or helical interpolation instruction exceeded the setting range.	Correct the circular arc length setting for the circular or helical interpolation instruction.
	0015 hex	No vertical axis set for the circular arc plane	The vertical axis was not set for a circular or helical interpolation instruction.	Set the vertical axis with the PLN instruction.
	0016 hex	No horizontal axis set for the circular arc plane	The horizontal axis was not set for a circular or helical interpolation instruction.	Set the horizontal axis with the PLN instruction.
	0017 hex	Number of axes over limit	The number of specified axes exceeds the limit of a circular interpolation instruction (2 axes max.) or a helical interpolation instruction (3 axes max.).	Correct the axis setting of the circular or helical interpolation instruction.
	0018 hex	Number of turns over limit	The number of turns that was specified for a circular or helical interpolation instruction exceeded the setting range.	Correct the number of turns setting of the circular or helical interpolation instruction.
	0019 hex	Radius exceeded LONG_MAX	The radius that was specified for a circular or helical interpolation instruction exceeded the setting range.	Correct the radius setting of the circular or helical interpolation instruction.
	001A hex	Center point setting error	The correct center point was not set for a circular or helical interpolation instruction.	Correct the center point setting of the circular or helical interpolation instruction.
	001B hex	Emergency stop	The axis movement instruction was stopped due to a Request for Stop of Program.	Turn OFF the Request for Stop of Program motion program control signal, and turn ON the Alarm Reset Request.
	001C hex	Linear interpolation travel distance exceeded LONG_MAX	The travel distance that was specified for a linear interpolation instruction exceeded the setting range.	Correct the travel distance for the linear interpolation instruction.
	001D hex	FMX is not defined	There was no FMX instruction executed in a motion program that includes an interpolation instruction.	Execute an FMX instruction. An FMX instruction is required for each program that contains an interpolation instruction.
	001E hex	T address out of range	The address setting in an IAC/IDC/FMX instruction exceeds the setting range.	Correct the setting in the IAC/IDC/FMX instruction.

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Alarm Code		Alarm Name	Alarm	Correction
Program Alarms	001F hex	P address out of range	The address setting in an IFP instruction exceeds the setting range.	Correct the setting in the IFP instruction.
	0020 hex	Specified register error	Registers that cannot be used are set.	Correct the motion program.
	0021 hex	PFORK execution error	Motion instructions were executed at the same time in the second fork of the PFORK instruction in the calling motion program and the second fork of the PFORK instruction in the subprogram.	Correct the motion program or the subprogram.
	0022 hex	Indirect designation register range error	The specified register number exceeds the range of the register size.	Correct the motion program.
	0023 hex	Travel distance out of range	The decimal-format axis travel distance specified in an axis movement instruction exceeds the allowed range.	Correct the axis travel distance.
	0024 hex	Interpolation override out of range	The interpolation override setting exceeded the setting range.	Correct the Interpolation Override Setting.
	0026 hex	PFORK number of parallel forks error	The number of parallel forks exceeded the number set for the parallel mode.	• Correct the motion program. • Correct the parallel mode setting.
	0028 hex	No composite travel distance for linear interpolation setting when target axis setting for interpolation feed speed was enabled	The composite travel distance was not set for a linear interpolation instruction when the target axis setting for interpolation feed speed was enabled.	Set the composite travel distance for the linear interpolation instruction when the target axis setting for interpolation feed speed is enabled.
	0030 hex	End of interpolation feeding speed exceeded	The final interpolation feed speed exceeded the setting range of the FMX instruction.	Correct the setting of the FMX instruction.
	0032 hex	Specified address error	Characters that cannot be used are set in the interpolation instruction.	Correct the setting of the interpolation instruction.
	0033 hex	Change interpolation S-curve time condition error	The interpolation S-curve time was changed when interpolation acceleration/deceleration mode was set to a value other than 0.	Set interpolation acceleration/deceleration mode to 0.
	007F hex	Refer to the expansion alarm registers.	A vision alarm occurred.	Check the expansion motion program alarm and correct the problem.

Continued on next page.

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Alarm Code		Alarm Name	Alarm	Correction
Axis Alarms*1	0080 hex	Logical axis use prohibited	More than one motion instruction was executed for the same axis.	Correct the motion program.
	0081 hex	The infinite-length axis setting exceeded POSMAX	The travel distance setting for infinite-length axis exceeded the POSMAX setting.	• Correct the setting of fixed parameter No. 10 (Infinite-length Axis Reset Position). • Correct the motion program.
	0082 hex	The axis travel distance exceeded LONG_MAX	The axis travel distance setting exceeded the allowed range.	Correct the motion program.
	0084 hex	Duplicated motion command	More than one instruction was executed for the same axis.	Check for and remove simultaneous references for the same axis from other programs.
	0085 hex	Motion command response error	A response for a different motion command was reported by the Motion Control Function Module when a motion instruction was executed.	• Remove the cause of the alarm at the target axis. • If the Servo is not ON, turn ON the Servo. • Check for and remove simultaneous references for the same axis from other programs.
	0087 hex	VEL setting out of range	The setting in the VEL instruction exceeds the allowed range.	Correct the VEL instruction.
	0088 hex	INP setting out of range	The setting in the INP instruction exceeds the allowed range.	Correct the INP instruction.
	0089 hex	ACC/SCC/DCC setting out of range	The setting in the ACC/SCC/DCC instruction exceeds the allowed range.	Correct the ACC/SCC/DCC instruction.
	0090 hex	Exceeded IFMX (maximum interpolation feed speed setting for individual axes)	The interpolation feed speed for the axis that was specified for the IFMX instruction exceeded the speed setting in the IFMX instruction.	Correct the speed setting in the IFMX instruction.
	008A hex	No time setting in MVT instruction	The T setting in the MVT instruction is zero.	Correct the MVT instruction.
	008B hex	Command cannot be executed	The specified motion instruction cannot be executed on the target Motion Control Function Module.	Correct the motion program.
	008C hex	Distribution incomplete	A motion instruction was executed when the Motion Control Function Module had not completed distribution for a previous instruction.	Correct the motion program so that the motion instruction is executed when the Distribution Completed Bit is ON.
	008D hex	Motion command error termination	The Motion Control Function Module is in Command Error status.	• Clear the error at the target axis. • Correct the motion program.
	008E hex	Servo ON Incomplete	An axis motion instruction was executed when the power to the Servomotor was OFF.	• Clear the error at the target axis. • Correct the motion program so that the motion instruction is executed when the power to the Servomotor is ON.
	008F hex	Axis alarm	An alarm occurred in the Motion Control Function Module to which a command was sent.	Clear the error at the target axis.

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Alarm Code		Alarm Name	Alarm	Correction
Vision Alarms*2	4001 hex	Vision command cannot be executed	A command was executed for an unknown Vision Unit.	Check the Module configuration definitions to see if the Vision Unit exists. Make sure that the specified circuit is correct and check the motion program.
	4002 hex	Duplicate image capture commands	Image capture was executed for a camera that was already executing an image capture command (VCAPI or VCAPS).	Correct the motion program.
	4003 hex	Duplicate vision commands	A vision command was executed during execution of a previous vision command (VFIL, VANA, or VRES).	Correct the motion program.
	4004 hex	Vision command circuit error	A circuit number of 0 was specified for a vision command (VCAPI, VCAPS, VFIL, VANA, or VRES).	Make sure the specified circuit is correct and check the motion program.
	4005 hex	Image capture command response error	A response for an image capture command (VCAPI or VCAPS) was not received within a specific time period.	Replace the Vision Unit.
	4006 hex	Vision command response error	A response for a vision command (VFIL, VANA, or VRES) was not received within a specific time period.	Replace the Vision Unit.
	4007 hex	Function number error	An unknown function number was specified.	Correct the specified function number.
	4040 hex	Duplicate image memory usage	More than one vision instruction was executed for the same image memory.	Correct the motion program.
	4041 hex	Parameter numeric range error	An out-of-range number was specified for a vision parameter.	Correct the vision parameter.
	4042 hex	Unregistered template	An unregistered template was specified.	Register the template.
	4043 hex	Image capture error	An image could not be captured for an image capture command (VCAPI or VCAPS).	Correct the camera parameters in the fixed parameters.
	4044 hex	VRES instruction execution error	The VRES instruction was executed while the VANA instruction was not being executed.	Correct the motion program.

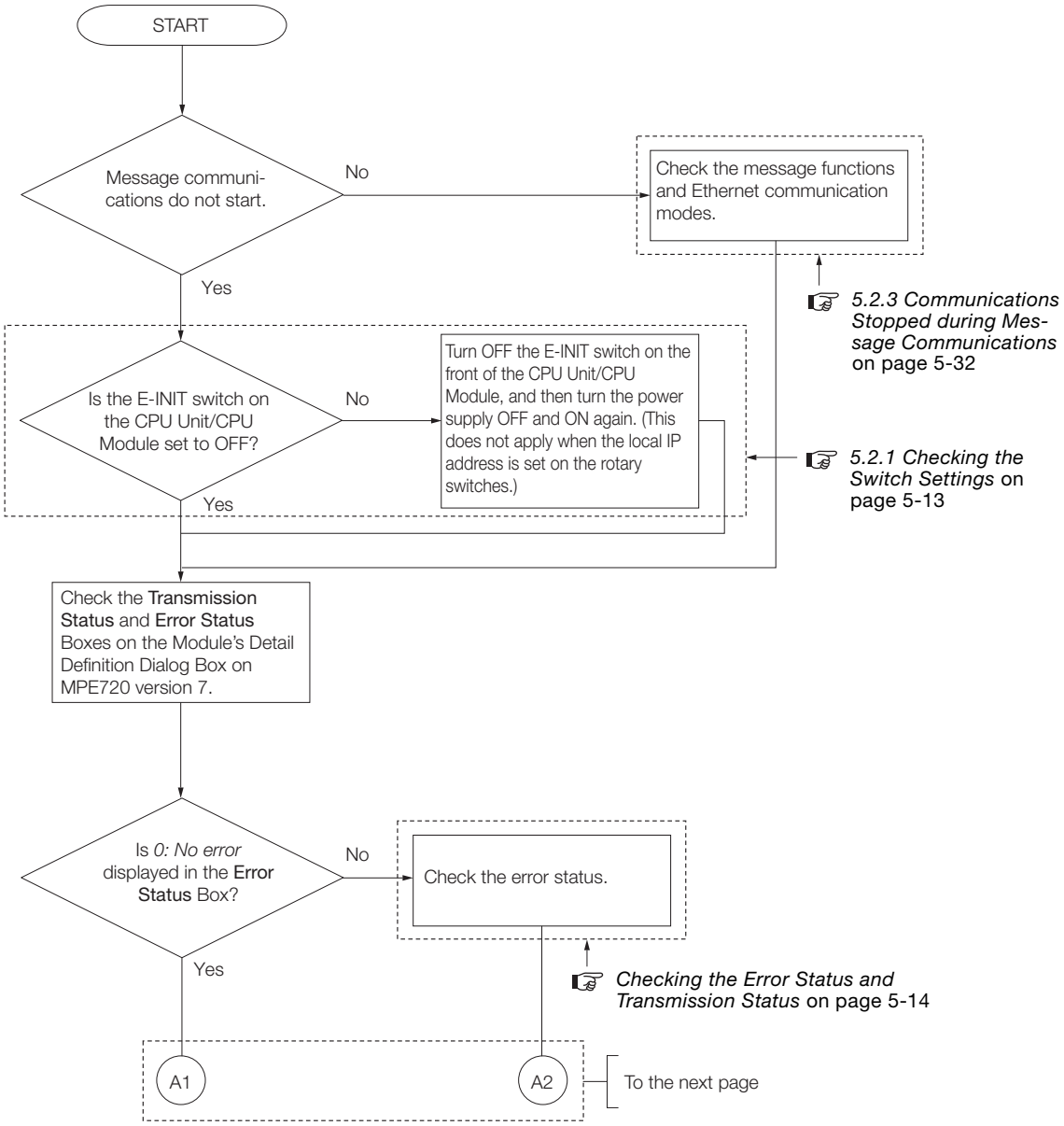
*1. If an axis alarm occurs, the axis number is stored in bits 8 to C.

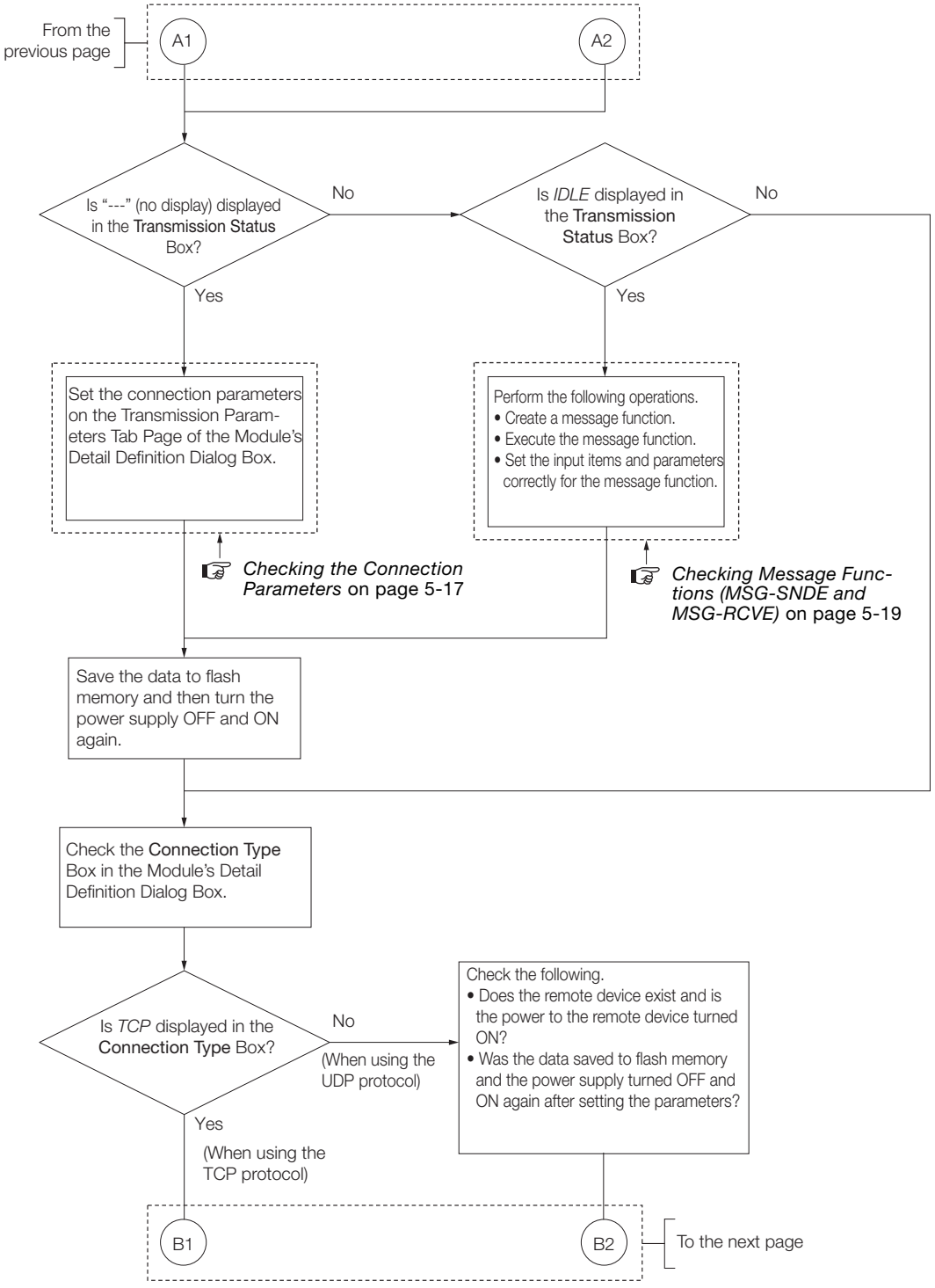
*2. If a vision alarm occurs, check the SL26000 to SL26510 system registers.

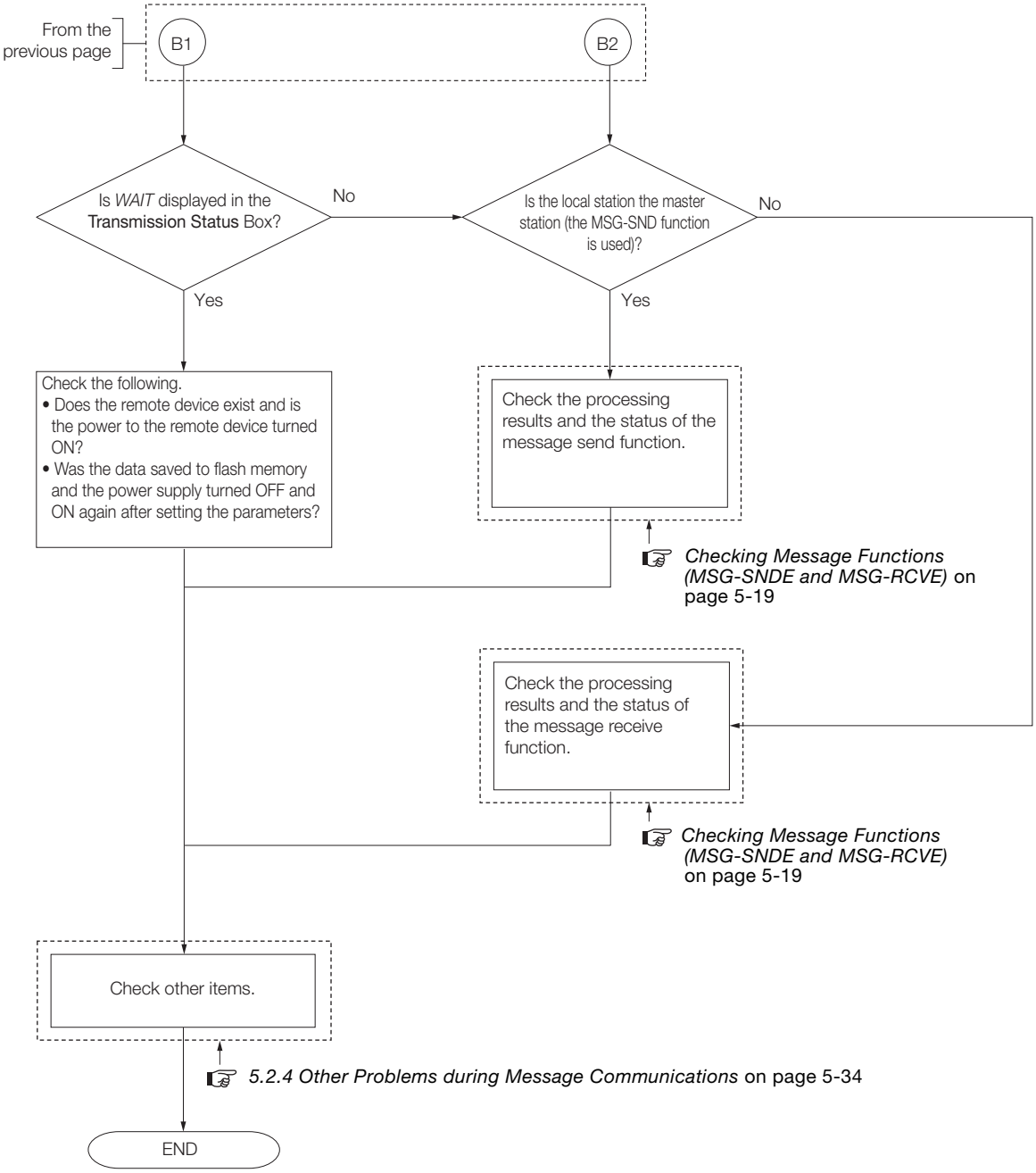
5.2 Troubleshooting Message Communications

Use the following flowchart to troubleshoot problems in message communications with other controllers, touch panel, or PC.

Information The MP3100 does not have a message communications function. Therefore, problems of message communications do not occur.

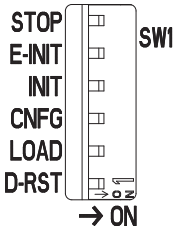



From the previous page
A1
A2
Is "---" (no display) displayed in the Transmission Status Box?
No
Is IDLE displayed in the Transmission Status Box?
No
Yes
Yes
Set the connection parameters on the Transmission Parameters Tab Page of the Module's Detail Definition Dialog Box.
Perform the following operations.
• Create a message function.
• Execute the message function.
• Set the input items and parameters correctly for the message function.
Checking the Connection Parameters on page 5-17
Checking Message Functions (MSG-SNDE and MSG-RCVE) on page 5-19
Save the data to flash memory and then turn the power supply OFF and ON again.
Check the Connection Type Box in the Module's Detail Definition Dialog Box.
Is TCP displayed in the Connection Type Box?
No
(When using the UDP protocol)
Check the following.
• Does the remote device exist and is the power to the remote device turned ON?
• Was the data saved to flash memory and the power supply turned OFF and ON again after setting the parameters?
Yes
(When using the TCP protocol)
B1
B2
To the next page


From the previous page
B1
B2
Is *WAIT* displayed in the **Transmission Status** Box?
No
Yes
Is the local station the master station (the MSG-SND function is used)?
No
Yes
Check the following.
• Does the remote device exist and is the power to the remote device turned ON?
• Was the data saved to flash memory and the power supply turned OFF and ON again after setting the parameters?
Check the processing results and the status of the message send function.
Checking Message Functions (MSG-SNDE and MSG-RCVE) on page 5-19
Check the processing results and the status of the message receive function.
Checking Message Functions (MSG-SNDE and MSG-RCVE) on page 5-19
Check other items.
5.2.4 Other Problems during Message Communications on page 5-34
END

5.2.1 Checking the Switch Settings

If message communications with a controller or touch panel from another manufacturer does not start even though a connection from the MPE720 can be established properly, check the following switch settings.



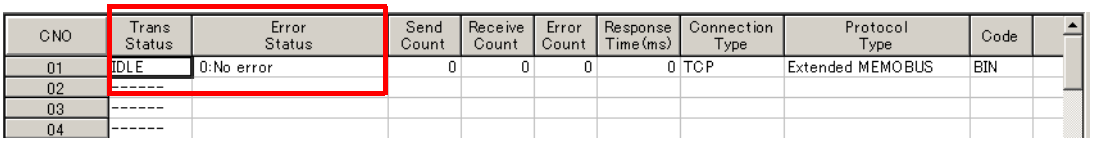
Device Code	Pin Name	Status	Operating Mode	Default	Remarks
S1_6	STOP	ON	Stops the user programs.	OFF	Turn ON the pin to stop execution of the user programs.
		OFF	Executes the user programs.		
S1_5	E-INIT	ON	Sets the IP address to 192.168.001.□□□.	OFF	The setting of □□□ is determined by the rotary switch setting.
		OFF	Sets the IP address that is set in the MPE720.		–
S1_4	INIT	ON	Resets memory.	OFF	Turn OFF the pin to execute the programs that are stored in flash memory.
		OFF	Normal operation		
S1_3	CNFG	ON	Configuration Mode	OFF	Turn ON the pin to perform self configuration. Turn OFF the pin to operate according to the definitions that are stored in flash memory.
		OFF	Normal operation		
S1_2	LOAD	ON	Loads data.	OFF	Turn ON the pin and then turn ON the power to batch load data from the USB memory/SD card to the CPU Unit.
		OFF	Does not load data.		
S1_1	D-RST	ON	Reserved for system.	OFF	Keep this pin OFF at all times.
		OFF	Normal operation		

5.2.2 Message Communications Errors

This section describes errors that can occur in message communications.

Checking the Error Status and Transmission Status

If message communications with a PLC, touch panel, or PC from another manufacturer do not start, get a general idea of the error in the status information in the Module's Detail Definition Dialog Box on the MPE720.



CNO	Trans Status	Error Status	Send Count	Receive Count	Error Count	Response Time(ms)	Connection Type	Protocol Type	Code
01	IDLE	0:No error	0	0	0	0	TCP	Extended MEMOBUS	BIN
02	------								
03	------								
04	------								

◆ Error Status Box = 0: No error

Get a general idea of the error by referring to the **Trans Status** Column.

■ When the TCP Protocol Is Selected

Trans Status (Transmission Status)	Status	Cause	Correction	Reference
- - - - -	Message communications are not set.	Connection parameters have not been set.	Set the connection parameters.	*Checking the Connection Parameters* on page 5-17
		The data was not saved to flash memory or the power supply to the Module was not turned OFF and ON again after changing the connection parameters.	Save the data to flash memory and turn the power supply OFF and ON again to the Module after setting connection parameters.	
IDLE	Standby mode for executing message functions.	No message functions have been created in the ladder program.	Create message functions in the ladder program.	*Checking Message Functions (MSG-SNDE and MSG-RCVE)* on page 5-19
		Message functions have been created in the ladder program but they have not been executed.	Create and execute message functions in the ladder program.	
		There is an error in a message function parameter setting (PARAM□□).	Set the message function parameter (PARAM□□) correctly.	
WAIT	Waiting for establishment of TCP connection with the remote device	The remote device is not connected or the power to the remote device is OFF.	Connect the remote device and turn ON the power to the remote device.	–
		The remote device does not have a communications function or setting for communicating with the Machine Controller or there is an error in communications settings.	Check the communications function or setting and the communication settings of the remote device.	–
		There is an error in the connection parameter settings in the Machine Controller.	Check the connection parameter settings in the Machine Controller.	*Checking the Connection Parameters* on page 5-17
CONNECT	Data communications with the remote device are enabled.	There is an error in the communications protocol.	Check the error status of the message function.	*Checking Message Functions (MSG-SNDE and MSG-RCVE)* on page 5-19

■ When the UDP Protocol Is Selected

Trans Status (Transmission Status)	Status	Cause	Correction	Reference
- - - - -	Message communications are not set.	Connection parameters have not been set.	Set the connection parameters.	*Checking the Connection Parameters* on page 5-17
		The data was not saved to flash memory or the power supply to the Module was not turned OFF and ON again after changing the connection parameters.	Save the data to flash memory and turn the power supply OFF and ON again to the Module after setting connection parameters.	
IDLE	Standby mode for executing message functions.	No message functions have been created in the ladder program.	Create message functions in the ladder program.	*Checking Message Functions (MSG-SNDE and MSG-RCVE)* on page 5-19
		Message functions have been created in the ladder program but they have not been executed.	Create and execute message functions in the ladder program.	
		There is an error in a message function parameter setting (PARAM□□).	Set the message function parameter (PARAM□□) correctly.	
CONNECT	Data communications with the remote device are enabled.	The remote device is not connected or the power to the remote device is OFF.	Connect the remote device and turn ON the power to the remote device.	–
		The remote device does not have a communications function or setting for communicating with the Machine Controller or there is an error in communications settings.	Check the communications function or setting and the communication settings of the remote device.	–
		There is an error in the connection parameter settings in the Machine Controller.	Check the connection parameter settings in the Machine Controller.	*Checking the Connection Parameters* on page 5-17
		There is an error in the communications protocol.	Check the error status of the message function.	*Checking Message Functions (MSG-SNDE and MSG-RCVE)* on page 5-19

◆ When Error Status Box Shows an Error

Check the nature of the error in the error status. The following tables list the most frequent error status.

Information The **Error Status** Column gives the most recent error. The error information is retained even after recovering from the error and starting normal communications.

■ When the TCP Protocol Is Selected

Error Status	Description	Cause	Correction
2: Local Port Number Error	Setting error in local station port number	The port number of a broken TCP connection was bound.	Correct the application so that at least one minute elapses after completion of the execution of the Abort command before the Execute command is turned ON in the message function in the Machine Controller.
		A command was simultaneously executed by another message function for the same remote device before the connection was ended.	Correct the program so that no more than one message function is executed for each connection.
4: M-SND Connection Error	TCP connection error when using the Send Message function	The TCP connection request from the Machine Controller was rejected by the remote device.	Make sure that the network settings of the remote device are set to open a port for communicating with the Machine Controller. (Settings to check: The port number for communicating with the Machine Controller, TCP/UDP selection, etc.)
5: M-RCV Connection Error	TCP connection error when using the Receive Message function	An error has occurred in the Machine Controller while processing a TCP connection request from the remote device.	Make sure that the network settings of the remote device are set correctly for the port for communicating with the Machine Controller.
7: TCP Data Send Error	Data sending error	The remote device is not connected or the power to the remote device is OFF.	Make sure that the power to the remote device is ON and that the remote device is connected to the Machine Controller with Ethernet cables.
9: TCP Data Receive Error	Data reception error	A TCP connection close request was received from the remote device.	If the close request was unexpected, correct the connection closing sequence at the remote device.
12:Data Conversion Error	Error in protocol conversion	There was a protocol data format error.	Match the settings for the protocol type and code (BIN/RTU/ASCII) between the remote device and the Machine Controller.

■ When the UDP Protocol Is Selected

Error Status	Description	Cause	Correction
12:Data Conversion Error	Error in protocol conversion	There was a protocol data format error.	Match the settings for the protocol type and code (BIN/RTU/ASCII) between the remote device and the Machine Controller.

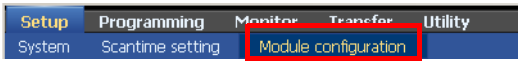
Checking the Connection Parameters

If message communications with a PLC, touch panel, or PC from another manufacturer do not start, the connection parameter settings in the Module's Detail Definition Dialog Box may be incorrect.

Use the following procedure to check the connection parameter settings.

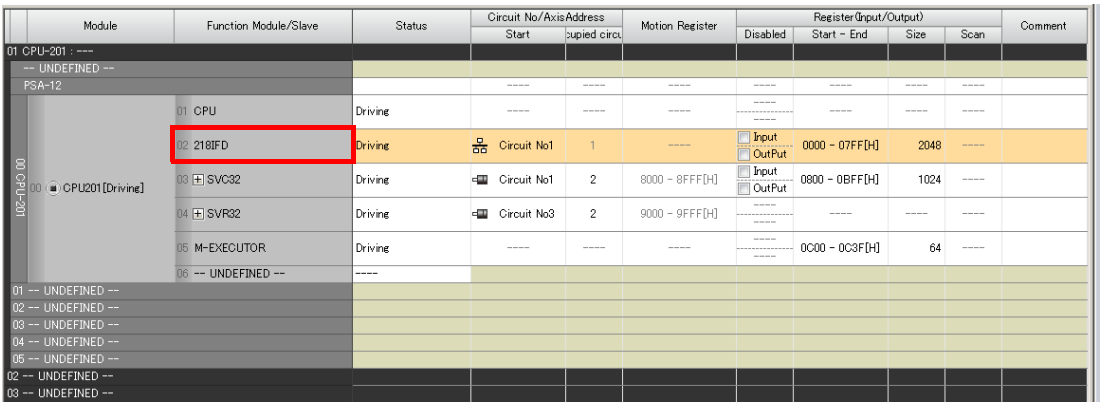
1. Start MP720 version 7 and connect to the Machine Controller online.

2. Select **Module configuration** from the Setup Menu.

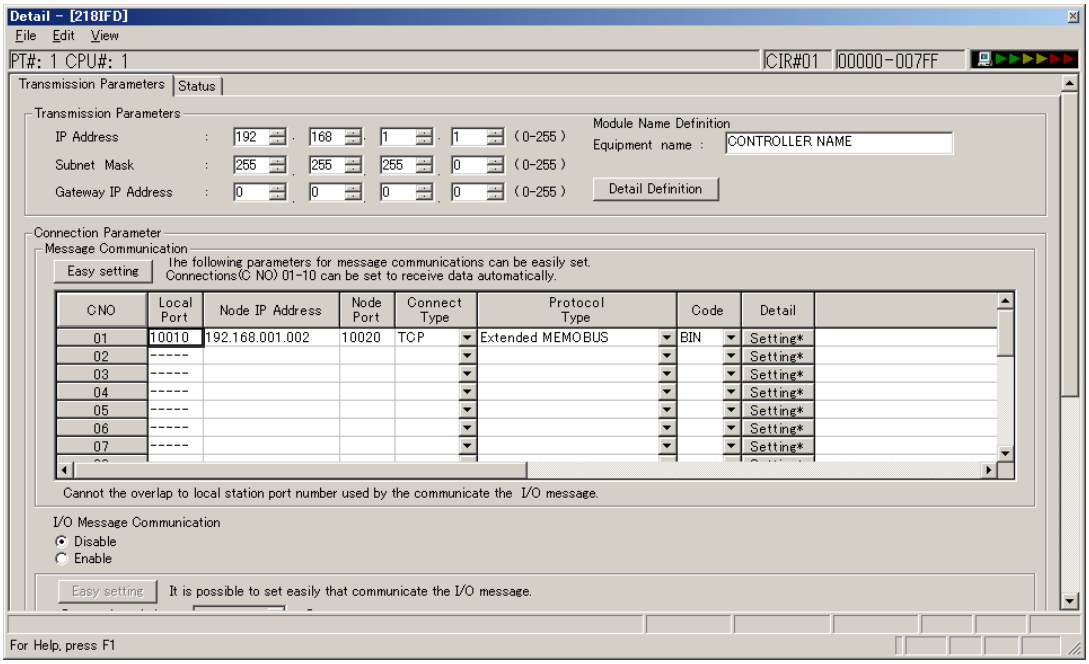


The Module Configuration Tab Page will be displayed.

3. Double-click the cell for 218IFD in the Module Configuration Tab Page.



The Module's Detail Definition Dialog Box will be displayed.



4. Check the connection parameter settings.

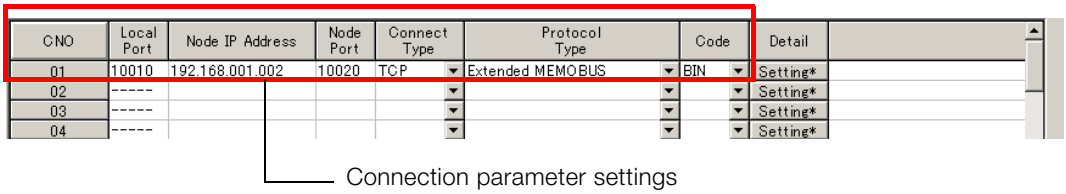


Table 5.1 Connection Parameter Check Items

Item	What to Check	Remarks
Local Port	Set the port number to which the remote station is to send data.	–
Node IP Address	Set the IP address of the remote station.	Set 000.000.000.000 to use the unpassive open mode.
Node Port	Set the port number from which the remote station sends data.	To change the port number of the remote station dynamically, use the unpassive open mode. To use the unpassive open mode, set 0000.
Connect Type	Set the connection type of the remote station.	–
Protocol Type	Set the protocol type that is supported by the remote station.	–
Code	Set the code type of the remote station.	–

Information

Unpassive Open Mode

To use unpassive open mode, set the connection parameters as follows:

- Set the IP address of the remote station (Node IP Address) to 000.000.000.000.
- Set the port number of the remote station (Node Port) to 0.

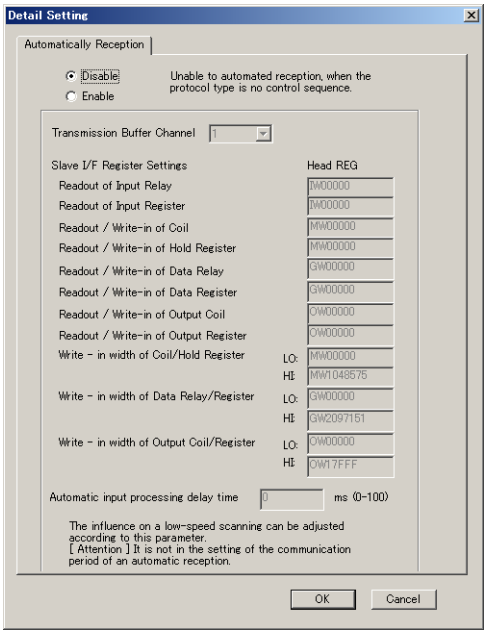
In unpassive open mode, the 218IFD connects to any station that attempts to access the relevant connection number. If more than one station attempts access, the connection will be established with the station that sent the connection request first.

When a connection is established in unpassive open mode, a connection request from another station will break the current connection and establish a connection with the station that sent the connection request later.

Example

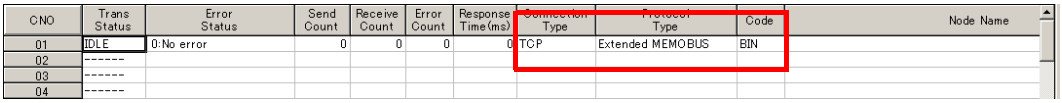
Using the 218IFD

Click the **Detail Setting** Button to display the Automatically Reception Dialog Box. Select the **Disable** Option to use message functions.



Note: If message functions are used with the **Enable** Option selected, communications may not be performed properly.

5. Click the **Status** Tab to display the Status Tab Page.
Make sure that the following items are the same as those on the Transmission Parameters Tab Page in the Module's Detail Definition Dialog Box.
- Connection Type
- Protocol Type
- Code



CNO	Trans Status	Error Status	Send Count	Receive Count	Error Count	Response Time(ms)	Connection Type	Protocol Type	Code	Node Name
01	IDLE	0:No error	0	0	0	0	TCP	Extended MEMOBUS	BIN	
02	------									
03	------									
04	------									

If the settings are different, the data may not have been saved to flash memory or the power supply to the Module may not have been turned OFF and ON again after changing or adding connection parameter settings.
Save the data to flash memory, turn the power supply to the Module OFF and ON again, and then check the settings again.


Important

When the transmission parameter or connection parameter settings are changed, the new settings are enabled only after the data is saved to flash memory and the power supply to the Module is turned OFF and ON again.
The parameter settings that are displayed on the MPE720 will be updated when you execute **Save** or **Save to Flash**, but you must always turn the power supply to the Module OFF and ON again to enable the new parameter settings.

Checking Message Functions (MSG-SNDE and MSG-RCVE)

If message communications with a PLC, touch panel, or PC do not start, the specific error can be determined by checking the processing results and status of the message functions.

The procedures for checking the processing results, status, and parameter settings of the message functions are given below.

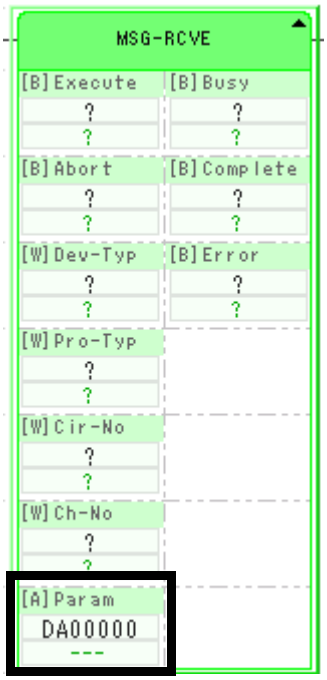
◆ Checking the Processing Results and Status

The processing results and status of a message function can be checked with the parameters in the following table.

Item	Description
Processing Result (PARAM00)	Gives the error that has occurred when the message function was executed. This information is useful for troubleshooting errors that can occur when message function parameters are not properly set.
Status (PARAM01)	This information is useful when a Communications Section Error (88□□ hex), which cannot be isolated with the processing results in PARAM00, has occurred.
Detail Error Code (PARAM02 and PARAM03)	Supplemental information for PARAM00 (Processing Result). These parameters give the error code from the remote device.

The procedures for checking the processing results, status, and corrections when using the Send Message and Receive Message functions are given below.

Send Message Function



Receive Message Function

Important

Use the register list on the MPE720 to check the contents of the registers.

Example

The parameter list with the first address set to DA00000 is shown below.

Parameter List

Register	F ····· 0	
DW00000	PARAM00	Processing Result
DW00001	PARAM01	Status
.	.	
.	.	
.	.	
.	.	

■ Checking the Processing Result (PARAM00) for the Send Message Function (MSG-SNDE)

The errors that may be given by the processing result of the Send Message function are listed in the following table.

• Processing Results Other Than a Communications Section Error (88□□ Hex)

Processing Result Value	Error	Cause	Correction
81□□ hex	Function code error	An unused function code was sent from the local station.	Check PARAM12 (function code).
		An unused function code was received from a remote station.	Check whether the remote station sent valid data.
82□□ hex	Address setting error	One of the following parameter settings is outside of the setting range. PARAM14 and PARAM15 (remote data address) PARAM20 and PARAM21 (local data address)	Check the parameter settings that are given on the left.
83□□ hex	Data size error	The send data size of the local station is outside of the setting range.	Check PARAM17 (data size).
		The receive data size from the remote station is outside of the setting range.	Check whether the remote station is sending data of a valid size.
84□□ hex	Circuit number setting error	The circuit number is outside of the setting range.	Check Cir-No (circuit number) in MSG-SNDE. The device may be set incorrectly. Also check the communications device type (Dev-Typ) in the MSG-SNDE function.
85□□ hex	Channel number setting error	The communications buffer channel number is outside of the setting range.	Check Ch-No (communications buffer channel number) in MSG-SNDE.
86□□ hex	Connection number error	The connection number is outside of the setting range.	Check PARAM10 (connection number).
89□□ hex	Device select error	An unavailable device is set.	Check Dev-Typ (communications device type) in MSG-SNDE and select the appropriate device type.
C0□□ hex	Register type error	The register type for the remote station is outside of the setting range.	Check PARAM16 (remote station register type) and set the correct register type.
C1□□ hex	Data type error	The data type is outside of the setting range. This error occurs when using function code 434D hex or 434E hex.	Check the remote address table and set the correct data type.
C2□□ hex	Local register type error	The register type for the local station is outside of the setting range.	Check PARAM22 (local station register type) and set the correct register type.

• Processing Result of Communications Section Error (88□□ Hex)

Processing Result Value	Error	Cause	Correction
88□□ hex	Communications section error (An error response was returned from the communications section or communications device.)	Communications are not enabled in the remote station.	Check the communications settings in the remote station.
		More than one MSG-SNDE was executed simultaneously for the same Cir-No (circuit number) and Ch-No (communications buffer channel number).	Correct the ladder program so that no more than one MSG-SNDE is executed simultaneously.
		More than one MSG-SNDE was executed simultaneously for the same Cir-No (circuit number) and PARAM10 (connection number).	Correct the ladder program so that no more than one MSG-SNDE is executed simultaneously.
		The MSG-SNDE was executed when the 218IFD was not ready to receive message send or receive requests (i.e., not in RUN status).	Adjust the timing for executing the MSG-SNDE for the first time in the ladder program, for example by using a timer command.

■ Checking the Processing Result (PARAM00) for the Receive Message Function (MSG-RCVE)

The errors that may be given by the processing result of the Receive Message function are listed in the following table.

• Processing Results Other Than a Communications Section Error (88□□ Hex)

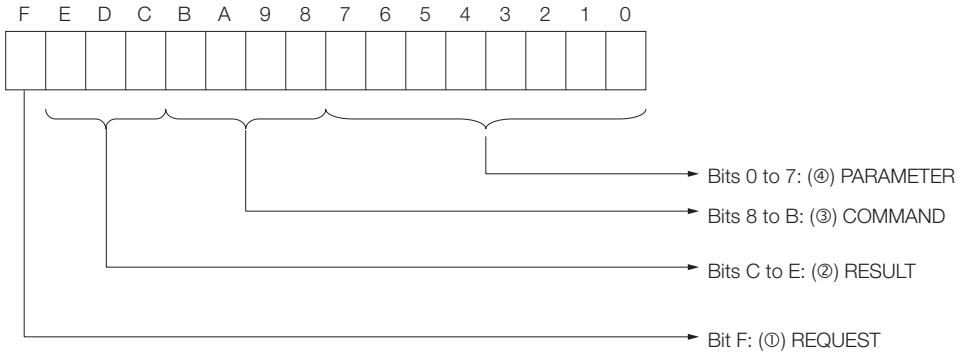
Processing Result Value	Error	Cause	Correction
81□□ hex	Function code error	An unused function code was received from a remote station.	Check whether the remote station sent valid data.
82□□ hex	Address setting error	Data for an address that is outside of the setting range was received from the remote station.	Check whether the remote station sent valid data.
		One of the following settings is outside of the setting range. PARAM14 and PARAM15 (remote data address) PARAM20 and PARAM21 (local data address)	Check the settings that are given on the left.
83□□ hex	Data size error	The receive data size from the remote station is outside of the setting range.	Check whether the remote station is sending data of a valid size.
84□□ hex	Circuit number setting error	The circuit number is outside of the setting range.	Check Cir-No (circuit number) in MSG-RCVE. The device may be set incorrectly. Also check the communications device type (Dev-Typ) in the MSG-RCVE function.
85□□ hex	Channel number setting error	The communications buffer channel number is outside of the setting range.	Check Ch-No (communications buffer channel number) in MSG-RCVE.
86□□ hex	Connection number error	The connection number is outside of the setting range.	Check PARAM10 (connection number).
89□□ hex	Device select error	An unavailable device is set.	Check Dev-Typ (communications device type) in MSG-RCVE and select the appropriate device type.
C0□□ hex	Register type error	The register type specified by the remote (sending) station is out of range.	Check the register type for the remote station specified at the local station and set the correct register type.
C1□□ hex	Data type error	The data type is outside of the setting range. This error occurs when using function code 434D hex or 434E hex.	Check the remote address table set at the sending station and set the correct data type.

• Processing Result of Communications Section Error (88□□ Hex)

Processing Result Value	Error	Cause	Correction
88□□ hex	Communications section error (An error response was returned from the communications section or communications device.)	Communications are not enabled in the remote station.	Check the communications settings in the remote station.
		More than one MSG-RCVE was executed simultaneously for the same Cir-No (circuit number) and Ch-No (communications buffer channel number).	Correct the ladder program so that no more than one MSG-RCVE is executed simultaneously.
		More than one MSG-RCVE was executed simultaneously for the same Cir-No (circuit number) and PARAM10 (connection number).	Correct the ladder program so that no more than one MSG-RCVE is executed simultaneously.
		The MSG-RCVE was executed when the 218IFD was not ready to receive message send or receive requests (i.e., not in RUN status).	Adjust the timing for executing the MSG-RCVE for the first time in the ladder program, for example by using a timer command.

■ Checking the Status (PARAM01)

If the value of the processing result (PARAM00) is 88□□ hex, indicating that a communications section error occurred, check the status in PARAM01 to isolate the error.



① REQUEST

This bit shows the request processing status of the message function.

Bit Status	Meaning
0	Processing is being requested.
1	Processing request was ended.

② RESULT (Processing Result)

These bits show the result of executing the message function.

Code	Abbreviation	Meaning
0	CONN_NG	The message send failed or connection ended with an error in Ethernet communications.
1	SEND_OK	The message was sent normally.
2	REC_OK	The message was received normally.
3	ABORT_OK	The request to abort execution was completed.
4	FMT_NG	A parameter formatting error occurred.*1
5	SEQ_NG	A command sequence error occurred.*2
6	RESET_NG	A reset occurred.*2
7	REC_NG	A data reception error (error detected in the lower-layer program) occurred.

*1. When this error occurs, detailed information is given in *(④) PARAMETER*.

*2. This error occurs if the message function is executed while the 218IFD is not ready to receive message send or receive requests.

③ COMMAND

These bits show the processing command of the message function. The processing that was executed can be determined from this information.

Code	Abbreviation	Meaning
1	U_SEND	General-purpose message transmission (for no-protocol communications)
2	U_REC	General-purpose message reception (for no-protocol communications)
3	ABORT	Forced abort
8	M_SEND	MEMOBUS command transmission: Completed when the response is received.
9	M_REC	MEMOBUS command reception: Sends a response when the MEMOBUS command is received.
C	MR_SEND	MEMOBUS response transmission

④ PARAMETER

When the RESULT is 4 (FMT_NG: parameter formatting error), these bits give one of the error codes from the following table.

RESULT	Code (Hex)	Meaning
When RESULT is 4 (FMT_NG: Parameter Formatting Error)	00	No error
	01	Connection number out of range
	02	Watchdog error for MEMOBUS response
	03	Error in number of retries setting
	04	Error in cyclic area setting
	05	CPU number error
	06	Data address error
	07	Data size error
	08	Function code error
Others	□□	Connection number

■ Detail Error Code (PARAM02 and PARAM03)

These parameters give the detail error code based on the contents of PARAM00 (Processing Result).

Value of Processing Result (PARAM00)	Error	Detail Error Code	Description
81□□ hex	Function code error	1	Gives the same value as the value of the detail result.
82□□ hex	Address setting error	2	
83□□ hex	Data size error	3	
84□□ hex	Circuit number setting error	4	
85□□ hex	Channel number setting error	5	
86□□ hex	Connection number error	6	
88□□ hex	Communications device error	8	
89□□ hex	Device select error	9	
8A□□ hex	Remote node error	0 to FF	Gives the error code stored in the error message sent by the remote device. Refer to the manual for the remote device with which communications are being performed for details on the error code.

Note: 1. The detail error code is updated only when the Complete or Error bit of the function turns ON.
2. The detail error code is updated only when the communications section or communications device detects an error.
If the Controller detects an error, the detail error code will be set to 0, even if processing results in an error.

■ Status 1 (PARAM04)

This parameter gives the Transmission Status listed in the following table as Status 1 of the 218IFD.

Status 1 Value	Status
1 (IDLE)	The connection is idle.
2 (WAIT)	The connection is waiting to be established.
3 (CONNECT)	The connection is established.
–	–

Note: The status is updated when the function is executed in each scan.

■ Status 2 (PARAM05)

This parameter gives the Latest Error Status listed in the following table as Status 2 of the 218IFD.

This parameter gives information on the latest error that occurred.

Status 2 Value	Meaning	Remarks
0	No error	Normal
1	Socket creation error	A socket could not be created.
2	Local port number error	Setting error in local station port number
3	Changing socket attribute error	A system error occurred while setting the socket attribute.
4	Connection error	M-SND: The remote station rejected an attempt to open a TCP connection.
5	Connection error	M-RCV: An error occurred while passively opening a TCP connection.
6	System error	A socket polling error occurred while receiving data.
7	TCP data send error	The remote station does not exist.
8	UDP data send error	The data send request command was sent to a socket that does not exist.
9	TCP data receive error	A disconnection request was received from the remote station.
10	UDP data receive error	A data receive request was executed for a socket that does not exist.
11	Changing socket option error	A system error occurred while changing the socket options.
12	Data conversion error	Error in protocol conversion

Note: The status is updated when the function is executed in each scan.

■ Status 3 (PARAM06)

This parameter gives the Send Count listed in the following table as Status 3 of the 218IFD.

Status 3 Value	Meaning	Remarks
0 to 65,535	Send Count	Counts the number of times a message was sent over the transmission path.

Note: The status is updated when the function is executed in each scan.

■ Status 4 (PARAM07)

This parameter gives the Receive Count listed in the following table as Status 4 of the 218IFD.

Status 4 Value	Meaning	Remarks
0 to 65,535	Receive Count	Counts the number of times a message was received over the transmission path.

Note: The status is updated when the function is executed in each scan.

■ Status 5 (PARAM08)

This parameter gives the Error Count listed in the following table as Status 5 of the 218IFD.

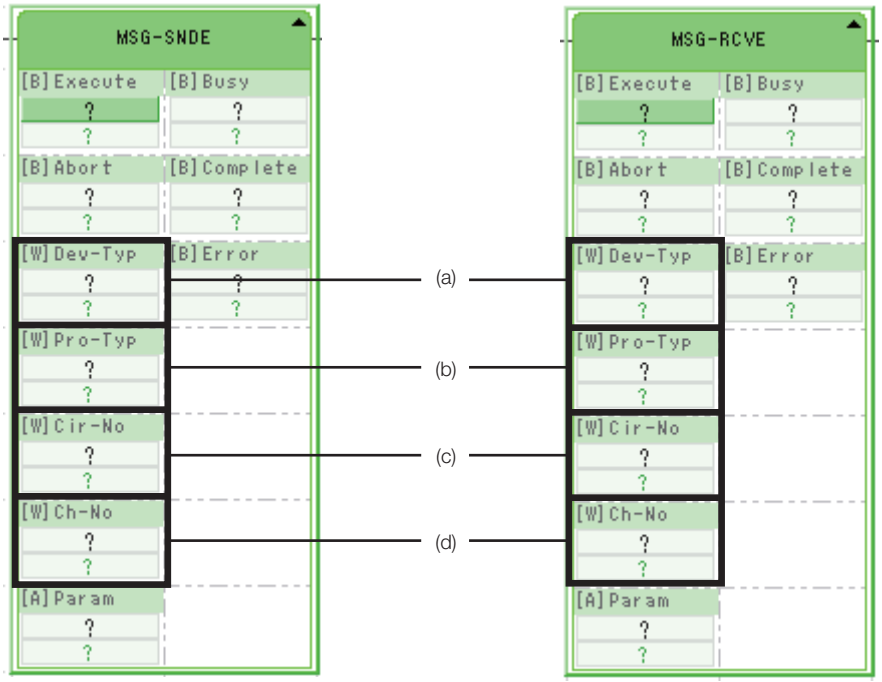
Status 5 Value	Meaning	Remarks
0 to 65,535	Error Counter	Counts the number of errors that occurred during message reception.

Note: The status is updated when the function is executed in each scan.

◆ Checking the Input Items to the Message Function

If message communications with a PLC, touch panel, or PC from another manufacturer do not start, the message function may not have been executed properly due to incorrect input items to the message function.

Use the following procedure to check the input items to the message function.



■ Dev-Typ (Communications Device Type)

Specify the type code of the communications device.

Device	Type Code (Decimal)
218IFD	16

■ Pro-Typ (Communications Protocol)

Specify the type code of the communications protocol.

Type Code	Communications Protocol	Remarks
1	MEMOBUS	• If the protocol type is set to **Extended MEMOBUS**, **MEMOBUS**, **MELSEC**, or **MODBUS/TCP** on the Connection Parameter Tab Page in the Module's Detail Definition Dialog Box, set 1 for the type code. • The communications protocol that is set here is used between the CPU Unit/CPU Module and the 218IFD. The Communications Function Module converts the data to the protocol that is set in the connection parameters
2	No-protocol communications 1 (unit: words)	Receives data in word units in no-protocol communications. A response is not sent to the remote station.
3	No-protocol communications 2 (unit: bytes)	Receives data in byte units in no-protocol communications. A response is not sent to the remote station.

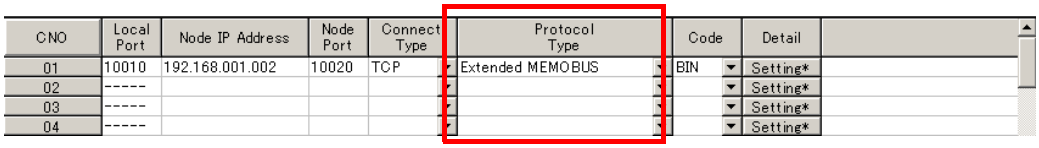
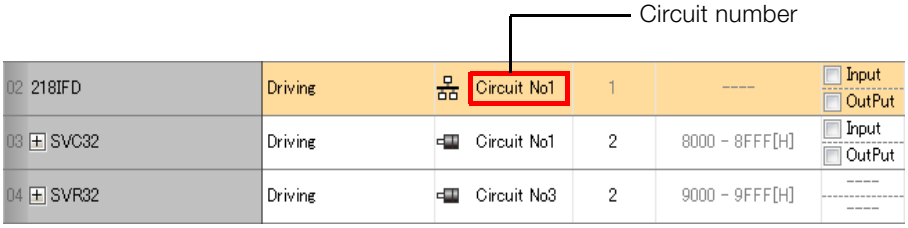


Figure 5.1 Connection Parameter Tab Page in Module's Detail Definition Dialog Box

◆ Cir-No (Circuit Number)

Specify the circuit number for the communications device.

Specify the same circuit number as displayed on the MPE720 Module Configuration Tab Page.



The following table gives the valid circuit numbers.

Communications Device	Valid Circuit Numbers
218IFD	1 to 8

◆ Ch-No (Communications Buffer Channel Number)

Specify the channel number of the communications buffer.

You can specify any channel number provided it is within the valid range.

> Important
>
> When executing more than one function simultaneously, do not use the same channel number within the same connection. You can use the same channel number as long as multiple functions are not executed at the same time.

The following table gives the valid channel numbers.

Communications Device	Valid Channel Numbers
218IFD	1 to 10

If the communications device is the 218IFD, there are 10 channels of communications buffers available for both transmission and reception. Therefore, 10 connections can be used for sending and receiving at the same time by using channels 1 to 10.

> Important
>
> There must be as many MSG-RCVE or MSG-SNDE functions as the number of connections used at the same time.

◆ Checking the Message Function Parameters

If message communications with a PLC, touch panel, or PC from another manufacturer do not start, the message function may not have been executed properly due to incorrect parameters in the message function.

Use the following procedure to check the parameters the message function.

Use the register list on the MPE720 to check the contents of the registers.

Example

The parameter list with the first address set to DA00000 is shown below.

Register	Parameter List F ··· ···· ···· ··· 0
DW00000	PARAM00
DW00001	PARAM01
DW00002	PARAM02
DW00003	PARAM03
DW00004	PARAM04
DW00005	PARAM05
DW00006	PARAM06
DW00007	PARAM07
⋮	⋮
DW00023	PARAM23
DW00024	PARAM24
DW00025	PARAM25
DW00026	PARAM26
DW00027	PARAM27
DW00028	PARAM28

■ Send Message Function (MSG-SNDE)

The parameters for the Send Message function are checked according to the following two communications protocols.

• Parameter List When Pro-Type (Communications Protocol) Is MEMOBUS

Parameter No.	IN/OUT*	Item	Description and What to Check
10	IN	Connection number	Set the remote station to which to send the message. (Set the connection number that is set in the connection parameters.) Make sure that the setting is within the following setting range. 218IFD: 1 to 20
11	IN	Option	Specify the options. The meaning of this parameter depends on the protocol.
12	IN	Function code	Set the function code to send.
14	IN	Remote data address, lower word	Set the register address to read or write at the remote station. (Specify the word address to access registers, and specify the bit address to access relays or coils.)
15	IN	Remote data address, upper word	
16	IN	Remote station register type	Set the register type to read or write at the remote station.
17	IN	Data size	Set the size of the data to read or write. (Specify the size in words for registers, and in bits for relays or coils.)
18	IN	Remote CPU module number	Set the CPU number at the remote station.
20	IN	Local data address, lower word	Set the data address to store read data or write data in the local station. (Specify the word address to access registers, and specify the bit address to access relays or coils.)
21	IN	Local data address, upper word	
22	IN	Local station register type	Set the register type to store read data or write data in the local station.

* IN: Input item

Note: Refer to the following manual for what to check in parameters 10 to 22 according to the protocol type that is being used.
MP3000 Series Communications User's Manual (Manual No.: SIEP C880725 12)

• Parameter List When Pro-Type (Communications Protocol) Is No-protocol 1 or No-protocol 2

Parameter No.	IN/OUT*	Item	Description and What to Check
10	IN	Connection number	Set the remote station to which to send the message. (Set the connection number that is set in the connection parameters.) Make sure that the setting is within the following setting range. 218IFD: 1 to 20
11 to 16	–	Not used.	–
17	IN	Data size	Set the size of the data to write. (Specify the size in words for No-protocol 1, and in bits for No-protocol 2.)
18	–	Not used.	–
20	IN	Local data address, lower word	Set the data address to store write data in the local station.
21	IN	Local data address, upper word	
22	IN	Local station register type	Set the register type of the write data to store in the local station.

* IN: Input item

■ Receive Message Function (MSG-RCVE)

The parameters for the Send Message function are checked according to the following two communications protocols.

• Parameter List When Pro-Type (Communications Protocol) Is MEMOBUS

Parameter No.	IN/OUT*	Item	Description and What to Check
10	IN	Connection number	Set the remote station from which to send the message. (Set the connection number that is set in the connection parameters.) Make sure that the setting is within the following setting range. 218IFD: 1 to 20
11	OUT	Option	Gives the optional settings. The meaning of this option depends on the protocol being used.
12	OUT	Function code	Contains the function code that was requested from the sending side.
14	OUT	Data address, lower word	Contains the start address of the data requested from the sending side. (Contains the word address for register access, or contains the bit address for relay or coil access.)
15	OUT	Data address, upper word	
16	OUT	Register type	Contains the register type that was requested by the sending side.
17	OUT	Data size	Contains the size of read or write data that was requested by the sending side. (Contains the size in words for registers, and in bits for relays or coils.)
18	OUT	Remote CPU module number	Contains the remote CPU number.
20	IN	Coil offset, lower word	Set the offset to the word address of the coil.
21	IN	Coil offset, upper word	
22	IN	Input relay offset, lower word	Set the offset to the word address for the input relay.
23	IN	Input relay offset, upper word	
24	IN	Input register offset, lower word	Set the offset to the word address for the input register.
25	IN	Input register offset, upper word	
26	IN	Holding register offset, lower word	Set the offset to the word address for the hold register.
27	IN	Holding register offset, upper word	
28	IN	Data relay offset, lower word	Set the offset to the word address for the data relay.
29	IN	Data relay offset, upper word	
30	IN	Data register offset, lower word	Set the offset to the word address for the data register.
31	IN	Data register offset, upper word	
32	IN	Output coil offset, lower word	Set the offset to the word address of the output coil.
33	IN	Output coil offset, upper word	
34	IN	Output register offset, lower word	Set the offset to the word address for the output register.
35	IN	Output register offset, upper word	
36	IN	M writing range lower limit, lower word	Set the word address of the lower limit for the writing range for hold registers and coils.
37	IN	M writing range lower limit, upper word	

Continued on next page.

Continued from previous page.

Parameter No.	IN/OUT*	Item	Description and What to Check
38	IN	M writing range upper limit, lower word	Set the word address of the upper limit for the writing range for hold registers and coils.
39	IN	M writing range upper limit, upper word	
40	IN	G writing range lower limit, lower word	Set the word address of the lower limit for the writing range for data registers and data relays.
41	IN	G writing range lower limit, upper word	
42	IN	G writing range upper limit, lower word	Set the word address of the upper limit for the writing range for data registers and data relays.
43	IN	G writing range upper limit, upper word	
44	IN	O writing range lower limit, lower word	Set the word address of the lower limit for the writing range for output registers and output coils.
45	IN	O writing range lower limit, upper word	
46	IN	O writing range upper limit, lower word	Set the word address of the upper limit for the writing range for output registers and output coils.
47	IN	O writing range upper limit, upper word	

* IN: Input item, OUT: Output item

Note: Refer to the following manual for what to check in parameters 04 to 11 according to the protocol type that is being used.
MP3000 Series Communications User's Manual (Manual No.: SIEP C880725 12)

• Parameter List When Pro-Type (Communications Protocol) Is No-protocol 1 or No-protocol 2

Parameter No.	IN/OUT*	Item	Description and What to Check
10	IN	Connection number	Set the remote station from which to send the message. (Set the connection number that is set in the connection parameters.) Make sure that the setting is within the following setting range. 218IFD: 1 to 20
11 to 16	–	Not used.	–
17	OUT	Data size	Contains the size of read or write data that was requested by the sending side. (Contains the size in words for registers, and in bits for relays or coils.)
18 to 35	–	Not used.	–
36	IN	M writing range lower limit, lower word	Set the offset to the word address for the hold register.
37	IN	M writing range lower limit, upper word	
38	IN	M writing range upper limit, lower word	Set the word address of the upper limit for the writing range for hold registers.
39	IN	M writing range upper limit, upper word	
40 to 47	–	Not used.	–

* IN: Input item, OUT: Output item

5.2.3 Communications Stopped during Message Communications

There are two general causes for message communications to be cut off.

No Error in Message Function

The following table shows the possible causes for message communications to stop during normal communications when no error is indicated in the error status in the Module's detailed definition or in the processing result of the message function.

Communications Function Module	Condition	Cause	Correction
218IFD	The communications mode of the remote station that is connected to the Ethernet Module is set to a fixed speed in 10Base-T/100Base-TX half-duplex communications,*1 and there is high traffic on the network.	There is high traffic on the network with frequent data collisions, and the data that was sent from the local or remote station was lost.	1. Set the communications mode of the remote station to auto-negotiation and perform full-duplex communications. 2. Divide the network into segments using a switching hub to reduce the traffic on the network. 3. Adjust the sent timing at the master devices so that multiple devices do not start communications at the same time. This does not apply when the no-protocol communications is specified as the protocol type.
	The communication mode of the remote station connected to the Ethernet Module is set to the fixed speed in 10Base-T/100Base-TX full-duplex.*2	Communication between the Ethernet Module and the remote station cannot be performed properly because the communication modes of the two stations are different, and the data that was sent from the local or remote station was lost.	1. Set the communications mode of the remote station to auto-negotiation and perform full-duplex communications. 2. Set the communications mode of the remote station to a fixed speed and perform 10Base-T/100Base-TX half-duplex communications.

*1. When connected to a hub, the communications mode of the hub is set to a fixed speed in 10Base-T/100Base-TX half-duplex communications.

*2. When connected to a hub, the communications mode of the hub is set to a fixed speed in 10Base-T/100Base-TX half-duplex communications.

Error in Message Function

The following table shows the possible causes for message communications to stop during normal communications when an error is indicated in the error status of the Module's detailed definition or in the processing result of the message function. These are in addition to the causes listed in when no error occurs.

Communications Function Module	Condition	Cause	Correction
218IFD	Communications are performed simultaneously with multiple remote stations.	The connection parameters or message functions were not prepared for the number of remote stations to communicate with.	Prepare the connection parameters and message functions for the number of remote stations to communicate with. (Communications with only one station (one connection) at one time is possible with one set of connection parameters and one message function.)
	Multiple message functions are being executed simultaneously.	More than one message function was executed simultaneously for the same Cir- No (circuit number) and Ch-No (communications buffer channel number) or PARAM02 (connection number).	Correct the ladder program so that no more than one message function is executed simultaneously. If the communications stop due to this cause, the error can be checked in the processing result of the message function. Refer to the following section for details on the processing results of message functions. ☞ ◆ *Checking the Processing Results and Status* on page 5-19
	There is a connection for which automatic reception is enabled.	A message function and automatic reception were executed at the same time for the same connection or communications buffer channel.	Execute only automatic reception or only the message function according to the application. Automatic reception can be enabled for connection numbers 1 to 10. It is disabled by default.

5.2.4 Other Problems during Message Communications

If the problem cannot be resolved with the corrections that are given in *5.2.1 Checking the Switch Settings* on page 5-13 to *5.2.3 Communications Stopped during Message Communications* on page 5-32, perform troubleshooting with the following table.

Communications Function Module	Error	Cause	Correction
218IFD	In a configuration where the remote station is the master station and the local station is the slave station, the remote station cannot write to certain register addresses in the Machine Controller.	There are errors in the following parameter settings of the MSG-RCVE function. • PARAM36 and PARAM37 (M writing range lower limit) • PARAM38 and PARAM39 (M writing range upper limit) • PARAM40 and PARAM41 (G writing range lower limit) • PARAM42 and PARAM43 (G writing range upper limit) • PARAM44 and PARAM45 (O writing range lower limit) • PARAM46 and PARAM47 (O writing range upper limit)	Correct the parameter settings of the MSG-RCVE function where the errors exist. Refer to the following manual for details on the parameters of the MSG-RCVE function. MP3000 Series Communications User's Manual (Manual No.: SIEP C880725 12)
	In a configuration where the local station is the master station and the remote station is the slave station, the Machine Controller cannot read or write from/to certain register addresses in the remote station.	An attempt has been made to access special registers or memory-protected registers in the remote station.	Check the specifications of the device that is used as the remote station.
	The addresses of the registers to read/write from the local station to the remote station and those of the registers to read/write from the remote station to the local station are inconsistent.	There are errors in the following parameter settings of the MSG-RCVE function. • PARAM20 and PARAM21 (coil offset) • PARAM22 and PARAM23 (input relay offset) • PARAM24 and PARAM25 (input register offset) • PARAM26 and PARAM27 (hold register offset) • PARAM28 and PARAM29 (data relay offset) • PARAM30 and PARAM31 (data register offset) • PARAM32 and PARAM33 (output coil offset) • PARAM34 and PARAM35 (output register offset)	Correct the parameter settings of the MSG-RCVE function where the errors exist. Refer to the following manual for details on the parameters of the MSG-RCVE function. MP3000 Series Communications User's Manual (Manual No.: SIEP C880725 12)
	I/O message communications do not start.	There are no slave settings (message receive settings and instructions) at the remote station.	Make the necessary slave settings (message receive settings and instructions) at the remote station. (I/O message communications can be used to execute the Send Message function without a ladder program. Two connections are used to read and write registers. Two connections are used to read and write registers. For this reason, receive settings (message receive settings and instructions) for two connections are required at the remote station.)

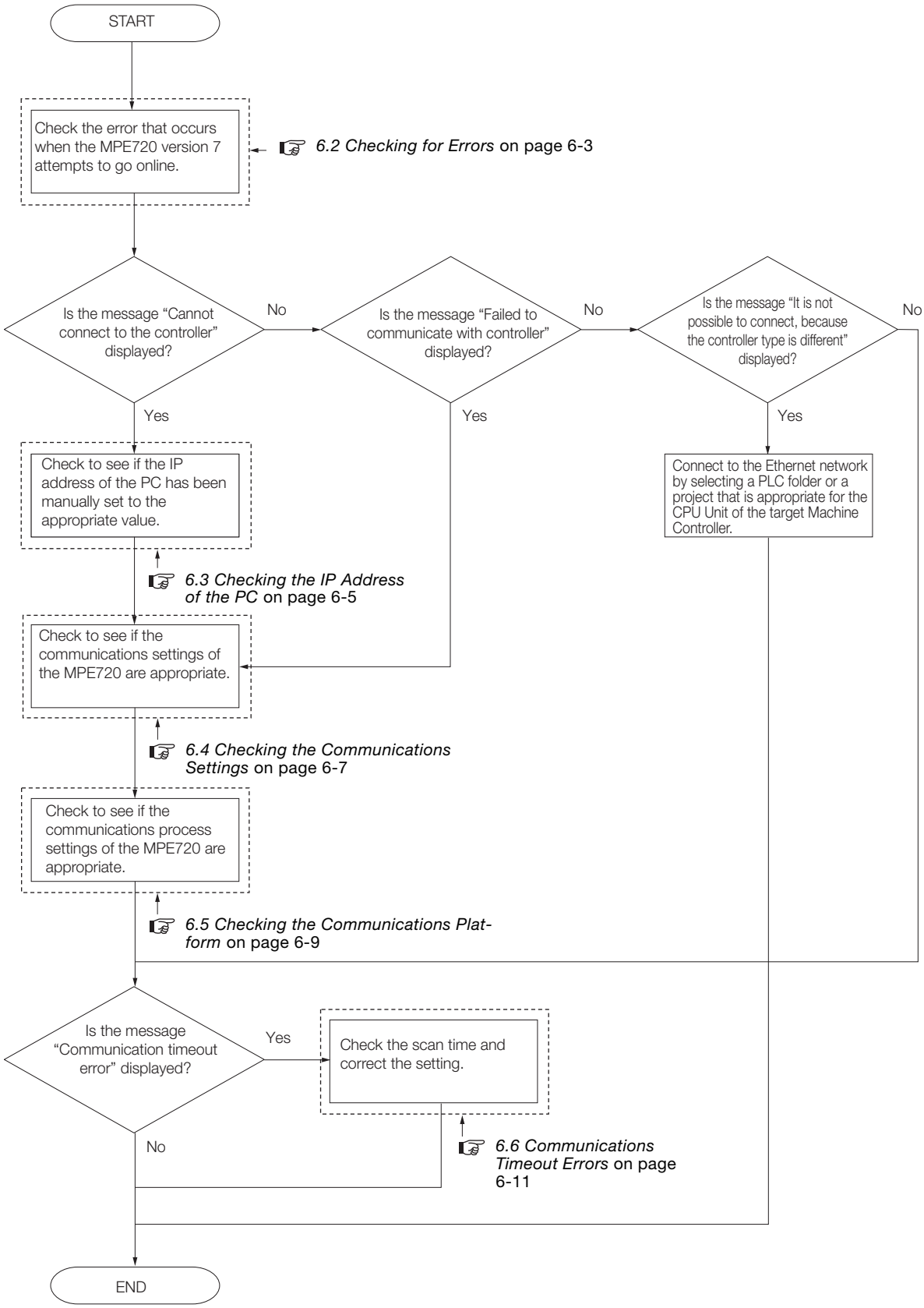
Troubleshooting Connections with the MPE720

6

This chapter describes how to troubleshoot problems if the MP3200 or MP3300 cannot be connected with the MPE720.

6.1 Troubleshooting Flowchart When the MPE720 Cannot Go Online with the Machine Controller

Use the following flowchart to troubleshoot the problem when you cannot go online with the Machine Controller from the MPE720.

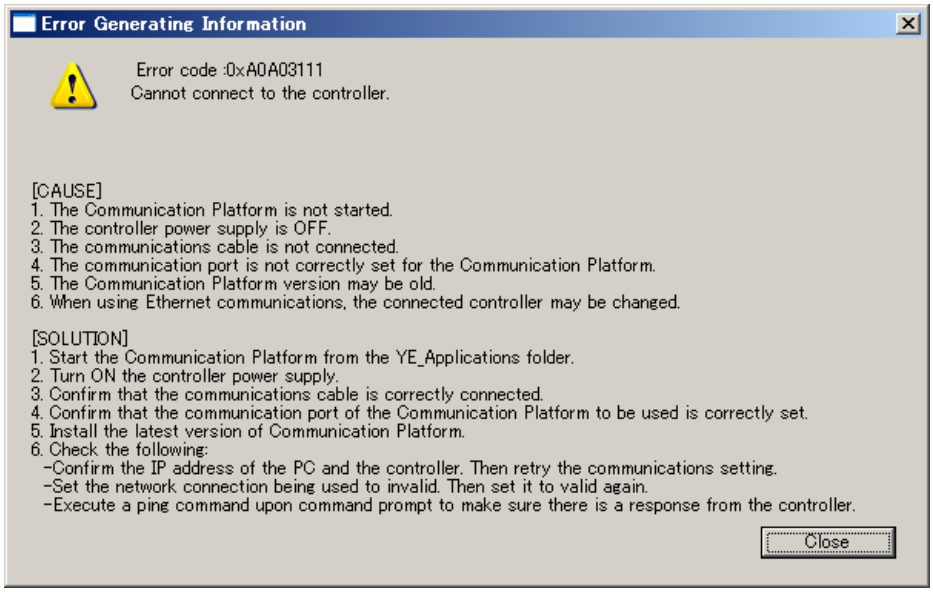


6.2 Checking for Errors

When the MPE720 cannot go online with the Machine Controller, the Error Generating Information Dialog Box will be displayed. This information can be used to identify the error.

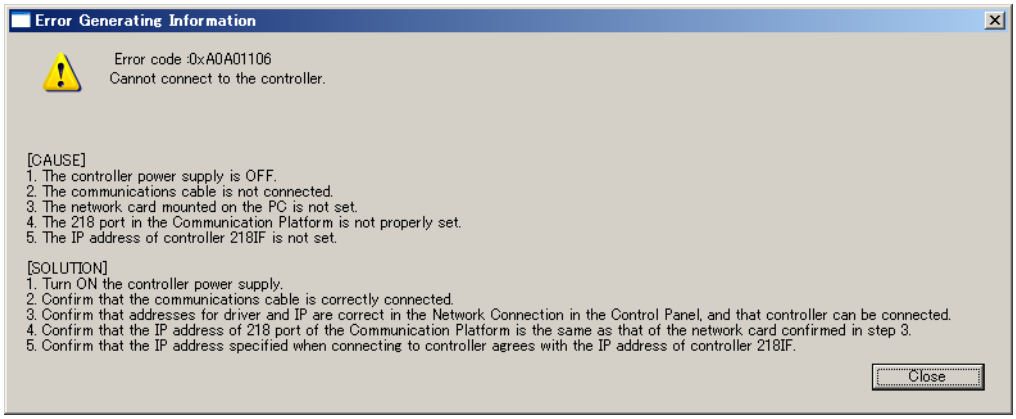
6.2.1 Connection Errors

The following Error Generating Information Dialog Box will be displayed if the IP address of the PC is automatically assigned or if the IP address of the PC is not set correctly due to the communications settings or communications process.



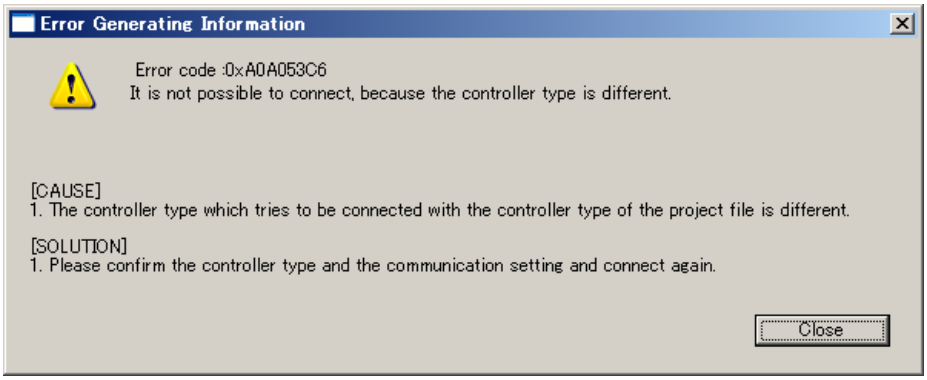
6.2.2 Communications Errors

The following Error Generating Information Dialog Box will be displayed if the IP address of the Machine Controller is not set correctly in the communications settings.



6.2.3 Model Errors

The following Error Generating Information Dialog Box will be displayed if you attempt to connect through Ethernet and the model of the CPU Unit in the current project is different from the model of the CPU Unit in the Machine Controller. Select a project that is appropriate for the CPU Unit of the Machine Controller to connect through Ethernet.



6.3 Checking the IP Address of the PC

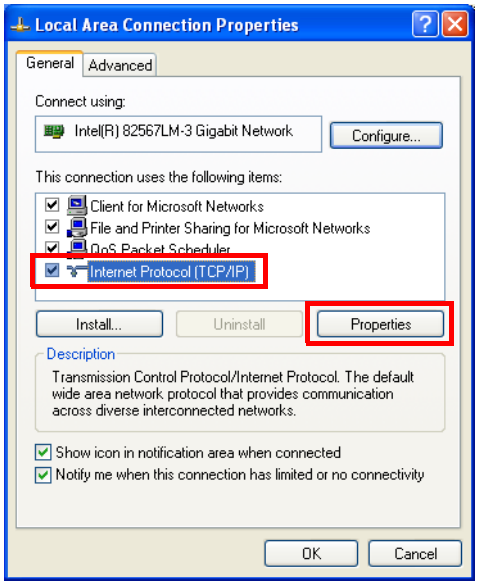
The procedure for checking and correcting the network settings of the PC (e.g., the IP address) is given below.

1. Display the Local Area Connection Properties Dialog Box on the PC.

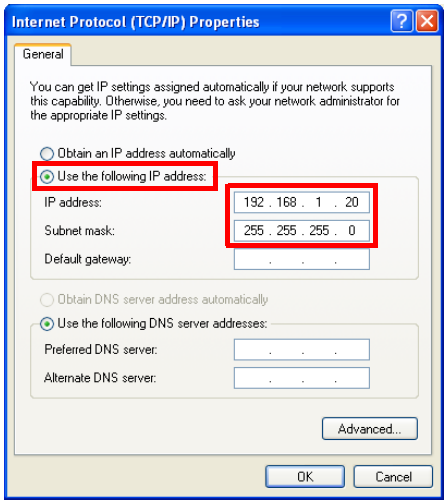
   Example
   Windows XP
   On the PC, select ***Control Panel*** – ***Network Connection*** – ***Local Area Connection*** from the Windows Start Menu and then click the **Properties** Button.

   Example
   Windows 7
   On the PC, select ***Control Panel*** – ***Network and Internet*** - ***Network and Sharing Center*** – ***Local Area Connection*** from the Windows Start Menu and then click the **Properties** Button.

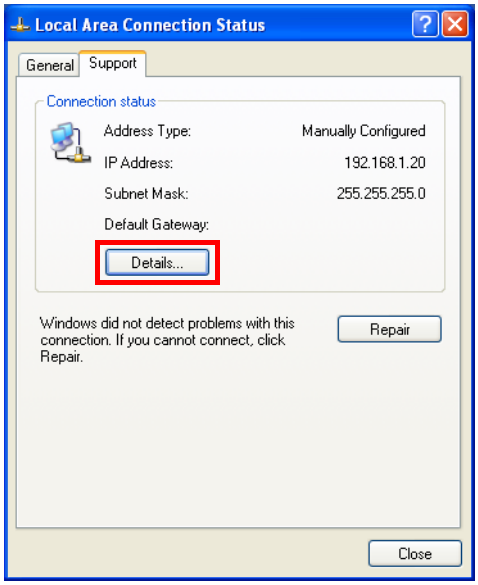
2. Select the **Internet Protocol (TCP/IP)** Check Box from the list and click the **Properties** Button.



3. In the Internet Protocol (TCP/IP) Properties Dialog Box, select the **Use the following IP address** Option.
   Set the **IP address** Box and the **Subnet mask** Box as required. If you change any settings, continue to step *4*.
   If you have not changed any settings, click the **OK** Button to complete checking of the IP address of the PC.



4. Click the **Details** Button on the Support Tab Page in the Local Area Connection Status Dialog Box.



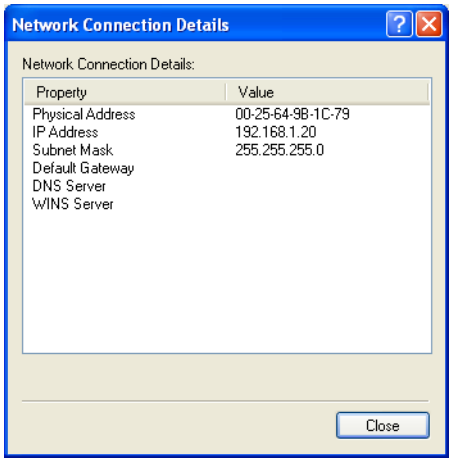
5. Check the actual IP address and subnet mask.

Example

Windows XP
On the PC, select **Control Panel** – **Network Connection** – **Local Area Connection Status** from the Windows Start Menu and then click the **Support** Tab.

Example

Windows 7
On the PC, select **Control Panel** – **Network and Internet** – **Network Connection** - **Network and Sharing Center** – **Local Area Connection Status** from the Windows Start Menu and then click the **Details** Button.



If the values are the same as those that were set in step 3, click the **Close** Button to close the dialog box.

Information

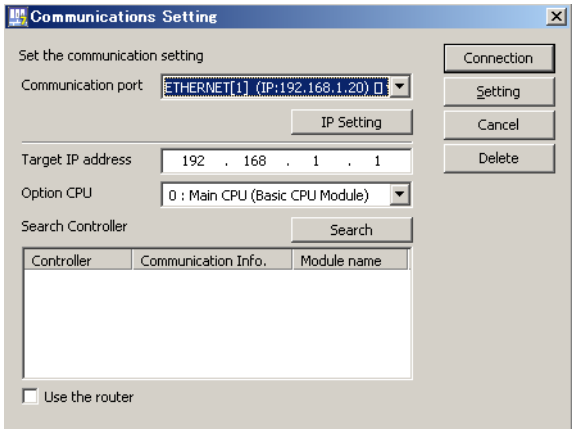
If the displayed values differ from the values that were set in step *3*, restart the PC to enable the settings that were made manually.

6.4 Checking the Communications Settings

The procedure for checking and correcting the communications settings of MPE720 version 7 is given below.

1. Start up MPE720 version 7, and select **Communications Setting**.

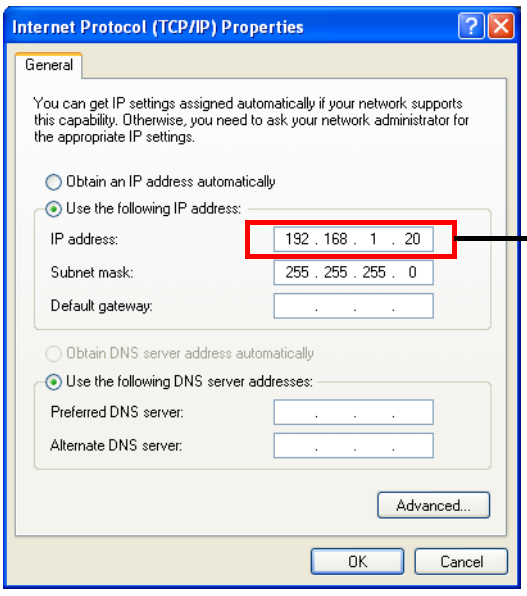
The Communications Setting Dialog Box will be displayed.



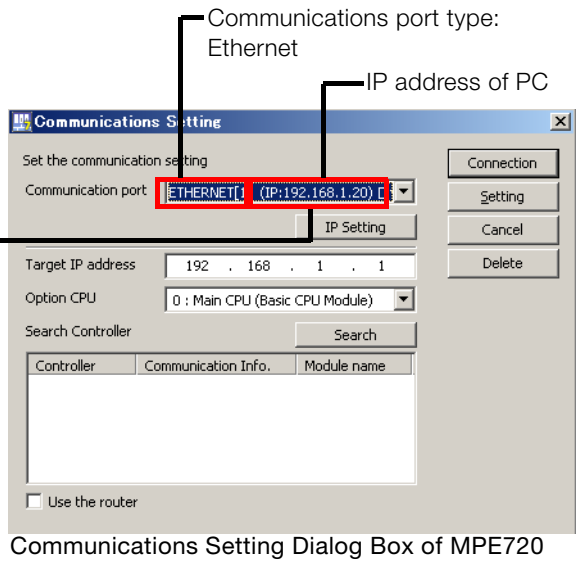
2. To check the settings of the Communications Setting Dialog Box, display the Internet Protocol (TCP/IPv4) Properties Dialog Box, the dialog box to set the IP address on the PC.
Refer to the following sections for details.
☞ *6.3 Checking the IP Address of the PC* on page 6-5

3. Check the following two points in the Communications Setting Dialog Box.
   - Make sure that the communications port type at Communication Port is set to ETHERNET.
   - Make sure that the IP address of the PC is set at Communication Port.

If the settings are not appropriate, select the appropriate items from the list.
If the appropriate communications port or IP address is not displayed, refer to the following section.
☞ *6.5 Checking the Communications Platform* on page 6-9



Dialog Box to Set the IP Address on the PC



Communications Setting Dialog Box of MPE720 Version 7

4. Make sure that the IP address of the Machine Controller is properly set in the **Target IP address** Box in the Communications Setting Dialog Box of MPE720 version 7.

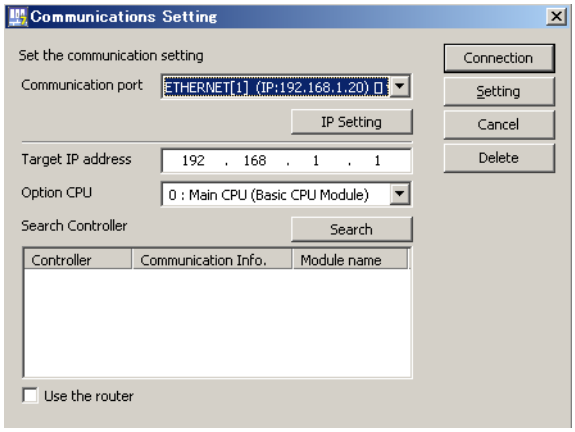
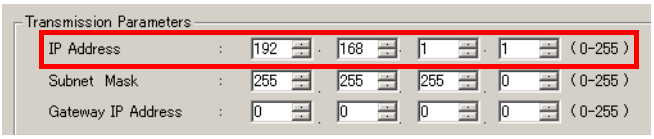


Figure 6.1 Default Network Settings

Information

1. When the E-INIT or INIT Switch on the CPU Unit/CPU Module Is ON, the network settings of the Machine Controller will be as given below.
   In this case, the definition data that is saved in the flash memory of the Machine Controller will be ignored.
   IP address: 192.168.1.1
   Subnet mask: 255.255.255.0
   Default gateway: 0.0.0.0
2. When the E-INIT and INIT Switch on the CPU Unit/CPU Module Are ON, the network settings of the Machine Controller will be as given below. The IP address of the Machine Controller will be the address that was set in the 218IFD Detail Definition Dialog Box from the MPE720 and saved in flash memory.



Note

1. If the settings that were found in step *4* are not appropriate, correct the settings in the Detail Definition Dialog Box of each Module using the MPE720 and save the data to flash memory.
2. To reset the IP address from the Module's Detail Definition Dialog Box, turn OFF the E-INIT and INIT switches on the CPU Unit/CPU Module and turn the power supply OFF and ON again.
3. If a connection with the MPE720 cannot be established in this state, temporarily turn ON the E-INIT or INIT switch on the front of the CPU Unit/CPU Module to establish a connection from the MPE720 with the default network settings and check the settings.

This concludes the procedure to check the communications settings.

6.5 Checking the Communications Platform

The procedure for checking and correcting the communications platform settings on the MPE720 is given below.

1. Start the communications platform.

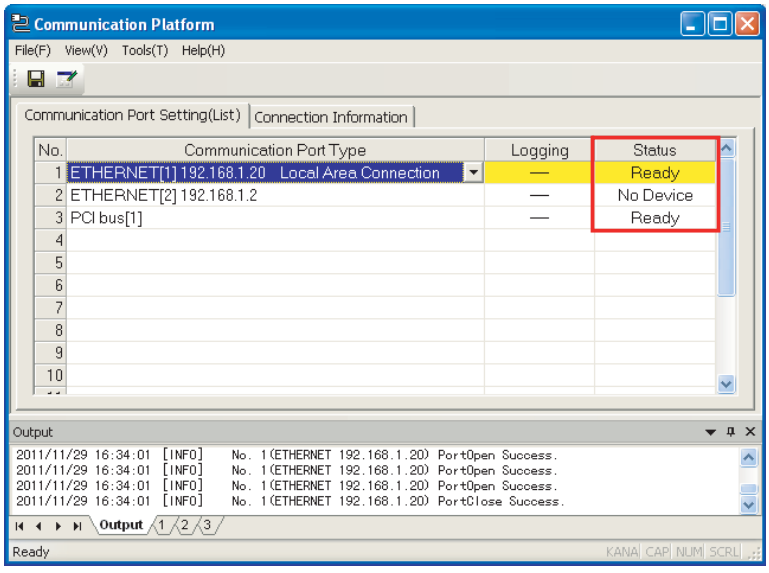
   Note: This operation can be skipped if the communications platform has already been started.

   Example — Windows XP
   On the PC, select **Programs** – **YE_Applications** – **Communication Platform** from the Windows Start Menu.

   Example — Windows 7
   On the PC, select **All Programs** – **YE_Applications** – **Communication Platform** from the Windows Start Menu.

2. Double-click the communications platform indicator in the task bar of the PC to display the Communication Platform Window.

3. Make sure that the **Status** Column for MPE720 version 7 in the Communication Platform Window shows **Ready**.

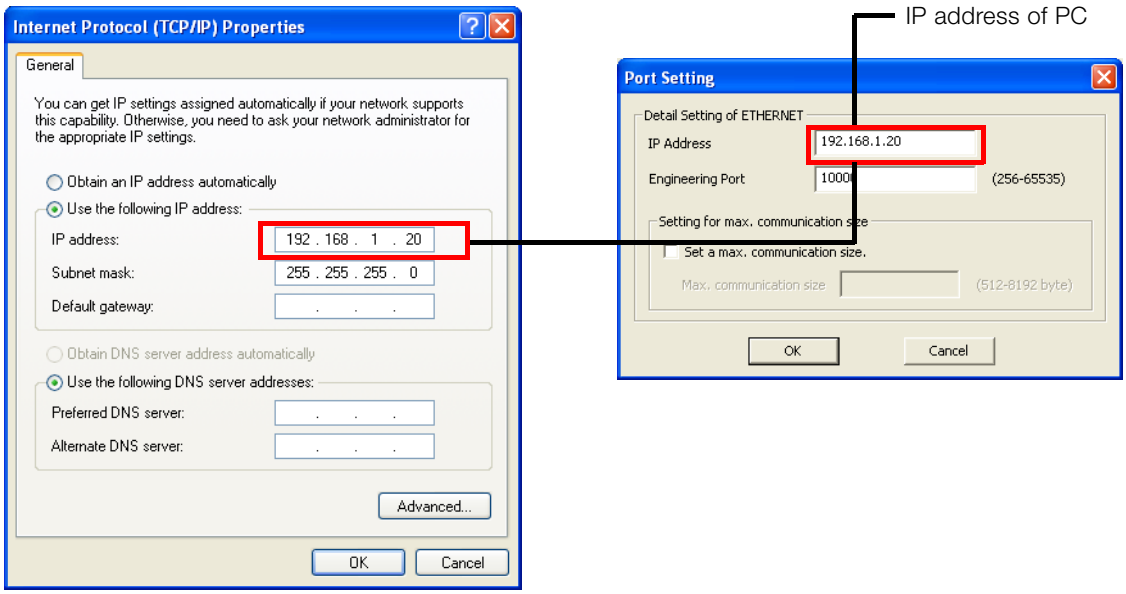


> Important
>
> When the **Status** Column Does Not Show **Ready**
> The LAN driver of the PC may be faulty.
> Perform troubleshooting in Windows Device Manager Window.

4. Double-click the number in the **No.** Column displayed in the Communication Port Setting (List) Tab Page to display the Port Setting Dialog Box.

5. To check the settings of the Communications Setting Dialog Box, display the Internet Protocol (TCP/IPv4) Properties Dialog Box, the dialog box to set the IP address on the PC.
   Refer to the following sections for details.
   ☞ *6.3 Checking the IP Address of the PC* on page 6-5

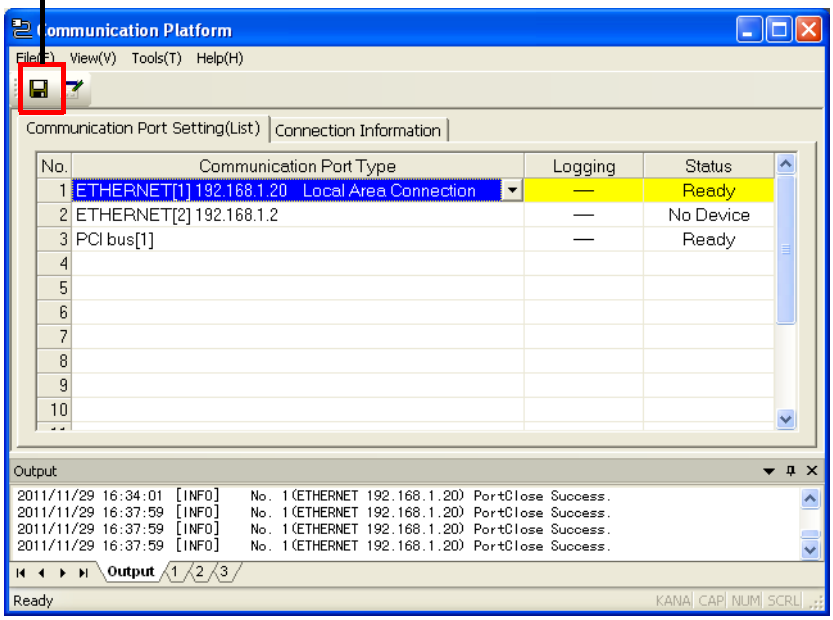
6. Make sure that the IP address of the PC is displayed in the **IP Address** Box in the Port Setting Dialog Box.



- If the **IP Address** Box shows any address other than the IP address of the PC, enter the IP address of the PC in the box and then click the **OK** Button.

7. Save the communications platform. The settings are enabled immediately.

Click icon to save the communications process.



6.6 Communications Timeout Errors

Communications with the MPE720 are processed with a lower priority than the high-speed scan. Because of this, communications with MPE720 may time out if the high-speed scan time is too short.

Set a value for the high-speed scan that is sufficiently long compared with the current and maximum values during operation of the application.

The set value, current value, and maximum value of the high-speed scan can be checked and set in the Environment Setting Dialog Box of MPE720 version 7.

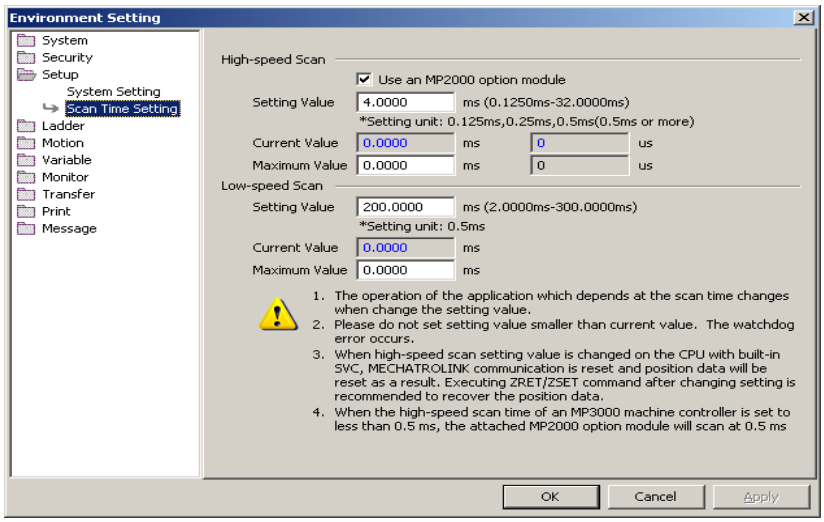


Figure 6.2 Environment Setting Dialog Box of MPE720 Version 7

Troubleshooting System Errors

7

This chapter describes how to troubleshoot system errors.

7.1 Overall Configuration of the System Registers

The indicators on the CPU Unit/CPU Module show the operating status and error status of the MP3000-series Machine Controller. You can use the system (S) registers to obtain more detailed information on errors. The contents of the system registers will allow you to isolate errors and implement corrections.

The following table shows the overall configuration of the system registers. Refer to the sections that are given in the righthand column for details.

Register Addresses	Contents	Reference
SW00000 to SW00029	System Service Registers	–
SW00030 to SW00049	System Status	*7.5.1 CPU System Status* on page 7-8
SW00050 to SW00079	System Error Status	*7.5.2 System Error Status* on page 7-10
SW00080 to SW00089	User Operation Error Status	*7.5.3 User Operation Error Status in Ladder Programs* on page 7-11
SW00090 to SW00103	System Service Execution Status	*7.5.4 System Service Execution Status* on page 7-14
SW00104 to SW00109	Reserved for system.	–
SW00110 to SW00189	Detailed User Operation Error Status	*Detailed User Operation Error Status* on page 7-13
SW00190 to SW00199	Reserved for system.	–
SW00200 to SW00503	System I/O Error Status	*7.5.5 System I/O Error Status* on page 7-15
SW00504 and SW00505	Reserved for system.	–
SW00506 and SW00507	Security Status	*7.5.6 Security Status* on page 7-41
SW00508 to SW00649	Reserved for system.	–
SW00650 to SW00667	USB-related System Status	*7.5.7 USB/SD-related System Status* on page 7-41
SW00668 to SW00693	Reserved for system.	–
SW00694 to SW00697	Message Relaying Status	*7.5.8 Message Relaying Status* on page 7-42
SW00698 to SW00789	Interrupt Status	*7.5.9 Interrupt Status* on page 7-42
SW00790 to SW00799	Reserved for system.	–
SW00800 to SW00815	CPU Unit/CPU Module Information	*7.5.10 CPU Unit/CPU Module Information* on page 7-44
SW00816 to SW01095	Optional Module Information	*7.5.11 Optional Module Information* on page 7-46
SW01096 to SW01410	Reserved for system.	–
SW01411 to SW01442	MPU-01 Status	*7.5.12 MPU-01 Module Status* on page 7-50
SW01443 to SW01474	Reserved for system.	–
SW01475 to SW01482	Sub CPU Status	*7.5.13 Sub CPU Status* on page 7-53
SW01483 to SW02687	Reserved for system.	–

Continued on next page.

Continued from previous page.

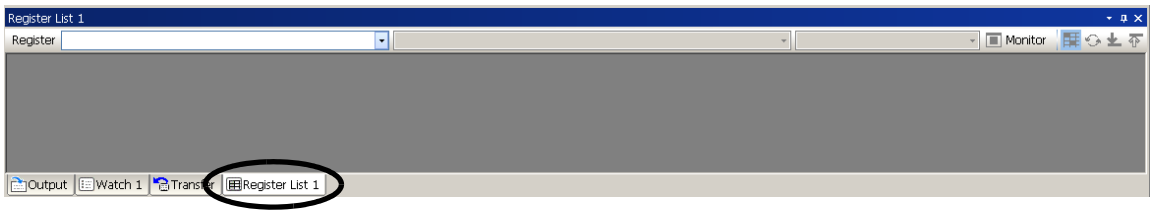
Register Addresses	Contents	Reference
SW02688 to SW03199	PROFINET Controller (266IF-01) IOPS Status	*7.5.14 PROFINET Controller (266IF-01) IOPS Status Information* on page 7-54
SW03200 to SW05119	Motion Program Information	*7.5.15 Motion Program Execution Information* on page 7-55
SW05120 to SW05247	Used by the system (system memory read).	–
SW05248 to SW08191	Reserved for system.	–
SW08192 to SW09215	Extended Motion Program Information	*7.5.15 Motion Program Execution Information* on page 7-55
SW09216 to SW09559	Reserved for system.	–
SW09560 to SW13699	Extended System I/O Error Status	*7.5.5 System I/O Error Status* on page 7-15
SW13700 to SW13747	Extended CPU Unit/CPU Module Information	*7.5.10 CPU Unit/CPU Module Information* on page 7-44
SW13748 to SW15795	Extended Optional Module Information	*7.5.11 Optional Module Information* on page 7-46
SW15796 to SW15799	Reserved for system.	–
SW15800	Extended System Status	*7.5.16 Extended System Status* on page 7-66
SW15801 to SW15814	Reserved for system.	–
SW15815 to SW15827	Extended System Service Registers	–
SW15828 to SW15997	Reserved for system.	–
SW15998 to SW16011	Extended System Service Execution Status	*7.5.17 Extended System Service Execution Status* on page 7-67
SW16012 to SW16199	Reserved for system.	–
SW16200 to SW17999	Alarm History Information	*7.5.18 Alarm History Information* on page 7-68
SW18000 to SW19999	Reserved for system.	–
SW20000 to SW22063	Product Information	*7.5.19 Product Information* on page 7-69
SW22064 to SW22999	Reserved for system.	–
SW23000 to SW23159	Unit and Rack Information	*7.5.20 Unit and Rack Information* on page 7-70
SW23160 to SW23999	Reserved for system.	–
SW24000 to SW24321	Data Logging Execution Status	*7.5.21 Data Logging Execution Status* on page 7-71
SW24322 to SW24399	Reserved for system.	–
SW24400 to SW24719	FTP Client Status and Controls	*7.5.22 FTP Client Status and Control Information* on page 7-72
SW24720 to SW24999	Reserved for system.	–
SW25000 to SW25671	Automatic Reception Status during Ethernet Communications	*7.5.23 Automatic Reception Status (Ethernet Communications)* on page 7-74
SW25672 to SW27599	Reserved for system.	–
SW27600 to SW29775	Maintenance Monitor Information	*7.5.24 Maintenance Monitor Information* on page 7-76
SW29776 to SW65535	Reserved for system.	–

7.2 Viewing the Contents of the System Registers

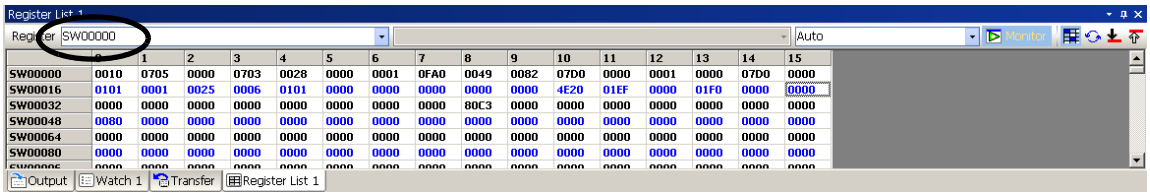
To view the contents of the system registers, start the MPE720 Engineering Tool and display a register list.

Use the following procedure to display the register list.

1. Display the Register List 1 Pane in MPE720 version 7.
   By default, there will be a **Register List 1** Tab at the bottom of the Pane.



2. Enter the register address of the first system register to display in the **Register** Box in the form SW□□□□□. The contents of the system registers starting with the specified first register will be displayed.



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SW00000	0010	0705	0000	0703	0028	0000	0001	0FA0	0049	0082	07D0	0000	0001	0000	07D0	0000
SW00016	0101	0001	0025	0006	0101	0000	0000	0000	0000	0000	4E20	01EF	0000	01F0	0000	0000
SW00032	0000	0000	0000	0000	0000	0000	0000	0000	80C3	0000	0000	0000	0000	0000	0000	0000
SW00048	0080	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
SW00064	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
SW00080	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000

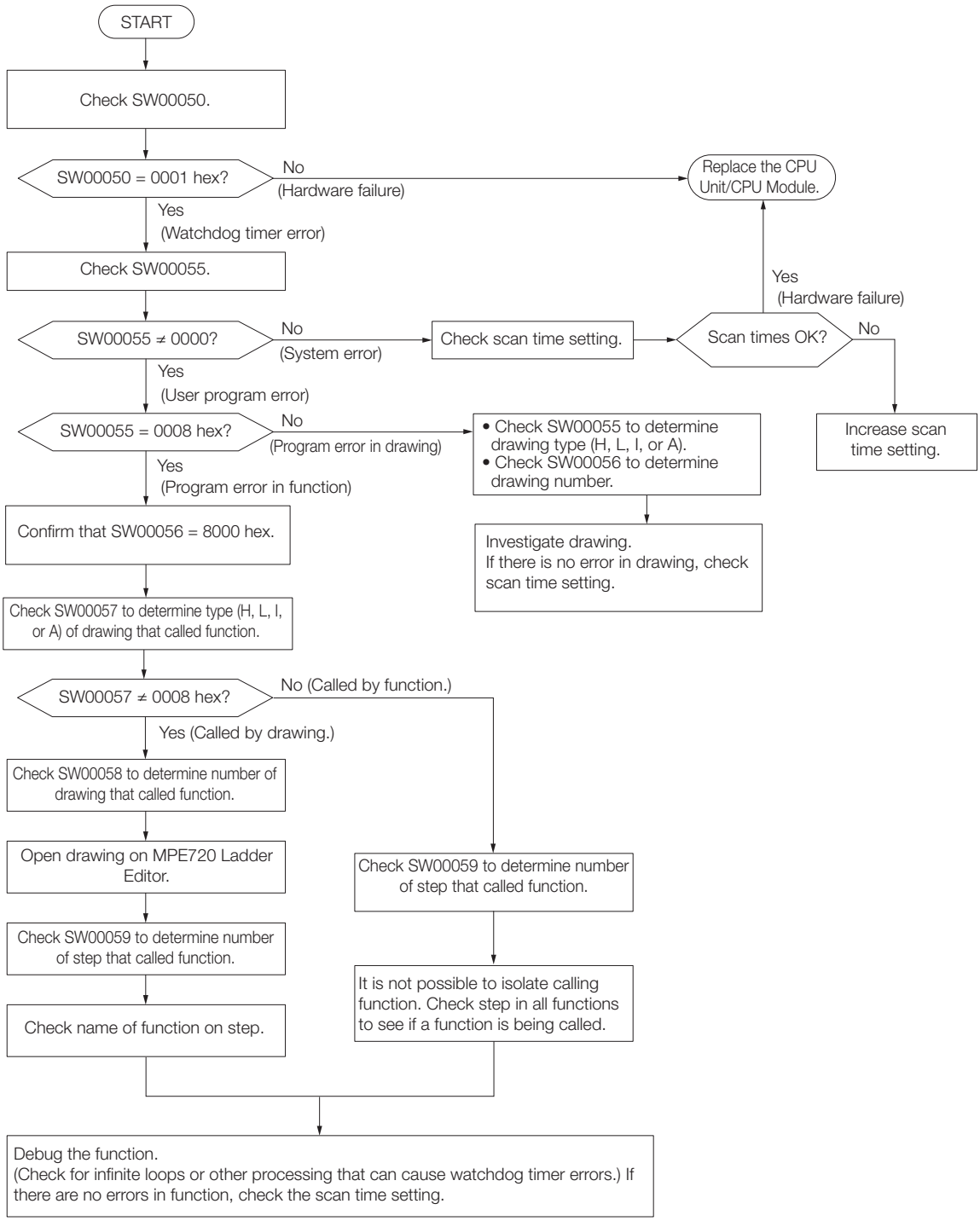
Note: By default, the data type will be decimal. Right-click in the list and select **Hexadecimal** from the pop-up menu to display hexadecimal values (as shown above).

7.3 Troubleshooting for the ERR Indicator

A serious error (hardware failure or user program error) may have occurred in the following cases.

- MP3100: The S1 indicator is lit red (ERR state).
- MP3200/MP3300: The ERR indicator of the CPU Unit/CPU Module is lit.

Stop the Machine Controller (turn ON pin 6 on the DIP switch) and use the following flowchart to investigate the problem.



Note: Refer to the following section for the contents of SW00050 to SW00059.

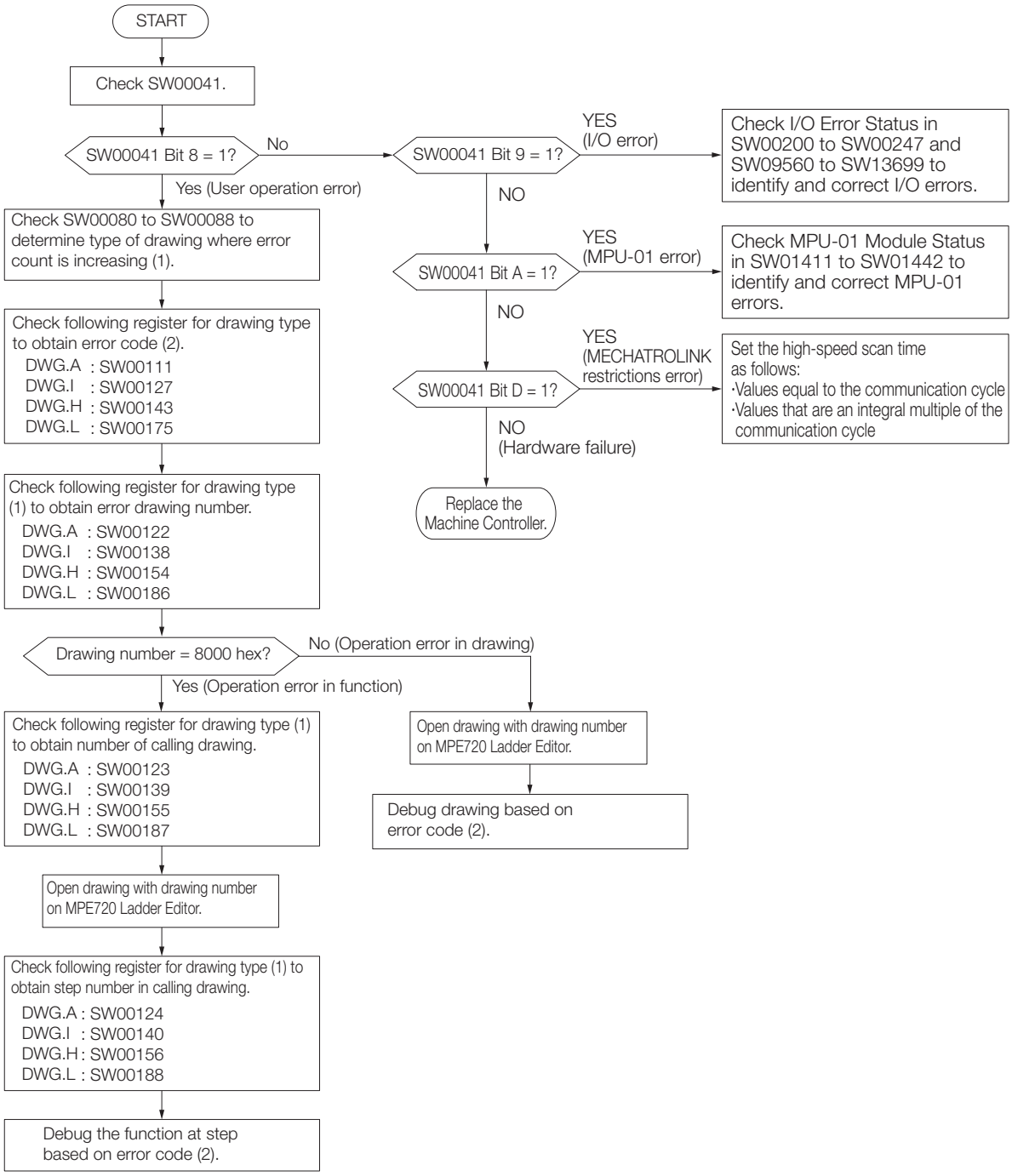
☞ *7.5.2 System Error Status* on page 7-10

7.4 Troubleshooting for the ALM Indicator

A serious error (hardware failure, user operation error, or I/O error) may have occurred in the following cases

- MP3100: The S2 indicator is lit red (ALM state).
- MP3200/MP3300: The ALM indicator of the CPU Unit/CPU Module is lit or the RDY, RUN, and ALM indicators of the CPU Unit/CPU Module are lit.

Stop the Machine Controller (turn ON pin 6 on the DIP switch) and use the following flowchart to investigate the problem.



Note: 1. Refer to the following section for the contents of SW00041.
☞ *7.5.1 CPU System Status* on page 7-8

2. Refer to the following section for the contents of SW00080 to SW00088 and SW00110 to SW00188.
☞ *7.5.3 User Operation Error Status in Ladder Programs* on page 7-11

3. Refer to the following section for the contents of SW00200 to SW00247 and SW09560 to SW13699.
☞ *7.5.5 System I/O Error Status* on page 7-15

7.5 System Register Configuration and Error Status

This section describes the configuration of the system registers and errors.

7.5.1 CPU System Status

The operating status or error status of the system are stored in the following system registers. You can check these system registers to determine whether the cause of the error is hardware or software related.

Name	Register Addresses		Contents	
Reserved for system.	SW00030 to SW00039		–	
CPU Status	SW00040	SB000400	READY	0: Error, 1: Ready
		SB000401	RUN	0: Stopped, 1: Running
		SB000402	ALARM	0: Normal, 1: Alarm
		SB000403	ERROR	0: Normal, 1: Error
		SB000404	Reserved for system.	–
		SB000405	M-ALM	0: Normal, 1: Axis alarm
		SB000406	FLASH	0: INIT Start, 1: Flash Operation
		SB000407	WEN	0: Writing disabled 1: Writing enabled
		SB000408 to SB000409	Reserved for system.	–
		SB00040A	Flash Save Request from MPE720	0: Not saving data to flash memory, 1: Saving data to flash memory
		SB00040B	Status of Synchronization with Main CPU Unit/CPU Module (Sub CPU Units only)	0: High-speed scans synchronized, 1: High-speed scans not synchronized
		SB00040C	CPU Mode	0: Main CPU, 1: Sub CPU
		SB00040D	Operation Stop Request from Main CPU Unit/CPU Module (Sub CPU Units only)	0: RUN selected, 1: STOP selected
		SB00040E	Operation Stop Request from MPE720	0: RUN selected, 1: STOP selected
		SB00040F	Run Switch Status at Power ON	0: STOP, 1: RUN

Continued on next page.

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Name	Register Addresses		Contents	
CPU Error Status	SW00041	SB000410	Serious Failure	0: Normal, 1: Serious failure
		SB000411 and SB000412	Reserved for system.	–
		SB000413	Exception Error	0: Normal, 1: Exception error
		SB000414 to SB000417	Reserved for system.	–
		SB000418	User Operation Error	0: Normal, 1: User operation error
		SB000419	I/O Error	0: Normal, 1: I/O error
		SB00041A	MPU-01 Error	0: Normal, 1: MPU-01 error
		SB00041B	Sub CPU Error (Main CPU Unit/CPU Module only)	0: Normal, 1: Sub CPU Unit error
		SB00041C	MECHATROLINK Station Address Duplication	0: Normal 1: MECHATROLINK slave device station address duplication
		SB00041D	MECHATROLINK Restrictions Error	0: Normal, 1: Restrictions error in MECHATROLINK communications cycle
		SB00041E	Reserved for system.	–
		SB00041F	Temperature Warning	0: Normal, 1: Temperature warning
H Scan Exceeded Counter	SW00044		H Scan Exceeded Count	
L Scan Exceeded Counter	SW00046		L Scan Exceeded Count	
Reserved for system.	SW00047		Reserved for system.	–
Hardware Configuration Status	SW00048	SB000480	D-RST	Mode switch 1 setting status: 0: OFF, 1: ON
		SB000481	LOAD	
		SB000482	CNFG	
		SB000483	INIT	
		SB000484	E-INIT	
		SB000485	STOP	
		SB000486	Reserved for system.	–
		SB000487	Battery Alarm	–
		SB000488 and SB000489	Reserved for system.	–
		SB00048A	MNT	Mode switch 2 setting status: 0: OFF, 1: ON
		SB00048B	TEST	
		SB00048C	E-PM1/SLOT0	
		SB00048D	E-PM0/SLOT1	
		SB00048E and SB00048F	Reserved for system.	–
Reserved for system.	SW00049		Reserved for system.	–

7.5.2 System Error Status

The system error status shows the error status of the system. The data is stored in the following system registers.

Name	Register Addresses	Contents	
32-bit Error Code	SW00050	0001 hex	Watchdog timer error
		0051 hex	Module synchronization error
		0052 hex	Main CPU System Down Detected (Sub CPU only)
	SW00051	For system error analysis	
32-bit Error Address	SW00052 and SW00053	For system error analysis	
Program Error Task	SW00054	0000 hex	system
		0001 hex	DWG.A
		0002 hex	DWG.I
		0003 hex	DWG.H
		0005 hex	DWG.L
Program Type	SW00055	0000 hex	system
		0001 hex	DWG.A
		0002 hex	DWG.I
		0003 hex	DWG.H
		0005 hex	DWG.L
		0008 hex	Function
		000F hex	Motion program/sequence program
Program Error Drawing Number	SW00056	FFFF hex	Ladder program parent drawing
		8000 hex	Ladder program function
		□□00 hex	Ladder program child drawing (H□□: Child drawing No.)
		xxyy hex	Ladder program grandchild drawing (Hxx: Child drawing No., Hyy: Grandchild drawing No.)
		F□□□ hex	Motion program or sequence program (H□□□: Program No.)
Drawing Type of Calling Program	SW00057	Type of the calling drawing in which the error occurred	
		0001 hex	DWG.A
		0002 hex	DWG.I
		0003 hex	DWG.H
		0005 hex	DWG.L
		0008 hex	Function
		000F hex	Motion program/sequence program
Drawing No. of Calling Program	SW00058	Number of the calling drawing in which the error occurred	
		FFFF hex	Parent drawing
		8000 hex	Function
		□□00 hex	Child drawing (H□□: Child drawing No.)
		xxyy hex	Grandchild drawing (Hxx: Child drawing No., Hyy: Grandchild drawing No.)
Drawing Step No. in Calling Program	SW00059	Step Number in the Calling Drawing in Which the Error Occurred This is set to 0 if the error occurs in the parent drawing.	

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Name	Register Addresses	Contents	
Error Data	SW00060 and SW00061	Reserved for system.	
	SW00062 to SW00065	Name of task that caused the error	
	SW00066 and SW00067	Reserved for system.	
	SW00068	Year When Error Occurred	
	SW00069	Month When Error Occurred	
	SW00070	Day of Week When Error Occurred	
	SW00071	Day When Error Occurred	
	SW00072	Hour When Error Occurred	
	SW00073	Minutes When Error Occurred	
	SW00074	Seconds When Error Occurred	
	SW00075	Milliseconds When Error Occurred	
	SW00076	xyzz hex	Slot Where the Module Synchronization Error Was Detected (x: Rack number from 1 to 7, y: unit number from 1 to 4, zz: slot number from 01 to 09)
	SW00077 to SW00079	Reserved for system.	

7.5.3 User Operation Error Status in Ladder Programs

The user operation error status shows operation error status in the ladder programs. The data is stored in the following system registers.

Refer to the following sections for details on the user operation error status.

☞ *Detailed User Operation Error Status* on page 7-13

Drawing Type	Error Description	Register Addresses	Contents
DWG.A	Error Count	SW00080	• Error Count Gives the number of errors that have occurred. • Error Code Gives the details of the error. 0□□□ hex: Operation error ☞ ◆ *User Operation Error Code -1: Operation Errors* on page 7-12 x□□□ hex (x = 1, 2, 3): Index error ☞ ◆ *User Operation Error Code -2: Index Errors* on page 7-12
	Error Code	SW00081	
DWG.I	Error Count	SW00082	
	Error Code	SW00083	
DWG.H	Error Count	SW00084	
	Error Code	SW00085	
DWG.L	Error Count	SW00088	
	Error Code	SW00089	

◆ User Operation Error Code -1: Operation Errors

	Error Code	Error Description	Operation When an Error Occurs*
Integer Operations	0001 hex	Integer operation underflow	[-32768]
	0002 hex	Integer operation overflow	[32767]
	0003 hex	Integer operation division error	[The A register stays the same.]
	0009 hex	Double-length integer operation underflow	[-2147483648]
	000A hex	Double-length integer operation overflow	[2147483647]
	000B hex	Double-length integer operation division error	[The A register stays the same.]
	000C hex	Quadruple-length integer operation underflow	[-9223372036854775808]
	000D hex	Quadruple-length integer operation overflow	[9223372036854775807]
	000E hex	Quadruple-length integer operation division error	[The A register stays the same.]
	0101 hex to 010E hex	Integer operation error in Operation Error Drawing	[The A register stays the same.]
Real Number Operations	0010 hex	Non-numerical integer storage error	Data is not stored. [00000]
	0011 hex	Integer storage underflow	Data is not stored. [-32768]
	0012 hex	Integer storage overflow	Data is not stored. [+32767]
	0021 hex	Real number storage underflow	Data is not stored. [-1.0E+38]
	0022 hex	Real number storage overflow	Data is not stored. [1.0E+38]
	0023 hex	Real number operation division by zero error	Data is not stored. [F register stays the same]
	0030 hex	Invalid real number operation (non-numeric)	Data is not stored.
	0031 hex	Real number operation exponent underflow	0.0
	0032 hex	Real number operation exponent overflow	Maximum value
	0033 hex	Real number operation division error (0/0)	Operation is not executed.
	0034 hex	Real number storage exponent underflow	Stores 0.0.
	0040 hex to 0059 hex	Real number operation error in standard system function	Operation is aborted and output is set to 0.0.

0040 hex: SQRT	0047 hex: EXP	004E hex: PD	0055 hex: SLAU
0041 hex: SIN	0048 hex: LN	004F hex: PID	0056 hex: REM
0042 hex: COS	0049 hex: LOG	0050 hex: LAG	0057 hex: RCHK
0043 hex: TAN	004A hex: DZA	0051 hex: LLAG	0058 hex: BSRCH
0044 hex: ASIN	004B hex: DZB	0052 hex: FGN	0059 hex: SORT
0045 hex: ACOS	004C hex: LIM	0053 hex: IFGN	–
0046 hex: ATAN	004D hex: PI	0054 hex: LAU	

* The numeric values given in brackets [ ] are set by the system in the Changed A Register or Changed F Register before the operation error drawing is executed.

◆ User Operation Error Code -2: Index Errors

	Error Code	Error Description	Operation When an Error Occurs
Integer and Real Number Operations	1000 hex	Index error in drawing	Re-executed as if i and j were set to 0. (Both i and j registers stay the same.)
	2000 hex	Index error in function	Re-executed as if i and j were set to 0. (Both i and j registers stay the same.)
	3000 hex	Index error in motion program or sequence program	Re-executed as if i and j were set to 0. (Both i and j registers stay the same.)

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	Error Code	Error Description		Operation When an Error Occurs	
Real Number Operations	x040 hex to x059 hex (x = 1, 2, 3)	Real number operation error in standard system function		Operation is aborted and output is set to 0.0.	
		x040 hex: SQRT	x047 hex: EXP	x04E hex: PD	x055 hex: SLAU
		x041 hex: SIN	x048 hex: LN	x04F hex: PID	x056 hex: REM
		x042 hex: COS	x049 hex: LOG	x050 hex: LAG	x057 hex: RCHK
		x043 hex: TAN	x04A hex: DZA	x051 hex: LLAG	x058 hex: BSRCH
		x044 hex: ASIN	x04B hex: DZB	x052 hex: FGN	x059 hex: SORT
		x045 hex: ACOS	x04C hex: LIM	x053 hex: IFGN	–
		x046 hex: ATAN	x04D hex: PI	x054 hex: LAU	
Integer Operations	x060 hex to x0C9 hex (x = 1, 2, 3)	Integer operation error in standard system function		Operation is aborted and output is set to input. [A register stays the same.]	
		x06D hex: PI	x091 hex: ROTR	x0A0 hex: BEXTEND	x0B1 hex: SPEND
		x06E hex: PD	x092 hex: MOVB	x0A1 hex: BPRESS	x0C0 hex: TBLBR
		x06F hex: PID	x093 hex: MOVW	x0A2 hex: SORT	x0C1 hex: TBLBW
		x070 hex: LAG	x094 hex: SETW	x0A4 hex: SORT	x0C2 hex: TBLSRL
		x071 hex: LLAG	x095 hex: XCHG	x0A6 hex: RCHK	x0C3 hex: TBLSRC
		x072 hex: FGN	x096 hex: LIMIT	x0A7 hex: RCHK	x0C4 hex: TBLCL
		x073 hex: IFGN	x097 hex: LIMIT	x0A8 hex: COPYW	x0C5 hex: TBLMW
		x074 hex: LAU	x098 hex: DZA	x0A9 hex: ASCII	x0C6 hex: QTBLR
		x075 hex: SLAU	x099 hex: DZA	x0AA hex: BINASC	x0C7 hex: QTBLRI
		x076 hex: FGN	x09A hex: DZB	x0AB hex: ASCBIN	x0C8 hex: QTBLW
		x077 hex: IFGN	x09B hex: DZB	x0AC hex: BSRCH	x0C9 hex: QTBLWI
		x08E hex: INS	x09C hex: PWM	x0AD hex: BSRCH	–
		x08F hex: OUTS	x09E hex: SHFTL	x0AE hex: TIMEADD	
		x090 hex: ROTL	x09F hex: SHFTR	x0AF hex: TIMSUB	

Detailed User Operation Error Status

Details when a user operation error occurs in a user program are stored in the following system registers.

Name	Register Address				Remarks
	DWG.A	DWG.I	DWG.H	DWG.L	
Error Count	SW00110	SW00126	SW00142	SW00174	• Error Drawing No. FFFF hex: Parent drawing □□00 hex: Child drawing (H□□: Child drawing No.) xxyy hex: Grandchild drawing (Hxx: Child drawing No., Hyy: Grandchild drawing No.) 8000 hex: Function F□□□ hex: Motion program or sequence program (H□□□: Program No.) • Calling Drawing No. Number of the calling drawing in which the operation error occurred • Calling Drawing Step No. Step number in the calling drawing in which the operation error occurred This number is set to 0 if the error occurs in the parent drawing. • Error Step No. Step number when the operation error occurred
Error Code	SW00111	SW00127	SW00143	SW00175	
Error A Registers	SW00112	SW00128	SW00144	SW00176	
	SW00113	SW00129	SW00145	SW00177	
Changed A Registers	SW00114	SW00130	SW00146	SW00178	
	SW00115	SW00131	SW00147	SW00179	
Error F Registers	SW00116	SW00132	SW00148	SW00180	
	SW00117	SW00133	SW00149	SW00181	
Changed F Registers	SW00118	SW00134	SW00150	SW00182	
	SW00119	SW00135	SW00151	SW00183	
Address Where Error Occurred	SW00120	SW00136	SW00152	SW00184	
	SW00121	SW00137	SW00153	SW00185	
Error Drawing No.	SW00122	SW00138	SW00154	SW00186	
Calling Drawing No.	SW00123	SW00139	SW00155	SW00187	
Calling Drawing Step No.	SW00124	SW00140	SW00156	SW00188	
Error Step No.	SW00125	SW00141	SW00157	SW00189	

7.5.4 System Service Execution Status

The system service execution status shows the execution status of the system. The data is stored in the following system registers.

Name	Register Address		Remarks	
Reserved for system.	SW00090 to SW00097		–	
Data Trace Definition Existence	SW00098	SB000980	Group 1	0: Definition does not exist, 1: Definition exists
		SB000981	Group 2	
		SB000982	Group 3	
		SB000983	Group 4	
		SB000984 to SB000987	Reserved for system.	
Data Trace Enabled or Disabled Status		SB000988	Group 1	0: Enabled 1: Disabled
		SB000989	Group 2	
		SB00098A	Group 3	
		SB00098B	Group 4	
		SB00098C to SB00098F	Reserved for system.	
Data Trace Execution Status	SW00099	SB000990	Group 1	0: Tracing in progress, 1: Tracing stopped
		SB000991	Group 2	
		SB000992	Group 3	
		SB000993	Group 4	
		SB000994 to SB000997	Reserved for system.	
Data Trace Trigger Condition Status		SB000998	Group 1	0: Trace is not waiting for trigger condition, 1: Trace is waiting for trigger condition
		SB000999	Group 2	
		SB00099A	Group 3	
		SB00099B	Group 4	
		SB00099C to SB00099F	Reserved for system.	
Group 1 Record No.	SW00100		Latest record number in group 1.	
Group 2 Record No.	SW00101		Latest record number in group 2.	
Group 3 Record No.	SW00102		Latest record number in group 3.	
Group 4 Record No.	SW00103		Latest record number in group 4.	

7.5.5 System I/O Error Status

The system I/O error status shows the I/O error status of the system. The data is stored in the following system registers.

Name	Register Addresses		Remarks
	MP2000 Compatible	MP3000 Expansion	
I/O Error Count	SW00200	SW09560	Number of I/O error occurrences
Input Error Count	SW00201	SW09561	Number of input error occurrences
Input Error Address	SW00202	SL09562	Latest input error address (register address in IW□□□□)
Reserved for system.	–	SW09564	–
Output Error Count	SW00203	SW09565	Number of output error occurrences
Output Error Address	SW00204	SL09566	Latest output error address (register address in OW□□□□)
Reserved for system.	SW00205 to SW00207	SW09568 to SW09571	–
I/O Error Status	SW00208 to SW00223	SW09572 to SW09603	CPU Unit/CPU Module Error Status Refer to the following sections for details. ☞ *CPU Unit/CPU Module Error Status* on page 7-17
	SW00224 to SW00503*1	SW09604 to SW13699*2	Optional Modules/Vision Unit Error Status System registers where error status is stored vary with the rack configuration. For details on the system registers and error status, refer to the following sections. ☞ *Error Status for Optional Modules* on page 7-25 ☞ *Vision Unit Error Status* on page 7-40

*1. Area of system register: 8 words from the first register
*2. Area of system register: 32 words from the first register

■ CPU-203

Name	Register Addresses		Remarks
	MP2000 Compatible	MP3000 Expansion	
Error Status of 218IFG 218IF Port 1	–	SW29900 to SW29907	CPU-203 Unit Error Status Refer to the following section for details. ☞ *CPU Unit/CPU Module Extended Error Status (Only for CPU-203)* on page 7-18
Error Status of 218IFG 218IF Port 2		SW29908 to SW29915	
Error Status of 218IFG 263IF Port 1		SW29916 to SW29923	
Error Status of 218IFG 263IF Port 2		SW29924 to SW29931	
Reserved for system.		SW29932 to SW29947	
Error Status of SVC64 Port 1 and 2		SW29948 to SW29963	
Error Status of SVC64 Port 3 and 4		SW29964 to SW29979	

■ CPU-203F

Name	Register Addresses		Remarks
	MP2000 Compatible	MP3000 Expansion	
Error Status of 218IFG 218IF Port 1	–	SW29900 to SW29907	CPU-203F Unit Error Status Refer to the following section for details. ☞ *CPU Unit/CPU Module Extended Error Status (Only for CPU-203F)* on page 7-21
Error Status of 218IFG 218IF Port 2		SW29908 to SW29915	
Error Status of 218IFG 263IF Port 1		SW29916 to SW29923	
Error Status of 218IFG 263IF Port 2		SW29924 to SW29931	
Reserved for system.		SW29932 to SW29947	
Error Status of SVF64 Port 1 and 2		SW09577 to SW09588	
Error Status of SVF64 Port 3 and 4		SW09589 to SW09600	

CPU Unit/CPU Module Error Status

The CPU Unit/CPU Module error status is illustrated in the following figure.

218IFD	SW00208/ SW09572	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW00209/ SW09573	Bit 2 to Bit F Not used.			Bit 1 Write	Bit 0 Read
	SW00210/ SW09574	Bit C to Bit F Write transmission ST	Bit 8 to Bit B Reserved for system.	Bit 4 to Bit 7 Read transmission ST	Bit 0 to Bit 3 Reserved for system.	
	SW00211/ SW09575	Not used.				
	SW00212/ SW09576	Not used.				
SVC, SVC32	SW00213/ SW09577	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 3)	
	SW00214/ SW09578	Bit F ST#15	.....	Bit 2 ST#2	Bit 1 ST#1	Bit 0 Not used.
	SW00215/ SW09579	Bit F ST#31	Bit E ST#30	Bit D ST#29	.....	Bit 1 ST#17	Bit 0 ST#16
	SW00216/ SW09580	Bit B to Bit F Not used.		Bit A ST#42	.....	Bit 1 ST#33	Bit 0 ST#32
	SW00217/ SW09581	Not used.				

Information Up to 21 stations including I/O (with up to 16 servo axes) can be connected to the SVC.
Up to 42 stations including I/O (with up to 32 servo axes) can be connected to the SVC32.

- 218IFD Error Status Details

Item	Code	Remarks
Error code	0	Normal
	1	Station error
Read/write	0	Communications normal
	1	Communications error
Read/write transmission ST	0□0	No error
	0□4	Parameter formatting error
	0□5	Command sequence error
	0□6	Reset
	0□7	Data reception error
	0□8	Data sending error
	0□A	Connection error

- SVC/SVC32 Error Status Details

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

CPU Unit/CPU Module Extended Error Status (Only for CPU-203)

The CPU-203 error status is illustrated in the following figure.

■ 218IFG

218IFG 218IF port 1	SW29900	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29901	.....		Bit 1 Write	Bit 0 Read
	SW29902	Bit C to Bit F Write transmission ST	Bit 8 to Bit B Reserved for system.	Bit 4 to Bit 7 Read transmission ST	Bit 0 to Bit 3 Reserved for system.
	SW29903 to SW29907	Not used.			
218IFG 218IF port 2	SW29908	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29909	.....		Bit 1 Write	Bit 0 Read
	SW29910	Bit C to Bit F Write transmission ST	Bit 8 to Bit B Reserved for system.	Bit 4 to Bit 7 Read transmission ST	Bit 0 to Bit 3 Reserved for system.
	SW29911 to SW29915	Not used.			
218IFG 263IF port 1	SW29916	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29917	Bit F CNO#16	.....		Bit 0 CNO#1
	SW29918	Bit F ST#32	.....		Bit 0 ST#17
	SW29919	Bit F ST#48	.....		Bit 0 ST#33
	SW29920	Bit F ST#64	.....		Bit 0 ST#49
	SW29921 to SW29923	Not used.			
218IFG 263IF port 2	SW29924	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29925	Bit F CNO#16	.....		Bit 0 CNO#1
	SW29926	Bit F ST#32	.....		Bit 0 ST#17
	SW29927	Bit F ST#48	.....		Bit 0 ST#33
	SW29928	Bit F ST#64	.....		Bit 0 ST#49
	SW29929 to SW29931	Not used.			

• 218IFG Error Status Details

Item	Code	Remarks
Error code	0	Normal
	1	Station error
Read/write	0	Communications normal
	1	Communications error
Read/write transmission ST	0□0	No error
	0□4	Parameter formatting error
	0□5	Command sequence error
	0□6	Reset
	0□7	Data reception error
	0□8	Data sending error
	0□A	Connection error

■ SVC64

SVC64 port 1	SW29948	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 3)	
	SW29949	Bit F ST#15	.....	Bit 2 ST#2	Bit 1 ST#1	Bit 0 Not used.
	SW29950	Not used.				Bit 0 ST#16
	SW29951 to SW29955	Not used.				
SVC64 port 2	SW29956	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 3)	
	SW29957	Bit F ST#31	.....	Bit 2 ST#18	Bit 1 ST#17	Bit 0 Not used.
	SW29958	Not used.				Bit 0 ST#32
	SW29959 to SW29963	Not used.				
SVC64 port 3	SW29964	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 3)	
	SW29965	Bit F ST#47	.....	Bit 2 ST#34	Bit 1 ST#33	Bit 0 Not used.
	SW29966	Not used.				Bit 0 ST#48
	SW29967 to SW29971	Not used.				
SVC64 port 4	SW29972	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 3)	
	SW29973	Bit F ST#63	.....	Bit 2 ST#50	Bit 1 ST#49	Bit 0 Not used.
	SW29974	Not used.				Bit 0 ST#64
	SW29975 to SW29979	Not used.				

Information Up to 64 stations including I/O (with up to 64 servo axes) can be connected to the SVC64.

• SVC64 Error Status Details

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

CPU Unit/CPU Module Extended Error Status (Only for CPU-203F)

The CPU-203F error status is illustrated in the following figure.

■ 218IFG

218IFG 218IF port 1	SW29900	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29901	.....		Bit 1 Write	Bit 0 Read
	SW29902	Bit C to Bit F Write transmission ST	Bit 8 to Bit B Reserved for system.	Bit 4 to Bit 7 Read transmission ST	Bit 0 to Bit 3 Reserved for system.
	SW29903 to SW29907	Not used.			
218IFG 218IF port 2	SW29908	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29909	.....		Bit 1 Write	Bit 0 Read
	SW29910	Bit C to Bit F Write transmission ST	Bit 8 to Bit B Reserved for system.	Bit 4 to Bit 7 Read transmission ST	Bit 0 to Bit 3 Reserved for system.
	SW29911 to SW29915	Not used.			
218IFG 263IF port 1	SW29916	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29917	Bit F CNO#16	.....		Bit 0 CNO#1
	SW29918	Bit F ST#32	.....		Bit 0 ST#17
	SW29919	Bit F ST#48	.....		Bit 0 ST#33
	SW29920	Bit F ST#64	.....		Bit 0 ST#49
	SW29921 to SW29923	Not used.			
218IFG 263IF port 2	SW29924	Bit 8 to Bit F Error code (station error = 1)		Bit 0 to Bit 7 Subslot (function) number (= 2)	
	SW29925	Bit F CNO#16	.....		Bit 0 CNO#1
	SW29926	Bit F ST#32	.....		Bit 0 ST#17
	SW29927	Bit F ST#48	.....		Bit 0 ST#33
	SW29928	Bit F ST#64	.....		Bit 0 ST#49
	SW29929 to SW29931	Not used.			

• 218IFG Error Status Details

Item	Code	Remarks
Error code	0	Normal
	1	Station error
Read/write	0	Communications normal
	1	Communications error
Read/write transmission ST	0□0	No error
	0□4	Parameter formatting error
	0□5	Command sequence error
	0□6	Reset
	0□7	Data reception error
	0□8	Data sending error
	0□A	Connection error

■ SVF64

SVF64 port 1	SW09577	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 3)	
	SW09578	Bit F ST#15	.....	Bit 2 ST#15	Bit 1 ST#15	Bit 0 ST#15
	SW09579	Bit F ST#31	.....		Bit 1 ST#17	Bit 0 ST#16
	SW09580	Bit F ST#47	.....		Bit 1 ST#33	Bit 0 ST#32
	SW09581	Bit F ST#63	.....		Bit 1 ST#49	Bit 0 ST#48
	SW09582	Bit 1 to Bit F Not used.				Bit 0 ST#64
SVF64 port 2	SW09583	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 4)	
	SW09584	Bit F ST#15	.....	Bit 2 ST#15	Bit 1 ST#15	Bit 0 ST#15
	SW09585	Bit F ST#31	.....		Bit 1 ST#17	Bit 0 ST#16
	SW09586	Bit F ST#47	.....		Bit 1 ST#33	Bit 0 ST#32
	SW09587	Bit F ST#63	.....		Bit 1 ST#49	Bit 0 ST#48
	SW09588	Bit 1 to Bit F Not used.				Bit 0 ST#64
SVF64 port 3	SW09589	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 5)	
	SW09590	Bit F ST#15	.....	Bit 2 ST#15	Bit 1 ST#15	Bit 0 ST#15
	SW09591	Bit F ST#31	.....		Bit 1 ST#17	Bit 0 ST#16
	SW09592	Bit F ST#47	.....		Bit 1 ST#33	Bit 0 ST#32
	SW09593	Bit F ST#63	.....		Bit 1 ST#49	Bit 0 ST#48
	SW09594	Bit 1 to Bit F Not used.				Bit 0 ST#64
SVF64 port 4	SW09595	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 6)	
	SW09596	Bit F ST#15	.....	Bit 2 ST#15	Bit 1 ST#15	Bit 0 ST#15
	SW09597	Bit F ST#31	.....		Bit 1 ST#17	Bit 0 ST#16
	SW09598	Bit F ST#47	.....		Bit 1 ST#33	Bit 0 ST#32
	SW09599	Bit F ST#63	.....		Bit 1 ST#49	Bit 0 ST#48
	SW09600	Bit 1 to Bit F Not used.				Bit 0 ST#64

Information Up to 64 stations including I/O (with up to 64 servo axes) can be connected to the SVF64.

• SVF64 Error Status Details

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

Error Status for Optional Modules

The error status for Optional Modules is explained below.

◆ Configuration of the System Registers

The error status of each Optional Module differs in system register depending on the rack, unit, and slot in which the Optional Module is installed.

- Upper row: System registers compatible with those of the MP2000 series
  Area of system register: 8 words from the first register
- Lower row: System registers expanded with those of the MP3000 series
  Area of system register: 32 words from the first register

Rack Number	Unit Number	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9
Rack 1	Unit 1	SW00224	SW00232	SW00240	SW00248	SW00256	SW00264	SW00272	SW00280	–
		SW09604	SW09636	SW09668	SW09700	SW09732	SW09764	SW09796	SW09828	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW09860	SW09892	SW09924	SW09956	SW09988	SW10020	SW10052	SW10084	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW10116	SW10148	SW10180	SW10212	SW10244	SW10276	SW10308	SW10340	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW10372	SW10404	SW10436	SW10468	SW10500	SW10532	SW10564	SW10596	–
Rack 2	–	SW00288	SW00296	SW00304	SW00312	SW00320	SW00328	SW00336	SW00344	SW00352
		–	–	–	–	–	–	–	–	–
Rack 3	–	SW00360	SW00368	SW00376	SW00384	SW00392	SW00400	SW00408	SW00416	SW00424
		–	–	–	–	–	–	–	–	–
Rack 4	–	SW00432	SW00440	SW00448	SW00456	SW00464	SW00472	SW00480	SW00488	SW00496
		–	–	–	–	–	–	–	–	–
Rack 5	Unit 1	–	–	–	–	–	–	–	–	–
		SW10628	SW10660	SW10692	SW10724	SW10756	SW10788	SW10820	SW10852	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW10884	SW10916	SW10948	SW10980	SW11012	SW11044	SW11076	SW11108	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW11140	SW11172	SW11204	SW11236	SW11268	SW11300	SW11332	SW11364	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW11396	SW11428	SW11460	SW11492	SW11524	SW11556	SW11588	SW11620	–
Rack 6	Unit 1	–	–	–	–	–	–	–	–	–
		SW11652	SW11684	SW11716	SW11748	SW11780	SW11812	SW11844	SW11876	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW11908	SW11940	SW11972	SW12004	SW12036	SW12068	SW12100	SW12132	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW12164	SW12196	SW12228	SW12260	SW12292	SW12324	SW12356	SW12388	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW12420	SW12452	SW12484	SW12516	SW12548	SW12580	SW12612	SW12644	–
Rack 7	Unit 1	–	–	–	–	–	–	–	–	–
		SW12676	SW12708	SW12740	SW12772	SW12804	SW12836	SW12868	SW12900	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW12932	SW12964	SW12996	SW13028	SW13060	SW13092	SW13124	SW13156	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW13188	SW13220	SW13252	SW13284	SW13316	SW13348	SW13380	SW13412	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW13444	SW13476	SW13508	SW13540	SW13572	SW13604	SW13636	SW13668	–

Information
- The details of the error status depend on the Module. Refer to the following sections for details.
  ☞ ◆ *Error Status Detail for Optional Module* on page 7-27
  ☞ *Vision Unit Error Status* on page 7-40
  ☞ *Sub CPU Error Status* on page 7-40
- Refer to the following section for Rack configuration in detail.
  ☞ *7.6 Expansion Racks* on page 7-81
- Racks 5, 6, and 7 store only information on the Vision Unit or Sub CPU.
- Shaded areas of SW10660 to SW13668 are unused areas. No data is stored. System registers are for future use.

◆ Status Information on Optional Module

Not all Optional Module models can store I/O error status information. The following table gives the storage conditions.

Optional Module		I/O	
Abbreviation	Function	I/O Error Status	Reference
SVA-01	SVA01	×	–
SVB-01	SVB01	O	page 7-27
SVC-01	SVC01	O	page 7-27
SVF-01	SVF01	O	page 7-28
PO-01	PO	×	–
MPU-01	MPUIF	O	page 7-28
215AIF-01	217IF, MPLINK	O	page 7-29
216AIF-01	216IF	O	page 7-29
217IF-01	217IF	×	–
218IF-01	217IF, 218IF	×	–
218IF-02	217IF, 218IFB	×	–
260IF-01	217IF, 260IF	O	page 7-30
261IF-01	217IF, 216IFS	O	page 7-30
262IF-01	FL-net	O	page 7-31
263IF-01	EtherNetIP	O	page 7-31
264IF-01	EtherCAT-S	O	page 7-32
265IF-01	CompoNet-M	O	page 7-33
266IF-01	PROFINET-M	O	page 7-34
266IF-02	PROFINET-S	O	page 7-35
267IF-01	CC-Link-M	O	page 7-36
269IF-01	CCLinkIEFS	O	page 7-36
LIO-01	LIO	O	page 7-37
	CNTR	O	
LIO-02	LIO	O	
	CNTR	O	
LIO-04	LIO32	O	page 7-37
LIO-05	LIO32	O	
LIO-06	MIXIO	O	page 7-38
	CNTR-A	O	
DI-01	DI	O	page 7-39
DO-01	DO	O	page 7-39
AI-01	AI	×	–
AO-01	AVO	O	page 7-40
CNTR-01	CNTR01	×	–
EXIOIF	EXIO	×	–

Note: O: Stored, ×: Not stored

◆ Error Status Detail for Optional Module

■ Error Status for SVB-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 1)		
SW□□□□□ + 1	Bit F ST#15	.....		Bit 2 ST#2	Bit 1 ST#1	Bit 0 Not used.
SW□□□□□ + 2	Bit 6 to Bit F Not used.		Bit 5 ST#21	.....	Bit 1 ST#17	Bit 0 ST#16
SW□□□□□ + 3	Not used.					
SW□□□□□ + 4	Not used.					
SW□□□□□ + 5	Not used.					
SW□□□□□ + 6	Not used.					
SW□□□□□ + 7	Not used.					

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

Information Up to 21 stations including I/O (with up to 16 servo axes) can be connected to the SVB-01.

- SVB-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for SVC-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 1)		
SW□□□□□ + 1	Bit F ST#15	.....		Bit 2 ST#2	Bit 1 ST#1	Bit 0 Not used.
SW□□□□□ + 2	Bit 6 to Bit F Not used.		Bit 5 ST#21	.....	Bit 1 ST#17	Bit 0 ST#16
SW□□□□□ + 3	Not used.					
SW□□□□□ + 4	Not used.					
SW□□□□□ + 5	Not used.					
SW□□□□□ + 6	Not used.					
SW□□□□□ + 7	Not used.					

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

Information Up to 21 stations including I/O (with up to 16 servo axes) can be connected to the SVC-01.

- SVC-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for MPU-01 Module

SW□□□□□ + 0	Not used.	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Not used.	
SW□□□□□ + 3	Not used.	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

• MPU-01 Module Error Status Detail

Item	Code	Remarks
Error Code	0	No Error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for SVF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)			Bit 0 to Bit 7 Subslot (function) number (= 1)		
SW□□□□□ + 1	Bit F ST#15	.....		Bit 2 ST#2	Bit 1 ST#1	Bit 0 Not used.
SW□□□□□ + 2	Bit 6 to Bit F Not used.		Bit 5 ST#21	.....	Bit 1 ST#17	Bit 0 ST#16
SW□□□□□ + 3	Not used.					
SW□□□□□ + 4	Not used.					
SW□□□□□ + 5	Not used.					
SW□□□□□ + 6	Not used.					
SW□□□□□ + 7	Not used.					

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

Information Up to 21 stations including I/O (with up to 16 servo axes) can be connected to the SVF-01.

• SVF-01 Module Error Status Detail

Item	Code	Remarks
Error Code	0	No Error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 215AIF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)							Bit 0 to Bit 7 Subslot (function) number (= 2)
SW□□□□□ + 1	Bit F ST#16			.....				Bit 0 ST#1
SW□□□□□ + 2	Bit F ST#32			.....				Bit 0 ST#17
SW□□□□□ + 3	Bit F ST#48			.....				Bit 0 ST#33
SW□□□□□ + 4	Bit F ST#64			.....				Bit 0 ST#49
SW□□□□□ + 5	Not used.							
SW□□□□□ + 6	Not used.							
SW□□□□□ + 7	Not used.							

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 215AIF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 216AIF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)							Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Bit F ST#15			.....		Bit 2 ST#2	Bit 1 ST#1	Bit 0 Not used.
SW□□□□□ + 2	Bit F Not used.	Bit E ST#30	Bit D ST#29	.....			Bit 1 ST#17	Bit 0 ST#16
SW□□□□□ + 3	Not used.							
SW□□□□□ + 4	Not used.							
SW□□□□□ + 5	Not used.							
SW□□□□□ + 6	Not used.							
SW□□□□□ + 7	Not used.							

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 216AIF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 260IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)								Bit 0 to Bit 7 Subslot (function) number (= 2)						
SW□□□□□ + 1	Bit F ST#15							.....							Bit 0 ST#0
SW□□□□□ + 2	Bit F ST#31							.....							Bit 0 ST#16
SW□□□□□ + 3	Bit F ST#47							.....							Bit 0 ST#32
SW□□□□□ + 4	Bit F ST#63							.....							Bit 0 ST#48
SW□□□□□ + 5	Not used.														
SW□□□□□ + 6	Not used.														
SW□□□□□ + 7	Not used.														

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 260IF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 261IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)								Bit 0 to Bit 7 Subslot (function) number (= 2)						
SW□□□□□ + 1	Bit F ST#16							.....							Bit 0 ST#1
SW□□□□□ + 2	Bit F ST#32							.....							Bit 0 ST#17
SW□□□□□ + 3	Bit F ST#48							.....							Bit 0 ST#33
SW□□□□□ + 4	Bit F ST#64							.....							Bit 0 ST#49
SW□□□□□ + 5	Not used.														
SW□□□□□ + 6	Not used.														
SW□□□□□ + 7	Not used.														

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 261IF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 262IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)								Bit 0 to Bit 7 Subslot (function) number (= 1)						
SW□□□□□ + 1	Bit F Logic #16														Bit 0 Logic #1
SW□□□□□ + 2	Bit F Logic #32														Bit 0 Logic #17
SW□□□□□ + 3	Bit F Logic #48														Bit 0 Logic #33
SW□□□□□ + 4	Bit F Logic #64														Bit 0 Logic #49
SW□□□□□ + 5	Not used.														
SW□□□□□ + 6	Not used.														
SW□□□□□ + 7	Not used.														

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

- 262IF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
Logic#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 263IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)								Bit 0 to Bit 7 Subslot (function) number (= 1)						
SW□□□□□ + 1	Bit F CNO#16														Bit 0 CNO#1
SW□□□□□ + 2	Bit F CNO#32														Bit 0 CNO#17
SW□□□□□ + 3	Bit F CNO#48														Bit 0 CNO#33
SW□□□□□ + 4	Bit F CNO#64														Bit 0 CNO#49
SW□□□□□ + 5	Not used.														
SW□□□□□ + 6	Not used.														
SW□□□□□ + 7	Not used.														

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

- 263IF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
CNO#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 264IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Bit 0 to Bit F Communications phase	
SW□□□□□ + 3	Bit 0 to Bit F Data valid flags	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 264IF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
Communications phase	0	Non-INIT
	1	INIT
	2	PRE-OPERATIONAL
	3	SAFE-OPERATIONAL
	4	OPERATIONAL
Data valid flags	Bit 0	0: Process data not communicated/ 1: Process data communications in progress
	Bit 1 to Bit F	Not used.

■ Error Status for 265IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Bit 0 to Bit F Communications status flags	
SW□□□□□ + 3	Bit 0 to Bit F Module status code	
SW□□□□□ + 4	Bit 0 to Bit F Network status code	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 265IF-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	1	Station error
Communications status flags	Bit 0	0: Communications error or no communications 1: All communications normal
	Bit 1	0: No slave communications error 1: Slave communications error
	Bit 2	0: No repeater communications error 1: Repeater communications error
	Bit 3 to Bit F	Not used.
Module status code	0	–
	1	–
	2	Normal
	3	Minor error
	4	Fatal error
Network status code	0	Power OFF/startup
	1	Communications startup
	2	Communicating
	3	Minor communications error
	4	Fatal communications error

■ Error Status for 266IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Bit 0 to Bit F Communications phase	
SW□□□□□ + 3	Bit 0 to Bit F Communications status flags	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 266IF-01 Module Error Status Detail

Item	Code	Remarks
Error Code	0	No Error
	1	Station error
Communications phase	0	Unknown
	1	Not Configured
	2	STOP (communications stopped)
	3	IDLE (idle status)
	4	OPERATE (communications in progress)
Communications status flags	Bit 0	0: Initialization in progress 1: Initialization completed normally
	Bit 1	0: System failure 1: Normal
	Bit 2	0: Bus failure 1: Normal
	Bit 3	0: Alarm event 1: No alarm event
	Bit 4	0: Diagnostic event 1: No diagnostic event
	Bit 5	0: Maintenance event 1: No maintenance event
	Bit 6 to Bit F	Not used.

■ Error Status for 266IF-02 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Bit 0 to Bit F Communications phase	
SW□□□□□ + 3	Bit 0 to Bit F Communications status flags	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 266IF-02 Module Error Status Detail

Item	Code	Remarks
Error Code	0	No Error
	1	Station error
Communications phase	0	Unknown
	1	Not Configured
	2	STOP (communications stopped)
	3	IDLE (idle status)
	4	OPERATE (communications in progress)
Communications status flags	Bit 0	0: Initialization in progress 1: Initialization completed normally
	Bit 1	0: System failure 1: Normal
	Bit 2	0: Bus failure 1: Normal
	Bit 3 to Bit F	Not used.

■ Error Status for 267IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)						Bit 0 to Bit 7 Subslot (function) number (= 2)	
SW□□□□□ + 1	Bit F ST#16	.....			Bit 2 ST#3	Bit 1 ST#2	Bit 0 ST#1	
SW□□□□□ + 2	Bit F ST#32	.....			Bit 2 ST#19	Bit 1 ST#18	Bit 0 ST#17	
SW□□□□□ + 3	Bit F ST#48	.....			Bit 2 ST#35	Bit 1 ST#34	Bit 0 ST#33	
SW□□□□□ + 4	Bit F ST#64	.....			Bit 2 ST#51	Bit 1 ST#50	Bit 0 ST#49	
SW□□□□□ + 5	Not used.							
SW□□□□□ + 6	Not used.							
SW□□□□□ + 7	Not used.							

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 267IF-01 Module Error Status Detail

Item	Code	Remarks
Error Code	0	No Error
	1	Station error
ST#n	0	Communications normal
	1	Communications error at station n

■ Error Status for 269IF-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (station error = 1)						Bit 0 to Bit 7 Subslot (function) number (= 1)	
SW□□□□□ + 1	Bit 1 to Bit F Not used.							Bit 0 Master station
SW□□□□□ + 2	Message channel 1 error code							
SW□□□□□ + 3	Message channel 2 error code							
SW□□□□□ + 4	Not used.							
SW□□□□□ + 5	Not used.							
SW□□□□□ + 6	Not used.							
SW□□□□□ + 7	Not used.							

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• 269IF-01 Module Error Status Detail

Item	Code	Remarks
Error Code	0	No Error
	1	Station error
Master station	0	Communications normal
	1	Communications error in communications with the master station
Message channel 1 Error Code	□□□□H	The error code added to the message response from the remote station is given. The error code that is given is always the latest one. To clear error codes, clear this register to all zeros.
Message channel 2 Error Code		

■ Error Status for LIO-01/LIO-02 Modules

(LIO) SW□□□□□ + 0	Bit 8 to Bit F Error code (I/O error = 2)	Bit 0 to Bit 7 Subslot (function) number (= 1)
(CNTR) SW□□□□□ + 1	Bit 8 to Bit F Not used.	Bit 0 to Bit 7 Subslot (function) number (= 2)
SW□□□□□ + 2	Not used.	
SW□□□□□ + 3	Not used.	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• LIO-01/ LIO-02 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O Error Cause of Error • Fuse error

■ Error Status for LIO-04/LIO-05 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (I/O error = 2)	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Not used.	
SW□□□□□ + 3	Not used.	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• LIO-04/LIO-05 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O error Cause of Error • Fuse error

■ Error Status for LIO-06 Modules

(MIXIO) SW□□□□□ + 0	Bit 8 to Bit F Error code (I/O error = 2)				Bit 0 to Bit 7 Subslot (function) number (= 1)		
SW□□□□□ + 1	Bit 4 to Bit F Not used.				Bit 3 ADJO	Bit 2 ADJI	Bit 1 FUSE	Bit 0 FLT
(CNTR-A) SW□□□□□ + 2	Bit 8 to Bit F Error code (I/O error = 2)				Bit 0 to Bit 7 Subslot (function) number (= 2)		
SW□□□□□ + 3	Bit 3 to Bit F Not used.					Bit 2 PB	Bit 1 PA	Bit 0 FLT
SW□□□□□ + 4	Not used.							
SW□□□□□ + 5	Not used.							
SW□□□□□ + 6	Not used.							
SW□□□□□ + 7	Not used.							

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

- LIO-06 Module (MIXIO) Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O error
FLT	0	Oscillator and ASIC for AO are normal.
	1	Oscillator error or error in ASIC for AO
FUSE	0	Fuse normal
	1	Fuse error
ADJI	0	AI shipping adjustment value normal
	1	AI shipping adjustment value not set or adjustment value error
ADJO	0	AO shipping adjustment value normal
	1	AO shipping adjustment value not set or adjustment value error

Valid Ranges for AI/AO Adjustment Values

Offset : -9999 to 9999

Gain : 0.0001 to 1.9999

- LIO-06 Module (CNTR-A) Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O error
FLT	0	Counter ASIC normal
	1	Counter ASIC error
PA	0	Phase A normal
	1	Phase A disconnection detected
PB	0	Phase B normal
	1	Phase B disconnection detected

■ Error Status for DI-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (I/O Error = 2)	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Not used.	
SW□□□□□ + 3	Not used.	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• DI-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O error

■ Error Status for DO-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (I/O error = 2)	Bit 0 to Bit 7 Subslot (function) number (= 1)
SW□□□□□ + 1	Not used.	
SW□□□□□ + 2	Not used.	
SW□□□□□ + 3	Not used.	
SW□□□□□ + 4	Not used.	
SW□□□□□ + 5	Not used.	
SW□□□□□ + 6	Not used.	
SW□□□□□ + 7	Not used.	

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• DO-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O error Cause of Error • Fuse error

■ Error Status for AO-01 Modules

SW□□□□□ + 0	Bit 8 to Bit F Error code (I/O error = 2)								Bit 0 to Bit 7 Subslot (function) number (= 1)							
SW□□□□□ + 1	Bit 2 to Bit F Not used.														Bit 1 FLT	Bit 0 ADJO
SW□□□□□ + 2	Not used.															
SW□□□□□ + 3	Not used.															
SW□□□□□ + 4	Not used.															
SW□□□□□ + 5	Not used.															
SW□□□□□ + 6	Not used.															
SW□□□□□ + 7	Not used.															

SW□□□□□ + 8 to SW□□□□□ + 31	Not used. (Only when using the SW09604 to SW13699)

• AO-01 Module Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O error
ADJO	0	AO shipping adjustment value normal
	1	AO shipping adjustment value not set or adjustment value error
FLT	0	Oscillator normal
	1	Oscillator error

Valid Ranges for AO Adjustment Value

Offset : -9999 to 9999

Gain : 0.0001 to 1.9999

Vision Unit Error Status

The following table lists the system registers that are related to errors in the Vision Unit.

SW□□□□□ + 0	Bit 8 to Bit F Error code (I/O Error= 2)								Bit 0 to Bit 7 Subslot (function) number (= 1)							
SW□□□□□ + 1	Bit 0 to Bit F Detail error code															
SW□□□□□ + 2 to SW□□□□□ + 31	Not used.															

• Vision Unit Error Status Detail

Item	Code	Remarks
Error code	0	No error
	2	I/O error
Detail Error Code	0	Normal
	3	Temperature error
	4	High-temperature warning
	5	Fan alarm

Information In the case of the Vision Unit, the details of the error status are stored in the slot 1 area. The slots 2 to 8 areas are unused.

Sub CPU Error Status

The Sub CPU has no I/O error status in detail.

7.5.6 Security Status

The security status shows the execution status of online security.
The contents of the security status in detail are stored in the following system registers.

Name	Register Addresses		Description	
Security Status	SW00506		0: Security disabled, 1: Security enabled	
Security Read Protection Information	SW00507	SB005070 to SB005073	Restriction rights for file reading	□□□□ hex └ Restriction rights level (0 to 7) └ Reserved for system. └ File reading restriction 0: Not restricted 1: Restricted └ Reserved for system.
		SB005074 to SB005076	Reserved for system.	
		SB005077	File reading restriction	
		SB005078 to SB00507F	Reserved for system.	

7.5.7 USB/SD-related System Status

The USB/SD information and abnormal condition data are stored in the following system registers.

Name	Register Addresses		Remarks	
Available USB Memory/ SD Card	SL00650		Unit: Kilobytes	
Total USB Memory/SD Card	SL00652			
USB/SD Status	SW00654	SB006540	0: No USB memory device/SD card 1: USB memory device/SD card inserted	
		SB006541	0: Not supplying power 1: Supplying power	
		SB006542	0: Cannot recognize USB memory device/SD card 1: Recognized USB memory device/SD card	
		SB006543	0: Not accessing USB memory device/SD card 1: Accessing USB memory device/SD card	
		SB006544	0: – 1: Checking FAT file system	
		SB006545 to SB00654F	Reserved for system.	
FAT Type	SW00655		0002 hex	FAT16
			0003 hex	FAT32
Reserved for system.	SW00656 and SW00657		–	
Batch Load and Batch Save	SW00658	SB006580	1: Batch load in progress	
		SB006581	1: USB memory/SD card read error	
		SB006582	1: Load file model mismatch error	
		SB006583	1: Load file write error	
		SB006584	1: Save to flash memory error	
		SB006585	1: Folder for batch loading does not exist	
		SB006586	1: Loading error due to program write protection	
		SB006587	Reserved for system.	
		SB006588	1: Batch save in progress	
		SB006589	1: USB memory/SD card write error	
		SB00658A	1: Save file read error	
		SB00658B	1: Security error	
		SB00658C to SB00658F	Reserved for system.	
Reserved for system.	SW00659 to SW00667		–	

7.5.8 Message Relaying Status

The status of the command or response of the message function are stored in the following system registers.

Name	Register Address	Description
Message Relaying Information	SW00694	Normally processed command message counter
	SW00695	Command message error counter
	SW00696	Normally processed response message counter
	SW00697	Response message error counter

7.5.9 Interrupt Status

The interrupt status shows the status of information on interrupts from each I/O Module.

Not all Optional Module models can store interrupt status information. The following table gives the storage conditions.

Optional Module		Interrupt		
Abbreviation	Function	Interrupt Status	Interrupt Type	Reference
LIO-01	LIO	O	2	page 7-43
	CNTR	O	3	page 7-44
LIO-02	LIO	O	2	page 7-43
	CNTR	O	3	page 7-44
LIO-04	LIO32	O	2	page 7-43
LIO-05	LIO32	O	2	
LIO-06	MIXIO	O	2	page 7-43
	CNTR-A	O	3	page 7-44
DI-01	DI	O	2	page 7-44
DO-01	DO	×	–	–
AI-01	AI	×	–	–
AO-01	AVO	×	–	–
CNTR-01	CNTR01	O	3	page 7-44

Note: O: Stored, ×: Not stored

Configuration of the System Registers

The interrupt status is stored in the following system registers.

Name	Register Addresses	Remarks	
Interrupt Detection Count	SW00698	–	
Module Where an Interrupt Occurred	SW00699	Number of Modules with a single interrupt	
Interrupt Modules	SW00700 to SW00702	Interrupt Module 1	Refer to the following section for details. ☞ *Details* on page 7-43
	SW00703 to SW00705	Interrupt Module 2	
	⋮	⋮	
	SW00787 to SW00789	Interrupt Module 30	

Details

The following table gives details on the Interrupt Module.

Register Address	Remarks
SW007□□ + 0	Rack No., Unit No., Slot No. □□□□ hex 01 to 09: Gives the slot number where the Module in which the interrupt occurred is mounted. 1 to 4: Gives the unit number of the Module in which the interrupt occurred is mounted. 1 to 7: Gives the Rack number where the Module in which the interrupt occurred is mounted.
SW007□□ + 1	Interrupt Type 1: Reserved for system. 2: DI interrupt 3: Counter interrupt
SW007□□ + 2	Register value for hardware interrupt cause Depends on the hardware. Refer to the following section for details. ☞ ◆ *Hardware Interrupt Cause Register Values* on page 7-43

◆ Hardware Interrupt Cause Register Values

■ Interrupt Type = 1 (CPU I/O)

Bit	Meaning
0 to F	Reserved for system.

■ Interrupt Type = 2 (LIO-01/LIO or LIO-02/LIO)

Bit	Meaning
0 to 4	Reserved for system.
5	LIO-01 or LIO-02 interrupt input 1 = Interrupt input, 0 = No interrupt input
6 to F	Reserved for system.

■ Interrupt Type = 2 (LIO-04/LIO32 or LIO-05/LIO32)

Bit	Meaning
0 to 8	Reserved for system.
9	LIO-04 or LIO-05 interrupt input 1 1 = Interrupt input, 0 = No interrupt input
A	LIO-04 or LIO-05 interrupt input 2 1 = Interrupt input, 0 = No interrupt input
B	LIO-04 or LIO-05 interrupt input 3 1 = Interrupt input, 0 = No interrupt input
C	LIO-04 or LIO-05 interrupt input 4 1 = Interrupt input, 0 = No interrupt input
D to F	Reserved for system.

■ Interrupt Type = 2 (LIO-06/MIXIO)

Bit	Meaning
0 to 4	Reserved for system.
5	MIXIO interrupt input 1 = Interrupt input, 0 = No interrupt input
6 to F	Reserved for system.

■ Interrupt Type = 2 (DI-01/DI)

Bit	Meaning
0 to 8	Reserved for system.
9	DI-01 interrupt input 1 1 = Interrupt input, 0 = No interrupt input
A	DI-01 interrupt input 2 1 = Interrupt input, 0 = No interrupt input
B	DI-01 interrupt input 3 1 = Interrupt input, 0 = No interrupt input
C	DI-01 interrupt input 4 1 = Interrupt input, 0 = No interrupt input
D to F	Reserved for system.

■ Interrupt Type = 3 (LIO-01/CNTR, LIO-02/CNTR, or LIO-06/CNTR-A)

Bit	Meaning
0 to 3	Reserved for system.
4	Counter agreement status 1 = Counter agreement, 0 = Counter disagreement
5 to F	Reserved for system.

■ Interrupt Type = 3 (CNTR-01/CNTR01)

Bit	Meaning
0	Counter agreement status 1 = Counter agreement, 0 = Counter disagreement
1 to F	Reserved for system.

7.5.10 CPU Unit/CPU Module Information

The information on the CPU Unit and CPU Module is stored in the following system registers.
- SW00800 to SW01095: System registers compatible with those of the MP2000 Series
- SW13700 to SW15795: System registers expanded with those of the MP3000 Series

System Registers Compatible with Those of MP2000 Series

Register Addresses	Remarks
SW00800	CPU Unit ID/CPU Module ID
SW00801	Hardware version (HEX)
SW00802	Software version (BCD)
SW00803	Number of subslots (HEX)
SW00804	Function Module 1 ID (HEX)
SW00805	Function Module 1 Status
SW00806	Function Module 2 ID (HEX)
SW00807	Function Module 2 Status
SW00808	Function Module 3 ID (HEX)
SW00809	Function Module 3 Status
SW00810	Function Module 4 ID (HEX)
SW00811	Function Module 4 Status
SW00812	Function Module 5 ID (HEX)
SW00813	Function Module 5 Status
SW00814	Function Module 6 ID (HEX)
SW00815	Function Module 6 Status

Expansion System Registers of MP3000 Series

Register Addresses	SW13705 to SW13707
SW13700	CPU Unit ID/CPU Module ID (Low)
SW13701	CPU Unit ID/CPU Module ID (High)
SW13702	Hardware version (HEX)
SW13703	Software version (BCD)
SW13704	Number of subslots (HEX)
SW13705 to SW13707	Reserved for system.
SW13708	Function Module 1 ID (Low)
SW13709	Function Module 1 ID (High)
SW13710	Function Module 1 Status
SW13711	Reserved for system.
SW13712	Function Module 2 ID (Low)
SW13713	Function Module 2 ID (High)
SW13714	Function Module 2 Status
SW13715	Reserved for system.
SW13716	Function Module 3 ID (Low)
SW13717	Function Module 3 ID (High)
SW13718	Function Module 3 Status
SW13719	Reserved for system.
SW13720	Function Module 4 ID (Low)
SW13721	Function Module 4 ID (High)
SW13722	Function Module 4 Status
SW13723	Reserved for system.
SW13724	Function Module 5 ID (Low)
SW13725	Function Module 5 ID (High)
SW13726	Function Module 5 Status
SW13727	Reserved for system.
SW13728	Function Module 6 ID (Low)
SW13729	Function Module 6 ID (High)
SW13730	Function Module 6 Status
SW13731	Reserved for system.
SW13732	Function Module 7 ID (Low)
SW13733	Function Module 7 ID (High)
SW13734	Function Module 7 Status
SW13735	Reserved for system.
SW13736	Function Module 8 ID (Low)
SW13737	Function Module 8 ID (High)
SW13738	Function Module 8 Status
SW13739	Reserved for system.
SW13740	Function Module 9 ID (Low)
SW13741	Function Module 9 ID (High)
SW13742	Function Module 9 Status
SW13743	Reserved for system.
SW13744	Function Module 10 ID (Low)
SW13745	Function Module 10 ID (High)
SW13746	Function Module 10 Status
SW13747	Reserved for system.

7.5.11 Optional Module Information

Information on each Optional Module differs in system register depending on the rack, unit, and slot in which the Optional Module is installed.

Configuration of the System Registers

- Upper row: System registers compatible with those of the MP2000 series
  Area of system register: 8 words from the first register
- Lower row: System registers expanded with those of the MP3000 series
  Area of system register: 16 words from the first register

Rack Number	Unit Number	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9
Rack 1	Unit 1	SW00816	SW00824	SW00832	SW00840	SW00848	SW00856	SW00864	SW00872	–
		SW13748	SW13764	SW13780	SW13796	SW13812	SW13828	SW13844	SW13860	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW13876	SW13892	SW13908	SW13924	SW13940	SW13956	SW13972	SW13988	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW14004	SW14020	SW14036	SW14052	SW14068	SW14084	SW14100	SW14116	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW14132	SW14148	SW14164	SW14180	SW14196	SW14212	SW14228	SW14244	–
Rack 2	–	SW00880	SW00888	SW00896	SW00904	SW00912	SW00920	SW00928	SW00936	SW00944
		–	–	–	–	–	–	–	–	–
Rack 3	–	SW00952	SW00960	SW00968	SW00976	SW00984	SW00992	SW01000	SW01008	SW01016
		–	–	–	–	–	–	–	–	–
Rack 4	–	SW01024	SW01032	SW01040	SW01048	SW01056	SW01064	SW01072	SW01080	SW01088
		–	–	–	–	–	–	–	–	–
Rack 5	Unit 1	–	–	–	–	–	–	–	–	–
		SW14260	SW14276	SW14292	SW14308	SW14324	SW14340	SW14356	SW14372	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW14388	SW14404	SW14420	SW14436	SW14452	SW14468	SW14484	SW14500	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW14516	SW14532	SW14548	SW14564	SW14580	SW14596	SW14612	SW14628	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW14644	SW14660	SW14676	SW14692	SW14708	SW14724	SW14740	SW14756	–
Rack 6	Unit 1	–	–	–	–	–	–	–	–	–
		SW14772	SW14788	SW14804	SW14820	SW14836	SW14852	SW14868	SW14884	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW14900	SW14916	SW14932	SW14948	SW14964	SW14980	SW14996	SW15012	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW15028	SW15044	SW15060	SW15076	SW15092	SW15108	SW15124	SW15140	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW15156	SW15172	SW15188	SW15204	SW15220	SW15236	SW15252	SW15268	–
Rack 7	Unit 1	–	–	–	–	–	–	–	–	–
		SW15284	SW15300	SW15316	SW15332	SW15348	SW15364	SW15380	SW15396	–
	Unit 2	–	–	–	–	–	–	–	–	–
		SW15412	SW15428	SW15444	SW15460	SW15476	SW15492	SW15508	SW15524	–
	Unit 3	–	–	–	–	–	–	–	–	–
		SW15540	SW15556	SW15572	SW15588	SW15604	SW15620	SW15636	SW15652	–
	Unit 4	–	–	–	–	–	–	–	–	–
		SW15668	SW15684	SW15700	SW15716	SW15732	SW15748	SW15764	SW15780	–

Information
- The details of information on the Optional Module depend on the model. Refer to the following section for details.
  ☞ *Detailed Configuration of System Registers of Information on Optional Module* on page 7-47
- Refer to the following section for Rack configuration in detail.
  ☞ *7.6 Expansion Racks* on page 7-81
- Racks 5, 6, and 7 store only information on the Vision Unit or Sub CPU.
- Shaded areas of SW14276 to SW15795 are unused areas. No data is stored. System registers are for future use.

Detailed Configuration of System Registers of Information on Optional Module

◆ System Registers (SW00816 to SW01095) Compatible with those of MP2000 Series

Register Addresses	Remarks	
SW0□□□□ + 0	Optional Module ID	Refer to the following sections for the status in detail. ☞ *Optional Module Information Detail* on page 7-48
SW0□□□□ + 1	Hardware version (HEX)	
SW0□□□□ + 2	Software version (BCD)	
SW0□□□□ + 3	Number of subslots (HEX)	
SW0□□□□ + 4	Function Module 1 ID (HEX)	
SW0□□□□ + 5	Function Module 1 Status	
SW0□□□□ + 6	Function Module 2 ID (HEX)	
SW0□□□□ + 7	Function Module 2 Status	

◆ Expansion System Registers (SW13748 to SW15795) of MP3000 Series

Register Addresses	Remarks	
SW□□□□□ + 0	Optional Unit and Optional Module ID (Low)	Refer to the following sections for the status in detail. ☞ *Optional Module Information Detail* on page 7-48
SW□□□□□ + 1	Optional Unit and Optional Module ID (High)	
SW□□□□□ + 2	Hardware version (HEX)	
SW□□□□□ + 3	Software version (BCD)	
SW□□□□□ + 4	Number of subslots (HEX)	
SW□□□□□ + 5 to SW□□□□□ + 7	Reserved for system.	
SW□□□□□ + 8	Function Module 1 ID (Low)	
SW□□□□□ + 9	Function Module 1 ID (High)	
SW□□□□□ + 10	Function Module 1 Status	
SW□□□□□ + 11	Reserved for system.	
SW□□□□□ + 12	Function Module 2 ID (Low)	
SW□□□□□ + 13	Function Module 2 ID (High)	
SW□□□□□ + 14	Function Module 2 Status	
SW□□□□□ + 15	Reserved for system.	

Optional Module Information Detail

◆ Optional Module ID, Number of Subslots, Function Module ID Detail

Optional Module	Details		
	Optional Module ID	Number of subslots	Function Module ID
SVA-01	9093 hex	0001 hex	9013 hex
SVB-01	9195 hex	0001 hex	9115 hex
SVC-01	9490 hex	0001 hex	9410 hex
SVF-01	9790 hex	0001 hex	9710 hex
PO-01	9390 hex	0001 hex	9310 hex
MPU-01	82E0 hex	0001 hex	8260 hex
215AIF-01	8580 hex	0002 hex	• 217IF (Function Module 1): 8250 hex • MPLINK (Function Module 2): 8122 hex
216AIF-01	84A0 hex	0001 hex	8420 hex
217IF-01	8280 hex	0001 hex	217IF (Function Module 1, 2): 8520 hex
218IF-01	8180 hex	0002 hex	• 217IF (Function Module 1): 8520 hex • 218IF (Function Module 2): 8620 hex
218IF-02	8181 hex	0002 hex	• 217IF (Function Module 1): 8520 hex • 218IFB (Function Module 2): 8622 hex
260IF-01	8380 hex	0002 hex	• 217IF (Function Module 1): 8520 hex • 260IF (Function Module 2): 8B20 hex
261IF-01	8480 hex	0002 hex	• 217IF (Function Module 1): 8520 hex • 261IFS (Function Module 2): 8C21 hex
262IF-01	8DA0 hex	0001 hex	8D20 hex
263IF-01	8BA8 hex	0001 hex	8B28 hex
264IF-01	87A0 hex	0001 hex	8720 hex
265IF-01	8BA4 hex	0001 hex	8B24 hex
266IF-01	8CA2 hex	0001 hex	8C22 hex
266IF-02	8CA3 hex	0001 hex	8C23 hex
267IF-01	82A4 hex	0001 hex	8224 hex
269IF-01	82A8 hex	0001 hex	8228 hex
LIO-01	8080 hex	0002 hex	• LIO (Function Module 1): 8050 hex • CNTR (Function Module 2): 8230 hex
LIO-02	8081 hex	0002 hex	• LIO (Function Module 1): 8050 hex • CNTR (Function Module 2): 8230 hex
LIO-04	80D5 hex	0001 hex	8055 hex
LIO-05	80D6 hex	0001 hex	8055 hex
LIO-06	80D7 hex	0002 hex	• MIXIO (Function Module 1): 8056 hex • CNTR-A (Function Module 2): 8232 hex
DI-01	80D3 hex	0001 hex	8053 hex
DO-01	80D4 hex	0001 hex	8054 hex
AI-01	80D0 hex	0001 hex	8051 hex
AO-01	80D1 hex	0001 hex	8052 hex
CNTR-01	82B0 hex	0001 hex	8231 hex
EXIOIF	808F hex	0001 hex	800F hex

◆ Function Module Status Detail

Value	Text Displayed in MPE720 Module Configuration Definition	Status
0	None	There is no Module Definition and the Module is not mounted.
1	Empty	There is a Module Definition, but the Module is not mounted.
2	Operating (Driving)	The Module is operating normally.
3	Standby (Reserved for system.)	The Module is on standby.
4	Failure	An error was detected in the Module.
5	X Module name	The mounted Module does not match the definition.
6	Waiting for initialization	The Module is mounted, but there is no Detailed Function Module Definition.
7	Driving Stop	Local I/O is stopped.
8	Duplicate Address	The same station address is set for more than one of the connected MECHATROLINK slave devices.
9 or higher	–	Reserved for system.

7.5.12 MPU-01 Module Status

The status of the MPU-01 Multi-CPU Module is stored in the following system registers.

Name	Register Address	Description
MPU-01 Module Status	SW01411	MPU-01 Module Circuit 1 Status
	SW01412	MPU-01 Module Circuit 1 Error Status
	SW01413	MPU-01 Module Circuit 2 Status
	SW01414	MPU-01 Module Circuit 2 Error Status
	SW01415	MPU-01 Module Circuit 3 Status
	SW01416	MPU-01 Module Circuit 3 Error Status
	SW01417	MPU-01 Module Circuit 4 Status
	SW01418	MPU-01 Module Circuit 4 Error Status
	SW01419	MPU-01 Module Circuit 5 Status
	SW01420	MPU-01 Module Circuit 5 Error Status
	SW01421	MPU-01 Module Circuit 6 Status
	SW01422	MPU-01 Module Circuit 6 Error Status
	SW01423	MPU-01 Module Circuit 7 Status
	SW01424	MPU-01 Module Circuit 7 Error Status
	SW01425	MPU-01 Module Circuit 8 Status
	SW01426	MPU-01 Module Circuit 8 Error Status
	SW01427	MPU-01 Module Circuit 9 Status
	SW01428	MPU-01 Module Circuit 9 Error Status
	SW01429	MPU-01 Module Circuit 10 Status
	SW01430	MPU-01 Module Circuit 10 Error Status
	SW01431	MPU-01 Module Circuit 11 Status
	SW01432	MPU-01 Module Circuit 11 Error Status
	SW01433	MPU-01 Module Circuit 12 Status
	SW01434	MPU-01 Module Circuit 12 Error Status
	SW01435	MPU-01 Module Circuit 13 Status
	SW01436	MPU-01 Module Circuit 13 Error Status
	SW01437	MPU-01 Module Circuit 14 Status
	SW01438	MPU-01 Module Circuit 14 Error Status
	SW01439	MPU-01 Module Circuit 15 Status
	SW01440	MPU-01 Module Circuit 15 Error Status
	SW01441	MPU-01 Module Circuit 16 Status
	SW01442	MPU-01 Module Circuit 16 Error Status

MPU-01 Module Circuit □ Status Detail

Name	Register Addresses		Description	
MPU-01 Module Circuit □ Status	SW01411 SW01413 SW01415 SW01417 SW01419 SW01421 SW01423 SW01425 SW01427 SW01429 SW01431 SW01433 SW01435 SW01437 SW01439 SW01441	SB014□□0	READY	0: WDG, Self-diagnostic error, Sync error 1: Normal
		SB014□□1	RUN	0: Stopped (STOP) 1: Operating (RUN)
		SB014□□2	ALARM	0: Normal 1: Alarm (Reset when the cause of the alarm is eliminated)
		SB014□□3	ERROR	0: Normal 1: Error (Resetting)
		SB014□□4	Reserved for system.	
		SB014□□5	Reserved for system.	
		SB014□□6	FLASH	0: INIT Start 1: Flash Operation
		SB014□□7	WEN	0: Writing disabled 1: Writing enabled
		SB014□□8	BAT	0: Normal 1: The battery alarm occurred
		SB014□□9	Reserved for system.	
		SB014□□A	Reserved for system.	
		SB014□□B	SYNCCOND	0: High-speed scan service synchronized 1: High-speed scan service not synchronized
		SB014□□C	Reserved for system.	
		SB014□□D	STSTOPR	0: No operation stop request from other CPUs 1: Operation stop request from other CPUs
		SB014□□E	STOPREQ	Operation Stop Request from MPE720 0: RUN selected 1: STOP selected
		SB014□□F	RUNSW	Run Switch Status at Power ON 0: STOP 1: RUN

MPU-01 Module Circuit □ Error Status Detail

Name	Register Addresses		Description	
MPU-01 Module Circuit □ Error Status	SW01412 SW01414 SW01416 SW01418 SW01420 SW01422 SW01424 SW01426 SW01428 SW01430 SW01432 SW01434 SW01436 SW01438 SW01440 SW01442	SB014□□0	CPUDOWN	0: Normal 1: Serious failure
		SB014□□1	Reserved for system.	
		SB014□□2	Reserved for system.	
		SB014□□3	EX_ERROR	0: Normal 1: EX error
		SB014□□4	SYNCERR	0: Synchronization normal 1: Synchronization error
		SB014□□5	Reserved for system.	
		SB014□□6	Reserved for system.	
		SB014□□7	Reserved for system.	
		SB014□□8	UE_ERROR	0: Normal 1: User operation error
		SB014□□9	IO_ERROR	0: Normal 1: I/O error
		SB014□□A	Reserved for system.	
		SB014□□B	SCAN_ERROR	0: Scan setting normal 1: Scan setting error
		SB014□□C	CPUSCANERR	0: Normal 1: Main CPU H scan restrictions error
		SB014□□D	MPUSCANERR	0: Normal 1: Restrictions error in MECHATROLINK-III communications cycle
		SB014□□E	Reserved for system.	
		SB014□□F	Reserved for system.	

7.5.13 Sub CPU Status

The status of the Sub CPU is stored in the following system registers.

Name	Register Addresses	Remarks
Sub CPU#1 Status	SW01475	Sub CPU Circuit Number 1 Status
Sub CPU#1 Error Status	SW01476	Sub CPU Circuit Number 1 Error Status
Sub CPU#2 Status	SW01477	Sub CPU Circuit Number 2 Status
Sub CPU#2 Error Status	SW01478	Sub CPU Circuit Number 2 Error Status
Sub CPU#3 Status	SW01479	Sub CPU Circuit Number 3 Status
Sub CPU#3 Error Status	SW01480	Sub CPU Circuit Number 3 Error Status
Sub CPU#4 Status	SW01481	Sub CPU Circuit Number 4 Status
Sub CPU#4 Error Status	SW01482	Sub CPU Circuit Number 4 Error Status

Sub CPU#□ Status Detail

Name	Register Addresses		Description	
Sub CPU#□ Status	SW01475 SW01477 SW01479 SW01481	SB014□□0	READY	0: WDG, Self-diagnostic error, Sync error 1: Normal
		SB014□□1	RUN	0: Stopped (STOP) 1: Operating (RUN)
		SB014□□2	ALARM	0: Normal 1: Alarm (Reset when the cause of the alarm is eliminated)
		SB014□□3	ERROR	0: Normal 1: Error (Resetting)
		SB014□□4	Reserved for system.	
		SB014□□5	Reserved for system.	
		SB014□□6	FLASH	0: INIT Start 1: Flash Operation
		SB014□□7	WEN	0: Writing disabled 1: Writing enabled
		SB014□□8	BAT	0: Normal 1: The battery alarm occurred
		SB014□□9	Reserved for system.	
		SB014□□A	Reserved for system.	
		SB014□□B	SYNCCOND	0: High-speed scan service synchronized 1: High-speed scan service not synchronized
		SB014□□C	Reserved for system.	
		SB014□□D	STSTOPR	0: No operation stop request from other CPUs 1: Operation stop request from other CPUs
		SB014□□E	STOPREQ	Operation Stop Request from MPE720 0: RUN selected 1: STOP selected
		SB014□□F	RUNSW	Run Switch Status at Power ON 0: STOP 1: RUN

Sub CPU#□ Error Status Detail

Name	Register Addresses		Description	
Sub CPU#□ Error Status	SW01476 SW01478 SW01480 SW01482	SB014□□0	CPUDOWN	0: Normal 1: Serious failure
		SB014□□1	Reserved for system.	
		SB014□□2	Reserved for system.	
		SB014□□3	EX_ERROR	0: Normal 1: EX error
		SB014□□4	SYNCERR	0: Synchronization normal 1: Synchronization error
		SB014□□5	Reserved for system.	
		SB014□□6	Reserved for system.	
		SB014□□7	Reserved for system.	
		SB014□□8	UE_ERROR	0: Normal 1: User operation error
		SB014□□9	IO_ERROR	0: Normal 1: I/O error
		SB014□□A	Reserved for system.	
		SB014□□B	SCAN_ERROR	0: Scan setting normal 1: Scan setting error
		SB014□□C	CPUSCANERR	0: Normal 1: Main CPU H scan restrictions error
		SB014□□D	MPUSCANERR	0: Normal 1: Restrictions error in MECHATROLINK-III communications cycle
		SB014□□E	Reserved for system.	
		SB014□□F	Reserved for system.	

7.5.14 PROFINET Controller (266IF-01) IOPS Status Information

The IOPS status information for the PROFINET Controller (266IF-01) is stored in the following system registers.

Register Addresses	Remarks		
SW02688 to SW02695	Circuit 1	IOPS Output	–
SW02696 to SW02749		IOPS Status	The input IOPS status from the slaves (54 words) 0: Data disabled (BAD) 1: Data enabled (GOOD)
SW02750 to SW02751		Reserved for system.	–
SW02752 to SW02815	Circuit 2	Same as above.	
SW02816 to SW02879	Circuit 3	Same as above.	
SW02880 to SW02943	Circuit 4	Same as above.	
SW02944 to SW03007	Circuit 5	Same as above.	
SW03008 to SW03071	Circuit 6	Same as above.	
SW03072 to SW03135	Circuit 7	Same as above.	
SW03136 to SW03199	Circuit 8	Same as above.	

7.5.15 Motion Program Execution Information

This section gives the system register configuration of and details on the motion program execution information.

Configuration of the System Registers

The execution status of the motion programs is stored in the following system registers.

Register Addresses	Name	Reference
SW03200	Number of Currently Executing Program for Work 1	–
SW03201	Number of Currently Executing Program for Work 2	–
SW03202	Number of Currently Executing Program for Work 3	–
SW03203	Number of Currently Executing Program for Work 4	–
SW03204	Number of Currently Executing Program for Work 5	–
SW03205	Number of Currently Executing Program for Work 6	–
SW03206	Number of Currently Executing Program for Work 7	–
SW03207	Number of Currently Executing Program for Work 8	–
SW03208	Number of Currently Executing Program for Work 9	–
SW03209	Number of Currently Executing Program for Work 10	–
SW03210	Number of Currently Executing Program for Work 11	–
SW03211	Number of Currently Executing Program for Work 12	–
SW03212	Number of Currently Executing Program for Work 13	–
SW03213	Number of Currently Executing Program for Work 14	–
SW03214	Number of Currently Executing Program for Work 15	–
SW03215	Number of Currently Executing Program for Work 16	–
SW03216	Number of Currently Executing Program for Work 17	–
SW03217	Number of Currently Executing Program for Work 18	–
SW03218	Number of Currently Executing Program for Work 19	–
SW03219	Number of Currently Executing Program for Work 20	–
SW03220	Number of Currently Executing Program for Work 21	–
SW03221	Number of Currently Executing Program for Work 22	–
SW03222	Number of Currently Executing Program for Work 23	–
SW03223	Number of Currently Executing Program for Work 24	–
SW03224	Number of Currently Executing Program for Work 25	–
SW03225	Number of Currently Executing Program for Work 26	–
SW03226	Number of Currently Executing Program for Work 27	–
SW03227	Number of Currently Executing Program for Work 28	–
SW03228	Number of Currently Executing Program for Work 29	–
SW03229	Number of Currently Executing Program for Work 30	–
SW03230	Number of Currently Executing Program for Work 31	–
SW03231	Number of Currently Executing Program for Work 32	–
SW03232 to SW03263	Program Running Bits	*Details* on page 7-57
SW03264 to SW03321	Work 1 Program Information	• *System Work Numbers 1 to 8* on page 7-58
SW03322 to SW03379	Work 2 Program Information	
SW03380 to SW03437	Work 3 Program Information	
SW03438 to SW03495	Work 4 Program Information	
SW03496 to SW03553	Work 5 Program Information	
SW03554 to SW03611	Work 6 Program Information	
SW03612 to SW03669	Work 7 Program Information	
SW03670 to SW03727	Work 8 Program Information	

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Register Addresses	Name	Reference
SW03728 to SW03785	Work 9 Program Information	• *System Work Numbers 9 to 16* on page 7-60
SW03786 to SW03843	Work 10 Program Information	
SW03844 to SW03901	Work 11 Program Information	
SW03902 to SW03959	Work 12 Program Information	
SW03960 to SW04017	Work 13 Program Information	
SW04018 to SW04075	Work 14 Program Information	
SW04076 to SW04133	Work 15 Program Information	
SW04134 to SW04191	Work 16 Program Information	
SW04192 to SW04249	Work 17 Program Information	• *System Work Numbers 17 to 24* on page 7-62
SW04250 to SW04307	Work 18 Program Information	
SW04308 to SW04365	Work 19 Program Information	
SW04366 to SW04423	Work 20 Program Information	
SW04424 to SW04481	Work 21 Program Information	
SW04482 to SW04539	Work 22 Program Information	
SW04540 to SW04597	Work 23 Program Information	
SW04598 to SW04655	Work 24 Program Information	
SW04656 to SW04713	Work 25 Program Information	• *System Work Numbers 25 to 32* on page 7-64
SW04714 to SW04771	Work 26 Program Information	
SW04772 to SW04829	Work 27 Program Information	
SW04830 to SW04887	Work 28 Program Information	
SW04888 to SW04945	Work 29 Program Information	
SW04946 to SW05003	Work 30 Program Information	
SW05004 to SW05061	Work 31 Program Information	
SW05062 to SW05119	Work 32 Program Information	
SW08192 to SW08223	Work 1 Extended Program Information	• *System Work Numbers 1 to 8* on page 7-58
SW08224 to SW08255	Work 2 Extended Program Information	
SW08256 to SW08287	Work 3 Extended Program Information	
SW08288 to SW08319	Work 4 Extended Program Information	
SW08320 to SW08351	Work 5 Extended Program Information	
SW08352 to SW08383	Work 6 Extended Program Information	
SW08384 to SW08415	Work 7 Extended Program Information	
SW08416 to SW08447	Work 8 Extended Program Information	
SW08448 to SW08479	Work 9 Extended Program Information	• *System Work Numbers 9 to 16* on page 7-60
SW08480 to SW08511	Work 10 Extended Program Information	
SW08512 to SW08543	Work 11 Extended Program Information	
SW08544 to SW08575	Work 12 Extended Program Information	
SW08576 to SW08607	Work 13 Extended Program Information	
SW08608 to SW08639	Work 14 Extended Program Information	
SW08640 to SW08671	Work 15 Extended Program Information	
SW08672 to SW08703	Work 16 Extended Program Information	
SW08704 to SW08735	Work 17 Extended Program Information	• *System Work Numbers 17 to 24* on page 7-62
SW08736 to SW08767	Work 18 Extended Program Information	
SW08768 to SW08799	Work 19 Extended Program Information	
SW08800 to SW08831	Work 20 Extended Program Information	
SW08832 to SW08863	Work 21 Extended Program Information	
SW08864 to SW08895	Work 22 Extended Program Information	
SW08896 to SW08927	Work 23 Extended Program Information	
SW08928 to SW08959	Work 24 Extended Program Information	

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Register Addresses	Name	Reference
SW08960 to SW08991	Work 25 Extended Program Information	• *System Work Numbers 25 to 32* on page 7-64
SW08992 to SW09023	Work 26 Extended Program Information	
SW09024 to SW09055	Work 27 Extended Program Information	
SW09056 to SW09087	Work 28 Extended Program Information	
SW09088 to SW09119	Work 29 Extended Program Information	
SW09120 to SW09151	Work 30 Extended Program Information	
SW09152 to SW09183	Work 31 Extended Program Information	
SW09184 to SW09215	Work 32 Extended Program Information	

Details

The following table gives details on the Program Execution Bits from system register addresses SW03232 to SW03263.

The program is being executed when the corresponding bit is 1.

Register Address	Contents
SW03232	MP□016 (Bit F) to MP□001 (Bit 0)
SW03233	MP□032 (Bit F) to MP□017 (Bit 0)
SW03234	MP□048 (Bit F) to MP□033 (Bit 0)
SW03235	MP□064 (Bit F) to MP□049 (Bit 0)
SW03236	MP□080 (Bit F) to MP□065 (Bit 0)
SW03237	MP□096 (Bit F) to MP□081 (Bit 0)
SW03238	MP□112 (Bit F) to MP□097 (Bit 0)
SW03239	MP□128 (Bit F) to MP□113 (Bit 0)
SW03240	MP□144 (Bit F) to MP□129 (Bit 0)
SW03241	MP□160 (Bit F) to MP□145 (Bit 0)
SW03242	MP□176 (Bit F) to MP□161 (Bit 0)
SW03243	MP□192 (Bit F) to MP□177 (Bit 0)
SW03244	MP□208 (Bit F) to MP□193 (Bit 0)
SW03245	MP□224 (Bit F) to MP□209 (Bit 0)
SW03246	MP□240 (Bit F) to MP□225 (Bit 0)
SW03247	MP□256 (Bit F) to MP□241 (Bit 0)
SW03248	MP□272 (Bit F) to MP□257 (Bit 0)
SW03249	MP□288 (Bit F) to MP□273 (Bit 0)
SW03250	MP□304 (Bit F) to MP□289 (Bit 0)
SW03251	MP□320 (Bit F) to MP□305 (Bit 0)
SW03252	MP□336 (Bit F) to MP□321 (Bit 0)
SW03253	MP□352 (Bit F) to MP□337 (Bit 0)
SW03254	MP□368 (Bit F) to MP□353 (Bit 0)
SW03255	MP□384 (Bit F) to MP□369 (Bit 0)
SW03256	MP□400 (Bit F) to MP□385 (Bit 0)
SW03257	MP□416 (Bit F) to MP□401 (Bit 0)
SW03258	MP□432 (Bit F) to MP□417 (Bit 0)
SW03259	MP□448 (Bit F) to MP□433 (Bit 0)
SW03260	MP□464 (Bit F) to MP□449 (Bit 0)
SW03261	MP□480 (Bit F) to MP□465 (Bit 0)
SW03262	MP□496 (Bit F) to MP□481 (Bit 0)
SW03263	MP□512 (Bit F) to MP□497 (Bit 0)

System Registers Used for System Work Numbers 1 to 32

The system registers that are used for system work numbers 1 to 32 are given in the following table.

Two system registers are given in the register table for the alarm code, but we recommend that you use system registers SL26□□□. You can use the system registers that are given in parentheses to check for alarms in most cases, but they do not report all alarms.

Refer to the following section for details on alarm codes.

☞ *5.1.3 Motion Program Alarm Codes* on page 5-6

- System Work Numbers 1 to 8

System Work Numbers		Work 1	Work 2	Work 3	Work 4	Work 5	Work 6	Work 7	Work 8
Executing Main Program No.		SW03200	SW03201	SW03202	SW03203	SW03204	SW03205	SW03206	SW03207
Status		SW03264	SW03322	SW03380	SW03438	SW03496	SW03554	SW03612	SW03670
Control Signals		SW03265	SW03323	SW03381	SW03439	SW03497	SW03555	SW03613	SW03671
Fork 0	Program Number	SW03266	SW03324	SW03382	SW03440	SW03498	SW03556	SW03614	SW03672
	Block Number	SW03267	SW03325	SW03383	SW03441	SW03499	SW03557	SW03615	SW03673
	Alarm Code	SL26000 (SW03268)	SL26016 (SW03326)	SL26032 (SW03384)	SL26048 (SW03442)	SL26064 (SW03500)	SL26080 (SW03558)	SL26096 (SW03616)	SL26112 (SW03674)
Fork 1	Program Number	SW03269	SW03327	SW03385	SW03443	SW03501	SW03559	SW03617	SW03675
	Block Number	SW03270	SW03328	SW03386	SW03444	SW03502	SW03560	SW03618	SW03676
	Alarm Code	SL26002 (SW03271)	SL26018 (SW03329)	SL26034 (SW03387)	SL26050 (SW03445)	SL26066 (SW03503)	SL26082 (SW03561)	SL26098 (SW03619)	SL26114 (SW03677)
Fork 2	Program Number	SW03272	SW03330	SW03388	SW03446	SW03504	SW03562	SW03620	SW03678
	Block Number	SW03273	SW03331	SW03389	SW03447	SW03505	SW03563	SW03621	SW03679
	Alarm Code	SL26004 (SW03274)	SL26020 (SW03332)	SL26036 (SW03390)	SL26052 (SW03448)	SL26068 (SW03506)	SL26084 (SW03564)	SL26100 (SW03622)	SL26116 (SW03680)
Fork 3	Program Number	SW03275	SW03333	SW03391	SW03449	SW03507	SW03565	SW03623	SW03681
	Block Number	SW03276	SW03334	SW03392	SW03450	SW03508	SW03566	SW03624	SW03682
	Alarm Code	SL26006 (SW03277)	SL26022 (SW03335)	SL26038 (SW03393)	SL26054 (SW03451)	SL26070 (SW03509)	SL26086 (SW03567)	SL26102 (SW03625)	SL26118 (SW03683)
Fork 4	Program Number	SW03278	SW03336	SW03394	SW03452	SW03510	SW03568	SW03626	SW03684
	Block Number	SW03279	SW03337	SW03395	SW03453	SW03511	SW03569	SW03627	SW03685
	Alarm Code	SL26008 (SW03280)	SL26024 (SW03338)	SL26040 (SW03396)	SL26056 (SW03454)	SL26072 (SW03512)	SL26088 (SW03570)	SL26104 (SW03628)	SL26120 (SW03686)
Fork 5	Program Number	SW03281	SW03339	SW03397	SW03455	SW03513	SW03571	SW03629	SW03687
	Block Number	SW03282	SW03340	SW03398	SW03456	SW03514	SW03572	SW03630	SW03688
	Alarm Code	SL26010 (SW03283)	SL26026 (SW03341)	SL26042 (SW03399)	SL26058 (SW03457)	SL26074 (SW03515)	SL26090 (SW03573)	SL26106 (SW03631)	SL26122 (SW03689)
Fork 6	Program Number	SW03284	SW03342	SW03400	SW03458	SW03516	SW03574	SW03632	SW03690
	Block Number	SW03285	SW03343	SW03401	SW03459	SW03517	SW03575	SW03633	SW03691
	Alarm Code	SL26012 (SW03286)	SL26028 (SW03344)	SL26044 (SW03402)	SL26060 (SW03460)	SL26076 (SW03518)	SL26092 (SW03576)	SL26108 (SW03634)	SL26124 (SW03692)
Fork 7	Program Number	SW03287	SW03345	SW03403	SW03461	SW03519	SW03577	SW03635	SW03693
	Block Number	SW03288	SW03346	SW03404	SW03462	SW03520	SW03578	SW03636	SW03694
	Alarm Code	SL260014 (SW03289)	SL26030 (SW03347)	SL26046 (SW03405)	SL26062 (SW03463)	SL26078 (SW03521)	SL26094 (SW03579)	SL26110 (SW03637)	SL26126 (SW03695)
Logical Axis 1 Program Current Position		SL03290	SL03348	SL03406	SL03464	SL03522	SL03580	SL03638	SL03696
Logical Axis 2 Program Current Position		SL03292	SL03350	SL03408	SL03466	SL03524	SL03582	SL03640	SL03698
Logical Axis 3 Program Current Position		SL03294	SL03352	SL03410	SL03468	SL03526	SL03584	SL03642	SL03700
Logical Axis 4 Program Current Position		SL03296	SL03354	SL03412	SL03470	SL03528	SL03586	SL03644	SL03702

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System Work Numbers	Work 1	Work 2	Work 3	Work 4	Work 5	Work 6	Work 7	Work 8
Logical Axis 5 Program Current Position	SL03298	SL03356	SL03414	SL03472	SL03530	SL03588	SL03646	SL03704
Logical Axis 6 Program Current Position	SL03300	SL03358	SL03416	SL03474	SL03532	SL03590	SL03648	SL03706
Logical Axis 7 Program Current Position	SL03302	SL03360	SL03418	SL03476	SL03534	SL03592	SL03650	SL03708
Logical Axis 8 Program Current Position	SL03304	SL03362	SL03420	SL03478	SL03536	SL03594	SL03652	SL03710
Logical Axis 9 Program Current Position	SL03306	SL03364	SL03422	SL03480	SL03538	SL03596	SL03654	SL03712
Logical Axis 10 Program Current Position	SL03308	SL03366	SL03424	SL03482	SL03540	SL03598	SL03656	SL03714
Logical Axis 11 Program Current Position	SL03310	SL03368	SL03426	SL03484	SL03542	SL03600	SL03658	SL03716
Logical Axis 12 Program Current Position	SL03312	SL03370	SL03428	SL03486	SL03544	SL03602	SL03660	SL03718
Logical Axis 13 Program Current Position	SL03314	SL03372	SL03430	SL03488	SL03546	SL03604	SL03662	SL03720
Logical Axis 14 Program Current Position	SL03316	SL03374	SL03432	SL03490	SL03548	SL03606	SL03664	SL03722
Logical Axis 15 Program Current Position	SL03318	SL03376	SL03434	SL03492	SL03550	SL03608	SL03666	SL03724
Logical Axis 16 Program Current Position	SL03320	SL03378	SL03436	SL03494	SL03552	SL03610	SL03668	SL03726
Logical Axis 17 Program Current Position	SL08192	SL08224	SL08256	SL08288	SL08320	SL08352	SL08384	SL08416
Logical Axis 18 Program Current Position	SL08194	SL08226	SL08258	SL08290	SL08322	SL08354	SL08386	SL08418
Logical Axis 19 Program Current Position	SL08196	SL08228	SL08260	SL08292	SL08324	SL08356	SL08388	SL08420
Logical Axis 20 Program Current Position	SL08198	SL08230	SL08262	SL08294	SL08326	SL08358	SL08390	SL08422
Logical Axis 21 Program Current Position	SL08200	SL08232	SL08264	SL08296	SL08328	SL08360	SL08392	SL08424
Logical Axis 22 Program Current Position	SL08202	SL08234	SL08266	SL08298	SL08330	SL08362	SL08394	SL08426
Logical Axis 23 Program Current Position	SL08204	SL08236	SL08268	SL08300	SL08332	SL08364	SL08396	SL08428
Logical Axis 24 Program Current Position	SL08206	SL08238	SL08270	SL08302	SL08334	SL08366	SL08398	SL08430
Logical Axis 25 Program Current Position	SL08208	SL08240	SL08272	SL08304	SL08336	SL08368	SL08400	SL08432
Logical Axis 26 Program Current Position	SL08210	SL08242	SL08274	SL08306	SL08338	SL08370	SL08402	SL08434
Logical Axis 27 Program Current Position	SL08212	SL08244	SL08276	SL08308	SL08340	SL08372	SL08404	SL08436
Logical Axis 28 Program Current Position	SL08214	SL08246	SL08278	SL08310	SL08342	SL08374	SL08406	SL08438
Logical Axis 29 Program Current Position	SL08216	SL08248	SL08280	SL08312	SL08344	SL08376	SL08408	SL08440
Logical Axis 30 Program Current Position	SL08218	SL08250	SL08282	SL08314	SL08346	SL08378	SL08410	SL08442
Logical Axis 31 Program Current Position	SL08220	SL08252	SL08284	SL08316	SL08348	SL08380	SL08412	SL08444
Logical Axis 32 Program Current Position	SL08222	SL08254	SL08286	SL08318	SL08350	SL08382	SL08414	SL08446

• System Work Numbers 9 to 16

System Work Numbers		Work 9	Work 10	Work 11	Work 12	Work 13	Work 14	Work 15	Work 16
Executing Main Program No.		SW03208	SW03209	SW03210	SW03211	SW03212	SW03213	SW03214	SW03215
Status		SW03728	SW03786	SW03844	SW03902	SW03960	SW04018	SW04076	SW04134
Control Signal		SW03729	SW03787	SW03845	SW03903	SW03961	SW04019	SW04077	SW04135
Fork 0	Program Number	SW03730	SW03788	SW03846	SW03904	SW03962	SW04020	SW04078	SW04136
	Block Number	SW03731	SW03789	SW03847	SW03905	SW03963	SW04021	SW04079	SW04137
	Alarm Code	SL26128 (SW03732)	SL26144 (SW03790)	SL26160 (SW03848)	SL26176 (SW03906)	SL26192 (SW03964)	SL26208 (SW04022)	SL26224 (SW04080)	SL26240 (SW04138)
Fork 1	Program Number	SW03733	SW03791	SW03849	SW03907	SW03965	SW04023	SW04081	SW04139
	Block Number	SW03734	SW03792	SW03850	SW03908	SW03966	SW04024	SW04082	SW04140
	Alarm Code	SL26130 (SW03735)	SL26146 (SW03793)	SL26162 (SW03851)	SL26178 (SW03909)	SL26194 (SW03967)	SL26210 (SW04025)	SL26226 (SW04083)	SL26242 (SW04141)
Fork 2	Program Number	SW03736	SW03794	SW03852	SW03910	SW03968	SW04026	SW04084	SW04142
	Block Number	SW03737	SW03795	SW03853	SW03911	SW03969	SW04027	SW04085	SW04143
	Alarm Code	SL26132 (SW03738)	SL26148 (SW03796)	SL26164 (SW03854)	SL26180 (SW03912)	SL26196 (SW03970)	SL26212 (SW04028)	SL26228 (SW04086)	SL26244 (SW04144)
Fork 3	Program Number	SW03739	SW03797	SW03855	SW03913	SW03971	SW04029	SW04087	SW04145
	Block Number	SW03740	SW03798	SW03856	SW03914	SW03972	SW04030	SW04088	SW04146
	Alarm Code	SL26134 (SW03741)	SL26150 (SW03799)	SL26166 (SW03857)	SL26182 (SW03915)	SL26198 (SW03973)	SL26214 (SW04031)	SL26230 (SW04089)	SL26246 (SW04147)
Fork 4	Program Number	SW03742	SW03800	SW03858	SW03916	SW03974	SW04032	SW04090	SW04148
	Block Number	SW03743	SW03801	SW03859	SW03917	SW03975	SW04033	SW04091	SW04149
	Alarm Code	SL26136 (SW03744)	SL26152 (SW03802)	SL26168 (SW03860)	SL26184 (SW03918)	SL26200 (SW03976)	SL26216 (SW04034)	SL26232 (SW04092)	SL26248 (SW04150)
Fork 5	Program Number	SW03745	SW03803	SW03861	SW03919	SW03977	SW04035	SW04093	SW04151
	Block Number	SW03746	SW03804	SW03862	SW03920	SW03978	SW04036	SW04094	SW04152
	Alarm Code	SL26138 (SW03747)	SL26154 (SW03805)	SL26170 (SW03863)	SL26186 (SW03921)	SL26202 (SW03979)	SL26218 (SW04037)	SL26234 (SW04095)	SL26250 (SW04153)
Fork 6	Program Number	SW03748	SW03806	SW03864	SW03922	SW03980	SW04038	SW04096	SW04154
	Block Number	SW03749	SW03807	SW03865	SW03923	SW03981	SW04039	SW04097	SW04155
	Alarm Code	SL26140 (SW03750)	SL26156 (SW03808)	SL26172 (SW03866)	SL26188 (SW03924)	SL26204 (SW03982)	SL26220 (SW04040)	SL26236 (SW04098)	SL26252 (SW04156)
Fork 7	Program Number	SW03751	SW03809	SW03867	SW03925	SW03983	SW04041	SW04099	SW04157
	Block Number	SW03752	SW03810	SW03868	SW03926	SW03984	SW04042	SW04100	SW04158
	Alarm Code	SL26142 (SW03753)	SL26158 (SW03811)	SL26174 (SW03869)	SL26190 (SW03927)	SL26206 (SW03985)	SL26222 (SW04043)	SL26238 (SW04101)	SL26254 (SW04159)
Logical Axis 1 Program Current Position		SL03754	SL03812	SL03870	SL03928	SL03986	SL04044	SL04102	SL04160
Logical Axis 2 Program Current Position		SL03756	SL03814	SL03872	SL03930	SL03988	SL04046	SL04104	SL04162
Logical Axis 3 Program Current Position		SL03758	SL03816	SL03874	SL03932	SL03990	SL04048	SL04106	SL04164
Logical Axis 4 Program Current Position		SL03760	SL03818	SL03876	SL03934	SL03992	SL04050	SL04108	SL04166
Logical Axis 5 Program Current Position		SL03762	SL03820	SL03878	SL03936	SL03994	SL04052	SL04110	SL04168
Logical Axis 6 Program Current Position		SL03764	SL03822	SL03880	SL03938	SL03996	SL04054	SL04112	SL04170
Logical Axis 7 Program Current Position		SL03766	SL03824	SL03882	SL03940	SL03998	SL04056	SL04114	SL04172
Logical Axis 8 Program Current Position		SL03768	SL03826	SL03884	SL03942	SL04000	SL04058	SL04116	SL04174

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System Work Numbers	Work 9	Work 10	Work 11	Work 12	Work 13	Work 14	Work 15	Work 16
Logical Axis 9 Program Current Position	SL03770	SL03828	SL03886	SL03944	SL04002	SL04060	SL04118	SL04176
Logical Axis 10 Program Current Position	SL03772	SL03830	SL03888	SL03946	SL04004	SL04062	SL04120	SL04178
Logical Axis 11 Program Current Position	SL03774	SL03832	SL03890	SL03948	SL04006	SL04064	SL04122	SL04180
Logical Axis 12 Program Current Position	SL03776	SL03834	SL03892	SL03950	SL04008	SL04066	SL04124	SL04182
Logical Axis 13 Program Current Position	SL03778	SL03836	SL03894	SL03952	SL04010	SL04068	SL04126	SL04184
Logical Axis 14 Program Current Position	SL03780	SL03838	SL03896	SL03954	SL04012	SL04070	SL04128	SL04186
Logical Axis 15 Program Current Position	SL03782	SL03840	SL03898	SL03956	SL04014	SL04072	SL04130	SL04188
Logical Axis 16 Program Current Position	SL03784	SL03842	SL03900	SL03958	SL04016	SL04074	SL04132	SL04190
Logical Axis 17 Program Current Position	SL08448	SL08480	SL08512	SL08544	SL08576	SL08608	SL08640	SL08672
Logical Axis 18 Program Current Position	SL08450	SL08482	SL08514	SL08546	SL08578	SL08610	SL08642	SL08674
Logical Axis 19 Program Current Position	SL08452	SL08484	SL08516	SL08548	SL08580	SL08612	SL08644	SL08676
Logical Axis 20 Program Current Position	SL08454	SL08486	SL08518	SL08550	SL08582	SL08614	SL08646	SL08678
Logical Axis 21 Program Current Position	SL08456	SL08488	SL08520	SL08552	SL08584	SL08616	SL08648	SL08680
Logical Axis 22 Program Current Position	SL08458	SL08490	SL08522	SL08554	SL08586	SL08618	SL08650	SL08682
Logical Axis 23 Program Current Position	SL08460	SL08492	SL08524	SL08556	SL08588	SL08620	SL08652	SL08684
Logical Axis 24 Program Current Position	SL08462	SL08494	SL08526	SL08558	SL08590	SL08622	SL08654	SL08686
Logical Axis 25 Program Current Position	SL08464	SL08496	SL08528	SL08560	SL08592	SL08624	SL08656	SL08688
Logical Axis 26 Program Current Position	SL08466	SL08498	SL08530	SL08562	SL08594	SL08626	SL08658	SL08690
Logical Axis 27 Program Current Position	SL08468	SL08500	SL08532	SL08564	SL08596	SL08628	SL08660	SL08692
Logical Axis 28 Program Current Position	SL08470	SL08502	SL08534	SL08566	SL08598	SL08630	SL08662	SL08694
Logical Axis 29 Program Current Position	SL08472	SL08504	SL08536	SL08568	SL08600	SL08632	SL08664	SL08696
Logical Axis 30 Program Current Position	SL08474	SL08506	SL08538	SL08570	SL08602	SL08634	SL08666	SL08698
Logical Axis 31 Program Current Position	SL08476	SL08508	SL08540	SL08572	SL08604	SL08636	SL08668	SL08700
Logical Axis 32 Program Current Position	SL08478	SL08510	SL08542	SL08574	SL08606	SL08638	SL08670	SL08702

• System Work Numbers 17 to 24

System Work Number		Work 17	Work 18	Work 19	Work 20	Work 21	Work 22	Work 23	Work 24
Executing Main Program No.		SW03216	SW03217	SW03218	SW03219	SW03220	SW03221	SW03222	SW03223
Status		SW04192	SW04250	SW04308	SW04366	SW04424	SW04482	SW04540	SW04598
Control Signal		SW04193	SW04251	SW04309	SW04367	SW04425	SW04483	SW04541	SW04599
Fork 0	Program Number	SW04194	SW04252	SW04310	SW04368	SW04426	SW04484	SW04542	SW04600
	Block Number	SW04195	SW04253	SW04311	SW04369	SW04427	SW04485	SW04543	SW04601
	Alarm Code	SL26256 (SW04196)	SL26272 (SW04254)	SL26288 (SW04312)	SL26304 (SW04370)	SL26320 (SW04428)	SL26336 (SW04486)	SL26352 (SW04544)	SL26368 (SW04602)
Fork 1	Program Number	SW04197	SW04255	SW04313	SW04371	SW04429	SW04487	SW04545	SW04603
	Block Number	SW04198	SW04256	SW04314	SW04372	SW04430	SW04488	SW04546	SW04604
	Alarm Code	SL26258 (SW04199)	SL26274 (SW04257)	SL26290 (SW04315)	SL26306 (SW04373)	SL26322 (SW04431)	SL26338 (SW04489)	SL26354 (SW04547)	SL26370 (SW04605)
Fork 2	Program Number	SW04200	SW04258	SW04316	SW04374	SW04432	SW04490	SW04548	SW04606
	Block Number	SW04201	SW04259	SW04317	SW04375	SW04433	SW04491	SW04549	SW04607
	Alarm Code	SL26260 (SW04202)	SL26276 (SW04260)	SL26292 (SW04318)	SL26308 (SW04376)	SL26324 (SW04434)	SL26340 (SW04492)	SL26356 (SW04550)	SL26372 (SW04608)
Fork 3	Program Number	SW04203	SW04261	SW04319	SW04377	SW04435	SW04493	SW04551	SW04609
	Block Number	SW04204	SW04262	SW04320	SW04378	SW04436	SW04494	SW04552	SW04610
	Alarm Code	SL26262 (SW04205)	SL26278 (SW04263)	SL26294 (SW04321)	SL26310 (SW04379)	SL26326 (SW04437)	SL26342 (SW04495)	SL26358 (SW04553)	SL26374 (SW04611)
Fork 4	Program Number	SW04206	SW04264	SW04322	SW04380	SW04438	SW04496	SW04554	SW04612
	Block Number	SW04207	SW04265	SW04323	SW04381	SW04439	SW04497	SW04555	SW04613
	Alarm Code	SL26264 (SW04208)	SL26280 (SW04266)	SL26296 (SW04324)	SL26312 (SW04382)	SL26328 (SW04440)	SL26344 (SW04498)	SL26360 (SW04556)	SL26376 (SW04614)
Fork 5	Program Number	SW04209	SW04267	SW04325	SW04383	SW04441	SW04499	SW04557	SW04615
	Block Number	SW04210	SW04268	SW04326	SW04384	SW04442	SW04500	SW04558	SW04616
	Alarm Code	SL26266 (SW04211)	SL26282 (SW04269)	SL26298 (SW04327)	SL26314 (SW04385)	SL26330 (SW04443)	SL26346 (SW04501)	SL26362 (SW04559)	SL26378 (SW04617)
Fork 6	Program Number	SW04212	SW04270	SW04328	SW04386	SW04444	SW04502	SW04560	SW04618
	Block Number	SW04213	SW04271	SW04329	SW04387	SW04445	SW04503	SW04561	SW04619
	Alarm Code	SL26268 (SW04214)	SL26284 (SW04272)	SL26300 (SW04330)	SL26316 (SW04388)	SL26332 (SW04446)	SL26348 (SW04504)	SL26364 (SW04562)	SL26380 (SW04620)
Fork 7	Program Number	SW04215	SW04273	SW04331	SW04389	SW04447	SW04505	SW04563	SW04621
	Block Number	SW04216	SW04274	SW04332	SW04390	SW04448	SW04506	SW04564	SW04622
	Alarm Code	SL26270 (SW04217)	SL26286 (SW04275)	SL26302 (SW04333)	SL26318 (SW04391)	SL26334 (SW04449)	SL26350 (SW04507)	SL26366 (SW04565)	SL26382 (SW04623)
Logical Axis 1 Program Current Position		SL04218	SL04276	SL04334	SL04392	SL04450	SL04508	SL04566	SL04624
Logical Axis 2 Program Current Position		SL04220	SL04278	SL04336	SL04394	SL04452	SL04510	SL04568	SL04626
Logical Axis 3 Program Current Position		SL04222	SL04280	SL04338	SL04396	SL04454	SL04512	SL04570	SL04628
Logical Axis 4 Program Current Position		SL04224	SL04282	SL04340	SL04398	SL04456	SL04514	SL04572	SL04630
Logical Axis 5 Program Current Position		SL04226	SL04284	SL04342	SL04400	SL04458	SL04516	SL04574	SL04632
Logical Axis 6 Program Current Position		SL04228	SL04286	SL04344	SL04402	SL04460	SL04518	SL04576	SL04634
Logical Axis 7 Program Current Position		SL04230	SL04288	SL04346	SL04404	SL04462	SL04520	SL04578	SL04636
Logical Axis 8 Program Current Position		SL04232	SL04290	SL04348	SL04406	SL04464	SL04522	SL04580	SL04638

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System Work Number	Work 17	Work 18	Work 19	Work 20	Work 21	Work 22	Work 23	Work 24
Logical Axis 9 Program Current Position	SL04234	SL04292	SL04350	SL04408	SL04466	SL04524	SL04582	SL04640
Logical Axis 10 Program Current Position	SL04236	SL04294	SL04352	SL04410	SL04468	SL04526	SL04584	SL04642
Logical Axis 11 Program Current Position	SL04238	SL04296	SL04354	SL04412	SL04470	SL04528	SL04586	SL04644
Logical Axis 12 Program Current Position	SL04240	SL04298	SL04356	SL04414	SL04472	SL04530	SL04588	SL04646
Logical Axis 13 Program Current Position	SL04242	SL04300	SL04358	SL04416	SL04474	SL04532	SL04590	SL04648
Logical Axis 14 Program Current Position	SL04244	SL04302	SL04360	SL04418	SL04476	SL04534	SL04592	SL04650
Logical Axis 15 Program Current Position	SL04246	SL04304	SL04362	SL04420	SL04478	SL04536	SL04594	SL04652
Logical Axis 16 Program Current Position	SL04248	SL04306	SL04364	SL04422	SL04480	SL04538	SL04596	SL04654
Logical Axis 17 Program Current Position	SL08704	SL08736	SL08768	SL08800	SL08832	SL08864	SL08896	SL08928
Logical Axis 18 Program Current Position	SL08706	SL08738	SL08770	SL08802	SL08834	SL08866	SL08898	SL08930
Logical Axis 19 Program Current Position	SL08708	SL08740	SL08772	SL08804	SL08836	SL08868	SL08900	SL08932
Logical Axis 20 Program Current Position	SL08710	SL08742	SL08774	SL08806	SL08838	SL08870	SL08902	SL08934
Logical Axis 21 Program Current Position	SL08712	SL08744	SL08776	SL08808	SL08840	SL08872	SL08904	SL08936
Logical Axis 22 Program Current Position	SL08714	SL08746	SL08778	SL08810	SL08842	SL08874	SL08906	SL08938
Logical Axis 23 Program Current Position	SL08716	SL08748	SL08780	SL08812	SL08844	SL08876	SL08908	SL08940
Logical Axis 24 Program Current Position	SL08718	SL08750	SL08782	SL08814	SL08846	SL08878	SL08910	SL08942
Logical Axis 25 Program Current Position	SL08720	SL08752	SL08784	SL08816	SL08848	SL08880	SL08912	SL08944
Logical Axis 26 Program Current Position	SL08722	SL08754	SL08786	SL08818	SL08850	SL08882	SL08914	SL08946
Logical Axis 27 Program Current Position	SL08724	SL08756	SL08788	SL08820	SL08852	SL08884	SL08916	SL08948
Logical Axis 28 Program Current Position	SL08726	SL08758	SL08790	SL08822	SL08854	SL08886	SL08918	SL08950
Logical Axis 29 Program Current Position	SL08728	SL08760	SL08792	SL08824	SL08856	SL08888	SL08920	SL08952
Logical Axis 30 Program Current Position	SL08730	SL08762	SL08794	SL08826	SL08858	SL08890	SL08922	SL08954
Logical Axis 31 Program Current Position	SL08732	SL08764	SL08796	SL08828	SL08860	SL08892	SL08924	SL08956
Logical Axis 32 Program Current Position	SL08734	SL08766	SL08798	SL08830	SL08862	SL08894	SL08926	SL08958

• System Work Numbers 25 to 32

System Work Numbers		Work 25	Work 26	Work 27	Work 28	Work 29	Work 30	Work 31	Work 32
Executing Main Program No.		SW03224	SW03225	SW03226	SW03227	SW03228	SW03229	SW03230	SW03231
Status		SW04656	SW04714	SW04772	SW04830	SW04888	SW04946	SW05004	SW05062
Control Signal		SW04657	SW04715	SW04773	SW04831	SW04889	SW04947	SW05005	SW05063
Fork 0	Program Number	SW04658	SW04716	SW04774	SW04832	SW04890	SW04948	SW05006	SW05064
	Block Number	SW04659	SW04717	SW04775	SW04833	SW04891	SW04949	SW05007	SW05065
	Alarm Code	SL26384 (SW04660)	SL26400 (SW04718)	SL26416 (SW04776)	SL26432 (SW04834)	SL26448 (SW04892)	SL26464 (SW04950)	SL26480 (SW05008)	SL26496 (SW05066)
Fork 1	Program Number	SW04661	SW04719	SW04777	SW04835	SW04893	SW04951	SW05009	SW05067
	Block Number	SW04662	SW04720	SW04778	SW04836	SW04894	SW04952	SW05010	SW05068
	Alarm Code	SL26386 (SW04663)	SL26402 (SW04721)	SL26418 (SW04779)	SL26434 (SW04837)	SL26450 (SW04895)	SL26466 (SW04953)	SL26482 (SW05011)	SL26498 (SW05069)
Fork 2	Program Number	SW04664	SW04722	SW04780	SW04838	SW04896	SW04954	SW05012	SW05070
	Block Number	SW04665	SW04723	SW04781	SW04839	SW04897	SW04955	SW05013	SW05071
	Alarm Code	SL26388 (SW04666)	SL26404 (SW04724)	SL26420 (SW04782)	SL26436 (SW04840)	SL26452 (SW04898)	SL26468 (SW04956)	SL26484 (SW05014)	SL26500 (SW05072)
Fork 3	Program Number	SW04667	SW04725	SW04783	SW04841	SW04899	SW04957	SW05015	SW05073
	Block Number	SW04668	SW04726	SW04784	SW04842	SW04900	SW04958	SW05016	SW05074
	Alarm Code	SL26390 (SW04669)	SL26406 (SW04727)	SL26422 (SW04785)	SL26438 (SW04843)	SL26454 (SW04901)	SL26470 (SW04959)	SL26486 (SW05017)	SL26502 (SW05075)
Fork 4	Program Number	SW04670	SW04728	SW04786	SW04844	SW04902	SW04960	SW05018	SW05076
	Block Number	SW04671	SW04729	SW04787	SW04845	SW04903	SW04961	SW05019	SW05077
	Alarm Code	SL26392 (SW04672)	SL26408 (SW04730)	SL26424 (SW04788)	SL26440 (SW04846)	SL26456 (SW04904)	SL26472 (SW04962)	SL26488 (SW05020)	SL26504 (SW05078)
Fork 5	Program Number	SW04673	SW04731	SW04789	SW04847	SW04905	SW04963	SW05021	SW05079
	Block Number	SW04674	SW04732	SW04790	SW04848	SW04906	SW04964	SW05022	SW05080
	Alarm Code	SL26394 (SW04675)	SL26410 (SW04733)	SL26426 (SW04791)	SL26442 (SW04849)	SL26458 (SW04907)	SL26474 (SW04965)	SL26490 (SW05023)	SL26506 (SW05081)
Fork 6	Program Number	SW04676	SW04734	SW04792	SW04850	SW04908	SW04966	SW05024	SW05082
	Block Number	SW04677	SW04735	SW04793	SW04851	SW04909	SW04967	SW05025	SW05083
	Alarm Code	SL26396 (SW04678)	SL26412 (SW04736)	SL26428 (SW04794)	SL26444 (SW04852)	SL26460 (SW04910)	SL26476 (SW04968)	SL26492 (SW05026)	SL26508 (SW05084)
Fork 7	Program Number	SW04679	SW04737	SW04795	SW04853	SW04911	SW04969	SW05027	SW05085
	Block Number	SW04680	SW04738	SW04796	SW04854	SW04912	SW04970	SW05028	SW05086
	Alarm Code	SL26398 (SW04681)	SL26414 (SW04739)	SL26430 (SW04797)	SL26446 (SW04855)	SL26462 (SW04913)	SL26478 (SW04971)	SL26494 (SW05029)	SL26510 (SW05087)
Logical Axis 1 Program Current Position		SL04682	SL04740	SL04798	SL04856	SL04914	SL04972	SL05030	SL05088
Logical Axis 2 Program Current Position		SL04684	SL04742	SL04800	SL04858	SL04916	SL04974	SL05032	SL05090
Logical Axis 3 Program Current Position		SL04686	SL04744	SL04802	SL04860	SL04918	SL04976	SL05034	SL05092
Logical Axis 4 Program Current Position		SL04688	SL04746	SL04804	SL04862	SL04920	SL04978	SL05036	SL05094
Logical Axis 5 Program Current Position		SL04690	SL04748	SL04806	SL04864	SL04922	SL04980	SL05038	SL05096
Logical Axis 6 Program Current Position		SL04692	SL04750	SL04808	SL04866	SL04924	SL04982	SL05040	SL05098
Logical Axis 7 Program Current Position		SL04694	SL04752	SL04810	SL04868	SL04926	SL04984	SL05042	SL05100
Logical Axis 8 Program Current Position		SL04696	SL04754	SL04812	SL04870	SL04928	SL04986	SL05044	SL05102

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System Work Numbers	Work 25	Work 26	Work 27	Work 28	Work 29	Work 30	Work 31	Work 32
Logical Axis 9 Program Current Position	SL04698	SL04756	SL04814	SL04872	SL04930	SL04988	SL05046	SL05104
Logical Axis 10 Program Current Position	SL04700	SL04758	SL04816	SL04874	SL04932	SL04990	SL05048	SL05106
Logical Axis 11 Program Current Position	SL04702	SL04760	SL04818	SL04876	SL04934	SL04992	SL05050	SL05108
Logical Axis 12 Program Current Position	SL04704	SL04762	SL04820	SL04878	SL04936	SL04994	SL05052	SL05110
Logical Axis 13 Program Current Position	SL04706	SL04764	SL04822	SL04880	SL04938	SL04996	SL05054	SL05112
Logical Axis 14 Program Current Position	SL04708	SL04766	SL04824	SL04882	SL04940	SL04998	SL05056	SL05114
Logical Axis 15 Program Current Position	SL04710	SL04768	SL04826	SL04884	SL04942	SL05000	SL05058	SL05116
Logical Axis 16 Program Current Position	SL04712	SL04770	SL04828	SL04886	SL04944	SL05002	SL05060	SL05118
Logical Axis 17 Program Current Position	SL08960	SL08992	SL09024	SL09056	SL09088	SL09120	SL09152	SL09184
Logical Axis 18 Program Current Position	SL08962	SL08994	SL09026	SL09058	SL09090	SL09122	SL09154	SL09186
Logical Axis 19 Program Current Position	SL08964	SL08996	SL09028	SL09060	SL09092	SL09124	SL09156	SL09188
Logical Axis 20 Program Current Position	SL08966	SL08998	SL09030	SL09062	SL09094	SL09126	SL09158	SL09190
Logical Axis 21 Program Current Position	SL08968	SL09000	SL09032	SL09064	SL09096	SL09128	SL09160	SL09192
Logical Axis 22 Program Current Position	SL08970	SL09002	SL09034	SL09066	SL09098	SL09130	SL09162	SL09194
Logical Axis 23 Program Current Position	SL08972	SL09004	SL09036	SL09068	SL09100	SL09132	SL09164	SL09196
Logical Axis 24 Program Current Position	SL08974	SL09006	SL09038	SL09070	SL09102	SL09134	SL09166	SL09198
Logical Axis 25 Program Current Position	SL08976	SL09008	SL09040	SL09072	SL09104	SL09136	SL09168	SL09200
Logical Axis 26 Program Current Position	SL08978	SL09010	SL09042	SL09074	SL09106	SL09138	SL09170	SL09202
Logical Axis 27 Program Current Position	SL08980	SL09012	SL09044	SL09076	SL09108	SL09140	SL09172	SL09204
Logical Axis 28 Program Current Position	SL08982	SL09014	SL09046	SL09078	SL09110	SL09142	SL09174	SL09206
Logical Axis 29 Program Current Position	SL08984	SL09016	SL09048	SL09080	SL09112	SL09144	SL09176	SL09208
Logical Axis 30 Program Current Position	SL08986	SL09018	SL09050	SL09082	SL09114	SL09146	SL09178	SL09210
Logical Axis 31 Program Current Position	SL08988	SL09020	SL09052	SL09084	SL09116	SL09148	SL09180	SL09212
Logical Axis 32 Program Current Position	SL08990	SL09022	SL09054	SL09086	SL09118	SL09150	SL09182	SL09214

7.5.16 Extended System Status

The status of the power supply to Racks 1 and 5 to 7 is stored in the following system registers.

Name	Register Addresses		Name	Remarks
Power Supply Status	SW15800	SB158000	RACK1 WARN1	0: No warning 1 for Rack 1 Power Supply Unit 1: Warning 1 for Rack 1 Power Supply Unit
		SB158001	RACK1 WARN2	0: No warning 2 for Rack 1 Power Supply Unit 1: Warning 2 for Rack 1 Power Supply Unit
		SB158002, SB158003	Reserved for system.	–
		SB158004	RACK5 WARN1	0: No warning 1 for Rack 5 Power Supply Unit 1: Warning 1 for Rack 5 Power Supply Unit
		SB158005	RACK5 WARN2	0: No warning 2 for Rack 5 Power Supply Unit 1: Warning 2 for Rack 5 Power Supply Unit
		SB158006	RACK5 PWOFF	0: Rack 5 Power Supply Unit is turned ON 1: Rack 5 Power Supply Unit is turned OFF
		SB158007	Reserved for system.	–
		SB158008	RACK6 WARN1	0: No warning 1 for Rack 6 Power Supply Unit 1: Warning 1 for Rack 6 Power Supply Unit
		SB158009	RACK6 WARN2	0: No warning 2 for Rack 6 Power Supply Unit 1: Warning 2 for Rack 6 Power Supply Unit
		SB15800A	RACK6 PWOFF	0: Rack 6 Power Supply Unit is turned ON 1: Rack 6 Power Supply Unit is turned OFF
		SB15800B	Reserved for system.	–
		SB15800C	RACK7 WARN1	0: No warning 1 for Rack 7 Power Supply Unit 1: Warning 1 for Rack 7 Power Supply Unit
		SB15800D	RACK7 WARN2	0: No warning 2 for Rack 7 Power Supply Unit 1: Warning 2 for Rack 7 Power Supply Unit
		SB15800E	RACK7 PWOFF	0: Rack 7 Power Supply Unit is turned ON 1: Rack 7 Power Supply Unit is turned OFF
		SB15800F	Reserved for system.	–

Note: For the MP3300, this information is for the Base Unit of each Rack and not the Power Supply Unit of each Rack.

7.5.17 Extended System Service Execution Status

The execution status of the system when the Units are expanded is stored in the following system registers.

Name	Register Address		Remarks	
Data Trace Definition Existence	SW15998	SB159980	Group 1	0: Definition does not exist, 1: Definition exists
		SB159981	Group 2	
		SB159982	Group 3	
		SB159983	Group 4	
		SB159984 to SB159987	Reserved for system.	
Data Trace Enabled or Disabled Status		SB159988	Group 1	0: Enabled 1: Disabled
		SB159989	Group 2	
		SB15998A	Group 3	
		SB15998B	Group 4	
		SB15998C to SB15998F	Reserved for system.	
Data Trace Execution Status	SW15999	SB159990	Group 1	0: Tracing in progress, 1: Tracing stopped
		SB159991	Group 2	
		SB159992	Group 3	
		SB159993	Group 4	
		SB159994 to SB159997	Reserved for system.	
Data Trace Trigger Condition Status		SB159998	Group 1	0: Trace is not waiting for trigger condition. 1: Trace is waiting for trigger condition.
		SB159999	Group 2	
		SB15999A	Group 3	
		SB15999B	Group 4	
		SB15999C to SB15999F	Reserved for system.	
Group 1 Record No.	SL16000		Latest record number in group 1.	
Group 2 Record No.	SL16002		Latest record number in group 2.	
Group 3 Record No.	SL16004		Latest record number in group 3.	
Group 4 Record No.	SL16006		Latest record number in group 4.	
Reserved for system.	SL16008		Reserved for system.	
Reserved for system.	SL16010		Reserved for system.	

7.5.18 Alarm History Information

This section gives the system register configuration of and details on the alarm history information in the system registers.

Configuration of the System Registers

The alarm history information is stored in the following system registers.

Name	Register Addresses	Remarks	
Current Alarm	SW16200	Cleared when the power is turned ON.	
Alarm History Entries	SW16201	Number of alarm history entries	
Alarm Clear	SW16202	1: Alarm cleared 2: Current alarm and history cleared	
Alarm History	SW16203 to SW16218	Alarm History Entry 1	Refer to the following sections for details. ☞ *Details* on page 7-68
	SW16219 to SW16231	Alarm History Entry 2	
	⋮	⋮	
	SW17787 to SW17802	Alarm History Entry 100	
Reserved for system.	SW17803 to SW17999	–	

Details

The system registers for the alarm history entries are structured as shown below. This example shows the system register addresses for alarm history entry 1.

Register Address	Remarks	Register Address Example
SW□□□□□ + 0	□□□□ hex 01 to 09: Gives the slot number where the Module in which the alarm occurred is mounted. 1 to 4: Gives the unit number of the Module in which the alarm occurred is mounted. 1 to 7: Gives the Rack number where the Module in which the alarm occurred is mounted.	SW16203
SW□□□□□ + 1	Alarm Code	SW16204
SW□□□□□ + 2	Alarm Details Format Type 1: Operation error 2: I/O error 3: Other error	SW16205
SW□□□□□ + 3	Year when alarm occurred	SW16206
SW□□□□□ + 4	Month when alarm occurred	SW16207
SW□□□□□ + 5	Day when alarm occurred	SW16208
SW□□□□□ + 6	Hour when alarm occurred	SW16209
SW□□□□□ + 7	Minutes when alarm occurred	SW16210
SW□□□□□ + 8	Seconds when alarm occurred	SW16211
SW□□□□□ + 9	Alarm details The information depends on the alarm details format type. ☞ *Alarm Details* on page 7-69	SW16212
SW□□□□□ + 10		SW16213
SW□□□□□ + 11		SW16214
SW□□□□□ + 12		SW16215
SW□□□□□ + 13		SW16216
SW□□□□□ + 14	Reserved for system.	SW16217
SW□□□□□ + 15	Reserved for system.	SW16218

Alarm Details

Alarm details are given based on the alarm details format type.

- When the Alarm Details Format Type Is 1 (Operation Error)

Register Address	Remarks	Register Address Example
SW□□□□□ + 9	Error Drawing No.	SW16212
SW□□□□□ + 10	Calling Drawing No.	SW16213
SW□□□□□ + 11	Calling Drawing Step No.	SW16214
SW□□□□□ + 12	Reserved for system.	SW16215
SW□□□□□ + 13	Reserved for system.	SW16216

- When the Alarm Details Format Type Is 2 (I/O Error)

Register Address	Remarks	Register Address Example
SW□□□□□ + 9	Depends on the specifications of the Optional Module.	SW16212
SW□□□□□ + 10	Depends on the specifications of the Optional Module.	SW16213
SW□□□□□ + 11	Depends on the specifications of the Optional Module.	SW16214
SW□□□□□ + 12	Depends on the specifications of the Optional Module.	SW16215
SW□□□□□ + 13	Depends on the specifications of the Optional Module.	SW16216

- When the Alarm Details Format Type Is 3 (Other Errors)

Register Address	Remarks	Register Address Example
SW□□□□□ + 9	Reserved for system.	SW16212
SW□□□□□ + 10	Reserved for system.	SW16213
SW□□□□□ + 11	Reserved for system.	SW16214
SW□□□□□ + 12	Reserved for system.	SW16215
SW□□□□□ + 13	Reserved for system.	SW16216

7.5.19 Product Information

The product information is stored in the following system registers.

Name	Register Addresses	Remarks
Serial ID Information	SW20000	CPU Unit/CPU Module serial ID (15 ASCII characters + NULL character)
	SW20001	
	SW20002	
	SW20003	
	SW20004	
	SW20005	
	SW20006	
	SW20007	
	SW20008 to SW20015	Reserved for system.
Reserved for system.	SW20016 to SW22063	–

7.5.20 Unit and Rack Information

This section gives hardware information on Units and Racks of Rack numbers 1 and 5 to 7.

Configuration of the System Registers

System registers for data storage vary with the Rack number and Unit.

- Area of system register (common to all Racks): 8 words from the first register
- Area of system register (varying with each Unit): 4 words from the first register

Rack Numbers	Common to Racks	Varying with Each Unit								
		Types of Unit			Unit Numbers					
		Rack Expansion Interface Unit	Power Supply Unit	Main CPU Unit	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Rack 1	SW23000	SW23008	SW23012	SW23016	SW23020	SW23024	SW23028	SW23032	SW23036	–
Rack 5	SW23040	SW23048	SW23052	–	SW23056	SW23060	SW23064	SW23068	SW23072	SW23076
Rack 6	SW23080	SW23088	SW23092	–	SW23096	SW23100	SW23104	SW23108	SW23112	SW23116
Rack 7	SW23120	SW23128	SW23132	–	SW23136	SW23140	SW23144	SW23148	SW23152	SW23156

Information

- The details of Rack and Unit information depend on the model. Refer to the following section for details.
  ☞ *Unit and Rack Information Detail* on page 7-70
- Refer to the following section for Rack configuration in detail.
  ☞ *7.6 Expansion Racks* on page 7-81

Unit and Rack Information Detail

◆ Common to Racks

Register Addresses	Remarks	
SW□□□□□ + 0	Rack mounted	0: Rack not mounted 1: Rack mounted
SW□□□□□ + 1	Rack Status	0: No Rack has been set up 1: A Rack has been set up, but has not been mounted. 2: A Rack has been set up, and a Rack that matches the settings has been mounted. 3 or higher: Reserved for system.
SW□□□□□ + 2 to SW□□□□□ + 7	Reserved for system.	

◆ Varying with Each Unit

Register Addresses	Remarks	
SW□□□□□ + 0	Unit ID (Low)	
SW□□□□□ + 1	Unit ID (High)	
SW□□□□□ + 2	Unit Status	0: No Unit has been set up 1: A Unit has been set up, but it has not been mounted. 2: A Unit has been set up, and a Unit that matches the settings has been mounted. 3: Reserved for system. 4: Reserved for system. 5: A Unit has been set up, but the Unit mounted does not match the settings. 6 or higher: Reserved for system.
SW□□□□□ + 3	Reserved for system.	

7.5.21 Data Logging Execution Status

The execution status of data logging is stored in the following system registers.

Name		Register Addresses		Remarks
Data Logging Definition Existence		SW24000	SB240000	0: Logging 1 definition does not exist, 1: Logging 1 definition exists
			SB240001	0: Logging 2 definition does not exist, 1: Logging 2 definition exists
			SB240002	0: Logging 3 definition does not exist, 1: Logging 3 definition exists
			SB240003	0: Logging 4 definition does not exist, 1: Logging 4 definition exists
			SB240004 to SB24000F	Reserved for system.
Data Logging Execution Status		SW24001	SB240010	0: Logging 1 is in progress, 1: Logging 1 is stopped
			SB240011	0: Logging 2 is in progress, 1: Logging 2 is stopped
			SB240012	0: Logging 3 is in progress, 1: Logging 3 is stopped
			SB240013	0: Logging 4 is in progress, 1: Logging 4 is stopped
			SB240014 to SB240017	Reserved for system.
			SB240018	0: Logging 1 is not waiting for trigger condition, 1: Logging 1 is waiting for trigger condition
			SB240019	0: Logging 2 is not waiting for trigger condition, 1: Logging 2 is waiting for trigger condition
			SB24001A	0: Logging 3 is not waiting for trigger condition, 1: Logging 3 is waiting for trigger condition
			SB24001B	0: Logging 4 is not waiting for trigger condition, 1: Logging 4 is waiting for trigger condition
			SB24001C to SB24001F	Reserved for system.
Data Logging Execution Status Details	Logging 1	SL24002		File update counter
		SQ24004		Latest record number
		SW24008		Overrun counter
		SW24009		Error code 0000 hex: No error, 0001 hex: No USB memory device/SD card (at start of logging), 0002 hex: No USB memory device/SD card (while logging is in progress), 0003 hex: Directory creation error, 0004 hex: File creation error, 0005 hex: File write error
		SW24010 to SW24011		Reserved for system.
		SW24012 to SW24043		Latest folder name
		SW24044 to SW24065		Latest file name (includes extension such as □□□.csv)
	Logging 2	SW24066 to SW24129		Same as Logging 1.
	Logging 3	SW24130 to SW24193		Same as Logging 1.
	Logging 4	SW24194 to SW24257		Same as Logging 1.
Reserved for system.		SW24258 to SW24321		–

7.5.22 FTP Client Status and Control Information

The FTP client status and control information are stored in the following system registers.

Register Addresses	Remarks		
SW24400	ID101	SB244000	Reserved for system.
		SB244001	0: No session created. 1: Session created.
		SB244002	0: No connection. 1: Connection established.
		SB244003	0: Not logged in. 1: Logged in.
		SB244004	0: No upload in progress. 1: Upload in progress.
		SB244005	0: No download in progress. 1: Download in progress.
		SB244006 to SB244007	Reserved for system.
		SB244008	0: Active Mode 1: Passive Mode
		SB244009	0: Directory not created. 1: Directory created.
		SB24400A	0: No timeout. 1: Timed out.
		SB24400B to SB24400F	Reserved for system.
SW024401		Error Count	The value is incremented each time an error occurs.
SW024402		Error Processing Number	0001 hex: Session start processing 0002 hex: Connection processing 0003 hex: Login processing 0004 hex: Passive Mode change processing 0005 hex: Directory creation processing 0006 hex: STOR instruction processing 0007 hex: RETR instruction processing 0008 hex: Logout or disconnect processing 0009 hex: Close processing 000A hex: Session end processing
SW24403 to SW24415		Reserved for system.	
SW24416 to SW24431	ID102	Same as above.	
SW24432 to SW24447	ID103	Same as above.	
SW24448 to SW24463	ID104	Same as above.	
SW24464 to SW24479	ID105	Same as above.	
SW24480 to SW24495	ID106	Same as above.	
SW24496 to SW24511	ID107	Same as above.	
SW24512 to SW24527	ID108	Same as above.	
SW24528 to SW24543	ID109	Same as above.	
SW24544 to SW24559	ID110	Same as above.	
SW24560 to SW24575	ID111	Same as above.	

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Register Addresses	Remarks	
SW24576 to SW24591	ID112	Same as above.
SW24592 to SW24607	ID113	Same as above.
SW24608 to SW24623	ID114	Same as above.
SW24624 to SW24639	ID115	Same as above.
SW24640 to SW24655	ID116	Same as above.
SW24656 to SW24671	ID117	Same as above.
SW24672 to SW24687	ID118	Same as above.
SW24688 to SW24703	ID119	Same as above.
SW24704 to SW24719	ID120	Same as above.

7.5.23 Automatic Reception Status (Ethernet Communications)

This section describes the data on the execution status of automatic reception (message functions).

System Configuration

System registers for data storage of the execution status of the automatic reception (message function) vary with the circuit number and CH number.

Name	Circuit Number 1	Circuit Number 2	Circuit Number 3	Circuit Number 4	Circuit Number 5	Circuit Number 6	Circuit Number 7	Circuit Number 8
Common Status	SW25000 to SW25003	SW25084 to SW25087	SW25168 to SW25171	SW25252 to SW25255	SW25336 to SW25339	SW25420 to SW25423	SW25504 to SW25507	SW25588 to SW25591
CH1 Status	SW25004 to SW25011	SW25088 to SW25095	SW25172 to SW25179	SW25256 to SW25263	SW25340 to SW25347	SW25424 to SW25431	SW25508 to SW25515	SW25592 to SW25599
CH2 Status	SW25012 to SW25019	SW25096 to SW25103	SW25180 to SW25187	SW25264 to SW25271	SW25348 to SW25355	SW25432 to SW25439	SW25516 to SW25523	SW25600 to SW25607
CH3 Status	SW25020 to SW25027	SW25104 to SW25111	SW25188 to SW25195	SW25272 to SW25279	SW25356 to SW25363	SW25440 to SW25447	SW25524 to SW25531	SW25608 to SW25615
CH4 Status	SW25028 to SW25035	SW25112 to SW25119	SW25196 to SW25203	SW25280 to SW25287	SW25364 to SW25371	SW25448 to SW25455	SW25532 to SW25539	SW25616 to SW25623
CH5 Status	SW25036 to SW25043	SW25120 to SW25127	SW25204 to SW25211	SW25288 to SW25295	SW25372 to SW25379	SW25456 to SW25463	SW25540 to SW25547	SW25624 to SW25631
CH6 Status	SW25044 to SW25051	SW25128 to SW25135	SW25212 to SW25219	SW25296 to SW25303	SW25380 to SW25387	SW25464 to SW25471	SW25548 to SW25555	SW25632 to SW25639
CH7 Status	SW25052 to SW25059	SW25136 to SW25143	SW25220 to SW25227	SW25304 to SW25311	SW25388 to SW25395	SW25472 to SW25479	SW25556 to SW25563	SW25640 to SW25647
CH8 Status	SW25060 to SW25067	SW25144 to SW25151	SW25228 to SW25235	SW25312 to SW25319	SW25396 to SW25403	SW25480 to SW25487	SW25564 to SW25571	SW25648 to SW25655
CH9 Status	SW25068 to SW25075	SW25152 to SW25159	SW25236 to SW25243	SW25320 to SW25327	SW25404 to SW25411	SW25488 to SW25495	SW25572 to SW25579	SW25656 to SW25663
CH10 Status	SW25076 to SW25083	SW25160 to SW25167	SW25244 to SW25251	SW25328 to SW25335	SW25412 to SW25419	SW25496 to SW25503	SW25580 to SW25587	SW25664 to SW25671

Information Refer to the following sections for automatic reception status in detail.
☞ *Automatic Reception Status Detail* on page 7-74

Automatic Reception Status Detail

◆ Common Status Detail

Register Addresses	Description
SW□□□□□ + 0	Rack Numbers
SW□□□□□ + 1	Unit Numbers
SW□□□□□ + 2	Slot Numbers
SW□□□□□ + 3	Subslot Numbers

◆ CH□ Status Detail

Register Addresses	Description	
SW□□□□□ + 0	Transmission Status	0: Unused connection 1: IDLE (Standby mode for executing message functions) 2: WAIT (Waiting to establish a connection) 3: CONNECT (Ready to send and receive data)
SW□□□□□ + 1	Latest Error Status	0: No error (Normal) 1: Socket creation error (System error) 2: Local port number error (Local port number setting error (The same address is bound during disconnection of the TCP connection.)) 3: Changing socket attribute error (System error (for TCP)) 4: Connection Error (M-SND) (Connection error (The connection was rejected by the remote station when establishing a connection with an unpassive open for TCP.)) 5: Connection error (M-RCV) (Connection error (with a passive open for TCP)) 6: System error 7: TCP data send error (Data sending error (The remote station does not exist or has not started when using TCP.)) 8: UDP data send error (Data sending error (for UDP)) 9: TCP data receive error (Data reception error (The MP3000 received a request to disconnect from the remote station for TCP.)) 10. UDP data receive error (Data reception error (for UDP)) 11: Changing socket option error (System error) 12: Data conversion error
SW□□□□□ + 2	Transmission Pulse Counter	
SW□□□□□ + 3	Reception Pulse Counter	
SW□□□□□ + 4	Error Counter	
SW□□□□□ + 5 to SW□□□□□ + 7	Reserved for system.	

7.5.24 Maintenance Monitor Information

This section describes maintenance data of the Σ-7-series SERVOPACK connected to the MP3100 through MECHATROLINK communications.

System Configuration

System registers for data storage of maintenance monitor information vary with the group and axis.

Information
- Area of system register: 4 words from the first register
- Groups and axes must be set in the MPE720 in advance. Refer to the following manual for details.
  MP3000 Series MP3100 Product Manual (Manual No.: SIEP C880725 24)
- Refer to the following section for details on maintenance monitor information.
  Maintenance Monitor Information Detail on page 7-80

		Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Monitor Parameter Information		SW27600	SW27668	SW27736	SW27804	SW27872	SW27940	SW28008	SW28076
Axis Monitor Information	Selected Axis 1	SW27604	SW27672	SW27740	SW27808	SW27876	SW27944	SW28012	SW28080
	Selected Axis 2	SW27608	SW27676	SW27744	SW27812	SW27880	SW27948	SW28016	SW28084
	Selected Axis 3	SW27612	SW27680	SW27748	SW27816	SW27884	SW27952	SW28020	SW28088
	Selected Axis 4	SW27616	SW27684	SW27752	SW27820	SW27888	SW27956	SW28024	SW28092
	Selected Axis 5	SW27620	SW27688	SW27756	SW27824	SW27892	SW27960	SW28028	SW28096
	Selected Axis 6	SW27624	SW27692	SW27760	SW27828	SW27896	SW27964	SW28032	SW28100
	Selected Axis 7	SW27628	SW27696	SW27764	SW27832	SW27900	SW27968	SW28036	SW28104
	Selected Axis 8	SW27632	SW27700	SW27768	SW27836	SW27904	SW27972	SW28040	SW28108
	Selected Axis 9	SW27636	SW27704	SW27772	SW27840	SW27908	SW27976	SW28044	SW28112
	Selected Axis 10	SW27640	SW27708	SW27776	SW27844	SW27912	SW27980	SW28048	SW28116
	Selected Axis 11	SW27644	SW27712	SW27780	SW27848	SW27916	SW27984	SW28052	SW28120
	Selected Axis 12	SW27648	SW27716	SW27784	SW27852	SW27920	SW27988	SW28056	SW28124
	Selected Axis 13	SW27652	SW27720	SW27788	SW27856	SW27924	SW27992	SW28060	SW28128
	Selected Axis 14	SW27656	SW27724	SW27792	SW27860	SW27928	SW27996	SW28064	SW28132
	Selected Axis 15	SW27660	SW27728	SW27796	SW27864	SW27932	SW28000	SW28068	SW28136
	Selected Axis 16	SW27664	SW27732	SW27800	SW27868	SW27936	SW28004	SW28072	SW28140

		Group 9	Group 10	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16
Monitor Parameter Information		SW28144	SW28212	SW28280	SW28348	SW28416	SW28484	SW28552	SW28620
Axis Monitor Information	Selected Axis 1	SW28148	SW28216	SW28284	SW28352	SW28420	SW28488	SW28556	SW28624
	Selected Axis 2	SW28152	SW28220	SW28288	SW28356	SW28424	SW28492	SW28560	SW28628
	Selected Axis 3	SW28156	SW28224	SW28292	SW28360	SW28428	SW28496	SW28564	SW28632
	Selected Axis 4	SW28160	SW28228	SW28296	SW28364	SW28432	SW28500	SW28568	SW28636
	Selected Axis 5	SW28164	SW28232	SW28300	SW28368	SW28436	SW28504	SW28572	SW28640
	Selected Axis 6	SW28168	SW28236	SW28304	SW28372	SW28440	SW28508	SW28576	SW28644
	Selected Axis 7	SW28172	SW28240	SW28308	SW28376	SW28444	SW28512	SW28580	SW28648
	Selected Axis 8	SW28176	SW28244	SW28312	SW28380	SW28448	SW28516	SW28584	SW28652
	Selected Axis 9	SW28180	SW28248	SW28316	SW28384	SW28452	SW28520	SW28588	SW28656
	Selected Axis 10	SW28184	SW28252	SW28320	SW28388	SW28456	SW28524	SW28592	SW28660
	Selected Axis 11	SW28188	SW28256	SW28324	SW28392	SW28460	SW28528	SW28596	SW28664
	Selected Axis 12	SW28192	SW28260	SW28328	SW28396	SW28464	SW28532	SW28600	SW28668
	Selected Axis 13	SW28196	SW28264	SW28332	SW28400	SW28468	SW28536	SW28604	SW28672
	Selected Axis 14	SW28200	SW28268	SW28336	SW28404	SW28472	SW28540	SW28608	SW28676
	Selected Axis 15	SW28204	SW28272	SW28340	SW28408	SW28476	SW28544	SW28612	SW28680
	Selected Axis 16	SW28208	SW28276	SW28344	SW28412	SW28480	SW28548	SW28616	SW28684

		Group 17	Group 18	Group 19	Group 20	Group 21	Group 22	Group 23	Group 24
Monitor Parameter Information		SW28688	SW28756	SW28824	SW28892	SW28960	SW29028	SW29096	SW29164
Axis Monitor Information	Selected Axis 1	SW28692	SW28760	SW28828	SW28896	SW28964	SW29032	SW29100	SW29168
	Selected Axis 2	SW28696	SW28764	SW28832	SW28900	SW28968	SW29036	SW29104	SW29172
	Selected Axis 3	SW28700	SW28768	SW28836	SW28904	SW28972	SW29040	SW29108	SW29176
	Selected Axis 4	SW28704	SW28772	SW28840	SW28908	SW28976	SW29044	SW29112	SW29180
	Selected Axis 5	SW28708	SW28776	SW28844	SW28912	SW28980	SW29048	SW29116	SW29184
	Selected Axis 6	SW28712	SW28780	SW28848	SW28916	SW28984	SW29052	SW29120	SW29188
	Selected Axis 7	SW28716	SW28784	SW28852	SW28920	SW28988	SW29056	SW29124	SW29192
	Selected Axis 8	SW28720	SW28788	SW28856	SW28924	SW28992	SW29060	SW29128	SW29196
	Selected Axis 9	SW28724	SW28792	SW28860	SW28928	SW28996	SW29064	SW29132	SW29200
	Selected Axis 10	SW28728	SW28796	SW28864	SW28932	SW29000	SW29068	SW29136	SW29204
	Selected Axis 11	SW28732	SW28800	SW28868	SW28936	SW29004	SW29072	SW29140	SW29208
	Selected Axis 12	SW28736	SW28804	SW28872	SW28940	SW29008	SW29076	SW29144	SW29212
	Selected Axis 13	SW28740	SW28808	SW28876	SW28944	SW29012	SW29080	SW29148	SW29216
	Selected Axis 14	SW28744	SW28812	SW28880	SW28948	SW29016	SW29084	SW29152	SW29220
	Selected Axis 15	SW28748	SW28816	SW28884	SW28952	SW29020	SW29088	SW29156	SW29224
	Selected Axis 16	SW28752	SW28820	SW28888	SW28956	SW29024	SW29092	SW29160	SW29228

		Group 25	Group 26	Group 27	Group 28	Group 29	Group 30	Group 31	Group 32
Monitor Parameter Information		SW29232	SW29300	SW29368	SW29436	SW29504	SW29572	SW29640	SW29708
Axis Monitor Information	Selected Axis 1	SW29236	SW29304	SW29372	SW29440	SW29508	SW29576	SW29644	SW29712
	Selected Axis 2	SW29240	SW29308	SW29376	SW29444	SW29512	SW29580	SW29648	SW29716
	Selected Axis 3	SW29244	SW29312	SW29380	SW29448	SW29516	SW29584	SW29652	SW29720
	Selected Axis 4	SW29248	SW29316	SW29384	SW29452	SW29520	SW29588	SW29656	SW29724
	Selected Axis 5	SW29252	SW29320	SW29388	SW29456	SW29524	SW29592	SW29660	SW29728
	Selected Axis 6	SW29256	SW29324	SW29392	SW29460	SW29528	SW29596	SW29664	SW29732
	Selected Axis 7	SW29260	SW29328	SW29396	SW29464	SW29532	SW29600	SW29668	SW29736
	Selected Axis 8	SW29264	SW29332	SW29400	SW29468	SW29536	SW29604	SW29672	SW29740
	Selected Axis 9	SW29268	SW29336	SW29404	SW29472	SW29540	SW29608	SW29676	SW29744
	Selected Axis 10	SW29272	SW29340	SW29408	SW29476	SW29544	SW29612	SW29680	SW29748
	Selected Axis 11	SW29276	SW29344	SW29412	SW29480	SW29548	SW29616	SW29684	SW29752
	Selected Axis 12	SW29280	SW29348	SW29416	SW29484	SW29552	SW29620	SW29688	SW29756
	Selected Axis 13	SW29284	SW29352	SW29420	SW29488	SW29556	SW29624	SW29692	SW29760
	Selected Axis 14	SW29288	SW29356	SW29424	SW29492	SW29560	SW29628	SW29696	SW29764
	Selected Axis 15	SW29292	SW29360	SW29428	SW29496	SW29564	SW29632	SW29700	SW29768
	Selected Axis 16	SW29296	SW29364	SW29432	SW29500	SW29568	SW29636	SW29704	SW29772

Maintenance Monitor Information Detail

◆ Monitor Parameter Information Detail

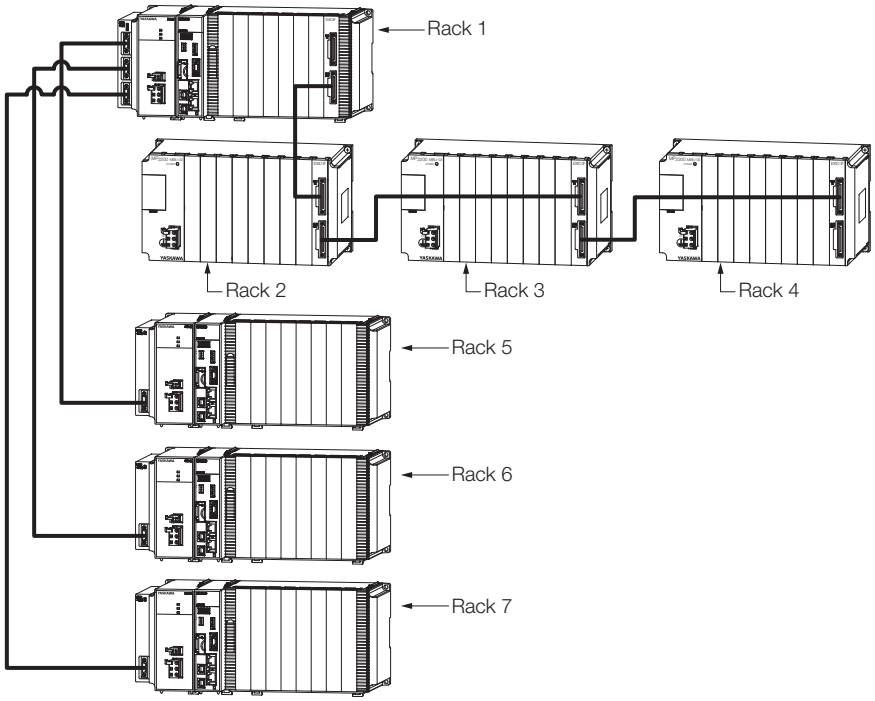
Register Addresses	Description	
SL□□□□□ + 0	Monitor Parameter Type	
SW□□□□□ + 2	Monitor Size	0001 hex: Word 0002 hex: Long word
SW□□□□□ + 3	Reserved for system.	

◆ Axis Monitor Information: Selected Axis □

Register Addresses	Description	
SW□□□□□ + 0	Circuit Number	
SW□□□□□ + 1	Axis Number	
SL□□□□□ + 2	Monitor Value	System registers for data storage vary with the monitor size. • Word Monitor Size SW□□□□□ + 2: Monitor Value SW□□□□□ + 3: Reserved for system. (Always 0) • Long Word Monitor Size SL□□□□□ + 2: Monitor Value

7.6 Expansion Racks

The following figure illustrates Rack Expansion.



Rack expansion is restricted by the Machine Controller model used for the Main Rack.

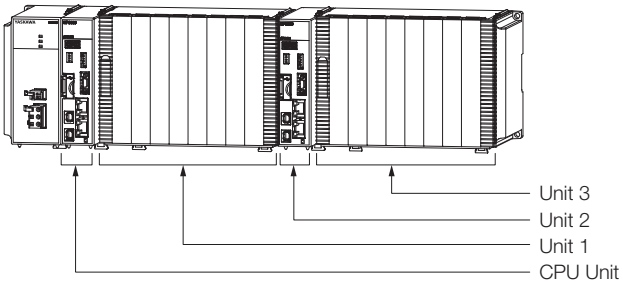
Expansion Rack	Main Rack			Method to Add Expansion Racks
	MP3100*1	MP3200*2	MP3300	
Rack 2	○	○	○	• Use EXIOIF Module • If the Main Rack is the MP3100, use the Rack Expansion Interface Board on the Main Rack side.
Rack 3	○	○	○	
Rack 4	○	○	○	
Rack 5	○	○*2 *3 *4	–	Use Rack Expansion Interface Unit
Rack 6	–	○*2 *3 *4	–	
Rack 7	–	○*2 *3 *4	–	

*1. The MP3100 is attached to a personal computer. Keep in mind that the above image used differs from the actual configuration.

*2. Two or more Units (Base Unit, Sub CPU Unit, and Vision Unit) can be installed per Rack in the case of the MP3200 Main Rack and Racks 5 to 7. The following figure shows Rack configuration examples that use the MP3200.

Rack Configuration Example	CPU Unit	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Example 1	CPU-201	MBU-B08	–	–	–	–
Example 2	CPU-201	MBU-B08	CPU-201 (Sub CPU)	MBU-B08	–	–
Example 3	CPU-201	MBU-B08	CPU-201 (Vision Unit)	MBU-B08	YVD-001 (Vision Unit)	YVD-001 (Vision Unit)

The following figure illustrates Example 2.



*3. The Sub CPU for CPU-203 is supported in version 1.55 and later. Refer to the following manual for details.
MP3200 Product Manual (Manual No.: SIEP C880725 10)

*4. The Sub CPU for CPU-203F is not supported.

MP3200/ MP3300 Battery Replacement

8

This chapter describes how to replace the Battery in the MP3200 or MP3300.

8.1 MP3200 Battery Replacement

The replacement procedure for the Battery is given below.

This procedure assumes that the power supply is already turned ON.

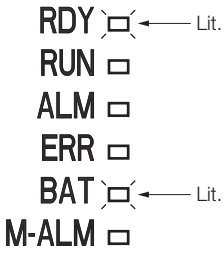
⚠ CAUTION

- **Suitable battery replacement must be performed and it must be performed only by an experienced technician.**
  There is a risk of electrical shock, injury, or device damage.
- **Replace the Battery only while power is supplied to the Machine Controller.**
  Replacing the Battery while the power supply to the Machine Controller is turned OFF may result in loss of the data stored in memory in the Machine Controller.
- **Do not touch the electrodes when replacing the Battery.**
  Static electricity may damage the electrodes.
- **Observe all local laws and ordinances when you dispose of used Batteries.**

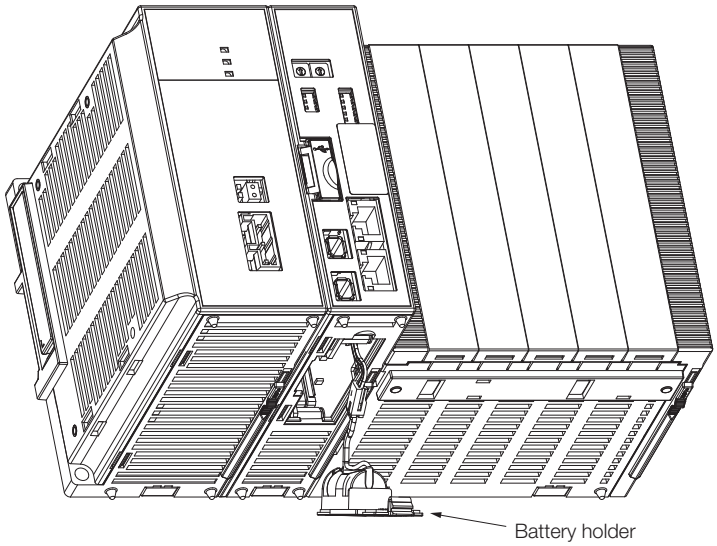
When Using the CPU-201

1. Back up the programs and data stored in the CPU Unit.
   Note: The backup can be used to recover the data if the data accidentally gets deleted during Battery replacement.

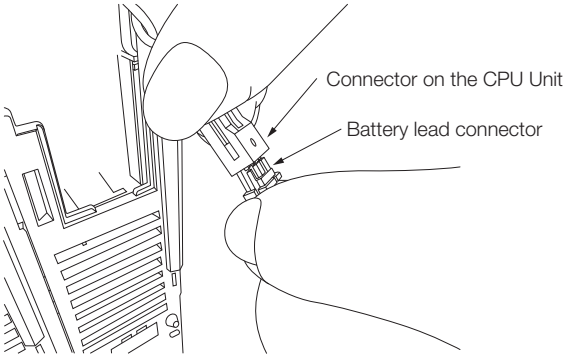
2. Confirm that the RDY indicator on the CPU Unit is lit.



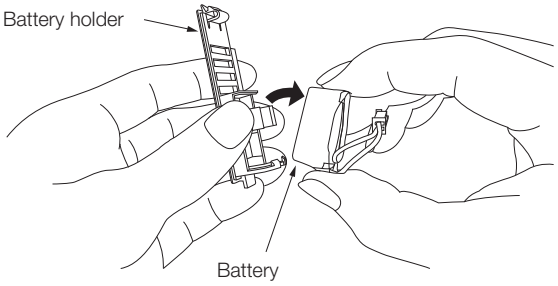
3. Open the battery holder on the bottom of the CPU Unit.



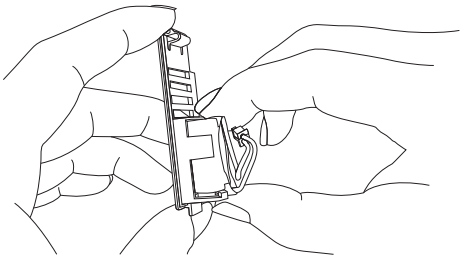
4. Remove the connector on the end of the Battery lead from the connector on the CPU Unit.



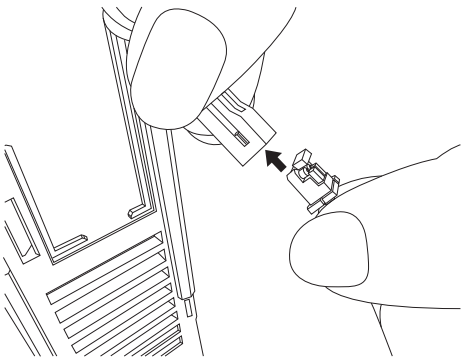
5. Remove the Battery from the battery holder.



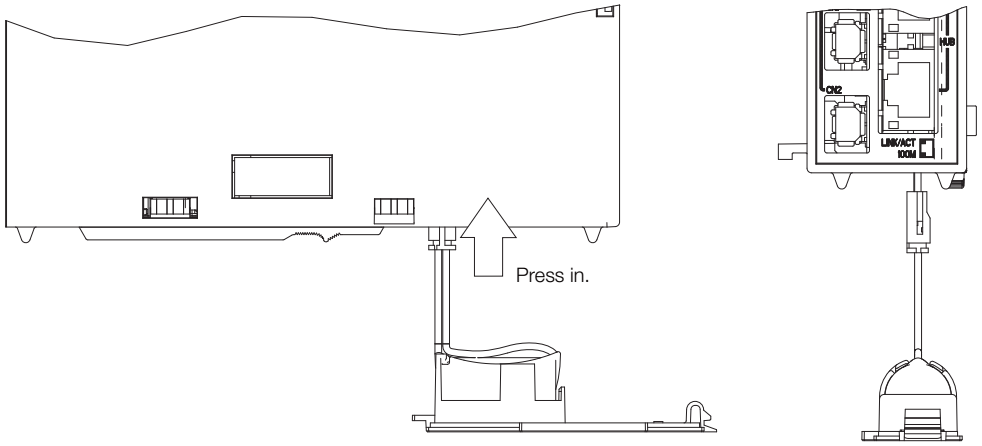
6. Insert the new Battery into the battery holder.



7. Securely connect the lead connector on the lead wires of the new Battery to the connector on the CPU Unit.

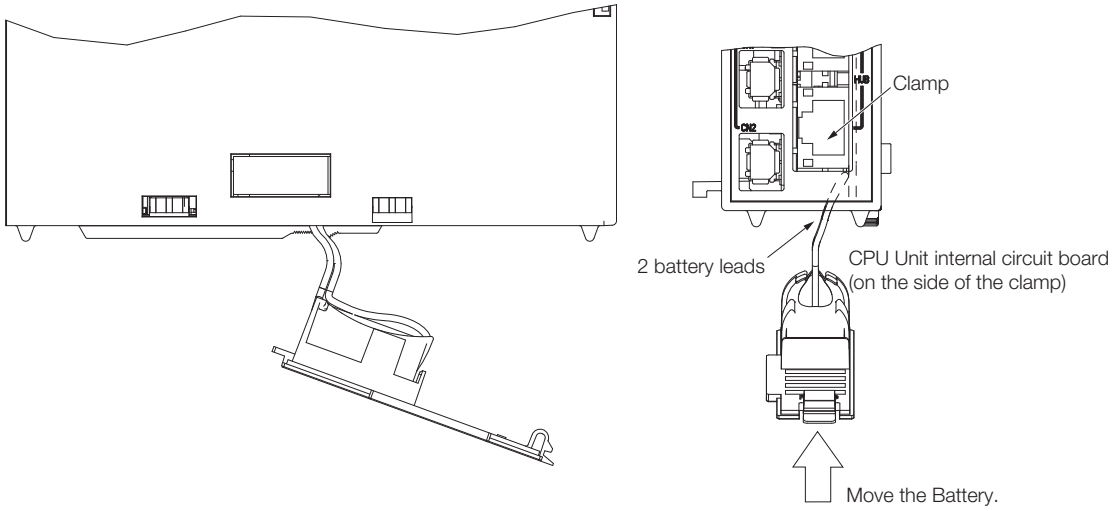


8. Press the connector back into the CPU Unit.



9. Hold the connector, and while pressing it toward the CPU Unit's internal circuit board (the board on the side of the clamp), move the Battery and the battery holder into the CPU Unit.

Note: If this procedure is not followed, the battery leads may pinched between the Battery and the circuit board, causing stress on the leads. If that occurs, the battery holder will bulge after step 8 of the procedure.



10. Close the battery holder and confirm that the BAT indicator on the CPU Unit is not lit.

RDY ◻ ← Lit.
RUN ◻
ALM ◻
ERR ◻
BAT ◻ ← Not lit.
M-ALM ◻

This concludes the Battery replacement procedure.

When Using the CPU-202, CPU-203, or CPU-203F

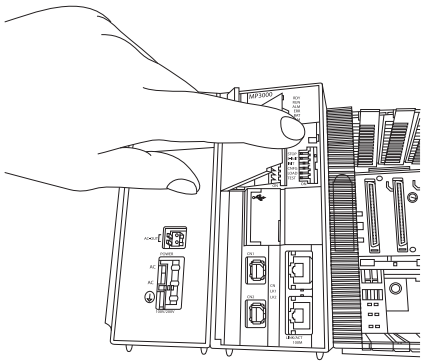
1. Back up the programs and data stored in the MP3200.

   Note: The backup can be used to recover the data if the data accidentally gets deleted during Battery replacement.

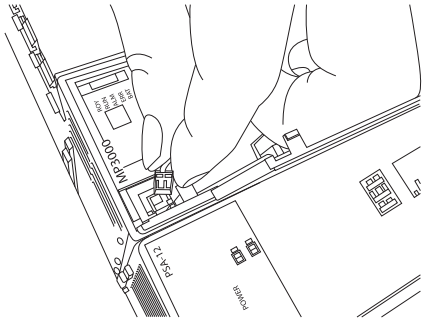
2. Confirm that the RDY indicator on the CPU Unit is lit.

   RDY ☐ ← Lit.
   RUN ☐
   ALM ☐
   ERR ☐
   BAT ☐ ← Not lit.
   M-ALM ☐

3. Open the cover on the front of the CPU Unit.

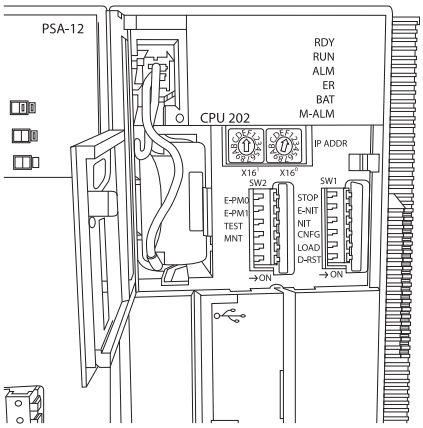


4. Remove the connector on the end of the Battery lead from the connector on the CPU Unit and remove the Battery.



5. Securely connect the lead connector of the replacement Battery to the connector on the CPU Unit and attach the replacement Battery.

6. Press the cable back into the CPU Unit.



7. Close the cover on the CPU Unit and confirm that the BAT indicator on the CPU Unit is not lit.

RDY ◻ ← Lit.
RUN ◻
ALM ◻
ERR ◻
BAT ◻ ← Not lit.
M-ALM ◻

This concludes the Battery replacement procedure.

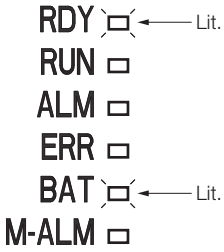
8.2 MP3300 Battery Replacement

⚠ CAUTION

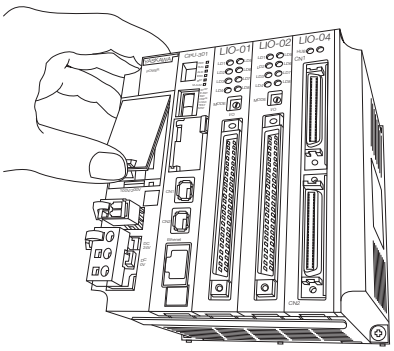
- Suitable battery replacement must be performed and it must be performed only by an experienced technician.
  There is a risk of electrical shock, injury, or device damage.
- Replace the Battery only while power is supplied to the Machine Controller.
  Replacing the Battery while the power supply to the Machine Controller is turned OFF may result in loss of the data stored in memory in the Machine Controller.
- Do not touch the electrodes of the Battery.
  Static electricity may damage the electrodes.
- Observe all local laws and ordinances when you dispose of used Batteries.

1. Back up the programs and data stored in the CPU Module.
   Note: The backup can be used to recover the data if the data accidentally gets deleted during Battery replacement.

2. Confirm that the RDY indicator on the CPU Module is lit.

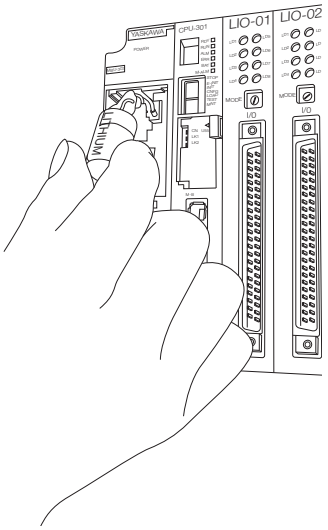


3. Open the battery cover on the front of the Base Unit.



4. Disconnect the lead connector of the Battery from the connector on the Base Unit, and remove the Battery from the battery holder.

5. Securely connect the lead connector of the Replacement Battery to the connector on the Base Unit, and insert the Replacement Battery into the battery holder.



6. Confirm that the BAT indicator of the CPU Module is not lit.

7. Close the cover.

This concludes the Battery replacement procedure.

Fan Replacement

9

This section describes how to replace the MP3200 Fan.

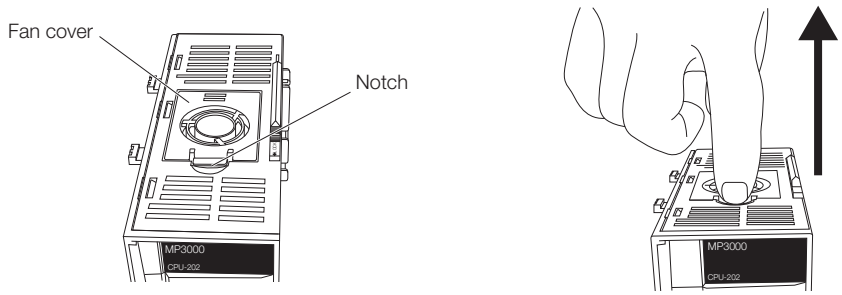
A Fan is built into the CPU-202 Unit and CPU-203 or CPU-203F Unit of the MP3200.

The Fan service life is 50,000 hours minimum (at an average ambient operating temperature of 40°C). The FAN indicator on the CPU Unit will light if the Fan stops. If the Fan service life has expired and the fan stops, you must replace it (CPU-202 Unit Fan model: JEPMC-OP3101-E, CPU-203 and CPU-203F Unit Fan model: JEPMC-OP3102-E).

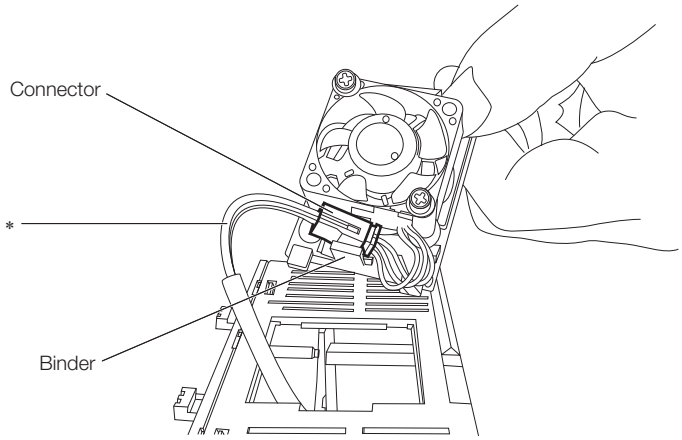
Use the following procedure to replace the Fan.

1. Turn OFF the power supply to the Machine Controller.
   Confirm that all of the indicators on the MP3200 are not lit.

2. Catch your nail in the notch in the fan cover on the top of the CPU Unit and lift up the cover.

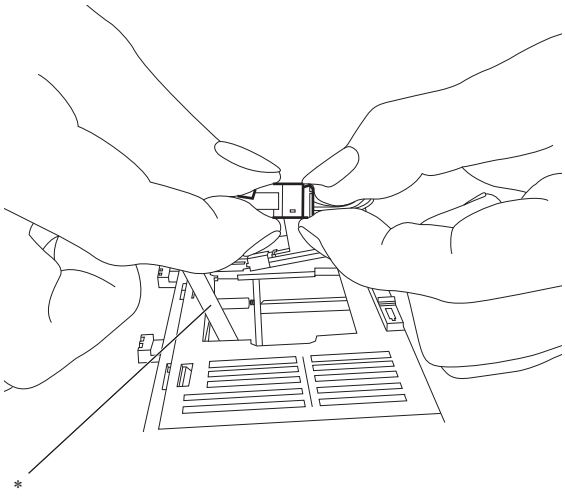


3. Remove the connector from the binder on the back of the fan cover.



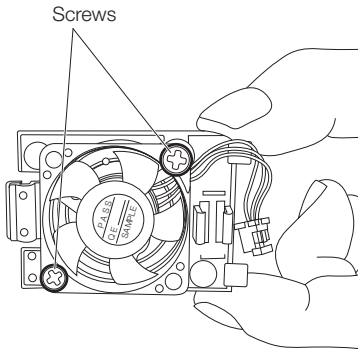
* Do not pull strongly on the fan cable connected to the CPU Unit. There is a risk of damage to the connector on the circuit board or malfunction due to pins being pulled out of the connector.

4. Disconnect the connector and remove the fan cover from the CPU Unit.



* Do not pull strongly on the fan cable connected to the CPU Unit. There is a risk of damage to the connector on the circuit board or malfunction due to pins being pulled out of the connector.

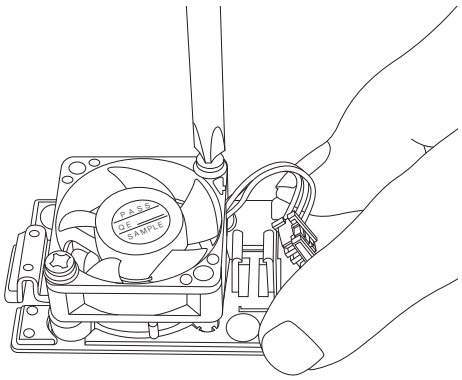
5. Remove the two screws that hold the Fan to the fan cover and remove the Fan.
Keep the screws. You will use these screws to attach the new Fan.



6. Attach the new Fan to the fan cover with the screws.

Note

- Use the screws that you removed (M3 × 14 length, spring and small washers) to attach the Fan.
- Tighten the screws to a torque of 0.49 N·m ±10% when you attach the Fan.
  If the screws are not tightened sufficiently, the Fan may fall off or fail.



7. Attached the fan cover to the CPU Unit by reversing steps 2, 3, and 4.

This concludes the Fan replacement procedure.

EDLC Life Estimation

10

This chapter describes the life estimation of the EDLC in the CPU-203 and CPU-203F Unit.

The CPU-203 and CPU-203F Unit in the MP3200 includes an EDLC (Electric Double Layer Capacitor).

To maximize transfer speeds, the CPU-203 and CPU-203F Unit allocates the register data to high-speed volatile memory and backs up the data to non-volatile memory when the power is turned OFF.

When backing up after turning OFF the power, power is supplied from the EDLC to ensure that there is time to perform the backup process.

The degradation process of the EDLC varies depending on the operating temperature and time. The life is considered to have been reached when there is a 30% drop from the initial capacitance (approx. 6800 mF).

If the EDLC capacitance drops to 5000 mF or less, contact your Yaskawa representative to determine whether it needs to be replaced.

The estimated change in the EDLC capacitance over time is shown in the following graph.

Check the EDLC capacitance by using the following system register.

Register Address	Name	Remarks
SW15803	EDLC Capacitance	Unit: mF After turning ON the power, wait at least 30 minutes for the state to stabilize before checking the value.

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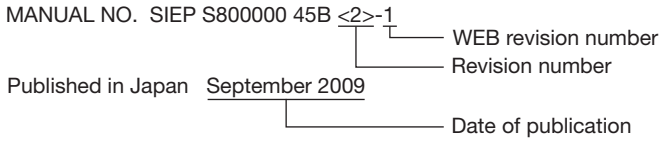
Revision History

The date of publication, revision number, and web revision number are given at the bottom right of the back cover. Refer to the following example.



Date of Publication	Rev. No.	Web Rev. No.	Section	Revised Contents
March 2025	<5>	2	2.2.2	Partly revised.
June 2024		1	2.2.1	Partly revised.
			Back cover	Revision: Address
January 2022		0	All chapters	Addition: Information on MP3200 (CPU-203F) built-in SVF64
October 2021	<4>	1	2.2.2	Addition: The patterns of the MP3100 status indicators (Details)
			5.1.3	Addition: Alarm code 0020 hex
			Back cover	Revision: Address
May 2021		0	All chapters	Addition: Information on MP3200 (CPU-203)
			Back cover	Revision: Address
January 2019	<3>	0	All chapters	Addition: Information on the MP3100
			2.2	Addition: A373, A374
			Chapter 3	Revision: Operating procedures
			Chapter 7	Addition: Information on the Sub CPU status
				Addition: Information on the DI-01 Module
			7.5	Completely revised.
			7.6	Newly added.
			Back cover	Revision: Address
August 2018	<2>	1	Chapter 9	Addition: Information on handling the fan cable
			Back cover	Revision: Address
December 2015		0	Front cover	Revision: Format
			2.2, chapter 7	Addition: Information on A404 error code
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				Addition: Information on vision alarms
				Addition: Information on Rack Expansion Interface Unit
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Machine Controller MP3000 Series

Machine Controller System
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