6-1-6 Types of Errors

The type of error that has occurred can be identified by checking the indicators on the front of the CPU Unit and the Power Supply Unit, or by using the CX-Programmer to check the error status. The errors detected by the CPU Unit are listed in the following table.

For details on errors that are not detected by the CPU Unit, refer to *6-3 Non-CPU Unit Errors and Remedies*.

Error name		POWER	RUN	ERR/ALM	INH	PRPHL	COMM	Error code (stored in A400)	Operation status
Power supply error		OFF	OFF	OFF	OFF	OFF	OFF	---	Operation stops.
CPU Standby		ON	OFF	OFF	---	---	---	---	Operation stops.
CPU reset								---	Operation stops.
CPU error (WDT error)*1		ON	OFF	ON	---	---	---	---	Operation stops.
USB port communications error		ON	ON	OFF	---	OFF	---	---	Operation continues.
RS-232C port communications error		ON	ON	OFF	---	---	OFF	---	Operation continues.
Fatal errors*1*2	Cycle time exceeded error	ON	OFF	ON	---	---	---	0x809F	Operation stops.
	I/O bus error							0x80C0 to 0x80C7, 0x80CE, 0x80CF	
	I/O setting error							0x80E0	
	Too many I/O points error							0x80E1	
	Unit number duplication error							0x80E9	
	Rack number duplication error							0x80EA	
	Program error							0x80F0	
	Memory error							0x80F1	
	Version error							0x80F2	
	Memory Card Transfer Error							0x80F4	
	FALS (007) error							0xC101 to 0xC2FF	
Non-fatal errors*2	Duplicated refreshing error	ON	ON	Flashing	---	---	---	0x008B	Operation continues.
	Basic I/O error							0x009A	
	PLC Setup error							0x009B	
	Option Board error							0x00D1	
	Backup memory error							0x00F1	
	Tag memory error*3							0x00F2	
	System work errors							0x00F3	
	Battery error							0x00F7	
	CPU Bus Unit error							0x0200 to 0x020F	
	Special I/O Unit error							0x0300 to 0x035F, 0x03FF	
	CPU Bus Unit setting error							0x0400 to 0x040F	
	FAL (006) error							0x4101 to 0x42FF	
	Special I/O Unit setting error							0x0500 to 0x055F	

*1 The indicator status is the same for CPU errors and fatal errors, but they can be distinguished because a Programming Device can be connected when a fatal error occurs, but not when a CPU error occurs.

*2 For details on fatal errors and non-fatal errors, refer to *A-3 Fatal and Non-fatal Error Details*.

*3 CJ2H-CPU6□-EIP only.

Note The indicator status shows the status of the errors that have occurred in RUN or MONITOR mode.

6-1-7 Handling Errors

This section describes the measures to take for the errors that most commonly occur. First check the error status. Then, make a preliminary determination of the cause of the error, confirm the cause, correct the error, and take measures to ensure that it will not occur again. For all other errors, refer to *A-3 Fatal and Non-fatal Error Details*.

Power Supply Errors

A power supply error occurs when a voltage of 5 V is not output from the Power Supply Unit.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Not lit.	Not lit.	Not lit.	None	None	None

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
Power is not being input.	Use a tester to measure the voltage at the input terminals of the Power Supply Unit.*1	Turn the power ON again.	Investigate the reason that the power was turned OFF.
Connection status of power supply selector terminals	• 100 VAC: Use a tester check for short-circuits. • 200 VAC: Check for disconnections.	Reconnect and secure the terminal connections.	Periodically (approximately once a year) tighten the terminal connections.
The voltage is out of the allowable range for the power supply.	Use a tester to measure the voltage at the input terminals to the Power Supply Unit.*1	Correct the power supply system for the PLC.	Same as at the left.
Power Supply Unit failure	Replace the Power Supply Unit and check operation. (Check whether the POWER indicator is lit.)	Replace the Power Supply Unit.	Depends on the type of error.
Failure at another Unit	Remove in order the Units mounted in the Rack and check the POWER indicator.	Replace the failed Unit.	Depends on the type of error.

*1 The following table shows the allowable power supply ranges for each Power Supply Unit model.

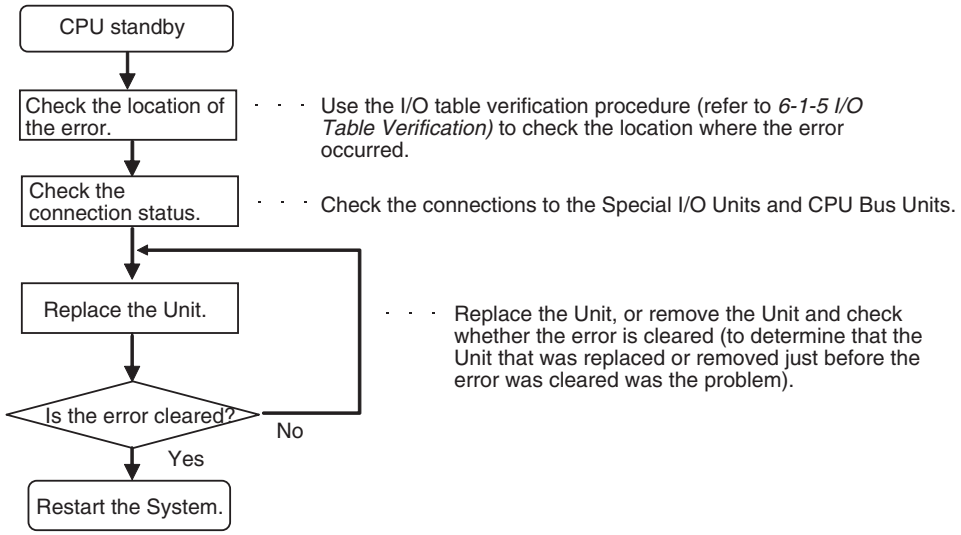
Model	Power supply voltage	Allowable power supply voltage fluctuation
CJ1W-PA205R/PA202	100 to 240 VAC	85 to 264 VAC
CJ1W-PD025	24 VDC	19.2 to 28.8 VDC

CPU Standby Errors

When a CJ-series PLC is turned ON, the CPU starts cyclic servicing and enters RUN mode only after all Special I/O Units and CPU Bus Units have been detected. If the startup mode is RUN or MONITOR mode, the CPU will remain on standby until all Units have been detected.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Not lit.	Not lit.	None	None	None

● Recovery Processing Flow



● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
Faulty connection at Unit (at a connector)	Check the insertion at the connector. Restart the Unit and check whether the error is cleared.	Tighten the screws.	Same as at the left.
Unit failure	Replace the Unit that is causing the standby (the undetected Unit). If the error is not cleared, remove the Units in order until the status returns to normal.	• Replace the Special I/O Unit or Interrupt Unit for which "$" is displayed when the I/O tables are read. • Replace the failed Unit.	(Determined by the cause of the failure.)
The remote I/O power supply is OFF or there is no terminator for SYSMAC BUS.	Check whether the power is turned ON. Check the terminator settings.	Turn ON the power or set the terminators. If the error is not cleared, replace the Unit.	---

Additional Information

The CJ2 CPU Units support the following function.

- **Startup Condition Setting**

  After the power supply is turned ON, it is possible to start operation of the CPU Unit in RUN mode or MONITOR mode even if there is one or more Units that has not completed startup. Select the *Start running program when initializing Unit/Inner board recognition* Check Box in the PLC Setup. For details, refer to the *CJ-series CJ2 CPU Unit Software User's Manual* (Cat. No. W473).

CPU Reset

The CPU Unit is being reset, and Programming Devices cannot be connected.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Not lit.	Not lit.	None	None	None

● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
Power to an Expansion Rack is OFF.	Use a tester to measure the voltage at the input terminals of the Power Supply Unit.*1	Turn ON the power.	Investigate the reason that the power was OFF.
The I/O Connecting Cable is incorrectly installed. • The IN-OUT connectors are reversed. • The cable does not have good contact at the connectors. • Two or more I/O Control Units are mounted on the CPU Rack, or an I/O Control Unit is mounted to an Expansion Rack.	Check the connections.	Reconnect the cable.	If the Cable is disconnected, check for vibration and shock.

*1 The following table shows the allowable power supply ranges for each Power Supply Unit.

Model	Power supply voltage	Allowable power supply voltage fluctuation
CJ1W-PA205R/PA202	100 to 240 VAC	85 to 264 VAC
CJ1W-PD025	24 VDC	19.2 to 28.8 VDC

Precautions for Correct Use

Observe the following points when using Expansion Racks.

- Always confirm the safety of any related equipment before turning the power supply ON or OFF.
- When the power supply is interrupted to an Expansion Rack, the CPU Unit will stop program execution and the same operations as are performed when the power supply to the CPU Unit is interrupted will be performed. For example, if the power OFF interrupt task is enabled, it will be executed. If power is then restored to the Expansion Rack, the CPU Unit will perform startup processing. The same operational status as existed before the power interrupt will not necessarily be continued.

CPU Errors

CPU errors are error that occur in the CPU Unit itself. A CPU error occurs when the WDT (watchdog timer) times out. Programming Devices cannot be connected when a CPU error occurs.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Not lit.	Lit.	None	None	None

● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
Unit failure	A CPU error has possibly occurred in the following cases. • If the error is not cleared when the CPU Unit is restarted after the recovery measures. • If the error occurs frequently • If the condition improves when the Unit is replaced.	Replace the CPU Unit.	Same as at the left.
A conductive object has gotten inside.	Check for conductive objects.	Clean the inside of the Unit with an air blower or replace the CPU Unit.	Do not do any metal working in the vicinity of the control panel. Close the control panel.
Noise • The microcomputer inside the CPU Unit is malfunctioning.	When the CPU Unit is restarted after the recovery measures, the error will either be cleared or will continue to occur. Check whether errors become less frequent after the Unit is replaced.	Take measures against noise. (Investigate the path of entry.) • FG • Power lines	Same as at the left.

Precautions for Correct Use

- Always confirm the safety of any related equipment before turning the power supply ON or OFF.
- When power supply is interrupted to an Expansion Rack, the CPU Unit will stop program execution and the same operations as are performed when the power supply to the CPU Unit is interrupted will be performed. For example, if the power OFF interrupt task is enabled, it will be executed. If power is then restored to the Expansion Rack, the CPU Unit will perform startup processing. The same operational status as existed before the power interrupt will not necessarily be continued.

Communications Error (Peripheral (USB) Port)

A communications error will occur if there is an error in communications between the peripheral (USB) Port and a connected device.

POWER	RUN	ERR/ALM	PRPHL	COMM	Error flag	Error code	Error information
Lit.	Lit.	Not lit.	Not lit.	Not lit.	None	None	None

● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
The communications cable is disconnected.	Perform a visual inspection and pull on the cables.	Reconnect the cables.	During operation, confirm that the connections are secure. Check for vibration or shock.

Communications Error (Serial Port (RS-232C))

A communications error will occur if there is an error in communications between the serial (RS-232C) port and a connected device.

POWER	RUN	ERR/ALM	PRPHL	COMM	Error flag	Error code	Error information
Lit.	Lit.	Not lit.	Not lit.	Not lit.	None	None	None

● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
Communications settings are incorrect.	• Check whether the DIP switch pin 5 setting and and the serial port settings in the PLC Setup are correct. • If a host computer is connected, check the host computer serial port settings and the program.	• Correctly set DIP switch pin 5 and the serial port settings in the PLC Setup. • Correct the host computer serial port settings and the program.	Same as at the left.
A communications cable is incorrectly connected.	• Check the cable connections.	• Correct the cable connections.	Same as at the left.
A communications cable is disconnected.	Perform a visual inspection and pull on the cables.	Reconnect the cables.	During operation, confirm that the connections are secure. Check for effects of vibration or shock.

Cycle Time Exceeded Error (Fatal Error)

● Cycle Time Exceeded Error

A cycle time exceeded error will occur if the PLC cycle time exceeds the setting for Watch Cycle Time in the PLC Setup.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Not lit.	Lit.	A401.08	809F	None

● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
An interrupt task with a long processing time was executed.	Check the Max. Interrupt Task Processing Time (A440)*	Divide the interrupt task into sections.	Same as at the left.
An incorrect value (an extremely large number) was set for the number of repeats of FOR(512).	Set up a trap in the ladder program to monitor the number of repeats.	Correct the ladder program.	Same as at the left.

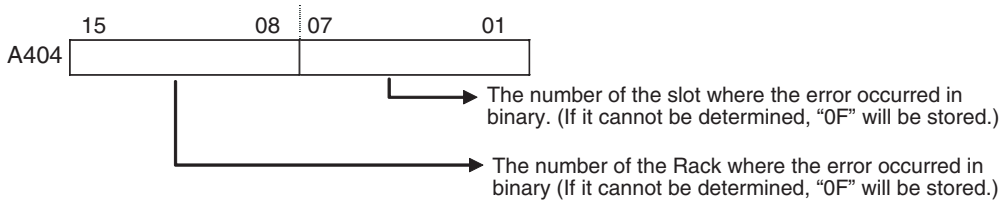
* The maximum processing time for an interrupt task will not be stored in A440 if High-speed interrupt function is enabled in the PLC Setup.

I/O Bus Error (Fatal Error)

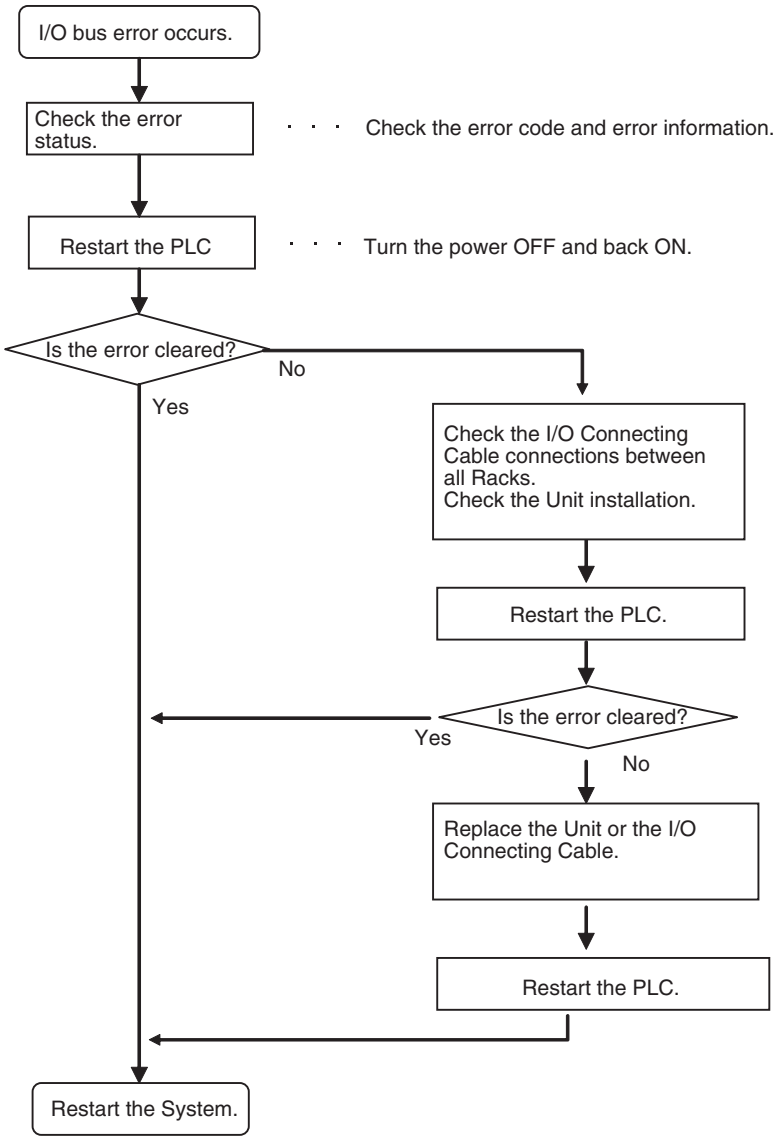
An I/O bus error will occur if there is an error in a data transfer between the CPU Unit and a Unit connected in the Rack.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Not lit.	Lit.	A401.10	80C0 to 80C7 or 80CF	A404*1

*1 The numbers of the slot and Rack where the I/O bus error was detected are stored in word A404.



● Recovery Processing Flow



● Error Causes and Remedies

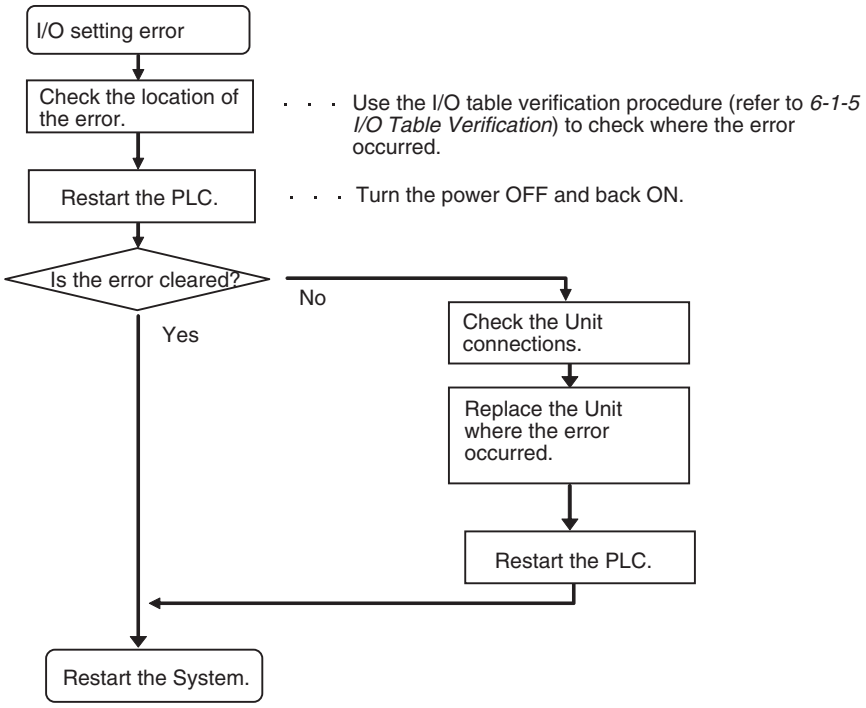
Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
The I/O Connecting Cable is disconnected.	Perform a visual inspection and pull on the Cables.	Reconnect the cables.	During operation, confirm that the connections are secure. Check for vibration or shock.
Equipment failure • CPU Unit • I/O Connecting Cable (damage to bus interface circuit)	An I/O bus error has possibly occurred in the following cases. • If the error is not cleared when the CPU Unit is restarted • If the error occurs frequently • If the condition improves when the Unit is replaced.	Replace the equipment. • CPU Unit • I/O Connecting Cable	---
A conductive object has gotten inside.	Check for conductive objects.	Clean the inside of the Unit with an air blower or replace the CPU Unit.	Do not do any metal working in the vicinity of the control panel. Close the control panel.
Faulty connector contact (A foreign object has gotten inside.)	Check for foreign objects in the connector.	Replace the Unit or take off the connector and remove the foreign object.	Make sure that the operating environment is free of dirt and dust.
Noise • Data corruption in bus signals • Malfunctioning in bus interface circuit	When the CPU Unit is restarted after the recovery measures, the error will either be cleared or will continue to occur. Check whether errors become less frequent after the Unit is replaced.	Take measures against noise. (Investigate the path of entry.) • FG • Power lines • I/O connecting cable (inductive noise)	Same as at the left.

I/O Setting Error (Fatal Error)

An I/O setting error will occur if the Units that are actually connected do not match the Unit in the registered I/O tables.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Not lit.	Flashing.	A401.10	80E0	---

● Recovery Processing Flow



● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
Faulty connection at Unit (at a connector)	Check the insertion at the connector. Restart the Unit and check whether the error is cleared.	Tighten the screws.	Same as at the left.
Unit failure	If restarting the Unit does not clear the error, check whether the error is cleared by replacing the Unit.	Replace the applicable Unit.	Same as at the left.
Noise • Data corruption in bus signals	Restart the CPU Unit and check whether the error continues to occur.	Take measures against noise. (Investigate the path of entry.) • FG • Power lines	Same as at the left.

Memory Error (Fatal Error)

A memory error will occur if there is a memory error in the CPU Unit or if a checksum error is detected (checksum checked by the PLC with each cycle). The details of the cause of the error will be stored in the error information in the Auxiliary Area.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Not lit.	Lit.	A401.15	80F1	A403*1

*1 Individual bits in A403 indicate where the memory error occurred.

● Recovery Measures

Check the detailed error contents in the error information in the Auxiliary Area, and then implement the following recovery measures. If these measures cannot solve the problem, there is a strong probability that the Unit has failed, so replace the Unit.

Error information	Error contents	Recovery measures
A403.00: ON	A checksum error has occurred in the user program memory.	Transfer the user program to the CPU Unit again.
A403.04: ON	A checksum error has occurred in the PLC Setup.	Transfer the PLC Setup to the CPU Unit again.
A403.05: ON	A checksum error has occurred in the registered I/O table.	Transfer the I/O tables to the CPU Unit again.
A403.07: ON	A checksum error has occurred in the routing tables.	Transfer the routing tables to the CPU Unit again.
A403.08: ON	A checksum error has occurred in the CPU Bus Unit setup.	Transfer the CPU Bus Unit setup again.

Additional Information

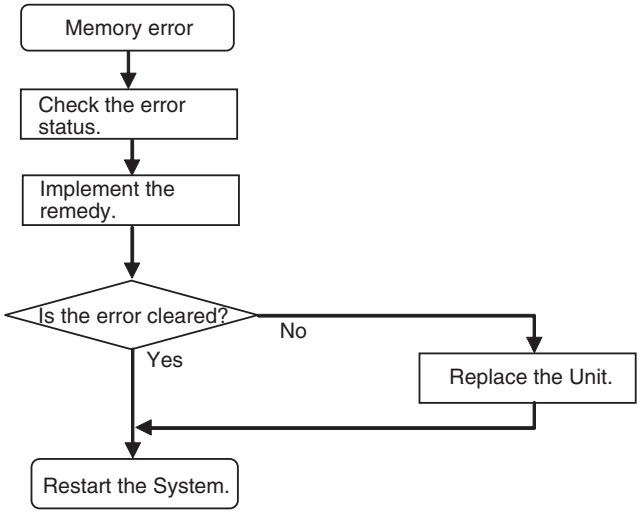
Checksums are used to detect illegal rewriting in a specific area of memory by calculating and comparing sums written to memory in advance to sums during operation. When a checksum error is detected by the CJ2H CPU Unit during operation, memory is automatically recovered by automatically reading data from flash memory. If recovery is not possible, an error occurs and operation stops.

Use any of the following methods to transfer the data again.

- Use the CX-Programmer to download data.
- Use the automatic transfer at startup function to download data saved on a Memory Card. For details, refer to the *CJ-series CJ2 CPU Unit Software User's Manual* (Cat. No. W473).
- Use the simple backup function to download data saved on a Memory Card. For details, refer to *8-3 Simple Backup*.

The CJ2 CPU Unit has built-in flash memory for backup. When the CPU Unit is restarted, data is transferred to memory for calculation and this sometimes enables an error to be cleared.

Recovery Processing Flow



Error Causes and Remedies

If the measures described above do not clear the error, take the measures shown in the following table.

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
Unit failure • Memory element failure • Memory peripheral circuit failure	A memory error has probably occurred in the following cases. • If the error is not cleared when the CPU Unit is restarted after the recovery measures • If the error occurs frequently • If the condition improves when the Unit is replaced.	Replace the CPU Unit.	Determined by the cause of the failure.
A conductive object has gotten inside.	Check for conductive objects.	Clean the inside of the Unit with an air blower or replace the CPU Unit.	Do not do any metal working in the vicinity of the control panel. Close the control panel.
Noise • Data corruption in memory • Microcomputer malfunctioning • Memory write circuit malfunctioning	When the CPU Unit is restarted after the recovery measures, the error will either be cleared or will continue to occur. Check whether errors become less frequent after the Unit is replaced.	Take measures against noise. (Investigate the path of entry.) • FG • Power lines	Same as at the left.
Software error*1	None	None	None

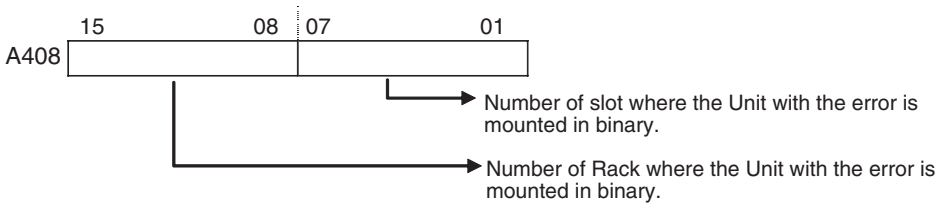
*1 This refers to errors caused by data corruption. SRAM is used for the CPU Unit user memory. SRAM is affected by cosmic rays (neutrons) and naturally occurring radiation, so data can become corrupted.

Basic I/O Error (Non-fatal Error)

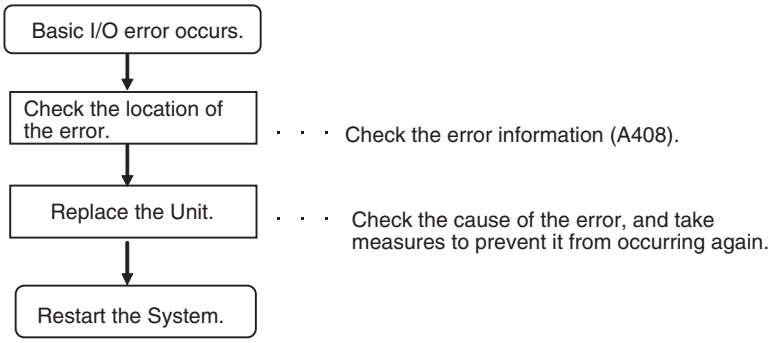
A basic I/O error occurs when there is an error at a Basic I/O Unit.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Lit.	Flashing.	A402.12	009A	A408*1

*1 Error Information



● Recovery Processing Flow



● Error Causes and Remedies

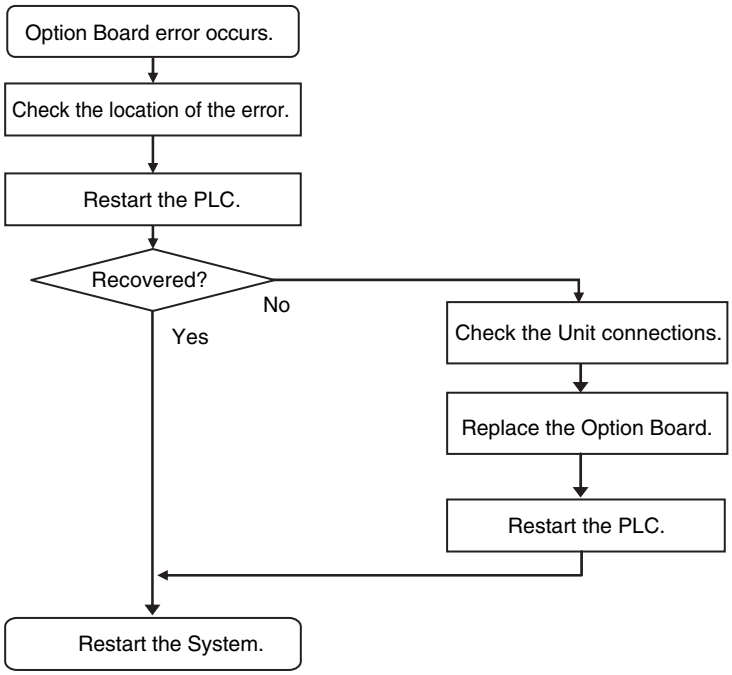
Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
A fuse is burned out.	Measure the voltage at the power supply terminals. Check whether 24 V is being supplied. (Check whether the problem is solved by replacing the fuse.)	Replace the fuse.	Check the maximum switching current.
The external power supply is OFF (disconnected).	Measure the voltage at the power supply terminals. Check whether 24 V is being supplied.	Turn ON the power supply.	Investigate the reason that the power was turned OFF.
Other errors specific to Units	Refer to the manual for the particular Unit.	Same as at the left.	Same as at the left.

Option Board Errors

An Option Board error will occur if the Option Board is removed while the power is being supplied.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Lit.	Flashing.	A315.13 A402.00	00D1	---

● Recovery Processing Flow



● Error Causes and Remedies

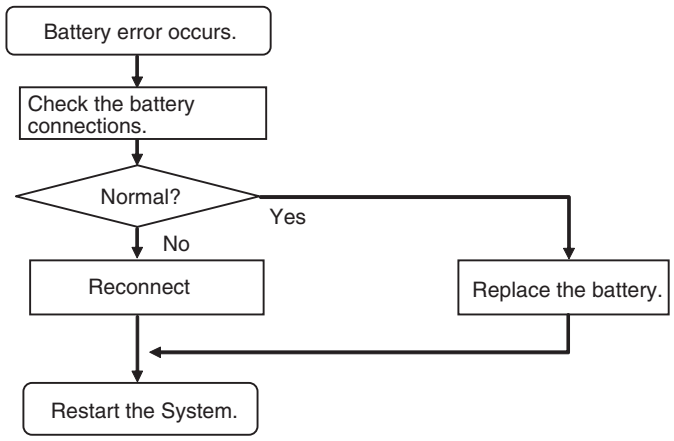
Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
The Option Board was removed while the system was operating.	Check the mating of the Option Board connector.	Reconnect.	Check for vibration and shock.
Option Board failure	If restarting does not clear the error, check whether the error is cleared by replacing the Option Board.	Replace the Option Board.	Same as at the left.

Battery Error (Non-fatal Error)

A battery error occurs when the battery voltage drops.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Lit.	Flashing.	A402.04	00F7	---

● Recovery Processing Flow



● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
A connector is disconnected.	Check the connection at the connector.	Reconnect the connector.	Check for vibration and shock.
Battery voltage is low.	Check whether the error is cleared by replacing the battery.	Replace the battery. For details, refer to *7-2 Replacing the Battery*.	Periodically replace the battery.

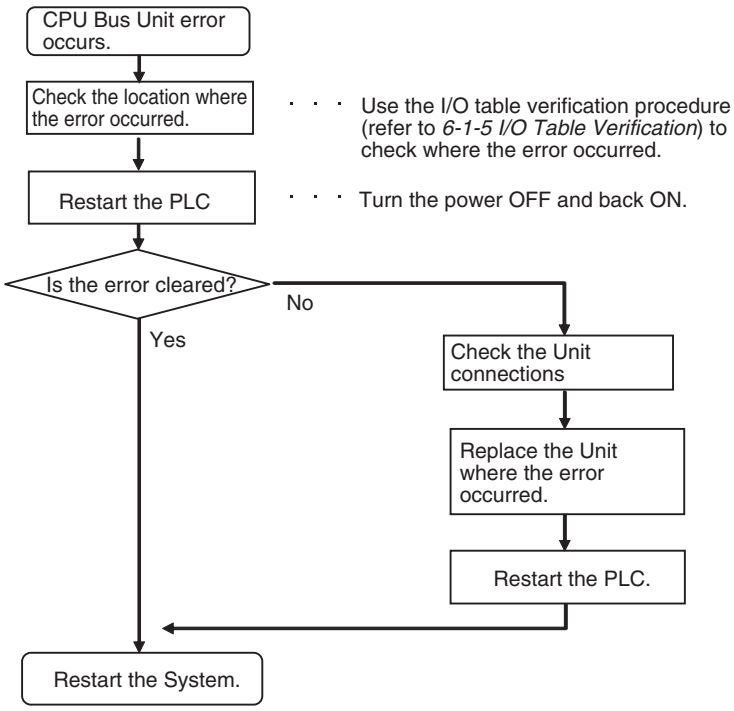
CPU Bus Unit Error (Non-fatal Error)

A CPU Bus Unit error occurs when there is an error in the data conversion between the CPU Unit and a CPU Bus Unit.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Lit.	Flashing.	A402.07	0200 to 020F	A417*

* The bit corresponding to the unit number where the error occurred turns ON. (Bits 00 to 15 correspond to unit numbers 0 to F.)

● Recovery Processing Flow



● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
An error specific to the Unit	Refer to the manual for the particular Unit.	Same as at the left.	Same as at the left.
Faulty connection at Unit (at a connector)	Check the insertion at the connector. Restart the Unit and check whether the error is cleared.	Tighten the screws.	Check for vibration and shock.
Unit failure	If restarting the Unit does not clear the error, check whether the error is cleared by replacing the Unit.	Replace the applicable Unit.	Same as at the left.
Noise • Data corruption in bus signals	Restart the CPU Unit and check whether the error occurs again.	Take measures against noise. (Investigate the path of entry.) • FG • Power lines	Same as at the left.

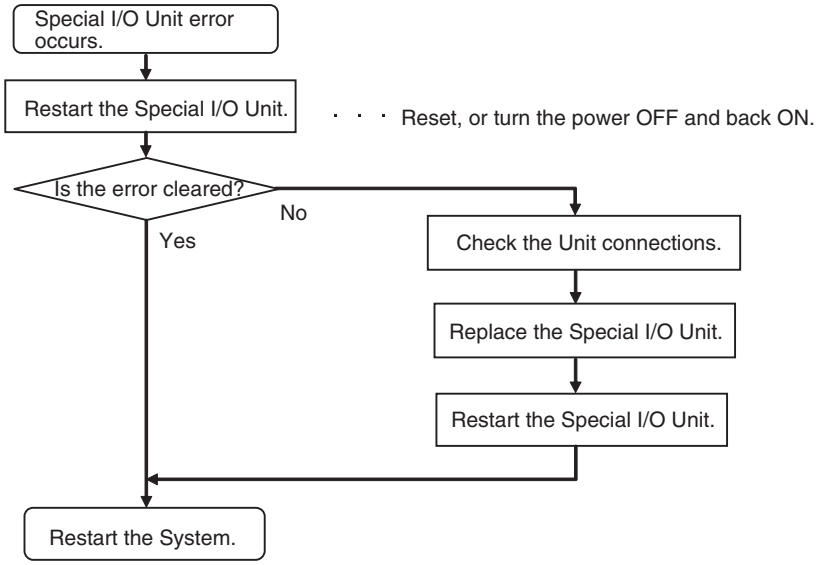
Special I/O Unit Error (Non-fatal Error)

A Special I/O Unit error occurs when there is an error in the data conversion between the CPU Unit and a Special I/O Unit.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Lit.	Flashing.	A402.06	0300 to 035F or 03FF	A418 to A423 *

* The bit corresponding to the unit number where the error occurred turns ON.

● Recovery Processing Flow



● Error Causes and Remedies

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
An error specific to the Unit	Refer to the manual for the particular Unit.	Same as at the left.	Same as at the left.
Faulty connection at Unit (at a connector)	Check the insertion at the connector. Restart the Unit and check whether the error is cleared.	Tighten the screws.	Check for vibration and shock.
Unit failure	If restarting the Unit does not clear the error, check whether the error is cleared by replacing the Unit.	Replace the applicable Unit.	Same as at the left.
Noise • Data corruption in bus signals	Restart the CPU Unit and check whether the error occurs again after this.	Take measures against noise. (Investigate the path of entry.) • FG • Power lines	Same as at the left.

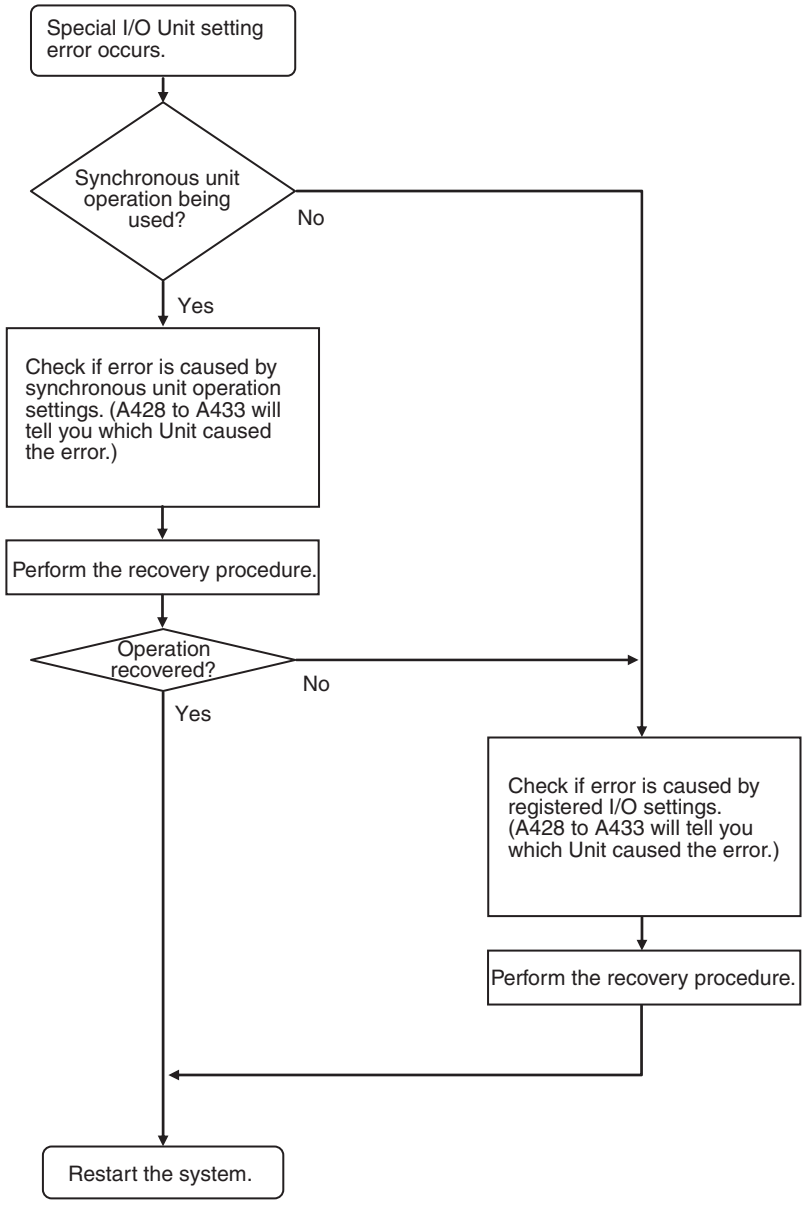
Special I/O Unit Setting Error (Non-fatal Error)

A Special I/O Unit setting error will occur if a Unit registered in the registered I/O tables does not agree with the Unit actually connected in the PLC. A Special I/O Unit setting error will also occur if a Unit set as a Synchronous Unit in the synchronous operation parameter settings is not actually connected in the PLC or does not support synchronous unit operation.

POWER	RUN	ERR/ALM	Error flag	Error code	Error information
Lit.	Lit.	Flashing.	A402.02	0500 to 055F	A428 to A433*

* The bit corresponding to the Unit for which the error occurred will turn ON.

● Recovery Processing Flow



● Error Causes and Remedies for Synchronous Unit Operation Settings

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
A Unit set in the synchronous unit operation settings does not support synchronous unit operation.	Check the operation manual for the Unit.	Transfer the settings again.	Same as at the left.
A Unit set in the synchronous unit operation settings does not exist in the PLC.	Check the Units in the PLC.	Transfer the settings again.	Same as at the left.
A Unit set in the synchronous unit operation settings does not exist on the CPU Rack (i.e., it is on an Expansion Rack).	Check the Units in the PLC.	Move the Synchronous Unit to the CPU Rack. If I/O tables have been registered, change the registered I/O tables.	Same as at the left.

● Error Causes and Remedies for Registered I/O Table Settings

Suspected cause of error	Confirmation method	Remedy	Prevention of recurrence
The model of a CPU Bus Unit in the registered I/O tables is different from the model the Unit actually mounted in the PLC.	Check the Units in the PLC.	Correct the I/O table settings.	Same as at the left.