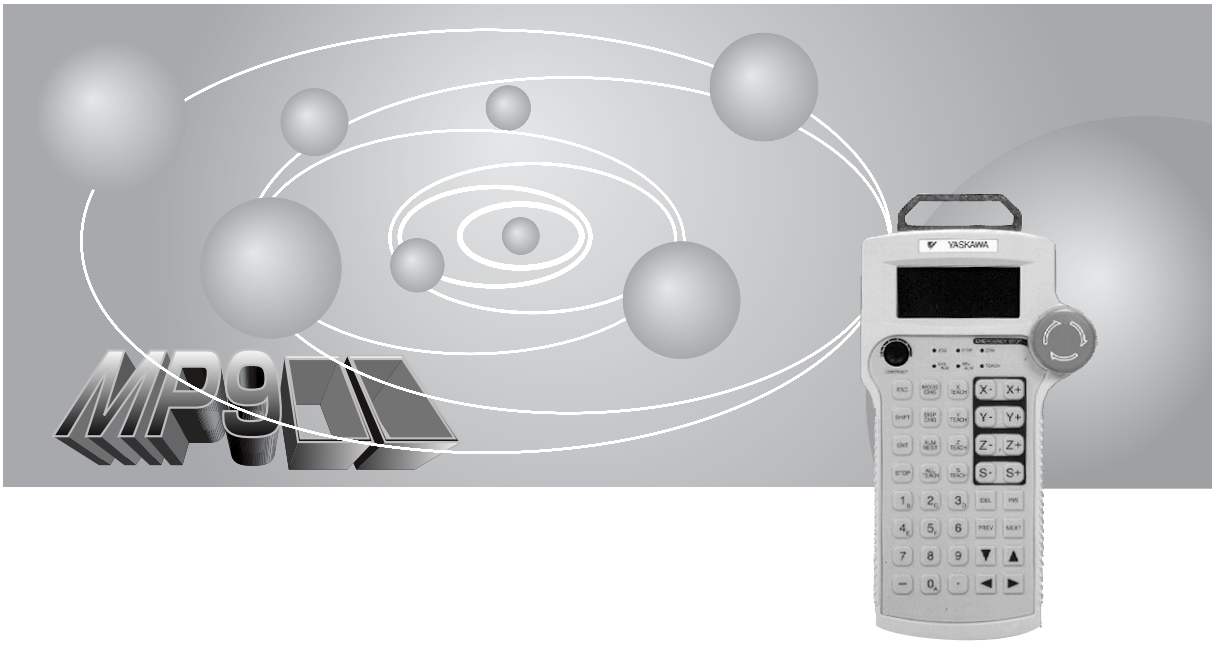
Machine Controller MP9□□

TEACH PENDANT USER'S MANUAL



YASKAWA

MANUAL NO. SIEZ-C887-1.6

Safety Information

The following conventions are used to indicate precautions in this manual. Failure to heed precautions provided in this manual can result in serious or possibly even fatal injury or damage to the products or to related equipment and systems.

⚠ WARNING Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.

⚠ Caution Indicates precautions that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

The warning symbols for ISO and JIS standards are different, as shown below.

ISO	JIS
	

The ISO symbol is used in this manual.

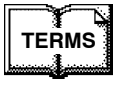
Both of these symbols appear on warning labels on Yaskawa products. Please abide by these warning labels regardless of which symbol is used.

Visual Aids

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

IMPORTANT Indicates important information that should be memorized.

Indicates supplemental information.



- Indicates definitions of terms used in the manual.

OVERVIEW

TABLE OF CONTENTS

Overview of Manual

This manual provides information on using the Teach Pendant for MP9□□ Machine Controllers, and provides information on the following items.

- Hardware specifications
- Description of functions
- Setting and operating methods
- Status and monitoring information

Read this manual carefully in order to properly use the Teach Pendant for MP9□□ Machine Controllers. Keep this manual in a safe place so that it can be used whenever necessary.

Reference Manuals

Refer to the following related manuals as needed.

Thoroughly check the specifications and conditions or restrictions of the product before using it.

Manual Name	Manual Number	Contents
MP920 Machine Controller Design and Maintenance User's Manual	SIEZ-C887-2.1	Describes the design and maintenance for the MP920 Machine Controllers.
MP930 Machine Controller Design and Maintenance User's Manual	SIEZ-C887-1.1	Describes the functions, specifications, and usage of the MP930 Machine Controllers. • Describes functions and specifications. • Describes startup procedures.
MP9□□ Machine Controller Ladder Logic Programming User's Manual	SIEZ-C887-1.2	Describes the instructions used in MP900 Series ladder logic programming.
MP9□□ Machine Controller Motion Programming User's Manual	SIEZ-C887-1.3	Describes the motion programming language used for MP900 Series Machine Controllers.
MP9□□ Machine Controllers CP-717 Engineering Tool Programming Software User's Manual	Part 1: SIEZ-C887-2.2-1 Part 2: SIEZ-C887-2.2-2	Describes the installation and operating procedures for the CP-717 Engineering Tool Programming Software for MP9□□ Machine Controllers.
MP920 Machine Controller Motion Module User's Manual	SIEZ-C887-2.5	Describes the functions, specifications, and usage of the MP920 Motion Modules (SVB-01, PO-01 etc.).
MP920 Machine Controller Communications Module User's Manual	SIEZ-C887-2.6	Describes the functions, specifications, and usage of the MP920 Communications Modules (215IF, 217IF, and 218IF).

Using this Manual

This manual was designed for the following readers.

- Readers who have or will set up a MP9□□ Machine Controller System.

The following functions can be performed from the Teach Pendant, making it very useful for system setup.

- Manual operation
- Teaching positions
- Monitoring internal registers, I/O registers, and the current position of each axis.
- Force-resetting I/O registers and internal registers.

■ Basic Abbreviations

In this manual, the following terms are described as follows unless otherwise specified:

- MP920 = MP920 Machine Controller
- MP930 = MP930 Machine Controller
- MP9□□ = The Machine Controller Series, including the MP920, MP930, etc.
- TP = Teach Pendant

■ Reverse Signal Names

In this manual, a slash is placed in front of the signal name to indicate reverse signals (those valid when they are low).

- $\overline{\text{S-ON}}$ = /S-ON
- $\overline{\text{P-CON}}$ = /P-CON

Safety Precautions

This section outlines safety precautions for the correct use of this product. Read this manual and other related manuals carefully before attempting to install, operate, maintain, or inspect the Teach Pendant for MP9□□ Machine Controllers. Attempt to use the product only after you have a clear understanding of the device, safety precautions, and the safety symbols.

■ Wiring Precautions

⚠ Caution

- Connect the correct power supply for the required ratings.
  Connecting unsuitable power supplies may cause heat damage or fire.
- Wiring must be performed by qualified personnel.
  Wrong or inappropriate wiring may result in fire, failure, or electric shock.
- Care must be taken not to let foreign matter such as cable chips into the Units.
  Foreign matter in the Modules may cause fire, failures and/or malfunctions.

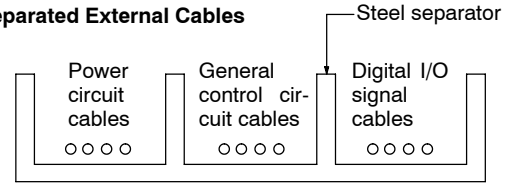
Mandatory

- Ground the protective ground terminal to a resistance of 100 Ω or less.
  Not grounding the protective ground terminal may result in electric shock or malfunction.

Select, separate, and lay external cables correctly.

- Consider the following items when selecting the I/O signal lines (external cables) to connect the MP9□□ to external devices.
  - Mechanical strength
  - Noise interference
  - Wiring distance
  - Signal voltage, etc.
- Separate the I/O signal lines from the power lines both inside and outside the control panel to reduce the influence of noise from the power lines.
  If the I/O signal lines and power lines are not separated properly, malfunction may result.

Example of Separated External Cables



■ Application Precautions

⚠ WARNING

- Do not touch Unit terminals while the power is turned ON.

  Touching Unit terminals may cause electric shock.

⚠ Caution

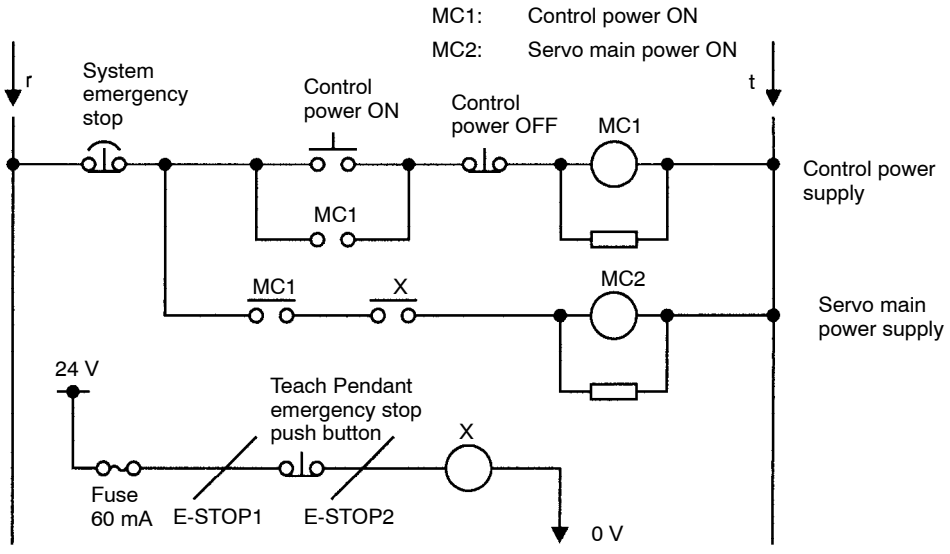
- Do not perform operations such as RUN, STOP, forced outputs, and MP9□□ program changes during operation.

  Operational or programming errors may damage the machine or cause accidents.

⚠ WARNING

- Refer to the following circuit diagram when constructing an emergency circuit using the emergency stop pushbutton on the Teach Pendant.

  The following example shows a Teach Pendant emergency stop circuit. With this circuit, the main power supply to the Servo will be cut OFF when the Teach Pendant cable is disconnected.



■ Maintenance Precautions

⃠ Prohibited

- Do not attempt to disassemble or modify the Units in any way.
  Doing so may cause fires, product failure, or malfunctions.
- Do not replace the built-in fuse.
  Replacing the built-in fuse may cause damage to the Unit or malfunction. To replace the fuse, contact you nearest Yaskawa Service Center.

■ General Precautions

Always note the following to ensure safe use.

- The MP9□□ was not designed or manufactured for use in devices or systems directly related to human life. Users who intend to use the product described in this manual for special purposes such as devices or systems relating to transportation, medical, space aviation, atomic power control, or underwater use must contact Yaskawa Electric Corporation beforehand.
- MP9□□ has been manufactured under strict quality control guidelines. However, if this product is to be installed in any location in which a failure of MP9□□ involves a life and death situation or in a facility where failure may cause a serious accident, safety devices MUST be installed to minimize the likelihood of any accident.
- Drawings in this manual show typical product examples that may differ somewhat from the product delivered.
- This manual may change without prior notice due to product improvements and specification changes or for easier use. We will update the manual number of the manual and issue revisions when changes are made. The revision number of the revised manual appears on the back of the manual.
- Contact your nearest Yaskawa sales representative or the dealer from whom you purchased the product and quote the manual number on the front page of the manual if you need to replace a manual that was lost or destroyed.
- Contact your nearest Yaskawa sales representative or the dealer from whom you purchased the product to order new nameplates whenever a nameplate becomes worn or damaged.
- Products modified by the customer are not covered by the Yaskawa warranty, nor does Yaskawa assume any liability for injury or damage that may result from such modifications.

1

Specifications and System Configuration

This chapter describes the specifications and system configuration for the MP9□□-Series Teach Pendant.

1.1 Specifications and Appearance

This section describes the specifications and appearance of the Teach Pendant.

1.1.1 General Specifications

The general specifications for the Teach Pendant are given in the following table.

Item		Specifications
Environmental Conditions	Ambient Operating Temperature	0 to 40°C
	Storage Temperature	–20 to 60°C
	Ambient Operating Humidity	20% to 80% RH (with no condensation)
	Ambient Storage Humidity	5% to 95% RH (with no condensation)
	Pollution Level	Pollution level 1 (conforming to JIS B3501)
	Corrosive Gas	No corrosive or flammable gases
	Operating Altitude	2000 m or less above sea level
Electrical Operating Conditions	Noise Resistance	1,000 V in either normal or common mode with pulse widths of 1 μs (with noise simulator) (conforming to JIS B3502)
Mechanical Operating Conditions	Vibration Resistance	Conforms to JIS B3502.
	Shock Resistance	Functionality will be maintained for a free-fall drop of up to 1.2 m, but the case and LED area may be damaged.
Installation Requirements	Cooling Method	Natural cooling

1.1.2 Hardware Specifications

The hardware specifications for the Teach Pendant are shown in the following table.

Item	Specifications
Model Name	MP9□□-Series Teach Pendant
Model Number	JEPMC-TB350
Serial Interface	RS-232C with baud rate of 19.2 kbps max.
LED Area	Display capacity: 128×56-dot graphic display 21 characters× 7 rows 5×7-dot fonts STN transmissive grey-mode liquid crystals Adjustment knob for LCD contrast LED backlight (color: yellow-green) Status LEDs: 2 orange, 4 green
Power Supply Voltage and Current Consumption	Approx. 200 mA at 24 VDC +10% to –35% (using chopper regulator)
Operation Keys	5×8 keys in a matrix layout
Emergency Stop	Red mushroom-shape pushbutton with 32 mm diameter (conforming to EN standards). Push to lock, turn to reset. Special wiring to N.C. contact.
Communications Connector	HR22-12TPM-13SC, 13 pins
Dimensions	Approx. 122 × 211 × 37.6 mm (W×H×D) The holding section is approximately 87 mm wide.
Approximate Mass	400 g

1.1.3 Appearance

The following diagram shows the appearance of the MP9□□-Series Teach Pendant.

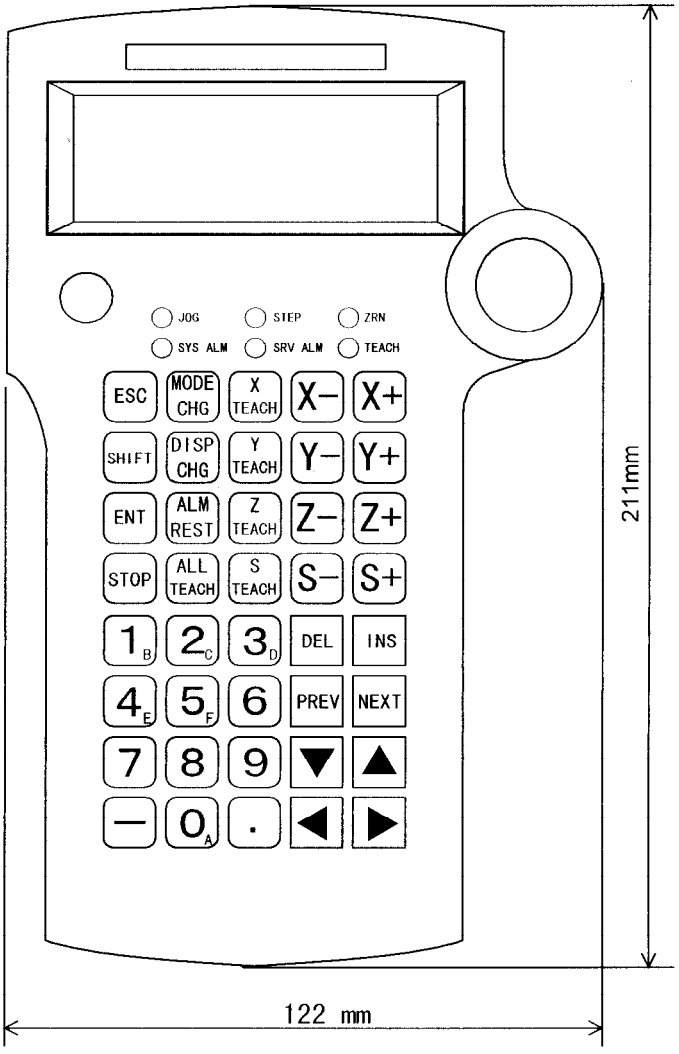


Figure 1.1 Appearance of the Teach Pendant

1.2 System Configuration

This section describes the system configuration in which the Teach Pendant is used.

1.2.1 System Configuration Example

The following diagram shows an example system configuration when the Teach Pendant is connected to the MP930.

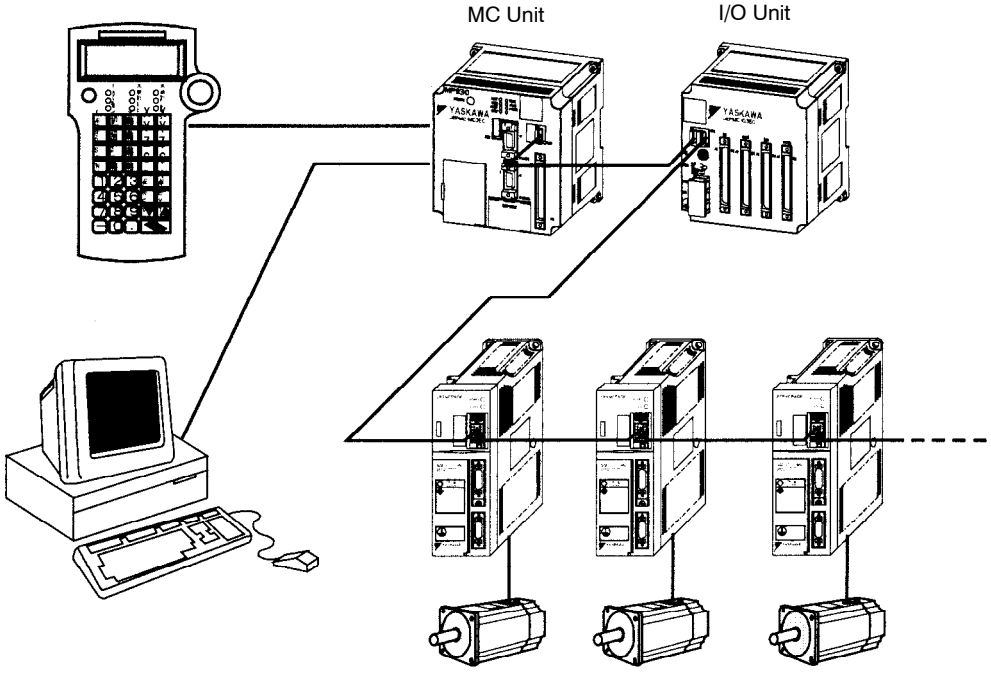
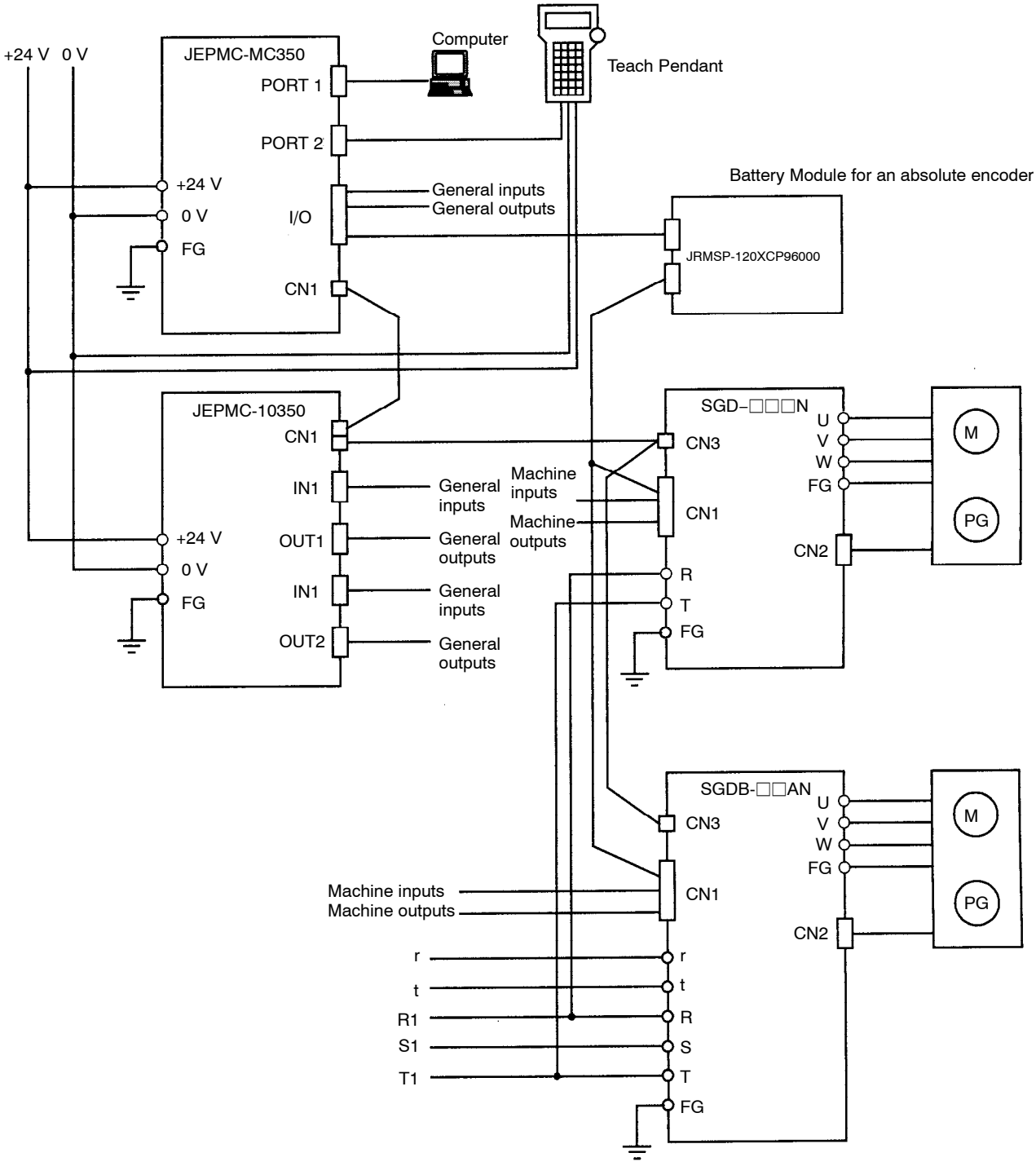


Figure 1.2 Basic System Configuration

1.2.2 Connection Example

The following diagram shows a system connection example when an MP930 and the Teach Pendant are used.

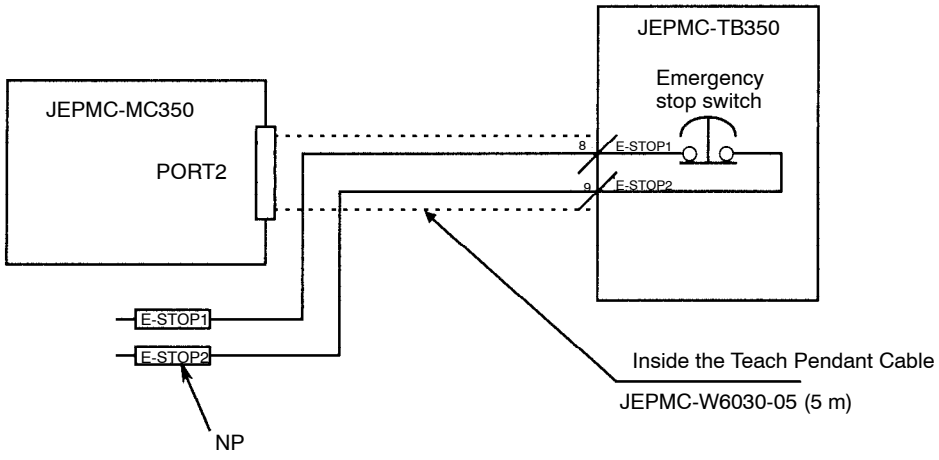


1.2.3 Using the Emergency Stop Input

An example of how to use the emergency stop switch on the Teach Pendant is described below.

■ Connecting the Emergency Stop Switch

The emergency switch on the Teach Pendant cannot be detected inside either the Teach Pendant or the MP9□□ Machine Controller. When a standard Teach Pendant Cable is connected, the switch connection wires can easily be pulled out, as shown in the following diagram.



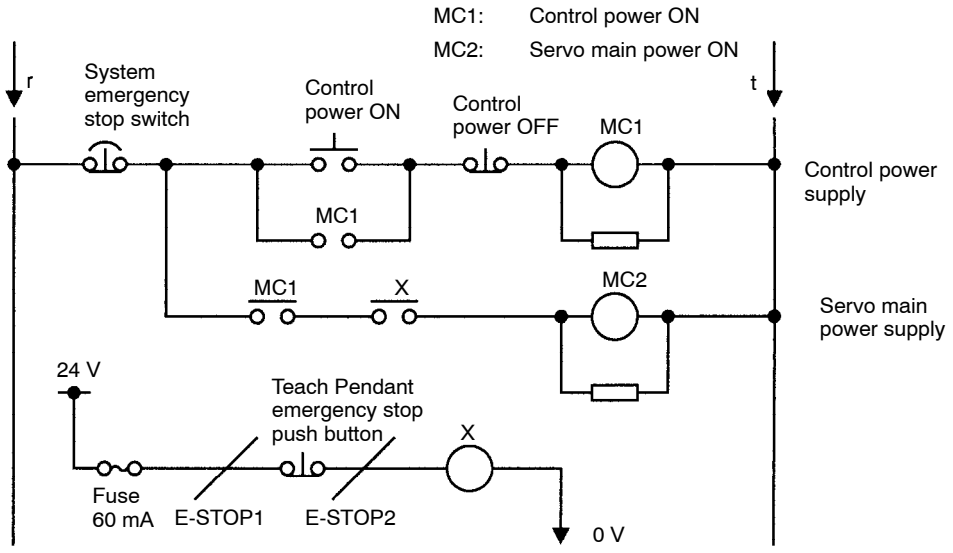
IMPORTANT

Cable disconnection is monitored by the interface ladder for the MP9□□ Teach Pendant. The monitoring, however, is affected by the scan time and other factors, and the circuit should be made to activate a hardware emergency stop.

■ Power ON Sequence Example

Construct the power ON sequence so that the main power supply to the Servo is turned OFF when the Teach Pendant emergency switch is pressed.

The following diagram provides an example of that sequence. In this example, the main power supply to the Servo will turn OFF when the Teach Pendant Cable is disconnected.



1.2.4 Standard Cables

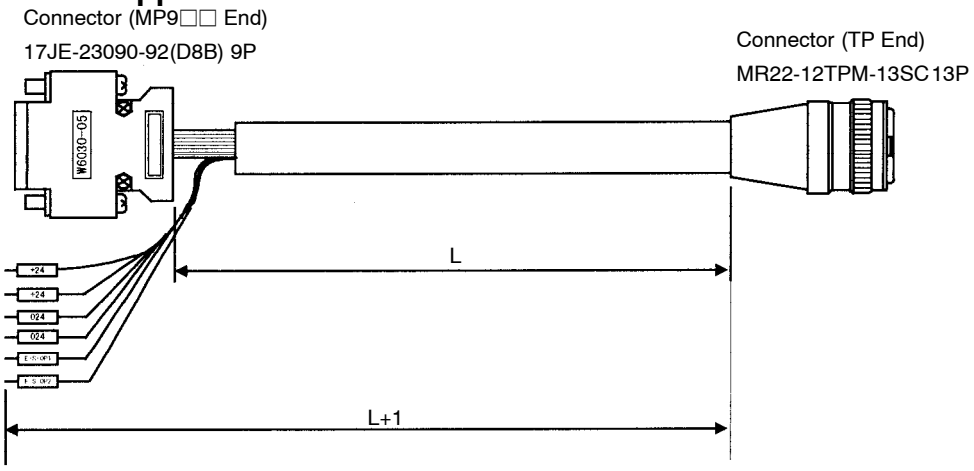
■ Connecting Directly to a MP9□□ Machine Controller

Use one of the following cables to connect the Teach Pendant directly to an MP9□□ Machine Controller.

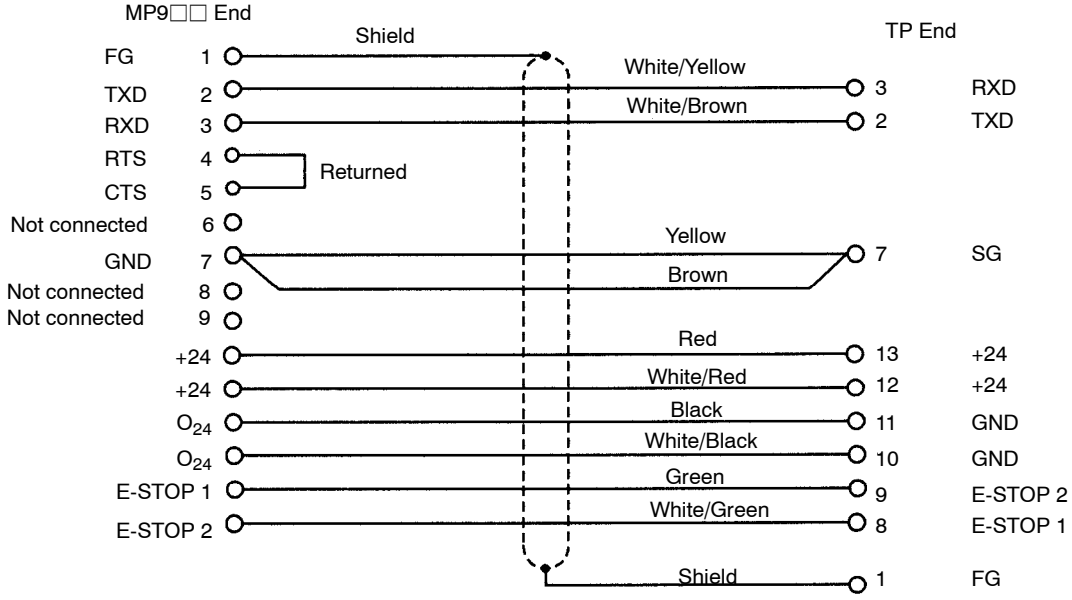
Cable Model Numbers

- JEPMC-W6030-05: 5 m
- JEPMC-W6030-10: 10 m
- JEPMC-W6030-15: 15 m

External Appearance



Connection Diagram



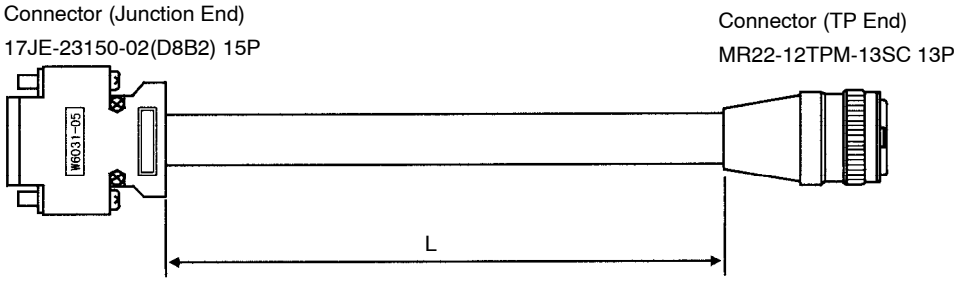
■ Connecting using a Junction Connector

Two cables can be used to connect the Teach Pendant and the MP9□□ via a junction connector. The cables used are shown below.

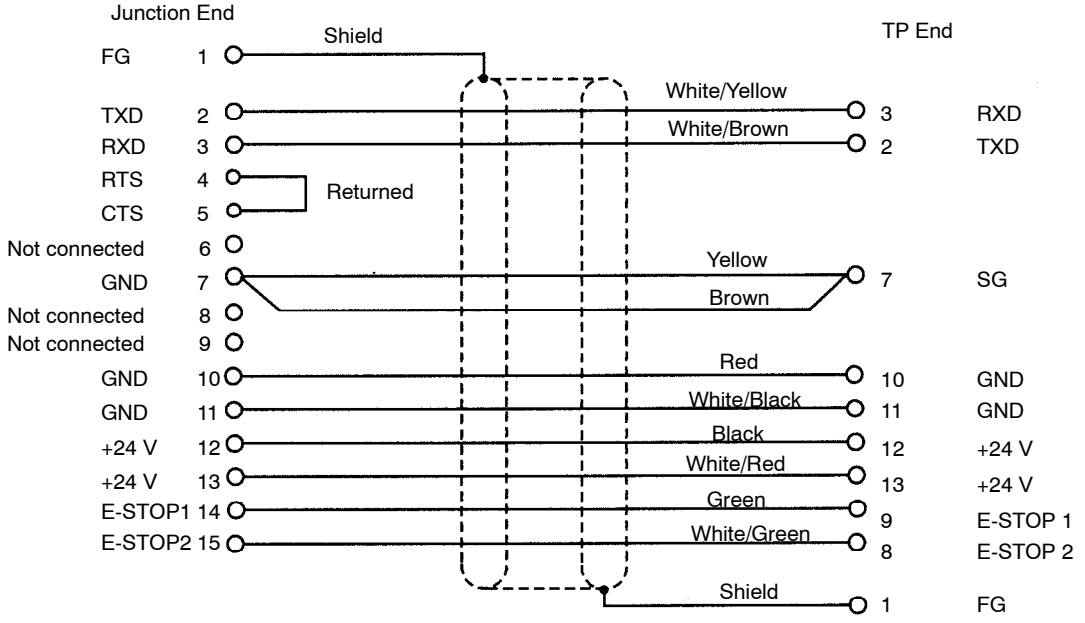
TP End: Cable Model Numbers

- JEPMC-W6031-05: 5 m
- JEPMC-W6031-10: 10 m
- JEPMC-W6031-15: 15 m

TP End: External Appearance



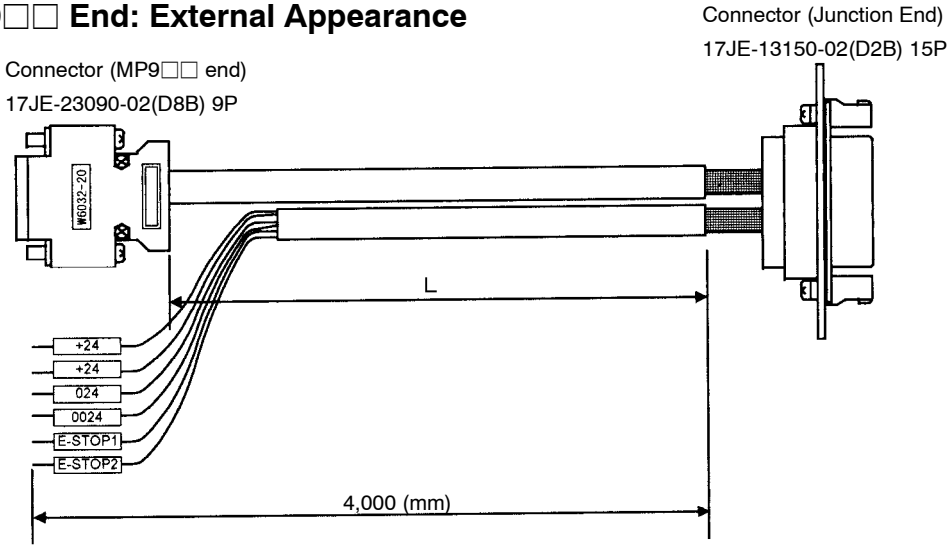
TP End: Connection Diagram



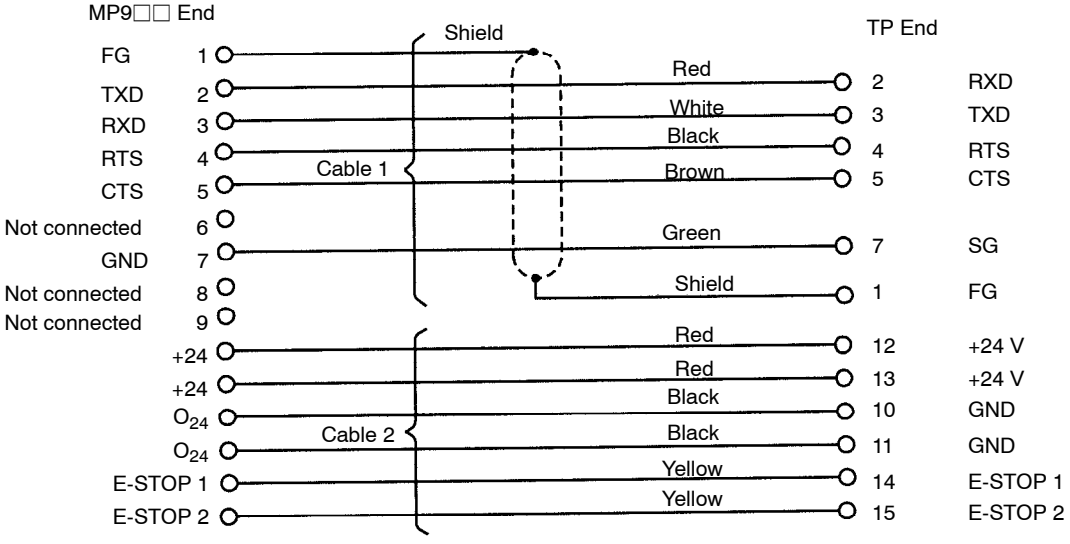
MP9□□ End: Cable Model Numbers

- JEPMC-W6032-20: 2 m
- JEPMC-W6032-40: 4 m

MP9□□ End: External Appearance



MP9□□ End: Connection Diagram



1.2.5 System Interface

It is necessary to create a ladder logic program specifically for use as the Teach Pendant interface, so that the status of the MP9□□-Series Machine Controller and the Teach Pendant system can be managed.

User functions are provided for the interface ladder logic program. These functions must be called every scan from both a high-speed diagram and a low-speed diagram.

There are a total of 15 interface ladder logic functions, and one of these is used in the high-speed drawing and one in a low-speed drawing.

■ Allocating Registers

Table 1.1 I/O Register Allocation

Name	Data Type	I/O Register
M-WORK	Integer	MW□□□□□
PORT	Integer	□□□□□
DUMMY	Bit output	DB□□□□□□
MWORKADR	Address input	MA□□□□□

■ Functions

Calling Function from High-speed Drawing: TP_HSCAN

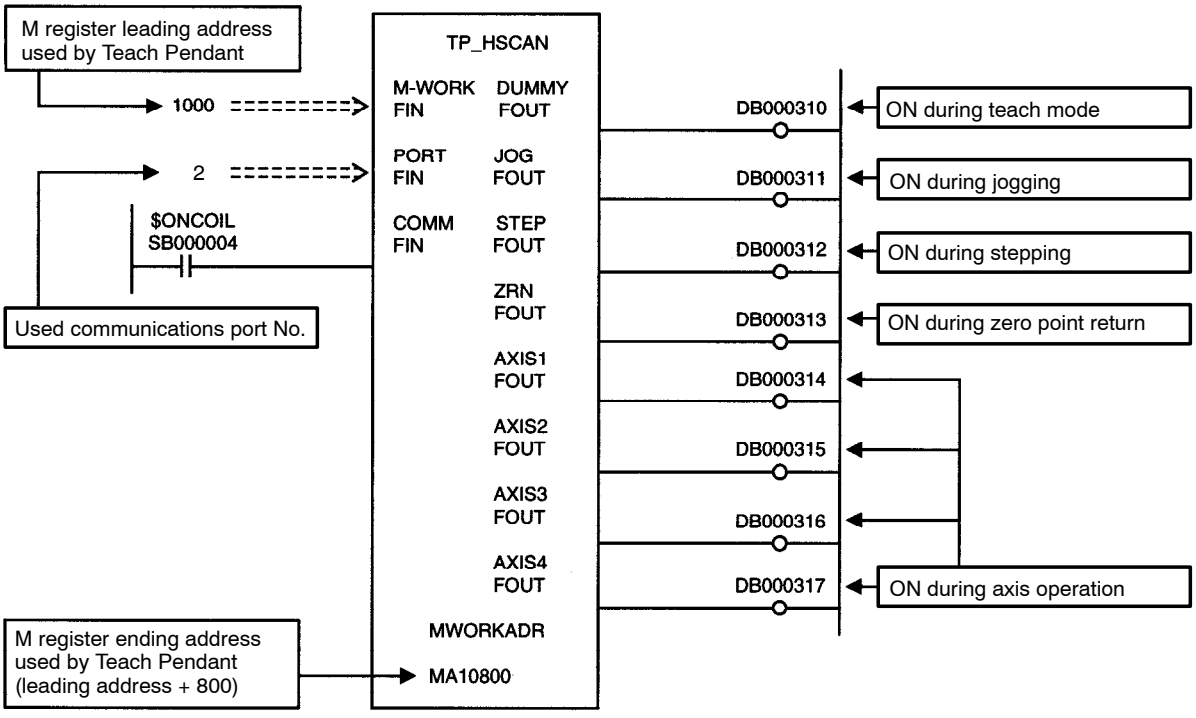


Figure 1.3 TP_HSCAN Setting Example

Output coil is ON during execution, and can be used to light an LED indicator.

Calling Function from Low-speed Drawing: TP_LSCAN

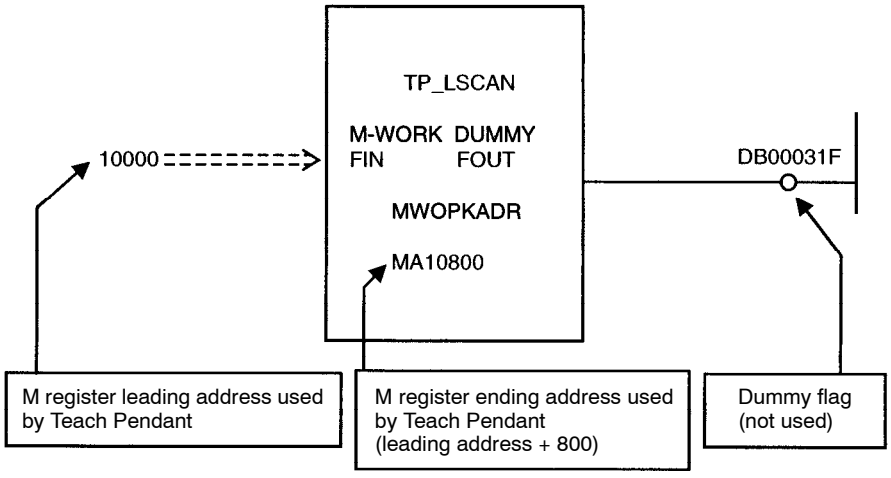


Figure 1.4 TP_LSCAN Setting Example

INFO

Leading Address and Ending Address

- Do not set the addresses in areas used by functions other than the Teach Pendant.
- Set the same addresses in the high-speed drawing and low-speed drawing.
- Set the leading address to between 100 and 31900.

Other TP Functions

These functions are used in TP_HSCAN and TP_LSCAN.

- TP–SVMNG: Servo managing
- TP_COMM: Communications processing
- TP_PTBL: Point table managing
- TP_PTPLC: Point table managing (for C registers)
- TP_STS: Status managing
- TP_POSMN: Position managing
- TP_REGED: Register managing
- TP_IW_RD: IW register reading
- TP_IL_RD: IL register reading
- TP_OW_RD: OW register reading
- TP_OL_RD: OL register reading
- TP_OW_WR: OW register writing
- TP_OL_WR: OL register writing

■ Setting Communications

Setting Example for MP930

Open **SLOT02** from the Module Configuration Definition Window and set the port used for the Teach Pendant to the same communications settings as the Teach Pendant.

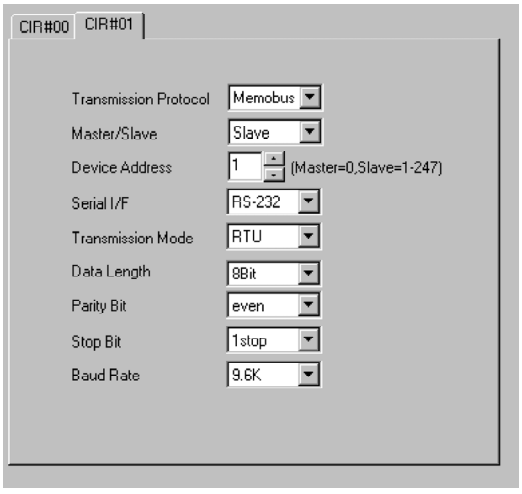


Figure 1.5 Setting Example for Module Configuration Definition Window (SLOT02)

Setting Example for MP920

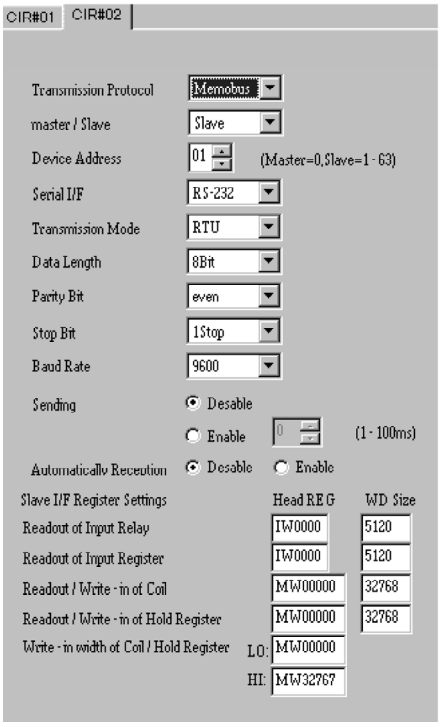


Figure 1.6 Setting Example for Module Configuration Definition Window (MP920)

Using User Functions

- The interface ladder logic functions for connecting the Teach Pendant are provided on a floppy disk.
- Copy the user functions from the floppy disk to your hard disk using the file transfer function on the CP-717 Engineering Tool.
- For further information on file transfer methods, refer to *File Transfers* in the *MP9□□ Machine Controller CP-717 Engineering Tool Programming Software User's Manual.*

2

Overview of Functions

This chapter provides an overview of Teach Pendant functions.

2.1 Displays

This section describes the display components on the MP9□□-Series Teach Pendant.

2.1.1 Liquid Crystal Display

The liquid crystal display can display up to 7 lines containing 21 alphanumeric characters each.

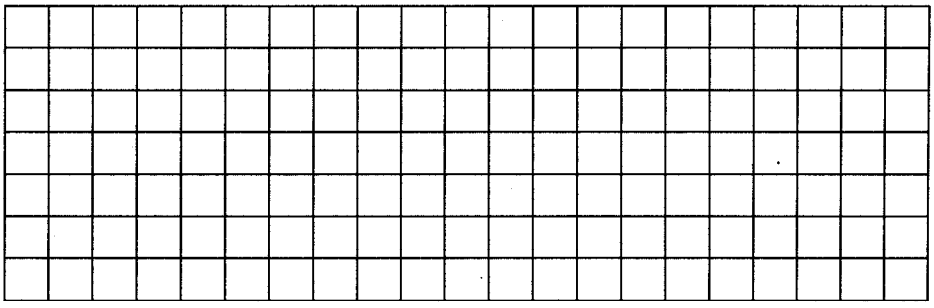


Figure 2.1 Appearance of the Liquid Crystal Display

2.1.2 LED Indicators

The six indicators (LEDs) on the Teach Pendant indicate the following.

Table 2.1 LED List

LED	Name	Meaning
JOG	JOG Mode	Lit when jog operation is possible. Flashes when a jog operation is being performed.
STEP	STEP Mode	Lit when step operation is possible. Flashes when a step operation is being performed.
ZRN	ZERO POINT RETURN Mode	Lit when zero point return operation is possible. Flashes when a zero point return operation is being performed.
SYS ALM	System Alarm	Lit when the system alarm has been triggered. (An alarm originating in the Controller.)
SRV ALM	Servo Alarm	Lit when a servo alarm has been triggered.
TEACH	Teach Mode	Lit when the Teach Pendent is in Teach Mode.

2.1.3 Operation Keys

The following table lists the usage of the 40 operation keys on the Teach Pendant.

Table 2.2 Operation Keys

Key	Name	Usage
ESC	Escape	Canceling
SHIFT	Shift	Expansion functions
ENT	Enter	Confirmation
STOP	Stop	Stopping operation
MODE CHG	Mode Change	Switching between operation modes
DISP CHG	Display Change	Switching displays
ALM REST	Alarm Reset	Resetting alarms
ALL TEACH	Teach All Axes	Teaching position data for all axes (X, Y, Z, and S)
X TEACH	Teach Axis Keys	Teaching position data for one axis at a time
Y TEACH		
Z TEACH		
S TEACH		
X+ X−	Axis Keys	Manual operation
Y+ Y−		
Z+ Z−		
S+ S−		
INS	Insert	Inserting and deleting characters
DEL	Delete	
NEXT	Next	Moving to the next or previous address
PREV	Previous	
▼ ▲	Cursor Keys	Selecting functions and other purposes
◀ ▶		
1 2 3 4 5 6 7 8 9 − 0 .	Numeric Keys	Selecting functions and other purposes

2.2 Functions

2.2.1 Setting and Display Functions

The setting and display functions for the Teach Pendant are listed in the following table.

Table 2.3 Setting and Display Functions

Main Functions		Subfunctions		Remarks
No.	Name	No.	Name	
1	System	1	Machine Type	Sets the model of MP9□□ Machine Controller used.
		2	Program	Registers the motion program.
2	Run	1	Axis	Registers a physical axis address for each of the logical axis name of the Operation Keys.
		2	Speed	Sets the rapid transverse speed.
		3	Override	Sets rapid transverse speed override.
		4	Step	Sets the step amount.
3	Position	1	Program Position	Position controlled by the motion program.
		2	Error Pulse	IL□□20: User monitoring information on the Servo Drive.
		3	Machine Position	IL□□08: Monitors the position on the machine coordinates.
4	Status	1	Program Status	Status of the motion program.
		2	Program Alarm	Alarm generated by the motion program.
		3	Run Status	IW□□00
		4	MECHATROLINK Servo Status	IW□□01
		5	Motion Command Status	IW□□15
		6	Position Management Status	IW□□17
		7	Servo Alarm	IL□□22
		8	MECHATROLINK Servo Alarm Code	IW□□24
		9	MECHATROLINK Servo I/O Monitor	IW□□25
5	I/O	1	Input Relay	I registers
		2	Output Coil	O registers

Main Functions		Subfunctions		Remarks
No.	Name	No.	Name	
6	Parameter	1	Fixed	–
		2	Setting	OW□□□□
		3	Monitor	IW□□□□
		4	Servo	Cn-01
7	Register	1	S Register	System registers
		2	M Register	Data registers
		3	I Register	Input registers
		4	O Register	Output registers
		5	D Register	Program data registers
8	Point Table	1	PTBL Set	Reserves a point table area for M and C registers.
		2	PTBL Edit	Edits point table data.
		3	PTBL Initial	Clears data in the point table area.
9	Set Communications*	–	–	Sets the communications parameters.

* The Set Communications function cannot be selected after the Teach Pendant has been activated. This function can be selected by holding down both the **Shift** and **Enter** when starting the Teach Pendant.

2.2.2 Operational Functions

The following table lists the operational functions that can be executed from the Teach Pendant.

Table 2.4 Operational Functions

No.	Function	Comments
1	Changing the teaching mode	–
2	Changing the operating mode	Switches between JOG, STEP and ZRN.
3	Jogging	–
4	Stepping	–
5	Zero point return	–
6	Teaching	Position teaching
7	Alarm reset	Resets alarm
8	Stop	Stops operation

3

Operation

This chapter describes the operation of the MP9□□-Series Teach Pendant.

3.1 Settings and Displays

This section describes how to use the setting and display operations for the MP9□□-Series Teach Pendant.

3.1.1 Main Menu Screen

Operating procedures from the Initial Screen and Main Menu Screen are described below.

1. The Initial Screen, shown in the following diagram, will be displayed when the Teach Pendant is started.

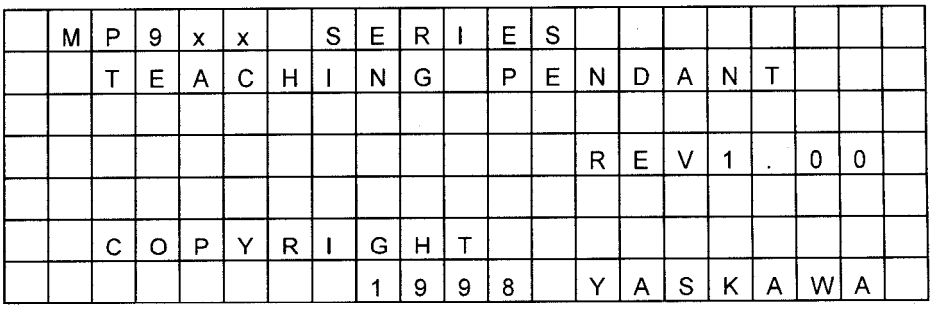


Figure 3.1 Initial Screen

2. The Initial Screen will be displayed for approximately 3 seconds, and then the display will switch automatically to the Main Menu Screen shown in the following diagram. The cursor will flash on function number 1.

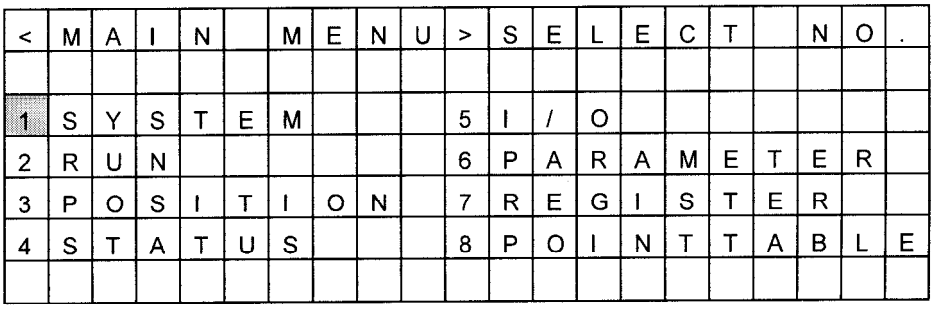


Figure 3.2 Main Menu Screen

Move the cursor to the desired position using the **Numeric** Keys or the **Cursor** Keys. The cursor will flash at the specified position.

3. Press the **ENT** Key at the specified position to select the function. The display will switch to the Submenu Screen (the Main Screen for each function).

4. Press the **ESC** Key to return to the Main Menu Screen from the Submenu Screen.

Submenu Screen Operations

Use the following procedure to switch from the Submenu Screen directly to another Submenu Screen.

- Press the NEXT Key (or PREV Key) while pressing the DISP CHG Key. The Submenu Screen for the next function (or the previous function) will be displayed.
- Press any one of the Numeric Keys (1 to 9) while pressing the DISP CHG Key. The Submenu Screen of the desired function will be displayed.

General Guidelines for Switching Screens

Follow the guidelines given below when switching screens.

- Any function can be selected by pressing the **ENT** Key when the cursor is at the specified position.
- Press the **ESC** Key to exit the current setting or display function.
- Press a **Numeric** Key while pressing the **DISP CHG** Key to jump to the desired setting or display function.

3.1.2 System Settings

■ System Menu Screen

Operating procedures from the System Menu Screen are described below.

<	S	Y	S			M	E	N	U	>	S	E	L	E	C	T		N	O	.
1	M	A	C	H	I	N	E		T	Y	P	E								
2	P	R	O	G	R	A	M													

Figure 3.3 System Menu Screen

1. When this screen is displayed, the cursor will flash at item number 1 on the submenu. Move the cursor to the desired position (a submenu number) using the **Numeric** Keys or the **Cursor** Keys. The cursor will flash at the specified position.
2. Press the **ENT** Key at the specified position to select the function. The display will switch to the Function Screen.
3. Press the **ESC** Key to return to the Submenu Screen from the Function Screen.

Function Screen Operations

Use the following procedure to switch from a Function Screen directly to another Function Screen.

- Press the NEXT Key (or PREV Key) while pressing the DISP CHG Key. The Function Screen for the next function (or the previous function) will be displayed.
- Press a Numeric Key (1 or 2) while pressing the DISP CHG Key. The Function Screen of the desired function will be displayed.

The procedure for switching screens when selecting a function is the same as the above procedure for other functions.

■ Machine Type

Operating procedures from the Machine Type Screen are described below.

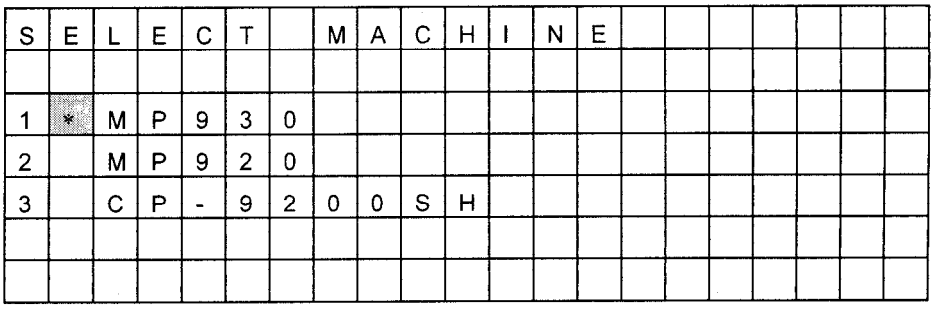


Figure 3.4 Select Machine Screen

1. Select a machine number (1 to 3) using either the **Cursor** or **Numeric** Keys.
2. Press the **ENT** Key to confirm the selection.

   An asterisk will be displayed in the space to the right of the machine number. This asterisk indicates the machine type that has been selected. When a machine type is already selected, it will be cleared and the asterisk will be reset.

INFO In this version (REV 1.00), the CP-9200SH cannot be selected.

■ Program

Operating procedures from the Set Program Name Screen are described below.

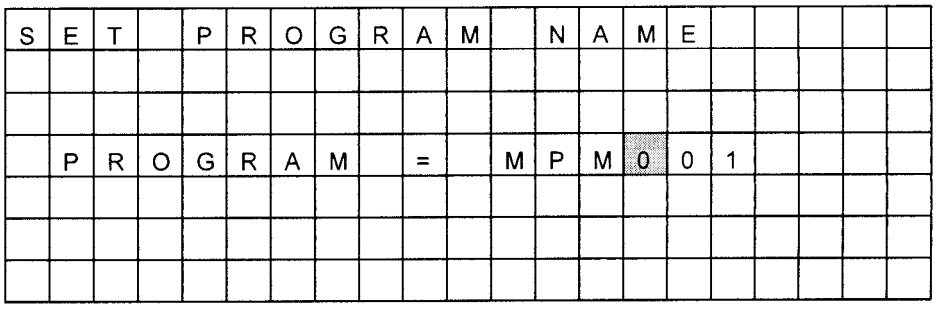


Figure 3.5 Set Program Name Screen

Use the **Numeric Keys** or the **ENT** Key to input the motion program name. It is fixed at MPM.

Information on the following monitoring functions will be displayed for the motion program number.

- Program current position monitoring function.
- Program status and program alarm monitoring function.
- Register display function (D Register).

The subroutine (MPS□□□) cannot be specified, because there is no program current position, program status, or program alarm information.

Inputting New Data

The following procedure describes how to input new data.

1. When the Data Input Screen is displayed, the cursor will flash at the first digit of the item.
2. Use the **Numeric** Keys to input numbers.
3. When an error is made at inputting data, press the **DEL** Key to delete one character (or one number) at a time, and re-input the data.
4. When numerals are input, the cursor will move to the right. (If more than the specified number of digits are input, the key will not respond.)
5. When less than the specified number of digits are input and the **ENT** Key pressed, the input numerals will automatically be displayed as the rightmost digits and zeros will be displayed in the leftmost digits.
6. To return to the original screen, press the **ESC** Key before pressing the **ENT** Key.

Inputting Edited Data

The following procedure describes how to input data over existing data.

1. When the **Numeric** Keys are used to input numbers, the numbers below the cursor will be overwritten.
2. Follow steps 3. and 4. to input new data.
3. Press the **DEL** Key and the numerals below the cursor will be deleted and the numerals will shift one space to the left from the rightmost digit. (The rightmost digit will become blank.)
4. Press the **INS** Key and a blank space will be inserted at the cursor and the numerals will shift one space to the right from the rightmost digit. (The rightmost digit in the specified row will be deleted.)
5. Press the **ENT** Key immediately after step 3. or 4. to confirm the changes. This is the same as when new data is input. (In step 4. however, if there are blank spaces between numerals, these will be cut and the numerals shifted to the left.)
6. To re-input the numerals, press the **ESC** Key before pressing the **ENT** Key.

Use the procedure outlined above when inputting data for other functions.

If the program selection has not been correctly set, motion program information (program current position, program status, program alarms, and D registers) cannot be accessed.

3.1.3 Operation Settings

■ RUN Menu Screen

The RUN Menu Screen is shown in the following diagram.

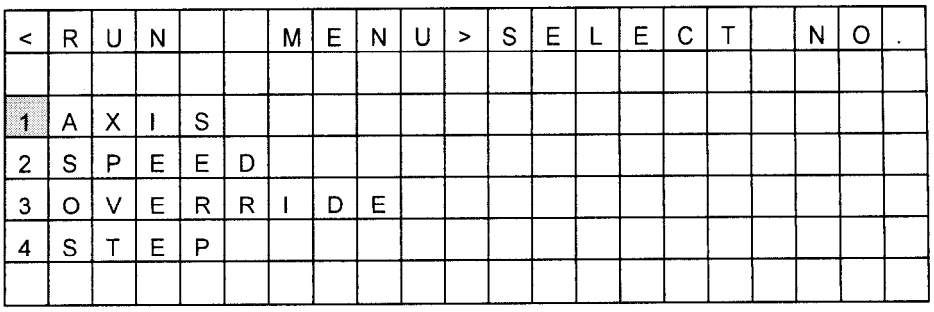


Figure 3.6 RUN Menu Screen

■ Selecting the Axis

This section describes how to set the controlled axes using the Teach Pendant's operation keys (logical axes). Up to a maximum of 4 logical axes can be controlled at the same time from the Teach Pendant.

There are two methods for setting this information, as shown in the following procedures.

Setting a Physical Address for a Logical Axis

1. Select the logical axis name to be set using the **Up** and **Down Cursor** Keys.

   The cursor will flash in the space to the right of the logical axis name.

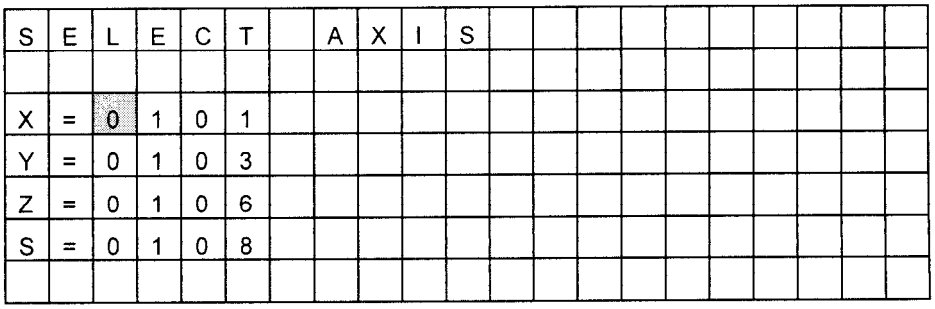


Figure 3.7 Logical Axis Setting Screen

2. Input the physical axis address using the **Numeric** Keys and press the **ENT** Key to confirm.

   The physical axis address will be set in the space to the right of the logical axis name. If the physical axis address set in the above procedure is already set for another address, the most recent setting will be effective. (The existing setting will be deleted and the display will be cleared.)

3. To delete existing settings, press the **DEL** Key to delete all the physical axis addresses and then press the **ENT** Key.

   The physical axis address to the right of the logical axis name will be cleared.

INFO

Notation for the Physical Address

If the line number is 1 and the station number is 3, the physical address is expressed as 0103.

Setting a Logical Axis Name for a Physical Axis

1. Select the physical axis address of the axis to be set using the **Up** and **Down Cursor** Keys.

The cursor will flash in the space to the right of the physical axis address.

S	E	L	E	C	T		A	X	I	S									
0	1	0	1	=	X		0	1	0	6	=	Z		0	1	1	1	=		
0	1	0	2	=			0	1	0	7	=			0	1	1	2	=		
0	1	0	3	=	Y		0	1	0	8	=	S		0	1	1	3	=		
0	1	0	4	=			0	1	0	9	=			0	1	1	4	=		
0	1	0	5	=			0	1	1	0	=									

Figure 3.8 Physical Axis Setting Screen

2. Press the **Axis** Keys (X+, Y+, Z+, S+) and press the **ENT** Key to confirm.

The logical axis name will be set in the space to the right of the physical axis address. If the logical axis name set in the above procedure is already set for another physical axis, the most recent setting will be effective. (The existing setting will be deleted and the display will be cleared.)

3. To delete existing settings, press the **Axis** Keys (X–, Y–, Z–, S–) and press the **ENT** Key.

The logical axis name to the right of the physical axis address will be cleared.

INFO

1. When more than one Module is connected to the MP920 or CP-9200SH, axes can be set for 1 to 16 Modules. At this time, "▲" and "▼" will be displayed on the upper-right of the screen. (Refer to the following screen.) To switch among the Modules, press the **NEXT** or **PREV** Keys from the Physical Axis Setting Screen.

SELECT AXIS																		▲
																		▼
0201=X		0206=				0211=												
0202=		0207=				0212=												
0203=		0208=				0213=												
0204=		0209=				0214=												
0205=		0210=																

Figure 3.9 Physical Axis Setting Screen

- ▼: When this symbol is displayed, use the **NEXT** Key to increase one number at a time.
- ▲: When this symbol is displayed, use the **PREV** Key to decrease one number at a time.

2. When the Axis Selecting Function is selected, the Logical Axis Setting Screen will be displayed first. To switch between the Logical Axis Setting Screen and the Physical Axis Setting Screen, press the **Left** and **Right Cursor** Keys while pressing the **DISP CHG** Key. (The contents of the Logical Axis Setting Screen and the Physical Axis Setting Screen are always the same.)

3. The procedure for switching between the Logical Axis Setting Screen and the Physical Axis Setting Screen is the same from other setting screens.

4. When a logical axis has not been set on the Physical Axis Setting Screen, the physical axis address will be displayed as 0101 when the screen is switched to the Logical Axis Setting Screen.

■ Speed Settings

This section describes how to set the rapid transverse speed for jogging and stepping operations. There are two methods for setting this information, as shown in the following procedures.

Using the Logical Axis

1. Move the cursor to the input area of the logical axis name to be set, using the **Up** and **Down Cursor** Keys.

SET SPEED																			
X:0101		=		0	0	0	0	0	0	0	0	0	0						
Y:0103		=		0	0	0	0	0	0	0	0	0	0						
Z:0106		=		0	0	0	0	0	0	0	0	0	0						
S:0108		=		0	0	0	0	0	0	0	0	0	0						

Figure 3.10 Set Speed Screen 1

2. Input the rapid transverse speed using the **Numeric** Keys and press the **ENT** Key to confirm.

Using the Physical Axis

1. Move the cursor to the input area of the physical axis address to be set using the **Up** and **Down Cursor** Keys, as shown in *Figure 3.11* and *Figure 3.13*.
2. Input the rapid transverse speed using the **Numeric** Keys and press the **ENT** Key to confirm.

SET SPEED																			
																			▼
0101	:	X		=		0	0	0	0	0	0	0	0	0	0				
0102	:			=		0	0	0	0	0	0	0	0	0	0				
0103	:	Y		=		0	0	0	0	0	0	0	0	0	0				
0104	:			=		0	0	0	0	0	0	0	0	0	0				
0105	:			=		0	0	0	0	0	0	0	0	0	0				

Figure 3.11 Set Speed Screen 2

SET SPEED																			▲
																			▼
0106	:	Z		=		0	0	0	0	0	0	0	0	0	0				
0107	:			=		0	0	0	0	0	0	0	0	0	0				
0108	:	S		=		0	0	0	0	0	0	0	0	0	0				
0109	:			=		0	0	0	0	0	0	0	0	0	0				
0110	:			=		0	0	0	0	0	0	0	0	0	0				

Figure 3.12 Set Speed Screen 3

SET SPEED																			▲
0111	:			=		0	0	0	0	0	0	0	0	0	0				
0112	:			=		0	0	0	0	0	0	0	0	0	0				
0113	:			=		0	0	0	0	0	0	0	0	0	0				
0114	:			=		0	0	0	0	0	0	0	0	0	0				

Figure 3.13 Set Speed Screen 4

INFO

1. When the data to be displayed does not fit on one screen, as shown in *Figure 3.12 Set Speed Screen 3*, ▼ or ▲ will be displayed in the upper-right of the screen. These marks have the following meaning.
   - ▲: There is data above the screen that is not displayed.
   - ▼: There is data below the screen that is not displayed.
2. When this symbols are displayed, use the **Up** and **Down Cursor** Keys to scroll one data item at a time, or the **NEXT** or **PREV** Keys to scroll one page at a time.

   The above procedure for scrolling screens is the same from other setting screens.

■ Override Setting

This section describes how to set the override for the jogging and stepping operations. There are two methods for setting this information, as shown in the following procedures.

Using the Logical Axis

1. Move the cursor to the input area of the logical axis name to be set, using the **Up** and **Down Cursor** Keys.

S	E	T		O	V	E	R	R	I	D	E								
X	:	0	1	0	1	=	1	0	0										
Y	:	0	1	0	3	=	0	9	0										
Z	:	0	1	0	6	=	0	0	4										
S	:	0	1	0	8	=	0	1	6										

Figure 3.14 Set Override Screen 1

2. Input the override using the **Numeric** Keys and press the **ENT** Key to confirm.

Using the Physical Axis

1. Move the cursor to the input area of the physical axis address to be set, using the **Up** and **Down Cursor** Keys, as shown in *Figure 3.15* and *Figure 3.17*.
2. Input the override using the **Numeric** Keys and press the **ENT** Key to confirm.

S	E	T		O	V	E	R	R	I	D	E								
																			▼
0	1	0	1	:	X	=	1	0	0										
0	1	0	2	:		=	0	2	0										
0	1	0	3	:	Y	=	0	9	0										
0	1	0	4	:		=	0	1	0										
0	1	0	5	:		=	0	3	0										

Figure 3.15 Set Override Screen 2

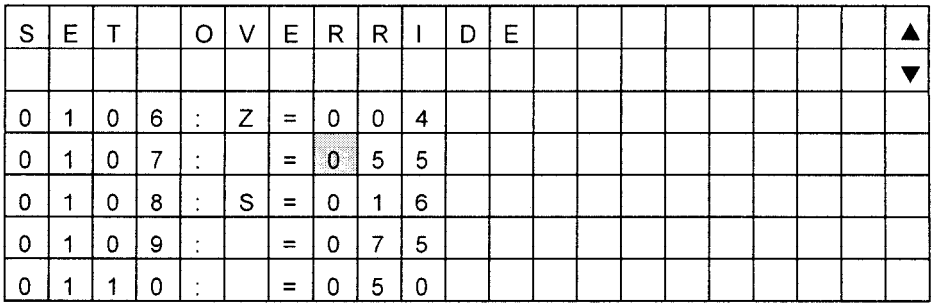


Figure 3.16 Set Override Screen 3

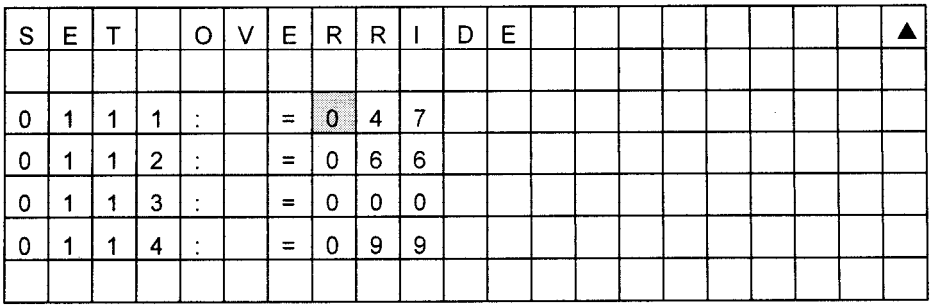


Figure 3.17 Set Override Screen 4

Set the override to between 0 and 327.

■ Step Amount

This section describes how to set the step amount. There are two methods for setting this information, as shown in the following procedures.

Using the Logical Axis

1. Move the cursor to the input area of the logical axis name to be set, using the **Up** and **Down Cursor** Keys.

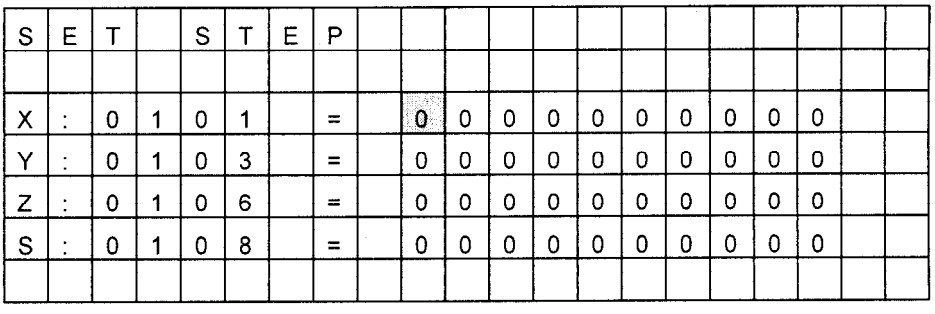


Figure 3.18 Set Step Screen 1

2. Input the step amount using the **Numeric** Keys and press the **ENT** Key to confirm.

Using the Physical Axis

1. Move the cursor to the input area of the physical axis address to be set, using the **Up** and **Down Cursor** Keys, as shown in *Figure 3.19* and *Figure 3.21*.

SET STEP																			
																			▼
0101	:	X		=		0	0	0	0	0	0	0	0	0	0				
0102	:			=		0	0	0	0	0	0	0	0	0	0				
0103	:	Y		=		0	0	0	0	0	0	0	0	0	0				
0104	:			=		0	0	0	0	0	0	0	0	0	0				
0105	:			=		0	0	0	0	0	0	0	0	0	0				

Figure 3.19 Set Step Screen 2

SET STEP																			
																		▲	
																		▼	
0106	:	Z		=		0	0	0	0	0	0	0	0	0	0				
0107	:			=		0	0	0	0	0	0	0	0	0	0				
0108	:	S		=		0	0	0	0	0	0	0	0	0	0				
0109	:			=		0	0	0	0	0	0	0	0	0	0				
0110	:			=		0	0	0	0	0	0	0	0	0	0				

Figure 3.20 Set Step Screen 3

SET STEP																			
																		▲	
0111	:			=		0	0	0	0	0	0	0	0	0	0				
0112	:			=		0	0	0	0	0	0	0	0	0	0				
0113	:			=		0	0	0	0	0	0	0	0	0	0				
0114	:			=		0	0	0	0	0	0	0	0	0	0				

Figure 3.21 Set Step Screen 4

2. Input the step amount using the **Numeric** Keys and press the **ENT** Key to confirm.

INFO

When more than one Module is connected to the MP920 or CP-9200SH, axes step amounts can be set for 1 to 16 Modules.

To switch among the Modules, press the **SHIFT + NEXT** Keys, or **SHIFT + PREV** Keys.

S	E	T		S	T	E	P												
																			▼
0	2	0	1	:			=		0	0	0	0	0	0	0	0	0		
0	2	0	2	:			=		0	0	0	0	0	0	0	0	0		
0	2	0	3	:			=		0	0	0	0	0	0	0	0	0		
0	2	0	4	:			=		0	0	0	0	0	0	0	0	0		
0	2	0	5						0	0	0	0	0	0	0	0	0		

Figure 3.22 Set Step Screen 4

- Press the **SHIFT + NEXT** Key to increase one Module number at a time.
- Press the **SHIFT + PREV** Key to decrease one Module number at a time.

3.1.4 Position Display

■ Position Menu Screen

The Position Menu Screen is shown in the following diagram.

<	P	O	S			M	E	N	U	>	S	E	L	E	C	T		N	O	.
1	P	R	O	G	R	A	M		P	O	S	I	T	I	O	N				
2	E	R	R	O	R		P	U	L	S	E									
3	M	A	C	H	I	N	E		P	O	S	I	T	I	O	N				

Figure 3.23 Position Menu Screen

■ Program Position

The position of workpiece coordinates controlled by the motion program are displayed on this screen.

P	R	O	G	R	A	M		P	O	S	I	T	I	O	N				
X	:	0	1	0	1		=		0	0	0	0	0	0	0	0	0		
Y	:	0	1	0	3		=		0	0	0	0	0	0	0	0	0		
Z	:	0	1	0	6		=		0	0	0	0	0	0	0	0	0		
S	:	0	1	0	8		=		0	0	0	0	0	0	0	0	0		

Figure 3.24 Program Position Screen

■ Error Pulses

Error pulses are displayed on this screen.

E	R	R	O	R		P	U	L	S	E									
X	:	0	1	0	1		=		0	0	0	0	0	0	0	0	0	0	
Y	:	0	1	0	3		=		0	0	0	0	0	0	0	0	0	0	
Z	:	0	1	0	6		=		0	0	0	0	0	0	0	0	0	0	
S	:	0	1	0	8		=		0	0	0	0	0	0	0	0	0	0	

Figure 3.25 Error Pulse Screen

■ Machine Position Display

The position of the machine coordinate system is displayed on this screen.

M	A	C	H	I	N	E		P	O	S	I	T	I	O	N				
X	:	0	1	0	1		=		0	0	0	0	0	0	0	0	0	0	
Y	:	0	1	0	3		=		0	0	0	0	0	0	0	0	0	0	
Z	:	0	1	0	6		=		0	0	0	0	0	0	0	0	0	0	
S	:	0	1	0	8		=		0	0	0	0	0	0	0	0	0	0	

Figure 3.26 Machine Position Screen

INFO

Physical axis displays can be displayed at the same time as functions on the position displays.he screen can also be scrolled. Axes that do not have a group definition, however, will be displayed as zero.

3.1.5 Status Displays

■ Status Menu Screen

The Status Menu Screen is shown in the following diagram.

```
< STAT MENU > SELECT NO.

1 PROG STAT  6 POSI STAT
2 PROG ALRM  7 SERV ALRM
3 RUN  STAT  8 MECH ALRM
4 MECH STAT  9 MECH I/O
5 MOTI STAT
```

Figure 3.27 Status Menu Screen

■ Program Status

Operating procedures from the Program Status Screen are described below.

1. Program status can be referenced in bit units. The bit number is displayed above the bit status.

```
PROGRAM STATUS

 FEDC BA98 7654 3210
 0000 0000 0000 0000
           ▲
B01:HOLDING
```

Figure 3.28 Program Status Screen

2. The ▲ moves when the **Left** or **Right Cursor** Key is pressed.

The bit number specified by ▲ and its meaning will be displayed at the lowest line of the screen.

INFO The status display bit information function can be used for other status screens in the same way.

■ Program Alarms

Operating procedures from the Program Alarm Screen are described below.

1. Alarm codes will be displayed for program threads 1 to 4.

When the PFORK command is not used in the motion program, a zero will be displayed in 2 to 4.

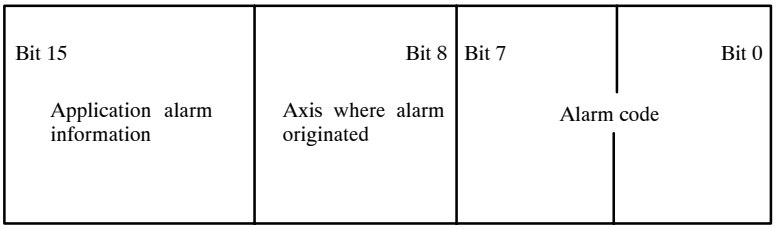
PROGRAM ALARM																			
		CODE						APL				AXS			CODE				
1	=	0	0	F	F	H			0	0			0	0			2	5	5	
2	=	0	0	0	0	H			0	0			0	0			0	0	0	
3	=	0	0	0	0	H			0	0			0	0			0	0	0	
4	=	0	0	0	0	H			0	0			0	0			0	0	0	

Figure 3.29 Program Alarm Screen

2. Alarms will be displayed in hexadecimal for all threads of the specified motion program.

3. Alarm codes display different types of information.

Motion program alarm codes contain a combination of the following 3 types of information.



This information is displayed in decimal under the following.

- Application alarm information: APL
- Axis where the alarm originated: AXS
- Alarm Code: CODE

■ Module Switching

Module can be switched on each screen in the remainder of this section 3.1.

When more than one Module is connected to the MP920 or CP-9200SH, the Module number can be switched for 1 to 16 Modules by pressing the **NEXT or PREV** Key in the "Physical Axis Display" of the following statuses.

3	RUN Status	7	Alarm Status
4	MECHATROLINK Servo Status	8	MECHATROLINK Servo Alarm Code
5	Motion Command Status	9	MECHATROLINK Servo I/O Monitor
6	Position Status		

- Press the NEXT Key to increase the Module number one at a time.
- Press the PREV Key to decrease the Module number one at a time.

IMPORTANT

1. The line number set in the CP-717 Module Configuration Definition Window is the same as the Module number.

2. Confirm that the line number is set properly, and then set the Module number.

INFO

1. When monitoring the program status or program alarms, confirm that the program number is set in the system settings.
   When the program number is not set, selecting the program status or program alarms will return you to the sub-menu screen.
2. The program alarm code can be displayed for up to 16 modules by a setting in the Controller.
3. The SVA cannot monitor the status of MECHATROLINK Servo Status, MECHATROLINK Servo Alarm Codes, MECHATROLINK Servo I/O Monitor. Selecting these status will return you to the sub-menu screen.

■ RUN Status

Operating procedures from the RUN Status Screen are described below.

1. The RUN Status Screen is used to monitor the operating status of the Servo Controller.
2. To scroll to the status displays of other axes, press the **Up** or **Down Cursor** Keys.
   a) The logical axes names (*Figure 3.30*) will be scrolled in order of name when the logical axes are being monitored.

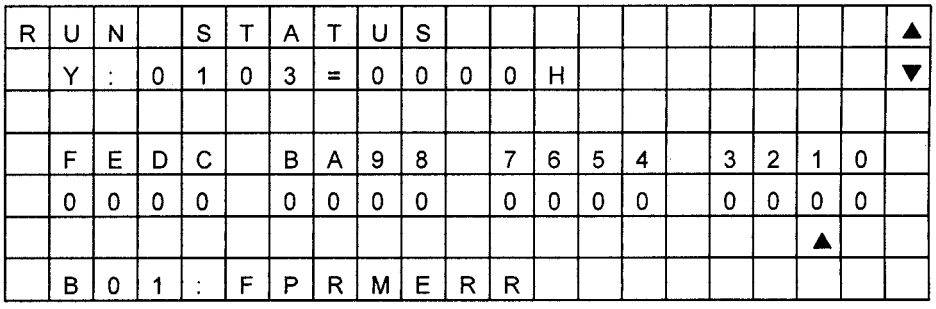


Figure 3.30 RUN Status Screen (Logical Axis Display)

   b) The physical axis addresses (*Figure 3.31*) will be scrolled in order of address when the physical axes are being monitored.

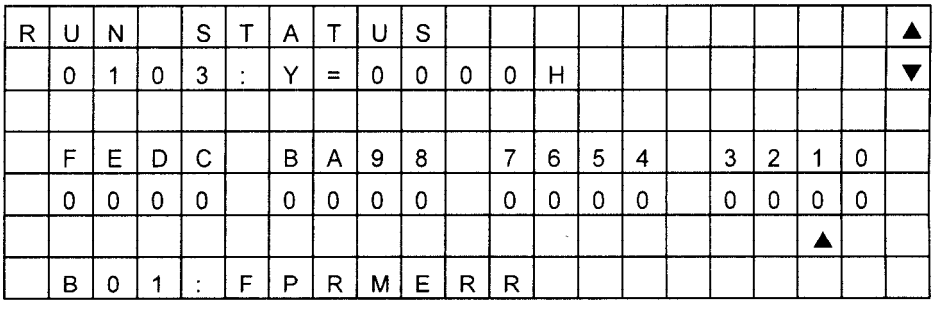


Figure 3.31 RUN Status Screen (Physical Axis Display)

3. To switch between the Logical Axis Name Screen and the Physical Axis Address Screen, press the **Left** and **Right Cursor** Keys while pressing the **DISP CHG** Key. The screen will not switch to the Logical Axis Name Screen for axes which do not have a logical axis set.

4. Alarm codes appear in hexadecimal next to the axis information.

INFO The scroll function can be used from other status screens in the same way.

■ MECHATROLINK Servo Status

This screen is used to monitor the status of the MECHATROLINK Servo.

M	E	C	H	A	T	R	O	L	I	N	K		S	V		S	T	A	T	▲
	Y	:	0	1	0	3	=	0	0	0	0	H								▼
	F	E	D	C		B	A	9	8		7	6	5	4		3	2	1	0	
	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
																		▲		
	B	0	1	:	W	A	R	N	G											

Figure 3.32 MECHATROLINK Servo Status Screen

■ Motion Command Status

This screen is used to monitor the execution status of motion commands.

M	O	T	I	O	N		C	O	M	M	A	N	D		S	T	A	T		▲
	Y	:	0	1	0	3	=	0	0	0	0	H								▼
	F	E	D	C		B	A	9	8		7	6	5	4		3	2	1	0	
	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
																			▲	
	B	0	0	:	B	U	S	Y												

Figure 3.33 Motion Command Status Screen

■ Position Status

This screen is used to monitor the position management status.

P	O	S	I	T	I	O	N		M	A	N	A	G	E		S	T	A	T	▲
	Y	:	0	1	0	3														▼
	F	E	D	C		B	A	9	8		7	6	5	4		3	2	1	0	
	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
																		▲		
	B	0	1	:	Z	E	R	O												

Figure 3.34 Position Status Screen

■ Servo Alarms

This screen is used to monitor servo controller alarm status.

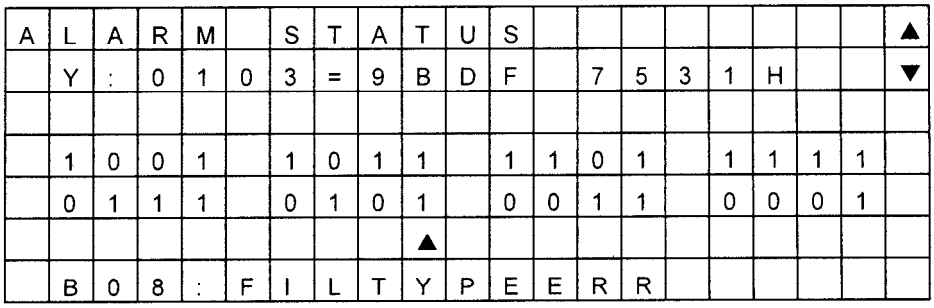


Figure 3.35 Alarm Status Screen 1

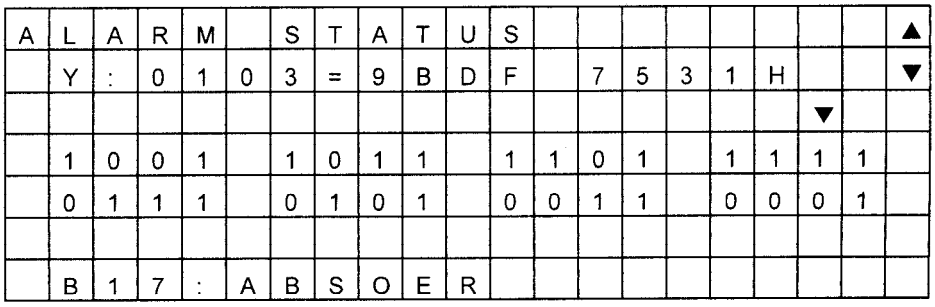


Figure 3.36 Alarm Status Screen 2

INFO

Alarm status is 32-bit data, so information is displayed in bits using binary data.

As with other status displays, bits can be specified using the **Left** or **Right Cursor** Keys. ▲ will be displayed for bits 0 to 15 (Alarm Status Screen 1), and ▼ will be displayed for bits 16 to 32 (Alarm Status Screen 2).

■ MECHATROLINK Servo Alarms

This screen is used to monitor alarm codes generated by the MECHATROLINK Servo.

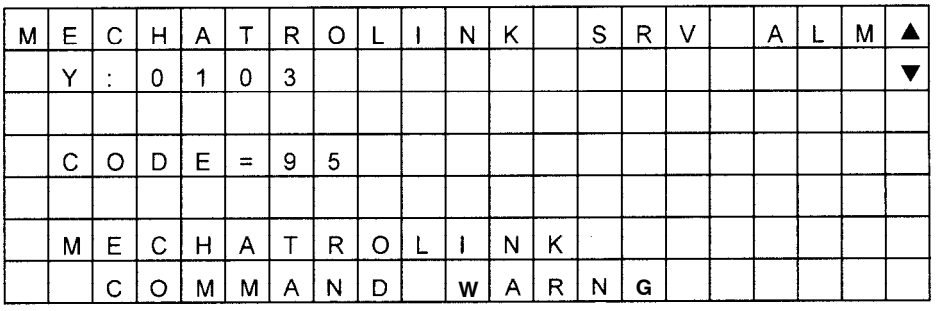


Figure 3.37 MECHATROLINK Servo Alarm Screen

■ MECHATROLINK Servo I/O Monitor

This screen is used to monitor the I/O status of the MECHATROLINK Servo.

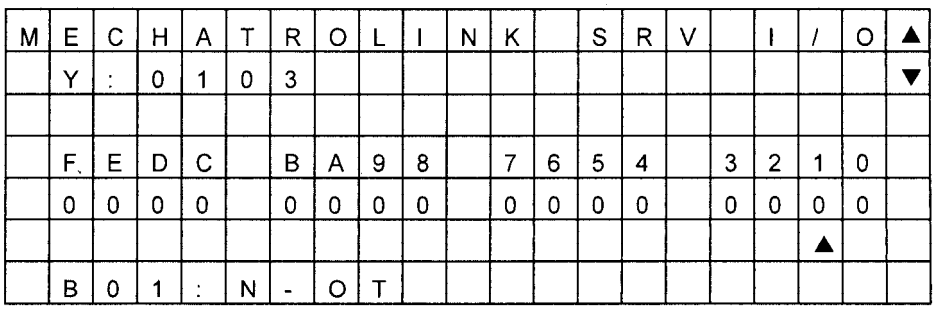


Figure 3.38 MECHATROLINK Servo I/O Monitor Screen

3.1.6 Setting I/O

■ I/O Menu Screen

The I/O Menu Screen is shown in the following diagram.

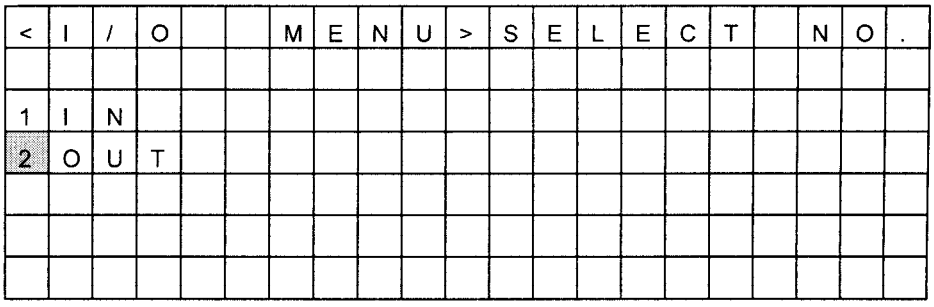


Figure 3.39 I/O Menu Screen

■ Setting Input Relays (IN)

The following procedure describes how to set input relays.

1. When the following screen is displayed, the cursor will flash in the third line from the top on the left-hand side of the screen.

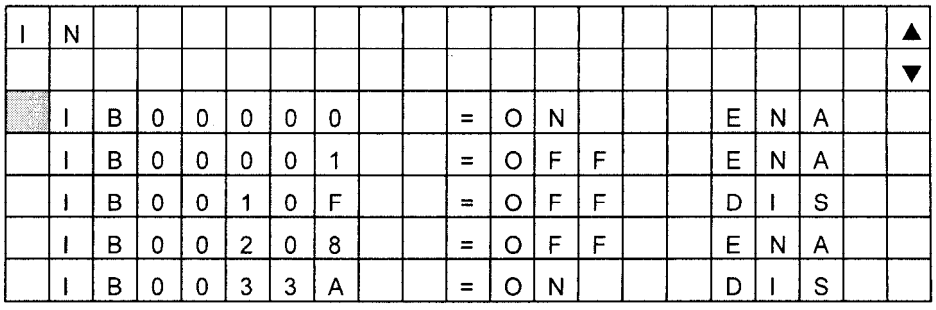


Figure 3.40 Input Relay Screen

2. Move the cursor to the row to be displayed using the **Up** and **Down Cursor** Keys.
3. Input the register and bit numbers using the **Numeric** Keys and press the **Enter** Key to confirm.

   IB will be displayed automatically when the **Numeric** Keys are used.
4. ***ENA*** (Enable) or ***DIS*** (Disable) will be displayed.
5. To delete the displayed data, move the cursor to the data and press the **DEL** Key while pressing the **SHIFT** Key.
6. To switch between ***ENA*** and ***DIS***, move the cursor to ***ENA/DIS*** and press the **Left** or **Right Cursor** Keys while pressing the **SHIFT** Key.

   The ON/OFF status can be controlled when ***DIS*** is displayed. Move the cursor to ***ON/OFF*** and press the **Left** or **Right Cursor** Key while pressing the **SHIFT** Key.
7. As in step 6., move the cursor to the # register display and overwrite the bit address or # register using the **Numeric** and **ENT** Keys.

Hexadecimal digits A to F can be input by pressing the **Numeric** Keys 0 to 5 while pressing the **SHIFT** Key.

INFO

1. The **Left** and **Right Cursor** Keys are enabled for the currently displayed row.
2. A maximum of 5 items of data can be displayed on one screen. (A maximum of 20 items of data can be set and the screen can be scrolled between them.)
3. When switching to other screens, the currently displayed registers will be recorded, so when you return to the original screen the same registers will be displayed.
4. It is possible to disable a setting only when the coil is being used in a ladder logic program.

■ Setting Output Coils (OUT)

The procedure for setting output coils is the same as for input relays.

O	U	T																	▲
																			▼
	O	B	0	0	0	0	0			=	O	N				E	N	A	
	O	B	0	0	0	0	1			=	O	F	F			E	N	A	
	O	B	0	0	1	0	F			=	O	F	F			D	I	S	
	O	B	0	0	2	0	8			=	O	F	F			E	N	A	
	O	B	0	0	3	3	B			=	O	N				D	I	S	

Figure 3.41 Output Coil Screen

INFO

When a register with no I/O definition is specified, the register will be displayed, but it cannot be set.

3.1.7 Setting Parameters

■ Parameter Menu Screen

The Parameter Menu Screen is shown in the following diagram.

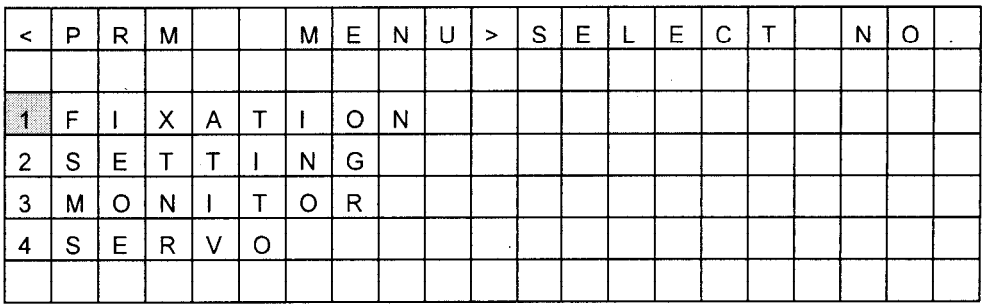


Figure 3.42 Parameter Menu Screen

The procedure for switching screens is described below.

Switching Parameters

- The screen can be scrolled or another parameter selected using the **Up** and **Down Cursor** Keys.
- The screen can be scrolled one page at a time using the **NEXT/PREV** Keys.

Switching Axes

The next axis can be selected using the **Left** or **Right Cursor** Keys. (In order of the logical axis or physical axis address.)

Other Switching Operations

To switch between the logical axis display and the physical axis display, press the **Left** or **Right Cursor** Keys while pressing the **DISP CHG** Key.

Editing Parameters

The procedure for editing parameters is described below.

1. Move the cursor to the parameter number using the **Up** and **Down Cursor** Keys and press the **ENT** Key. The cursor will move to the setting area.
2. Input the numeric value using the **Numeric** Keys.
3. Press the **ENT** Key to confirm. The cursor will move to the parameter number area.

Note: Write-prohibited parameters will not be moved to the setting area when the **ENT** key is pressed.

INFO

1. Some parameters (memory switches, modes, flag settings, etc.) are displayed in hexadecimal (displayed as □□□□ H) for parameter display/setting. Monitoring parameters cannot be changed.
2. Servo parameters cannot be changed under the following circumstances.
   - When b0 of setup parameter No. 2: Servo drive RUN setting OW□□01 is ON.
   - When the Servo of the Servopack whose parameters you are attempting to change is ON.
   - When an alarm has occurred in the Servopack whose parameters you are attempting to change. (Except when IL□□22 is zero.)
3. SVA Servo parameters cannot be monitored.

■ Fixed Parameters

This screen is used to display or set the fixed parameters.

F	I	X	A	T	I	O	N		P	A	R	A	M	E	T	E	R			▲
	Z	:	0	1	0	6														▼
1	5	=		-	-	-	-	-	-	-	-	-	-							
1	6	=		1																
1	7	=		F	F	F	F	H												
1	8	=		3																
1	9	=		0	0	0	0	3	6	0	0	0	0							

Figure 3.43 Fixed Parameter Screen

■ Setup Parameters

This screen is used to display or set the setup parameters.

S	E	T	T	I	N	G		P	A	R	A	M	E	T	E	R				▲
	Z	:	0	1	0	6														▼
1	5	:	O	W	C	1	5	0	=		3	2	7	6	7					
1	6	:	O	W	C	1	5	1	=		2	0	0							
1	7	:	O	L	C	1	5	2	=	-	2	1	4	7	4	8	3	6	4	8
1	8	:	O	W	C	1	5	4	=		6	5	5	3	5					
1	9	:	O	W	C	1	5	5	=		0	0	0	0	0	0	0	0	0	0

Figure 3.44 Setting Parameter Screen

■ Monitoring Parameters

This screen is used to display or set the monitor parameters.

M	O	N	I	T	O	R		P	A	R	A	M	E	T	E	R				▲
	Z	:	0	1	0	6														▼
1	5	:	I	W	C	1	5	5	=		F	F	F	F	H					
1	6	:	I	W	C	1	5	6	=		3									
1	7	:	I	W	C	1	5	7	=		0	0	0	0	H					
1	8	:	I	L	C	1	5	8	=	+	2	1	4	7	4	8	3	6	4	7
1	9	:	I	W	C	1	5	A	=		0	0	0	0	0	0	0	0	0	0

Figure 3.45 Monitor Parameter Screen

■ Servo Parameters

This screen is used to set or display servo parameters.

S	E	R	V	O		P	A	R	A	M	E	T	E	R				▲
	Z	:	0	1	0	6												▼
1	5	:	C	N	0	0	1	5	=		1	0	0					
1	6	:	C	N	0	0	1	6	=		5	0						
1	7	:	C	N	0	0	1	7	=		4	0	0					
1	8	:	C	N	0	0	1	8	=		0							
1	9	:	C	N	0	0	1	9	=		0	0	0	0	H			

Figure 3.46 Servo Parameter Screen

3.1.8 Setting Registers

■ Register Menu

Operating procedures from the Register Menu Screen are described below.

<	R	E	G			M	E	N	U	>	S	E	L	E	C	T		N	O	.
1	S		R	E	G	I	S	T	E	R										
2	M		R	E	G	I	S	T	E	R										
3	I		R	E	G	I	S	T	E	R										
4	O		R	E	G	I	S	T	E	R										
5	D		R	E	G	I	S	T	E	R										

Figure 3.47 Register Menu Screen

- The **Left** and **Right Cursor** Keys are enabled for the currently displayed row.
- A maximum of 5 items of data can be displayed on one screen. (A maximum of 20 items of data can be set and the screen can be scrolled between them.)
- When switching to other screens, the currently displayed registers are recorded, so when you return to the original screen the same registers will be displayed.

■ S Registers

This screen is used to display or set the S registers.

S		R	E	G	I	S	T	E	R									▲
																		▼
S	B	0	0	0	0	0	4	=	O	N								
S	W	0	0	1	4	2		=	+	3	2	7	6	7				D
S	W	0	0	0	5	0		=		0	0	0	D					H

Figure 3.48 S Register Screen

Displaying Registers

The following procedure describes how to display registers.

1. When the Register Setting Screen is displayed, the cursor will flash in the third line from the top on the left-hand side of the screen.
2. The cursor can be moved to the row to be displayed using the **Up** and **Down Cursor** Keys.
3. Press the **ENT** Key.

   The cursor will move to the right of the register type, ready to input the data type.
4. Select the data type using the **Up** and **Down Cursor** Keys and press the **ENT** Key to confirm. The data type will be displayed in circular sequence W→L→B→F→W. The cursor will move to the # register area, ready to input the # register.
5. Input the # register number using the **Numeric** Keys and press the **ENT** Key to confirm. The cursor will move to the display format area ready to input the display format.
6. Select the display format using the **Up** and **Down Cursor** Keys and press the **ENT** Key to confirm.

   The register contents will be displayed.

   The display format can be changed in cyclic fashion as follows:

   - B (binary)→D (signed)→U (unsigned)→H (hexadecimal)→F (floating point)→ A (ASCII)→B (binary)
7. By moving the cursor to a displayed # register, the # register can be overwritten. The # register can be easily overwritten and displayed. (This is the same for data format and display type.)

Contents of the D Register Display

The D register displays the contents of the motion program register set from the Program Select Screen.

Editing Register Contents

The following procedure describes how to edit register contents.

1. Move the cursor to the register contents area using the **Left** and **Right Cursor** Keys and press the **ENT** Key.

   The displayed data will be cleared, ready to input data.

   a) When the data format is B**.**

   Select ***ON*** or ***OFF*** using the **Up** and **Down Cursor** Keys.

   b) When the data format is W or L.

   Input data using the **Numeric** Keys.

   c) When the data format is F.

   Input 4 digits of data using the **Numeric** Keys and press the **ENT** Key. Then input 3 digits of data using the **Numeric** Keys.
2. Press the **ENT** Key to confirm.

Switching Screens

The following procedure describes how to edit register contents.

1. The screen can be scrolled or another register selected using the **Up** and **Down Cursor** Keys.
2. The screen can be scrolled one page at a time using the **NEXT**/**PREV** Keys.

Display	B (Binary)	D (Signed)	U (Unsigned)	H (Hexadecimal)	F (Floating Point)	A (ASCII)
MB	ON	Cannot be specified	Cannot be specified	Cannot be specified	Cannot be specified	Cannot be specified
MW	Cannot be specified	–1	65535	FFFF	Cannot be specified	--
ML	Cannot be specified	+0808530483	0808530483	30313233	+6.446E-010	0123
MF	Cannot be specified	–2147483648	4294967295	80000000	–0.000E+000	----

INFO

Due to the limited number of digits on the Teach Pendant screen, some combinations of register specification methods and display methods cannot be displayed. In this case, the display method cannot be specified. If a display method that cannot be displayed is selected and the **ENT** Key pressed, the **ENT** Key will not respond.

■ M Registers

This screen is used to display or set the M registers.

M		R	E	G	I	S	T	E	R										▲
																			▼
M	W	1	1	1	1	1		=		A	B	C	D						H
M	W	7	7	7	7	7		=	+	3	2	7	6	7					D
M	L	0	0	1	4	2		=		7	F	F	F		F	F	F	F	H
M	L	0	0	0	5	0		=	+	2	1	4	7	4	8	3	6	4	7	D
M	F	0	0	0	0	6		=	+	1	.	2	3	4	E	+	0	1	1	F

Figure 3.49 M Register Screen

■ I Registers

This screen is used to display or set the I registers.

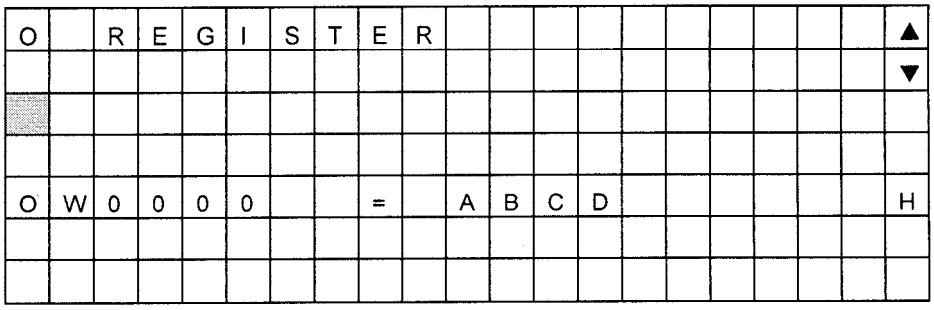


Figure 3.50 I Register Screen

■ O Registers

This screen is used to display or set the O registers.

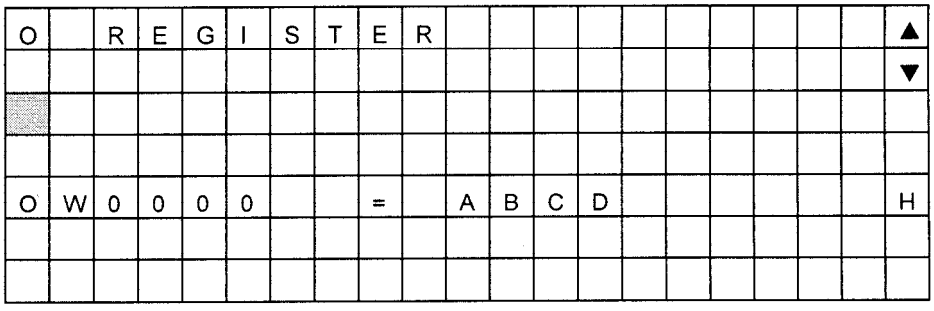


Figure 3.51 O Register Screen

■ D Registers

This screen is used to display or set the D registers.

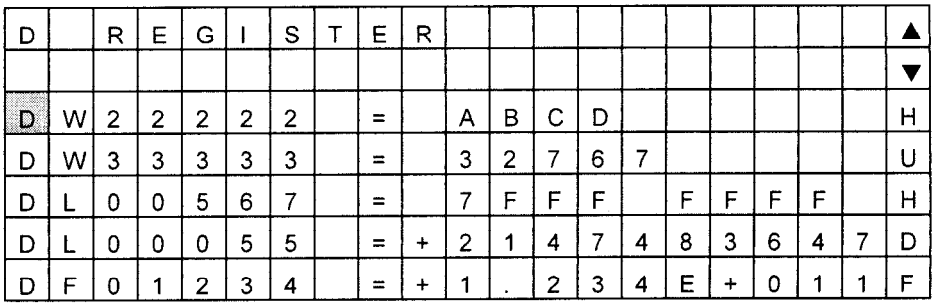


Figure 3.52 D Register Screen

3.1.9 Setting the Point Table

■ Point Table Menu Screen

The Point Table Menu Screen is shown in the following diagram.

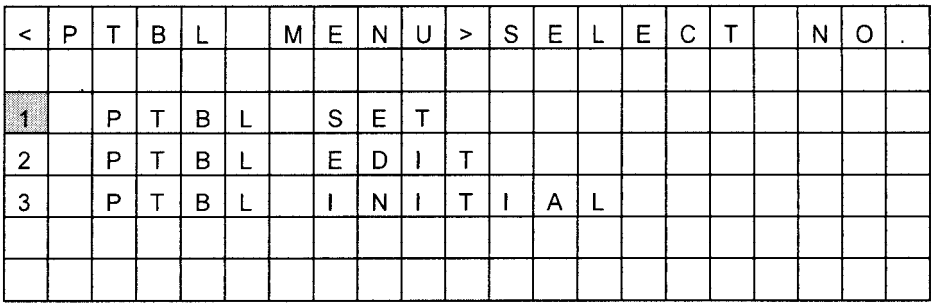


Figure 3.53 Point Table Menu Screen

■ Point Table Save/Reset

Operating procedures from the Point Table Save/Reset Screen are described below.

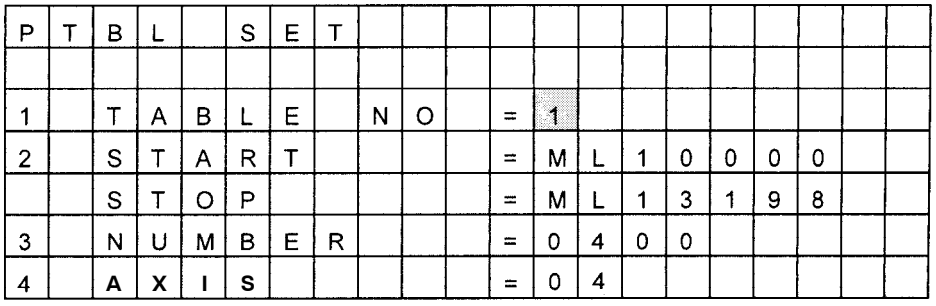


Figure 3.54 Point Table Save/Reset Screen

Saving Point Tables

1. Input the table number in the input area to the right of ***TABLE NO*** **=** and press the **ENT** Key to confirm.
2. Input the leading # register number in the input area to the right of ***START*** **=** and press the **ENT** Key to confirm.
3. Input the number of points in the table in the input area to the right of ***NUMBER*** **=** and press the **ENT** Key.
4. Input the number of axes in the input area to the right of ***AXIS*** **=** and press the **ENT** Key to confirm. The last # register will automatically be displayed in the space to the right of ***STOP*** **=**.
5. To switch to Physical Axis Setting Screen, press the **DISP CHG** + **Left** or **Right Cursor** Keys. (Refer to the following screen.)
6. Select the axis to be set using **Up** and **Down Cursor** Keys.

   The cursor will be to the right of the axis number to be set.
7. Input the physical axis number in the above space using the **Numeric** Keys, and press the **ENT** Key to confirm.

   The physical axis number will be set to the right space of the axis number.

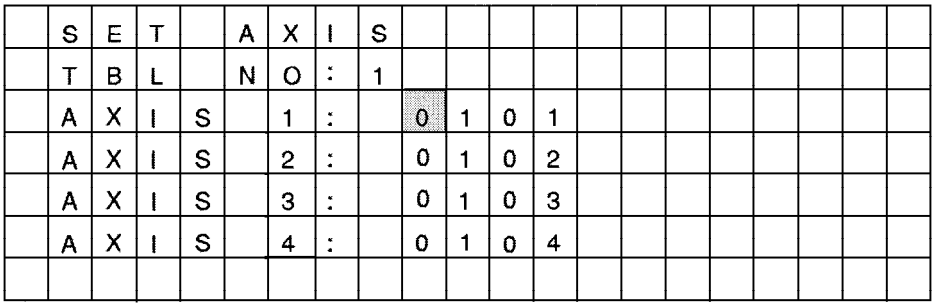


Figure 3.55 Point Table Physical Axis Number Setting Screen

INFO

1. For each table, data for the 16 axes is saved.

Example of register allocations:

The register allocations when the table number is 1, the first register is ML00100, the number of points is 100, and the axis number is 4 as shown below.

	X	Y	Z	S
P0001	ML00100	ML00300	ML00500	ML00700
P0002	ML00102	ML00302	ML00502	ML00702
P0003	ML00104	ML00304	ML00504	ML00704
•	•	•	•	•
•	•	•	•	•
P0100	ML00298	ML00498	ML00698	ML00898

2. M registers are used for the table numbers 1 to 4, and C registers for numbers 5 to 8.

3. When the table to be saved is the same as an existing table or system working area, or the table is not within range, the input values cannot be saved. The examples are shown below.

- When 100 or lower of the M registers is set for START (the area used by the Controller)
- When STOP exceeds the maximum value of M registers (M registers: 32768 or more, C registers: 4096 or more)

4. When M registers or C registers are used other than for the Teach Pendant, confirm that the register range is not the same as the table area to be saved.

5. "EDIT" is displayed on the screen during inputting setting data. At this time, the cursor cannot be moved to other axis using the **Up** and **Down Cursor** Keys.

Resetting Point Tables

To reset a table, save the table filled with zeros (0).

■ Editing Point Tables

Point table can be edited using the procedure outlined in *3.1.7 Setting Parameters*. Switching between screens is possible using the same method as switching between parameters. Data can be input only in decimal form.

P	T	B	L		E	D	I	T											▲
	T	A	B	L	E		N	O	:	1		S							▼
P	0	0	5	5		=			0	0	0	0	0	0	0	0	0		
P	0	0	5	6		=		+	1	2	3	4	5	6	7	8	9	0	
P	0	0	5	7		=		-	0	0	0	0	0	0	0	1	2	3	
P	0	0	5	8		=		+	0	0	0	0	2	3	0	0	0	0	
P	0	0	5	9		=		+	0	0	0	0	0	0	0	0	1	6	

Figure 3.56 Point Table Edit Screen

The procedure for switching between screens is described below.

3

Switching Tables

The desired table can be selected by pressing a **Numeric** Key (1 to 8) while pressing the **SHIFT** Key. Tables that have not been saved cannot be specified.

Switching Axes

The desired axis can be selected by pressing the **Left** or **Right Cursor** Keys while pressing the **SHIFT** Key.

- Press the **SHIFT** + **Right Cursor** Key to increase the axis number one at a time.
- Press the **SHIFT** + **Left Cursor** Key to decrease the axis number one at a time.

Switching Table Point Number and Register Display

To switch the display, press the **Left** or **Right Cursor** Key while pressing the **DISP CHG** Key. This operation can be used to confirm registers to which the teaching data will be saved.

P	T	B	L		E	D	I	T											▲
	T	A	B	L	E		N	O	:	1		S	:	0	1	0	8		▼
M	L	1	0	1	1	4			+	0	0	0	0	0	0	0	0	0	
M	L	1	0	1	1	6		=	+	1	2	3	4	5	6	7	8	9	0
M	L	1	0	1	1	8		=	-	0	0	0	0	0	0	1	2	3	4
M	L	1	0	1	2	0		=	+	0	0	0	2	3	0	0	0	0	0
M	L	1	0	1	2	2		=	+	0	0	0	0	0	0	0	1	6	0

Figure 3.57 Point Table Editing Screen

■ Initializing Point Tables

Operating procedures from the Point Table Initialization Screen are described below.

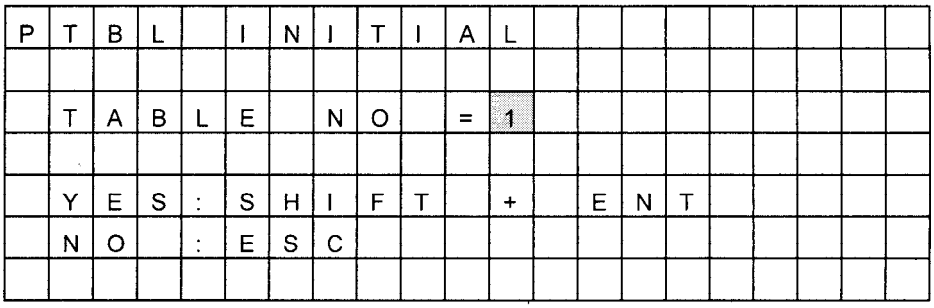


Figure 3.58 Point Table Initialization Screen

1. Input the table number in the input area to the right of ***TABLE NO*** **=** and press the **ENT** Key to confirm.
2. The saved point table region will be cleared to zeros when the **SHIFT** and **ENT** Keys are pressed simultaneously.

Point table initialization is effective only when this screen is displayed.

3.1.10 Communications Settings

■ Set Communications

When the Teach Pendant is started while pressing the **SHIFT** and **ENT** Keys simultaneously, the Set Communications Screen will be displayed. When the **ENT** Key is pressed at "OK?," the set contents will be saved to FLASH memory and the system will restart. At this time, the LED will light and a buzzer will sound.

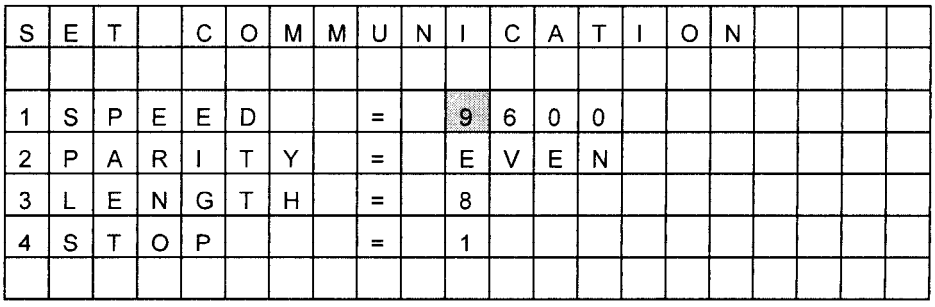


Figure 3.59 Set Communications Screen

- Select RS-232C from ***SERIAL*** using the **Left** and **Right Cursor** Keys and press the **ENT** Key to confirm. Press the Left and Right Cursor Keys to switch the setting value as shown below.

Table 3.1 Serial Setting

Setting	Standard
RS-232C	RS-232C
RS-422	RS-422

Note: Always set RS-232C.

■ Baud Rate (Speed)

Select a baud rate using the **Left** and **Right Cursor** Keys and press the **ENT** Key to confirm. Use the **Left** and **Right Cursor** Keys to switch between any of the settings listed below.

Table 3.2 Baud Rate Settings

Setting	Meaning
2400	2400 bps
4800	4800 bps
9600	9600 bps
19200	19200 bps

■ Parity

Select the parity using the **Left** and **Right Cursor** Keys and press the **ENT** Key to confirm. Use the **Left** and **Right Cursor** Keys to switch between any of the settings listed below.

Table 3.3 Parity Settings

Setting	Meaning
EVEN	Even parity
ODD	Odd parity
NONE	No parity

■ Data Length

Select the data length using the **Left** and **Right Cursor** Keys and press the **ENT** Key to confirm. Use the **Left** and **Right Cursor** Keys to switch between any of the settings listed below.

Table 3.4 Data Length Settings

Setting	Meaning
7	7 bits
8	8 bits

■ Stop Bits

Select the number of stop bits using the **Left** and **Right Cursor** Keys and press the **ENT** Key to confirm. Use the **Left** and **Right Cursor** Keys to switch between any of the settings listed below.

Table 3.5 Stop Bit Settings

Setting	Meaning
1	1 bit
2	2 bits

MEMOBUS in RTU Mode is used as the transmission protocol.

3.2 Operation

This section describes Teach Pendant operations.

3.2.1 Switching to Teach Mode

The following procedure describes how to change to Teach Mode.

1. Switch to Teach Mode by pressing the **MODE CHG** Key while pressing the **SHIFT** Key.
2. The TEACH indicator will light when Teach Mode has been entered.

IMPORTANT

To exit Teach Mode, use the same procedure (i.e., press the **MODE CHG** Key while pressing the **SHIFT** Key.)

When Teach Mode is entered, the JOG indicator will light and operation will be enabled.

Operations can be performed when any of the function screens listed in the following table are displayed except for the shaded areas.

Table 3.6 List of Available Functions

Main Functions		Subfunctions		Comments
No.	**Name**	**No.**	**Name**	
1	System	1	Machine Type	Set the model of MP9□□ Machine Controller used.
		2	Program	Registers the motion program.
2	Run	1	Axis	Registers a physical axis address for the logical axis name of the operation keys.
		2	Speed	Sets the rapid transverse speed.
		3	Override	Sets the rapid transverse speed override.
		4	Step	Sets the step amount.
3	Position	1	Program Position	Position controlled by the motion program.
		2	Error Pulse	IL□□20: User monitoring information on the servo drive.
		3	Machine Position	IL□□08: Monitors the machine position coordinates.

Main Functions		Subfunctions		Comments
No.	Name	No.	Name	
4	Status	1	Program Status	Status of the motion program.
		2	Program Alarm	Alarm generated by the motion program.
		3	Run Status	IW □□ 00
		4	MECHATROLINK Servo Status	IW □□ 01
		5	Motion Command Status	IW □□ 15
		6	Position Management Status	IW □□ 17
		7	Servo Alarm	IW □□ 22
		8	MECHATROLINK Servo Alarm Code	IW □□ 24
		9	MECHATROLINK Servo Alarm I/O Monitor	IW □□ 25
5	I/O	1	Input Relay	I registers
		2	Output Coil	O registers
6	Parameter	1	Fixed	
		2	Setup	
		3	Monitor	
		4	Servo	
7	Register	1	S Register	System registers
		2	M Register	Data registers
		3	I Register	Input registers
		4	O Register	Output registers
		5	D Register	Program data registers
8	Point Table	1	PTBL Save/Reset	Reserves a point table area.
		2	PTBL Edit	Edits point table data.
		3	PTBL Initialization	Clears data in the point table area.
9	Set Communication	–	–	Sets the communications parameters.

* Operations cannot be performed from the screens in the shaded areas.

3.2.2 Switching Operating Modes

The operating mode can be changed from Teach Mode by pressing the **MODE CHG** Key. The LED indicator will change in a cyclic form from JOG→STEP→ZRN→JOG.

3.2.3 Jogging Operations

In Jog Mode, jogging operations will be executed using the **Axis** Keys according to the rapid transverse speed set from the Set Speed Screen.

The following items describe how to perform jogging operations.

1. The **Axis** Keys have the following functions.
   - X+ (or X−): Moves the X axis in the positive (or negative) direction.
   - Y+ (or Y−): Moves the Y axis in the positive (or negative) direction.
   - Z+ (or Z−): Moves the Z axis in the positive (or negative) direction.
   - S+ or (S−): Moves the S axis in the positive (or negative) direction.
2. When any of the **Axis** Keys is pressed from the physical axis display on the Position Screen, the currently displayed axis will be activated. Axes (X, Y, Z, S) will be allocated in order from the top.

This function is performed in the same way for both stepping and zero point return operations.

3.2.4 Stepping Operations

When the Teach Pendant is in STEP Mode, stepping operations can be performed according to the rapid transverse speed and the step amount set on the Set Step Screen.

The operating procedure is that same as for jogging operations. To stop, press the **STOP** Key and all 4 axes will be stopped.

3.2.5 Zero Point Return Operation

When the Teach Pendant is in ZRN Mode, the zero point return operation can be executed by pressing any of the **Axis** Keys.

The operating procedure is that same as for jogging operations. To stop, press the **STOP** Key and all 4 axis will be stopped.

3.2.6 Teaching Operations

When the **TEACH** Key is pressed from the Machine Position Screen, teaching will be preformed for the displayed position.

1. Press the **X TEACH**, **Y TEACH**, **Z TEACH**, or **S TEACH** Keys to start teaching the position for the corresponding axis. Press the **ALL TEACH** Key to teach all four axes at the same time.
2. When a **TEACH** Key is pressed, the display will switch to a screen prompting the storage destination of the teaching data.

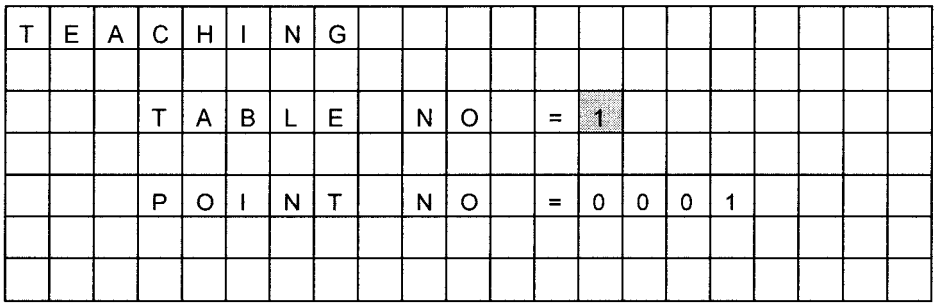


Figure 3.60 Teaching Screen

3. Input the table number and point number where the data is to be stored using the **Numeric** Keys and press the **ENT** Key to confirm. The display will then return to the Position Screen.

INFO

Teaching Operations from the Physical Axis Screen

When teaching is performed from the Physical Axis Screen, the currently displayed position is recorded and the logical axis name position, recorded during RUN settings is ignored. (The position allocated using the **Axis** Keys is recorded.)

Default Values for Table Number and Point Number on the Teaching Screen

- When the power is turned ON, the table number will be 1, and the point number will be 0001.
- When teaching is performed more than twice, the table number or the point number will be the previous value incremented by one. (When the power is turned ON, the point number will be set to the incremented number.)
- When only the table number is changed to the previous teach number + 1 using the **Numeric** Keys, the table number will be set to the incremented number.
- In the same way, when only the point number is changed to the previous teach number + 1 using the **Numeric** Keys, the point number will be set to the incremented number.
- If an attempt is made to teach values that are out of range, the table number will return to 1.

3.2.7 Alarm Reset Operation

- When a system alarm or servo alarm occurs, the alarm status can be reset by pressing the **ALM REST** Key.

INFO

1. The alarm status cannot be reset during Servo ON.
2. The alarm status caused by parameters or functions cannot be reset. When the system alarm occurs after restarting the Controller and Teach Pendant, follow the troubleshooting procedures in the Controller manual. Communications are not performed if there is an error in the Controller and the Teach Pendant cannot be used.

3.2.8 Stop Operation

Axis movement can be stopped during stepping or zero point return operations by pressing the **STOP** Key.

A

Status Lists

This appendix provides list of all the status and monitoring information available from the Teach Pendant.

A.1 RUN Status

Table A.1. RUN Status

Name	Register	Details	
RUN Status	IW □□ 00	Monitors the operating status of the Servo Controller.	
		b1: PRMERR	Parameter setting error
		b2: FPRMERR	Fixed parameter error
		b3 to b6:	Not used.
		b7: SVCRDY	Servo Controller ready.
		b8: SVCRUN	Servo Controller operating.
		b9: DIRINV	Operating direction for absolute encoder
		b10: ABSRDC	Absolute value read signal
		b11:	Not used.
		b12: FBP0	No feedback pulses
		b13: POSCOMP	Positioning completed.
		b14:	Not used.
		b15: ZRNC	Zero point return completed.

A.2 Motion Command Status

Table A.2. Motion Command Status

Name	# Register	Details	
Motion Command Status	IW □□ 15	Flags indicating the execution status of motion commands.	
		b0: BUSY	**Command Executing** The motion command is being executed and new motion commands cannot be issued.
		b1: HOLDL	**Command Hold Completed** Turns ON when a motion command hold has been requested by setup parameter OW□□21, b0: Command Hold, and that hold is completed.
		b2: DEN	**Distribution Completed** The distribution completed status of the MECHATROLINK Servo has been stored.
		b3: ZSET	**Zero Point Completed** Turns ON when motion command ZSET has finished executing.
		b4: EX_LATCH	**External Positioning Signal Latch Completed** Turns ON when the latch is completed by the external signal, while motion command EX_POJING/LATCH is being executed.
		b:5 FAIL	**Command Ended in an Error** Turns ON when an error occurs during motion command processing.
		b:6 ZRNC	**Zero Point Return Completed** ON when a zero point return operation has been completed.
		b7 to b15:	Not used.

A.3 MECHATROLINK Servo Status

Table A.3. MECHATROLINK Servo Status

Name	# Register	Details	
MECHA-TROLINK Servo Status	IW □□ 01	Flags indicating the execution status of the MECHATROLINK Servo.	
		b0: ALARM	**Alarm** Set to 1 when an alarm has been detected in the Servo Drive. Held until ALM_CLR is executed.
		b1: WARNG	**Warning** Set to 1 when a warning has been detected in the Servo Drive. • Held until ALM_CLR is executed. • Automatically cleared when the cause of the warning has been removed.
		b2: CMDRDY	**Command Ready** Set to 1 when commands can be received. When a command is issued when the Servo Controller is busy, the command will be ignored and no response will be sent.
		b3: SVON	**Servo ON** Set to 1 when the base block is released.
		b4: PON	**Main Power Supply ON** Set to 1 when the main power supply to the Servo is ON.
		b5: MLOCK	**Machine Lock** Set to 1 when the machine is locked.
		b6: ZPOINT	**Zero Point** Set to 1 when the absolute position (APOS) is within the zero point range. The zero point will not be detected when an incremental PG is used and the zero point has not been set.
		b7: PSET	**Positioning Completed** Set to 1 when CLEAR COMPLETED (DEN=1) or the absolute position (APOS) are within the positioning completion range for the machine coordinate system final target position (TPOS–Usr_ofst–Mlck_ofst). • Set to 1 when APOS after decelerating to a stop has been completed following motion interruption due to the HOLD command.

Name	# Register	Details	
		b8: DEN	**Distribution Completed** Set to 1 when the final target position (TPOS) equals the reference position (APOS) after acceleration/deceleration filter distribution has been completed. • DEN remains as 1 when a motion command with no motion distance is used. • Becomes 0 at least once even when the motion is completed within one communications cycle.
		b9: T_LIM	**Within Torque Limit** Set to 1 when within torque limits.
		b10: L_CMP	**Latch Completed** The Servo is in latch mode when a latch command is being received. In latch mode, this flag becomes 1 when latch signals are received and latch positioning has been completed. The flag is 0 when the power is turned ON.
		b11: NEAR	**Near Positioning** Set to 1 when the final target position (TPOS−Usr_ofst−Mlck_ofst) of the machine coordinate system is near the positioning range. • DEN has no affect on NEAR.
		b12: P–SOT	**Positive Software Limit** Set to 1 when the absolute position (APOS) or the reference position (POS) exceeds the positive software limit. • The software limit will not be detected when an incremental PG is used and the zero point has not been set.
		b13: N–SOT	**Negative Software Limit** Set to 1 when the absolute position (APOS) or the reference position (POS) exceeds the reverse software limit.
		b14: Reserved	Reserved
		b15: Reserved	Reserved

A.4 Position Control Status

Table A.4. Position Control Status

Name	# Register	Details	
Position Control Status	IW □□ 17	Flags indicating the position control status.	
		b0: MLKL	The machine is locked.
		b1: ZERO	**Machine Position** ON when APOS (machine coordinate system feedback position) is within the range set in setup parameter OW□□33 (Machine Position Output Width).
		b2: PSET2	**Secondary In-position Range Completed** ON when the difference between the reference position and the feedback position after distribution has been completed, is within the range set for set-up parameter OW□□32 (Secondary Input Position Width).
		b3: ABSLDE	**ABS System Unlimited** Position control information has finished loading.
		b4: TPRSE	Preset completed for the number of POSMAX turns.
		b5: GEARM	Same as the selection of the enabled electrical gears.
		b6: MODSELM	Same as the axis selection.
		b:12 to b15: USRMONSERL	**Responses to MECHATROLINK User Monitoring Information Selection** Stores the monitor information stored in monitor parameter IL□□20 (MECHATROLINK Servo User Monitoring Information).

A.5 Alarm Monitoring

Table A.5. Alarms

Name	# Register	Details	
Alarm	IL □□ 22	Servo Controller alarms are monitored using bit information.	
		b0: SVERR	**Servopack Error** Servopack alarm detected. (For alarm details see IW□□24.)
		b1: OTF	**Positive Overtravel** Positive overtravel detected in the Servopack. (The P-OT signal is ON.)
		b2: OTR	**Negative Overtravel** Negative overtravel detected in the Servopack. (The N-OT signal is ON.)
		b3: SOTF	**Positive Software Limit** Movement detected beyond the positive software limit range.
		b4: SOTR	**Negative Software Limit** Movement detected beyond the negative software limit range.
		b5: SVOFF	**Servo Power OFF** A motion command was issued while the Servo power was OFF.
		b6: TIMEOVER	**Positioning Time Over** After completion of distribution, positioning was not completed within the time specified in OW□□34 (Positioning Check Time).
		b7: DISTOVER	**Positioning Distance Over** Movement attempted which exceeds the positioning distance limit.
		b8: FILTYPERR	**Filter Type Error** Attempt was made to change the filter type before distribution was completed.
		b9: FILTYMERR	**Filter Time Error** Attempt was made to change the filter time before distribution was completed.
		b10: MODERR	**Control Mode Error** Position Control Mode motion commands were issued in a mode other than Position Control Mode.
		b11: SET_NRDY	**Zero Point Not Set** The zero point has not been set.

Name	# Register	Details	
		b12: ZSET_MOV	**Zero Set During Movement** The motion command ZSET was issued while the axis was moving.
		b13: CN_ERR	**User Constant Setting Error** The settings were incorrect when the motion command CN_RD/CN_RD was issued.
		b14: WDT_ERR	**MECHATROLINK Servo Synchronous Communications Error** The M930 Machine Controller detected a MECHATROLINK Servo synchronous communications error.
		b15: COM_ERR	**MECHATROLINK Servo Communications Error** The M930 Machine Controller detected two consecutive MECHATROLINK Servo errors.
		b16: SVTIMOUT	**MECHATROLINK Servo Command Timeout Error** A MECHATROLINK Servo command was not completed within the prescribed time.
		b17: ABSOVER	**Absolute Encoder Revolutions Over** The number of absolute encoder revolutions exceeded the range that can be handled by the MP930 Machine Controller.
		b18 to b31	Not used.

A.6 MECHATROLINK Servo Alarm Codes

Table A.6. MECHATROLINK Servo Alarm Codes

Name	# Register	Details		
Position Management Status	IW □□ 24	MECHATROLINK Servo alarm codes		
		Code	**Meaning**	**Type of Error**
		99	Normal	–
		94	User constant setting warning	Warning
		95	MECHATROLINK command warning	Warning
		96	MECHATROLINK communications warning	Warning
		00	Absolute encoder data error	Servo alarm
		02	User constant breakdown	Servo alarm
		10	Overcurrent	Servo alarm
		11	Ground fault	Servo alarm
		40	Overvoltage	Servo alarm
		51	Overspeed	Servo alarm
		71	Instantaneous overload	Servo alarm
		72	Continuous overload	Servo alarm
		80	Absolute encoder error	Servo alarm
		81	Absolute encoder backup error	Servo alarm
		83	Absolute encoder sumcheck error	Servo alarm
		84	Absolute encoder battery error	Servo alarm
		85	Absolute encoder data error	Servo alarm
		B1	Gate array 1 error	Servo alarm
		B2	Gate array 2 error	Servo alarm
		B3	U-phase current feedback error	Servo alarm
		B4	V-phase current feedback error	Servo alarm
		B5	Watchdog detector error	Servo alarm
		C1	Servo overrun	Servo alarm
		C2	Encoder phase detection error	Servo alarm

Name	# Register	Details		
		C3	Encoder A-phase and B-phase disconnection	Servo alarm
		C4	Encoder C-phase disconnection	Servo alarm
		C5	Incremental encoder initial pulse error	Servo alarm
		D0	Position error overflow	Servo alarm
		E5	MECHATROLINK synchronization error	Communications alarm
		E6	MECHATROLINK communications error	Communications alarm
		F3	Momentary power interruption	Servo alarm

A.7 MECHATROLINK Servo I/O Monitoring

Table A.7. MECHATROLINK Servo I/O Status

Name	# Register	Details	
MECHA-TROLINK Servo I/O Monitor	IW □□ 25	Parameters for monitoring MECHATROLINK Servo I/O monitoring information.	
		b0: P–OT	Positive overtravel input
		b1: N–OT	Negative overtravel input
		b2: DEC	Deceleration LS input
		b3: PA	A-phase encoder input
		b4: PB	B-phase encoder input
Position Management Status		b5: PC	C-phase encoder input
		b6:	Not used.
		b7:	Not used.
		b8:	Not used.
		b9: BRK	Brake input
		b10 to b15	Not used.

Machine Controller MP9□□
TEACH PENDANT USER'S MANUAL

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