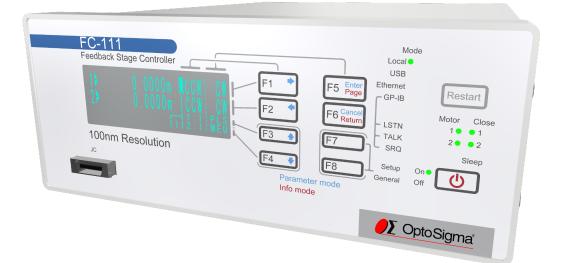


Instruction manual

- FS Series Stage -



Target FV01.030 ~ Target EN01.06



MF-1023-01.01

This time thank you for having you purchase a feedback stage controller.

About this instruction manual

This instruction manual describes the correct usage and functions of the equipment and notes on use. Please read carefully before use to ensure proper operation. Also, keep this manual in a handy place for when you do not understand when using it.

The content of the instruction manual has been prepared with all possible measures. If there are any suspicious points, errors or omissions, please contact us or your distributor.

* Reprinting and copying of the instruction manual requires our consent.

* The contents of the instruction manual and product specifications are subject to change without notice.

Warranty

If a failure occurs due to our manufacturing or delivery within one year from the date of purchase, we will repair it free of charge.

However, in the following cases, repair will be charged even if it is within one year of purchase.

- 1. If there is a failure or damage due to usage or carelessness different from what is described in the instruction manual
- 2. If there is a malfunction or damage due to improper modification, adjustment or repair
- 3. If there is a failure or damage due to natural disaster, fire, or other external factors

Repair

We will repair it. If you suspect a malfunction or damage, please contact us or your distributor. When transporting this equipment to us, pack it carefully so that it will not be damaged during transportation, and write down the occurrence, failure or damage. In addition, we cannot guarantee about malfunction and damage caused by transportation.

Contact

Tokyo Head Office	TEL	+81-3-5638-6551
Osaka Branch	TEL	+81-6-6307-4835
Kyushu Sales Office	TEL	+81-92-481-4300

Precautions for use

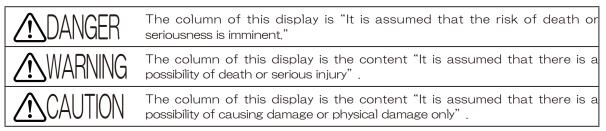
Please read this instruction manual carefully before use to ensure correct use. Then save it carefully and read it when necessary.

- This equipment is a equipment for controlling the feedback stage in closed loop and open loop. Do not use it for any other purpose.
- · This instrument is a precision instrument. Please handle with care.
- · Make sure that there is no impact or excessive force on the equipment.
- Maintain the installation environment described in this instruction manual.
- If the equipment is used in a manner not specified in this manual, the protection functions of the equipment may be impaired. The Company is not liable for any damages arising from use that violates this precaution.
- Fire caused by this equipment, damage caused by extinguishing agents, earthquakes, flooding, lightning strikes, other accidents, intentional or negligence of customers and third parties, use other than the intended use of the product, use in environments other than specifications The Company is not liable for any damages.
- · No warranty other than those described in this instruction manual.
- The Company shall not be liable for any damage caused by malfunction or malfunction caused by connection of the feedback stage other than our feedback stage or feedback stage conforming to our stage specifications, intentional change of the dial switch for motor driver setting on the right side. Not responsible.
- This equipment is not intended for use in human life equipment such as medical equipment, nuclear equipment, aerospace equipment, equipment that requires high reliability, and equipment. The Company assumes no responsibility for any damage to human life or property caused by the malfunction or malfunction of this equipment.

■ Safety Please be sure to observe

Explains what you must observe to prevent harm to people and others, and damage to property.

• The degree of harm or damage caused by improper use is classified and explained in the following display.



• The types of content to be protected are categorized and explained by the following indications.



Indicates "forced" content that must be executed.

Indicates "prohibited" contents that must not be executed.

Indicates the "Caution" that you should be aware of. Also displayed on the equipment.

• Explains what you should follow.

	WARNING
	Use within the power supply voltage range specified in this instruction manual. If it is used at a voltage outside the specified range, it may cause smoke or fire.
	Do not use a damaged power cable. Using it with pain may result in electric shock, short circuit, or fire.
0	Make sure that the power cable plug is fully inserted. Incomplete insertion may cause smoke or fire due to electric shock or overheating.
	Use the fuse specified in this instruction manual. Using anything other than the rated value may cause smoke or fire.
	Be sure to ground the protective earth terminal. Be sure to ground the protective earth terminal to earth ground to prevent electric shock.
\bigcirc	Do not use in an explosive atmosphere. Never use it in a place where flammable or explosive gas or vapor is present because it may cause an explosion or fire.
\bigcirc	Do not place in a corrosive atmosphere. Doing so may cause corrosion of the conductor or poor contact of the connector, which may cause malfunction or failure, resulting in a fire.
\bigcirc	Do not use in dusty places. If dust accumulates on the power cable plug, insulation may be damaged due to moisture, etc., which may cause smoke or fire.
\bigcirc	Do not use the product where it will be exposed to water. It may cause an electric shock or malfunction.
\bigcirc	Do not open the cover. It may cause an electric shock or malfunction.
\bigcirc	Do not plug or unplug the power cable with wet hands. There is a risk of electric shock.
\bigcirc	Do not connect stages other than those described in this instruction manual. It may cause an electric shock or malfunction. Also, there is a risk of stage runaway, smoke, or fire.
\bigcirc	Do not use the product in a broken or damaged state. There is a risk of electric shock, smoke, or fire. Unplug the power cable from the outlet.

The symbols on the product



Indicates a protective ground terminal.

Indicates a frame terminal.

Precautions for transporting or carrying

The following are precautions for moving and transporting the equipment. Please be sure to observe.

- Turn off the MAIN POWER switch, remove all connection cables, and then move the instrument.
- Do not move the equipment by stacking multiple equipments.
- · When transporting the equipment, be sure to use the exclusive packing materials.
- Be sure to attach this instruction manual when moving or transporting the product.

Precautions for install

The following are precautions for installing the equipment. Please be sure to observe.

- Avoid places where the temperature and humidity are high, where the product is exposed to direct sunlight, or where the temperature changes rapidly.
- · Do not install it in a place where it will be exposed to water.
- Install it on a sturdy and horizontal base.
- There is an intake slit on the right side and an exhaust slit for the cooling fan on the left side. To prevent the internal temperature from rising, provide a space of 50 mm or more on both sides.
- When using it in a closed space such as a rack, make sure that the ambient temperature of the equipment does not exceed 40 $^\circ\!C$.
- Do not place anything over 20 kg on this equipment.
- · Be sure to ground the protective earth terminal to earth.
- Connect the surface plate or metal mount that holds the stage connected to the instrument to the frame terminal of the instrument.
- Do not use the product in a place where there is a strong magnetic field or electric field, or where there is a lot of distortion or noise in the input power supply waveform.
- Secure enough space to reach the back so that the MAIN POWER switch does not become difficult to operate.
- Do not plug the power cable into an outlet that makes it difficult to insert or remove the plug, or place anything that makes it difficult to connect or disconnect.

Precautions for peripheral equipment connection

The following are precautions for connecting equipments and peripheral equipments. Please be sure to observe.

- Do not connect or disconnect the connector while the power is on by turning on the POWER key.
- Please connect only the feedback stage that conforms to our feedback stage and our stage specifications.
- Do not connect an AC adapter or other equipment that outputs power to the EMG connector.
- Be sure to connect models that are compatible with the minimum resolution for the feedback stage and feedback stage controller.

Cleaning

If it gets dirty, use a soft cloth with a mild detergent diluted with water and wipe gently.

WARNING When cleaning, be sure to turn off the power with the POWER key, turn off the MAIN POWER switch, and unplug the power cable from the outlet.

CAUTION Use only neutral detergent diluted with water. Discoloration and roughness of the painted surface, fading of printed characters, and cloudiness of the acrylic board may occur.

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1. Overview

This equipment is a equipment for controlling the feedback stage in closed loop and open loop. The communication interface is GP-IB, USB, or Ethernet, and remote operation is possible using ASCII communication commands. Equipped with a teaching function, this equipment can be automatically executed by writing an operation program to the internal memory. The teaching function can be operated from the front panel, general-purpose I / O, each communication interface, and jog controller.

2. Package Contents

Purchasers should find that the package contains the items listed below. If anything is missing or damaged, contact us or your distributor.

Name	Model or specification	Quantity	Remarks
Feedback stage controller	FC-111 FC-411 FC-511 FC-611 FC-911	1	Any one
Power cable	Plug : KP-218 Connector : KS-16A Code : VCTF3 × 0.75mm2	1	2.3m, Tracking resistance
Protective ground wire, frame connection wire	AWG18	2	3m, Green/Yellow
Fuse	250V, 2.5A, Time lag	4	2 pre-installed at the time of shipment
Instruction manual	-	1	This book

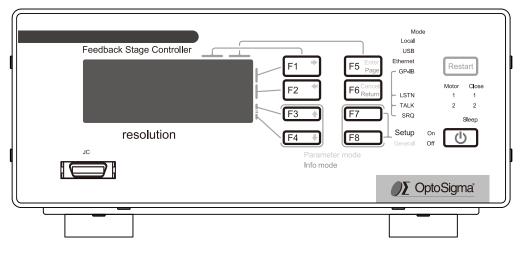
3. Option

A jog controller is available. For details, see our catalog or website.

4. Part names and functions

4-1.Front panel

Explains the name and function of the front panel.



(1) Display unit



(2)F1 / 🌩	key
(3)F2 / 🖛	key
(4)F3 / 🛧	key
(5)F4 / 🖊	key

F1 to F4 execute the functions displayed on the right side of the display unit. The blue arrow is used in parameter mode. For F1 to F4, See "5. Display and operation" for more information. For blue arrows, See "5. Display and operation" and "7. Parameters".

(6)F5 / Enter / Page key

F5 performs the function displayed on the right side of the display. Enter is used in parameter mode, and Page is used in INFORMATION mode. For F5, See "5. Display and operation" and "7. Parameters".

(7)F6/ Cancel / Return key

F6 performs the function displayed on the right side of the display. Cancel is used in para ∋, 7 and Return is used in INFORMATION mode. For F6 Return, See "5. Display and opera Parameters".

- (8)F7 Key
- (9)F8 Key

F7 and F8 execute the functions displayed on the right side of the display unit. General is used to display parameter mode, and Setup is used to display setup mode. For F7, F8 and Setup, See "5. Display and operation". For General, See "7. About parameters".

	F1	+
	F2	÷
ĺ	F3	+

F4

F5	Enter Page
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amete			
tion″	а	Ind	7

F6 Retu

F7	ו
F8	Setup

(10)Restart key

"Restart" will restart the equipment. When the key is pressed and released, the same startup operation as when the power is turned on is performed. The state after restart is shown below.

ltem	Contents
Parameters	It will not be defaulted, but if it is being changed, the changed content will not be reflected. See "7. About parameters".
Mode	It starts in the mode set by the parameter "Ini Mode".
Coordinate value	Both axes are set to zero.
Stage	If it is operating, it stops. If it is stopped, it remains stopped. At startup, the motor is demagnetized once, but the motor is excited immediately.
Command	The command is discarded. If the command "A:" or "M:" is executed without setting the command "D:" or "ACC:" after the restart, it operates at the speed of parameters "Max Speed" and "Acc Time". See "7. About parameters".
Teaching registration contents	It will not be deleted, but if the command "T_OFF:" is not executed after editing, the edited content will not be reflected and will be discarded.
Communication	Communication is disconnected. After the restart is complete, it will be in the initial state, so it will be the mode set by the parameter "Ini mode". Depending on the control software used, communication may resume after the equipment has been restarted or after the mode has been changed, resulting in unintended stage operation.
Link during USB communication	Will be disconnected. To relink, the software must close the COM port and then reconnect the cable. For USB, See (2) USB.
Jog controller	Reboot according to the mode.

(11)POWER key

U

Restart

(12)On lamp

(13)Off lamp

Operates the equipment power. Press to turn the power on when the MAIN POWER switch on the rear panel is ON. Press to turn off the power when the power is on or in sleep mode. However, it cannot be used when the "On lamp", "Off lamp", and "Sleep lamp" are off. The operation method is shown below.

Power on	Powe	er off	Usage prohibited			
Sleep	Sleep	Sleep	Sleep			
On Off	On● Off	On U	On Off			
\downarrow						
Press for over 0.2 seconds	Press for ove	er 1 seconds				
Sleep		Sleep				
On • U Off	On Off ●	Ċ				

If the power does not turn on even if you press it for more than 0.2 seconds when turning on the power, the internal power supply output may be shorted or overloaded. Turn off the MAIN POWER switch on the rear panel and unplug the power cable from the outlet.

 Be sure to read "Installation" and "Peripheral equipment connection" before turning on the power.
• If you do not intend to use the unit for a long time, turn off the MAIN POWER switch on the
 rear panel. Before turning off the MAIN POWER switch on the rear panel, turn off the power with this key. If the MAIN POWER switch on the rear panel is turned OFF without turning off the power with this key, the state of this key will remain ON. When the MAIN POWER switch is turned on, the power to the instrument turns on without operating this key.

(14)LOCAL lamp

- (15)USB lamp
- (16) Ethernet lamp

(17)GP-IB lamp

The green indicators lights up in the currently selected mode. In TEACH mode, both the "LOCAL lamp" and "REMOTE lamp" are lit.

LOCAL		REMOTE		TEACH				
LOCAL	USB	Ethernet	GP-IB	USB	Ethernet	GP-IB		
Mode Local ● USB	Mode Mo Local Local USB USB		Mode Local USB	Mode Local ● USB ●	Mode Local ● USB	Mode Local ● USB		
Ethernet	Ethernet GP-IB	Ethernet GP-IB	Ethernet	Ethernet GP-IB	Ethernet GP-IB	Ethernet		
– LSTN – TALK – SRQ	– TALK – TALK		– LSTN – TALK – SRQ					

(18) LSTN lamp

(19) TALK lamp

(20) SRQ lamp

When communication is performed when the communication interface is set to GP-IB, the LSTN lamp, TALK lamp, and SRQ lamp will be Lights depending on the status. The LSTN lamp lights when this equipment receives a command, and the TALK lamp Lights when sent to. The SRQ lamp lights when a service request is executed from this equipment.

LSTN	TALK	SRQ
Mode	Mode	Mode
Local	Local	Local
USB	USB	USB
Ethernet	Ethernet	Ethernet
⊂ GP-IB ●	GP-IB	GP-IB
- LSTN	- LSTN	- LSTN
– TALK	- TALK	- TALK
L _{SRQ}	L SRQ	L SRQ ●

(21) Motor1, 2 lamp

This shows the motor excitation status of the stage. The axis whose green lamp is lit is energized and the axis whose light is off is demagnetized.

First axis excitation On	First axis excitation On	First axis excitation Off	First axis excitation Off
Second excitation On	Second excitation Off	Second excitation On	Second excitation Off
Motor	Motor	Motor	Motor
1	1 •	1	1
2	2	2 ●	2

(22)Close1, 2 lamp

Indicates the stage control loop status. An axis whose green lamp is lit is in a closed loop state, and an axis that is not lit is in an open loop state.

First axis Close	First axis Close	First axis Open	First axis Open
Second axis Close	Second axis Open	Second axis Close	Second axis Open
Close 1 2	Close	Close	Close
	1	1	1
	2	●2	2



Lights when the equipment is in sleep mode. At this time, the On lamp goes off.

(24) Sleep function

In sleep mode, the display turns off and the motor is demagnetized. Modes, coordinate values, statuses, and commands retain the state prior to sleep execution. When returning from the sleep state, if the stage table has moved to a different position from before sleep execution, it will move to the coordinate value before sleep execution by feedback control. However, if an error other than a limit error, overflow error, or emergency stop occurs in the sleep state, the coordinates before the sleep execution cannot be restored. In addition, when the instrument is restarted due to a power failure or instantaneous voltage drop, all retained modes, coordinate values, statuses, and commands are discarded. For error, See "11. Status". For Restart, See "(10) Restart key". Becomes a little warm in sleep mode, but this is not a malfunction.

(25) JC connector

	JC		
Ć		\square	ľ

This connector is for connecting an optional jog controller. Used when operating with the jog controller.

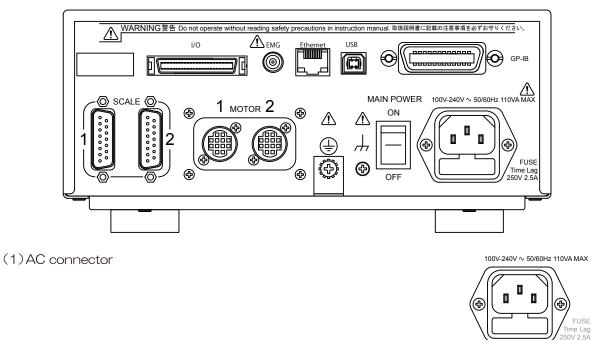
MARNING Do not connect equipment other than our jog controller or equipment that complies with our jog controller specifications.

Mhen removing the jog controller from the instrument, shut off the power supply to the jog controller.

	~	0		_	-		0	-	10		10	10			10
1	1	~~	Λ	5	6		8	G	1()	11	12	1'2	1/	16	16
		0		\cup	0	1	0	0				10			10

4-2.Rear panel

Explains the name and function of the rear panel.



This connector is for power cable. When the power supply is AC100 V, use the included power cable. For power supplies other than AC100 V, please prepare the power supply cable which acquired the safe standard of the country to use. If you have any questions, please contact the distributor. For the specifications of the connectable power cable and the procedure for inserting the plug of the power cable into the power outlet, refer to the following.

Current	Connector	Length		
7A or more	IEC-60320-C13	2.3m or less		

Step1 Make sure the power supply is within the AC 100 V to 240 V range.

Step2 Check that the MAIN POWER switch is OFF.

Step3 Connect the power cable to the AC inlet.

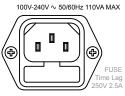
Step4 Insert the power cable plug into an outlet.

MARNING Connect to an overvoltage category II power supply.

• Use only the power cable that comes with the product or that meets the national safety
standards. • Do not use the power cable supplied with this equipment as the power cable for other
equipments. Please follow the procedure for plugging the power cable into the outlet.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
_ [\smile		0	0		0	U				10		10	10

(2)Fuse holder

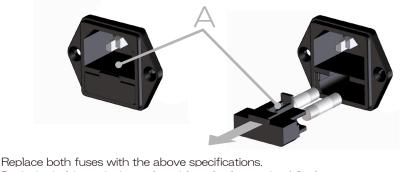


The fuse holder is under the AC connector. Refer to the following for fuse specifications and replacement procedure.

Voltage	Current	Characteristic	Size
AC250V	2.5A	Time lag	ϕ 5mm $ imes$ 20mm

Step1	Check that the	switch is OFF
SLEPT	UIEUN LI IAL LI IE	SVILCITIS OFF.

- Step2 Unplug the power cable from the outlet,
- Step3 Disconnect the power cable from the AC inlet.
- Step4 Hook the tip of a thin flathead screwdriver or the like into the groove in part A below, and apply force in the direction of the arrow to remove the holder.



- Step6 Push the holder with the replaced fuse firmly into the AC inlet.
- Step7 Connect the power cable to the AC inlet.
- Step8 Connect the power cable according to the AC inlet insertion procedure.

 Do not use the included fuse for other equipment. When replacing, be sure to replace both.

(3) Protective earth terminal

Step5



This terminal is for grounding. Connect the round crimp terminal of the included protective conductor wire to this terminal. When grounded with an power cable, this terminal does not have to be used.

When you use a power supply cable without a ground terminal, please ground earth ground MARNING by all means because it is a class I apparatus. There might be the electric shock when I do not ground.

· Use the protective grounding cable supplied with the instrument for grounding. A · Do not use the included the protective grounding cable for other equipment.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(.	4)Enc	losure	termin	al											,H,
															æ
															Y
	This terminal is used to connect the instrument to a surface plate or metal mount that holds the stage connected to the instrument. Connect the round crimp terminal side to this terminal.												e stage		

 MARNING Do not use as a protective earth terminal.

 CAUTION If it is not connected, it may malfunction.

Use the attached frame connection line for connection.
Do not use the frame connection cable supplied with this equipment for other equipment.

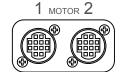
(5) MAIN POWER switch

A



Turns the main power on and off. Just turning this switch on does not turn on the power to the instrument. By operating the POWER key on the front panel, you can turn on the instrument.

(6) Motor cable connectors



Connect the stage motor cable. Connect the One-axis stage to the left connector and the Two-axis stage to the right connector.

MARNING Please connect only the feedback stage that conforms to our feedback stage and our stage specifications.

CAUTION Be sure to correctly connect the motor cable and scale cable to the first and second axes with the power off. If the connection is incorrect, unintended operation will occur.

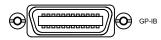
(7) Scale cable connectors

Connect the stage scale cable. Connect the One-axis stage to the left connector and the Two-axis stage to the right connector.

 $\operatorname{Marnon}_{\operatorname{specifications.}}$

CAUTION Be sure to correctly connect the motor cable and scale cable to the first and second axes with the power off. If the connection is incorrect, unintended operation will occur.

(8) GP-IB connector



Connect the GP-IB cable. Use this when you want to operate the instrument via the GP-IB interface. For details, see (1) GP-IB.

(9) USB connector (B type)

Connect the USB cable. Use this when you want to operate the instrument via the USB interface. For details, see (2) USB.

(10) Ethernet connector (LAN)

Connect the Ethernet cable. Use this when you want to operate the instrument via the Ethernet interface, For details, see $\H(3)$ Ethernet $\H(3)$

(11)I/O connector

It has general-purpose input and output, teaching operation input and status output, scale division signal output, in-position signal output, and alarm signal output. Refer to (4) General purpose I/O for details.

(12)EMG connector

Connect the emergency stop switch. Use this when you want to stop the stage operation in an emergency. Refer to "(5) Emergency stop" for details.

WARNING When using it, be sure to change the parameter "EMG Connecter" to Enable and perform a test operation to confirm that it can be used.

ACAUTION Do not connect an AC adapter or other equipment that outputs power.



USB



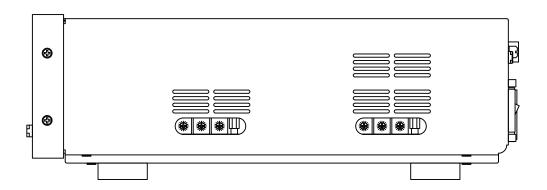
1/0	



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		<u> </u>			<u> </u>		<u> </u>	<u> </u>	10						

4-3.Right side panel

Explains the name and function of the right side panel.



(1) Elongated holes

These holes are for ventilation.

 \bigwedge CAUTION Do not block the intake slit. See "Installation" for details.

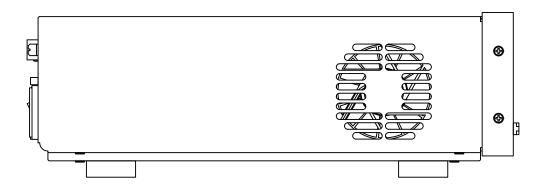
(2) Dial switch for motor driver setting

Dial switch for motor driver setting. For details, refer to "(6) Motor driver setting switch".

CAUTION Depending on your environment, you may be asked to change the settings. Do not change any other settings. If it is changed intentionally, an unintended stage operation may occur.

4-4.Left side panel

Explains the name and function of the left side panel.



(1) Elongated holes

These holes are for ventilation.

CAUTION Do not block the intake slit. See "Installation" for details.

(2)Electric fan

This is a cooling fan.

1 2 3 4 5 6 7 8 9 10 11 12 13 14	15 16	
----------------------------------	-------	--

4-5.Beep

A beep is heard when operating the instrument. The beep can be turned off with the parameter. Note that the beep may be interrupted for a moment, but this is not a malfunction.

Length of beep	Operation							
About 0.1 seconds	Key operation							
About 0.1 seconds	Completion of command "RESET:"							
About 0.1 seconds twice	Start of command "RESET:"							
About 0.3 seconds (two-step sound)	Transition to sleep mode and return							
	POWER key operation							
About 0.4 seconds	Restart key operation							
About 1 seconds	Entering stage stroke limits							
About 2 seconds	Error occurrence							
Continuous ringing	Internal power supply output short circuit or overload The volume depends on the degree of overload of the internal power supply. It also sounds in sleep mode. See "14. Troubleshooting" for details.							

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

5. Operations

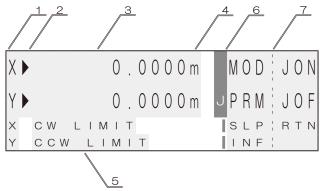
5-1.List of modes

The operation modes are as follows.

Mode	Contents									
SETUP	You can switch modes.									
LOCAL	It can be operated with front panel keys and jog controller.									
REMOTE	You can perform operations by communication using each communication interface.									
TEACH	Automatic execution with commands registered in the internal memory is possible.									
MOVEMENT TEST	The test operation can be executed.									
PARAMETER	Parameters can be manipulated.									
INFORMATION	Displays equipment information.									

5-2.Common contents

The display contents are common to all modes.



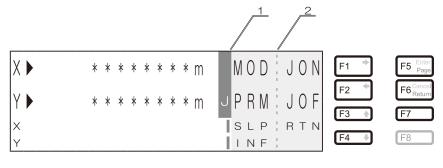
No	ltem	Contents														
1	Axis name					the lower side is the second axis side (Y). of the parameter "AXIS Name".										
		•	READY			s It remains in the in-position range after positioning is completed. *1								after		
2	Positioning status	⊳	READY			It deviated from the in-position range after positioning was completed. *1										
	FUSILION IN B STATUS	>	BUSY		eration has n denied.	Positio	onin	g to	in-p	ositi	on ra	ange	e. *1	, *2		
		🗌 no display	BUSY		eration has n denied.	Comi occur			per	ratio	on (or e	erro	r is		
		The upper is th values of the e												ding		
	Coordinate value	Model	Minim	digit	Example (unit :mm)											
		FC-111	10	Onn	า			0		0	0	0	1	m		
3		FC-411	50			0		0	0	0	0	5	m			
		FC-511	10	Dnm			0		0	0	0	0	1	m		
		FC-611	5	'nm		0		0	0	0	0	0	5	m		
		FC-911	1	0		0	0	0	0	0	1	m				
						the 2nd axis. It is displayed according to his case, both axes will be millimeter.										
		Unit							Example (Model: FC-111)							
4	l hait	n	Nanom	leter	(nm)	1	2	З	4	5	6	0	0	n		
4	Unit	u	Microm	eter	(um)		1	2	З	4	5		6	u		
		m	Millime				1	2		З	4	5	6	m		
		o	Degre				1	2		З	4	5	6	0		
			Minimum digit is					1	2	З	4	5	6			
5	Status	See <i>"</i> 11. Statu	is″ for more ir													
	Jog controller	J	″J″ in the blo	ock	Power is su	pplying	to	the J	log c	ontro	oller.					
6	connection		Block only		The power				-					off.		
	confirmation mark	no display The Jog co					con	nect	or is	not d	conn	ecteo	d			
7	Menu	This is a function assigned from F1 to F7.														

*1 See parameter "INPos Range" for in-position range. *2 BEC key and command "BEC:" can be used. *3 BEC key and command "BEC:" cannot be used.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

5-3.SETUP Mode

This is the mode for choosing the item of each mode, sleep and the Jog Controller's power supply. To switch to this mode, press the F7 and F8 keys simultaneously when the stage is stopped in LOCAL, REMOTE, or TEACH mode.



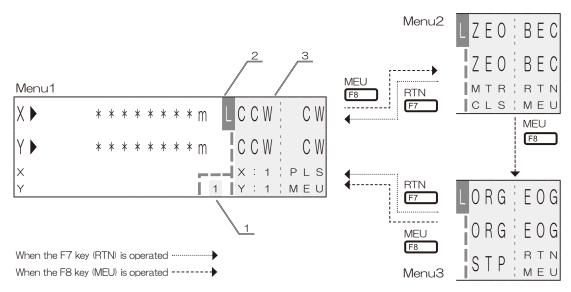
No	ltem	Contents
1	Mode	Block only
2	Menu	This is a function assigned from F1 to F7.

KEY	Display	Contents								
		Select a mode. Each time you press it, it switches.								
F1	MOD	$LOCAL \rightarrow REMOTE \rightarrow TEACH \rightarrow Back \text{ to top}$								
F2	PRM	Move to PARAMETER mode.								
F3	SLP	Transit to sleep state. For details, see "(24) Sleep function". To return from sleep mode, press any of the F1 to F8 keys.								
F4	INF	Move to INFORMATION mode.								
F5	JON * 1	Supply power to the Jog controller.								
F6	JOF * 1, 2	Power supply to the jog controller is stopped.								
F7	RTN	Exit the SETUP mode.								
F8	-	None								

* 1 If the jog controller connector is not connected, it will not be displayed. If it is connected, either will be displayed.
 * 2 Can be used only when positioning is completed or an error occurs and the stage is stopped.

5-4.LOCAL Mode

The stage can be operated from the front panel of the instrument. This mode, menus 1 to 3 used to operate from the front panel. Use the F7 or F8 key to switch menus. For the procedure to switch to this mode, refer to "5-3. SETUP mode".



No	ltem	Contents
		It represents the quantity of movement pulses output to the stage when single clicked the CW or CCW key. Use the "PLS" to select the pulse amount. Only menu 1 is displayed.
2	Mode	L (LOCAL) is displayed.
3	Menu	This is a function assigned from F1 to F7.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Menu	KEY	Target axis	Display	Contents						
	F1	1	CCW	Move the stage in the CCW direction (Motor side). Press and hold for continuous operation, and press once (single click) for pulse operation. See "PLS" for pulse amount selection. Flashes when moving to the stroke limit.						
	F2	2		The control status during continuous operation differs depending on the setting of the parameters "Jog Cont" and "Stage Cont Type". *1						
	F3	1	3, 2, 1	Choose the movement speed of the stage when operated the CW or CCW key. The operation speed changes each time the key is pressed. The speed depends on the setting of parameters "Jog Speed 3", "Jog Speed 2" and "Jog Speed 1". 1 at startup. Axis display depends on the parameter "AXIS						
	F4	2		Name" setting. In this case, the first axis side is X and the second axis side is X [Speed stage1 => Speed stage2 => Speed stage3 => Back to Speed stage1]						
1	F5	1	CW	Move the stage in the CW direction(Anti motor side). Press and hold for continuous operation, and press once (single click) for pulse operation. See "PLS" for pulse amount selection. Flashes when moving to the stroke limit.						
	F6	2		The control status during continuous operation differs depending on the setting of the parameters "Jog Cont" and "Stage Cont Type". *1						
	F7	-	PLS, PST	Choose the quantity of movement pulses output to the stage when single clicked the CW or CCW key. When the display is PLS, it changes each time it is pressed. It is "1" at startup. The speed depends on the parameter "Jog Speed 1". When the stage moves, the display changes to blinking PST, and the function of this key switches to movement stop. When movement is completed or stopped by this key, the display returns to PLS. [1pulse => 100pulse => 1000pulse => Back to top]						
	F8	-	MEU	Switch to menu 2.						
	F7+F8	-	-	If both key are pressed at the same time switches to the SETUP mode. For details on the SETUP mode, see "5-3, SETUP mode".						
	F1	1	ZEO	Set the coordinate value of the target axis to zero. *1						
	F2	2								
	F3	_	MTR	Choose excitation or non-excitation of the motor. It changes each time it is pressed. For state, check the Motor lamp on the front panel. [excitation : Exc] Moter 1 Exc => Exc => Not => Not => Not => Back to top						
2	F4	_	CLS	Chooses the positioning control method (Closed loop or Open loop). It changes each time it is pressed. For state, check the Close lamp on the front panel. Close 1 Close => Close => Open => Open Close 2 Close => Open => Open => Back to top						
	F5	1	BEC	Completion of forced positioning (It is only when positioning status display is $\tilde{\gamma}$) or cancel of emergency stop is executed. When limit error, overflow error						
	F6	2		or TEACHING command error, errors can be canceled without affecting the coordinate values. To cancel the emergency stop, press either key.						
	F7	-	RTN	Return to Menu 1.						
	F8	-	MEU	Switch to menu 3.						
	F7+F8	-	-	If both key are pressed at the same time switches to the SETUP mode. For details on the SETUP mode, see "5-3. SETUP mode". Return the stage to the mechanical origin . Even if the software limit is set.						
	F1	1	ORG	the software limit is ignored. The return method can be selected by the parameter "ORG Mode Sel". Refer to "9. Return to origin" for the return						
	F2	2		method. For details on software limits, see "3. Options" , "+ Soft LMT Pos" and "-Soft LMT Pos" . *1						
З	F3 F4	1, 2	STP	Stops movement of machine origin return and the electric origin return.						
	F5 F6	1 2	EOG	Return the stage to electrical origin. Refer to ["] 9. Return to origin" for the return method. *1						
	F7	-	RTN	Return to Menu 1.						
	F8	-	MEU	Return to Menu 1.						
	F7+F8	-	-	If both key are pressed at the same time switches to the SETUP mode. For details on the SETUP mode, see "5-3. SETUP mode".						

* 1 While one axis is operating, the other axis can be operated.

Before demagnetizing the motor or operating the stage, make sure that there is no influence on the surroundings.

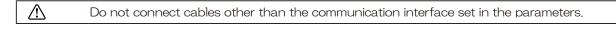
 $[\]triangle$

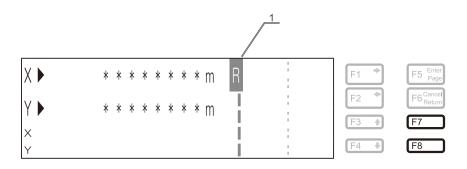
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

5-5.REMOTE mode

This is the mode which operations the stage by remote control from the personal computer. For the procedure to switch to this mode, refer to "1 SETUP mode".

For parameters, refer to "7. Parameters". For each communication interface, refer to "12. Specifications".





No	ltem	Contents
1	Mode	R (REMOTE) is displayed. When shifting to the parameter setting mode, P (PARAMETER) is displayed. For details, refer to "6. Commands".

KEY	Display	Contents
F1-F8	-	None
F7+F8		If both key are pressed at the same time switches to the SETUP mode. For details on the SETUP mode, see "5-3, SETUP mode".

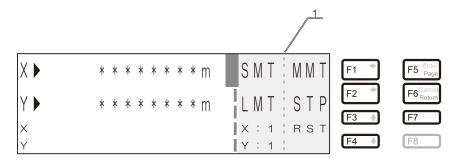
5-6.TEACH mode

The operation program registered in the internal memory of the equipment can be executed. For the procedure to switch to this mode, refer to "1 SETUP mode". For the operation, refer to "8. TEACHING function".

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

5-7.MOVEMENT TEST mode

This mode is the mode that moves the stage with one of three prepared movement patterns. This mode can be switched by double clicking the F5 key after entering the TEACH mode. Restart is necessary to exit this mode. For TEACH mode, refer to "5-6. TEACH mode". For details of operation, refer to "10. Movement test".



No	ltem	Contents
1	Menu	It is the function of the F1 to F7 keys.

KEY	Target axis	Display	Contents
F1	1,2	SMT	Perform step movement. Pitch is ten percent of the stage's stroke.
F2	1,2	LMT	Perform reciprocating motion between limit sensors.
F3	1	3, 2, 1	Select the operation speed of the test operation. The operation speed
F4	2		changes each time the button is pressed. The speed depends on the setting of parameters "Jog Speed 3", "Jog Speed 2" and "Jog Speed 1". 1 at startup.
F5	1,2	MMT	Perform step movement. Pitch is 1mm.
F6	1,2	STP	Stops test operation.
F7	-	RST	Reset the equipment to exit this mode.
F8	-	-	None
F8	-	-	None

5-8.PARAMETER mode

This mode is the mode to check or change the parameters. Refer to "5-3. SETUP mode" for how to enter this mode. For the operation, see "7. Parameters" .

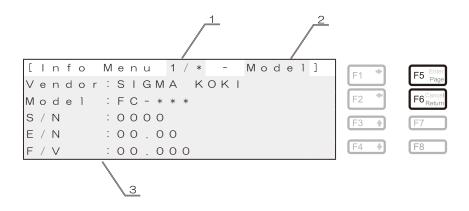
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

5-9.INFORMATION mode

This mode is the mode to display on the display panel the information on this equipment. For the procedure to switch to this mode, refer to "5-3. SETUP mode".

(1) Equipment information

Displays information such as the controller model name.



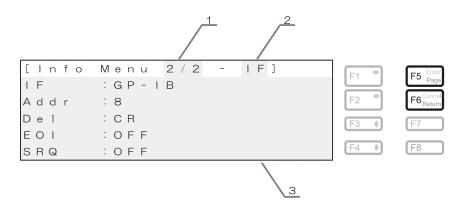
No	ltem			Contents						
1	Page	Page nu	mber							
2	Category	Model	ndicates Equipment information.							
		Vendor	Vendor name	Vendor name						
				FC-111						
				FC-411						
		Model	Model name	FC-511						
3	Information			FC-611						
				FC-911						
		S/N	Serial Number							
		E/N	Equipment Number							
		F/V	Firmware Version							

KEY	Display	Contents
F1-F4	-	None
F5 (Page)	-	Switch to next page.
F6 (Return)	-	Returns to the mode before the transition to INFORMATION mode.
F7-F8	-	None

			1			1								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

(2) GP-IB interface information

If the parameter "I / F Sel" is set to GP-IB, the GP-IB settings are displayed.

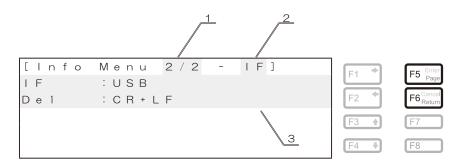


No	ltem		Contents						
1	Page	Page nu	mber						
2	Category	IF	It means the communication information						
		IF	The configured communication interface.						
		Addr	GP-IB address setting value						
З	Information	Del	GP-IB delimiter						
		EOI	GP-IB end of Identify						
		SRQ	GP-IB service request						

KEY	Display	Contents
F1-F4	-	None
F5 (Page)	-	Return to first page.
F6 (Return)	-	Returns to the mode before the transition to INFORMATION mode.
F7-F8	-	None

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

(3) USB interface information If the parameter "I / F Sel" is set to USB, the USB settings are displayed.



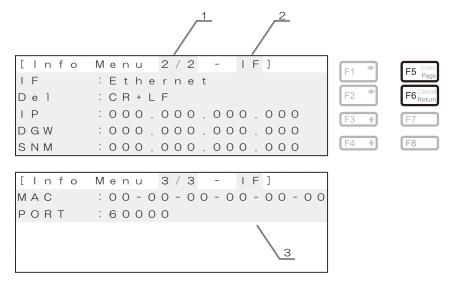
No	ltem		Contents						
1	Page Page number								
2	Category	IF It means the communication information							
2	Information	IF	The configured communication interface.						
3	Intornation	Del	USB delimiter						

KEY	Display	Contents
F1-F4	-	None
F5 (Page)	-	Return to first page.
F6 (Return)	-	Returns to the mode before the transition to INFORMATION mode.
F7-F8	-	None

						1									
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

(4) Ethernet interface information

If the parameter "I / F Sel" is set to Ethernet, the Ethernet settings are displayed.



No	ltem		Contents					
1	Page	Page nu	mber					
2	Category	IF	It means the communication information					
		IF	The configured communication interface.					
		Del	Ethernet delimiter					
		IP	Ethernet IP address					
3	Information	DGW	Ethernet default gateway					
		SNM	Ethernet subnet mask					
		MAC	Ethernet MAC address					
		PORT	Ethernet Port Number (Fixed)					

KEY	Display	Contents
F1-F4	-	None
F5 (Page)	-	Moves to the next page for the second page and to the first page for the third page.
F6 (Return)	-	Returns to the mode before the transition to INFORMATION mode.
F7-F8	-	None

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

6. Commands

Commands are sent and received from the communication interface in ASCII code format.

	 Before control, check that the communication interface is operating normally. Please familiarize yourself with the functions before using the commands. Set the command transmission interval to 10msec or more. Please check the around of the stage before doing the operation. 	
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6-1. List of commands

The modes that can be used are LOCAL, REMOTE, and TEACH modes. Commands cannot be used in other modes.

(1) Available modes

Describes the modes in which the command can be used.

Symbol	Contents
L	It indicates that it can be used in the LOCAL mode.
R	It indicates that it can be used in the REMOTE mode.
R	Indicates that it can be used after switching from REMOTE mode to PARAMETER mode.
Т	It indicates that it can be used in the TEACH mode.
Т	Indicates that it can only be registered in the internal memory as a teaching program.

(2) Available positioning states

Describes the positioning states in which the command can be used.

Symbol	Contents
R	It indicates that it can be used in the positioning completed state.
В	Indicates that it can be used during stage move.
-	This command is not related to the positioning status.

(3)List

ltem	No,	Command name	Description	N	/lod	е	State	Page
Control	01	RESET:	Reset controller	L	R	Т	R B	26
	02	*RST	Reset controller	L	R	Т	RB	26
	03	RESET_RET:	Reset controller ("END" is returned after completion)	L	R	Т	RB	26
	04	SLEEP:	Turn on or off the sleep function	L	R	Т	R	26
	05	SLEEP_RET:	Turn on or off the sleep function (Status is returned after completion)	L	R	Т	R	26
	06	SLEEP?	Get the sleep status	L	R	Т	R	27
	07	MODE:	Change mode	L	R	Т	R	27
	08	MODE?	Get current mode	L	R	Т	RB	27
	09	F:	Change the positioning control method (Closed or Open loop)	R		Т	R	28
	10	FR:	Get positioning control method (Close or Open loop)		R		R	28
	11	C:	Change the excitation state of the motor	R		T	R	28
	12	CR:	Get the excitation state of the motor		R		R	29
	13	BEC:	Cancel busy and error conditions	L	R	Т	RB	29
	14	CMDR:	Get the last sent command (Exclude this command)	L	R	Т	RB	29
	15	ECHO:	Change command echo back state		R		R	30
		ECHOR:	Get command echo back status		R		R	30
Information	17	*IDN?	Get the equipment information	L	R	Т	R	30
	18	VENDOR:	Get the vendor name		R		R	30
		MODEL:	Get the model name		R		R	31
	20	SN:	Get the serial number		R		R	31
	21	EN:	Get the equipment number		R		R	31
		FV:	Get the firmware varsion		R		R	31
		RESO:	Get the resolution		R		R	32
	24	LIMR:	Get the stage stroke		R		R	32
	25	AN:	Get the axis name		R		R	33
	26	UNT:	Get the unit		R		R	33

1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16

ltem	No,	Command name	Description	Мс	ode	Sta	ate	Pag
Motion status	27	Q:	Get the status (Position coordinate values, Error, Motion, and Positioning)	R	Т	R	В	34
Information	28	SRQ:	Get the status (Error, Motion, and Positioning)	R	Т	R	В	37
	29	P:	Get the position coordinate values	R	Т	R	В	39
	30	ER:	Get the error status	R	Т	R	В	40
	31	STS:	Get the motion status	R	Т	R	В	42
	32	1:	Get the positioning status	R	Т	R	В	43
Origin		H:	Return to mechanical origin	R	Т	F		44
	34	Z:	Return to electrical origin	R	T		२	44
	35	R:	Set the position coordinate values to zero	R	Ť	F		45
		LIMG:						
			Perform the stage stroke detection movement	F		F		45
Motion	37	L:	Operation stop and emergency stop	F	1	R		45
	38	ACC:	Set the acceleration and deceleration time	R			7	46
	39	ACCR:	Get the acceleration and deceleration time	F	7	R	В	46
	40	D:	Set the movement speed of the stage	R	Т	F	R	47
	41	DR:	Get the movement speed	F	7	R	В	48
	42	A:	Set the position to move in absolute motion	R	Т	F	2	49
	43	M:	Set the amount of movement to move in relative motion	R	Т	F	3	50
	44	G	Start moving (The setting values is lost after execution)	R	Ť	F		5
	45	GN:	Start moving (The setting values is not lost.)	R	Ť	F		5
	46	GC:	Delete the setting values of the "A:" and "M:" commands					52
			_	F			2	
	47	GR:	Get the setting values of the "A:" and "M:" commands		7	R	_	52
	48	JG:	It moves according to the set number of pulses	R	T		7	53
	49	JY:	Start moving without specifying a target point	F	7	R	В	53
Position	50	PIT_DEL:	Delete location information registered for the specified number	F	R	F	7	54
registration	51	PIT_SET:	Register current coordinate value to specified number	F	7	F	7	54
	52	PIT_GET:	Get the coordinate value registered in the specified number	F	3	F	2	54
	53	PITG:	Start Moving to the coordinate value registered in the specified number	F	7	F	2	54
General	54	1:	Get general-purpose input status	R	Т	R	В	55
ourpose I/O	55	D:		R				-
		-	Set general-purpose Output status		T	R	_	55
Teaching	56	T_ON:	Enter edit mode				2	56
	57	T_OFF:	Save contents and exit		Γ	F		56
	58	T_DEL:	Delete content		Γ	F	R	56
	59	T_SET:	Set content	٦	Γ	F	7	56
	60	T_GET:	Get content	٦	Г	F	7	56
	61	TC:	Select a channel	٦	Г	F	2	56
	62	TCR:	Get current channel	٦	Г	R	В	5
	63	TQ:	Get teaching status	7			В	5
	64	TG:	Teaching start		Г		2	5
	65	TP:	Pause		г Г	R	_	5
	66	TO:	Execute line by line	1			}	5
	67	TL:	Stop execution		Г	R	В	58
	68	TR:	Get channel subscription status		Г	R	В	58
	69	TFR:	Get the loop count		Г	R		5
	70	TM:	Set the Teaching monitor function	٦	Γ	F	R	59
	71	TMR:	Get the Teaching monitor function setting	٦	Г	F	7	6
	72	TNR:	Get current line number	٦	Г	R	В	6
	73	TACR:	Get current execution command		Г			6
Feaching	74	FS:	Loop setting		- -	-		6
egistration		FE:	Set loop end				_	6
only			· · · · ·					
		END:	Set the execution end line					6
	77	T:	Set the wait time			-	-	6
	78	GIS:	Wait until the specified general-purpose input state is reached		Г	-	-	6
						<u> </u>	_	6
Parameter	79	PRM ON:	Switch to parameter setting mode	F	۲ I	F	<u> </u>	ניו ו
		PRM_ON:	Switch to parameter setting mode	F		F		6
Parameter settings	80	PRM_ON: PRM_OFF: PRM_SET:	Switch to parameter setting mode Exit parameter setting mode Set parameters	F		R R	К В В	6

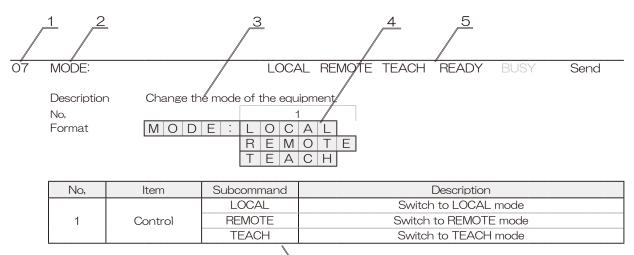
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	
----------------------------------------	--

6-2. Command description format

Explains how to read the command description.

(1)Send command format

Describes the send command format. Sending means sending a command from the computer to the equipment. There is no reply from the equipment to the computer with the send command. The command format is not case sensitive.



6

No	lte	em	Contents	Description
1	Command N	lumber	-	The command number.
2	Command N	lame	-	The name of the command.
3	Feature Des	cription	-	Describes the feature of the command.
4	Send Forma	t	-	This is the format when sending commands.
	Conditions	Mode	LOCAL REMOTE REMOTE TEACH TEACH	It indicates that black characters are usable, and gray characters are disabled. The outline character of REMOTE can be used after sending the command "PRM_ON:". The outline character of TEACH can be used only for registration in the internal memory as a Teaching program.
5	that can be sent	Control state	READY * 1 BUSY * 2	It indicates that black characters are usable, and gray characters are disabled.
			Send	Indicates that the command is a send-only command.
		Command	Send/Reply	Indicates that the command has a reply after sending the command.
		type	Teaching registration only	It can be used only when registering in the internal memory as a Teaching program.
			No,	Format block number.
6	Details		Subcommand	The name of the subcommand.
			Description	Describes the subcommand.

* 1 All operations are accepted.

* 2 Operation related to operation is denied.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

(2) Send / Reply command format

Explains the format of the send /reply command. With the send/reply command, there is a reply from the equipment after sending. Sending means sending a command from the computer to the equipment. Reply means that there is a reply from the device to the computer. The command format is not case sensitive.

8	MODE?		LOCA	AL REMOTE /EACH READY BUSY Send/Rep
	Description Send format	Check the cur M O D E	rrent mode of t	he equipment.
	No, Reply format	1 **** ,	2	
	Item	No,1	No,2	Description
			None	LOCAL mode
			SETUP	SETUP mode
		LOCAL	PRM	PARAMETER mode (From SETUP mode)
			INFO	INFORMATION mode
			None	REMOTE mode
			PRMCMD	PARAMETER mode (From "PRM_ON:" command)
		REMOTE	SETUP	SETUP mode
			PRM	PARAMETER mode (From SETUP mode)
	Status		INFO	INFORMATION mode
			JOGCMD	TEACH mode (JOG and command operation) * 1
			IO	TEACH mode (I/O port operation) * 1
		TEACH	EDIT	TEACH edit mode (From "T_ON:" command)
			TEST	
			ILSI	MOVEMENT TEST mode
		T EAOIT	SETUP	SETUP mode
	* 1. It can be con		SETUP PRM INFO	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode
	* Example 1 LOC/	ifirmed by the rep	SETUP PRM INFO	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" .
	* Example 1 LOC/ Send	ifirmed by the rep	SETUP PRM INFO	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay
	* Example 1 LOC/	ifirmed by the rep	SETUP PRM INFO	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" .
	* Example 1 LOC/ Send MODE ? * Example 2 PAR	firmed by the rep	SETUP PRM INFO ly contents by th	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N." command) 3
	* Example 1 LOC/ Send MODE ? * Example 2 PAR Send	firmed by the rep	SETUP PRM INFO ly contents by th	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N:" command) Replay
	* Example 1 LOC/ Send MODE ? * Example 2 PAR	firmed by the rep	SETUP PRM INFO ly contents by th	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N." command) 3
õ	* Example 1 LOC/ Send MODE ? * Example 2 PAR Send	firmed by the rep	SETUP PRM INFO ly contents by th	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N:" command) Replay REMOTE,PRMCMD
0	* Example 1 LOC/ Send MODE ? * Example 2 PAR Send MODE ? ECHOR: Description	AL mode AL mode AMETER mode Check the ech	SETUP PRM INFO ly contents by th (From "PRM_O LOCA	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N:" command) Replay REMOTE,PRMCMD
õ	* Example 1 LOC/ Send MODE ? * Example 2 PAR Send MODE ? ECHOR:	AL mode AMETER mode	SETUP PRM INFO ly contents by th (From "PRM_O	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N:" command) Replay REMOTE,PRMCMD
<u></u>	* Example 1 LOC/ Send MODE ? * Example 2 PAR Send MODE ? ECHOR: Description	AL mode AL mode AMETER mode Check the ech	SETUP PRM INFO ly contents by th (From "PRM_O LOCA	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N:" command) Replay REMOTE,PRMCMD
6	* Example 1 LOC/ Send MODE ? * Example 2 PAR Send MODE ? ECHOR: Description Send format No,		SETUP PRM INFO ly contents by th (From "PRM_O LOCA	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode e command "PRM_GET: A15" . Replay LOCAL N:" command) Replay REMOTE,PRMCMD
6	* Example 1 LOC/ Send MODE ? * Example 2 PAR Send MODE ? ECHOR: Description Send format No, Reply format	AL mode AL mode AMETER mode Check the ech E C H O	SETUP PRM INFO ly contents by th (From "PRM_O LOCA no back status, R :	SETUP mode PARAMETER mode (From SETUP mode) INFORMATION mode le command "PRM_GET: A15" . Replay LOCAL N:" command) Replay REMOTE,PRMCMD AL REMOTE TEACH READY BUSY Send/Rep

No	ltem	Contents	Description
1	Reply format	-	Reply format
		No,	Block number for reply format.
2	Details	Reply	The reply content.
		Description	A description of the reply.
3	Reply example	-	This is a reply example.

1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16

6-3. Echo back

When the echo back is turned on, the command sent immediately before is echoed back. If the command sent from the equipment is a command error, "CMD ER" is returned. Note : Please be sure to clear the receive buffer of the personal computer before sending the next command.

(1)Command w	ithout a reply
Send format	MODE:LOCAL
No, Reply format	
No,	Description
1	Reply send command

(2)Command with a reply

Send format	MODE?]			
No,	1	2			З
Reply format	MODE?		L	0	С

No,	Description
1	Reply send command
2	Space
3	Reply contents of "MODE?" Command reply

AL

(3) When a command error occurs due to a send command

Send form	at ***
No, Reply form	at CMDER * There is a space between "CMD" and "ER".
No,	Description
1	Reply command error

	2	2 3	4 5	6 7	8	9 10	11	12	13 14	- 15	16
6-4	. Co	ommand d	escription								
(·	1)C	ontrol con	nmands								
C)1	RESET:			LOCAL	REMOTE	TEACH	READ	Y BUS	Y Se	end
		Description	n Restart	the equipm	nent. Sam	e as the Re	start key	on the	front pan	el, but do	bes not
				ect the USB	communic	ation link.					
		Send form	nat RE	S E T :							
C)2	*RST			LOCAL	REMOTE	TEACH	READ	Y BUS	Y Se	end
		Description	n Restart	the equipm	nent. Sam	e as the Re	start key	on the	front pan	el, but da	bes not
				ect the USB	communic	ation link.					
		Send form	nat 🛛 🗶 🛛 🕅	ST							
Ō)3	RESET_R	ET:		LOCAL	REMOTE	TEACH	READ	Y BUS	Y Send	/Reply
		Description	n Restart	the equipme	nt. "END"	will be returr	ned after t	he resta	rt is comple	eted. Same	e as the
						but does no	t disconne	ect the U	SB commu	inication lii	nk.
		Send form	nat RE	<u>S E T _</u>	R E T	- :					
		No,	1	_							
		Reply form	nat ENI	D							
			1		1			<u> </u>	•		
		No,	ltem	Rep				Descript			
		1	Status	EN	D		Ke	estart cor	nplete		
_											
0)4	SLEEP:			LOCAL	. REMOTE	TEACH	READ	Y BUS	Y Se	end
		_						_			
		Descriptior				turns to slee					
		No,	ealting p	parameters a		ng contents, f	-or details	s on sleep), see (∠4)	Sleep tur	iction .
					1						
		Sond form									
		Send form	nat SL	E E P :	0						
		Send form	nat SL	E E P :	0						
					1			Descript	ion		
		Send form	ltem	Subcom	1			Descript	ion		
				Subcom	1			OFF	ion		
		No,	Item	Subcom	1				ion		
_		No, 1	Item Status	Subcom	1 Imand	DEMOTE	TEACU	OFF ON			
0	05	No,	Item Status	Subcom	1 Imand	. REMOTE	TEACH	OFF ON		Y Send	/Reply
Ō)5	No, 1 SLEEP_RI	Item Status ET:	Subcom O 1	LOCAL			OFF ON READ	Y BUS'		
0	05	No, 1	Item Status ET: n The equ	Subcom O 1	LOCAL	urns to sleep	mode. Re	OFF ON READ	Y BUS' going to sle	eep mode	or after
Ō)5	No, 1 SLEEP_RI	ET: The equireturning	Subcom O 1 ipment enter g. Transfer c	LOCAL rs and retu	urns to sleep performed w	mode. Re hile editin	OFF ON READ	Y BUS' going to sle	eep mode	or after
Ō	05	No, 1 SLEEP_RI Description	ET: The equireturning	Subcom O 1 ipment enter g. Transfer c	LOCAL rs and retu	urns to sleep performed w Sleep functio	mode. Re hile editin	OFF ON READ	Y BUS' going to sle	eep mode	or after
ō	05	No, 1 SLEEP_RI Description	ET: The equireturning For deta	ipment enter g. Transfer c	LOCAL rs and retu annot be see "(24) s	urns to sleep performed w Sleep functio	mode. Re hile editin	OFF ON READ	Y BUS' going to sle	eep mode	or after
ō	05	No, 1 SLEEP_RI Description	ET: The equireturning For deta	Subcom O 1 iipment enter g. Transfer c ails on sleep,	LOCAL rs and retu	urns to sleep performed w Sleep functio	mode. Re hile editin	OFF ON READ	Y BUS' going to sle	eep mode	or after
ō	05	No, 1 SLEEP_RI Description	ET: The equireturning For deta	ipment enter g. Transfer c	LOCAL rs and retu annot be see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ	Y BUS' going to sle	eep mode	or after
ō	05	No, 1 SLEEP_RI Description	ET: The equireturning For deta	ipment enter g. Transfer c	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ	Y BUS" going to ske eters and to	eep mode	or after
ō	95	No, 1 SLEEP_RI Description No, Send form	ET: The equinate of the returning of the second se	Subcom O 1 iipment enter g. Transfer c ails on sleep, E E P _	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame	Y BUS" going to ske eters and to	eep mode	or after
ō)5	No, 1 SLEEP_RI Description No, Send form	ET: The equirer returning For detained	Subcom O 1 iipment enter g. Transfer c iils on sleep, E E P _ Subcom	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame	Y BUS" going to ske eters and to	eep mode	or after
ō	05	No, 1 SLEEP_RI Description No, Send form	ET: The equinate of the returning of the second se	Subcom O 1 iipment enter g. Transfer c iils on sleep, E E P _ Subcom	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame Descript OFF	Y BUS" going to ske eters and to	eep mode	or after
ō	05	No, 1 SLEEP_RI Description No, Send form	ET: The equinate of the returning of the second se	Subcom O 1 iipment enter g. Transfer c iils on sleep, E E P _ Subcom	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame Descript OFF	Y BUS" going to ske eters and to	eep mode	or after
ō)5	No, 1 SLEEP_RI Description No, Send form 1	Item Status ET: n The equ returnin; For deta nat SL Item Control	Subcom O 1 iipment enter g. Transfer c iils on sleep, E E P _ Subcom	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame Descript OFF	Y BUS" going to ske eters and to	eep mode	or after
ō	05	No, 1 SLEEP_RI Description No, Send form 1 No,	Item Status ET: n The equ returnin; For deta nat SL Item Control	Subcom O 1 iipment enter g. Transfer c iils on sleep, E E P _ Subcom	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame Descript OFF	Y BUS" going to ske eters and to	eep mode	or after
ō	95	No, 1 SLEEP_RI Description No, Send form 1 No,	Item Status ET: n The equ returnin; For deta nat SL Item Control	Subcom O 1 iipment enter g. Transfer c iils on sleep, E E P _ Subcom	LOCAL rs and retu see "(24) s	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame Descript OFF	Y BUS" going to ske eters and to	eep mode	or after
ō)5	No, 1 SLEEP_RI Description No, Send form 1 No,	Item Status ET: n The equ returnin; For deta nat SL Item Control	Subcom O 1 iipment enter g. Transfer c iils on sleep, E E P _ Subcom	LOCAL rs and retu cannot be see "(24) : R E 1	urns to sleep performed w Sleep functio 1 - : 0	mode. Re hile editin	OFF ON READ ply after g parame Descript OFF	Y BUS' going to ske eters and to	eep mode	or after
ō)5	No, 1 SLEEP_RI Description No, Send form 1 No, Reply form	Item Status ET: n The equirer returning For deta nat SL Item Control	Subcom O 1 iipment enter g. Transfer c ails on sleep, E E P _ Subcom 0 1	LOCAL rs and retu sannot be see "(24) : R E 1	urns to sleep performed w Sleep functio 1 - : 0	mode, Re hile editin, n".	OFF ON READ oly after g parame Descript OFF ON	Y BUS' going to ske eters and to	eep mode eaching co	or after

1	2 3	4	5	6	(8	9	10	11	12	13	14	15	16
26	SLEEP?					LOCA	AL REM	IOTE	TEACH	I REA	٩DY	BUSY	Send	I/Repl
	Descriptio					e status	. For det	ails on	sleep, se	e (24) Sleep	function	ົ.	
	Send forn	nat	SL	EE	P ?									
	No,		1											
	Reply forr	nat	0											
			1											
	No,		ltem		Repl	Y					ription			
	1		Status		0						ode OF			
					1					Sleep m	node ON	١		
70	MODE:					LOCA	AL REM	IOTE	TEACH	I REA	٩DY	BUSY	Se	end
	Descriptic	'n	Change	the m	node of .	the equ	ipment.							
	No, Send forr	not	MOI	DE	: L	0 C								
	Send for	nat		DIE	R		A L O T E	Ξ						
						EA	CH	-						
	No,		ltem	S	ubcomr	nand				Descr	ription			
					LOCA	L			Swite	ch to L	OCAL r	node		
									C					
	1		Control		REMO				Switc	n to Re	EMOTE	mode		
	1		Control		REMO TEAC	TE					EMOTE EACH r			
	1		Control			TE								
08	1 MODE?		Control			TE H	AL REM	IOTE	Swite	ch to T	EACH r		Send	I/Rep
28	MODE?				TEAC	TE H LOCA			Swite	ch to T	EACH r	node	Send	I/Rep
08	MODE?		Check th		TEAC	TE H LOCA	AL REM		Swite	ch to T	EACH r	node	Send	I/Rep
08	MODE?		Check th		TEAC	TE H LOCA			Swite	ch to T	EACH r	node	Send	I/Rep
<u>78</u>	MODE? Descriptic Send form		Check th		TEAC				Swite	ch to T	EACH r	node	Send	I/Rep
08	MODE? Descriptic Send form No,	nat	Check th M O I		TEAC				Swite	ch to T	EACH r	node	Send	I/Rep
08	MODE? Descriptic Send form	nat	Check th		TEAC	TE H LOCA			Swite	ch to T	EACH r	node	Send	I/Rep
08	MODE? Descriptic Send form No,	nat	Check th M O I		TEAC	TE H LOCA			Swite	ch to T	EACH r	node	Send	I/Rep
08	MODE? Descriptic Send form No,	nat nat	Check th M O I	DE,	TEAC	TE H LOCA			Swite	h to T	EACH r	node	Send	I/Rep
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	DE,	TEAC	TE H LOCA ode of th			Swite	Descr	EACH r	node	Send	I/Rep
800	MODE? Descriptic Send form No, Reply form	nat nat	Check th M O I 1 ***	D E ,	TEAC	TE H LOCA ode of th		ment.	Swite	Descr LOCAL SETUF	iption mode	BUSY		I/Rep
800	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	D E ,	TEAC	TE H LOCA ode of th		ment.	TEACH	Descr LOCAL SETUF mode	ription _ mode ^ mode (From S	BUSY		I/Rep
800	MODE? Descriptic Send form No, Reply form	nat nat	Check th M O I 1 ***	D E ,	TEAC	TE H LOCA ode of th ,2 ne UP M TOP		ment.	Swite TEACH	Descr LOCAL SETUF mode ORMA ⁻	ription ADY _ mode ^ mode (From S TION mode	BUSY BUSY BETUP n ode		I/Rep
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th M O I 1 ***	D E ,	TEAC	TE H LOCA ode of th ,2 ne UP M TO ne	nis equip	PAR4	Swite TEACH	Descr LOCAL SETUF mode ORMAT REMOT	ription ADY mode mode (From S TION mode E mode	BUSY BUSY	node)	
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	D E ,	TEAC	TE H LOCA ode of th de of th de of th D D CMD	nis equip	PAR4	Swite TEACH	Descr Descr LOCAL SETUF mode ORMA REMOT de (Fro	ription - mode - mode - mode From S TION ma E mode m "PRN	BUSY BUSY BETUP n ode	node)	
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th M O I 1 ***	D E ,	TEAC	TE H LOCA ode of th ode of th D D D D D D D D D D D D D D D D D D D	nis equip	PARA	Swite TEACH AMETER INF I TER mo	Descr Descr LOCAL SETUF mode ORMA REMOT de (Fro SETUF	iption ADY mode From S TION m E mode m ⁷ PRM mode	BUSY BUSY GETUP n ode a 1_ON:~ o	node) ommane	
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	D E ,	TEAC	TE H LOCA ode of th ode of th p,2 ne UP M CMD UP	nis equip	PARA	Swite TEACH AMETER INF ITER mo	Descr Descr LOCAL SETUF mode ORMA ^T REMOT de (Fro SETUF mode	Fiption - mode - m	BUSY BUSY SETUP n ode 1_ON: ~ o	node) ommane	
800	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	D E ,	TEAC	TE H LOCA ode of th ode of th ode of th ode ne CMD CMD CMD CMD CMD	nis equip	PARA PARA PARA	Swite TEACH AMETER INF I TER mo AMETER INF	Descr Descr LOCAL SETUF mode ORMAT REMOT de (Fro SETUF mode ORMAT	EACH r ADY ADY iption _ mode P mode (From § TION mode (From § TION mode (From §	BUSY BUSY SETUP n ode 1_ON: ~ o	node) ommani node)	d)
8	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	D E ,	TEAC	LOCA bde of the bde of	nis equip	PARA PARA PARA	Swite TEACH	Descr Descr LOCAL SETUF mode ORMAT REMOT de (Fro SETUF mode ORMAT OG and	EACH r ADY iption mode mode From s TION m From s TION m comma	BUSY BUSY BETUP n ode a A_ON: ~ cu SETUP n ode	node) ommann node) ation) *	d)
800	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	D E ,	TEAC	TE H LOCA ode of th ode of th cone UP M CMD CMD CMD CMD CMD CMD CMD	nis equip	PARA PARA PARA PARA	Swite TEACH AMETER INF INF TER mo AMETER Ode (JC CH mod	Descr LOCAL SETUF mode ORMA REMOT de (Fro SETUF mode ORMA DG and le (I/O	EACH r ADY iption mode mode From S TION m E mode (From S TION m comma port op	BUSY BUSY BUSY ALON: Call BETUP In ode and oper	node) ommann node) ation) *	d)
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th MOI	DE,	TEAC	TE H LOCA ode of th ode of th code ne UP M CMD CMD CMD CMD CMD CMD CMD	nis equip	PARA PARA PARA PARA	Swite TEACH TEACH AMETER INF INF Ode (JC CH mod H edit mod	Descr LOCAL SETUF mode ORMA REMOT de (Fro SETUF mode ORMA de (I/O ode (Fro ode (Fro	EACH r ADY iption mode mode From S TION m E mode (From S TION m comma port op	BUSY BUSY BUSY SETUP n ode 3 1_ON:" co SETUP n ode and oper peration) DN:" com	node) ommann node) ation) *	d)
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th M O I 1 *** No, LOC,	DE,	TEAC	TE H LOCA ode of th ode of th D CAD CMD CMD CMD CMD CMD CMD CMD CMD CMD CM	nis equip	PARA PARA PARA PARA PARA TEACH TEACH	Swite TEACH TEACH AMETER INF INF INF Ode (JC CH moot H edit moot MOV	Descr Descr LOCAL SETUF mode ORMA REMOT de (Fro SETUF mode (Fro or and le (I/O ode (Fro SETUF SETUF	ription ADY ADY iption mode mode (From S TION mode (From S (From S (BUSY BUSY BUSY SETUP n ode M_ON:" of SETUP n ode and oper peration) DN:" com mode	node) ommano node) ation) * * 1 mand)	d)
80	MODE? Descriptic Send form No, Reply form	nat nat	Check th M O I 1 *** No, LOC,	DE,	TEAC	TE H LOCA ode of th ode of th CMD CMD CMD CMD CMD CMD CMD CMD CMD CMD	nis equip	PARA PARA PARA PARA PARA TEACH TEACH	Swite TEACH TEACH AMETER INF I TER mo AMETER Ode (JC CH moc AMETER	Descr LOCAL SETUF mode ORMA REMOT de (Fro SETUF mode (I/O sde (Fro SETUF mode CRMA SETUF mode MENT SETUF	ription ADY ADY iption mode mode (From S TION mode (From S (From S (BUSY BUSY BUSY SETUP n ode M_ON:" of SETUP n ode mode SETUP n SETUP n	node) ommano node) ation) * * 1 mand)	d)

Send	Reply
MODE ?	LOCAL

* Example 2 PARAMETER mode (From "PRM_ON:" command)

Send	Reply
MODE ?	REMOTE, PRMCMD

1	2 3	4 5	6	7	8	9	10	11	12	13	14	15	16
09	F:				LOCA	AL REI	NOTE	TEACH	READ	DY	BUSY	Se	end
	Descriptio	n Char	ige the f	eedback	stage	control ı	nethod.						
	No,		1 2										
	Send forn	nat F :		_									
			21 W										
			VV										
	No,	ltem		Subcomr	nand				Descrip	otion			
				1					First a				
	1	Axis		2 W					Second Both a				
				0					Open 1				
	2	Control		1					Closed				
10	FR:				LOCA	AL REI	NOTE	TEACH	READ	ΟY	BUSY	Send	/Reply
	D					1							
	Descriptio No,	n Get t	ne teedk	back stag	ge cont	rol metr	100.						
	Send forn	nat FF		1									
			1										
			2										
			W	/									
	No,	ltem		Subcomr	nand		Desc	ription		Re	eply form	nat block	k No,
				None	Э	Depe	nds on :	the para Sel″ * 1	ameter		N	one	
	1	Axis		1				t axis				1	
				2			Secor	nd axis				1	
				W			Both	n axis		1∶Fi	rst axis	2 : Secc	nd axis
	* 1 It can b	be checked by [*]	PRIVI_GE	1.GU1 C	commar	nd.							
	No,	1	2										
	Reply forn		0										
		1	1										
	No,	ltem		Reply					Descrip	otion			
				0					Open 1				
	1,2	Status		1					Closed				
11	C:				LOCA	AL REI	NOTE	TEACH	READ	ΟY	BUSY	Se	end
	Descriptio	n Chan	are the c	current m	notor or	voitation	stato						
	No,	in Onai	1 2			Konation	state.						
	Send forn	nat C :											
			2 1										
			W										
	No,	ltem		Subcomr	nand				Descrip	otion			
				1					First a				
	1	Axis		2					Second				
		ļ							Both a				
	2	Control		0					Non-exci				

Excitation

1

1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

1	2	С	R:

LOCAL REMOTE TEACH READY

Send/Reply

Send

Description

Get the current motor excitation status.

1

1 2 W

No,		
Send format	CR	:

No,	ltem	Subcommand	Description	Reply format block No,
	Axis	None	Depends on the parameter	None
1		1	First axis	1
		2	Second axis	1
		W	Both axis	1 : First axis 2 : Second axis

* 1 It can be checked by "PRM_GET: G01" command.

No,	1		2
Reply format	0	,	0
	1		1

	1	,	1		
	ltem	n		Reply	

[No,	ltem	Reply	Description
ſ	1,2	Status	0	Non-excitation
			1	Excitation

13 BEC:

LOCAL REMOTE TEACH READY BUSY

Description

Forcibly completes positioning during operation. Cancel in case of error or emergency stop.

Limit error	
Overflow error	
Teaching command error	
Emergency	
-	

* 2 Command errors are excluded because they are cleared when a normal command is received.

No, Send format



	No,	ltem	Subcommand	Description
Γ	1	Axis	None	Depends on the parameter "AXIS Sel" * 3
			1	First axis
			2	Second axis
			W	Both axis

* 3 It can be checked by "PRM_GET: G01" command.

Command

B

14 CMDR:

1

LOCAL REMOTE TEACH READY BUSY Send/Reply

Last command sent

Description			nand sent other than this command. If a command has not s command, " $*$ " is returned.
Send format	CMD	R :	
No, Reply format	1 ****		
No.	ltem	Benly example	Description

BEC:

1	2	3	4	5	6	(8	9	10	11	12	13	14	15	16
1	5	ECHO:					LOCA	RE	MOTE	TEACH	REA	ADY	BUSY	Se	end
		Descripti	ion	Sat ash		k ofter e	onding	ommo	nd For	details, s	···· "6-'	2 Eabo	book"		
		No,	IOF	Setech	J Dac	k anter s	enaing c	COMINA	aria. For	details, s	see 0-,	S. ECHC	DDACK .		
		Send for	mat	EC	HO										
						1									
		No,		ltem		Subcomr	mand					ription			
		1		Control	_	0					Echo ba Echo b				
						I						ack Or	N		
- 1	6	ECHOR:					I OCA	RE	MOTE	TEACH	BE	ADY	BUSY	Send	/Reply
1	10	LONON	•				LUUA			ILAUI			DUST	Seria	Teply
		Descripti	ion	Get ech	o bac	k setting	s status.								
		Send for	mat	EC	ΗO	R :]								
		No,		1											
		Reply for	rmat	0											
		No,		Item		Repl	у				Desci	ription			
		1		Status		0					Echo ba				
						1					Echo b	ack ON	١		
(2)10	fonation													
	$\frac{2}{10}$	fomation	1 COIT	imanos						TEACH					
I	(*IDN?					LUCA		IVIOTE	IEACF	1 KEA	AD Y	BUSY	Sena	/Reply
		Descripti	ion	Get equ	ipmer	nt inform	nation.								
		Send for	mat	*	DN	?									
		No,		1	-	2	3		4	5					
		Reply for	rmat	****	, *	*** ,	****	, **	*** ,	****					
		No,		ltem	F	Reply exa	ample				Desci	ription			
		1				SIGMA k						r name)		
		2				FC-1					Mode	l name			
		3	li	nformation		0000					Serial N				
		4				00.0					uipmer				
		5				00.00	00			Fi	irmwar	e Versi	on		
_									MOTE	TEAOL					
1	8	VENDO	K.				LOCA	L KE	IVIOTE	TEACH	REA	ADY	BUSY	Send	/Reply
		Descripti	ion	Get the	vend	or name	of this e	auipm	hent						
		Send for		VE		OR									
		No,		1											
		Reply for	rmat	****											
		No,		ltem		Reply exa					Desci	ription			
		1	li	nformation		SIGMA k						r name)		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
19	9	MODEL:					LOCA	REN	NOTE	TEACH	REA	DY	BUSY	Send	/Reply
		Descriptio	n	Get the N	lodel	name o	of this ea	quipmer	nt.						
		Send form	nat	MOD) E	L:									
		No,		1											
		Reply form	nat	****											
		No,		Item		Repl	у				Descri	ption			
						FC-1	11								
						FC-4	11								
		1	Info	ormation		FC-5	11				Model	name			
						FC-6	11								
						FC-9	11								
20	0	SN:					LOCA	BEN	IOTE	TEACH	REA	JDY	BUSY	Send	Reply
	0						200/1				110		2001	00110	
		Descriptio	n	Get the S	Serial I	Numbe	r name o	of this e	equipme	ent.					
		Send form		SN:	_										
				9											
		No,		1											
		Reply form	nat	****											
		No,		Item	Re	eply exa	ample				Descri	ption			
		1	Info	ormation		0000					Serial N		-		
		L	•												
2	1	EN:					LOCA	BEN	NOTE	TEACH	REA		BUSY	Send	/Reply
~	1						LUUA			I LAUH			DOOT	OCHO,	TOPI
		Descriptio	n	Get the E		ment N	umber o	f this ea	quinme	nt					
		Send form							quipino						
			lat												
		No,		1											
		Reply form	nat	****											
			iat												
		No,		Item	Re	eply exa	ample				Descri	iption			
		1	Info	ormation		00.0				Ea	uipmen		oer		
			1			00.0									
	0									TEAOU				Const	/Devel:
22	<	FV:					LUCA		NUTE	TEACH	REA	Uĭ	BUSY	Send	/Reply
		Descriptio	n	Cot the F	irrow	oroV/c	roion of t	bio or:	inmort	F					
				Get the F		are ver	SION OF L	nis equ	lipment	L.					
		Send form	idl	FV:											
		NI													
		No, Davalu farm		1											
		Reply form	nat	****											
		NIa	1	ltom							Deser	ntice			
		No,		Item	Re	eply exa					Descri				
		1	Into	ormation		00.00	JU			Fi	rmware	versio	on		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
_	2								IOTE				DUCV	Carad	/Develue
2	3	RESO:					LOCAL		IOTE	TEACH	REA	Dĭ	BUSY	Sena	/Reply
		Descriptio	n	Get the M	<i>A</i> inin	num reso	olution of	this ec	quipme	nt.					
		No,				1									
		Send form	nat	RES	8 0										
						2									
						W									
		No,	1	ltem		Subcomn	nand		Dosc	rintion		P	eply form		
		1.10,						Description Depends on the parameter			Imeter				< τ NO,
						None	9			Sel ["] * 1				one	
		1		Axis	_	1				st axis Ind axis				1 1	
						 W				h axis		1 : Fii	rst axis		nd axis
		* 1 It can b	be che	cked by "PRN	/_GE	T: G01″ c	command								
						2									
		No, Reply forr	nat	1	_	2 ***									
			- loce	,											
		No,		ltem		Reply		Description							
					_	100 50									
		1,2		Status		10				Mir	nimum r		on		
						5					(unit:	nm)			
						1									
_										75401					<u>/p_1</u>
.2	4	LIMR: LOCAL REMOTE TEACH READY BUSY Send/F									/Reply				
		Description Get the stage stroke, It is necessary to execute the "LIMG:" command in advance, If the "LIMG:" command has not been executed, "*" is returned. No, Send format										e. If the			
				2											
						W									
		No,		ltem		Subcomn	nand		Desc	cription		Re	ply form	at block	k No,
						None		Deper		the para Sel″ * 2	Imeter			one	
		1		Axis		1				st axis				1	
						2				nd axis				1	
						W			Bot	h axis		1 : Fi	rst axis	2 : Secc	ond axis
		*∠it can r	be che	cked by "PRN	/I_GE	GUIC	command	•							
		No,		1		2									
		Reply form	nat	**** ,		***									
		No,		ltem	F	Reply exa	mple				Descri	ption			
		1,2		Stage	1	200000					Stro				
			_	nformation				F F 0							
		* J The mi	Inimum	n digit is the n	ninim	um resolu	ition digit	. ⊢or ⊢C	-111, it	. is 20,00	JUmm.				

|--|

25	AN:

LOCAL REMOTE TEACH READY BUSY Send/Reply

Description	Get the axis name.
No,	1
Send format	AN:
	1
	2
	W

No,	ltem	Subcommand	Description	Reply format block No,
		None	Depends on the parameter	None
1	Axis	1	First axis	1
		2	Second axis	1
		W	Both axis	1 : First axis 2 : Second axis

* 1 It can be checked by "PRM_GET: G01" command.

2 *

No, Reply format

1 *

No,	Reply example	Description
1	×	First axis name
2	Y	Second axis name

26 UNT:

Description	Get the unit.
No,	1
Send format	U N T :
	1
	2
	W

	LOCAL	REMOTE	TEACH	READY	BUSY	Send/Reply
Get the unit.						
1						
U N T :						
1						
2						
W						

No,	ltem	Subcommand	Description	Reply format block No,
		None	Depends on the parameter	None
1	Axis	1	First axis	1
		2	Second axis	1
		W	Both axis	1 : First axis 2 : Second axis

* 2 It can be checked by "PRM_GET: G01" command.

No, Reply format

1		2
*	,	*

No,	ltem	Reply	Description
		N	Nanometer
	1,2 Unit	U	Micrometer
1,2		Unit M	Millimeter
		D	Degree
		Р	No unit (minimum digit is minimum resolution digit)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	
----------------------------------------	--

(3) Motion status Information commands

Q

```
27
```

Q:

LOCAL REMOTE TEACH READY BUSY Send/Reply

Description

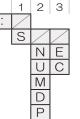
Get the coordinate values, the error, motion, and positioning status.

There are two types of reply format, and it choose by block number 1 of the send format. Reply format 1 is conventional.

Reply format 2 can choose the type and unit of coordinate value.

Also, it is possible to check the positioning status of each axis and all errors that occurre.

No, Send format

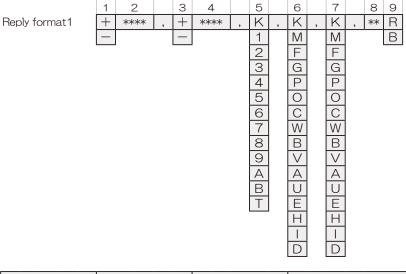


* 1 If there is "No," to be set to "None", pad the specified No, additional command to the left. However, when No,1 is "None", No,2 and No,3 cannot be selected.

No,	ltem	Subcommand	Description
1	Paply format	None	Format1
*1	Reply format	S	Format2
		None	Reply in the unit set in parameter "UNIT Sel" * 2
	2 * 1 Unit	Ν	Nanometer
2		U	Micrometer
*1		Μ	Millimeter
		D	Degree
		Р	No unit (minimum digit is minimum resolution digit)
		None	Reply with the value set in the parameter "Count Sel" * 3
3	Coordinate value type	E	Encoder values
	UDE	С	Command values

 \ast 2 Can be confirmed with the reply by Command "PRM_GET: A03" or "PRM_GET: A04" .

 \ast 3 Can be confirmed with the reply by Command "PRM_GET: G15" or "PRM_GET: G16" .



No,	ltem	Reply	Description
1 (First axis)	Cierre	+	Plus
3 (Second axis)	Sign	_	Minus
2 (First axis)	Coordinate	00000001 * 4	Coordinate value
4 (Second axis)	value	0000001*4	Coordinate value

* 4 The response content is an example. In the case of FC-111, it represents 100nm.

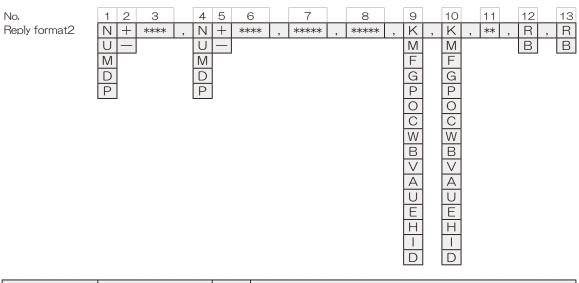
4	0		4	5	\sim	_	0	\cap	10	 10	10	4.4		4.0
	2	J	4	5	6	(8	9	10	12	13	14	15	16

No,	ltem	Reply	Description
		K	Normal (No error)
5		1	Command error
		2	Scale error
		3	Limit stop
		4	Over speed error
		5	Overflow error
	Status (Error)	6	Emergency stop
		7	Interpolator error
		8	Limit error
		9	System error
		А	Slowdown sensor area
		В	Software Limit stop
		Т	TEACHING command error
6 (First axis)	Status (Motion)	K	Normal stop
		M	During command move
		F	Out of the in-position range (After positioning is completed) $* 1$
		G	During fine adjustment * 2, * 3
		Р	During electrical origin return
		0	During mechanical origin return
		С	CW side limit stop
		W	CCW side limit stop
7 (Second axis)		В	CW side software limit stop
		\vee	CCW side software limit stop
		А	CW side slowdown sensor area
		U	CCW side slowdown sensor area
		E	Error occurred
		Н	Motor is transitioning to excitation
		I	Motor is transitioning to non-excitation
		D	Disabled axis (Not set by parameter "AXIS Sel")
8	System reservation	0000	System reservation
9	Status	R	All axes have been positioned and no errors have occurred, * 1
5	(Positioning)	В	Positioning of all axes is incomplete or an error has occurred. * 2

* 1 All operations are accepted. (This state is READY)

* 2 Refusing operation related to the move of the stage. (This state is BUSY)

* 3 It can be READY state by "BEC:" command.



No,	ltem	Reply	Description
		N	Nanometer
		U	Micrometer
1 (First axis) 2 (Second axis)	Unit	Μ	Millimeter
		D	Degree
		Р	No unit (minimum digit is minimum resolution digit)
2 (First axis)	Sign	+	Plus
5 (Second axis)		—	Minus



No,	Item	Reply		Description				
3 (First axis) 6 (Second axis)	Coordinate value	****		Depends on the instruction unit, * 4				
			Bit	Reply: 1	Reply: O			
			1 (MSB)	Normal	Error occurred			
			2	Command error	No occurred			
			3	Scale error	No occurred			
			4	Limit stop	Other			
			5	Over speed error	No occurred			
7 (First axis)	Status	1,0	6	Overflow error	No occurred			
8 (Second axis)	(Error)	1,0	7	Emergency stop	No occurred			
			8	Interpolator error	No occurred			
			9	Limit error	No occurred			
			10	System error	No occurred			
			11	Slowdown sensor area	Other			
			12	Software limit stop	Other			
			13 (LSB)	TEACHING command error	No occurred			
	Status (Motion)	K	Normal stop					
		M		During command me	ove			
		F	Out of the	in-position range (After positio	oning is completed) * 1			
		G		During fine adjustment, * 2, * 3				
		Р		During electrical origin return				
		0		During mechanical origin	return			
		С		CW side limit stop)			
9 (First axis)		W	CCW side limit stop					
10 (Second axis)		В	CW side software limit stop					
		\vee	CCW side software limit stop					
		A	CW side slowdown sensor area					
		U		CCW side slowdown sens	sor area			
		E	Error occurred					
		Н		Motor is transitioning to excitation				
				Motor is transitioning to nor				
		D	Disabled axis (Not set by parameter "AXIS Sel")					
11	System reservation	0000		System reservation				
12 (First axis)	Status	R		we been positioned and no err				
13 (Second axis)	(Positioning)	В	Positioning	of all axes is incomplete or an	error has occurred. * 2			

* 1 All operations are accepted. (This state is READY)

* 2 Refusing operation related to the move of the stage. (This state is BUSY)

* 3 It can be READY state by "BEC:" command.

* 4 Example 1 : When the coordinate value is 12.3456mm. (use FC-111)

Unit	Reply coordinate value
nm	12345600
um	12345.6
mm	12.3456
None	123456

 $*\,4$ Example 2 : When the coordinate value is 1.23456 $^\circ$. (use FC-511)

Unit	Reply coordinate value
Degree	1,23456
None	123456

Example : First axis is stopped at -12,345678mm, and the unit is nm. The second axes are operating at a position of 0,123456 mm, and the unit is μ m. (use FC-911)

Send	Reply
Q:	-12345678,+00123456,K,K,M,0000,B
Q:S % 5	N-12345678,U+123.456,1000000000000,10000000000,K,M,0000,R,B
Q:SM * 5	M-12,345678,M+0,123456,1000000000000,10000000000,K,M,0000,R,B
Q:SE % 5	N-12345678,U+123.456,1000000000000,10000000000,K,M,0000,R,B
Q:SUC * 5	U-12345.678,U+123.456,100000000000,10000000000,K,M,0000,R,B

*5 The number of digits of the coordinate value varies depending on the unit.



28 SRQ:

LOCAL REMOTE TEACH READY BUSY Send/Reply

Description

Get the status. Select Reply format in block No. 1 of Send format. Reply format1 can acquire the conventional method, and Reply format2 can acquire the positioning status and error status for each axis.

No, Send format

No,	ltem	Subcommand	Description
	Developferment	None	Format1
	1 Reply format	S	Format2

No,	1		2		З		4		5
Reply format1	Κ	,	K	,	Κ	,	**	,	R
	1		M F		M				В
	З		G		G				
	4		Ρ		Ρ				
	5		0		0				
	6		С		С				
	7		W		W				
	8		В		В				
	9		\vee		\vee				
	Α		Α		А				
	В		U		U				
	Т		E		Ε				
			Η		Н				
			Ι						
			D		D				

No,	ltem	Reply	Description
		K	Normal (No error)
		1	Command error
		2	Scale error
		3	Limit stop
		4	Over speed error
		5	Overflow error
1	Status (Error)	6	Emergency stop
		7	Interpolator error
		8	Limit error
		9	System error
		A	Slowdown sensor area
		В	Software Limit stop
		Т	TEACHING command error
		K	Normal stop
		M	During command move
		F	Out of the in-position range (After positioning is completed) * 1
		G	During fine adjustment. * 2, * 3
		Р	During electrical origin return
		0	During mechanical origin return
		С	CW side limit stop
2 (First axis)	Status	W	CCW side limit stop
3 (Second axis)	(Motion)	В	CW side software limit stop
		\vee	CCW side software limit stop
		A	CW side slowdown sensor area
		U	CCW side slowdown sensor area
		E	Error occurred
		н	Motor is transitioning to excitation
			Motor is transitioning to non-excitation
		D	Disabled axis (Not set by parameter "AXIS Sel")
4	System reservation	0000	System reservation

* 1 All operations are accepted. (This state is READY)

* 2 Refusing operation related to the move of the stage. (This state is BUSY)

	N		1	ltem		Renly				Decer				
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

No,	Item	Reply	Description
5	Status	R	All axes have been positioned and no errors have occurred. * 1
	(Positioning)	В	Positioning of all axes is incomplete or an error has occurred. * 2
No,	1 2	3	4 5 6 7
Reply format2	***** , ***** ,	K ,	K , ** , R , R
		M	M B B
		F	F
		G	G
		Ρ	P
		0	0
		С	С
		W	W
		В	В
		\vee	V
		A	A
		U	U
		E	E
		Н	Н
		D	D

No,	Item	Reply		Description						
			Bit	Reply: 1	Reply: O					
			1 (MSB)	Normal	Error occurred					
			2	Command error	No occurred					
			3	Scale error	No occurred					
			4	Limit stop	Other					
			5	Over speed error	No occurred					
1 (First axis)	Status	1 0	6	Overflow error	No occurred					
1 (First axis) 2 (Second axis) 3 (First axis)	(Error)	1,0	7	Emergency stop	No occurred					
			8	Interpolator error	No occurred					
		Bit Reply: 1 Reply: 0 1 (MSB) Normal Error occurred 2 Command error No occurred 3 Scale error No occurred 4 Limit stop Other 5 Over speed error No occurred 6 Overflow error No occurred 7 Emergency stop No occurred 9 Limit error No occurred 10 System error No occurred 11 Slowdown sensor area Other 12 Software limit stop Other 13 LSB) TEACHING command error No occurred M During command move F Out of the in-position range (After positioning is completed) * 1 G During fine adjustment. * 2, * 3 P P During mechanical origin return O During mechanical origin return C CW side software limit stop W CCW side software limit stop V CCW side slowdown sensor area U <								
2 (Second axis)			10	System error	No occurred					
			11	Slowdown sensor area	Other					
			12	Software limit stop	Other					
			13 (LSB)	TEACHING command error	No occurred					
		K	Normal stop							
		M	During command move							
		F								
			During fine adjustment, * 2, * 3							
		P		During electrical origin	return					
		0		During mechanical origin	n return					
1 (First axis) Status (Error) 1,0 3 4 5 6 7 8 9 10 11 12 13 1.0 11 12 13 1.0 11 12 13 1.0 11 12 13 1.0 11 12 13 1.0 11 12 13 1.0 11 12 13 1.0 1 1 12 13 1.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CW side limit stop)								
3 (First axis)	Status	W		CCW side limit sto	Reply 1Reply 0NormalError occurredCommand errorNo occurredScale errorNo occurredLimit stopOtherOver speed errorNo occurredEmergency stopNo occurredInterpolator errorNo occurredLimit errorNo occurredSystem errorNo occurredSystem errorNo occurredSystem errorNo occurredSystem errorNo occurredSystem errorNo occurredDuring command errorNo occurredNormal stopDuring command moveDuring fine adjustment. * 2, * 3During electrical origin returnCW side limit stopCCW side limit stopCCW side limit stopCCW side software limit stopCW side slowdown sensor areaError occurredlotor is transitioning to excitationaxis (Not set by parameter "AXIS Sel")System reservation					
4 (Second axis)	(Motion)	В		CW side software limit						
		\vee		CCW side software limi	t stop					
		A		CW side slowdown sens	or area					
				CCW side slowdown sen	sor area					
		E		Error occurred						
		Н		Motor is transitioning to e	excitation					
		· · · · · · · · · · · · · · · · · · ·								
			Disa	abled axis (Not set by parame	eter "AXIS Sel")					
5	System reservation			System reservation	n					
			All axes ha	ave been positioned and no err	rors have occurred. * 1					
7 (Second axis)	(Positioning)	В	Positioning	of all axes is incomplete or an	error has occurred. * 2					

* 1 All operations are accepted. (This state is READY)

* 2 Refusing operation related to the move of the stage. (This state is BUSY)

* 3 It can be READY state by "BEC:" command.

Example: When axis 1 is stopped and axis 2 is operating.

Send	Reply
SRQ:	K,K,M,0000,B
SRQ:S	100000000000,10000000000,K,M,0000,R,B

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

20	D.
/9	. г.

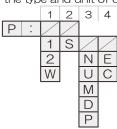
LOCAL REMOTE TEACH READY BUSY Send/Reply

Description

Get the coordinate values. There are two types of reply format, and it choose by block number 2 of the send format. Reply format 1 is conventional. Reply format 2 can choose the type and unit of coordinate value.

Send format

No,



* 1 If there is "No," to be set to "None", pad the specified No, additional command to the left. However, when No,2 is "None", No,3 and No,4 cannot be selected.

No,	ltem	Subcommand	Description	Reply format block No,
		None	Depends on the parameter "AXIS Sel" * 2	None
		1	First axis	1,2 (Reply format1)
		2	Second axis	1,2,3 (Reply format2)
1 ※1	Axis	W	Both axis	1,2: First axis 3,4: Second axis (Reply format1) 1,2,3: First axis 4,5,6: Second axis (Reply format2)
2	Reply	None	Format1	_
<u>* 1</u>	format	S	Format2	
		None	Reply in the unit set in parameter "UNIT Sel" * 3	
		N	Nanometer	
3	Unit	U	Micrometer	_
※ 1	Offic	Μ	Millimeter	
		D	Degree	
		Р	No unit (minimum digit is minimum resolution digit)	
4	Coordinate	None		
× 1	value type	E	Encoder values	-
		С	Command values	

* 2 It can be checked by "PRM_GET: G01" command.

 \ast 3 Can be confirmed with the reply by Command "PRM_GET: A03" or "PRM_GET: A04" .

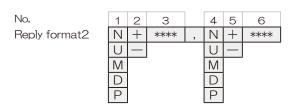
* 4 Can be confirmed with the reply by Command "PRM_GET: G15" or "PRM_GET: G16" .

 No,
 1
 2
 3
 4

 Reply format1
 + ****
 + ****
 + ****

	No,	ltem	Reply Description						
ſ	1 0		+	Plus					
	1,3	Sign	_	Minus					
ſ	2.4	Coordinate value	00000001 * 5	Coordinate value					

* 5 Contents are examples. For FC-511, it represents 10nm.



No,	ltem	Reply	Description						
		N	Nanometer						
	1,4 Unit	U	Micrometer						
1,4		Μ	Millimeter						
		D	Degree						
		Р	No unit (minimum digit is minimum resolution digit)						

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

No,	Item	Reply	Description					
2,5 Sign		+	Plus					
2,5	JIGU	_	Minus					
3,6	Coordinate value	****	Varies by unit * 1					

* 1 Example 1 : When the coordinate value is 12.3456mm. (use FC-111)

Reply coordinate value
12345600
12345.6
12.3456
123456

* 1 Example 2 : When the coordinate value is 1.23456 $^{\circ}$. (use FC-511)

Unit	Reply coordinate value
Degree	1.23456
None	123456

Example : First axis is stopped at -12,345678mm, and the unit is nm. The second axes are operating at a position of 0.123456 mm, and the unit is μ m. (use FC-911)

Send	Reply
P:	-12345678,+00123456
P:S *2	N-12345678,U+123,456
P:1S	N-12345678
P:2S	U+123.456
P:WSN *2	N-12345678,N+123456

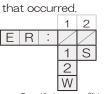
* 2 The number of digits of the coordinate value varies depending on the unit.

30 ER:

Description

No,

Send format



* 3 If there is "No," to be set to "None", pad the specified No, additional command to the left. However, when No,1 is "None", No,2 cannot be selected.

LOCAL REMOTE TEACH READY

Get the error status. There are two types of reply format, and it choose by block number 1 of the send format, Reply format 1 is conventional. Reply format 2 can check all errors

BUSY

Send/Reply

No,	Item	Subcommand	Description	Reply format2 block No,		
		None	Depends on the parameter "AXIS Sel" * 4	None		
1	Axis	1	First axis	1		
*3	AXIS	2	Second axis	1		
		W	Both axis	1: First axis 2: Second axis		
2 * 3	Reply format	None	Format1			
*3	neply tormat	S	Format2	-		

* 4 It can be checked by "PRM_GET: G01" command.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	No Re	o, eply forn	nat1	1 K 1 2 3 4 5 6 7 8 9 A B T											

No,	ltem	Reply	Description
		K	Normal (No error)
		1	Command error
		2	Scale error
		3	Limit stop
		4	Over speed error
		5	Overflow error
1	Status (Error)	6	Emergency stop
		7	Interpolator error
		8	Limit error
		9	System error
		Α	Slowdown sensor area
		В	Software Limit stop
		Т	TEACHING command error

No, Reply format2 1 2 ***** , *****

No,	ltem	Reply		Description	
			Bit	Reply: 1	Reply: O
			1 (MSB)	Normal	Error occurred
			2	Command error	No occurred
			3	Scale error	No occurred
			4	Limit stop	Other
			5	Over speed error	No occurred
1,2	Status		6	Overflow error	No occurred
,∠	(Error)	1,0	7	Emergency stop	No occurred
			8	Interpolator error	No occurred
			9	Limit error	No occurred
			10	System error	No occurred
			11	Slowdown sensor area	Other
			12	Software limit stop	Other
			13 (LSB)	TEACHING command error	No occurred

Example: Both axes are normal

Send	Reply
ER:	К
ER:S	10000000000,1000000000



31 STS:

No,

No,

LOCAL REMOTE TEACH READY BUSY Send/Reply

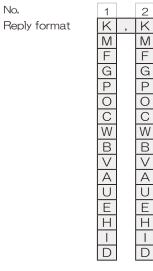
Description Get the motion status. STS Send format

No,	ltem	Subcommand	Description	Reply format block No,		
		None	Depends on the parameter "AXIS Sel" * 1	None		
	Axis -	1	First axis	1		
		2	Second axis	I		
		W	Both axis	1: First axis 2: Second axis		

* 1 It can be checked by "PRM_GET: G01" command.

1

1 2 W



No,	ltem	Reply	Description
		K	Normal stop
		M	During command move
		F	Out of the in-position range (After positioning is completed) * 2
		G	During fine adjustment, * 3, * 4
		Р	During electrical origin return
		0	During mechanical origin return
		С	CW side limit stop
1 (First axis)	Status	W	CCW side limit stop
2 (Second axis)	(Motion)	В	CW side software limit stop
		V	CCW side software limit stop
		A	CW side slowdown sensor area
		U	CCW side slowdown sensor area
		E	Error occurred
		Н	Motor is transitioning to excitation
		1	Motor is transitioning to non-excitation
		D	Disabled axis (Not set by parameter "AXIS Sel")

* 2 All operations are accepted. (This state is READY)

* 3 Refusing operation related to the move of the stage. (This state is BUSY)

* 4 It can be READY state by "BEC:" command.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
--	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

32 1:

LOCAL REMOTE TEACH READY BUSY Send/Reply

Description

Get the positioning status. There are two types of reply format, and it choose by block number 1 of the send format. Reply format 1 is conventional. Reply format 2 can check the positioning status of each axis.

No, Send format

1 2 1 2 W S

1

 * 1 If there is "No," to be set to "None", pad the specified No, additional command to the left. However, when No,1 is "None", No,2 cannot be selected.

No,	Item	Subcommand	Description	Reply format block No,		
		None	Depends on the parameter "AXIS Sel" * 2	None		
1	Axis	1	First axis	1		
* 1	AXIS	2	Second axis	I		
		W	Both axis	1: First axis 2: Second axis		
2	Reply format	None	Format1			
*1	neply Iomat	S	Format2	-		

* 2 It can be checked by "PRM_GET: G01" command.

1 R

В



No,	ltem	Reply	Description
1	Status	R	All axes have been positioned and no errors have occurred. * 3
	(Positioning)	В	Positioning of all axes is incomplete or an error has occurred. * 4

No, Reply format2

1 2 R , R B B

No,	ltem	Reply	Description
1, 2	Status	R	All axes have been positioned and no errors have occurred. * 3
	(Positioning)	В	Positioning of all axes is incomplete or an error has occurred. * 4

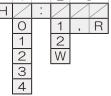
* 3 All operations are accepted. (This state is READY)

* 4 Refusing operation related to the move of the stage. (This state is BUSY)

Example: When axis 1 is stopped and axis 2 is operating.

Send	Reply
!:	В
!:S	R,B
!:1S	R
!:WS	R,B

				_											
1	2	3	4	5	6	(8	9	10	11	12	13	14	15	16
(4	(4)Commands related to the origin														
З	з н	:					LOCA	REN	10TE	TEACH	I REA	ΔY	BUSY	Se	end
	Description Performs machine home position return. For details, see "9. Home Return". When the axis to be executed is non-excitation, the command error occurs. If ", R" is specified at the end of the command, a positioning completion reply is sent for each axis.														
No, 1 2 3															
	Se	end forr	nat	H		R									



* 1 If there is a number to be set to "None", pad the additional command with the specified number to the left.

No,	Item	Subcommand	Description					
		None	Depends on the parameter "ORG Mode Sel" * 2					
		0	ModeO					
1		1	Mode1					
*1	Mode	2	Mode2					
		3	Mode3					
		4	Mode4					
		None	Depends on the parameter "AXIS Sel" * 3					
2	Axis	1	First axis					
*1	Axis	2	Second axis					
		W	Both axis					
2	Reply request	None	Do not request a reply					
3 * 1		,R	After positioning is complete, return "1" for the first axis and "2" for the second axis.					

* 2 Can be confirmed with the reply by Command "PRM_GET: A30" or "PRM_GET: A31" .

* 3 It can be checked by "PRM_GET: G01" command.

34	Z:	LOCAL	REMOTE	TEACH	READY	BUSY	Send

Description

No,

Perform electrical home return. For details, see "9. Home Return". When the axis to be executed is non-excitation, the command error occurs. If ", R" is specified at the end of the command, a positioning completion reply is sent for each axis.

Send format



%4 If there is a number to be set to "None", pad the additional command with the specified number to the left.

No,	Item	Subcommand	Description						
		None	Depends on the parameter "AXIS Sel" * 5						
1	Auria	1	First axis						
* 4	Axis	2	Second axis						
		W	Both axis						
2		None	Do not request a reply						
2 * 4	Reply request	,R	After positioning is complete, return "1" for the first axis and "2" for the second axis.						

* 5 It can be checked by "PRM_GET: GO1" command.

	Į į	l				J			ļ.				
1	2 3	4 5	6 7	8 9	10	11 12	13	14	15	16			
35	R:	R: LOCAL REMOTE TEACH READY BUSY Send											
	Descriptio	Description Executes the electrical origin setting (zero set). For details, see "9. If the motor is in the											
			netized state, a										
	No,	execut											
	Send form	nat R :	1										
			1										
			2										
			W										
	Nia	Itana			Description								
	No,	ltem	Subcommand None		Depends	Descrip on the param		<u>S Sel″ * 1</u>	1				
			1		Depends (First a			1				
	1	Axis	2			Second							
			W			Both a	xis						
	* 1 lt can b	be checked by "P	RM_GET: GO1″ d	command.									
36	LIMG:			LOCAL RE	EMOTE	FEACH RE	EADY	BUSY	Se	end			
	Descriptio	Evenut	too the stage	atralia dataati	op operat	ion This ve		a abtai	and by				
	Descriptio		tes the stage s and. When the										
			",R" is added to										
	N L-	comple	eted.	-									
	No, Send form		1 M G :	2									
				, R									
			2	, , , , , , , , , , , , , , , , , , , ,									
			W										
		*2	If there is a num number to the 1		o "None", p	pad the additi	onal comr	nand with	n the spe	ecified			
	No,	Item	Subcommand			Descrip	tion						
			None		Depends o	on the param	eter ″AXIS	S Sel″ * 3	3				
	1	Axis	1			First a							
	*2		2	Second axis Both axis									
			W None		Г	Do not reque		,					
	2	Reply request				er positioning							
	<u>↑</u> ∠		,R		"1" for the	e first axis ar	id "2" for	the seco	ond axis	3.			
	* 3 lt can b	* 3 It can be checked by "PRM_GET: G01" command.											
(5)(Commonde	Commands related to the motion											
$\frac{(3)}{37}$	L:			LOCAL RE	EMOTE	EACH RE	EADY	BUSY	C	end			
31	L.			LUUAL H		LAUT he		1600	36	1 IU			
	Descriptio	n Execut	e stop and em	ergency stop.									
	No,		1										
	Send form	nat <u>L</u> :	\square										
			1										
			2										
	No,	ltem	Subcommand			Descrip							
			None		Depends o	on the param	eter ["] AXIS	5 Sel″ * 4	1				
	1	1	1 4			Eirot o	vio						

			First axis
1	Axis	2	Second axis
		W	Both axis
		E	Emergency stop ¥5
		DIA OFTI OO //	

* 4 It can be checked by "PRM_GET: G01" command.

 \ast 5 Can be canceled with Command "BEC:" .

	_												
1 2 3	4	<u> </u>	\sim		0	\cap	10	11	10	10	1 1	15	10
	4	5	n	(- A	9				1.5	14		0
		\cup	<u> </u>		<u> </u>	<u> </u>	10		12	10		10	10

1 2	2 3	4 5	6 7	8 9	10 1	1 12	13	14	15	16	
38	ACC:			LOCAL REM	IOTE TEA	ACH RE	ADY	BUSY	Se	nd	
	Description	restar withou	ed, or the GEN ut setting of th	/ deceleration t IERAL paramete is value, execu er "Acc Time" is	er is change ting the "A	ed, the set , "M:" or	: conten [.] ″JG:″ co	ts are dis ommands	carded s, the	l. When setting	
	No, Send form	The se A18	etting value of t and ⁷ PRM_GET 1 2 C : 1 2 W	A parameter "A : A19" comman 3 4 **** , ***	cked by [.]	the reply	of "PRN	M_GET			
	No,	ltem	Subcommand	D	escription		Se	end forma	at block	: No,	
	1	Axis	1 2	Se		3					
			W	E	Both axis		3: Fi	rst axis 4	: Secon	nd axis	
	2	Space	Space sign		Space		-	-			
	3	Time	*** ***		n millisecon D ~ 2000)		-				
39	ACCR: Description No, Send form		res the set acce 1 C R : 1 2 W	LOCAL REM	IOTE TEA		ADY	BUSY	Send/	Reply	
	No,	ltem	Subcommand		escription			eply forma	at block	No,	
			None	Depends on the	parameter [*]	´AXIS Sel´´ *	< 1	No	ne		
	1	Axis	1 2		First axis			1			
			W	E	Both axis		1: Fi	1: First axis 2: Second axis			
	* 1 lt can b	e checked by "F	RM_GET: GO1″ (command.			~				

No, 2 1 Reply format *** *** ,

No),	ltem	Reply example	Description
1,	2	Time	100	In this case is100 ms.

40 D:

LOCAL REMOTE TEACH READY BUSY Send

Description

Set the movement speed of the stage. However, when the power is turned off, RESET,

restart or the GENERAL parameter is changed, this value will be lost. When without setting of this value, executing the "A:", "M:" or "JG:" commands, the setting value of the parameter "Max Speed" is applied for the movement speed. The setting value of the parameter "Max Speed" can be checked by the reply of "PRM_GET: GO2" and "PRM_GET: GO3" command.

No, Send format

		1	2	З	4	5
D	:	1	F	****	F	****
		2	Ρ		Ρ	
		W	Ζ		Ζ	
			U		U	
			Μ		Μ	
			D		D	

No,	ltem	Subcommand	Description	Send format block No,			
		1	First axis	2			
1	Axis	2	Second axis	3			
		W	Both axis	3: First axis 4: Second axis			
		F, P	No unit / secon	d * 1			
		N	Nanometer / sec				
2, 4	Unit	U	Micrometer / sec				
		M	Millimeter / se	ec			
		D	Degree / se	C			
3, 5	Speed	****	The setting speed is from the mir	nimum resolution / sec			
3, 3	Speed	-111	to the parameter "Max Speed". * 2				

* 1 The minimum digit of the operation speed is the digit of the minimum resolution.

 \ast 2 Example: Operating speed setting (when FC-111 is used and 12.3456 mm / sec)

Unit	Speed
No unit / sec	123456
nm/sec	12345600
µm/sec	12345.6
mm/sec	12.3456

Example: First axis side operation speed is 12.34567mm / sec, second axis side operation speed is $500 \,\mu$ m / sec, and when no unit is specified for both axes. (When using FC-511)

Axis	Command
First axis only	D:1F1234567
Second axis only	D:2F50000
Both axis	D:WF1234567F50000

Example: When the First axis side operation speed is 1.234567mm / sec and Millimeter is specified, and the second axis side operation speed is $500 \,\mu$ m / sec and Micrometer is specified. (When using FC-911)

Axis	Command
First axis only	D:1M1.234567
Second axis only	D:2U500
Both axis	D:WM1,234567U500

1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16	
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	--

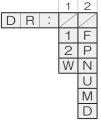
41 DR:

LOCAL REMOTE TEACH READY BUSY Send/Reply

Description

No, Send format

Acquires the set operation speed.



* 1 If there is a number to be set to "None", pad the additional command with the specified number to the left.

No,	ltem	Subcommand	Description	Reply format block No,				
		None	Depends on the parameter "AXIS Sel" * 2	None				
1	Axis	1	First axis					
* 1	Axis	2	Second axis	1, 2				
		W	Both axis	1, 2: First axis 3, 4: Second axis				
		None	Depends on the parameter	r "UNIT Sel" * 3				
	Unit	F, P	No unit (minimum digit of operation speed	l is digit of minimum resolution)				
2		N	Nanometer	-				
* 1	Onit	U	Micrometer	-				
		M	Millimeter					
		D	Degree					

* 2 It can be confirmed by the reply contents by Command "PRM_GET: GO1".

* 3 lt can be confirmed by the reply contents by Command "PRM_GET: A03" and "PRM_GET: A04" .

No,	1	2]	З	4
Reply format	F	****	,	F	****
	Ρ			Ρ	
	Ν			Ν	
	U			U	
	Μ			Μ	
	D			D	

No,	ltem	Reply	Description				
		F, P	No unit (minimum digit of operation speed is digit of minimum resolution)				
		N	Nanometer				
1,3	Unit	U	Micrometer				
		Μ	Millimeter				
	D		Degree				
2, 4	Speed	****	The setting speed is from the minimum resolution / sec to the parameter "Max Speed". * 4				

* 4 Example: Operating speed setting (when FC-111 is used and 12.3456 mm / sec)

Unit	Reply speed
No unit/sec	123456
nm/sec	12345600
um/sec	12345.6
mm/sec	12.3456

* 4 Example: Operating speed setting (when FC-411 is used and 12.3455 $^\circ$ / sec)

Unit	Reply speed
No unit/sec	123455
° /sec	1,23455

Example: When the First axis side operation speed is 1.234567mm / sec and Millimeter is specified, and the second axis side operation speed is $500 \,\mu$ m / sec and Micrometer is specified, (When using FC-911)

Send	Reply
DR:	N1234567,U500
DR:M	M1.234567,M0.5

	1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16
--	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

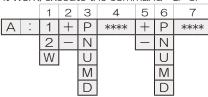
42 A:

LOCAL REMOTE TEACH READY BUSY Send

Description

Set the absolute movement coordinate value. Set the coordinate value from the origin (position where the coordinate value is zero). This command alone will not work. To make it work, execute the command "G" or "GN:" . See commands "G" and "GN:" for details.

No, Send format



No,	Item	Subcommand	Description	Send format block No,			
		1	First axis	2, 3, 4			
1	Axis	2	Second axis	2, 3, 4			
2.5		W	Both axis	2, 3, 4: First axis 5, 6, 7: Second axis			
	Sign	+	Plus				
2, 5	Jigh	_	Minus				
		Р	No unit (minimum digit of coordinate value	e is digit of minimum resolution)			
	Unit	N	Nanometer				
3, 6		U	Micrometer	Micrometer			
		M	Millimeter				
		D	Degree				
4, 7	Coordinate value	****	Coordinate value * 1 (Setting range depends on the connected stage)				

* 1 Moving coordinate value setting example (when FC-111 is used and 12.3456mm)

Unit	Coordinate value
No unit	123456
nm	12345600
um	12345.6
mm	12,3456

 \ast 1 Moving coordinate value setting example (when FC-411 is used and it is 1.23455 $^\circ$)

Unit	Coordinate value
No unit	123455
0	1.23455

Example: When using FC-911 and moving the first axis (Unit: nm) from the origin (position where the coordinate value is zero) to -1.234567mm and the second axis (Unit: um) to + 0.5mm

Send example	Send order	Command
	1	A:W-N1234567+U500
Example1	2	G
[1	A:W-N1234567+U500
Example2	2	GN:W

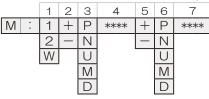
43 M:

Description

LOCAL REMOTE TEACH READY BUSY Send

Set the relative movement distance. This command alone will not work. To make it work, execute the command "G" or "GN:" . See commands "G" and "GN:" for details.

No, Send format



No,	Item	Subcommand	Description	Send format block No,			
		1	First axis				
1	Axis	2	Second axis	2, 3, 4			
		W	Both axis	2, 3, 4: First axis 5, 6, 7: Second axis			
2.5	Sign	+	Plus				
2, 5	Jigi i	—	Minus				
		Р	No unit (minimum digit of moving distance	is digit of minimum resolution)			
	Unit	N	Nanometer	-			
3,6		U	Micrometer				
		M	Millimeter				
		D	Degree				
4, 7	Distance	****	Set the Movement distance * 1 (The range depends on the connected stage)				

* 1 Movement distance setting example (when FC-111 is used and 12.3456mm).

Unit	Movement distance
No unit	123456
nm	12345600
um	12345.6
mm	12,3456

 \ast 1 Movement distance setting example (when FC-411 is used and it is 1.23455 $^\circ$).

Unit	Movement distance
No unit	123455
0	1,23455

Example: When using FC-911 and moving from the current position to the first axis (Unit: nm) -12,345678mm and the second axis (Unit: um) to + 0.5mm.

Send example	Send order	Command
Example1	1	M:W-N12345678+U500
	2	G
[Luamen]aQ	1	M:W-N12345678+U500
Example2	2	GN:W

1	2 3		4 5	6 7	8 9	10	11 12	2 13	14 1	5 16		
44	G	G LOCAL REMOTE TEACH READY BUSY Send										
	Description The operation set by Command "A:" and "M:" starts. After execution, the values set with the commands "A:" and "M:" are discarded. When ", R" is specified at the end, positioning completion reply is sent for each axis.											
	No, Send f	orma	1									
	No,		ltem S	ubcommand			Descrip	otion				
				None		D	o not reque	est a reply				
	1		Reply request	,R	return	After ″1″ for the	· positioning first axis ar			axis.		
45	GN:				LOCAL RE	MOTE T	EACH R	EADY	BUSY	Send		
	Descrip No, Send f		comman completio	ds "A:" and on reply is se	1 , R 2							
	No,		ltem S	ubcommand	ocommand Description							
				None		Depends o	n the paran	neter "AXIS	Sel [‴] * 1			
	1	Axis		1	First axis							
	'			2								
					W Both axis							
				None								
	2	'	Reply request	,R	,R After positioning is complete, return $1^{\prime\prime}$ for the first axis and $2^{\prime\prime}$ for the second axis.							
	* 1 lt ca	an be	confirmed by the	e reply content	eply contents by Command "PRM_GET: G01".							
	Example	(Bef	nen FC-111 is us ore sending, conf , "SRQ." , "!:" An	irm that the po				t axis is REA	ADY with the	e command		
	No				Description			nt setting lue	Coordin	ate value		
	No	5	end command		Description		First axis	Second axis	First axis	Second axis		
	1	R:W		Set the electron (zero set)	ctrical origin fo	r both axes	None	None	Omm	Omm		
	2	A:1-	P100000	First axis: A	bsolute motion	(A) -10mm	A -10mm	\uparrow	\uparrow	\uparrow		
	3	GN:1		Move first a	ıxis		↑	<u>↑</u>	-10mm	1		
	4	GN:2		Command e			<u>↑</u>	1	<u>↑</u>	<u>↑</u>		
	5		P100000		Absolute motion	n (A) +10mm		A +10mm	↑ ↑	<u>↑</u>		
	6	GN:2	2	Move secon		the plane !	<u>↑</u>	<u>↑</u>	<u>↑</u>	+10mm		
	7	GN:V	N	moving to t	work because he destination.		<u>↑</u>	<u>↑</u>	1	1		
	8	M:W-	-P10000-P10000		elative motion (1 s: Relative motio		M -1mm	M -1mm	\uparrow	\uparrow		

First axis: Absolute motion (A) -1mm

 \uparrow

 \uparrow

 \uparrow

 \uparrow

A -1mm

 \uparrow

 \uparrow

None

Discarded Discarded

 \uparrow

 \uparrow

 \uparrow

 \uparrow

 \uparrow

 \uparrow

 \uparrow

None

-11mm

-12mm

 \uparrow

-13mm

 \uparrow

-1mm

 \uparrow

 \uparrow

 \uparrow

 \uparrow

 \uparrow

+9mm

+8mm

 \uparrow

 \uparrow

+7mm

+6mm

 \uparrow

Move first axis

Move first axis

Move second axis

Move both axes

Move first axis

Move both axes

Move both axes

Command error

9

10

11

12

13

14

15

16 G

17

GN:1

GN:1

GN:2

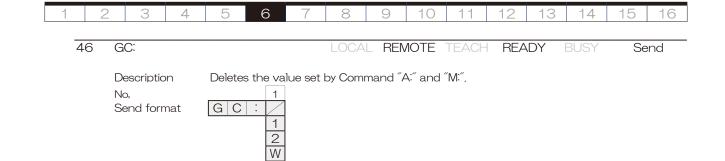
GN:W

GN:1

GN:W

GN:W

A:1-P10000



No,	ltem	Subcommand	Description
,		None	Depends on the parameter "AXIS Sel" * 1
	<u>.</u> .	1	First axis
	Axis	2	Second axis
		W	Both axis

* 1 It can be confirmed by the reply contents by Command "PRM_GET: GO1" .

47 GR:

Description

No, Send format



GR



*2 If there is a number to be set to "None", pad the additional command with the specified number to the left.

LOCAL REMOTE TEACH READY

Get the coordinate value and movement distance of the set command "A:", "M:".

BUSY

Send/Reply

No,	Item	Subcommand	Description	Reply format block No,						
		None	Depends on the parameter "AXIS Sel" * 3	None						
		1	First axis	1004						
*2	Axis	2	Second axis	XIS Sel [®] * 3 None 1, 2, 3, 4 1, 2, 3, 4: First axis 5, 6, 7, 8: Second axis e parameter [°] UNIT Sel [®] * 4 ing distance is digit of minimum resolution) Nanometer						
		W	Both axis							
		None	Depends on the parameter	er "UNIT Sel" * 4						
		Р	No unit (minimum digit of moving distance	is digit of minimum resolution)						
2	Unit	N	Nanometer							
*2	Onit	U	Micrometer							
		M	Millimeter							
	-	D	Degree							

* 3 It can be confirmed by the reply contents by Command "PRM_GET GO1" .

* 4 It can be confirmed by the reply contents by Command "PRM_GET: A03" and "PRM_GET: A04" .

No, 2 З 5 7 1 4 6 8 Reply format * * * * А N + А + **** **** Ν Μ U Μ U _ Μ Μ D D Ρ

No,	ltem	Reply	Description
1,5	Command	А	Absolute ("A:" command)
1, 5	Commanu	Μ	Absolute ("A." command) Relative ("M." command) No unit (minimum speed digit is minimum resolution digit) Nanometer Micrometer Millimeter Degree Move in the plus direction Move in the minus direction Coordinate value or moving distance
		Р	No unit (minimum speed digit is minimum resolution digit)
		Ν	Nanometer
2,6	A Absolute ("A." command) M Relative ("M." command) M Relative ("M." command) P No unit (minimum speed digit is minimum resolution N Nanometer Unit U M Millimeter D Degree + Move in the plus direction Sign -	Micrometer	
		A Absolute (~A." command) M Relative (~M." command) M Relative (~M." command) P No unit (minimum speed digit is minimum resolution dig N Nanometer Unit U M Micrometer M Millimeter D Degree Sign + Ordinate value ****	
		D	Absolute ("A:" command) Relative ("M:" command) No unit (minimum speed digit is minimum resolution digit) Nanometer Micrometer Millimeter Degree Move in the plus direction Move in the minus direction Coordinate value or moving distance
3,7	Cian	+	Move in the plus direction
3, 7	Sign	—	Move in the minus direction
4, 8	Coordinate value	****	Coordinate value or moving distance
(Common	*	When not set

1 2	3	4 5	6 7	8 9 10 11 12 13 14 15 16								
48	JG:			LOCAL REMOTE TEACH READY BUSY Send								
	Descriptior			by specifying the number of pulses (1 pulse = minimum resolutior d at the end, positioning completion reply is sent for each axis.								
	No, Send form	nat JG	1 2 3 1 + 2 -	4 5 *** , R								
	No,	ltem	Subcommand	Description								
		Auto	1	First axis								
		Axis	2	Second axis								
	2	Space	Space sign	Space								
		Cierra	+	Move in the plus direction								
	3	Sign	_	Move in the minus direction								
	1	Coordinate	***	Set movement command value (1 or 1000)								

49 JY:

Set movement command value $(1 \sim 1000)$

Do not request a reply

After positioning is complete,

return "1" for the first axis and "2" for the second axis.

Description

4

5

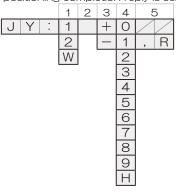
value

Reply

request

Executes the operation without specifying the movement distance. The operation continues until a limit sensor input, operation stop command "L:" or speed stage "O" is transmitted. The operation speed can be selected from nine parameters "Jy Speed 1" to "Jy Speed 9" and "Jy Speed H". When operating at speed stages 1-9, the operating speed can be changed in stages 1-9. When operating at speed stage H, speed stages 1 to 9 cannot be selected. The control status during operation depends on the settings of the parameters "Jy Cont" and "Stage Cont Type". When ", R" is specified at the end, positioning completion reply is sent for each axis.





None

,R

No,	Item	Subcommand	Description
		1	First axis
1	Axis	2	Second axis
		W	Both axis
2	Space	Space sign	Space
3	Sign	+	Move in the plus direction
3	Jigi i	_	Move in the minus direction
		0	Stop movement when executing JY command
4	Speed stage	1~9	Set 1 to 9 (depends on parameter "Jy Speed 1 to 9")
		Н	Set H (depends on parameter "Jy Speed H")
	Reply	None	Do not request a reply
5	request	,R	After positioning is complete, return $1^{"}$ for the first axis and $2^{"}$ for the second axis,

LOCAL REMOTE TEACH READY BUSY Send

1	2 3	4 5	6 7	8 9	10	11 12	13	14	15	16
	Coordinate	ragiatratian	o o no no o o do							
50	PIT_DEL:	registration	commands	LOCAL REN	NOTE	EACH R E	ADY	BUSY	Se	nd
00								DOOT	00	пu
	Description	n Deletes	s the 1st and 2	2nd axis positior	n informat	tion registere	ed with C	Commano	d ″PIT_S	ET:".
	No, Send form			1						
	Send Torm	nat PI	T _ D E							
	No,	Item	Subcommand			Descrip	ion			
	1	Number	***	Locatio	on registra	ation design	ation nu	mber (1	~20)	
51	PIT_SET:			LOCAL REM	NOTE	EACH RE	ADY	BUSY	Se	end
	Descriptior	n Registe	ers the currer	nt position of tl	ne first a	nd second	axes to	the spe	cified n	umber.
		Howev	ver, the regist	ered position v						
	No,	restart	ed, or paramet	ter is changed.						
	Send form	at PI	T_SE	T : ***						
	No,	ltem	Subcommand			Descrip			>	
	1	Number	***	Locatio	on registra	ation design	ation nu	mber (1	~20)	
52	PIT_GET:			LOCAL REM	NOTE	EACH RE	ADY	BUSY	Send	Reply
	Descriptior	n Acquir	es the locatior	n information reg	sistered wi	ith Commar	id "PIT_S	SET:".		
	No,			1						
	Send form	nat PI	T _ G E	T : **						
	No,	Item	Subcommand		Descriptior		B	eply form	at block	' No
				Location reg					irst axis	(110,
	1	Number	***	num	ber (1 \sim		3,4: Sec	cond axi	S	
	No,	1	2 3	4						
	Reply form		2 3	<u>4</u>						
		+ *	** + *	**						
		—	—							
	No,	Item	Reply			Descrip	ion			
		_	+			Plus				
	1, 3	Sign				Minu				
	2 ,4	Coordinate	***	Coordinate val	ue (minimu	um digit is d	git with	minimum	resoluti	on) * 1
	Co	value	*	I		When no	t set			
				AXIS Sel" is zero.						
53	PITG:			LOCAL REM	ΛΟΤΕ ΤΙ	EACH RE	ADY	BUSY	Se	nd
	Decerivation			registered with	<u></u>		الأجام و		*	
	Descriptior			T, restarted, or						
		registe	red with the c	ommand "PIT_S	SET:" will I	be discarde				
	No,	end, po		oletion reply is se	ent for eac	ch axis,				
	Send form	nat PI		1 2						
			··	, R						
				,						
	No,	Item	Subcommand	<u>. </u>	n rogist	Descrip		mbor (1	0(20)	
	1	Number	*** None			ation design			·~ 20)	
	2	Reply request			After	r positioning	is comp	lete,		
			,R	return "	1″ for the	first axis an	d <i>"</i> 2″ for	the seco	ond axis	

	2 3	4 5 6	6 7	8	9	10	11	12	13	14	15	16			
	_ ,														
		rpose I / O com	mands												
54	:			LOCA	REN	10TE	TEACH	REA	ЪŊ	BUSY	Y Send/Reply				
	Descriptior	Get the sta	atus of the	general		e innut	port								
	Send form			50110141	parpos	o in iput	port.								
	No, Reply form	1 at *													
	No,	ltem	Repl	Y				Descr	iption						
	1	Status	*				Inp	out stat	e numk	ber					
	Input status Input state number * 1 Input1 (3pin) Input2 (28pin) Input3 (4pin)														
	Input :		In	OFF	spin)		Input2 (OF			Inpu	OFF	ער			
		0		OFF		_	OF				OFF				
		2		OFF			0			OFF					
		3		ON		_	0			OFF					
		4		OFF			OF	-		ON					
		5		ON			OF				ON				
		6		OFF			O	N			ON				
		7		ON			O	N			ON				
55	O: Description No, Send form	1	atus of the	LOCA	REM	10TE	TEACH	REA	ADY	BUSY	Se	nd			
	No,	ltem	Subcomr	nand				Descr	iption						
	1	Control	*				Out	put sta	te num	iber					
	Output sta	atus													
	Output	t state number * 1	Οι	itput1 (1pin)	(Output2 (26pin))	Output3		in)			
		0		OFF				OFF			OFF				
		1		ON		OFF			OFF						
		2		OFF			ON				OFF				
		3		ON		ON					OFF				
		4		OFF			OF	۰F		ON					

6 7
 7
 ON

 * 1 See "(4) General-purpose I / O" for ON / OFF status and input circuit.

5

ON OFF

OFF

ON

ON

ON

ON

ON

1	2	3	2	4 5	6 7	8	9	10	11	12	13	14	15	16		
(8	3)Ca	ommanc	ds re	lated to teach	ning											
5	6	T_ON:				LOCA	L REM	NOTE	TEACH	REA	٩DY	BUSY	Se	end		
		Descripti	ion	Move to t	he teaching	; registra	ation edi	t mode								
		No,														
		Send for	rmat	T _ O	N :											
5	7	T_OFF:				LOCA	AL REM	NOTE	TEACH	REA	ADY	BUSY	Se	end		
		Descripti	ion	Return fro	om the tead	ching re	gistratic	n edit i	mode. Th	e regis	tered o	content is	s saved	before		
				returning.												
		No,				1										
		Send for	rmat	T _ O	F F :											
58	8	T_DEL:				LOCA	L REM	ЛОТЕ	TEACH	REA	١DY	BUSY	Se	end		
					Deletes the contents of the registered line of teaching for the currently selected chan											
		Descripti	ion		ne contents mand can l											
								enaing	the com	manu		and is	renecte	anter		
		No,			sending the command "T_OFF:".											
		Send for	rmat	T _ D	EL:	***										
		No,		ltem	Subcom	mand				Descri	iption					
		1		Line	***				Set line	numbe	er (1 ~	~200)				
59	9	T_SET:				LOCA	L REM	ЛОТЕ	TEACH	REA	NDY	BUSY	Se	end		
		Descripti	ion		eaching co											
					commands that can be set, see "(4) Registered commands". This command ca after sending the command "T_ON:" and is reflected after sending the com											
				OFF:".	aing the co	ommanc		i and	is reflect	ed atte	er send	aing the	comma	ina I_		
		No,		011.		1	2	3								
		Send for	rmat	TS	ETI	***										
		No,		ltem	Subcom	mand				Descri	iption					
		1		Line	***				Set line	numbe	er (1 ~	~ 200)				
		2		Space	Space	sign				Spa	ace					
		3		Command	****	*			Regis	stration	n comm	nand				
60	О	T_GET:				LOCA	L REM	ЛОТЕ	TEACH	REA	NDY	BUSY	Send,	/Reply		
		Descripti	ion	Acquires 1	the content	s of the	register	ed line	of the cu	rrently	selecte	ed chann	el.			
		No,				1										
		Send for	rmat	T _ G	<u> </u> E T :	***										
				ltana	Culassia					Decer	inting					
		No,	_	Item	Subcom				Catiliaa	Descri	-					
		1		Line	***				Set line			<u> 200) </u>				
		No,		1	7											
		Reply for	rmat	****												
			mat													
		No,		ltem	Rep	ly l				Descri	iption					
		1		Command	****	-			Re		d conte	ent				
6	1	TC:					J REM	IOTE	TEACH	REA		BUSY	Sc	end		
0		10.				LUUA			I LAON			DOOT	00	, na		
		Descripti	ion	Select the	teaching c	hannel	Please \	vait for	the regis	tration	conter	nts to be	read.			
		No,			1				0.1			-	-			
		Send for	rmat	TC:	*											
		No,		ltem	Subcom	mand				Descri	iption					
		1		Channel	*				Chan	inel sele	ect (1	~5)				

2	2 3	4 5 6	6 7	8	9	10	11	12	13 1	14	15	16		
62	TCR:			LOCAL	REM	IOTE	TEACH	READ	Y BU	JSY	Send	Reply		
	Descriptior		irrent teach	iing chani	nel.									
	Send form	at T C R	:											
	No,	1												
	Reply form	nat *												
	No,	ltem	Repl	у				Descripti	on					
	1	Channel	*				C	urrent cha	annel					
63	TQ:			LOCAL	REM	IOTE	TEACH	READ	Y BU	JSY	Send	Reply		
	Descriptior	n Acquires t	he status re	elated to t	teachin	ıg.								
	Send form	at TQ:]											
		· · · · · · · · · · · · · · · · · · ·												
	No,	1 2	3	4	1									
	Reply form		, ***	, ***	***									
		M												
		P												
		0												
		Ť												
		R												
		E												
	No,	ltem	Repl	v				Descripti	on					
	1 10,		K	,				Stopped						
			M											
			P		During move * 1 Paused									
			0			Dur	ing move			line) * 1				
	1	Status				Dui		I I/O opera		by line) * 1				
			T					aching edi		atus				
			R			loodi		ng registra		ntopt				
			E			iuaui		ning comm			5 ** 2			
	2	Channel	*					urrent cha						
	3	Line	***					rent line r						
	4	Command	****	k										
		ne parameter "TEAC	I		ho motic	on otot		irrent com						
		ations are disabled u				JIIStat	us carrio		.					
			un nin reaching	is complet	le.									
0.4							TEAOL							
64	TG:			LOCAL	_ KEIVI	IOTE	TEACH	READ	Y BU	JSY	Se	nd		
				C .1										
	Description		execution o	of the sele	ected c	hanne	el. It also r	esumes ex	xecutior	1 wher	n pause	ed.		
	Send form	at TG:												
65	TP:			LOCAL	REM	IOTE	TEACH	READ	Y BU	JSY	Se	nd		
	Descriptior		t during tea	aching, it	will pa	use. It	f you wa	nt to resu	ime, exe	cute f	the cor	nmand		
		″TG:″.	1											
	Send form	at TP:												
66	TO:			LOCAL	REM	IOTE	TEACH	READ	Y BU	JSY	Se	end		
-								2	20		20			
	Descriptior	n Executes	the conter	nts line b	y line i	n the	paused	state. If t	he stag	se is c	operatir	ng, this		
			is not allow							-		_		
	Send form]											
		• · · · · ·	-											

1	2	3	4	5 6	6 7	8	9	10	11	12	13	14	15	16				
6	67	TL:				LOCA	AL REM	NOTE	TEACH	REA	ADY	BUSY	Se	end				
		Descriptio	n	Stops tead	ching and	l returns t	he line r	humber	to the fir	st line								
		No,	511					lambol		01 11 10.								
		Send for	mat	TL:														
					E													
		No,		ltem	Subco	mmand				Descr	ription							
						one					teaching							
		1		Axis		E					rgency							
		* It can be	cancel	ed with Comn	nand "BEC													
F	68	TR:				LOCA	N REM	IOTE	TEACH	BE/	ADY	BUSY	Send	Reply				
		11.0				LOO						DOOT	Ouria	i lopij				
		Descriptio	on	Check the	registrati	ion status	s of the ⁻	teaching	g channe].								
		No,			1				-									
		Send form	mat	TRI														
					1													
					2													
					2 3 4 5													
					4													
					5													
		No,		ltem	<u>. </u>	mmand					ription							
		1		Channel		one					hannel							
					1	~ 5			Se	et each	i chann	el						
		No,				4	F											
		Reply for	mot	1 2	3	, 0,	4 5 O , O											
			Παι	0,0	, 0	, <u>0</u> , 1												
		No,		ltem	Re	ply	Description											
		1					Char	nel1 or	specified	d chan	nel							
		2	_						nannel2									
		3		Status	O,	, 1	Chappel3 0: Unregistered											
		4					Channel4 1: Registered											
		5					Channel5											
Ē	69	TFR:				LOCA	AL REM	NOTE	TEACH	RE/	ADY	BUSY	Send	Reply				
-																		
		Descriptio	on	Check the	number	of loops	currentl	y being	executed	l. It car	n be us	ed only d	during te	eaching				
				execution.	When th	e reply co	ontent is	O, it inc	dicates th	nat the	target	loop is r	not exec	uted or				
		Nie		unused.														
		No, Send forr																
		Send for	nat	TFR														
					1													
					2													
					5													
					6													
					2 3 4 5 6 7													
					8													
					9													

No,	ltem	Subcommand	Description
1	Laan	None	Set all loops
	Loop	1~9	Set each loop

1	2	3	4	5	6		7		8		9	1()	11		12	13	14		15	16	
		No,		1	2	3	3	4		5		6	7] [8	Γ	9					
		Reply form	nat		**	<u> </u>	* .	**		**		** .	**		**		**					
			lace	, ,		,	,		,		,	,		,		,						
		No,		ltem			Rep								[Desc	ription					
		1			+				_			oop1	or S	necit								
		2	-									0001		pccii pccii	nca	1000	,					
		3	-											Sp2								
		4	-											505 504				-				
		5		nt of loops			**							5p4 5p5				Current loop count				
		6		11 01 1000:	5		ጥጥ											(1	~ 9	99999	3)	
		7	-											op6								
			-											p7								
		8												8qc								
		9												9qc								
7	0	TM:				LOCAL REMOTE TEACH											ADY	BUSY	/	Se	end	
		No, Send form	nat	the inter and "FE the reply	:" is / co :	Rep	ly for	rmat	t2. T	he s	set v	value	of th	ie pa	Iram							
		No,		Subcommand					Description													
		1		Control		0					Monitor setting OFF											
				JOI ILI OI		1						Monitor setting ON										
		No, Reply form	nat1	1 :	2		3 ***															
		No,		Item			Rep	ly							[Desc	ription					
		1		Line			***					E	Execi	ution	ı line	e nui	mber (200)		
		2		Space	+	S	bace	sigr	ר ר								bace					
		3	<u> </u>	ommand	+		****		-	Execution command												
		No, Reply form	nat2	1	2		3 ***	4	5	<u> </u>	6 *	6]										
		No,		ltem			Rep								1	Deer	ription					
		1		Line	+		***		_			F		Ition) 201~2	200)		
		2	<u> </u>	Space	+	<i>C</i> ,	cace					i			0					/		
		3	<u> </u>	ommand	+		3000 ****							F	Xec		n comm	and				
		4		Space	+																	
		5			+	3		JIGÍ	1									or				
		6	<u> </u>	rackets nt of loops	+		L **			Use as sepa Current loop count (\overline{aa}			
		7	b	<u></u>		1						Cur				separat		<u>(</u>				
		(USE	as	separal	.01							
		Example 1	When t	he line nur	nbe	r is tł	ne sec	conc	l line	and	l the	execu	ution (comn	nano	d is ″l	M:‴.					
												reply										
							0)02,1	M:1+	P100	00											
																// 						

Example 2: When the line number is the second line, the execution command is "FE:", and the loop count is the third.
Auto reply
002 FE:1 [3]

1	2	3	4	5	6 7	' 8	9	10	11	12 13	3 14	15	16
	71	TMR:				LOCA	AL REN	ЛОТЕ	TEACH	READY	BUSY	Send/	Reply
		Descriptior Send form		Gets the		monitor se	etting sta	itus.					
		No, Reply form	at	1 0 1									
		No,		ltem	R	eply				Description)		
		1		Status		0			Moni	tor setting is	s OFF		
		I	`	Status		1			Mon	itor setting	is ON		
	72	TNR:				LOCA	AL REN	NOTE	TEACH	READY	BUSY	Send	Reply
		Descriptior Send form		Gets the	_	line numb	er currer	ntly beir	ng execute	ed or in star	ndby.		
		No, Reply form	at	1 ***									
		No,		ltem	R	eply				Description)		
		1		Line	;	k**			Execu	ution line nu	umber		
	73	TACR:				LOCA	AL REN	/IOTE	TEACH	READY	BUSY	Send/	Reply
		Descriptior Send form		Gets the		command	current	y being	executed	l or in stanc	lby.		
		No, Reply form	at	1 *****									
		No,		ltem	R	eply				Description	1		
		1	Co	ommand	*:	****			Exec	cution comr	nand		

1	2 3	4 5	6	5 7	8	9	10	11	12	13	14	15	16	
(9)(Commands	related to	teach	ning regist	ration	only								
74	FS:					L REN	10TF	TFACH	REA	DY	BUSY	Reg	ister	
	1.01				200/						2001	1108		
	Description	n Set tl	he loo	p operatior	to rep	eat the s	specified	d range	The lo	on ran	ige is het	ween th	e same	
	Decemption			ers from th										
				oop. For a										
				vhen using										
		occu	r.											
	No,			1 2	3									
	Send form	nat FS	S :	* *	***									
		· · · · ·												
	No,	ltem		Reply	,				Descr	iption				
	1	Loop		*				S	et loop		<u>)</u>			
	2	Space		Space s	ign				Spa		_ /			
	3	Count of lo	one	***	1011				count (9999)			
	0							LOOP		1 0	00007			
75	FE:				LOCA	L REN	10TE	TEACH	REA	ΔY	BUSY	Reg	ister	
	Description			d of the loc										
	number of this command. You can put another loop inside the loop. For a descripti example, see "(1) Transmission example 1". When using this command, be sure to u													
	"FS:". If "FS:" is not registered, unintended operation may occur.													
	No, 1													
	Send format													
	No,	Item												
	110,	ILEITI		Subcomm	land				Descr					
	1	Loop		Subcomm *	land			S	et loop		9)			
					land			S			9)			
76	1					L REM	IOTE		et loop	(1~		Reg	rister	
76					LOCA	L REM	10TE		et loop	(1~	9) BUSY	Reg	ister	
76	1 END:	Loop	he las	*	LOCA			TEACH	et loop I REA	(1~		Reg	ister	
76	END: Description	Loop n <u>Set t</u>			LOCA			TEACH	et loop I REA	(1~		Reg	ister	
76	1 END:	Loop n <u>Set t</u>	he las N D	*	LOCA			TEACH	et loop I REA	(1~		Reg	ister	
	1 END: Description Send form	Loop n <u>Set t</u>		*	LOCA	ecution e	ends at 1	TEACH	et loop	(1~) DY	BUSY	Reg	ister	
76	END: Description	Loop n <u>Set t</u>		*	LOCA		ends at 1	TEACH	et loop	(1~) DY		Reg	ister	
	1 END: Description Send form	Loop n <u>Set t</u>		*	LOCA	ecution e	ends at 1	TEACH	et loop	(1~) DY	BUSY	Reg	ister	
	1 END: Description Send form	n Set ti nat <u>E</u> N	N D	*	LOCA ine, Exe	ecution e	ends at 1 10TE	TEACH this line TEACH	et loop I REA	(1~) \DY	BUSY	Reg	jister	
	1 END: Description Send form T:	n Set ti nat <u>E</u> N	N D	* t teaching li :	LOCA ine, Exe	ecution e	ends at 1 10TE	TEACH this line TEACH	et loop I REA	(1~) \DY	BUSY	Reg	ister	
	1 END: Description Send form T: Description	n Set ti nat EN	N D	* t teaching li : it time durir	LOCA ine, Exe	ecution e	ends at 1 10TE	TEACH this line TEACH	et loop I REA	(1~) \DY	BUSY	Reg	ister	
	1 END: Description Send form T: Description No,	n Set ti nat EN	N D	* t teaching li : it time durir 1	LOCA ine, Exe	ecution e	ends at 1 10TE	TEACH this line TEACH	et loop I REA	(1~) \DY	BUSY	Reg	rister	
	1 END: Description Send form T: Description No, Send form	n Set ti nat EN	N D	* t teaching li : it time durir 1 ***	LOCA ine. Exe LOCA	ecution e	ends at 1 10TE	TEACH this line TEACH	et loop I REA I REA	(1~) DY f 0.1 s	BUSY	Reg	rister	
	1 END: Description Send form T: Description No,	n Set t nat EN n Set t nat T	N D	* t teaching li : it time durir 1	LOCA ine. Exe LOCA	ecution e	ends at 1 10TE	TEACH this line TEACH	et loop I REA I REA nents of Descri	DY DY f 0.1 s	BUSY BUSY econds,	Reg	rister	
	1 END: Description Send form T: Description No, Send form No, No,	n Set t nat EN n Set t	N D	* t teaching li : : it time durir 1 *** Subcomm	LOCA ine. Exe LOCA	ecution e	ends at 1 10TE	TEACH this line TEACH	et loop I REA I REA	DY DY f 0.1 s	BUSY BUSY econds,	Reg	rister	
77	1 END: Description Send form T: Description No, Send form No, 1	n Set t nat EN n Set t nat T	N D	* t teaching li : : it time durir 1 *** Subcomm	LOCA ine, Exe LOCA ng teach	ecution e	nds at 1	TEACH this line TEACH n increr Set wa	et loop	(1 ~ 1 DY f 0.1 s (0.1 ~	BUSY BUSY econds,			
	1 END: Description Send form T: Description No, Send form No, No,	n Set t nat EN n Set t nat T	N D	* t teaching li : : it time durir 1 *** Subcomm	LOCA ine, Exe LOCA ng teach	ecution e	nds at 1	TEACH this line TEACH n increr Set wa	et loop	(1 ~ 1 DY f 0.1 s (0.1 ~	BUSY BUSY econds,		rister ister	
77	1 END: Description Send form T: Description No, Send form No, 1 GIS:	n Set ti nat E M nat T : Item Time	he wa	* t teaching li : it time durir 1 *** Subcomm ***	LOCA ine. Exe LOCA ng teach	hing exe	nds at 1	TEACH this line TEACH n increm Set wa	et loop	(1 ~) DY f 0,1 s iption (0,1 ~	BUSY BUSY econds, - 99,9) BUSY	Reg	ister	
77	1 END: Description Send form T: Description No, Send form No, 1	n Set tl nat <u>E</u> <u>n</u> n Set tl nat <u>T</u> <u>Item</u> n Wait	he wa	* t teaching li : t time durir 1 *** Subcomm *** he specified	LOCA ine, Exe LOCA ng teach LOCA	hing exe	NOTE	TEACH this line TEACH n increm Set wa TEACH	et loop	(1 ~ 1 DY f 0.1 s iption (0.1 ~	BUSY BUSY econds, - 99,9) BUSY e that th	Reg e ON ha	ister old time	
77	1 END: Description Send form T: Description No, Send form No, 1 GIS:	n Set tl nat <u>E</u> <u>n</u> n Set tl nat <u>T</u> <u>Item</u> n <u>Item</u>	he wa	* t teaching li : it time durir 1 *** Subcomm ***	LOCA ine, Exe LOCA ng teach LOCA	hing exe	NOTE	TEACH this line TEACH n increm Set wa TEACH	et loop	(1 ~ 1 DY f 0.1 s iption (0.1 ~	BUSY BUSY econds, - 99,9) BUSY e that th	Reg e ON ha	ister old time	
77	1 END: Description Send form T: Description No, Send form No, GIS: Description	n Set tl nat <u>E</u> <u>n</u> n Set tl nat <u>T</u> <u>Item</u> n Wait	he wa	* t teaching li t time durin t time durin t subcomm *** he specified 10msec or	LOCA ine, Exe LOCA ng teach LOCA	hing exe	NOTE	TEACH this line TEACH n increm Set wa TEACH	et loop	(1 ~ 1 DY f 0.1 s iption (0.1 ~	BUSY BUSY econds, - 99,9) BUSY e that th	Reg e ON ha	ister old time	
77	1 END: Description Send form T: Description No, Send form [No,] GIS: Description No,	n Set tl nat E M nat Time	N D he wa : : until t ld be	* t teaching li t time durin t time durin t subcomm *** he specified 10msec or 1	LOCA ine, Exe LOCA ng teach LOCA	hing exe	NOTE	TEACH this line TEACH n increm Set wa TEACH	et loop	(1 ~ 1 DY f 0.1 s iption (0.1 ~	BUSY BUSY econds, - 99,9) BUSY e that th	Reg e ON ha	ister old time	
77	1 END: Description Send form T: Description No, Send form No, GIS: Description	n Set that E N nat E N nat Time	he wa	* t teaching li t time durin t time durin t subcomm *** he specified 10msec or	LOCA ine, Exe LOCA ng teach LOCA	hing exe	NOTE	TEACH this line TEACH n increm Set wa TEACH	et loop	(1 ~ 1 DY f 0.1 s iption (0.1 ~	BUSY BUSY econds, - 99,9) BUSY e that th	Reg e ON ha	ister old time	
77	1 END: Description Send form T: Description No, Send form GIS: Description No, Send form	n Set that E N n Set that E N n Set that T : Item Time n Wait shou I / O"	N D he wa : : until t ld be	* t teaching li : t time durin t t time durin t swalther t t t t t t t t t t t t t t t t t t t	LOCA ine. Exe LOCA ng teach nand LOCA d gener more. F	hing exe	NOTE	TEACH this line TEACH n increm Set wa TEACH	et loop	(1 ~ 9 DY DY f 0.1 s iption (0.1 ~	BUSY BUSY econds, - 99,9) BUSY e that th	Reg e ON ha	ister old time	
77	1 END: Description Send form T: Description No, Send form [No,] GIS: Description No,	n Set tl nat E M nat Time	N D he wa : : until t ld be	* t teaching li t time durin t time durin t subcomm *** he specified 10msec or 1	LOCA ine. Exe LOCA ng teach nand LOCA d gener more. F	hing exe	nds at 1	TEACH this line TEACH n increm Set wa TEACH is and i	et loop	iption (0.1 s (0.1 s (0.1 ^ (0.1 ^	BUSY BUSY econds, - 99,9) BUSY e that th	Reg e ON hc eneral-p	ister old time	

1	2	3	4 5	5 6	6 7	8	Q	9	10	11	12	13	14	15	16
				_											
				to Par	ameter se	ettings									
79	9	PRM_ON:				LOCA		REMC	DTE	TEACH	REA	ΔY	BUSY	Se	end
		Deceriation	- \\.			ttin er me	مام								
		Description Send form		RM	arameter se	iung m	ode.								
		Send Torn				•									
0															
80)	PRM_OFF				LOCA		REMC	JIE	TEACH	REA	ΔY	BUSY	Se	ena
		Description	n Sav	Save the parameters and return from parameter setting mode to REMOTE mode. If only											If only
		Decemption		Save the parameters and return from parameter setting mode to REMUTE mode. If only the AXIS parameter is changed, it will not be restarted *, but if the GENERAL parameter is											
					t will be rest								_		
					munication is	not dise	conn	nected.	Othe	rwise it is 1	he sam	e as the	e Restart	key on th	ne front
		Send format													
				1											
8	1	PRM_SET	<u>.</u>					REMO)TF	TEACH	REA	JDY	BUSY	Se	nd
0						200,							2001	00	
		Descriptior	n Set	t the pa	rameters, Fo	or detai	ils or	n para	amete	r number	s and o	conten	t numbe	rs, see "	7-5.
		No,					1	2	3	4					
		Send form	nat P	RM	_ S E	T :	А	***		****					
							G								
	ſ	No,	lterr		Subcomm	and					Descri	ntion			
		INO,	liten	1	A	land			_	Δ		ramete	r		
		1	Тур	е	G							parame			
	ŀ	2	Numk	ber	***							ter nun			
	Ì	3	Spac	e	Space s	ign					Spa	ace			
	[4	Conte	nts	****					Set pa	aramet	er cont	tents		
82	2	PRM_GET	Γ:			LOCA	LF	REMC	DTE	TEACH	REA	DY.	BUSY	Send	Reply
		Description			ontents of see "7-5.	the pa	Iram	neter.	For a	details or	n para	meter	numbers	s and c	ontent
		No,	nur	nders, s	see 7-0,	Γ	1	2							
		Send form	at P	RM	GE	т : Г	A	***							
							G		_						
	[No,	lterr	1	Subcomn	nand					Descri	ption			
		1	Тур	e	Α							ramete			
					G							parame			
	l	2	Numb	ber	***					Set p	arame	ter nun	nber		
		No,		1											
		Reply form		***											
			-												
	[No,	lterr	l	Reply	/					Descri	ption			
	ĺ	1	Conte	nts	****					Par	ameter	conter	nts		

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7. Parameters

Describes the built-in setting parameters.

When changing parameters, please do after understanding the function fully.

- 7-1. List of parameters
 - (1)Parameter type
 - AXIS Parameters:

Perform settings related to stage operation and machine home position return direction.

GENERAL parameters: Perform settings related to stage control and communication.

Туре	No,	Axis	Display	Description	Page
	01	First			i i
	02	Second	AXIS Name	Setting the display axis name	72
	03	First			70
	04	Second	UNIT Sel	Unit setting	72
	05	First			70
	06	Second	Pos Dir	Setting the coordinate count direction	72
	07	First			
	08	Second	INPos Range	In-position range setting	72
	09	First			
	10	Second	FB Speed	Setting the feedback speed	73
	11	First			
			ZERO Cont	Zero control setting	73
	12	Second			
	13	First	Stage Config	Stage configuration settings	73
	14	Second			70
	15	-	TEACH IF	TEACH operation interface settings	73
	16	First	Acc Cont	Acceleration / deceleration control settings	74
	17	Second			
	18	First	Acc Time	Acceleration / deceleration time setting	74
	19	Second			' -
	20	First	Jog Speed 3	JOG speed 3 setting	74
	21	Second	JOB Sheen 2	UOD speed o settillig	14
	22	First		IOC around 2 patting	74
	23	Second	Jog Speed 2	JOG speed 2 setting	'4
AXIS	24	First	la a Ora a al d		75
	25	Second	Jog Speed 1	JOG speed 1 setting	75
	26	First		Operation control settings when operating CCW and	
	27	Second	Jog Cont	CW keys	75
	28	First			
	29	Second	ORG Dir	Setting the machine origin return direction	75
	30	First			
	31	Second	ORG Mode Sel	Setting the machine origin return mode	75
	32	First		Machine origin return Mode 3 specified	\vdash
	33	Second	ORG Mode3 Pos	position setting	76
	34	First			$\left - \right $
	35	Second	ORG Speed H	Machine origin return speed H setting	76
	36	First			$\left - \right $
			ORG Speed M	Machine origin return speed M setting	76
	37	Second			$\left - \right $
	38	First	ORG Speed L	Machine origin return speed L setting	77
	39	Second			\mid
	40	First	EORG Speed	Electric origin return speed setting	77
	41	Second			
	42	First	Soft LMT Sel	Software limit function setting	77
	43	Second			
	44	First	+ Soft LMT Pos	Setting the software limit position on the plus	78
	45	Second		side	10
	46	First	– Soft LMT Pos	Setting the software limit position on the	78
		1 11 0 0			

Туре	No,	Axis	Display	Description	Page
	48	-	L <-> R Sel	Jog controller left / right button operation axis setting	78
	49	-	T <-> B Sel	Jog controller up / down button operation axis setting	78
	50	-	Right Dir	Setting the count direction of the right button of the jog controller	79
	51	-	Top Dir	Setting the count direction of the up button of the jog controller	79
	52 53	First Second	Jy Cont	Command "JY:" control settings	79
	54 55	First Second	Jy Speed H	JY speed H setting	79
	56 57	First	Jy Speed 9	JY speed 9 setting	80
	58	First	Jy Speed 8	JY speed 8 setting	81
AXIS	59 60	Second First	Jy Speed 7	JY speed 7 setting	81
	61 62	Second First	Jy Speed 6	JY speed 6 setting	81
	63 64	Second First	Jy Speed 5	JY speed 5 setting	82
	65 66	Second First			
	67 68	Second First	Jy Speed 4	JY speed 4 setting	82
	69 70	Second	Jy Speed 3	JY speed 3 setting	82
	71	Second	Jy Speed 2	JY speed 2 setting	83
	72 73	First Second	Jy Speed 1	JY speed 1 setting	83
	01	-	AXIS Sel	Control target axis setting	83
	02 03	First Second	Max Speed	Maximum speed setting	83
	04 05	First Second	Lin/Rot	Setting the control stage type	84
	06 07	First Second	Stop Sel	Stop control setting	84
	08 09	First Second	EMG Motor Excite	Setting of motor status at emergency stop	84
	10	-	EMG Connector	Enable / disable emergency stop function	84
	11 12	First Second	Motor Excite	Setting the motor status at startup	84
	13 14	First	Stage Cont Type	Setting the feedback stage control method	85
	15 16	First	Count Sel	Setting display contents of display unit counter	85
GENERAL	17	First	CD Drive	Setting the current down drive	85
GENERAL	18 19	First	INP Dec	In-position judgment time setting	85
	20 21	Second First	FBT Sel	Setting the feedback start timing	86
	22 23	Second -	Ini Mode	Initial mode setting	86
	24	-	I/F Select	Interface settings	86
	25	-	USB Del	USB delimiter setting	86
	26	-	GP-IB Addr	GP-IB address setting	86
	27	-	GP-IB Del	GP-IB delimiter setting	87
	28	-	GP-IB EOI	GP-IB EOI setting	87
	29	-	GP-IB SRQ	GP-IB SRQ setting	87
	30	-	ETHER Del	Ethernet delimiter setting	87
	31	-	IP Address	Ethernet IP address setting	87
	32	-	Default Getway	Ethernet default gateway settings	88
	33	-	Subnet Mask	Setting the Ethernet subnet mask	88
	34	-		Setting the command echo back function	88
	35	-	TEACH Monitor	Teaching monitor function setting	88

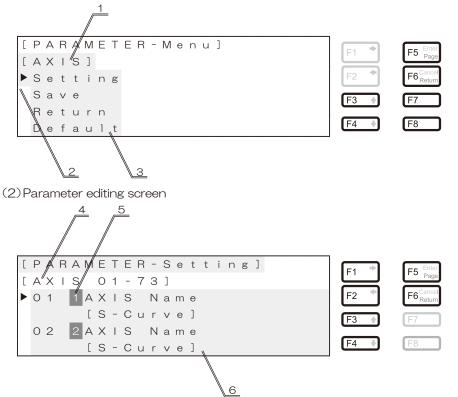
1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16	
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	. <u> </u>				
Туре	No,	Axis	Display	Description	Page
	36	-	GENERAL IN Chat	General-purpose input port chattering check function setting	88
GENERAL	37	-	TEACH IN Chat	TEACH input port chattering check function setting	89
	38	-	Sleep Sel	Enable / disable sleep function	89
	39	-	BEEP Sel	Enable / disable beep sound	89
	40	-	Disp bright	Setting the display brightness	89

7-2. Description of display panel

 \triangle

(1) PARAMETER mode top screen



No	ltem		Description						
1	Туре	The type of param	eter.						
2	Cursor	Selection cursor.							
		Setting	Move to the parameter edit screen.						
		Save	Save the parameters. If the parameter has not been changed, it will not be saved.						
3	Menu	Return	Returns to the mode before entering PARAMETER mode. Coordinate values are maintained. This content is displayed except after changing the GENERAL parameter.						
		Reset To Start	Reboot with the same operation as the command "RESET:". Displayed when "2: Save" is executed with the GENERAL parameter changed.						
		Default	Default all parameters of the displayed type. * After that, if you execute "2: Save", it will be saved with default parameters.						
4	Range	The range of parameter No.							
5	Supported axes	The axis corresponding to the parameter. Parameters without axis display are common to both axes.							
6	Contents								

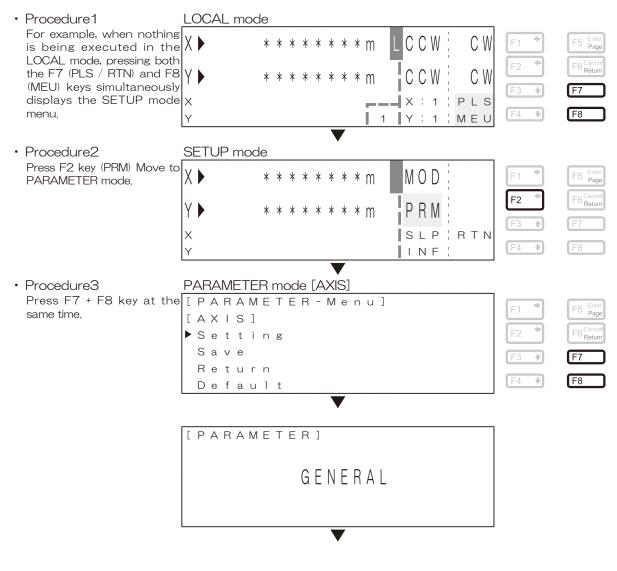
* Default parameters may differ from factory parameters. See the attached "Parameter sheet at shipment".

Please do not operating by setting all parameters to default values. Be sure to set according to the performance of the connected stage.

1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16
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KEY	Display	Description
	Тор	None
F1 / ➡	Edit	Move the cursor up 10 items.
F2 / 🖛	Тор	None
	Edit	Move the cursor down 10 items.
F3 / 🛧	Тор	Move the cursor up.
F3/ T	Edit	Move the cursor up 1 items.
F4 / 🖶	Тор	Move the cursor down.
	Edit	Move the cursor down 1 items.
F5 (Enter)	Тор	Determine the item of the cursor.
F5 (Linter)	Edit	Move to the lower layer.
F6 (Cancel)	Тор	None
	Edit	Move to the upper layer.
F7	Тор	None
	Edit	
F8	Тор	None
	Edit	
F7 + F8	Тор	Move to GENERAL parameter.
	Edit	None

7-3. Procedure for transition to GENERAL parameters Describes the procedure for moving to the GENERAL parameter.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L			ocedure NERAL		ter editi	PAF				ENER/ Men						
		moo				[G ▶ S	ΕNΕ	R A L i n g]							

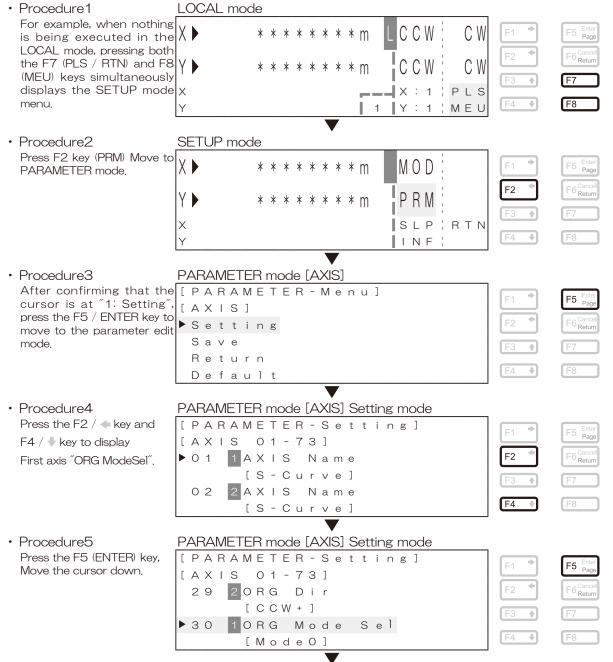
Return Default

7-4. How to change parameter settings

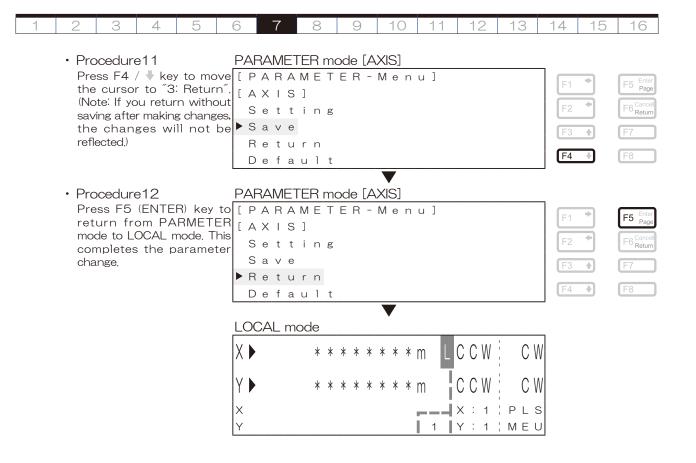
The parameter settings can be changed using the front panel operation or commands. For the setting method, see the setting example below.

(1)Example 1

From the LOCAL mode, change the mechanical origin return method $'' ORG \ {\rm Mode} \ {\rm Sel}''$ on axis 1 by operating the front panel.



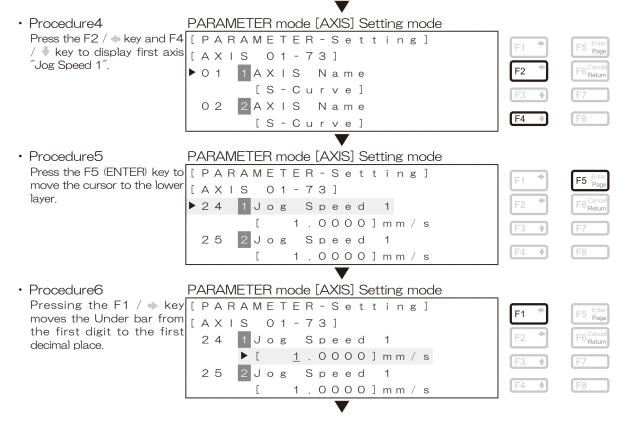
1 2 3 4 5 6 7 8 9 10 11 12 13	3 14 15 -	16
 Procedure6 PARAMETER mode [AXIS] Setting mode Press F3 /		
the item from [ModeO] to [AXIS 01-73]	F1 F5	5 Enter Page
[Mode1]. 29 20RG Dir	F2 F 6	6 Cancel Return
[C C W +]	F3 • F 7	
30 1 ORG Mode Sel		
▶ [M o d e O]	F4 F 8	3
Procedure7 PARAMETER mode [AXIS] Setting mode Press the F5 (ENETR) key [PARAMETER - Setting]		
to move the cursor to the [AXIS 01-73]	F1 🕈 F5	5 Enter Page
upper layer. (Note: Pressing	F2 F 6	6 Cancel Return
the F6 (CANCEL) key 29 20 KG DTT returns the parameter to [CCW+]		
the state before the change, 30 1 ORG Mode Sel	F3 + F7	
and moves the cursor to the [Mode1]	F4 ● F8	3
Procedure8 PARAMETER mode [AXIS] Setting mode		
Press F6 (CANCEL) key to [PARAMETER-Setting] return from parameter edit [AXIS 01-73]	F1 F5	5 Enter Page
mode to PARAMETER mode. 29 20 RG D i r	F2 F 6	6 Cancel Return
► 30 ORG Mode Sel	F3 • F7	7
[Mode1]	F4 + F8	3
\blacksquare		
Procedure9 PARAMETER mode [AXIS]		
Press F4 / I key to move [PARAMETER - Menu] the cursor to "2: Save".	F1 + F5	5 Enter Page
the cursor to ∠. save. [A X S] ► Setting		6 Cancel Return
Save		
Return	F3 1 F7	7
Default	F4 F8	3
]	
Procedure10 PARAMETER mode [AXIS]		
Press F5 (ENTER) key to [PARAMETER-Menu] save the changes. After [AXIS]	F1 + F5	5 Enter Page
"Save OK" is displayed		6 Cancel Return
on the screen, return to Setting		Return
PARAMETER mode. (Note: Save If the power is turned off Return	F 3 ↑ F 7	7
or restarted before saving, Default	F4 F 8	8
the changes will not be reflected.		
[PARAMETER]		
SAVE OK		
]	



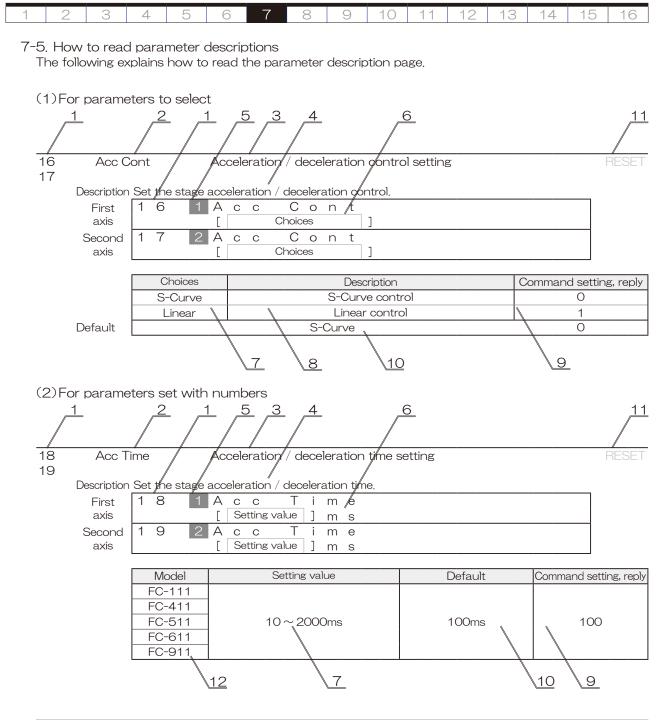
(2)Example 2

From the LOCAL mode, change the JOG speed L $^{\prime\prime}Jog$ Speed 1 $^{\prime\prime}$ on first axis by operating the front panel.

- Procedure1 \sim 3
 - Same as example 1.



1 2 3 4 5 6 7 8 9 10 11 12 13	14 15	16
Procedure7 PARAMETER mode [AXIS] Setting mode		
Press F3 / 🛧 key to change [P A R A M E T E R - S e t t i n g]		Enter
[O] to [5].	F1 -	F5 Enter Page
24 1 Jog Speed 1	F2 🕈	F6 Cancel Return
► [1. <u>0</u> 000]mm/s		
25 2 Jog Speed 1	F3 🛉	F7
[1.0000]mm/s	F4 🕈	F8
Procedure8 PARAMETER mode [AXIS] Setting mode		
Press the F5 (ENETR) key [PARAMETER - Setting]		
to move the cursor to the $[A X S 0 1 - 73]$	F1	F5 Enter Page
upper layer. (Note: Pressing	F2	F6 Cancel Return
the F6 (CANCEL) key 24 50g Speed 1 returns the parameter to F [1.5000] mm/s		
the state before the change, 25 2 Jog Speed 1	F3 🕇	F7
and moves the cursor to the $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$ m m / s	F4 +	F8
upper layer.)		
Procedure9 PARAMETER mode [AXIS] Setting mode		
Press F6 (CANCEL) key to [PARAMETER - Setting]		
return from parameter edit $\begin{bmatrix} A \times I \\ S & 0 \end{bmatrix} = 73$	F1 •	F5 Enter Page
mode to PARAMETER mode. \triangleright 2 4 1 J og Speed 1	F2 🗲	F6 Cancel Return
[1.5000]mm/s		
25 2 Jog Speed 1	F3 🕇	F7
[1.0000]mm/s	F4 🔸	F8
•		
After that, the procedure is [PARAMETER - Menu]	1	
the same as steps 9 to 12 $\begin{bmatrix} A \times A \end{bmatrix}$	1	
of setting example 1.	1	
Save	1	
Return	1	
Default	1	



No	ltem	Contents
1	Parameter No.	Parameter number. Used with the commands "PRM_GET:" and "PRM_SET:".
2	Parameter display name	This is the name of the parameter displayed on the display unit.
3	Parameter name	The name of the parameter.
4	Parameter description	A description of the parameter.
5	Target axis	The target axis. If the target axis is not displayed, use the common setting for both axes or select the axis to be used.
6	Choices or Setting value	Indicates the type to be set. Choices or settings.
7	Details	Indicates a choices candidate or a settable range.
8	Description	A description of the choice.
9	Command setting, reply	The value to be sent or returned when using the commands "PRM_SET:" and "PRM_GET:".
10	Default	Indicates the default of the parameter. * 1
11	Whether to restart	Indicates whether or not a restart is performed automatically after saving parameters. Black text is executed, gray text is not executed. * 2
12	Model	Indicates the model name of the feedback stage controller.

* 1 The default parameters may be different from the factory parameters. See the attached "Parameter sheet at shipment".

* 2 Restarting is the same operation as the command "RESET:".

6. F	Parameter de	escri	ption				
(1)	AXIS param	nete	ers				
01	AXIS I	Nam	ne Di	splay a	axis name		RES
02							
	Description	Set	the axis nam	e to be	displayed. Both axes can be set the same.		
	First axis	0	1 1 A	XI	S Name		
	1 11 31 4713	'	[Choices]		
	Second axis	0	2 2 A	XI	S N a m e		
	Securia axis	·	[Choices]		
						<u>.</u>	
			Choices		Description	Command set	ting, r
		1 ~	\sim 9 and A \sim 2	7	Specify with numbers and alphabets	Axis name	
		Ľ		-		Axis name	A: 10
	Default		First axis		1	1	
	Deradit		Second axis		2	2	
03	UNIT S	Sel	Di	splay u	unit		RE
04							
	Description	Set	the unit to b	e displa	iyed.		
		0	3 1 L	ΝΙ	T Sel		
	First axis		[Choices]		
		0	4 2 L	NI	T Sel		
	Second axis		(Choices]		
			Choices		Description	Command set	ting, r
			nm		Display in nanometers	0	
			um		Display in micrometer	1	
			mm		Display in millimeter	2	
			Degree	-			
			Degree OFF		Display in degree	3	
	Default		Degree OFF		Display in degree Display without units *	3	
	Default * The mini		OFF	coordin	Display in degree Display without units * mm	3	
			OFF	coordin	Display in degree Display without units *	3	
05	* The mini	imur	OFF		Display in degree Display without units * mm ate value is the minimum resolution digit.	3	DE
05		imur	OFF		Display in degree Display without units * mm	3	RES
05 06	* The mini Pos Di	ir	OFF n digit of the Ca	oordina	Display in degree Display without units * mm ate value is the minimum resolution digit. ate value counting direction	3	RES
	* The mini Pos Di	ir Set	OFF n digit of the Ca the direction	oordina in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. ate value counting direction ch the coordinate value counts up.	3	RE
	* The mini Pos Di	ir Set	OFF n digit of the Ca	oordina	Display in degree Display without units * mm ate value is the minimum resolution digit. ate value counting direction ch the coordinate value counts up. D i r	3	RE
	* The mini Pos Di Description	ir Set	OFF n digit of the Ca the direction 5 1 P [in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. ate value counting direction oh the coordinate value counts up. D i r Choices]	3	RE
	* The mini Pos Di Description	ir Set	OFF n digit of the Ca the direction	in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. ate value counting direction the coordinate value counts up. D i r Choices] D i r	3	RE
	* The mini Pos Di Description First axis	ir Set	OFF n digit of the Ca the direction 5 1 P [in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. ate value counting direction oh the coordinate value counts up. D i r Choices]	3	RE
	* The mini Pos Di Description First axis	ir Set	OFF n digit of the the direction 5 1 P [6 2 P [in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display without units * mm Choices] Display in degree Display and the coordinate value counts up. Display and the coordin		
	* The mini Pos Di Description First axis	ir Set	OFF n digit of the the direction 5 1 P 6 2 P [Choices	in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display without units * mm Choices Display minimum resolution digit. Display minimum resolution display minimum resolution digit. Display minimum resolution display minimum resolution display minimum resolution display minimum	Command set	
	* The mini Pos Di Description First axis	ir Set	OFF n digit of the of the direction 5 1 P [6 2 P [Choices CCW+	in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co		
	* The mini Pos Di Description First axis Second axis	Set	OFF n digit of the the direction 5 1 P 6 2 P [Choices	in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co	3 4 2 Command set 0 1	
	* The mini Pos Di Description First axis	Set	OFF n digit of the of the direction 5 1 P [6 2 P [Choices CCW+	in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co		
	* The mini Pos Di Description First axis Second axis	Set	OFF n digit of the of the direction 5 1 P [6 2 P [Choices CCW+	in whic	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co	3 4 2 Command set 0 1	
	* The mini Pos Di Description First axis Second axis		OFF n digit of the the direction 5 1 P [6 2 P [Choices CCW+ CW+	oordina os os	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co	3 4 2 Command set 0 1	ting, re
06	* The mini Pos Di Description First axis Second axis Default		OFF n digit of the the direction 5 1 P [6 2 P [Choices CCW+ CW+	oordina os os	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display without units * mm Choices Display without units * mm Display without units * mm Display direction Display and the coordinate value counts up. Display direction Display direction Display without units * mm Display direction Display direction Display direction Display direction (motor side) CCW+ Display without units * mm Display without units * mm Display direction (motor side) Display direction (motor side) CCW+ Display direction (motor side) Display direction (motor side) Display direction (motor side) Display direction (motor side) CCW+ Display direction (motor side) Display	3 4 2 Command set 0 1	ting, re
06	* The mini Pos D Description First axis Second axis Default	Set	OFF n digit of the direction 5 1 P 6 2 P (Choices CCW+ CW+ CW+ Nge In	oordina os os	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display without units * mm tate value is the minimum resolution digit. The coordinate value counts up. Display direction Display and the counts up. Display direction Display and the counts up. Display direction Display direction Display direction Display direction Display direction (motor side) CCW+ Display direction (motor side) Display direc	3 4 2 Command set 0 1	ting, re
06	* The mini Pos D Description First axis Second axis Default INPos Description	Set	OFF n digit of the direction 5 1 P 6 2 P (Choices CCW+ CW+ CW+ Nge In	oordina o s o s	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display without units * mm tate value is the minimum resolution digit. The coordinate value counts up. Display direction Display and the completion (motor side) CCW+ Display without units * Display without units * mm tate value counts up. Display direction Display direction Display direction Display without units * Display without units * mm tate value counts up. Display direction Display direction Display direction (motor side) CCW+ Display direction (positioning. Display direction of positioning. Display direction of position of	3 4 2 Command set 0 1	ting, r
06	* The mini Pos D Description First axis Second axis Default	Set	OFF n digit of the direction 5 1 P 6 2 P (Choices CCW+ CW+ CW+ Nge In	oordina os os	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co	3 4 2 Command set 0 1	ting, re
06	* The mini Pos D Description First axis Second axis Default INPos Description First axis		OFF In digit of the direction 5 1 P 6 2 P (1) 6 2 P (1) Choices CCW+ CW+ CW+ CW+ CW+ CW+ CW+ CW	pordina in whice o s o s - positice deterr	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co	3 4 2 Command set 0 1	ting, r
06	* The mini Pos D Description First axis Second axis Default INPos Description		OFF n digit of the direction 5 1 P 6 2 P (Choices CCW+ CW+ CW+ Nge In	oordina o s o s	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co	3 4 2 Command set 0 1	ting, r
06	* The mini Pos D Description First axis Second axis Default INPos Description First axis		OFF In digit of the direction 5 1 P 6 2 P (1) 6 2 P (1) Choices CCW+ CW+ CW+ CW+ CW+ CW+ CW+ CW	pordina in whice o s o s - positice deterr	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The co	3 4 2 Command set 0 1	ting, r
06	* The mini Pos D Description First axis Second axis Default INPos Description First axis		OFF n digit of the direction the direction the direction f left P left Choices CCW+ CW+ CW+ CW+ left left P	pordina in whice o s o s - positice deterr	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display direction The coordinate value counts up. Display direction Display without units * Display without units * mm text value is the minimum resolution digit. Display direction Display without units * Display without units * mm text value is the minimum resolution digit. Display direction Display direction Display direction Display direction (motor side) Display direction (opposite motor side) CCW+ Display direction of positioning. Display direction of position of posit	3 4 2 2 0 1 0 1 0	rting, n
06	* The mini Pos D Description First axis Second axis Default INPos Description First axis		OFF n digit of the direction 5 1 P [6 2 Choices CCW+ CW+ CW+ CW+ Ange In the range fo 7 1 I E 8 2 I E Choices Choices	pordina in whice o s o s - positice deterr	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. The coordinate value counts up. Display direction The coordinate value counts up. Display direction Display without units * The coordinate value counts up. Display direction Display direction Display without units * The coordinate value counts up. Display direction Display direction Display direction Display direction Display direction Display direction (motor side) Display direction (opposite motor side) CCW+ Display direction of positioning. Display direction of positioning. Display direction Disp	3 4 2 2 Command set 0 1 0 1 0 1 0 1 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	rting, n
06	* The mini Pos D Description First axis Second axis Default INPos Description First axis		OFF n digit of the direction 5 1 P [6 2 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [7	pordina in whice o s o s - positice deterr	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Description Description Set in CCW direction (motor side) CCW+ Description Des	3 4 2 2 Command set 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	rting, n
06	* The mini Pos D Description First axis Second axis Default INPos Description First axis		OFF n digit of the direction 5 1 P [6 2 P [Choices CCW+ CW+ CW+ CW+ 1 1 8 2 1 8 2 1 [8 2 1 [Choices ± 1count ± 3count	pordina in whice o s o s - positice deterr	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display direction Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Display direction Display direction Display direction Description Descri	3 4 2 2 Command set 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 1	RES
06	* The mini Pos D Description First axis Second axis Default INPos Description First axis		OFF n digit of the direction 5 1 P [6 2 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [8 2 P [7 1 P [7	pordina in whice o s o s - positice deterr	Display in degree Display without units * mm ate value is the minimum resolution digit. The coordinate value counts up. Description Description Set in CCW direction (motor side) CCW+ Description Des	3 4 2 2 Command set 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ting, re

1 2 3	4 5 (6 7 8 9 10 11 12 1	3 14 15 16
09 FB Sp 10	eed Fe	edback speed	RESET
	Set the feedback	speed during positioning operation (BUSY).	
First axis	091F	B Speed	
1 11 51 4215]	Choices]	
Second axis	102F	B S p e e d Choices 1	
	L		
	Choices	Description	Command setting, reply
	FAST	Faster than before	0
	NORMAL	Conventional speed	1
Default		NORMAL	1
	Caust Za	un anatural	DECET
11 ZERO 12	Cont Ze	ro control	RESET
	After positioning	is completed, set whether to perform positioning c	ontrol to reach the target
Description	coordinate positio	on even within the in-position range.	
First axis	1 1 1 Z	EROCont	
	1 2 2 Z	Choices] E R O C o n t	
Second axis		Choices]	
	L		
	Choices	Description	Command setting, reply
	OFF	No control (stops in the in-position range)	0
	ON	Control for target position	1
Default		ON	1
13 Stage	Config Sta	age configuration	RESET
14 Otage	COINE Sta		I ILOL I
	Set the stage cor	figuration. The factory settings are set according to t	he stage connected to this
		nge the settings, contact us or our distributor.	
First axis	13 <u>1</u> S	tage Config Choices 1	
	142S	tage Config	
Second axis		Choices]	
		•	
	Choices	Description	Command setting, reply
		Type1 / Type2 / Type3 以外に対応	0
	Type1 Type2	Standard settings FC-911 standard setting	1 2
	ТуреЗ	Long stroke stage standard setting	3
Default		Type1	1
15 TEAC	HIF TE	ACH interface	RESET
_			
Description		operation interface.	
	15 T	EACH IF Choices	
			I
	LL		
	Choices	Description	Command setting, reply
		Stage controller JOG operation and command,	Command setting, reply
	JOG/CMD	Stage controller JOG operation and command, select jog controller	0
Default	JOG/CMD	Stage controller JOG operation and command,	

1	2 3	4	5	6	7	8	9	10	11	12	13	14	15	16
16	Acc C	ont		Acce	eration	/ dece	leration	contr	ol					RESET
17	Description	Set	the stage	accele	ration /	deceler	ation tim	ne.						
		1	6 1		C	C o	n t	10.						
	First axis]]	С	hoices]						
	Second axis	1	7 2	Ac	С	Со	n t	-						
				L	C	hoices								
			Choices				Desc	cription			(Commar	ıd settir	ng, reply
			S-Curve				S-Curv	/e cont	rol				0	
			Linear					r contr	ol				1	
	Default					S-C	urve						0	
40				<u> </u>		/ .1	1 +!	41						DECET
18 19	Acc T	ime		Acce	eration	/ dece	leration	time						RESEI
10	Description	Set	the stage	accele	ration /	deceler	ation tim	ne.						
	First axis	1	8 1	Ac	С	Τi	m e							
			0		etting va		m s							
	Second axis	1	9 2		C etting va	l i	m e m s							
							111 3							
			Model		Se	etting va	lue			Default		Comm	and sett	ing, reply
		-	C-111											
			C-411 C-511		10	~ 2000	Jme			100ms			100	
			C-611	-	10	2000	51113			100113			100	
			C-911											
20	Jog Si	peed	3	JOG	Speed 3	3								RESET
21		Sot	the opera	tion or	2 vood 3 v	uhon nr	occioa a	nd hol	ding the		land		trollor k	iove Sot
	Description		elow the "I											
	First axis	2	0 1	Jo		Sp	ее	d	3					
			1 2	[s value	-1] r 3	<u>mm/</u>	S			
	Second axis	2	1 2	J o I	g	S p Setting		d		nm/	S			
				L					J I	11 111 /				
			Model		Se	etting va	lue		[Default *		Comm	and sett	ing, reply
			C-111							0000mm			10000	
		-	C-411 C-511		lav Sna	od" mm	/ s or le)0000mr)0000mr		_	10000	
			C-611	- ``	nan ope		, s UI IB	00		00000m			00000	
		F	C-911	1					5.00)0000mr	m/s		50000	OC
	* At the tir	me o	f paramet	er defa	ult exec	oution, if	″Max S	peed" i	s less tha	an the de	fault,	it will be	"Max S	Speed".
22 23	Jog Si	peed	∠ ג	JUG	Speed 2	2								RESEI
20	Description	Set	the opera	tion sp	eed 2 v	vhen pro	essing a	nd hol	ding the	CW, CCV	l and	Jog con	troller k	keys. Set
	·	it be	elow the "	Jog Sp	eed 3″. I	If the se	tting val	lue is la	arge, it wi					
	First axis	2	2 1	Jo	g	S p Setting		d	2	n m /	0			
	_	2	3 2	Jo	g			d	2 r	<u>n m /</u>	S			
	Second axis	Ĺ	2	[0		g value	~		<u>m m /</u>	S			
				1								1-		
					Se	tting va	lue			Default *	1-	Comm		ing, reply
		-	C-111 C-411	-)000mm 0000mn			5000 50000	
			C-511		og Spee	d 3″ mn	n/sorl	ess		0000mm			50000	
			C-611])0000mr			50000	
			C-911		1.		"NA C	<i></i>)0000mr			25000	
	* At the tir	mo o	t poromot	or dofe	u ult ovoc	wittion if		nood i	a looo the	n the de	toult	It will be		nood

* At the time of parameter default execution, if "Max Speed" is less than the default, it will be "Max Speed".

Description Set the operation speed 1 when pressing and holding the CW. CCW and Jog control ler keys it below the 'Jog Speed 2.'' if the setting value is larger, will return to the previous setting value Second axis 2 5 2 J o g S p e e d 1 [Setting value] m m / s	24 25	Jog Sp	beed 1 JC	DG Speed 1		R
it below the 'Jog Sceed 2'. If the setting value is large, it will return to the previous setting value First ansign 2 2 1 0 g 0 e 1 m m setting value 1 setting value setting value setting value 1 setting value setting value setting value seting value <t< th=""><th>20</th><th>Description</th><th>Set the operation</th><th>n speed 1 when pressing and ho</th><th>Iding the CW, CCW and</th><th>d Jog controller key</th></t<>	20	Description	Set the operation	n speed 1 when pressing and ho	Iding the CW, CCW and	d Jog controller key
Pirst axe Image: Second axe Image: Sec						
Second axis 2 5 2 3 0 g S p e d 1 I setting value I m m / s Second axis 2 5 2 3 0 g S p e d 1 I setting value I m m / s Moxisi Setting value Default + Command setting 1,00000mm/s 100000 1,00000mm/s FC-111 "Jog Speed 2" mm / s or less 1,00000mm/s 1000000 1,000000mm/s 1000000 1,000000mm/s * At the time of parameter default execution, if "Max Speed" is less than the default, it will be "Max Speed" is less than the default, it will be "Max Speed" is less than the default, it will be "Max Speed" is less than the default, it will be "Max Speed" is less than the default, it will be "Max Speed" is less than the default, it will be "Max Speed" is less than the default. Z Jog Cont Set control when operating CCW and CW keys FF Description Set the operation when operating of the parameter "Stage Cont Type" is set to "Choices" in the performed during operation. FF Second axis 2 6 1 0 g C on t 1 0 0 n G on t 1 0 0 n G I 0 0 n G On t 1 0 0 n G On t 1 0 0 n G 1 0 0 n G Z I 0 g G On t 1 0 n G O n t 1 0 0 n G Second axis 2 7 2 J o g C on t 1 0 n G O n t 1 0 0 n G Second axis 2 7 8 1 0 n G O i r 1 0 0 n G 1 0 0 n G Default 0 n G O i r		Firet avie	24 1 J	og Speed	1	
Second ass [Setting value] m / s Model Sotting value Default * Command astring FC-611 "Jog Speed 2" mm / s or less 1.00000mm/s 100000 FC-611 "Jog Speed 2" mm / s or less 1.00000mm/s 100000 FC-611 "Jog Cont Set control when operating CCW and CW keys FR 26 Jog Cont Set control when operating CCW and CW keys FR 27 Description Set the operation when operating of the parameter 'Stage Cont Type' is set to "Cloce" and the set speed is 10 µ m / s or less, even if it is set to open ontrol when ope control when operating correction. FR 27 Description Set the operation when operating of the parameter 'Stage Cont Type' is set to "Cloce" and the set speed is 10 µ m / s or less, even if it is set to open ontrol when ope control will not be performed during operation. Cont Type' is set to "Cloce" is is control when operating in return. Condess Description Set the direction of mechanical origin return. Condess Description Set the direction of mechanical origin return. Condess Description		1 11 31 4713	[Setting value] m m / s	
Model Setting value Imm / s Model Setting value Default * Command setting FC-111 100000mm/s 1000000mm/s FC-511 *Jog Speed 2" mm / s or less 1000000mm/s 1000000mm/s FC-511 *Jog Speed 2" mm / s or less 1000000mm/s 1000000mm/s 1000000mm/s FC-511 *Jog Speed 2" mm / s or less 1000000mm/s 1000000mm/s 1000000mm/s 1000000mm/s *At the time of parameter default execution. If "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. FMax Speed" is less		Second axis	25 2J		1	
F0-111 F0-111 Tog Speed 2" mm / s or less 1.00000mm/s 100000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" 1000000mm/s 1000000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" 1000000mm/s 1000000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" F000000 10000000mm/s 10000000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" F000000 F000000 F0000000 26 Jog C Ont Set control when operating CCW and CCW keys on the front panel. After the operations, it returns to the setting of the parameter "Stage Cont Type", However, if the parameter "Stage Cont Type", However, if the parameter "Stage Cont Type", However, if the parameter is stage Cont Type", However, if the parameter is stage Cont Type", However, if it is set to open hop control 1 Second axis 2 7 2 0 0 0 1 28 ORG Dir Mechanical origin return direction F000000000000000000000000000000000000			[Setting value] m m / s	
F0-111 F0-111 Tog Speed 2" mm / s or less 1.00000mm/s 100000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" 1000000mm/s 1000000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" 1000000mm/s 1000000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" F000000 10000000mm/s 10000000 * At the time of parameter default execution. If "Max Speed" is less than the default. It will be "Max Speed" F000000 F000000 F0000000 26 Jog C Ont Set control when operating CCW and CCW keys on the front panel. After the operations, it returns to the setting of the parameter "Stage Cont Type", However, if the parameter "Stage Cont Type", However, if the parameter "Stage Cont Type", However, if the parameter is stage Cont Type", However, if the parameter is stage Cont Type", However, if it is set to open hop control 1 Second axis 2 7 2 0 0 0 1 28 ORG Dir Mechanical origin return direction F000000000000000000000000000000000000			Madal	Satting value	Dofouilt *	Command patting
FC-411 FC-611 "Jog Speed 2" mm / s or less 1.00000mm/s 1000000 * At the time of parameter default execution. if "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. it will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. It will be "Max Speed" is less than the default. 26 Jog Cont Set cont Top". However, if the parameter "Stage Cont Type" O 37 I or go Co on t I or Oncommend setting. Second axis 2 I or R G D is r I or Oncommend setting. 28 ORG Dist Mechanical origin return. File Second axis 2 <td< td=""><td></td><td></td><td></td><td>Setti ig value</td><td></td><td></td></td<>				Setti ig value		
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Mode3Set to Mode33Mode4Set to Mode44	29	ORG E Description First axis Second axis Default ORG M Description First axis	Set the direction 2 8 1 C 2 9 2 C 2 9 2 C 2 9 2 C 2 9 2 C Choices CCW+ CW+ CW+ CW+ C Mode Sel M C 3 0 1 C 3 1 2 C Choices ModeO C C	ON echanical origin return direction of mechanical origin return. PRGDir Choices] PRGDir Choices] PRGDir Description Set in CCW direction (opport CW+ echanical origin return method. PRGModeS Choices] PRGModeS Choices] PRGModeS Choices]	n (motor side) (motor side) (mo	1 RE Command setting, 0 1 1 RE pout 9. Origin for Command setting, 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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	29	ORG E Description First axis Second axis Default ORG M Description First axis	Set the direction 2 8 1 C 2 9 2 C 2 9 2 C 2 9 2 C Choices CCW+ CW+ CW+ CW+ Mode Sel M Set the machininformation. 3 0 1 C 3 0 1 C [3 1 2 C [Set the machininformation. 1 C [3 1 2 C [Set the machininformation. 1 C [3 1 2 C [ModeO Mode2 Mode3 [ON echanical origin return directio of mechanical origin return. PRGDir Choices] PRGDir Choices] PRGDir Description Set in CCW direction Set in CCW direction Set in CW direction (opport CW+ echanical origin return method. PRGModeS Choices] PRGModeS Choices] PRGModeS Choices]	n (motor side) posite motor side) d ease refer to the "Ak e 1 e 1 e 1 e 1 e 2 e3	1 RE Command setting, 0 1 RE Dout 9. Origin" for Command setting, 0 1 1 2 3

32	ORG Mode	3 Pos I	Vechanical origin return Mod	e3 specified position	RI
33	Description Cat th			, watu wa Mada2 ia aat Diaaaa	uniform to the o "Ala
			position when mechanical origir for more information.	return wooes is set. Please	ererer to the AD
	3 3		ORG Mode 3	Pos	
	First axis	-	Setting value] m m	
		3 2	ORG Mode 3	Pos	
	Second axis		Setting value] m m	
				· · · · · · · · · · · · · · · · · · ·	
	N	lodel	Setting value	Default	Command setting
	FC	-111	0.0001~999.9999m	m 0.5000mm	5000
	FC	-411	0.00005~999.99995m	m 0.50000mm	50000
	FC	-511	$0.00001 \sim 999.99999$ m	m 0.5000mm	50000
	FC	-611	0.000005~999.99995m	m 0.50000mm	500000
	FC	-911	$0.000001 \sim 999.999999$ m	m 0.50000mm	500000
				·	· · · · · · · · · · · · · · · · · · ·
34	ORG Speed	IH I	Mechanical origin return spee	d H	R
35					1.15
00	Description Set t	he mecha	anical origin return speed High.	Please refer to the "About	t 9 Home Return
			on. Set it below the "Max Spee		
		ous settin			
	First axis 3 4	1	ORG Speed	Н	
	FIRST AXIS		[Setting value] m m / s	
	Second axis 3 5	5 2	ORG Speed	Н	
	Second axis		[Setting value] m m / s	
			· · · · · · · · · · · · · · · · · · ·		
	N	lodel	Setting value	Default *	Command setting
	FC	-111		10.0000mm/s	100000
	FC	-411		10.0000mm/s	1000000
	FC	-511	"Max Speed" mm / s or less	10.0000mm/s	1000000
	FC	-611		10.00000mm/s	1000000
		-911		5.00000mm/s	5000000
	* At the time of	paramete	r default execution, if "Max Spee	$ed^{\prime\prime}$ is less than the default, it	t will be "Max Spe
36	ORG Speed	M	Nechanical origin return spee	ed M	RE
37					
			nical origin return speed Middle		
			on. Set it below the "ORG Speed	d H″. If the setting value is la	rge, it will return t
		ous settin		N A	
	First axis 3 6		ORG Speed	M	
		7	Setting value	<u> </u>	
	Second axis 3 7	2	ORG Speed	M	
			[Setting value	jmm/s	
			Sotting volue	Defey ilt *	Command actting
			Setting value	Default *	Command setting
		-111		5.0000mm/s	50000
		-411		5.0000mm/s	50000
		-511	"ORG Speed H" mm / s or les		500000
		-611		5.00000mm/s	500000
	L FC	-911		2.50000mm/s	2500000
		· · · · · · · · · · · · · · · · · · ·			
	* At the time of	paramete	r default execution, if "Max Spee	$ed^{"}$ is less than the default, it	t will be "Max Spe

38	ORG	Speed L		Mech	anical	origin re	eturn sr	beed L					
39			-										
	Descriptio	n Set the	e mech	anical	origin	return s	peed Lo	w. Plea	ase refe	r to the	e ″Abou	it 9. Ho	me Re
		more in	format	tion. Se	et it belo	ow the "(ORG Sp	eed M″.	If the se	etting va	alue is la	arge, it v	vill retu
		previou	ıs settir										
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							s value			mm,	/ S		
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		Mo	 طما		S	etting va	lue			Default	*	Comm	and set
		FC-1				stuing va	liue			0000mr			1000
		FC-4		-				F		0000m		_	1000
		FC-5		/ // // // // // // // // // // // // //	RG Shee	ed M″ mr	m / s or	less		0000m			1000
		FC-6								00000r			10000
		FC-9		-				-		00000r		_	10000
	* At the 1			er defa	ult exe	cution, if	Max S	peed" is					
						,							
40	EOD	G Speed		Flootr	io origi	n returr							
40 41	EUN	a Speed		Electr	IC ON	nreturr	i speed						
41			· · ·							″ A I			
	Descriptio			-	-		ed. Plea						
						- ″NA C	······································						
				et it be	elow the	e ″Max S	peed". If	the set	ting vali	ue is lar	ge, it wil	ll return	to the
		setting							ting valu	ue is lar	ge, it wil	ll return	
	First axi	setting			R G	i S	ре	the set				II return	
	First axi	setting s 4 0	value. 1	E 0	RG	i S Setting	p e g value	e d		ue is lar, m_m	/ s	ll return	
	First axi Second axi	setting s 4 0 4 1			RG	i S Setting i S	p e g value p e		1 [mm,	/ s	II return	
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42	Second axi * If the "N value of	setting 4 0 4 1 5 4 1 FC-4 FC-4 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-6 FC-	value. 1 2 del 111 511 511 511 611 011 d [°] is le peed [°] .	E O [E O [R G R G Se Max Spe	Setting Setting Setting va etting va	p e g value g value lue	e d e d] 1] 1 5.0 5.0 5.00 5.00 2.50	m m	/ s / s m/s nm/s nm/s nm/s nm/s	Comm	and set 5000 5000 50000 25000
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5	econd axis	47	2	- 3	S o f	t	LM	Т	Ρo	S				
C				[Setting	g value		1 [n m				
		M	odel		Se	etting va	lue			Default		Comm	and set	ting, repl
		FC-	-111		0.00	$01 \sim 99$	99.999	9mm	99	9.9999	mm		99999	99
			-411	ļ	0.0000					9.99995		_	999999	
			-511		0.0000		9.99999	9mm	999	9.99999	9mm	9	999999	
		I ⊢C-	-611				00000	-		~~~~	_			
							999999			.999999			99999	
			-911		000005					.999999 .999999			99999 999999	
48	<u>L <-> </u>	FC-		0.0		~ 999.	999999	Эmm	999	.999999	9mm			
		FC-	-911	Jog	controlle	~ 999. er left /	999999 right b	9mm utton c	999 operatic	.99999 n axis s	9mm setting	9		9999
	L <-> Descriptior	FC- R Sel	-911 ne axis t	Jog	controlle	~ 999. er left / vith the i	999999 right b left / rig	9mm utton c ht butto	999 operatic	.99999 n axis s	9mm setting	9		9999
		FC-	-911 ne axis t	Jog	controlle erates w	~999. er left / /ith the > R	999999 right b	9mm utton c	999 operatic	.99999 n axis s	9mm setting	9		9999
		FC- R Sel	-911 ne axis t	Jog	controlle erates w	~ 999. er left / vith the i	999999 right b left / rig	9mm utton c ht butto	999 operatic	.99999 n axis s	9mm setting	9		9999
		FC- R Sel Set th 4 8	-911 ne axis t Choices	Jog	controlle erates w	~999. er left / /ith the > R	999999 right b left / rig S Des	Omm utton c ht butto e 1] cription	999 operatic	.99999 n axis s	9mm setting ontroller	9	99999 nd settir	RESE
		FC- R Sel	-911 le axis t Choices None	Jog	controlle erates w	~999. er left / /ith the > R	999999 right b left / rig S Des Na	Omm utton c ht butto e 1] cription o use	999 operatio	.99999 n axis s	9mm setting ontroller	9	999999 nd settir 0	RESE
		FC-	-911 le axis t Choices None AXIS1	Jog	controlle erates w	~999. er left / /ith the > R	9999999 right b left / rig S Des Ne Set f	Omm utton c ht butto e 1] cription o use first axis	999 operatio	.99999 n axis s	9mm setting ontroller	9	999999 nd settir 0 1	RESE
		FC- R Sel	-911 le axis t Choices None	Jog	controlle erates w	~ 999. er left / /ith the > R Choices	9999999 right b left / rig S Des Ne Set f	Omm utton c ht butto e 1] cription o use	999 operatio	.99999 n axis s	9mm setting ontroller	9	999999 nd settir 0	RESE
	Descriptior	FC- R Sel	-911 le axis t Choices None AXIS1	Jog	controlle erates w	~ 999. er left / /ith the > R Choices	9999999 right b left / rig S Des Des Set 1 Set se	Omm utton c ht butto e 1] cription o use first axis	999 operatio	.99999 n axis s	9mm setting ontroller	9	999999 nd settir 0 1 2	RESE
I	Descriptior	FC- R Sel Set th 4 8	-911 le axis t Choices None AXIS1	Jog hat op L	controlle erates w	~ 999. er left / /ith the > R Choices	999999 right b left / rig S Des No Set 1 Set se (IS1	Omm utton c ht butto e 1] cription o use iirst axis cond ax	999 operatio ons of th	.99999 n axis s ne jog co	9mm setting ontroller	9	999999 nd settir 0 1 2	1999 RESET
49	Description Defaul [*] T <->	FC- R Sel A Set th 4 8	-911 le axis t Choices None AXIS1 AXIS2	Jog de la construction de la construcción de la con	controlle	~ 999. er left / /ith the > R Choices AX	9999999 right b left / rig S Des Na Set 1 Set se (IS1 down b	Dmm utton c ht butto e] cription p use irrst axis cond ax utton c	999 operatio ons of th iis	n axis s ne jog co ne jog co	9mm setting ontroller (c setting	20mmar	999999 nd settir 0 1 2	1999 RESET
49	Descriptior Defaul	FC- R Sel Set th 4 8 C C C C C C C C C C C C C C C C C C C	-911 le axis t Choices None AXIS1 AXIS2 le axis t	Jog d hat op	controlle	~ 999. er left / /ith the Choices AX er up /	9999999 right b left / rig S Des Ne Set 1 Set se GS1 down b	Omm utton c ht butto e 1] cription o use first axis cond ax utton c wn butto	999 operatio ons of th iis	n axis s ne jog co ne jog co	9mm setting ontroller (c setting	20mmar	999999 nd settir 0 1 2	9999 RESE
49	Description Defaul [*] T <->	FC- R Sel A Set th 4 8	-911 le axis t Choices None AXIS1 AXIS2 le axis t	Jog de la construction de la construcción de la con	controlle controlle controlle controlle erates w < -	~ 999. er left / /ith the Choices AX er up / /ith the > B	9999999 right b left / rig S Des Na Set 1 Set se (IS1 down b	Omm utton c ht butto e 1] cription o use first axis cond ax utton c wn butto	999 operatio ons of th iis	n axis s ne jog co ne jog co	9mm setting ontroller (c setting	20mmar	999999 nd settir 0 1 2	9999 RESE
49	Description Defaul [*] T <->	FC- R Sel Set th 4 8 C C C C C C C C C C C C C C C C C C C	-911 le axis t Choices None AXIS1 AXIS2 le axis t	Jog d hat op	controlle controlle controlle controlle erates w < -	~ 999. er left / /ith the Choices AX er up /	9999999 right b left / rig S Des Ne Set 1 Set se GS1 down b	Omm utton c ht butto e 1] cription o use first axis cond ax utton c wn butto	999 operatio ons of th iis	n axis s ne jog co ne jog co	9mm setting ontroller (c setting	20mmar	999999 nd settir 0 1 2	1999 RESET
49	Description Defaul [*] T <->	FC- R Sel Set th 4 8 C B Sel B Sel A 9	-911 le axis t Choices None AXIS1 AXIS2 le axis t	Jog d hat op	controlle controlle controlle controlle erates w < -	~ 999. er left / /ith the Choices AX er up / /ith the > B	999999 right b left / rig S Des Des Set 1 Set se (IS1 down b up / dov S	Omm utton c ht butto e 1] cription o use first axis cond ax utton c wn butto	999 operatio ons of th iis	n axis s ne jog co ne jog co	9mm setting ontroller controller	er.	999999 nd settir 0 1 2 1	1999 RESET
49	Description Defaul [*] T <->	FC- R Sel Set th 4 8	-911 e axis t Choices None AXIS1 AXIS2 e axis t Choices None	Jog d hat op	controlle controlle controlle controlle erates w < -	~ 999. er left / /ith the Choices AX er up / /ith the > B	999999 right b left / rig S Des Des Set 1 Set se JS1 down b up / dow S up / dow S	Demm utton c ht butto e] cription o use iirst axis cond ax utton c wn butt e]	999 operatio ons of th iis	n axis s ne jog co ne jog co	9mm setting ontroller controller	er.	999999 nd settir 0 1 2 1 1 nd settir 0	1999 RESET
49	Description Defaul [*] T <-> 1	FC- R Set th 4 8 C B Set 4 9 C C C C C C C C C C C C C	-911 e axis t Choices None AXIS1 e axis t Choices None AXIS1	Jog d hat op	controlle controlle controlle controlle erates w < -	~ 999. er left / /ith the Choices AX er up / /ith the > B	999999 right b left / rig S Des Na Set 1 Set se down b up / dov S Des Na Set 1	Emm Utton c ht butto e 1] cription o use irst axis cond ax utton c wn button e 1] cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription cription	999 pperatic ons of th is operatio	n axis s ne jog co ne jog co	9mm setting ontroller controller	er.	999999 nd settir 0 1 2 1 nd settir 0 1 1 1 1 1 1 1 1 1 1 1 1 1	1999 RESET
49	Description Defaul [*] T <-> 1	FC- R Sel A 8 A 8 C C C C C C C C C C C C C	-911 e axis t Choices None AXIS1 AXIS2 e axis t Choices None	Jog d hat op	controlle controlle controlle controlle erates w < -	~ 999. er left / /ith the ' > R /hoices Ax er up / /ith the > B /hoices	999999 right b left / rig S Des Na Set 1 Set se down b up / dov S Des Na Set 1	Emm Utton c ht button cription o use irst axis cond ax utton c wn button e 1] cription cription o use	999 pperatic ons of th is operatio	n axis s ne jog co ne jog co	9mm setting ontroller controller	er.	999999 nd settir 0 1 2 1 1 nd settir 0	9999

1	2 3	4	5	6	7	8	9	10	11	12	13	14	15	16
50	0 Right	Dir		Jog co	ontroller	right	button	count	directio	n				RESET
	Description	n Set th	ne count	directio	on when	operat	ting the	right bu	utton of	the jog	contro	oller.		
		5 C)	Ri	g h	t	Di	r						
				[Ch	noices]						
		(Choices				Desc	ription			T	Commai	nd settir	ng, reply
			Plus			Set	t in the p		ection				0	
			Minus				in the m	ninus dir	rection				1	
	Default	t				Plu	JS						0	
5	1 Top [Dir			ontroller		uttop of		raction					DECET
5	I IOPL	זו		JOB CC	Jritroller	up pu		Juni ai	rection					RESEI
	Description	Set th	ne count	directio	on when	operat	ting the	up butt	on of th	ne jog co	ontrolle	ər.		
		5 1		Τo	•	Di	r	_						
					Ch	noices]						
		(Choices				Desc	ription				Commai	nd settir	ng, reply
			Plus			Set	t in the p		ection				0	0
			Minus				in the m	ninus dir	rection				1	
	Default	t				Plu	JS						0	
52	2 Jy Co	nt		Comm	nand "J`	V." oor	trol							RESET
5		110		COITIN		1. 001								NLOLI
	Description													
			etting of "Close"											
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		L		L										
		(Choices					cription				Comma	nd settir	ng, reply
			OFF		Settir				ge Cont	Type"			0	
	Default		ON			O	to oper	1 100p C	ontrol				11	
	Doradi	-									I			
54	4 Jy Sp	eed H		JY Sp	eed H									RESET
5														
	Description		ne opera return to					it belov	v the "M	lax Spee	ed". If t	the settir	ng value	is large,
		5 /		JC	_	p e		Η						
	First axis	S		[Setting	; value] r	n m	s			
	Second axis	5 5	5 2	Jс	S	p e		Н			,			
				L		Setting	s value] r	n m /	S			
		M	lodel		Set	ting va	lue		[Default	*	Comn	hand sett	ing, reply
			-111			_				0000m			10000	
	FC-411 10.0000mm/s							1000000						
			-511	″M	ax Spee	d″ mm	/ s or le	ss		00000n			10000	
			-611 -911	-				_		00000r 00000n			10000C 50000	
				I					0.00		111/3		555500	

5.000000mm/s * At the time of parameter default execution, if "Max Speed" is less than the default, it will be "Max Speed".

								1									
1	2	3	4	5		6	7	8		9	10	11	12	13	14	15	16
												÷					
Ę	56	Jy Sp	eed 9	9	Ū	Y Sp	eed 9										RESET
Ę	57					•											
		escriptior	n Set	the op	eratio	on spe	ed 2 v	vhen p	oress	ing aı	nd hold	ding th	e CW, CC	W and J	Jog con	troller k	eys. Set
			it be	elow the	∍″Jo	g Spe	ed 3″.	If the s	settir	ng val	ue is la	rge, it	will return	n to the	previous	s setting	g value.
		First axis	5	6	1	Jу	S	ре	e e	d	9						
		I II SL AXIS				[Setti	ng va	alue]	m m	/ s			
	Se	cond axis	5	7	2	Jу	S	ре	e e	d	9						
	Se	CONU AXIS				[Setti	ng va	alue]	m m	/ s			
				Model			Se	etting \	/alue				Default	*	Comm	and sett	ing, reply
			F	C-111								Ę	5.0000m	m/s		50000	C
			F	C-411								5	.00000n	nm/s		50000	0
			F	C-511		رل″	/ Speec	Η″ m	m / s	s or le	SS	5	.00000m	nm/s		50000	0
			F	C-611								5.	000000r	nm/s	Ę	500000	00

* At the time of parameter default execution, if "Max Speed" is less than the default, it will be "Max Speed".

■ About the minimum speed of Jy Speed1 to 8

FC-911

The minimum operation speed of Jy Speed1 to 8 is determined by the setting of Jy Speed9. See the table below for details. For example, if Jy Speed 9 is set to 10 mm / s while using FC-111, the minimum operation speed is 0.0002 mm / s. The minimum speed of FC-111 can be set to 0.0001 mm / s, but in this example, it does not operate because the minimum speed is 0.0002 mm / s.

4.00000mm/s

4000000

Model	Jy Speed 9 s	peed s	setting range	Minimum speed
	0.0001mm/s	-	6.5535mm/s	0.0001mm/s
	6.5536mm/s	-	13.1070mm/s	0.0002mm/s
FC-111	13.1071mm/s	-	32.7675mm/s	0.0005mm/s
	32.7676mm/s	-	65.5350mm/s	0.0010mm/s
	65.5351mm/s	-	100.0000mm/s	0.0020mm/s
	0.00005mm/s	-	3.27675mm/s	0.00005mm/s
	3.27680mm/s	-	6.55350mm/s	0.00010mm/s
	6.55355mm/s	-	16.38375mm/s	0.00025mm/s
FC-411	16.38380mm/s	-	32.76750mm/s	0.00050mm/s
	32.76755mm/s	-	65.53500mm/s	0.00100mm/s
	65.53550mm/s	-	100.0000mm/s	0.00250mm/s
	0.00001mm/s	-	0.65535mm/s	0.00001mm/s
	0.65536mm/s	-	1.31070mm/s	0.00002mm/s
	1.31071mm/s	-	3.27675mm/s	0.00005mm/s
FC-511	3.27676mm/s	-	6.55350mm/s	0.00010mm/s
	6.55351mm/s	-	13.10700mm/s	0.00020mm/s
	13.10701mm/s	-	32.76750mm/s	0.00050mm/s
	32.76751mm/s	-	50.0000mm/s	0.00100mm/s
	0.00005mm/s	-	0.327675mm/s	0.00005mm/s
	0.327680mm/s	-	0.655350mm/s	0.000010mm/s
	0.655355mm/s	-	1.638375mm/s	0.000025mm/s
FC-611	1.638380mm/s	-	3.276750mm/s	0.000050mm/s
	3.276755mm/s	-	6.553500mm/s	0.000100mm/s
	6.553550mm/s	-	16.383750mm/s	0.000250mm/s
	16,383755mm/s	-	30,000000mm/s	0.000500mm/s
	0.000001mm/s	-	0.065535mm/s	0.00001mm/s
	0.065536mm/s	-	0.131070mm/s	0.00002mm/s
	0.131071mm/s	-	0.327675mm/s	0.00005mm/s
FC-911	0.327676mm/s	-	0.655350mm/s	0.000010mm/s
	0.655351mm/s	-	1.310700mm/s	0.000020mm/s
	1.310701mm/s	-	3.276750mm/s	0.000050mm/s
	3.276751mm/s	-	6.00000mm/s	0.000100mm/s

First Second * At th 60 Jy 61 Descrip First Second * At th 62 Jy 63 Descrip	cription Set the 8th operation spee large, it will return to the pre			KE
First Second * At th 60 Jy 61 Descrip First Second * At th 62 Jy 63 Descrip First	large, it will return to the pre	d of . IY sneed Set it k	below the ", ly Speed 9"	If the setting value
* At th 60 Jy 61 Descrip First Second * At th 62 Jy 63 Descrip First	58 1 L V S		below the by Opeed D	. Il the setting val
* At th 60 Jy 61 Descrip First Second * At th 62 Jy 63 Descrip First		peed 8		
* At th 60 Jy 61 Descrip First Second * At th 62 Jy 63 Descrip First		Setting value] m m / s	
* At th 60 Jy 61 Descrip First Second * At th 62 Jy 63 Descrip First	592JyS	peed 8		
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst		Setting value] m m / s	
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst	Model Se	etting value	Default *	Command setting,
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst	FC-111		1.0000mm/s	10000
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst	FC-411		1.00000mm/s	100000
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst		9″ mm / s or less	1.00000mm/s	100000
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst	FC-611		1.000000mm/s	1000000
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst	FC-911		1.000000mm/s	1000000
60Jy61DescripFirstSecondSecond* At th62Jy63DescripFirst	At the time of parameter default exec	cution, if "Max Speed" is		
61 Descrip First Second * At th 62 Jy 63 Descrip First				
Elescrip First Second * At th 62 Jy 63 Descrip First	Jy Speed 7 JY Speed 7			RE
First Second * At th 62 Jy 63 Descrip First				
Second * At th 62 Jy 63 Descrip First	scription Set the 7th operation spee	d of JY speed. Set it l	below the "Jy Speed 8"	. If the setting value
Second * At th 62 Jy 63 Descrip First	large, it will return to the pre			
Second * At th 62 Jy 63 Descrip First	First axis 6 0 1 J y S	•		
* At th 62 Jy 63 Descrip First		Setting value] m m / s	
* At th 62 Jy 63 Descrip First	opd axis 6 1 2 J y S	peed 7		
62 Jy 63 Descrip First		Setting value] m m / s	
62 Jy 63 Descrip First	Model Se	etting value	Default *	Command setting,
62 Jy 63 Descrip First	FC-111		0.5000mm/s	5000
62 Jy 63 Descrip First	FC-411		0.50000mm/s	50000
62 Jy 63 Descrip First		3 8″ mm / s or less	0.50000mm/s	50000
62 Jy 63 Descrip First	FC-611		0,50000mm/s	50000
62 Jy 63 Descrip First	FC-911		0.500000mm/s	500000
62 Jy 63 Descrip First	At the time of parameter default exec	ution if "Max Spood" i		
63 Descrip First	At the time of parameter default exec	Sution, IT Wax Speed is	s less than the default, h	t will be wax spee
63 Descrip First				
Descrip First	Jy Speed 6 JY Speed 6			RES
First				
	scription Set the 6th operation spee large, it will return to the pre		below the Jy Speed (. If the setting value
		peed 6]
Second	First axis 6 2 1 J y S	Setting value		
Second	632JyS		Jmm/s	
	ond axis 6 3 2 J y S	p e e d 6 Setting value] m m / s	
		etting value	Default *	Command setting,
	Model		0.1000mm/s	1000
	FC-111		0.10000mm/s	10000
	FC-111 FC-411	7"	0.1000mm/s	10000
	FC-111 FC-411 FC-511 [″] Jy Speed	d 7" mm / s or less		
. .	FC-111 FC-411 FC-511 [″] Jy Speed FC-611	d 7" mm / s or less	0.100000mm/s	100000
* At th	FC-111 FC-411 FC-511 [″] Jy Speed		0.100000mm/s 0.100000mm/s	100000

64	Jy Speed	5	JY Speed 5			RES
65	Description Sat	t the 5th c	poration spoo	d of IV speed Sat it	below the "Jy Speed 6"	If the setting value
				evious setting value.	. Delow the by Speed O	. Il the setting valu
	6	4 1	Jy S			
	First axis		[Setting value] m m / s	
	Second axis 6	5 2	Jy S	peed 5		
			[Setting value] m m / s	
		Model	Se	etting value	Default *	Command setting, r
		FC-111			0.0500mm/s	500
		FC-411	-		0.05000mm/s	5000
		FC-511	/ //v Speed	d 6″ mm / s or less	0.05000mm/s	5000
		FC-611			0.050000mm/s	50000
		FC-911	-		0.05000mm/s	50000
			er default exec	cution, if "Max Speed"	is less than the default, i	
66	Jy Speed	4	JY Speed 4			RES
67						
					below the "Jy Speed 5"	. If the setting valu
	6	6 1		evious setting value. peed 4]
	First axis	0	Г S	Setting value	/	
	6	7 2	Jy S			
	Second axis		r S	Setting value] m m / s	
			L] / 3	
		Model	Se	etting value	Default *	Command setting, r
		FC-111		<u> </u>	0.0100mm/s	100
		FC-411			0.01000mm/s	1000
		FC-511	<i>"</i> Jy Speed	d 5″ mm / s or less	0.01000mm/s	1000
		FC-611			0.010000mm/s	10000
		FC-911	1		0.010000mm/s	10000
	* At the time of	of paramet	er default exec	cution, if "Max Speed"	is less than the default, i	t will be "Max Speed
60	ly Speed		JY Speed 3			RES
68 69	Jy Speed	3	JT Speed S			nea
00	Description Set	r the 3th c	peration spee	d of JY speed. Set it	below the "Jy Speed 4"	If the setting valu
				evious setting value.		
	First axis 6	8 1	Jy S	peed 3	3	
			[]	Setting value] m m / s	
	Second axis 6	9 2	J <u>y</u> S	peed 3	3	
			[Setting value] m m / s	
		Martel			Defende	Commercial
			Se	etting value	Default *	Command setting, r
		FC-111	-		0.0050mm/s	50
		FC-411	<i>"</i> by Correct	1 1 ["] mana / c 1	0.00500mm/s	500
		FC-511	Jy Speed	$4^{\prime\prime}$ mm / s or less	0.00500mm/s	500
		FC-611	-		0.005000mm/s	5000
		FC-911			0.005000mm/s	5000
	* At the time of	ot paramet	er detault exec	oution, it Max Speed	is less than the default, i	t will be Wax Speed

71 Description Set the 2th operation speed of JY speed. Set it below the "Jy Speed 3". If the setting	RESET
71 Description Set the 2th operation speed of JY speed. Set it below the "Jy Speed 3". If the setting	RESET
71 Description Set the 2th operation speed of JY speed. Set it below the "Jy Speed 3". If the setting	nlol i
Description Set the 2th operation speed of JY speed. Set it below the "Jy Speed 3". If the setting	
	value is
large, it will return to the previous setting value.	value le
First axis 7 0 1 J y S p e e d 2	
First axis [Setting value] m m / s	
Second axis 7 1 2 J y S p e e d 2	
Second axis [Setting value] m m / s	
Model Setting value Default * Command setti	ting, reply
FC-111 0.0010mm/s 10	
FC-411 0.00100mm/s 100 FC-511 "Jy Speed 3" mm / s or less 0.00100mm/s 100	
FC-611 Sy Speed 3 min / s of less 0.00100mm/s 100	
FC-911 0.001000mm/s 1000	
* At the time of parameter default execution, if "Max Speed" is less than the default, it will be "Max Speed" is less than the default.	
	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
72 Jy Speed 1 JY Speed 1	RESET
73	I LOL I
Description Set the 1th operation speed of JY speed. Set it below the "Jy Speed 2". If the setting	value is
large, it will return to the previous setting value.	
First axis 7 2 1 J y S p e e d 1	
[Setting value] m m / s	
Second axis 7 3 2 J y S p e e d 1	
[Setting value] m m / s	
Model Setting value Default * Command setti	ting, reply
FC-111 0.0005mm/s 5	
= 0.00050 mm/s	
FC-411 0.00050mm/s 50 FC-511 " lv Speed 2" mm / s or loss 0.00050mm/s 50	
FC-511 "Jy Speed 2" mm / s or less 0.00050mm/s 50	
FC-511 "Jy Speed 2" mm / s or less 0.00050mm/s 50 FC-611 0.000500mm/s 500	
FC-511 "Jy Speed 2" mm / s or less 0.00050mm/s 50 FC-611 0.000500mm/s 500 FC-911 0.000500mm/s 500	
FC-511 "Jy Speed 2" mm / s or less 0.00050mm/s 50 FC-611 0.000500mm/s 500	
FC-511 "Jy Speed 2" mm / s or less 0.00050mm/s 50 FC-611 0.000500mm/s 500 FC-911 0.000500mm/s 500	
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* Do not set a value that exceeds the maximum moving speed of the connected stage.

04		-		
05	Lin/Rot	Со	ntrol stage type	RE
00	Description Se	et the type of sta	age to be controlled.	
	First axis	551L	in/Rot	
		6 2 L	Choices]	
	Second axis	562L	in/Rot Choices	
		L		
		Choices	Description	Command setting, I
		Linear	Set to linear stage	0
	Default	Rotate	Set to rotating stage Linear	1 0
	Deladit		Linda	0
06	Stop Sel	Sto	op control setting	RE
07			·	
			he stage. Valid when executing the front panel JOG k	ey and command "L:"
	First axis	57 <u>1</u> S	t o p S e l Choices l	
	5	582S	top Sel	
	Second axis		Choices]	
		Choices	Description	Commerced catting
		SD Stop	Description Stop deceleration	Command setting, I O
		IM Stop	Stop immediately	1
	Default		SD Stop	0
08 09	EMG Mc	tor Excite Mc	tor status at emergency stop	RE
09	Description Se	et the motor sta	tus at emergency stop.	
	First axis		MG Motor Excite	
			Choices]	
	Second axis	502E	MG Motor Excite Choices]	
		Choices	Description	Command setting, I
		Disable	Not excite	0
		Enable	Excite	1
	Default		Disable	0
10	EMG Co	npector Lls	e of emergency stop	RE
10				11
			se the emergency stop function.	
	6			
	I	5 1 <u>1</u> E	MGConnector Choices	
		5 1 <u>1</u> E	Choices]	
		[Choices	Choices] Description	
		Choices Disable	Choices] Description Not Use	0
	Default	[Choices	Choices] Description Not Use Use	
	Default	Choices Disable	Choices] Description Not Use	0 1
11	Default Motor E	Choices Disable Enable	Choices] Description Not Use Use	0 1 0
11 12	Motor Ex	Choices Disable Enable Kcite Mc	Choices] Description Not Use Use Disable	0 1 0
	Motor E: Description Se	Choices Disable Enable Koite Mo	Choices] Description Not Use Use Disable tor status at startup tus at startup.	0 1 0
	Motor Ex	Choices Disable Enable Koite Mo	Choices] Description Not Use Use Disable	1
	Motor Ex Description Se First axis	Choices Disable Enable Koite Mo	Choices] Description Not Use Use Disable tor status at startup tus at startup, o t o r E x c i t e Choices] o t o r E x c i t e	0 1 0
	Motor E: Description Se First axis	Choices Disable Enable Koite Mo et the motor sta	Choices] Description Not Use Use Disable tor status at startup tus at startup. o t o r E x c i t e Choices]	0 1 0
	Motor Ex Description Se First axis	Choices Disable Enable kcite Mc et the motor sta 2 1 M [3 3 2 M [Choices]	O 1 O RE
	Motor Ex Description Se First axis	Choices Disable Enable Koite Mo et the motor sta	Choices] Description Not Use Use Disable tor status at startup tus at startup, o t o r E x c i t e Choices] o t o r E x c i t e	0 1 0

	0 0	4 5	\mathbf{c} 7 0 0 10 11 10 12	11 15 16
	2 3	4 5	6 7 8 9 10 11 12 13	14 15 16
13	Stage	Cont Type Fe	edback stage control type	RESET
14	Description	Sat the feedback	ators control mathed	
	Description	6 4 1 S	stage control method. tage Cont Type	
	First axis		Choices]	
	.	6525	tage Cont Type	
	Second axis		Choices]	
		Choices	Description	Command setting, reply
		Close	Closed loop	0
	Defeat	Open	Open loop	1
	Default	[Close	0
15 16	Count	t Sei D	splay counter contents	RESET
10	Description	. Set the type of c	punter to be displayed.	
			ount Sel	
	First axis		Choices]	
		6720	ount Sel	
	Second axis		Choices]	
			· · · · · · · · · · · · · · · · · · ·	
		Choices	Description	Command setting, reply
		Encoder	Encoder reading coordinate value	0
	Default	Out Pulse	Command coordinate value Encoder	0
	Delault	L		0
17	CD Dr		urrent down drive	RESET
18		0		TILOL I
10	Description	Set whether to a	perate with the motor drive current constantly reduced.	
	Einet en de	6810	D Drive	
	First axis	L	Choices]	
	Second axis	6920	Drive	
		'[Choices]	
		Clasicas	Description	
		Choices OFF	Description Normal	Command setting, reply O
		ON	Reduce drive current	1
	Default		OFF	0
		L		
19	INP De	ec In	position judgment time	RESET
20				
	Description	Set the in-position	n judgment time.	
	First axis	7011	NP Dec	
	1 11 SL AXIS	L	Choices]	
	Second axis	7 1 2 I	N P D e c	
			Choices]	
		Choices	Description	Command setting, reply
		Normal	Normal	O O
		Short	Decrease the judgment time	1
	Default		Normal	0
		1		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
21	F	BT S	Sel		Feed	back s	tart timi	ng							RESET
22															
	Descri	iption											of the fe		
							cording nmand e						is choos	se, tee	dback is
			7 2		FE		S e		al Uless			speed.			
	Firs	t axis	s ' _	-	ſ		Choices		1						
	_		7 3	3 2	FE		S e	1							
	Second	d axis			ſ		Choices	•	1						
				Choices				Des	cription			(Comman	d setti	ng, reply
				Normal				No	ormal			İ		0	
				After		St	arted wł	nen the	move co	ommanc	d ends			1	
	De	efault	:				Nor	rmal						0	
23	lr	ni Mo	de		Initia	mode									RESET
	Descri	iption	Set th	ne startu	up moc	le.									
			7 4		lr	n i	Мо	d e]	
					[(Choices]						
				Choices					cription				Comman		ng, reply
				REMOTE				art in RE						0	
								tart in L						1	
		I.		TEACH				tart in T	EACH n	node				2	
	De	efault					LO	CAL						1	
24	I/	F Se			Com	munica	tion inte	ertace							RESET
	Descri	Iption		ne comm	nunica			1							
			7 5)			S e Choices	I	1						
					L		51101065]						
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25	L	JSB [Del		USB	delimite	er								RESET
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26	e	iP-IB	Addr		GP-I	3 addre	ess								RESET
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27	GP-IB	Del GF	P-IB delimiter	RE
	Description	Set the GP-IB inte	erface delimiter.	
		78 G		
		L	Choices]	
		Choices	Description	Command setting, r
		CR + LF	Carriage return code and line feed code	0
		EOI	End or Identify	1 2
		CR LF	Carriage return code Line feed code	3
	Default		CR + LF	0
28	GP-IB	EOI GF	P-IB EOI	RE
	Description		EOI of GP-IB interface.	
		79 G		
		L	Choices]	
		Choices	Description	Command setting, r
		OFF	Disable	0
		ON	Enable	1
	Default		ON	1
29	GP-IB			
20		Sh& Gr	P-IB SRQ	RE
20			P-IB SRQ	RE
20			s the SRQ of the GP-IB interface.	
20		Enables / disable	es the SRQ of the GP-IB interface.	RE
20		Enables / disable 8 0 G [es the SRQ of the GP-IB interface. P - I B S R Q Choices]	
20		Enables / disable	es the SRQ of the GP-IB interface. P - I B S R Q	
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20		Enables / disable 8 0 G [Choices OFF ON	es the SRQ of the GP-IB interface. P - I B S R Q Choices] Description Disable	Command setting, r 0
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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8. Teaching function

The teaching function is a function to execute commands registered inside this equipment when in the TEACH mode. It can execute all lines automatically or one line at a time. The registered commands are executed sequentially from the first line, and execution ends when the command "END:" or the completion of the 200th line. If there is a line where no command is registered (blank line), skip that line. In the case of an error that can be cleared, executing the error clear returns to the first line. The error can be cleared by operating the "BEC" key of the target axis after switching to the command "BEC:" or LOCAL mode.

<u>^</u>	• Before moving the stage, make sure that there is no effect on the surroundings.
	 Check the registration details before performing teaching.

8-1. About channels

There are 1 to 5 channels, and the number of stored lines per channel is 200. The following table shows the image stored in the internal memory.

Line	Channel1	Channel2	Channel3	Channel4	Channel5
1	D:1M1	D:1M1	JG:1 +100	JG:1 -100	FS:1 100
2	M:1+M10	M:1-M10			FS:2 100
3	G	G	END:	END:	M:1+U100
4	END:	END:			G
5					FE:2
			2		
198					FE:1
199					END:
200					

8-2. About registration and editing

Registration of contents is possible only by command. The commands used for registration and editing are shown below.

ltem	No,	Commands	Function	Page
Teaching	56	T_ON:	Move to teaching edit mode	56
	57	T_OFF:	Save teaching content and return to TEACH mode	56
	58	T_DEL:	Delete the contents of the line registered for teaching	56
	59	T_SET:	Set teaching content for each line	56
	60	T_GET:	Get the contents of the line registered for teaching	56
	61	TC:	Select teaching channel	56
	62	TCR:	Get the current teaching channel	57
	63	TQ:	Get teaching status	57
	68	TR:	Get teaching channel registration status	58

(1)Example 1

Set the operation speed of the first axis to 1 mm / sec. After moving 10 times in increments of 1 mm from the current position, move the axis in the negative direction 10 mm and wait for 1 second. Repeat this 10 times.

Send command	Description
T_ON:	Move to TEACH edit mode
TC:1	Select channel 1
T_SET:1 D:1M1	First axis operation speed set to 1mm / sec
T_SET:2 H:1	Set First axis mechanical home return
T_SET:3 FS:1 10	Set 10 times for loop level 1
T_SET:4 M:1+M1	Set first axis relative movement set value to 1mm
T_SET:5 FS:2 10	Set 10 times for loop level 2
T_SET:6 GN:1	Start moving
T_SET:7 FE:2	End location of loop level 2
T_SET:8 M:1-M10	Set first axis relative movement set value to -10mm
T_SET:9 G	Start moving
T_SET:10 T:1.0	Wait 1 second
T_SET:11 FE:1	End location of loop level 1
T_SET:12 END:	Teaching end line setting
T_OFF:	Save teaching contents and return to normal mode

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

(2)Example 2

Retrieve the first and fourth lines from Example 1.

Send command	Reply command	Description
T_ON:	-	Move to TEACH edit mode
TC:1	-	Select channel 1
T_GET:1	D:1M1	Get first line
T_GET:4	M:1+M1	Get line 4
T_GET:13	-	Not registered

(3)Example 3

Delete the first to fourth lines of Example 1.

Send command	Description
T_ON:	Move to TEACH edit mode
TC:1	Select channel 1
T_DEL:1	Delete first line
T_DEL:2	Delete line 2
T_DEL:3	Delete line 3
T_DEL:4	Delete line 4
T_OFF:	Save teaching contents and return to normal mode

(4) Registration target command

This is a list of commands that can be registered for teaching.

Item	No,	Commands	Function	Page		
Control	09	F:	Change the positioning control method (Closed or Open loop)	28		
	11	C:	Change the excitation state of the motor	28		
Origin	33	H:	Return to mechanical origin	44		
	34	Z:	Return to electrical origin	44		
	35	R:	Set the position coordinate values to zero	45		
Motion	38	ACC:	Set the acceleration and deceleration time	46		
	40	D:	Set the movement speed of the stage	47		
	42	A:	Set the position to move in absolute motion	49		
	43 M: Set the amount of movement to move in relative motion					
	44	G	Start moving (The setting values is lost after execution)	51		
	45	GN:	Start moving (The setting values is not lost.)	51		
	48	JG:	It moves according to the set number of pulses	53		
General purpose I/O	55	O:	Set general-purpose Output status	55		
Teaching	74	FS:	Loop setting	61		
registration	75	FE:	Set loop end	61		
only	76	END:	Set the execution end line	61		
ĺ	77	T:	Set the wait time	61		
	78	GIS:	Wait until the specified general-purpose input state is reached	61		

1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16
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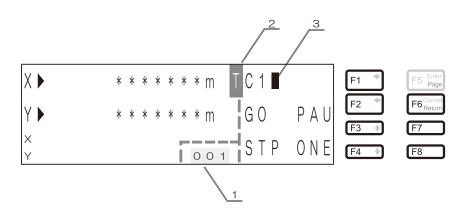
8-3. Teaching operation

Perform teaching operations with the front panel, commands, general-purpose I / O, and jog controller. When "I / O" is selected in the parameter "TEACH IF", operation is possible only with general-purpose I / O. When "JOG / CMD" is selected, operation can be performed from other than general-purpose I / O. There is no need to unify the types of operations. For example, you can start execution on the front panel and stop it with a jog controller or command.

 \triangle Before moving the stage, make sure that there is no effect on the surroundings.

(1) Front panel operation

Operable when the parameter "TEACH IF" is "JOG / CMD".



No	ltem	Contents
1	Line number	Displays the current line number.
2	Mode	T (TEACH) is displayed.
3	Confirmation of registration	You can check the registration of teaching content.

KEY	Display	Contents
F1	C1 🔳	Select the teaching channel. It changes each time the F1 (C) key is pressed. If no command is registered, the right side of the channel number will be blank. When the display is blinking, the teaching contents are being registered, so the F1 to F8 keys cannot be operated. The state on the left shows that channel 1 is selected and commands are registered. $C1 \rightarrow C2 \rightarrow C3 \rightarrow C4 \rightarrow C5 \rightarrow Return to C1$
F2	GO	Perform teaching. The display flashes during execution.
F3	STP	Stop the teaching execution. The blinking "GO", "PAU", and "ONE" will stop
F4	516	blinking.
F5	-	If the teaching execution has stopped, press the switch twice (double-click) to switch to the operation test mode. * The operation test mode has nothing to do with teaching.
F6	PAU	If pressed during teaching, pauses after the current execution is completed. The display flashes during pause. To restart, press F2 (GO) key.
F7		Press when stopped or paused to execute one command line. The display
F8	ONE	flashes during execution of one line. After execution of one line, the display stops blinking and pauses.
F7 + F8	-	If both key are pressed at the same time switches to the SETUP mode. For details on the SETUP mode, see "5-3. SETUP mode".

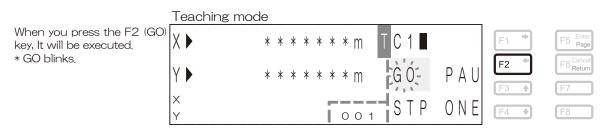
Channel selection

Select a channel with the F1 (C) key. It changes each time it is pressed.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
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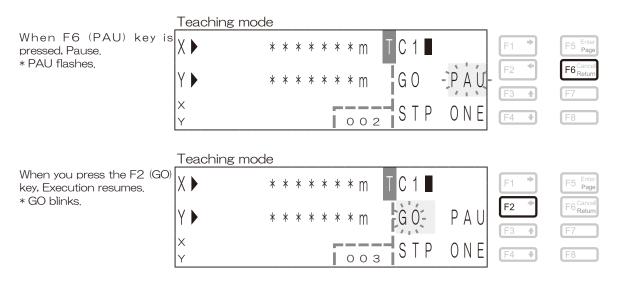
Start moving

Press F2 (GO) key to start execution. GO starts flashing when execution starts, Execution starts from the first line, and when the command "END:" or the 200th line is completed, execution and GO stop blinking, return to the state before execution, and wait. If an error occurs or an emergency stop occurs during execution, the operating stage stops immediately and stops at the line where it was executing. If a stop occurs due to a limit error, overflow error, or emergency stop, the line returns to the first line when released with the BEC key or command "BEC." on the front panel. To clear any error other than the above, restart the power, restart, or send the command "RESET.".



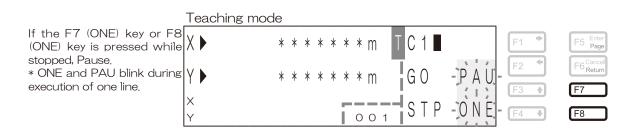
· Pause

To pause during execution, press the F6 (PAU) key. Pauses after execution of the currently executed line is completed, and PAU blinks. To resume execution, press the F2 (GO) key.



One line execution

Press F7 (ONE) key or F8 (ONE) key to execute one line at a time. Can be executed while paused or stopped. When stopped, press F7 (ONE) key or F8 (ONE) key to execute one line and pause. When paused, one line is executed each time the button is pressed. However, if the stage is operating, no operation will be accepted. If an error occurs or an emergency stop occurs during execution, the operating stage stops immediately and stops at the line where it was executing. In the case of a stop due to a limit error, overflow error, or emergency stop, if it is released with the BEC key on the front panel or the command "BEC:", it returns to the first line and waits. To clear any error other than the above, restart the power, restart, or send the command "RESET:".



1	2	3 4	5	6	7	8	9	10	11	12	13	14	15	16
	or exe ond * C	ess the F7 F8 (ONE) ke coute the ne ce. INE and PAU coution of one	ey again xt line o blink duri	to Nly Y			* *	* * m * * m		C 1 ∎ G O S T P	- P A (- 0 N (F1 F2 F3 F3	* *	F5 Enter Page F6 Cancel F7 F8
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• Stop

If you press the F3 (STP) key or the F4 (STP) key, the stage will stop immediately if it is running, and will stop executing. After stopping, it returns to the first line.

Teaching mode Press F3 (STP) or F4 (STP) TC1 XÞ * * * * * M F5 Page to stop execution. F6 Cancel Return GΟ PAU * * * * * * * m YÞ F3 Х STP ONE 003 F4

(2) Command operation

Operable when the parameter $\rm {\it ``TEACH IF''}$ is $\rm {\it ``JOG / CMD''}.$ The list of operation commands is shown below.

Item	No,	Commands	Description	Page
Teaching	61	TC:	Select a channel	56
	62	TCR:	Get current channel	57
	63	TQ:	Get teaching status	57
	64	TG:	Teaching start	57
	65	TP:	Pause	57
	66	TO:	Execute line by line	57
	67	TL:	Stop execution	58
	68	TR:	Get channel subscription status	58
	69	TFR:	Get the loop count	58
	70	TM:	Set the Teaching monitor function	59
	71	TMR:	Get the Teaching monitor function setting	60
	72	TNR:	Get current line number	60
	73	TACR:	Get current execution command	60

(3) Jog controller operation

Operable when the parameter <code>"TEACH IF"</code> is <code>"JOG / CMD"</code>. See the jog controller instruction manual.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

(4) Operation with general-purpose I / O Operable when the parameter "TEACH IF" is "I / O". Teaching operation can be performed by switch input. For details, see "(4) General-purpose I / O".

The input current waveform should be pulsed (rise and fall time <100 $\,\mu\,{\rm sec}).$

Terminal name	Terminal number	Description
T_1	43	
T_2	19	Change channel
T_3	44	
T_START	20	Start moving
T_PAUSE	45	Pause
T_ONE_STEP	21	One line execution
T_STOP	46	Stop

• Explanation of terms

 \triangle

Item	Description
ON	ON means that a current flows through the input terminal of the photocoupler inside this
	equipment.
OFF	OFF means to cut off the current flowing to the input terminal of the photocoupler inside this
	equipment.

• Explanation of Terminal

ltem			Descr	iption				
T_1, T_2, T_3	T_STOP are av T_2, and T_3 a	vailable while yo re set to other t	ou continue to than channels 1	select channels	at T_1, T_2, a e terminal funct	nd T_3. If T_1, tions cannot be		
	Terminal name	Channel1	Channel2	Channel3	Channel4	Channel5		
	T_1	ON	OFF	ON	OFF	ON		
	T_2	OFF	ON	ON	OFF	OFF		
	T_3	OFF	OFF	OFF	ON	ON		
T_START	T_START is a [.] width.	terminal to star	t teaching exec	ution. Turn ON	for 10ms or m	nore with pulse		
T_PAUSE	T_PAUSE is a t the next line.	erminal for tem	porarily stopping	g teaching. While	e ON, pause wit	hout executing		
T_ONE_STEP	T_ONE_STEP is a terminal to execute the registered contents line by line. Executes each time a pulse is input. However, if the stage is operating, this command will not be permitted and will be discarded until positioning is completed. If a pulse is input to the T_ONE_STEP pin while the T_PAUSE pin is turned ON when T_START is not being executed, the registered contents can be executed line by line from the first line. The pulse width should be 10ms or more.							
T_STOP	T_STOP is a p stopping the te 10ms or more v	eaching execut	ion. After stop	-	-	operating and e. Turn ON for		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

Check execution status

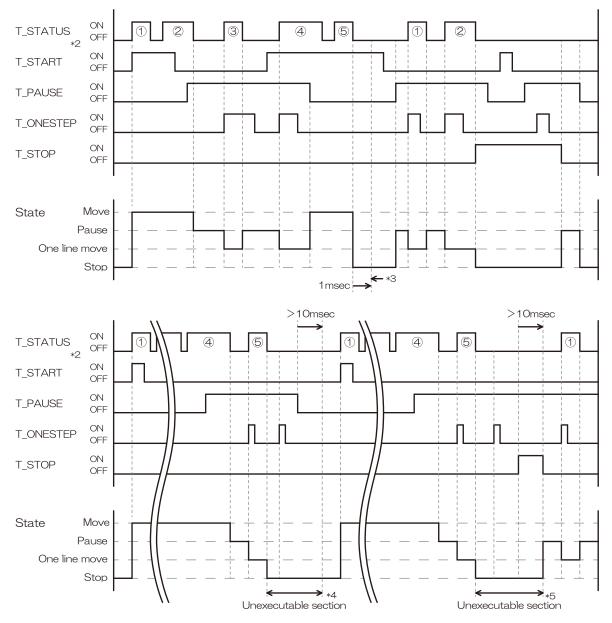
The status can be checked with the following terminals.

Terminal name	Terminal number	Description
T_STATUS	17	Output HIGH during execution of registration line
/T_STATUS	42	Inverted output of T_STATUS
		· · · · · · · · · · · · · · · · · · ·

*1 The T_STATUS signal is output regardless of the setting of the parameter "TEACH IF".

· Operation example and execution status of each terminal

Line number	Registered contents	Description
1	D:1M1	First axis operation speed set to 1 mm / sec
2	H:1	Set First axis mechanical home return
3	M:1+M1	Set first axis relative movement set value to +1mm
4	G	Start moving
5	END:	Teaching end line setting



*2 ON of the T_STATUS signal has the same meaning as T_STATUS pin HIGH.

*3 The OFF time of the T_STATUS signal during automatic execution is about 500 μ sec. If the OFF time of the T_STATUS signal continues for 500 μ sec or more (for example, 1 msec) while the T_PAUSE pin is not turned ON, determine that automatic execution has ended.

*4 After executing the last line in one line execution, it cannot be re-executed unless the T_PAUSE pin is turned OFF for 10msec or more.

*5 If the T_PAUSE pin remains ON after executing the last row in one row execution, it cannot be re-executed unless the T_STOP pin is turned ON for at least 10 msec.

1 2 3 4 5 6 7 8 9 10 11 12	13 14	15 16
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9.Home return

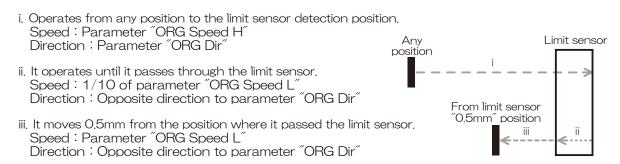
There are two types of origin, mechanical origin and electric origin.

\triangle	Before moving the stage, make sure that there is no effect on the surroundings.

Туре	Contents
Machine origin	Position after Mode 0 to 4 operation based on the limit sensor mounted inside the stage
Electric origin	Zero position of coordinate value

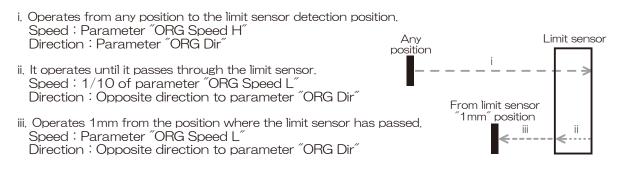
9-1.Mechanical origin return

(1) Mechanical origin return ModeO Move to the position of 0.5mm from the limit sensor and set the coordinate value to zero.



(2) Mechanical origin return Mode1

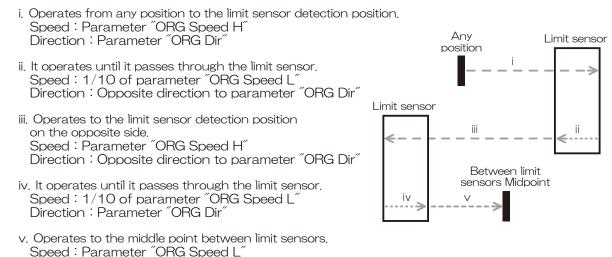
Move to the position of 1mm from the limit sensor and set the coordinate value to zero.



(3) Mechanical origin return Mode2

Direction : Parameter "ORG Dir

Move to the middle point between the CW and CCW limit sensors and set the coordinate value to zero.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	16
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(4) Mechanical origin return Mode3

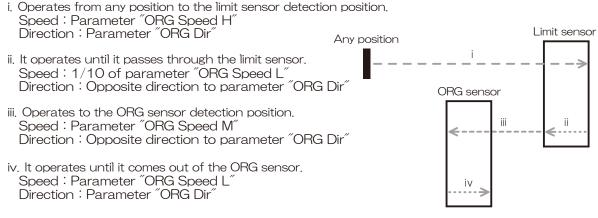
Move from the limit sensor to the setting position of the parameter $\rm ^{\prime\prime}ORG$ Mode3 Pos $\rm ^{\prime\prime}$ and set the coordinate value to zero.

i. Operates from any position to the limit sensor detection position. Speed : Parameter "ORG Speed H" Any Limit sensor Direction : Parameter "ORG Dir position ii. It operates until it passes through the limit sensor. Speed: 1/10 of parameter "ORG Speed L Direction : Opposite direction to parameter "ORG Dir" ORG Mode3 Pos iii. It operates from the position where the limit sensor setting position has been passed to the position set in the parameter "ORG Mode3 Pos". iii ii 4 6 Speed : Parameter "ORG Speed M" Direction : Opposite direction to parameter "ORG Dir"

(5) Mechanical origin return Mode4

|--|

Operates to the ORG sensor detection position and sets the coordinate value to zero.



9-2. Electric home return

(1) Electric home return

Move to the position of zero (Omm) of the coordinate value from the current position.

Speed : Parameter "EORG Speed"	Current position	Zero (Omm) position
Direction : Zero direction of coordinate value from current position		>

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

10. About Movement Test

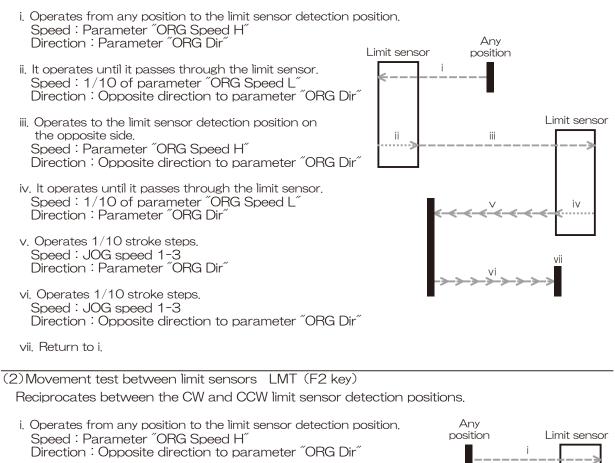
You can check that the stage is connected correctly to this instrument. There are three types of operation, and operations are performed on the front panel. See "5-7. MOVEMENT TEST mode" for how to shift to the operation test mode.

Before moving the stage, make sure that there is no effect on the surroundings.

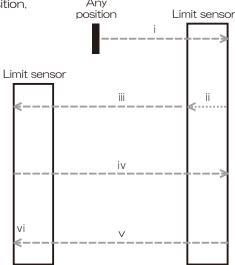
10-1.Movement Test

(1)Step Movement Test SMT (F1 key)

The travel distance obtained by dividing the stage stroke (nominal value) into 10 steps is one step, and the stage is reciprocated in 10 steps. After reciprocating, the stroke calculation operation is performed again. The stage stroke (nominal value) is calculated from the value by operating between the CW and CCW limit sensors.



- ii. It operates until it passes through the limit sensor. Speed : 1/10 of parameter "ORG Speed L" Direction : Parameter "ORG Dir"
- iii, Operates to the limit sensor detection position on the opposite side,
 Speed : Parameter "ORG Speed H" Direction : Parameter "ORG Dir"
- iv. It operates until it passes through the limit sensor.
 Speed : Parameter "ORG Speed H"
 Direction : Opposite direction to parameter "ORG Dir"
- v. Operates to the limit sensor detection position on the opposite side.
 Speed : Parameter "ORG Speed H" Direction : Parameter "ORG Dir"



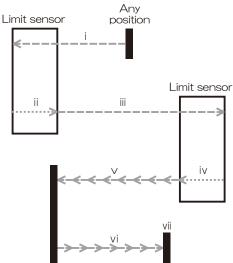
vi. Return to iv.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	16	6
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(3) Milli Step Movement Test MMT (F5 key)

Calculate the stage stroke (nominal value) and reciprocate between strokes in 1mm steps. After reciprocating, the stroke calculation operation is performed again. The stage stroke (nominal value) is calculated from the value by operating between the CW and CCW limit sensors.

- i. Operates from any position to the limit sensor detection position. Speed : Parameter "ORG Speed H" Direction : Parameter "ORG Dir"
- ii. It operates until it passes through the limit sensor.
 Speed: 1/10 of parameter "ORG Speed L"
 Direction: Opposite direction to parameter "ORG Dir"
- iii. Operates to the limit sensor detection position on the opposite side.
 Speed : Parameter "ORG Speed H" Direction : Opposite direction to parameter "ORG Dir"
- iv. It operates until it passes through the limit sensor. Speed : 1/10 of parameter "ORG Speed L" Direction : Parameter "ORG Dir"
- v. Operates 1mm step. Speed : JOG Speed 1 ~ 3 Direction : Parameter "ORG Dir"
- vi. Operates 1mm step. Speed : JOG Speed 1 ~ 3 Direction : Opposite direction to parameter "ORG Dir"



vii. Return to i.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

11. About status

Status can be checked with the display and status command. For the display, see "5. Operation" . Refer to "6. Command" for the command.

11-1. Operation related status

This status indicates the operation status of the connection stage and this equipment.

(1)Operation status list

No	Contents	Reply *
01	Normal stop(This state is READY)	K
02	During command move(This state is BUSY)	Μ
03	Out of the in-position range (After positioning is completed) (This state is FREADY)	F
04	Out of the in-position range (During fine adjustment) (This state is FBUSY)	G
05	During electrical origin return	Р
06	During mechanical origin return	0
07	CW side limit stop	С
08	CCW side limit stop	W
09	CW side software limit stop	В
10	CCW side software limit stop	V
11	CW side slowdown sensor area	А
12	CCW side slowdown sensor area	U
13	Error occurred	E
14	Motor is transitioning to excitation	Н
15	Motor is transitioning to non-excitation	
16	Disabled axis (Not set by parameter "AXIS Sel")	D

 \ast See the commands "Q:" , "SRQ:" and "STS:" .

(2) Operation status description

01 Normal stop

Description	Positioning is completed within the in-position range.
Display	See "Positioning status" in "5.0perations".
Status command reply contents	K

02 During command move

Description	Command operation is being performed.
Display	See "Positioning status" in "5.0perations".
Status command reply contents	M

03 Out of the in-position range (After positioning is completed) (This state is READY)

Description	It is out of the in-position range after positioning is completed.
Display	See "Positioning status" in "5.0perations".
Status command reply contents	F

04 Out of the in-position range (During fine adjustment) (This state is BUSY)

	This is the state where the positioning operation after the command operation is being executed.
Display	See "Positioning status" in "5.0perations".
Status command reply contents	G

05 During electrical origin return

Description	It is operating toward the electrical origin.
Display	-
Status command reply contents	P

06 During mechanical origin return

Description	It is operating toward the machine origin.
Display	-
Status command reply contents	0

07 CW side limit stop

Description	It is a state stopping with CW limit sensor.
Display	CW LMT (CW key flashing)
Status command reply contents	С

08 CCW side limit stop

Description	It is a state stopping with CCW limit sensor.
Display	CCW LMT (CCW key flashing)
Status command reply contents	W

09 CW side software limit stop

Description	It is a state stopping with CW software limit.
Display	CW SLMT (CW key flashing)
Status command reply contents	В

10 CCW side software limit stop

Description	It is a state stopping with CCW software limit.
Display	CCW SLMT (CCW key flashing)
Status command reply contents	V

11 CW side slowdown sensor area

Description	It is in the CW side slowdown sensor.
Display	CW S/D
Status command reply contents	A

12 CCW side slowdown sensor area

Description	It is in the CCW side slowdown sensor.
Display	CCW S/D
Status command reply contents	U

13 Error occurred

Description	An error has occurred.
Display	-
Status command reply contents	E

14 Motor is transitioning to excitation

Description	This is the state in which the motor is being shifted to the excitation state.
Display	-
Status command reply contents	Н

15 Motor is transitioning to non-excitation

	This is the state in which the motor is being shifted to the demagnetized state.
Display	-
Status command reply contents	



16 Disabled axis (Not set by parameter "AXIS Sel")

	This is the state where all controls related to the axis are disabled. Set by the parameter "AXIS Sel". See "AXIS Sel" in "7. Parameterts"
Display content	-
Status command reply contents	D

11-2.Error status

This status indicates the error status of the connection stage and this equipment.

(1)Error status list

No	Caratanta	Display	Rep	oly *
INO	Contents	Display	Format1	Format2 (13 bits)
01	Normal (No error)	(Hidden)	K	1st bit is 1
02	Command error	CMD ER	1	2nd bit is 1
03	Scale error	SCALE ER	2	3rd bit is 1
04	Limit stop	CW LMT • CCW LMT	3	4th bit is 1
05	Over speed error	OS ER	4	5th bit is 1
06	Overflow error	OF ER	5	6th bit is 1
07	Emergency stop	EMERGENCY	6	7th bit is 1
08	Interpolator error	IP ER	7	8th bit is 1
09	Limit error	LIMIT ER	8	9th bit is 1
10	System error	SYS ER	9	10th bit is 1
11	Slowdown sensor area	CW S/D • CCW S/D	А	11th bit is 1
12	Software Limit stop	CW SLMT · CCW SLMT	В	12th bit is 1
13	TEACHING command error	TCMD ER	Т	13th bit is 1

* See the commands "Q:", "SRQ:" and "STS:".

Error status description

01 Normal (No error)

Description		No error has occurred.
Display		(Hidden)
Status command	Reply format 1	К
reply contents	Reply format 2	1st bit is 1

02 Command error

Description		This error occurs when a command string that is not defined in this equipment or that does not match the status of this equipment is sent from the PC.
Display		CMD ER
Status command	Reply format 1	1
reply contents Reply format 2		2nd bit is 1

CMD ER

	1) A command was sent that cannot be used in the current mode.			
	2) An ASCII code string other than the defined command was sent.			
	3) A code other than ASCII code was sent.			
	A normal delimiter was sent with a string that did not match the delimiter settings already sent to this equipment.			
Occurrence case	5) There is an unnecessary code in the communication buffer, and a command with this unnecessary code added was sent.			
Case	6) A command to specify an axis other than the controllable axis was sent.			
	7) The motor of the axis that issues the operation command is demagnetized.			
	8) In the limit sensor input state, a command to operate to the further limit sensor was transmitted.			
	9) In the state where the software limit is set, a command that operates to the further software limit is sent.			
Release and recovery	The command can be sent even in the command error state, so it will be canceled when a command string defined in this equipment or in accordance with the status of this equipment is sent.			

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

03 Scale error

SCALE ER

Description	Occurs when no scale signal is input,
Display	SCALE ER
Status command Reply format 1	2
reply contents Reply format 2	3rd bit is 1

Occurrence case	1) The scale cable connector has disconnected from this equipment.					
	2) The scale cable is broken.					
Case	3) Encoder is broken.					
Release and	Turn off the power of the instrument, remove the cause, and then turn on the					
recovery	power.					

04 Limit stop

CW LMT • CCW LMT

Description		It is in the CW or CCW limit sensor of one or both axes.
Diaplay	For CW limit	CW LMT (CW key flashing)
Display	For CCW limit	CCW LMT (CCW key flashing)
Status command	Reply format 1	3
reply contents	Reply format 2	4th bit is 1

Release and It cannot be operated in the limit sensor direction any more. Operate in the opposite direction.

05 Over speed error

OS ER

Description		Occurs when operating at a speed higher than the count capability of the coordinate value counter.
Display		OS ER
Status command	Reply format 1	4
reply contents	Reply format 2	5th bit is 1

	1) Something collided with the stage.
Occurrence	2) The stage is undergoing vibration.
case	3) Strong noise is mixed in the scale signal.
	4) A strong flash hit the stage.
Release and	After removing the cause, restart or restart the power supply or send the command
recovery	TRESET.

06 Overflow error OF ER

Description		Occurs when the difference between the coordinate value and the specified position is 5mm or more.
Display		OF ER
Status command	Reply format 1	5
reply contents	Reply format 2	6th bit is 1

	1) The stage got out of step-out.			
Occurrence	 After the positioning was completed, the stage knob was turned and moved by 5 mm or more. (Only in closed loop state) 			
case	When the stage moves without permission because the connection axis of the 3) motor cable and the scale cable do not match (when the stage moves more than 5 mm)			
	If you want to keep the coordinate values after removing the cause, perform busy error cancel. If it is not necessary to maintain the coordinate values, restart o restart the power supply, or send the command "RESET.".			



07 Emergency stop

EMERGENCY

Description		Emergency stop.
Display		EMERGENCY
Status command	Reply format 1	6
reply contents	Reply format 2	7th bit is 1

Release and See "(5) Emergency stop". recovery

08 Interpolator error IP ER

		Occurs when the magnitude of the scale signal is out of the specified range.	
Display		IP ER	
Status command	Reply format 1	7	
reply contents Reply format 2		8th bit is 1	

Occurrence case	 The scale is dirty A strong flash hit the stage. 	
	3) Encoder is broken.	
Release and	Turn off the power of the instrument, remove the cause, and then turn on the	
recovery	power.	

09 Limit error

LIMIT ER

IDescription		Occurs when the CW and CCW limits are on at the same time.
Display		LIMIT ER
Status command	Reply format 1	8
reply contents	Reply format 2	9th bit is 1

	1) The motor cable connector has disconnected from this equipment.	
	2) Both the CW and CCW limit sensor wires of the motor cable are broken.	
Occurrence case	 Either the CW or CCW limit sensor wire of the motor cable has been disconnected, and the limit has been entered on the opposite side from the disconnected side. 	
	4) Dirt or foreign matter has entered both the CW and CCW limit sensors mounted on the stage.	
	5) The limit sensor mounted on the stage has failed.	
Release and recovery	If you want to keep the coordinate values after removing the cause, perform busy error cancel. If it is not necessary to maintain the coordinate values, restart restart the power supply, or send the command "RESET:".	

10 System error SYS ER

Description		Occurs when this quipment system is out of order.
Display		SYS ER
Status command	Reply format 1	9
reply contents	Reply format 2	10th bit is 1

Release and It cannot be canceled or restored. Unplug the power cable from the outlet and contact our company or our distributor.

11 Slowdown sensor input CW S/D • CCW S/D

Description		Either one-axis or both-axis CW and CCW slowdown sensors are included.
Display For CW slowdown sensor input For CCW slowdown sensor input		CW S/D CCW S/D
Status command		A
reply contents	Reply format 2	11th bit is 1

12 Software limit stop

top CW SLMT • CCW SLMT

Description		One or both axes CW or CCW software limit is included.	
ll)isplay		CW SLMT (CW key flashing) CCW SLMT (CCW key flashing)	
Status command reply contents	Reply format 1 Reply format 2	B 12th bit is 1	

Release and It cannot be operated in the limit sensor direction any more. Operate in the opposite direction.

13 Teaching command error TCMD ER

		The content of the teaching registration line to be executed does not match the status of this equipment.		
Display		TCMD ER		
Status command	Reply format 1	Т		
reply contents Reply format 2		13th bit is 1		

Occurrence case	 In the limit sensor input state, it was the contents of the registration line that operates on the limit sensor side that is further included. 	
	Set the operation speed (command "D:") in the registration line, and then 2) set the parameter "Max Speed" to a value less than the registered operation speed (command "D:") and execute the registration line.	
Release and recovery	If you want to keep the coordinate values after removing the cause, perform busy error cancel. If it is not necessary to maintain the coordinate values, restart restart the power supply, or send the command "RESET:".	

1 2 3 4 5 6 7 8 9 10 11 12 1	3 14	15 16
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12.Specification

These are the specifications for this equipment.

12-1.Basic performance

Model	Minimum command unit	In-position range * 1	Maximum speed setting	The maximum amount of movement setting range
FC-111	100nm	\pm 100, \pm 300, \pm 700nm	100mm/sec	-13421.7728~+13421.7727mm
FC-411	50nm	± 50, ± 150, ± 350nm	100mm/sec	-6710.88640~+6710.88635mm
FC-511	10nm	± 10, ± 30, ± 70nm	50mm/sec	-1342.17728~+1342.17727mm
FC-611	5nm	± 5, ± 15, ± 35nm	30mm/sec	-671.088640~+671.088635mm
FC-911	1nm	± 1, ± 3, ± 7nm	6mm/sec	-134.217728~+134.217727mm

 \ast 1 Set the in-position range with the parameter "INPos Range" .

lt	tem	Contents				
Stage control axes		2				
		Command error, Scale error, Limit stop				
Error detection, etc.		Overspeed error, Overflow error, Emergency stop				
Error detection, etc.		Interpolator error, Limit error, System error				
		Software limit stop, Teaching command error				
I IUNE TOT EACH		Jog controller, Emergency stop input GP-IB, USB, Ethernet, General purpose I / O				

12-2. General specifications

Item	Contents
Power source	AC100V ~ 240V, 50/60Hz
Allowable variations of voltage	AC90V~264V
Power consumption	110VA max
Fuse	250V, 2.5A, Time lag, 2 used
External dimensions	W220 × H88 × D290mm
Weight	5.2kg
Operating temperature	0°C~ 40°C
Operating ambient humidity	20% ~ 80%RH (No condensation)
Storage temperature	-10°C~55°C
Ambient storage humidity	20% ~ 80%RH (No condensation)
Place of use	Indoor
Storage altitude	up to 2000m
Operating altitude	up to 2000m
Maximum operating time	Continuous operation possible

12-3. Safety and electromagnetic compatibility

Item	Contents
Target model	FC-511, FC-611, FC-911
Safety	EN61010-1:2010 compliant, Overvoltage category II, Pollution degree 2
1 9	EN61326-1:2013 compliant, EN61000-3-2:2014 compliant EN61000-3-3:2013 compliant

Item			Conditions				
	Cable	Motor	Attach a ferrite core to one end (body side) of the cable. *3				
	(2m or less)	Scale	Attach ferrite cores to both ends of the cable. *3				
		Jog controller	Attaci i leinte coles to boti i ellos of ti le cable. *3				
Electromagnetic			Wrap one end (body side) of the prepared cable twice around the ferrite core. *4				
compatibility	Cable	GP-IB (shield) *2					
	(3m or less)	ILISK (shipid) */	Attach a ferrite core that matches the external shape of the prepared cable to one end (body				
			side) of the cable. *4				
		汎用 I/O(shield)					
	General	Connector hood	EMI measures				
	purpose I / O	Housing	General-purpose I / O board stored in metal box				

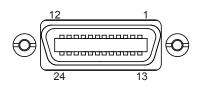
 $\ast 2$ Connect only the interface that communicates

*3 Ferrite core model: ZCAT 1730-0730A: made by TDK

*4 Ferrite core model: ZCAT series: made by TDK

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 1

12-4.Interface specifications (1)GP-IB



Connection

This instrument is equipped with a GP-IB connector and can be connected to a personal computer. When using, prepare a GP-IB cable.

Communication

In order for the PC to communicate with the instrument, the PC must have GP-IB communication-capable software (such as our sample software). Also, it is necessary to set the mode of this equipment to REMOTE and set the parameter "I / F Sel" to GP-IB. The GP-IB address must not be the same as other devices. Check the connection between the PC and this equipment by sending and receiving operation information commands (such as "Q.").

• To disconnect

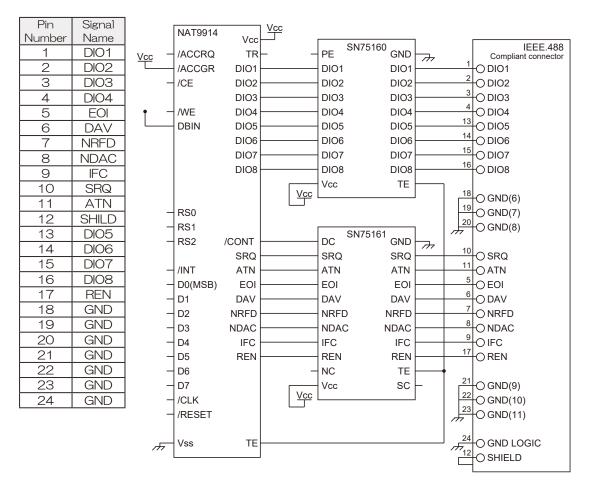
Close GP-IB from the PC software. When disconnecting the cable, there is no problem even if this equipment is turned on. However, it is recommended that this equipment be turned off for safety. For information on personal computers, see the instruction manual for your personal computer.

Specification

lte	em	Contents					
	SH1	Source handshake all functions					
	AH1	Acceptor handshake all functions					
	T6	Basic talker function, Serial poll function, Talker cancellation by MLA					
	TEO	No extended talker function					
	L4	Basic listener function, Release of listener by MTA (no listen only)					
Function	LEO	No function					
Function	SR1	Service request all functions					
	DC2	No SDC function					
	RL2	No local lockout function					
	DTO	No device trigger function					
	PPO	No parallel pole function					
	CO	Without controller function					
Address		1~30					
Delimiter		CR+LF, EOI, CR, LF					
Service request		Enabled or disabled					
Flow conti	rol	None (fixed)					
Connector used		Manufacturer: DDK Corporation Model: 57LE-20240 (57LE Series)					
Applicable	plug, cable	IEEE-488 compliant product, GP-IB compliant product					

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Pin assignment and circuit diagram



(2)USB



Connection

This instrument is equipped with a USB typeB connector (Function) and can be connected to a USB typeA connector (Host) of a personal computer. When using, please prepare USB1.0, 1.1, 2.0, 3.0, 3.1 compatible cable *1. *1 Standard-A (male) -Standard-B (male) Connector straight cable (USB1.0, USB1.1, USB2.0, USB3.0, USB3.1)

- Driver installation (for Windows 10) When connecting for the first time, connect the USB cable, turn on the PC, and then turn on the power of the instrument. The driver is automatically installed on the PC and recognized as a COM port.
- Driver installation (for Windows 7, 8, 8,1)

The setting information file "stage_controller_usb_cdc_drv_w ***. Inf" is required. This setting information file can be obtained from the download page of our homepage (note that the setting information file differs depending on the version of Windows OS). Start the installation by manually specifying the setting information file when installing the driver. After the driver is installed, "Stage Controller Usb Cdc Port (COM *)" will be created in the port of the PC.

The COM number of "Stage Controller Usb Cdc Port (COM *)" is changed for each USB port. Once the driver is installed, the newly added USB port will be automatically installed.

Communication

The port is recognized as a virtual COM port. In order for the PC to communicate with the DX, software that enables serial communication with the PC is required. Also, it is necessary to set the mode of this equipment to REMOTE and set the parameter "I / F Sel" to USB. Check the COM port number with Device Manager. The baud rate (communication speed) of the COM port can be set to any number (example: 9600 bps). Check the connection between the PC and this equipment by sending and receiving operation information commands (such as "Q:").

To disconnect

When disconnecting, be sure to close the COM port with the PC software before disconnecting. When disconnecting the cable, there is no problem even if this equipment is turned on. However, it is recommended that this equipment be turned off for safety. For information on personal computers, see the instruction manual for your personal computer. If the power to the instrument is restarted or restarted without closing the COM port from the PC software, it may be necessary to reconnect the cable after closing the COM port from the software to relink. (Some software automatically closes the COM port and automatically connects after restarting.)

	ltem	Contents				
Function		Used as a virtual COM port.				
Number of port 1 port						
Transfer sp	nsfer speed Supports full-speed transfer (12Mbps)					
Delimiter		CR+LF, CR, LF				
Coursestan	Manufacturer	OMRON Corporation				
Connector used	Model	XM7B-0442				
useu	Туре	Standard-B				
Applicable plug, cable		「Standard-A (male)」connector - 「Standard-B (male)」connector Straight cable (USB1.0, USB1.1, USB2.0, USB3.0, USB3.1)				

Specification

Pin assignment

Pin number	Signal name
1	VBUS
2	D-
3	D+
4	GND

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(3)Ethe	ernet												1	8
												Green Yellow			
		nnectio		auinne	ad with	n an F	therne	t conr	pector	and o	an he				preopal

This device is equipped with an Ethernet connector, and can be connected to a personal computer directly or via a hub (router). LAN cable can be either cross or straight. Use a cable category that supports 10Mbps and 100Mbps transfers. When connecting, you need to set the IP address, default gateway, and subnet mask. Set the parameters of this equipment according to the information of the IP address, default gateway, and subnet mask of the personal computer used. For the IP address setting, if the IP address of the PC used as an example is "192.168.015.188", set "188" to another value. Set the default gateway and subnet mask to the same values as on the PC. If you use the same LAN area, you do not need to set the default gateway.

Communication

In order for the PC to communicate with this instrument, the PC must have software capable of TCP / IP communication (sample software provided by NEC). Also, it is necessary to set the mode of this equipment to REMOTE and set the parameter I / F Sel[®] to Ethernet. Check the connection between the PC and this equipment by sending and receiving operation information commands (such as Q.O.). When communicating with a communication application, it is necessary to set the port number in addition to the IP address settings.

Specification

ltem	Contents
Number of port	1
Product specifications	IEEE802.3x Flow control compliant
Transfer speed	Supports 10Mbps and 100Mbps transfer
Delimiter	CR+LF, CR, LF
IP address	000.000.000 ~ 255.255.255.255
Default gateway	000.000.000 ~ 255.255.255.255
Subnet mask	000.000.000 ~ 255.255.255.255
Port number	60000 (fixed)
Connector used	RJ45

Pin assignment

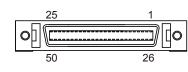
-					
Pin number	Signal name				
1	TX+				
2	TX-				
3	RX+				
4	NC				
5	NC				
6	RX-				
7	NC				
8	NC				

• LED

LED color	Contents
	communication speed is 1010 logs or when no cable is connected.
Yellow lighting	Illuminates when a valid link is detected and flashes when data transmission or reception is detected.



(4) General purpose I / O



This section describes the functions of each pin of the general-purpose I / O.

Specification

	Item	Contents					
		General purpose input $ imes$ 3 port					
	Input	Teaching operation \times 1					
		Busy error cancel $ imes$ 1					
Function		General purpose output $ imes$ 3 port					
FUNCTION		Scale division pulse signal $ imes$ 2 axes					
	Output	Alarm signal $ imes$ 2 axes					
		In-position signal $ imes$ 2 axes					
		Teaching state \times 1					
Connector	Manufacturer	3M Japan Co., Ltd.					
used	Model	50 pin half pitch connector (MDR) 10150-5202PL					
Augusticadata	Manufacturer	3M Japan Co., Ltd.					
Applicable	Maalal	50 pin half pitch connector (MDR) 10150-3000PE					
plug	Model	50 pin half pitch connector (MDR) 10150-6000**					

· Pin assignment and function explanation

i. Input terminal The internal circuit and specifications are shown in "Internal Circuit and Specifications"-"Input Terminal".

Terminal Number	Terminal Name	Contents
3	General purpose input 1	
28	General purpose input 2	Select each general purpose input. The status can be checked with the command "!:".
4	General purpose input 3	
29	General purpose input COMMON	Common terminal for general purpose input.
43	T_1	Select a teaching number. See the table below for
19	T_2	patterns. Patterns other than those in the table below
44	T_3	are invalid.
20	T_START	Start teaching.
45	T_PAUSE	Pauses teaching execution.
21	T_ONE_STEP	Execute teaching one line at a time for each input.
46	T_STOP	Stop the teaching execution.
22	T_COMMON	Common terminal for teaching operation input.
24	BE_CANCEL	Executes busy error cancellation. See "BEC" or the command "BEC:" for details.
49	BE_COMMON	Common terminal for BE CANCEL input.

Teaching number pattern table

Terminal			Channel		
Terminar	1	2	3	4	5
T_1	ON	OFF	ON	OFF	ON
T_2	OFF	ON	ON	OFF	OFF
T_3	OFF	OFF	OFF	ON	ON

1	2	З	4	5	6	7	8	9	10	11	12	13	14	15	16

ii. Output terminal The internal circuit and specifications are shown in "Internal Circuit and Specifications"-"Output Terminal".

	lerminal.		
Terminal Number	Terminal Name	Contents	Output circuit
1	General purpose output1		0
26	General purpose output2	Outputs the status selected by the "O:" command. It is off at startup.	Open collector
2	General purpose output3		CONECTO
27	General purpose output COMMON	Common terminal for general purpose output.	-
8	1PA	A-phase output of scale-divided pulse (2-phase square wave) on First axis side	
33	1/PA	Inverted output of 1PA	Line
9	1PB	B-phase output of scale-divided pulse (2-phase square wave) on First axis side	driver
34	1/PB	Inverted output of 1PB	
10	1AL	Alarm output for First axis. Outputs a HIGH level when any of an interpolator error, scale error, limit error, or overflow error occurs. See "11. Status" for details of each error. In the case of only a limit error, if a normal stage is connected to the motor cable, it returns to the LOW level.	
35	1/AL	Inverted output of 1AL	
11	1INP	In-position output for First axis. Outputs HIGH level upon completion of positioning and detection by limit sensor, and outputs LOW level when an operation command is input. However, if an operation command is input during detection of the limit sensor, a LOW level is output when the signal passes through the limit sensor.	
36	1/INP	Inverted output of 1INP	
37	2PA	A-phase output of scale-divided pulse (2-phase square wave) on Second axis side	
13	2/PA	2PA inverted output,	
38	2PB	B-phase output of scale-divided pulse (2-phase square wave) on Second axis side	Line
14	2/PB	Inverted output of 2PB	driver
39	2AL	Alarm output for Second axis. Outputs a HIGH level when any of an interpolator error, scale error, limit error, or overflow error occurs. See "11. Status" for details of each error. In the case of only a limit error, if a normal stage is connected to the motor cable, it returns to the LOW level.	
15	2/AL	Inverted output of 2AL	
40	2INP	In-position output for Second axis. Outputs HIGH level upon completion of positioning and detection by limit sensor, and outputs LOW level when an operation command is input. However, if an operation command is input during detection of the limit sensor, a LOW level is output when the signal passes through the limit sensor.	
16	2/INP	2INP inverted output.	
17	T_STATUS	Execution status output of teaching registration contents	
42	/T_STATUS	Inverted output of T_STATUS	
5, 6, 25, 30, 47	+5V	5V power supply terminal. The maximum output current of each terminal is 0.2A. Do not exceed 1A in total.	_
7, 12, 18, 23, 31, 32, 41, 48, 50	GND	GND terminal for 5V power supply.	-

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	16	16
-------------------------------------	----	----

· Internal circuit and specifications

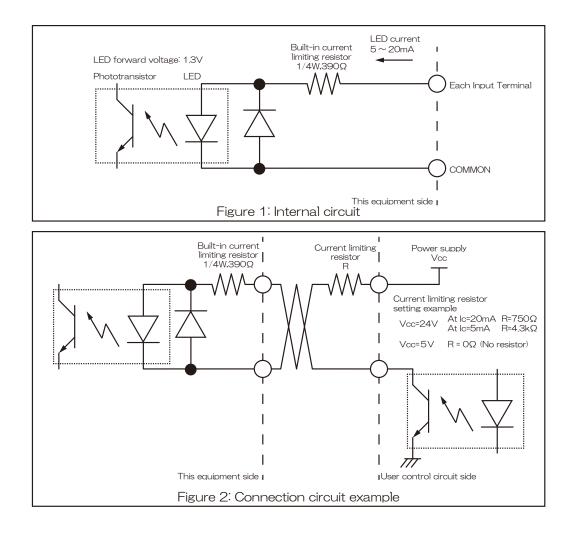
i. Input terminal

⚠

Input terminals include general-purpose input, teaching operation, and busy error cancel. The input is a photocoupler LED. The phototransistor is turned on by passing current through the LED, and the phototransistor is turned off by interrupting the current. In the case of general-purpose input, the status of this phototransistor can be checked with the command "I.". See "I." in "6. Commands" for details. For teaching operation and busy error cancellation, the function "Pin assignment and function explanation" can be executed by turning on the phototransistor.

 Λ CAUTION The input current must not exceed 20mA. Exceeding this may cause a failure.

- Use LED current within the range of 5 to 20mA.
- The input current waveform should be pulsed (rise and fall time <100 μ sec).
 - The time width of ON and OFF of general-purpose input should be at least longer than the transmission cycle of command "I.".
 - When connecting the COMMON terminal to the GND of this instrument, use the power supply of the input terminal at 5V of this instrument.



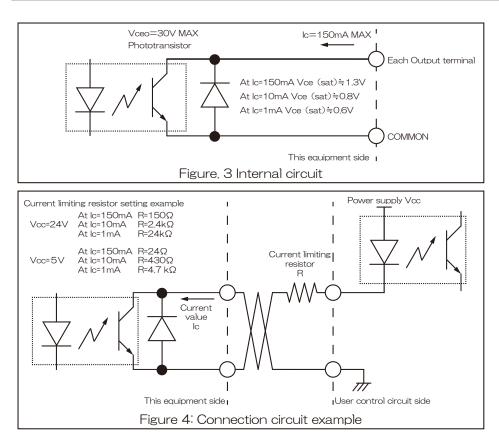
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

- ii. Output terminal
 - a. Open collector

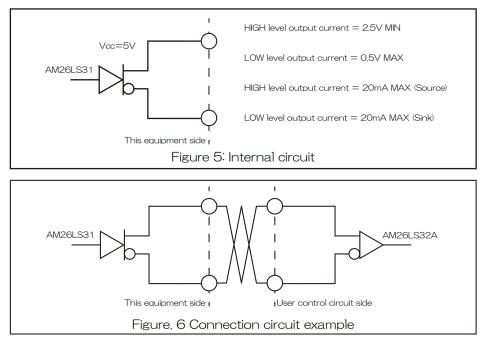
The output is a phototransistor of a photocoupler, which is open collector. The photo transistor can be turned ON and OFF with the command $^{\prime\prime}$ O: $^{\prime\prime}$. See "O:" in "6. Commands" for details.

CAUTION Vceo should not exceed 30V and lc should not exceed 150mA. Exceeding this may cause a failure.





b. Line driver



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-																

(5)Emergency

Input (inside)

The contact type of the input contact is "B contact". The contact type cannot be changed. After changing the parameter "EMG Connector" to "Enable" and releasing the short circuit between the input and GND, the operation of the stage connected to the instrument is immediately stopped and "EMERGENCY" is displayed on the display. The state of the motor at this time depends on the setting of the parameter "EMG Motor Excite". After that, operations related to the stage operation cannot be performed. To recover, short-circuit the input and GND, and then cancel the busy error to maintain the coordinate value. If it is not necessary to maintain the coordinate values, restart the power, restart, or send the command "RESET:". See "BEC" or the command "BEC:" for busy error cancellation. See "EMG Motor Excite" for the parameter "EMG Motor Excite" for setting the motor excitation and demagnetization during an emergency stop.

MARNING When using, be sure to change the parameter "EMG Connector" to Enable and perform a test operation to confirm that it can be used.

 \underline{M} CAUTION Do not connect anything that outputs power, such as an AC adapter.

Specification

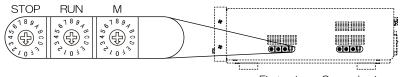
	Item	Contents
Connector	Manufacturer	Hosiden Corporation
used	Model	HEC3800-01-010 DC power jack (JEITA RC-5320A compliant)
Applicable	plug, cable	JEITA RC-5320A TYPE4 Twisted pair

(6) Motor driver setting switch

The input terminal motor driver is set for each axis. When the right side of the stage controller is viewed from the front, the left side is the setting switch for First axis and the right side is the setting switch for Second axis. The settings to be made are the stop current, drive current, and number of divisions. At the time of shipment, it is set according to the stage purchased at the same time. If you want to change the settings, please contact us or our distributor.

CAUTION Depending on your environment, you may be required to change the settings, but do not change anything else. If you change it intentionally, the stage may move unintentionally.

• Settings (FC-111, FC-411)



First axis Second axis

i. Stop current (STOP)

Set the stop current value as a percentage (%) of the drive current.

SW No.	0	1	2	З	4	5	6	7	8	9	А	В	С	D	Е	F
%	25	30	35	41	45	50	55	59	63	67	71	75	79	83	87	91

ii. Drive current (RUN)

Set the current value when driving the motor.

SW No.	0	1	2	З	4	5	6	7	8	9	А	В	С	D	Е	F
Current value(A)	0.35	0.44	0.52	0.59	0.67	0.75	0.83	0.9	0.98	1.05	1.12	1.19	1.27	1.34	1.4	1.48

iii. Setting the number of divisions (M)

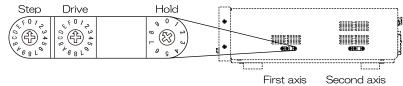
Set the number of divisions. *

SW No.	0	1	2	3	4	5	6	7	8	9	А	В	С	D	E	F
Division number	1	2	4	5	8	10	20	40	80	16	25	50	100	125	200	250

* The step angle for the number of divisions is "step angle = basic step angle (0.72 or 0.36 °) / number of divisions"

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-			-			-		_							

• Settings (FC-511, FC-611, FC-911)



iv. Setting the number of divisions (Step) Set the number of divisions. *

SW No.	0	1	2	З	4	5	6	7	8	9	А	В	С	D	Е	F
Division number	1	2	4	10	20	40	100	200	400	800	-	-	-	-	-	-

* The step angle for the number of divisions is "step angle = basic step angle (0.72 or 0.36 $^\circ$) / number of divisions"

v. Drive current (Drive)

Set the current value when driving the motor.

SW No.	0	1	2	3	4	5	6	7	8	9	А	В	С	D	Е	F
Current value(A)	0.3	0.325	0.35	0.375	0.4	0.425	0.45	0.475	0.5	0.525	0.55	0.575	0.6	0.65	0.7	0.75

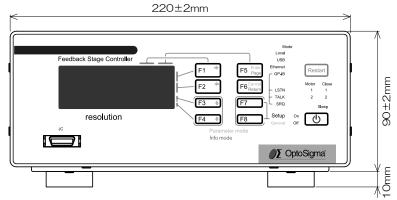
vi. Stop current (Hold) Set the stop current value as a percentage (%) of the drive current.

SW No.	0	1	2	3	4	5	6	7	8	9
%	10	20	30	40	50	60	70	80	90	100

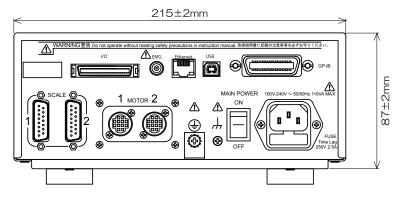
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

13. Dimensions

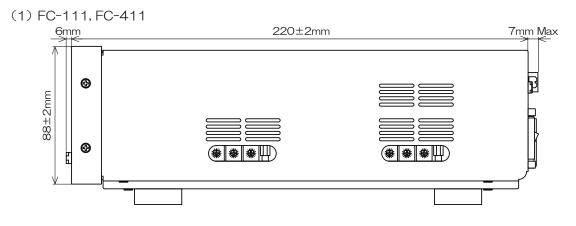
13-1.Front panel

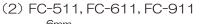


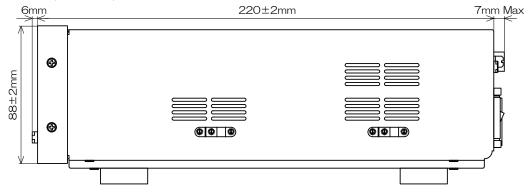
13-2.Rear panel



13-3.Right side panel

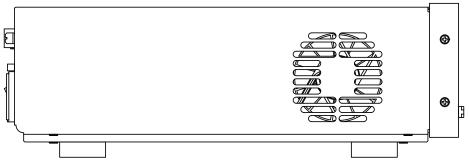








13-4.Left side panel



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1	2 3	4 5	6 7	8 9	10 11	12 13	14 15	16
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14. Trouble shooting

If a problem occurs, check the following. If this does not solve the problem, unplug the power cable from the outlet and contact our company or our distributor.

Contents	Possible cause	Workaround	Page
• Can not turn on.	Power cable is not connected.	Connect the power cable.	6
• The power turned off during use.	The fuse has blown,	Check the fuse and replace it if it is blown. If it cuts off frequently, the instrument may be malfunctioning. Unplug the power cable from the outlet and contact our company or our distributor.	7
	The MAIN POWER switch on the rear panel is not turned on.	Turn on the MAIN POWER switch.	8
	power supply is short-circuited or overloaded.	 step 1 Turn off the MAIN POWER switch, disconnect all the cables of the connected peripheral devices, and wait at least 10 seconds. step 2 Turn ON the MAIN POWER switch with only the power cable connected. If the beep continues to sound, proceed to step 4. step 3 Check that the Off lamp is lit, then press and release the POWER key for one second. step 4 If the power cannot be turned on, the beep continues to beep even if it can be turned on, or if the Off lamp goes off while the POWER key is being pressed, the instrument may be malfunctioning. Unplug the power cable from the outlet and contact our company or our distributor. If the power can be turned on, one of the peripheral devices may be faulty or a device with a different pin assignment may be connected. Check the peripheral devices. 	8, 11
The display screen is off.	panel is not ON.	Press the POWER key to turn it on	3
	The MAIN POWER switch on the rear panel is not turned on	Turn on the MAIN POWER switch.	8
	The computer is sleeping.	Wake up from sleep.	5
 The menu is off. Certain keys cannot be operated. 		Switch to LOCAL or TEACH mode.	13
GP-IB communication is not possible.	Communication interface setting is other than GP-IB.	Select GP-IB in parameter "I / F Sel".	86
	Communication settings do not match.	Check the communication conditions and set the parameters.	86
USB communication is not possible.	Communication interface setting is other than USB.	Select USB in parameter "I / F Sel".	86
	Communication settings do not match.	Check the communication conditions and set the parameters.	86
Ethernet communication is not possible.	Communication interface setting is other than Ethernet	Select Ethernet in parameter "I / F Sel".	86
	match.	Check the communication conditions and set the parameters.	86, 87
cannot be performed with the front panel, command, or jog controller.	"TEACH IF"	Change the parameter "TEACH IF" to "JOG / CMD".	73
	the general-purpose I / O connector does not meet the specifications.		112
	"JOG / CMD" is selected in parameter "TEACH IF"	Change the parameter "TEACH IF" to "1 / O".	73

|--|

Contents	Possible cause	Workaround	Page
	Jog controller is disconnected.	Check the connection of the jog controller. * See the jog controller instruction manual for details.	1, 5
Emergency stop is not possible.	You have not changed any parameters.	Change the parameter "EMG Connector" to Enable,	84
cannot be released.	The connector connected to the EMG connector is disconnected		116
• Make an unintended emergency stop.	The cable connected to the EMG connector is broken	Check the connected cable.	116
	The EMERGENCY switch of the optional jog controller is pressed	Set the EMERGENCY switch of the jog controller to Off. * See the jog controller instruction manual for details.	1
• Sleep cannot be performed.	The stage is operating,	Wait for positioning to be completed.	12, 43
	An error has occurred.	Please clear the error.	14, 29, 101
	Teaching is running.	Wait for the execution to be completed or stop the execution.	90
Stage does not work.	Motor not energized.	Check the lighting status of the front panel Motor lamp.	4
	The axis connected to the axis selection parameter does not match	Check the connection with the parameter "AXIS Sel".	83
The stage moves on its own.	The axes of the motor cable and scale cable are not aligned.	Check the connection.	8, 9
completed.	fixes the stage is vibrating	Make sure that vibration is not transmitted to the stage	-
stable during positioning	Strong light is on the stage	Avoid strong light on the stage	-
operation.	Receives strong magnetic fields, electric fields, and noise	Please do not receive them.	-
CMD ER is displayed.	A command string that is not defined in this equipment or that does not match the status of this equipment is sent from the PC.		103
SCALE ER is displayed.	No scale signal is input.	See "11. Status" .	104
• OS ER is displayed.	Operating at a speed higher than the count capability of the coordinate value counter.		104
OF ER is displayed.	The difference between the coordinate value and the specified position is 5mm or more.		104
LIMIT ER is displayed.	CW and CCW limits are entered at the same time		105
 IP ER is displayed. 	The magnitude of the scale signal is out of the specified range		105
EMERGENCY is displayed.	Emergency stop	See "11. Status" .	105
SYS ER is displayed.	The instrument system is broken	See "11. Status"	105
TCMD ER is displayed.	The content of the teaching registration line to be executed does not match the status of this equipment.		106

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

15.Update history

Edition	Document control number	Revision date	Supported FV	Supported EN	Contents
1	MF-1023-01.01	-	01.030~	01.06	_

Memo

	1 2	3	4	5	6	7	8		9	10	11	12	13	14	15	16
16.Index																
μ E	About com AC100V AC adapte AC inlet Alarm ASCII AXIS parar BEC Beep BUSY Busy error	21 6, 105 9, 114 6, 7 9, 110, 111 21, 102 72 14, 21, 88, 91 11, 65, 87, 116 12, 23, 73 14, 29, 103			F	F1 / key F2 / key F3 / key F4 / key F5 / key F6 / key F7 / key F8 / key Feedback stage Feedback stage Feedback stage Frame connection line Frame terminal					i, 1 i, 1 17, 21, 30, 31 1, 8					
C	Del Default ga Display uni DGW	T down se vare lim sensor s lamp p error formatio pwn ser are limit ensor st teway	it stop stop on stop		100, 100, 99, 1 99, 1 99, 1 v 4, 12 4 4, 12 101, 101, 100, 100, 100, 99, 1 99, 1 99, 1 18, 1	14 101, 1 101, 1 100 100 100 1, 21, 8 1, 28, 8 102 102 102 102 102 101, 1 101, 1 101, 1 100 100	04 04 3, 89 3 02 04 04 04 84	G	Fus F/V Ger Ger GGP GGP GGP- GGP- GGP- IF INF(In-p	e holde ' neral sp neral pu	er ecifica irpose param param ress face e nector niter	I / O content	onnecto	7 17 105 110 r 9, 1 81 90, 1 8, 18, 18, 18, 18, 18, 18, 18, 18, 18, 1	iii, 1, 7, 105, 116 7 17 105 110 9, 116 81 90, 91, 92 18, 64, 85 18, 64, 85 18, 84, 106 9, 18, 84, 85 9, 106 9 18, 85 4 18, 19, 20 13	36, 37, 3, 64, 3, 99, 111 7, 38, 103,
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