4 Axis Jog Dial Console

MD-400

User's Manual

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For Your Safety

● Before using this product, read this manual and all warnings or cautions in the documentation provided.

● Only Factory Authorized Personnel should be changes and/or adjust the parts of controller.

The Symbols Used in This Manual

⚠ WARNING	⚠ CAUTION
This symbol marks warnings that should be read and used to prevent serious injury or death.	This symbol indicates where caution should be used to avoid possible injury to yourself or others, or damage to property.

The above indications are used together with the following symbols to indicate the exact nature of the warning or caution.

Examples of Symbols Accompanying Warnings and Cautions	
⚡	△Symbols enclosed in a triangle indicate warnings and cautions. The exact nature of the warning or caution is indicated by the symbol inside (the symbol at left indicates risk of electrocution).
🚫	○Symbols enclosed in a circle mark indicate prohibitions(actions that must not be performed).The exact nature of the prohibition is indicates by the symbol inside or next to the circle mark (the symbol at left indicates that the product must not be disassembled).
⬛	●Symbols inside a black circle mark actions that must be performed to ensure safety. The exact nature of the action that must be performed is indicated by the symbol inside (the symbol at left is used in cases in which the AC adapter must be unplugged to ensure safety).

Symbols on the product

The symbol mark on the product calls your attention. Please refer to the manual, in the case that you operate the part of the symbol mark on the product.

⚠	This symbol labeled on the portion calls your attention.

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④ If the equipment is used in a manner not specified by the SIGMAKOKI CO., LTD. the protection provided by the equipment may be impaired.

⚠ WARNING

● Do not use this product in the presence of flammable gas, explosives, or corrosive substances, in areas exposed to high levels of moisture or humidity, in poorly ventilated areas, or near flammable materials.

● Do not connect or check the product while the power is on.

● Installation and connection should be performed only by a qualified technician.

● Do not bend, pull, damage, or modify the power or connecting cables.

● Do not touch the products internal parts.

● Connect the earth terminal to ground.

● Should the product overheat, or should you notice an unusual smell, heat, or unusual noises coming from the product, turn off the power immediately.

● Do not turn on the power in the event that it has received a strong physical shock as the result of a fall or other accident.

● Do not touch the stage while operation.

● Use dry clothes only for cleaning the equipment.

Contents

Chapter1. Before You Begin

1-1. Overview

This product have multi jog dial type UI. It's have display.

It can be connected to our stage controller, SHOT-30* series and SHOT-702H and PGC-04-U/HSC-103/FC-series/SHRC-203.

The operation box, connected to the controller via a dedicated cable, provides remote operation. This means that the jog dial allows you to work near the motorized stage while checking its behavior even if the controller and the motorized stage are away from each other.

This product can be used with the version of each controller listed in the table below or later. If your controller version is an older version, please contact our sales department.

Table.1-1-1　Controller Version

Product name	Version
SHOT-302GS/SHOT-304GS	Ver1.30～
SHOT-702H	Ver1.00～
PGC-04-U	Ver1.02～
HSC-103	Ver1.01～
FC-series (FC-*1*/SC-*1*)	Ver1.031～
SHRC-203	Ver1.00～

The contents enclosed with your purchase are as follows. If any of the items are missing or damaged, please contact our sales department.

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☐User's manual (This document)　　　1

> ⚠ The following dedicated cable (sold separately) is required to connect this product.
>
> Table.1-1-2　　Dedicated cable table
>
> | Product name | Dedicated cable part number |
> |---|---|
> | SHOT-302GS/SHOT-304GS/SHOT-702H PGC-04-U/HSC-103/SHRC-203 | MDR14-CA-2.5 |
> | FC-series (FC-*1*/SC-*1*) | FC-MDR14-CA-2.5 |

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1-2. Connecting method

The following are the conditions and procedures for connecting this product to a controller.

① Connection conditions

This product has two connection ports, PORTA is used mainly and PORTB is used to connect the second unit. Please follow the connection conditions below.

Table.1-2-1   Controller connection conditions

PORTA	PORTB	Remarks
SHOT-304GS PGC-04-U HSC-103 SHRC-203	Not connected	・If you connect it to PORTB, it will not respond.
SHOT-302GS SHOT-702H FC-series	Unconnected SHOT-302GS SHOT-702H FC-series	・It is not possible to use PORTB when it is connected only to PORTB. ・It is not necessary to match the model of PORTA and PORTB. ・When SHOT-304GS / PGC-04-U / HSC-103 is connected to PORTB, PORTB cannot be used.

② Connection procedure

The following is the connection procedure.

・When connecting a single controller
 A) Connect the dedicated cable to the connection connector PORTA of this product.
 B) Connect the dedicated cable to the connection connector of the controller. Refer to Table.1-2-2 for the mounting position of the connection connector of the controller.
 C) After completing the connection, turn on the power of the controller connected to PORTA.
 D) Make sure that the LCD panel of this product displays correctly. If the display does not appear correctly, check again that the connections are correct.

・ When connecting two controllers

    A) Connect the dedicated cable to the connection connectors PORTA and PORTB of this product.

    B) Connect the dedicated cable to the connection connector of each controller. Please refer to Table.1-2-2 for the position of the connection connector of the controller.

    C) After completing the connection, turn on the power of the PORTA-connected controller first, and then turn on the power of the PORTB-connected controller after the coordinate values are displayed on the LCD panel of this product.

    D) Check that the coordinate values are displayed correctly on the LCD panel of this product. If it does not display correctly, check again if the connection is correct.

Note: If "Connection err Remove connector" is displayed on the LCD panel after connecting the product to the controller, turn off the controller power, reconnect the dedicated cable, and then turn the power back on. For details, refer to "2-4. Error".

Note: Even if the power of the PORTB connection controller is turned on first, it will not fail, but it may not operate properly.

> ⚠ Be sure the controller is off when you connect this product. You may not able to use the buttons and so on this product if you connect or disconnect either device while the controller is on.

Table.1-2-2　Connector mounting position

Product name	Mounted position	Connector name
SHOT-302GS / SHOT-304GS PGC-04-U/SHRC-203	Front panel	JOYSTICK or OPTION
SHOT-702H/HSC-103	Rear panel	OPTION
FC-series (ex:FC-411 and so on)	Front panel	JC

③ **Removal Procedure**

Please follow the reverse procedure of "② Connection procedure".

Chapter2. Note on Use

2-1. Name of each part

③ZERO button
⑩Connection connector
①LCD panel
④M-ORG button
②MODE button
⑤E-ORG button

PORT B
Multi-Axis Jog Dial
MD-400
OptoSigma®
PORT A

PORT B MODE   ZERO
M-ORG   E-ORG

1   SPEED   STOP   RATE   4

2   3

⑨SPEED dial switch
⑧RATE dial switch
⑦Jog dial
⑥STOP button
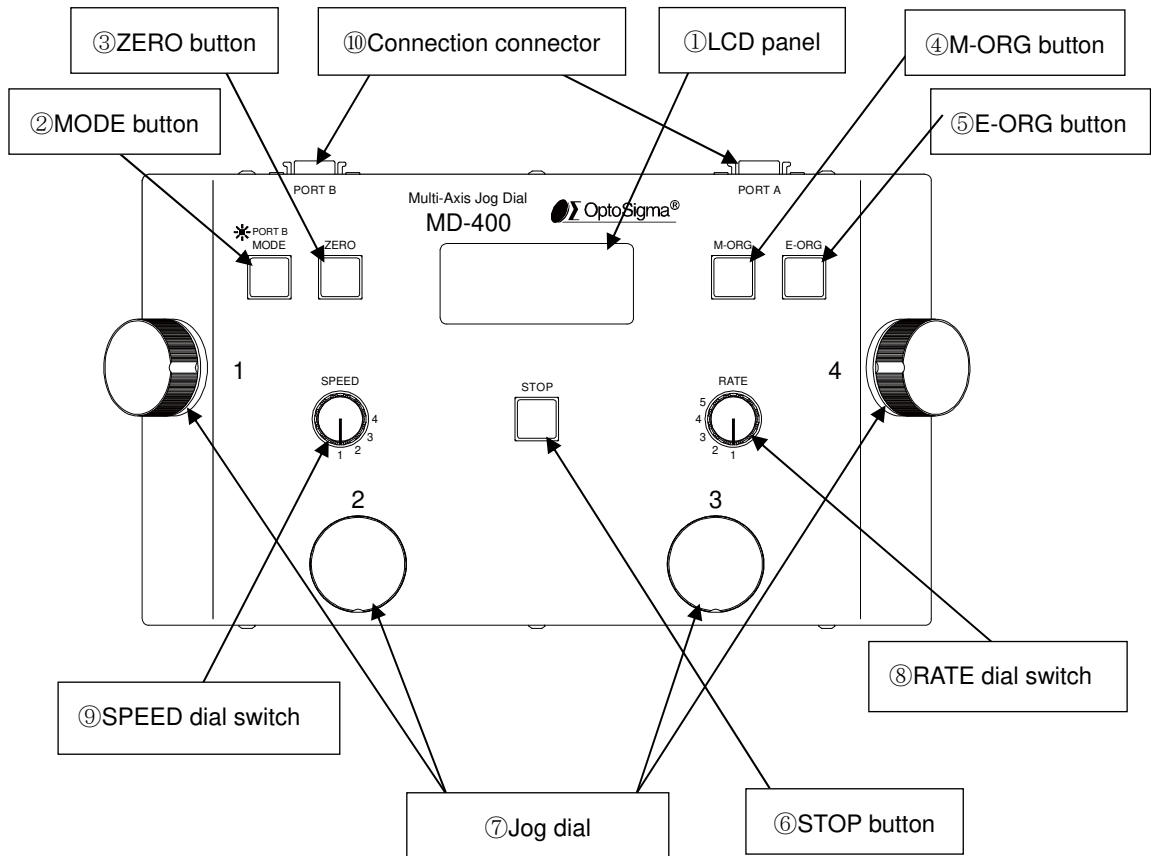
Fig.2-1-1 Name of each part

2-2. Operating method

① LCD panel

The display contents will vary depending on the number of controllers connected. Refer to section 2-3 "Memory Switch Mode Operation" for the display contents when editing memory switches.

・ When one 4-axis controller is connected（SHOT-304GS/PGC-04-U）

MODE						SIGN	POSITION COORDINATES				UNIT	

PORTA

H	1	:					+	1	.	0	0	u	
1	2	:	AXIS1				−	2	.	0	0	u	+
	3	:	AXIS2				+	3	.	0	0	u	−
	4	:	AXIS3				−	4	.	0	0	u	±
			AXIS4								LIMIT		
	SPEED												
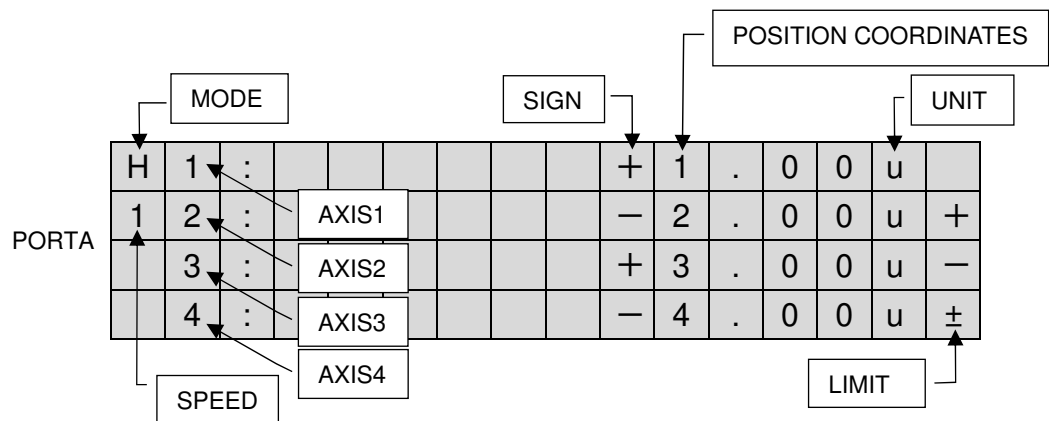
Fig.2-2-1   Example of 4-axis controller display

・ When one 3-axis controller is connected（HSC-103/SHRC-203）

MODE						SIGN	POSITION COORDINATES				UNIT	

PORTA

H	1	:					+	1	.	0	0	u	
1	2	:	AXIS1				−	2	.	0	0	u	+
	3	:	AXIS2				+	3	.	0	0	u	−
			AXIS3								LIMIT		
	SPEED												
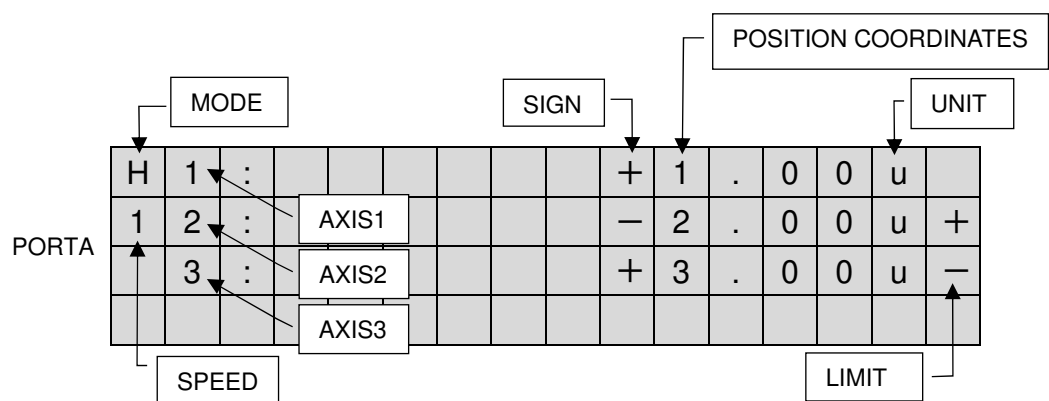
Fig.2-2-2   Example of 3-axis controller display

POSITION COORDINATES

MODE   SIGN   UNIT

H	1 :						1	.	0	0	0	U
1	2 :	AXIS1				−	2	.	0	0	0	+
U	3 :	AXIS2					3	.	0	0	0	−
		AXIS3										

PORTA

SPEED   INTERFACE   LIMIT

Fig.2-2-3   Example of 3-axis controller display (SHRC-203)

・ When one 2-axis controller is connected（SHOT-302GS/SHOT-702H/FC-series）

POSITION COORDINATES

MODE   SIGN   UNIT

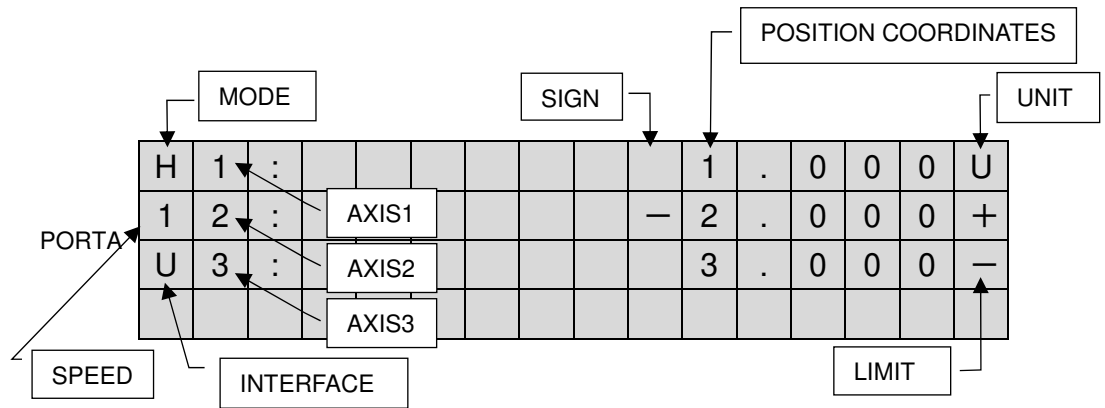| H	1 :					+	1	.	0	0	L	
1	2 :	AXIS1			−	2	.	0	0	L	+
		AXIS2										

PORTA

SPEED   LIMIT
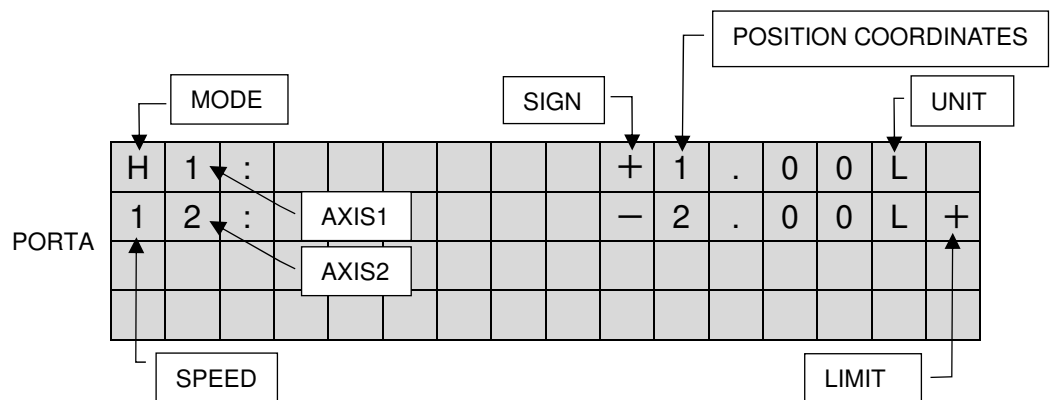
Fig.2-2-4   Example of 2-axis controller display (SHOT-702H)

・ When two 2-axis controllers are connected（SHOT-302GS/SHOT-702H/FC-series）

POSITION COORDINATES

MODE   SPEED   SIGN   UNIT

PORTA
H	1 :				+	1	.	0	0	u	
1	2 :	AXIS1		−	2	.	0	0	u	+
H	1 :	AXIS2		+	1	.	0	0	u	
1	2 :	AXIS1		−	2	.	0	0	u	−
		AXIS2								

PORTB

MODE   SPEED   LIMIT
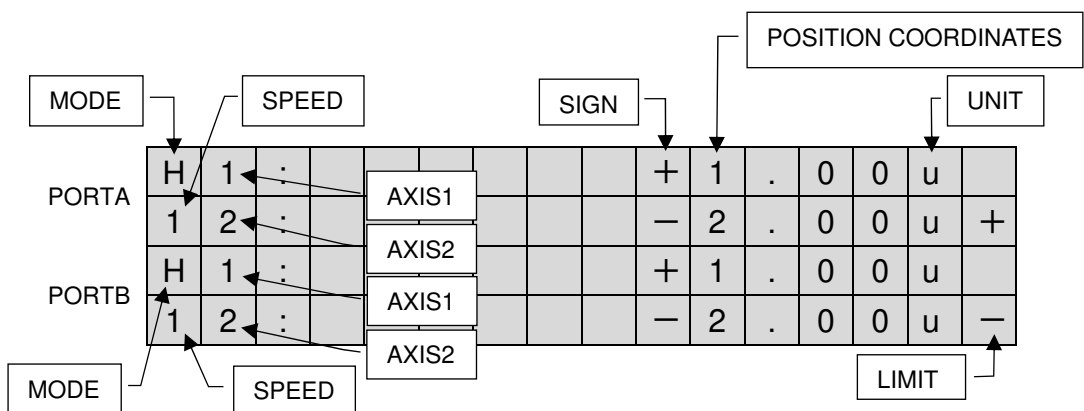
It has the UNIT when display. HSC-103 and FC-series (ex:FC-411 and so on)

Fig.2-2-5   Example of display when two 2-axis controllers are connected

Table.2-2-1   Content Details

Item	Description	Display		Details	
MODE	Current mode	H etc.		For details, refer to the instruction manual of the connecting controller.	
AXIS	Axis name	1 etc.			
POSITION COORDINATES	Stage position coordinates	1.00 etc.			
SIGN	Sign of coordinate value	＋		+ direction	
		－		- direction	
SPEED	Current SPEED setting value	1〜4		For details, refer to ⑨SPEED Dial Switch.	
INTERFACE	Current interface	U		USB	
		G		GPIB	
		E		Ethernet	
UNIT	Display unit for position coordinates	None	p	pulse	
		u	s	μm	
		d	°	Degree	
		m		mm	
		n		Nm	
		L		PGC-04-U HSC-103 FC-series	Limit sensor input is present
				SHOT-302GS SHOT-304GS SHOT-702H	L display fixed
LIMIT	Limit sensor status	None		No limit sensor input	
		+		+ direction limit sensor input	
		-		- direction limit sensor input	
		±		Stage not connected	

② **[MODE] button**

Switches the mode of the SHOT-302GS/SHOT-304GS/FC-series/SHRC-203 controller. The [MODE] button changes the target port according to the lighting status of the LED. To switch the target port, press and hold the [MODE] button for at least one second. Refer to Table.2-2-2.

Please note that if you are not connected to PORTB, or if the model connected to PORTA is SHOT-304GS/ PGC-04-U/ HSC-103/SHRC-203, you cannot switch the port even if you press and hold the button. For details of the mode, refer to the instruction manual of SHOT-302GS/SHOT-304GS/FC-series/SHRC-203 controller.

Table.2-2-2　【MODE】　Button LED status

state	Target port
Light off	PORTA
Light on	PORTB

NOTE) IN SHOT-702/PGC-04-U/HSC-103, the MODE change is invalid.

③ **[ZERO] button**

Reset position coordinates for all axes to zero.
This operation is performed for all connected controllers.

④ **[M-ORG] button**

Moves the stage to its mechanical origin.
The button's LED indicator lights up when the stage is moving and lights off when the stage is at mechanical origin position.
This operation is performed for all connected controllers.

⑤ **[E-ORG] button**

Position stage at logical origin "0" for all axes.
The button's LED indicator lights up when the stage is moving and lights off when the stage is at logical position.
This operation is performed for all connected controllers.

⑥ **[STOP] button**

If you were push this button, all operating motorized stages stop.
Refer to the manual of each controller for stopped condition.

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⑦ **Jog dial**

You can operate the stage assigned to each of the four jog dials.

Each jog dial can be assigned a stage to operate by using the "Dial* AXIS" memory switch in the product. There are two types of jog dial operation: click-mode and jog-mode. Turning the jog dial to the right will operate in the + direction, and turning it to the left will operate in the - direction.

・Click-mode

If you rotate the stage to the left or right without pressing the jog dial, the stage will run for the number of pulses set by the RATE dial switch for each click.
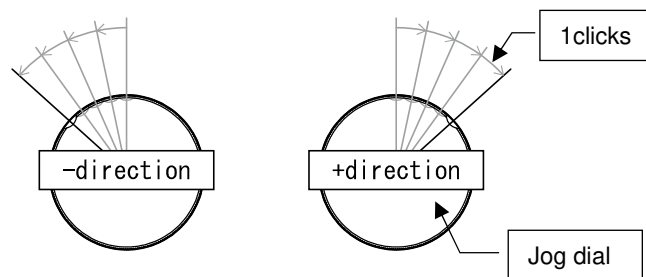

Fig.2-2-5   Click-mode operation image

・Jog-mode

If you make a certain number of clicks to the left or right while holding down the jog dial, the stage will move continuously at the speed set by the SPEED dial switch. The stage will stop when the jog dial is returned to the stop range or when you release the jog dial. The number of clicks to start operation is set by the memory switch "JOG ACT CLK" in this product.
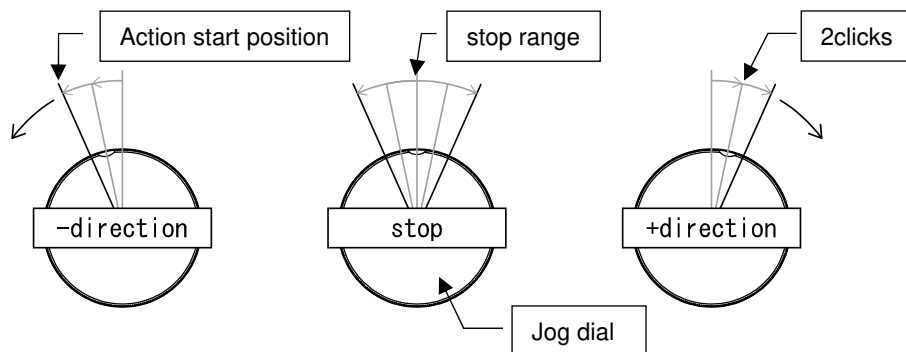

Fig.2-2-6   Jog-mode operation image（When "JOG ACT CLK" is set to 2 clicks）

⚠ When reversing the direction of motion in the jog mode of jog dial operation, return the unit to the stop range and operate it again after at least one second. If you do not follow the instructions on the left, the unit may not operate normally.

⑧ **RATE dial switch**

The number of pulses for stage operation in the jog dial operation click mode can be switched between five steps. The number of pulses can be set for each step using the "RATE* PULSE" memory switch in the product.

⑨ **SPEED dial switch**

Jog dial operation Switches the movement speed in the jog mode in four steps. Refer to Table.2-2-3 for the corresponding memory switches of the movement speed. For FC-series, the speed step corresponds to the [Jy speed] parameter. Refer to Table.2-2-4.

Table.2-2-3   Controller memory switch with support for speed steps

Dial switch Speed step	LCD panel display	Memory switches
Step1	1	SPEED1
Step2	2	SPEED2
Step3	3	SPEED3
Step4	4	SPEED4

Table.2-2-4   FC-series controller parameters for speed steps

Dial switch Speed step	LCD panel display	Parameters
Step1	1	Jy speed 1
Step2	2	Jy speed 4
Step3	3	Jy speed 7
Step4	4	Jy speed 9

Note: When the controller starts up, the speed set in the controller takes priority regardless of the setting of this dial switch. If you want to change the speed, operate this dial switch. When the speed of the controller is set by the "D" command, the speed set in the controller will take priority and the operation will be performed at that speed as above. However, in the case of FC-series, it operates at the speed set by this dial switch.

⑩ **Connection connector**

This connector is used to connect the controller to the dedicated cable.

⚠ Do not connect anything other than our dedicated cables.

2-3. Checking and Setting Memory Switches

This product allows you to edit the memory switches of SHOT-302GS/SHOT-304GS/
SHOT-702H/FC-series controllers and this product. For details of the memory switch of
each controller, refer to the instruction manual of the controller.

Note) The PGC-04-U/HSC-103 does not have a memory switch mode, so this function
cannot be used.

Note) SHRC-203 does not support memory switch mode operation.

Note) In the FC-series, the memory switch is referred to as a parameter. Please note this
when referring to the instruction manual.

① **Memory switch layer**

The memory switch operation has a layer for selecting and editing the connected
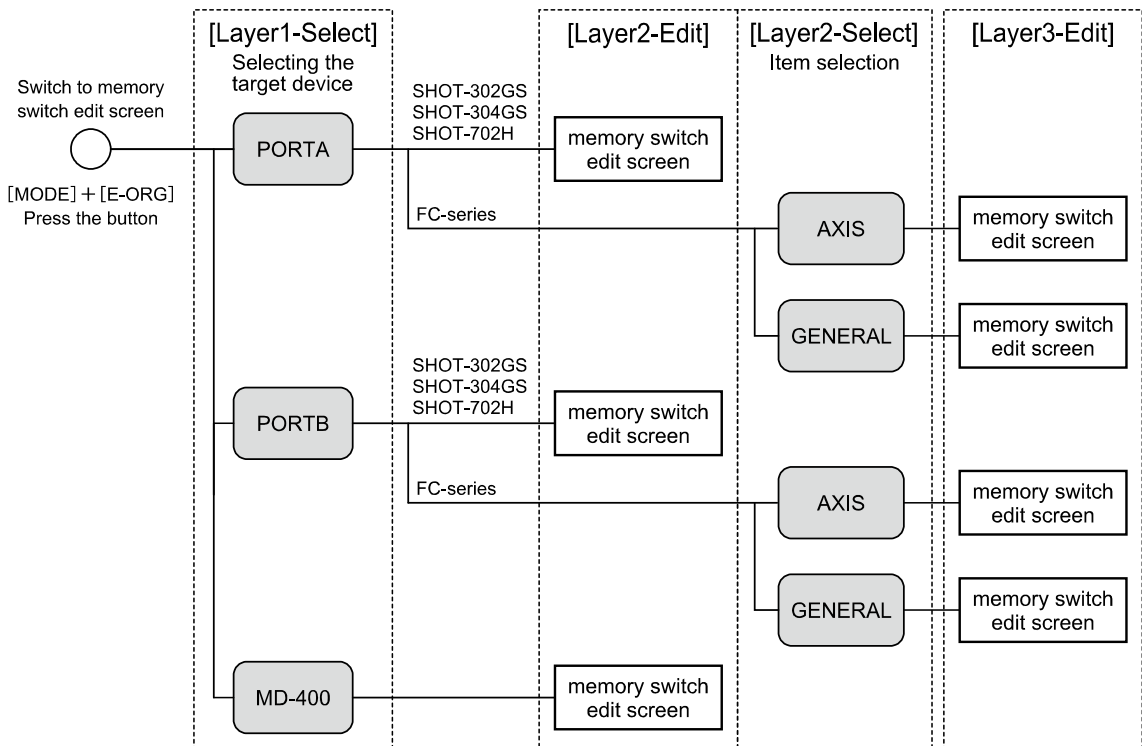controller and the product memory switch.

Fig.2-3-1   Memory switch hierarchy

② **How to shift to the memory switch edit screen**

Pressing the [MODE] button and the [E-ORG] button at the same time when each controller is in the following transferable mode will take you to the memory switch edit screen.

Table.2-3-1 Memory switch edit screen transferable mode

Product name	Memory switch edit screen transferable mode	LCD panel display
SHOT-302GS/SHOT-304GS	MANUAL	M
SHOT-702H	HOST	H
FC-series	LOCAL	L

③ **Memory switch operation**

In the memory switch selection screen and the edit screen, the functions shown in the table below are assigned to the jog dials and buttons.

Table.2-3-2 [Layer1-Select] Selecting the target device

Operation	Function
[Jog dial1] Right rotation	Target device switching (PORTA⇒PORTB⇒MD-400⇒PORTA)
[Jog dial1] Left rotation	Target device switching (PORTA⇒MD-400⇒PORTB⇒PORTA)
[Jog dial1] Push button	Go to the memory switch edit screen of the target device.

Table.2-3-3 [Layer 2-Edit] Memory switch edit operation
(SHOT-302GS/SHOT-304GS/SHOT-702H/MD-400)

Operation	Function
[Jog dial1] Right rotation	Setting item switching(Last No⇒No.1⇒No.2)
[Jog dial1] Left rotation	Setting item switching(No.2⇒No.1⇒Last No)
[Jog dial2] Right rotation	Change value (Move to the right digit of the change cursor)
[Jog dial2] Left rotation	Change value (Move to the left digit of the change cursor)
[Jog dial4] Right rotation	Change setting contents (Increase for numeric value)
[Jog dial4] Left rotation	Change setting contents (decrease for numeric value)

Operation	Function
[MODE] button	ⅰ. Move to the setting completion screen. (Move to the operation in section ⅱ)
	ⅱ. On the setting completion screen, cancel Exit to go to the editing screen.
[MODE] button＋ [ZERO] button	ⅱ. Register the changed data in the setting completion screen and exit.
[MODE] button＋ [E-ORG] button	ⅱ. Discard the changed data in the setting completion screen and exit.
[MODE] button＋ [M-ORG] button	Memory switch initialization

Table.2-3-4 [Layer2-Select] Item selection (FC-series)

Operation	Function
[Jog dial1] Right rotation	Switching settings (AXIS⇒GENERAL⇒AXIS)
[Jog dial1] Left rotation	Switching settings (AXIS⇒GENERAL⇒AXIS)
[Jog dial1] Push button	Go to the memory switch setting screen for the target item.

Table.2-3-5 [Layer3-Edit] Memory switch edit operation (FC-series)

Operation	Function
[Jog dial1] Right rotation	Setting item switching(Last No⇒No.1⇒No.2)
[Jog dial1] Left rotation	Setting item switching(No.2⇒No.1⇒Last No)
[Jog dial2] Right rotation	Change value (Move to the right digit of the change cursor)
[Jog dial2] Left rotation	Change value (Move to the left digit of the change cursor)
[Jog dial4] Right rotation	Change setting contents (Increase for numeric value)
[Jog dial4] Left rotation	Change setting contents (decrease for numeric value)
[MODE] button	ⅰ. Move to the setting completion screen. (Move to the operation in section ⅱ)
	ⅱ. On the setting completion screen, cancel Exit to go to the editing screen.
[MODE] button＋ [ZERO] button	ⅱ. Register the changed data in the setting completion screen and exit.
[MODE] button＋ [E-ORG] button	ⅱ. Discard the changed data in the setting completion screen and exit.

④ **Memory switch display contents**

These are the LCD panel display contents for the memory switch selection screen and the edit screen.

・[Layer1-Select] Target device selection screen (PORTA/PORTB/This product)

	T	a	r	g	e	t		d	e	v	i	c	e	
			P	o	r	t		A				

Choices
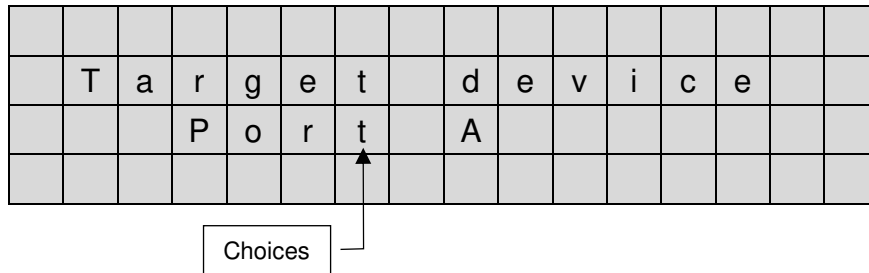
Fig.2-3-2   Example of target device selection screen display

・[Layer2-Edit] Memory switch edit screen (SHOT-302GS/SHOT-304GS)

No

0	1		S	P	E	E	D		S	E	L			
											1	

Memory switch contents   Set value
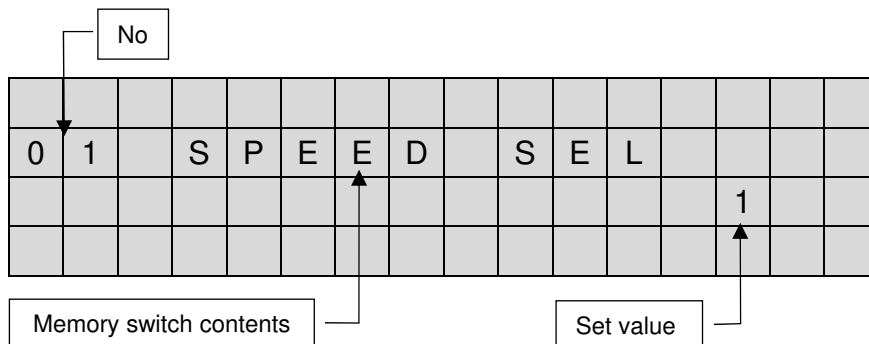
Fig.2-3-3   Example of SHOT-302GS/SHOT-304GS edit screen display

・[Layer2-Edit] Memory switch edit screen (SHOT-702H)

No

M	E	M	R	Y		S	W	I	T	C	H		0	1
S	P	D		S	E	L	:						1

Memory switch contents   Set value
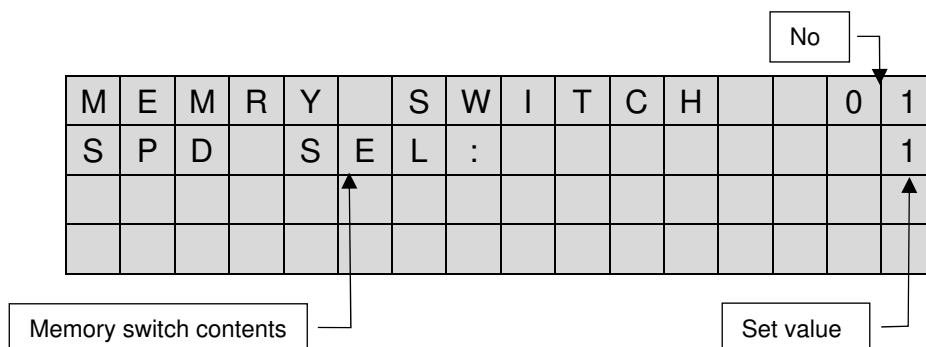
Fig.2-3-4   Example of SHOT-702H edit screen display

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・[Layer2-Edit] Memory switch edit screen (This product)

Fig.2-3-5   Example of this product edit screen display

・[Layer2-Select] Memory switch Item selection screen (FC-series)

Fig.2-3-6   Example of FC-series item selection screen display
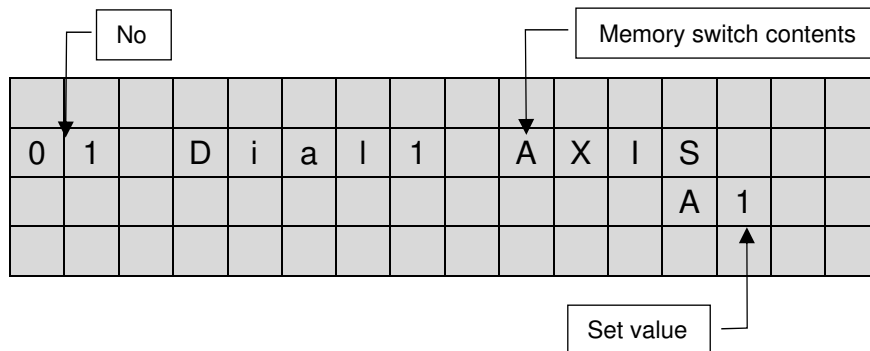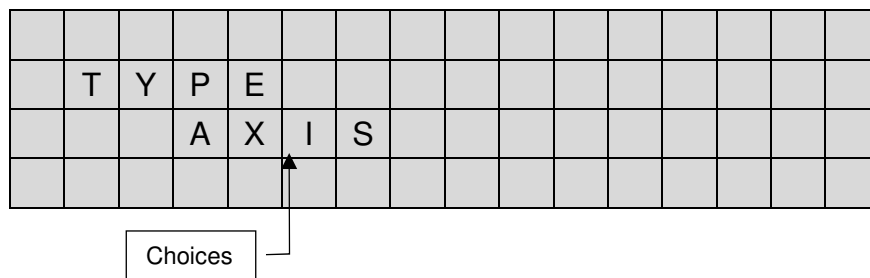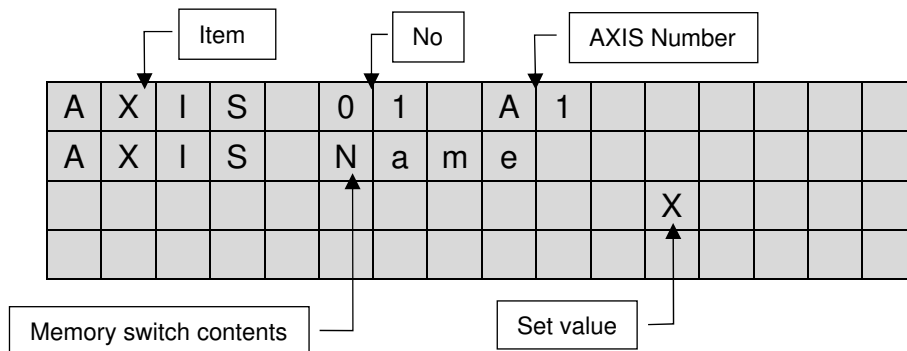
・[Layer3-Edit] Memory switch edit screen (FC-series)

Fig.2-3-7   Example of FC-series edit screen display

⑤ **MD-400 memory switch contents**

Please refer to the table below for the description and contents of the memory switch of this product.

Table.2-3-6 This product memory switch contents

No	Display contents	Description	
		Setting range/selected items	Initial value
01	Dial1 AXIS	Set the operating axis of Dial1	
		A1/A2/A3/A4/B1/B2/DISABLE	A1
02	Dial2 AXIS	Set the operating axis of Dial2	
		A1/A2/A3/A4/B1/B2/DISABLE	A2
03	Dial3 AXIS	Set the operating axis of Dial3	
		A1/A2/A3/A4/B1/B2/DISABLE	A3
04	Dial4 AXIS	Set the operating axis of Dial4	
		A1/A2/A3/A4/B1/B2/DISABLE	A4
05	RATE1 PULSE	Set the number of pulses for step1 of the RATE dial switch	
		0 ~ 40,000 (invalid if 0)	1
06	RATE2 PULSE	Set the number of pulses for step2 of the RATE dial switch	
		0 or RATE1 PULSE set value ~ 40,000 (invalid if 0)	5
07	RATE3 PULSE	Set the number of pulses for step3 of the RATE dial switch	
		0 or RATE2 PULSE set value ~ 40,000 (invalid if 0)	10
08	RATE4 PULSE	Set the number of pulses for step4 of the RATE dial switch	
		0 or RATE3 PULSE set value ~ 40,000 (invalid if 0)	20
09	RATE5 PULSE	Set the number of pulses for step5 of the RATE dial switch	
		0 or RATE4 PULSE set value ~ 40,000 (invalid if 0)	30
10	JOG ACT CLK	Set the number of clicks to start jog mode operation of the jog dial.	
		1/2/3	1

Note: A* of the Dial* AXIS set value specifies the axis of the PORTA-connected controller.

Note: B* of the set value of Dial* AXIS specifies the axis of the PORTB-connected controller.

2-4. Error

This section describes errors in this product and SHOT-302GS/SHOT-304GS/FC-series controllers.

① **This product**

・ Connection error

This problem occurs when communication with the connected controller cannot be performed normally. Turn off the controller power, reconnect the dedicated cable, and then turn on the controller power again. The following is an example of the display when a connection error occurs in PORTB.

H	1	:							+	1	.	0	0	u	
1	2	:							−	2	.	0	0	u	+
C	o	n	n	e	c	t	i	o	n		e	r	r	
R	e	m	o	v	e		c	o	n	n	e	c	t	o	r

PORTA (rows 1-2), PORTB (rows 3-4)

Fig.2-4-1   Example of connection error screen display

・ Memory switch operation unconnected port error

This error message is displayed when a port that is not connected to the controller is selected in the [Layer 1 - Select] target model selection of the memory switch operation. After this error is displayed, the screen will return from the Memory Switch Mode screen to the Stage Operation screen.

	U	n	c	o	n	n	e	c	t	e	d	
	p	o	r	t		r	e	t	u	r	n	.	.	.

Fig.2-4-2   Example of Memory switch operation
unconnected port error screen display

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・Memory switch operation not supported controller error

This error message is displayed when the port to which a controller that does not support memory switch operation is connected is selected in the [Layer 1 - Select] target model selection of memory switch operation. After this error is displayed, the screen will return from the Memory Switch Mode screen to the Stage Operation screen.

	M	e	m	o	r	y		S	w	i	t	c	h		
	C	a	n	n	o	t		o	p	e	r	a	t	e	
	r	e	t	u	r	n	.	.	.						

Fig.2-4-3   Example of controller error screen

display for non-memory switch operation

・System error

If any of the following errors occur, stop using the product and contact our sales department. Refer to Table.2-4-1 for the error details.

Error contents

M	D	-	4	0	0										
S	y	s	t	e	m		e	r	r	o	r				
*	*	*	*	*	*	*									
P	l	e	a	s	e		r	e	b	o	o	t			

Fig.2-4-4   Example of system error screen display

Table.2-4-1 System error details

Display	Contents
Memory write	A problem occurred when writing to the internal memory.
Memory read	A problem occurred when reading to the internal memory.
Com send Port*	The connection with the controller has been confirmed, and a writing problem has occurred in communication with the controller connected to Port*.
Com read Port*	The connection with the controller has been confirmed, and a reading problem has occurred in communication with the controller connected to Port*.

② **SHOT-302GS/SHOT-304GS**

This is an example of display when the controller is connected to both ports and ALARM occurs in SHOT-302GS connected to PORTA. For details of ALARM, please refer to the instruction manual of SHOT-302GS/SHOT-304GS.

ALARM

	A	L	A	R	M		N	o	,	S	1	(	M	)	
	R	E	S	E	T	!									
H	1	:								＋	0	.	0	u	
1	2	:								＋	0	.	0	u	

Fig.2-4-5　　Example of SHOT-302GS ALARM display

③ **FC-series**

In the case of FC-series, the error display is independent for each axis. The following is an example of the display when a controller is connected to both ports and an error occurs in the first axis of the FC-series connected to PORTA. For details of the error, refer to the instruction manual of FC-series.

Error

L	1	:	S	C	A	L	E		E	R				
1	2	:				＋	0	.	0	0	0	0	m	
L	1	:							＋	0	.	0	u	
1	2	:							＋	0	.	0	u	

Fig.2-4-6　　Example of FC-series error display

④ **SHRC-203**

In the case of SHRC-203, the error display independent for each axis and the entire error content are displayed. Refer to the SHRC-203 instruction manual for the error display details and details.

Error

H	1	:	S	C	A	L	E		E	R				
1	2	:					0	.	0	0	0	0	0	M
U	3	:					0	.	0	0	U			
		S	8		C	M	D							

Overall error

Fig.2-4-7　　Example of SHRC-203 error display

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Chapter3. Specifications

3-1. Specifications

Display function	LCD 16digit×4lines
Power supply	Supplied from controller via PORTA connection cable
Operating temperature	5～40℃
Storage temperature	-20～60℃
Altitude	up to 2000m
Indoor use only	
Installation category	Ⅱ
Pollution degree	2
Ambient humidity	20～80%RH (no condensation)
External dimensions	245W×140D×40H [mm] (excluding projections)
Weight	About 1.2 [kg] (Not including cables)
Electrostatic discharge	EN61000-4-2(2009) Level 2

3-2. Connector pin number and signal

Table.3-2-1 Connector pin assignment (PORTA)

Pin number	Signal name	Pin number	Signal name
1	SG	8	SG
2	+5V	9	+5V
3	TXD+	10	TXD-
4	RXD+	11	RXD-
5	STOP	12	CONNECT-
6	-	13	-
7	-	14	-

Table.3-2-2 Connector pin assignment (PORTB)

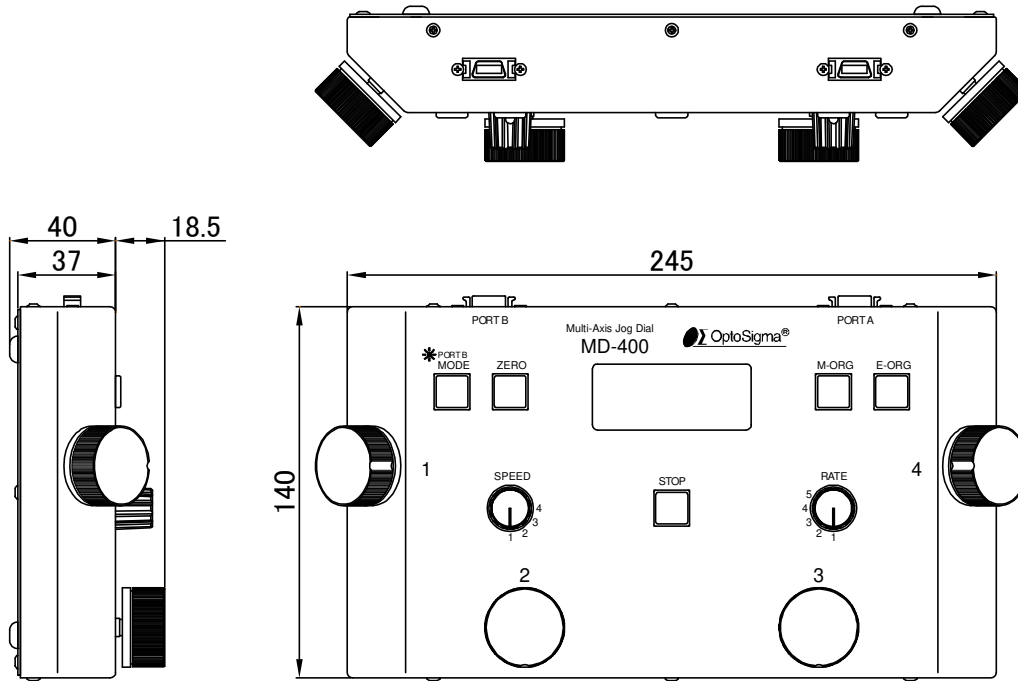| Pin number	Signal name	Pin number	Signal name
1	SG	8	SG
2	+5V (RS-422 section only)	9	+5V (RS-422 section only)
3	TXD+	10	TXD-
4	RXD+	11	RXD-
5	STOP	12	CONNECT-
6	-	13	-
7	-	14	-

3-3. External dimensions

Fig.3-3-1 External dimensions