

mitsubishi

MITSUBISHI PERSONAL MACHINE CONTROLLER

MODEL W

TEACHING BOX OPERATING MANUAL

BNP-B2099*

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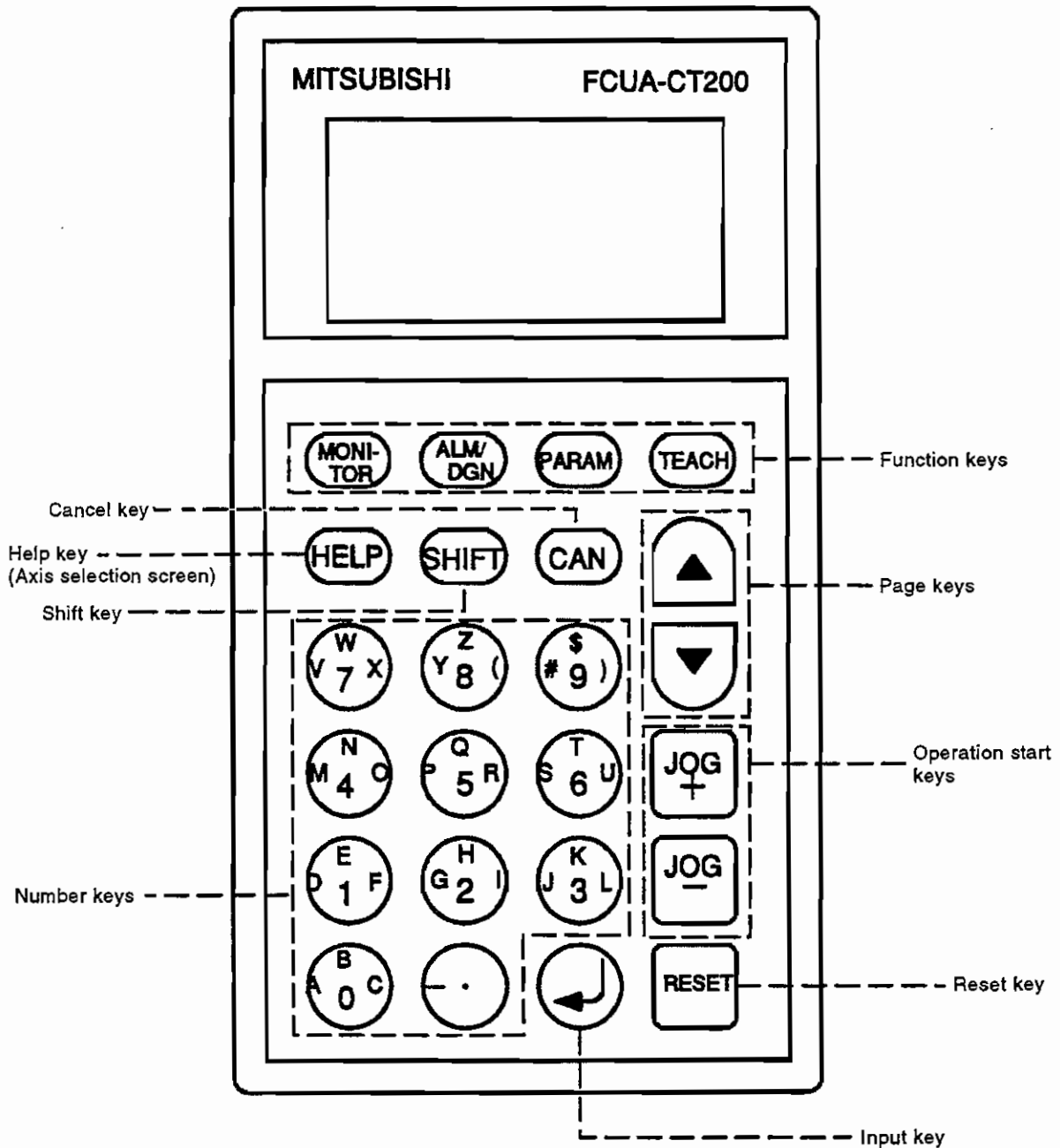
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1. OVERVIEW

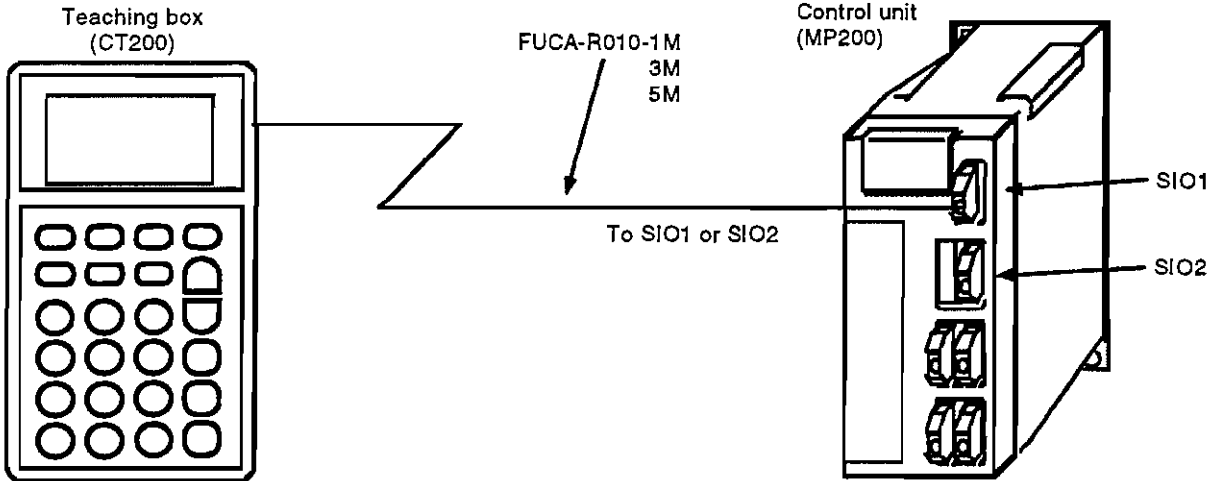
1.1 Introduction to the Teaching Box

By connecting the terminal unit to the machine controller, you can refer to or display the data of the machine controller or move the axes from the keypad. Also, you can monitor the data of each axis, refer to or set manual operation (single-axis operation) or point-specified operation (max. three interpolation axes) parameter files, display alarms, make absolute position initial setting, refer to or set PLC controlling I/O signals, and refer to or set point data.

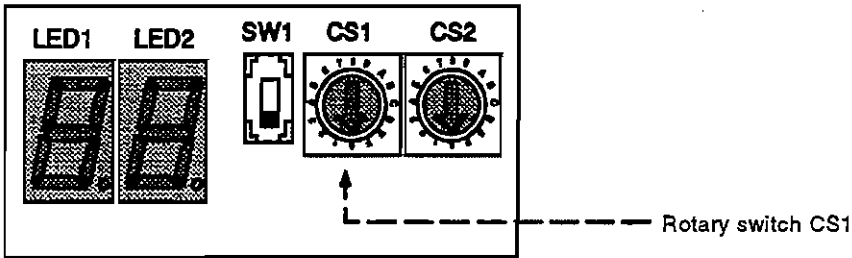
1.2 Appearance of the Terminal Unit



1.3 System Configuration



Use the rotary switch CS1 to change the combination of connected equipment. (After this changing, power must be switched on again.)

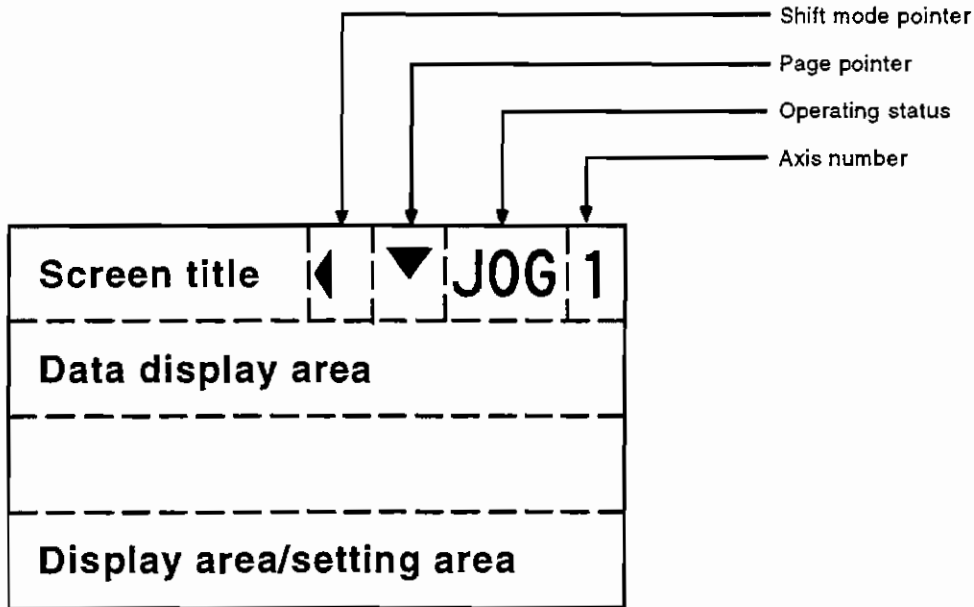


CS1	SIO1	SIO2
0	Setup software	MELSEC peripheral
1	Setup software	Teaching box
2	Teaching box	MELSEC peripheral
3	Teaching box	Setup software

To connect the dedicated screen to be connected for the command function communication procedure (customer-prepared software), connect it to the position of the setup software given in the left list.

2. BASIC OPERATION

2.1 Display Functions



(1) Shift mode pointer

Indicates the status of the shift mode.

◀ : Points that the character written on the left side of the key is valid.

▼ : Points that the character written on the top side of the key is valid.

▶ : Points that the character written on the right side of the key is valid.

This pointer disappears when the shift mode is reset.

(2) Page pointer

Indicates that there is a next and/or preceding page.

▼ : Points that there is a next page. There is no preceding page.

▲ : Points that there is a preceding page. There is no next page.

◆ : Points that there are next and preceding pages.

No pointer indicates that there are no pages.

(3) Operation mode/alarm indication

Indicates the operating status of the axis selected on the axis selection screen.

(4) Axis number indication

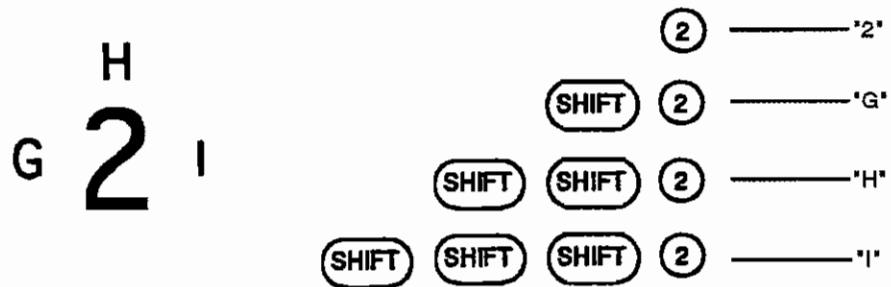
Indicates the axis number selected on the axis selection screen.

2.2 Functions of the Keys

The teaching box has the function keys, page keys, operation start keys, shift key, number keys, cancel key, help key, input key and reset key.

- (1) **Function keys**
There are four function keys: MONITOR, ALM/DGN, PARAM and TEACH. Press the required function key to select the corresponding menu screen.
- (2) **Page keys**
Press either of the page keys (▼ , ▲) to change the page.
- (3) **Operation start keys**
Press either of the operation start keys (JOG+, JOG-) to start operation. The operation start keys are made valid only when the teaching box or operation mode is selected. Refer to Section 2.4 "Operation Starting Procedure".
- (4) **Shift key**
Press the shift (SHIFT) key to switch between the statuses of the shift mode. Press the shift key once to select the shift 1 status, twice to select the shift 2 status, or three times to select the shift 3 status.
Press the key four times to reset the shift status. The shift status is also reset when any key other than the shift key is pressed in the shift status.
- (5) **Number keys**
Use the number keys ("0" to "9", ".") to enter numbers. Also use these keys with the shift key to enter alphabets, etc. Each number key has alphabets, etc. (max. three characters) written around the number.
Normally when you press the required number key, the number at the center of the key is entered. When any shift status has been selected by pressing the shift key, the alphabet or the like is entered according to the shift status. The valid character is the one on the left of the number in the shift 1 status, the one above the number in the shaft 2 status, and the one on the right of the number in the shaft 3 status.

(Example)

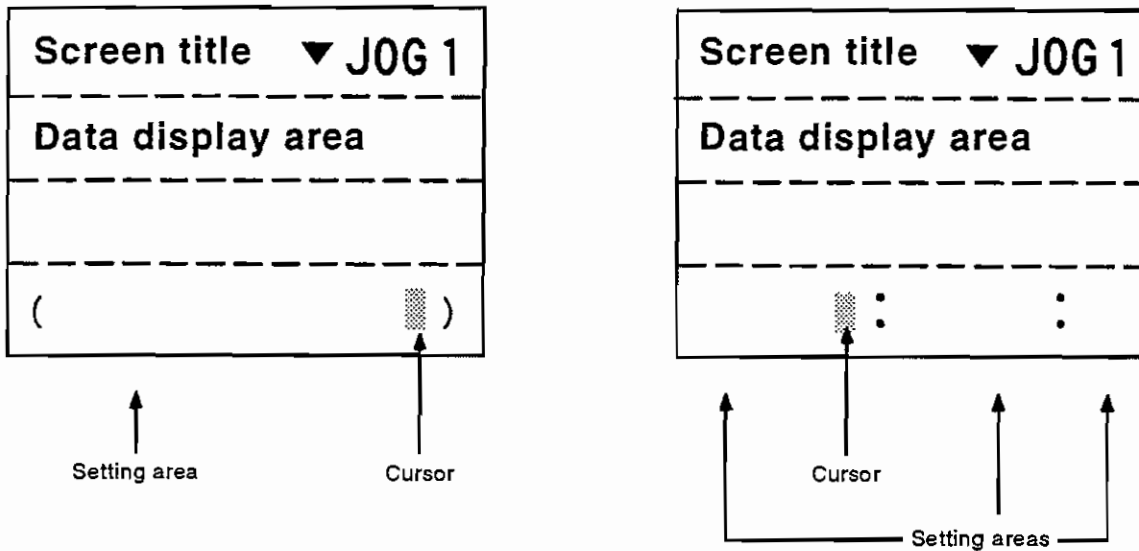


- (6) **Cancel key**
Press the cancel (CAN) key to clear the data in the setting area where the cursor exists.
- (7) **Help key**
Press the help (HELP) key to call the axis selection screen. For more information, refer to Section 3.2 "Axis Selection".
- (8) **Input key**
Press the input key to set the data entered in the setting area.
- (9) **Reset key**
Press the reset key to reset operation.

2.3 Data Setting in the Setting Area

The screen on which you can set data shows the setting area and cursor.

The setting area(s) is (are) located on the bottom line of the screen and separated by () or :.



(1) How to enter data to the setting area from the keypad

When the cursor is shown on the screen, the data entered from the keypad is displayed at the cursor.

(Example) To enter "12" from the keypad to the setting area.

No data entered in the setting area



Enter "1".



Enter "2".

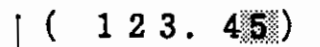


(2) How to clear the data entered in the setting area

Use the cancel key to clear the data entered in the setting area. Pressing the cancel key clears all data in the setting area where the cursor exists.

(Example) To clear the data in the setting area.

"123.45" entered in the setting area.



Press the cancel key.



(3) Setting method

Enter numeric or alphabetic data from the keypad to the setting area and press the INPUT key to set that data. To make data setting over again, press the cancel key to clear all data entered in the setting area, and set data again from the beginning.

(Example) To set 123.45 from the setting area.

Enter data from the keypad in order of "1", "2", "3", ".", "4" and "5". (1 2 3 . 4 5)

Press the INPUT key. ()

Data setting processing is carried out according to the data in the setting area, the result is shown in the data display area, and the data of the setting area disappears.

(4) Cursor movement

When there are more than one setting area, select the shift mode and press the required page key (▲, ▼) to move the cursor between the setting areas.

Cursor located in the leftmost setting area.	█ : :
Press ▼ in the shift 1 status.	: █ :
Press ▼ in the shift 1 status.	: : █
Press ▲ in the shift 1 status.	: █ :
Press ▲ in the shift 1 status.	█ : :

(5) Setting error

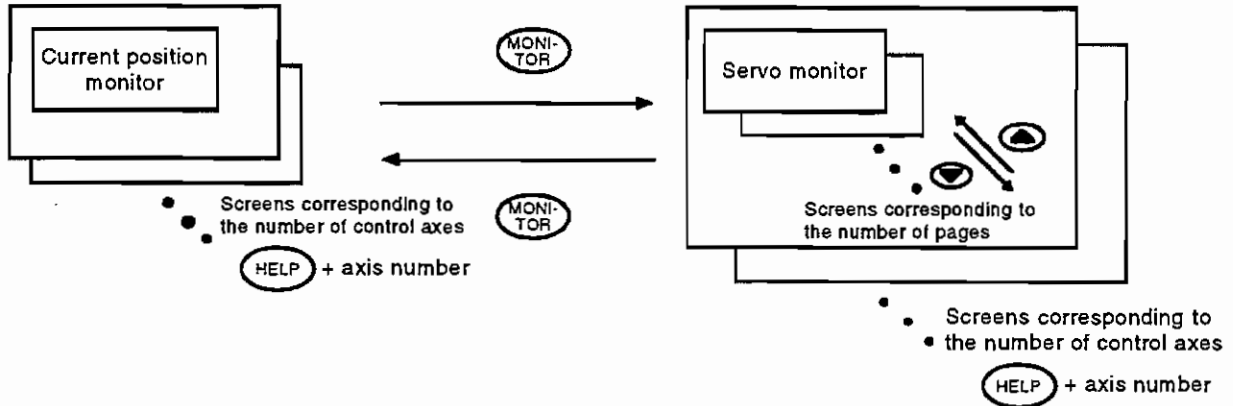
If the data set in the setting area is unauthorized or outside the acceptable range, a setting error occurs and the setting area shows "ERROR". Press the cancel key and do data setting over again or change the screen to reset the setting error.

3. SCREEN TRANSITION

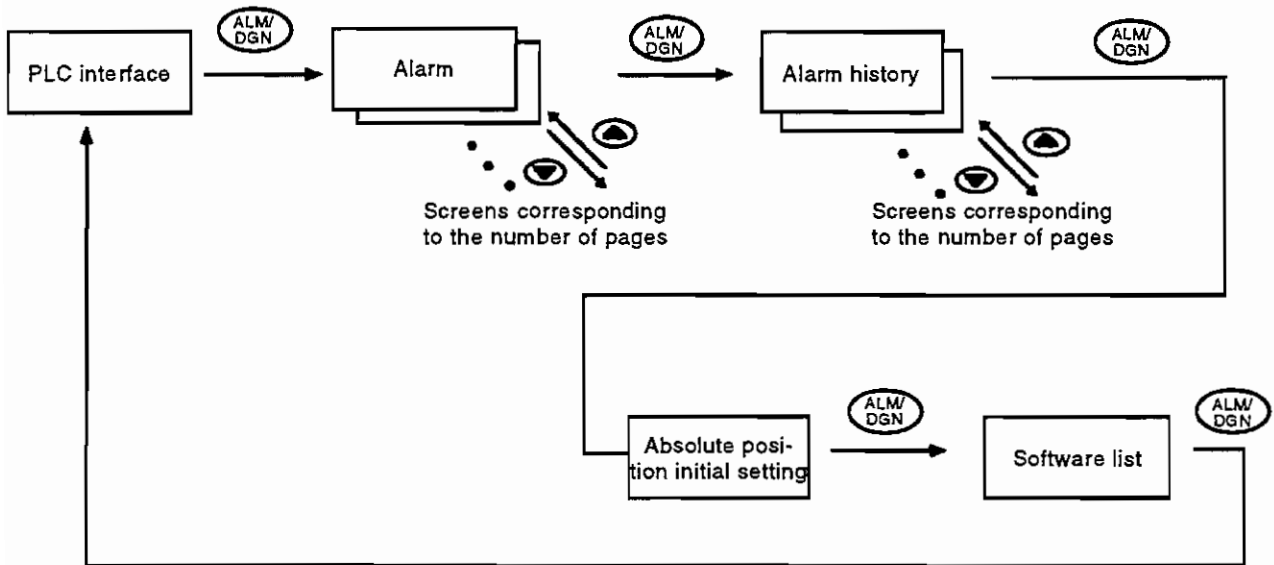
3.1 Screen Structure

The screen consists of four functions: monitor, alarm diagnostic, parameter and teaching.

(1) Monitor MONI-TOR

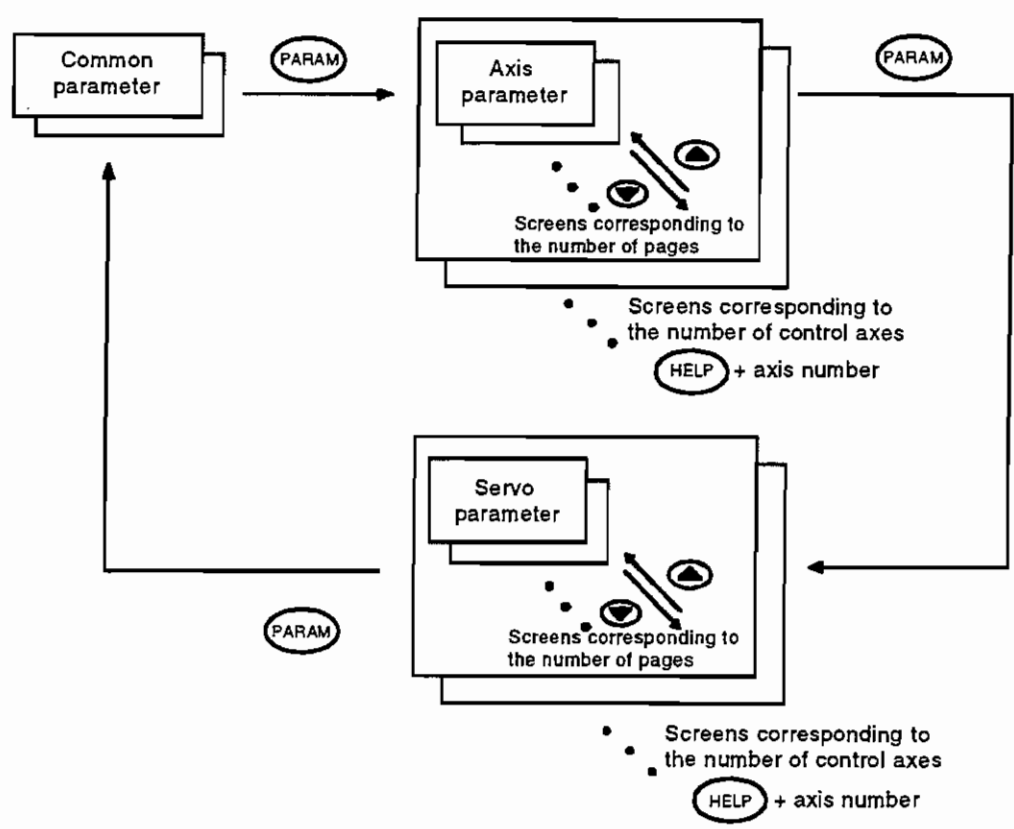


(2) Alarm diagnostic ALM/DGN

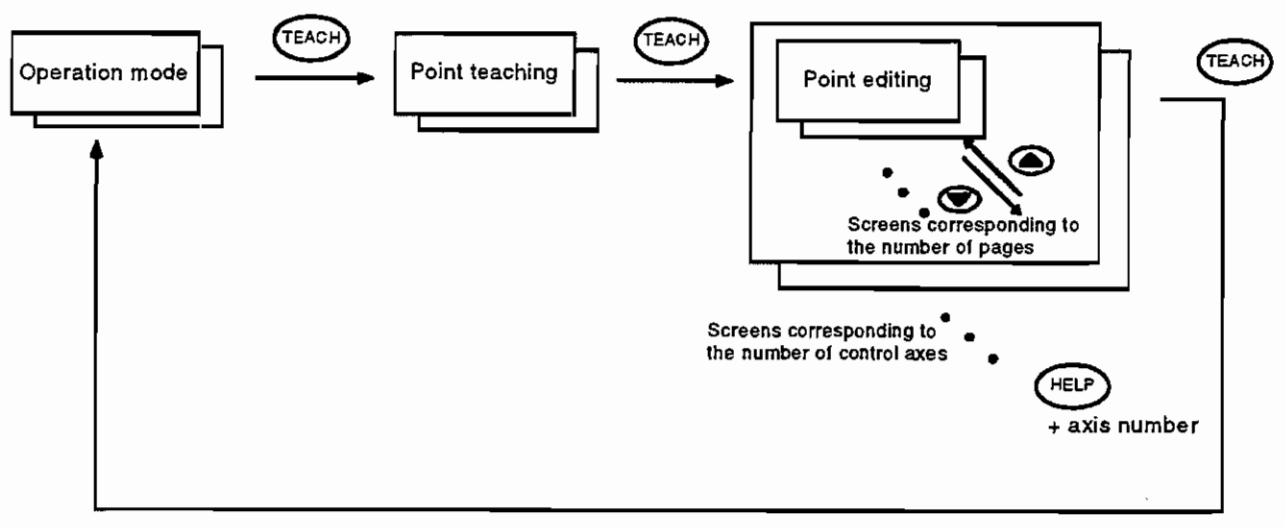


Screen Structure

(3) Parameter (PARAM)



(4) Teaching (TEACH)



3.2 Screen Selection

The screen has three levels: function, menu and page. Use the function and page keys to select between screens. Press the required key to switch from one screen to another. Screens may be changed by any of function switching, menu switching and page switching.

3.2.1 Function switching

There are four different functions: MONITOR, ALM/DGN, PARAM and TEACH. Use the function keys to switch between these functions. Press the required function key to call the screen of the corresponding function. Function switching displays the menu and page that were selected previously for that function.

3.2.2 Menu switching

Each function has several menu screens. To switch between menu screens, press the function key corresponding to the selected function.

Press the function key to switch to the next menu. When you press the function key on the last menu, it returns to the first menu. Menu switching displays the page that was selected previously for that menu.

3.2.3 Page switching

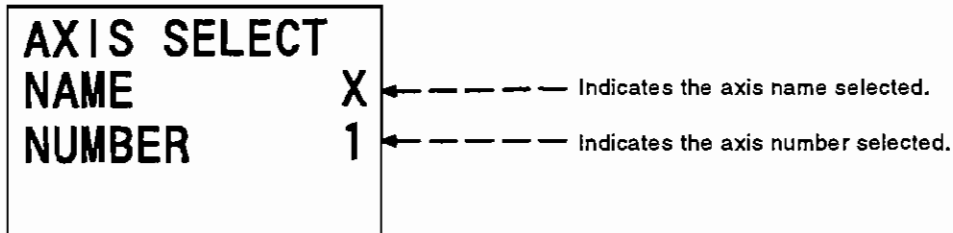
Use the page keys to switch between pages. Press ▲ to select the preceding page or ▼ to select the next page. This switching method is valid only when the page switching pointer is shown. You cannot switch from the first page to the preceding page or from the last page to the next page.

3.3 Axis Selection

The axis selection screen is displayed by pressing the help key. The help key is valid on any screen. Each axis data screen displays the data of a single axis. You can select the axis data to be displayed.

You can also select the axis for manual operation. Such axis selections are made on the axis selection screen.

Axis selection screen



By entering the desired axis number on the axis selection screen, the axis selection screen returns to the previous menu screen (the menu screen which had been displayed before the help key was pressed). The data of the newly selected axis is displayed on the previous menu screen. The axis number being selected is shown on top right of the screen.

Example: To refer to the data of the third axis on the current value monitor screen.

The data of the first axis is displayed.

POS1 JOG1
X
-12345.678] [

Pressing the help key calls the axis selection screen. Enter "3" on this screen.

AXIS SELECT
NAME X
NUMBER 1

The data of the third axis is displayed.

POS1 JOG3
Z
-12345.678] [

4. SCREEN SPECIFICATIONS

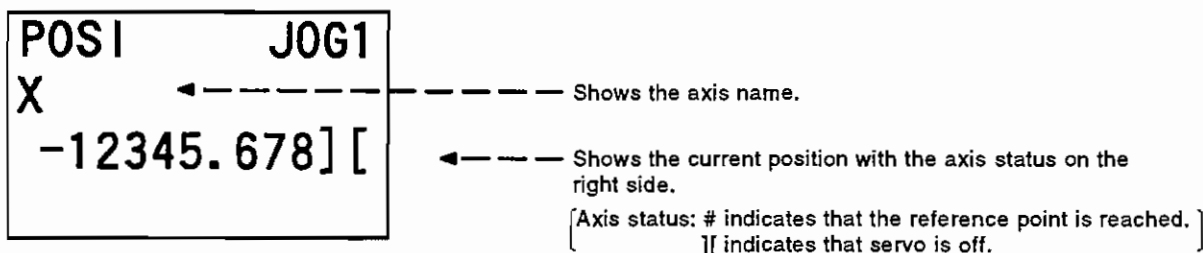
The screen is roughly divided into the monitor screen, alarm/diagnostic screen, parameter screen and teaching screen. Use the corresponding function key to select any of the four screens.

4.1 Monitor

The monitor screen is used to monitor the data of the corresponding axis. There are two different menus: current position monitor screen and servo monitor screen. Each screen has screens corresponding to the number of control axes. For switching between axis screens, refer to Section 3.3 "Axis Selection".

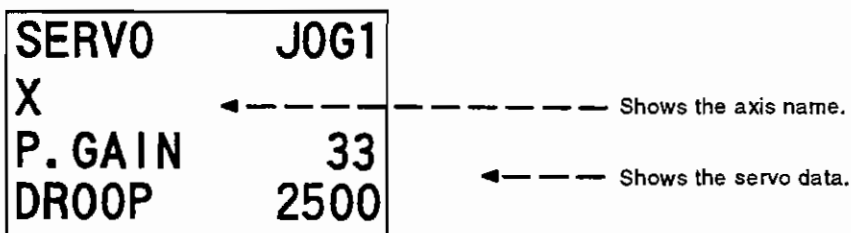
4.1.1 Current position monitor

Shows the current position of the corresponding axis.



4.1.2 Servo monitor

Shows the servo data of the corresponding axis. The servo data shown includes: position loop gain, position loop droop, motor speed, motor current, motor load, regenerative load, current servo alarm, grid amount.

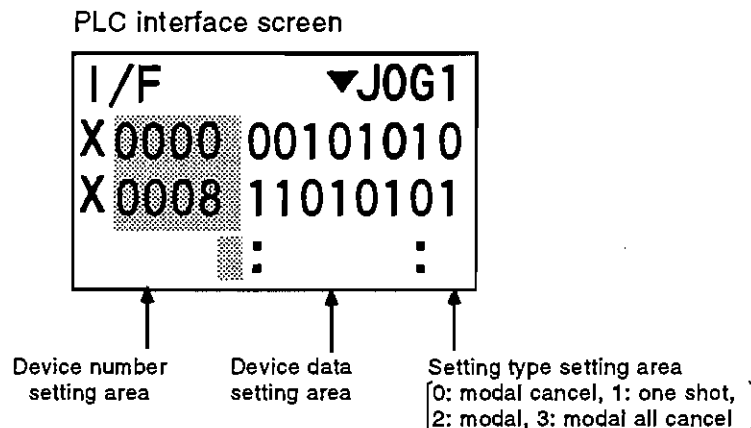


4.2 Alarm/Diagnostic

The alarm/diagnostic screen is used to display alarms, display a software list, display or set the PLC controlling I/O signals, and set the absolute position reference position. There are five different menus: PLC interface screen, alarm screen, alarm history, absolute position reference position setting screen and software list.

4.2.1 PLC interface

This screen shows the PLC controlling I/O signals. It also allows you to set I/O signals from the setting area (forced output). There are three setting areas: for device number, device data and setting type.



(Device number)

In the device number setting area, enter the device number (such as X000, Y000) you want to set.

(Device data)

In the device data setting area, enter the data to be set. For bit data, enter "0" or "1". For byte data, enter hexadecimal data. For the setting procedure, refer to Section 2.3 "Data Setting in the Setting Area".

(Setting type)

In the setting type setting area, enter the setting type. There are four different setting types:

0: Cancels the signal forcibly output in modal type.

(Enter the device number to be canceled in the device number setting area.)

1: Forcibly outputs the signal in one shot type.

2: Forcibly outputs the signal in modal type.

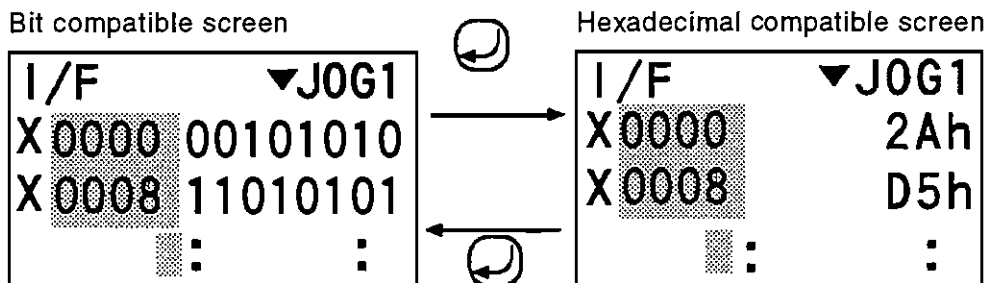
3: Cancels all signals forcibly output in modal type.

(The device number to be canceled need not be entered.)

Four signals are held in the modal type. When there are more than four signals, the older signals are canceled.

(Display mode changing)

When there is no data set in the setting areas, you can change the interface (I/F) display mode by pressing the input key. (Between bit compatible and hexadecimal compatible screens. Note that for R and D registers, the display mode changes between hexadecimal, decimal and double word.)

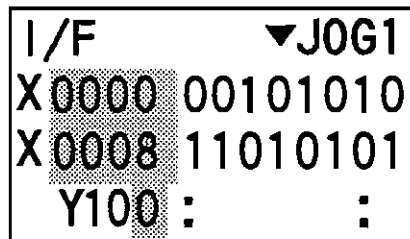


(Device number selection)

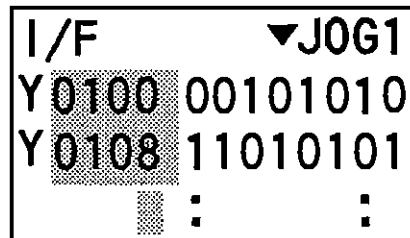
The device number to be displayed on the screen may either be selected by scrolling with the page keys or by setting the device number in the setting area. When the device number is set in the setting area, the data of the set device number is shown at the beginning.

Example: To refer to the data of Y100

Enter "Y", "1", "0", "0".

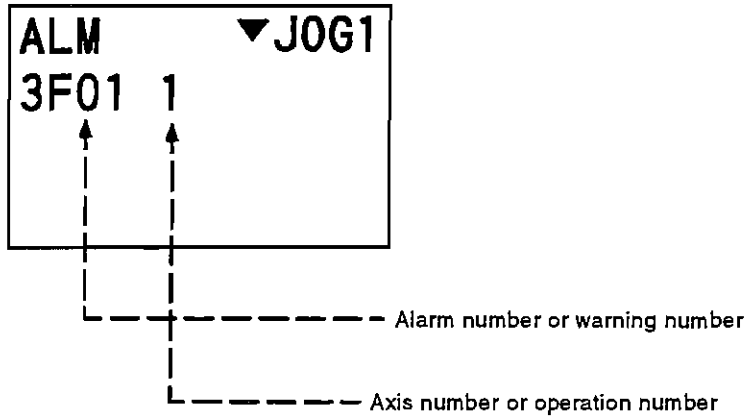


Press the input key.

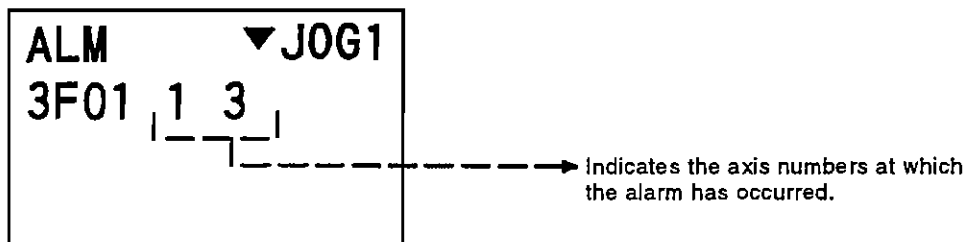


4.2.2 Alarm screen

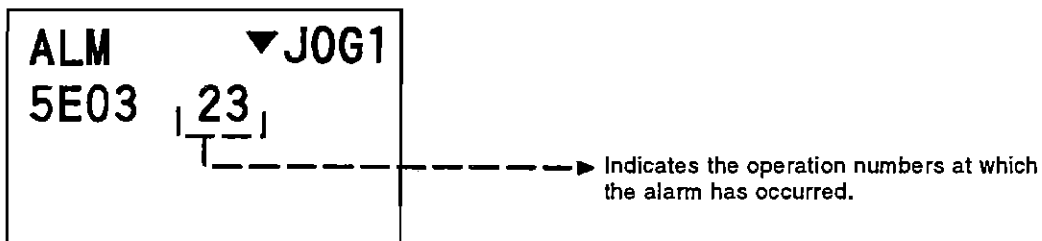
This screen shows the current alarm numbers or warning numbers. Up to six alarm or warning numbers are displayed.



Example: When the first and third axes are interlocked (Warning number 3F01)



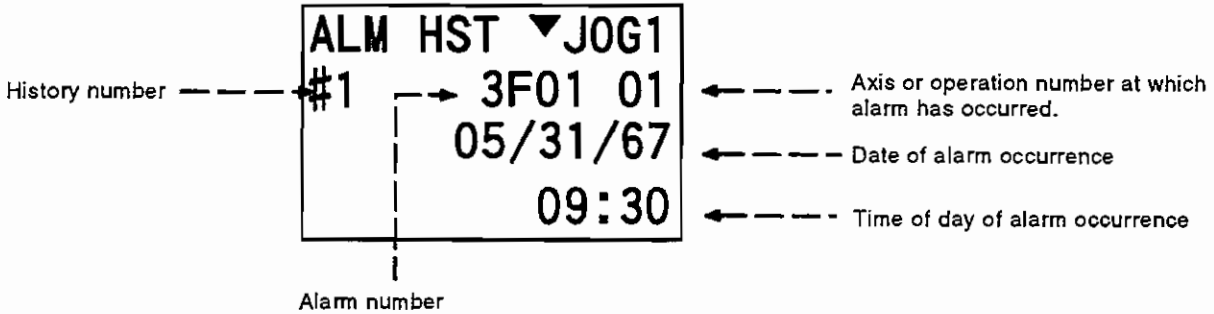
Example: When an alarm has occurred in programmed operation (operation numbers 2 and 3) (Alarm number 5E03)



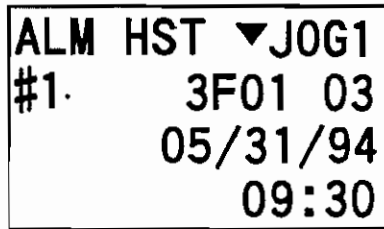
Alarm history screen

4.2.3 Alarm history screen

Shows the alarm history information.



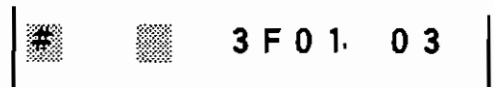
Example: Alarm history information Alarm number : 3F01
 Axis number : 3
 Date : May 31, 1994
 Time of day : 9:30 AM



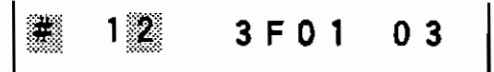
(History number selection)

The history number may either be selected by scrolling with the page keys or by setting the number on the screen. When "#" is entered on the history screen, "#" is highlighted and the cursor appears in the history number display position. Enter the required value in the cursor position and press the input key. The history number is then updated.

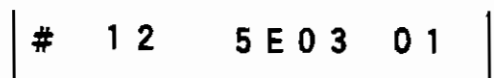
When "#" is entered, "#" is highlighted and the cursor appears.



Enter "12".



By pressing the input key, the history information of history number 12 appears.



4.2.4 Absolute position initial setting

You can select the initial setting mode or set the reference position. To select the axis for reference position setting, open the axis selection screen with the help key. For axis selection, refer to Section 3.3. "Axis Selection".

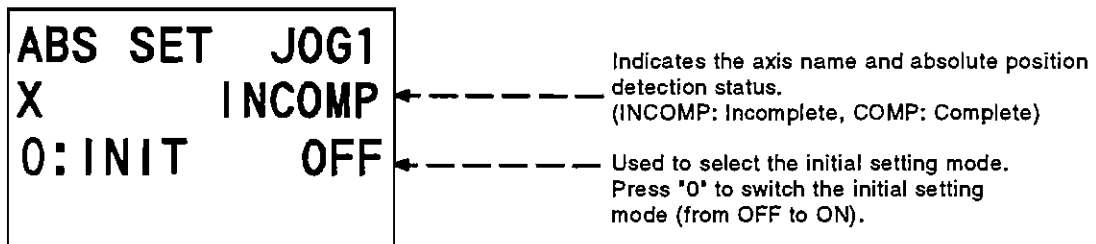
Set the reference point in the following procedure:

- (1) Open the absolute position initial setting screen.
- (2) Select the axis for reference point setting.
- (3) Switch on the initial setting mode.
- (4) Execute initial setting.

- (1) Open the absolute position initial setting screen.

When the absolute position initial setting screen is opened, the following screen (screen displayed when the initial setting mode is off) appears:

Screen displayed when the initial setting mode is OFF



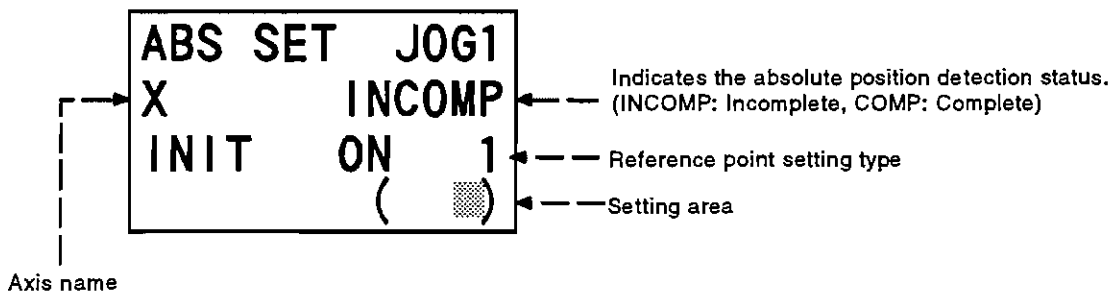
- (2) Select the axis for reference point setting.

Press the help key to open the axis selection screen, and enter the axis number of the axis at which the reference point will be set.

- (3) Switch on the initial setting mode.

The reference point may only be set when the initial setting mode is ON. When the initial setting mode is OFF, press "0" on the initial setting screen to switch on the initial setting mode. The setting area and cursor are then displayed.

Screen displayed when the initial setting mode is ON



(Information on the initial setting mode)

When any function key is pressed to switch to the other menu screen, the initial setting mode is switched off. This mode is not switched off by pressing the help key to switch to the other screen.

(Information on the reference point setting type)

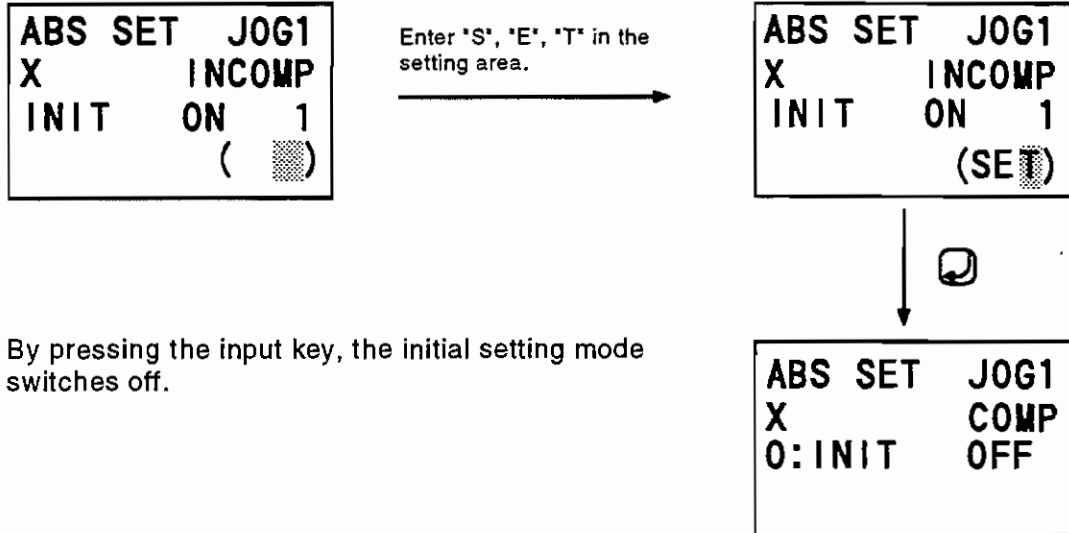
When the initial setting mode is ON, the reference point setting type is displayed on the right side of the initial setting mode. The reference point setting type shown is the data set in the parameter.

Absolute position initial setting

(4) Execute initial setting.

On the screen displayed when the initial setting mode is ON, set "SET" in the setting area to set the reference point. If the characters set are not "SET", the setting area and cursor disappear and the screen returns to the initial setting mode selection screen. (The initial setting mode is switched off. At this time, reference point setting is not executed.)

Screen displayed when the initial setting mode is ON

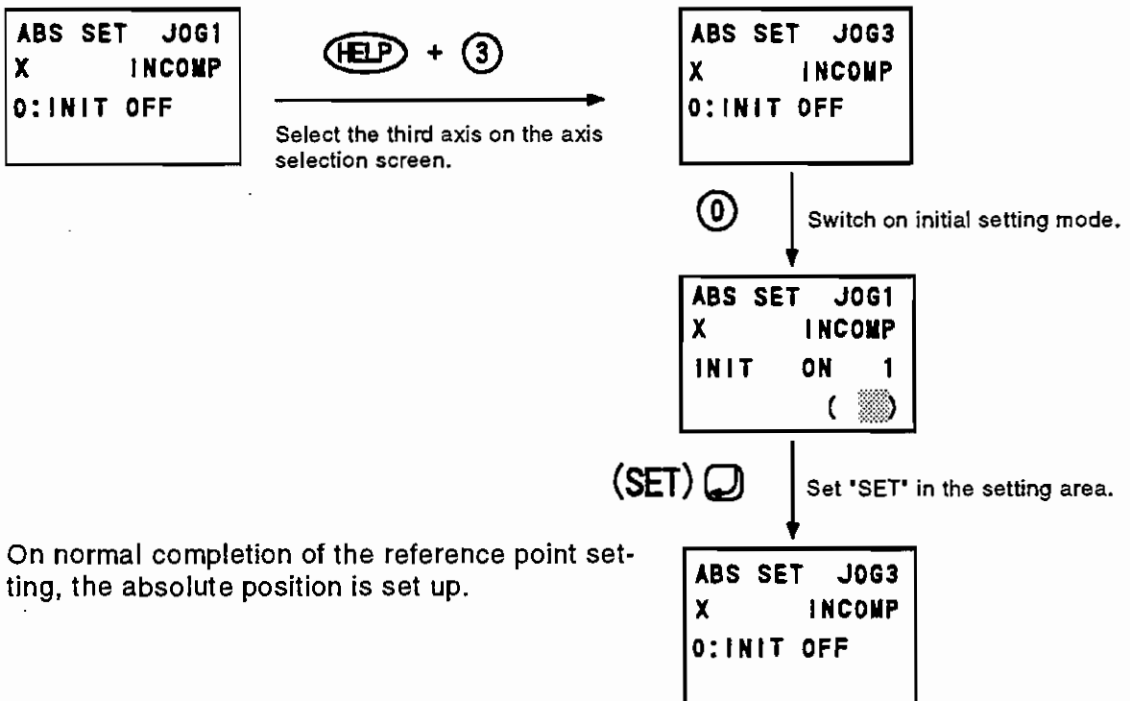


By pressing the input key, the initial setting mode switches off.

Note: On normal completion of the reference point setting, the absolute position is set up and the absolute position detection status turns to COMP. If the absolute position detection status remains INCOMP, execute the reference setting again.

Example: To set the reference point of the third axis.

Open the absolute position initial setting screen.



On normal completion of the reference point setting, the absolute position is set up.

4.2.5 Software list

Shows the version of the main system software or servo system software.

Version of main system software

S/W	▼JOG1
MODEL W	
MAIN	
802W000B0	

Version of servo system software

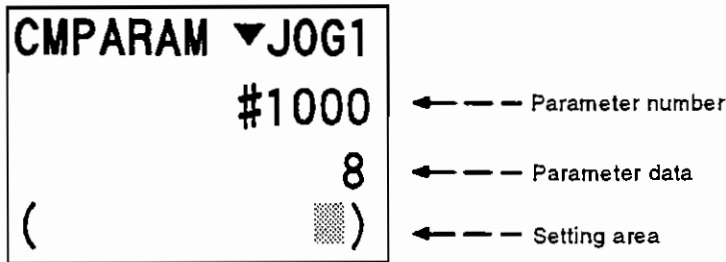
S/W	▲JOG1
MODEL W	
SV1	
510000A0A	

4.3 Parameter Screen

On the parameter screen, you can refer to or set various parameter files. There are three different menus: common parameter, axis parameter and servo parameter.

4.3.1 Common parameter

You can refer to or set common parameters.



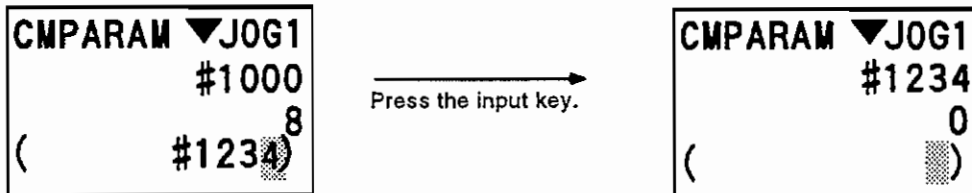
(Parameter data setting method)

The parameter screen has the setting area provided for parameter setting so that data entered in the setting area may be set into the parameter. For the setting procedure, refer to Section 2.3 "Data Setting in the Setting Area".

(Parameter number selection)

The parameter number may either be selected by scrolling with the page keys or by setting the parameter number in the setting area (with # placed before the number). By setting the parameter number in the setting area (with # placed before the number), the data of the set parameter number appears.

Example 1: To set the parameter number in the setting area to select the parameter #1234.

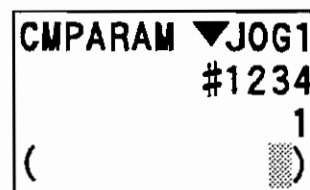
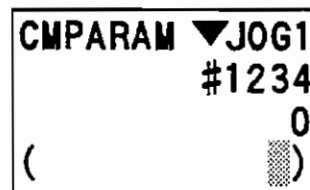


Example 2: To set 1 in the common parameter #1234.

Scroll the screen with the page keys or set the parameter number in the setting area to select the common parameter #1234.

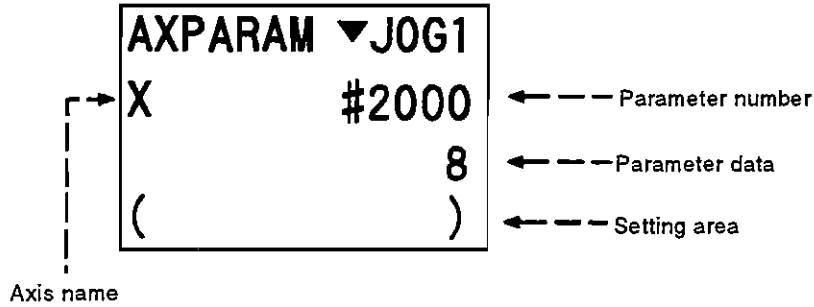
Set "1" in the setting area.

Press the input key.



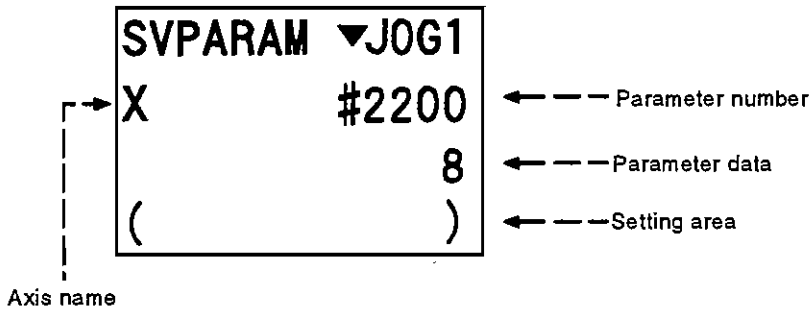
4.3.2 Axis parameter

You can refer to or set the axis parameters. This menu has screens corresponding to the number of control axes. For selection between axis screens, refer to Section 3.3 "Axis Selection". The parameter data setting method and parameter number selection are similar to those of the common parameter menu.



4.3.3 Servo parameter

You can refer to or set the servo parameters. This menu has screens corresponding to the number of control axes. For selection between axis screens, refer to Section 3.3 "Axis Selection". The parameter data setting method and parameter number selection are similar to those of the common parameter menu.



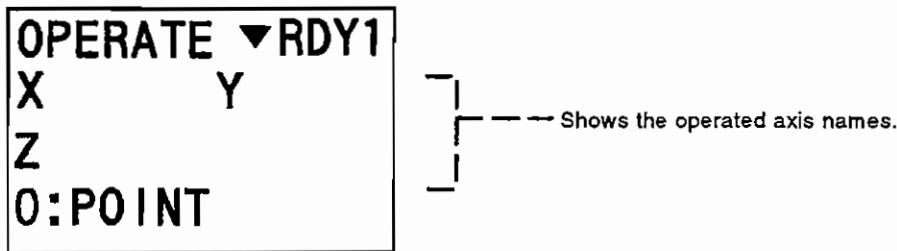
4.4 Teaching Screen

The teaching screen has three different screens: operation data selection screen, point data teaching screen and point data editing screen.

4.4.1 Operation data selection

You can select the operation mode, operated axes, speed and feed multiplying factor. The operation data screen is available in two different screens: operation mode selection screen and corresponding operation data selection screen (manual, point). The first page is the operation mode selection screen and the second and subsequent pages are the corresponding operation data selection screens (manual, point).

Operation mode selection screen (operation data selection screen page 1)



(Operation mode selection method)

Press "0" to switch the operation mode in sequence of NO OPE → MANUAL → POINT

NO OPE: Non-operation mode. In this mode, operation start is not effected from the teaching box.

MANUAL: Manual operation mode

POINT: Point-specified operation mode

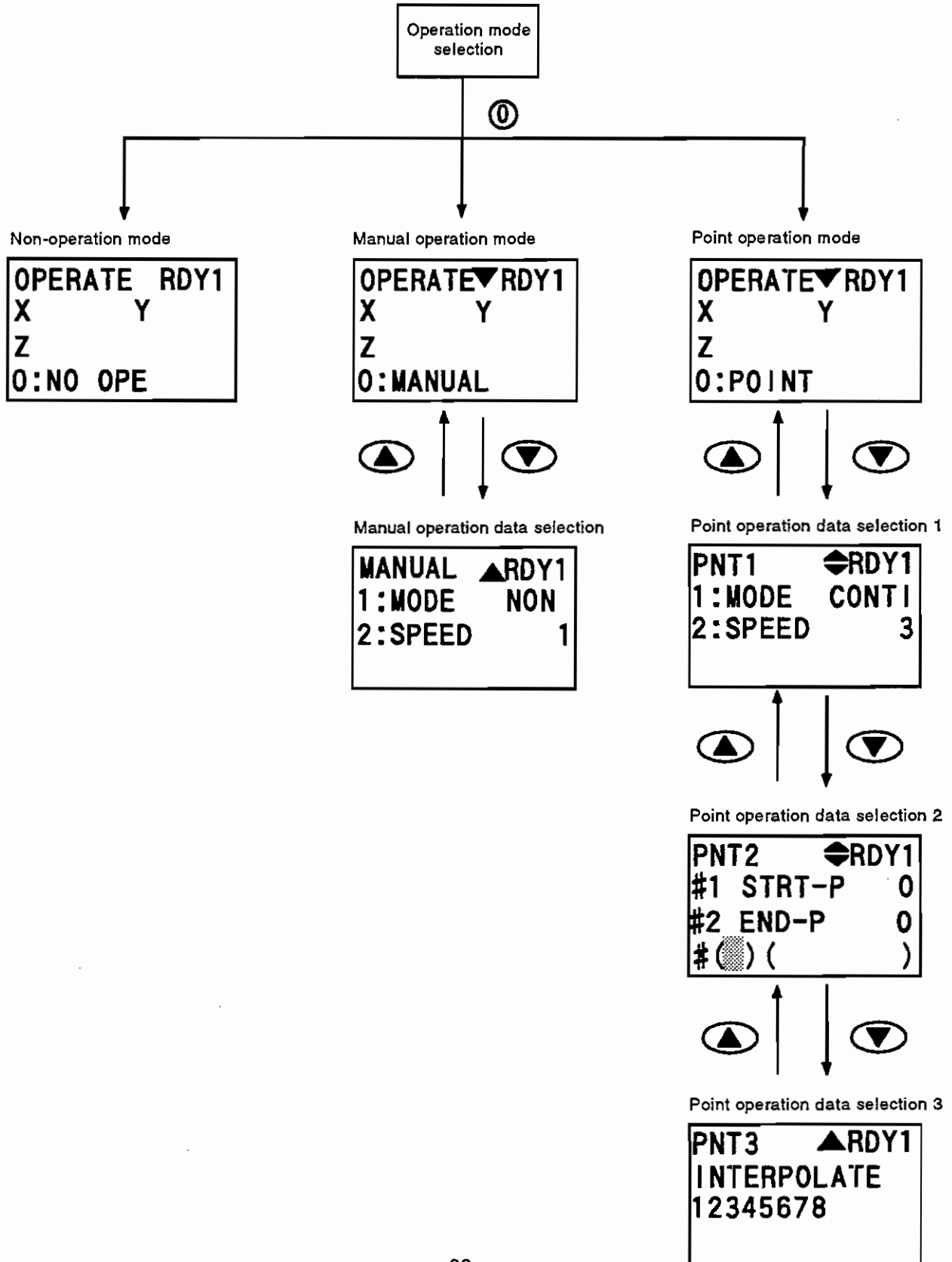
(Information on the operated axis name display)

The names of the axes selected as the operated axes are shown. To select the manually operated axes, open the axis selection screen using the help key. Refer to Section 3.3 "Axis Selection". Select the point operation axes on the point operation data selection 3 screen. Refer to the explanation of point operation data selection 3.

Operation data selection

(Information on the corresponding operation data selection screens (manual, point))

The operation data selection screens on the second and subsequent pages are displayed in accordance with the operation mode. The manual operation data selection screen is displayed in the manual operation mode and the point-specified operation data selection screen appears in the point-specified operation mode. The second and subsequent pages are not displayed in the non-operation mode.



(1) Manual operation data selection screen (Operation data selection screen page 2)

MANUAL	▲RDY1
1:MODE	STP
2:SPEED	1
3:FEED	1

(Manual mode selection)

Select the manual mode by pressing the "1" key. Press the "1" key to change the mode in sequence of NON→JOG→STP→HND→ZRN.

- NON: Non-manual mode
- JOG: Jog feed
- STP: Step feed
- HND: Pulse generator feed
- ZRN: Zero return

(Manual speed selection)

Select the speed by pressing the "2" key. Press the "2" key to change the manual speed in sequence of speed 1→speed 2→speed 3→speed 4→speed 5.

The speed is available in five steps, which are set in the parameter.

(Manual multiplying factor selection)

Select the multiplying factor by pressing the "3" key. Press the "3" key to change the multiplying factor in order of factor 1→factor 2→factor 3→factor 4.

The multiplying factor is available in four steps, which are set in the parameter.

Note: The multiplying factor is displayed only in the step and pulse generator modes.

(2) Point operation data selection 1 screen (Operation data selection screen page 2)

PNT1	◆ RDY1
1:MODE	SINGL
2:SPEED	1

(Continuous single mode switching)

Switch between the continuous and single modes by pressing the "1" key. Press the "1" key to change the mode in sequence of continuous → single → continuous →

(Speed selection)

Select the speed by pressing the "2" key. Press the "2" key to change the manual speed in sequence of speed 1 → speed 2 → speed 3 → speed 4 → speed 5 → speed 1 → ... The speed used is the manual speed set in the parameter. The speed is available in five steps, which are set in the parameter.

(3) Point operation data selection 2 screen (Operation data selection screen page 3)

PNT2	◆ RDY1	
#1 STRT-P	120	← Preset starting point number
#2 END-P	125	← Preset end point number
#() ()		← Set the starting/end point.

↑
----- Set 1 (starting) or 2 (end).

(Example) To set the end point to 30.

Enter data in the setting area.

PNT2	◆ RDY1
#1 STRT-P	12
#2 END-P	125
#(2) (30)

Press the input key.

PNT2	◆ RDY1
#1 STRT-P	120
#2 END-P	125
#(2) (30)

(4) Point operation data selection 3 screen (Operation data selection screen page 4)

PNT3 ▲ RDY1
 INTERPOLATE
 12345678

By entering the axis numbers, the axis numbers entered are highlighted and interpolation is performed between the highlighted axes. Entering the axis numbers of the highlighted axes will reset the highlighting of those axis numbers. Up to the number of control axes (eight axes) may be selected, but if four or more axes are selected, a warning will be displayed and point-specified operation cannot be started.

Example 1: To select the second and third axes for interpolation.

The first and fourth axes selected for interpolation.

PNT3 ▲ RDY1
 INTERPOLATE
 12345678

Press "1" and "4".

① ④

PNT3 ▲ RDY1
 INTERPOLATE
 12345678

Press "2" and "3".
 Axis numbers 2 and 3 are highlighted and interpolation is made between the second and third axes.

② ③

PNT3 ▲ RDY1
 INTERPOLATE
 12345678

Operation data selection

Example 1: To select the following manual operation data:

Operation mode: Manual (MANUAL)
 Manual mode: Step (STP)
 Speed: Manual speed 3
 Multiplying factor: Manual multiplying factor 2

(1) Open the manual mode selection screen.

```

OPERATE RDY1
X      Y
Z
0:NO OPE
    
```


(2) Press "0" to set the operation mode to the manual operation mode (MANUAL).

①

```

OPERATE ▼RDY1
X      Y
Z
0:MANUAL
    
```

(3) Open the next page.
 (Press )



```

MANUAL ▲RDY1
1:MODE  NON
2:SPEED  1
    
```

(4) Press "1" to set the manual mode to step (STP).

①

```

MANUAL ▲RDY1
1:MODE  STP
2:SPEED  1
3:FEED  1
    
```

(5) Press "2" to set the speed to manual speed 3.

②

```

MANUAL ▲RDY1
1:MODE  STP
2:SPEED  3
3:FEED  1
    
```

(6) Press "3" to set the multiplying factor to manual multiplying factor 2.

③

```

MANUAL ▲RDY1
1:MODE  STP
2:SPEED  3
3:FEED  2
    
```

Operation data selection

Example 2: To select the following point operation data:

Operation mode: Point-specified (POINT)
Continuous operation

Speed: Manual speed 3

Starting point: 120

End point: 125

Interpolation axes: First, third and fourth axes

(1) Open the operation mode selection screen.

```

OPERATE RDY1
X      Y
Z
0:NO OPE
    
```

(2) Press "0" to set the operation mode to the point operation mode.

↓ ①

```

OPERATE ▼RDY1
0:POINT
    
```

(3) Open the next page.
(Press ▼.)

↓ ▼

```

PNT1  ◆RDY1
1:MODE  SINGL
2:SPEED  1
    
```

(4) Press "1" to set the mode to the continuous mode.
Press "2" to set the speed to manual speed 3.

↓ ① ②

```

PNT1  ◆RDY1
1:MODE  CONTI
2:SPEED  3
    
```

(5) Open the next page.
(Press ▼.)

↓ ▼



```

PNT2  ◆RDY1
#1 STRT-P  0
#2 END-P   0
#(●)( )
    
```


↓ Set data in the setting area.

Operation data selection

(6) Set 120 to #1STRT-P and 125 to #2END-P from the setting area.

#(1) (120) 
#(2) (125) 

PNT2 ◀RDY1
#1 STRT-P 120
#2 END-P 125
#(●)()

(7) Open the next page.
(Press .)



PNT3 ▲RDY1
INTERPOLATE
12345678

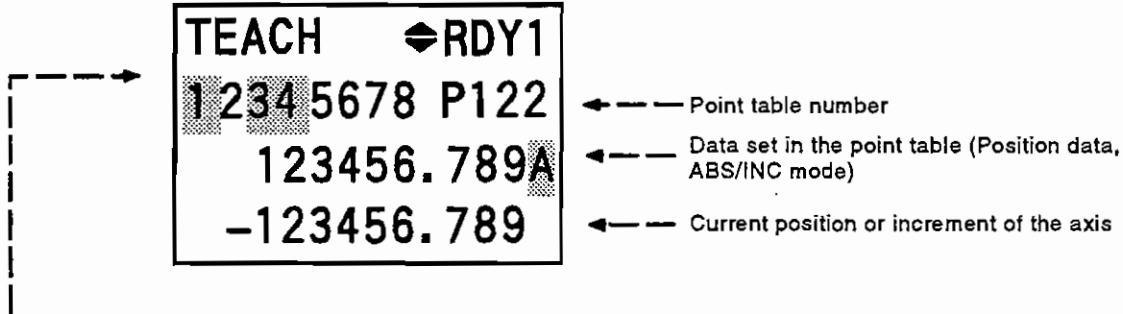
(8) Press "1", "3" and "4" to select the first, third and fourth axes for interpolation.

① ③ ④

PNT3 ▲RDY1
INTERPOLATE
12 34 5678

4.4.2 Point data teaching

You can refer to or set point data. Point data may either be set by setting the current mechanical position as point data or by setting the increment of the mechanical position as point data.



Taught axes (axis numbers selected are highlighted)

(Information on the current position or increment display)

When this screen is selected, the current position or increment of the axis selected on the axis selection screen is displayed at the bottom of the screen according to the ABS/INC mode data set in the point table. The current position is shown in the ABS mode, or the increment is displayed in the INC mode. (Increment: Distance the axis has traveled while the point data teaching screen is displayed)

(Information on ABS/INC mode setting)

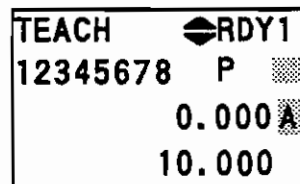
Enter "A" to select the ABS mode or enter "I" to select the INC mode.
Enter "N" to make the corresponding point data invalid.

(Information on point number selection)

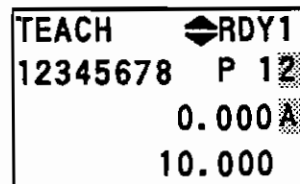
When numerical data is entered after "P", it is set as a point number and you can select the point number. By entering "P", the point number is highlighted and the cursor appears. After entering a numeric value at the cursor, press the input key. The point number is then updated. The point number may also be selected by using the page keys.

(Example) To select point number 12.

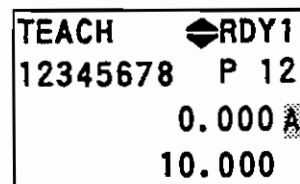
By entering "P", "P" is highlighted and the cursor appears.



Enter "12".



Pressing the input key displays the data of point number 12.



(Information on point data setting)

By pressing the input key on this screen, the current position or increment of the axis having the highlighted axis number is set in the point table. The current position is set when the ABS/INC mode data set in the point table is ABS, or the increment is set when the mode data is INC. Since the ABS/INC mode data is provided for each axis, whether the current position or increment is set differs with the axes. (Increment: Distance the axis has traveled while the point data teaching screen is displayed)

(Information on the taught axis (axis to which point data is set) selection)

Use the number keys to change the axis numbers highlighted. Press any of the number keys "1" to "8" to change the highlight mode of the corresponding axis number. Enter a non-highlighted axis number to highlight that axis number or enter a highlighted axis number to return that axis number to a non-highlighted state.

Point teaching

Example 1: To teach the current positions.

To set the current position data of the first, second and third axes to the point table.

(Current position data: first axis 10.000, second axis 20.000, third axis 30.000)

- (1) Select the point number to which the current position will be taught, and set the ABS/INC mode of all the first, second and third axes to ABS.
 Select the first axis on the axis selection screen, and press "A" on the point teach screen.
 Use the same procedure for the second and third axes.

TEACH	▼RDY1
12345678	P 1
	0.000 A
	10.000

TEACH	▼RDY2
12345678	P 1
	0.000 A
	20.000

TEACH	▼RDY3
12345678	P 1
	0.000 A
	30.000

- (2) Select the axes to be taught.
 Press "1", "2" and "3".

TEACH	▼RDY1
12345678	P 1
	0.000 A
	10.000

- (3) Execute teaching.
 Press the INPUT key.
 Make sure that the point data of each axis has been set.

TEACH	▼RDY1
12345678	P 1
	10.000 A
	10.000

TEACH	▼RDY1
12345678	P 1
	20.000 A
	20.000

TEACH	▼RDY1
12345678	P 1
	30.000 A
	30.000

Point teaching

Example 2: To teach the increments.

To set the increment data of the first, second and third axes to the point table.
 (Current position data: first axis 10.000, second axis 20.000, third axis 30.000)

- (1) Select the point number to which the increments will be taught, and set the ABS/INC mode of all the first, second and third axes to INC.

Select the first axis on the axis selection screen, and press "1" on the point teach screen. Use the same procedure for the second and third axes.

TEACH	▼RDY1
12345678	P 1
	0.000
	0.000

TEACH	▼RDY2
12345678	P 1
	0.000
	0.000

TEACH	▼RDY3
12345678	P 1
	0.000
	0.000

- (2) With the point teaching screen open, move the first, second and third axes to 20.000, 40.000 and 60.000, respectively.

TEACH	▼RDY1
12345678	P 1
	0.000
	10.000

TEACH	▼RDY2
12345678	P 1
	0.000
	20.000

TEACH	▼RDY3
12345678	P 1
	0.000
	30.000

- (3) Select the axes to be taught.
 Press "1", "2" and "3".

TEACH	▼RDY1
12345678	P 1
	0.000
	10.000

- (4) Execute teaching.
 Press the INPUT key.
 Make sure that the point data of each axis has been set.

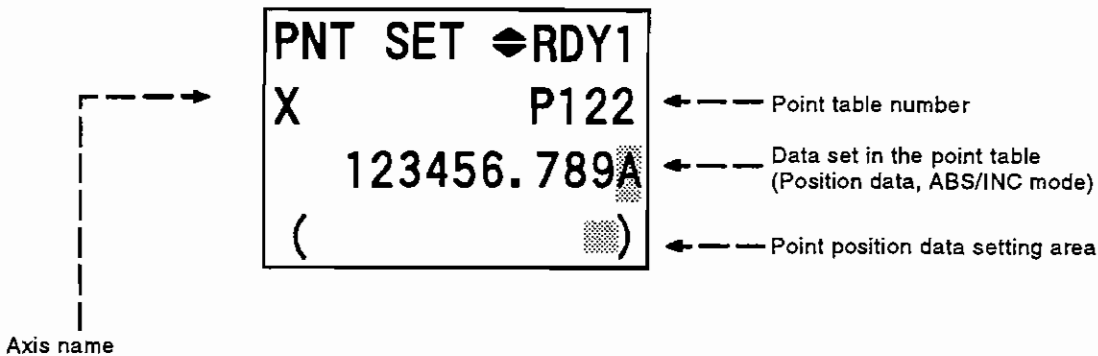
TEACH	▼RDY1
12345678	P 1
	10.000
	0.000

TEACH	▼RDY1
12345678	P 1
	20.000
	0.000

TEACH	▼RDY1
12345678	
	30.000
	0.000

4.4.3 Point data editing

You can refer to or set the point data of the each axis.



(Information on point data setting)

Enter desired point position data in the setting area and press the input key to set that data.

(Information on ABS/INC mode setting)

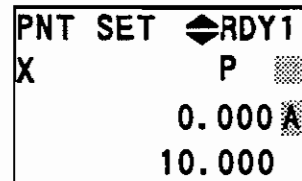
Enter "A" to select the ABS mode or enter "I" to select the INC mode.
Enter "N" to make the corresponding point data invalid.

(Information on point number selection)

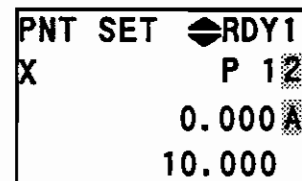
When numerical data is entered after "P", it is set as a point number and you can select the point number. By entering "P", the point number is highlighted and the cursor appears. After entering a numeric value at the cursor, press the input key. The point number is then updated. The point number may also be selected by using the page keys.

(Example) To select point number 12.

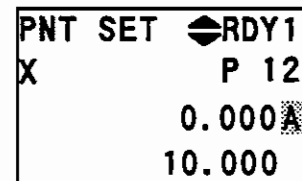
By entering "P", "P" is highlighted and the cursor appears.



Enter "12".



Pressing the input key displays the data of point number 12.



5. OPERATION START

You can start manual operation or point-specified operation from the teaching box.

This start is enabled when the manual operation mode or point operation mode is selected from the teaching box. For the procedure of selecting the manual operation mode or point operation mode from the teaching box, refer to Section 4.4, (1) Operation screen.

5.1 Manual Operation Starting Procedure

1. Jog, step or zero return starting procedure

Start jog, step or zero return in the following procedure:

- (1) Set the operation mode to manual operation on the operation mode selection screen.
- (2) Set the manual mode to jog, step or zero return on the manual operation data selection screen.
- (3) Select manual speed on the manual operation data selection screen.
- (4) Select the axis for manual operation (jog, step or zero return) on the axis selection screen.
- (5) Hold down the [JOG/+] or [JOG/-] key. The axis moves while the key is pressed.
The [JOG/+] or [JOG/-] key is valid on any screen.

(Example) To move the third axis by jog feed at manual speed 1.

- (1) Press "0" on the operation mode selection screen to set the operation mode to manual operation.

OPERATE ▼ RDY1
X Y
Z
0: MANUAL



- (2) Open the manual operation data selection screen.
Press "1" to set the manual mode to JOG.
Press "2" to set the speed to manual speed 1.

MANUAL ▲ RDY1
1: MODE JOG
2: SPEED 1



- (3) Select the axis for jog feed on the axis selection screen.

MANUAL ▲ RDY3
1: MODE JOG
2: SPEED 1

- (4) Hold down the [JOG/+] key. The axis moves in the positive direction while the key is pressed.
- (5) Hold down the [JOG/-] key. The axis moves in the negative direction while the key is pressed.

Manual Operation Starting Procedure

2. Pulse generator feed starting procedure

Start pulse generator feed in the following procedure:

- (1) Set the operation mode to manual operation on the operation mode selection screen.
- (2) Set the manual mode to pulse generator feed on the manual operation data selection screen.
- (3) Select manual speed on the manual operation data selection screen.
- (4) Select the axis for manual operation (pulse generator feed) on the axis selection screen.
- (5) Turn the pulse generator to move the axis. The pulse generator is valid on any screen.

(Example) To move the fourth axis by pulse generator feed at manual speed 2.

- (1) Press "0" on the operation mode selection screen to set the operation mode to manual operation.

OPERATE	▼	RDY1
X		Y
Z		
0:MANUAL		



- (2) Open the manual operation data selection screen.
Press "1" to set the manual mode to pulse generator (HND).
Press "2" to set the speed to manual speed 2.

MANUAL	▲	RDY1
1:MODE		HND
2:SPEED		2



- (3) Select the axis for pulse generator feed on the axis selection screen.

MANUAL	▲	RDY4
1:MODE		HND
2:SPEED		2

- (4) Turn the pulse generator in the positive direction. The axis moves in the positive direction.
- (5) Turn the pulse generator in the negative direction. The axis moves in the negative direction.

5.2 Point-Specified Operation Starting Procedure

Use the keys to start point-specified operation. In the point-specified operation mode, press the [JOG/+] or [JOG/-] key to start operation. Use the same procedure also for single operation. Operation is performed in accordance with the speed, starting point, end point and operated axes selected from the teaching box for the point-specified operation. For the selection procedure, refer to Section 4.4 (1) Operation screen.

1. Point-specified operation starting procedure

Start point-specified operation in the following procedure:

- (1) Set the operation mode to point-specified operation on the operation mode selection screen.
- (2) Select the continuous or single operation on the point operation data selection 1 screen.
- (3) Select manual speed on the point operation data selection 2 screen.
- (4) Select the axis for point operation on the point operation data selection 3 screen.
- (5) Press the [JOG/+] or [JOG/-] key. Point operation is performed.
The [JOG/+] or [JOG/-] key is valid on any screen.

(Example) To perform point-specified operation with the following data:

Continuous operation

Speed: Manual speed 3

Starting point: 120

End point: 125

Interpolation axes: First, third and fourth axes

- (1) On the operation mode selection screen, press "0" to set the operation mode to point-specified operation.

OPERATE▼RDY1
X Y
Z
0:POINT



- (2) Open the point operation data selection 1 screen.
Press "1" to set the mode to continuous.
Press "2" to set the speed to manual speed 3.

PNT1 ◆RDY1
1:MODE CONT1
2:SPEED 3



- (3) Open the point operation data selection 2 screen.
Set 120 to #1STRT-P and 125 to #2END-P from the setting area.
#(1) (120) [↵]
#(2) (125) [↵]

PNT2 ◆RDY1
#1 STRT-P 120
#2 END-P 125
#(●) ()



Point-Specified Operation Starting Procedure



- (4) Open the point operation data selection 3 screen.
Select the axes for point operation.
Press "1", "3" and "4".

PNT3	▲RDY1
INTERPOLATE	
1 2	3 4 5 6 7 8

- (5) Press the [JOG/+] or [JOG/-] key. Point operation is performed.

REVISION HISTORY

Sub Number	Revision Date	Revisions
*	Nov, 1996	First edition

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