MEE

Programming unit

Model
EPU00E

Operating Manual

EPU00E

● SAFETY PRECAUTIONS ●

(Always read these precautions prior to use.)

Before using this product, thoroughly read this manual and the associated manuals introduced in this manual. In addition, pay careful attention to safety and handle the module properly.
These precautions apply only to this product. For programmable controllers system safety precautions, refer to the user's manual for the CPU module to be used.
The safety precautions are ranked as "DANGER" and "CAUTION" in this manual.

⚠ 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 minor injury and/or property damage.

Note that failure to observe the ⚠ CAUTION level instructions may lead to a serious consequence according to the circumstances. Always follow the precautions of both levels as they are important to personal safety.
Please keep the manuals enclosed with the product in an easy-to-access location for future reference, and always provide the manual to the end user.

Precautions for Design

⚠ DANGER

● Always provide an interlock circuit outside of the programmable controllers system to ensure that the entire system functions safely even in the event of data change, program change or status control of a running programmable controllers from a peripheral device.
Predetermine the actions to be taken by the system if the communication fails because of a cable connection fault, etc., during online operation of the programmable controllers CPU from a peripheral device.

Precautions for Installation

⚠ DANGER

- The 5VDC 0.4A current consumed by the EPU00E is supplied from the power supply module of the main base unit.
  Confirm that the current output from the power supply module is sufficient before connecting the EPU00E.
  If the output current is insufficient, the programmable controllers will stop operations, and all output points will turn OFF.

Precautions for Installation and Handling

⚠ CAUTION

- Use the EPU00E in the general specifications environment given in the manual.
  Using the EPU00E in an environment not meeting these specifications, could lead to electric shock, fire, malfunctioning and damage or deterioration of the product.
- Make sure that foreign matter such as cutting chips or wiring scraps do not get in the EPU00E.
  There is a risk of fire, faults or malfunctioning.
- When connecting the EPU00E in the add-on method, plug the connectors securely and tighten the clamp screws securely.
  In the connection of the hand-held method, plug the RS-422 cable connector securely and tighten the clamp screws securely.
  Otherwise, the connection gets loose to cause malfunctioning.

Precautions for Start-up and Maintenance

⚠ DANGER

- Thoroughly read the manual and carefully confirm safety before online starting online operations (especially program changing, forced output or change of operation status) with a peripheral device connected to the running CPU module. Careless operation could lead to machine damage or accidents.
- Never disassemble or modify the EPU00E.
  Failure to observe this could lead to faults, malfunctioning, injury or fire.

Precautions for Disposal

⚠ CAUTION

- Dispose of this product as industrial waste.

REVISIONS

* The manual number is given on the bottom left of the back cover.

Print Date	* Manual Number	Revision
Sep.,2008	50CM-D180028-A	First edition

INTRODUCTION

Thank you for choosing the Programming unit type EPU00E. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end User.

CONTENTS

IBM, IBM-DOS(PC-DOS) are registered trademark of the International Business Machines Corporation.

How to use this manual

This manual is structured as follows:

General description
The features of the EPU00E programming unit (hereafter called the EPU00E) are explained.

Basics
Operations are explained by using examples, so that somebody using the EPU00E for the first time can easily understand the operations.

1) Connection methods

2) Inputting, modifying, monitoring, and testing of sequence programs

Details
The details of the functions and the operating methods of the EPU00E are explained. Use this as a dictionary.

In addition, the following manuals give details about the instructions explained in Mitsubishi manual.

- ACPU Programming Manual (Fundamental)····· IB-66249
- ACPU Programming Manual (Common Instructions)····· IB-66250

M E M O

1. GENERAL DESCRIPTION

This manual explains specifications, handling, and operations of the EPU00E.

The EPU00E is a peripheral device that is used with the Mitsubishi MELSEC-A series of general-purpose programmable controllers. It can read from and write to sequence programs in a MELSEC-A series PC CPU.
The EPU00E is also used for monitoring and testing devices. Follow the procedures in this manual when using the A7PUS to perform program I/O, as well as inspection and maintenance.

1.1 Features

(1) A2A(S1) and A3ACPU are supported.
All A2A(S1) and A3ACPU devices are supported.

(2) Expanded display area
The display area was expanded by using a back-lit LCD of 4 lines×20 character. Therefore, inputting/editing/monitoring/testing of sequence programs can be easily executed.

(3) Easy key operations
Key operations are easier thanks to the long key stroke.

(4) Accessing another station's PC CPU is enabled
Writing, monitoring, and testing of sequence programs can be executed from the station to which EPU00E is connected to another station(master station/local station) on MELSECNET(Ⅱ)/B.

(5) Writing when the CPU is in the RUN state is enabled
If the number of steps in a sequence program changes, the sequence program can be changed when the CPU is in the RUN state.

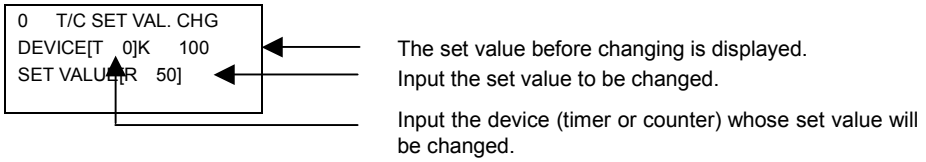
(6) Extensive help functions
Help functions for reading/writing/inserting/deleting/monitoring/testing operations in the menu selection format using dialog are supported.

(7) Easier control of parameters and sequence programs
Checking, revising, changing, inserting, and monitoring of PC CPU parameters and sequence programs is now easier.

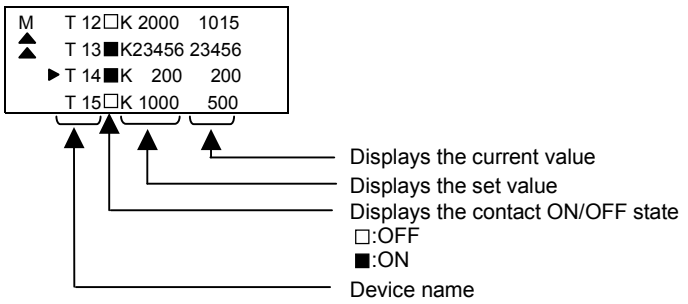
1) Example of changing a sequence program instruction

```
LD   X0          Change        LD   X0
OUT  Y20    ------------->      MOV  D0 D1
LD   X1                        LD   X1
```

2) Example of changing the T/C set value
The T/C set value can be changed in the menu format when the CPU is in the RUN state.

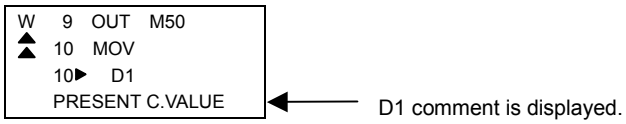


3) Device memory monitoring example
The device memory of a PC CPU can be easily checked.

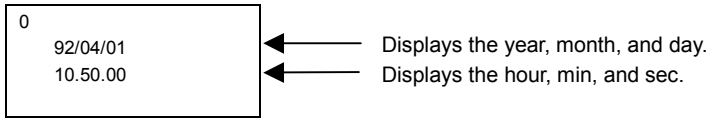


T12: Set value=2000, Current value=1015, Contact=OFF
T13: Set value=23456, Current value=23456, Contact=ON
T14: Set value=200, Current value=200, Contact=ON
T15: Set value=1000, Current value=500, Contact=OFF

(8) Comments of each device can be displayed
The comment of the device where the cursor is can be displayed by using a help function.

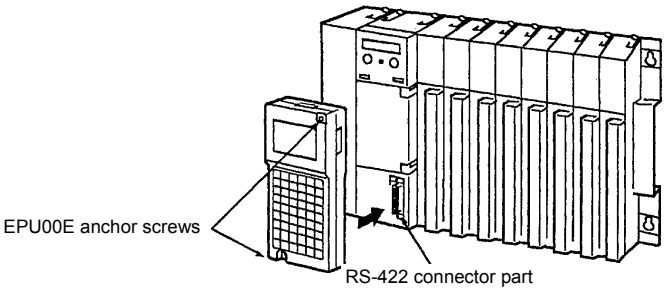


(9) Clock display is enabled
Clock data in the PC CPU can be displayed. (The EPU00E turns the clock data read request M9028 ON and OFF automatically.)

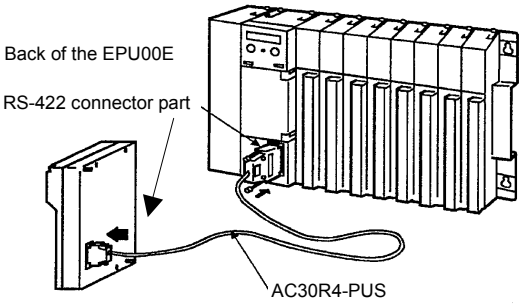


(10)Connections using the add-on or hand-held methods are enabled
There are 2 ways to connect EPU00E to a PC CPU.

[Add-on method]
Connects the EPU00E directly to a PC CPU.



[Hand-held method]
Connect the EPU00E to a PC CPU via an AC30R4-PUS cable.



1.2 Included Items

After buying the EPU00E, make sure the following items are included:

Model Name	Items	Amount	Remarks
EPU00E	Programming unit	1	—
—	Protective caps for the RS-422 connectors	2	Placed on the connectors at the factory

The following abbreviations are used in this manual:

(1) EPU00E
EPU00E Programming Unit

(2) ACPU
A-series PC CPUs to which the EPU00E can be connected (see Section 3.3.2).

(3) [ ] CPU
Including PC CPUs with the MELSECNET(II) link function.
(Also including A1CPU→A1CPUP21/R21.)

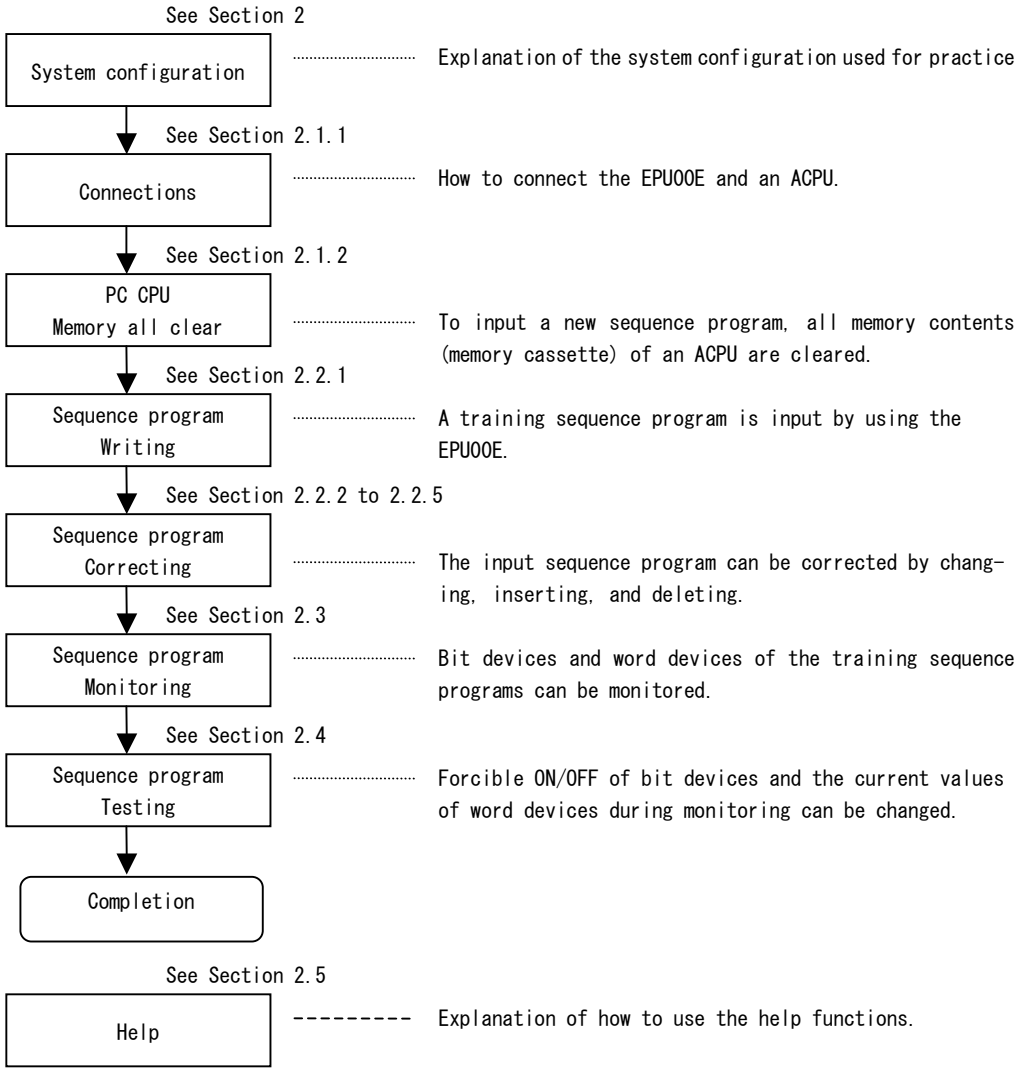
(4) Peripheral devices
All peripheral devices equipped with usable GPP functions in the MELSEC-A series

M E M O

[BASICS]

2. LET'S TRY USING THE EPU00E

It is possible to understand EPU00E operations quickly by practicing the creation and monitoring of actual programs. A very basic training program can be created and its operations can be checked by using the monitoring test function.
A simple example is shown below. Try to operate the EPU00E in accordance with the example.

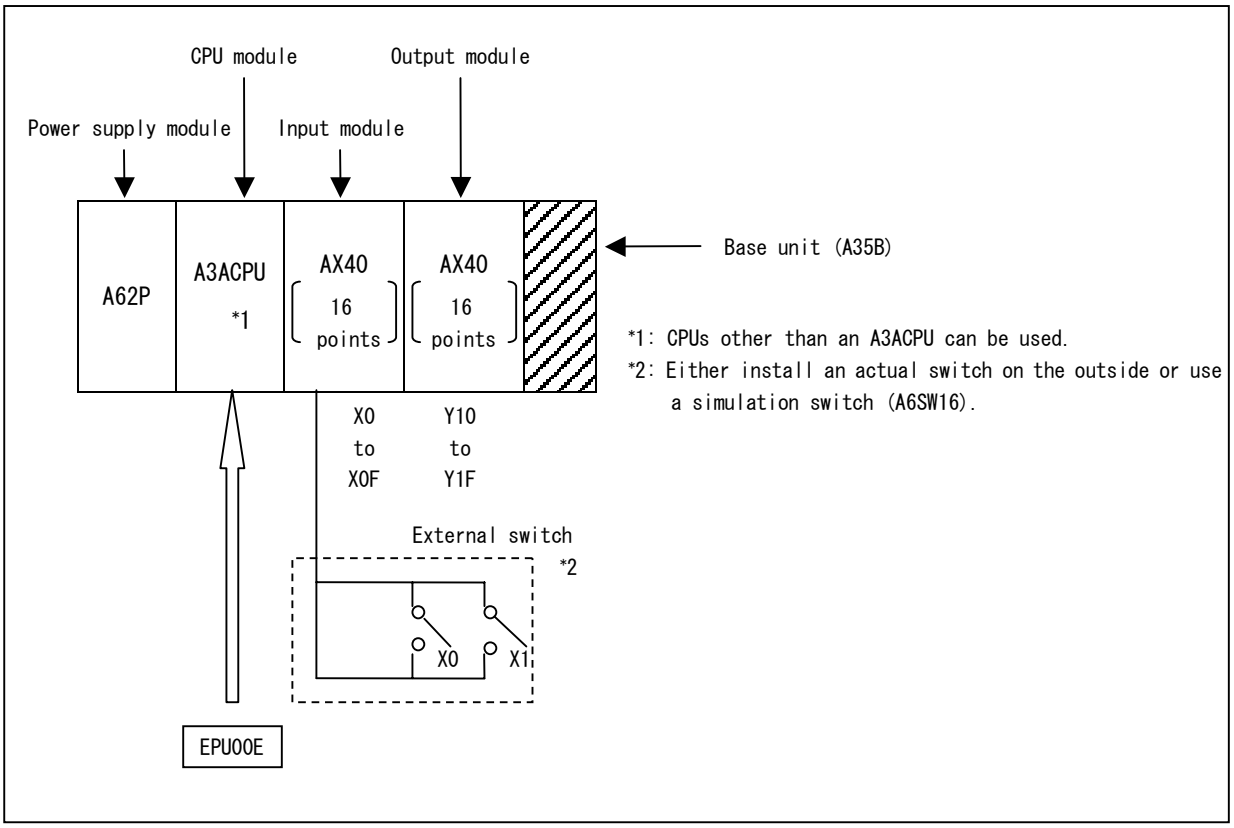


Since this section explains only the basic operations of the EPU00E, see Section 6 for greater details about operations and the contents of each mode.

2. LET'S TRY USING THE EPU00E

The system configuration to actually perform basic operations is shown below.

[System configuration]

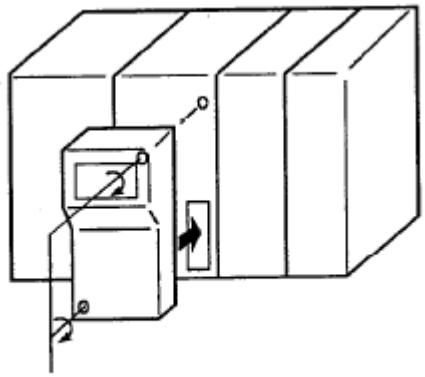


2.1 Before Inputting a Sequence Program

This section explains how to connect the EPU00E to an ACPU and how to clear the entire memory (memory all clear) to write a new sequence program to the ACPU.

2.1.1 Let's try connecting the EPU00E to an ACPU

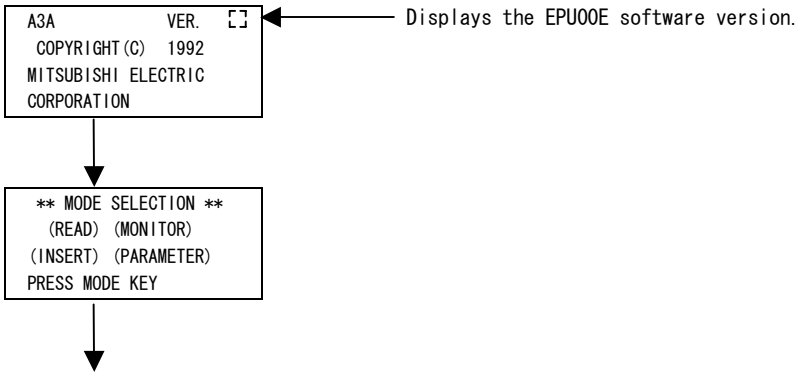
1) Connect the EPU00E to an ACPU as follows:



Tighten the anchor screws of the EPU00E.

2) Put the ACPU in the STOP state.

3) Turn ON the power supply.
The display area of EPU00E can be switched as shown below.



Then, key operations in all modes can be done.

Let's try executing a memory all clear in the CPU so that we can write a new sequence program to the ACPU.

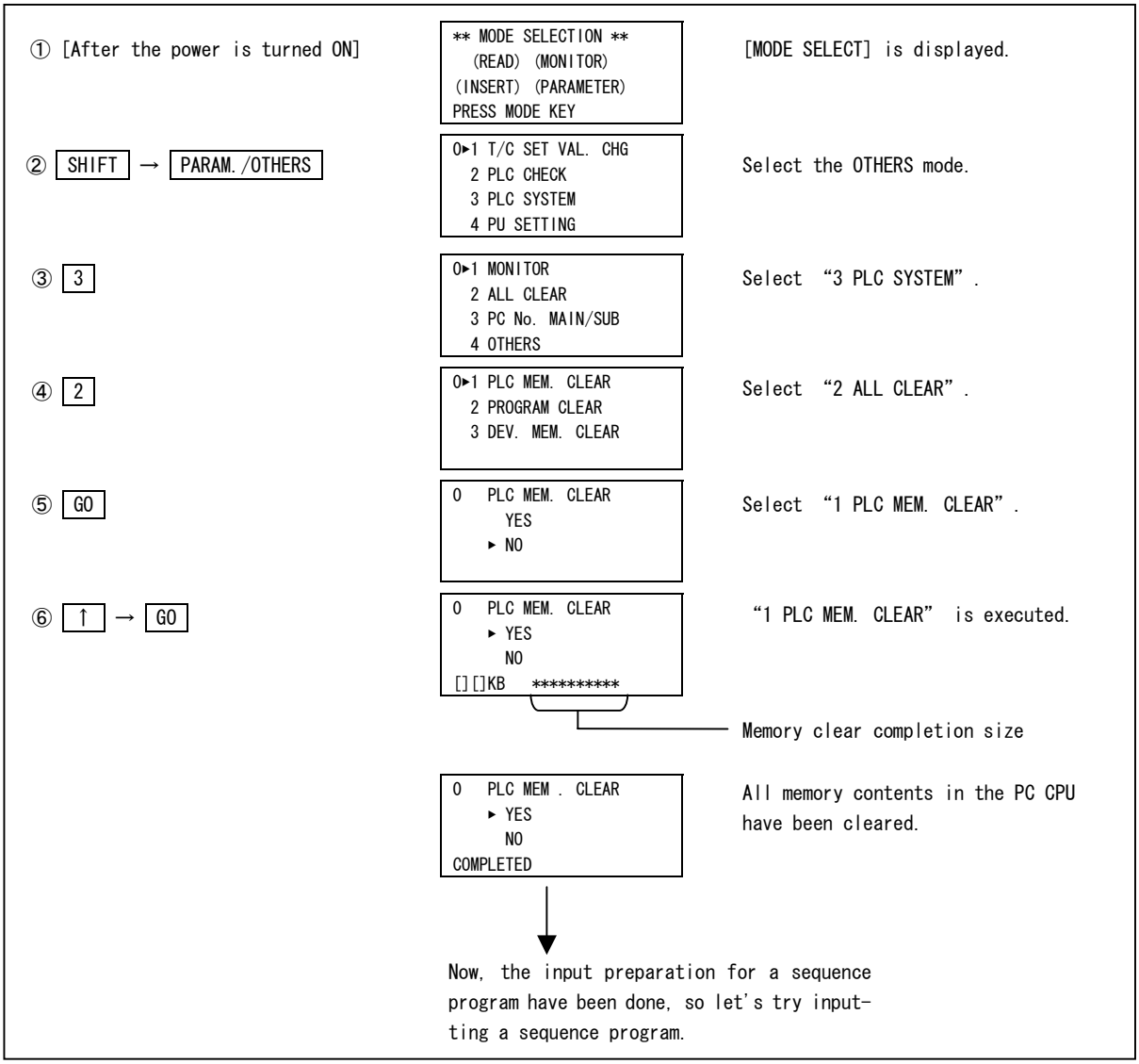
REMARK

When a key word is set, operate as shown in Section 5.1.3.

2.1.2 Let's try clearing all the memory contents of an ACPU

This section shows how to clear all memory contents (memory cassette) to write a new sequence program to an ACPU.

[Sample operation]

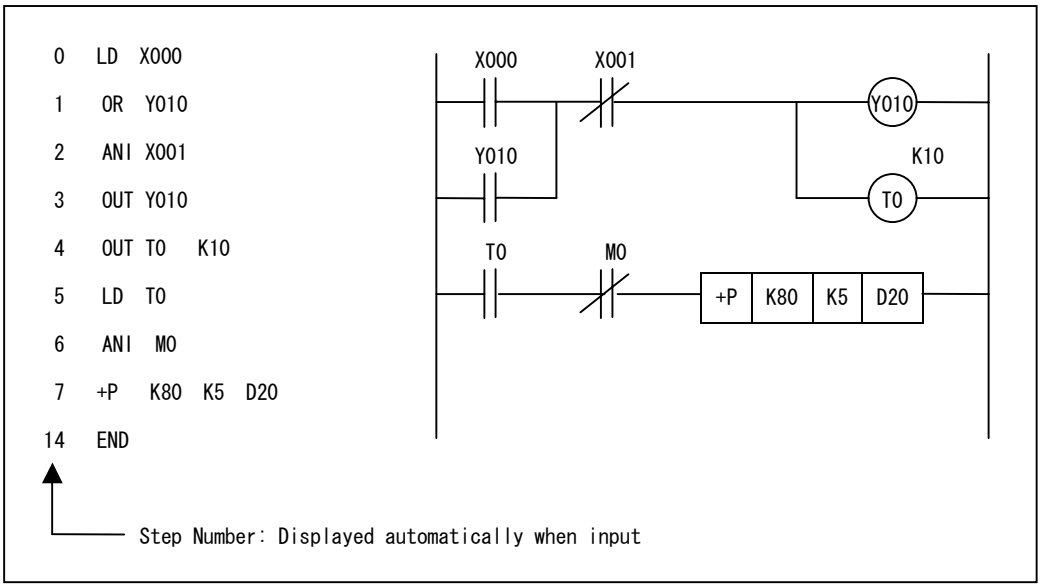


2.2 Let's Try Inputting a Sequence Program

This section explains how to write, read, change, insert in, and delete sequence programs.

2.2.1 Let's try writing a new sequence program

Input the following sequence program:



How to correct a wrong input:
Either see the operations in Sections 2.2.2 to 2.2.5 or execute a memory all clear (see Section 2.1.2) and input from the beginning.

[Sample operation]

① SHIFT → READ/WRITE

```
W
▲
▲
```

Select the WRITE mode.

② STEP NUMBER → 0 → GO

```
W    0► NOP
▲    1  NOP
▲    2  NOP
     3  NOP
```

Read step 0.

③ LD → X → 0 → GO

```
W    0  LD  X000
▲    1► NOP
▲    2  NOP
     3  NOP
```

④ OR → Y → 1 → 0 → GO

```
W    0  LD  X000
▲    1  OR  Y010
▲    2► NOP
     3  NOP
```

⑤ ANI → X → 1 → GO

```
W    1  OR  Y010
▲    2  ANI X001
▲    3► NOP
     4  NOP
```

⑥ OUT → Y → 1 → 0 → GO

```
W    2  ANI  X001
▲    3  OUT  Y010
▲    4► NOP
     5  NOP
```

⑦ OUT → T → 0 → SP → K → 1 → 0 → GO

```
W    4  OUT  T0
▲    4   K10
▲    5► NOP
     6  NOP
```

⑧ LD → T → 0 → GO

```
W    4   K10
▲    5  LD   T0
▲    6► NOP
     7  NOP
```

⑨ ANI → M → 0 → GO

```
W    5  LD   T0
▲    6  ANI  M0
▲    7► NOP
     8  NOP
```

⑩ + → P → K → 8 → 0 → SP → K → 5 → SP → D* → 2 → 0 → GO

```
W    7   K5
▲    7   D20
▲   14► NOP
    15  NOP
```

*: Both the [D D] and [AND D] keys are valid.

⑪ END → GO

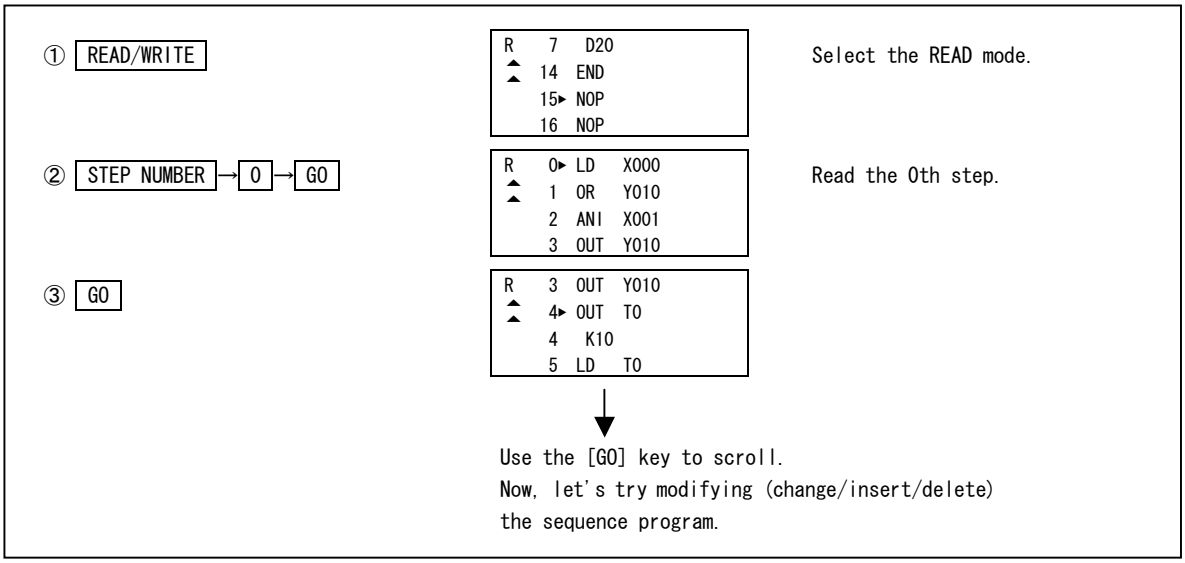
```
W    7    D20
▲   14  END
▲   15► NOP
    16  NOP
```

The sequence program has now been input.
Now, let's try reading the input sequence program from a PC CPU to the EPU00E.

2.2.2 Let's try reading the sequence program

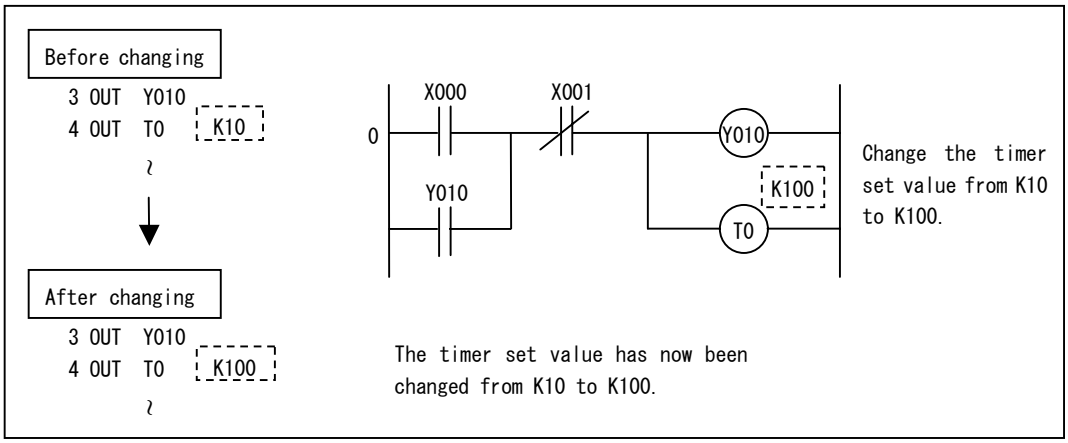
This section shows how to read the sequence program written in Section 2.2.1 to check it.

[Sample operation]

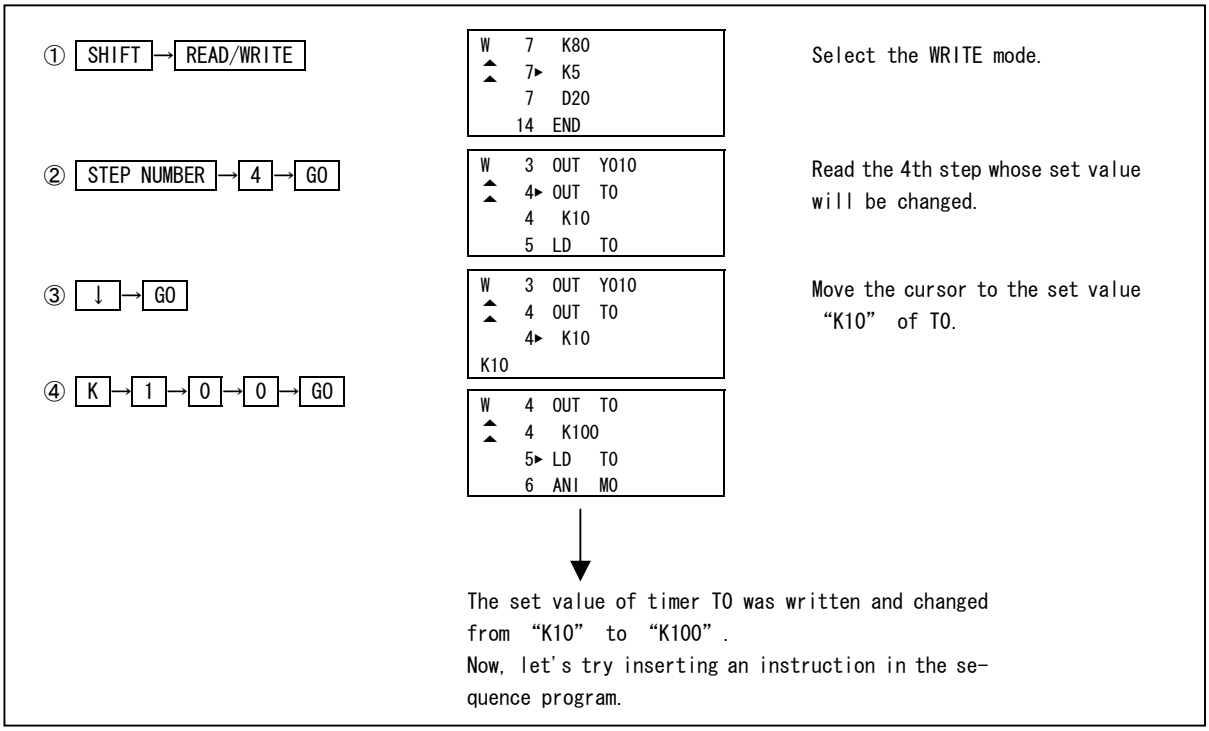


2.2.3 Let's try changing (overwriting) an instruction

This section shows how to change the sequence program written in Section 2.2.1.

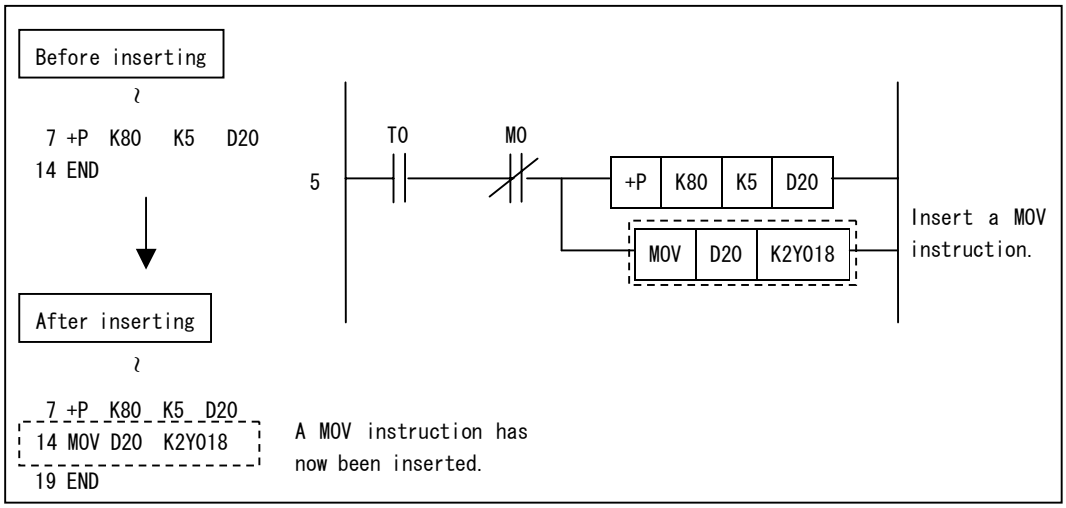


[Sample operation]

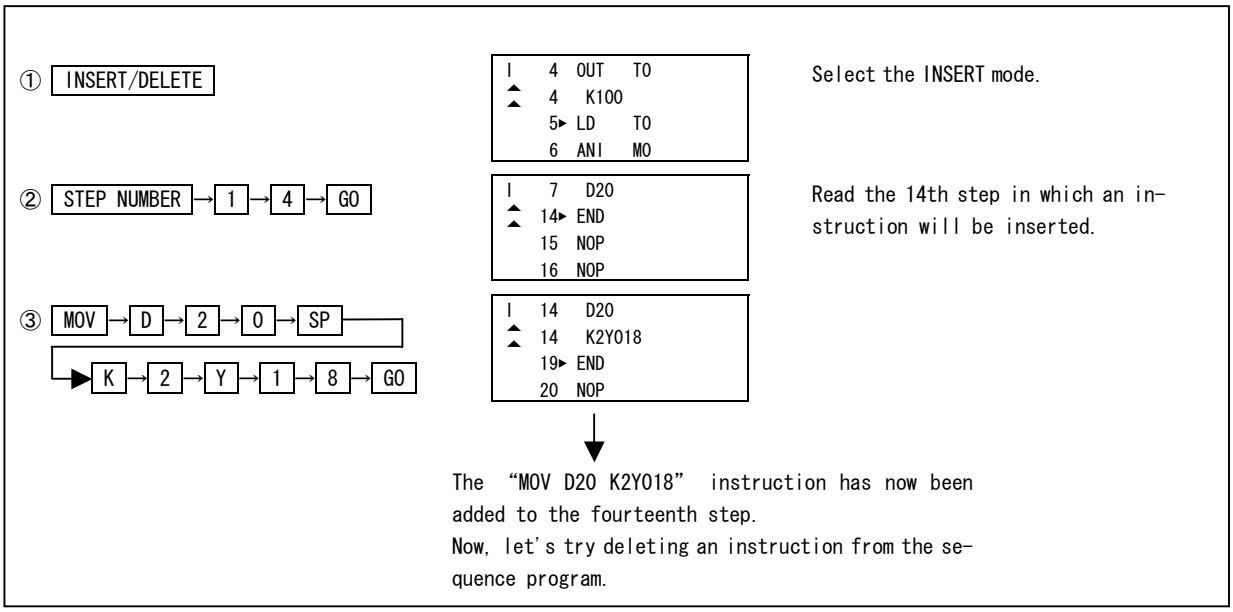


2.2.4 Let's try inserting (adding) of an instruction

This section shows how to insert an instruction to the program input in Section 2.2.1

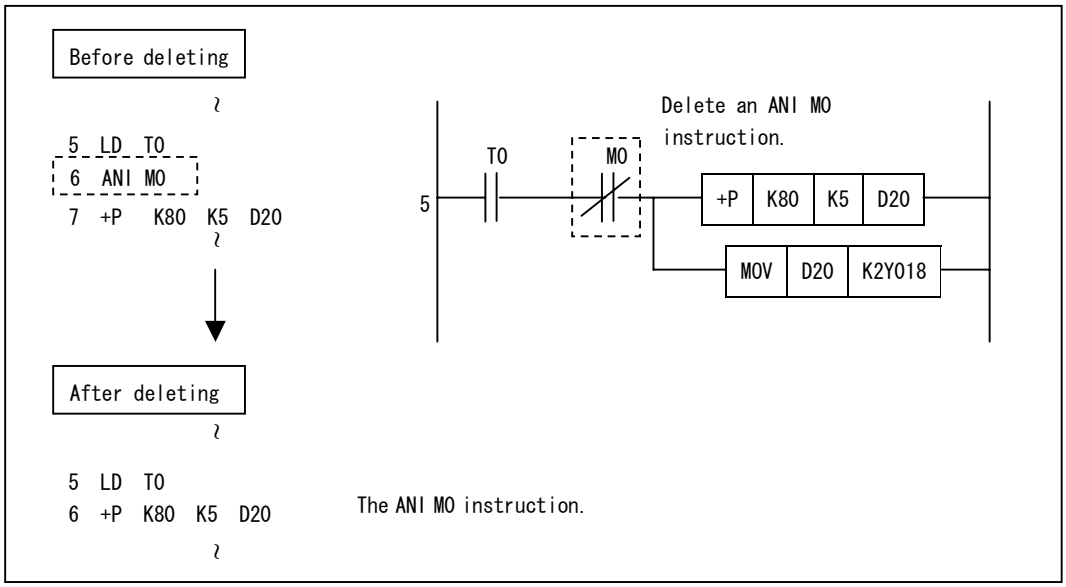


[Sample operation]

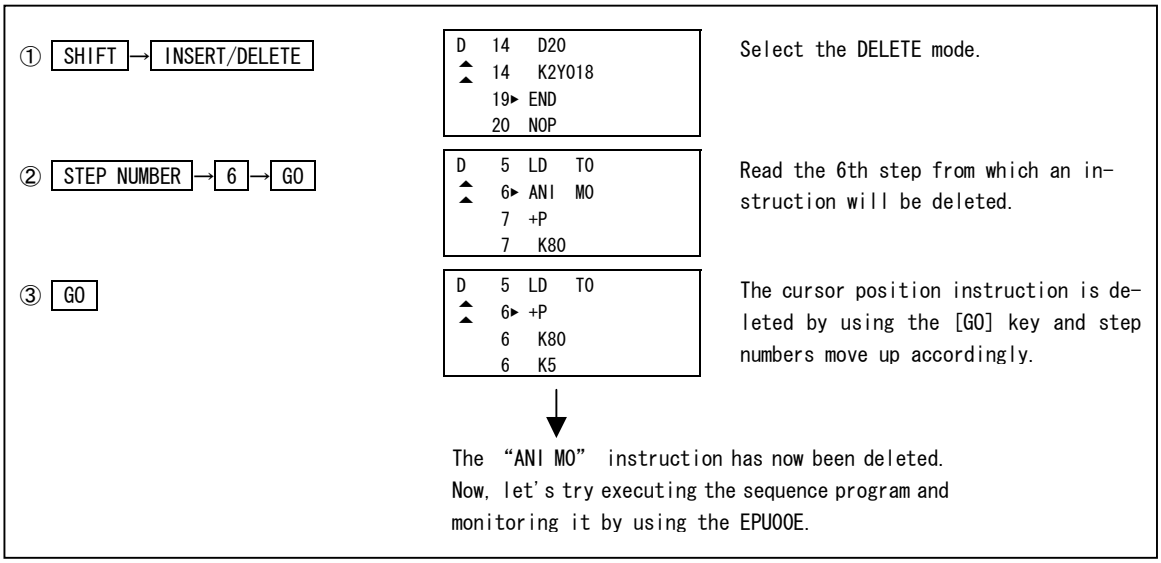


2.2.5 Let's try deleting an instruction

This section shows how to delete an instruction from the program written in Section 2.2.1.



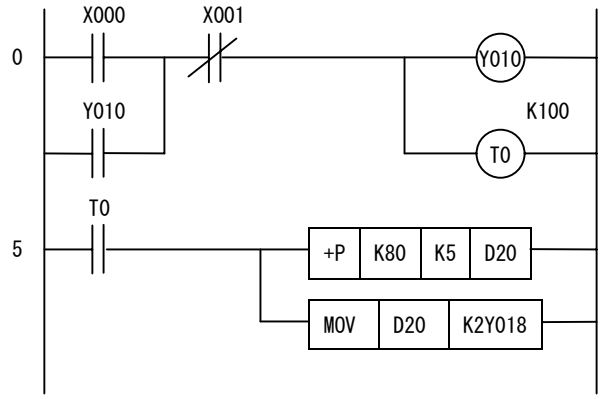
[Sample operation]



2.3 Let's Try Monitoring the Sequence Program

The sequence program written in Section 2.2.1 and modified in Sections 2.2.3 to 2.2.5 is shown below.
This section shows how to execute the sequence program and monitor a bit device and a word device.

```
 0   LD   X000
 1   OR   Y010
 2   ANI  X001
 3   OUT  Y010
 4   OUT  T0    K100
 5   LD   T0
 6   +    K80   K5   D20
13   MOV  D20   K2Y018
18   END
```



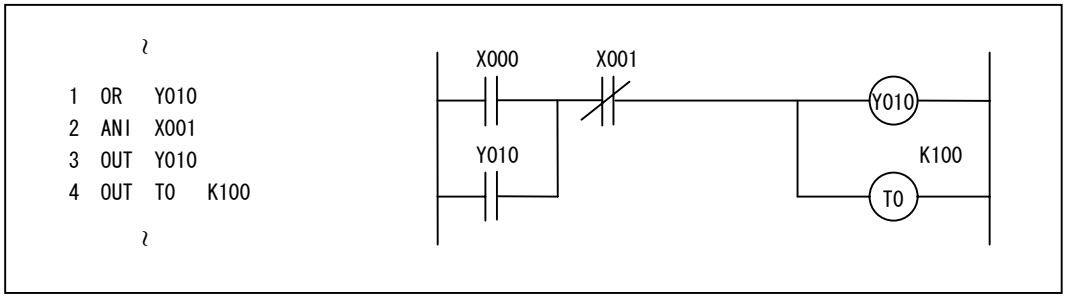
[General description of the operations]

The program is as follows:
Timer T0 goes ON when X0 is turned ON. And then, Y18, Y1A, Y1C, and Y1E go ON after 10 sec. (The Y18, Y1A, Y1C, and Y1E LEDs of the AY40's output module all light.)

Now, let's try executing and monitoring the sequence program written in Section 2.3.1.

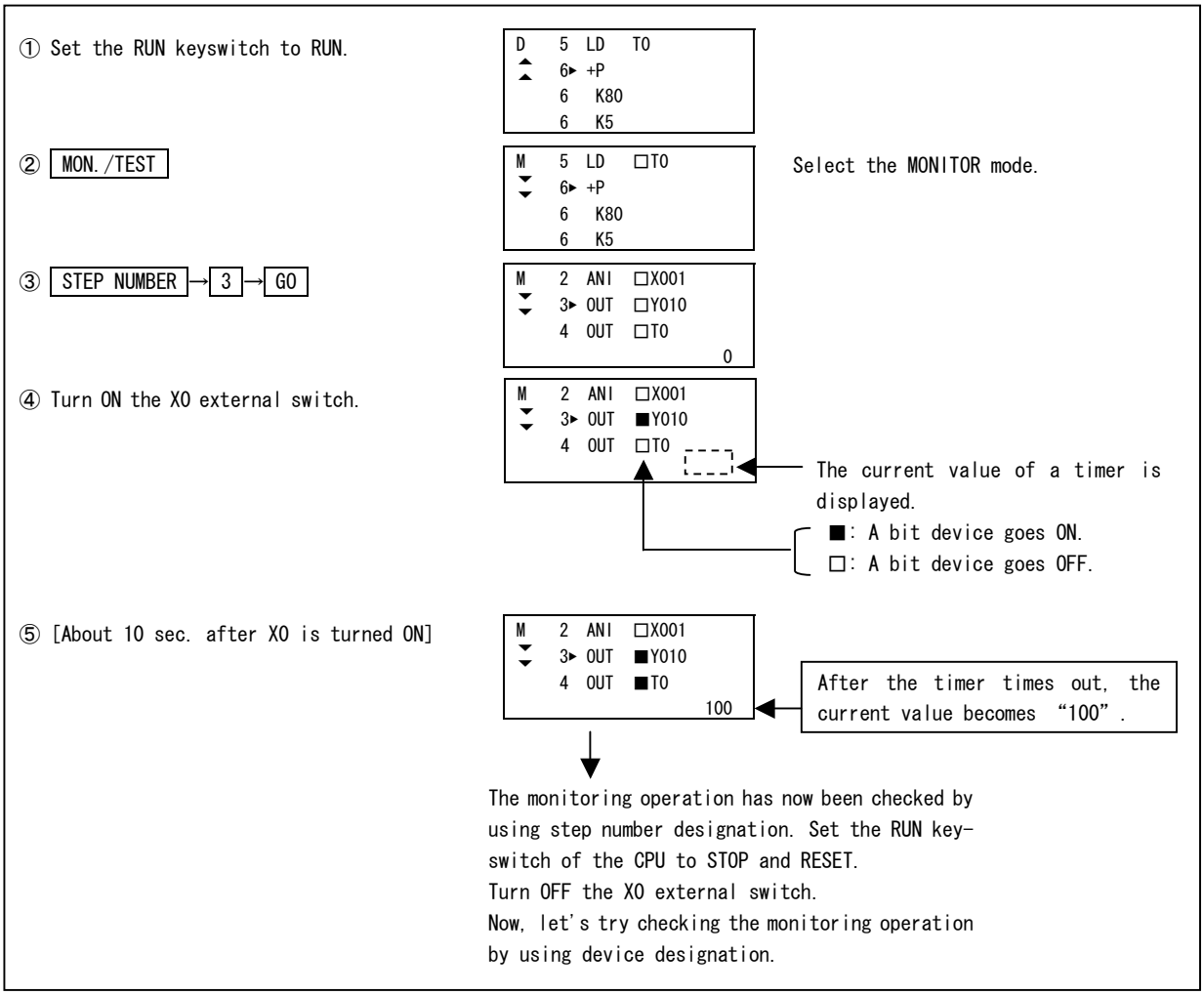
2.3.1 Let's try monitoring the execution status of a program

This section shows how to monitor the execution state of a sequence program, and how to check the current values of the ON/OFF states of bit devices and word devices.

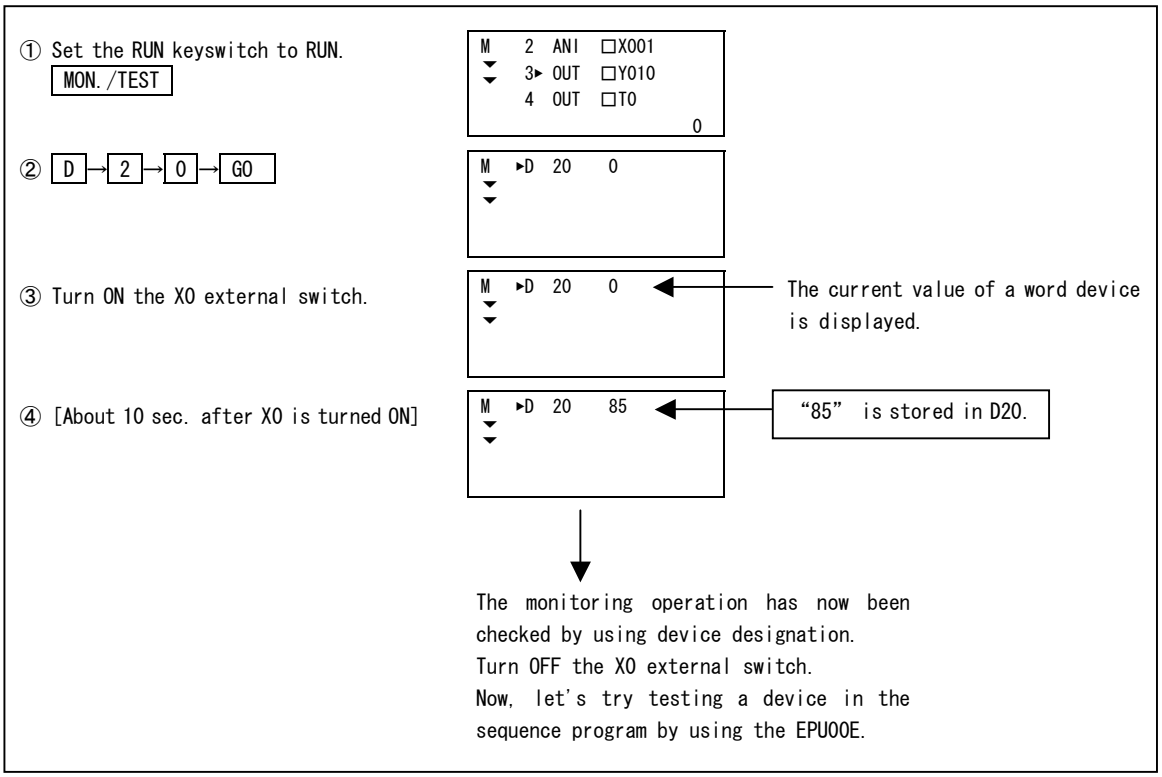


[Sample operation]

(1) Monitoring operation by using step number designation



(2) Checking the monitoring operation by using device designation
Monitoring device: D20

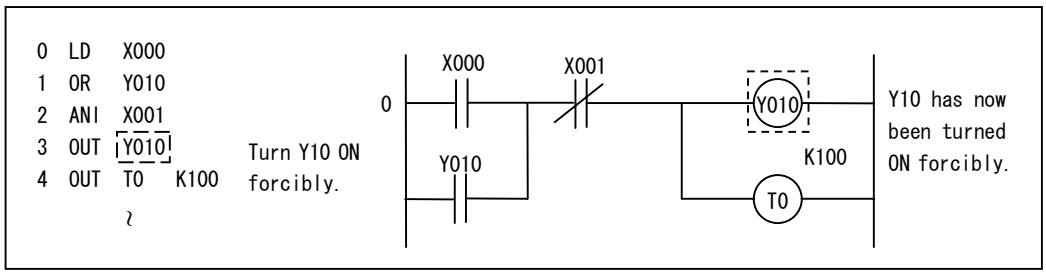


2.4 Let's Try Testing the Sequence Program

This section shows how to execute and test the sequence program written in Section 2.2.1 and modified in Sections 2.2.3 to 2.2.5.

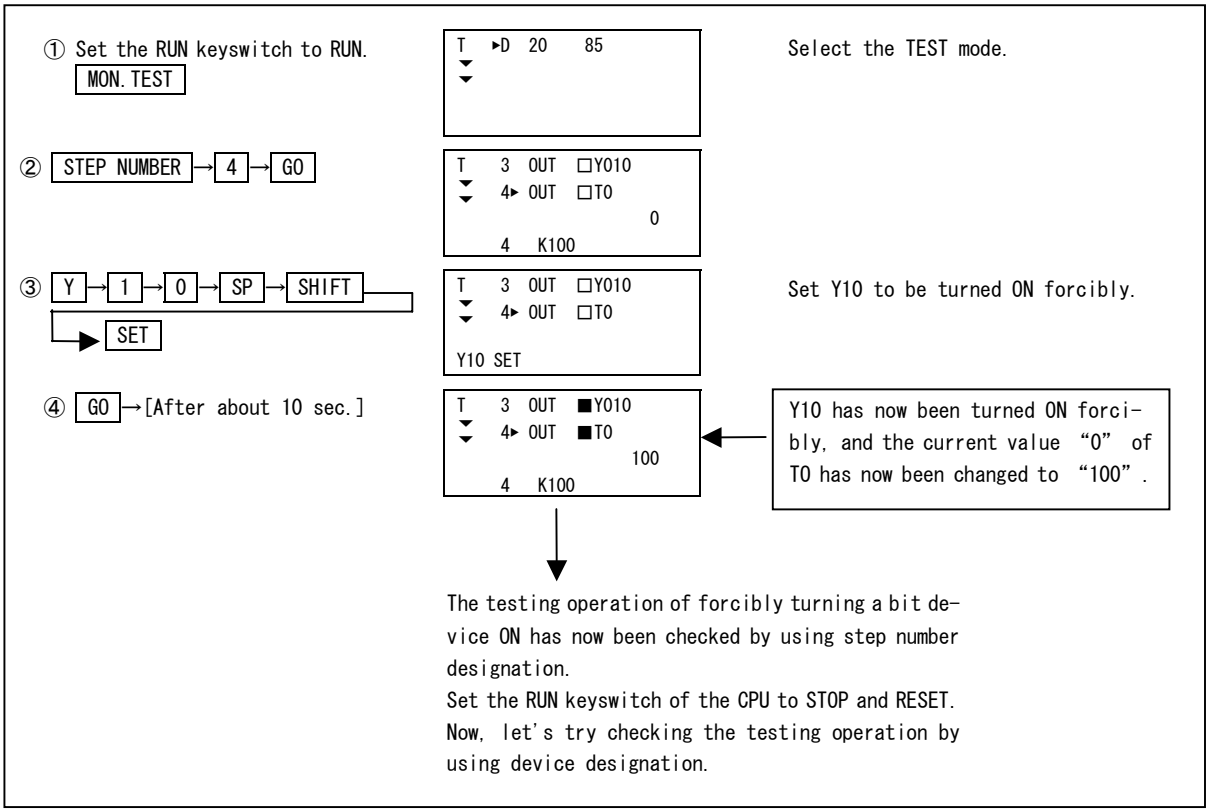
2.4.1 Forcibly turning a bit device ON/OFF

This section shows how to check that Y10 was turned ON forcibly, and that the current value of T0 became “100” after 10 sec.

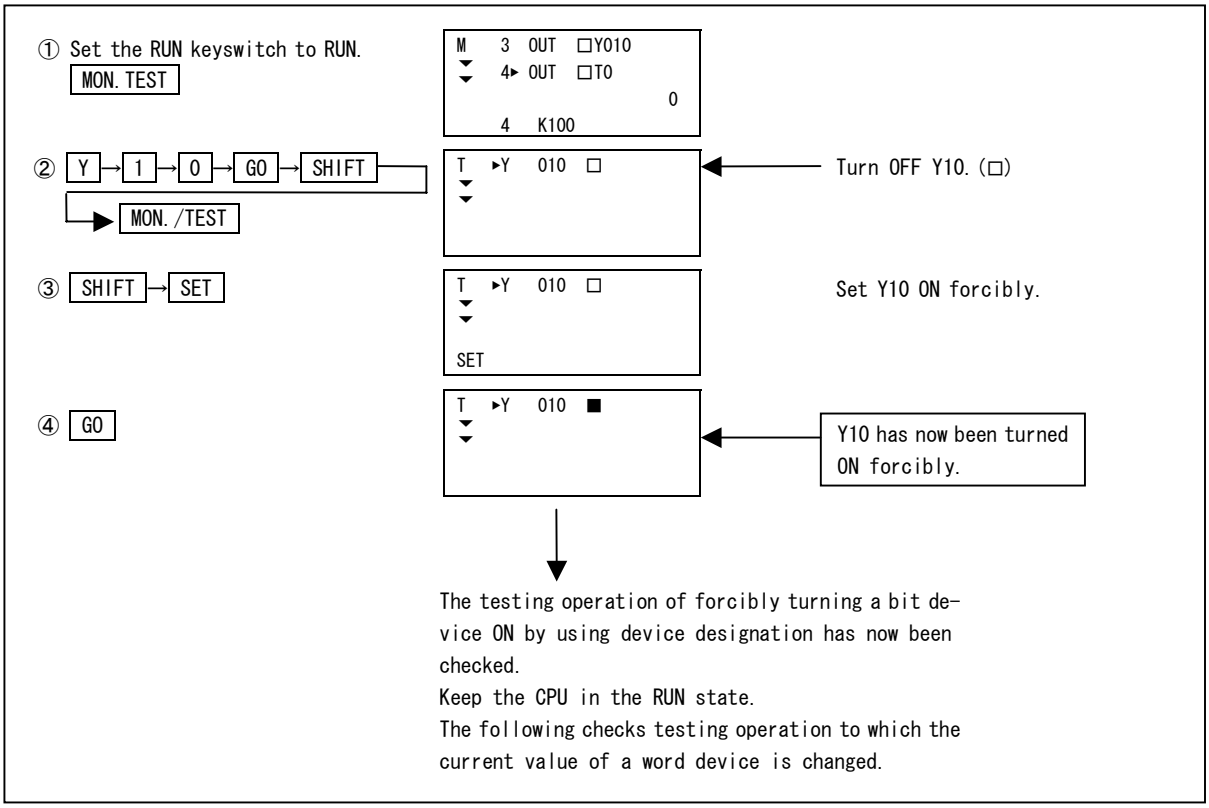


[Sample operation]

(1) Testing operation by using step number designation (list monitoring)

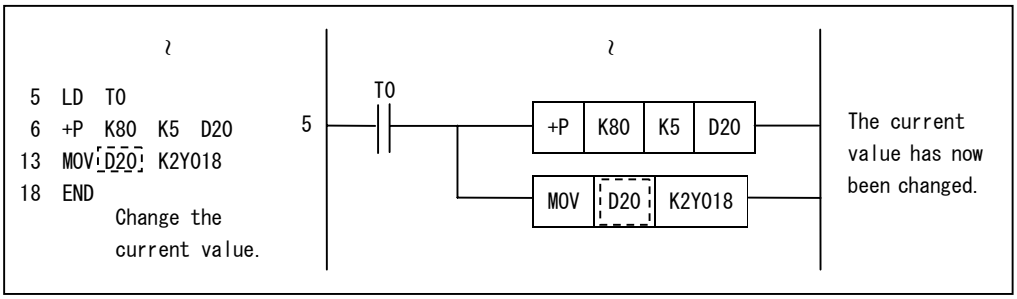


(2) Checking the testing operation by using device designation (device monitoring)



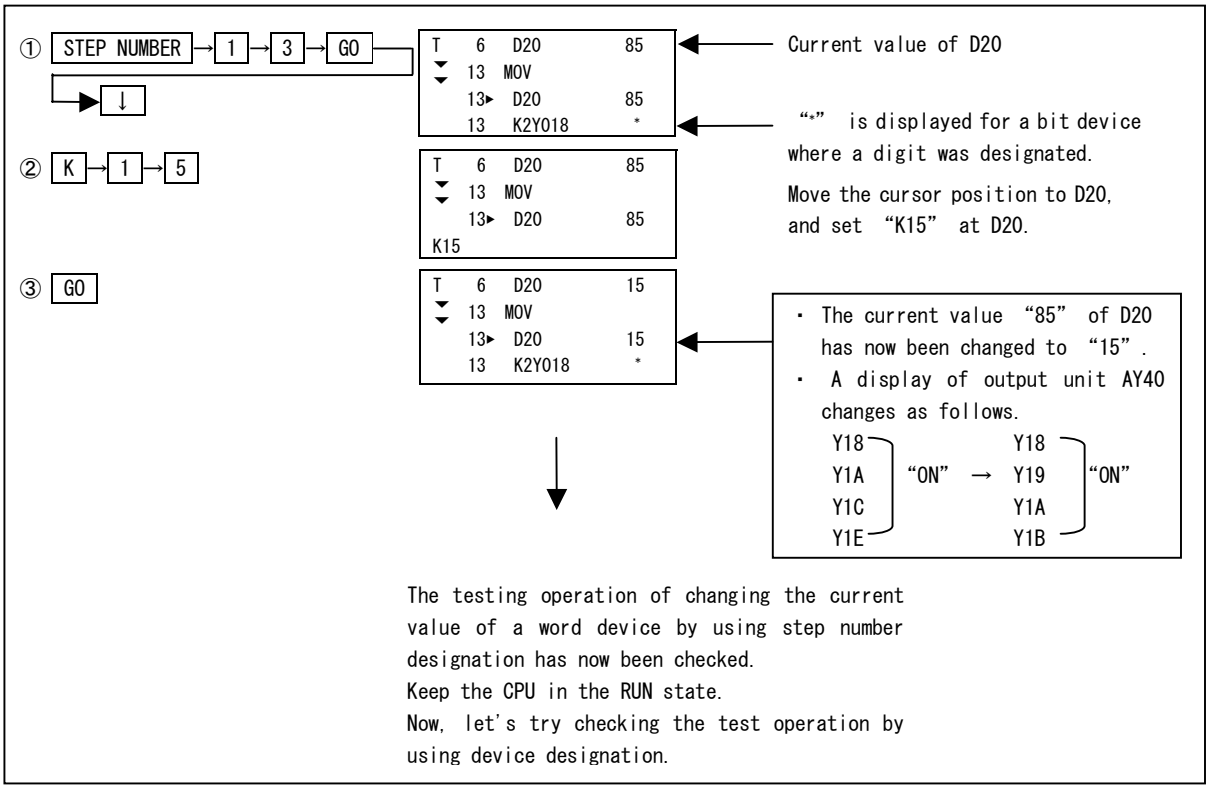
2.4.2 Changing the current value of a word device

This section shows how to perform the test which changes the current value of D20 when the CPU is in the RUN state.

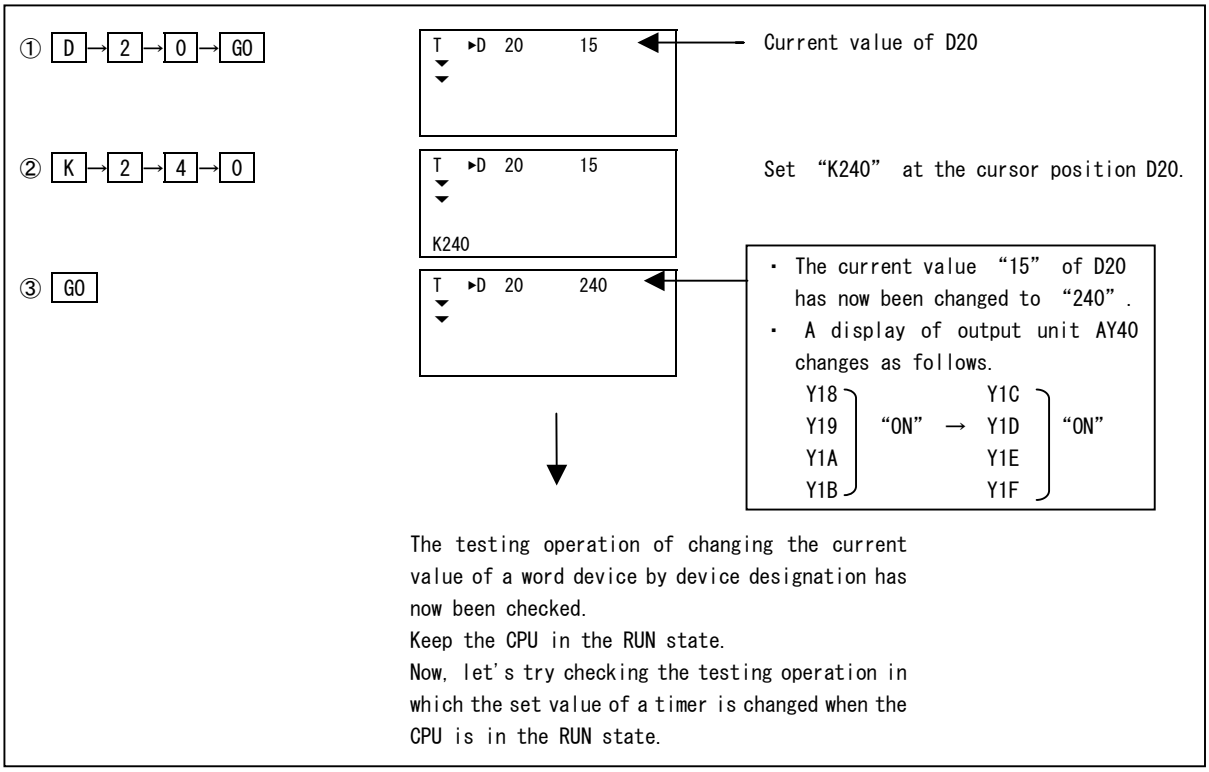


[Sample operation]

(1) Testing operation by using step number designation (list monitoring)
(Change the current value “85” of D20 to “15”.)

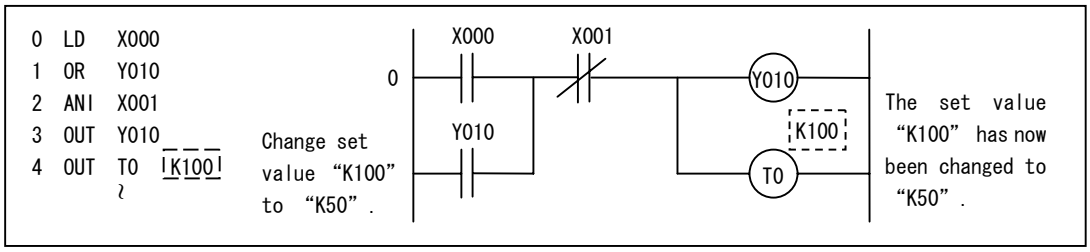


(2) Checking the test operation by using device designation (device monitoring)
(Change the current value “15” of D20 to “240”.)

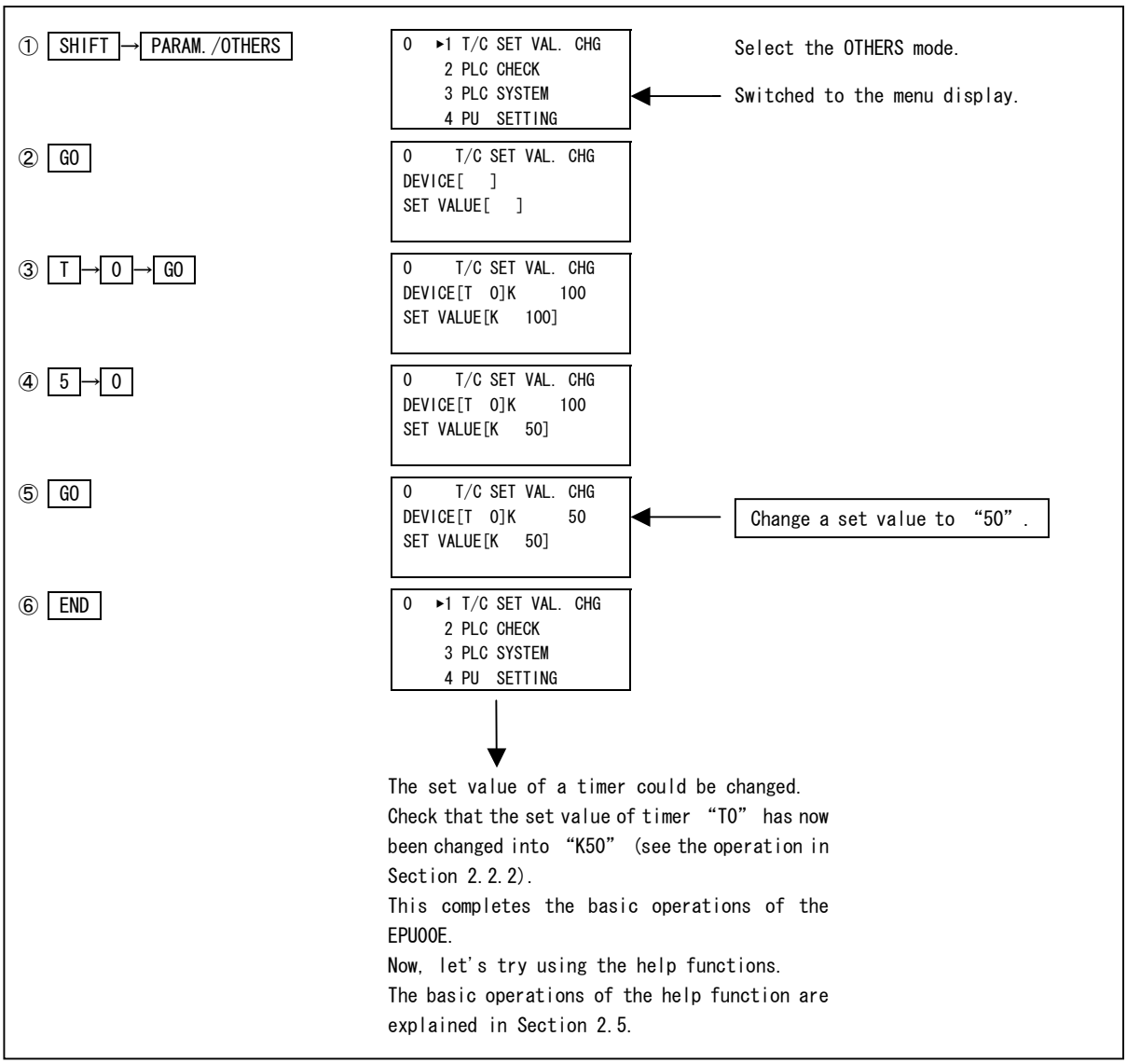


2.4.3 Changing the set value of a timer when the CPU is in the RUN state

This section shows how to forcibly change the set value of a timer of sequence programs in the RUN state.
Change the set value “K100” of timer “T0” in the program to “K50” when the CPU is in the RUN state.



[Sample operation]



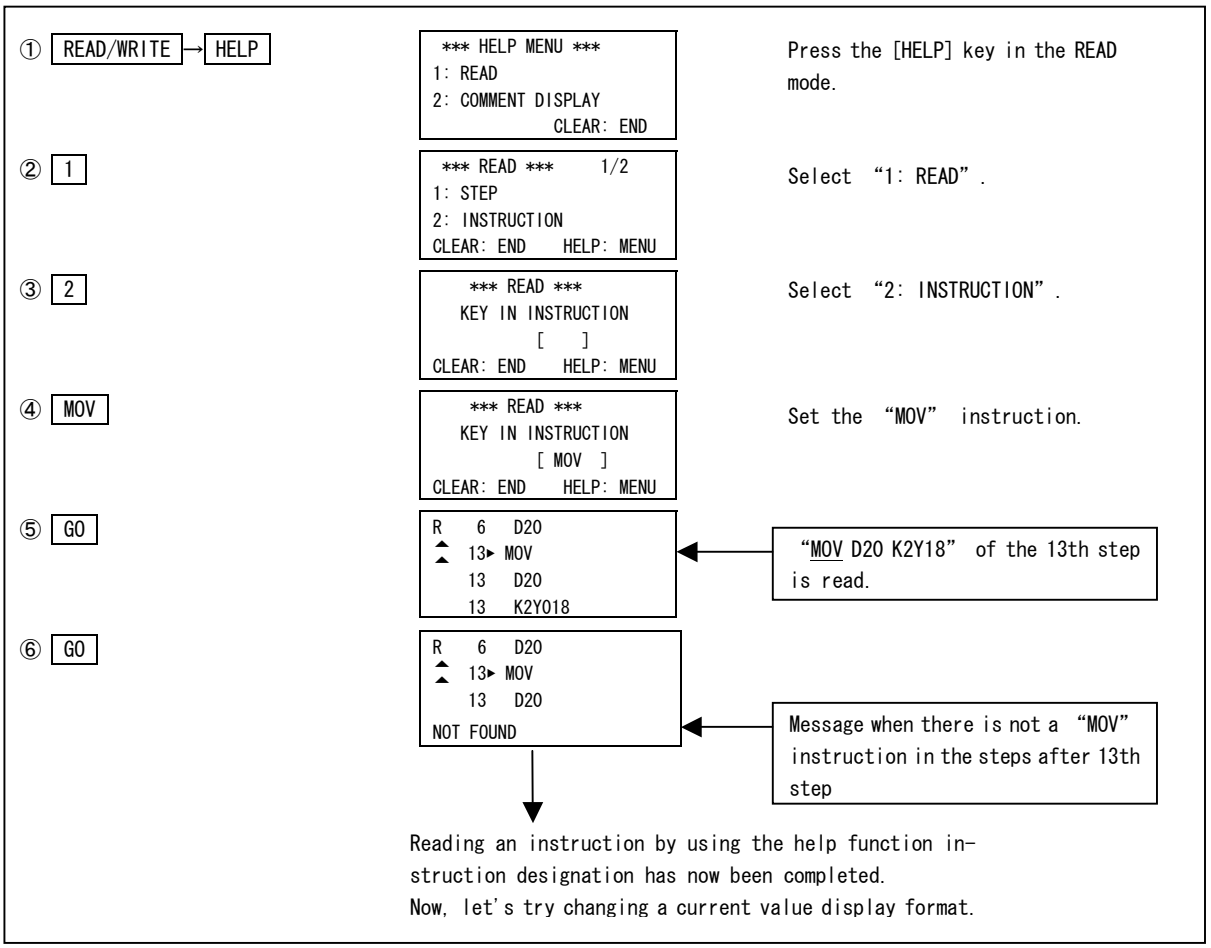
2.5 Let's Try Using Help

The [HELP] key is pressed when using the help functions.
The help function items of each mode are displayed in a menu format by pressing the [HELP] key. Therefore, corresponding items can be selected and executed.
This section explains, as sample operations, the reading operation by using instruction designation and the changing operation of the display format of a current value.

2.5.1 Reading an instruction in a sequence program

This section explains how to read the place where the "MOV" instruction is used in the sequence program.

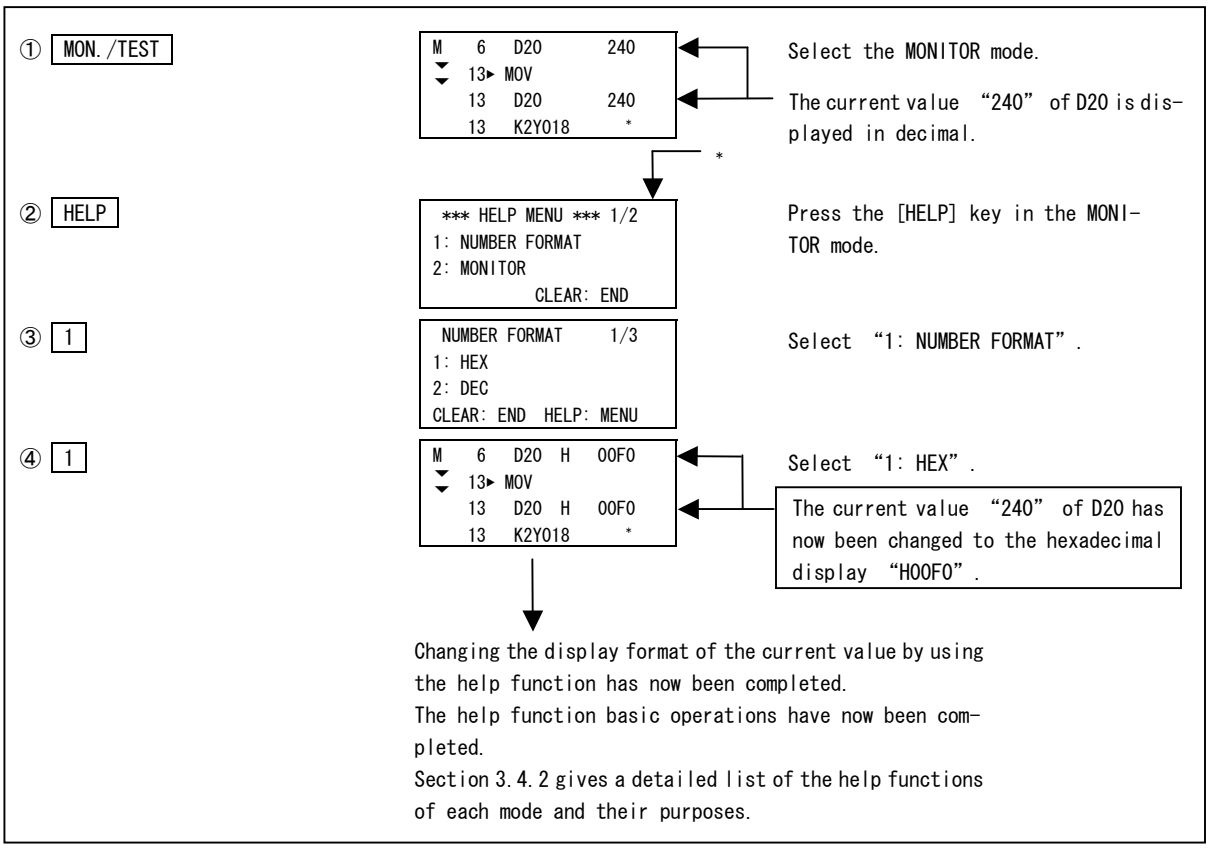
[Sample operation]



2.5.2 Changing of the display format of a current value

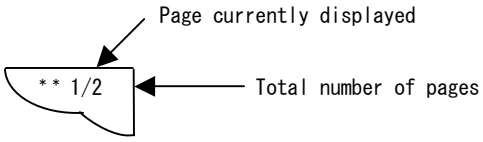
This section shows how to change the current value display format in the MONITOR mode from decimal to hexadecimal display.

[Sample operation]



* When the number of pages is displayed on the upper right hand side of a help screen, press the [↑] and [↓] keys to change the pages on the screen.

Page display example



[DETAILS]

3. SPECIFICATIONS

3.1 General Specifications

Table 3.1 EPU00E General Specifications

Items	Specifications					
Ambient temperature	Operating	0 to 40℃				
	Storage	-20 to 70℃				
Ambient humidity	Operating	20 to 85% RH, no condensation				
	Storage	10 to 90% RH, no condensation				
Vibration resistance	Conforms to *JIS-C0911	Frequency	Acceleration	Amplitude	Sweep Count	
		10 to 55Hz	—	0.075mm (0.003 inches)	10 times (1 octave/minute)	
		55 to 150Hz	9.8m/s^2(1G)	—		
Shock resistance	Conforms to *JIS-C0912 (10G × 3 times in 3 directions)					
Operating ambience	No corrosive gases or dust.					
Cooling method	Self-cooling					

*JIS: Japanese Industrial Standard

3.2 Performance Specifications

Table 3.2 EPU00E Performance Specifications

Items	Specifications		
Connected module	ACPU (see Section 3.3.2)		
Power, current consumption	Power supplied from connected ACPU (5VDC, 0.4A)		
Connection method	Add-on	Attached directly to the ACPU.	
	Hand-held	Connected via RS-422 cable.	
LCD display	Display of 4 lines × 20 characters (with cursor)		
Operating method	Consists of 54 operation keys (covered with polyurethane film)		
Key operation check	Buzzer		
Display lifespan	100000 hours or more (when using the unit at 15 to 35℃ ambient temperature and 65% RH or less ambient humidity)		
Backlight lifespan	50000 hours or more (when using the unit at 25℃ operating ambient temperature) If ON, goes OFF if a key has not been input for 10 minutes.		
Keypad lifespan	1000000 times		
External interface	RS-422	Rear side of the unit	Add-on connection and AC30R4-PUS cable connections
	Extended interface	Upper side of the unit	Unused
Outside dimensions mm (in.)	188(7.40)(height) × 95(3.74)(width) × 44.5(1.75)(depth) When installed onto an ACPU, the depth is 37.5(1.48).		
Weight kg (lb)	0.5(1.1)		

3.3 System Configuration

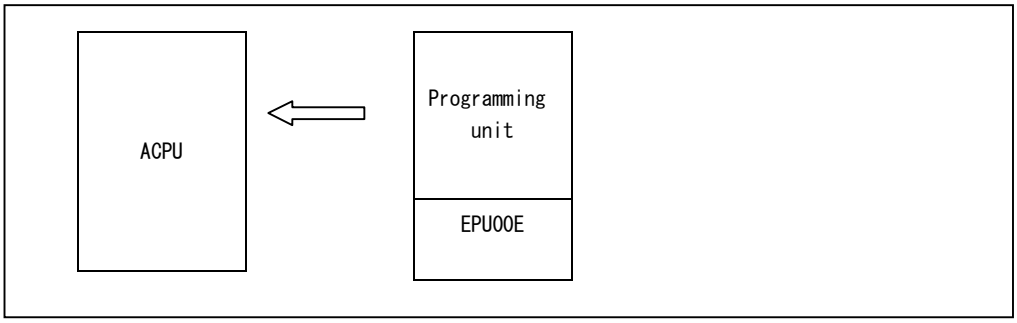
This section shows the system configuration and system equipment when using the EPU00E.

3.3.1 System configuration

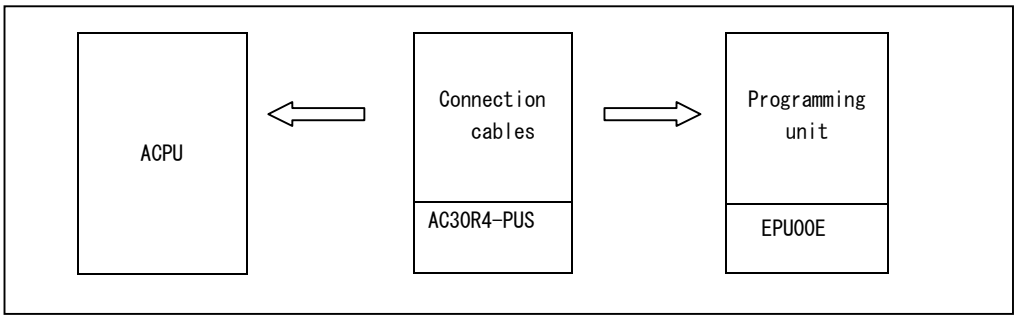
The EPU00E is connected to and operates with an ACPU by using either of the following methods:

Connecting Methods	How to Connect
Add-on method	Attach the EPU00E directly to the ACPU.
Hand-held method	Connect the EPU00E and ACPU via RS-422 cable.

(1) Add-on method



(2) Hand-held method



REMARK

Section 3.3.2 gives connectable ACPUs.

3.3.2 Connectable ACPUs

ACPUs to which the EPU00E can be connected are as follows:

Connectable ACPUs	Connecting Methods	
	Add-On	Hand-held
		AC30R4-PUS Cables
A0J2CPU A0J2HCPU A1CPU, A1NCPU A1SCPU A2CPU(-S1), A2NCPU(-S1) A2CCPU(C24/PRF) A2ACPU(-S1) A3CPU, A3NCPU A3ACPU A3HCPU A3MCPU A3VCPU A73CPU, A373CPU	Applicable to other than an A1S and A2C(C24/PRF)	Applicable

POINT

The EPU00E uses power from the connected ACPU.
Since the current consumption of EPU00E is 5VDC and 0.4A, the power supply and the capacity of the total internal current consumption of a connected ACPU must be taken into consideration when connecting the EPU00E.

3.3.3 System equipment

The following table shows the equipment needed to use the EPU00E.

Model Names	Parts	Remarks	Weights(kg)
EPU00E	Programming unit	Programming unit with an LCD and programming function	0.5
AC30R4-PUS	RS-422 cable	Cable for connecting the RS-422 connector on the rear side of EPU00E to an ACPU Length: 3 m (Option)	0.5

3.4 Lists of Functions

3.4.1 List of functions

Modes (Mode Displays)	Functions				Purposes	Reference Sections
WRITE(W)	Writing programs				To write, insert, and change programs	6.2.2
	Device change				To change devices used in designated steps in programs	6.2.2
	Help	Write	Instruction help	Instruction display /selection	Display/selection of instructions that begin with the designated characters	6.2.3
				Step read	To designate step numbers and read programs	—
			NOP continuation		To make designated ranges in programs with NOP	6.2.1
		Comment display			To display comments of designated devices	6.2.4
READ(R)	Reading programs				To designate step numbers and read programs	6.3.1
					To designate utilized instructions and read programs	6.3.2
					To designate utilized devices and read programs	6.3.3
	Automatic scrolling				To display programs read to designated steps by scrolling automatically	6.3.4
	Help	Read	Step		Same as the purposes of the read and automatic scrolling functions.	—
			Instruction			—
			Device			—
			Automatic scrolling			—
		Comment display			To display comments of designated devices	6.2.4
INSERT(I)	Inserting in programs				To insert new programs in existing programs	6.4.1
	Help	Insertion	Instruction help	Instruction display /selection	Display/selection of instructions that begin with designated characters	6.2.3
				Step read	To designate step numbers and read programs	—
			Move		To move designated ranges in programs to designated positions	6.4.2
			Copy		To copy designated ranges in programs to designated positions	6.4.3
		Comment display			To display comments of designated devices	6.2.4
DELETE(D)	Deleting programs				To delete programs of designated steps	6.5.1
	Help	Deletion	Range designation		To delete designated ranges in programs	6.5.2
			NOP batch		To batch-delete NOP instructions in programs up up to the END instructions (NOPLF instructions are not deleted.)	6.5.3
		Comment display			To display comments of designated devices	6.2.4
MONITOR(M)	List monitoring				To read programs of designated steps and display the continuity of instructions, ON/OFF states of contacts, and current values	6.6.1
	Monitoring search				To search and display OUT/SET/RST instructions using designated contact devices(Monitoring continues.)	6.6.2
	Device monitoring				To display current values(including T/C set values) of the ON/OFF states of bit devices and word devices	6.6.3
	Help	Display change			To display values in designated formats or ASCII.	6.6.4
		Monitor	List monitoring		To read and monitor programs of designated steps	—
					Same as the monitor search function.	—
			Device monitoring		To display current values (including T/C set values) of the ON/OFF state of bit devices and word devices	—
					To set displays of offline switches	6.6.5
		Comment display			To display comments of designated devices	6.2.4

(Continued on the next page.)

(Continued from the previous page)

Modes (Mode Displays)	Functions			Purposes	Reference Sections
Test(T)	Testing by list monitoring			To set(turn ON)/reset(turn OFF) bit devices To change current values of word devices	6.7.1 6.7.2
	Test by device monitoring			To set/cancel offline switches and separate designated bit devices utilized in OUT instructions from ACPU operation processing. Or to cancel separations	6.7.5
				To set (turn ON)/reset(turn OFF) bit devices To change current values of word devices	6.7.3 6.7.4
	Help	Display change		To display values in designated formats or ASCII.	6.6.4
		Test	List monitoring test	To read programs of designated steps, to set(turn ON)/reset(turn OFF) bit devices, and to change current values of word devices Same as the Test by list monitoring.	—
			Device monitoring test	To display current values(including T/C set values) of the ON/OFF state of bit devices and word devices	—
		Comment display		To display comments of designated devices	6.2.4
PARAMETER (P)	All clear of parameters			To only clear parameters in an ACPU	6.8.1
	Setting of parameters			To set memory capacities, timer counters, and latch ranges, etc. of all kinds of parameters Or to change set values	6.8.2
				To set entry codes Or to change entry codes	5.1.3 6.8.2
OTHERS(O)	Change of T/C set values			To change set values of designated devices (T/C)	6.9.1
	PC check	Error step read		To display the descriptions of errors that occur in an ACPU and the step numbers where errors occur	6.9.2
		Program check		To check duplex coil/instruction codes, etc. in programs	6.9.3
	PC system	Monitoring	Link monitoring	To display MELSECNET(Ⅱ)/B link states	6.9.4
			Buffer memory batch monitoring	To monitor the buffer memory contents of designated addresses for the special-function modules of designated I/O numbers	6.9.5
			Clock monitoring	To monitor ACPU clocks(D9025 to D9027)	6.9.6
		All clear	PC memory	To clear the entire memory of ACPUs and return to initial states	6.9.7
			Program	To clear currently selected programs(main/sub)	6.9.8
			Device memory	To clear all device memories except special D and special M and R	6.9.9
		Switching	PC NO. setting	To switch applicable operating programs in all EPU00E modes.	6.9.10
			Main/sub switching	To switch applicable operating programs (main/sub) in all EPU00E modes	6.9.11
		Others	Remote RUN/STOP	To forcibly switch ACPU execution states (RUN/STOP)	6.9.12
			Machine language reading/writing	To read and write in machine language for the memory of ACPUs	6.9.13
	PU setting	Program mode selection		To set whether or not writing is executed when programs are in the RUN state, and whether or not only the MONITOR and TEST are utilized.	6.9.14
		Continuity display		To set whether or not the continuity of each instruction is displayed when the list monitoring function is used.	6.9.15
		Buzzer setting		To set whether or not buzzer is ON/OFF when a key is pressed.	6.9.16

3.4.2 List of help functions

The following table shows the help functions for each mode. Operate the help function without using the reference section in accordance with the items in each help menu.

Modes (Mode Displays)	Help Functions	Purposes	Help Operations	Normal Operations	Reference Sections
WRITE(W)	Instruction display/selection	・To input initials and display instruction names that correspond to such initials in lists ・To select instructions to be written from lists	○	—	6.2.3
	Step read	To designate step numbers in which instructions are written and to display programs	○	○	—
	Continuous writing(range) of NOP	To designate start and final step numbers and execute NOP batch writing	○	—	6.2.1
	Continuous writing(all) of NOP	To designate only start step numbers and execute NOP batch writing until the flag step	○	—	
	Comment display	To display comments of devices where the cursor is	○	—	6.2.4
READ(R)	Read by using step designation	To designate step numbers and display programs	○	○	—
	Read by using an instruction*1	To input instruction names and search programs	○	○	—
	Read by using a device	To input device numbers and search programs	○	○	—
	Automatic scrolling	To scroll programs automatically in designated directions	○	○	—
	Comment display	To display comments of device where the cursor is	○	—	6.2.4
INSERT(I)	Instruction display/selection	・To input initials and display instruction names that correspond to such initials in lists ・To select instructions to be inserted from lists	○	—	6.2.3
	Read by using step designation	To designate step numbers in which instructions are inserted and to display programs	○	○	—
	Batch movement of programs	To designate step ranges and move in batch	○	—	6.4.2
	Batch copying of programs	To designate step ranges and copy them in batch	○	—	6.4.3
	Comment display	To display comments of devices where the cursor is	○	—	6.2.4

*1: See (2) and (3) in the Explanations part of Section 6.3.2 for the instruction to be set.

(Continued on the next page.)

(Continued from the previous page)

Modes (Mode Displays)	Help Functions	Purposes	Help Operations	Normal Operations	Reference Sections
DELETE(D)	Batch deleting of programs	To designate step ranges and delete them in batch	○	—	6.5.2
	NOP batch delete	To batch-delete NOP instructions	○	—	6.5.3
	Comment display	To display comments of devices where the cursor is	○	—	6.2.4
MONITOR(M)	Changing display formats	To change displayed numerical values to binary, octal, decimal, hexadecimal, and ASCII displays	○	—	6.6.4
	Read by using step designation	To designate step numbers that do list monitoring and display programs	○	○	—
	Monitoring search	To move the cursor to contact instructions and search the corresponding OUT, SET, and RST instructions	○	○	—
	Monitor device	To designate devices to be monitored and display devices and device states	○	○	—
	Setting of an offline switch display	To set whether or not there is an offline switch display during device monitoring	○	—	6.6.5
	Comment display	To display comments of devices where the cursor is	○	—	6.2.4
TEST(T)	Changing display formats	To change displayed numerical values to binary, octal, decimal, hexadecimal, and ASCII displays	○	—	6.6.4
	Read by using step designation	To designate step numbers in which list monitoring is tested and to display programs	○	○	—
	Device monitoring test	To designate devices which device monitoring is tested and display devices and device states	○	○	—
	Comment display	To display comments of devices where the cursor is	○	—	6.2.4
OTHERS(O)*2	Changing display formats	To change displayed numerical values to binary, octal, decimal, hexadecimal, and ASCII displays	○	—	6.6.4

*2: Can be executed only during buffer memory batch monitoring.

M E M O

4. HANDLING AND NOMENCLATURE

This section tells how to handle the EPU00E and explains the part names

4.1 Precautions When Handling the EPU00E

The following precautions should be taken when handling the EPU00E:

(1) Since the case is made of plastic, do not drop the EPU00E or subject it to severe shocks.

(2) Do not disassemble the case (doing so could cause a malfunction).

(3) When not using the EPU00E, handle the RS-422 connector as follows:
Attach the protective cap to the RS-422 connector on the rear side of the unit.

(4) Do not remove the connector cover of the extension interface on the upper side of the unit.

(5) Do not touch the RS-422 connector pins (doing so could cause a malfunction).

(6) Do not remove the cover of the EPU00E.
Do not loosen the screws that hold the cover (doing so could cause a malfunction).

(7) Always press the [CLEAR] key before disconnecting the EPU00E from an ACPU.

(8) Never use a cleaning agent such as thinner, alcohol, or freon.

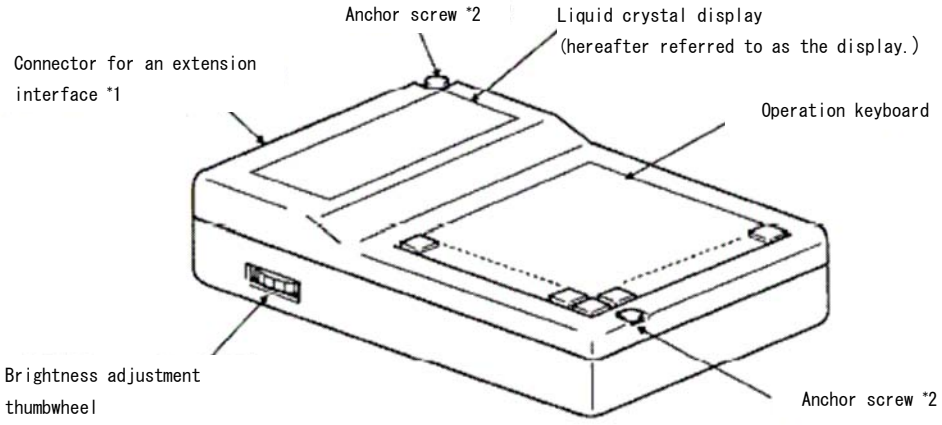
(9) Press keys only with the fingers.
Using a sharp instrument, etc. could cause a malfunction.
Since the EPU00E beeps when a key is pressed, key operations can be confirmed by the sound.

IMPORTANT

When designing the system, to protect the PC, make sure to provide a safety circuit outside that system.

4.2 Nomenclature

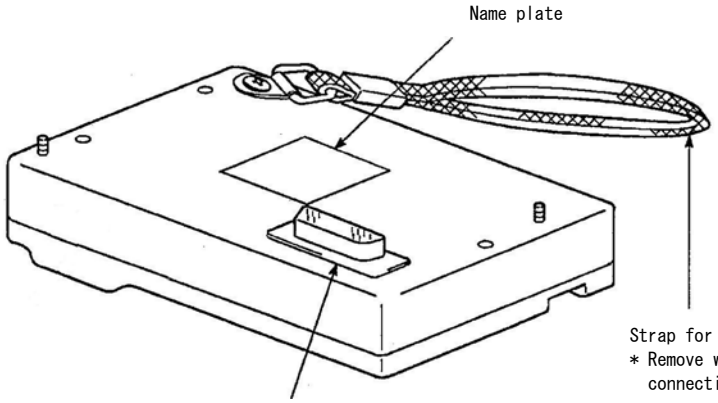
This section shows and explains the nomenclature of the EPU00E.
(Front view)



*1: The connector for an extension interface cannot be currently used.
Do not remove the connector cover.

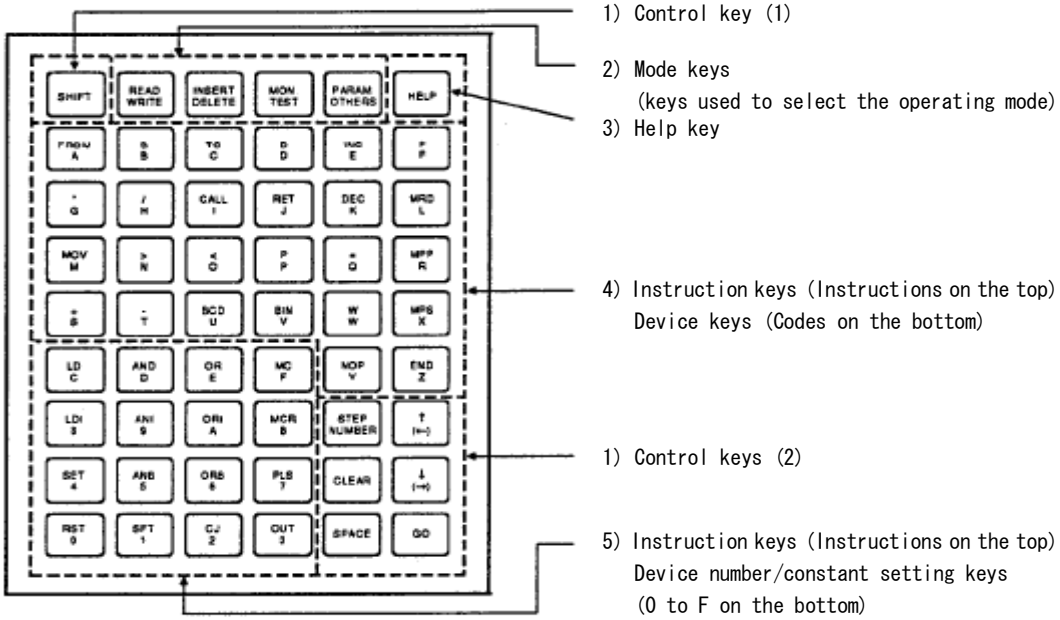
*2: The anchor screw (M3) tightening torque is (39 to 49 N･cm 4 to 5kg･cm).

(Rear view)



4.3 Layout of the Keyboard and List of Key Functions

This section gives the layout of the EPU00E operating keyboard, and lists the keys and their functions.



Num-bers.	Names	Keys	Functions	Main Reference Sections
1)	Control key	STEP NUMBER	Used to declare start inputting step numbers or for automatic scrolling. Sections 2 and 6 give examples of its use. Used to make the bottom functions of a key valid. The top/bottom setting can be confirmed by the display.	2 6
		SHIFT	Used to make the top functions of a key valid. The top/bottom setting can be confirmed by the display.	5.4.1
		CLEAR	In modes other than PARAMETER, OTHERS, and help function modes: Used to return to the mode selection state. (All input instructions or device numbers will be cleared except the mode.) Used to correct a mistake when the wrong key is input.	6
			In the PARAMETER mode: Used to interrupt processing. After processing has been restarted, continue operations as before.	6.8
			Returns to the previous display in the OTHERS mode.	6.9
			When the help function is used: Returns to the display when the [HELP] key was pressed.	6
			When disconnecting the EPU00E from an ACPU: Processing of EPU00E during execution is interrupted. Be sure to press the [CLEAR] key before disconnecting them.	5.1.5
		SPACE	Used to input a blank between an instruction part and a device name	6
		↑ (←) ↓ (→)	Used to move the cursor(▶,■) on the display or indicate the scrolling direction of a scrolling display.	6
		GO	Pressed at the end of a series of key operations. Key operations are executed until this key is pressed. Press this key after confirming the contents of the series of key operation in the display.	6

(Continues on the next page.)

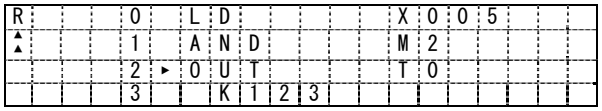
(Continued from the previous page)

Num-bers.	Names	Keys	Functions	Main Reference Sections
2)	Mode keys	READ WRITE to PARAM OTHERS	Used to select EPU00E modes. The top and bottom modes can be switched by pressing the [SHIFT] key.	5.1.4
3)	Help key	HELP	Used to select the help function in the mode supporting a help function (Sections 2.5, 6.2 to 6.7, and 6.9.5. give details about applicable modes.)	2.5 6
4)	Instruction/Device keys	FROM A to END Z	Used to input K/H when instructions, device names and constants are input. Pressing the [SHIFT] or [STEP NUMBER] keys enables switching the valid key area between the top and bottom.	5.4.2 5.4.1
5)	Instruction/ Device number/ constant setting keys	RST 0 to MC F	Used to input instructions, device numbers, and constants. Pressing the [SHIFT] or [STEP NUMBER] keys enables switching the valid key area between the top and bottom.	

* The following shows the movements between the steps, between menu items, and in the input area.

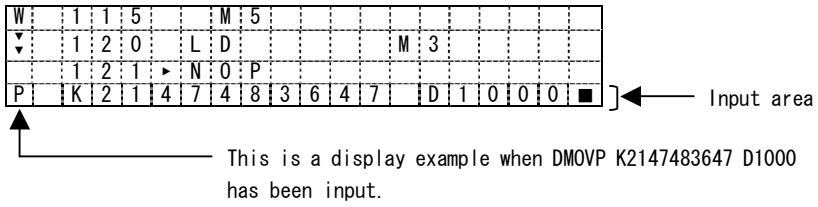
(1) Repeated pressing of the cursor keys move the cursor in the designated key direction.

(2) Movement between menu items or between steps
To display the programs immediately before or after a currently displayed instruction, press the [↑]/[↓] keys.
[↑]: Program immediately before (the program next to step 0 will not change)
[↓]: Program immediately after (the program next to the final step will not change)



"▸" can move in a designated direction (up and down) by pressing [↑] or [↓] key.

(3) Movement in the input area
Press the [(←)]/[(→)] keys to move the cursor among instruction names, sources, and destinations.



"■" can move in a designated direction (right and left) by pressing the [(←)] or [(→)] key.

In this manual, EPU00E key operations are abbreviated as follows:

(1) [Key 1] → [Key 2] → …[Key n]: This means all keys between[Key 1] and [Key n] are pressed in order.

(2) [Key 1] + [Key 2]: This means that both [Key 1] and [Key 2] are pressed simultaneously.

(3) Keys such as RST 0 and MOV M keys which are used for dual purposes (instruction and device/constant input), and the control keys of the EPU00E are referred to as follows:

(a) The mode instruction or alphanumeric character which corresponds to the purpose of those keys.

Example:
RST 0 → [RST] or [0], MOV M → [MOV] or [M]

(b) When an instruction input is explained, the explanation uses only the instruction symbol. (The alphanumeric character is omitted.) When an alphanumeric character input is explained, the explanation uses only the alphanumeric character. (The instruction name is omitted.)

Example:
When the MOV M key is referred to:
When an instruction input is explained: [MOV]
When an alphanumeric character input is explained: [M]

4.4 Maintenance

Except for the brightness control, the EPU00E has no components which require inspection or replacement.

Rules for storing the EPU00E:

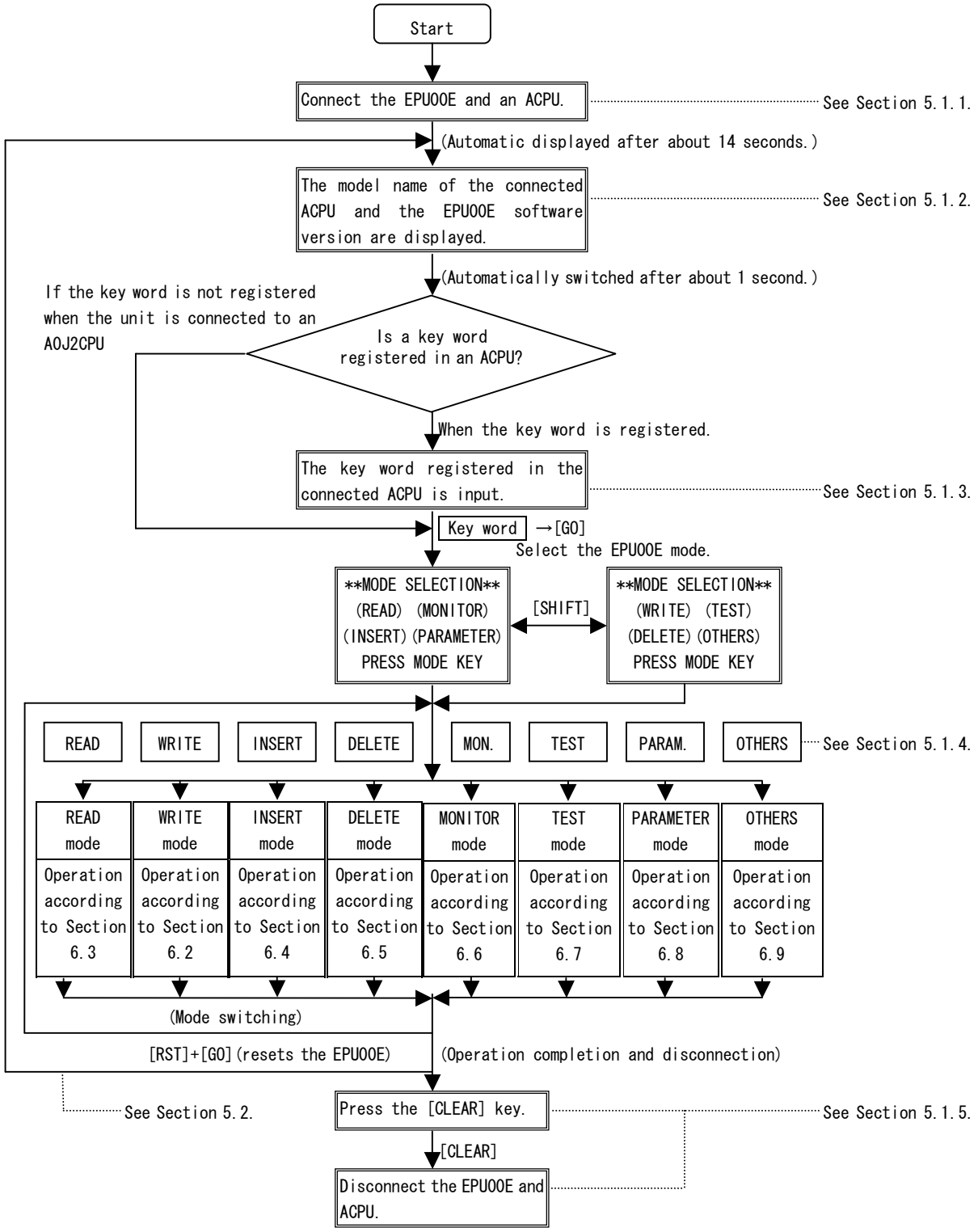
(1) Do not store the EPU00E in the following environments:
- Where ambient temperature is outside the range of -20℃ to 70℃.
- Where ambient humidity is outside the range of 10 to 90% RH.
- Where condensation occurs due to sudden temperature changes.
- Anywhere the EPU00E might be exposed to wind, rain, or the direct sunlight.
- Anywhere with excessive amounts of conductive powders (such as dust, dirt, and iron filings) or corrosive gases, oil mist, and salt.

(2) When storing, make sure the protective cap is on the RS-422 connector on the rear side of the EPU00E.

5. OPERATING PROCEDURES

This section explains the operating procedures from the time the EPU00E is connected to an ACPU until it is disconnected, as well as related window displays and basic operations.

5.1 Procedure From the Beginning to the End of the Operation

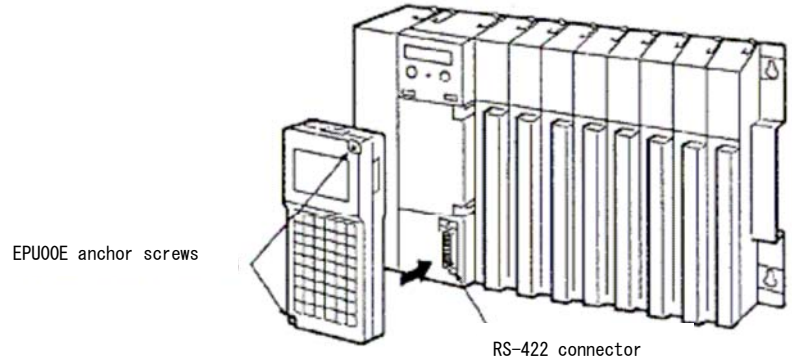


5.1.1 Connecting the EPU00E to an ACPU

Although the EPU00E can be connected to an ACPU even while it is running, the EPU00E should be connected to ACPU in the STOP state. If it must be connected while in the RUN state, make sure to insert the connector properly.

(1) Connection using the add-on method
In this method, the EPU00E is installed directly onto the ACPU module.

However, the add-on method cannot be used for connecting an A1S and A2CCPU (C24/PRF) because screws cannot be tightened.
Connect then using the hand-held method.



The connection procedure is as follows:

1) Remove the cover of the ACPU's RS-422 connector.

2) Remove the RS-422 connector protection cap from the rear of the EPU00E.
Put the protection cap in a safe place.

3) Connect the EPU00E to the RS-422 connector of an ACPU, and firmly tighten the EPU00E anchor screws.
Tighten the anchor screws at a torque of 39 to 49N・cm(4 to 5kg・cm).

4) About 14 seconds after the connection is completed, both the EPU00E software version and the ACPU model name will be displayed.

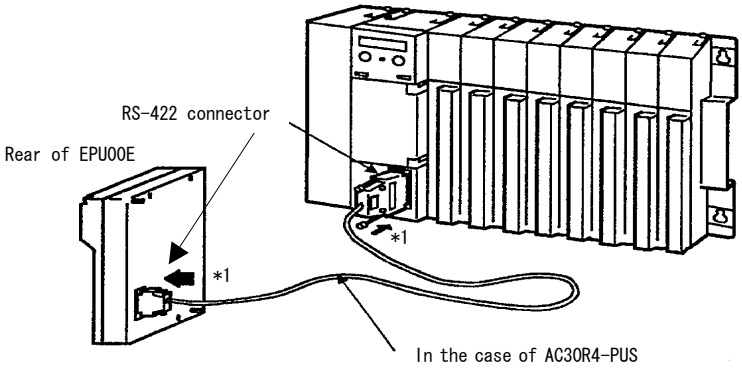
(2) Connection using the hand-held method
Connect the EPU00E to an ACPU by using the RS-422 cable.

The connection procedure is as follows:

1) Remove the cover of the ACPU's RS-422 connector.

2) When using an AC30R4-PUS cable
Remove the RS-422 connector protection cap from the rear of the EPU00E.
Put the protection cap in a safe place.

3) Connect the EPU00E to the ACPU using the RS-422 cable.

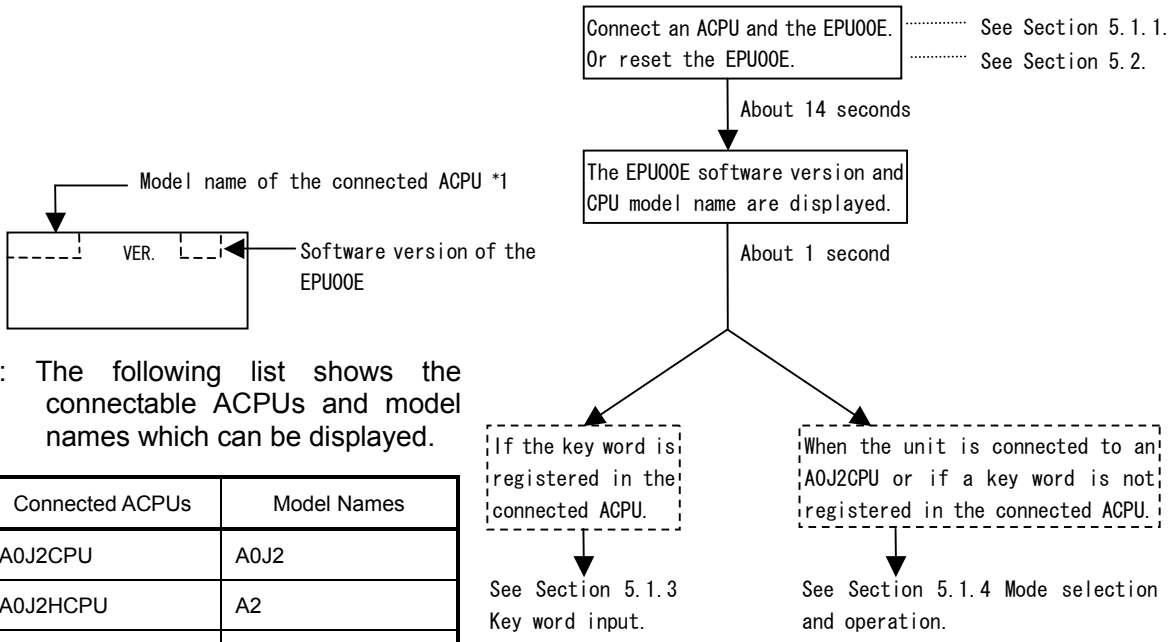


*1 Firmly tighten a anchor screws of the connector.

4) About 14 seconds after the connection is completed, both the EPU00E software version and the model name of the connected ACPU will be displayed.

5.1.2 EPU00E software version and CPU model name display

After (a) completing the connection with an ACPU, or (b) resetting (pressing the [RST]+[GO] keys) the EPU00E, the EPU00E software version and CPU model name are shown in the EPU00E display.
Confirm the display contents as shown below.

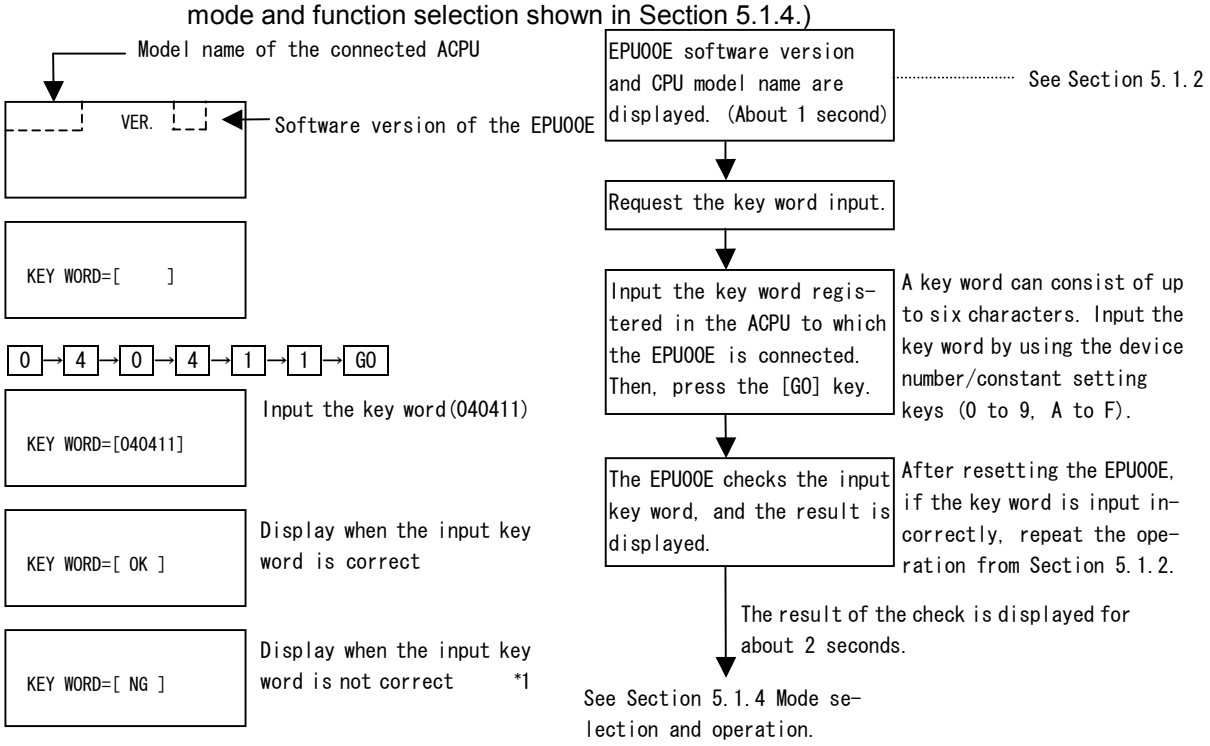


*1: The following list shows the connectable ACPUs and model names which can be displayed.

Connected ACPUs	Model Names
A0J2CPU	A0J2
A0J2HCPU	A2
A1CPU	A1
A1NCPU	A1
A1SCPU(-S1)	A1S
A2CPU(-S1)	A2
A2NCPU(-S1)	A2
A2CCPU(C24/PRF)	A2
A2ACPU(-S1)	A2A
A3CPU	A3
A3NCPU	A3
A3ACPU	A3A
A3HCPU	A3H
A3MCPU	A3M
A3VCPU	A3

5.1.3 Key word input

When a connected ACPU or the PC NO. of the ACPU to be operated is switched, if the key word is registered in the ACPU, the EPU00E requests an input of the registered key word. Input the key word registered in the ACPU. Then, press the [GO] key.
If the key word is not registered in the ACPU or the EPU00E is connected to an A0J2CPU, the operation shown in this section is unnecessary. (The EPU00E automatically goes into the mode and function selection shown in Section 5.1.4.)



*1: If the key word which was input does not correspond with the key word registered in the ACPU, only the following operations can be done (Section 6 gives details):

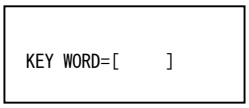
- MONITOR mode
  - Device monitoring ..... See Section 6.6.3
  - Monitoring the offline switch ..... See Section 6.6.5
- TEST mode
  - Test by device monitoring ..... See Sections 6.7.3 and 6.7.4
  - Setting/canceling the offline switch ..... See Section 6.7.5
- OTHERS mode
  - Error step read ..... See Section 6.9.2
  - Monitoring/switching the PC system ..... See Sections 6.9.4, 6.9.5, 6.9.6, 6.9.10, and 6.9.11
  - PU setting ..... See Sections 6.9.14, 6.9.15, and 6.9.16

POINT

- When operating in modes other than MONITOR, TEST, and OTHERS, if the key word registered in the ACPU is unknown, see the “PC memory all clear” operation shown on the next page. And then, clear (delete) the unknown registered key word. If “PC memory all clear” is executed, all other user data (such as sequence programs) will also be cleared.
- Section 6.8.2 gives details about when (a) the key word registered in an ACPU is changed, or (b) a new key word is registered.

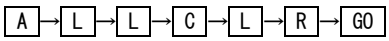
All clear of parameters and a sequence programs as well as key words registered in an ACPU is enabled by the following operation when a key word input is requested:

(Procedure 1) Key word input request is displayed.

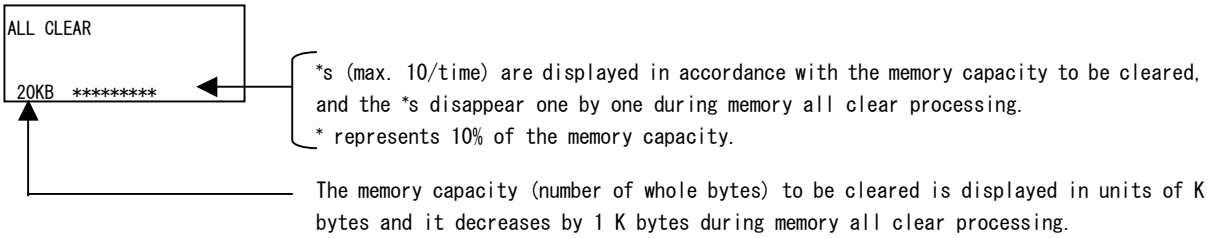


(Procedure 2) ACPU STOP operation
Put the ACPU in the STOP state.

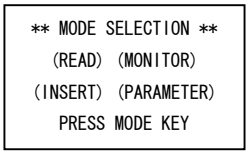
(Procedure 3) PC memory all clear operation
Input “ALLCLR”, and then press the [GO] key.



(Procedure 4) PC memory all clear processing display
When memory all clear processing by the EPU00E begins, the screen shown on the left is displayed, and the display on the “*” line and the number of whole bytes changes sequentially.



(Procedure 5) Completion of PC memory all clear processing
When memory all clear processing by the EPU00E has been completed, a buzzer sounds.
The screen is switched to the one shown on the left. (State before selecting the EPU00E mode)



(Procedure 6) The next operation begins
Select the mode in accordance with Section 5.1.4, and start the next operation.

5.1.4 Mode selection and operation

After displaying the CPU model name and EPU00E software version and executing the key word input operation, perform the EPU00E mode selection to prepare for the operations shown Section 6.

(1) Using the mode keys to select and change modes

To select the mode, press the corresponding mode key. Then, operations can be performed in the selected mode as shown in Section 6.

When the operations shown in Sections 6.2 to 6.9 are executed, the mode can be changed. Therefore, the operation that is executed can be interrupted, and the mode can be changed.*1

The relationship between mode keys, modes and their corresponding sections in this manual is shown below:

READ	READ mode	Section 6.3
WRITE	WRITE mode	Section 6.2
INSERT	INSERT mode	Section 6.4
DELETE	DELETE mode	Section 6.5
MON.	MONITOR mode	Section 6.6
TEST	TEST mode	Section 6.7
PARAM.	PARAMETER mode	Section 6.8
OTHERS	OTHERS mode	Section 6.9

*1: Pressing the mode key is always valid.
Input data (except step numbers) is cleared by pressing the mode key.
The input mode returns to the initial state.

(2) Selecting the write enabled/disabled function when the ACPU is in the RUN state

Write enabled/disabled when in the ACPU is in the RUN state is decided by the program mode selection (see Section 6.9.14) in the OTHERS mode.

(3) To operate in all modes

The operations shown in Section 6 are enabled by the mode selected in (1) and the function selected in (2).

The mode, the ACPU operating format (RAM/EEPROM/ROM), and the ACPU's operation enabled/disabled state are shown on the top of the first page of each operation explanation.

Because the operating methods in Section 6 are explained by using names which correspond with the purposes of the various modes, perform operations in accordance with these explanations.

See Section 7 when an error message is displayed during operations.

5.1.5 Disconnecting the EPU00E from an ACPU

(1) Disconnection when the add-on method is used
The disconnection procedure is as follows:

1) Press the [CLEAR] key.

2) To disconnect the EPU00E from an ACPU, unscrew the EPU00E anchor screws.

3) Disconnect the EPU00E from the ACPU.

4) Put the stored protective cap back on the RS-422 connector on the rear side of the EPU00E.

5) Put the cover on the RS-422 connector of the ACPU.

6) Store the EPU00E carefully.

(2) Disconnection when the hand-held method is used
The disconnection procedure is as follows:

1) Press the [CLEAR] key.

2) Unscrew the connector anchor screws of the ACPU, and remove the RS-422 cable from the ACPU.

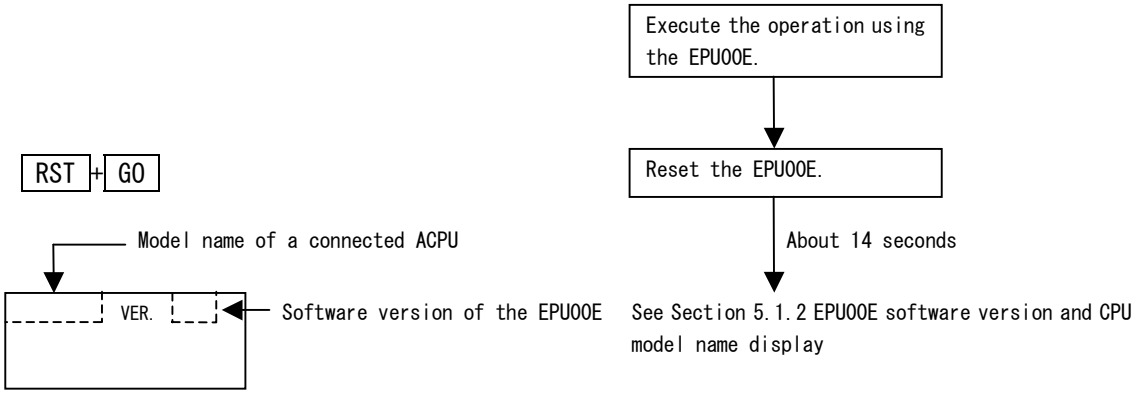
3) Put the cover on the RS-422 connector of the ACPU.

4) Method for removing RS-422 cable from the EPU00E
Unscrew the connector anchor screw of the EPU00E, and remove the RS-422 cable from the EPU00E.
Put the stored protective cap on the RS-422 connector on the rear side of the EPU00E.

5) Store the EPU00E and RS-422 cable carefully.

5.2 How to Reset the EPU00E

This section tells how to reset the EPU00E during operations.
After resetting the EPU00E, resume operations in accordance with Section 5.1.2 EPU00E software version and CPU model name display.

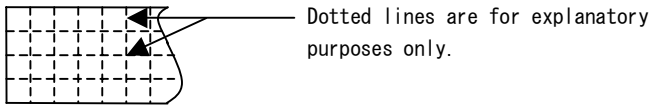


5.3 Display Adjustments and Display Format

This section explains how to adjust the display and the display format of the EPU00E.

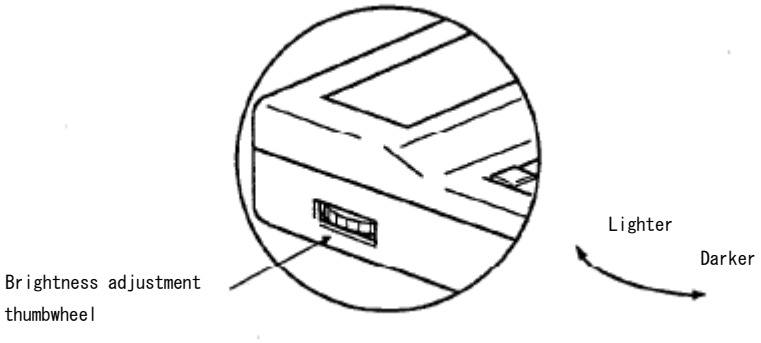
REMARK

The position where each character is shown on the display is indicated by the dotted lines in the display explanations given below.



5.3.1 How to adjust the brightness

After starting up the EPU00E, the brightness of the display can be adjusted by turning the brightness adjustment thumbwheel on the left side of the unit.
Adjust as necessary.



5.3.2 Display backlight ON/OFF states

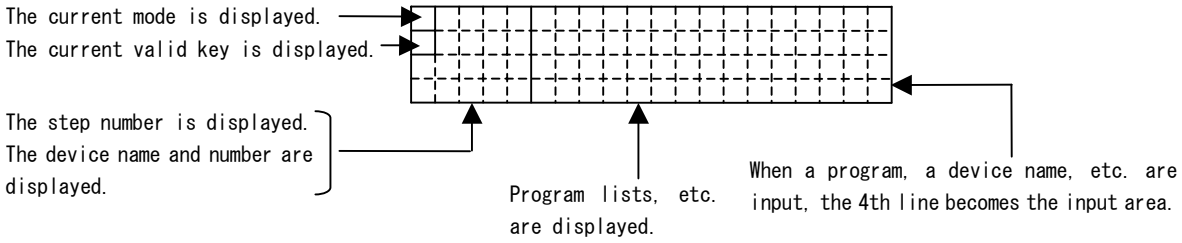
The backlight is ON/OFF in the following cases:
When the backlight is ON, perform operations as necessary.

(1) Goes ON
- When the EPU00E is started up
- When starting/restarting key inputting

(2) Goes OFF
- If a key is not input for 10 minutes or more

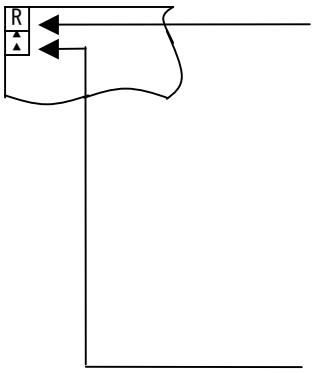
5.3.3 Display format

This section explains the positions and contents of all data displayed on the EPU00E.
Depending on the mode, the actual display may sometimes differ from the following explanation. Section 6 gives details.



(1) Mode and valid key displays

The following shows the mode display after selecting the EPU00E mode and the display of the valid key that shows the validity of top/bottom of all dual-purpose keys.



The currently selected mode is displayed.

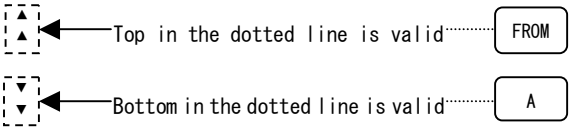
(Mode display) (Mode)
- R·····READ mode
- W·····WRITE mode
- I·····INSERT mode
- D·····DELETE mode
- M·····MONITOR mode
- T·····TEST mode
- P·····PARAMETER mode
- O·····OTHERS mode

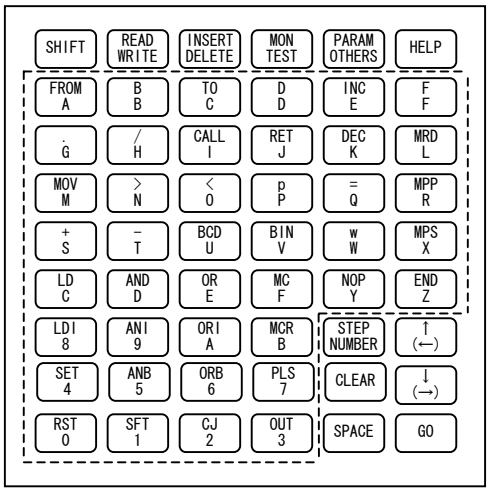
The current valid key is displayed. (Sometimes not displayed.)

The valid keys are within the dotted frame in the figure on the left figure.

▲ ▲ : Top is valid.
▼ ▼ : Bottom is valid.

(Example) In the case of the [FROM A] key





POINT

A valid key (top/bottom) can be switched by using the [SHIFT] or [STEP NUMBER] keys.
See Section 5.4.1.

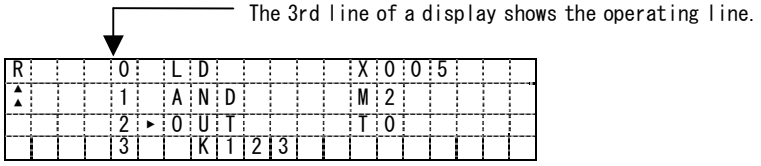
(2) Cursor display

The EPU00E controls the cursor display when data is input and "■" is shown at the cursor position. See (6) below.

However, when the cursor is moved onto a display character, the display character and "■" are displayed alternately.

(3) Operating line display

When a program list is displayed, the operating line is indicated by "▸" immediately after the step number.



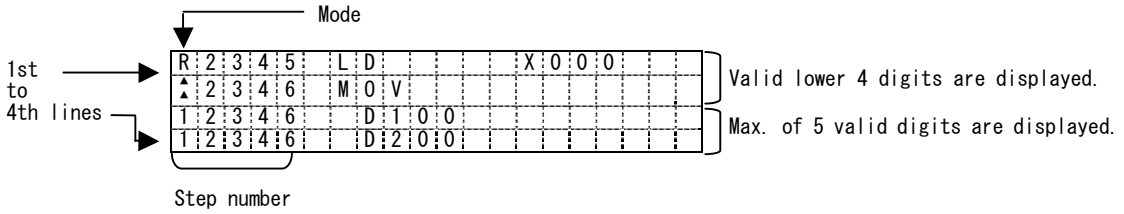
Use the [↑] or [↓] keys to move "▸" in a designated direction (up or down).

(4) Step number display

The step number is displayed in decimal.

1st to 2nd lines of the display show the valid lower 4 digits.

3rd to 4th lines of the display shows the max. 5 valid digits of the step number.



(5) Device display

If a basic instruction and an application instruction have 2 or more devices, they are displayed by the same step number.

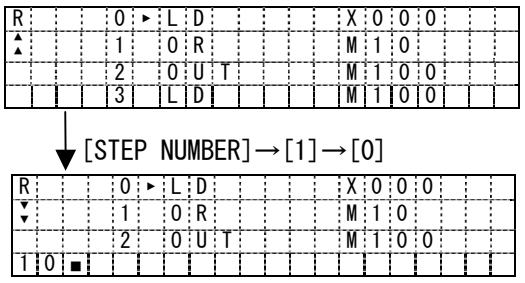
See (4) above.

(6) Keyed-in data display

Keyed-in data is displayed at the cursor position sequentially and the cursor moves to right sequentially.

"■" is displayed at the cursor position.

(Example) When [STEP NUMBER]→ [1] → [0] are input

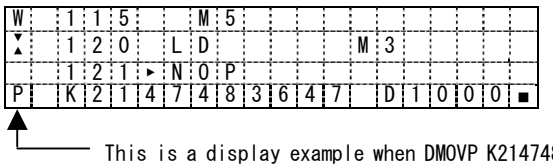


(7) Left shift display when a program is input

When a program is input, before the [GO] key is pressed, the program is displayed on the 4th line (at the bottom) of the display.

If a program cannot be displayed on 1 line, whenever a key is pressed, the contents of the displayed 4th line are shifted sequentially to the left.

(The input contents are stored internally.)



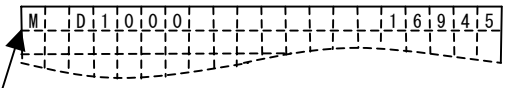
(8) Numerical value display

The numerical value display of each device and the constant display when a program is input are as follows.

Both are examples: for details, see Section 6.

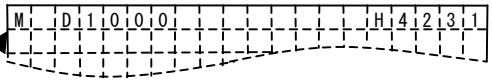
1) Decimal display

Only valid digits are displayed by zero suppress.



2) Hexadecimal display

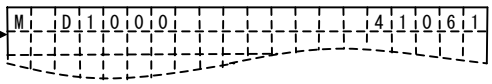
4 digits are displayed without zero suppress.



3) Octal display

6 digits are displayed without zero suppress.

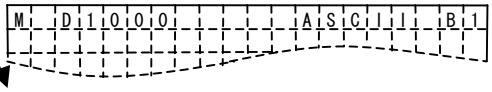
(Example)
D1000 [4231H]



4) ASCII format display

The numerical value of a designated device is controlled by 1 byte, and the numerical value is considered as a character code. And then, a corresponding character is displayed.

Then, if the numerical value is other than 20H to 7FH, A0H to DFH, dot ".." is displayed.



(9) Error message display

Error messages are displayed on the 4th line of the display.

When an error message is displayed, take corrective actions in accordance with Section 7.

The displayed error message can be cleared by pressing a key. The unit returns to the state before the error message was displayed.

5.4 Basic Key Operations

This section explains the basic key operations after starting up the EPU00E.

5.4.1 Valid key switching (top/bottom)

When starting EPU00E operations, the validity of the top/bottom of dual-purpose keys is displayed on the left side of the second line of the display (see Section 5.3.3).
Valid keys are controlled and displayed by the EPU00E. However, users can switch valid key functions by pressing the following keys:

[SHIFT]* : Top key is valid.
[STEP NUMBER] : Bottom key is valid.

* Even when the bottom part of a dual-purpose key is valid, the following keys can be pressed. (The [SHIFT] key does not have to be pressed.)
  - Comparison symbol key when a comparison operation instruction is input ·····[>],[<],[=]
  - Minus key of a source data area of an instruction ·····[-]

After setting the different modes, valid keys are switched as follows:

The READ mode, the WRITE mode, and the INSERT mode	:	top part of the key is valid (When the cursor position in the set value or device step in the WRITE mode, the bottom part of the key is valid.)
MONITOR mode and TEST mode	:	bottom part of the key is valid
PARAMETER mode and OTHERS mode	:	the bottom part of the key is always valid
Help function in each mode	:	the bottom part of the key is always valid (When INSTRUCTION READ is selected in the help of the READ mode, the top part of the key is valid.)

If the [SHIFT] key is pressed and a valid key is switched, the key switched before one of the following operations becomes valid.

- The mode key is input.....
- A control key is input.....] See Section 4.3.
- EPU00E is reset..... See Section 5.2.

5.4.2 How to input instructions

The methods of inputting instructions to the EPU00E are as follows:

1) To use the instruction shown on a key, press the instruction key.

2) Press the alphanumeric character keys that correspond to each character of an instruction sequentially.

3) Select and input an instruction by using the help function.

How to input instructions using 1) and 2) is shown below.
Section 6.2.3 explains how to input instructions using 3).

POINT

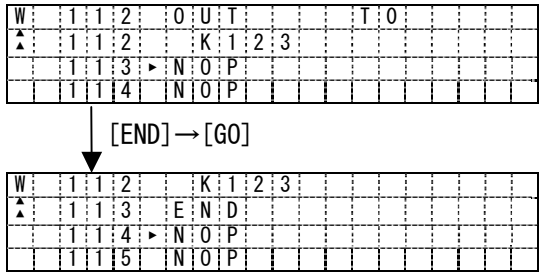
When inputting an instruction, the input contents are displayed on the 4th line (at the bottom) of the display.
When the [SPACE] key has to be pressed in the following explanation, if a blank is inserted automatically between an input instruction and the cursor position, the [SPACE] key does not have to be pressed.
See the examples for each explanation

(1) Only in the case of an instruction code

1) When inputting a keyboard instruction

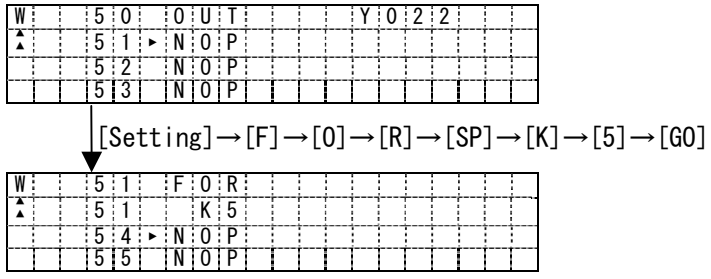
Instruction key → [GO]

(Example) When [END] is input



2) When inputting a non-keyboard instruction

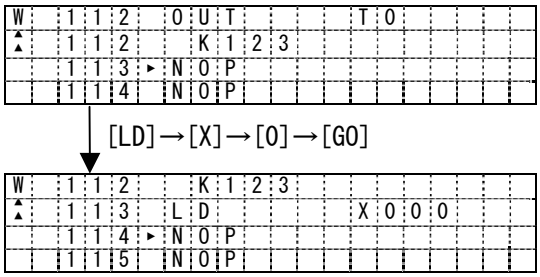
(Example) When FOR K5 is input



(2) In the case of an instruction code and a device

Instruction → [SP] → Device → Device number → [GO]

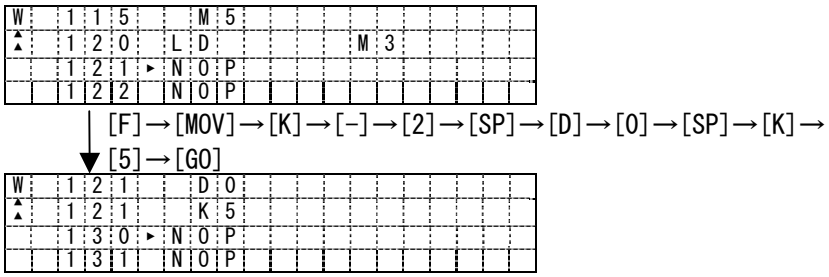
(Example) When LD X0 is input



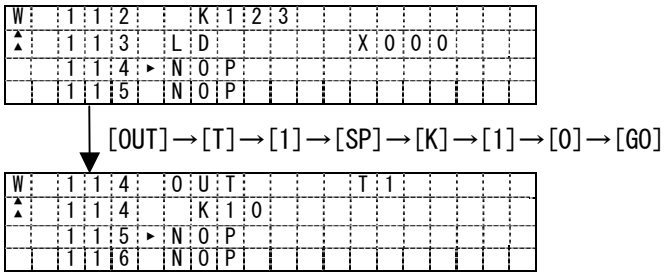
(3) In the case of an instruction other than the above

Press the [SPACE] key between an instruction, a device, source data, and destination data.

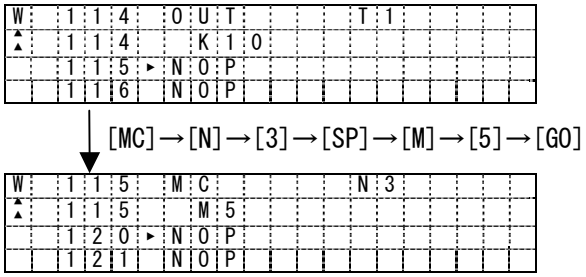
(Example 1) When FMOV K-2 D0 K5 is input



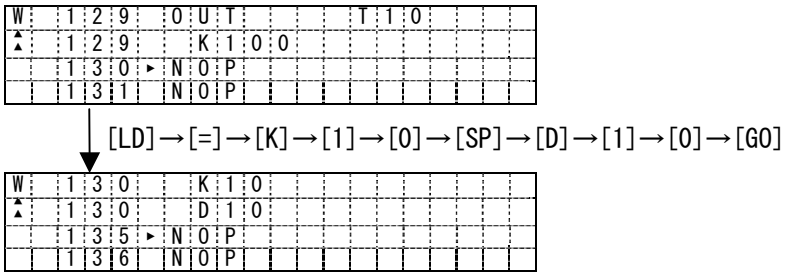
(Example 2) When OUT T1 K10 is input



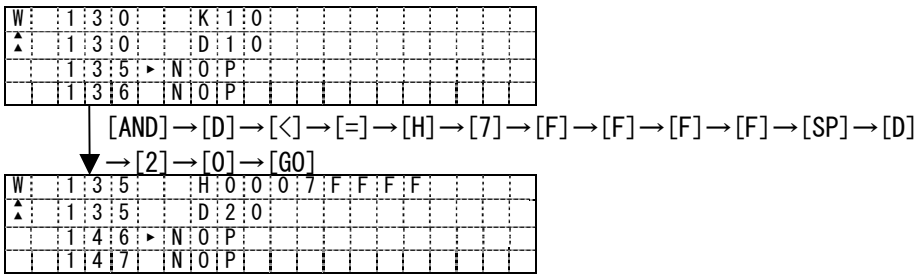
(Example 3) When MC N3 M5 is input



(Example 4) When LD=K10 D10 is input



(Example 5) When AND D<= H7FFFF D20 is input



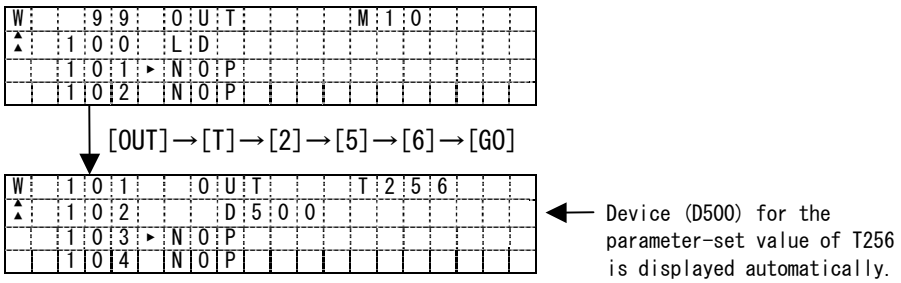
(4) Handling devices M, L, and S

For the devices M, L, and S in the TEST, MONITOR, WRITE, and INSERT modes, the display varies in accordance with the contents set by parameters.

For example, if LD L0 is input when the parameter settings are M0 to 999 and L1000 to L2047, LD M0 will be displayed.

(5) In the case of the extension timer/extension counter of an A2A and A3ACPU
If an extension timer (T256 to T2047) or extension counter (C256 to C1023) is input as a first device of an instruction, input the first device and a device number.

(Example) When OUT T256 D500 is input



POINT

When an extension timer or extension counter is used, be sure to set 257 points or more and device (D, W,R) for the set value at a parameter, as well as the timer or counter (see Section 6.8.2).

5.4.3 Corrective action when a wrong key has been pressed

(1) Before pressing the [GO] key, press the [CLEAR] key, and redo the operation.
Pressing the [CLEAR] key clears the previously-input instruction and its device number, and returns the EPU00E WRITE mode to its previous state. Then, the operation can be redone.

(2) When the [GO] key is pressed, redo the previous operation.

REMARK

If the [CLEAR] key is pressed while the EPU00E is in the PARAMETER mode, processing stops.
When the operation is continued, continue the pressing the keys as before.

5.5 Functions of the EPU00E on a MELSECNET(/B) Data Link System

The EPU00E can execute testing, reading, writing, and monitoring of programs for the PC CPU of another station connected to the MELSECNET(/B) data link system (hereafter called MELSECNET).

(1) Stations that can access another station on MELSECNET are in the following ranges:

(a) When the EPU00E is connected to a master station
The self and all local stations can be accessed.
Remote I/O stations cannot be accessed.
Set and perform monitoring and testing for the I/O module of a remote I/O station at the self (master station).

(b) When the EPU00E is connected to a local station
The self and master stations can be accessed. Other local stations and remote I/O stations cannot be accessed.

(c) When the EPU00E is connected to a remote I/O station
The self and master stations can be accessed. Other local stations and remote other I/O stations cannot be accessed.

(2) Functions when accessing another station on MELSECNET

(a) When connecting the EPU00E to a master station/local station and accessing the self
It is possible to operate all functions.

(b) When connecting EPU00E to a remote I/O station and accessing the self
Link monitoring (see Section 6.9.4) and PC number setting (see Section 6.9.10) are possible.

(c) When connecting the EPU00E to a master station and accessing a local station
It is possible to operate functions that are the same as when the EPU00E was connected to the self-except for link monitoring(see Section 6.9.4) and PC memory all clear (see Section 6.9.7).

(d) When connecting the EPU00E to a local station and accessing a master station
It is possible to operate functions that are the same as when the EPU00E was connected to the self-except for link monitoring (see Section 6.9.4) and PC memory all clear (see Section 6.9.7).

(e) When connecting the EPU00E to a remote I/O station and accessing a master station
It is possible to operate functions that are the same as when the EPU00E was connected to the self-except for link monitoring (see Section 6.9.4) and PC memory all clear (see Section 6.9.7).

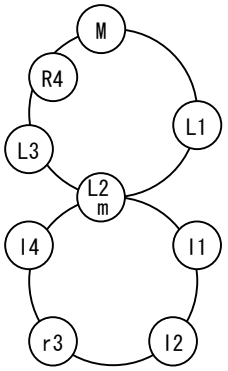
(3) The PC number setting when accessing another station on MELSECNET

(a) When connecting the EPU00E to a remote master station/local station/I/O station and accessing the self
Set “FF” to PC number.

(b) When connecting the EPU00E to a master station and accessing a local station
Set the station number of the local station to be accessed to PC number. For example, when accessing the third local station, set the PC number to 3.

(c) When connecting the EPU00E to a remote local station/I/O station and accessing a master station
Set the PC number to 0.

Fig.5.1 shows the ranges in which the EPU00E can access other stations and the PC numbers when a 3-tier system has been established on MELSECNET.



M :Master station (tier 1)
L1 :Local station (tier 2)
L2/m:Local station (tier 2)
Master station
L3 :Local station (tier 2)
R4 :Remote I/O station (tier 2)
I1 :Local station (tier 3)
I2 :Local station (tier 3)
r3 :Remote I/O station (tier 3)
I4 :Local station (tier 3)

FF, 0 to 64: Can be accessed (The numerals show PC numbers to be set.)
× : Cannot be accessed

Station to which the EPU00E is connected	Accessable other stations (PC numbers)									
	Self	M	L1	L2/m	L3	R4	I1	I2	r3	I4
M	FF	0	1	2	3	×	×	×	×	×
L1	FF	0	—	×	×	×	×	×	×	×
L2/m	FF	0	×	—	×	×	1	2	×	×
L3	FF	0	×	×	—	×	×	×	×	×
R4	FF	0	×	×	×	—	×	×	×	×
I1	FF	×	×	0	×	×	—	×	×	×
I2	FF	×	×	0	×	×	×	—	×	×
r3	FF	×	×	0	×	×	×	×	—	×
I4	FF	×	×	0	×	×	×	×	×	—

Fig.5.1. Ranges in which the EPU00E can access other stations

REMARK

Set the PC numbers to be accessed in the OTHERS mode (see Section 6.9.10).

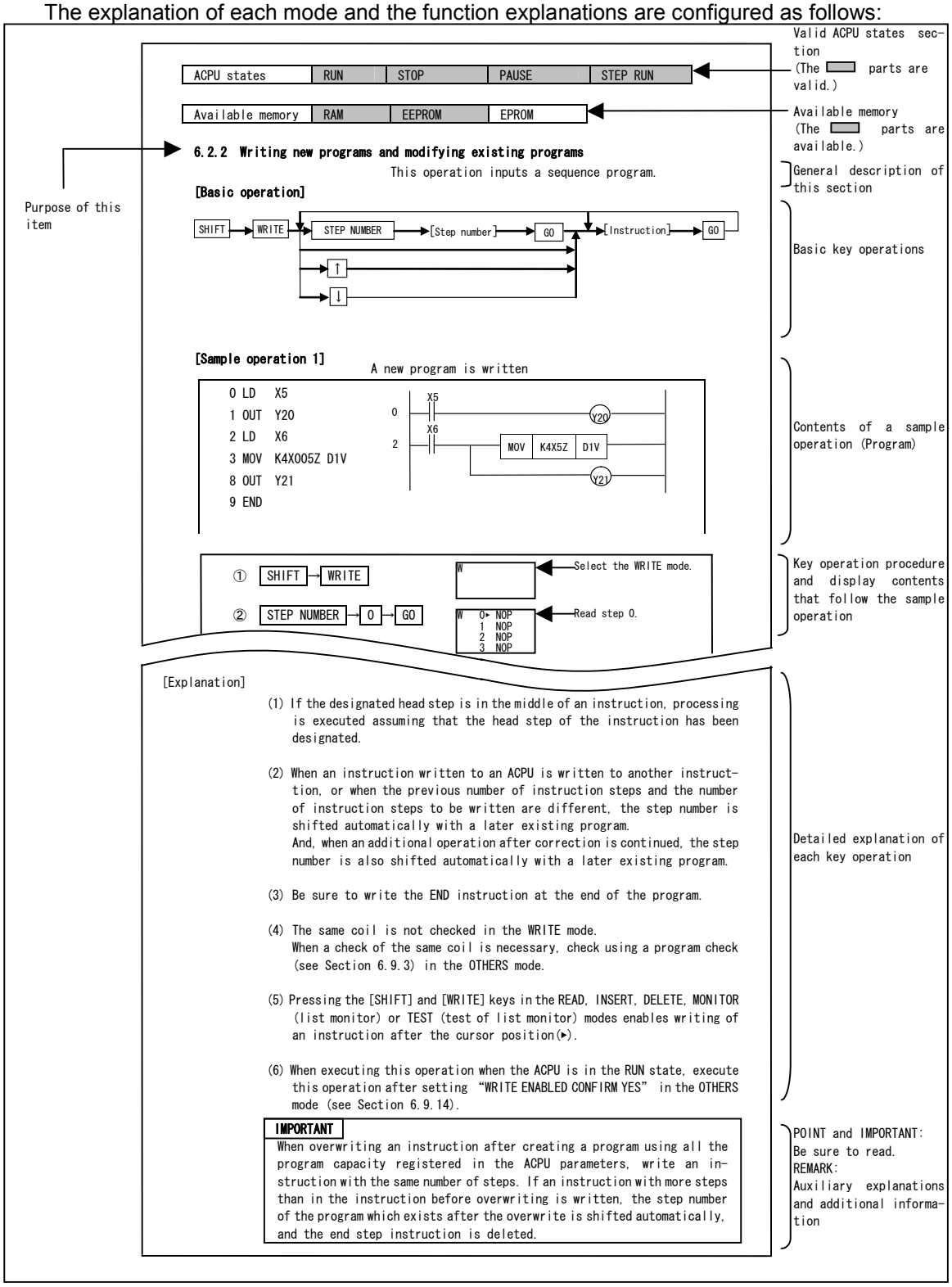
M E M O

6. HOW TO USE EACH FUNCTION

This section explains how to use each function in all modes.

6.1 How to Understand the Operation Explanations

The explanation of each mode and the function explanations are configured as follows:



ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

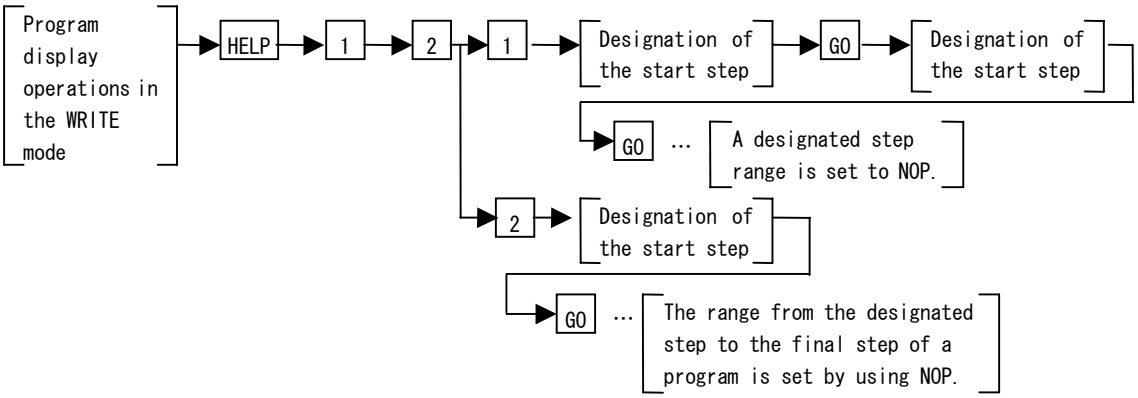
6.2 WRITE Mode (W) Operations

This mode writes programs to the ACPU and makes corrections (modifications to and insertions in) of ACPU programs.
When writing microcomputer programs, follow the procedures given in Section 6.9.13.

6.2.1 Setting a designated range in the program by using NOP (Continuous writing of NOP)

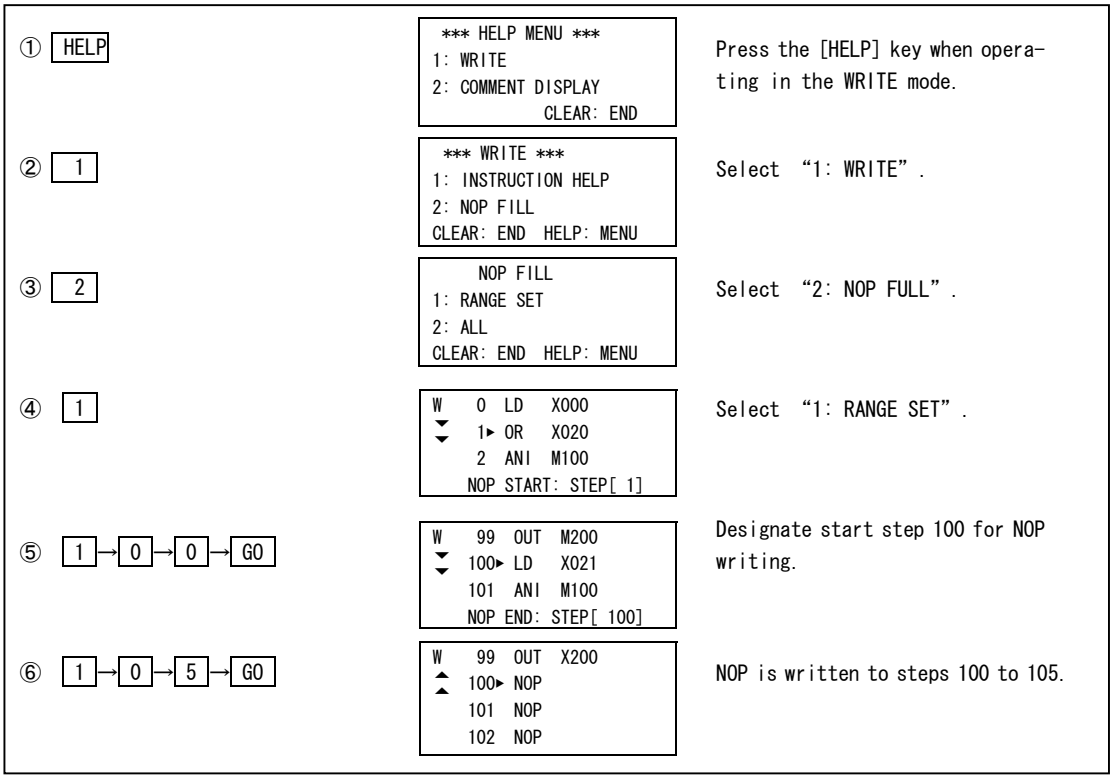
The range is designated and the NOP instruction is written continuously.
(WRITE mode help operation)

[Basic operation]



[Sample operation]

NOP is written to steps 100 to 105.



[Explanation]

(1) When executing NOP batch writing by “1: RANGE SET”, designate the start step and end step in the range to be written.
NOP is written to the range from the designated start step to the end step.

(2) When executing NOP batch writing by “2: ALL”, designate the start step in the range to be written.
NOP is written to the range from the designated start step to the end step of the program.

(3) The start step and end step can be designated by using the [↑] and [↓] keys to move the cursor to the step to be designated and press [GO] or inputting the numbers.

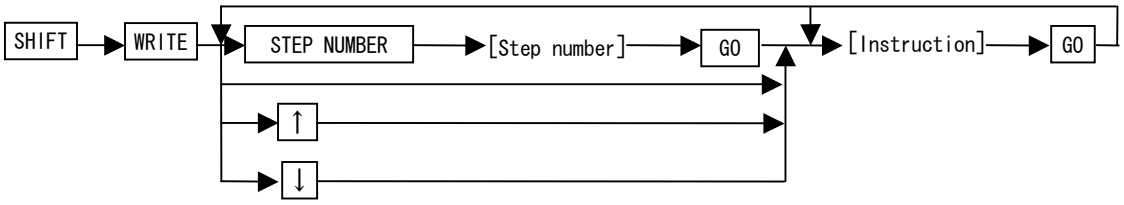
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.2.2 Writing new programs and modifying existing programs

This operation inputs a sequence program.

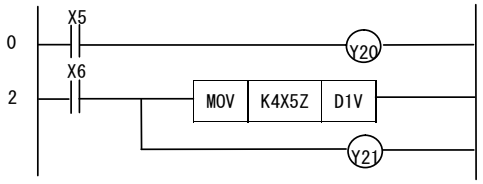
[Basic operation]



[Sample operation 1]

A new program is written

```
0  LD   X5
1  OUT  Y20
2  LD   X6
3  MOV  K4X005Z  D1V
8  OUT  Y21
9  END
```



① SHIFT → WRITE

```
W
▲
▲
```

← Select the WRITE mode.

② STEP NUMBER → 0 → GO

```
W   0► NOP
▲   1  NOP
▲   2  NOP
    3  NOP
```

← Read step 0.

③ LD → X → 5 → GO

```
W   0  LD   X005
▲   1► NOP
▲   2  NOP
    3  NOP
```

④ OUT → Y → 2 → 0 → GO

```
W   0  LD   X005
▲   1  OUT  Y020
▲   2► NOP
    3  NOP
```

⑤ LD → X → 6 → GO

```
W   1  OUT  Y020
▲   2  LD   X006
▲   3► NOP
    4  NOP
```

⑥ MOV → K → 4 → X → 5 → Z → SP → D → 1 → V → GO

```
W   3   K4X005Z
▲   3   D1V
▲   8► NOP
    9  NOP
```

⑦ OUT → Y → 2 → 1 → GO

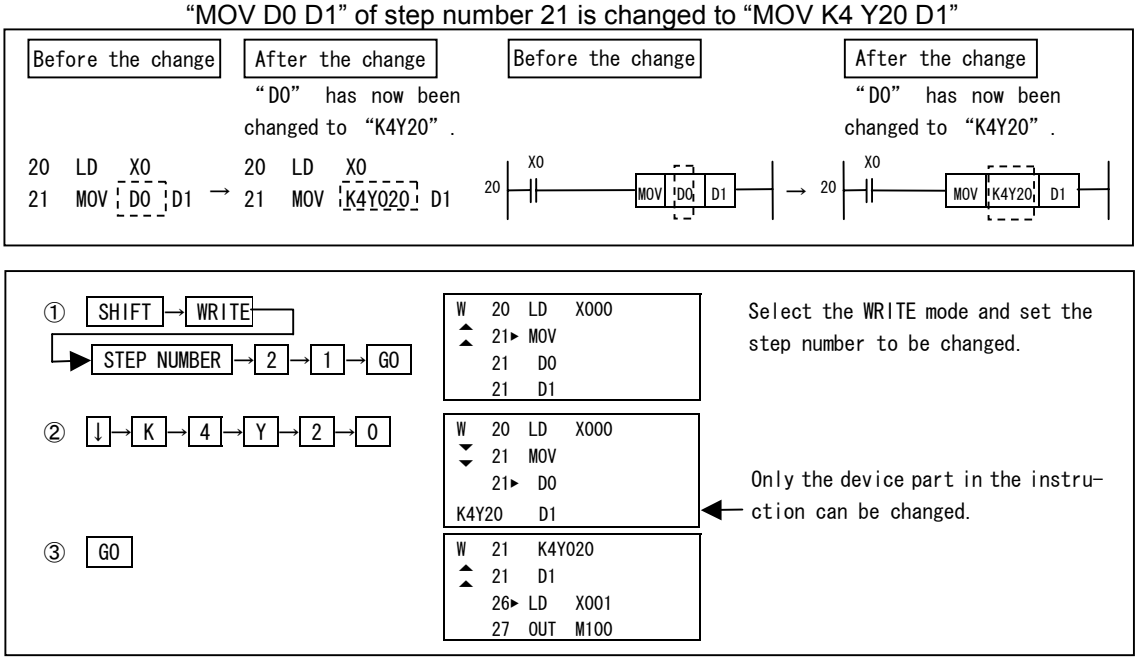
```
W   3   D1V
▲   8  OUT  Y021
▲   9► NOP
   10  NOP
```

⑧ END → GO

```
W   8  OUT  Y021
▲   9  END
▲  10► NOP
   11  NOP
```

[Sample operation 2]

"MOV D0 D1" of step number 21 is changed to "MOV K4 Y20 D1"



[Explanation]

(1) If the designated head step is in the middle of an instruction, processing is executed assuming that the head step of the instruction has been designated.

(2) When an instruction written to an ACPU is written to another instruction, or when the previous number of instruction steps and the number of instruction steps to be written are different, the step number is shifted automatically with a later existing program.
And, when an additional operation after correction is continued, the step number is also shifted automatically with a later existing program.

(3) Be sure to write the END instruction at the end of the program.

(4) The same coil is not checked in the WRITE mode.
When a check of the same coil is necessary, check using a program check (see Section 6.9.3) in the OTHERS mode.

(5) Pressing the [SHIFT] and [WRITE] keys in the READ, INSERT, DELETE, MONITOR (list monitor) or TEST (test of list monitor) modes enables writing of an instruction after the cursor position (▸).

(6) When executing this operation when the ACPU is in the RUN state, execute this operation after setting "WRITE ENABLED CONFIRM YES" in the OTHERS mode (see Section 6.9.14).

IMPORTANT

When overwriting an instruction after creating a program using all the program capacity registered in the ACPU parameters, write an instruction with the same number of steps. If an instruction with more steps than in the instruction before overwriting is written, the step number of the program which exists after the overwrite is shifted automatically, and the end step instruction is deleted.

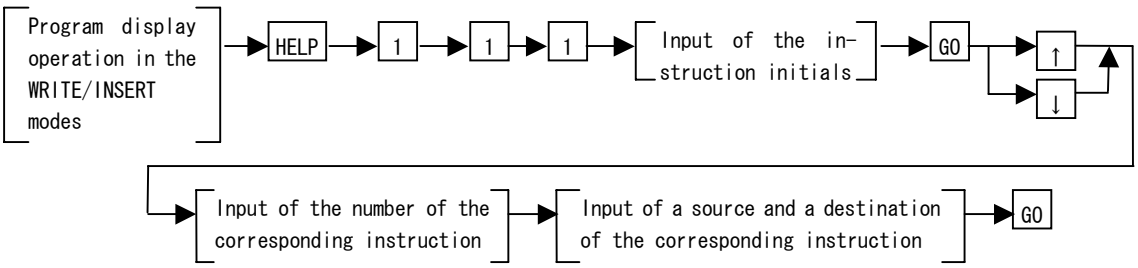
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.2.3 Displaying/selecting an instruction

This operation inputs the initials of an instruction and displays the instruction name. After selecting the displayed instruction name, writing/insertion can be operated continuously. (Help operation in the WRITE/INSERT modes)

[Basic operation]



[Sample operation]

The instruction name (RCL) whose initial is “R” is selected from the list and is written

①	W 8 OUT Y021 ▲ 9 LD X00C ▲ 10▸ NOP 11 NOP	When 16 bits of left rotation instruction data is written.
② HELP	*** HELP MENU *** 1: WRITE 2: COMMENT DISPLAY CLEAR: END	Press the [HELP] key when operating in the WRITE mode.
③ 1	*** WRITE *** 1: INSTRUCTION HELP 2: NOP FILL CLEAR: END HELP: MENU	Select “1: WRITE”.
④ 1	INSTRUCTION HELP 1: INSTR. SELECTION 2: STEP READ CLEAR: END HELP: MENU	Select “1: INSTRUCTION HELP”.
⑤ 1	* INSTR. SELECTION * KEY IN FIRST LETTER [ ] CLEAR: END HELP: MENU	Select “1: INSTR. SELECTION”.
⑥ R → GO	* INSTR. SELECTION * 1 RCL N 2 RCR N 3 RET	The relationship between the instruction names that begin with “R”, the source, and the destination are displayed.
⑦ 1 → (←) → P → SP → K → 3 → GO	W 10 RCLP ▲ 10 K3 ▲ 13▸ NOP 14 NOP	Select “1 RCL” from the instruction display list, and write “RCLP K3” at the cursor position.

[Explanation]

(1) All A-series instructions are displayed.
Sometimes instructions that cannot be used with the ACPU to which the EPU00E is connected are displayed. The Programming Manual gives details about usable instructions.

(2) Dedicated instructions of an A2A and A3ACPU cannot be displayed.

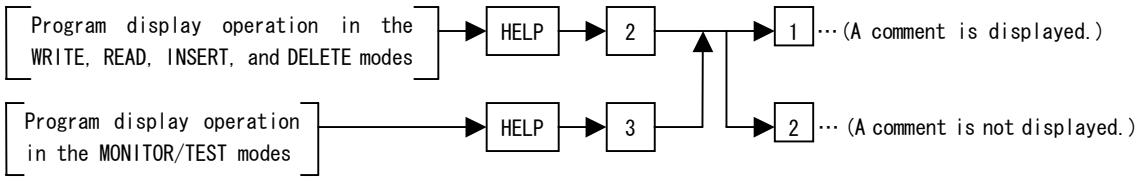
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.2.4 Comment display

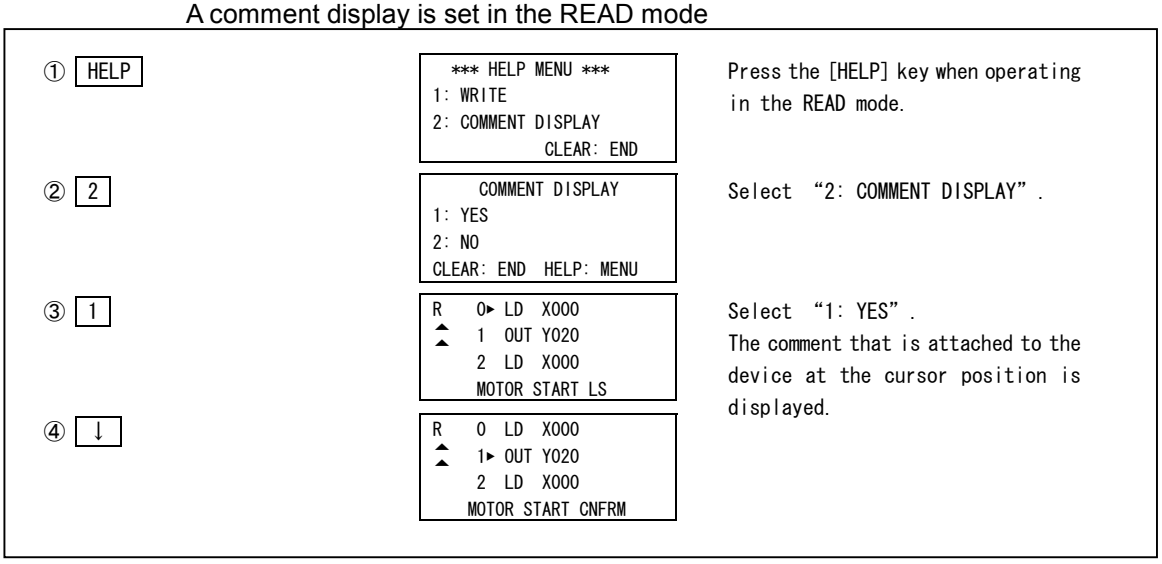
This operation displays comment stored in an ACPU. (Help operation in the WRITE, READ, INSERT, DELETE, MONITOR, and TEST modes)

[Basic operation]



[Sample operation]

A comment display is set in the READ mode



[Explanation]

(1) Comments cannot be created in the EPU00E.
To display a comment, create the comment by using the GPP function of a peripheral device, and then write it to an ACPU.

ACPU states	RUN	STOP	PAUSE	STEP RUN

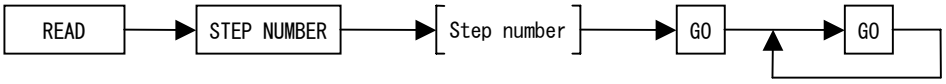
Available memory	RAM	EEPROM	EPROM

6.3 READ Mode (R) Operations

This mode reads programs written to an ACPU by designating step numbers, instructions, or devices.
Section 6.9.13 explains how to read microcomputer programs.

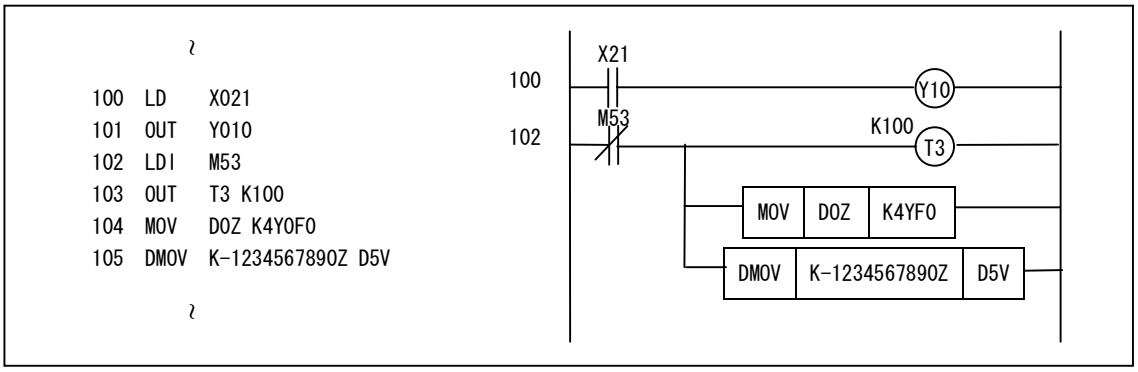
6.3.1 Reading the instruction of the step number designated in the program. (Instruction read by designating the step number)

[Basic operation]

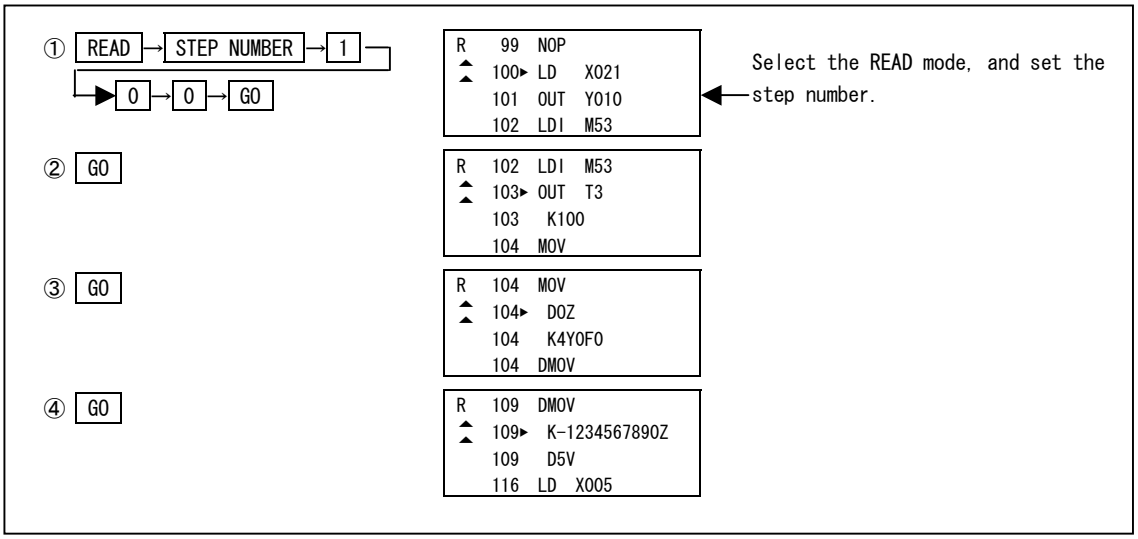


[Sample operation]

The instruction that was designated after step number 100 in the following program is read.



[Sample operation]



[Explanation]

(1) If the designated head step is in the middle of an instruction, processing is executed assuming that the head step of the instruction has been designated.
(Example) When step 106 is designated in the example on the previous page, steps 104 and after are displayed.

(2) When the ACPU is in the RUN state, processing takes longer than in the STOP state. Therefore, wait until an instruction to be read is displayed.
(The processing time is proportional to the number of steps in a program.)

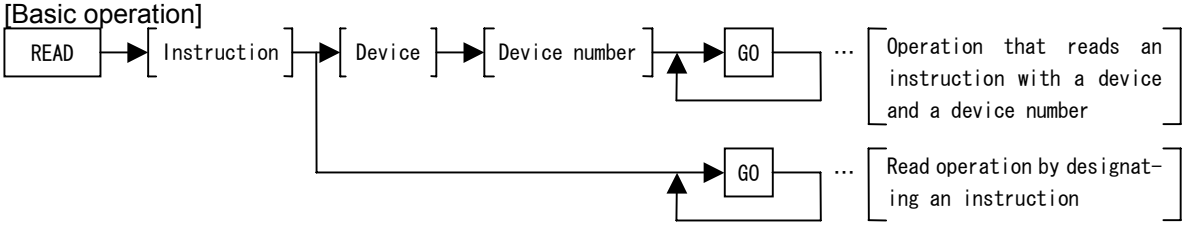
(3) If the [GO] key is pressed after pressing the [STEP NUMBER], the step number, and the [GO] keys, the screen is scrolled up.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

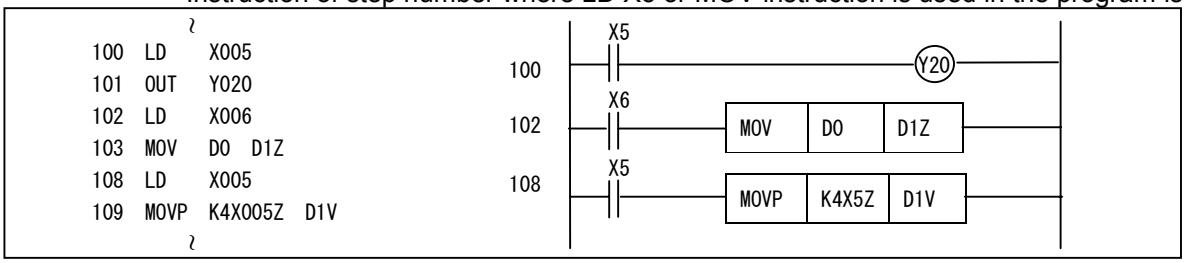
6.3.2 Reading an instruction designated in the program (Instruction read by designating an instruction)

[Basic operation]



[Sample operation]

Instruction of step number where LD X5 or MOV instruction is used in the program is read.



① READ → LD → X → 5

```
R     5  OUT  M100
      6▸ OUT  M200
      7  LD   X000
LD X5
```

Select the READ mode and set the instruction, device, and device number of the instruction to be searched.

② GO

```
R    99  OUT  M200
   100▸ LD   X005
    101  OUT  Y020
    102  LD   X006
```

Read the 100th step "LD X005".

③ GO

```
R   103   D1Z
  108▸ LD   X005
    109  MOVP
    109   K4X005Z
```

Read the 108th step "LD X005".

④ GO

```
R   103   D1Z
  108▸ LD   X005
    109  MOVP
NOT FOUND
```

Message when there is no "LD X005" instruction after step 109

⑤ CLEAR → MOV

```
R   103   D1Z
  108▸ LD   X005
    109  MOVP
MOV
```

Set only the instructions to be read.

⑥ GO

```
R   102  LD   X006
  103▸ MOV
    103   D0
    103   D1Z
```

Read the 103rd step "MOV D0 D1Z".

⑦ GO

```
R   108  LD   X005
  109▸ MOVP
    109   K4X005Z
    109   D1V
```

Read the 109th step "MOVP K4X005Z D1V".

⑧ GO

```
R   108  LD   X005
  109▸ MOVP
    109   K4X005Z
NOT FOUND
```

Message when there is no "MOV" instruction after step 114

[Explanation]

(1) The instruction is searched from step 0 by pressing the [GO] key after setting an instruction. And then, the detected step is displayed. Thereafter, an instruction is searched from the following step by pressing the [GO] key, and the detected step is displayed.
When an instruction cannot be detected even if it is searched to the END instruction, PROGRAM NOT FOUND is displayed.

(2) The method of inputting the instruction to be designated by this operation is as follows.

1) Designate the following instruction with a device and a device number.
(MC and MCR can only be designated by an instruction.)

LD	OR	AND	SET	PLS	SFT	SFTP	OUT	MC
LDI	ORI	ANI	RST					MCR

(a) Designate the OUT instruction with the first device.
(Example)
LD X5
OUT T123
MC N3 or MC

```
OUT T123 K123 is impossible.
MC N3 M1023 is impossible.
```

(b) When an A2A or A3ACPU is used, be sure to modify indexes to the device number when reading an instruction modified with the indexes Z, Z1 to Z6, V and V1 to V6 to the device number.

(Example)

Designated Instructions	Instructions to be Read
LD X5	LD X5 only
LD X5V	LD X5V only

2) P and I instructions cannot be read by this operation.
Follow the operation given in Section 6.3.3.

3) For instructions other than the above, designate instructions only.

(3) Additional explanations of comparison and pulse ([instruction] P) instructions.
The following related instructions can be also read by a designated instruction by using this operation.
When restricting instructions to be read, designate all instructions. (For example, LD= and LDD=, etc.)

1) Comparison instructions

Designated Instructions	Instructions to be Read		
=	LD=	,AND=	,OR=
D=	LDD=	,ANDD=	,ORD=
<>	LD<>	,AND<>	,OR<>
D<>	LDD<>	,ANDD<>	,ORD<>
>	LD>	,AND>	,OR>
D>	LDD>	,ANDD>	,ORD>
<=	LD<=	,AND<=	,OR<=
D<=	LDD<=	,ANDD<=	,ORD<=
<	LD<	,AND<	,OR<
D<	LDD<	,ANDD<	,ORD<
>=	LD>=	,AND>=	,OR>=
D>=	LDD>=	,ANDD>=	,ORD>=

2) Pulse instructions

Designated Instructions	Instructions to be Read	Examples
[Instruction]	[Instruction] and [Instruction] P	MOV, MOVP
[Instruction] P	[Instruction] P	MOVP

(4) Changing input data

Before pressing the [GO] key, data can be changed by the following operations:

・After pressing the [CLEAR] key, reenter the correct data.

・When changing an [instruction], reenter the instruction after pressing the [CLEAR] key.

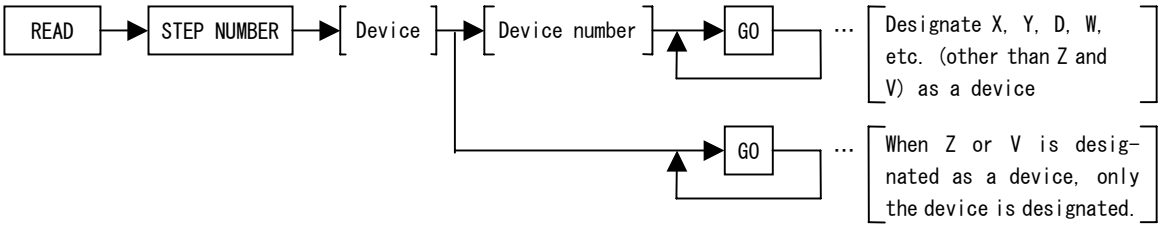
・When changing a [device] and a [device number], reenter the correct data.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

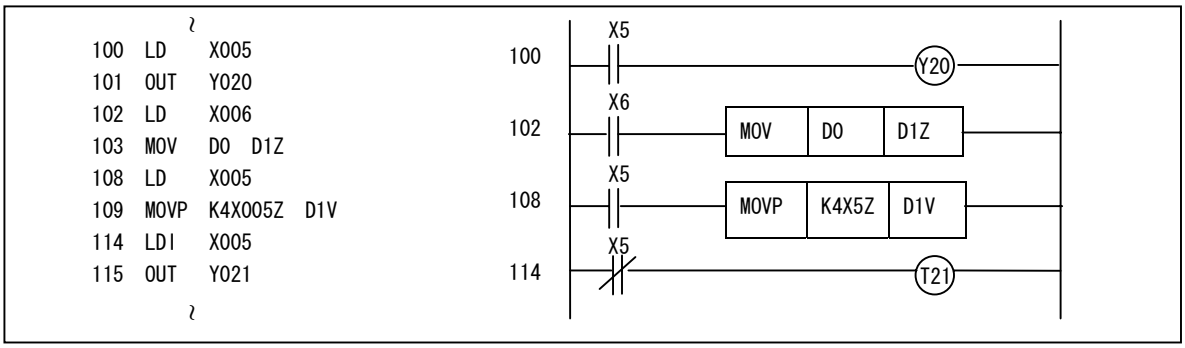
6.3.3 Reading an instruction by designating a used device in the program (Instruction read by designating a device)

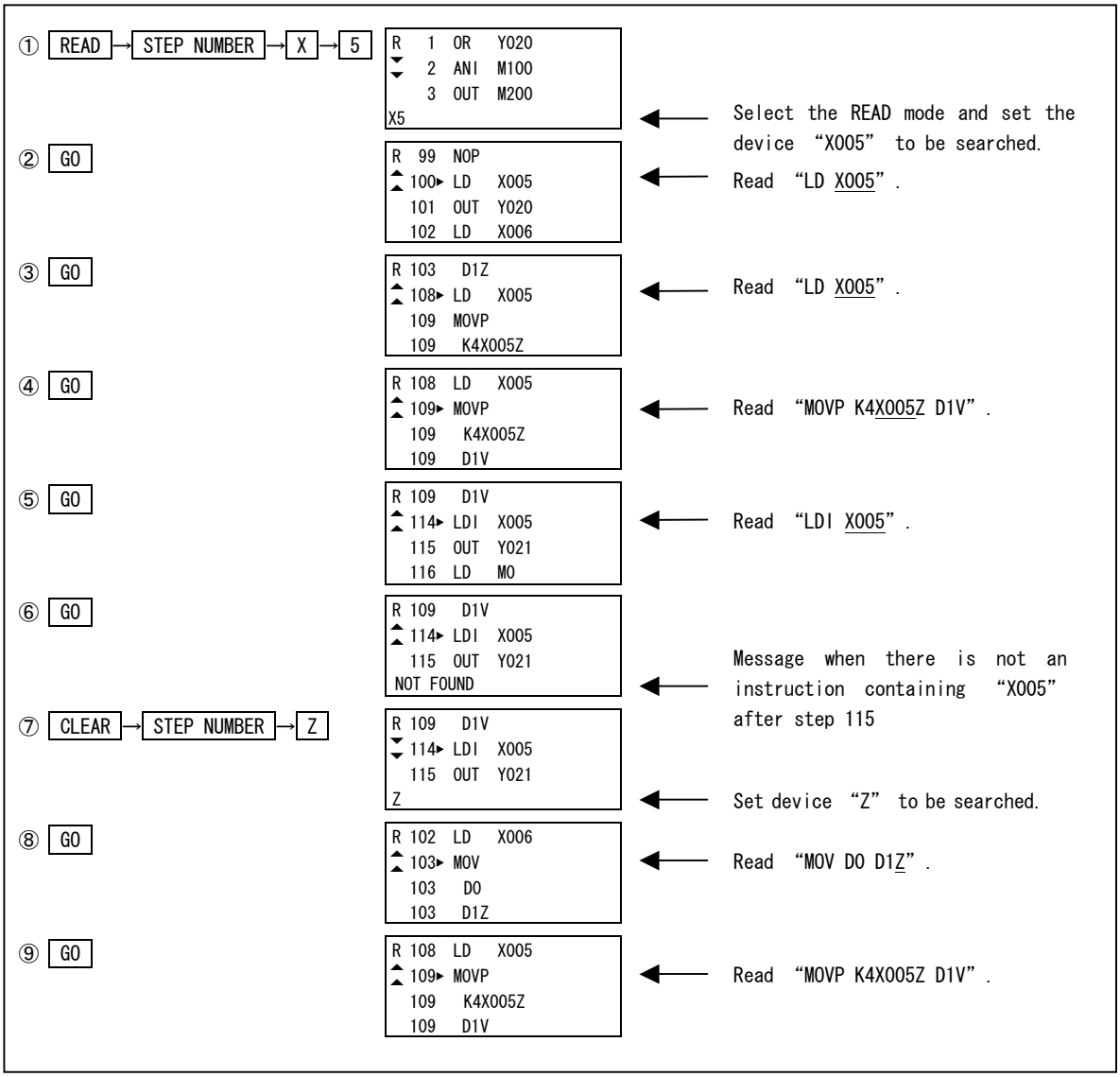
[Basic operation]



[Sample operation]

The instruction of the step number for which device “X5” and “Z” are used is read in the following program




① READ → STEP NUMBER → X → 5
R 1 OR Y020
2 ANI M100
3 OUT M200
X5
Select the READ mode and set the device "X005" to be searched.
② GO
R 99 NOP
100 LD X005
101 OUT Y020
102 LD X006
Read "LD X005".
③ GO
R 103 D1Z
108 LD X005
109 MOVP
109 K4X005Z
Read "LD X005".
④ GO
R 108 LD X005
109 MOVP
109 K4X005Z
109 D1V
Read "MOVP K4X005Z D1V".
⑤ GO
R 109 D1V
114 LDI X005
115 OUT Y021
116 LD M0
Read "LDI X005".
⑥ GO
R 109 D1V
114 LDI X005
115 OUT Y021
NOT FOUND
Message when there is not an instruction containing "X005" after step 115
⑦ CLEAR → STEP NUMBER → Z
R 109 D1V
114 LDI X005
115 OUT Y021
Z
Set device "Z" to be searched.
⑧ GO
R 102 LD X006
103 MOV
103 D0
103 D1Z
Read "MOV D0 D1Z".
⑨ GO
R 108 LD X005
109 MOVP
109 K4X005Z
109 D1V
Read "MOVP K4X005Z D1V".

[Explanation]

(1) The device and device number are searched from step 0 by pressing the [GO] key after setting device and device number. And then, the detected step is displayed. Thereafter, an instruction is searched from the following step by pressing the [GO] key, and the detected step is displayed. When an instruction cannot be detected even if it is searched to the END instruction, PROGRAM NOT FOUND is displayed.

* Changing input data before pressing the [GO] key, data can be changed by the following operations:
- After pressing the [CLEAR] key, reenter the correct data.
- When changing a device and a device number, reenter the correct data.

(2) When reading by using device numbers, a designated device modified by indexes Z or V (when an A2A or A3ACPU is used: Z, Z1 to Z6; V, V1 to V6) is also read as the corresponding device. (See sample operation 4).)
If a device number with indexes is designated, a DEVICE ERROR occurs and it cannot be read.
(Example)

STEP NUMBER → D → 0 → Z → GO ..... DEVICE ERROR

(3) When reading device number “CD” of link relay (B), input [B], [0], [C] and [D]. If only [B], [C] and [D] are input, a BCD instruction is read.
(Example)

STEP NUMBER → B → 0 → C → D → GO ..... LD BOCD

Device number “CD” of link relay (B) is read.

STEP NUMBER → B → C → D → GO ..... BCD D1 D100

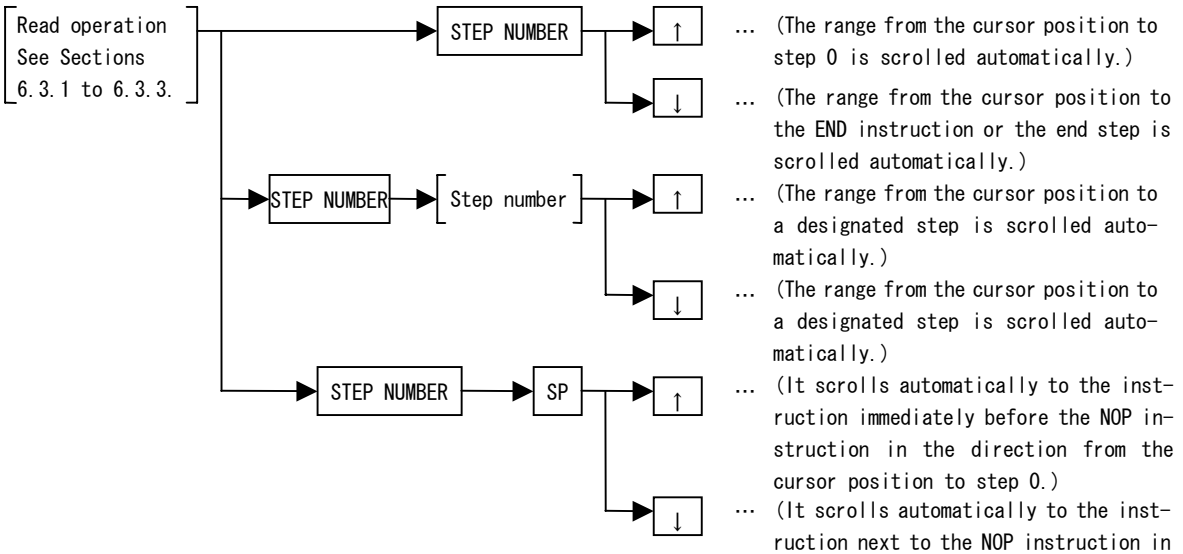
BCD instruction is read.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

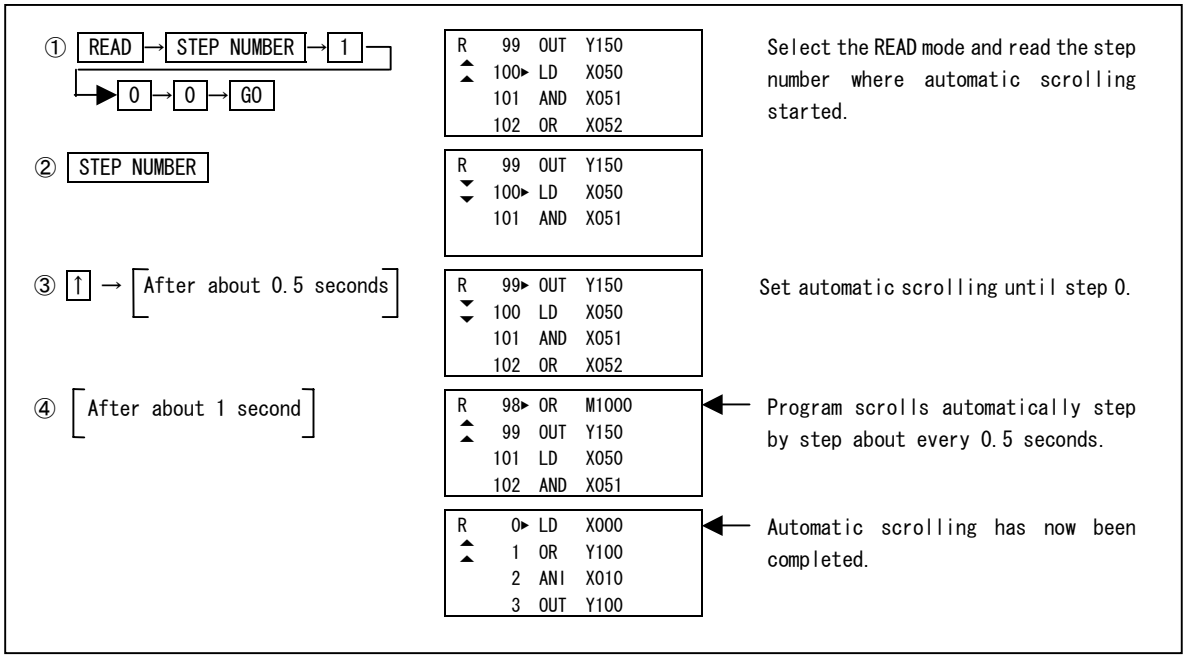
6.3.4 Automatic scrolling of a program

[Basic operation]



[Sample operation]

A program is scrolled automatically to step 0



[Explanation]

(1) The program scrolls automatically from the cursor position to the direction set by [↑] or [↓] keys.

(2) Press any key to interrupt scrolling.

ACPU states	RUN	STOP	PAUSE	STEP RUN

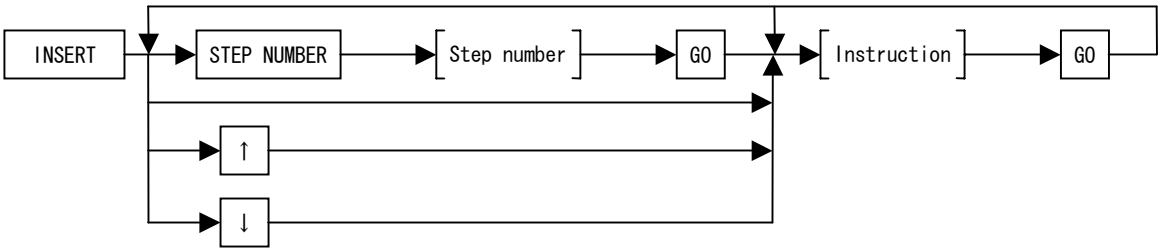
Available memory	RAM	EEPROM	EPROM

6.4 INSERT (I) Mode Operations

This mode inserts new instructions to modify ACPU programs.

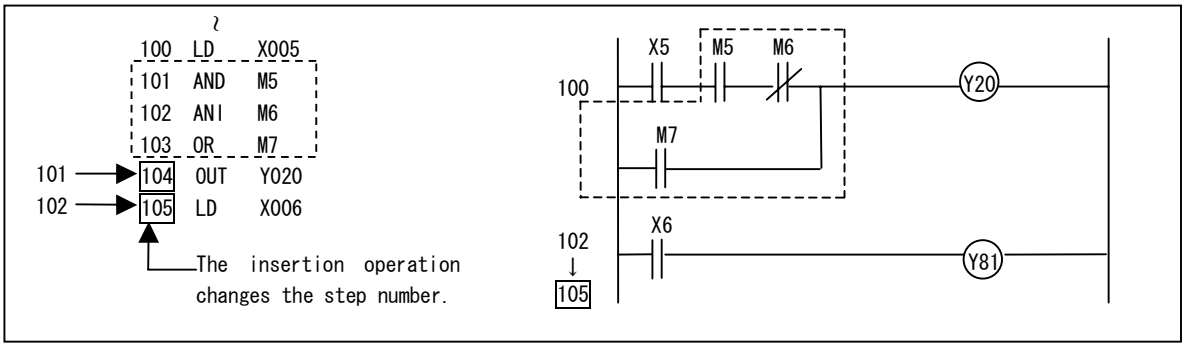
6.4.1 Inserting an instruction in a program (Program insertion)

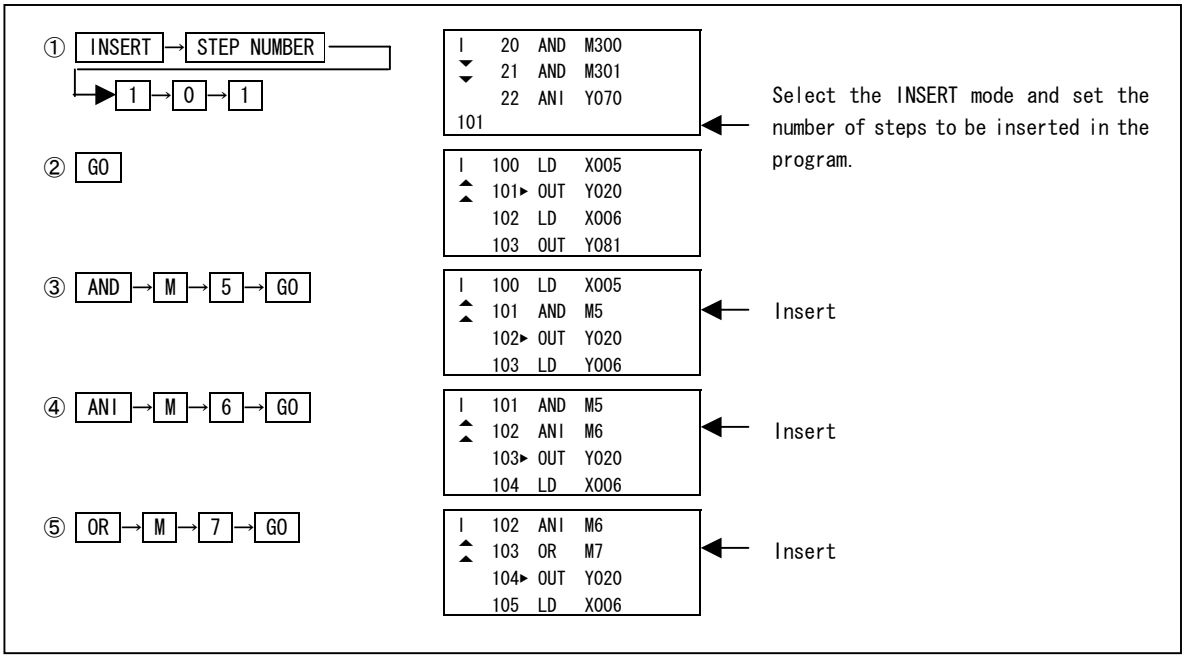
[Basic operation]



[Sample operation]

A program (dotted area) is inserted

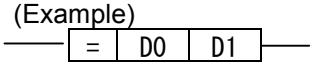




[Explanation]

(1) When this operation is completed normally, the inserted instruction is written to an ACPU as it is, and the following step number is displayed.

(2) Instructions must not be input by step units; use instruction units.
(Example)

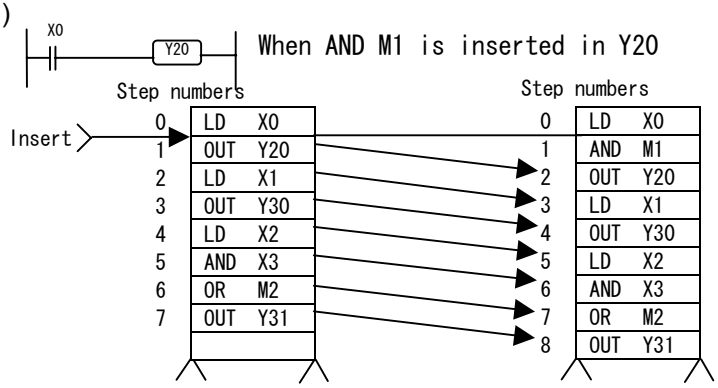


Do not insert AND=, D0 and D1 separately. Insert AND=, D0, and D1 together.
After the operation has been completed, confirm an inserted part in the READ mode.

(3) If the designated head step is in the middle of an instruction, processing is executed assuming that the head step of the instruction has been designated.

(4) When an instruction is inserted, the step number is shifted automatically in the existing program.

1)



(5) The same coil is not checked in the INSERT mode.
When a check of the same coil is necessary, check using a program check (see Section 6.9.3) in the OTHERS mode.

(6) Pressing the [INSERT] key in the READ, INSERT, DELETE, MONITOR (list monitor) or TEST (test of list monitor) modes enables inserting of an instruction after the cursor position (▸).

(7) After pressing the [STEP NUMBER], step number, and [GO] keys, press the [GO] key to scroll the program up.

(8) When executing this operation when the ACPU is in the RUN state, execute this operation after setting “WRITE ENABLED CONFIRM YES” in the OTHERS mode (see Section 6.9.14).

IMPORTANT

When overwriting an instruction after creating a program using all the program capacity registered in the ACPU parameters, write an instruction with the same number of steps. If an instruction with more steps than in the instruction before overwriting is written, the step number of the program which exists after the overwrite is shifted automatically, and the end step instruction is deleted.

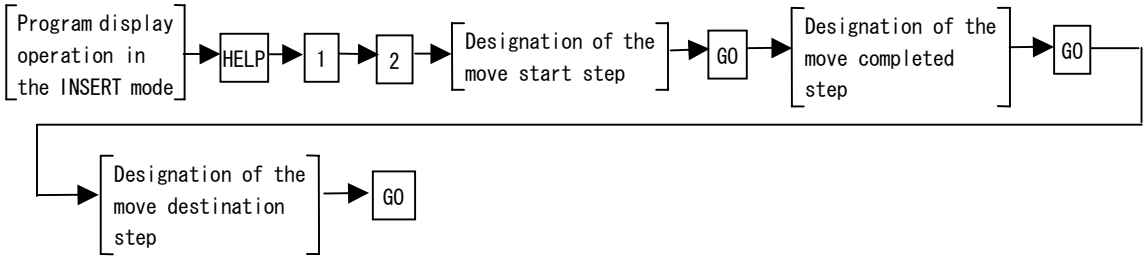
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.4.2 Batch moving a program

This operation moves a program in a designated range to a designated position.
(Help operation in the INSERT mode)

[Basic operation]



[Sample operation]

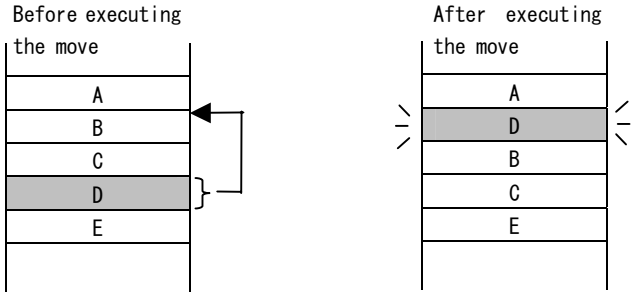
Steps 16 to 18 are moved to step 50

① HELP	*** HELP MENU *** 1: INSERT 2: COMMENT DISPLAY CLEAR: END	Press the [HELP] key when operating in the READ mode.
② 1	*** INSERT *** 1/2 1: INSTR. HELP 2: TRANSFER CLEAR: END HELP: MENU	Select "1: INSERT".
③ 2 → 1 → 6	I 0► LD X000 ▼ 1 OUT Y020 ▼ 2 LD X000 START STEP [16]	Select "2: TRANSFER". Set 16 as the move start step.
④ GO → 1 → 8	I 15 OUT Y023 ▼ 16► LD Y023 ▼ 17 ANI T1 END STEP [18]	Set 18 as the move END step.
⑤ GO → 5 → 0	I 17 ANI T1 ▼ 18► OUT T0 ▼ 18 K10 DESTINATION [50]	Set 50 as the move destination step.
⑥ GO	I 49 K10 ▲ 50► NOP ▲ 51 NOP ▲ 52 NOP	The program of steps 16 to 18 has been moved to just before step 50.

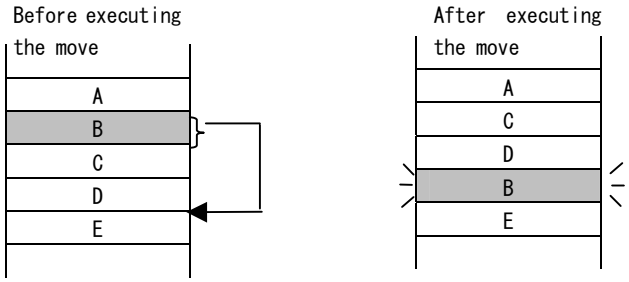
[Explanation]

(1) When the move is executed, it is moved to just before the move destination step.

(a) If the move destination is before a movement source, instructions in the range from the movement destination to the movement source are shifted in descending order.
The figure below is an example of shifting ladder block D before ladder block B.



(b) When a move destination is after a movement source, instructions in the range from the move destination to the movement source are shifted in ascending order.
The figure below is an example of shifting ladder block B before ladder block E.



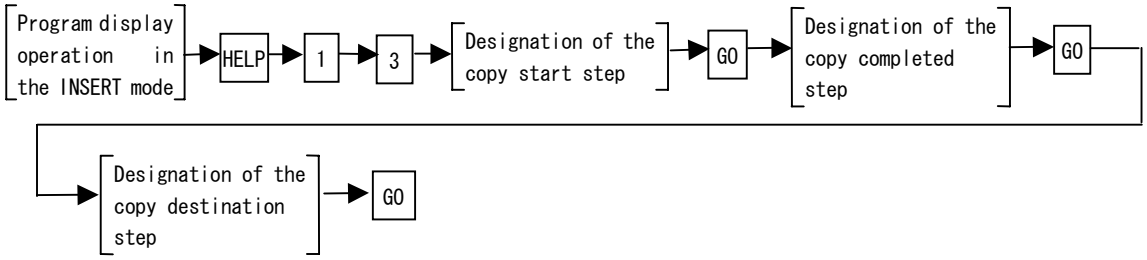
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.4.3 Copying a program

This operation copies a program to the designated position when it is composed of an instruction that is the same as the created program. (Help operation in the INSERT mode)

[Basic operation]



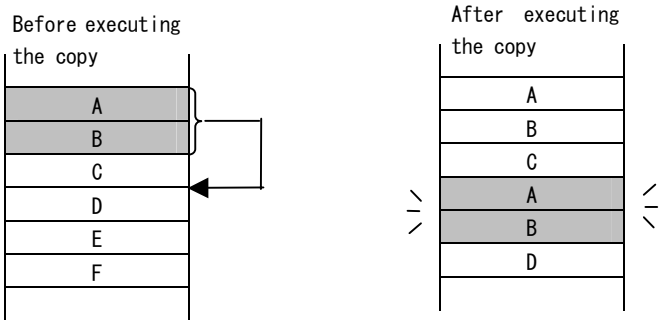
[Sample operation]

When steps 15 to 20 are copied to step 60

① HELP	*** HELP MENU *** 1: INSERT 2: COMMENT DISPLAY CLEAR: END	Press the [HELP] key when operating in the INSERT mode.
② 1	*** INSERT *** 1/2 1: INSTR. HLP 2: TRANSFER CLEAR: END HELP: MENU	Select "1: INSERT".
③ ↓	*** INSERT *** 2/2 3: COPY CLEAR: END HELP: MENU	Switch to the display "*** INSERT*** 2/2".
④ 3→1→6	I 0▸ LD X000 ▾ 1 OUT Y020 ▾ 2 LD X000 START STEP [16]	Select "3: COPY". Set 16 as the copy start step.
⑤ GO→1→8	I 15 OUT Y023 ▾ 16▸ LD Y023 ▾ 17 ANI T1 END STEP [18]	Set 18 as the copy END step.
⑥ GO→6→0	I 17 ANI T1 ▾ 18▸ OUT T0 ▾ 18 K10 DESTINATION [60]	Set 60 as the copy destination step.
⑦ GO	I 59 NOP ▴ 60▸ LD Y023 ▴ 61 ANI T1 62 OUT T0	The program of step 16 to 18 is copied to step 60 and after.

[Explanation]

(1) When the copy is executed, a program is copied to just after the copy destination step, and the subsequent instructions are shifted back.
The figure below is an example of copying ladder blocks A and B before ladder block D.



(2) When pointer (P, I) is included in the range to be copied, SETTING ERROR occurs.
Leave out pointers of ranges to be copied.

ACPU states	RUN	STOP	PAUSE	STEP RUN

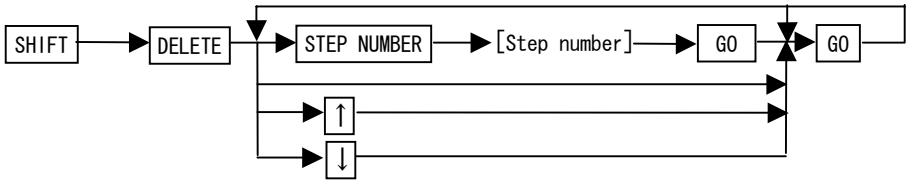
Available memory	RAM	EEPROM	EPROM

6.5 DELETE (D) Mode Operations

This mode deletes existing instructions to modify ACPU programs.

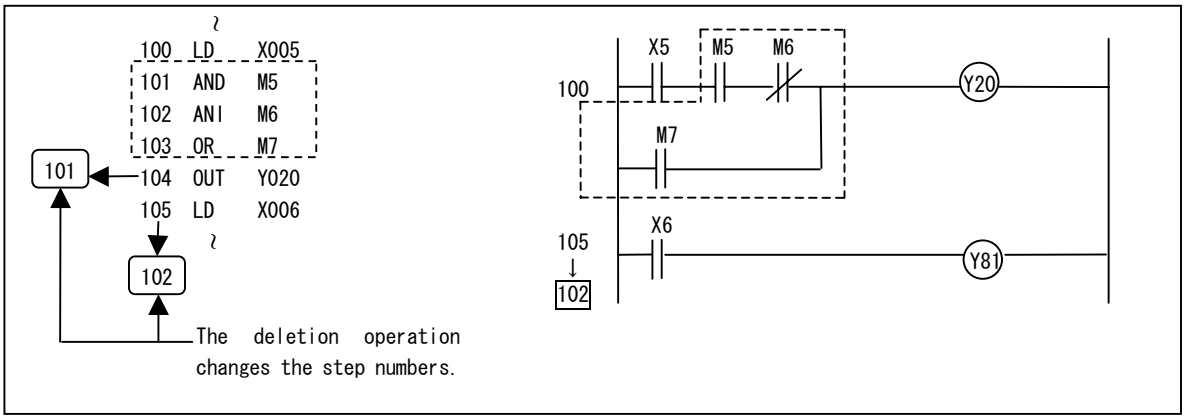
6.5.1 Deleting an instruction in a program (Program deletion)

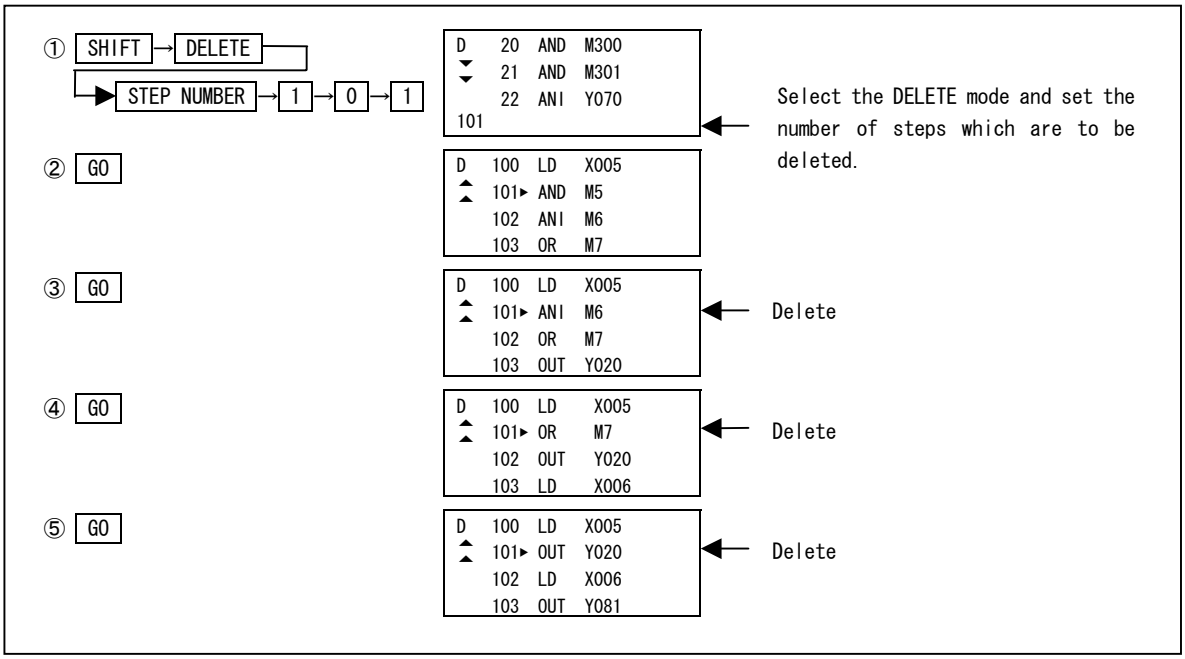
[Basic operation]



[Sample operation]

A program (dotted area) is deleted

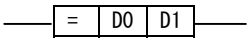




[Explanation]

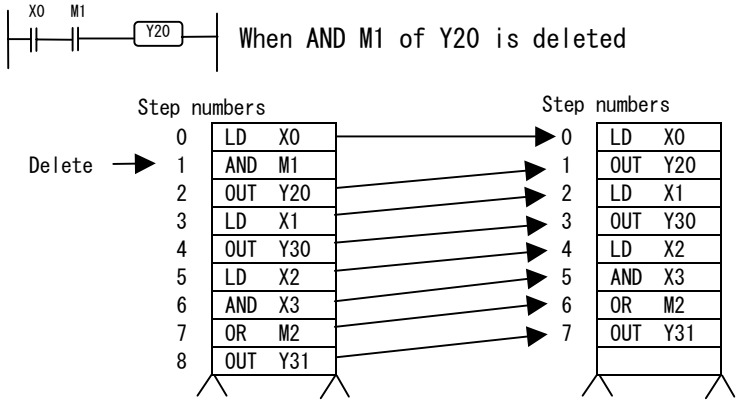
(1) If the designated head step is in the middle of an instruction, processing is executed assuming that the head step of the instruction has been designated.

(2) Instructions must not be deleted by step units; use instruction units.
(Example)



Do not delete AND=, D0 and D1 separately. Delete AND=, D0, and D1 together.
After the operation has been completed, confirm a deleted part in the READ mode.

(3) When the operation is completed normally, the instruction of a designated step number is deleted from an ACPU and the step number is now displayed with the next instruction.



(4) Pressing the [SHIFT] and [DELETE] keys in the READ, WRITE, INSERT, MONITOR (list monitor) or TEST (test of list monitor) modes enables deleting of an instruction after the cursor position (▶).

(5) When executing this operation when the ACPU is in the RUN state, execute this operation after setting “WRITE ENABLED CONFIRM YES” in the OTHERS mode (see Section 6.9.14).

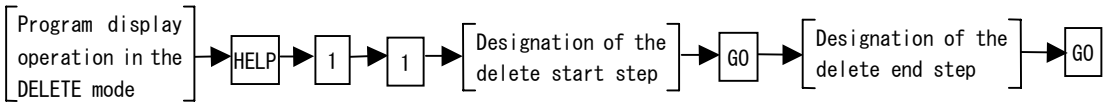
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.5.2 Deletion by designating a range

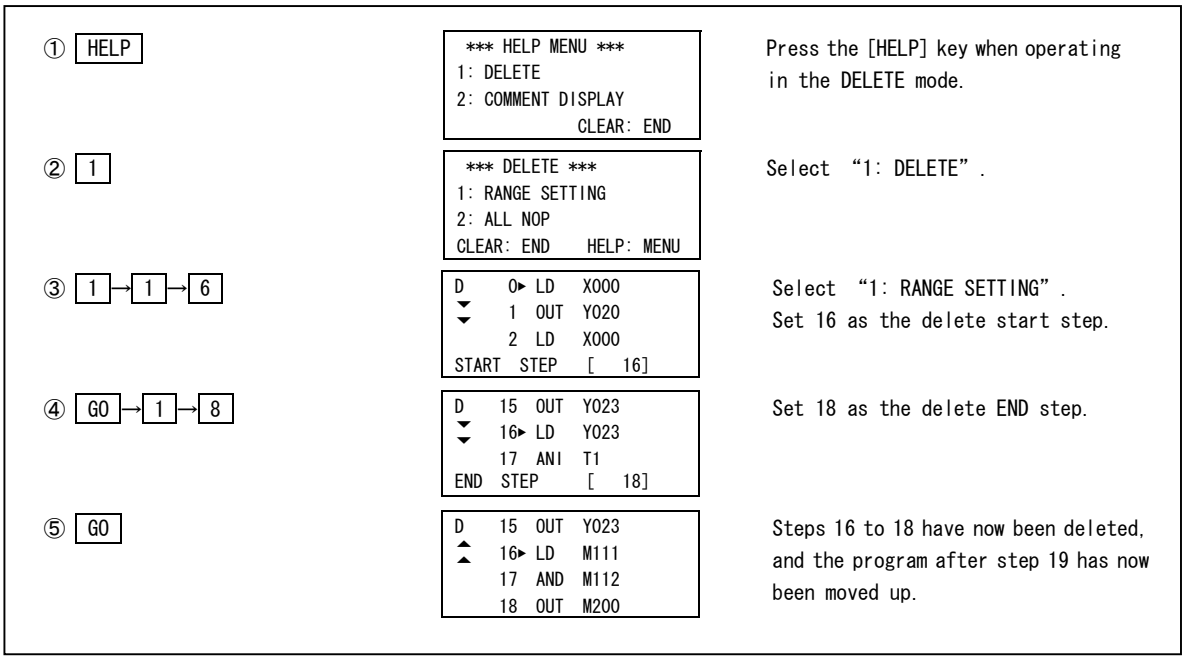
This operation deletes several instructions by designating a range. (Help operation in the DELETE mode)

[Basic operation]



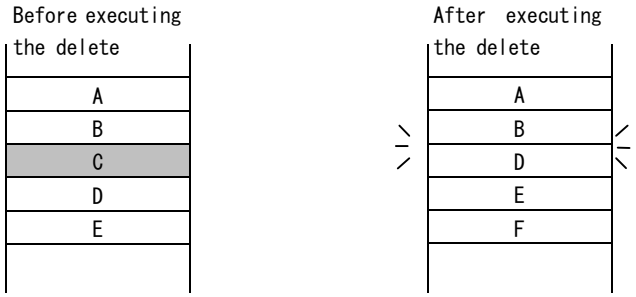
[Sample operation]

Steps 16 to 18 are deleted



[Explanation]

(1) When deletion is executed, the program is moved up. The figure below is an example of deleting ladder block C.



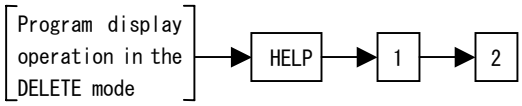
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.5.3 Batch deletion of NOP in the program

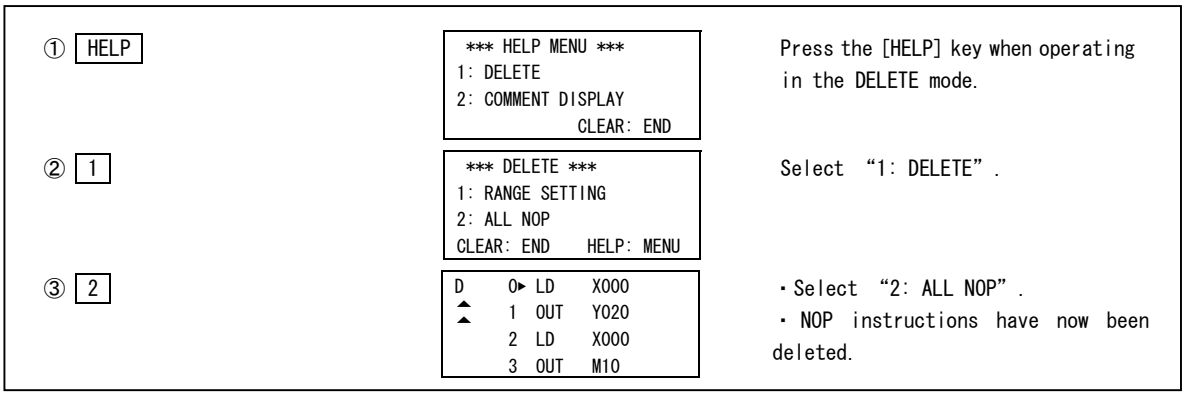
This operation deletes all NOP instructions in the program (step 0 to the END instruction). (Help operation in the DELETE mode)

[Basic operation]



[Sample operation]

NOP instructions are batch-deleted



[Explanation]

(1) When batch deletion of NOP instructions has been executed, the program is condensed.

(2) The NOPLF instruction (instruction used to change a page at any position when printing a circuit diagram and an instruction list using the GPP function) is not deleted.

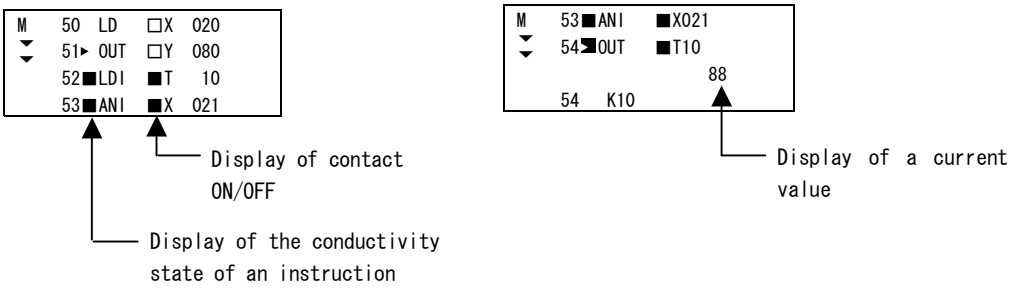
6.6 MONITOR (M) Mode Operations

This mode checks operations of ACPU programs. The following checks can be done:

(1) List monitoring

Bit devices can be turned ON/OFF when displaying sequence programs, and the current value of word devices and conductivity status can be monitored.

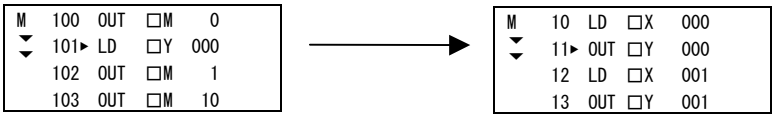
List monitoring example



(2) Monitoring search

OUT, SET, and RST instructions of a corresponding device can be searched by moving the cursor to the contact instruction. Example of moving the cursor to“LD Y000”, searching“OUT Y000”, and displaying the corresponding program

Before executing

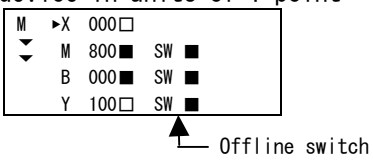


After executing

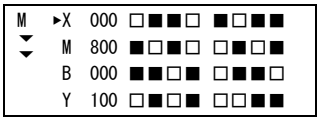
(3) Device monitoring

(a) Monitoring the ON/OFF state and the offline switch state of a bit device

Example of monitoring a bit device in units of 1 point

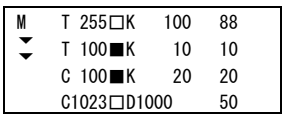


Example of monitoring by designating multiple bit devices



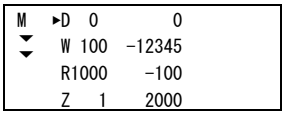
(b) Monitoring the contact of T/C, the set value, and the current value

T/C monitoring example

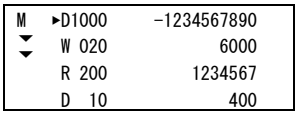


(c) Monitoring the current value of a word device

Word device monitoring example



Monitoring example when a word device is designated to 32 bits



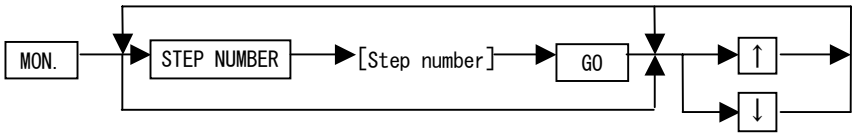
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.6.1 Confirming the operating state by displaying a program (List monitoring)

This operation monitors the ON/OFF state of a contact instruction, the current value of a word device, and conductivity state (whether the instruction is active or not) while displaying a program.

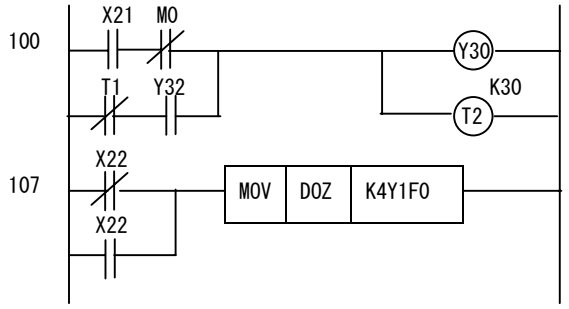
[Basic operation]



[Sample operation]

A program in the figure below is list monitored

```
      ≀
100   LD    X21
101   ANI   M0
102   LDI   T1
103   AND   Y32
104   ORB
105   OUT   Y30
106   OUT   T2    K30
107   LDI   X22
108   OR    X23
109   MOV   DOZ   K4Y1F0
      ≀
```



① MON. → STEP NUMBER → 1 → 0 → 0

```
M     0▸ LD    □X000
      1  ANI   ■M100
      2  OR    □M101
100
```

Select the MONITOR mode.

② GO

```
M    99  OUT   □M200
100▸  LD    ■X021
101   ANI   □M0
102   LDI   ■T1
```

Display the program of step 100, and execute list monitoring.

③ GO

```
M   102  LDI   ■T1
103▸  AND   □Y032
104   ORB
105   OUT   ■Y030
```

The next screen is displayed.

④ GO

```
M   105  OUT   ■Y030
106▸  OUT   ■T2
                  30
106   K30
```

The next screen is displayed.

⑤ GO

```
M   106   K30
107▸  LDI   ■X022
108   OR    □X023
109   MOV
```

The next screen is displayed.

⑥ GO

```
M   109  MOV
109▸  DOZ          *
109   K4Y1F0       *
114   LD    □M100
```

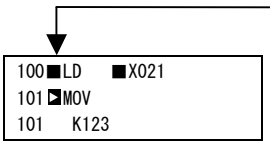
The next screen is displayed.

[Explanation]

(1) Not only the program is read by an operation that is the same as the read by the step number, but the conductivity state, ON/OFF state of a device contact, and the current value of a device are also monitored.
However, the conductivity state of an A0J2CPU, A3HCPU, A3MCPU, A2ACPU(S1) and A3ACPU will not be not displayed.

(2) Explanation of display contents

(a) Monitoring conductivity states
Checks whether an instruction such as OUT, MOV, BCD, BIN and operation instruction is executed.
The conductivity state is displayed on the left side of the instruction.
To display the conductivity state, set the conductivity state display setting (see Section 6.9.15) to "YES" in the OTHERS mode. When the power supply is turned ON, the conductivity state display is set to "NO".

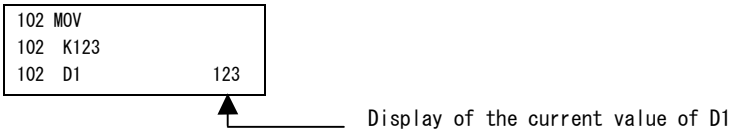


When it is conductive, "■" is displayed; when not conductive, it becomes blank. However, when a conductivity state display and the cursor overlap, "▶" indicates conductivity, and "▸" indicates non-conductivity.

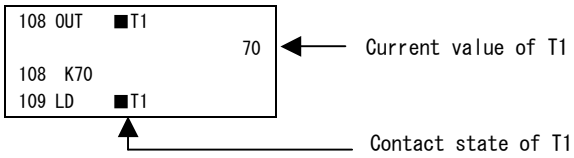
(b) Monitoring bit devices
The ON/OFF state of a bit device is displayed on the left side of the device number.

When a bit device turns ON, "■" is displayed, and when a bit device turns OFF "□" is displayed.

(c) Monitoring word devices
The current value of a word device is displayed. A 16-bit instruction displays 1-word data, and a 32-bit instruction displays 2-word data.
Change the display format (octal display, decimal display, hexadecimal display and ASCII display) of a current value according to the Help operation (see Section 6.6.4).



(d) T/C monitoring
The contact instruction of T/C monitors the ON/OFF state of a contact.
The OUT T/C instruction monitors the ON/OFF state of a contact and a current value.



(e) Instructions that cannot be monitored

Contacts and current values of instructions (example MOV K4M0 D0) to which the number of digits of a bit device has been designated and instructions (examples LD X000Z and MOV D0 D100Z) modified by indexes cannot be monitored. * is displayed in the monitoring display position.

```
114  LD   X0Z          *
116▸ MOV
116   K4M0             *
116   D0           12345
```

(3) After pressing the [STEP NUMBER], step number, and [GO] keys, press the [GO] key to scroll the program up.

(4) Pressing the [MON.] key in the READ, WRITE, INSERT, or TEST (test of list monitor) modes enables list monitor.

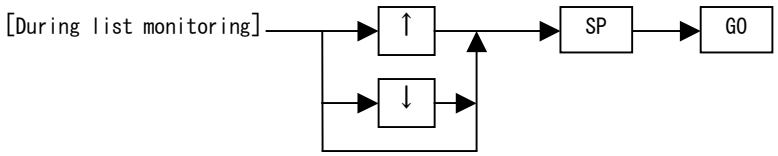
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.6.2 Searching a coil from the contact (Monitoring search)

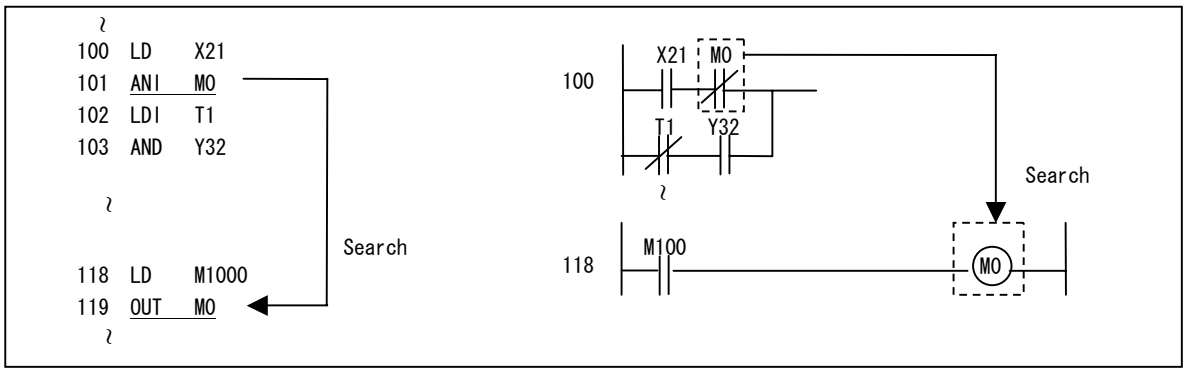
This operation searches and displays OUT, SET, and RST instructions of bit devices (Y, M, L, S, T, C, F, B) used in contact instructions.

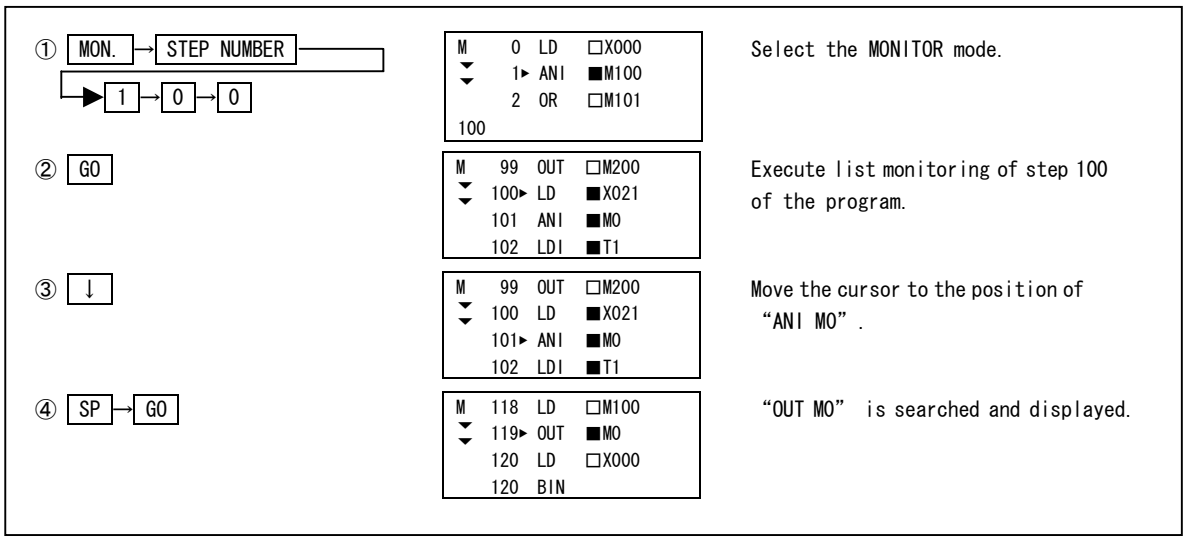
[Basic operation]



[Sample operation]

The output instruction of M0 is searched from the contact instruction of M0 in the program below





[Explanation]

(1) The program of an OUT, SET, and RST instruction of a bit device (Y, M, L, S, T, C, F, B) used in an LD, LDI, AND, ANI, OR, and ORI instruction is read.

(2) The search is started beginning with step 0 and the program of the step found first is displayed. If there are several OUT, SET and RST instructions, the subsequent programs cannot be searched.

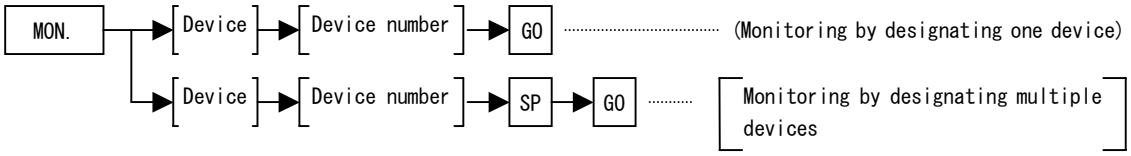
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.6.3 Device monitoring

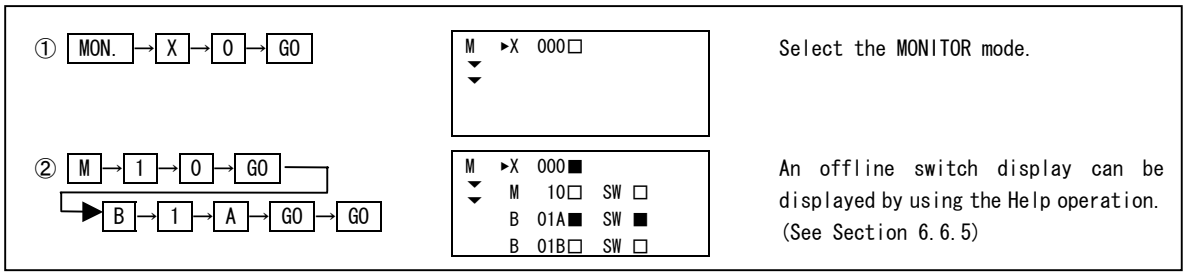
This operation monitors the ON/OFF state and the offline switch state of a bit device and a current value of word device.
1-point designation (monitoring in units of 1 point of a designated device) and multiple-point designation (bit device: monitoring in units of 8 points, word device: monitoring 32-bit data) are used for monitoring.

[Basic operation]



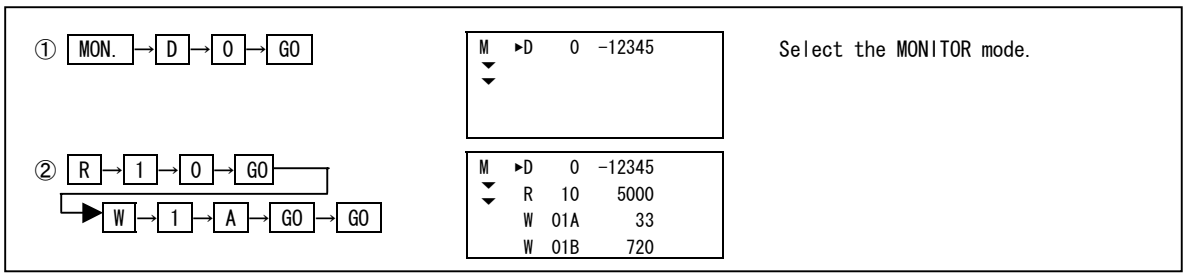
[Sample operation 1]

A 1-bit device is designated, and ON/OFF is monitored Monitoring



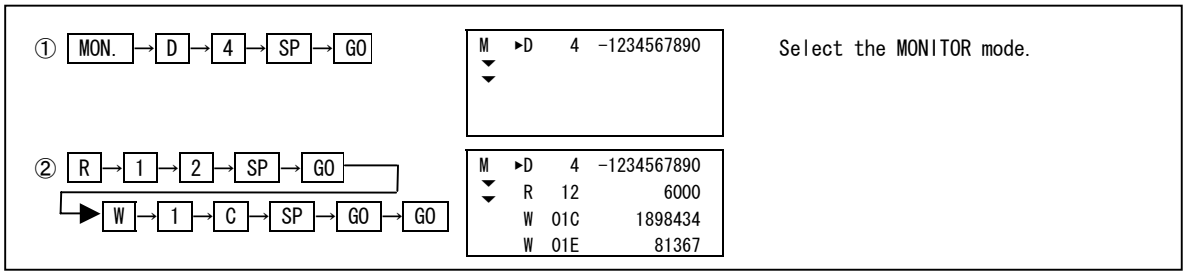
[Sample operation 2]

A 1-word device is designated and monitored in 16-bit data Monitoring



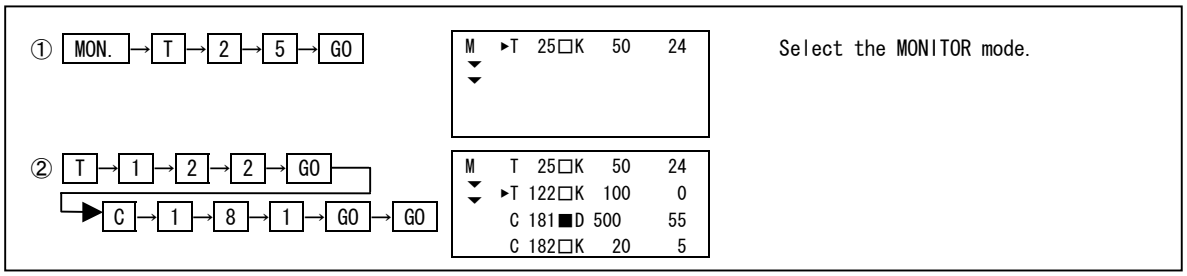
[Sample operation 3]

Multiple word devices are designated and monitored in 32-bit data Monitoring



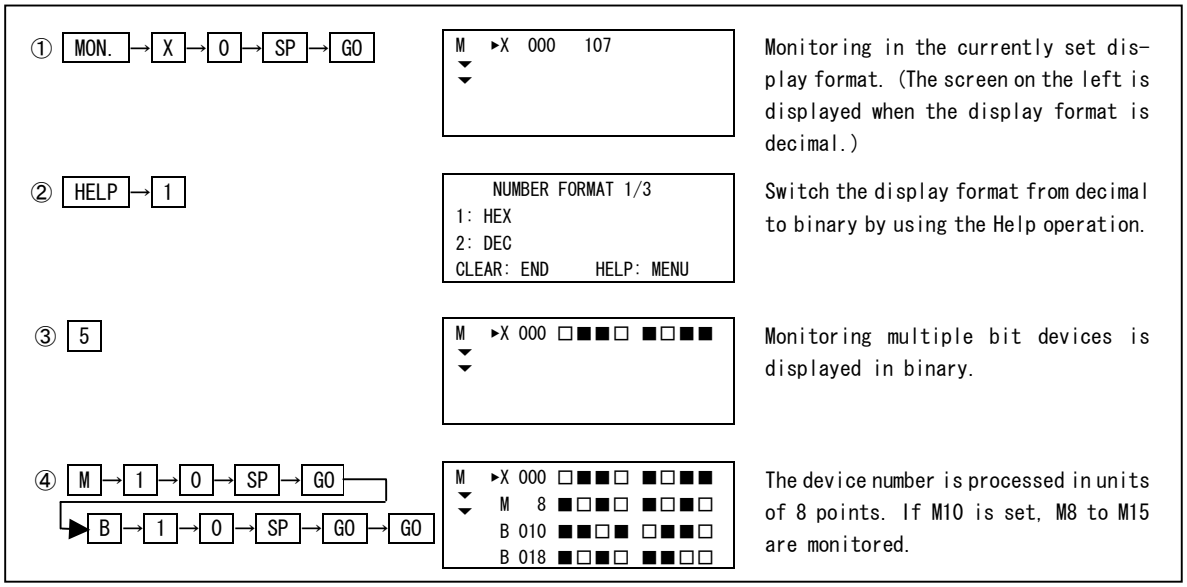
[Sample operation 4]

A 1-point timer counter is designated and monitored Monitoring



[Sample operation 5]

Multiple bit devices are designated and monitored in binary



[Explanation]

(1) Monitoring by designating 1 point

(a) The ON/OFF states of bit devices (X, Y, M, L, S, B) can be monitored. Monitoring of an offline switch state can be also executed. (There is no offline switch function in the A0J2CPU, A2ACPU, A3HCPU, A3MCPU and A3ACPU.)
An offline switch is displayed by using the Help operation or offline switch setting of the TEST Mode. (See Sections 6.6.5 and 6.7.5.)

(b) The current values of word devices (D, W, R) can be monitored.

(c) The set values, current values, and ON/OFF states of contact timer counters (T, C) can be monitored.
However, when the set value is set at a word device, a device number is displayed.

(d) The number of monitored points is 4 max.
However, only 4 points of a bit device, timer/counter, or word device can be monitored.
Monitoring cannot be executed by mixing bit devices, timers, counters, and word devices.

(2) Monitoring by designating multiple points

(a) Designation of multiple bit devices
Monitoring the ON/OFF state of bit devices is executed in units of 8 points.
When a set bit device number cannot be divided by 8, it is monitored automatically by device number in units of 8 points. For example, if multiple M10 are designated, M8 to M15 are monitored.

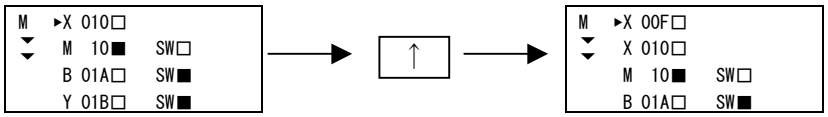
(b) Designation of multiple word devices
These are handled as 32-bit data, and a current values are monitored.

(c) The number of points to be monitored is 4 max.
However, only 4 points of a bit device or word device can be monitored.
Monitoring cannot be executed by mixing bit devices and word devices.

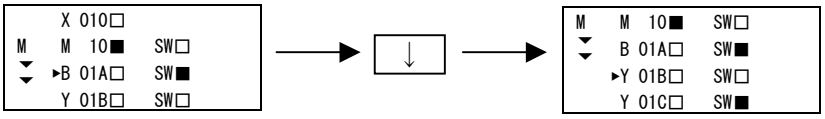
(3) Operation that monitors a serial device number

(a) If the [GO] key is pressed after inputting a device number, the following device number is displayed.

(b) When the cursor is in the top line, a device number immediately before displayed in the top line is monitored by pressing the [↑] key.



(c) When the cursor is in the third line, the device number next to a device number displayed on the bottom line is monitored by pressing the [↓] key.



REMARK

The current value of a word device can be displayed in binary, octal, decimal, hexadecimal and ASCII code. Change the display format by using the Help operation (see Section 6.6.4).

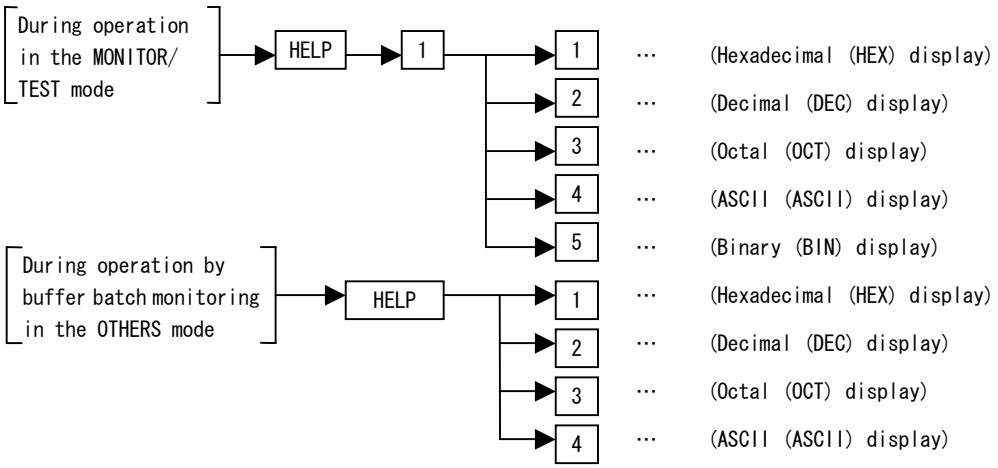
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.6.4 Changing the display format of a current value

This operation switches a current value to binary, octal, decimal, hexadecimal or ASCII display by list monitoring and device monitoring. (Help operation in the MONITOR/TEST/OTHERS modes)

[Basic operation]



[Sample operation]

Changing to hexadecimal display during device monitoring

①	M ▸D 0 -12345 R 10 5000 W 01A 33 W 01B 720	During monitoring in decimal
② HELP	*** HELP MENU *** 1/2 1: NUMBER FORMAT 2: MONITOR CLEAR: END	Press the [HELP] key during monitoring.
③ 1	NUMBER FORMAT 1/3 1: HEX 2: DEC CLEAR: END HELP: MENU	Select "1: NUMBER FORMAT".
④ 1	M ▸D 0 HCFC7 R 10 H1388 W 01A H0021 W 01B H02D0	Select "1: HEX". The current value of the device is switched to hexadecimal.

[Explanation]

(1) This operation changes the display format of the current position in the MONITOR, TEST, and OTHERS modes.
Set the display format when displaying the MONITOR mode's list monitoring and device monitoring, the TEST mode's word devices (D, R, W) and the OTHERS mode's buffer batch monitoring current values.
Timers/counters (T, C) are displayed only in decimal.

(2) The display format can be binary display, octal display, decimal display, hexadecimal display, or ASCII display.
The display format when the power supply is turned ON is decimal.
Four kinds of display formats other than binary display are available for buffer batch monitoring in the OTHERS mode.

(3) Some display formats cannot be designated depending on the monitoring device and function. When a display format that cannot be displayed is set, the display format is decimal display.

(a) Binary display
The display format is binary display only when many bit devices are monitored by device monitoring.

(b) Octal display
Devices other than the timer (T)/counter (C) can be displayed in octal.

(c) Decimal display
Monitoring of all devices can be displayed in decimal.

(d) Hexadecimal display
Devices other than the timer (T)/counter (C) can be displayed in hexadecimal.

(e) ASCII display
The devices other than the timer (T)/counter (C) can be displayed in ASCII.
Characters can be displayed in the ranges of 20H to 7FH and A0H to DFH. All characters outside these ranges are displayed as dots (..).
(See APPENDIX 4.)

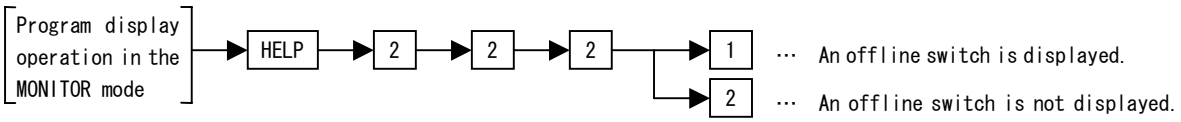
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.6.5 Setting the offline switch YES/NO display (Offline switch display)

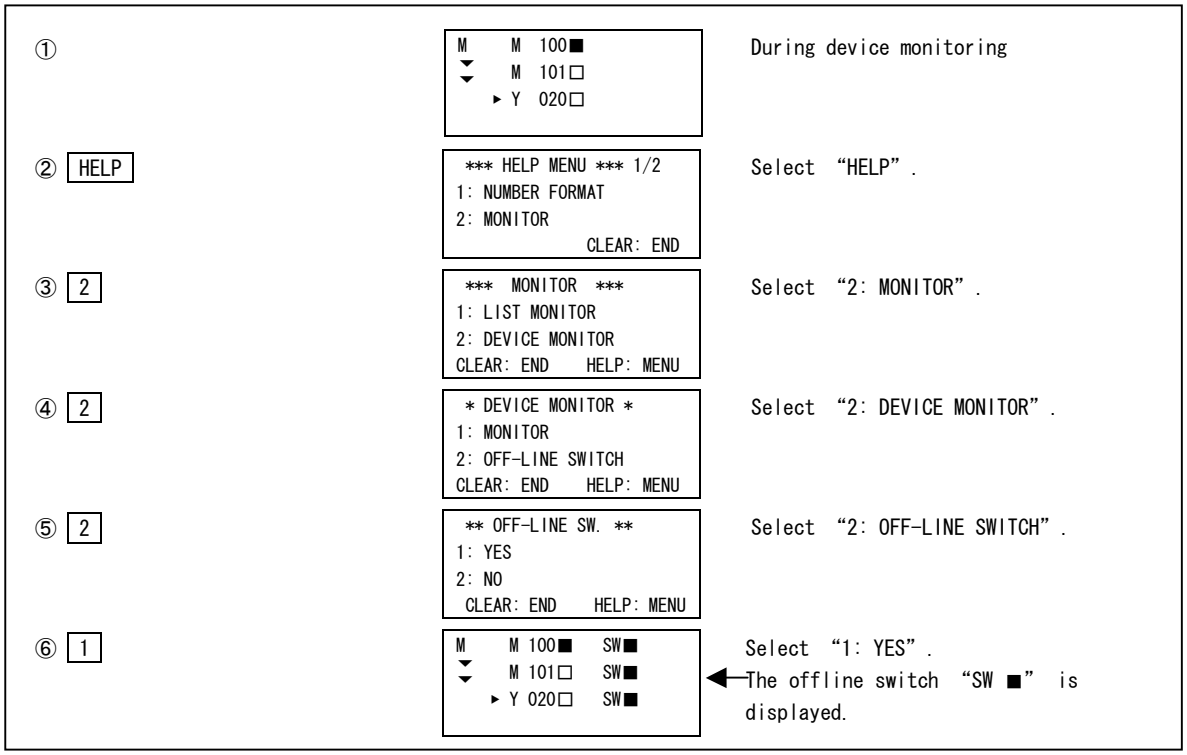
This operation sets the offline switch display YES/NO during device monitoring and device monitoring tests.

[Basic operation]



[Sample operation]

An offline switch is displayed during device monitoring



[Explanation]

(1) When the connected ACPU is an A0J2CPU, A2ACPU, A3HCPU, A3MCPU, or A3ACPU, offline switches are not displayed.

(2) Devices that can display offline switches are Y, M, L, B, and F.

(3) If an offline switch is set or canceled during the device monitoring test in the TEST mode, the offline switch is displayed automatically.

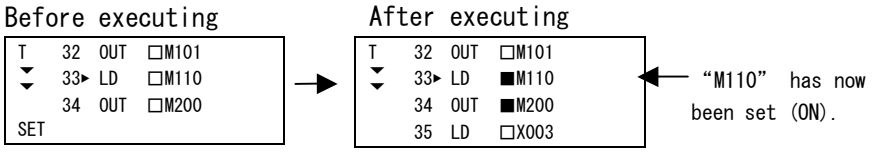
(4) Section 6.7.5 explains how to operate offline switches.

6.7 TEST (T) Mode Operations

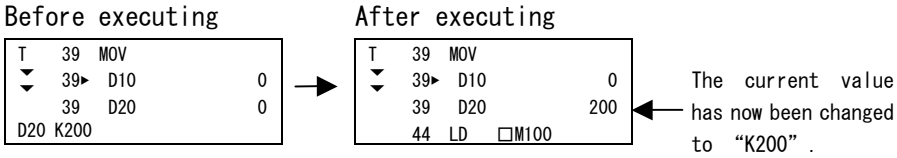
This mode performs test operations of ACPU programs. The following are enabled:

(1) Testing by list monitoring

(a) Setting/resetting bit devices X, Y, M, L, B and F
Example of setting device “M110” of the cursor position

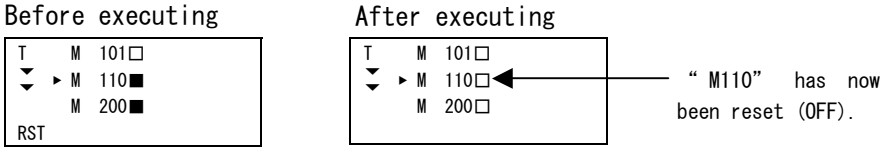


(b) Changing the current value of word devices T, C, D, W, R, A, Z and V (Z1 to Z6 and V1 to V6: only when A2ACPU or A3ACPU is used)
Example of changing the current value of designated device “D20” to “K200”

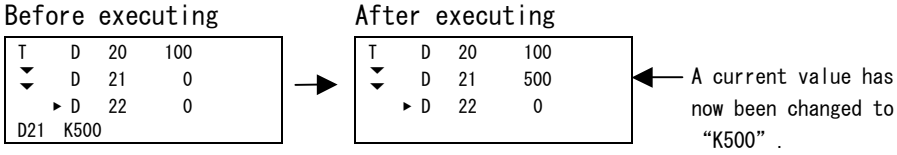


(2) Testing by device monitoring

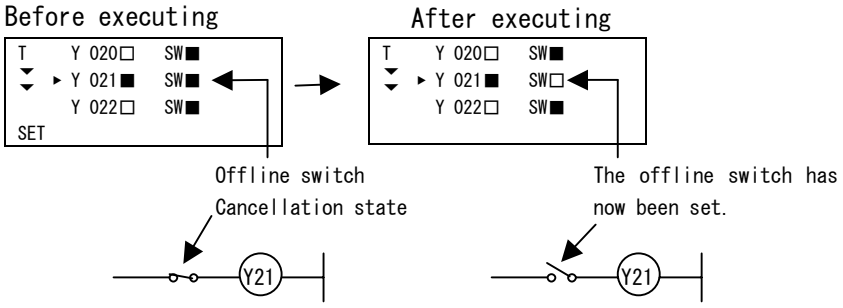
(a) Setting/resetting bit devices X, Y, M, L, B, and F
Example of resetting device “M110” at the cursor position



(b) Changing the current value of word devices T, C, D, W, R, A, Z, and V (Z1 to Z6 and V1 to V6: only when A2ACPU or A3ACPU is used)
Example of changing the current value of designated device “D21” to “K500”



(c) Setting/canceling an offline switch of bit devices Y, M, L, B, and F
Example of setting an offline switch of device “Y21” at the cursor position



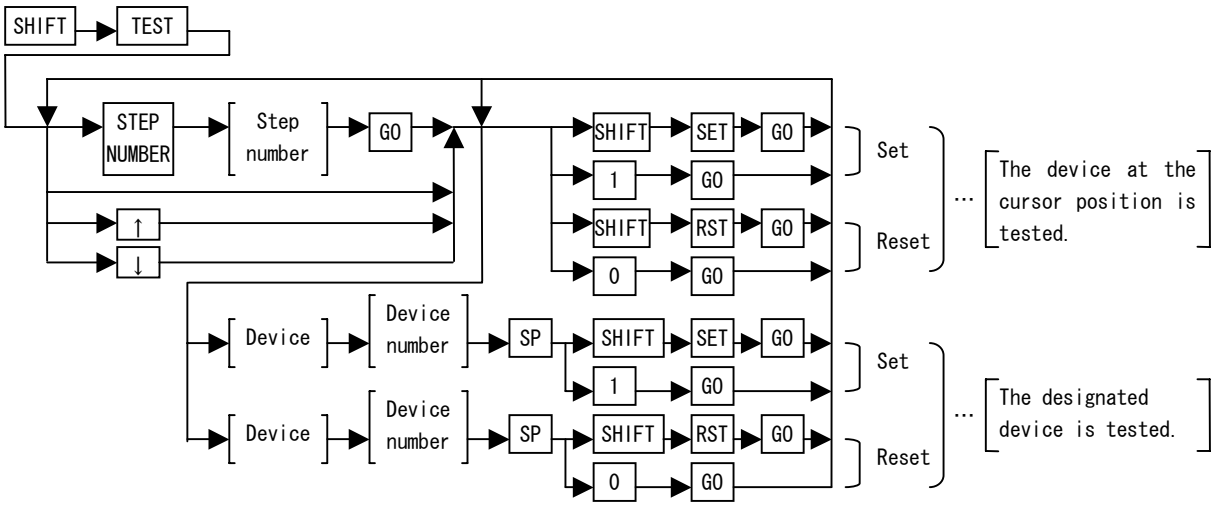
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.7.1 Setting/resetting X, Y, M, L, B, and F by list monitoring (Set/reset of a bit device)

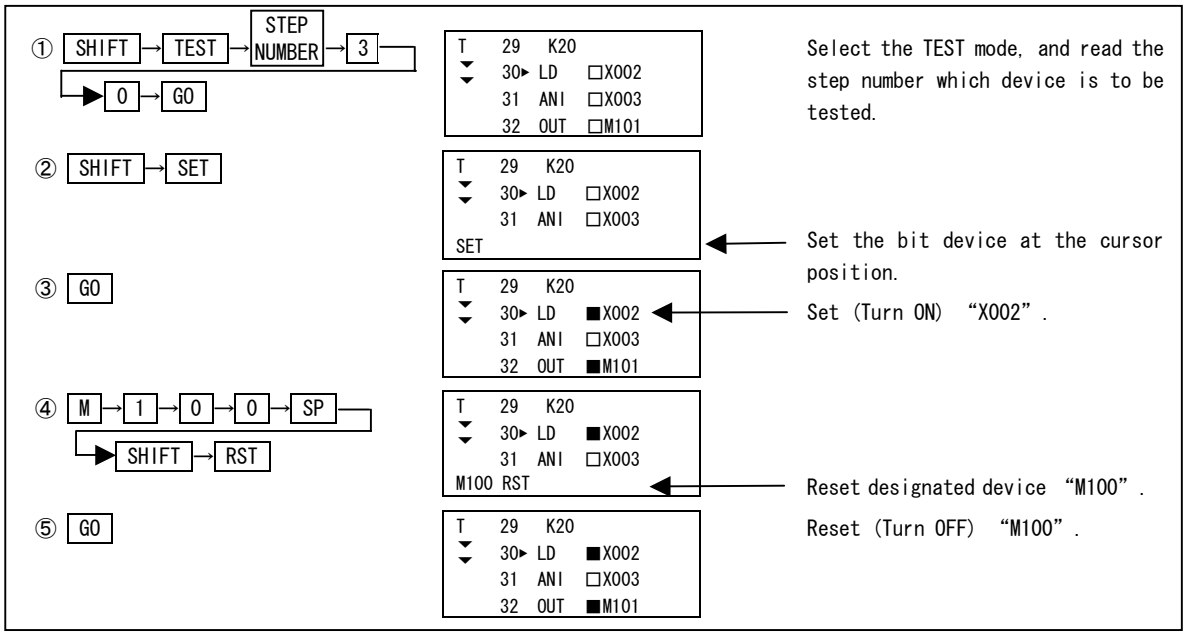
This operation sets/resets (turns ON/OFF) a bit device forcibly by designating a device and a device number.

[Basic operation]



[Sample operation]

Device “X002” at the cursor position is set and designated device “M100” is reset



[Explanation]

(1) Turn ON a device number set by pressing the [SHIFT]→[SET]→[GO] ([1]→[GO]) keys. Turn it OFF by pressing the [SHIFT]→[RST]→[GO] ([0]→[GO]) keys.

(2) As for forcible set/reset operations when the ACPU is in the RUN state, program execution has priority.
Therefore, even if forcible set/reset is executed when an instruction using a correspondent device is being executed, the state only changes for a moment and returns back.

(3) Even if a process input is OFF, when input (×) is set forcibly, an ACPU executes the operation processing as ON.
And, even if input (×) is reset forcibly when a process input is ON, the PC CPU is processed as ON.
If input (×) was set, be sure to reset it after the test operation has been completed.

(4) As for special-function modules, some of the Y numbers cannot be set/reset.

(5) Special relay (M) is controlled by the OS of the CPU. Operate set/reset of special relays after checking the contents utilizing the User's Manual of the connected ACPU.

(6) Pressing the [SHIFT] and [TEST] keys in the READ, WRITE, INSERT, DELETE, and MONITOR modes (list monitoring) enables the test operation of the designated device indicated by the cursor(▶).

IMPORTANT
Be sure to reset devices set by this operation before operating. Batch reset can be executed by using the CPU's reset switch.

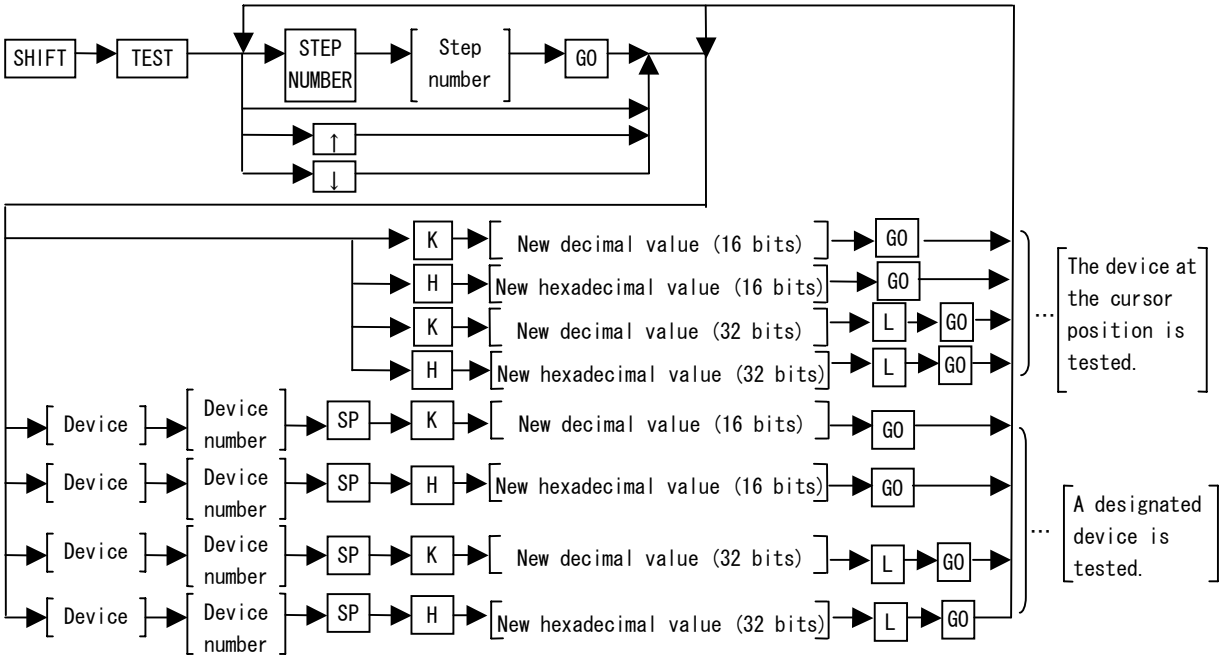
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.7.2 Changing the current values of T, C, D, W, R, A, Z, or V by list monitoring (Changing current values of word device)

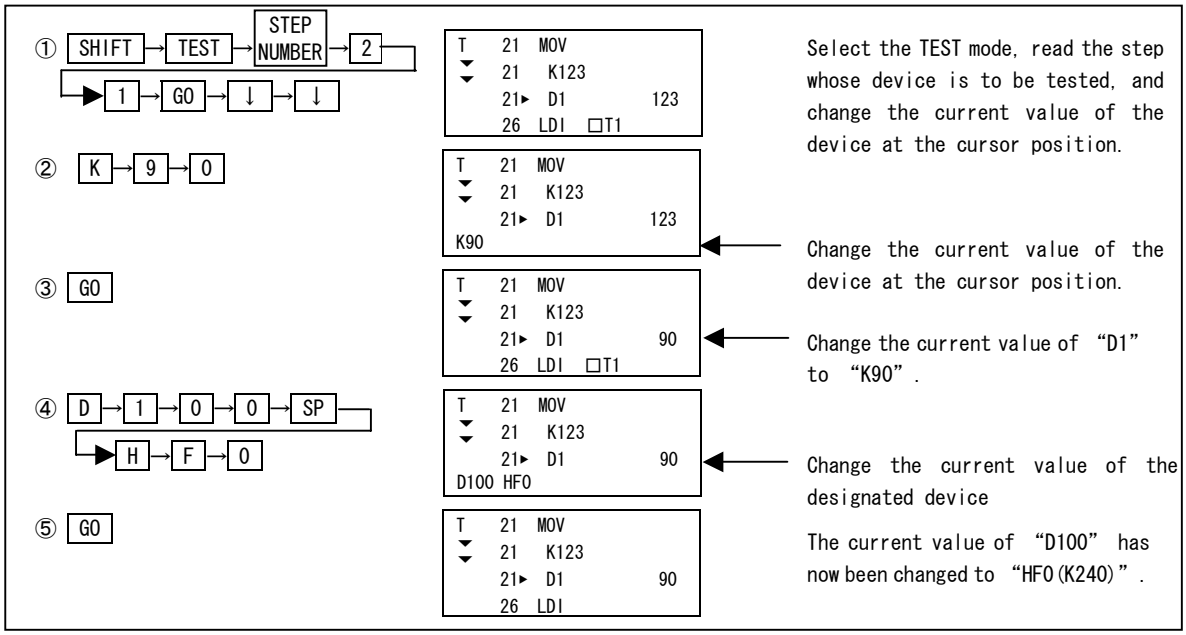
This operation changes the current value of a word device forcibly by designating a device and a device number.

[Basic operation]



[Sample operation]

The current value of device “D1” at the cursor position is changed to “K90” and the current value of designated device “D100” is changed to “HF0(K240)”



[Explanation]

(1) The current value of a device changes according to the contents of the sequence program being processed when the ACPU is in the RUN state.

(2) Special registers are managed by the OS of ACPU.
When changing the current value of a special register, operate after confirming the contents by utilizing the User's Manual of the connected ACPU.

(3) Pressing the [SHIFT] and [TEST] keys in the READ, WRITE, INSERT, DELETE, and MONITOR modes (list monitoring) enables the test operation of the designated device indicated by the cursor (▶).

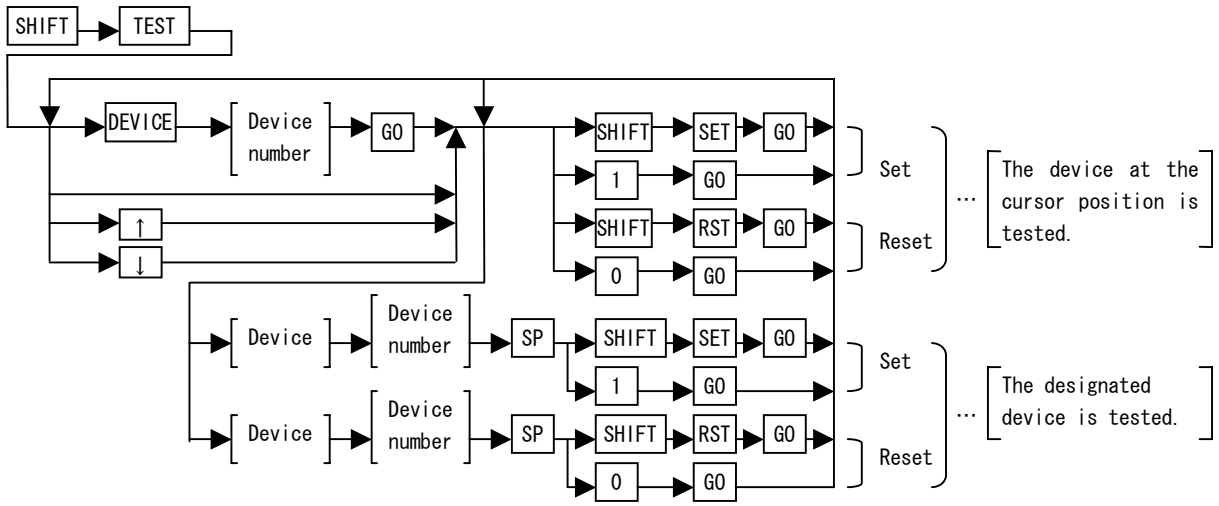
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.7.3 Setting/resetting X, Y, M, L, B or F by device monitoring (Bit device set/reset)

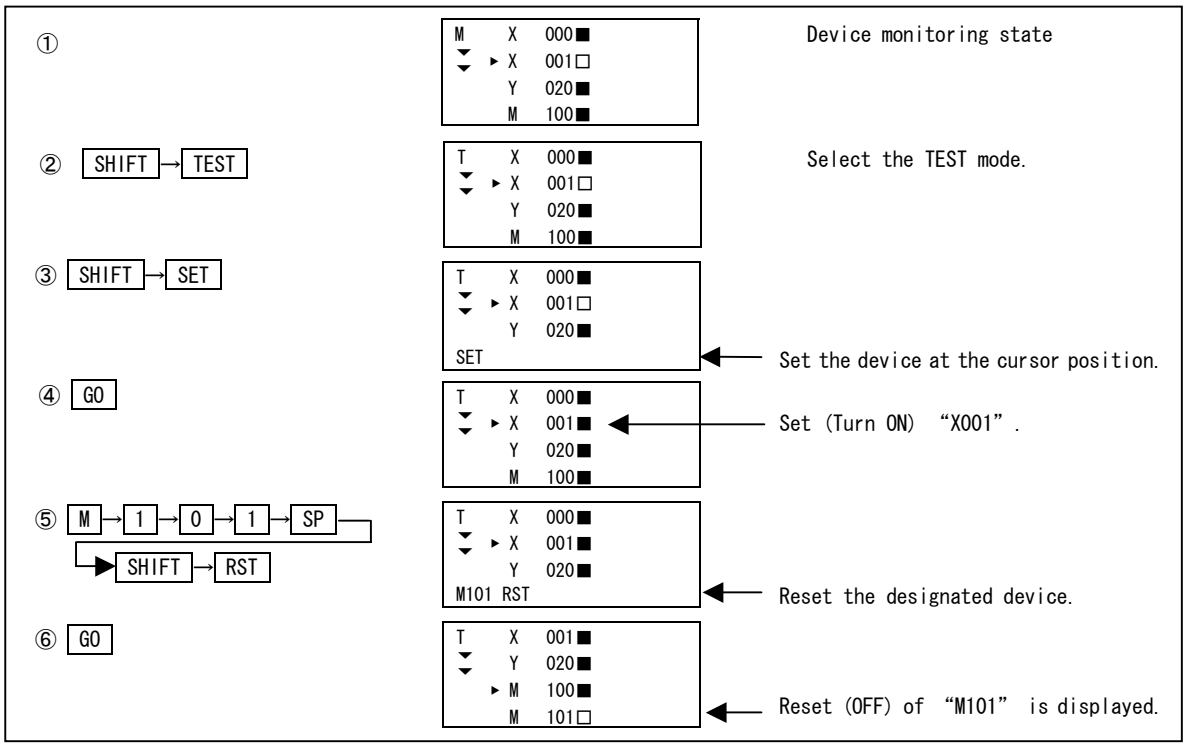
This operation sets/resets (turns ON/OFF) a bit device forcibly by designating a device and a device number.

[Basic operation]



[Sample operation]

Device “X001” at the cursor position is set and designated device “M101” is reset



[Explanation]

(1) Turn ON a device number set by pressing the [SHIFT]→[SET]→[GO] ([1]→[GO]) keys.
Turn it OFF by pressing the [SHIFT]→[RST]→[GO] ([0]→[GO]) keys.

(2) When a device that is not displayed is set or reset, the corresponding device and device state are displayed.

(3) As for forcible set/reset operations when the ACPU is in the RUN state, program execution has priority.
Therefore, even if forcible set/reset is executed when an instruction using a correspondent device is being executed, the state only changes for a moment and returns back.

(4) Even if a process input is OFF, when input (×) is set forcibly, an ACPU executes the operation processing as ON.
And, even if input (×) is reset forcibly when a process input is ON, the PC CPU is processed as ON.
If input (×) was set, be sure to reset it after the test operation has been completed.

(5) As for special-function modules, some of the Y numbers cannot be set/reset.

(6) Special relay (M) is controlled by the OS of the CPU. Operate set/reset of special relays after checking the contents utilizing the User's Manual of the connected ACPU.

(7) Pressing the [SHIFT] and [TEST] keys in the MONITOR mode (list monitoring) enables the test operation of the designated device indicated by the cursor (▶).
When the [SHIFT] and [TEST] keys are pressed in the READ, WRITE, INSERT, DELETE, or MONITOR (list monitoring) mode, the test operation is enabled by inputting the designated device and device number.

IMPORTANT
Be sure to reset devices set by this operation before operating. Batch reset can be executed by using the CPU's reset switch.

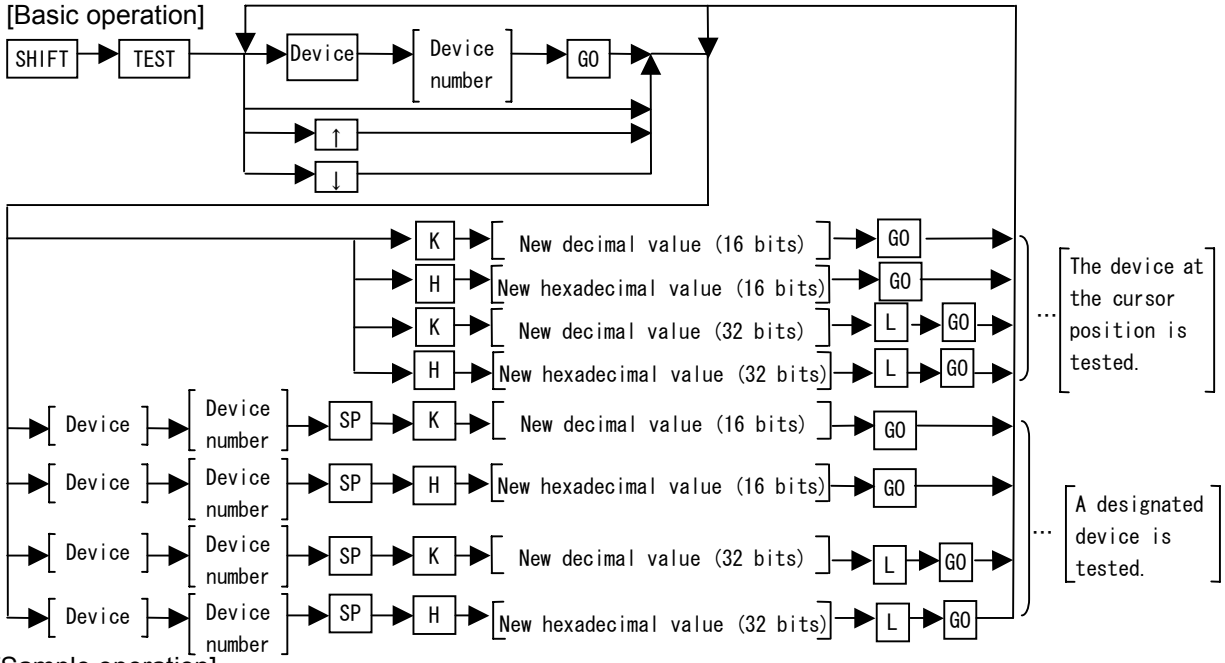
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.7.4 Changing the current value of T, C, D, W, R, A, Z, or V by device monitoring (Current value change of a word device)

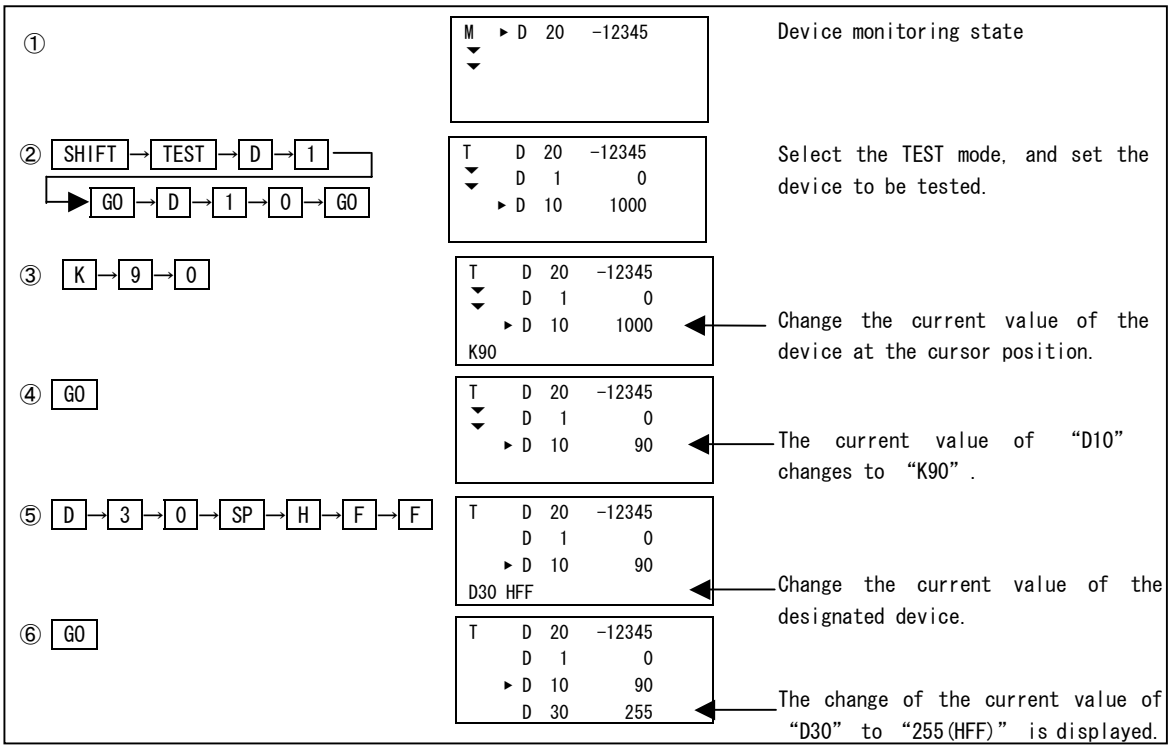
This operation changes the current value of a word device forcibly by designating a device and a device number.

[Basic operation]



[Sample operation]

The current value of device “D10” at the cursor position is changed to “K90”, and the current value of designated device “D30” is changed to “HFF (K255)”



[Explanation]

(1) When a device that is not displayed is set or reset, the corresponding device and device state are displayed.

(2) The current value of a device changes according to the contents of the sequence program being processed when the ACPU is in the RUN state.

(3) Special registers are managed by the OS of ACPU.
When changing the current value of a special register, operate after confirming the contents by utilizing the User's Manual of the connected ACPU.

(4) Pressing the [SHIFT] and [TEST] keys in the MONITOR mode (list monitoring) enables the test operation of the designated device indicated by the cursor (▶).
When the [SHIFT] and [TEST] keys are pressed in the READ, WRITE, INSERT, DELETE, or MONITOR (list monitoring) mode, the test operation is enabled by inputting the designated device and device number.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

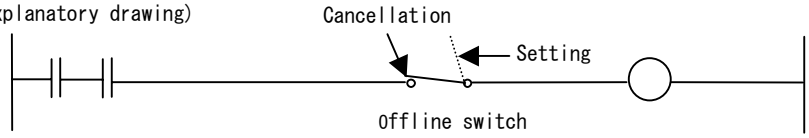
6.7.5 Setting/canceling an offline switch of Y, M, L, B, or F by device monitoring (Setting/cancellation of an offline switch)

This operation sets and cancels the offline switch that separates the device (Y, M, L, B, and F) used in an OUT instruction from the operation processing of a sequence program.
The device of the device number that set an offline switch is separated from the operation processing of a sequence program. It can be turned ON and OFF optionally by set/reset operation of the bit device (see Section 6.7.1 and 6.7.3)

Setting of an offline switch ..... Separated from the operation processing of a sequence program.

Canceling of an offline switch ..... It is processed according to the operation of the sequence program.

(Explanatory drawing)



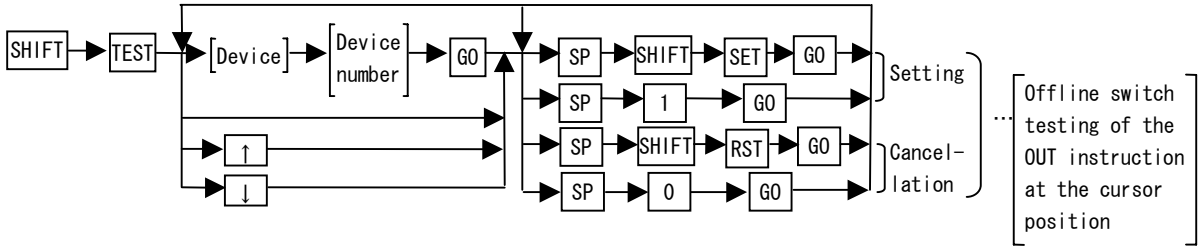
If the connected ACPU is an A0J2CPU, A2ACPU, A3HCPU, A3MCPU or A3ACPU, this operation cannot be executed.

POINT

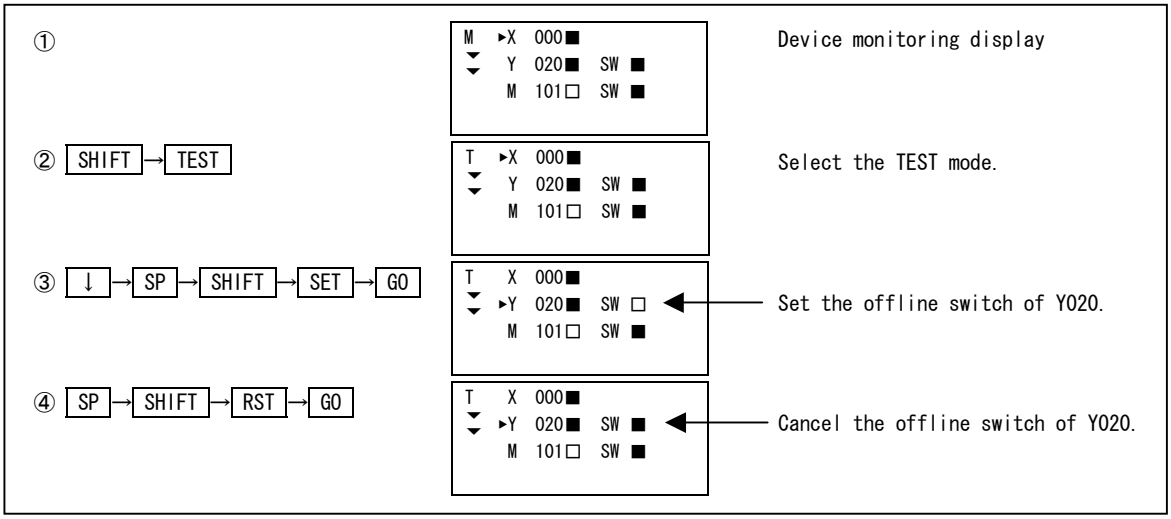
(1) An offline switch is displayed automatically if the offline switch is set or canceled in the state for not displaying an offline switch.
An offline switch is displayed by the “Offline SW setting” of the [HELP] operation in the MONITOR mode.

(2) An offline switch is displayed only during device monitoring in the MONITOR and TEST modes.

[Basic operation]



[Sample operation]



[Explanation]

(1) Be sure to set the cursor (▸) at the device which sets/cancels the offline switch.
The set device number goes into the offline state by pressing the [SP] → [SHIFT]→[SET]→[GO] ([SP]→[1]→[GO]) keys , and it goes into the online state by pressing the [SP]→[SHIFT]→[RST]→[GO] ([SP]→[0]→[GO]) keys.

(2) As for special-function module, some Y numbers cannot set offline switches.

(3) Pressing the [SHIFT] and [TEST] keys in the MONITOR mode (device monitoring) enables the offline switch operation of the designated device indicated by the cursor (▸).
When the [SHIFT] and [TEST] keys are pressed in the READ, WRITE, INSERT, or MONITOR (list monitoring) mode, the offline switch operation is enabled by inputting the designated device and device number.

6.8 Parameter Setting

This section explains how to clear all parameters of an ACPU and explains how to set the program capacity, file register capacity, etc.
Only those parameters that can be set by the EPU00E are given on the parameter sheet attached to the APPENDIX. An A6GPP/A6PHP (SW [ ] GP-GPPA), IBM * PC/AT (SW [ ] IX-GPPAE) and A7PHPE (SW [ ] RX-GPPAE), etc. are necessary for setting of other parameters.
Since this manual only explains parameter setting operations, determine the setting contents of parameters by referring to the Programming Manual of the particular ACPU.
The operation given below illustrates parameter setting.

*IBM is a registered trade mark of the International Business Machines Corporation.

PARAMETER mode

- Parameter all clear ..... The contents of a parameter in the EPU00E are set to default.
- Parameter setting ..... Parameters in the EPU00E are set.

In the case of ACPUs other than an A0J2CPU

- 1. Memory capacity setting ..... Program capacity and file register capacity are set.
- 2. M, L, S setting ..... The internal relay (M), latch relay (L), and step relay (S) ranges are set.
- 3. Timer setting ..... The low-speed, high-speed, and addition timer ranges are set.
- 4. Counter function ..... The number of device points of an extension counter and the set value head device are set.
- 5. Latch range setting ..... The latch ranges of B, T, C, D, and W are set.
- 6. WDT setting ..... WDT is set.
- 7. I/O control ..... The I/O control method is set.
- 8. Key word setting ..... Key words of 6 digits or less are registered in hexadecimal.

In the case of an A0J2CPU

- 1. Latch range setting ..... The latch ranges of M (L, S), B, T, C, D, and W are set.
- 2. Step relay setting ..... The range of step relay (S) is set.

- Parameter writing ..... A parameter in the EPU00E is written to the ACPU.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.8.1 All clearing of parameters

This operation clears all parameters written to the ACPU and sets them to default.

[Basic operation]

PARAM. → 1 → ↑ → GO → END → ↑ → GO

[Sample operation]

All the parameters of the ACPU are cleared and are set to default

① PARAM.	P▸1 PARAM. ALL CLEAR 2 PARAM. SETTING <END> TO WRITE	Select the PARAMETER mode.
② 1	P PARAM. ALL CLEAR YES ▸ NO	Select "1: PARAM. ALL CLEAR".
③ ↑	P PARAM. ALL CLEAR ▸ YES NO	Move the cursor to "YES".
④ GO	P▸1 PARAM. ALL CLEAR 2 PARAM. SETTING <END> TO WRITE	When the parameters in the EPU00E are set to default, the screen shown on the left is displayed.
⑤ END	P PARAM. SETTING YES ▸ NO	Select YES.
⑥ ↑ → GO	P PARAM. SETTING ▸ YES NO COMPLETED	When the writing of parameters in the EPU00E to an ACPU have been completed, "COMPLETED" is displayed. Pressing the [GO] key when the cursor is at "NO" returns to the ④ operation.

[Explanation]

(1) Operation of “1: PARAM. ALL CLEAR” sets the parameters in the EPU00E to default.

(2) If writing to ACPU has not been executed and the mode is transferred to the OTHERS mode after operating “1: PARAM. ALL CLEAR”, the parameters in the EPU00E return to the setting before operating “1: PARAM. ALL CLEAR”.

(3) If the key word is registered, parameter all clear cannot be executed.

REMARK

The parameter in the EPU00E is set to a set value read from ACPU when starting up the EPU00E.

POINT

- When executing parameter all clear, if the key word registered in the ACPU is unknown, see the “PC memory all clear” operation shown in Section 5.1.3. And then, clear (delete) the unknown registered key word.
  If “PC memory all clear” is executed, all other user data (such as sequence programs) will also be cleared.

- Section 6.8.2 gives details about when (a) the key word registered in an ACPU is changed, or (b) a new key word is registered.

ACPU states	RUN	STOP	PAUSE	STEP RUN

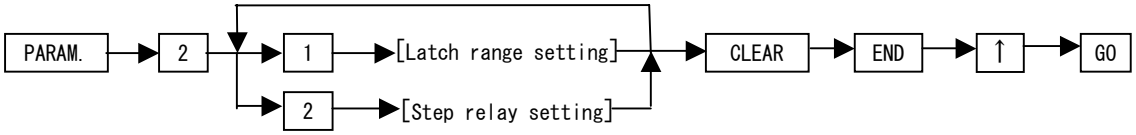
Available memory	RAM	EEPROM	EPROM

6.8.2 Parameter setting

This operation sets parameters and writes them to an ACPU.
The operation of each type of ACPU type (other than an A0J2CPU and A0J2CPU) is explained.

1. In the case of an A0J2CPU

[Basic operation 1]



[Sample operation 1]

A0J2CPU parameters have now been set

① PARAM.	P▸1 PARAM. ALL CLEAR 2 PARAM. SETTING <END> TO WRITE	Select the PARAMETER mode.
② 2	P▸1 LATCH RANGE SET 2 S RELAY SETTING	Select "2: PARAM. SETTING".
③ 1 → ↑	P LATCH RANGE SET ▸ NO LATCH 1/2 LATCH ALL LATCH	Sample operation for selecting "1: LATCH RANGE SET" and setting "NO LATCH"
④ GO → 2 → ↓	S RELAY SETTING NONE ▸ PART 1536-2047	Sample operation for selecting "2: S RELAY SETTING" and setting "PART 1536-2047"
⑤ GO → CLEAR	P 1 PARAM. ALL CLEAR ▸2 PARAM. SETTING <END> TO WRITE	Display of the parameters menu
⑥ END	P PARAM. SETTING YES ▸ NO	Select NO.
⑦ ↑ → GO	P PARAM. SETTING ▸ YES NO COMPLETED	When the writing of parameters in the EPU00E to an ACPU has been completed, "COMPLETED" is displayed.

Pressing the [GO] key when the cursor is at "NO" returns to the ⑤ operation.

[Explanation 1]

(1) Latch range setting
Select the latch range from not latched, 1/2 latch, or all latched.

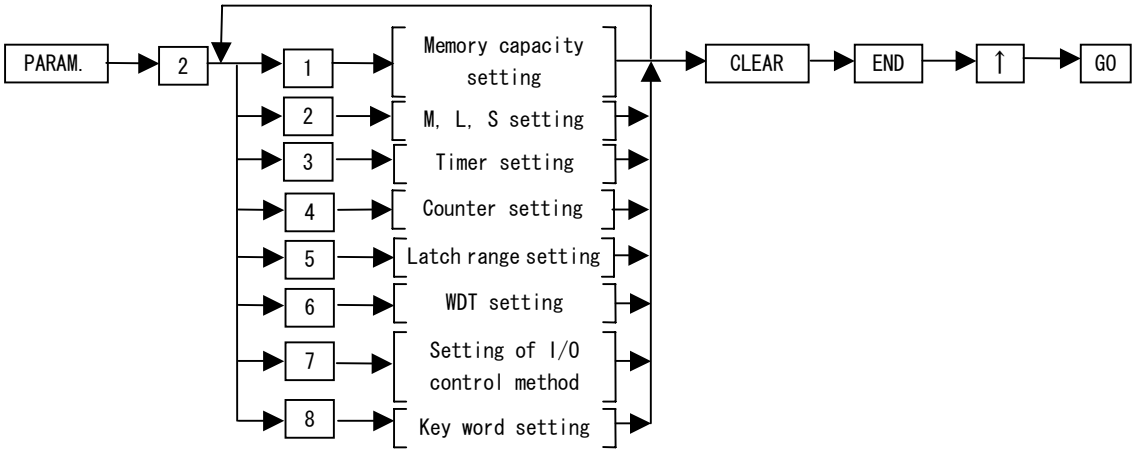
Latch Items	Latch Ranges
Not latched	————————————————————
1/2 latch	L1024 to 2047 (L1024 to 1535, S1536 to 2047) T40 to 79/T100 to 119/T124 to 127 C64 to 127 D256 to 511 B200 to 3FF (W200 to 3FF)
All latched	L0 to 2047 (L0 to 1535, S1536 to 2047) T0 to 127 C0 to 127 D0 to 511 B000 to 3FF (W000 to 3FF)

(2) Step relay setting
PART (S1536 to 2047)/NONE of the step relay is set.

(3) If writing to ACPU has not been executed and the mode is transferred to the OTHERS mode after operating “1: PARAM. SETTING”, the parameters in the EPU00E return to the setting before operating “2: PARAM. SETTING”.

2. In the case of ACPUs other than an A0J2CPU

[Basic operation 2]



[Sample operation 2]

Operation from “1.MEM. CAPACITY SET” until “8.KEY WORD” is set
(Operation of the previous parameter item is shown in this example. However, some items cannot be set depending on the type of ACPU model to which the EPU00E is connected.)

① PARAM.	P▸1 PARAM. ALL CLEAR 2 PARAM. SETTING <END> TO WRITE	Select the PARAMETER mode.
② 2	P▸1 MEM. CAPACITY SET 2 M, L, S SETTING 3 TIMER SETTING ↓4 COUNTER SETTING	Select “2: PARAM. SETTING”. When the operation of each item has been completed, the screen returns to this display.
③ 1→4→GO→2	P MEM. CAPACITY SET PROGRAM 1- [ ]KS F REG. 0- [ ]KP	Set the program capacity to 4 K steps, and set the file register to 2 K points.
④ GO	P▸1 MEM. CAPACITY SET 2 M, L, S SETTING 3 TIMER SETTING ↓4 COUNTER SETTING	Complete “1: MEM. CAPACITY SET”.
⑤ 2→CLEAR→GO	P M, L, S SETTING M[0-] L[-] S[-]	Set the latch relay to 0 point.
⑥ GO	P 1 MEM. CAPACITY SET ▸2 M, L, S SETTING 3 TIMER SETTING ↓4 COUNTER SETTING	Complete “2: M, L, S SETTING”
⑦ 3→5→1→2→GO D→1→0→2→4 GO	P TIMER SETTING EXT.T 0-2048 [512] SET D, R, W [D1024] ↓	Set the number of timer device points to 512 points in the A3ACPU, and set the head device number in which the set value is stored to D1024.

⑧ GO → CLEAR → GO → GO

```
P   TIMER  SETTING
  T(100ms) [    0-]
  T(10ms ) [     -]
↓ T(RET. ) [     -]
```

Set T0 to T255 to the 100 msec timer.

⑨ GO → 2 → 5 → 6 → GO

```
P   TIMER  SETTING
↑ T(100ms) [     -]
  T(10ms ) [  256-]
  T(RET. ) [     -]
```

Set T256 to T511 to 10 the msec timer.

⑩ GO

```
P 1 MEM.  CAPACITY  SET
  2 M, L, S  SETTING
 ▸3 TIMER    SETTING
↓ 4 COUNTER  SETTING
```

Complete "3: TIMER SETTING".

⑪ 4 → 4 → 8 → 0 → GO
▶ D → 1 → 2 → 8 → 0

```
P   COUNTER  SETTING
  EXT. T 0-1024   [ 480]
  SET D, R, W   [D1280]
```

Set the number of counter device points to 480 points in A3ACPU, and set the head device number in which the set value is stored to D1280.

⑫ GO

```
P  1 MEM.  CAPACITY  SET
   2 M, L, S  SETTING
   3 TIMER    SETTING
↓ ▸4 COUNTER  SETTING
```

Complete "4: COUNTER SETTING".

⑬ 5 → ↓ → ↓ → ↓ → ↓ → ↓
▶ 5 → 1 → 2 → GO → 1
▶ 0 → 2 → 3

```
P   LATCH RANGE SET
↑ C      [     -    ]
  D      [ 512-1023 ]
↓ RANGE    0-1023
```

Sample operation of setting D512 to D1023 to the latch in the A3ACPU.

⑭ GO → ↓ → ↓ → ↓ → ↓
▶ GO → GO

```
P▸5 LATCH  RANGE  SET
  6 WDT      SETTING
  7 I/O      CONTROL
  8 KEY      WORD
```

Complete "5: LATCH RANGE SET".

⑮ 6 → 1 → 5 → 0

```
P   WDT    SETTING
               [  150]ms
 RANGE         10-2000
```

Set the WDT (watchdog timer) setting to 150 msec.

⑯ GO

```
P 5 LATCH  RANGE  SET
 ▸6 WDT      SETTING
  7 I/O      CONTROL
  8 KEY      WORD
```

Complete "6: WDT SETTING".

⑰ 7 → ↑

```
P   I/O    CONTROL
   DIRECT   [     .Y]
   REFRESH  [ X.    ]
USE  CURSOR  TO  SELECT
```

Set the I/O control method to input: REFRESH and output: DIRECT

⑱ GO

```
P 5 LATCH  RANGE  SET
  6 WDT      SETTING
 ▸7 I/O      CONTROL
  8 KEY      WORD
```

Complete "7: I/O CONTROL".

⑲ 8 → 8 → 6 → 0 → 2
▶ 0 → 2

```
P   KEY     WORD

        [860202]
```

Set the key word to "860202".

⑳ GO

```
P 5 LATCH  RANGE  SET
  6 WDT      SETTING
  7 I/O      CONTROL
 ▸8 KEY      WORD
```

Complete "8: KEY WORD".

㉑ CLEAR

```
P 1 PARAM.    ALL   CLEAR
 ▸2 PARAM.    SETTING

<END>  TO  WRITE
```

Display of the menu of a parameter

㉒ END

```
P   PARAM.   SETTING
      YES
    ▸ NO
```

Select YES.

㉓ ↑ → GO

```
P   PARAM.   SETTING
    ▸ YES
      NO
COMPLETED
```

When the writing of a parameter in the EPU00E to an ACPU has been completed, "COMPLETED" is displayed.

Pressing the [GO] key when the cursor is at "NO" returns to the ㉑ operation.

[Explanation 2]

(1) Memory capacity setting
Set the main sequence program capacity and the file register capacity. When an A3(N), A3H A3M, A3V, A73, A373, or A3ACPU is used, the setting of a subsequence program capacity is enabled.

(2) M, L, S setting

(a) When an A0J2H, A2C, A1(N), A2(N), A3(N), A3H, A3M, A3V, A73, or A373CPU is used, set the head device number that is used by latch relay/step relay.

(b) When an A2A or A3ACPU is used, set the head device number that is used by latch relay/step relay/internal relay.

(c) Erase the display of the head device number of a device not to be used by pressing the [CLEAR] key. It can be set to 0 points.

(3) Timer setting

(a) When an A0J2H, A2C, A1(N), A3(N), A3H, A3M, A3V, A73, or A373CPU is used, set the head device number that is used for low-speed/ high-speed/addition timer.

(b) When an A2A or A3ACPU is used
Set the number of timer device points, the head device number in which a set value after T256 is stored and the head device number to be used by low-speed/high-speed/addition timer.
Set the head device number that is used for the range of T0 to 255 and the range after T256 by low-speed/high-speed/addition timer when the number of timer device points exceeds 256 points.

(c) Erase the display of the head device number of a device not to be used by pressing the [CLEAR] key. It can be set to 0 points.

(4) Counter setting
Set the head device number in which the number of counter device points and the set value after C255 are stored.
This setting is necessary only when using an A2A or A3ACPU.

(5) Latch range setting

(a) Set the range of a device to be set to latch.
The allowable setting range is displayed on the bottom line of the screen.

(b) Erase the display of the head device number of a device not to be used by pressing the [CLEAR] key. It can be set to 0 points.

(6) WDT setting
Set the set value of WDT to 10 msec units.

(7) Setting of the I/O control method
When an A3H or A3MCPU is used, set an I/O control method.

(8) Setting of a key word

(a) Input a key word of 6 digits or less in hexadecimal.

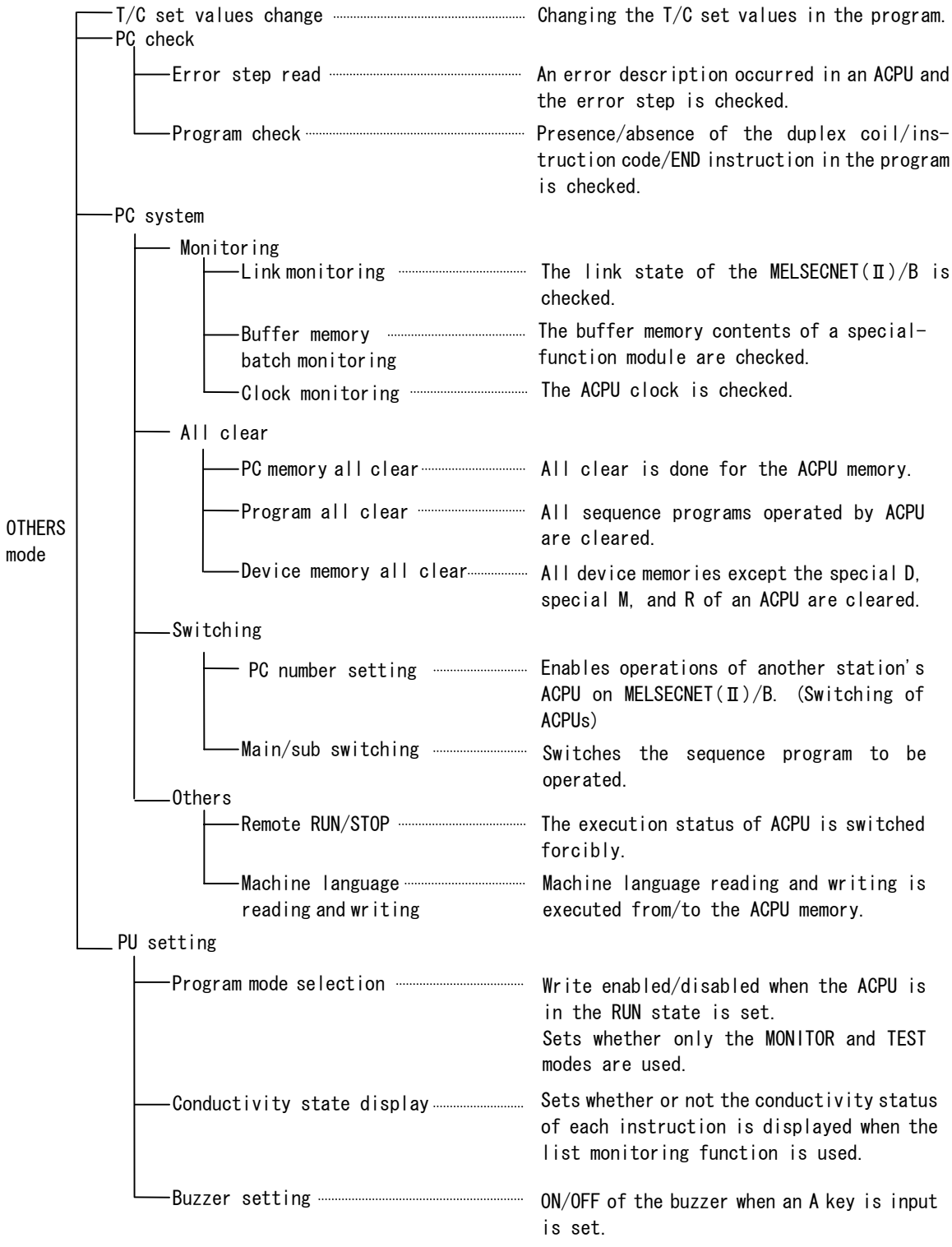
(b) When a key word is not set, a blank is displayed.

(c) To cancel a key word, press the [CLEAR]→[GO] keys.

(9) If writing to ACPU has not been executed and the mode is transferred to the OTHERS mode after operating “2: PARAM. SETTING”, the parameters in the EPU00E return to the setting before operating “2: PARAM. SETTING”.

6.9 OTHERS (O) Mode Operations

This mode changes the set values of timers and counters, does PC error checks, PC memory all clears, as well as setting, etc. of the EPU00E.
An item can be selected in the menu format in the OTHERS mode, and the following operation can be executed:



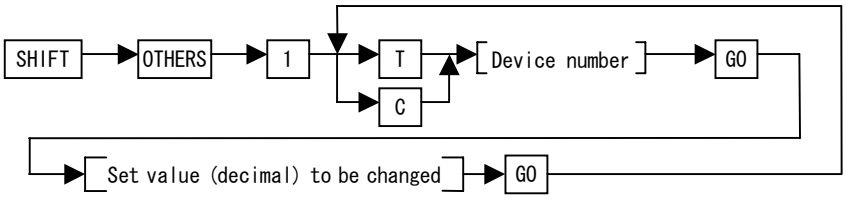
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

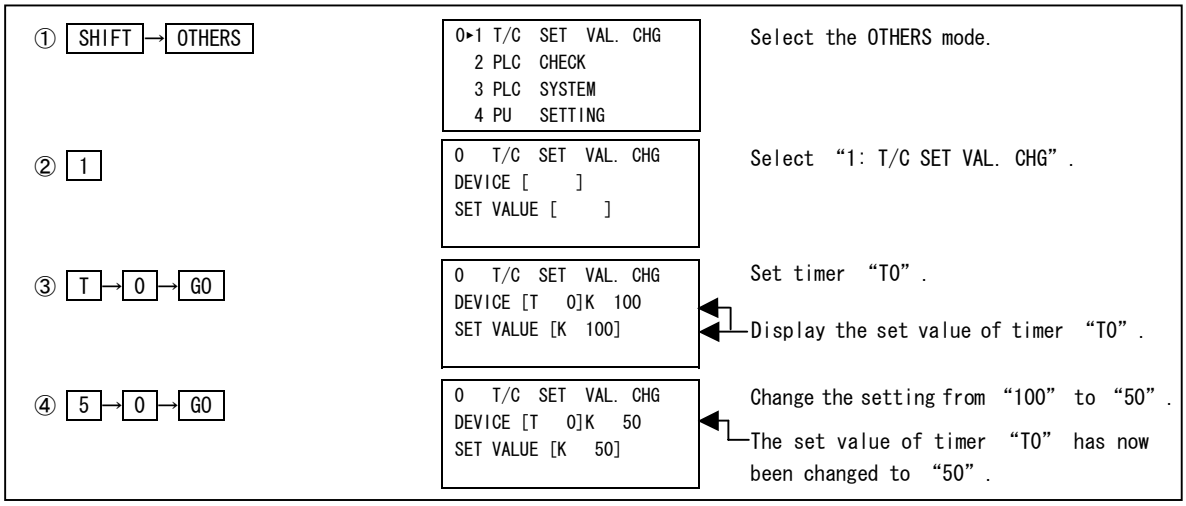
6.9.1 Changing the T/C set values when the ACPU is in the RUN state

This operation changes the set value (the constant designation) of T (timer)/C (counter) when the connected ACPU is in the RUN state.
In addition, when the indirectly designated set values of T and C (designated by device D) are changed, changing these set values follows changing the TEST mode current value (see Section 6.7.2 and 6.7.4).

[Basic operation]



[Sample operation]



[Explanation]

(1) Always change the set value of a constant in decimal.
It can be changed from a constant to indirect designation, and it cannot be changed from indirect designation to a constant.

(2) Pressing the [END] or [CLEAR]→[CLEAR] keys returns to the OTHERS mode menu.

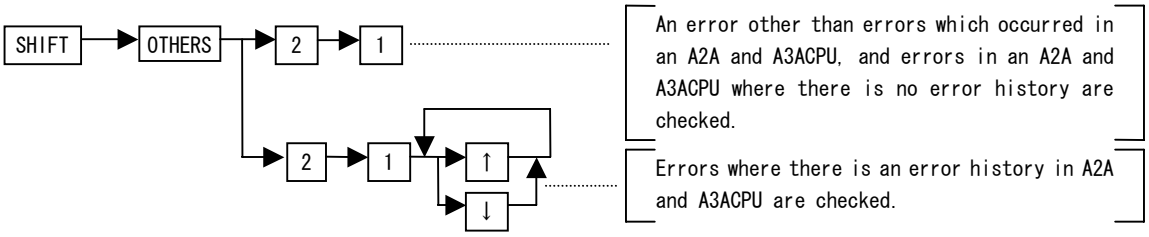
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.2 Checking an error step/error code when an error occurs (Error check)

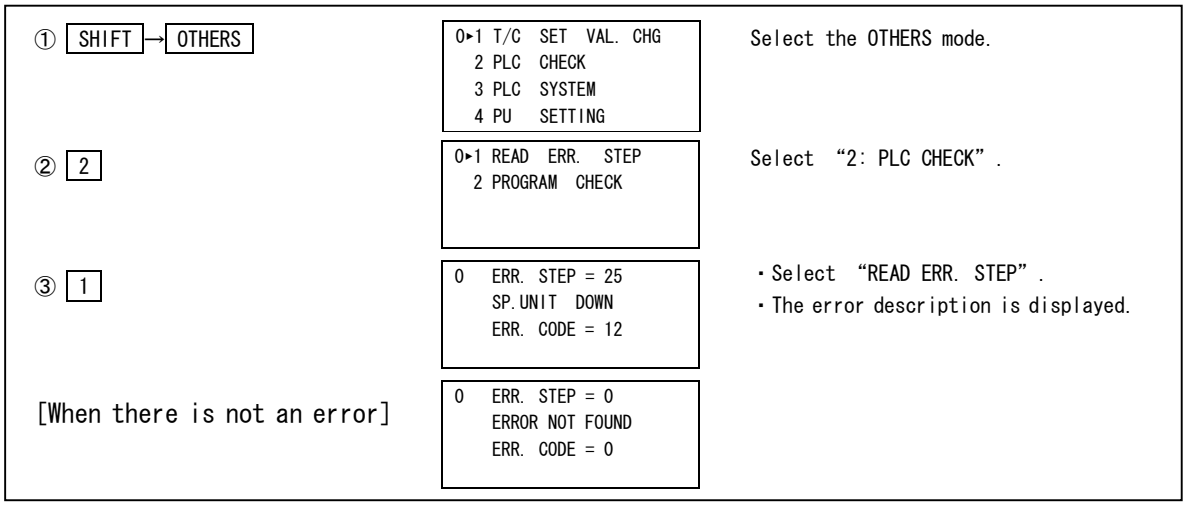
This operation checks the error step number/error code of the error that occurs in an ACPU.

[Basic operation]



[Sample operation]

(1) In the case of ACPUs other than an A2A or A3ACPU



(2) When there are no error histories in an A2A or A3ACPU

① SHIFT → OTHERS	0▸1 T/C SET VAL. CHG 2 PLC CHECK 3 PLC SYSTEM 4 PU SETTING	Select the OTHERS mode.
② 2	0▸1 READ ERR. STEP 2 PROGRAM CHECK	Select "2: PLC CHECK".
③ 1	0 ERR. STEP = 25 SP.UNIT DOWN ERR. CODE = 41 ERR. INFO = 411	・Select "1: READ ERR. STEP". ・The error description is displayed.

(3) When there are error histories in an A2A or A3ACPU

① SHIFT → OTHERS	0▸1 T/C SET VAL. CHG 2 PLC CHECK 3 PLC SYSTEM 4 PU SETTING	Select the OTHERS mode.
② 2	0▸1 READ ERR. STEP 2 PROGRAM CHECK	Select "2: PLC CHECK".
③ 1	0 ERR. STEP = 25 SP.UNIT DOWN ERR. CODE = 41 ↓ ERR. INFO = 411	Select "1: READ ERR. STEP". The newest error description is displayed.
④ ↓	0 ERR. STEP = 25 1SP.UNIT DOWN ERR. CODE = 41 411 ↓ 92/01/10 10:57:30	The error description of error history number 1 is displayed.
⑤ ↓	0 ERR. STEP = 0 2AC DOWN ERR. CODE = 9 0 ↓ 92/01/20 11:55:10	The error description of error history number 2 is displayed.

[Explanation]

(1) Section 7.2 gives details about error indications.

(2) If an A2A or A3ACPU has an error history, errors that occurred are displayed in order from the latest error by pressing the [↓] key.

(3) The ACPU Programming Manual (Common Instructions) and the User's Manual of the connected CPU give details about error codes and error messages.

(4) Pressing the [END] or [CLEAR] key returns to the "2: PLC CHECK" menu.

ACPU states	RUN	STOP	PAUSE	STEP RUN

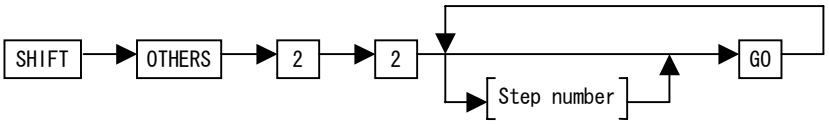
Available memory	RAM	EEPROM	EPROM

6.9.3 Checking a program

This operation executes the following checks of sequence programs written to an ACPU.

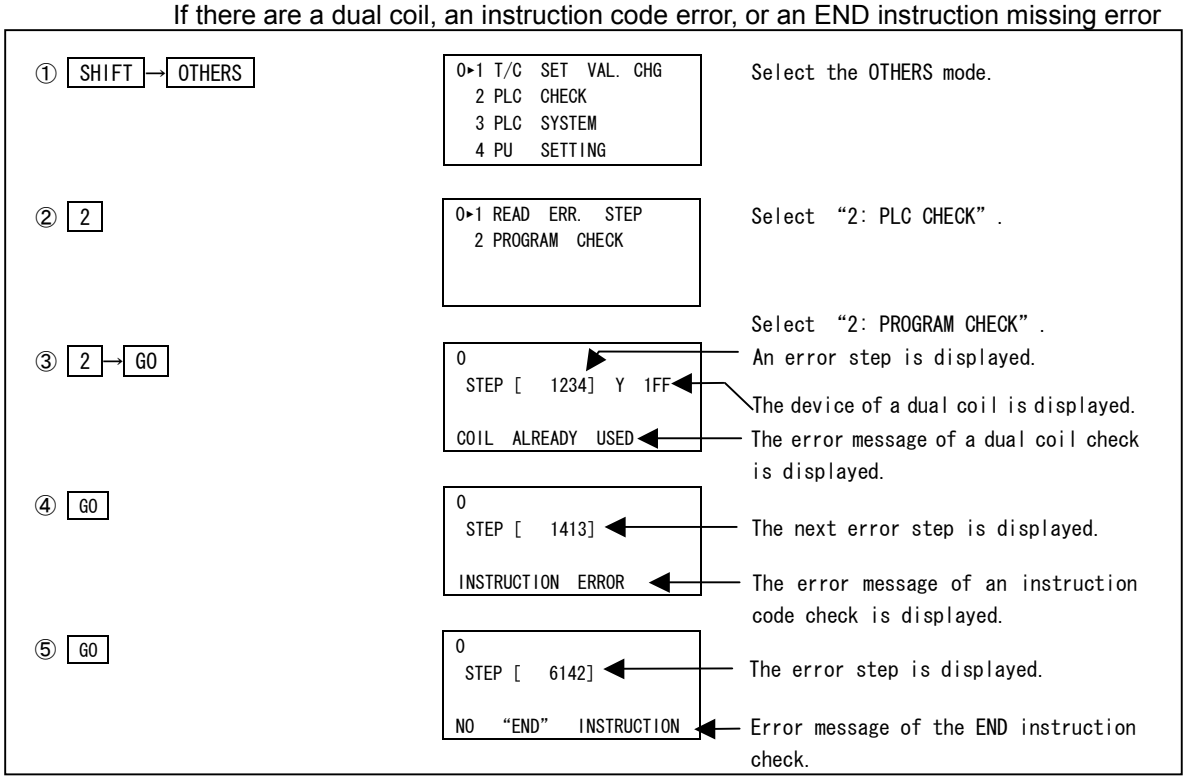
1) Dual coil check ····· This checks whether the device (Y, M, L, B, F, T, C) used in a sequence instruction (OUT, SET, SFT, PLS, MC, PLF) is a dual coil.
2) Instruction code check ····· This checks whether or not there is an error in the instruction codes (memory contents) of a sequence program. (The arrangement of instructions is not checked.)
3) END instruction check ····· This checks whether or not there is an END instruction in the sequence program.

[Basic operation]



[Sample operation]

If there are a dual coil, an instruction code error, or an END instruction missing error



[Explanation]

(1) The EPU00E starts a program check and checks “dual coil”, “instruction code error”, and “END instruction missing” of all instructions in the range from a designated step to the END instruction of a sequence program written to an ACPU. (Therefore, checking will take some time.)

(2) When a program check is completed normally, the step number of the END instruction and “END” are displayed.

(3) When an error or fault is detected by a program check, the step number where the error or fault occurred and the message that corresponds to the fault contents are displayed, and the program check is interrupted.

1) Press the [GO] key to execute continuous program checking. A program check is started from the step next to a stopped step.

2) When modifying error or fault contents detected by program check, press the [READ] key, or [SHIFT]→[WRITE] keys when an error or fault is detected (when a program check is interrupted).
The program of the step number where an error or fault occurred is displayed by pressing the [READ] key, or [SHIFT]→[WRITE] keys.

Therefore, correction can be done easily. When an error or fault occurs, modify the sequence program as follows:
Designated dual coil ····· Modify the program if necessary.
Instruction code error ····· Overwrite the same instruction. (Rewrite)
END instruction missing ····· Add it.

3) Use the following methods to continue the program check after modifying the program:
Method of continuing a program check from the stopped step
····· Select “2: PROGRAM CHECK” from the OTHERS mode, and press the [GO] key. (The interrupted number of steps is displayed.)
Method of continuing from the designated step
····· Select “2: PROGRAM CHECK” from the OTHERS mode, input the designated step number, and press the [GO] key.

4) Pressing the [END] or [CLEAR] key returns to the “2: PLC CHECK” menu.

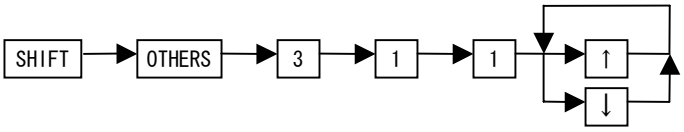
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.4 Monitoring MELSECNET(Ⅱ)/B link state (link monitoring)

This operation monitors the MELSECNENT(Ⅱ)/B link state of the self.
THE Reference Manual of data link system gives details about the display contents.

[Basic operation]



[Sample operation]

Link monitoring is executed when the connected station is a master station (M/m)

① SHIFT → OTHERS	0▸1 T/C SET VAL. CHG 2 PLC CHECK 3 PLC SYSTEM 4 PU SETTING	Select the OTHERS mode.
② 3	0▸1 MONITOR 2 ALL CLEAR 3 PC No. MAIN/SUB 4 OTHERS	Select "3: PLC SYSTEM".
③ 1	0▸1 LINK MONITOR 2 BUFFER MEM.MON 3 CLOCK MONITOR	Select "1: MONITOR".
④ 1	0 SCAN TIME (ms) F LOOP: OK MAX. 20 R LOOP: OK MIN. 10 PRESENT 20	Select "1 LINK MONITOR", and the loop state and link scan time are displayed.
⑤ ↓	0 [L 1] 10 PARAM.: 0 CYCLIC COMM. OTHER: 0 CPU RUN F LOOP: 0 R LOOP: 0	Pressing the [↓] key displays the state of machine No.1. (Example of displaying a local station)
⑥ ↓	0 [R 2] 10 PARAM.: 0 CYCLIC COMM. OTHER: 0 CPU RUN F LOOP: 0 R LOOP: 0	Pressing the [↓] key displays the state of machine No.2. (Example of displaying a remote I/O station)

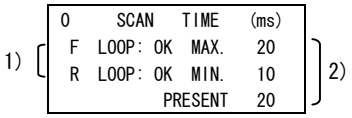
[Explanation]

(1) The MELSECNET(Ⅱ)/B link state can be displayed on only the self.
Even if it is set at another station by the PC number setting, the MELSECNET(Ⅱ)/B link state of the self is displayed.

(2) Link state display contents differ depending on whether the connected station is a master station, local station, or remote I/O station.
However, when connecting to a tier-3 master station, it is displayed as a master station. A local station cannot be displayed.

(3) When connecting to a master station the loop state and link scan time as well as the operating state of a slave station can be displayed.

(a) Display of loop state and link scan time

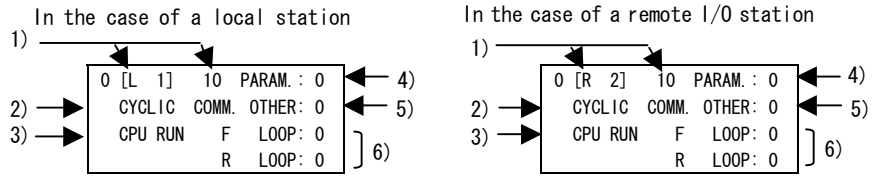


1) Positive loop line (F loop) or reverse loop line (R loop) state of a master station is displayed.
(The contents of the special relay for links M9225 and M9226 are displayed.)

OK: When the line is normal
NG: When the line is abnormal

2) Max., min., and current values of a link scan time are displayed. The contents of special registers for link D9207 to D9209 are displayed.

(b) Operating state of a slave station



1) The station number during monitoring and the number of connected slave stations are displayed.
(The contents of the special registers for link D9243 and D9244 are displayed.)

[Ln]: In the case of a local station
[Rn]: In the case of a remote I/O station
m : Number of connected slave stations

2) The following messages display communications states:
(The contents of the special registers for link D9224 to D9231 are displayed.)

CYCLIC COMM : When normal communications has been executed
DISCONNECTED : When communications has been interrupted or is in a disconnected state
PARAM. COMN : When parameters is communicated with a master station

3) The operating state of the ACPU of a monitoring slave station is displayed by the following message:
(The contents of the special registers for link D9212 to D9215 are displayed.)

CPU RUN : When the ACPU is in the RUN state.
CPU STOP: When the ACPU is in the STOP or PAUSE state.

4) When the monitoring slave station is 3-tier master station, it is displayed on a remote I/O station whether an I/O allocation is correct or not.
(The contents of the special registers for link D9220 to D9223 are displayed.)

0: Normal
E: Error

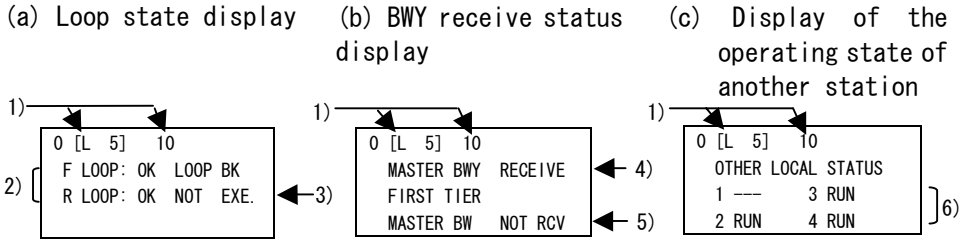
5) It displays whether the monitoring local station could find that an error occurred in other local stations.
(The contents of the special registers for link D9216 to D9219 are displayed.)

0: Normal
E: Error
"0" is displayed when the monitoring station is a remote I/O station.

6) The state of a positive loop line (F loop) or the reverse loop line (R loop) of a monitoring slave station is displayed.
(The contents of the special registers for link D9232 to D9239 are displayed.)

0: Normal
E: Error

(4) When it is connected to a local station, the loop state, BWY receive state, and the operation state of other slave stations can be displayed.



1) The station number of the self and the number of connected slave stations are displayed.
(The contents of the special registers for link D9243 and D9244 are displayed.)

[Ln]: In the case of a local station
[Rn]: In the case of a remote I/O station
m : Number of connected slave stations

2) The state of the positive loop line (F loop) or the reverse loop line (R loop) of the self is displayed.
(The contents of the special relay for link M9241 and M9242 are displayed.)

OK: When the line is normal
NG: When the line is abnormal

3) It displays whether or not loopback is executed in the self.
(The contents of the special relay for link M9243 are displayed.)

EXECUTED : When executing a loopback in the self
NOT EXE. : When not executing a loopback in the self

4) It displays whether or not data of link relay(B), link register(W), or link output(Y) could be received from the master station.
(The contents of the special relay for link D9246 are displayed.)

RECEIVED : When receiving B, W, or Y of a master station by using cyclic communications
NOT RCV : When the self cannot receive B, W, and Y of a master station because of disconnection

5) It displays whether or not the link relay(B) and link register(W) can be received from the master station of a higher loop.
(The contents of the special relay for link D9247 are displayed.)

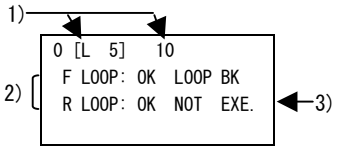
RECEIVED: When receiving B, W, and Y of a master station using cyclic communications
NOT RCV : When B and W of the master station of a tier-2 system cannot be received, or when turning ON M9208

6) The operating state of other local station is displayed by the following messages:
(The contents of the special registers for link D9248 to D9255 are displayed.)

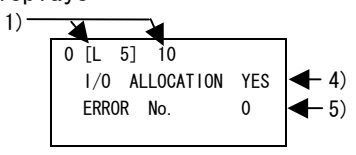
RUN : When the ACPU is in the RUN state.
STOP: When the ACPU is in the STOP or PAUSE state.
DOWN: When it goes into the disconnected state by the power supply going OFF.
When the monitoring station is a remote I/O station, the display remains “RUN”.

(5) When connected to a remote I/O station, the loop state, I/O allocation state, and error codes can be displayed.

(a) Loop state display



(b) I/O allocation state and an error code displays



1) The station number of the self and the number of connected slave stations are displayed.
(The contents of the special registers for link D9243 and D9244 are displayed.)

[Ln]: In the case of a local station
[Rn]: In the case of a remote I/O station
m : Number of connected slave stations

2) The state of a positive loop line (F loop) or the reverse loop (R loop) of the self is displayed.
(The contents of the special relay for link M9241 and M9242 are displayed.)

OK: When the line is normal
NG: When the line abnormal

3) Displays whether or not a loopback is executed in the self.
(The contents of the special relay for link M9243 are displayed.)

EXECUTED: When executing a loopback in the self
NOT EXE : When not executing a loopback in the self

4) Displays whether or not I/O allocation is being executed in a master station.

YES: When I/O allocation is executed in a master station
NO : When I/O allocation is not being executed in a master station

5) The error code that is occurring in the self is displayed.

(6) When a connected station is not performing data link, either of the following message is displayed according to the state:

WAITING PARAM	: When waiting for the receive of parameter information from the master station
DISCONNECTED	: When the self goes into the disconnected state and communications is interrupted
OFF-LINE	: When the mode of the self is set to off-line, self- loopback test, or station-to-station test
LOOP TEST	: When the mode of the self is set to the positive loop test or the reverse loop test

(7) Pressing the [END] or [CLEAR] keys returns to the “1: MONITOR” menu.

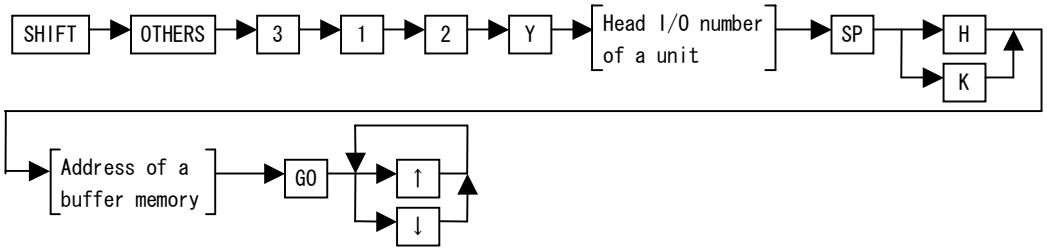
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.5 Monitoring the buffer memory of a special-function module (Buffer memory batch monitoring)

This operation monitors the buffer memory contents of a special-function module.
The Manual of the monitoring special-function module gives details about display contents.

[Basic operation]



[Sample operation]

When the digital output value (buffer memory address: 10) and the I/O numbers X/Y0B0 to 0CF installed in an A68AD are monitored

① SHIFT → OTHERS	0▸1 T/C SET VAL. CHG 2 PLC CHECK 3 PLC SYSTEM 4 PU SETTING	Select the OTHERS mode.
② 3	0▸1 MONITOR 2 ALL CLEAR 3 PC No. MAIN/SUB 4 OTHERS	Select "3: PLC SYSTEM".
③ 1	0▸1 LINK MONITOR 2 BUFFER MEM.MON 3 CLOCK MONITOR	Select "1: MONITOR".
④ 2	0 BUFFER MEM. MON. KEY IN BUFF.ADDRESS	Select "2: BUFFER MEM. MON".
⑤ Y → B → SP → K → 1 → 0	0 BUFFER MEM. MON. KEY IN BUFF.ADDRESS YB K10	Head I/O number X/Y0B0 of a unit Input the first 2 digits of the hexadecimal 3 digits, and designate address 10 of the buffer memory.
⑥ GO	0 10 1020 11 1018 12 0 13 1114	10 to 13 of the buffer memory is monitored.
⑦ ↓	0 14 1116 15 1014 16 998 17 1120	The following address is monitored by pressing the [↓] key:

[Explanation]

(1) The special-function head I/O number and the buffer memory address are designated and is monitored

(a) Designate the head I/O number in the first 2 digits when the head I/O number of the special-function module is represented 3 digits.

(b) The head address of a buffer memory can be designated in decimal or hexadecimal. The buffer memory monitoring address display is decimal if the head address is designated in decimal. If it is designated in hexadecimal, the address is displayed in hexadecimal.

(2) When a special-function module is not installed in the designated head I/O number or when a designated address does not have a buffer memory, an address error is displayed.

(3) The display format of a value can be changed by pressing the [HELP] key. (hexadecimal /octal/ASCII/decimal)
When changing a display format, do so in accordance with the indicated display contents (see Section 6.6.4).

(4) Pressing the [END] or [CLEAR] keys returns to the “1: MONITOR” menu.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.6 Monitoring the clock data of an ACPU (clock monitoring)

This operation monitors clock data (D9025 to D9027) of an ACPU.

[Basic operation]

SHIFT → OTHERS → 3 → 1 → 3

[Operation example]

When clock data is monitored

① SHIFT → OTHERS	0▸1 T/C SET VAL. CHG 2 PLC CHECK 3 PLC SYSTEM 4 PU SETTING	Select the OTHERS mode.
② 3	0▸1 MONITOR 2 ALL CLEAR 3 PC No. MAIN/SUB 4 OTHERS	Select "3: PLC SYSTEM".
③ 1	0▸1 LINK MONITOR 2 BUFFER MEM. MON 3 CLOCK MONITOR	Select "1: MONITOR".
④ 3	0 92/04/17 10.35.48	Select "3: CLOCK MONITOR". Clock data is displayed. Top : Year, month, and day are displayed. Bottom: Hour, min, and sec are displayed.

[Explanation]

(1) The clock data of an ACPU is monitored by using the information in D9025 to D9027 of the connected station.

(2) When monitoring is started and completed, the EPU00E turns M9028 ON and OFF automatically.

(3) Do not perform this operation for an ACPU which doesn't have a clock function.
If clock monitoring is executed for an ACPU without a clock function, an operating error will not occur. However, meaningless data (value of D9025 to D9027) is displayed.

(4) Pressing the [END] or [CLEAR] keys returns to the "1: MONITOR" menu.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.7 All clearing the memory contents of an ACPU (PC memory all clear)

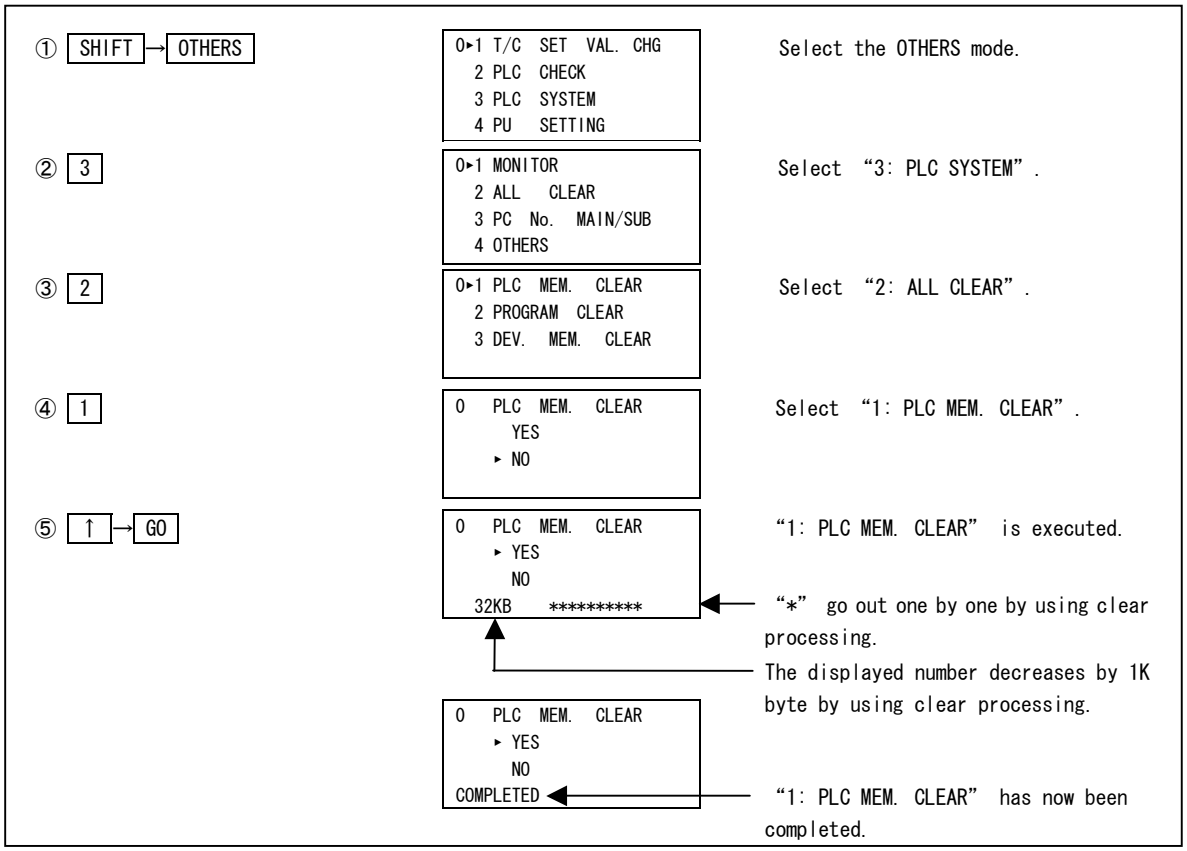
This operation clears all the memory contents (memory cassette) of an ACPU.

[Basic operation]

SHIFT → OTHERS → 3 → 2 → 1 → ↑ → GO

[Sample operation]

When PC memory all clear is executed



[Explanation]

(1) Keep the ACPU in the STOP state.
If it is not in the STOP state, put the ACPU in the STOP state before starting the operation.

(2) When this operation is completed, all contents (memory cassette) of a memory on the ACPU side are cleared, and the parameters are set to default values.
It is necessary to write parameters and sequence programs to the ACPU.

(3) Pressing the [END] or [CLEAR] keys returns to the "2: ALL CLEAR" menu.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.8 Clearing sequence programs, microcomputer programs, and T/C set value areas (Program all clear)

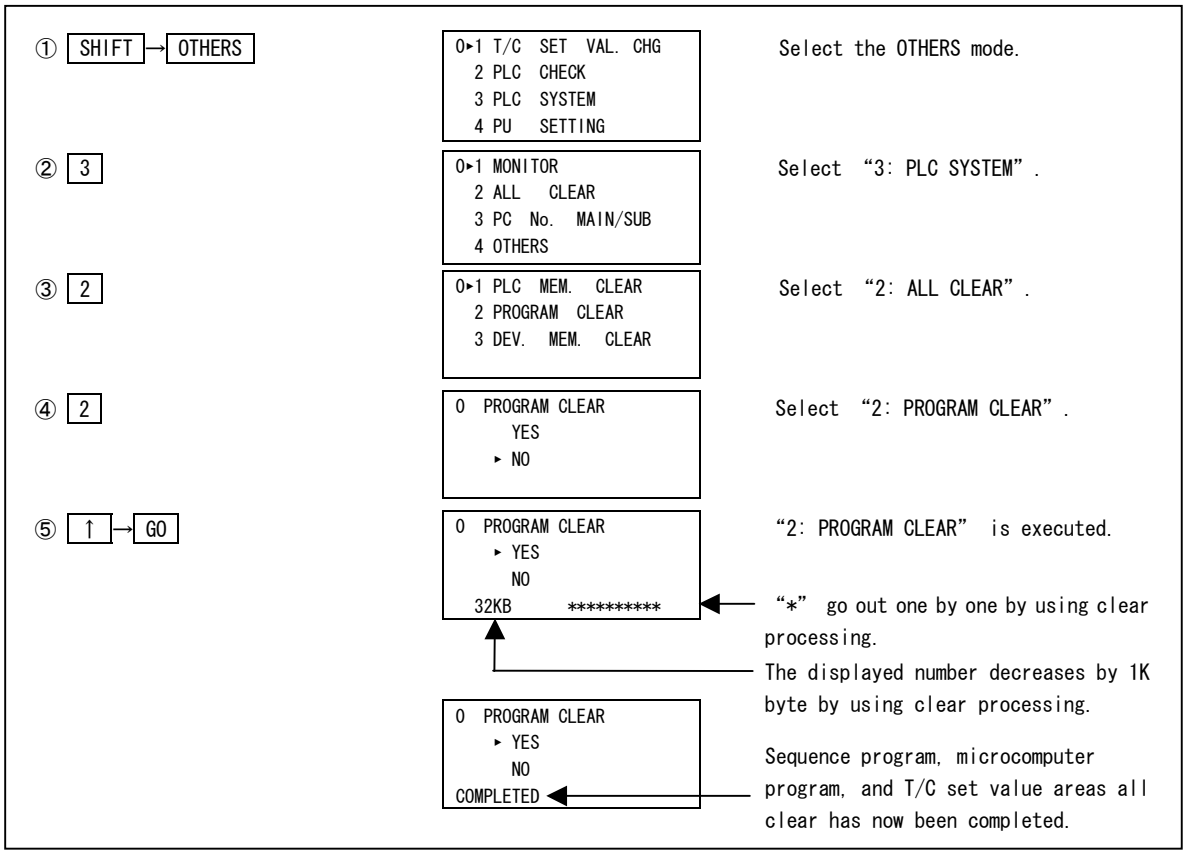
This operation clears the contents of main or sub-sequence programs, microcomputer programs, and T/C set value areas currently being read to the EPU00E.

[Basic operation]

SHIFT → OTHERS → 3 → 2 → 2 → ↑ → GO

[Sample operation]

When program all clear is executed



[Explanation]

(1) Keep the ACPU in the STOP state.
If it is not in the STOP state, put the ACPU in the STOP state before starting the operation.

(2) When this operation is completed, all ACPU sequence program and microcomputer program and T/C set value area contents are cleared.
It is necessary to write parameters and sequence programs to the ACPU.

(3) Pressing the [END] or [CLEAR] keys returns to the "2: ALL CLEAR" menu.

ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.9 Clearing the device memory of an ACPU (Device memory all clear)

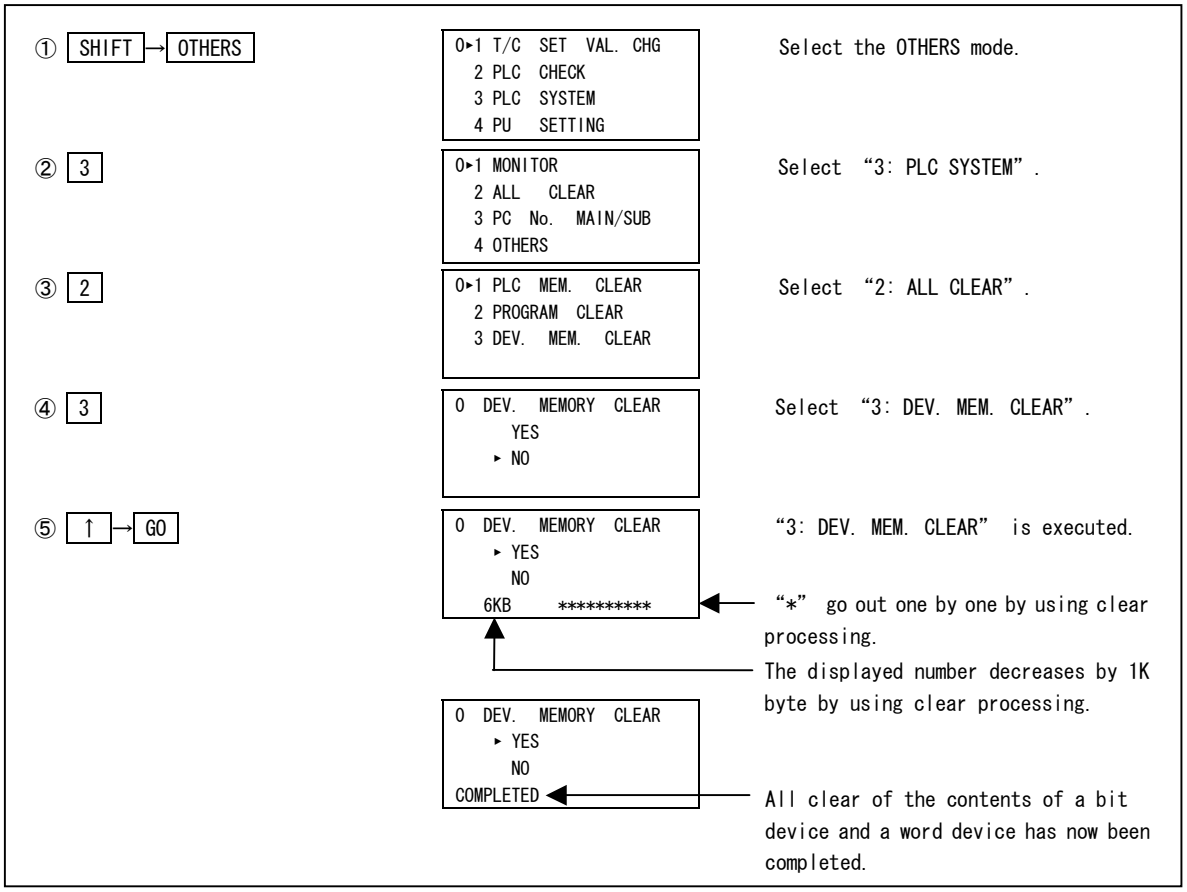
This operation clears the bit devices in the ACPU, and the word device contents (special relay (M), special register (D), and file register (F)).

[Basic operation]

SHIFT → OTHERS → 3 → 2 → 3 → ↑ → GO

[Sample operation]

When device memory all clear is executed



[Explanation]

(1) Keep the ACPU in the STOP state.
If it is not in the STOP state, put the ACPU in the STOP state before starting the operation.

(2) Pressing the [END] or [CLEAR] keys returns to the "2: ALL CLEAR" menu.

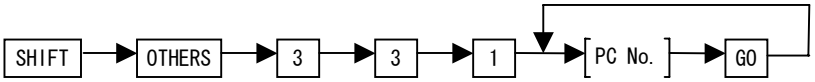
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

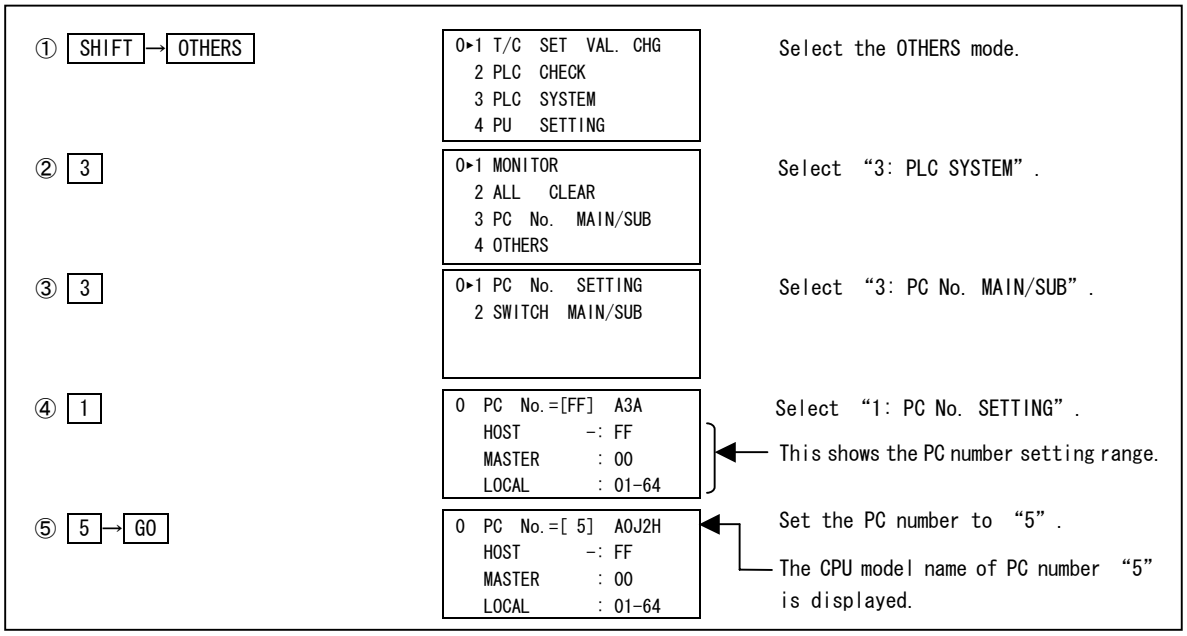
6.9.10 Setting the PC number

This operation sets the PC number of the ACPU of the other station that is accessed on MELSECNET(Ⅱ)/B.
(Default is “FF”.)

[Basic operation]



[Sample operation]



[Explanation]

(1) When an entry code is registered in an ACPU, see Section 5.1.3, and input the registered entry code.

(2) Section 5.5 gives details about how to set the PC number.

(3) Pressing the [END] or [CLEAR] keys returns to the “3: PC No. SETTING” menu.

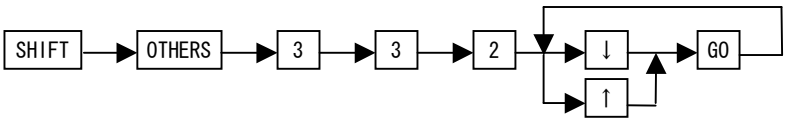
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.11 Switching main/sub-programs

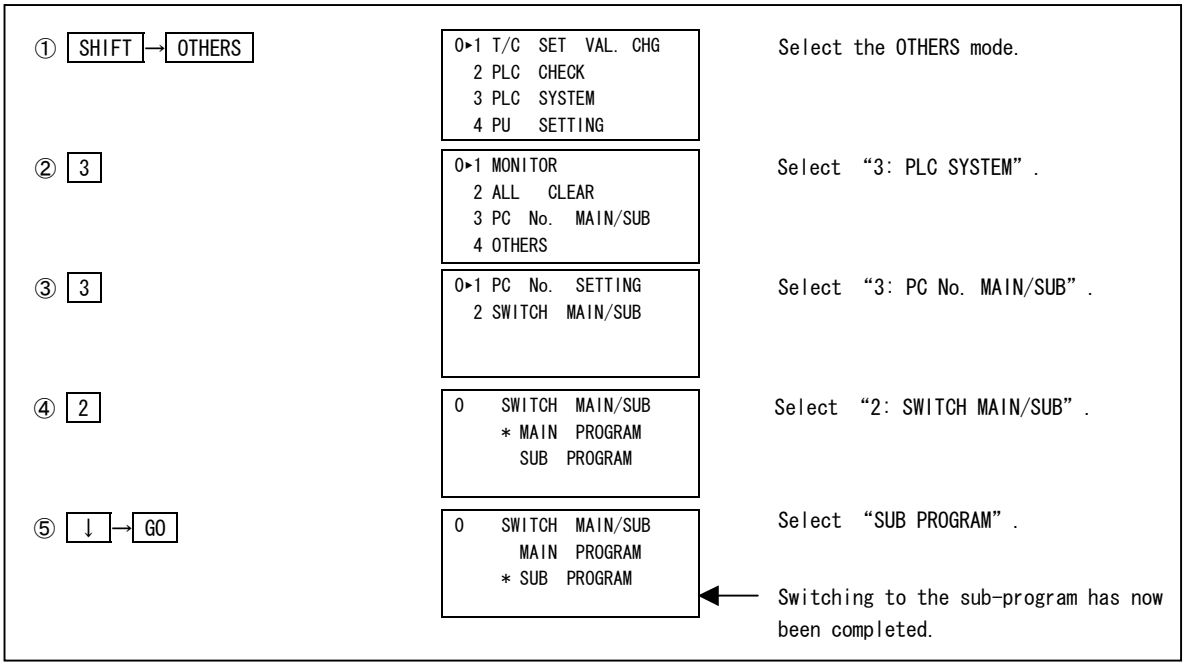
This operation selects the main program/sub-program to be displayed on the EPU00E.
(This operation is available for A3, A3N, A3A, A3H, A3M, A3V, A73, or A373 CPUs.)

[Basic operation]



[Sample operation]

When switched to a sub-program



[Explanation]

Pressing the [END] or [CLEAR] keys returns to the "3: PC No. MAIN/SUB" menu.

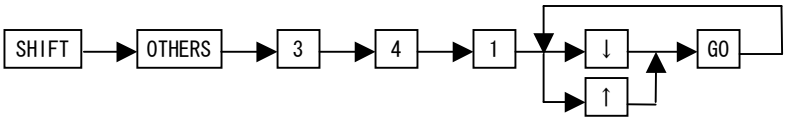
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.12 Executing remote RUN/STOP

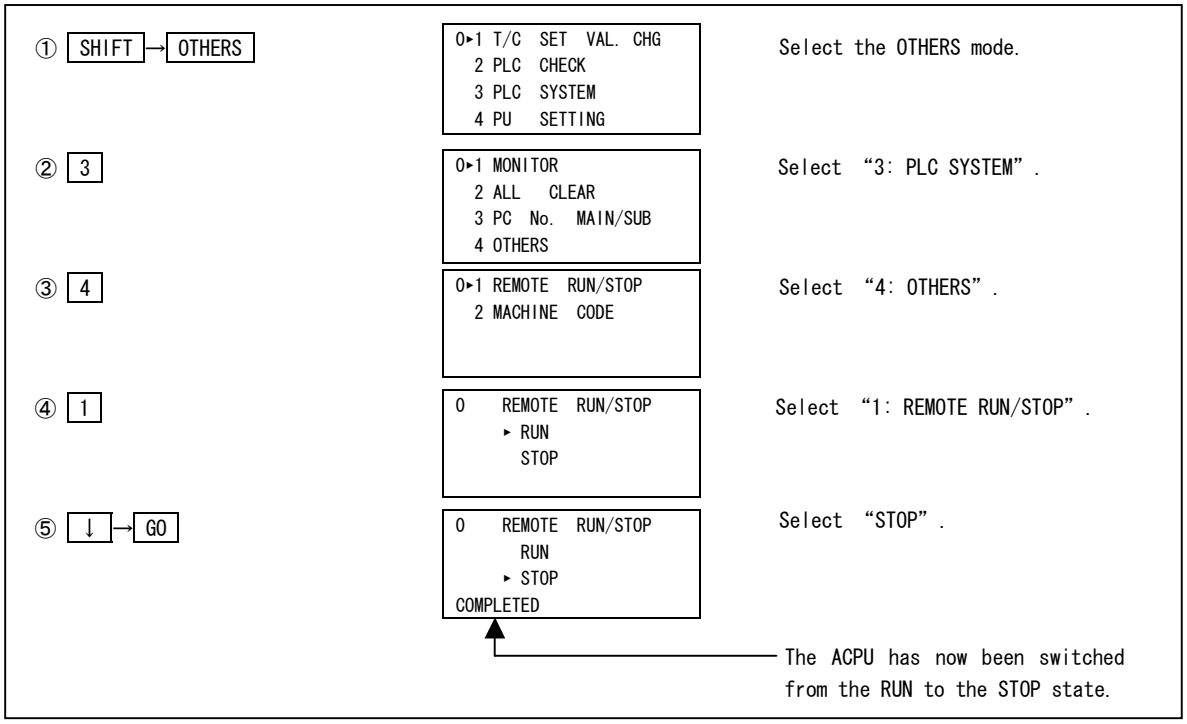
The RUN/STOP state of an ACPU can be operated by the EPU00E.

[Basic operation]



[Sample operation]

When the ACPU in the RUN state is put in the STOP state from the EPU00E



[Explanation]

(1) Begin operations after setting the RUN keyswitch to RUN.

(2) Pressing the [END] or [CLEAR] keys returns to the "4: OTHERS" menu.

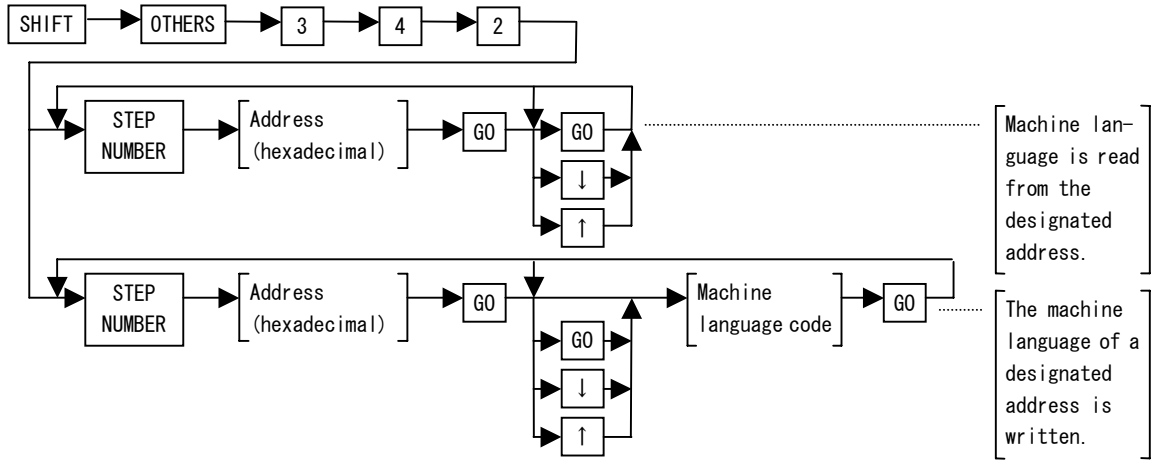
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.13 Reading/writing memory contents by using machine language

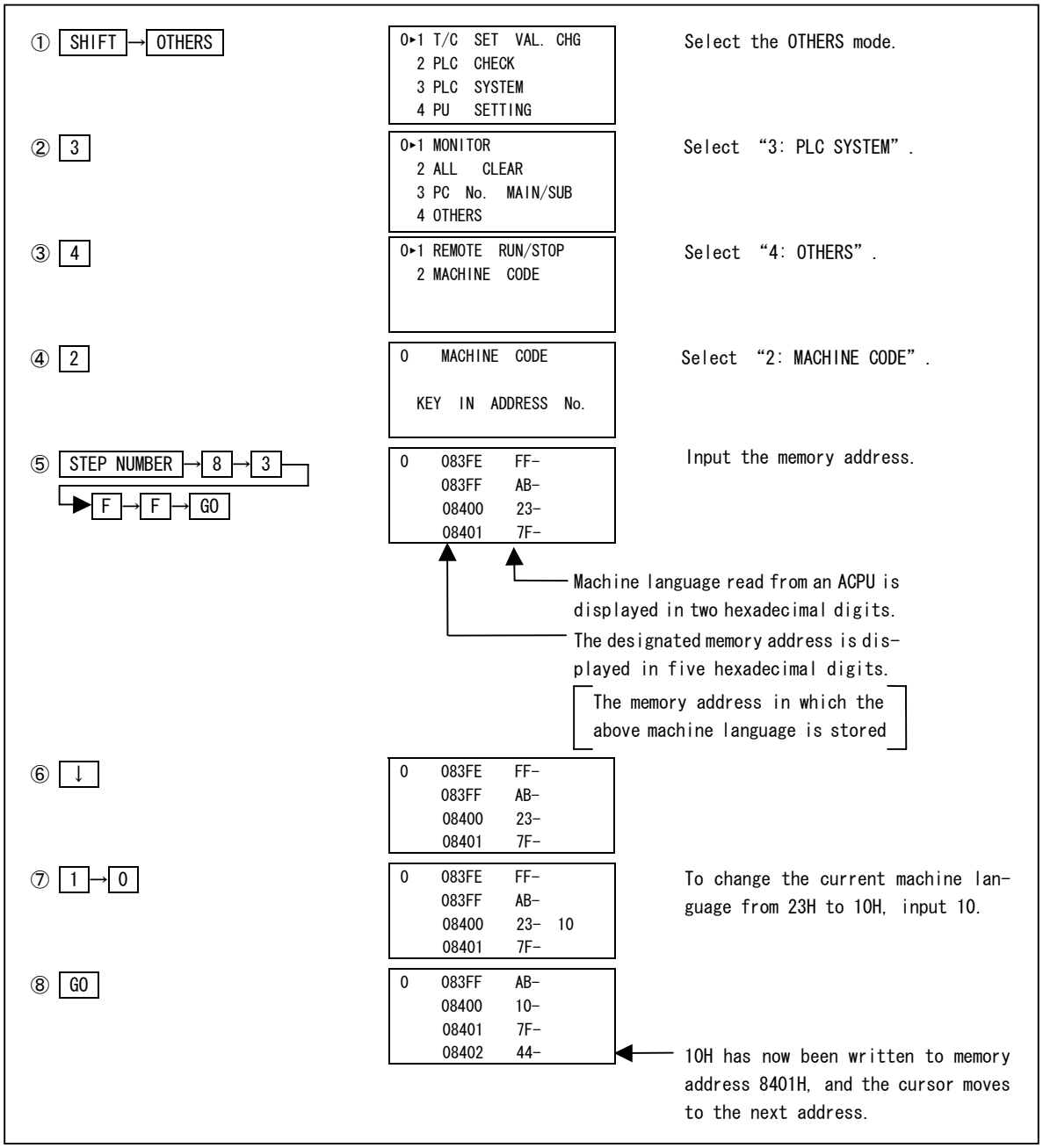
This operation reads memory contents by designating the memory address (absolute address) of an ACPU and does machine language writing to the memory.
Use this function to write/read the user's microcomputer programs to /from an ACPU.

[Basic operation]



[Sample operation]

When machine language is written to memory address 8400H or after



[Explanation]

(1) When writing to the memory is done
Begin operations after putting the ACPU in the STOP state.

(2) When writing to the memory is not done
Operations can be executed whether the ACPU is in the STOP or RUN state.

(3) The address is the memory address (absolute address) that reads the memory contents of an ACPU.
Input five hexadecimal digits max.
(Press the [0] to [9] and [A] to [F] keys on the lower part of the keyboard.)

(4) Input the machine language (two hexadecimal digits max.) to be written to the memory of the currently displayed memory address.
(Use the [0] to [9] and [A] to [F] keys on the lower part of the keyboard.)
When not writing to memory, this operation is unnecessary.
* When the key is pressed, press the correct key continuously.

(5) When writing machine language, execute writing in accordance with the use of the memory to ensure that the ACPU can operate normally.
When unnecessary writing is executed, the ACPU sometimes malfunctions.

(6) Pressing the [END] or [CLEAR] keys returns to the “4: OTHERS” menu.

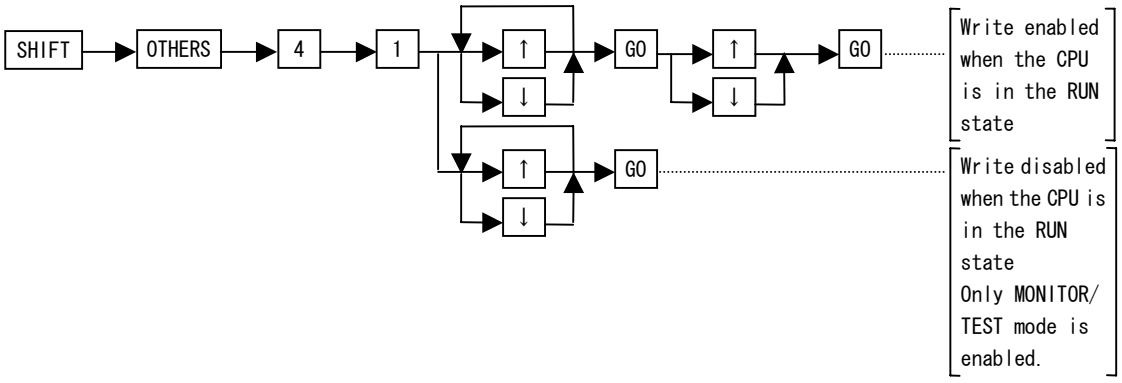
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.14 Setting write enabled/disabled when the CPU is in the RUN state and setting only MONITOR/TEST mode enabled (Program mode selection)

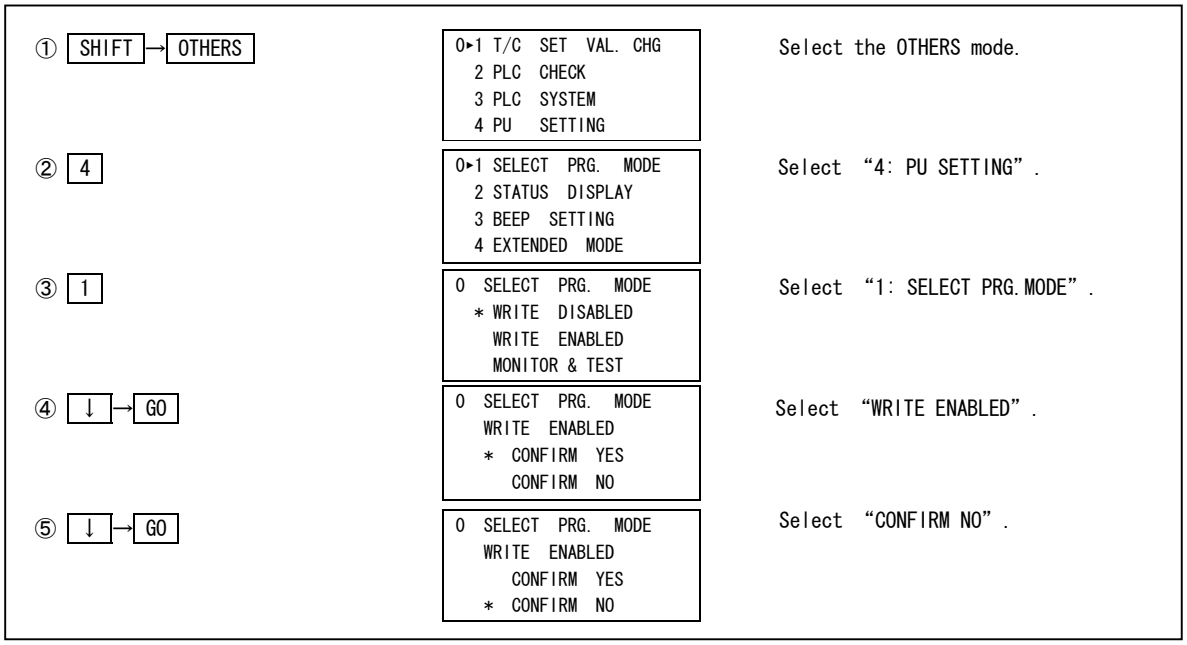
This operation sets the program write enable/disable when the CPU is in the RUN state from the EPU00E to an ACPU and also sets only MONITOR/TEST mode enabled. (Default is WRITE DISABLED.)

[Basic operation]



[Sample operation]

When program write is enabled when the CPU is in the RUN state and the CONFIRM NO message is set



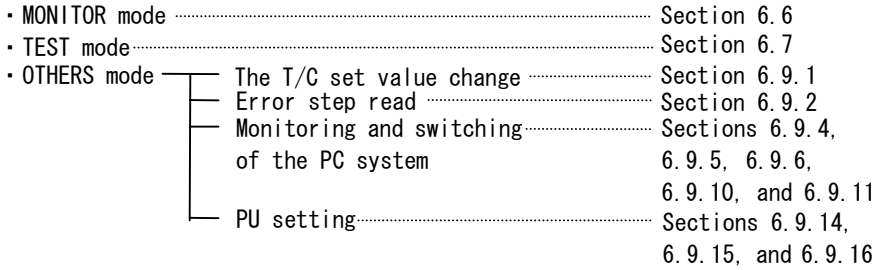
[Explanation]

(1) When “WRITE DISABLED” is selected
If writing is executed when the CPU is in the RUN state, the “PLC RUN” message is displayed on the fourth line of the screen.

(2) When “WRITE ENABLED: CONFIRM YES” is selected
If writing is executed when the CPU is in the RUN state, the “PLC RUN, PRESS GO KEY TO EXECUTE.” message is displayed on the fourth line of the screen.

(3) When “WRITE ENABLED: CONFIRM NO” is selected
Writing when the CPU is in the RUN state can be executed without displaying the message when the CPU is in the RUN state.

(4) When “MONITOR & TEST” is selected
Only the following operations are possible with the monitoring and test function:

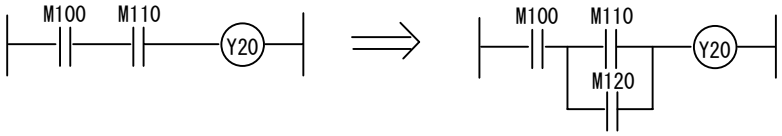


IMPORTANT

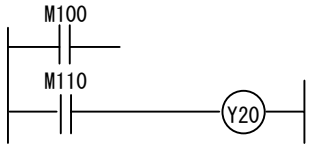
(1) Writing to the EEPROM when the CPU is in the RUN state is disabled.

(2) As for writing when the CPU is in the RUN state, only writing that can be corrected by one instruction can be executed. Be especially careful when the ladder configuration is being changed by writing when the CPU is in the RUN state.

Example)
When a ladder is added by writing when the CPU is in the RUN state



When the ladder has been added, the configuration of a ladder has now been changed as shown below.



(3) When writing when the CPU is in the RUN state is executed, the switching instruction [CHG] for sub-programs and main programs is automatically prohibited. However, an when A3ACPU is used, it is executed.
When writing when the CPU is in the RUN state has been completed, the prohibition of the [CHG] instruction is automatically canceled.

(4) When changing a program by using this function, do not operate the RUN-STOP-PAUSE-STEP RUN switch.
Doing so can destroy the program.

(5) Writing when the CPU is in the RUN state cannot be executed to the PC CPU of another station by setting the PC number on data link system.

(6) If there is a pulse instruction (PLS, P) in the program when writing is executed while the CPU is in the RUN state, the CPU executes or does not execute the pulse instruction unconditionally after completing writing when the CPU is in the RUN state. When it is not necessary to execute a pulse instruction, do not change any ladders while the CPU is in the RUN state.

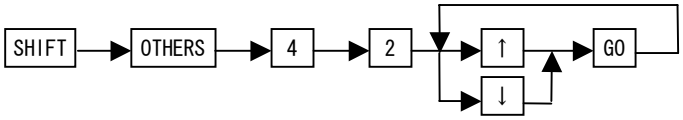
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.15 Setting conductivity display YES/NO

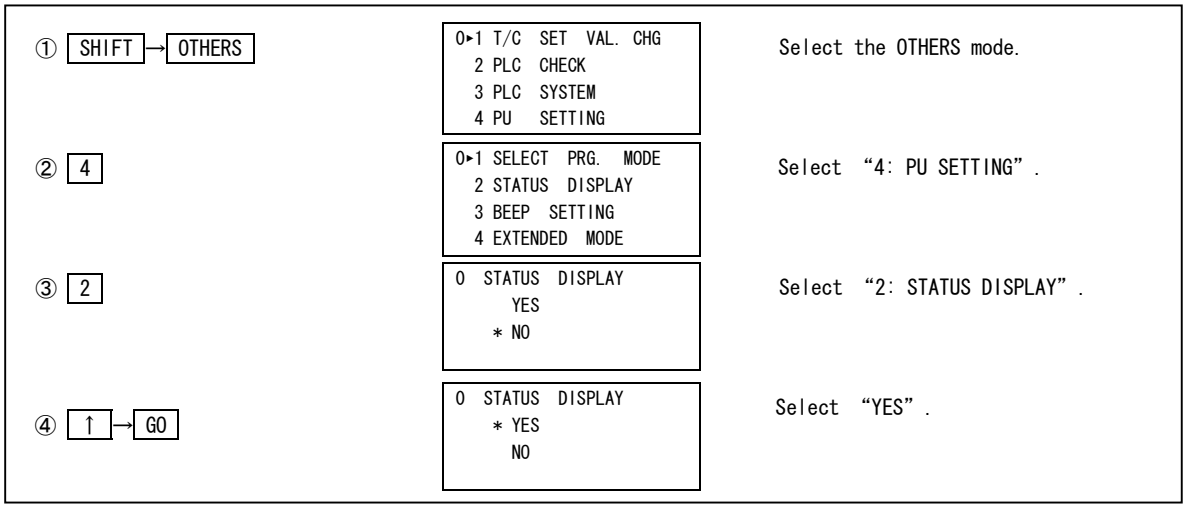
This operation sets the instruction conductivity display YES/NO during list monitoring.
This operation cannot be executed if the connected ACPU is A0J2, A2A, A3H, or A3ACPU.
(Default is the NO conductivity display.)

[Basic operation]



[Sample operation]

When conductivity is displayed



[Explanation]

(1) Section 6.6.1 gives details about conductivity display contents.

(2) Pressing the [END] or [CLEAR] keys returns to the "4: PU SETTING" menu.

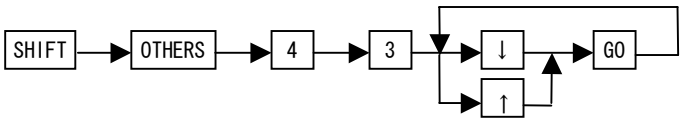
ACPU states	RUN	STOP	PAUSE	STEP RUN

Available memory	RAM	EEPROM	EPROM

6.9.16 Setting the buzzer ON/OFF when a key is pressed (Buzzer setting)

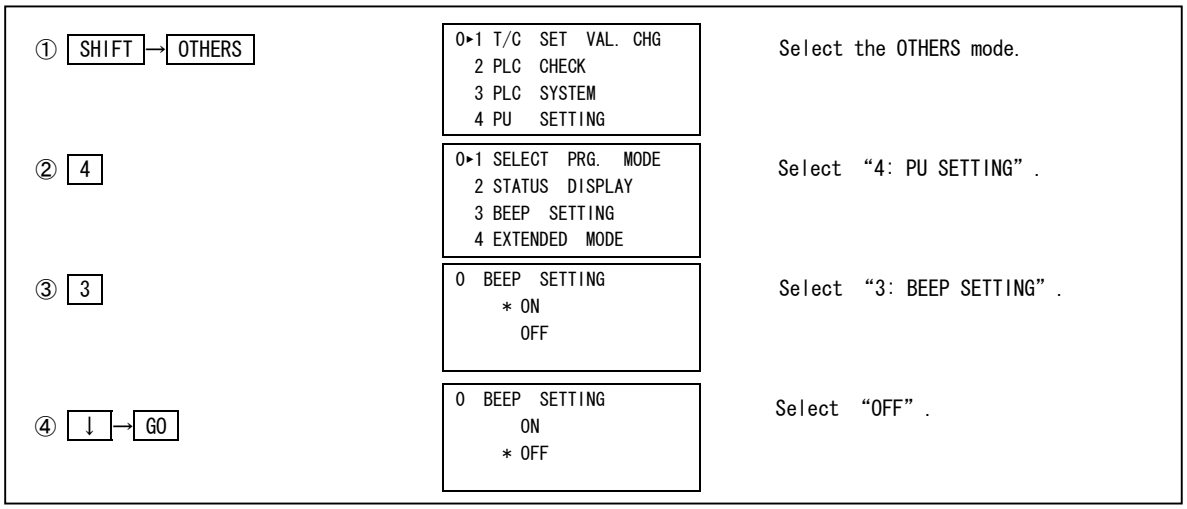
This operation turns the buzzer ON or OFF when an EPU00E key is pressed.
(Default is buzzer ON.)

[Basic operation]



[Sample operation]

When the buzzer is OFF when an EPU00E key is pressed.



[Explanation]

Pressing the [END] or [CLEAR] keys returns to the "4: PU SETTING" menu.

M E M O

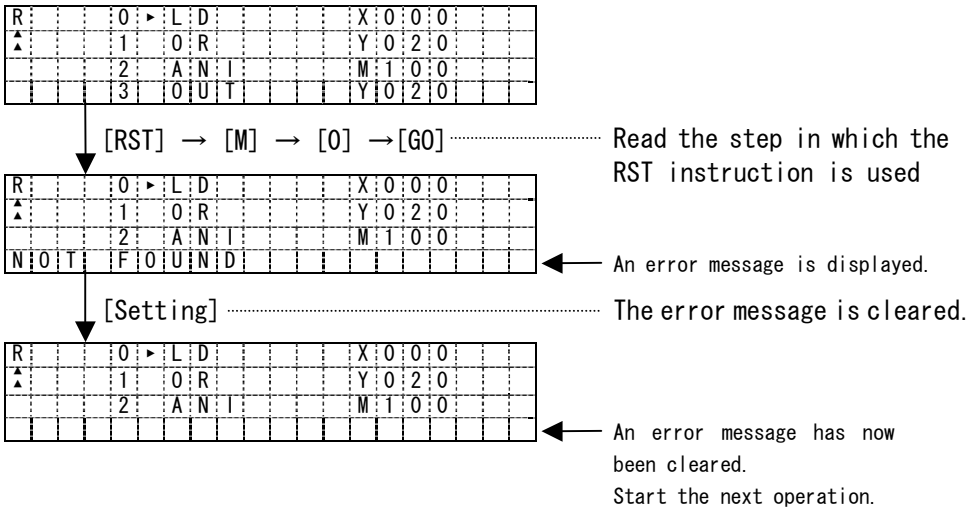
7. LISTS OF ERROR MESSAGES

7.1 Errors Detected by the EPU00E

Whenever the EPU00E detects an error while operating in any mode, an error message is displayed on the fourth line of the display area.
This section shows the error messages, display states, and corrective actions.
When an error message is displayed, perform the following, and then restart operations.

1) Check the error message.
2) Remove the cause of the error.
3) Press any key
   (doing so clears the error message. Then, the unit returns to the state before the error occurred.)

(Example)



7. LISTS OF ERROR MESSAGES

Table 7.1 List of EPU00E error messages

Explanation Nos.	Error Message	Display Conditions	Corrective Action(s)
1	ADDRESS ERROR	・When doing machine language writing, etc., an address was written to a write-disabled area.	・Set a correct address.
2	CAN'T BE SELECTED	・During start-up, because of a key word mismatch, an attempt was made to (a) select a mode that cannot be selected, or (b) execute an operation that cannot be done.	・Input the registered key word that resets the EPU00E, and restart operations. ・If the registered key word has been forgotten, execute the CPU memory all clear procedure, and restart operations. (See Sections 5.1.3 and 6.9.7.) Remember, that if this procedure is executed, the entire CPU memory will be cleared.
3	CHECK MEM. CASSETTE	・When clearing a key word or communicating with a CPU during parameter write operations, the memory cassette was either faulty or not installed.	・Replace the faulty memory cassette. ・Install a memory cassette correctly.
4	COIL ALREADY USED	・The same coil was already in the sequence program.	・If it is no problem as far as control is concerned, perform the next operation. ・If there is a problem as far as control is concerned, modify the program.
5	DEVICE ERROR	・The set device symbol was incorrect. ・The device number exceeded the range.	・Set a correct device symbol. ・Set the number within the CPU device range.
6	INSTRUCTION ERROR	・Could not be converted into a normal instruction when a program was read.	・When the CPU detects an error, switch the state from RUN to STOP. And then, after resetting the CPU, check the instructions before and after the step where the error occurred, and write a correct instruction. (Section 6.9.2 gives details about checking error steps.)
7	INSTRUCTION ERROR	・A set instruction was incorrect during READ, WRITE, or INSERT.	・Set a correct instruction.
8	MEMORY PROTECTED	・When writing was attempted in the WRITE/ INSERT/DELETE, etc. modes, the memory protect switch in the memory cassette was ON.	・Set the memory protect switch in the memory cassette to OFF.
9	MEM.CAP.EXCEEDED	・The memory allocation set in the parameter exceeded the capacity of the memory cassette.	・Reset the parameter within the capacity of the memory cassette.
10	NO “END” INSTRUCTION	・There was no END instruction	・Write an END instruction as the last step of the program.
11	NOT FOUND	・The designation instruction was not found.	・Check the program.
12	OPERATION ERROR	・An key error was made. ・An attempt was made to write data to the ROM or EEPROM of the CPU.	・Operate the key correctly. ・Writing to the EEPROM when the CPU is in the STOP state. ・Do not attempt to write to the ROM.
13	PLC COMM.ERR.	・Could not communicate with a CPU normally.	・Retry the operation. If communications still cannot be done, check the following : The connection state of the EPU00E The connection state of the cable The CPU (whether or not an error has occurred)
14	PLC RUN	・Write/insert/delete, etc. was attempted when the CPU was in the RUN state.	・Set the CPU in the STOP state. ・Reoperate it after selecting WRITE ENABLED by using the program mode selection of the OTHERS mode (see Section 6.9.14).
15	PLC WRITE ERROR	・Data could not be written to a CPU correctly in the WRITE, INSERT, etc. , modes.	・Check the RAM/ROM settings. ・Check the installation of the RAM, etc. ・Check the setting of the CPU's memory protect switch.
16	SETTING ERROR	・A set value was not correct.	・Set the value correctly.
17	STEP NO. EXCEEDED	・A set step number was larger than the maximum step number.	・Set a correct step number.

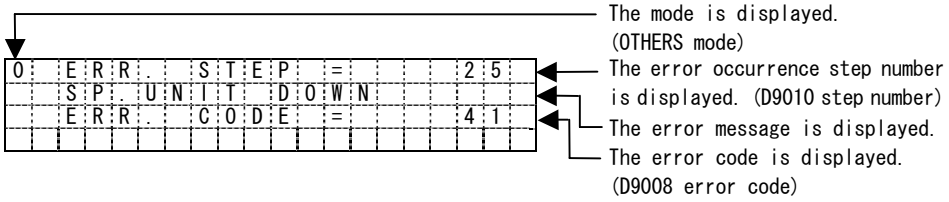
7.2 PC CPU Errors

When an error step in the OTHERS mode is read, the error message of the error that is occurring in the ACPU, the error step, etc. are displayed.
This section shows the error messages, error contents, and corrective action(s).
When an error message is displayed, perform the following, and then restart operations:

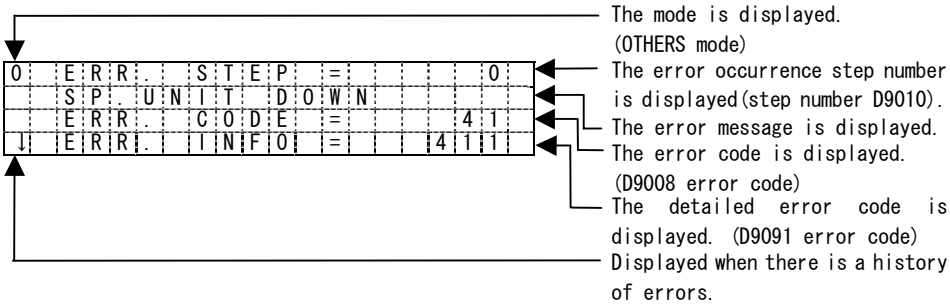
1) Check the error message.
2) When an error code is not displayed, check the error code of special register D9008 by device monitoring (see Section 6.6.3) in the MONITOR mode.
3) Remove the cause of the error.

(Display format)

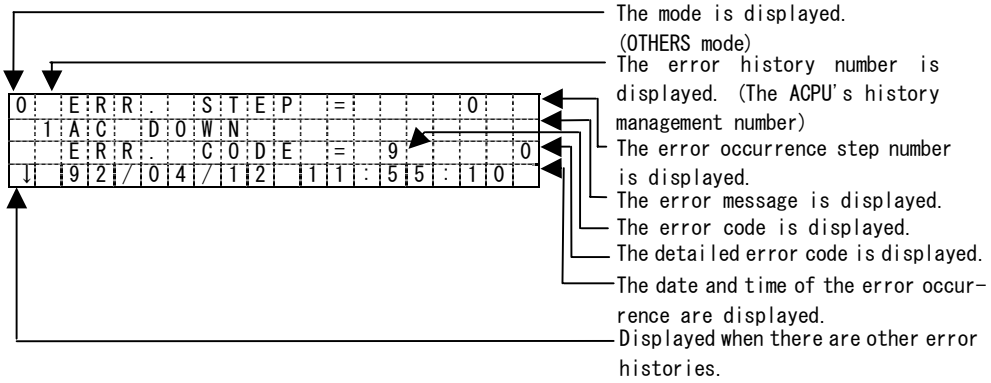
Display example when an error occurs in any CPU but an AnACPU



Display example when an error occurs in an AnACPU



Example of continuous display when "↓" above is displayed (When there is an error history)



POINT

When a PC CPU error message is displayed, take corrective action based on the ACPU Programming Manual (Common Instructions) and the User's Manual of each CPU.

7.3 Errors When Using the EPU00E in a Link System

The “PLC COMM. ERR.” message is sometimes displayed when the EPU00E is used in a link system). When this happens, check the error contents and take corrective action.

Error Numbers	Error Contents	Corrective Action(s)
4	Processing cancellation : A new processing request was output from the EPU00E though CPU was already processing.	Do key operations from the EPU00E side again.
5	Sum check error: A link communications sum check error occurred.	This error could be caused by noise influence. Recheck the system.
16	PC NO. error : The corresponding PC number station does not exist.	Check the PC number setting, and set the correct number.
19	When the ACPU is reset during monitoring, this error sometimes occurs.	Perform monitoring operations again.
24	Remote error : Though remote STOP/PAUSE was executed from the computer link unit, etc., remote RUN/STOP was executed from the EPU00E.	Execute remote RUN/STOP/PAUSE from either unit.
32	Link error : During monitoring of a master station from a slave station, the master station was reset.	Perform monitoring operations again.
34	EEPROM fault : Writing could not be executed because of a faulty EEPROM.	Replace the EEPROM.

When error code 25 is displayed, the cause could be one of the following:
Check the contents and take corrective action.

(1) When connected to a master station

Device Numbers	Names	Contents	
M9210	Link card error (For a master station)	OFF: Normal ON : Abnormal	The link card's H/W is abnormal during control. A link card in the CPU link unit is judged by the CPU. Replace the link unit.
M9224	Link state	OFF: Online ON : Offline, station- to-station test, or self-loopback test	Controlled by the master station state such as off-line, station-to-station test, or the self-loopback test mode. Check the mode switch.
M9227	Loop test state	OFF: Not executed ON : A positive loop test or a reverse loop test a being executed.	Controlled by whether a master station is executing a positive loop test or a reverse loop test.

(2) When connected to a local station

Device Numbers	Names	Contents	
M9211	Link card error (For a local station)	OFF: Normal ON : Abnormal	The link card's H/W is abnormal during control. A link card in the CPU link unit is judged by the CPU. Replace the link unit.
M9240	Link state	OFF: Online ON : Offline, station-to -station test, or self-loopback test	Controlled by the local station state such as offline, station-to-station test, or the self-loopback test mode. Check the mode switch.
M9257	Loop test state	OFF: Not executed ON : A positive loop test or a reverse loop test a being executed.	Controlled by whether a local station is executing a positive loop test or a reverse loop test.

APPENDICES

APPENDIX 1 COMPARING THE EPU00E WITH THE A7PU/A7PUS

This section shows the main differences between the EPU00E and conventional A7PU/A7PUS programming units.
For more details, see the particular Operating Manuals.

(1) Comparison of general specifications

Items \ Models		EPU00E	A7PU	A7PUS
Ambient temperature	When operating	0 to 40℃		
	When stored	-20 to 70℃	-10 to 50℃	
Ambient humidity	When operating	20 to 85% RH or less	10 to 85% RH or less	
	When stored	10 to 90% RH or less		

(2) Comparison of performance specifications

Items \ Models		EPU00E	A7PU	A7PUS
Connection methods	Add-on	EPU00E and A7PU cannot be screwed onto an A1SCPU and A2CCPU.		A7PUS can only be screwed onto an A1SCPU.
	Hand-held	Uses AC30R4- PUS cable.	Uses AC30R4/ AC300R4 cable.	Uses AC30R4-PUS cable.
Display methods		20 characters×4 lines Backlit display	16 characters×2 lines Illuminated display	
External interfaces		RS-422I/F×2, Extension I/F×1	RS-422×2, Audio cassette I/F×1	RS-422I/F×1
Outside dimensions mm (inch)	Heights	188 (7.40)	188 (7.40)	102 (4.02)
	Widths	95 (3.74)	79 (3.11)	109 (4.29)
	Depths	44.5 (1.75)	44.5 (1.75)	35.5 (1.40)

(3) Comparison of functions

(The operating modes are shown.)

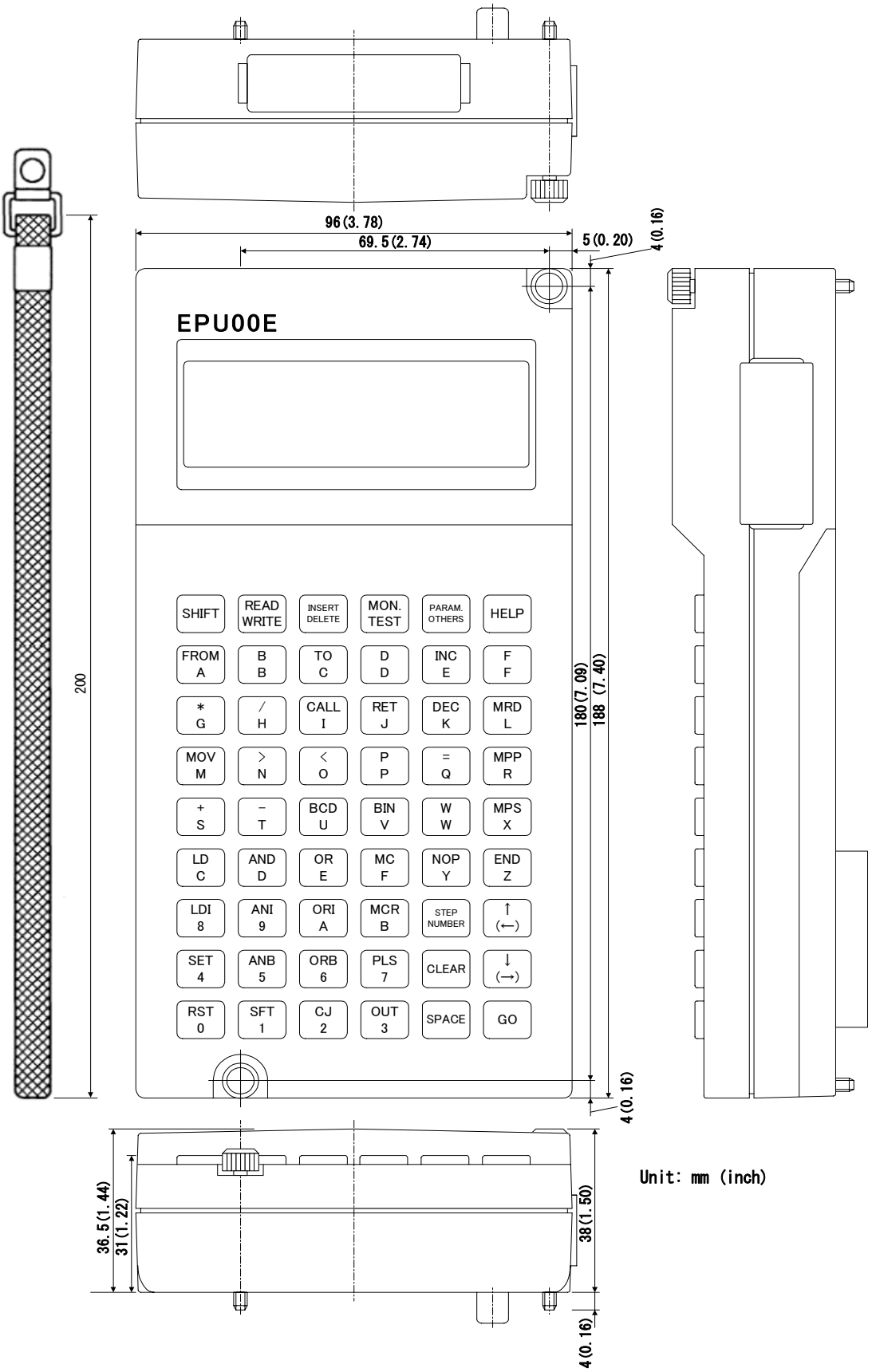
Items \ Models	EPU00E	A7PU	A7PUS
Applicable CPUs	See section 3.3.2	See Section 3.3.2. The device designation for an A2ACPU and an A3ACPU is limited to the same range as an A3HCPU.	
PC memory all clear	OTHERS mode/when starting up with a key word	When starting up with a key word	
Parameters all clear only	PARAMETER mode		
Programs all clear only	OTHERS mode	WRITE mode (NOP continuous writing)	
Devices all clear only	OTHERS mode	———	
NOP continuous writing	WRITE mode		
Writing a program	WRITE mode		
T/C set value change: CPU in RUN state	OTHERS mode	WRITE mode	
Reading a program	READ mode		
Program scrolling display	READ mode	———	
Inserting a program	INSERT mode	INSERT/DELETE modes	
Moving a program	INSERT mode	———	
Copying a program	INSERT mode	———	
Deleting a program	DELETE mode	INSERT/DELETE modes	
Deleting a designated range of a program	DELETE mode	———	
NOP batch delete	DELETE mode	———	

(Continued on the next page.)

(Continued from the previous page.)

Items \ Models	EPU00E	A7PU	A7PUS
Monitoring a bit device	MONITOR mode		
Monitoring a word device	MONITOR mode		
Monitoring T/C contact and current position data	MONITOR mode		
Continuity check	MONITOR mode		
Monitoring an offline switch	MONITOR mode		
Searching the output instruction of the designated contact	MONITOR mode	———	
Switching a numerical value's display format	MONITOR/TEST modes (binary/octal/decimal /hexadecimal /ASCII)	MONITOR mode (decimal/hexadecimal)	
Setting/resetting a bit device	TEST mode		
Changing the current value of a word device	TEST mode		
Setting/canceling an offline switch	TEST mode		
Checking a program	OTHERS mode	TEST mode	
Error check	OTHERS mode	TEST mode	
Reading/writing a machine language	OTHERS mode	TEST mode	
Setting parameters	PARAMETER mode		
Setting/changing a key word	PARAMETER mode		
Recording/replaying/verifying for an audio cassette	———	Executed by the audio cassette function	———
Link monitoring of MELSECNET(Ⅱ)/B	OTHERS mode	———	
Monitoring the buffer memory of a special- function module	OTHERS mode	———	
ACPU clock monitoring	OTHERS mode	———	
Accessing another station	Switching in the OTHERS mode	———	
Remote RUN/STOP	OTHERS mode	———	
Setting write enabled/disabled in the RUN state	OTHERS mode	When starting up	
Main/sub switching	OTHERS mode	When starting up	
Buzzer ON/OFF during key operation	OTHERS mode	———	

APPENDIX 2 EPU00E OUTSIDE DIMENSIONS



APPENDIX 3 ACPU PARAMETER SETTING SHEET

This section shows the parameters that can be set in different types of ACPUs by the EPU00E.

(1) A0J2CPU parameters that can be set by EPU00E

Latch range setting	No latch	———————————
	1/2 latch	Latch ranges L1024 to 2047 (L1024 to 1535, S1536 to 2047) T40 to 79/T100 to 119/T124 to 127 C64 to 127 D256 to 511 B200 to 3FF (W200 to 3FF)
	All latch	Latch ranges L0 to 2047 (L0 to 1535, S1536 to 2047) T0 to 127 C0 to 127 D0 to 511 B000 to 3FF (W000 to 3FF)
Step relay setting		Without/with (S1536 to 2047)

(2) A0J2H, A2C, A1(N), A2(N), and A3(N) CPU parameters that can be set by the EPU00E

Memory capacity	Program capacity	Main sequence: K steps		
		Sub-sequence: K steps		
	File register capacity	Point (K bytes)		
M, L, and S setting		M-	L-	S-
Timer setting		Low speed: T-	Medium speed: T-	High speed: T-
Counter setting		Counter: C-	Interruption counter: C	
Latch range setting		B-		
		T (low speed)-	T (medium speed)-	T(high speed)-
		C-	D-	W-
WDT setting		msec		
I/O control method		Unavailable		
Key word				

(3) A3H and A3MCPU parameters that can be set by the EPU00E

Memory capacity	Program capacity	Main sequence: K steps		
		Sub-sequence: K steps		
	File register capacity	Point (K bytes)		
M, L, and S setting		M-	L-	S-
Timer setting		Low speed: T-	Medium speed: T-	High speed: T-
Counter setting		Cannot be set		
Latch range setting		B-		
		T (low speed)-	T (medium speed)-	T(high speed)-
		C-	D-	W-
WDT setting		Unavailable (fixed 200 msec)		
I/O control method		Input:	Output:	
Key word				

(4) A2A and A3ACPU parameters that can be set by the EPU00E

Memory capacity	Program capacity	Main sequence: K steps		
		Sub-sequence: K steps		
	File register capacity	Point (K bytes)		
M, L, and S setting		M-	L-	S-
		M-		
Timer setting	The number of device points			
	Range of T0 to 255	Low speed: T	Medium speed: T-	High speed: T-
	Range of T256 to 2047	Low speed: T	Medium speed: T-	High speed: T-
	Set value storage device			
Counter setting	Then number of device points			
	Set value storage device			
Latch range setting		B-	D-	W-
	Range of T0 to 255	T (low speed)-	T (medium speed)-	T(high speed)-
	Range of C0 to 255	C-		
	Range of T256 to 2027	T (low speed)-	T (medium speed)-	T(high speed)-
	Range of C256 to 1023	C-		
Key word				

APPENDIX 4 ASCII DISPLAY CHARACTER CODE

Higher 4 bits →

←Lower 4 bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	‘	p								
1			!	1	A	Q	a	q								
2			“	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			’	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	¥	l	|								
D			−	=	M	]	m	}								
E			.	>	N	^	n	→								
F			/	?	O	_	o	←								

IMPORTANT

Design the configuration of a system to provide an external protective or safety inter locking circuit for the PCs.

Product Warranty Details

Please confirm the following product warranty details prior to product use.

Gratis Warranty Terms and Gratis Warranty Range

If any fault or defect (hereinafter referred to as “Failure”) attributable to Mitsubishi Electric Engineering Company Limited (hereinafter referred to as “MEE”) should occur within the gratis warranty period, MEE shall repair the product free of charge via the distributor from whom you made your purchase.

■ Gratis Warranty Period

The gratis warranty period of this product shall be one (1) year from the date of purchase or delivery to the designated place.
Note that after manufacture and shipment from MEE, the maximum distribution period shall be six (6) months, and the gratis warranty period after manufacturing shall be limited to eighteen (18) months.
In addition, the gratis warranty period for repaired products shall not exceed the gratis warranty period established prior to repair.

■ Gratis Warranty Range

The gratis warranty range shall be limited to normal use based on the usage conditions, methods and environment, etc., defined by the terms and precautions, etc., given in the instruction manual, user’s manual and caution labels on the product.

Warranty Period after Discontinuation of Production

(1) MEE shall offer product repair services (fee applied) for seven (7) years after production of the product has been discontinued. Discontinuation of production shall be reported via distributors.
(2) Product supply (including spare parts) is not possible after production has been discontinued.

Exclusion of Opportunity Loss and Secondary Loss from Warranty Liability

Regardless of the gratis warranty period, MEE shall not be liable for compensation for damages arising from causes not attributable to MEE, opportunity losses or lost profits incurred by the user due to Failures of MEE products, damages or secondary damages arising from special circumstances, whether foreseen or unforeseen by MEE, compensation for accidents, compensation for damages to products other than MEE products, or compensation for other work carried out by the user.

Changes in Product Specifications

The specifications given in the catalogs, manuals and technical documents are subject to change without notice.

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED
HEAD OFFICE: NIHONJISHO-DAIICHI BUILDING,1-13-5,KUDANKITA,CHIYODA-KU,TOKYO,JAPAN

New publication,effective SEPT. 2008
Specifications subject to change without notice.
Printed in Japan on recycled paper.

50CM-D180028A(0809)MEE