

JOG Operation BOX

JB-401

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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- ① SIGMAKOKI CO., LTD. does not accept liability for damages resulting from the use of this product or the inability to use this product.
- ② SIGMAKOKI CO., LTD. does not accept liability for damages resulting from the use of this product that deviates from that described in the manual.
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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.



- 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.

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Chapter 1: Before You Begin

1-1. Overview

This product have button type UI. It's have display.

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

The operation box, connected to the controller via a cable, provides remote operation.

This means that the operation box 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.

When you use JB-401, you can use when Table1-1 controller version.

Table1-1 Controller version

SHOT-302GS/304GS	Ver1.20~
SHOT-702	Ver1.05~
PGC-04-U	Ver1.02~
HSC-103	Ver1.01~

This product This contains items such as the following.

- JB-401 1
- User's manual (This document) 1



When you use this product, you need MDR14-CA cable.

1-2. Connecting method

This product is connected to the controller with MDR14-CA cable.

- ① Connect a standard cable (MDR14-CA-*) to the connector on the rear panel of the JB-401.
- ② Connect the cable from the JB-401 to the “JOYSTICK” or “OPTION” of the connector on the front panel of the SHOT-30X series and PGC-04-U controller.
(In the case of SHOT-702/HSC-103, it becomes the rear panel part.)
(In the case of SHOT-702/HSC-103, it becomes the rear panel part.)
- ③ Turn power switch of the controller on.

And confirm that the open message is displayed correctly. If it can not be displayed, reconfirm if connection of cable is done correctly.



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

Chapter 2: Notes on Use

2-1. Name of each part

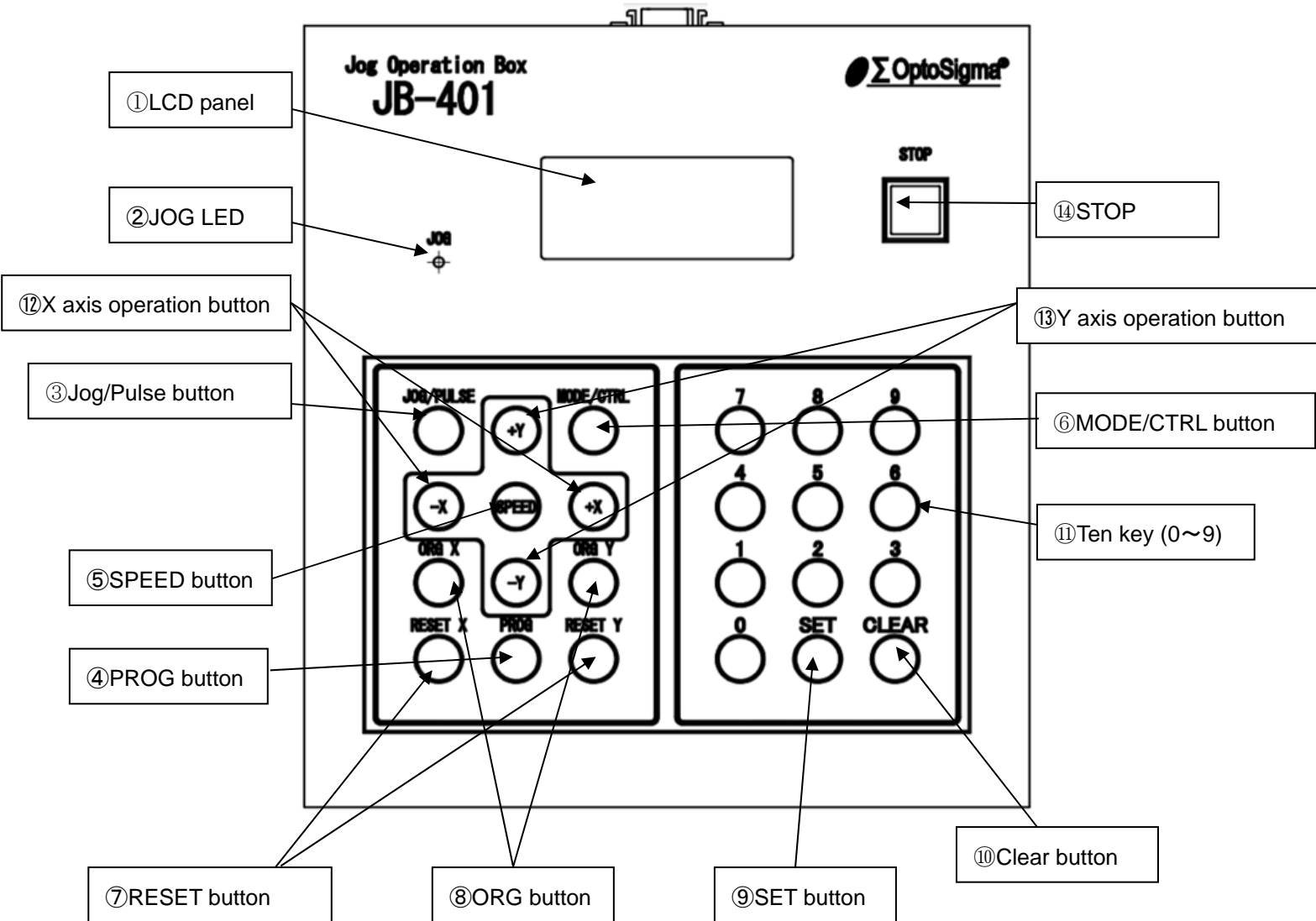
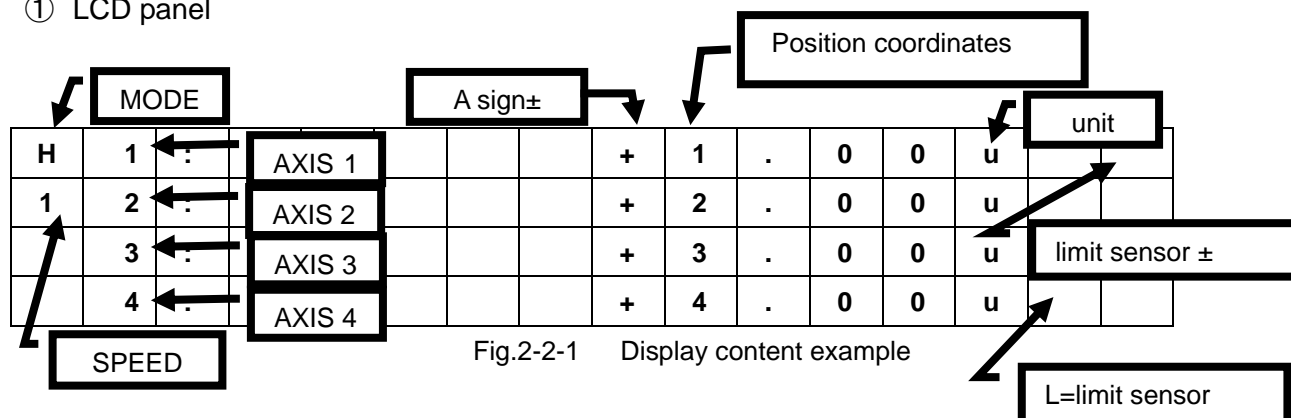


Fig.2-1 Name of each part

2-2. Operating method

① LCD panel



※When you disconnected stage,displayed "+ -".

unit : p = [pulse]

u = [μ m]

d = [°]

s = [μ m]

Display the position coordinates for each axis and the operating mode.

Display Digit : 16 digit x 4 lines

② JOG LED

The LED indicator lights up when Jog operation mode and lights off when Fixed pulse mode. Change Jog operation mode/ Fixed pulse mode setting every time pushing the 【JOG/Pulse】 button.

NOTE) Set during memory-switch editing and the whole Edit-mode editing in Jog operation mode.

③ 【JOG/PULSE】 button

Change Jog operation mode/ Fixed pulse mode setting every time pushing the 【JOG/Pulse】 button. The LED indicator lights up when Jog operation mode and lights off when Fixed pulse mode.

NOTE) Set during memory-switch editing and the whole Edit-mode editing in Jog operation mode.

④ 【PROG】 button

Pressing this button will start programmed operation in controller (SHOT-30*).

Pressing 【PROG】 and 【Reset X】 buttons will start No.1 programmed operation.

Pressing 【PROG】 and 【Reset Y】 buttons will start No.2 programmed operation.

NOTE) Do not work only in this button.

NOTE) IN SHOT-702, the program function is invalid.

⑤ 【SPEED】 button

Cycle through "SPEED 1/2/3/4" settings stored in controller's memory switches (1→2→3→4→1 . . .).

When "●" position means lightning LED. Number of lightning LED means speed value.

●○○○ SPEED=1
 ●●○○ SPEED=2
 ●●●○ SPEED=3
 ●●●● SPEED=4

Fig.2-2-2 Number of lightning LED means speed value.

NOTE) Because there is not speed indication, in the case of SHOT-702, PGC-04-U, HSC-103, a controller is invalid.

⑥ 【MODE/CTRL】 button

Press the 【MODE/CTRL】 button to cycle through operating modes in controller.

Example) Host⇒Manual⇒Remote⇒Teaching⇒Edit⇒Load⇒Test⇒Host. . .

Refer to a User's Manual of SHOT-302GS/SHOT-304GS for various modes.

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

⑦ 【RESET】 button

【RESET X】 : Reset position coordinates X-axis (AXIS 1) to zero.

【RESET Y】 : Reset position coordinates Y-axis (AXIS 2) to zero.

【MODE/CTRL】 and 【RESET X】 : Reset position coordinates Z-axis (AXIS 3) to zero.

【MODE/CTRL】 and 【RESET Y】 : Reset position coordinates U-axis (AXIS 4) to zero.

【RESET X】 and 【RESET Y】 : Reset position coordinates all-axis to zero.

⑧ 【ORG】 button

【ORG X】 : Position X-axis (AXIS 1) stage at mechanical origin.

【ORG Y】 : Position Y-axis (AXIS 2) stage at mechanical origin.

【MODE/CTRL】 and 【ORG X】 : Position Z-axis (AXIS 3) stage at mechanical origin.

【MODE/CTRL】 and 【ORG Y】 : Position U-axis (AXIS 4) stage at mechanical origin.

【ORG X】 and 【ORG Y】 : Position all-axis stage at mechanical origin.

⑨ **【SET】** button

After fixed pulse settings have been completed.

(NOTE) This function is only usable with SHOT-302GS and SHOT-304GS.

⑩ **【CLEAR】** button

Pressing this button will clear fixed pulse (0 clear).

⑪ Ten key (0~9)

Setting fixed pulse with this button.

Input pulse is 0~99999999.

For fixed pulse mode operation, fixed pulses are selected from 1 to 6.

Example) In fixed pulse operation, when ten key 2 is pressed,

fixed pulse setting 2 pulse can be output.

⑫ **【X axis operation】** button

Enables operation of X-axis (AXIS 1). Pressing of this button continuously moves the stage continuously when Jog pulse mode. Releasing this button stops the stage.

When fixed pulse mode, Pressing of this button moves the stage by fixed pulse.

When **【MODE/CTRL】** and **【X axis operation】** buttons simultaneously press, able to operation of Z-axis (AXIS 3).

When fixed pulse mode, Pressing of this button moves the stage by fixed pulse.

⑬ **【Y axis operation】** button

Enables operation of Y-axis. Pressing of this button continuously moves the stage continuously when Jog pulse mode. Releasing this button stops the stage.

When fixed pulse mode, Pressing of this button moves the stage by fixed pulse.

When **【MODE/CTRL】** and **【Y axis operation】** buttons simultaneously press, able to operation of U-axis (AXIS 4).

⑭ **【STOP】** button

If you were push this button, all operating motorized stages stop.

Refer to the manual of each controller for stopped condition.

2-3. Fixed pulse setting

JB-401 has two operating modes Jog operation mode and fixed pulse mode.

In Fixed pulse mode, operate a stage by fixed pulses.

In Fixed pulse, six kinds of 1-6 are settable.

Default Fixed Pulse: Fixed Pulse1:10, Fixed Pulse2:100, Fixed Pulse3:1000,

Fixed Pulse4:2000, Fixed Pulse5:5000, Fixed Pulse6:10000.

[Operations]

- ① Press the **【JOG/PULSE】** and **【MODE/CTRL】** buttons simultaneously.

The fixed pulse settings screen will be displayed. (Fig.2-3-1)

	F	i	x	e	d		P	u	l	s	e	1							
												1	0						

Fig.2-3-1 Fixed pulse setting

- ② Changes of the fixed pulse by the “ten key” (0~9).
- ③ Press the **【SET】** button when changes to settings are complete.
When fixed pulse settings clear, press the **【CLEAR】** button.
- ④ Press the **【SPEED】** button when changes to setting No.(1~6).
No.1⇒No.2⇒No.3⇒No.4⇒No.5⇒No.6⇒No.1 . . .

Pressing the **【SET】** button saves changes to settings and returns you to normal display.

2-4. Memory Switch and Editing Program setting

This product can be setting Memory switch and Edit Program in controller (SHOT-30*).

Memory switch settings can be changed using the buttons on this product.

NOTE) This function is only usable with SHOT-302GS and SHOT-304GS.

(*) For more information about memory switch and Edit program, refer to User's manual of SHOT-302GS/SHOT-304GS.

NOTE) IN SHOT-702 and PGC-04-U/HSC-103, the Memory switch and program function is invalid.

① Changing Memory switch setting

To display the memory switch settings screen in Manual(M) mode, press the 【MODE/CTRL】 and 【SET】 buttons simultaneously.

Table2-4-1 Memory Switch and Editing Program setting

Button	Function
【+X】	For numeric options, move cursor to right digit
【-X】	For numeric options, move cursor to left digit
【+Y】	Cycle through items in descending order (No.2⇒1⇒86⇒85)
【-Y】	Cycle through items in ascending order (No.85⇒86⇒1⇒2)
【SET】	①Cycle through options for the current item (or increase the value of numeric options)
	②After changes to settings have been completed, save change to settings and exit
【SPEED】	①Cycle through options for the current item (or decrease the value of numeric options)
	②After changes to settings have been completed, cancel changes to settings and exit
【MODE/CTRL】	①Press to end changes to settings (a confirmation screen will be displayed)
	②Exit confirmation screen and return to memory switch settings screen
【RESET X】 and 【ORG X】and【CLEAR】	Restore memory switch settings to factory defaults

NOTE) When editing the memory switch, set the operation mode to the JOG operation mode.(JOG LED is lit)

NOTE) when fixed pulse operation mode, you can't edit.

②Edit mode setting

In Edit mode, you can be recording and selection and Data input from JB-401.

From the Edit mode screen, press the **【SET】** button. The program-number selection screen will appear.

Programs can be edited using the buttons on the JB-401.

Table2-4-2 Edit mode setting

Button	Function
【+X】	Move the edit cursor to the right
【-X】	Move the edit cursor to the left
【+Y】	① Cycle through program numbers in the order No.1⇒2⇒1 ② Scroll through program line numbers in descending order (No.3⇒2⇒1)
【-Y】	① Cycle through program numbers in the order No.1⇒2⇒1 ② Scroll through program line numbers in ascending order (No.1⇒2⇒3)
【SET】	①In the Edit mode start-up screen, press this button to begin editing ②On the confirmation screen, press this button to exit and record changes to settings ③ Make changes to the selected item (numerical data increases)
【SPEED】	①On the confirmation screen, exit without saving changes to settings ② Make changes to the selected item (numerical data decreases)
【MODE/CTRL】	①Press to exit Edit mode(a confirmation screen will be displayed) ②In the confirmation displayed at completion of Edit mode operations, press MODE to return to Edit mode

Chapter 3: Specifications

3-1. Specifications

Display function	LCD 16 digit x 4 lines
Power supply	Supplied from the controller via connection cable
Operating temperature	5~40°C
Storage temperature	-20~60°C
Altitude	up to 2000m
Indoor use only	
Installation category	II
Pollution degree	2
Ambient humidity	20~80%RH (no condensation)
External dimensions	178W×195D×41H [mm](excluding projections)
Weight	About 1.0 [kg] However, it does not include cables
Electrostatic discharge	EN61000-4-2(2009) Level 2

3-2. Connector pin number and signal

Table3-2 Connector pin assignment

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	-

3-3. Exterior Dimensions

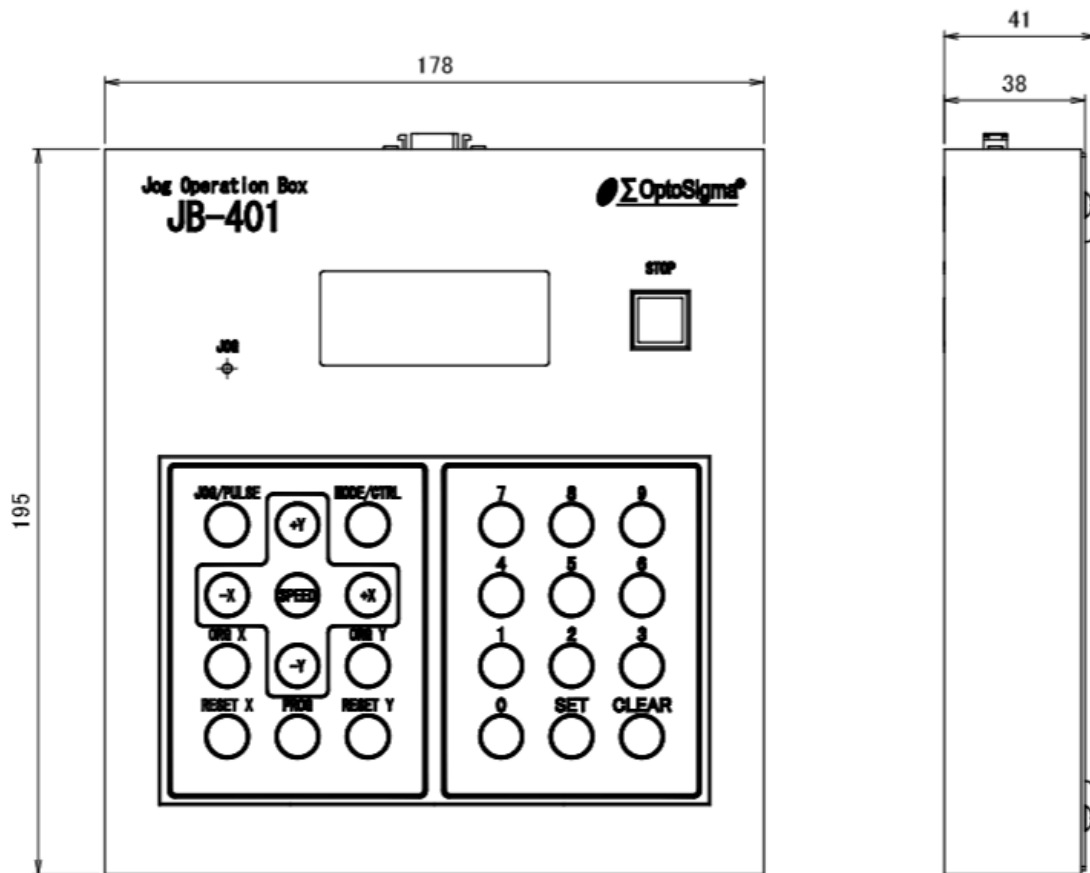


Fig.3-3 Exterior Dimensions

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