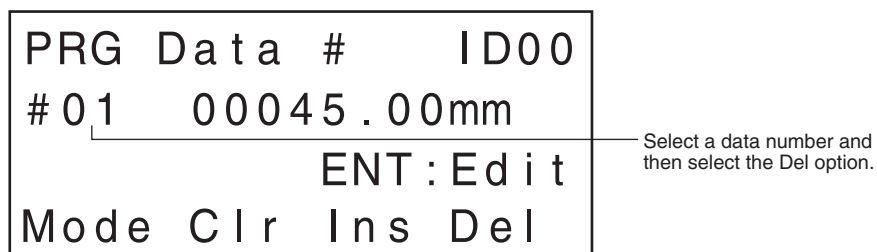


### 4.5.4 Deleting Data

The following operation deletes a data number previously set.  
The subsequent data numbers are automatically decremented by one.

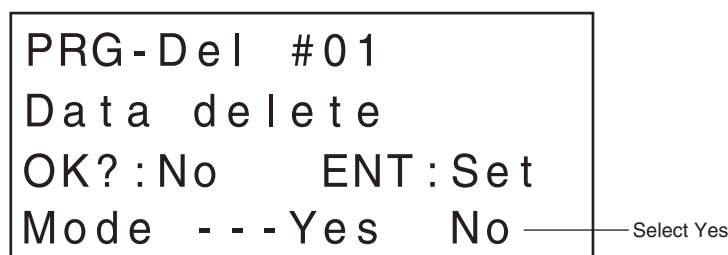
- 1. Select the data number to be deleted from the first screen of the PRG mode.**  
Press the  $\uparrow$ ,  $\downarrow$ ,  $\leftarrow$  or  $\rightarrow$  key to select the data number you want to delete. The data number can also be selected using the numerical keys.

■ Figure 4-19 First Screen of the PRG Mode/Number Selection 1



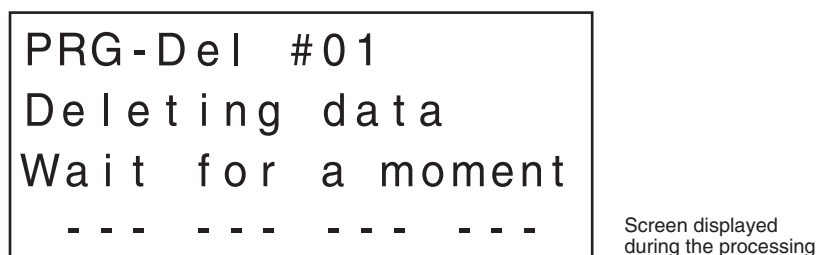
- 2. Press the F4 key (corresponding to the Del option) in order to delete the data number.**  
A message "Data delete OK?: No" is displayed.

■ Figure 4-20 Data Deletion Confirmation Screen



- 3. Select "Yes" by pressing the F3 key, and press the ENT key.**  
The data is deleted.

■ Figure 4-21 Data Deletion Screen



- 4. When the deletion is complete, the screen returns to the first screen of the PRG mode.**

## 4.6 Clearing All Operation Data

The following operation deletes all data previously set.

1. Continue pressing the SHIFT key while the first screen of the PRG mode is displayed.

■ Figure 4-22 Screen for Number Selection 2 of the PRG Mode

PRG Data #	ID00
# 01	00045.00mm
Mode AcIr	- - - - -

Select the AcIr option

2. Hold down the SHIFT key, and press the F2 key (corresponding to the AcIr option).

The message "Clearing data OK?: No" is displayed.

■ Figure 4-23 Confirmation Screen for Clearing All Operation Data

PRG-AcIr OP Data
Clearing data
OK?: No ENT: Set
Mode - - - Yes No

Select Yes

3. Select "Yes" by pressing the F3 key, and press the ENT key.  
All the operation data is cleared.

■ Figure 4-24 Screen for Clearing All Operation Data

PRG-AcIr OP Data
Clearing all data
Wait for a moment
- - - - -

Screen displayed during the processing

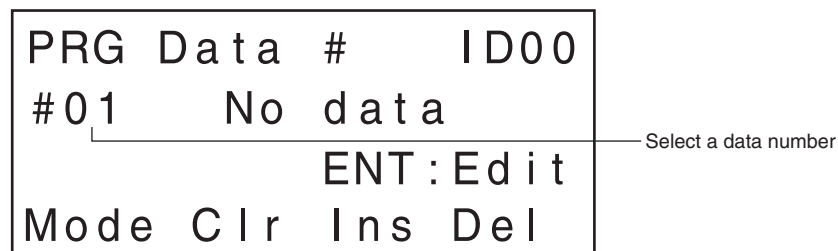
4. When all the operation data is cleared, the screen returns to the first screen of the PRG mode.

## 4.7 Remote Teaching

In the remote teaching method, you operate the slider/cylinder via the arrow keys of the teaching pendant and enter the stopping position.

1. Press the F1 key and switch to the first screen of the PRG mode.

■ Figure 4-25 First Screen of the PRG Mode/Number Selection 1



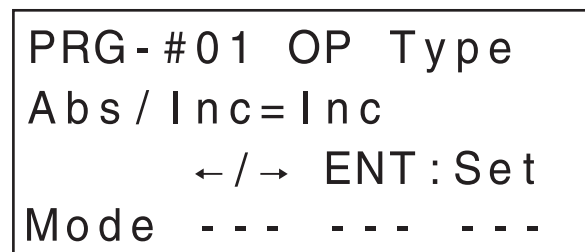
2. Press the ↑, ↓, ← or → key to select the data number for which you want to perform remote teaching.

Pressing the ↑ and ↓ keys causes the number of tens to increase and decrease, respectively. Pressing the ← and → keys causes the number of units to increase and decrease, respectively. The data number can also be selected using the numerical keys.

3. Press the ENT key.

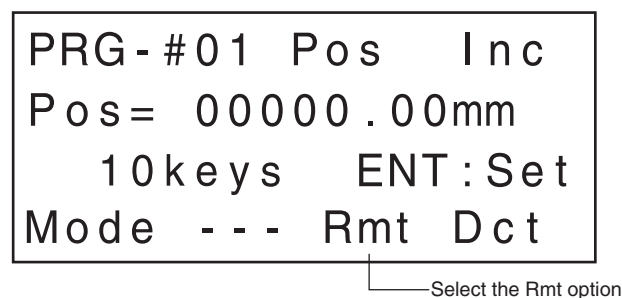
The data of the selected data number can now be edited.

■ Figure 4-26 Positioning-Method Setting Screen



4. Press the ↓ key to call up the position setting screen.

■ Figure 4-27 Position Setting Screen



**5. Press the F3 key (corresponding to the Rmt option) to select remote teaching.**

The slider/cylinder can now be moved by pressing the ← and → keys.

■ Figure 4-28 Remote Teaching Screen

PRG - #01 - Rmt	Inc
Pos = 00000.00mm	
← / →	ENT : Set
Mode - - - - -	

Operate the slider/cylinder

**6. Press the ← and → keys to change the position.**

If you press one of the keys once, the slider/cylinder will move by 0.01 mm (0.0004 inch).

If you keep the key pressed for more than a second, the slider/cylinder will begin to move at low speed as long as the key is pressed. When the key is released, the slider/cylinder decelerates to a stop.

If the **SHIFT** key is pressed during operation, the slider/cylinder will accelerate and operate at high speed \*1. When the **SHIFT** key is released, the slider/cylinder decelerates and returns to operation at low speed \*2.

The current position is displayed on the screen in real time.

\*1 The common operating speed (Vr) set in the speed parameters of the PAR mode


\*2 The starting speed (Vs) set in the speed parameters of the PAR mode

**7. Determine the position, and press the ENT key.**

The current position is set as the positioning position, and the operating-speed input screen is displayed.

## 4.8 Direct Teaching

In the direct teaching method, you can move the moving part of the slider/cylinder directly in order to adjust the positioning position manually.

 <b>Caution</b>	<ul style="list-style-type: none"> <li>● In order to avoid injury and equipment damage, do not perform direct teaching unless the slider/cylinder is installed in the horizontal direction. When performing direct teaching, the motor will lose its holding brake force and the load may drop. (The motor's output current will be cut off, and the electromagnetic brake will be released as well.)</li> </ul>
--	--

**1. Press the F1 key and switch to the first screen of the PRG mode.**

■ Figure 4-29 First Screen of the PRG Mode/Number Selection 1

PRG Data #	ID00	
#01	No data	
	ENT: Edit	Select a data number
Mode Clr	Ins Del	

**2. Press the ↑, ↓, ← or → key to select the data number for which you want to perform direct teaching.**

Pressing the ↑ and ↓ keys causes the number of tens to increase and decrease, respectively. Pressing the ← and → keys causes the number of units to increase and decrease, respectively. The data number can also be selected using the numerical keys.

**3. Press the ENT key.**

The data of the selected data number can now be edited.

■ Figure 4-30 Positioning-Method Setting Screen

PRG - #01	OP Type
Abs / Inc	= Inc
← / →	ENT: Set
Mode	- - - - -

**4. Press the ↓ key to call up the position setting screen.**

■ Figure 4-31 Position Setting Screen

PRG - #01	Pos Inc
Pos =	00000.00mm
10keys	ENT: Set
Mode	- - - Rmt Dct

Select the Dct option

5. Press the F4 key (corresponding to the Dct option) to call up the direct teaching screen (1).  
 Select "Yes" by pressing the F3 key, and press the ENT key.

■ Figure 4-32 Direct Teaching Screen (1)

PRG - # 0 1 - D c t  
 M o t o r   f r e e  
 O K ? : N o      E N T : S e t  
 M o d e   - - - Y e s   N o

Select Yes

Press the **F4** key to return to the position setting screen.

6. The screen switches to the one shown in Figure 4-33.  
 The moving part of the slider/cylinder can now be moved by hand.

■ Figure 4-33 Direct Teaching Screen (2)

PRG - # 0 1 - D c t    I n c  
 P o s =   0 0 0 0 0 . 0 0 m m  
 M o t o r   F r e e   E N T : S e t  
 M o d e   - - -   - - -   - - -

Move the moving part  
by hand

7. Move the moving part manually and change the position.  
 The current position is displayed on the screen in real time.
8. Determine the position, and press the ENT key.  
 The current position is set as the positioning position, and the operating-speed input screen is displayed.

## 4.9 Setting Range of Operation Data

Table 4-2 lists the setting ranges of operation data that can be set and changed in the PRG mode.

■ Table 4-2 Data Setting Range in the PRG Mode

Data	Display	Description	Setting range	Initial value
Positioning method	Abs/Inc	<p>Sets the positioning method.</p> <p>There are two positioning methods that can be used for positioning operation: absolute (Abs) and incremental (Inc). In the absolute method, the travel amount (distance) from the mechanical home position is set. In the incremental method, the position to which the motor moved in the last operation (current position) is set as the start point of the next move. It is suitable when the same travel amount (distance) is repeated.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>Absolute method (Abs)</b></p> </div> <div style="text-align: center;"> <p><b>Incremental method (Inc)</b></p> </div> </div>	Inc Abs	Inc
Position	Pos	Sets the position used for positioning operation	-83886.08 to 83886.07 mm (-3302.60 to +3302.60 inch)	0.00 mm
Operating speed	Spd	Sets the operating speed used for positioning operation	0.01 to 800.00 mm/s ※ (0.0004 to 31.5 in/sec)	60.00 mm/s (2.36 in/sec)
Operation function	Func	<p>Sets an additional function used in the positioning operation.</p> <ul style="list-style-type: none"> <li> <b>SingleMotion:</b> Single-motion positioning is performed.            In this case, the positioning operation of the selected data number only is carried out.            </li> <li> <b>LinkedMotion:</b> Linked-motion positioning operation is performed.            In this case, the positioning operations of the data numbers for which "linked-motion" is selected as the operation function are carried out in sequence.            The operation ends upon completion of the positioning operation of a data number for which "single-motion" or "push-motion" is selected.            Only operation data of the same direction can be linked.            If multiple push-motion operations are linked, the speed specified when push-motion operation was set becomes the starting speed.            </li> <li> <b>PushMotion:</b> Push-motion operation is performed.            In this case, the push-motion operation of the selected data number only is carried out.            </li> </ul>	SingleMotion LinkedMotion PushMotion	SingleMotion
Push current	Push Cur.	<p>Sets the push current.</p> <p>The push current can be set only when "push-motion" is selected.</p>	0 to 50%	20%

※ The maximum speed varies, depending on the slider/cylinder connected to the controller.

## 4.10 Performing Positioning Operation

Press the **F1** key or turn the power supply off and then on again, and select the EXT mode.

Run the data saved in the controller's memory.

The I/O connector to which the user-defined controller is connected has the M0 to M5 input used to select the data number and the START input used to start the operation.

Select the data numbers by setting the M0 to M5 input and activate the START input to perform the operation.

Data No.	M5	M4	M3	M2	M1	M0
No.1	OFF	OFF	OFF	OFF	OFF	ON
No.2	OFF	OFF	OFF	OFF	ON	OFF
:	:	:	:	:	:	:
:	:	:	:	:	:	:
No.62	ON	ON	ON	ON	ON	OFF
No.63	ON	ON	ON	ON	ON	ON



# Chapter 5 Setting and Modifying Parameters

This chapter explains the procedures involved in setting and changing parameters, which are performed in the PAR mode.



## Warning

- In order to avoid injury and equipment damage, be sure that engineers having expert knowledge of the structure and operation of the EZHS/EZHC/EZHP Series controllers and sliders/cylinders, along with an awareness of the degree of risk involved in the operation, perform the connection of the teaching pendant.

## 5.1 Parameters

In order to operate sliders/cylinders, it is necessary to set not only operation data but data that defines the slider/cylinder operating environment. Such data is referred to as parameters.

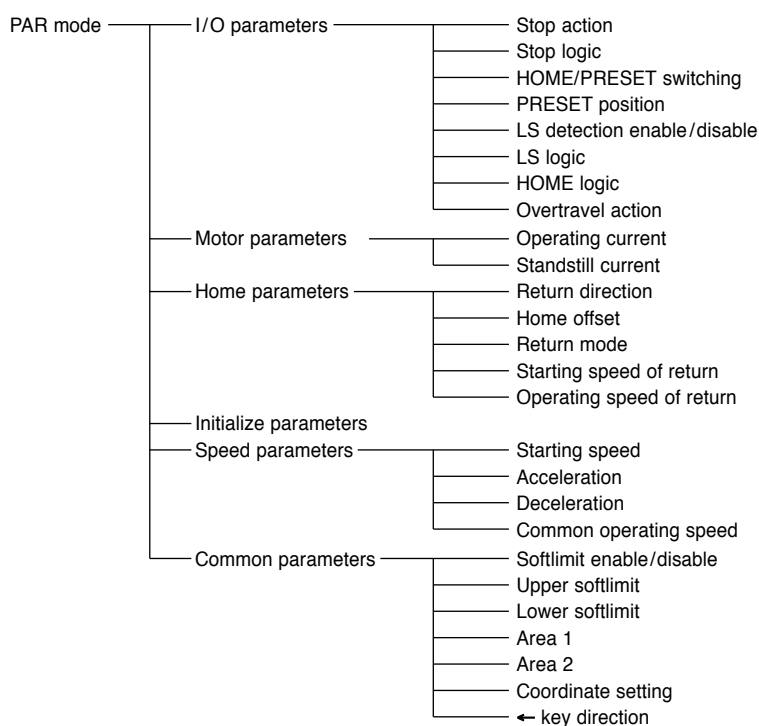
There are five types of parameters: common parameters intrinsic to the slider/cylinder; motor parameters that specify the motor current; speed parameters relating to the operating speed; I/O parameters relating to control; and home parameters relating to return-to-home operation. The speed parameters are commonly used in positioning and return-to-home operations.

## 5.2 Functions Available in the PAR Mode

Functions available in the PAR mode are those to set and change the following parameters and initialize all the data/parameters.

Figure 5-1 shows the items that can be set and changed in the PAR mode.

■ Figure 5-1 Parameters Set and Changed in the PAR Mode



## 5.3 Parameter Setting Screens

Press the **F1** key twice in the EXT mode to switch to the first screen of the PAR mode. There are two types of parameter-item selection screens: the first screen shown in Figure 5-2 and the screen shown in Figure 5-3. The screen shown in Figure 5-3 is displayed when the **SHIFT** key is pressed in the first screen.

■ Figure 5-2 First Screen of the PAR Mode/Item Selection 1

PAR	ID00
Select	
SHIFT, F2 / F3 / F4	
Mode	I / O Mtr Hmp

Press the **SHIFT** key to display the screen for item selection 2.

This screen is used to set and change I/O parameters, motor parameters and home parameters.

■ Figure 5-3 Screen for Item Selection 2

PAR	ID00
Select	
F2 / F3 / F4	
Mode	Ini Spd Com

Release the **SHIFT** key to display the screen for number selection 1.

This screen is used to set and change speed parameters and common parameters, and to initialize all the data.

## 5.4 Setting and Modifying I/O Parameters

I/O parameters can be set and changed according to the following procedure. It is possible to set and change the logic of a controller's STOP input, HOME/PRESET switching, PRESET position, LS inputs and HOME input, the stop action used for the slider/cylinder at overtravel action and the enabling/disabling of LS detection. Table 5-1 shows the parameters that can be set and changed by I/O parameters.

**1. Press the F2 key (corresponding to the I/O setting) in the screen for item selection 1.**

**2. The screen used to set and change the stop action is displayed.**

■ Figure 5-4 Stop Action Setting/Modification Screen

Press either the ← or → key to select a stop-action option, and press the **ENT** key.

Imd stop: Immediate stop

Dec stop: Deceleration stop

Imd stop + MB + C.OFF: Immediate stop + MB operation + Current off

Dec stop + MB + C.OFF: Deceleration stop + MB control + Current off

### Note

To activate the MB control + Current off, keep the STOP input ON. The sequence of operation is described below:

1. Turn ON the STOP input while the motor is operating.
2. The motor stops immediately or decelerates to a stop, depending on the setting.
3. If the STOP input is still ON when the motor stops, the MB control is activated and the current is turned off.
4. When the STOP input is turned OFF, the current turns ON and the MB control is released.

**3. The screen used to set and change the stop logic is displayed.**

■ Figure 5-5 Stop Logic Setting/Modification Screen

Press either the ← or → key to select a stop-logic option, and press the **ENT** key.

**4. The screen used to set and change the HOME/PRESET is displayed.**

■ Figure 5-6 HOME/PRESET Setting/Modification Screen

Press either the ← or → key to select a HOME/PRESET, and press the **ENT** key.

**5. The screen used to set and change the PRESET position is displayed.**

■ Figure 5-7 PRESET Position Setting/Modification Screen

PAR - I / O PRESET

PRES= 00000.00mm Enter the PRESET value.

10keys ENT: Set

Mode - - - - -

Enter the PRESET position using the numerical keys, and press the **ENT** key.

**6. The screen used to set and change the LS detection enable/disable status is displayed.**

■ Figure 5-8 LS detection Enable/Disable Setting/Modification Screen

PAR - I / O LS Detect

LS Detect = Off Select either Off or On.

← / → ENT: Set

Mode - - - - -

Press either the ← or → key to select the LS detection enable/disable status, and press the **ENT** key.

**7. The screen used to set and change the LS logic is displayed.**

■ Figure 5-9 LS Logic Setting/Modification Screen

PAR - I / O LS LGC

LS LGC = NO set Select either  
NO (normally-open) or  
NC (normally-closed).

← / → ENT: Set

Mode - - - - -

Press either the ← or → key to select an LS-logic option, and press the **ENT** key.

**8. The screen used to set and change the HOME logic is displayed.**

■ Figure 5-10 HOME logic Setting/Modification Screen

PAR - I / O HOME LGC

HOME LGC = NO set Select either  
NO (normally-open) or  
NC (normally-closed).

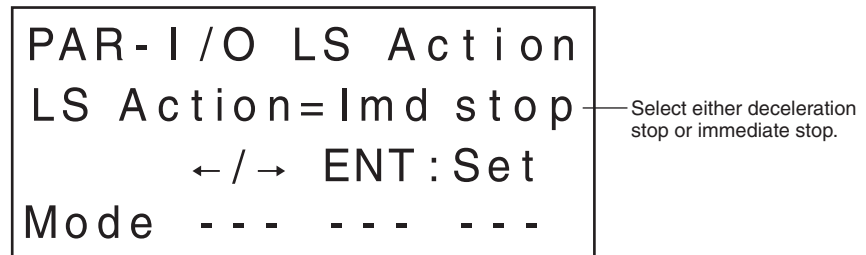
← / → ENT: Set

Mode - - - - -

Press either the ← or → key to select a HOME-logic option, and press the **ENT** key.

## 9. The screen used to set and change the overtravel action is displayed.

■ Figure 5-11 Overtravel Action Setting/Modification Screen



Press either the ← or → key to select an overtravel-action option, and press the **ENT** key.

When the **ENT** key is pressed, the screen shown in Figure 5-4 is displayed.

Imd stop: Immediate stop

Dec stop: Deceleration stop

■ Table 5-1 I/O Parameters

Parameter	Display	Description	Setting range	Initial value
Stop action	STOP Act	Sets how the slider/cylinder is stopped when the STOP input becomes active	Imd stop Dec stop Imd stop + MB + C.OFF Dec stop + MB + C.OFF	Dec stop
Stop logic	STOP LGC	Sets the logic of the STOP input	NO set NC set	NO set
HOME/PRESET switching	HO/PR Sel	Sets the switching between HOME and PRESET	HOME PRESET	HOME
PRESET position	PRES	Sets the PRESET position	–83886.08 to 83886.07 mm (–3302.60 to +3302.60 inch)	0.00 mm
LS detection enable/disable	LS Detect	Sets whether to enable or disable LS detection	On Off	Off
LS logic	LS LGC	Sets the logic of the LS sensor input	NO set NC set	NO set
HOME logic	HOME LGC	Sets the logic of the HOME sensor input	NO set NC set	NO set
Overtravel action	LS Action	Sets how the slider/cylinder is stopped when the sensor input becomes active	Dec stop Imd stop	Imd stop

## 5.5 Setting and Modifying Motor Parameters

Motor parameters can be set and changed according to the following procedure. It is possible to set and change the operating current and standstill current of the motor for driving the slider/cylinder.

Table 5-2 lists the motor parameters that can be set and changed.

**1. Press the F3 key (corresponding to the Mtr option) in the screen for item selection 1.**

**2. The screen used to set and change the operating current is displayed.**

■ Figure 5-12 Operating Current Setting/Modification Screen

PAR-Mtr Run Cur.  
 Run Cur. = 100% Enter a current ratio  
 10keys ENT: Set  
 Mode - - - - -

Enter the operating current via the numerical keys, and press the **ENT** key.

**3. The screen used to set and change the standstill current is displayed.**

■ Figure 5-13 Standstill Current Setting/Modification Screen

PAR-Mtr Stop Cur.  
 Stop Cur. = 50% Enter a current ratio  
 10keys ENT: Set  
 Mode - - - - -

Enter the standstill current via the numerical keys, and press the **ENT** key. When the **ENT** key is pressed, the screen shown in Figure 5-12 is displayed.

### Note

Decrease the operating current and standstill current when there is an allowance in the slider/cylinder's thrust force and you wish to reduce vibration during operation or suppress heat generation from the motor. However, be careful of an excessive decrease in current, since the thrust force and holding brake force will drop in rough proportion to the operating current.

■ Table 5-2 Motor Parameters

Parameter	Display	Description	Setting range	Initial value
Operating current	Run Cur.	ets the operating current of the motor	0 to 100%	100%
Standstill current	Stop Cur.	Sets the standstill current of the motor	0 to 50%	50%

## 5.6 Setting and Modifying Home Parameters

Home parameters can be set and changed according to the following procedure. It is possible to set and change the return direction, home offset position, return mode, starting speed of return and operating speed of return to the return-to-home operation of the slider/cylinder. Table 5-3 lists the home parameters that can be set and changed.

**1. Press the F4 key (corresponding to the Hmp option) in the screen for item selection 1.**

**2. The screen used to set and change the return direction is displayed.**

■ Figure 5-14 Return Direction Setting/Modification Screen

### Note

Do not change the return direction of the cylinder's return-to-home operation.

Press either the ← or → key to select a return-direction option, and press the **ENT** key.

### Note

The values specified by the speed parameters are set for acceleration and deceleration at the return-to-home operation.

**3. The screen used to set and change the home offset position is displayed.**

■ Figure 5-15 Home Offset Position Setting/Modification Screen

Enter the home offset position via the numerical keys, and press the **ENT** key.

**4. The screen used to set and change the return mode is displayed.**

■ Figure 5-16 Return Mode Setting/Modification Screen

Press either the ← or → key to select a return mode, and press the **ENT** key.

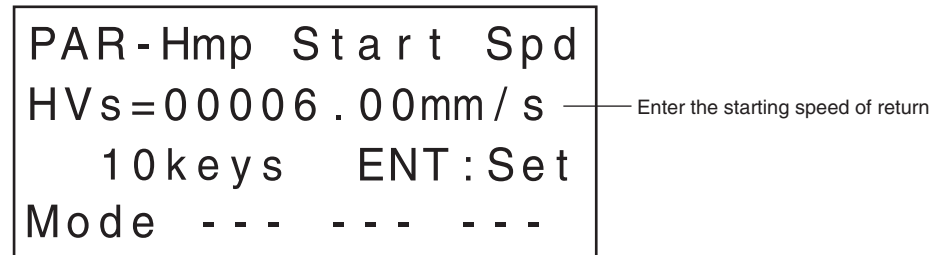
Push: Push-motion

2: 2-sensor

3: 3-sensor

**5. The screen used to set and change the starting speed of return is displayed.**

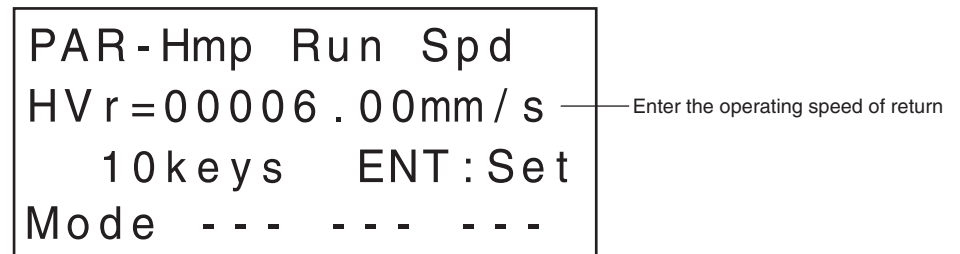
■ Figure 5-17 Return Starting Speed Setting/Modification Screen



Enter the starting speed of return via the numerical keys, and press the **ENT** key.

**6. The screen used to set and change the operating speed of return is displayed.**

■ Figure 5-18 Return Operating Speed Setting/Modification Screen



Enter the operating speed of return via the numerical keys, and press the **ENT** key.

When the **ENT** key is pressed, the screen shown in Figure 5-14 is displayed.

■ Table 5-3 Home Parameters

Parameter	Display	Description	Setting range	Initial value
Return direction	Home Dir	Sets the direction of the return-to-home operation	To Motor Opp Motor	To Motor
Home offset position	Pos	Sets the offset position from the mechanical home position of the slider/cylinder	-83886.08 to 83886.07 mm (-3302.60 to +3302.60 inch)	0.00 mm
Return mode	Home	Selects the return-to-home operation method, sensor-less or with sensors	Push 2 3	Push
Starting speed of return	HVs	Sets the starting speed of the return-to-home operation	0.01 to 250.00 mm/s (0.0004 to 9.84 in/sec) [up to 6.00 mm/s (0.24 in/sec) in the case of a push-motion return]	6.00 mm/s (0.24 in/sec)
Operating speed of return	HVr	Sets the operating speed of the return-to-home operation	0.01 to 800.00 mm/s ※ (0.0004 to 31.50 in/sec) [up to 6.00 mm/s (0.24 in/sec) in the case of a push-motion return]	6.00 mm/s (0.24 in/sec)

※ The maximum speed varies, depending on the slider/cylinder connected to the controller.



## 5.7 Setting and Modifying Speed Parameters

Speed parameters can be set and changed according to the following procedure:

- Set and change the starting speed (excluding starting speed of return), acceleration, deceleration and common operating speed, which are commonly used during operation of the slider/cylinder.

Table 5-4 lists the speed parameters that can be set and changed.

**1. Press the F3 key (corresponding to the Spd option) in the screen for item selection 2 (displayed by pressing the SHIFT key).**

**2. The screen used to set and change the starting speed is displayed.**

■ Figure 5-19 Starting Speed Setting/Modification Screen

PAR-Spd Start Spd	
Vs=00006.00mm/s	Enter the starting speed
10keys ENT:Set	
Mode - - - - -	

Enter the starting speed via the numerical keys, and press the **ENT** key.

**3. The screen used to set and change the acceleration is displayed.**

■ Figure 5-20 Acceleration Setting/Modification Screen

PAR-Spd Acc Rate	
Acc=00000.45m/s <sup>2</sup>	Enter the acceleration
10keys ENT:Set	
Mode - - - - -	

Enter the acceleration via the numerical keys, and press the **ENT** key.

**4. The screen used to set and change the deceleration is displayed.**

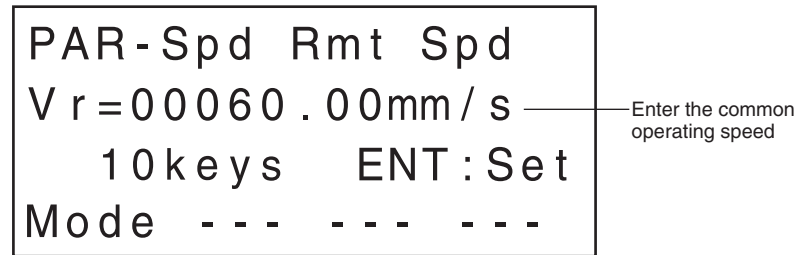
■ Figure 5-21 Deceleration Setting/Modification Screen

PAR-Spd Dec Rate	
Dec=00000.45m/s <sup>2</sup>	Enter the deceleration
10keys ENT:Set	
Mode - - - - -	

Enter the deceleration via the numerical keys, and press the **ENT** key.

**5. The screen used to set and change the common operating speed is displayed.**

■ Figure 5-22 Common Operating Speed Setting/Modification Screen



Enter the common operating speed via the numerical keys, and press the **ENT** key.

■ Table 5-4 Speed Parameters

Parameter	Display	Description	Setting range	Initial value
Starting speed ※	V s	Sets or changes the starting speed commonly used at the startup of all operations (excluding return-to-home and push-motion operations). The speed specified via this parameter is also used in low-speed operation during remote teaching.	0.01 to 250.00 mm/s (0.0004 to 9.84 in/sec)	6.00 mm/s (0.24 in/sec)
Acceleration	Acc	Sets or changes the acceleration commonly used during all operations	0.01 to 100.00 m/s <sup>2</sup> (0.03 to 328.3 ft/sec <sup>2</sup> )	0.45 m/s <sup>2</sup> (1.48 ft/sec <sup>2</sup> )
Deceleration	Dec	Sets or changes the deceleration commonly used during all operations	0.01 to 100.00 m/s <sup>2</sup> (0.03 to 328.3 ft/sec <sup>2</sup> )	0.45 m/s <sup>2</sup> (1.48 ft/sec <sup>2</sup> )
Common operating speed	V r	Sets or changes the common operating speed commonly used in manual operation, remote teaching and FWD/RVS operation	0.01 to 250.00 mm/s (0.0004 to 9.84 in/sec)	60.00 mm/s (2.36 in/sec)

※ When multiple push-motion operations are linked, the push-motion operating speed becomes the starting speed.

The following settings cause the starting speed to become the operating speed:

- Common operating speed < Starting speed
- Operating speed set in program mode < Starting speed

## 5.8 Setting and Modifying Common Parameters

Common parameters can be set and changed according to the following procedure. It is possible to set and change the softlimit, upper softlimit, lower softlimit, area 1, area 2, coordinate setting, as well as the direction of the ← key as common control parameters for the slider/cylinder. Table 5-5 lists the common parameters that can be set and changed.

1. Press the F4 key (corresponding to the Com option) in the screen for item selection 2 (displayed by pressing the SHIFT key).
2. The screen used to set and change the softlimit enable/disable status is displayed.

■ Figure 5-23 Softlimit Setting/Modification Screen

PAR-Com Soft Lim			
Soft	Lim=On	Select either On or Off	
← / →		ENT: Set	
Mode	- - -	- - -	- - -

Press either the ← or → key to enable or disable the softlimit, and press the ENT key.

3. The screen used to set and change the upper softlimit is displayed.

■ Figure 5-24 Upper Softlimit Setting/Modification Screen

PAR-Com Soft Lim+			
Lim+=	00401.00mm	Enter the upper softlimit (Initial value when the stroke is 400 mm (15.75 inch))	
10keys		ENT: Set	
Mode	- - -	- - -	- - -

Enter the upper softlimit via the numerical keys, and press the ENT key.

4. The screen used to set and change the lower softlimit is displayed.

■ Figure 5-25 Lower Softlimit Setting/Modification Screen

PAR-Com Soft Lim-			
Lim-=	-00001.00mm	Enter the lower softlimit	
10keys		ENT: Set	
Mode	- - -	- - -	- - -

Enter the lower softlimit via the numerical keys, and press the ENT key.

### Note

If the set value of the lower softlimit is greater than that of the upper softlimit, an alarm (softlimit detection) will be generated.

**5. The screen used to set and change area 1 is displayed.**

■ Figure 5-26 Area 1 Setting/Modification Screen

PAR-Com Area 1  
 Area 1= 00000.00mm Enter area 1  
 10keys ENT:Set  
 Mode - - - - -

Enter area 1 via the numerical keys, and press the **ENT** key.

**6. The screen used to set and change area 2 is displayed.**

■ Figure 5-27 Area 2 Setting/Modification Screen

PAR-Com Area 2  
 Area 2= 00000.00mm Enter area 2  
 10keys ENT:Set  
 Mode - - - - -

Enter area 2 via the numerical keys, and press the **ENT** key.

**7. The screen used to set and change the coordinate setting is displayed.**

■ Figure 5-28 Coordinate Setting/Modification Screen

PAR-Com Pos Dir  
 +Dir=Opp Motor Select either  
opposite the motor side  
or motor side  
 ← / → ENT:Set  
 Mode - - - - -

Press either the ← or → key to select a coordinate setting, and press the **ENT** key.

**8. The screen used to set and change the direction of the ← key is displayed.**

■ Figure 5-29 ← Key Direction Setting/Modification Screen

PAR-Com ←Key Dir  
 ←Dir=To Motor  
 ← / → ENT:Set  
 Mode - - - - -

When the **ENT** key is pressed, the screen shown in Figure 5-23 is displayed.

■ Table 5-5 Common Parameters

Parameter	Display	Description	Setting range	Initial value
Softlimit	Soft Lim	Sets whether to enable or disable the softlimit	On Off	On
Upper softlimit	LIM+	Sets the softlimit value that applies in the + direction when setting the coordinates. (The default setting is opposite the motor side.)	–83886.08 to 83886.07 mm (–3302.60 to +3302.60 inch)	Valid stroke +1 mm (+0.04 inch)
Lower softlimit	LIM–	Sets the softlimit value that applies in the – direction when setting the coordinates. (The default setting is motor side.)	–83886.08 to 83886.07 mm (–3302.60 to +3302.60 inch)	–1.00 mm (–0.04 inch)
Area 1	Area1	Sets the position at which the area output is activated	–83886.08 to 83886.07 mm (–3302.60 to +3302.60 inch)	0.00 mm
Area 2	Area2	Sets the position at which the area output is activated	–83886.08 to 83886.07 mm (–3302.60 to +3302.60 inch)	0.00 mm
Coordinate setting	+Dir	Sets the + direction in coordinate management	Opp Motor To Motor	Opp Motor
← key direction	←Dir	Sets the direction in which the slider/cylinder will move when the ← key is pressed	Opp Motor To Motor	To Motor

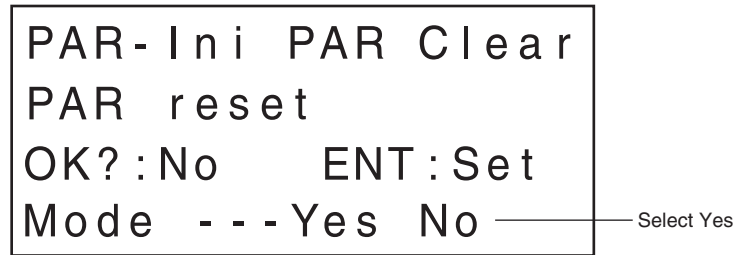
## 5.9 Initializing parameters

The following operation initializes entered parameters to the corresponding factory-set values (defaults).

You can initialize parameters according to the following procedure:

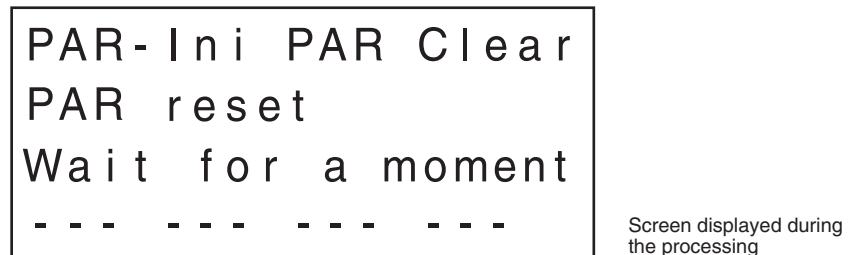
- 1. Press the F2 key (corresponding to the Ini option) in the screen for item selection 2 (displayed by pressing the SHIFT key).**
- 2. The screen switches to the one for initializing parameters.**  
 The message "Parameter reset OK?: No" is displayed.

■ Figure 5-30 Confirmation Screen for Initializing Parameters



- 3. Select "Yes" by pressing the F3 key, and press the ENT key.**  
 The parameters are initialized.

■ Figure 5-31 Execution Screen for Initializing Parameters



- 4. The screen shown in Figure 2-3 is displayed once the initialization is complete.**

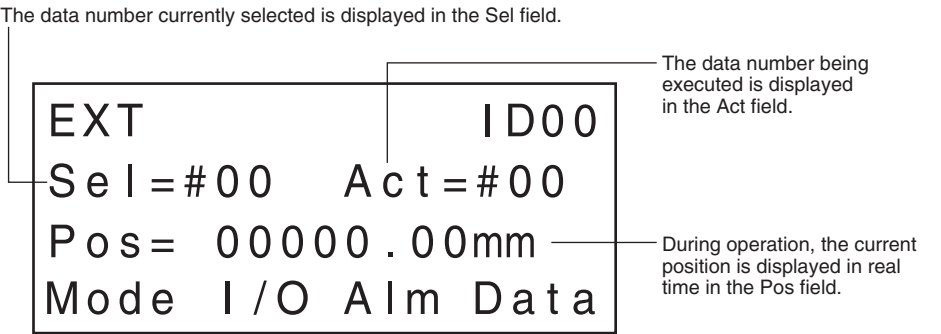
# Chapter 6 Monitoring Operation Data

This chapter describes the monitor functions of the external (EXT) mode. The EXT mode is the default mode that is automatically selected and displayed when the teaching pendant is started. It is the mode for performing operations of controllers and sliders/cylinders via user I/O. The first screen of the EXT mode displays the controller's operation status in real time.

## 6.1 Monitoring Functions

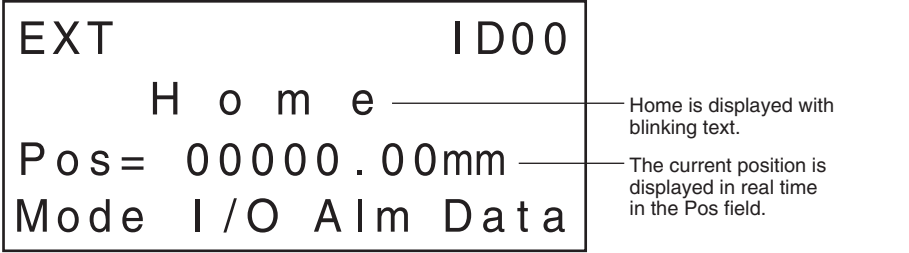
The available monitoring functions include the operation data monitor, I/O monitor, alarm monitor and alarm-history clear function. Figure 6-1 shows the first screen of the EXT mode.

■ Figure 6-1 First Screen of the EXT mode/Current Position Display

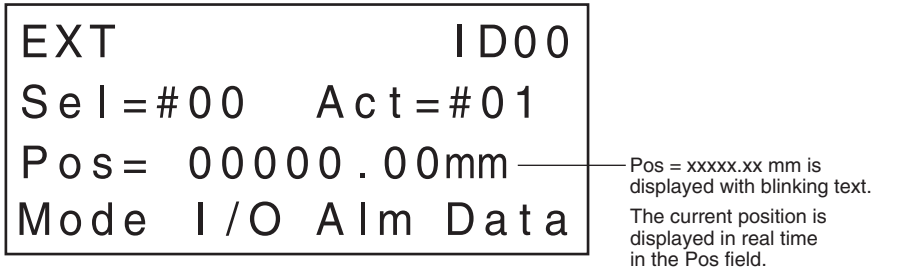


The screens shown in figures 6-2 to 6-4 are displayed during return to mechanical home operation and push-motion operation and upon the occurrence of an error, respectively.

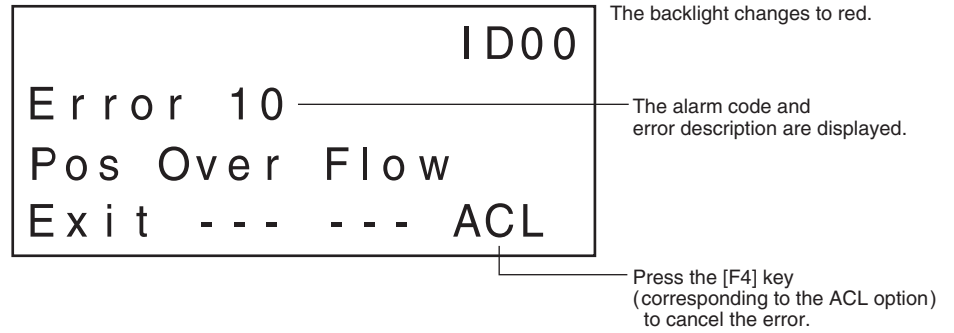
■ Figure 6-2 During Return to Mechanical Home Operation



■ Figure 6-3 During Push-Motion Operation



■ Figure 6-4 Upon an Error Occurrence



In order to check the monitor items shown in Table 6-1, switch between the display screens by pressing the following keys while the screens shown in figures 6-1 to 6-3 are displayed.

1. Press the **F2** key (corresponding to the I/O option) to monitor I/O status.
2. Press the **F3** key (corresponding to the Alm option) to monitor alarm information.
3. Press the **F4** key (corresponding to the Data option) to monitor operation data.
4. Press the **↑** and **↓** keys to switch between items in each monitor function selected by the **F2** to **F4** keys.

## 6.2 Monitor Items Available in the EXT Mode

Table 6-1 shows the monitor items available in the EXT mode.

■ Table 6-1 Monitor Items

Monitor item	Display	Description	Display range
I/O	I/O In1 START ACL, (CK) ※1 FREE STOP, /STOP ※3	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
	I/O In2 M Bit M5 M4 M3	The selected data number is displayed in the M field. A bit image is displayed in the Bit field. Each bit corresponds to bits M5, M4, M3, M2, M1 and M0. ※ is displayed for each of the M5, M4 and M3 inputs if it is active, while • is displayed if it is non-active.	00 to 63 1: Active 0: Non-active ※ •
	I/O In3 M2 M1 M0 HOME, (PRESET) ※2 REQ	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
	I/O In4 /EMG FWD RVS	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
	I/O S-IN +LS, /+LS ※3 -LS, /-LS ※3 HOME, /HOME ※3	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
	I/O Out1 ALM MOVE	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •



Monitor item	Display		Description	Display range
I/O	I/O Out2	T-UP, (OUT1) ※ 1 AREA, (OUT0) ※ 1 END, (OUTR) ※ 1	* is displayed if the input is active. • is displayed if the input is non-active.	* •
	I/O ALL	IN OUT S-IN	The status of all I/O signals can be checked. * is displayed if the signal is active. • is displayed if the signal is non-active.  The inputs (IN) are, from the left, START, ACL (CK) ※ 1, /FREE, /STOP, M5, M4, M3, M2, M1, M0, HOME/PRESET, REQ, /EMG, FWD and RVS. The outputs (OUT) are, from the left, /ALM, MOVE, T-UP (OUT1) ※ 1, AREA (OUT0) ※ 1, END(OUTR) ※ 1. S-IN are, from the left, +LS, –LS and HOME.	* •
Alm	Alm Now	Error	The message of the present alarm is displayed.	00 to FF
	Alm Hist	Hist Error	The messages of the alarms generated to date are displayed.	0 to 9 00 to FF
Data	Data	Abs/Inc	The information of the data number selected in the Act field is displayed. The positioning method and positioning data are displayed.	Abs Inc
		Pos		–83886.08 to 83886.07 mm (–3302.60 to +3302.60 inch)
	Data	Func	The operation function and operating speed are displayed. SingleMotion: Single-motion positioning operation LinkedMotion: Linked-motion positioning operation PushMotion: Push-motion operation	SingleMotion LinkedMotion PushMotion
		Spd		0.01 to 800.00 mm/s (0.0004 to 31.50 in/sec)
	Data	Push Cur.	The push current is displayed. “– – %” is displayed during single-motion or linked- motion operation.	0 to 50%

※ 1 When the ABS data is loaded

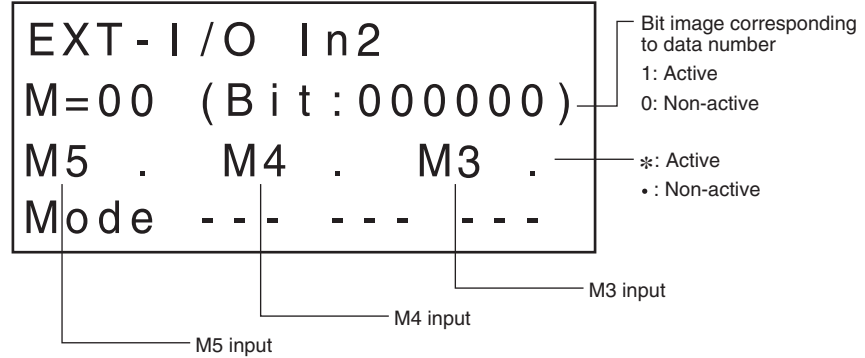
※ 2 When PRESET is selected

※ 3 When the input logic is reversed

## 6.3 Descriptions of Monitor Screens

Figure 6-5 shows the screen that indicates the selected data number, the bit image and the status of M5, M4 and M3 inputs. The “\*” symbol will be displayed if the input in question is active, while “.” will be displayed if the input is non-active.

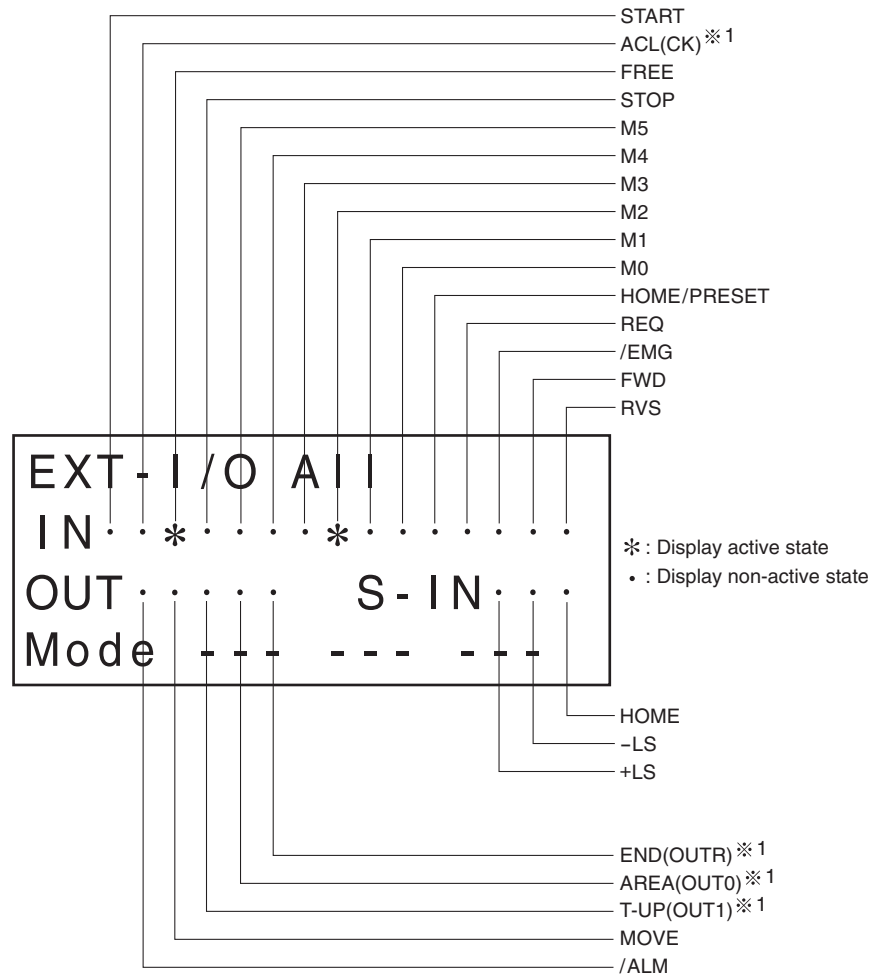
■ Figure 6-5 I/O Monitor Screen: In2



It is possible to change monitor screen by pressing the ↑ and ↓ keys.

Figure 6-6 shows the screen that displays the statuses of all the I/O signals. The “\*” symbol will be displayed if the signal in question is active, while “.” will be displayed if the signal is non-active.

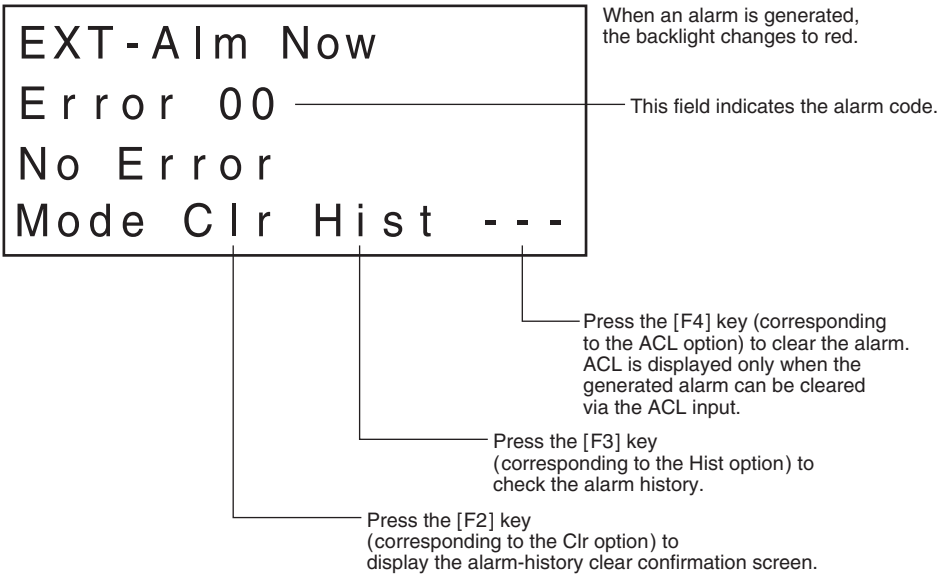
■ Figure 6-6 I/O Monitor Screen: All



※1 The designations in ( ) are displayed when the ABS data is loaded.

Figure 6-7 shows the screen that indicates alarm information. In this screen it is possible to check the current alarm message and display the alarm history, as well as to delete alarms and clear the alarm history.

■ Figure 6-7 Alarm Monitor





# Chapter 7 Manual Operation and I/O Checking

This chapter explains how to perform manual operation of the slider/cylinder and check the controller's I/O status in the test (TST) mode.



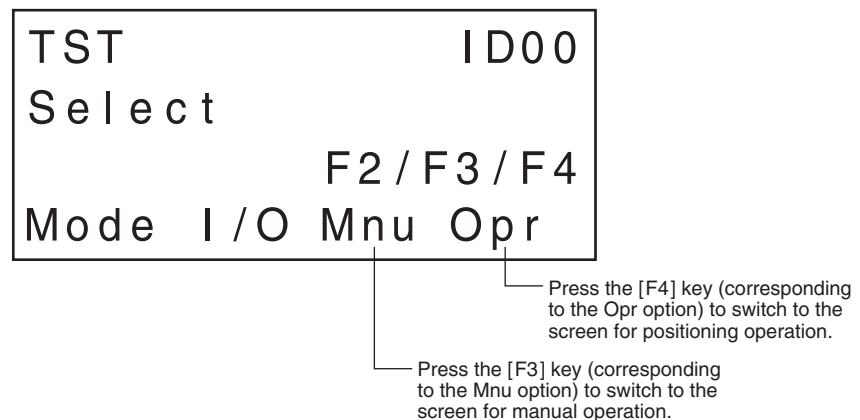
## Warning

- In order to avoid injury and equipment damage, be sure that engineers having expert knowledge of the structure and operation of the EZHS/EZHC/EZHP Series controllers and sliders/cylinders, along with an awareness of the degree of risk involved in the operation, perform the connection of the teaching pendant.

## 7.1 Manual Operation

There are two types of manual operations: positioning operation using operation data set via the teaching pendant and manual operation performed by pressing the ← and → keys. In order to perform manual operation, it is necessary to select the test (TST) mode. Press the **F1** key to display the first screen of the TST mode. Figure 7-1 shows the first screen of the TST mode.

■ Figure 7-1 First Screen of the TST Mode/Item Selection



### 7.1.1 Manual Operation

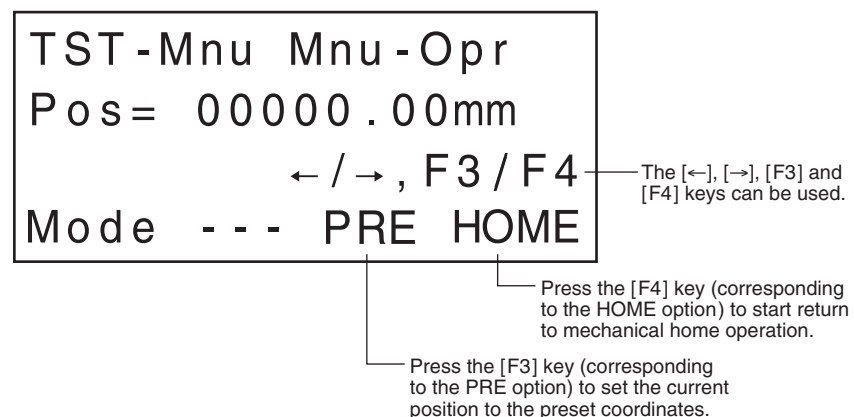
The slider/cylinder can be operated manually through the following procedure:

Press the **F3** key in the first screen of the TST mode to switch to the screen for manual operation.

■ Figure 7-2 Manual Operation Execution Screen

#### Note

Selecting PRESET sets the current position to the position set by the PRESET position parameter. Once a PRESET position is set, positioning operation will be performed based on the PRESET position.



### 1. Press the ← or → key to start the slider/cylinder operation.

The current position is displayed in the Pos field during the operation.

If the **SHIFT** key is pressed during operation, the slider/cylinder will accelerate and operate at high speed \*1. When the **SHIFT** key is released, the slider/cylinder decelerates and returns to operation at low speed \*2.

\*1 The common operating speed (Vr) set in the speed parameters of the PAR mode

\*2 The starting speed (Vs) set in the speed parameters of the PAR mode

### 2. Press the F4 key to select HOME to start the return to mechanical home operation.

### 3. Press the ESC key to end the manual operation.

The screen returns to the first screen of the TST mode.

## 7.1.2 Positioning Operation

The slider/cylinder's positioning operation can be performed according to the following procedure:

Press the **F4** key in the first screen of the TST mode to switch to the screen for positioning operation.

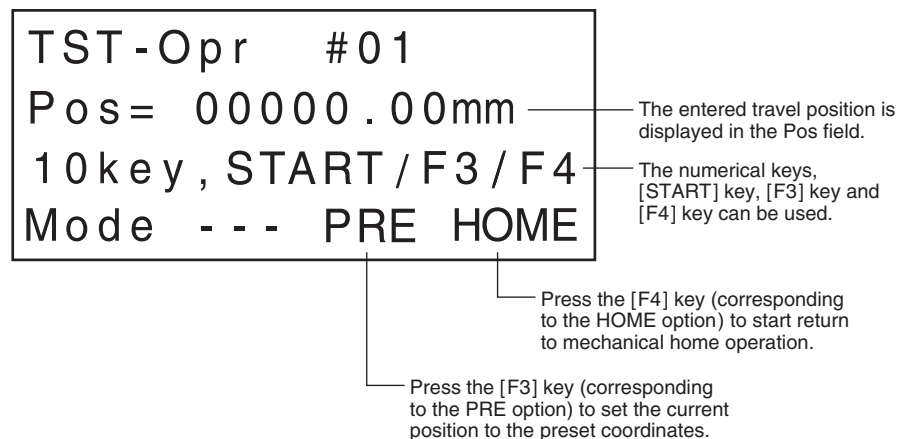
#### Note

Provide safety barrier when operating the slider/cylinder at speeds exceeding the range of safety (250 mm/s (9.84 in/sec)).

#### Note

Selecting PRESET sets the current position to the position set by the PRESET position parameter. Once a PRESET position is set, positioning operation will be performed based on the PRESET position.

■ Figure 7-3 Positioning Operation Execution Screen



### 1. Press the F4 key (corresponding to the HOME option) to perform the return to mechanical home operation.

### 2. Select the operation data number you want to use for the positioning operation.

Pressing the ↑ and ↓ keys causes the number of tens to increase and decrease, respectively. Pressing the ← and → keys causes the number of units to increase and decrease, respectively.

The data number can also be selected using the numerical keys.

### 3. Press the START key.

The positioning operation using the data of the selected operation data number is started.

Press the **STOP** key in order to stop the positioning operation in the middle.

### 4. Press the ESC key to end the positioning operation.

The screen returns to the first screen of the TST mode.

## 7.2 I/O Checking

The I/O checking function is used to confirm the connection status of the controller's I/O via the teaching pendant.

Connection with the user-defined controller and the operation status can be checked by confirming the status of the controller's input and switching the output status.

The “\*” symbol will be displayed if the signal is active, while “.” will be displayed if the signal is non-active.

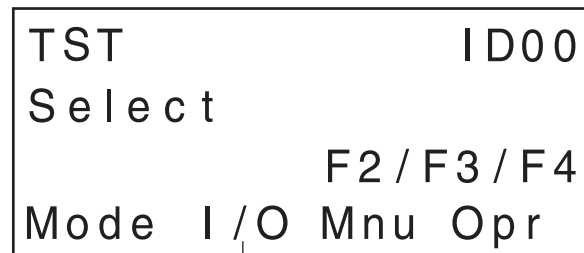
The I/O checking function should be used when you want to check the wiring conditions of the controller during machine setup and maintenance.

### Note

All the I/O functions and operations are disabled during I/O checking.

Select the test (TST) mode in order to perform I/O checking. Press the **F1** key to display the first screen of the TST mode. Figure 7-4 shows the first screen of the TST mode.

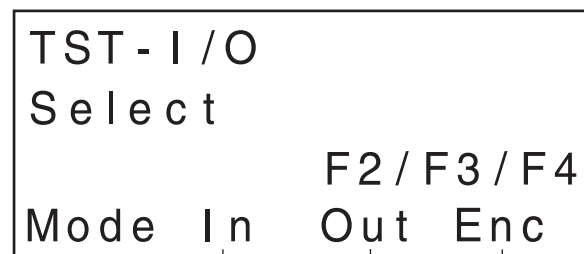
■ Figure 7-4 First Screen of the TST Mode/Item Selection



Press the [F2] key (corresponding to the I/O option) to switch to the IN/OUT selection screen.

### 1. Press the F2 key in the first screen of the TST mode.

■ Figure 7-5 I/O Checking Execution Screen



Press the [F2] key (corresponding to the In option) to check the input status.

Press the [F4] key (corresponding to the Enc option) to check the output status of encoder.

Press the [F3] key (corresponding to the Out option) to check the output status.

In order to check the I/O checking items shown in Table 7-1, switch between the display screens by pressing the following keys while the screen shown in Figure 7-5 is displayed.

2. Press the F2 key (corresponding to the In option) to check the input status.
3. Press the F3 key (corresponding to the Out option) to check the output status.
4. Press the F4 key (corresponding to the Enc option) to check the output status of encoder pulse.
5. Press the ↑ and ↓ keys to switch between items of the input/output checking selected via the F2, F3 or F4 key.
6. Press the ESC key twice to end I/O checking.  
The screen returns to the first screen of the TST mode.

## 7.2.1 I/O Checking Items

Table 7-1 shows the I/O checking items available in the TST mode.

■ Table 7-1 I/O Checking Items

Display	Description	Display range
I/O-In In1 START ACL /CK ※ 1 FREE STOP, /STOP ※ 3	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
I/O-In In2 M Bit M5 M4 M3	The selected data number is displayed in the M field. A bit image is displayed in the Bit field. Each bit corresponds to bits M5, M4, M3, M2, M1 and M0. ※ is displayed for each of the M5, M4 and M3 inputs if it is active, while • is displayed if it is non-active.	00 to 63 1: Active 0: Non-active ※ •
I/O-In In3 M2 M1 M0 HOME/PRESET ※ 2 REQ	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
I/O-In In4 /EMG FWD RVS	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
I/O-In S-IN +LS, /+LS ※ 3 -LS, /-LS ※ 3 HOME, /HOME ※ 3	※ is displayed if the input is active. • is displayed if the input is non-active.	※ •
I/O-In All IN  S-IN	The status of all input signals can be checked. ※ is displayed if the signal is active. • is displayed if the signal is non-active.  The inputs (IN) are, from the left, START, ACL/CK ※ 1, FREE, STOP, M5, M4, M3, M2, M1, M0, HOME/PRESET, REQ, /EMG, FWD and REV. S-IN are, from the left, /+LS, /-LS and /HOME ※ 3.	※ •
I/O-Out Out1 /ALM, F4:ON/OFF	Press the <b>F4</b> key to switch /ALM between active and non-active state.	※ •
I/O-Out Out2 MOVE, F4:ON/OFF	Press the <b>F4</b> key to switch MOVE between active and non-active state.	※ •
I/O-Out Out3 T-UP/OUT1, F4:ON/OFF	Press the <b>F4</b> key to switch T-UP/OUT1 between active and non-active state.	※ •
I/O-Out Out4 AREA/OUT0, F4:ON/OFF	Press the <b>F4</b> key to switch AREA/OUT0 between active and non-active state.	※ •
I/O-Out Out5 END/OUTR, F4:ON/OFF	Press the <b>F4</b> key to switch END/OUTR between active and non-active state.	※ •
I/O-Out All OUT	It is possible to switch each signal between active and non-active state by pressing the specified numerical key. The outputs (OUT) are, from the left, /ARM (9), MOVE (8), T-UP/OUT1 (7) ※ 1, AREA/OUT0 (6) ※ 1, END/OUTR (5) ※ 1.	※ •
TST-I/O Enc	Encoder pulse output can be checked. Pressing the [F4] key outputs 1000 encoder pulses (1000 Hz). ※ is displayed while encoder pulse is being output.	

※ 1 When the ABS data is loaded    ※ 2 When PRESET is selected    ※ 3 When the input logic is reversed



# Chapter 8 Troubleshooting

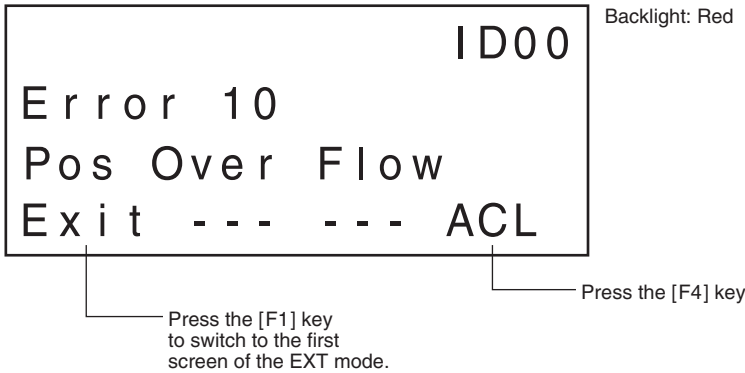
Should any problem occur during use of the teaching pendant, perform troubleshooting with reference to the information provided in this section.  
If the device does not operate normally after the appropriate action has been taken, call our Technical Support Line.

## 8.1 Error Messages

A message may be displayed in the LCD panel while using the teaching pendant.  
If an error message is displayed, perform the following procedure for prompt recovery from the error state.  
See 2.1.5, “Error Display Screens”, on p. 2-6 for details on how to recover from an error in the teaching pendant.  
Table 8-1 lists the errors of the teaching pendant.  
Table 8-2 lists the errors of the controller.

- 1. Press the **F4** key (corresponding to the ACL option) in the screen where the error message is displayed.  
The alarm is canceled and the backlight returns to green.

■ Figure 8-1



- 2. Depending on the type of alarm, it may not be able to recover from an error by pressing the **F4** key (corresponding to the ACL option).  
In this case, turn the power supply to the controller off and back on again. See Table 8-2.

■ Table 8-1 Errors of the Teaching Pendant

Alarm code	Controller's ALARM LED	Error	Slider/cylinder action	Cause	Action	ACL input
※ 1	Not lit	No ID connected	※ 2	There was no response from any controller during ID checking.	Press the <b>F1</b> key and perform ID checking of the connected controllers again.	Cannot be used
※ 1	Not lit	ID duplication	※ 2	Multiple controllers with the same ID are connected to the pendant.	Set the IDs of the controllers so that they do not duplicate, and press the <b>F1</b> key and perform controller ID checking again. Press the <b>F2</b> key to disconnect a controller with a duplicate ID, and then select the ID again.	Cannot be used
※ 1	Not lit	Communication error	※ 2	The controller with the selected ID does not respond.	Press the <b>F1</b> key and perform ID checking of the connected controllers again. Press the <b>F2</b> key to disconnect a controller that generates communication errors, and then select the ID again.	Cannot be used
※ 1	Not lit	No ID recognized	※ 2	There is no selectable controller ID due to ID duplication or communication error.	Change the duplicated ID or remove the cause of communication error, and press the <b>F1</b> key to perform ID checking of the connected controllers again.	Cannot be used

※ 1 No alarm code will be displayed if an error occurs in the teaching pendant.

※ 2 Errors of the teaching pendant cannot be detected on the controller side; the status prior to error occurrence is maintained.

## 8.2 Checking the Alarm History

It is possible to check the history of alarms generated to date.

1. Press the F3 key (corresponding to the Alm option) in the first screen of the EXT mode.

The current alarm information screen is displayed.

■ Figure 8-2 Current Alarm Information Screen

```
EXT-Alm Now
Error 00
No Error
Mode Clr Hist - - -
```

2. Press the F3 key (corresponding to the Hist option) to display the most recent alarm in the history.

■ Figure 8-3 Alarm History Display Screen

```
EXT-Alm-Hist 0
Error 00
No Error
Mode - - - - -
```

3. Press the ↑ or ↓ key to display the history of alarms generated to date. Up to ten alarms from the most recent one can be displayed.

■ Figure 8-4 Alarm History Display Screen 2

```
EXT-Alm-Hist 9
Error 00
No Error
Mode - - - - -
```

**Table 8-2 Numbers of LED Blinks and Alarm Codes**

Alarm code	No. of LED blinks	Phenomenon	Slider/cylinder action	Cause	Action	ACL input
21	2	Overheat protection	The motor current is cut off. The electromagnetic brake is activated.	The driver's heat-sink temperature reached approx. 85°C (185°F).	Review the ventilation conditions within the enclosure.	Can be used
26		Motor overheat protection	The motor current is cut off. The electromagnetic brake is activated.	The motor temperature reached approx. 85°C (185°F).	Reduce the load. Review the ventilation condition of the surroundings.	Can be used
30		Overload	The motor current is cut off. The electromagnetic brake is activated.	A load exceeding the maximum thrust force was applied for five seconds or more.	Reduce the load or decrease the acceleration.	Can be used
31		Overspeed	The motor current is cut off. The electromagnetic brake is activated.	The motor speed exceeded 5500 r/min.	Set the motor speed to 5500 r/min or less.	Can be used
22	3	Overvoltage protection	The motor current is cut off. The electromagnetic brake is activated.	The DC voltage of the main circuit is too high.	Reduce the load or decrease the acceleration.	Can be used
23		Main power OFF detection	The motor current is cut off. The electromagnetic brake is activated.	The power-OFF condition of the main circuit was detected.	Check to see if the main power is input correctly.	Can be used
10	4	Excessive position deviation	The motor current is cut off. The electromagnetic brake is activated.	The deviation between the command position and actual position exceeded three motor-shaft revolutions.	Reduce the load or decrease the acceleration.	Can be used
20	5	Overcurrent protection	The motor current is cut off. The electromagnetic brake is activated.	The motor cable was shorted.	Check the motor cable and its connection to the controller.	Cannot be used
68	6	EMG input detection	The motor current is cut off. The electromagnetic brake is activated.	An emergency stop input was detected.	Reset the emergency stop button on the teaching pendant.	Cannot be used
27	7	Insufficient ABS battery voltage (absolute type only)	The motor current is cut off. The electromagnetic brake is activated.	The ABS backup battery voltage dropped to or below the specified value. (If the absolute position has been lost, then alarm code 33, "Absolute position loss error", is displayed instead.)	Operate the ACL input and reset the alarm, and then charge the battery.	Can be used
33		Absolute position loss (absolute type only)	The motor stops	<ul style="list-style-type: none"> <li>Power was turned on for the first time after the battery was connected.</li> <li>Battery is not connected or has been consumed.</li> </ul>	Operate the ACL input to reset the alarm.	Can be used
60		LS logic error	The motor stops	Both the -LS and +LS sensors were detected in the sensor-enable mode.	Make the -LS and +LS sensors non-active and operate the ACL input.	Can be used
61		LS reverse-connection error	The motor stops	The LS sensor opposite to the operating direction was detected during a return-to-home operation.	Make the detected LS sensor non-active and operate the ACL input.	Can be used
62		Return-to-home error	The motor stops	A return-to-home operation didn't complete normally.	An unanticipated load may have been applied during the return-to-home operation. Check the load.	Can be used
63		HOMELS non-detection error	The motor stops	The HOME LS signal is not output at a position between +LS and -LS during HOME operation (3-sensor mode).	Set a HOME sensor between the limit sensors (+LS, -LS).	Can be used
66		LS detection error	The motor stops	Both the -LS and +LS sensors were detected at the same time in the sensor-enable mode.	Make the detected LS sensor non-active and operate the ACL input.	Can be used
67		Softlimit detection	The motor stops	The table or rod reached a softlimit position.	Check the operation data (position, speed) and possible linked data.	Can be used
6A		HOME offset error	The motor stops	The LS signal was detected during home offset operation.	Input the ACL signal and reset the error, and then check the home offset value.	Can be used

Alarm code	No. of LED blinks	Phenomenon	Slider/cylinder action	Cause	Action	ACL input
70	7	Abnormal operation data	The motor stops	There is an abnormality in the operation data.	Check the operation data. Operation data may not be set, five or more data may be linked, data of different directions may be linked, or sequence-forward data No. 01 may not be set. Or, the operating speed during push-motion operation is set to a value exceeding 6 mm/s (0.24 in/sec).	Cannot be used
28	8	Sensor error	The motor current is cut off. The electromagnetic brake is activated.	A sensor error was detected during operation.	Turn off the power and check the actuator communication cable and its connection to the controller, and then reconnect the power.	Cannot be used
2A		Actuator communication error	The motor current is cut off. The electromagnetic brake is activated.	An error occurred while communicating with the slider communication board.	Turn off the power and check the actuator communication cable and its connection to the controller, and then reconnect the power.	Cannot be used
42		Sensor error	The motor current is cut off. The electromagnetic brake is activated.	A sensor error occurred when the power was turned on (cable not connected, etc.).	Turn off the power and check the motor cable and its connection to the controller. If the controller is of the absolute type, reconnect the battery.	Cannot be used
43		Rotation at initialization	The motor current is cut off. The electromagnetic brake is activated.	Initialization failed because the motor was rotating when the power was turned on, or for another reason.	Check the load. An external load or a load exceeding the specified value has been applied to the moving part of the slider/cylinder when the power was turned on.	Cannot be used
44		Nonvolatile memory error	The motor current is cut off. The electromagnetic brake is activated.	The stored data was damaged.	Turn off the power and check the actuator communication cable and its connection to the controller, and then reconnect the power.	Cannot be used
45		Actuator combination error	The motor current is cut off. The electromagnetic brake is activated.	A slider/cylinder not supported by the controller was connected.	Check the controller model and slider/cylinder model, and then connect a controller and a slider/cylinder in the correct combination.	Cannot be used
29	9	Subsystem error	The motor current is cut off. The electromagnetic brake is activated.	An error occurred during communication between the main and sub CPUs.	Turn off the power, and then reconnect the power.	Cannot be used
41		Nonvolatile memory error	The motor current is cut off. The electromagnetic brake is activated.	The stored data was damaged.	When alarm code 41 is displayed, initialize the controller using the teaching pendant. Check the load.	Cannot be used



# Appendix A Table of Operation Switching

## A.1 External (EXT) Mode Operation Monitor <Controller Mode> (English display)

Display of current position and for return-to-home operation, push-motion operation and error occurrence changes with the conditions.  
[ ] indicates the name of a key.

First screen	
<p><b>Current position display</b></p> <pre> EXT  ID00 Sel=#00  Act=#00 Pos= 00000.00mm Mode I/O Al m Data [F1] [F2] [F3] [F4] </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Display for return-to-home operation</b></p> <pre> EXT  H o m e Pos= 00000.00mm Mode I/O Al m Data [F1] [F2] [F3] [F4] </pre> <p>[F1] To the data checking screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Display for push-motion operation</b></p> <pre> EXT  ID00 Sel=#00  Act=#01 Pos= 00000.00mm Mode I/O Al m Data [F1] [F2] [F3] [F4] </pre> <p>[F1] To the data checking screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Display for error occurrence</b></p> <pre> Error 10 Pos Over Flow Exit ... .. ACL [F1] </pre> <p>[F1] Cancel alarm and return the backlight to green To the first screen of the EXT mode with the backlight still red [ESC] To the ID checking screen</p>	<p><b>I/O monitor</b></p> <p>The status of I/O is indicated by * and .</p> <p>※1,※2</p> <pre> EXT-I/O In1 START . ACL . FREE . STOP . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>※3</p> <pre> EXT-I/O In2 M=00 (Bit: 000000) M5 . M4 . M3 . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>※4</p> <pre> EXT-I/O In3 M2 . M1 . M0 . PRESET . REQ . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>※5</p> <pre> EXT-I/O In4 FWD . RVS . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>※6</p> <pre> EXT-I/O S-I N +LS . -LS . HOME . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>※7</p> <pre> EXT-I/O Out1 T-UP . AREA . END . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>※8</p> <pre> EXT-I/O Out2 T-UP . AREA . END . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>※9</p> <pre> EXT-I/O Out3 T-UP . AREA . END . Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p>The inputs (IN) are, from the left, START, ACL (CK)※8, FREE, STOP, M5, M4, M3, M2, M1, M0, HOME/PRESET, REQ, /EMG, FWD and RVS</p> <p>The outputs (OUT) are, from the left, /ALM, MOVE, T-UP (OUT)※8, AREA (OUT)※8 and END (OUT)※8</p> <p>The S-IN are, from the left, +LS, -LS and HOME</p> <p>※8 When the ABS data is loaded</p>
<p><b>Alarm monitor</b></p> <p>It is possible to display the current alarm and alarm history, as well as to cancel alarms.</p> <p><b>Current alarm information</b></p> <pre> EXT-Al m Now No Error Mode Clr Hist ... [F1] [F2] [F3] [F4] </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Clear alarm history</b></p> <pre> EXT-Al m-Clr Clear alarm hist. OK? No ENT-Set Mode ... Yes No [F1] [F2] [F3] [F4] </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Alarm history</b></p> <pre> EXT-Al m-Hist0 Error 61 LS Rev Error Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Language setting</b></p> <pre> EXT-Lang Language=Japanese Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p>	<p><b>Language setting</b></p> <pre> EXT-Lang Language=Japanese Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Current position display</b></p> <pre> EXT  ID00 Sel=#00  Act=#00 Pos= 00000.00mm Mode ... .. Lang </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Language setting</b></p> <pre> EXT-Lang Language=Japanese Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p>
<p><b>Data checking</b></p> <p>Operation data can be checked.</p> <pre> EXT-Data #01 Abs/Inc-Inc Pos= 00000.00mm Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Function display</b></p> <pre> EXT-Data #01 Func=PushMotion Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>PushMotion: Push-motion operation</b></p> <pre> EXT-Data #01 Push Cur.=20% Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Language setting</b></p> <pre> EXT-Lang Language=Japanese Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p>	<p><b>Language setting</b></p> <pre> EXT-Lang Language=Japanese Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Current position display</b></p> <pre> EXT  ID00 Sel=#00  Act=#00 Pos= 00000.00mm Mode ... .. Lang </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p> <p><b>Language setting</b></p> <pre> EXT-Lang Language=Japanese Mode ... .. </pre> <p>[F1] To the PRG mode screen [F2] To the alarm monitor screen [F3] To the I/O monitor screen [F4] To the PRG mode screen</p>

## A.2 Program (PRG) Mode Operation Data Setting <Controller Mode> (English display)

In this mode it is possible to enter and edit operation data, and to clear all operation data.  
[ ] indicates the name of a key.

### First screen

No. selection 1  
PRG Data # 1 000  
#01 No data  
ENT: Edit  
Mode: C.Lr. Ins. Del.  
[F1] [F2] [F3] [F4]  
To the data deletion screen  
To the data insertion screen  
To the data clear screen  
To the PAR mode screen

Select from No. 01 to No. 63  
[↑]: No. + 10  
[↓]: No. - 10  
[→]: No. + 1  
[←]: No. - 1  
Can also be selected using [0] to [9].

No. selection 2  
PRG Data # 1 000  
#01 No data  
Mode: Aclr OP Data  
[F1] [F2]  
To the screen for clearing all operation data  
To the PAR mode screen  
[ESC] To the first screen of the EXT mode

### Data creation

Operation method  
PRG-#01 Op Type  
Abs./Inc=Inc  
←/→ ENT: Set  
Mode ... ..  
[F1] To the PAR mode screen  
[F2] To the PAR mode screen  
[F3] To the PAR mode screen  
[F4] To the PAR mode screen  
To the direct teaching screen  
To the remote teaching screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen

Position (numerical value entry)  
PRG-#01 Pos Inc  
Pos= 00000.00 mm  
10keys ENT: Set  
Mode ... Rmt Dct  
[F1] [F2] [F3] [F4]  
To the direct teaching screen  
To the remote teaching screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen

Operating speed  
PRG-#01 Speed  
Spd=00060.00 mm/s  
10keys ENT: Set  
Mode ... ..  
[F1] To the PAR mode screen  
[F2] To the PAR mode screen  
[F3] To the PAR mode screen  
[F4] To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen

Operating function  
PRG-#01 Op Func  
Func=SingleMotion  
←/→ ENT: Set  
Mode ... ..  
[F1] To the PAR mode screen  
[F2] To the PAR mode screen  
[F3] To the PAR mode screen  
[F4] To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen

Push current  
PRG-#01 Push Cur.  
Push Cur.=20%  
10keys ENT: Set  
Mode ... ..  
[F1] To the PAR mode screen  
[F2] To the PAR mode screen  
[F3] To the PAR mode screen  
[F4] To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen  
To the PAR mode screen

### Data clear, insertion and deletion

Data clear  
PRG-Clr #01  
Data clear  
OK?: No ENT: Set  
Mode ... Yes No  
[F1] [F2] [F3] [F4]  
To the PAR mode screen  
Yes: Clear and move to the first screen  
No: To the first screen  
[ESC] To the first screen

Data insertion  
PRG-Ins #01  
Data insert  
OK?: No ENT: Set  
Mode ... Yes No  
[F1] [F2] [F3] [F4]  
To the PAR mode screen  
No: To the position setting screen  
Yes: To the position setting screen  
[ESC] To the first screen

Data deletion  
PRG-Del #01  
Data delete  
OK?: No ENT: Set  
Mode ... Yes No  
[F1] [F2] [F3] [F4]  
To the PAR mode screen  
No: To the position setting screen  
Yes: To the position setting screen  
[ESC] To the first screen

Screen displayed during the processing  
PRG-Clr #01  
Inserting data  
Wait for a moment  
... ..  
The display switches to the first screen after completion.  
[ESC] To the first screen

Screen displayed during the processing  
PRG-Ins #01  
Inserting data  
Wait for a moment  
... ..  
The display switches to the first screen after completion.  
[ESC] To the first screen

Screen displayed during the processing  
PRG-Del #01  
Deleting data  
Wait for a moment  
... ..  
The display switches to the first screen after completion.  
[ESC] To the first screen

### All operation data clear

All operation data clear  
PRG-Aclr OP Data  
Clearing data  
OK?: No ENT: Set  
Mode ... Yes No  
[F1] [F2] [F3] [F4]  
To the PAR mode screen  
Yes: Clear and move to the first screen  
No: To the first screen  
[ESC] To the first screen

Screen displayed during the processing  
PRG-Aclr OP Data  
Clearing all data  
Wait for a moment  
... ..  
The display switches to the first screen after completion.  
[ESC] To the first screen