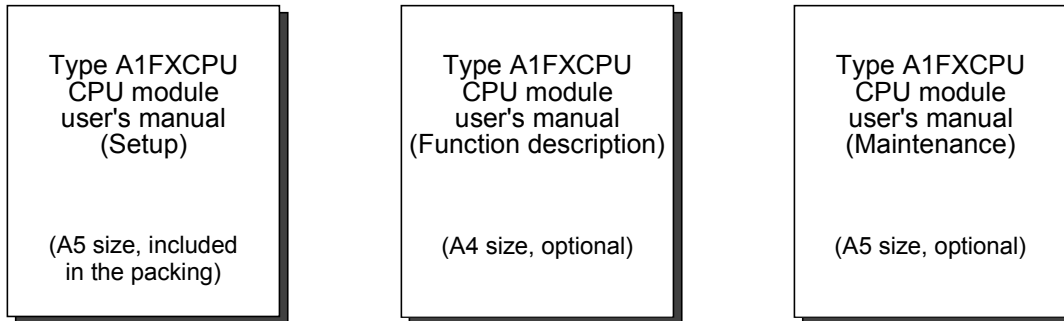


[Manual Makeup]

There are three different manuals related to the A1FXCPU: setup, function description and maintenance manuals.



1) A1FXCPU user's manual (Setup)

This manual provides procedures from product and accessory checkup to installation and wiring to be followed after you have purchased the A1FXCPU and unpacked the package.

The setup manual describes the following items.

- A1FXCPU performances (CPU section, power supply section, built-in functions)
- Names of parts
- Settings of parts (hardware settings)
- I/O number assignment
- EMC Directive, Low Voltage Directive
- Installation of A1FXCPU
- External wiring
- Outline dimension drawings

2) A1FXCPU user's manual (Function description)

This manual includes the explanation, data setting and programming of the built-in functions added to the A1FXCPU, I/O number assignment needed for I/O control, methods of communication with special modules/special blocks, error codes and other information.

The function description manual describes the following items.

- System configuration
- Performances of A1FXCPU (CPU section, power supply section, built-in functions)
- Built-in functions of A1FXCPU (simple inter-PC link, simple positioning, high-speed counter, external interrupt)
- I/O number assignment
- Communication with special modules/special blocks
- Error codes
- Special relays, special registers
- Outline dimension drawings

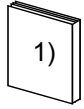
3) A1FXCPU user's manual (Maintenance)

This manual explains the inspection of a system using the A1FXCPU and troubleshooting at error occurrence.

- Names of parts
- Settings of parts
- Maintenance and inspection
- Troubleshooting
- Special relays, special registers

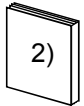
Refer to the ACPU programming manuals for the instructions needed for devices and programming of the A1FXCPU, and to the GPP function software package operating manuals for peripheral operation to be performed for programming.

[A1FXCPU Manuals]



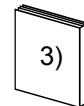
Type A1FXCPU CPU module user's manual (Setup)

(A5 size, included in the packing)



Type A1FXCPU CPU module user's manual (Function description)

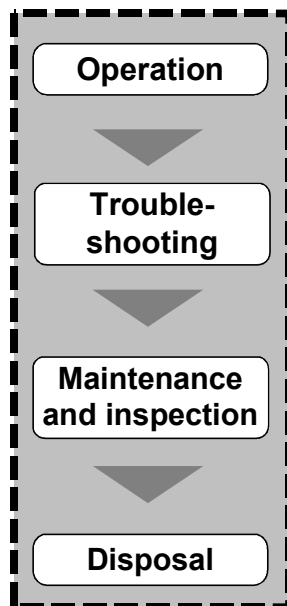
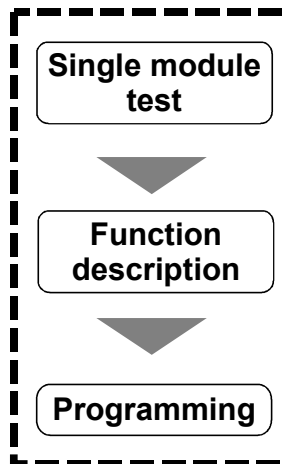
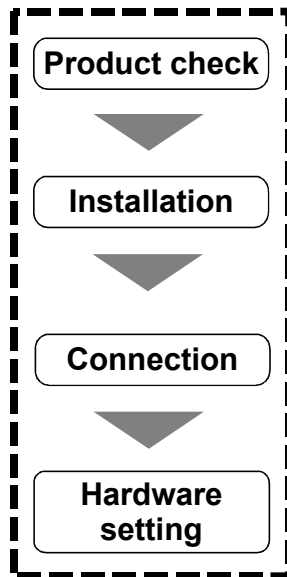
(A4 size, optional)



Type A1FXCPU CPU module user's manual (Maintenance)

(A5 size, optional)

[Operation Sequence in Time Series]



[Relevant Manuals]

ACPU programming manuals (Basics, common instructions)

GPP function software packing operating manuals

About This Manuals

The following product manuals are available. Please use this table as a reference to request the appropriate manual as necessary.

Related Manuals

Manual Name	Manual No. (Model Code)
type A1FXCPU module user's manual (Setup) Provides the specifications, installation, wiring and other information of the module for use of the A1FXCPU. (Option)	IB-66839 (13JL57)
type A1FXCPU module user's manual (Function description) Includes the system configuration, performance specifications, functions, handling, I/O number assignment and error codes of the A1FXCPU. (Option)	SH-4002 (13JL59)
type ACPU (Fundamentals) Programming Manual Offers programming methods, device names, parameters, program types, memory area makeup, etc. needed to write programs. (Option)	IB-66249 (13J740)
type ACPU (Common Instructions) Programming Manual Gives how to use sequence, basic and application instructions and microcomputer programs. (Option)	IB-66250 (13J741)
type MELSAP-II Programming Manual Provides specifications, functions, instructions, programming methods, etc. needed when the MELSAP-II is used for programming with SFC programs. (Option)	IB-66361 (13JF40)
type SW3IVD-GPPA (Supplement) Operating Manual Includes the detailed SW3IVD-GPPA system configuration, how to register (install) the software package to hard disk, GPP function startup procedure, basic usage of GPP functions, typical function operating methods, etc. (Option)	BCN-85834
type SW3IVD-GPPA (GPP) Operating Manual Describes the system configuration, performance specifications, functions, system startup procedure, operation details of each GPP function, and error messages of the SW3IVD-GPPA. (Option)	IB-66691 (13J906)

Manual Name	Manual No. (Model Code)
type SW3IVD-GPPA (A6TEL) Operating Manual Gives the performance specifications, functions and operation methods of the A6TEL (telephone line) among the functions of the SW3IVD-GPPA. (Option)	IB-66693 (13J908)
type SW3IVD-GPPA (SFC) Operating Manual Offers the performance specifications, functions, system startup procedure, operation details and error messages of the SFC mode among the functions of the SW3IVD-GPPA. (Option)	IB-66692 (13J907)

POINT	
For the FX series, refer to the manual of the module used.	

● SAFETY PRECAUTIONS ●

(Always read these instructions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.

In this manual, the safety instructions are ranked as "WARNING" and "CAUTION".



DANGER

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the CAUTION level may lead to a serious consequence according to the circumstances. Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[Startup/Maintenance Instructions]

WARNING

- Do not touch the terminals while power is on.
This can cause an electric shock or misoperation.
- Connect the battery correctly. Do not recharge, disassemble, heat, short or solder the battery or throw it into fire.
Improper handling of the battery may result in injury or fire due to heating, burst, combustion, etc.
- Before starting cleaning or terminal screw retightening, always switch power off externally in all phases.
Not doing so can cause an electric shock.
Overtightening can cause a drop, short circuit or misoperation due to damaged screws or module.

[Startup/Maintenance Instructions]

CAUTION

- Before starting online operation with the peripheral connected to the running CPU module (especially program modification, forced output, operating status change), carefully read the manual and fully ensure safety.
Not doing so can cause machine damage or accident due to operational mistakes.
- Do not disassemble or modify each module.
This can cause a failure, misoperation, injury or fire.
- The module case is made of resin. Do not drop it or give it hard impact.
This can damage the module.
- Before mounting or dismounting the module, always switch power off externally in all phases.
Not doing so can cause the module to fail or misoperate.
- When performing test operation for positioning, set a low speed, make preparations so that positioning can be stopped immediately when a hazardous condition occurs, and then make operation checks.

[Disposal Instructions]

CAUTION

- When disposing of the product, handle it as industrial waste.

Revisions

*The manual number is noted at the lower left of the back cover.

Print Date	*Manual Number	Revision
Feb.1998	SH(NA)-4003-A	First edition

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

Introduction

Thank you for the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers.
Please read this manual carefully so that equipment is used to its optimum.
A copy of this manual should be forwarded to the end user.

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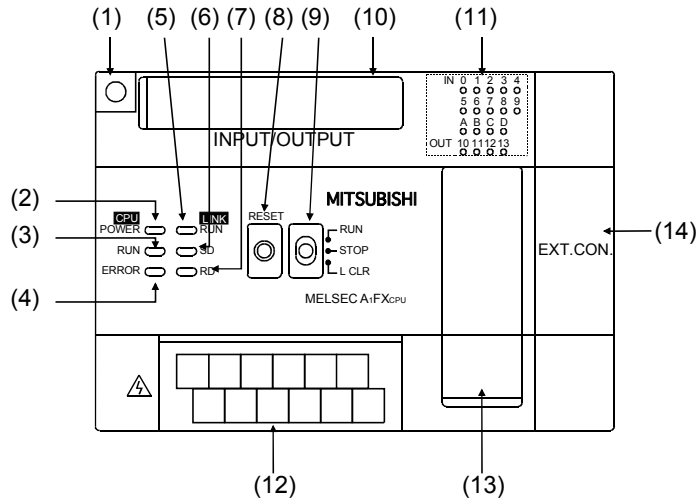
1. NAMES OF PARTS AND THEIR SETTINGS

MELSEC-A

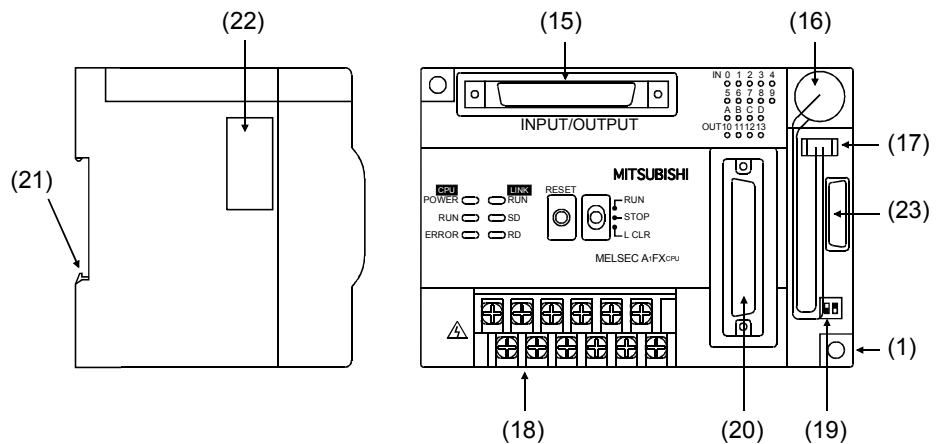
1. NAMES OF PARTS AND THEIR SETTINGS

1.1 Names of Parts

Front view



Left side view and the front view without cover



No.	Name	Application
1	Mounting hole (For M4 screw)	Pear-shaped hole used to mount this module to a panel such as a control box.
2	"POWER" LED	· 5VDC power indicator LED
3	"RUN" LED	<ul style="list-style-type: none"> · On : Indicates that the RUN/STOP switch is in the "RUN" position and sequence program operation is being executed. (Remains on if an error defined to continue sequence program operation occurs.) · Off : Turns off when. <ul style="list-style-type: none"> · 100 to 240VAC is not supplied to the A1FXCPU. · The RUN/STOP switch is in the "STOP" position. · Remote STOP is performed. · Remote PAUSE is performed. · Flicker : Flickers when. <ul style="list-style-type: none"> · The self-diagnostic function detected an error defined to stop sequence program operation. · Latch clear operation is performed.

1. NAMES OF PARTS AND THEIR SETTINGS

MELSEC-A

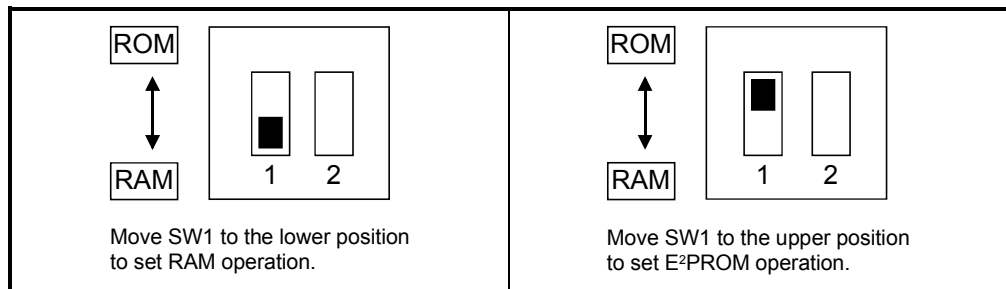
No.	Name	Application
4	"ERROR" LED	<ul style="list-style-type: none"> · On : Indicates that the self-diagnostic function detected an error. (Remains off when the error detected is the one preset to be turned off in the LED indication priority setting.) · Off : Indicates a normal status or that a failure was detected with the CHK instruction. · Flicker : Indicates that the annunciator (F) was switched on in the sequence program.
5	"LINK RUN" LED	<ul style="list-style-type: none"> · On : Indicates normal operation of simple inter-PC link. · Off : Indicates a simple inter-PC link fault.
6	"SD" LED	<ul style="list-style-type: none"> · Flicker : Indicates that data is being sent to the other station in simple inter-PC link. · Off : Indicates that data is not yet sent to the other station in simple inter-PC link.
7	"RD" LED	<ul style="list-style-type: none"> · Flicker: Indicates that data is being received from the other station in simple inter-PC link. · Off : Indicates that data is not yet received from the other station in simple inter-PC link.
8	RESET switch	<ul style="list-style-type: none"> · RESET: Hardware reset. Used to make a reset at occurrence of an operation fault and initialize operation.
9	RUN/STOP switch	<ul style="list-style-type: none"> · RUN/STOP: Used to execute/stop sequence program operation. · LATCH CLEAR (L CLR): Used to clear (OFF or 0) latch clear data set in parameters. (LATCH CLEAR also clears data other than the latch clear data.)
10	Built-in function connector cover	Cover for protection of the built-in function connector When the connector is not used, put this cover on.
11	Indicator LEDs	I/O indicator LEDs
12	Terminal block cover	Cover for protection of the terminal block. Put this cover on except when making connections.
13	Peripheral connector cover	Connector cover for connection of a peripheral. When a peripheral is not used, put this cover on.
14	Protective cover	Cover for protection of the battery, connector, etc. of the A1FXCPU. Open the protective cover to perform the following operations. <ul style="list-style-type: none"> · DIP switch setting · Connection to the battery connector · Battery replacement · Connection/disconnection to/from the extension block connector When the above operations are not performed, put this cover on.
15	Built-in function connector	Connector for the high-speed counter, positioning output and external interrupt input.
16	Battery	Used to back up program, latch range device, file register and other data.
17	Battery connector	For connection of the battery side connector.
18	Terminal block	Terminal block for AC power input, service power output and simple inter-PC link.
19	DIP switches	Used to set memory protect and select between RAM and E ² PROM.
20	Peripheral connector (D sub-25 pins)	Connector used to perform main program write/read, monitoring and test using a peripheral.
21	DIN rail catch	Catch for mounting this module to a DIN rail.
22	Cover	Do not open this cover.
23	Extension block connector	Connector for connection of the FX0N and FX2N series extension modules, extension blocks, special modules and special blocks.

1.2 Settings

The A1FXCPU settings include RAM/E²PROM operation and write protect settings.

1.2.1 RAM/E²PROM operation setting

The memory operation system includes RAM and E²PROM modes. Use the DIP switch (SW1) to select the memory operation system. SW1 is factory-set in the RAM operation (lower) position.



POINT
Before choosing the E²PROM mode, read the contents of RAM with a peripheral.

1.2.2 Write protect switch setting

The write protect switch is used to prevent RAM and E²PROM data from being rewritten by operation performed from a peripheral.

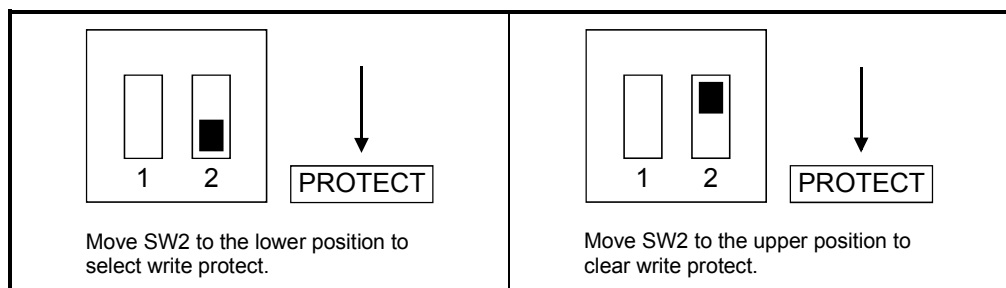
Use this switch to prevent a program created from being rewritten or deleted, for example.

When this function is used, RAM is write-protected in the RAM operation mode and E²PROM write-protected in the E²PROM operation mode.

Before making corrections to the RAM memory contents, clear write protect (move the switch to the upper position).

Use the DIP switch (SW2) to select or clear write protect.

SW2 is factory-set in the write protect clear (upper) position.



1.3 Latch Clear Operation

When performing latch clear using the RUN/STOP switch, perform operation in the following procedure. This operation also clears non-latched devices.

(1) Move the RUN/STOP switch from the "STOP" position to the "L CLR" position several times to flicker the "RUN" LED.

When the "RUN" LED flickers, latch clear is ready.

(2) After the "RUN" LED has flickered, move the RUN/STOP switch from the "STOP" position to the "L CLR" position again. Latch clear is then completed and the "RUN" LED goes off.

To cancel the latch clear operation at any point, move the RUN/STOP switch to the "RUN" position to place the A1FXCPU in the RUN mode or press the RESET switch to reset the A1FXCPU.

REMARKS

Latch clear may also be done by GPP function operation.

For example, latch clear from the A6GPP may be performed using the test function "device memory all clear" in the PC mode.

For the operation method, refer to the GPP Function Operating Manual.

2. INSPECTION AND MAINTENANCE



WARNING

- Do not touch the terminals while power is on.
This can cause an electric shock or misoperation.
- Connect the battery correctly. Do not recharge, disassemble, heat, short or solder the battery or throw it into fire.
Improper handling of the battery may result in injury or fire due to heating, burst, combustion, etc.
- Before starting cleaning or terminal screw retightening, always switch power off externally in all phases.
Not doing so can cause an electric shock.
Undertightening can cause a drop, short circuit or misoperation.
Overtightening can cause a drop, short circuit or misoperation due to damaged screws or module.



CAUTION

- Do not disassemble or modify the module.
This can cause a failure, misoperation, injury or fire.
- Before mounting or dismounting the module, always switch power off externally in all phases.
Not doing so can cause the module to fail or misoperate.
- Dispose of the product as industrial waste.

To ensure proper use of the PC in the best conditions, you are requested to perform maintenance and inspection daily and periodically as described below.

2. INSPECTION AND MAINTENANCE

MELSEC-A

2.1 Daily Inspection

Table 2.1 provides inspection items to be observed daily.

Table 2.1 Daily Inspection

No.	Item	Description	Criteria	Action	
1	Mounting condition on DIN rail	Make sure that the module/block is mounted on the DIN rail securely.	The module/block is fitted completely.	Mount on the DIN rail securely.	
	Mounting condition on panel surface	Check for loose mounting screws and covers.	The module mounting screws are tightened securely.	Retighten the screws.	
2	Extension module, extension block, special module, special block mounting conditions	Make sure that the module/block is mounted on the DIN rail securely.	The module/block is fitted completely.	Mount on the DIN rail securely.	
		Check for loose mounting screws and covers.	The module mounting screws are tightened securely.	The module mounting screws are tightened securely.	
3	Connecting conditions	Check for loose terminal screws.	No loose screws.	Retighten the terminal screws.	
		Close solderless terminals.	Proper intervals	Correct.	
		Check the extension cable connectors.	No loose connectors.	Plug the connectors securely.	
4	Module indicator lamps	"POWER" LED	Make sure that the LED is lit.	Lit (Off indicates a fault.)	Refer to Section 3.2.2.
		"RUN" LED	Make sure that the LED is lit in the "RUN" mode.	Lit. (Off/flicker indicates a fault.)	Refer to Sections 3.2.3 and 3.2.4.
		"ERROR" LED	Make sure that the LED is lit at error occurrence.	Off. (On indicates error occurrence.)	Refer to Sections 3.2.5 and 3.2.6.
		"LINK RUN" LED	Make sure that the LED is lit and extinguished.	Extinguished when simple inter-PC link is not used.(Without link setting program) Lit when simple inter-PC link is used. (Any condition other than the above indicates a fault.)	Refer to Sections 3.2.7 and 3.2.8.
		"SD" LED	Make sure that the LED is lit and extinguished.	Extinguished when simple inter-PC link is not used. (Without link setting program) Lit/flickers when simple inter-PC link is used. (Any condition other than the above indicates a fault.)	Refer to Section 3.2.8.
		"RD" LED	Make sure that the LED is lit and extinguished.		
		Input LEDs	Lit when the corresponding inputs turn on.	Extinguished when the corresponding input signal turn off. Flickers when high-speed counter pulses are input signal. (Any condition other than the above indicates a fault.)	Refer to Section 3.2.9.

2. INSPECTION AND MAINTENANCE

MELSEC-A

Table 2.1 Daily Inspection (Continued)

No.	Item		Description	Criteria	Action
4	indicator	Output LEDs	Make sure that the LEDs are lit and extinguished.	Flickers when simple positioning pulses are output. (Any condition other than the above indicates a fault.)	Refer to Section 3.2.10.

2.2 Periodic Inspection

The following table lists inspection items to be followed every six months to every year. This inspection should also be made when the equipment is moved or modified or wiring is changed.

Table 2.2 Periodic Inspection

No.	Item		Method	Criteria	Action
1	Ambient environment	Ambient temperature	Measure with thermometer/hygrometer. Measure corrosive gas.	0 to 55°C	When the PC is used inside an enclosure, the ambient temperature is the temperature inside the enclosure.
		Ambience humidity		10 to 99%RH	
		Atmosphere		No corrosive gas	
2	Power supply voltage check		Measure voltage across 100 to 200VAC terminals.	85AC to 264V	Change supply voltage.
3	Mounting conditions	Looseness	Move the module.	The module should be mounted firmly.	Retighten screws.
		Dirt, foreign matter	Visual check.	No contamination	Remove and clean.
4	Connecting conditions	Loose terminal screws.	Retighten with a screwdriver.	No loose screws.	Retighten.
		Close solderless terminals.	Visual check.	Proper intervals	Correct.
		Loose connectors.	Visual check.	No loose connectors.	Retighten connector fixing screws.
5	Battery		Make sure that M9006 or M9007 is off in the monitoring mode of the peripheral.	(Preventive maintenance)	If there is no battery low indication, change the battery when the specified life is exceeded.

2.3 Battery Replacement

WARNING

- Connect the battery correctly. Do not recharge, disassemble, heat, short or solder the battery or throw it into fire.
Improper handling of the battery may result in injury or fire due to heating, burst, combustion, etc.

CAUTION

- Dispose of the product as industrial waste.

M9006 or M9007 are switched on to indicate that the voltage of the battery for program and power failure-compensated data backup has reduced. If this special relay is switched on, the programs and power failure-compensated data are not erased immediately. However, they may be erased if ON of the special relay is overlooked.

Change the battery within the total power failure time after M9006 or M9007 is switched on, indicated in Table 2.4.

The battery life guideline and changing procedure are given below.

2.3.1 Battery life

Table 2.3 indicates the battery life.

Table 2.3 Battery Life

Battery Life CPU Type	Battery Life (Total power failure time) [Hr]		
	Guaranteed time (Minimum)	Actual operating time (Typical)	After M9006/M9007 Switched On
A1FXCPU	4000	20000	100

*The actual operating time indicates an average value and the guaranteed time indicates a minimum value.

The following preventive maintenance should be observed.

- [1] Replace any battery after 4 to 5 years if the total power failure time is less than the above guaranteed time.
- [2] Replace any battery when the total power failure time has exceeded the above guaranteed time and M9006 is on.

2.3.2 Battery replacement

When the battery life has expired, change the battery in the following procedure. Without the battery, the capacitor provides memory backup for some time. However, the battery should be changed as soon as possible since memory contents may be erased if the changing time exceeds the guaranteed time indicated in Table 2.4.

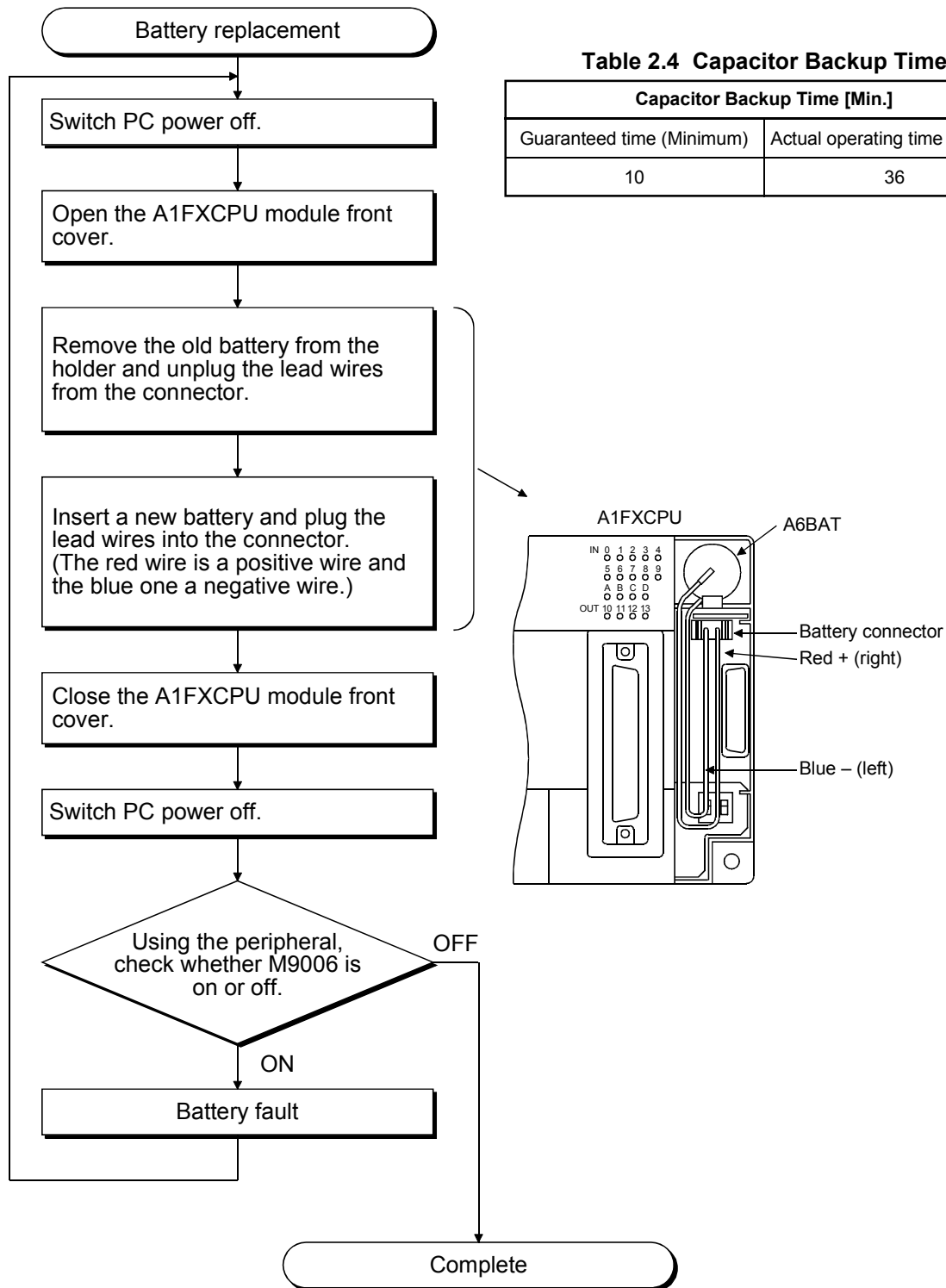


Table 2.4 Capacitor Backup Time

Capacitor Backup Time [Min.]	
Guaranteed time (Minimum)	Actual operating time (Typical)
10	36

3. TROUBLESHOOTING

This chapter describes various errors which may occur during use of the system and how to clear up their causes and take proper actions.

3.1 Basic Troubleshooting

To increase system reliability, important points are to use equipment having high reliability and to restore the system to normal as soon as possible when any fault has occurred.

To restore the system to normal as soon as possible, the following troubleshooting basics must be observed:

(1) Visual checks

Check the following.

- (a) Machine motions (in stop and operating statuses)
- (b) Power supply on or off
- (c) I/O equipment status
- (d) Wiring conditions (I/O wires, cables)
- (e) Display states of various indicators (POWER, RUN, ERROR, I/O LEDs, etc.).
- (f) Various switch settings (RAM/E²PROM setting, memory protect, etc.)

After completing the visual checks (a) to (f), connect the peripheral and monitor the PC operating status and program.

(2) Fault check

Observe any changes in the error condition during the following.

- (a) Set the RUN/STOP switch to [STOP].
- (b) Reset the CPU with the RESET switch.
- (c) Switch power off and on.

(3) Narrow down the possible causes.

Deduce where the fault lies.

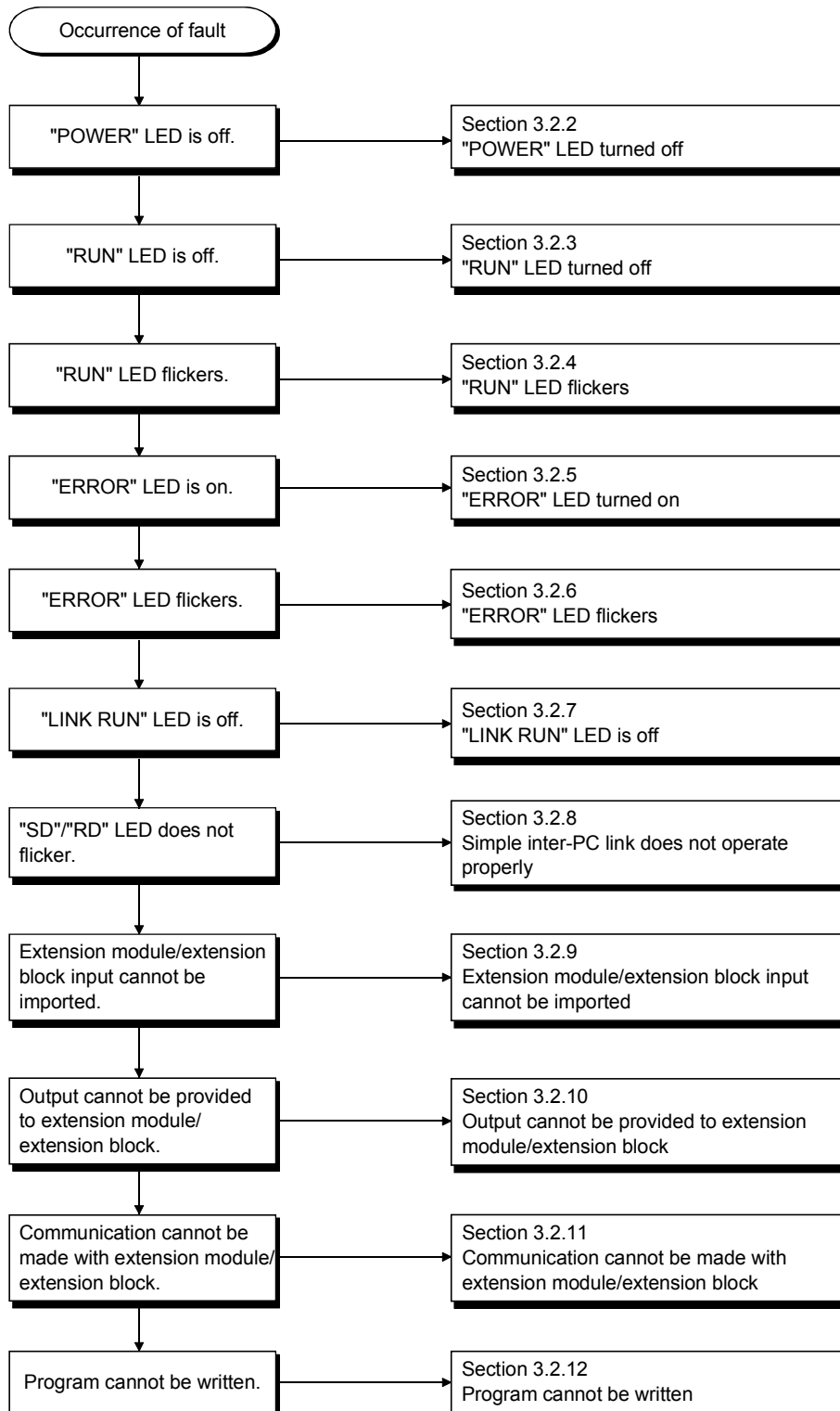
- (a) Inside or outside the PC.
- (b) Extension module, extension block or otherwise.
- (c) Sequence program.

3.2 Troubleshooting

This section explains how to clear up the causes of faults, the definitions of errors corresponding to error codes, and what actions to be taken.

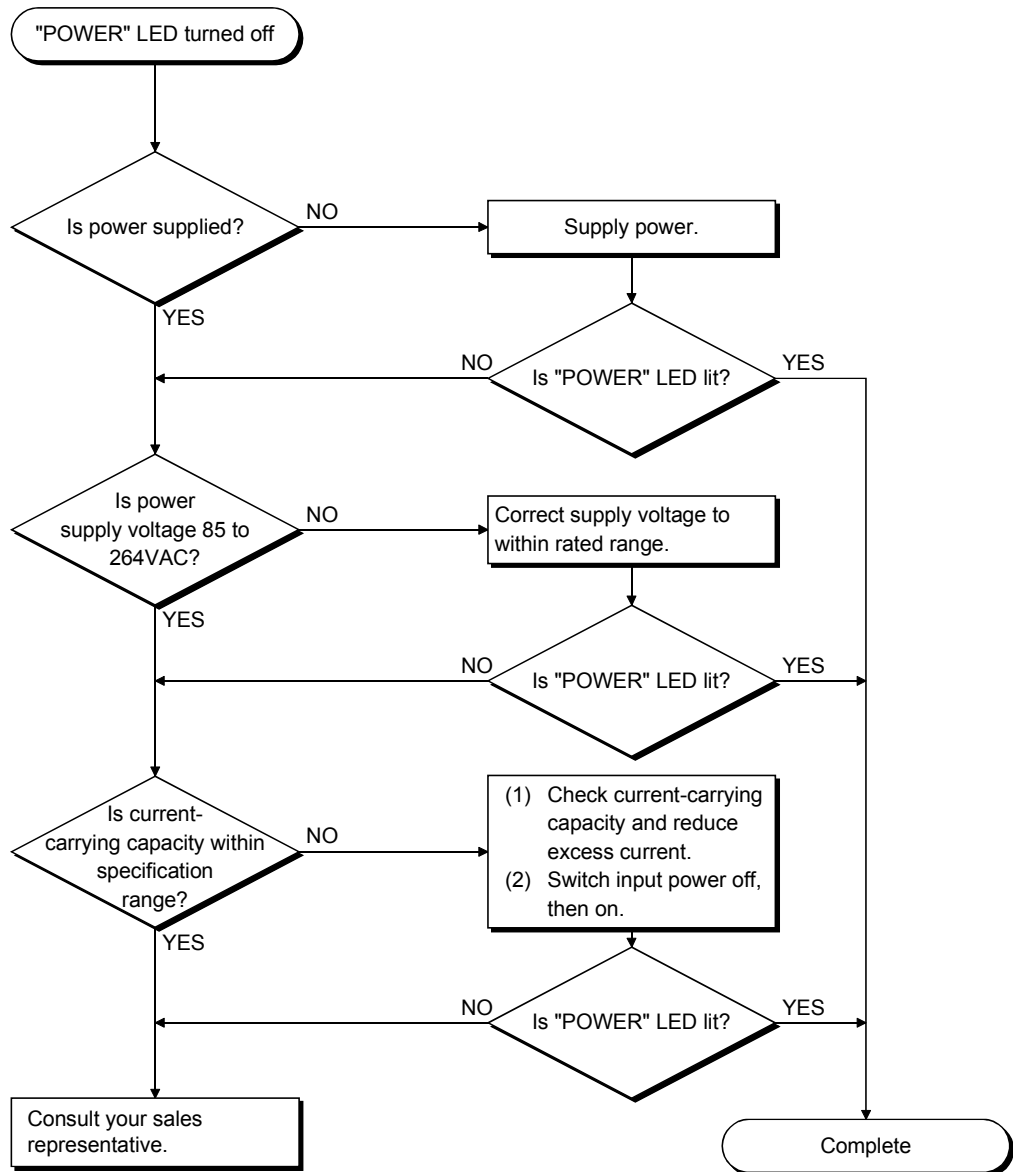
3.2.1 Troubleshooting flowcharts

Faults are described phenomenon by phenomenon.



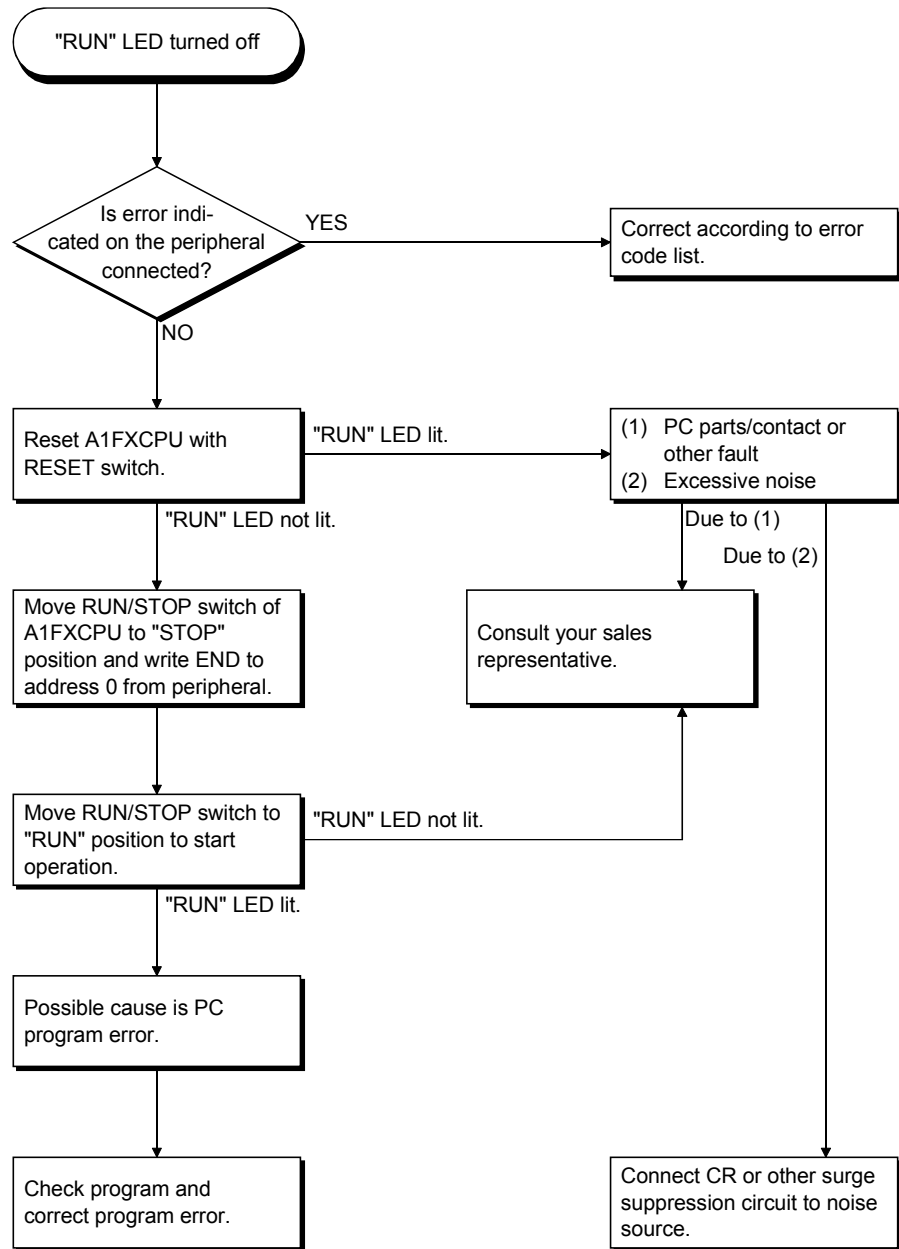
3.2.2 "POWER" LED turned off

The following flowchart gives what to do when the "POWER" LED is extinguished at power-on or during operation.



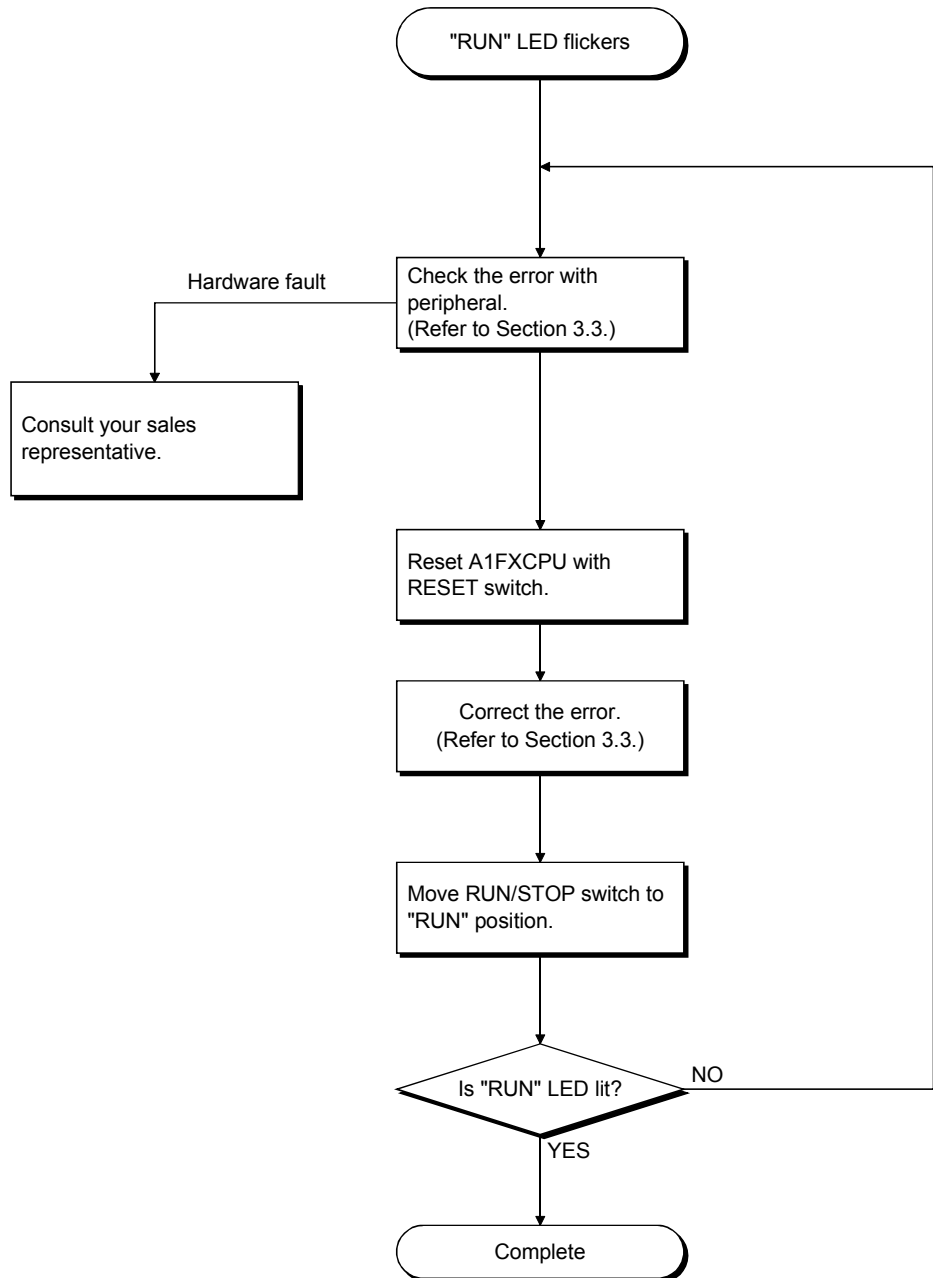
3.2.3 "RUN" LED turned off

The following flowchart gives what to do when the "RUN" LED is extinguished during operation.



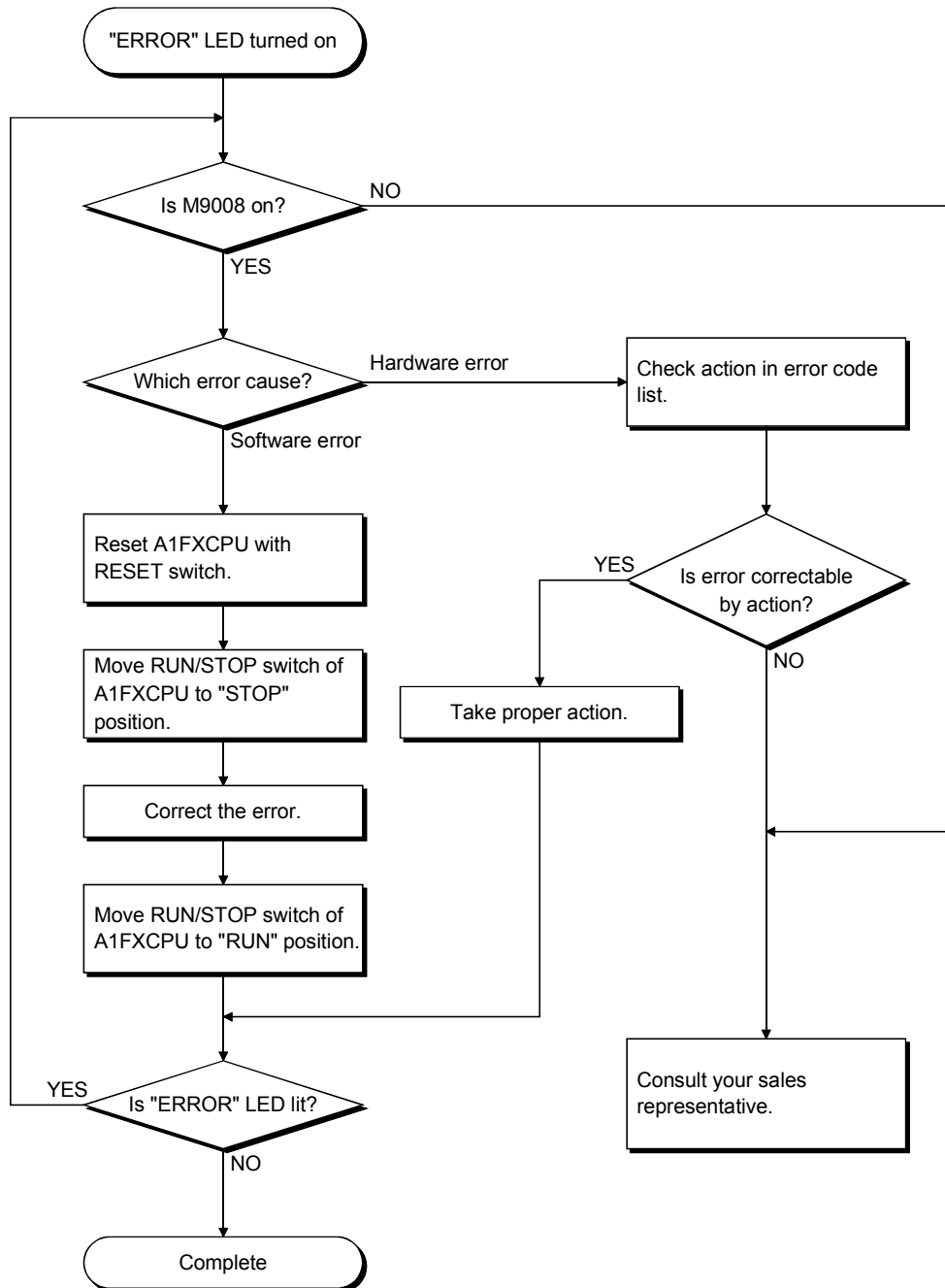
3.2.4 "RUN" LED flickers

The following flowchart gives what to do when the "RUN" LED flickers at power-on, at operation start or during operation.



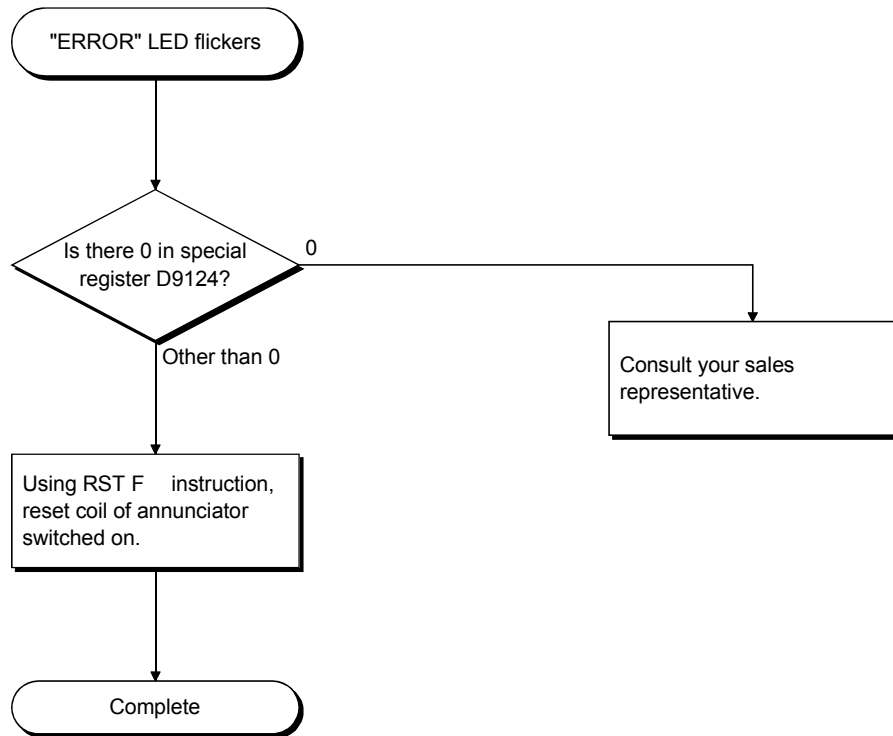
3.2.5 "ERROR" LED turned on

The following flowchart gives what to do when the "ERROR" LED is lit during operation.



3.2.6 "ERROR" LED flickers

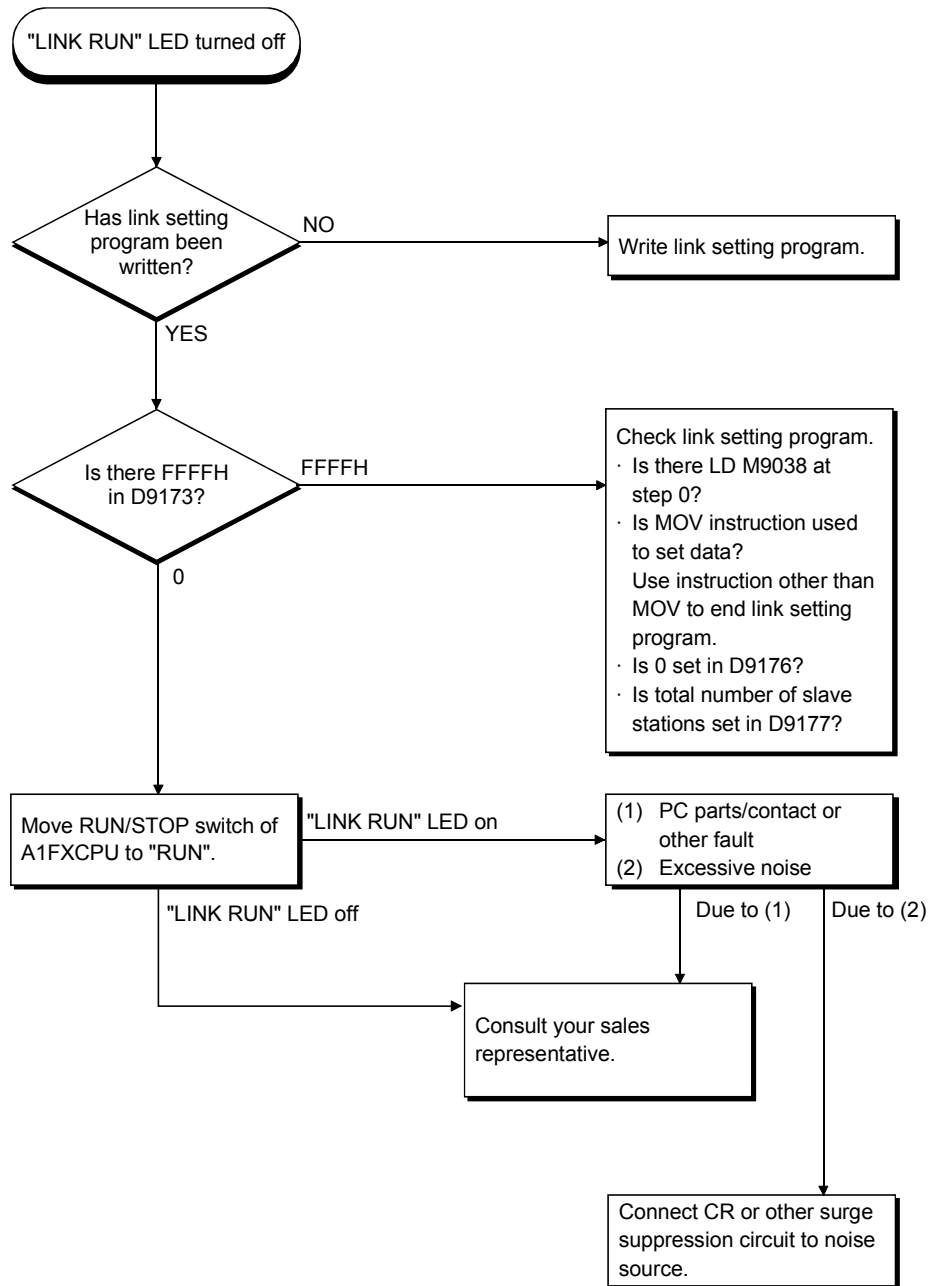
The following flowchart gives what to do when the "ERROR" LED flickers during operation.



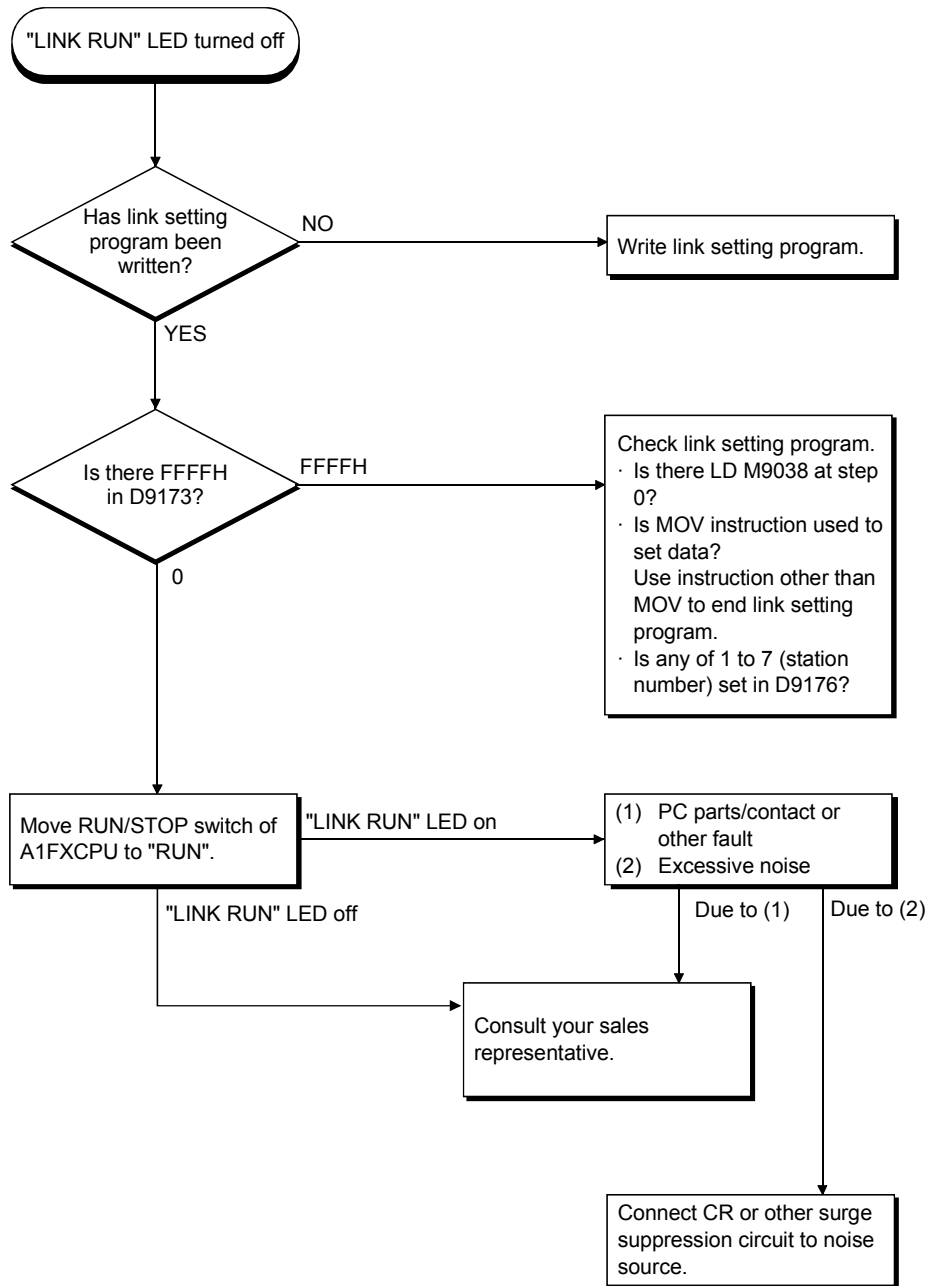
3.2.7 "LINK RUN" LED is off

The following flowchart gives what to do when the "LINK RUN" LED is off during link operation.

(1) For master station

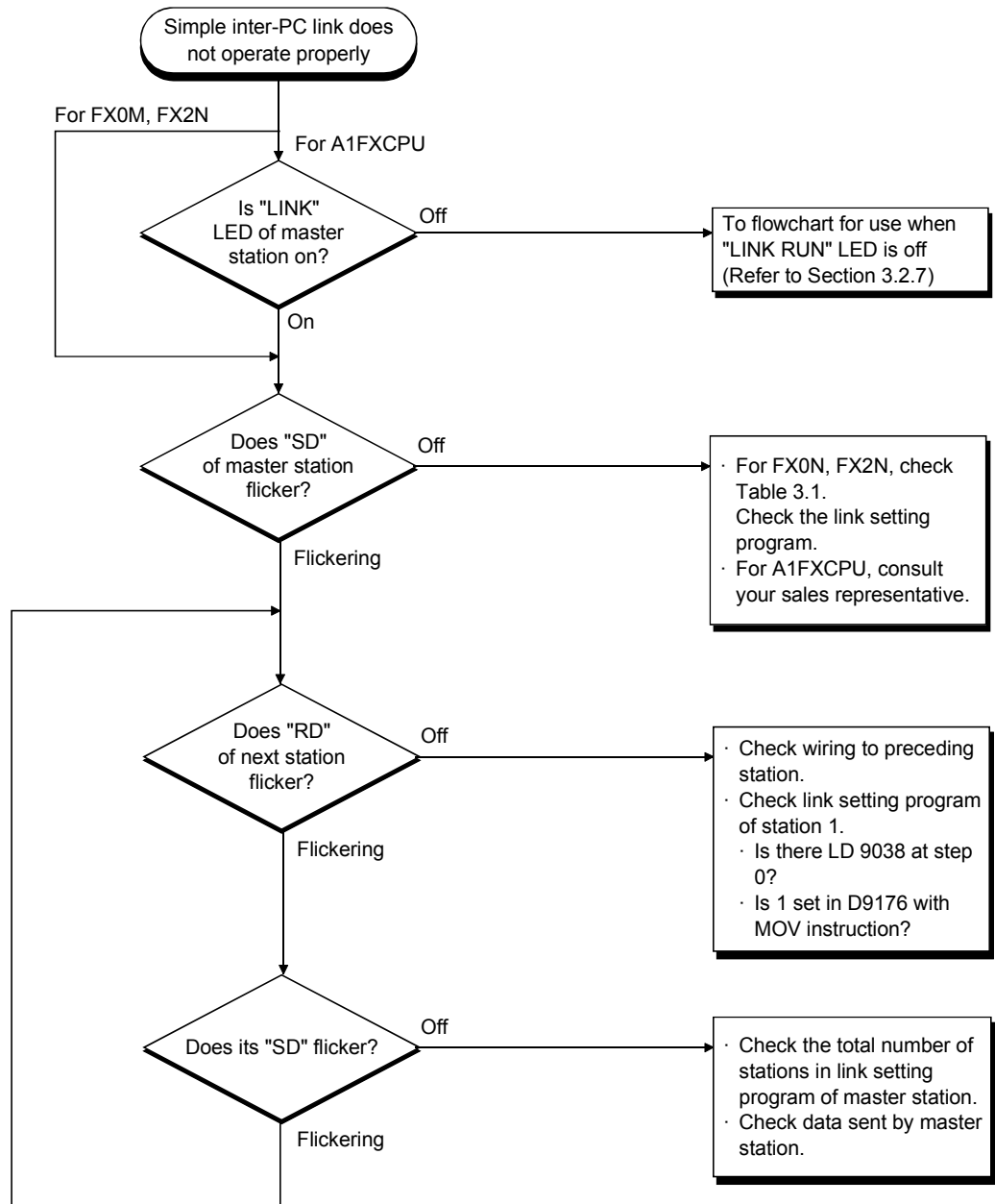


(2) For local station



3.2.8 Simple inter-PC link does not operate properly

(1) The following flowchart provides what to do when simple inter-PC link does not operate properly.



(2) When simple inter-PC link does not operate properly using the FX0N or FX2N, check the following items.

Table 3.1 Actions for Use of FX0N/FX2N

Item	Action
Is FX0N/FX2N version V.2.00 or later?	Version of all FX0N's and FX2N's connected to simple inter-PC link should be V.2.00 or later (simple inter-PC link compatible).
Is communication adaptor connected to FX0N/FX2N? ^{*1}	Connect FX0N-485ADP to the FX0N. Connect FX0N-485ADP or FX2N-485ADP to the FX2N.
Is FX2N-485ADP communication adaptor used with FX2N in 50m or longer overall distance?	For 50m or longer overall distance, use FX0N-485ADP communication adaptor with FX2N.
Is serial number of FX0N-485ADP 79**** or earlier? ^{*2}	Use FX0N-485ADP of 7X**** or later since FX0N-485ADP of 79**** or earlier serial number cannot be used with simple inter-PC link.
Is 24VDC supplied to FX0N-485ADP?	Supply 24VDC as FX0N-485ADP operates on external 24VDC.
Are M503 to M511 or D201 to D255 used with FX0N?	Use other devices because M503 to M511 and D201 to D255 are occupied by simple inter-PC link in FX0N.

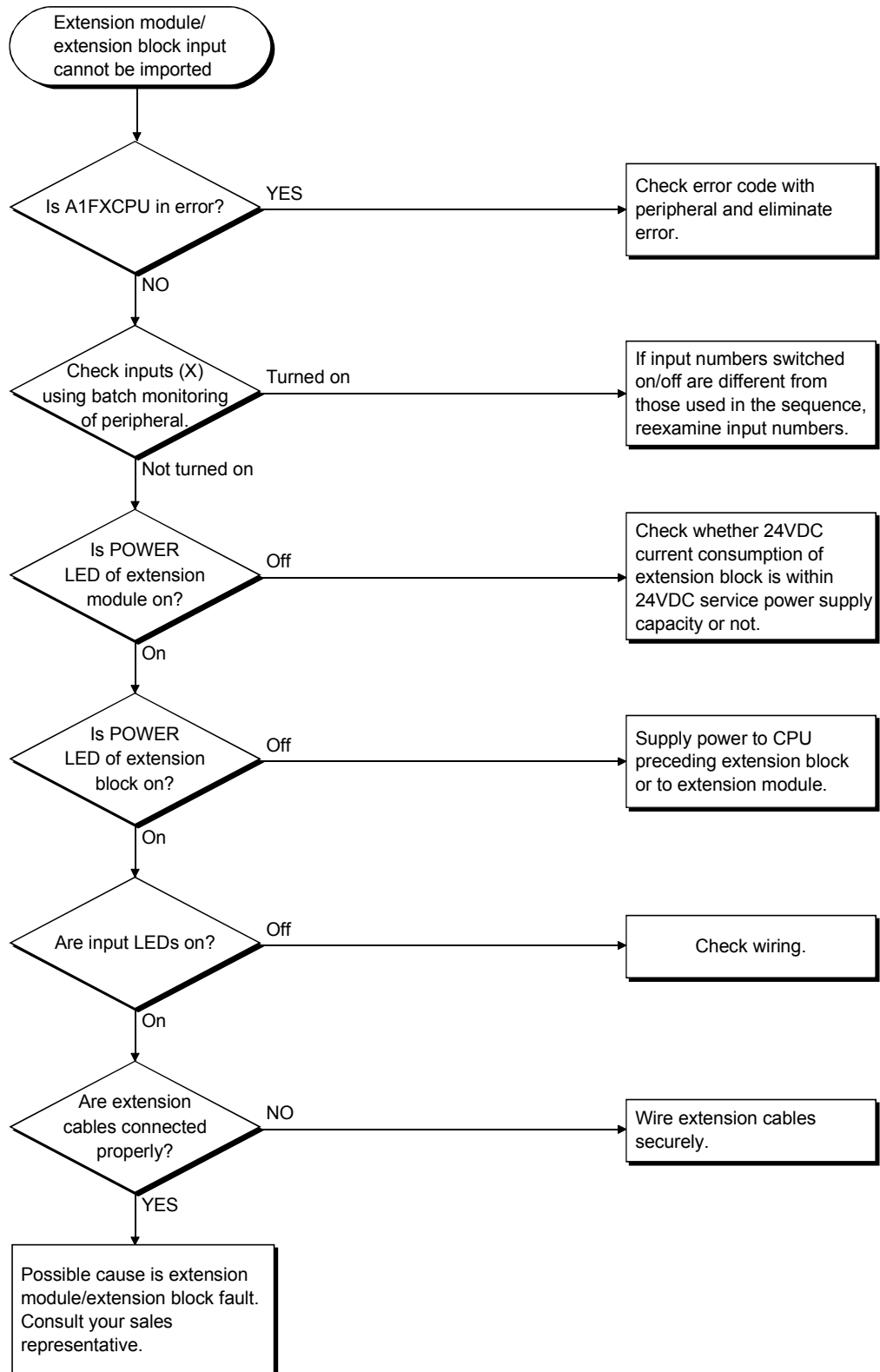
REMARKS

*1: The versions of the FX0N and FX2N are printed on the side face of the modules.

*2: The serial number of the FX0N-485ADP is printed on the side face of the module.

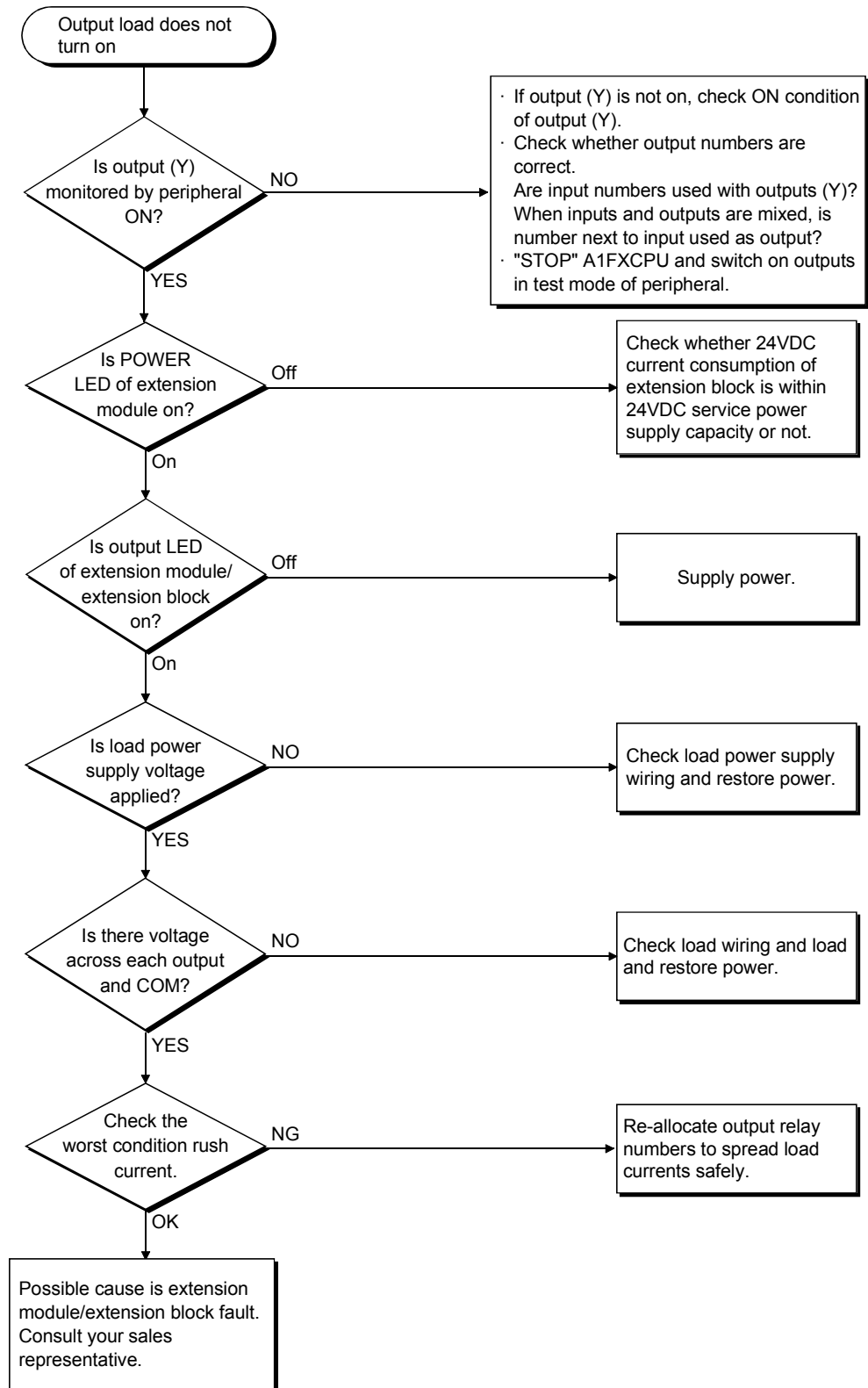
3.2.9 Extension module/extension block input cannot be imported

The following flowchart provides what to do when extension module/extension block input cannot be imported.



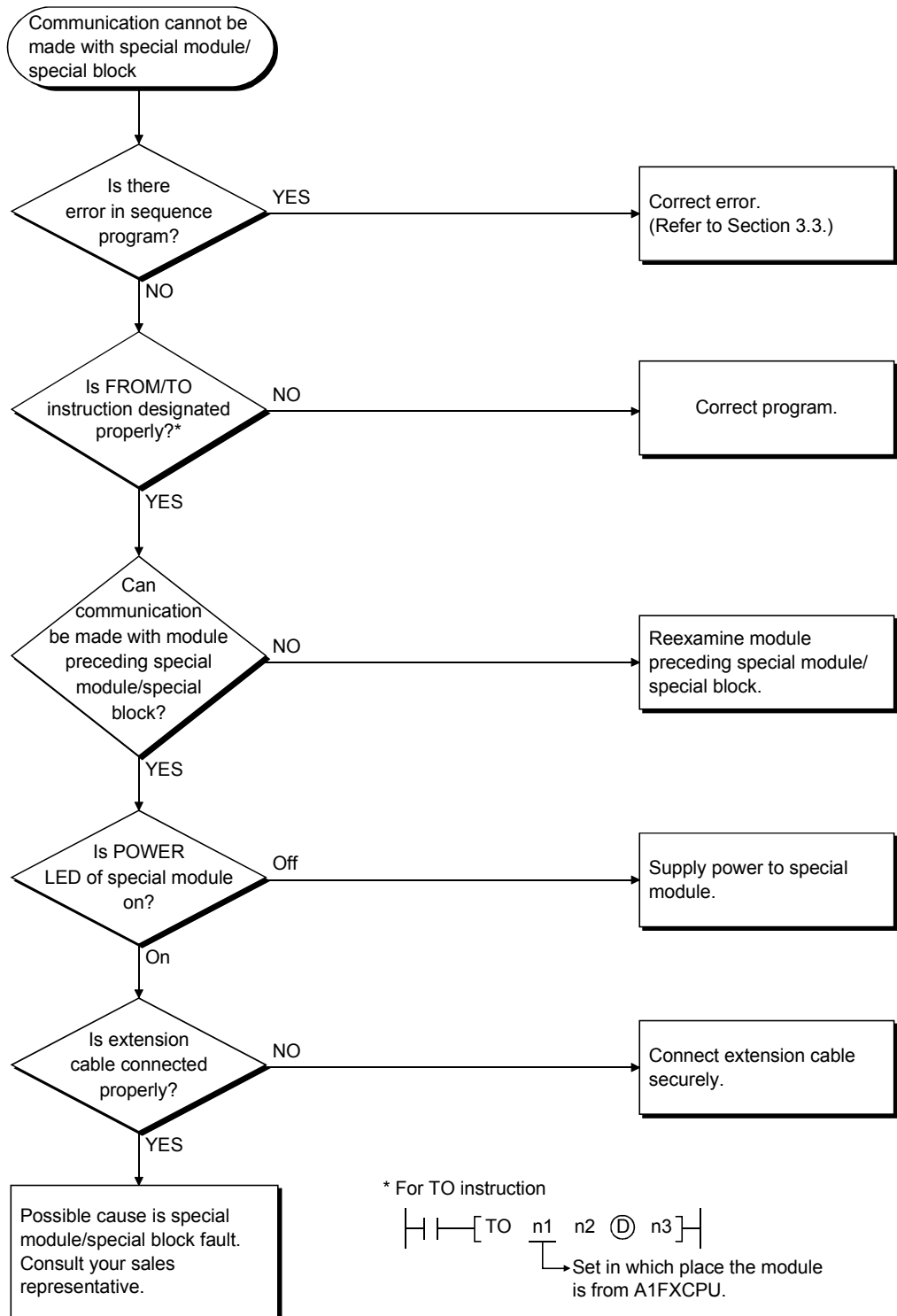
3.2.10 Output cannot be provided to extension module/extension block

The following flowchart offers what to do when output cannot be provided to extension module/extension block.



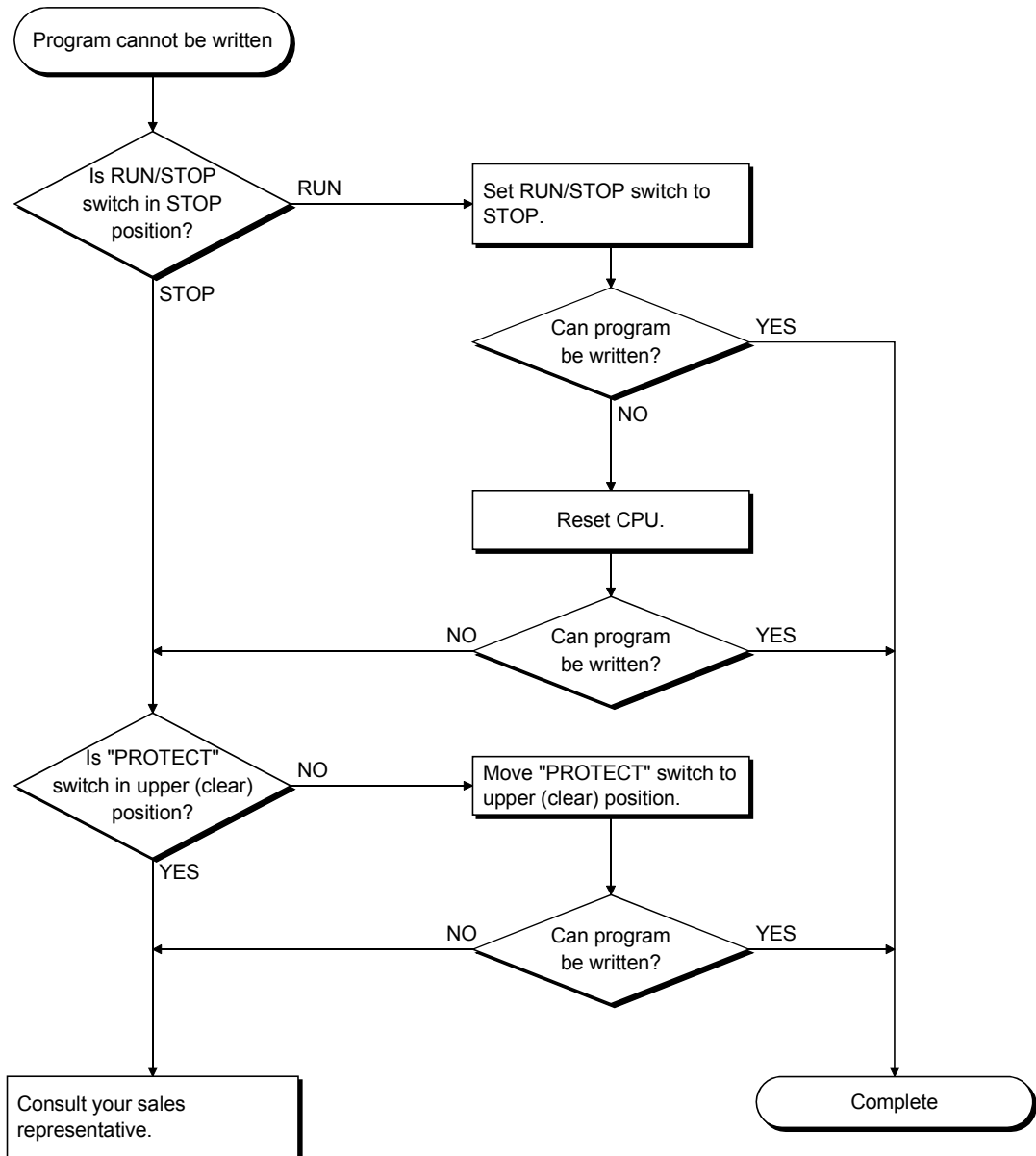
3.2.11 Communication cannot be made with special module/special block

The following flowchart deals with what to do when communication cannot be made with special module/special block.



3.2.12 Program cannot be written

The following flowchart provides what to do when a program or other data cannot be written to the CPU.



3.3 Error Code List

If an error occurs when the PC is run or while it is running, the self-diagnostic function causes the error to be displayed or the error code (including the step number) to be stored in the special register.

Table 3.3 indicates how to read the error code at error occurrence, error causes, and how to take action. Take proper action to remove the error cause.

Error messages, error codes, definitions and causes of errors, and corrective actions are given below.

Table 3.3 Error Code List

Error Message	Content of Special Register D9008 (BIN Value)	CPU Status	Error and Cause	Action
"INSTRUCT CODE ERR."	10	Stop	An unrecognized instruction code is included in the program. (1) The program including an unrecognized instruction code was written from the peripheral. (2) Memory contents changed for some reason, causing the unrecognized instruction code to be included. (3) Though the DIP switch is set to E ² PROM, the program is not written to E ² PROM.	(1) Read the error step with the peripheral and correct the program in that step. (2) Write the program to E ² PROM. (3) Write the program from the peripheral to E ² PROM.
"PARAMETER ERROR"	11	Stop	Parameter data in CPU memory changed due to noise.	Read the parameter data of CPU memory with the peripheral, check and correct the data, and write them to memory again.
"MISSING END INS."	12	Stop	There is no END (FEND) instruction in the program.	Write END at the end of the program.

Table 3.3 Error Code List (Continued)

Error Message	Content of Special Register D9008 (BIN Value)	CPU Status	Error and Cause	Action
"CAN'T EXECUTE (P)"	13	Stop	<ul style="list-style-type: none"> (1) No jump destination or several destinations specified for the CJ, SCJ, CALL(P) or JMP instruction. (2) The RET instruction has been executed with no corresponding CALL(P) instruction. (3) The CJ, SCJ, CALL(P) or JMP instruction has been executed with jump destination located after the END instruction. (4) The number of FOR instructions does not match that of NEXT instructions. (5) The JMP instruction is provided between FOR and NEXT to exit from FOR-NEXT. (6) Before the RET instruction is executed, the JMP instruction has been executed to exit from the subroutine. (7) The JMP instruction has been executed to jump into the step between FOR and NEXT or into the subroutine. 	<p>Read the error step with the peripheral and correct the program in that step. (Correct by inserting a jump destination or reducing destinations to one.)</p>

Table 3.3 Error Code List (Continued)

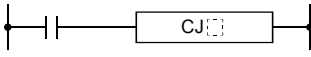
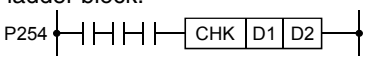
Error Message	Content of Special Register D9008 (BIN Value)	CPU Status	Error and Cause	Action			
"CHK FORMAT ERR."	14	Stop	<p>(1) The CHK instruction ladder block contains an instruction (including NOP) other than LD X□, LDI X□, AND X□ and ANI X□.</p> <p>(2) There are several CHK instructions.</p> <p>(3) There are more than 150 contacts in the CHK instruction ladder block.</p> <p>(4) The X device number in the CHK instruction ladder block is greater than X1FE.</p> <p>(5) There is no following ladder block before the CHK instruction ladder block.</p>  <p>(6) The device (number) of D1 in the <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>CHK</td><td>D1</td><td>D2</td></tr></table> instruction is not the same as that of the contact before the CJ□ instruction.</p> <p>(7) Pointer P254 is not provided at the beginning of the CHK instruction ladder block.</p> 	CHK	D1	D2	(1) Check for any of (1) to (7) error causes in the CHK instruction ladder block. If any, correct the fault with the peripheral and restart operation.
CHK	D1	D2					
"CAN'T EXECUTE (I)"	15	Stop	<p>(1) There are several interrupt pointer I numbers.</p> <p>(2) No IRET instruction in the interrupt program.</p> <p>(3) IRET instruction used outside the interrupt program.</p>	<p>(1) Create a corresponding number of interrupt programs or remove the same I numbers.</p> <p>(2) Check for IRET instruction in the interrupt program. If not found, write the IRET instruction.</p> <p>(3) Check for the IRET instruction outside the interrupt program. If found, delete the IRET instruction.</p>			
"RAM ERROR"	20	Stop	(1) The CPU could not access the data memory area of the CPU.	CPU hardware fault, contact your sales representative.			
"OPE. CIRCUIT ERR."	21	Stop	(1) The sequence processing operation circuit in the CPU does not operate properly.				

Table 3.3 Error Code List (Continued)

Error Message	Content of Special Register D9008 (BIN Value)	CPU Status	Error and Cause	Action
"WDT ERROR"	22	Stop	Scan time exceeds watchdog error monitor time. (1) User program scan time has increased. (2) Instantaneous power failure during program scan has caused scan time to increase.	(1) Calculate or check user program scan time and reduce it using CJ instruction, etc. (2) Check for instantaneous power failure by monitoring special register D9005 with the peripheral. If the value is other than 0, power supply voltage is instable. Check the power supply and reduce voltage fluctuation.
"END NOT EXECUTE"	24	Stop	(1) When executed, the END instruction was read as another instruction code due to noise, etc. (2) The END instruction has changed into another instruction code for some reason.	(1) Reset the CPU and run it again. If the error still persists, it is a CPU hardware fault. Consult your sales representative.
"WDT ERROR"	25	Stop	The CJ instruction or like caused the sequence program to enter a loop, making the END instruction inexecutable.	Check for programs which may go into an endless loop and correct if any.

Table 3.3 Error Code List (Continued)

Error Message	Content of Special Register D9008 (BIN Value)	CPU Status	Error and Cause	Action
"UNIT VERIFY ERR."	31	Stop (Run)	I/O data different from those at power-on. (1) The connection cable of extension module, extension block, special module or special block unplugged.	<p>(1) Monitor the special register D9116 (in blocks of 16 points) with the peripheral to check for "1" in the bit corresponding to the extension module, extension block, special module or special block resulting in verify error. Change the corresponding module or block.</p> <p>(2) Monitor the special register D9116 (in blocks of modules) with the peripheral to check for "1" in the bit corresponding to the extension module, extension block, special module or special block resulting in verify error. Change the corresponding module or block.</p> <p>(3) When the current module may be kept connected, reset the CPU with the RESET switch.</p>
"FUSE BREAK OFF"	32	Run (Stop)	(1) Power of the extension module/special module not on.	<p>(1) The peripheral may also be used to check whether the power of the extension module/special module is off or not. Monitor the special registers D9100-D9101 to check for "1" in the bit corresponding to the extension module/special module resulting in power-off.</p> <p>(2) Check whether the power of the extension module/special module is on or off.</p>

Table 3.3 Error Code List (Continued)

Error Message	Content of Special Register D9008 (BIN Value)	CPU Status	Error and Cause	Action
"CONTROL-BUS ERR."	40	Stop	FROM and/or TO instruction not executed. (1) Special module control bus error.	(1) Special module, CPU module or extension cable hardware fault. Change the module and check the faulty module. Consult your sales representative.
"SP. UNIT ERROR"	46	Stop (Run)	(1) Access to where no special module exists (FROM/TO instruction executed). (2) Extension module/special block not supplied with power.	(1) Read the error step with the peripheral, and check and correct the FROM/TO instruction in that step with the peripheral. (2) Switch on power of special module. Switch on power of extension module which supplies power to special block.
"LINK PARA. ERROR"	47	Run	(1) Link setting program setting data is outside setting range. (LINK RUN LED flickers)	(1) Correct the link setting program.
"OPERATION ERROR"	50	Run (Stop)	(1) BCD conversion result exceeded specified range (9999 or 99999999). (2) Setting in excess of specified device range made operation inexecutable. (3) File registers used in program without file register capacity being set.	(1) Read the error step with the peripheral, and check and correct the program in that step. (Check device setting range, BCD conversion value, etc.)
"MAIN CPU DOWN"	60	Stop	(1) Interrupt (INT) instruction used in microcomputer program. (2) CPU misoperated due to noise, etc. (3) CPU hardware fault.	(1) Remove INT instruction as it cannot be used in microcomputer program. (2) Eliminate noise. (3) Change CPU.
"BATTERY ERROR"	70	Run	(1) Battery voltage dropped below specified level. (2) Battery not connected.	(1) Change battery. (2) Connect battery when built-in RAM memory or power failure compensation is used.

3.4 Extension Module/Extension Block Troubleshooting

This section describes possible problems with the extension module/extension block and their corrective actions.

3.4.1 Input circuit

If the LED of the extension module/extension block is on or off but the corresponding input monitored by the programming panel is off or on, check to see if the input signal switch is on or off positively.

- (1) A contact fault is more likely to occur if the rated current-carrying capacity of the input switch is too large. A contact fault may have occurred due to oil ingress, etc.
- (2) When a resistor for turning on LED is provided in parallel with the input switch, the PC input may be activated through this parallel circuit if the input switch has turned off.
- (3) For input equipment such as an optical sensor, the input may not switch on positively because of its sensitivity change due to light emitter/receiver contamination, etc.
- (4) Inputs which switch on or off in a shorter time than the PC operation cycle may not be accepted.
- (5) If the output of 24VDC for sensor power supply is overloaded or shorted, the protective circuit is activated to drop the voltage of that output automatically, causing all PC inputs to be deactivated. In such a case, disconnect the wiring of the 24+ terminal.
- (6) Application of a different voltage to the input terminal may damage the input circuit.
- (7) As a possible cause is the contact fault of the input terminal connector on the extension module, unplug and plug the connector from and into the input terminal block.
- (8) Input circuit
The input primary and secondary circuits are photocoupler isolated and the secondary circuit is provided with a C-R filter to prevent misoperation due to the chattering of input contacts and the entry of noise from input lines.
For this reason, the PC is designed to delay approx. 10ms in response to input ON to OFF or OFF to ON changes.

3.4.2 Output circuit

If the LED of the extension module/extension block is on or off but the load does not switch on or off, it may be due to an open-circuit leakage current (triac output) or any of the following causes.

- (1) The relay output contacts may be fused due to overloading, load shorting, capacitance load's inrush current or like, or a contact fault may have occurred due to rough contact surfaces.
Note that the life of the relay contacts will be considerably shortened if inrush overcurrent is shut off.
- (2) As a possible cause is the contact fault of the output terminal connector on the extension module, unplug and plug the connector from and into the input terminal block.
- (3) C-R absorbers are connected in parallel with the triac output terminals of the FX2N series extension module/extension block. Hence, an open-circuit leakage current of 1mA/100VAC or 2mA/200VAC flows.

Appendix 1 Special Relay and Special Register Lists

Appendix 1.1 Special relays M

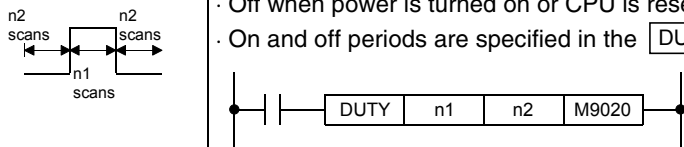
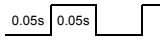
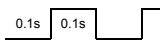
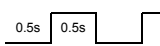
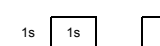

The special relays (M9000 to M9255) are internal relays which have predetermined applications in the PC.

Therefore, the special relays not marked *1 and *2 should not be switched on-off in the program. The special relays not given in the table should not be switched on-off, either.

Appendix Table 1.1 Special Relay List

Number	Name	Description	Details
M9000*1	Power-off	OFF: Normal ON : Power-off in a module	· Turned on when there is one or more extension modules whose external supply power is off. Remains on after normal status is restored.
M9002*1	I/O module verify error	OFF: Normal ON : Error	· Turned on when a module connected to the A1FXCPU is different from the one registered at power-on. Remains on after normal status is restored.
M9005*1	AC DOWN detection	OFF: AC supply normal ON : AC is down	· Turned on by a power failure of within 10ms. Reset when power goes from OFF to ON.
M9006	Battery low	OFF: Normal ON : Battery low	· Turned on when battery voltage drops below that specified. Turned off when battery voltage is restored.
M9007*1	Battery low latch	OFF: Normal ON : Battery low	· Turned on when battery voltage drops below that specified. Remains on after battery voltage is restored.
M9008*1	Self-diagnostic error	OFF: No error ON : Error	· Turned on by self-diagnosed error.
M9009	Annunciator detection	OFF: No annunciator detected ON : Annunciator detected	· Turned on when OUT F or SET F instruction is executed. Switched off when content of D9124 is reset to zero.
M9010	Operation error flag	OFF: No error ON : Error	· Turned on by an application instruction processing error. Turned off when error is removed.
M9011*1	Operation error flag	OFF: No error ON : Error	· Turned on by an application instruction processing error. Remains on after normal status is restored.
M9012	Carry flag	OFF: Carry off ON : Carry on	· Carry flag used in application instructions.
M9016	Data memory clear flag	OFF: Ignore ON : Output clear	· Clears all data memory (other than special relays and special registers) including the latch range in the remote run mode from a computer, etc. when M9016 is on.
M9017	Data memory clear flag	OFF: Ignore ON : Output clear	· Clears the unlatched data memory (other than special relays and special registers) in the remote run mode from a computer, etc. when M9017 is on.

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description	Details
M9020	User timing clock No. 0		<ul style="list-style-type: none"> · Scan dependent clock pulse. · Off when power is turned on or CPU is reset. · On and off periods are specified in the DUTY instruction. 
M9021	User timing clock No. 1		
M9022	User timing clock No. 2		
M9023	User timing clock No. 3		
M9024	User timing clock No. 4		
M9025*2	Clock data set request	OFF: Ignore ON : Set request	· Writes clock data in D9025-D9028 to clock elements after END instruction is executed in a scan when M9025 changed from OFF to ON.
M9026	Clock data error	OFF: No error ON : Error	· Turned on when error occurs in clock data (D9025-D9028). Off when there is no error.
M9028*2	Clock data read request	OFF: Ignore ON : Read request	· Reads clock data in BCD to D9025-D9028 when M9028 is on.
M9030	0.1 second clock		<ul style="list-style-type: none"> · Time dependent clock pulse: 0.1 second, 0.2 second, 1 second, 2 second, and 1 minute clocks. · Not scan dependent, i.e. will be switched during scan if corresponding time has elapsed. · Off when power is turned on or CPU is reset.
M9031	0.2 second clock		
M9032	1 second clock		
M9033	2 second clock		
M9034	1 minute clock		
M9036	Normally ON	ON _____	<ul style="list-style-type: none"> · Used as dummy contacts for initialization and application instructions in sequence program. · M9036 and M9037 are turned on and off independently of the RUN/STOP switch position on the CPU. · M9038 and M9039 change depending on the RUN/STOP switch position. · M9038 and M9039 are switched off if the RUN/STOP switch is in STOP position. M9038 is switched off (on for one scan only) and M9039 switched on (off for one scan only) if the RUN/STOP switch is not in STOP position.
M9037	Normally OFF	OFF _____	
M9038	On only for 1 scan after run	ON _____ OFF _____	
M9039	RUN flag (off only for 1 scan after run)	ON _____ OFF _____ ON _____ OFF _____	
M9040	PAUSE enable coil	OFF: PAUSE disabled ON : PAUSE enable	<ul style="list-style-type: none"> · If M9040 is on at the time when the remote pause contact has turned on, the PC enters the PAUSE mode and M9041 is turned on.
M9041	PAUSE status contact	OFF: Other than pause ON : During pause	

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description	Details
M9042	Stop status contact	OFF: Other than stop ON : During stop	· Turned on when the switch is in STOP position.
M9043	Sampling trace complete	OFF: During sampling trace ON : Sampling trace complete	· Turned on to indicate that sampling trace has been recorded the specified number of times after execution of STRA instruction. Reset when STRAR instruction is executed.
M9046	Sampling trace	OFF: Trace inactive ON : Trace active	· Switched on during sampling trace.
M9047	Sampling trace ready	OFF: Sampling trace stop ON : Sampling trace start	· M9047 should be switched on to start sampling trace. By turning off M9047, sampling trace is stopped.
M9049	Output character count changing	OFF: Output of up to NULL code ON : 16 characters output	· When M9049 is off, all characters up to NULL (00H) code are output at a time. · When M9049 is on, 16 characters are output in ASCII.
M9052*2	SEG instruction switching	OFF: 7 segment display ON : Partial I/O refresh	· Executed as 7-segment display instruction when M9052 is off. · Executed as I/O partial refresh instruction when M9052 is on.
M9055	Status latch completion flag	OFF: Incomplete ON : Complete	· Turned on when status latch is completed. Turned off by reset instruction.
M9084*2	Error check	OFF: Checks enabled ON : Checks disabled	· Specify whether the following errors are to be checked or not after the END instruction is executed (to reduce END processing time). · Extension module/special module power off · I/O module verify error · Battery error
M9100	SFC program presence/absence	OFF: SFC program absent ON : SFC program present	· Turned on when the SFC program is registered and the SFC program running work area can be reserved. Turned off when the SFC program is not registered or the SFC program running work area cannot be reserved.
M9101*2	SFC program run enable/disable	OFF: SFC program disable ON : SFC program enable	· Turned on by the user when executing the SFC program. Turning off M9101 turns off the operation output of the executed step and stops the SFC program.
M9102*2	SFC program start status	OFF: Initial start ON : Resumption	· Select the start step when M9101 is used to restart the SFC program. OFF : Running conditions at SFC program stop are all cleared and the SFC program is started at the initial step of block 0. ON : The SFC program is resumed at the step of the block executed at the time when it was stopped. · Since M9102 is automatically latched, it retains its value if power is switched off.

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description	Details
M9103* ²	Continuous transition enable/disable	OFF: Continuous transition disable ON : Continuous transition enable	· Select whether the steps whose transition conditions have been satisfied within one scan are all executed or not when the transition conditions of consecutive steps have all been satisfied. ON : Executed consecutively (continuous transition enable) OFF : One step is executed per scan (continuous transition disable)
M9104	Continuous transition obstruction flag	OFF: At transition end ON : When there is no transition	· Turned on when continuous transition is not executed with continuous transition enabled. Turned off when one-step transition ends. By writing M9104 with AND as transition condition, continuous transition of corresponding steps can be obstructed.
M9108* ²	Step transition monitor timer start (corresponding to D9108)		
M9109* ²	Step transition monitor timer start (corresponding to D9109)		
M9110* ²	Step transition monitor timer start (corresponding to D9110)		
M9111* ²	Step transition monitor timer start (corresponding to D9111)	OFF: Monitor timer reset ON : Monitor timer start	Turned on to start timing of the step transition monitor timer. Turned off to reset the monitor timer.
M9112* ²	Step transition monitor timer start (corresponding to D9112)		
M9113* ²	Step transition monitor timer start (corresponding to D9113)		
M9114* ²	Step transition monitor timer start (corresponding to D9114)		

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description	Details
M9119	Interrupt control during FROM/TO instruction execution	OFF: Interrupt disable ON : Interrupt enable	· OFF : Interrupt disabled during FROM/TO instruction execution · ON : Interrupt enabled during FROM/TO instruction execution
M9120	Interrupt pointer I0 polarity setting	OFF: X0 leading edge ON : X0 trailing edge	· OFF : Interrupt accepted on leading edge of X0 · ON : Interrupt accepted on trailing edge of X0
M9121	Interrupt pointer I1 polarity setting	OFF: X1 leading edge ON : X1 trailing edge	· OFF : Interrupt accepted on leading edge of X1 · ON : Interrupt accepted on trailing edge of X1
M9122	Interrupt pointer I2 polarity setting	OFF: X2 leading edge ON : X2 trailing edge	· OFF : Interrupt accepted on leading edge of X2 · ON : Interrupt accepted on trailing edge of X2
M9123	Interrupt pointer I3 polarity setting	OFF: X3 leading edge ON : X3 trailing edge	· OFF : Interrupt accepted on leading edge of X3 · ON : Interrupt accepted on trailing edge of X3
M9124	Interrupt pointer I4 polarity setting	OFF: X4 leading edge ON : X4 trailing edge	· OFF : Interrupt accepted on leading edge of X4 · ON : Interrupt accepted on trailing edge of X4
M9125	Interrupt pointer I5 polarity setting	OFF: X5 leading edge ON : X5 trailing edge	· OFF : Interrupt accepted on leading edge of X5 · ON : Interrupt accepted on trailing edge of X5
M9126	X-axis pulse output logic switching	OFF: Negative logic ON : Positive logic	· Set the pulse output logic (negative logic/positive logic) according to the servo amplifier and stepping motor driver used.
M9127	X-axis pulse method switching	OFF: CW/CCW ON : PULSE/SIGN	· Set the pulse output method (CW/CCW, PULSE/SIGN).
M9128	Enable/disable of X axis use	OFF: Disabled ON : Enabled	· Turned off when the simple positioning function is not used. · Turned on when simple positioning is used.
M9129	X-axis direction switching	OFF: CW for forward rotation CCW for reverse rotation ON : CW for reverse rotation CCW for forward rotation	· Set the direction of rotation.
M9130	X-axis pulse output start signal	OFF to ON: Pulse output start	· Turned on to start X-axis positioning. · Turned from off to on to start X-axis pulse output.
M9131	X-axis deceleration-to-stop signal	OFF to ON: Deceleration to stop	· Turned on to decelerate the X axis to a stop at any point during positioning. · Turned from off to on to decelerate the X axis to a stop. · After a stop, turned off before starting positioning.

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description	Details
M9132	X-axis forced stop signal	OFF to ON: Stop	<ul style="list-style-type: none"> · Turned on to force the X axis to stop without deceleration at any point during positioning. · Turned from off to on to stop the X axis immediately without deceleration. (Stopped during on) · After a stop, turned off before starting positioning.
M9133	X- and Y-axis simultaneous pulse output start signal	OFF to ON: Pulse output start	<ul style="list-style-type: none"> · Turned on to start the X and Y axes simultaneously. · Turned from off to on to start the pulse output of the X and Y axes.
M9134	X- and Y-axis simultaneous deceleration-to-stop signal	OFF to ON: Deceleration to stop	<ul style="list-style-type: none"> · Turned on to decelerate the X and Y axes to a stop simultaneously at any point during positioning. · Turned from off to on to decelerate the X and Y axes to a stop. · After a stop, turned off before starting positioning.
M9135	X- and Y-axis simultaneous forced stop signal	OFF to ON: Stop	<ul style="list-style-type: none"> · Turned on to force the X and Y axes to stop simultaneously without deceleration at any point during positioning. · Turned from off to on to stop the X and Y axes immediately without deceleration. (Stopped during on) · After a stop, turned off before starting positioning.
M9136	Y-axis pulse output logic switching	OFF: Negative logic ON : Positive logic	<ul style="list-style-type: none"> · Set the pulse output logic (negative logic/positive logic) according to the servo amplifier and stepping motor driver used.
M9137	Y-axis pulse method switching	OFF: CW/CCW ON : PULSE/SIGN	<ul style="list-style-type: none"> · Set the pulse output method (CW/CCW, PULSE/SIGN).
M9138	Enable/disable of Y axis use	OFF: Disabled ON : Enabled	<ul style="list-style-type: none"> · Turned off when the simple positioning function is not used. · Turned on when simple positioning is used.
M9139	Y-axis direction switching	OFF: CW for forward rotation CCW for reverse rotation ON : CW for reverse rotation CCW for forward rotation	<ul style="list-style-type: none"> · Set the direction of rotation.
M9140	Y-axis pulse output start signal	OFF to ON: Pulse output start	<ul style="list-style-type: none"> · Turned on to start Y-axis positioning. · Turned from off to on to start Y-axis pulse output.
M9141	Y-axis deceleration-to-stop signal	OFF to ON: Deceleration to stop	<ul style="list-style-type: none"> · Turned on to decelerate the Y axis to a stop at any point during positioning. · Turned from off to on to decelerate the Y axis to a stop. · After a stop, turned off before starting positioning.
M9142	Y-axis forced stop signal	OFF to ON: Stop	<ul style="list-style-type: none"> · Turned on to force the Y axis to stop without deceleration at any point during positioning. · Turned from off to on to stop the Y axis immediately without deceleration. (Stopped during on) · After a stop, turned off before starting positioning.

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description	Details
M9143	X-axis pulse output status	OFF: During stop ON : During pulse output	<ul style="list-style-type: none"> · Off while the X-axis pulse output is stopped. · On during X-axis pulse output.
M9144	Y-axis pulse output status	OFF: During stop ON : During pulse output	<ul style="list-style-type: none"> · Off while the Y-axis pulse output is stopped. · On during Y-axis pulse output.
M9145	X-axis setting error	OFF: Normal ON : Outside data range	<ul style="list-style-type: none"> · Turned on if. · X-axis setting data is outside range. · Running frequency is lower than the start/stop frequency of the X axis. · X-axis or simultaneous start pulse output start signal is turned on while the deceleration-to-stop/forced stop signal of the X axis is on.
M9146	Y-axis setting error	OFF: Normal ON : Outside data range	<ul style="list-style-type: none"> · Turned on if. · Y-axis setting data is outside range. · Running frequency is lower than the start/stop frequency of the Y axis. · Y-axis or simultaneous start pulse output start signal is turned on while the deceleration-to-stop/forced stop signal of the Y axis is on.

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description
M9147	CH1 counter value greater	· Turned on when CH1 counter value > set value (D9157, D9158).
M9148	CH1 counter value coincidence	· Turned on when CH1 counter value = set value (D9157, D9158). · Turned off when the coincidence signal reset command (M9151) is turned on.
M9149	CH1 counter value less	· Turned on when CH1 counter value < set value (D9157, D9158).
M9150	CH1 external preset request detection	· Turned on when a preset request is given by the external input (X8). · Turned off when the external preset detection signal reset (M9156) is turned on.
M9151	CH1 coincidence signal reset command	· Signal used to reset the counter value coincidence signal. · When M9151 is turned on, M9148 is turned off.
M9152	CH1 preset command	· Signal used to write the preset value stored in D9153 and D9152 (Valid when turned from off to on)
M9153	CH1 down count command	· Signal used to set up/down count in the single-phase mode OFF : Up count ON : Down count
M9154	CH1 count enable	· Turned on when count operation is performed.
M9155	CH1 present value read request	· Turned on when the present value of the high-speed counter is read to D9160 and D9161. (Valid when turned from off to on)
M9156	CH1 external preset detection reset command	· Turned on when the external preset request detection signal (M9150) is turned off.
M9157	CH1 ring counter setting	· Turned on when ring counter operation is performed.
M9158	CH1 counting speed selection	· Used to change the counting speed of the high-speed counter. OFF : 60kpps in both 1- and 2-phase modes ON : 10kpps in 1-phase mode, 7kpps in 2-phase mode.
M9159	CH1 counter function selection start command	OFF : Count operation is performed. OFF to ON : Counter's present value is latched. (D9159=1) ON : Count operation is stopped. (D9159=0)

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description
M9167	CH2 counter value greater	· Turned on when CH2 counter value > set value (D9167, D9168).
M9168	CH2 counter value coincidence	· Turned on when CH2 counter value = set value (D9167, D9168). · Turned off when the coincidence signal reset command (M9171) is turned on.
M9169	CH2 counter value less	· Turned on when CH2 counter value < set value (D9167, D9168).
M9170	CH2 external preset request detection	· Turned on when a preset request is given by the external input (X9). · Turned off when the external preset detection signal reset (M9176) is turned on.
M9171	CH2 coincidence signal reset command	· Signal used to reset the counter value coincidence signal. · When M9171 is turned on, M9168 is turned off.
M9172	CH2 preset command	· Signal used to write the preset value stored in D9162 and D9163 (Valid when turned from off to on)
M9173	CH2 down count command	· Signal used to set up/down count in the single-phase mode OFF : Up count ON : Down count
M9174	CH2 count enable	· Turned on when count operation is performed.
M9175	CH2 present value read request	· Turned on when the present value of the high-speed counter is read to D9170 and D9171. (Valid when turned from off to on)
M9176	CH2 external preset detection reset command	· Turned on when the external preset request detection signal (M9170) is turned off.
M9177	CH2 ring counter setting	· Turned on when ring counter operation is performed.
M9178	CH2 counting speed selection	· Used to change the counting speed of the high-speed counter. OFF : 60kpps in both 1- and 2-phase modes ON : 10kpps in 1-phase mode, 7kpps in 2-phase mode.
M9179	CH2 counter function selection start command	OFF : Count operation is performed. OFF to ON : Counter's present value is latched. (D9169=1) ON : Count operation is stopped. (D9169=0)
M9180	Step trace completion flag	· Turned on at completion of the step trace of all specified blocks. Turned off at start of step trace.
M9181	Step trace execution flag	· On during execution of step trace. Turned off at completion or stop of step trace.
M9182*2	Step trace enable	· Select enable/disable of step trace execution. ON : Step trace execution is enabled. OFF : Step trace execution is disabled. When M9182 is turned off during step trace execution, trace is suspended.

Appendix Table 1.1 Special Relay List (Continued)

Number	Name	Description/Details	Relevant Station
M9183	Data transmission sequence error (master station)	<ul style="list-style-type: none"> · Signal used in the local stations to check whether the master station is normal or not. · Turned on when an error occurs in the master station during execution of data transmission sequence. · Turned off when link is resumed after the faulty master station is restored from the error. (Master station normal) 	Local station
M9184	Data transmission sequence error (local station 1)	<ul style="list-style-type: none"> · Signals used in the master and local stations to check whether the local station is normal or not. · Turned on when an error occurs in the corresponding local station during execution of data transmission sequence. · Turned off when link is resumed after the faulty local station is restored from the error. (Local station normal) 	Master station Local station
M9185	Data transmission sequence error (local station 2)		
M9186	Data transmission sequence error (local station 3)		
M9187	Data transmission sequence error (local station 4)		
M9188	Data transmission sequence error (local station 5)		
M9189	Data transmission sequence error (local station 6)		
M9190	Data transmission sequence error (local station 7)		
M9191	Data transmission sequence in progress	<ul style="list-style-type: none"> · Signal used to check whether data transmission sequence is normal or not. (M9184 to M9190 are used to check whether the corresponding local stations are normal or not.) · On while data transmission sequence is in normal progress. (Turned on when any one local station responds to a sending request.) · Turned off when the master station or all local stations become faulty. 	
M9192	Error clear	<ul style="list-style-type: none"> · While on, clears M9183 to M9190 and D9183 and D9198. 	
M9193	Loopback self-check	<ul style="list-style-type: none"> · Signal used to make self-check. · Turned on to start check. · Turned off to end check. 	
M9196*2	Operation output at block stop	<ul style="list-style-type: none"> · Select operation output at a block stop. ON : ON/OFF state of the coil used for operation output of the step being executed at a block stop are held. OFF : All coil outputs are turned off. (Operation output by SET instruction is retained independently of whether M9196 is on or off.) 	—

POINTS
<p>(1) All contents of special relays are switched "off" by any of power-off, latch clear and reset operations. When the RUN/STOP switch is moved to "STOP", contents are held.</p> <p>(2) Special relays marked *1 above are latched "on" and will remain "on" after normal status is restored. Switch them "off" as follows.</p> <p>(a) From the user program Use the ladder rung shown on the right and turn on the reset command contact to clear the special relay M.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;"> <p>Reset command</p> </div> <div style="margin-left: 20px;"> <p>Specify the device to be reset.</p> </div> </div> <p>(b) From the peripheral equipment Use the test function of the peripheral to force-reset the special relay. For the operation procedure, refer to the corresponding peripheral manual.</p> <p>(c) Press the RESET switch on the CPU front to switch the special relays "off".</p> <p>(3) Special relays marked *2 are switched on/off in the sequence program.</p>

Appendix 1.2 Special registers D

The special registers are data registers having predetermined applications in the PC. Therefore, data should not be written to these registers (except those marked *1 and *2 in the table) in the program.

Data should not be written to the registers not given in the table, either.

Appendix Table 1.2 Special Register List

Number	Name	Description	Details
D9000	Power-off	Module number location with power-off	<ul style="list-style-type: none"> Indicates in hexadecimal the first I/O address of the lowest extension module number in which power switched off (e.g. "50" for an extension module having Y50-6F addresses). Use the hexadecimal monitor function on the peripheral equipment to read the data. (Cleared when D9100 is reset to 0.)
D9002	I/O module verify error	Module number location with I/O verify error	<ul style="list-style-type: none"> Indicates in hexadecimal the first I/O address of the lowest extension module number whose data is different from that registered at power-on (address written as in D9000). Use the hexadecimal monitor function on the peripheral equipment to read the data. (Cleared when D9116-D9123 are reset to 0.)
D9005*1	AC DOWN counter	AC DOWN count	<ul style="list-style-type: none"> 1 is added each time the input voltage drops to 80% or less of rated while the CPU module is operating, and the value stored in BIN.
D9008*1	Self-diagnostic error	Self-diagnostic error number	<ul style="list-style-type: none"> Records the self-diagnosed error number in BIN.
D9009	Annunciator detection	F number whose external failure was detected	<ul style="list-style-type: none"> Records the number (in BIN) of the earliest annunciator coil (F) to be switched on by <input type="checkbox"/>OUT F or <input type="checkbox"/>SET F. D9009 can be cleared by executing the <input type="checkbox"/>RST F or <input type="checkbox"/>LEDR instruction.0 If another F number has been detected, the clearing of D9009 causes the next number to be stored in D9009.
D9010	Error step	Step number location of operation error	<ul style="list-style-type: none"> Records the step number (in BIN) at which an application instruction processing error occurred. D9010 data is updated each time operation error occurs.
D9011	Error step	Step number location of operation error	<ul style="list-style-type: none"> Records the step number (in BIN) at which an application instruction processing error occurred. D9011 data cannot be updated until special relay M9011 is reset by the user program.
D9014	I/O control mode	I/O control mode number	<ul style="list-style-type: none"> Returns the preset I/O control mode with the following number. 3: Both input and output refresh

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description	Details																															
D9015	CPU operating status	CPU operating status	<p>The operating status of the CPU is stored in D9015 as shown below.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2">CPU RUN/STOP Switch</td> <td>No change in remote RUN/STOP</td> </tr> <tr> <td>0</td> <td>RUN</td> <td></td> </tr> <tr> <td>1</td> <td>STOP</td> <td></td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2">Remote RUN/STOP by Parameter Setting</td> </tr> <tr> <td>0</td> <td>RUN</td> </tr> <tr> <td>1</td> <td>STOP</td> </tr> <tr> <td>2</td> <td>PAUSE *1</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2">Status in Program</td> </tr> <tr> <td>0</td> <td>Other than below</td> </tr> <tr> <td>1</td> <td>STOP instruction executed</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2">Remote RUN/STOP by Computer</td> </tr> <tr> <td>0</td> <td>RUN</td> </tr> <tr> <td>1</td> <td>STOP</td> </tr> <tr> <td>2</td> <td>PAUSE *1</td> </tr> </table> <p>*1: The operation mode remains in the RUN mode if the switch is set to PAUSE when the CPU is running and M9040 is off.</p>	CPU RUN/STOP Switch		No change in remote RUN/STOP	0	RUN		1	STOP		Remote RUN/STOP by Parameter Setting		0	RUN	1	STOP	2	PAUSE *1	Status in Program		0	Other than below	1	STOP instruction executed	Remote RUN/STOP by Computer		0	RUN	1	STOP	2	PAUSE *1
CPU RUN/STOP Switch		No change in remote RUN/STOP																																
0	RUN																																	
1	STOP																																	
Remote RUN/STOP by Parameter Setting																																		
0	RUN																																	
1	STOP																																	
2	PAUSE *1																																	
Status in Program																																		
0	Other than below																																	
1	STOP instruction executed																																	
Remote RUN/STOP by Computer																																		
0	RUN																																	
1	STOP																																	
2	PAUSE *1																																	
D9016	ROM/RAM setting	1: RAM 2: E ² PROM	Indicates the setting of memory selection switch and stores 1 or 2 in BIN.																															
D9017	Scan time	Minimum scan time (in 10ms increments)	Records the minimum program scan time as a BIN integer multiple of 10ms.																															
D9018	Scan time	Scan time (in 10ms increments)	Records the program scan time as a BIN integer multiple of 10ms.																															
D9019	Scan time	Maximum scan time (in 10ms increments)	Records the maximum program scan time as a BIN integer multiple of 10ms.																															
D9020*1	Constant scan	Constant scan time (Set by user in 10ms increments)	<p>Set the interval between consecutive program starts in multiples of 10ms.</p> <p>0 : No setting 1 to 200 : Set.</p> <p>Program is executed at intervals of (set value) × 10ms.</p>																															

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description	Details																
D9025* ²	Clock data	Clock data (Year, month)	<p>Indicates the year (lower 2 digits) and month in BCD as shown below.</p> <p>Example: Year 87, July H8707</p>																
D9026* ²	Clock data	Clock data (Day, hour)	<p>Indicates the day and hour in BCD as shown below.</p> <p>Example: 31st, 10 o'clock H3110</p>																
D9027* ²	Clock data	Clock data (Minute, second)	<p>Indicates the minute and second in BCD as shown below.</p> <p>Example: 35 minutes, 48 seconds H3548</p>																
D9028* ²	Clock data	Clock data (0, day of the week)	<p>Indicates the day of the week in BCD as shown below.</p> <p>Always set "0".</p> <table border="1"> <thead> <tr> <th colspan="2">Day of the week</th> </tr> </thead> <tbody> <tr><td>0</td><td>Sunday</td></tr> <tr><td>1</td><td>Monday</td></tr> <tr><td>2</td><td>Tuesday</td></tr> <tr><td>3</td><td>Wednesday</td></tr> <tr><td>4</td><td>Thursday</td></tr> <tr><td>5</td><td>Friday</td></tr> <tr><td>6</td><td>Saturday</td></tr> </tbody> </table>	Day of the week		0	Sunday	1	Monday	2	Tuesday	3	Wednesday	4	Thursday	5	Friday	6	Saturday
Day of the week																			
0	Sunday																		
1	Monday																		
2	Tuesday																		
3	Wednesday																		
4	Thursday																		
5	Friday																		
6	Saturday																		
D9038* ² D9039* ²	LED display priority	Priority 1 to 4 Priority 5	<p>Set the element numbers of "ERROR" LED light-up (flickering) priority levels 1 to 4 (D9038) and level 5 (D9039) when an error occurs.</p> <p>Priority</p> <p>If "0" is set, the error at which the CPU stops operation (including parameter setting) is displayed on the LED unconditionally. Default values D9038=H4321 D9039=H0006</p> <table border="1"> <thead> <tr> <th>Element Number</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0.</td><td>Not displayed</td></tr> <tr><td>1.</td><td>I/O verify, fuse blown</td></tr> <tr><td>2.</td><td>Special module, link parameter, SFC parameter, SFC error</td></tr> <tr><td>3.</td><td>CHK instruction error</td></tr> <tr><td>4.</td><td>Annunciator</td></tr> <tr><td>6.</td><td>Battery error</td></tr> </tbody> </table>	Element Number	Description	0.	Not displayed	1.	I/O verify, fuse blown	2.	Special module, link parameter, SFC parameter, SFC error	3.	CHK instruction error	4.	Annunciator	6.	Battery error		
Element Number	Description																		
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3.	CHK instruction error																		
4.	Annunciator																		
6.	Battery error																		

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description	Details
D9049	SFC program executing work area	Extension file register block No. used as SFC program executing work area	<ul style="list-style-type: none"> · Stores the extension file register block No. (in BIN) used as SFC program executing work area. · Stores "0" when the 16k byte or less empty area which cannot be set as extension file register block No. 1 is used or M9100 is off.
D9050	SFC program error number	Error number generated in SFC program	<ul style="list-style-type: none"> · Stores the error number (in BIN) produced in SFC program. 0 : No error 80 : SFC program parameter error 81 : SFC code error 82 : Simultaneously executed step count excess 83 : Block start error 84 : SFC program operation error (For error details, refer to the MELSAP-II (SFC) programming manual.)
D9051	Error block	Block number where error occurred	<ul style="list-style-type: none"> · Stores the block number (in BIN) where error occurred in SFC program. For error 83, stores the block number of start source.
D9052	Error step	Step number where error occurred	<ul style="list-style-type: none"> · Stores the step number of operation output (in BIN) where error 84 occurred in SFC program. · Stores "0" when error 80, 81 or 82 occurred. · Stores the block start step number when error 83 occurred.
D9053	Error transition	Transition condition number where error occurred	<ul style="list-style-type: none"> · Stores the transition condition number (in BIN) where error 84 occurred in SFC program. · Stores "0" when error 80, 81, 82 or 83 occurred.
D9054	Error sequence step	Sequence step number where error occurred	<ul style="list-style-type: none"> · Stores the sequence step number of transition condition or operation output (in BIN) where error 84 occurred in the transition condition or step where the error occurred in SFC program.

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description	Details																																																																																																																																																																																																
D9100*1 D9101	Power-off extension module	Bit map of modules with power off in blocks of 16 points	<ul style="list-style-type: none"> Indicates the extension module numbers whose external supply power is off (in blocks of 16 points). <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td>D9100</td> <td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td></td> <td></td><td></td><td></td><td>YCO</td><td></td><td></td><td></td><td>Y80</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>D9101</td> <td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td></td> <td>Y1F0</td><td></td><td></td><td></td><td>Y1A0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table> <p style="text-align: center;">↑ Indicates external supply power is off.</p> <p>(Data is latched and must be cleared from the user program.)</p>		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	D9100	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0					YCO				Y80									D9101	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		Y1F0				Y1A0																																																																																																																						
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																																																																																																																																																																			
D9100	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0																																																																																																																																																																																			
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D9101	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																																			
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D9116*1 D9117	I/O module verify error	Bit map of modules with verify errors in blocks of 16 points	<ul style="list-style-type: none"> Indicates the extension module numbers whose data are different from those registered at power-on (in blocks of 16 points). <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td>D9116</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td> </tr> <tr> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>X70</td> </tr> <tr> <td>D9117</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td>XV 100</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table> <p style="text-align: center;">↑ Indicates I/O module verify error.</p> <p>(Data is latched and must be cleared from the user program.)</p>		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	D9116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																	X70	D9117	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0								XV 100																																																																																																																				
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D9117	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0																																																																																																																																																																																			
							XV 100																																																																																																																																																																																												
D9124	Number of detected annunciator signals	Number of detected annunciator signals	<ul style="list-style-type: none"> 1 is added to the contents of D9124 each time any of F0 to F25 is switched on by OUT F or SET F. 1 is subtracted from the contents of D9124 each time an F coil is reset by RST F or LEDR. Indicates the number of coils switched on by OUT F or SET F up to 8. 																																																																																																																																																																																																
D9125 D9126 D9127 D9128 D9129 D9130 D9131 D9132	Detected annunciator numbers	Detected annunciator numbers	<ul style="list-style-type: none"> D9125 to D9132 record the annunciator (F) numbers in the order in which they occur on a first-in first-out basis. Annunciator numbers are removed from any place in the queue by applying RST F. Subsequent entries then move up one place. The annunciator number at the beginning of the queue is cleared by the LEDR instruction and subsequent entries move up one place. The ninth annunciator number is ignored until there is room in the queue. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td></td> <td>SET</td><td>SET</td><td>SET</td><td>RST</td><td>SET</td><td>SET</td><td>SET</td><td>SET</td><td>SET</td><td>SET</td><td>SET</td><td>SET</td><td>SET</td><td></td> </tr> <tr> <td></td> <td></td> <td>F50</td><td>F25</td><td>F99</td><td>F25</td><td>F15</td><td>F70</td><td>F65</td><td>F38</td><td>F110</td><td>F151</td><td>F210</td><td>LEDR</td><td></td><td></td> </tr> <tr> <td>D9009</td> <td>0</td> <td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>99</td><td></td><td></td> </tr> <tr> <td>D9124</td> <td>0</td> <td>1</td><td>2</td><td>3</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>8</td><td>8</td><td></td><td></td> </tr> <tr> <td>D9125</td> <td>0</td> <td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>99</td><td></td><td></td> </tr> <tr> <td>D9126</td> <td>0</td> <td>0</td><td>25</td><td>25</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td></td><td></td> </tr> <tr> <td>D9127</td> <td>0</td> <td>0</td><td>0</td><td>99</td><td>0</td><td>15</td><td>15</td><td>15</td><td>15</td><td>15</td><td>15</td><td>15</td><td>70</td><td></td><td></td> </tr> <tr> <td>D9128</td> <td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>70</td><td>70</td><td>70</td><td>70</td><td>70</td><td>70</td><td>65</td><td></td><td></td> </tr> <tr> <td>D9129</td> <td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>65</td><td>65</td><td>65</td><td>65</td><td>65</td><td>38</td><td></td><td></td> </tr> <tr> <td>D9130</td> <td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>38</td><td>38</td><td>38</td><td>38</td><td>110</td><td></td><td></td> </tr> <tr> <td>D9131</td> <td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>110</td><td>110</td><td>110</td><td>151</td><td></td> </tr> <tr> <td>D9132</td> <td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>151</td><td>151</td><td>210</td><td></td> </tr> </table>			SET	SET	SET	RST	SET	SET	SET	SET	SET	SET	SET	SET	SET				F50	F25	F99	F25	F15	F70	F65	F38	F110	F151	F210	LEDR			D9009	0	50	50	50	50	50	50	50	50	50	50	50	99			D9124	0	1	2	3	2	3	4	5	6	7	8	8	8			D9125	0	50	50	50	50	50	50	50	50	50	50	50	99			D9126	0	0	25	25	99	99	99	99	99	99	99	99	99			D9127	0	0	0	99	0	15	15	15	15	15	15	15	70			D9128	0	0	0	0	0	0	70	70	70	70	70	70	65			D9129	0	0	0	0	0	0	0	65	65	65	65	65	38			D9130	0	0	0	0	0	0	0	0	38	38	38	38	110			D9131	0	0	0	0	0	0	0	0	0	0	110	110	110	151		D9132	0	0	0	0	0	0	0	0	0	0	0	151	151	210	
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D9132	0	0	0	0	0	0	0	0	0	0	0	151	151	210																																																																																																																																																																																					

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description/Details
D9136	X-axis current output pulse count (lower 16 bits)	· Stores the number of pulses output from X-axis pulse output start until now.
D9137	X-axis current output pulse count (upper 8 bits)	
D9138	Y-axis current output pulse count (lower 16 bits)	· Stores the number of pulses output from Y-axis pulse output start until now.
D9139	Y-axis current output pulse count (upper 8 bits)	
D9140	X-axis start/stop frequency	· Set the running frequency (bias speed) at start and stop of the X axis. Setting range: 0 to 60000 (Hz)
D9141	X-axis running frequency	· Set the running frequency (positioning speed) of the X axis. Setting range: 0 to 60000 (Hz)
D9142	X-axis acceleration/ deceleration time	· Set the acceleration/deceleration time of the X axis. Setting range: 1 to 32767 (ms)
D9143	X-axis output pulse count (lower 16 bits)	· Set the number of output pulses (travel) of the X axis. Setting range: 0 to 16777215
D9144	X-axis output pulse count (upper 8 bits)	
D9145	Y-axis start/stop frequency	· Set the running frequency (bias speed) at start and stop of the Y axis. Setting range: 0 to 60000 (Hz)
D9146	Y-axis running frequency	· Set the running frequency (positioning speed) of the Y axis. Setting range: 0 to 60000 (Hz)
D9147	Y-axis acceleration/deceleration time	· Set the acceleration/deceleration time of the Y axis. Setting range: 1 to 32767 (ms)
D9148	Y-axis output pulse count (lower 16 bits)	· Set the number of output pulses (travel) of the Y axis. Setting range: 0 to 16777215
D9149	Y-axis output pulse count (upper 8 bits)	
D9150	Setup/hold time for X-axis PULSE/SIGN method selection	· Set the setup/hold time when X-axis PULSE/SIGN method is selected. Setting range: 0 to 32767 (μs)
D9151	Setup/hold time for Y-axis PULSE/SIGN method selection	· Set the setup/hold time when Y-axis PULSE/SIGN method is selected. Setting range: 0 to 32767 (μs)

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description/Details
D9152	CH1 preset value (lower 16 bits)	· Stores the preset value of CH1 set when M9152 turns from off to on or X8 turns from off to on. Setting range: 0 to 16777215
D9153	CH1 preset value (upper 8 bits)	
D9154	CH1 pulse input mode register	· Set the pulse input method of CH1. 0 : 1-phase input multiplied by 1 2 : 2-phase input multiplied by 1 8 : 1-phase input multiplied by 2 10 : 2-phase input multiplied by 2 18 : 2-phase input multiplied by 4
D9155	CH1 present value read (lower 16 bits)	· Stores the count value of CH1 read when M9155 turns from off to on. 0 to 16777215
D9156	CH1 present value read (upper 8 bits)	
D9157	CH1 coincidence output set value (lower 16 bits)	· Set the coincidence output set value of CH1. · M9148 turns on when the present value and set value of CH1 match. Setting range: 0 to 16777215
D9158	CH1 coincidence output set value (upper 8 bits)	
D9159	CH1 counter function selection setting	· Select the counter function of CH1. 0 : Count disable function 1 : Latch counter function
D9160	CH1 latch count value read (lower 16 bits)	· Stores the count value of CH1 latched when M9159 turns from off to on or X6 turns from off to on. 0 to 16777215
D9161	CH1 latch count value read (upper 8 bits)	

Appendix Table 1.2 Special Register List (Continued)

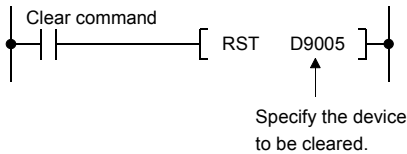
Number	Name	Description/Details
D9162	CH2 preset value (lower 16 bits)	· Stores the preset value of CH2 set when M9172 turns from off to on or X9 turns from off to on. Setting range: 0 to 16777215
D9163	CH2 preset value (upper 8 bits)	
D9164	CH2 pulse input mode register	· Set the pulse input method of CH2. 0 : 1-phase input multiplied by 1 2 : 2-phase input multiplied by 1 8 : 1-phase input multiplied by 2 10 : 2-phase input multiplied by 2 18 : 2-phase input multiplied by 4
D9165	CH2 present value read (lower 16 bits)	· Stores the count value of CH2 read when M9175 turns from off to on. 0 to 16777215
D9166	CH2 present value read (upper 8 bits)	
D9167	CH2 coincidence output set value (lower 16 bits)	· Set the coincidence output set value of CH2. · M9168 turns on when the present value and set value of CH2 match. Setting range: 0 to 16777215
D9168	CH2 coincidence output set value (upper 8 bits)	
D9169	CH2 counter function selection setting	· Select the counter function of CH2. 0 : Count disable function 1 : Latch counter function
D9170	CH2 latch count value read (lower 16 bits)	· Stores the count value of CH2 latched when M9179 turns from off to on or X7 turns from off to on. 0 to 16777215
D9171	CH2 latch count value read (upper 8 bits)	
D9172	CH1, CH2 statuses	· Stores the statuses of CH1 and CH2.

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description/Details	Relevant Station
D9173	Corresponding station number setting status	· Stores the parameter setting status (corresponding station number). Station 0 to 7	Master station Local station
D9174	Communication slave station setting status	· Stores the parameter setting status (number of communication slave stations). 1 to 7 stations	
D9175	Refresh range setting status	· Stores the parameter setting status (refresh range). 0: Pattern 00 1: Pattern 01 2: Pattern 02	
D9176	Corresponding station number setting	· Set the station number of the host station. 0 for master station, 1 to 7 for local stations. Station 0 to 7 (default value: FFFFh)	
D9177	Communication slave station count setting	· Set the number of slave stations to communicate with. 1 to 7 stations (default value: 7)	Master station
D9178	Refresh range setting	· Set the refresh range pattern. 0: Pattern 00 1: Pattern 01 2: Pattern 02 (Default value: 0)	
D9179	Number of retries up to error detection	· Master station: Set the number of retries up to error detection. · Local station: Stores the setting of the master station. 0 to 10 times (default value: 3 times)	Master station Local station
D9180	Monitoring time (10ms increments)	· Master station: Set the local station no-response time (monitoring time A). · Local station: Stores the master station no-response time (monitoring time B) after calculating it from the master station setting. (B=A×2) (Default value: 50ms)	
D9181	Current link scan time	· Stores link time (present value) during 1 cycle in 10ms increments.	Master station
D9182	Maximum link scan time	· Stores link time (maximum value) during 1 cycle in 10ms increments.	
D9183	Data transmission sequence error count (Master station)	· Stores the number of errors which occurred in the master station (number of times when M9183 turned from off to on). · Turn on M9192 to clear D9183.	
D9184	Data transmission sequence error count (Local station 1)	· Stores the number of errors which occurred in the corresponding local station (number of times when any of M9184 to M9190 turned from off to on). · Turn on M9192 to clear D9184 to D9190.	Master station Local station
D9185	Data transmission sequence error count (Local station 2)		
D9186	Data transmission sequence error count (Local station 3)		
D9187	Data transmission sequence error count (Local station 4)		

Appendix Table 1.2 Special Register List (Continued)

Number	Name	Description/Details	Relevant Station
D9188	Data transmission sequence error count (Local station 5)	· Stores the number of errors which occurred in the corresponding local station (number of times when any of M9184 to M9190 turned from off to on). · Turn on M9192 to clear D9184 to D9190.	Local station
D9189	Data transmission sequence error count (Local station 6)		
D9190	Data transmission sequence error count (Local station 7)		
D9191	Data transmission error No.(Master station)	· Stores the error No. detected by the master station. · Holds the error No. if link is resumed. Turn on M9192 to clear D9191.	Local station
D9192	Data transmission error No.(Local station 1)	· Stores the error No. detected by the corresponding local station. · Holds the error No. if link is resumed. Turn on M9192 to clear D9192 to D9198.	Master station Local station
D9193	Data transmission error No.(Local station 2)		
D9194	Data transmission error No.(Local station 3)		
D9195	Data transmission error No.(Local station 4)		
D9196	Data transmission error No.(Local station 5)		
D9197	Data transmission error No.(Local station 6)		
D9198	Data transmission error No.(Local station 7)		

POINTS
<p>(1) All contents of special registers are cleared by any of power-off, latch clear and reset operations. When the RUN/STOP switch is moved to "STOP", contents are held.</p> <p>(2) Special registers marked *1 above are latched and their data will remain unchanged after normal status is restored. Clear the registers as follows.</p> <p>(a) From the user program Use the ladder rung shown on the right and turn on the clear command contact to clear the register contents.</p> <div style="display: flex; align-items: center; justify-content: center;">  </div> <p>(b) From the peripheral equipment Use the test function of the peripheral to change the present value of the register to zero or force-reset the device to zero. For the operation procedure, refer to the corresponding peripheral manual.</p> <p>(c) By pressing the RESET switch on the CPU front, the special register is set to "0".</p> <p>(3) Write data to the special registers marked *2 using the sequence program.</p>