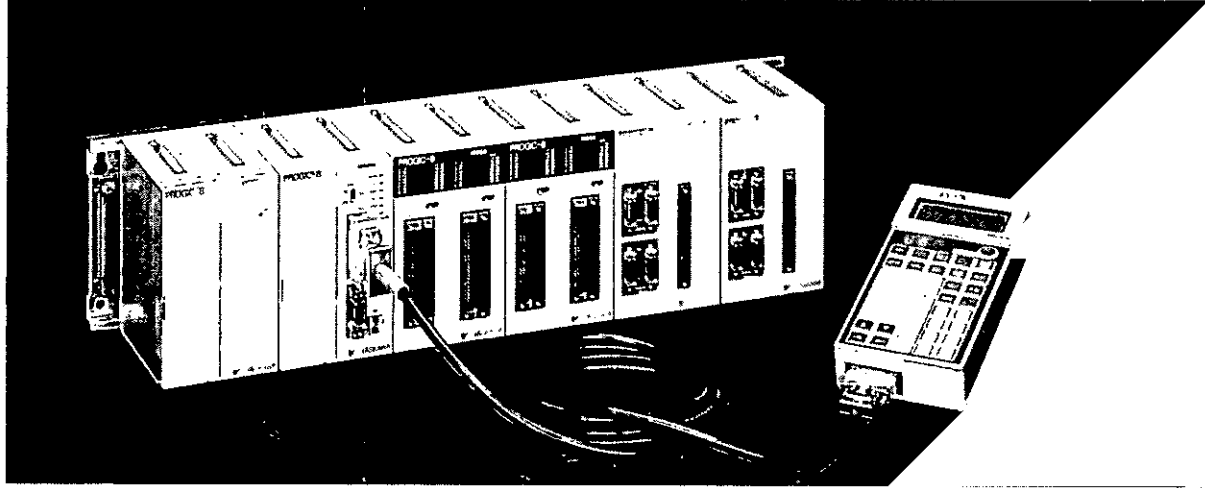


Teach Pendant

FOR MULTIAXES MOTION CONTROLLER PROGIC-8
USER'S MANUAL

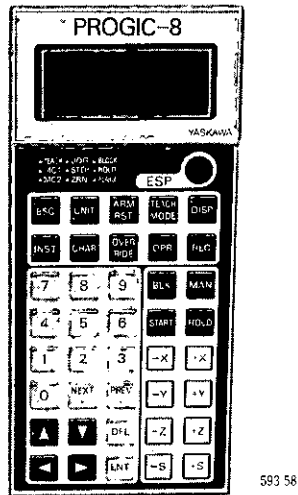


YASKAWA

BEFORE OPERATION

This instruction manual describes preparation before operation, operation teaching, hardware, error messages and alarm messages for the teach pendant for the PROGIC-8.

It is mandatory that operators read this instruction manual thoroughly before operation.



Teach Pendant

Refer to the following documents for additional information:

- PROGIC-8 PROGRAMMING MANUAL FOR PLC UNIT (SIE-C888-1.1)
- PROGIC-8 PROGRAMMING MANUAL FOR MC UNIT (SIE-C888-1.2)
- PROGIC-8 SYSTEM MANDBOOK (SIE-C888-1.3)
- PROGIC-8 PROGRAMMING SYSTEM
 OPERATION MANUAL (SIE-C888-1.4)
- PROGIC-8 INSTRUCTION MANUAL OF ADDITIONAL
 FUNCTIONS (SIE-C888-1.5)

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1. INTRODUCTION

1.1 OUTLINE

This teach pendant is an effective tool for the motion program "teaching" or "setup" of the multiaxes motion controller "PROGIC-8" system.

It is provided with the following functions.

- | | |
|---|---|
| · Each axis position monitoring | · Motion program monitoring and editing |
| · Various data monitoring and changes | · Point table monitoring and editing |
| · MC unit status monitoring (jog, step, zero-point return (homing) operation) | · Manual operation |
| · Block operation (single-block, multi-block operation) | |

By using the above functions, the following operations are enabled for the system setup.

- (1) Monitoring operation: Each axis current position, PLC/MC unit I/O ON/OFF status, PLC register contents, etc. can be monitored.
- (2) Program editing and check: After moving each axis to a target position in the manual mode operation, the current position data can be input to the motion program. Then you can check the program by executing block operation.
- (3) Forced operation : PLC/MC unit I/O can be turned ON or OFF or the contents of a register can be changed forcedly.

1.2 HOW TO USE THIS MANUAL

(1) To those in a hurry

Read the following section to perform actual operation so that you will see the basic operation:

SECTION 2 "PREPARATION BEFORE OPERATION"

SECTION 3 "LET'S START OPERATION"

SECTION 3 describes the monitoring operation, therefore, even if you make a mistake, it will not destroy the system data.

(2) To those with time to spare

Read the sections in the order to perform actual operation:

Since the system programs or data may be changed in the operation described in the following sections, adequate attention must be paid:

SECTION 5 "LET'S PERFORM TEACHING !"

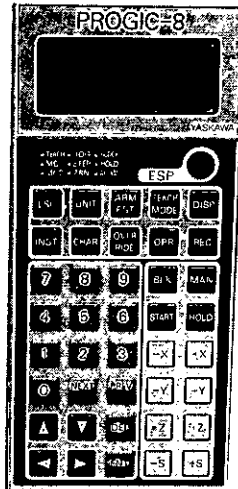
SECTION 6 "LET'S CHANGE DATA !"

Any section described in SECTION 7 and after is not related directly to the operation but is only for reference when necessary.

2. PREPARATION BEFORE OPERATION

2.1 WHAT IS NECESSARY?

(1) Prepare the teach pendant (type JEPMC-TB051).

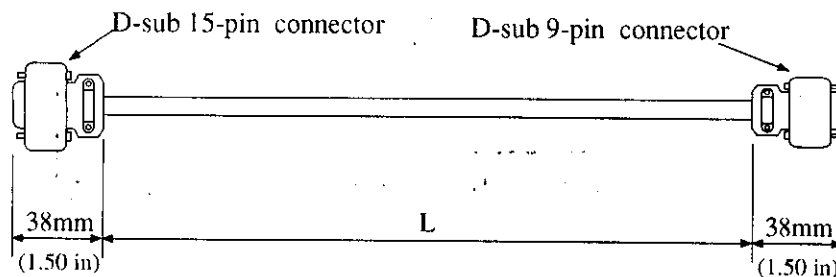


(2) In order to connect the teach pendant to the PLC unit, prepare one of the following "cable units".

- Cable for teach pendant (cable length: 2m) type: JEPMC-W5320-02 or
- Cable for teach pendant (cable length: 5m) type: JEPMC-W5320-05

(At PLC Unit Port 2)

(At Teach Pendant)



(3) The "PLC unit" to which the teach pendant can be connected is one of the following units that are provided with two communication ports.

- PLC unit type: JEPMC-PC055 or
- PLC unit type: JEPMC-PC056

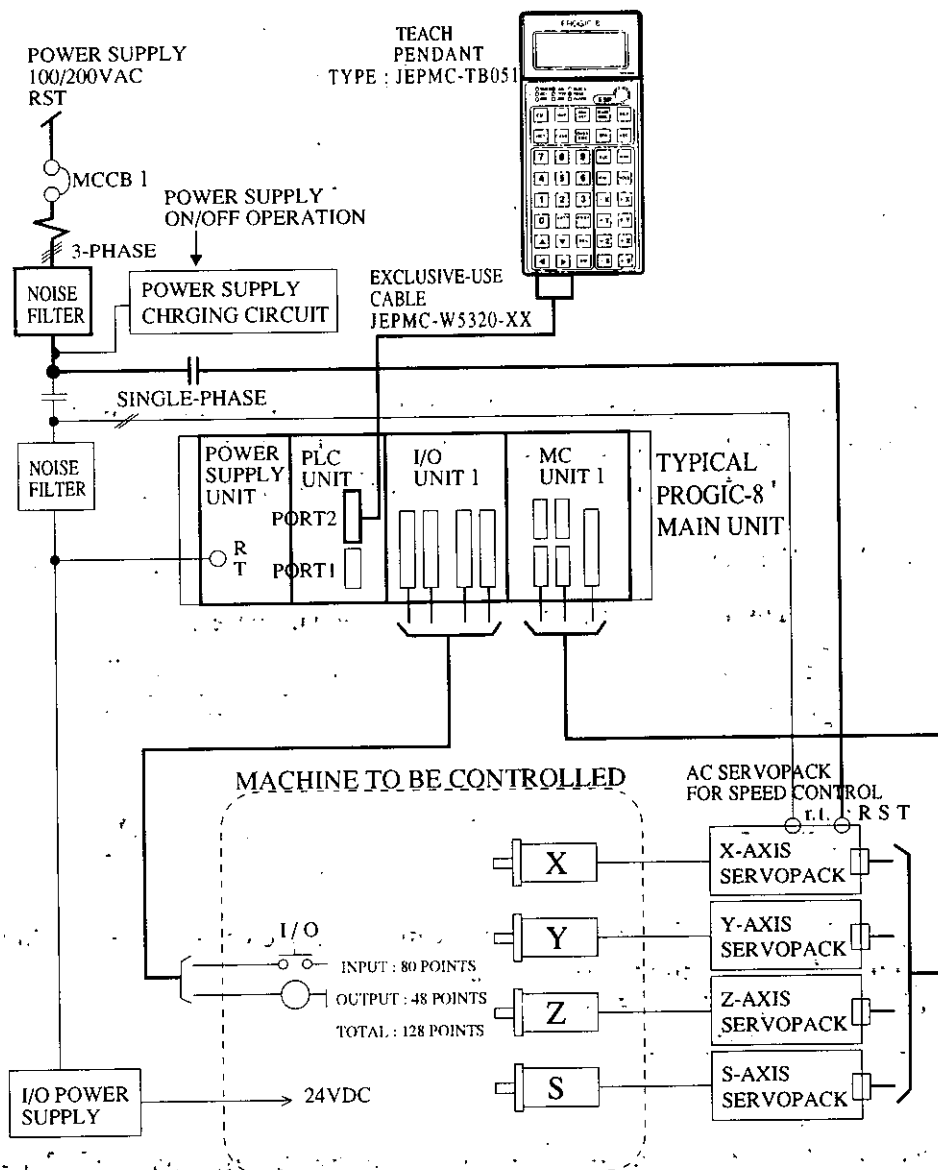
NOTE

The teach pendant cannot be connected to a PLC unit (type: JEPMC-PC050) which is provided with only one communication port.

2.2 CONNECTION AND START-UP

Perform the teach pendant connection and start-up as described below.

- (1) Turn OFF the power supply of the properly connected "PROGIC-8 system" the servo drive section.
- (2) Connect the PLC unit "communication port 2" to the "teach pendant" by using "cable for teach pendant".
Connect the cable "D-sub 15-pin connector" to the "communication port 2" side. Tighten the connector screw properly.



(3) Turn ON the power supply of the "PROGIC-8 system".

→ When the system starts up, the teach pendant starts up automatically.

Then the "initial display" is displayed and operation becomes enabled.

INITIAL DISPLAY

P	R	O	G	I	C	-	8						
	T	-	B	O	X		R	E	V	1	0		
			C	O	P	Y	R	I	G	H	T		
	1	9	9	3			Y	A	S	K	A	W	A

(4) After completion of operation by the teach pendant, turn OFF the power supply of the "PROGIC-8 system" before removing connection with the PLC unit.

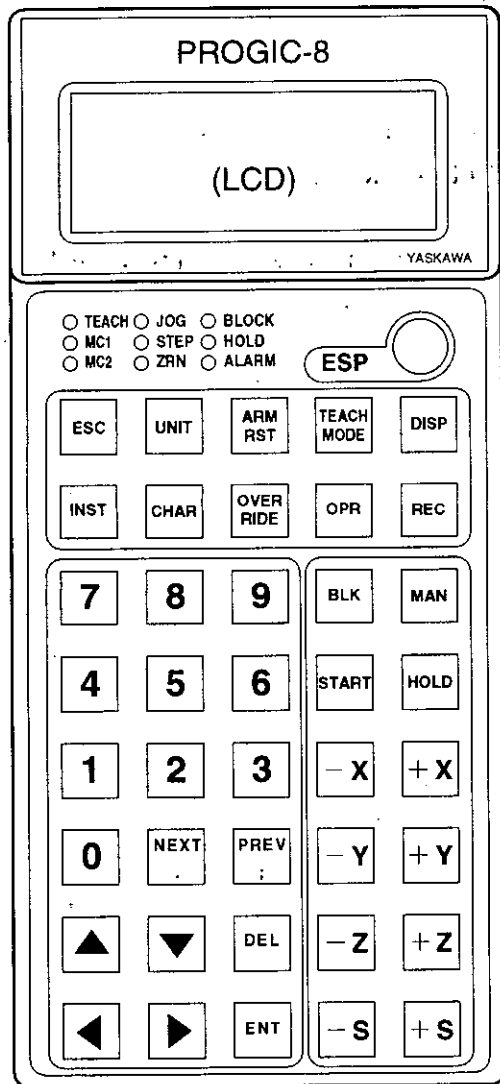
NOTE

Do not connect or disconnect the teach pendant when the power supply of the "PROGIC-8 system" is turned ON.

3. LET'S START OPERATION!

3.1 DISPLAY SECTION AND OPERATION KEYS

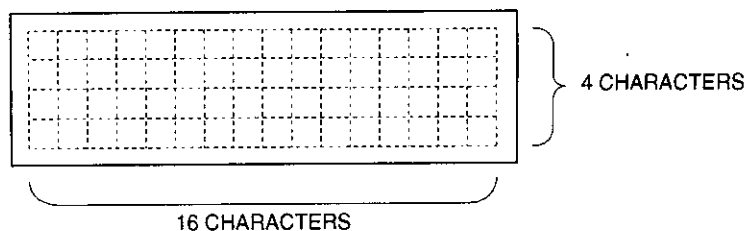
The following drawing shows the teach pendant operating panel.



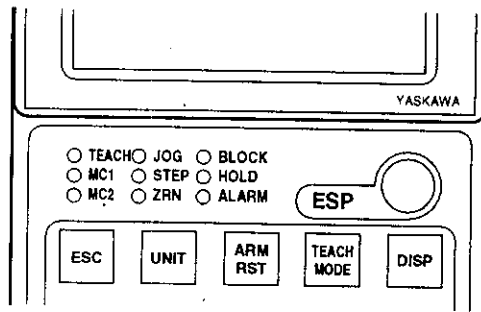
Adjusting volumes for the display section are provided inside the door on the right side.

- BRIGHT : For adjustment of brightness
- CONTRAST : For adjustment of contrast

(1) 16 alphanumeric characters can be displayed in each of four lines in the liquid crystal display section.



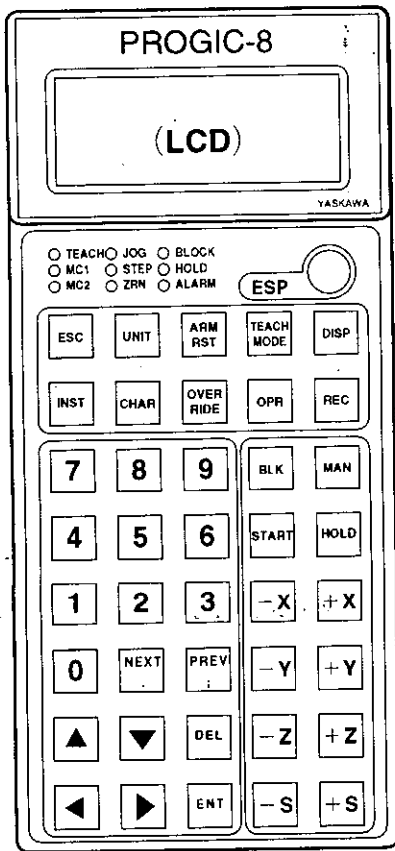
(2) The following describes the meanings of 9 indicator lamps (LEDs) when they light.



- TEACH: Selecting the teach mode.
Indicates the monitor mode while it is extinguished.
- MC1: Selecting MC unit 1 as a unit to be operated.
- MC2: Selecting MC unit 2 as a unit to be operated.
- JOG: Selecting "JOG operation" in the manual operation mode.
- STEP: Selecting "STEP operation" in the manual operation mode.
- ZRN: Selecting "zero-point return operation" in the manual operation mode.
- BLOCK: Selecting the block operation mode.
- HOLD: Holding by the "HOLD" key during block operation.
- ALARM: An alarm or error is occurring.

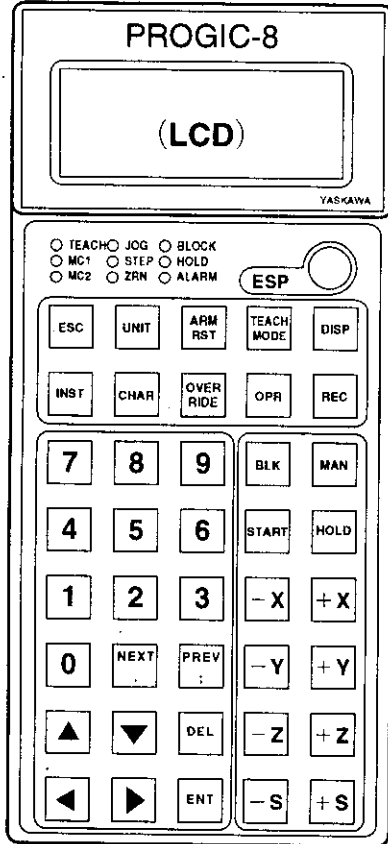
(3) The following describes the meaning of each operation key.















To those in a hurry, verify only the keys marked with ⊙.



Key	Contents
	Cancels. Or returns the procedure to one step prior to the former status.
	Switches "MC unit 1" and "MC unit 2" as a unit to be operated.
	Resets an alarm when it occurs. By depressing it at the same time as the key, "MC reset" is performed.
	Switches the teach mode and monitor mode.
	Switches the display on the screen. <div style="display: flex; justify-content: space-around; font-size: small;"> <div style="text-align: center;"> <p>TEACH MODE</p> <p>POSITION</p> <p>↓</p> <p>DATA</p> <p>↓</p> <p>STATUS</p> <p>↓</p> <p>PROGRAM</p> <p>↓</p> <p>TABLE</p> </div> <div style="text-align: center;"> <p>MONITOR MODE</p> <p>POSITION</p> <p>↓</p> <p>DATA</p> <p>↓</p> <p>STATUS</p> </div> </div>
	Teaches the current position data during program editing.
	Validates manual operation and block operation.
	For setting of jog operation override (%) and step operation step value.
	Screen for inputting 26 alphabets and symbols such as +, -, etc. ABCDEFGHIJKLMNOP QRSTUVWXYZ+*/=# ◊

	<p>Displays the commands during program editing and becomes a screen for inputting them.</p> <p>MOV MVS MCW MCC TIM PXY ·PYZ PZX PXS PZS PYS ZRN ABS INC PNT SET STP END GSB RET PFN SNG POS MVM PST PMV SKP</p>
--	--



Key	Contents
 	Cursor keys Moves the cursor to the right, left, up or down in the liquid crystal display (LCD) section.
	Deletes one character at the cursor. Deletes one line where the cursor is located in the data display.
	Determines the key-in value. Or feeds a line at program editing.
	Displays the data in the line next to the cursor line. Becomes the input key for "decimal point" at editing.
	Displays the data in line prior to the cursor line. Becomes the input key for "end of block" at editing.
 to 	Numerical keys For inputting numerical values of 0 to 9.
	Selects manual operation and changes the mode to either jog, step or zero-point return.
	Selects block operation.
	Starts block operation.
	Holds block operation.
 to 	Axis keys The depressed key starts in manual operation. Can be used as CHAR input when it is not "during operation mode". +X=X, +Y=Y, +Z=Z, +S=S, -X=X-, -Y=Y-, -Z=Z-, -S=S-

3:2 INITIAL DISPLAY AND POSITION DISPLAY

This section describes how to operate the teach pendant. Since this section describes the operation in the "monitor mode"; it will not change the system internal data.

Execute the operation procedure up to step ③ of Par. 2.2 and assume that the system and teach pendant have started up.

(1) The "initial display" shown on the right is displayed in the liquid crystal display section of the started up teach pendant.

INITIAL DISPLAY

P	R	O	G	I	C	-	8				
T	-	B	O	X		R	E	V	1	.	0
1	9	9	3								

(2) Depress any key.

→ The "position display" appears.

POSITION DISPLAY

P	O	S										
			X	-	1	2	3	4	5	.	6 7 8	
			Y	-	1	2	3	4	5	.	6 7 8	
O	0	0	1	Z	-	1	2	3	4	5	.	6 7 8
B	0	0	0	1	S					0	.	0 0 0

(3) Upon seeing indicator lamps ○MC1 and

○MC2, depress the key to select the MC unit to be operated.

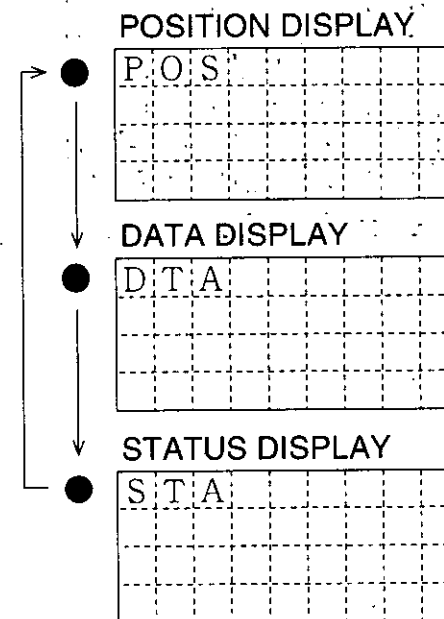
→ The selected MC unit "position display" appears. ^{Note 1}

(4) Check that indicator lamp ○TEACH is extinguished. ^{Note 2}

→ The "monitor mode" is selected.

(5) Depress the key.

→ Each time the key is depressed, the display changes as shown on the right.



Notes: 1. For a system without MC2:

Even if the key is depressed, indicator lamp ○MC1 remains lit and does not change.

2. By depressing the key, indicator lamp ○TEACH can be turned ON or OFF. However, set the MC unit operation mode to "ONLINE EDIT". Otherwise, the "teach mode" can not be selected.

When the key is depressed in any mode other than the "ONLINE EDIT" mode, error message "Illegal mode" is displayed.

3.3 DATA DISPLAY

In either "monitor mode" or "teach mode", various data in the system can be monitored. In this section, in order to prevent the data from being destroyed, use the "monitor mode". Since "data change" is enabled even in the monitor mode, do not perform any operation other than that specified.

3.3.1 Status Display of I/O

Status of the following I/O can be monitored.

- MC unit I/O
- PLC unit I/O

The operation procedure is as shown below.

(1) Depress DISP key to select "data display mode"(on screen). →

DATA DISPLAY

D	A	T																	

(2) Depress CHAR key.
→ Alphabets and symbols are displayed.

D	A	T																	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P				
Q	R	S	T	U	V	W	X	Y	Z	+	-	*	/	=	#				

(3) For an input point by the cursor keys, select "I",
or for an output point, select "O" using ▶
◀ keys.

D	A	T																	
I																			

Then depress the ENT key.

→ "I" or "O" is displayed.

(4) Input the I/O reference No. to be monitored
(for example, "5").

D	A	T																	
I	5																		

(5) Depress the ENT key.

→ The ON/OFF status of the selected I/O
No. is displayed.

D	A	T																	
I	0	0	0	5	=	O	F	F								E	N	A	

Note: "ENA" at the right side of the screen indicates that the signal is in the "enabled" status. That is, it is a mode where the ON/OFF status changes according to the I/O service or ladder decoding during MC unit or PLC unit operation.

NOTE When "DIS" or "disabled status" is displayed instead of "ENA", it is a mode where the I/O ON/OFF status can be operated forcedly. In order to prevent the data from being destroyed, refer to Par. 6.1 and change the mode to "ENA".

(6) Move the cursor to the next line and input the reference No. to be monitored (for example, "O48"). Then depress the **ENT** key.

D	A	T																	
I	0	0	0	5	=	O	N					E	N	A					
O	0	0	4	8	=	O	F	F				E	N	A					

→ The ON/OFF status of the selected reference No. is displayed.

(7) Move the cursor to the next line and input the MC unit direct input reference No. to be monitored (for example, "P65"). Then depress the **ENT** key.

D	A	T																	
I	0	0	0	5	=	O	N					E	N	A					
O	0	0	4	8	=	O	F	F				E	N	A					
P	0	0	6	5	=	O	N					E	N	A					

→ The ON/OFF status of the selected reference No. is displayed.

(In this example "P65" indicates the ON/OFF status of overtravel input at the + side of the MC unit 1 first axis.)

Note: Each signal status of the MC units can be monitored with reference Nos. P1 to P84. For details, refer to APPENDIX 2 of the "INSTRUCTION MANUAL OF ADDITIONAL FUNCTIONS" (SIE-C881-1.5).

3.3.2 Display of Register Contents

The contents of PLC unit "data register" can be monitored by the following operation procedure.

(1) Depress the **DISP** key to select "data display mode". →

D	A	T																	
—																			

(2) Move the cursor to the line to be displayed by using the cursor keys. (In this example, the cursor is to be moved one line below by the

▼ key.)

D	A	T																	
—																			

(3) Depress the **CHAR** key.

→ Alphabets and symbols are displayed.

D	A	T																	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P				
Q	R	S	T	U	V	W	X	Y	Z	+	-	*	/	=	#				

(4) Select the register address "W" by using the cursor keys and depress the **ENT** key.

→ "W" is displayed.

D	A	T																	
W																			

(5) Key-in the register No. to be monitored (for example, "10").

D	A	T																	
W	1	0																	

(6) Depress the **ENT** key.

→ The content of the selected register No. is displayed.

Note: "DEC" at the right side of the screen indicates that the displayed value is in the decimal notation.

D	A	T																	
W	0	0	1	0	=	0	1	0	0							D	E	C	

(7) In order to monitor the contents of the next register, depress the **NEXT** key.

→ The content of the next register No. is displayed in the cursor position. The former contents are moved one line up.

NEXT DISPLAY

D	A	T																	
W	0	0	1	0	=	0	1	0	0							D	E	C	
W	0	0	1	1	=	0	5	6	0							D	E	C	

(8) In order to monitor the contents of the previous register, depress the **PREV** key.

→ The contents of the previous register No. are displayed at the cursor position. The former contents are moved one line down.

PREVIOUS DISPLAY

D	A	T																	
W	0	0	1	0	=	0	1	0	0							D	E	C	
W	0	0	1	0	=	0	1	0	0							D	E	C	
W	0	0	1	1	=	0	5	6	0							D	E	C	

3.4 STATUS DISPLAY

Status of MC unit can be monitored. The following describes the operation procedure.

- (1) Depress the **DISP** key to select "status display mode"(on screen).
 - On the second line, the program No. and block No. that are currently executed are displayed.
 - On the third line, the MC unit mode status is displayed.
 - On the fourth line, the alarm code that is occurring in the MC unit is displayed.
- If no alarm occurs, "Normal" is displayed in the alarm code column.

STATUS DISPLAY

S	T	A										
			O	0	0	1		B	0	0	0	1
			M	O	D	E	:	E	d	i	t	
			A	L	A	R	M	:	2	0	1	

S	T	A													
			O	0	0	1		B	0	0	0	1			
			M	O	D	E	:	T	e	a	c	h	i	n	g
			A	L	A	R	M	:	N	o	r	m	a	l	

- (2) If an alarm occurs, depressing **ARM RST** key after eliminating the cause can release the alarm status.

NOTE For details of the "alarm codes", refer to APPENDIX 2.

3.5 DISPLAY OF ERROR MESSAGE

- (1) If minor errors, which are less serious and not listed as alarm codes, occurs in the system, they are displayed on the third and fourth lines in the display section as "error message", regardless of the teach pendant "mode" and "displayed screen".
- (2) The following examples describes the meanings of the symbols displayed at the right side of the screen.

· 6E = MC unit error message

EXAMPLE 1

A	L	A	R	M				6	E	
M	e	m	o	r	y		f	u	l	l

Error message: Meaning = MC unit motion program memory is not sufficient.

· 7E = PLC unit error message

EXAMPLE 2

A	L	A	R	M				7	E	
M	e	m	o	r	y		f	u	l	l

Error message: Meaning = PLC unit motion program memory is not sufficient.

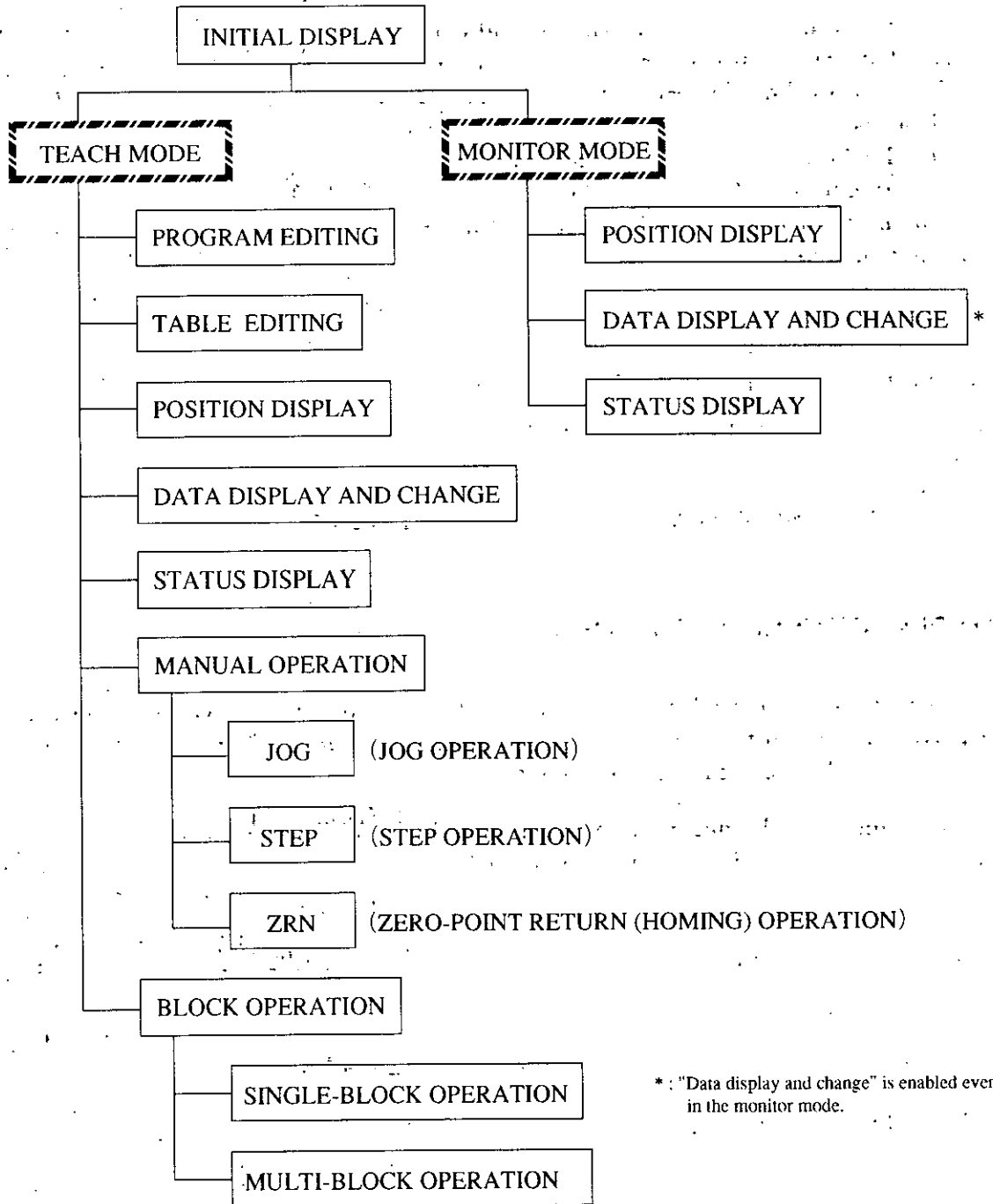
- (3) The display of "error message" can be automatically deleted when the error has been corrected.

NOTE For details of the "error message", refer to APPENDIX 1.

4. LET'S MOVE CONTROL AXES!

4.1 FUNCTION TREE

(1) The following shows the function tree of the teach pendant.
There are two modes: "monitor mode" and "teach mode".



(2) For the main operation procedure of the monitor mode, refer to SECTION 3, "LET'S START OPERATION !".

(3) The main operation procedure of the teach mode is described in the following sections:

- SECTION 4, "LET'S MOVE CONTROL AXES !"
- SECTION 5, "LET'S PERFORM TEACHING !"
- SECTION 6, "LET'S CHANGE DATA !"

NOTE To select the "teach mode" by depressing the **TEACH MODE** key, set the MC unit operation mode to "ONLINE EDIT" in advance. In the "EDIT", "MANUAL" or "AUTO" mode, an error message "Illegal mode" is displayed.

4.2 MANUAL OPERATION PROCEDURE

Before starting the following manual operation procedure, set the MC unit to the "ONLINE EDIT" mode.

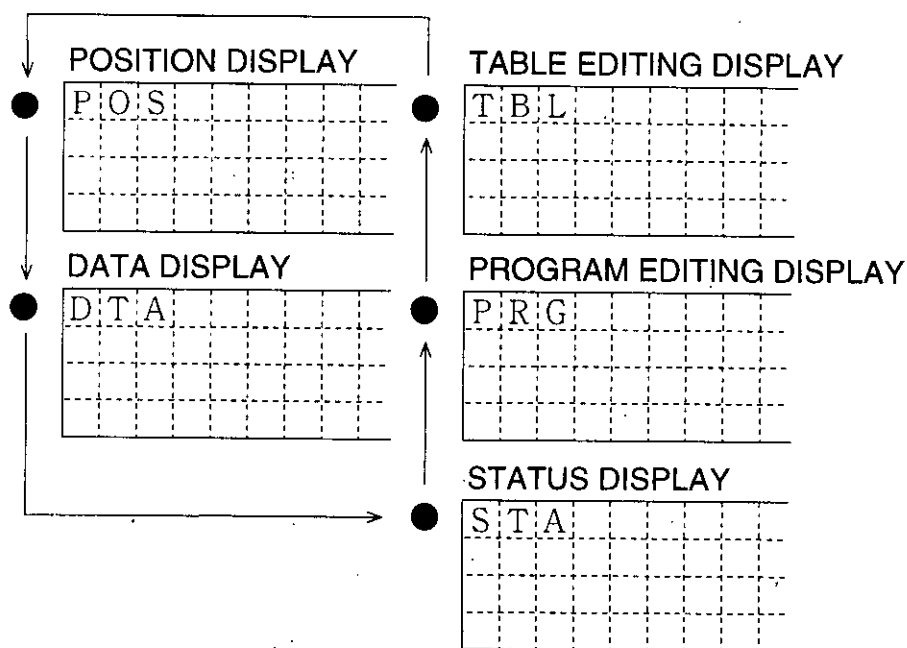
4.2.1 Manual Operation

Manual operation, that is, jog (JOG), step (STEP) or zero-point return(homing) (ZRN) operation is enabled.

The following describes the operation procedure.

- (1) Depress the **TEACH MODE** key so that indicator lamp \bigcirc TEACH will light.
 → The teach mode is selected.

- (2) Depress the **DISP** key.
 → Each time this key is depressed, the display changes as shown in the right.



- (3) Depress the **DISP** key to select "position display".
 → The current value of each axis is displayed.

POSITION DISPLAY

P	O	S		X	1	2	3	4	5	.	6	7	8	
				Y	1	2	3	4	5	.	6	7	8	
				Z	-	1	2	3	4	5	.	6	7	8
				S					0	.	0	0	0	

- (4) Depress the **OPR** key.
 → "Manual operation" and "block operation" are validated.

- (5) Depress the **MAN** key to select either of the following manual operation:

P	O	S		X	1	2	3	4	5	.	6	7	8	
				Y	1	2	3	4	5	.	6	7	8	
				Z	-	1	2	3	4	5	.	6	7	8
				S					0	.	0	0	0	

- ① Jog operation → (Display: \bigcirc JOG lights.)
 ② Step operation → (Display: \bigcirc STEP lights.)
 ③ Zero-point return operation → (Display: \bigcirc ZRN lights.)

(6) Depress the axis key in the direction in which operation is to be performed (for example, key).

① Jog operation:

While the axis key is depressed, the specified axis moves in jog operation; when it is released, the axis stops.

However, when the forward and reverse run keys of one axis are depressed simultaneously, the axis does not move.

JOG OPERATION DISPLAY

J	O	G	X	6	5	4	3	2	1	0		
			Y	8	3	4	5	6	7	8		
			Z	-	1	2	3	4	5	6	7	8
			S				0	0	0	0		

② Step operation:

Each time the axis key is depressed, the axis moves by the set "step value" at the set "feed speed override".

STEP OPERATION DISPLAY

S	T	E	P	X	6	5	4	3	2	1	0	
			Y	6	0	2	9	6	7	8		
			Z	-	1	2	3	4	5	6	7	8
			S				0	0	0	0		

③ Zero-point return (homing) operation:

When the axis key is depressed, zero-point return operation starts and the axis returns to the zero point. However, it cannot be stopped during movement by depressing the key.

(However, when the "ESP" switch is connected properly, it can be halted by depressing the switch. For the connecting method, refer to Par. 7.1.)

(7) The above operations can be used for each axis so that the axis can be moved to the position where teaching is to be performed.

(8) To cancel manual operation:

Depress the key.

→ The manual operation mode is canceled and the display returns to "position display".

(Depressing the key again can also cancel the manual operation mode.)

NOTE

When "manual operation" is executed, do not conduct communication operation using the PLC unit "communication port 1".

Especially, if communication is conducted by communication port 1 during "jog operation", jog operation may not be performed smoothly.

4.2.2 Feed Speed Override and Step Value Setting

"Feed speed override" of jog or step operation and "step value" of step operation can be set.
The following describes the operation procedure:

- (1) Depress the **TEACH MODE** key to select the teach mode.

Assume that "jog operation display" is selected.

JOG OPERATION DISPLAY

J	O	G		X	1	2	3	4	5	6	7	8	
				Y	1	2	3	4	5	6	7	8	
O	0	0	1	Z	-	1	2	3	4	5	6	7	8
B	0	0	0	1	S				0	0	0	0	



- (2) Depress the **OVER RIDE** key.

→ "Override setting display" appears.

This display sets % for "first feed speed (parameter: PA04*).

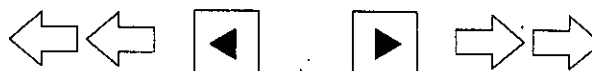
OVERRIDE SETTING DISPLAY

O	v	e	r	r	i	d	e					
1	s	t	.	s	p	e	e	d	*	1	0	%

- (3) Depress  or  key to select the override

value in %.

→ The available % values are as shown on the right.



- (4) Depress the **ENT** or  key.

→ The override value in % is set

and the display

changes to "step value setting display".

The "step value" default value is in units of "10" command units.

1, 2, 4, 8, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 %

STEP VALUE SETTING DISPLAY

S	t	e	p	v	o	l	.	X			1	0
				Y							1	0
				Z							1	0
				S							1	0

- (5) Key-in the "step value" of the desired axis.

The setting range is in units of 1 to 65535.

S	t	e	p	v	o	l	.	X	5	0	0	0
				Y	4	0	0	0				
				Z							1	0
				S							1	0

- (6) Depress the **ENT** key.

→ Enter the step value and the display returns to the former jog operation display.

J	O	G		X	1	2	3	4	5	6	7	8	
				Y	1	2	3	4	5	6	7	8	
O	0	0	1	Z	-	1	2	3	4	5	6	7	8
B	0	0	0	1	S				0	0	0	0	

*: "Parameter: PA04" is a parameter for each axis.

"A" indicates axis No.: 1, 2, 3 or 4.

4.3 BLOCK OPERATION PROCEDURE

In the block operation, single-block operation and multi-block operation are available.
 Before starting the block operation procedure, set the MC unit to the "ONLINE EDIT" mode.

4.3.1 Single-block Operation

The following describes the single-block operation procedure:

- (1) Depress the **TEACH MODE** key so that indicator lamp \bigcirc TEACH will light.

→ The teach mode is selected.

- (2) Depress the **DISP** key to select the "program editing display". →

PROGRAM EDITING DISPLAY

P	R	G													

- (3) Key-in the program No. by using the numerical keys.

(In this example, "1" is keyed in.)

The range of program Nos. is O01 to O99.

P	R	G													

- (4) Depress the **ENT** key.

→ Blocks are displayed in the order from the first block of the specified program No.

P	R	G													

- (5) Select the block to be operated by using the cursor keys.

(In this example, the second block is selected.)

P	R	G													

- (6) Depress the **OPR** key.

→ "Block operation" and "manual operation" are validated.

- (7) Depress the **BLK** key.

→ Indicator lamp \bigcirc BLOCK lights and the block operation mode is selected.

An asterisk * is displayed in the block to be executed.

B	L	K													

- (8) Depress the **ENT** key.

→ The block to be executed has been selected.

(9) Depress the **START** key.

→ The specified one block operation is executed.
After execution, the asterisk moves to the next block.

B	L	K			O	0	1		B	0	0	0	3	
	N	0	0	1	M	O	V		X	1	2	3	4	5
					M	O	V		Y	1	2	3	4	5
*					M	O	V		Z	1	2	3	4	5

(10) To operate one block after another continuously, repeat steps (8) and (9).

(11) To cancel block operation, depress the **ESC** key.

→ The block operation mode is canceled and the display returns to the "program editing display".

(Depress the **OPR** key again can also cancel the block operation mode.)

P	R	G			O	0	1		B	0	0	0	1	
	N	0	0	1	M	O	V		X	1	2	3	4	5
					M	O	V		Y	1	2	3	4	5
					M	O	V		Z	1	2	3	4	5

4.3.2 Multi-block Operation

The following describes the multi-block operation procedure:

(1) Depress the **TEACH MODE** key so that indicator lamp

○TEACH will light.

→ The teach mode is selected.

(2) Depress the **DISP** key to select the "program editing display". →

PROGRAM EDITING DISPLAY

P	R	G				O			B				

(3) Key-in the program No. by using the numerical keys.

(In this example, "10" is keyed in.)

The range of program Nos. is O01 to O99.

P	R	G				O	1	0	B				

(4) Depress the **ENT** key.

→Blocks are displayed in the order from the first block of the specified program No.

P	R	G				O	1	0	B	0	0	0	1		
			N	0	0	1	M	O	V	X	1	2	3	4	5
							M	O	V	Y	2	3	4	5	6
							M	O	V	Z	3	4	5	6	7

(5) Select the first block to be operated by using the cursor keys.

(In this example, it is still the first block.)

P	R	G				O	1	0	B	0	0	0	1		
			N	0	0	1	M	O	V	X	1	2	3	4	5
							M	O	V	Y	2	3	4	5	6
							M	O	V	Z	3	4	5	6	7

(6) Depress the **OPR** key.

→"Block operation" and "manual operation" are validated.

(7) Depress the **BLK** key.

→ Indicator lamp ○BLOCK lights and the block operation mode is selected.

An asterisk * is displayed in the block to be executed.

PROGRAM OPERATION MODE

B	L	K				O	1	0	B	0	0	0	2		
*			N	0	0	1	M	O	V	X	1	2	3	4	5
							M	O	V	Y	2	3	4	5	6
							M	O	V	Z	3	4	5	6	7

(8) Depress the **▼** key to select the last block to be executed.

→Asterisks are displayed in all blocks to be executed.

B	L	K				O	1	0	B	0	0	0	3		
*			N	0	0	1	M	O	V	X	1	2	3	4	5
*							M	O	V	Y	2	3	4	5	6
*							M	O	V	Z	3	4	5	6	7

(9) Depress the **DEL** key.

→Multi-blocks to be executed have been selected.

(In this example, the above three blocks are to be executed.)

(10) Depress the **START** key.

→The specified multi-block operation is executed.
After execution, the asterisk moves to the next block.

B	L	K			O	1	0	B	0	0	0	4	
*	N	0	0	1	M	O	V	X	4	5	6	7	8
*					M	O	V	Y	5	6	7	8	9
*					M	O	V	Z	6	7	8	9	0

(11) To continue multi-block operation, repeat steps (8) to (10).

(12) To hold block operation, depress the **HOLD** key.

→The system is in the "hold status". That is, the axes stop moving immediately when this key is depressed.

B	L	K			O	1	0	B	0	0	0	5	
					M	O	V	X	4	5	6	7	8
*					M	O	V	Y	5	6	7	8	9
*					M	O	V	Z	6	7	8	9	0

(13) To release the "hold status", depress the **START** key.

→Block operation restarts.

(Depressing the **HOLD** key again can also release the hold status.)

(14) To cancel block operation, depress the **ESC** key.

→The block operation mode is canceled and the display returns to the "program editing display".

(Depressing the **OPR** key again can also cancel block operation.)

P	R	G			O	1	0	B	0	0	0	7	
					M	O	V	X	3	2	1	9	8
					M	O	V	Y	2	3	4	5	6
					M	O	V	Z	1	2	3	4	5

5. LET'S PERFORM TEACHING!

In the teach mode, display and editing (changing or adding) of the MC unit "motion program" or "point table" can be performed.


To enter the teach mode, it is necessary that the MC unit is in the "ONLINE EDIT" mode.

5.1 PROGRAM EDITING


5.1.1 Program Display

The following describes the operation procedure to display a motion program.

However, set the MC unit to the "ONLINE EDIT" mode in advance.

- (1) Depress the  key so that indicator lamp \bigcirc TEACH will light.

→ The teach mode is selected.

- (2) Depress the  key to select the "program editing display": →

PROGRAM EDITING DISPLAY


P	R	G				O			B		

- (3) Key-in the program No. by using the numerical keys.

(In this example, "5" is keyed in.)


The range of program Nos. is 001 to 099.

P	R	G				O	0	5	B		

- (4) Depress the  key.

→ Blocks are displayed in the order from the first block of the specified program No.


P	R	G				O	0	5	B	0	0	0	1		
			N	0	0	1	M	O	V	X	5	4	3	2	1
							M	O	V	Y	4	3	2	1	0
							M	O	V	Z	3	2	1	0	9

- (5) To display blocks in the order from the specified block, depress the  key.

→ The cursor returns to one step prior to the operation status.

The other status do not change.

P	R	G				O	0	5	B	0	0	0	1		
			N	0	0	1	M	O	V	X	5	4	3	2	1
							M	O	V	Y	4	3	2	1	0
							M	O	V	Z	3	2	1	0	9

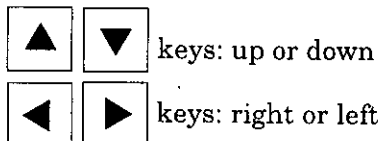
- (6) Depress  key and move the cursor to the right end. Then key-in the desired block No. (In this example, block No. "99" is keyed in.)

P	R	G				O	0	5	B	0	0	9	9		
			N	0	0	1	M	O	V	X	5	4	3	2	1
							M	O	V	Y	4	3	2	1	0
							M	O	V	Z	3	2	1	0	9

- (7) Depress the **ENT** key.
 → Blocks are displayed in the order from the specified block No. of the specified program No.

P	R	G				O	0	5		B	0	0	9	9	
						M	O	V		X	0	9	8	7	6
						M	O	V		Y	1	2	3	4	5
						M	O	V		Z	2	3	4	5	6

- (8) The display can be scrolled by using the cursor keys.



5.1.2 Program Change

The following describes the operation procedure to change the specified block data of the existing motion programs.

- (1) Key-in the program No. and block No. by "program display" operation to display the data.

- (2) Move the cursor to the place to be corrected in the block by using the cursor keys.
 To change commands, move the cursor to the head of the block.

P	R	G				O	0	5		B	0	0	1	1	
						M	O	V		X	3	4	5	6	7
						M	V	S		X	2	3	4	5	6
						M	O	V		Z	1	2	3	4	5

- (3) Depress the **INST** key.
 → The motion command list is displayed.


P	R	G				O	0	5		B	0	0	1	1	
						M	O	V		Z	1	2	3	4	5
						M	O	V		M	V	S	M	C	W
						T	I	M		P	X	Y	P	Z	Y
										P	X	Z			

- (4) Select the command to be changed by using the cursor keys.
 In this example, command "MVS" (linear interpolation) is selected.

P	R	G				O	0	5		B	0	0	1	1	
						M	O	V		Z	1	2	3	4	5
						M	O	V		M	V	S	M	C	W
						T	I	M		P	X	Y	P	Z	Y

- (5) Depress the **ENT** key.
 → The selected command is input to the place where the cursor was located.

P	R	G				O	0	5		B	0	0	1	1	
						M	O	V		X	3	4	5	6	7
						M	V	S		X	2	3	4	5	6
						M	V	S		Z	1	2	3	4	5

- (6) To change the next axis address, move the cursor to that location (in this example, "Z") by using  key.

P	R	G				O	0	5		B	0	0	1	1	
						M	O	V		X	3	4	5	6	7
						M	V	S		X	2	3	4	5	6
						M	V	S		Z	1	2	3	4	5

- (7) Depress the **CHAR** key.
 → Alphabets and symbols are displayed.

P	R	G				O	0	5		B	0	0	1	1	
						M	V	S		Z	1	2	3	4	5
						A	B	C		D	E	F	J	H	I
						Q	R	S		T	U	V	W	X	Y
						Z	+	-		*	/	=	#		

(8) Select the address to be inserted (in this example, "Y").

P	R	G						O	0	5		B	0	0	1	1	
								M	O	S		Z	1	2	3	4	5
A	B	C	D	E	F	J	H	I	J	K	L	M	N	O	P		
Q	R	S	T	U	V	W	X	Y	Z	+	-	*	/	=	#		

(9) Depress the **ENT** key.

→ The selected address is inserted.
The cursor moves to the next axis address.

P	R	G						O	0	5		B	0	0	1	1	
								M	O	V		X	3	4	5	6	7
								M	V	S		X	2	3	4	5	6
								M	V	S		Y	Z	1	2	3	4

(10) Depress the **DEL** key.

→ One character on the cursor is deleted.
(In this example, "Z" is deleted.)

P	R	G						O	0	5		B	0	0	1	1	
								M	O	V		X	3	4	5	6	7
								M	V	S		X	2	3	4	5	6
								M	V	S		Y	1	2	3	4	5

(11) Depress the **ENT** key.

→ The changed block is input.
The cursor is moved to the head of the next block.

P	R	G						O	0	5		B	0	0	1	2	
								M	V	S		X	2	3	4	5	6
								M	V	S		Y	1	2	3	4	5
								M	O	V		S	1	2	3	4	5

(12) Repeat steps (2) to (11) to change the necessary blocks.

NOTE

When program change (rewriting) is performed, interactive input is not available.

Depress the **CHAR** key to display the menu and select necessary address.

Programs cannot be changed "during operation mode".

Depress the **OPR** key again to cancel "during operation mode" and change the program.

5.1.3 Program Insertion

The following describes the operation procedure to add data for one block while position teaching is performed at the specified position of an existing motion program.

(1) Key-in the desired program No. and block No. by "program display" operation to display the data.

P	R	G				O	0	5				B	0	0	2	5
						M	O	V		X	3	4	5	6	7	
						M	O	V		X	2	3	4	5	6	
						M	O	V		Z	1	3	4	5	6	

(2) Move the cursor to the head of the block to be inserted by using the cursor keys.

P	R	G				O	0	5				B	0	0	2	5
						M	O	V		X	3	4	5	6	7	
						M	O	V		Z	2	3	4	5	6	

(3) Depress the **ENT** key.

→ The line where the cursor is located is fed and becomes blank. The cursor does not move.

(4) Depress the **INST** key.

→ The motion command list is displayed.

P	R	G				O	0	5				B	0	0	2	5	
						M	O	V		Z	1	2	3	4	5		
			M	O	V	M	V	S	M	C	W	M	C	C			
			T	I	M	P	X	Y	P	Z	Y	P	X	Z			

(5) Select the command to be inserted by using the cursor keys.

(In this example, "MVS" is selected.)

P	R	G				O	0	5				B	0	0	2	5	
						M	O	V		Z	1	2	3	4	5		
			M	O	V	M	V	S	M	C	W	M	C	C			
			T	I	M	P	X	Y	P	Z	Y	P	X	Z			

(6) Depress the **ENT** key.

→ The selected command is input to the cursor position. After that, the axis data receiving waiting status is entered.

P	R	G				O	0	5				B	0	0	2	5
						M	O	V		X	3	4	5	6	7	
						M	V	S		X						
						M	O	V		S	2	3	4	5	6	

Note: In this step, "key input" of axis data is enabled.

Each time the **ESC** key is depressed, the address is changed in the order

of X→Y→Z→S→F→... Select the address and key-in the

data and depress the **ENT** key to input the data. In this way, when

data for one block are created, depress the **PREV** and **ENT** key to ensure the insertion.

(7) Depress the **OPR** key.

→ "Manual operation" and "block operation" are validated.

(8) Depress the **MAN** key to select one of the following manual operations.

- ① Jog operation mode
- ② Step operation mode
- ③ Zero-point return mode

S	T	E	P	X					1	.	2	3	4
				Y					5	.	6	7	8
				Z					0	.	0	0	0
				S					0	.	0	0	0

By any of the above operation procedures or move each control axis to the position to be taught.
(For details of manual operation, refer to Par. 4.2.1.)

(9) Depress the **REC** key.

→ The current position data of the axis where manual operation was performed is input as axis data.

P	R	G							O	0	5	B	0	0	2	5
	3	4	5	6	7				6	7	8	Z	4	5	4	5
	1	.	2	3	4				Y	5	.	6	7	8	F	
	2	3	4	5	6				0	S	2	3	4	5	.	5

The display is scrolled so that the cursor will be at the position of address F of feed speed.

(10) Key-in the feed speed by using the numerical keys.

In this example, (F) "1000.0" is keyed in.

P	R	G							O	0	5	B	0	0	2	5					
	6	7	8						Z	4	5	4	5	.	3	3	3	;			
									Y	5	.	6	7	8	F	1	0	0	0	.	0
	0								S	2	3	4	5	.	5	6	7	;			

(11) Depress the **PREV** and **ENT** keys.

→ End-of-block code (;) is written in and one block insertion is completed.

P	R	G							O	0	5	B	0	0	2	6	
									M	O	V	X	3	4	5	6	7
									M	V	S	X	1	.	2	3	4
									M	O	V	S	2	3	4	5	6

(12) Additional blocks can be inserted by repeating steps (2) to (11).

NOTE

Program insertion and creation are performed by interactive input.

To select the command, the addresses (X, Y, ...F, etc.) are asked automatically by teach pendant.

After "change" or "insertion" of programs, check the operation by referring to Section. 4.3, "BLOCK OPERATION PROCEDURE".

5.2 POINT TABLE EDITING

The contents of "point table" for the "point table method position command" can be displayed or edited.

5.2.1 Display of Point Table

The following describes the operation procedure to display the contents of a point table. However, set the MC unit to the "ONLINE EDIT" mode in advance.

- (1) Depress the **TEACH MODE** key so that indicator lamp \bigcirc TEACH will light.
 →The teach mode is selected.

- (2) Depress the **DISP** key to select "table editing display".

TABLE EDITING DISPLAY

T	B	L	X	0.	0	0	0
0	0	3	Y	0.	0	0	0
			Z	0.	0	0	0
			S	0.	0	0	0

- (3) Key-in the point No. by using the numerical keys.
 (In this example, "15" is keyed in.)

T	B	L	X	0.	0	0	0
0	1	5	Y	0.	0	0	0
			Z	0.	0	0	0
			S	0.	0	0	0

- (4) Depress the **ENT** key.

→ The data of the selected point No. for 4 axes are displayed.

T	B	L	X	4	5.	3	4	5
0	1	5	Y	0.	0	0	0	0
			Z	2	0.	0	0	0
			S	0.	0	0	0	0

- (5) Each time the **NEXT** key is depressed, the data of the next point No. are displayed.

Note: If the key is depressed when point No. 500 is displayed, error message "data error" occurs.

- (6) Each time the **PREV** key is depressed, the data of the previous point No. are displayed.

Note: If the key is depressed when point No. 1 is displayed, error message "data error" occurs.

- (7) Repeat steps (3) to (6) to check the data of the point Nos.

5.2.2 Change of Point Table

The following describes the operation procedure to change the contents of a point table.

(1) Key-in the point No. by the "point table display" operation to display the point data.

(2) Depress the **NEXT** or **PREV** key to select the point No. to be changed.

T	B	L	X	1	2	3	4
0	2	0	Y	5	6	7	8
			Z	0	0	0	0
			S	3	4	5	6

(3) Move the cursor to the axis data side by using the



key.

T	B	L	X	1	2	3	4
0	2	0	Y	5	6	7	8
			Z	0	0	0	0
			S	3	4	5	6

(4) Depress axis key ($\pm X$, $\pm Y$, $\pm Z$ or $\pm S$).

(In this example, **-S** is depressed.)

→ The depressed axis is selected. However, the sign of the depressed axis is also input.

T	B	L	X	1	2	3	4	
0	2	0	Y	5	6	7	8	
			Z	0	0	0	0	
			S	-	3	4	5	6

(5) Key-in the data to be changed by using the numerical keys.

To change the data of the other axes, repeat steps (4) and (5).

T	B	L	X	1	2	3	4
0	2	0	Y	5	6	7	8
			Z	0	0	0	0
			S	6	5	4	3

(6) Depress the **ENT** key.

→ The point data for 4 axes are entered and the cursor moves to the next point No.

T	B	L	X	1	0	0	0	0
0	2	1	Y	5	0	0	0	0
			Z	0	0	0	0	0
			S	0	0	0	0	0

(7) Repeat steps (2) to (6) to change the contents of the necessary point Nos.

NOTE

The table contents cannot be changed "during operation mode".

Depress the **OPR** key again to cancel "during operation mode" and change the program.

5.2.3 Teaching to Point Table

The following describes the operation procedure to teach the position moved by "manual operation" to the point table.

(1) Key-in the point No. by the "point table display" operation to display the point data.

(2) Depress the **NEXT** or **PREV** key to select the point No. to be changed.

T	B	L	X	3	4	5	6	7	8
0	2	5	Y			0	0	0	0
			Z			0	0	0	0
			S			0	0	0	0

(3) Depress the **OPR** key.
→ "Manual operation" and "block operation" are validated.

(4) Depress the **MAN** key to select one of the following manual operations.

- ① Jog operation mode
- ② Step operation mode
- ③ Zero-point return operation mode

J	O	G	X	4	3	2	1
			Y	5	6	7	8
T	B	L	Z	1	2	3	4
0	2	5	S	0	0	0	0

By any of the above operation procedures or combined operation procedures, move each control axis to the position to be taught.

(For details of manual operation, refer to Par. 4.2.1.)

(5) Depress the **REC** key.
→ The current value of the axis where manual operation was performed is input as axis data. Check the value.

T	B	L	X	4	3	2	1
0	2	5	Y	5	6	7	8
			Z	1	2	3	4
			S	0	0	0	0

(6) Depress the **ENT** key.
→ It is entered as the data of the point No. and the next point No. and its contents are displayed.

T	B	L	X	2	3	4	5
0	2	6	Y	6	0	0	0
			Z	0	0	0	0
			S	0	0	0	0

(7) Repeat steps (2) to (6) to teach point data.

6. LET'S CHANGE DATA!

Each item of data in the system can be changed in either "teach mode" or "monitor mode".
Be careful so that important data of the system will not be destroyed.

6.1 I/O STATUS CHANGE

The following I/O status can be changed.

MC unit I/O

PLC unit I/O

The following describes the operation procedure.

(1) Depress the **DISP** key to select "data display".

DATA DISPLAY

D	A	T																	

(2) Depress **CHAR** key.

→ Alphabets and symbols are displayed.

D	A	T																	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P				
Q	R	S	T	U	V	W	X	Y	Z	+	-	*	/	=	#				

(3) For an input reference, select "I", and for an output reference, select "O" by using the cursor keys.

D	A	T																	
O																			

Then depress the **ENT** key.

→ "I" or "O" is displayed.

(4) Input the I/O reference No. to be monitored (for example, "8").

D	A	T																	
O	:	8																	



(5) Depress the **ENT** key.

→ The ON/OFF status of the input/I/O point No. is displayed.

D	A	T																	
O	:	0	:	0	:	0	:	8	=	O	F	F				E	N	A	

Note: "ENA" at the right side of the screen indicates that the signal is in the "enabled" status.


That is, it is a mode where the ON/OFF status changes according to the I/O service or ladder decoding during MC unit or PLC unit operation.


- (6) Move the cursor to the right end by the  key and depress the  key.

→ "ENA" (enabled status) changes to "DIS" (disabled status). Output reference "O8" is forced to be in the "OFF" status.

D	A	T													
O	0	0	0	8	=	O	F	F				D	I	S	


Note: "DIS" (disabled status) is a mode in which the status does not change even if the MC unit or PLC unit is operating but ON/OFF is enabled from the teach pendant forcibly.



Each time the  key is depressed, "DIS" changes to "ENA" and vice versa.

- (7) Move the cursor to the "OFF" position by using the cursor keys and depress the  key.

→ Output "O8" is forced to be in the "ON" status.

D	A	T													
O	0	0	0	8	=	O	N					D	I	S	

- (8) Each time the  key is depressed, "ON" and "OFF" forced status are changed alternately.
→ It is useful for system startup test or fault analyses.

- (9) Unless specified, move the cursor to the right end by the  key and depress the  key to return to the "ENA" status.

D	A	T													
O	0	0	0	8	=	O	F	F				E	N	A	

- (10) The cursor moves to the top of the next line.

D	A	T													
O	0	0	0	8	=	O	F	F				E	N	A	

- (11) Repeat steps (2) to (10) to perform forced ON/OFF operation of I/O.

6.2 AUTOMATIC FORCED OPERATION OF SPECIFIED INPUT POINTS

Only for PLC input reference I1 to I10, "forced ON operation" is enabled easily.

The following describes the operation procedure.

- (1) Depress the **DISP** key to select "data display".

DATA DISPLAY

D	A	T							

- (2) Depress the **INST** key.

→ "Automatic operation display" is entered.

AUTOMATIC OPERATION DISPLAY

A	U	T	O						

- (3) Keep depressing either of **0** to **9**.

(In this example, "9" is depressed.)

→ While the key is depressed, the input reference corresponding to the value (in this example, I0009) is forced to be in the ON status.

A	U	T	O							
	I	0	0	0	9	=	O	N		
								D	I	S

- (4) When the **INST** key is released, the previous "enabled status" is returned.

A	U	T	O							
	I	0	0	0	9	=	O	F	F	
								E	N	A

- (5) To cancel the automatic forced operation mode, depress the **INST** key again.

Note : The above status display is given only when there is a space in the display.

◎ Numerical keys corresponding to input points

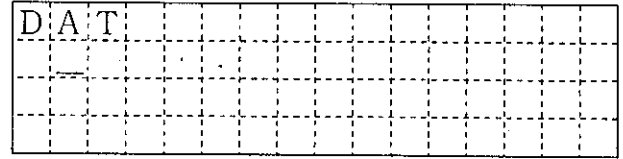
1	= I 0 0 1	6	= I 0 0 6
2	= I 0 0 2	7	= I 0 0 7
3	= I 0 0 3	8	= I 0 0 8
4	= I 0 0 4	9	= I 0 0 9
5	= I 0 0 5	0	= I 0 1 0

Note : To delete the data displayed by automatic forced operation, move the cursor to the top of the line to be deleted and depress the **DEL** key. The line is to be deleted.

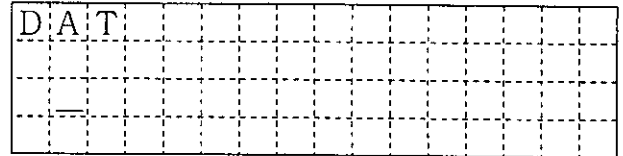
6.3 CHANGE OF REGISTER CONTENTS

The contents of the PLC unit "data register" can be changed in the following operation procedure.

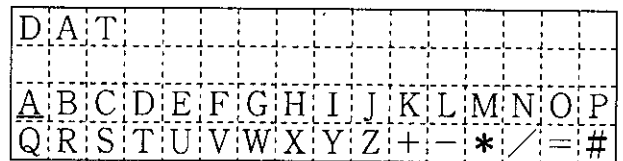
- (1) Depress the **DISP** key to select "data display".
→



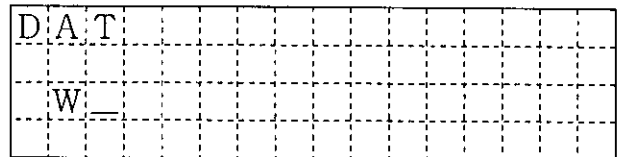
- (2) Move the cursor to the line to be displayed.
In this example, the cursor is moved one line below by the **▼** key.



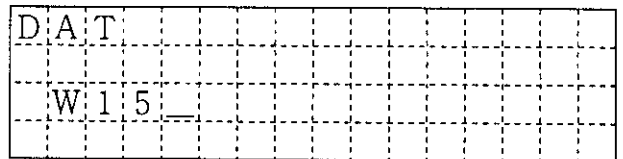
- (3) Depress the **CHAR** key.
→ Alphabets and symbols are displayed.



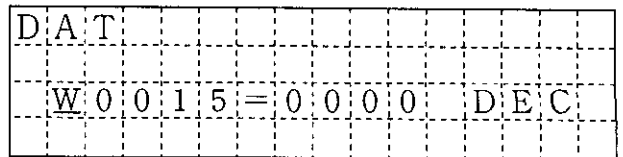
- (4) Select the register address "W" by using the cursor keys and depress the **ENT** key.
→ "W" is displayed.



- (5) Input the register No. to be monitored (for example, "15") and depress the **ENT** key.
→ The contents of the input register No. are displayed.

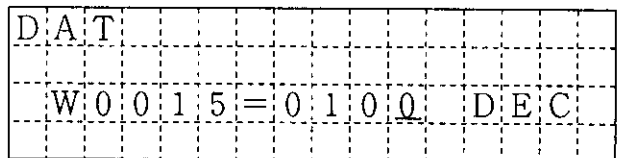


Note: "DEC" at the right side of the display indicates that the displayed value is in decimal notation.



- (6) Move the cursor to the data value and key-in the value to be changed.

- (7) Depress the **ENT** key.
→ The keyed-in data are entered.

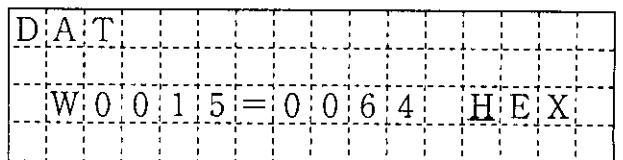


- (8) Move the cursor to the right end and depress the **ENT** key.

→ "DEC" (decimal) changes to "HEX" (hexadecimal).

The data value is displayed in hexadecimal notation.

(Each time the **ENT** key is depressed, "DEC" and "HEX" are changed to each other.)



(9) Depress the **NEXT** key.

→ The next register No. and its contents are displayed at the cursor position.

The former displayed contents move one line up.

The data value is displayed in "HEX".

D	A	T													
W	0	0	1	5	=	0	0	6	4	H	E	X			
W	0	0	1	6	=	0	0	7	8	H	E	X			

(10) Move the cursor to the data value and key-in the value to be changed in hexadecimal notation.

(11) Depress the **ENT** key.

→ The keyed-in data value are entered.

D	A	T													
W	0	0	1	5	=	0	0	6	4	H	E	X			
W	0	0	1	6	=	0	0	9	6	H	E	X			

(12) Repeat steps (2) to (11) to change the contents of arbitrary register Nos.

6.4 CHANGE OF OTHER DATA

The following data can be changed using the same procedures as described in the Section 6.1 and 6.3.

Reference No.	Name	Points	Meaning/Remarks
O1 to O512	Output coil	512 points	Standard I/O: O1 to O96
I1 to I512	Input relay	512 points	Standard I/O: I1 to I160
N1 to N1536	Internal coil	1536 points	N1536 = Battery coil (ON when battery voltage normal)
T1 to T256	Timer coil	256 points	T1 to T128 = 100msec timer T129 to T256 = 10msec timer
C1 to C256	Counter coil	256 points	C1 to C128 = Addition counter C129 to C256 = Subtraction counter
Y1 to Y512	MC unit coil	512 points	Y1 to Y256 = MC unit 1 input variables #11 to #1256 Y257 to Y512 = MC unit 2 input variables #11 to #1256
X1 to X512	MC unit relay	512 points	X1 to X256 = MC unit 1 output variables #01 to #0256 X257 to X512 = MC unit 2 output variables #01 to #0256
Q1 to Q256	MC control coil	256 points	Q1 to Q128 = Control coil for MC unit 1 Q129 to Q256 = Control coil for MC unit 2
P1 to P256	MC control relay	256 points	P1 to P128 = Control relay for MC unit 1 P129 to P256 = Control relay for MC unit 2
MUXX	M code relay	180 points	U = MC unit No.: 1, 2 XX = Code No.: 1 to 89
D1 to D1024	Link coil	1024 points	A type of internal coil
W1 to W2048	Data register	2048 words	W129 to W2048 when "expansion I/O" is provided
W1 to W128	Output register	128 words	Only when "expansion I/O" is provided
Z1 to Z128	Input register	128 words	Only when "expansion I/O" is provided
R1 to R1024	Link register	1024 words	A type of data register
T1 to T256	Timer register	256 words	A register to store timer value
C1 to C256	Counter register	256 words	A register to store counter value
	Input variable	512 points	Y1 to Y512: Refer to with MC unit coil.
	Output variable	512 points	X1 to X512: Refer to with MC unit relay.
#1 to #199	Common variable	199 items	A variable to be used in motion program
H1 to H8	Offset value data	8 items	For MC unit

Note: Only the following system variables cannot be changed. They can be displayed for monitoring.

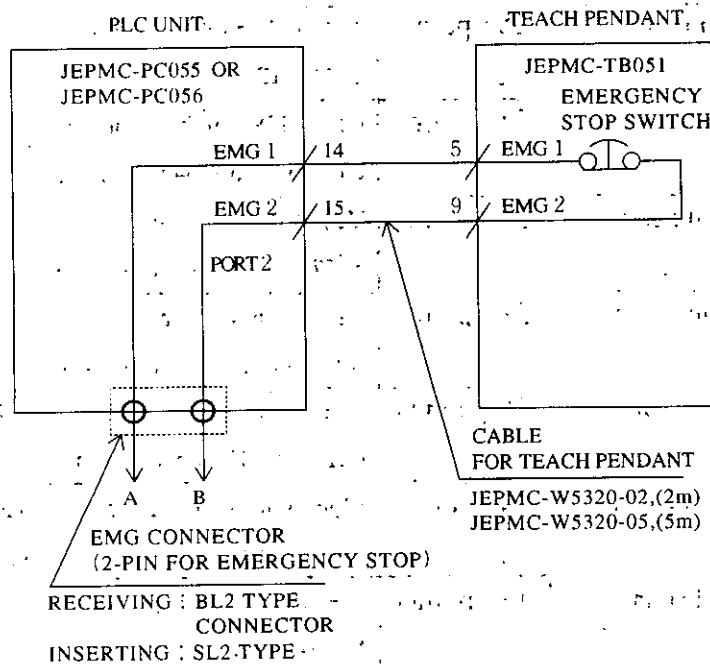
#1001 to #1008	System Variables	8 items	#1001 to #1004: Current position #1005 to #1008: Skip stored position
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7. HARDWARE

7.1 HOW TO USE EMERGENCY STOP SWITCH

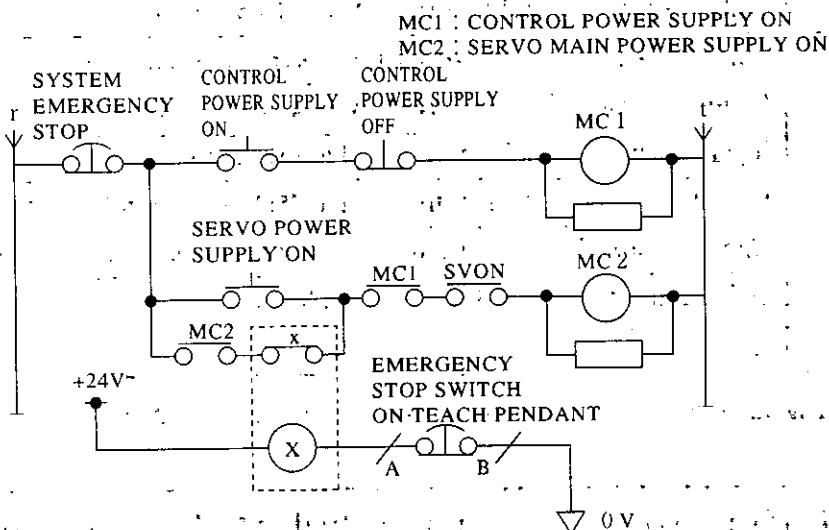
The following shows a typical use of the "emergency stop" switch on the teach pendant.

- (1) The "emergency stop" switch on the teach pendant is not detected internally in the teach pendant or the PLC unit. By connecting the standard "cable for teach pendant", the switch can be led out easily as shown below.



- (2) Supply power down sequence so that the servo main power supply will be turned OFF when the "emergency stop" on the teach pendant is depressed.

A typical sequence is shown below. However, in this sequence, the servo main power supply is turned OFF when the cable for the teach pendant is disconnected.

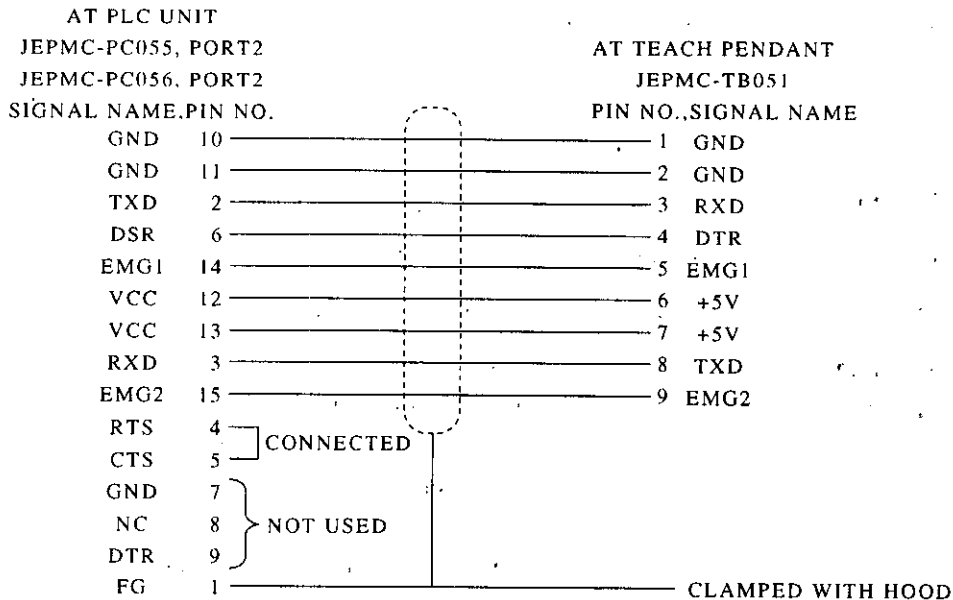


Note: Contact SVON must be turned OFF when SERVOPACK alarm is occurred.

7.2 PIN ASSIGNMENT OF CONNECTION CABLE

The following shows the pin assignment of the cable for the teach pendant.

- Cable type: JEPMC-W5320-02 (2m) or
- JEPMC-W5320-05 (5m)



7.3 SPECIFICATIONS

The following shows the basic specifications for teach pendant.

Teach Pendant Specifications

	Rating
Type	JEPMC-TB051
Display	Liquid crystal module with EL back-lighting (16 alphanumeric characters×4 lines), 9 indicator lamps (LEDs)
EL Lifetime	Brightness weakens after approx 2000 hours' use.
Switches	Operation key Switches × 40
Power Supply	Power is supplied by a cable from the controller.
Environmental Conditions	Ambient Temperature : 0 to 50°C, external air-cooling Storage Temperature : -20 to +60°C Humidity : 30 to 95 % RH (non-condensing) Vibration Resistance : Conforms to JIS C0911 (max.1G) Shock Resistance : Conforms to JIS C0912(max.10G) Location : Free from corrosive or explosive gases, or dust Protected from high temperature and moisture
Outside Dimensions in mm (in.)	85(3.3) (W) × 190(7.5) (H) × 37(1.5) (D)
Approx Mass	450g (0.991lb)

APPENDIX 1 LIST OF ERROR MESSAGES

If a minor error, which is less serious than one causing an alarm, occurs, an "error message" is displayed on the third and fourth lines of the display section. For details, refer to Section. 3.5.

A	L	A	R	M			6	E	
C	o	m	m	a	n	d	e	r	r

6E = MC Unit Error Messages

Message	Cause	Corrective Action
Command error	Communication data fault	Check the teach pendant cable connection. If it does not solve the problem, contact your YASKAWA representative.
COM busy		
CRC check error		
Memory prot. on	The PLC unit memory protect switch is turned "ON".	Turn OFF the memory protect switch.
Nothing MC prog.	The specified program does not exist in the MC unit.	Create the specified program and load it to the MC unit.
COM error	Communication data fault	Contact your YASKAWA representative.
Memory full	The MC unit motion program memory capacity is not sufficient.	Clear the MC unit programs.
FCN code error	Communication data fault	Contact your YASKAWA representative.
Illegal mode	The MC unit operation mode is wrong.	Change the MC unit operation mode.
MC unit busy	Motor is under operation or an MC alarm occurs.	Stop the motor or reset the alarm.
Nothing param.	Motion parameters are not loaded in the MC unit.	Load the motion parameters.
Not exist axis	The axis specified by the motion program does not exist.	Change the motion parameter specified axis or change the actual specified axis.
Duplicate prog.	Communication data fault	Contact your YASKAWA representative.
Illegal NO.	The data value specified by the motion program is out of range.	Change the MC program.
Already opened	The program is already opened.	Close the opened program.
Close error	An attempt was made to close the program which was not opened.	Contact your YASKAWA representative.

6E = MC Unit Error Messages

Message	Cause	Corrective Action
Com time out	The cable for the teach pendant is not connected properly. Or the PROGIC-8 unit power supply is not turned ON.	Verify that the cable is connected properly or that the PROGIC-8 unit power supply is turned ON.
Operating	An attempt was made to input the numerical keys or the CHAR key during operation mode.	Release "during operation mode".
Monitor mode	OPR or OVER RIDE key was depressed in monitor mode.	Depress the key after entering the teach mode.
Illegal data	The reference No. is wrong or out of range. The cursor position is wrong.	Input the correct value in the correct position.
Invalid operat.	O-number is not specified. An attempt was made to input more than two N-numbers in the same block. Or an attempt was made to input a number other than "N".	Input the correct O-number. Input only one N-number at the head of the block.
Character over	One block exceeds 128 characters (bytes).	Reduce the number of characters.
Nothing prog.	A block number which did not exist was input.	Specify the correct block No.
ROM sum error	An error occurred in the system ROM.	Replace the teach pendant.
RAM sum error	An error occurred in the memory.	Replace the teach pendant.
ROM & RAM error	An error occurred in the system ROM and memory.	Replace the teach pendant.
Buffer over	Data exceeding receiving buffer were received.	Check the teach pendant and PLC unit.
COM parity err	A parity error occurred in communication.	Check the communication parameter. Or check the teach pendant, PLC unit and cable.
COM over run err	An overrun error occurred in communication.	Check the communication parameter. Or check the teach pendant, PLC unit and cable.
COM framing err	A framing error occurred in communication.	Check the communication parameter. Or check the teach pendant, PLC unit and cable.

A	L	A	R	M			7	E					
I	n	v	a	l	i	d	c	o	m	m	a	n	d

7E = MC Unit Error Messages

Message	Cause	Corrective Action
Invalid command	Communication data fault	Check the teach pendant cable connection. If it does not solve the problem, contact your YASKAWA representative.
Invalid page		
invalid type		
Invalid param		
Invalid adr		
Invalid ref		
Memory prot. on	The PLC unit memory protect switch is turned "ON".	Turn OFF the memory protect switch.
Login error	A device which is logged in the other port exists.	Log out the logged-in device.
Memory full	The PLC unit sequence program memory capacity is not sufficient.	Clear the memory.
Invalid mode	Communication data fault	Check the teach pendant cable connection. If it does not solve the problem, contact your YASKAWA representative.
UART status err	Communication port fault	Check the teach pendant cable connection. If it does not solve the problem, contact your YASKAWA representative.
I/O alloc. full	The number of assigned expansion I/O points exceeded the specified range.	Recheck the expansion I/O assignment.
I/O slot full	The expansion I/O assignment exceeded the allowable number of slots.	Recheck the expansion I/O assignment.
Ill. port cfg.	The communication parameter is not correct.	Check the PLC unit.
COM fatal error	Communication data fault	Check the teach pendant cable connection. If it does not solve the problem, contact your YASKAWA representative.

APPENDIX 2 LIST OF ALARM CODES

If a fault occurs in the MC unit, an "alarm code" is displayed on the fourth line of the status display. For details, refer to Par. 3.4.

STATUS DISPLAY

S	T	A																		
			O	0	0	1			B	0	0	0	1							
			M	O	D	E		:	E	d	i	t								
			A	L	A	R	M	:	2	0	1									

Message is displayed on the personal computer programmer but not on the teach pendant.

Common Alarms

Code	Message	Cause	Corrective Action
001	Program mem. over	The program capacity was exceeded.	Delete the unnecessary programs.
002	Character over	The number of characters in one block exceeded 128 characters.	Correct the program (number of characters).
003	No prog. num.	The specified program cannot be found.	Load or correct the program.
004	Argument error	No data are provided after the symbol. No symbol is provided before the data.	Correct the program.
005	Numerical error	"-" (minus), "0" (zero) or "." (decimal point) is used improperly. The decimal point is not located at the correct position.	Correct the program. Check the parameter for decimal point setting.
006	Character error	The characters which cannot be used are used in the significant information area.	Correct the program.
007	Data over flow	The digit of the input data is not correct.	Correct the program (the data digit number).
008	Syntax error	The commands which cannot be used are used.	Correct the program.
009	Duplicate error	The commands which cannot be used simultaneously are given in one block.	Correct the program.
010	'F' error	Command F is not provided in interpolation.	Correct the program.

Common Alarms (Cont'd)

Code	Message	Cause	Corrective Action
011	No radius circl.	· The radius is 0 with the circular arc command.	· Correct the program (R, or I, J).
012	Circl. end pos.	· Out-of-range specified error with the circular arc command	· Correct the program (X, Y or R).
013	Illg. prog. num	· P value is out of the setting range.	· Correct the program (P).
014	Notch error	· Wrong parameter setting	· Check the parameter for function setting. · Correct the program.
015	—	None	None
016	Intp. error	· Interpolation command error · Plane command mistake · End-point command mistake	· Correct the program.
017	Invalid H num.	· Wrong designation of compensation No.	· Correct the program.
018	No sub. number	· P is not specified in the block of GSB.	· Correct the program (P).
019	No subprogram	· The program No. cannot be found at calling by GSB.	· Check the related programs.
020	No ret error	· No RET is provided at completion of sub-program.	· Correct the program.

Common Alarms (Cont'd)

Code	Message	Cause	Corrective Action
021	Multi sub. call	· Sub-program calling multiplicity exceeds 5.	· Correct the program so that the sub-program calling multiplicity is within 4.
022	No end error	· END is not provided at completion of program.	· Add END(END).
023	Time set error	· Time is not specified in the TIM block.	· Correct the program.
024	Axis undefined	· The axis to be used is not validated. · The servo power supply of the axis to be used is not turned ON.	· Correct the program. · Check the system setting parameter. · Check the servo-ON circuit. · Check the servo alarm.
025	Divide by ZERO	· Division was executed with 0.	· Correct the program. · Correct the related programs.
026	Over flow	· Overflow occurred at calculating.	· Correct the program. · Correct the related programs.
027	Branch error	· No destination is provided for branching command.	· Correct the program.
028	Repeat error	· END is not provided for repeating command. · The repeating range is overlapped.	· Correct the program.
029	Matrix error	· Matrix setting command set value is out of the setting range. · The numerical value of lattice point positioning command is out of range.	· Correct the program.
030	Point table err	· Designation of point table is out of range.	· Correct the program.

Common Alarms (Cont'd)

071	MC down (1) RAM	· MC unit fault	· Contact your YASKAWA representative.
072	MC down (2) RAM	· MC unit fault	· Contact your YASKAWA representative.
073	MC down (3) RAM	· MC unit fault	· Contact your YASKAWA representative.
074	MC down (4) RAM	· MC unit fault	· Contact your YASKAWA representative.
075	MC down (1) ROM	· MC unit fault	· Contact your YASKAWA representative.
076	MC down (2) ROM	· MC unit fault	· Contact your YASKAWA representative.
077	MC down (3) ROM	· MC unit fault	· Contact your YASKAWA representative.
078	MC down (4) ROM	· MC unit fault	· Contact your YASKAWA representative.
079	Param. broken	· The backup battery is removed. · Power supply system fault · MC unit fault	· Check the PLC built-in battery. · Check the power supply related section. · If the fault occurs again even after resetting the parameters, programs and offset, contact your YASKAWA representative.
080	Axis name dup.	· The axis name is overlapped.	· Correct the program.

Common Alarms (Cont'd)

Code	Message	Cause	Corrective Action
081	Emergency stop	Emergency stop	<ul style="list-style-type: none"> · Release emergency stop. · Check emergency stop input.
082			
083	Battery lo	The battery voltage dropped in the system using "absolute encoder".	<ul style="list-style-type: none"> · Replace the lithium battery (ER6V) in the "PLC unit" immediately. · The battery must be replaced within a month.
084			
085			
086			
087			
088			
089			
090			

(A: Axis Nos. 1 to 4) Each Axis Alarms

Code	Message	Cause	Corrective Action
A01	Servoamp abnorm	· Servo amplifier fault	· Check the servo amplifier error. · If the fault occurs again even after resetting the servo amplifier, contact your YASKAWA representative.
A02	P over travel	· The + direction overtravel signal is turned ON. · Operation mistake, program mistake · Wrong parameter setting	· Check the overtravel LS and reset it. Then retract in the opposite direction. · Check the parameters related to OT alarm detection. · Check the overtravel input signal.
A03	N over travel	· The - (minus) direction overtravel signal is turned ON. · Operation mistake, program mistake · Wrong parameter setting	· Check the overtravel LS and reset it. Then retract in the opposite direction. · Check the parameters related to OT alarm detection. · Check the overtravel input signal.
A04	Deviation over	· Excessive servo system following error	· Check the connection between the MC unit, servo amplifier and motor. · Check the parameters related to system setting and servo characteristics. · Check the machine system loads, etc.
A05	P soft ot	· The + direction software overtravel signal is turned ON. · Operation mistake, program mistake · Wrong parameter setting	· Check the program and operation and reset. Then retract in the opposite direction. · Check the parameter setting related to the soft limit.
A06	N soft ot	· The - direction software overtravel signal is turned ON. · Operation mistake, program mistake · Wrong parameter setting	· Check the program and operation and reset. Then retract in the opposite direction. · Check the parameter setting related to the soft limit.
A07	Positioning miss	· Improper positioning	· Check the parameters related to the servo characteristics. · Check the connection between the servo amplifier and motor. · Check the machine system loads, etc.
A08			
A09			
A10	PG broken wire	· Improper encoder wiring or disconnection · Encoder or servo amplifier fault · MC unit fault	· Check the encoder wiring. · Contact your YASKAWA representative.

(A: Axis Nos. 1 to 4) Each Axis Alarms (Cont'd)

Code	Message	Cause	Corrective Action
A11	Over running	<ul style="list-style-type: none"> Wrong parameter setting Improper motor or encoder wiring Overrun detected in MC unit MC unit fault 	<ul style="list-style-type: none"> Check the system setting parameters. Check the wiring of the motor and encoder. Recheck the servo system by changing the servo characteristics parameter setting, etc. Contact your YASKAWA representative.
A12	Pos. diff. P-on	<p>When an absolute encoder is used;</p> <ul style="list-style-type: none"> An axis moved while power supply was turned OFF. Improper parameter setting Absolute encoder fault 	<ul style="list-style-type: none"> Reset it after checking the machine position and display position. Check the system setting parameters. Check the wiring of the absolute encoder Initialize the absolute encoder.
A13	Motor rot. over	<p>When an absolute encoder is used;</p> <ul style="list-style-type: none"> The motor rotation value exceeded ± 99999 with the encoder initialized position as the reference. 	<ul style="list-style-type: none"> Check the machine position and display position. Check the parameters (gear ratio, etc.). Recheck the system concerning machine stroke, etc. Initialize the absolute encoder.
A14	Encoder alarm	<p>When an absolute encoder is used;</p> <ul style="list-style-type: none"> Absolute encoder alarm Initialize the absolute encoder. 	<ul style="list-style-type: none"> Check the alarm contents by using the SERVOPACK digital operator. Initialize the absolute encoder.
A15	Encoder com err	<p>When an absolute encoder is used;</p> <ul style="list-style-type: none"> Absolute encoder alarm 	<ul style="list-style-type: none"> Check the wiring between the MC unit and servo amplifiers. Check the SEN signal. Check the 24VDC power supply.
A16	Not zero set	<p>When an absolute encoder is used;</p> <ul style="list-style-type: none"> "Zero-point setting" has not been performed. 	<ul style="list-style-type: none"> Perform "zero-point setting".
A17	Zero set error	<p>When an absolute encoder is used;</p> <ul style="list-style-type: none"> Positioning has not been completed at "zero-point setting". "Zero-point setting" was executed during moving. 	<ul style="list-style-type: none"> Check the parameter "positioning completion range". Execute "zero-point setting" after completion of move.
A18	Encdr. b. alarm	<p>When an absolute encoder is used;</p> <ul style="list-style-type: none"> Battery alarm from the absolute encoder 	<ul style="list-style-type: none"> When alarm 083 occurs; Check the battery. When alarm 083 does not occur; Check the wiring between MC unit and servo amplifier, or the servo amplifier and motor.
A19			
A20			

Teach Pendant

FOR MULTIAxes MOTION CONTROLLER PROGIC-8

USER'S MANUAL

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