

User's Manual

Intelligent Positioner GIP-101A

<u>User's Manual</u> Ver.1.1



Application

This user's manual is applied for GIP-101A Intelligent Positioner.

Revision History

First version

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•This user's manual is conforming to the software Version 1.24 or later versions.

For Your Safety

Before using this product, read this manual and any warnings or cautions in the documentation provided. This manual contains instructions that must be followed to prevent damage to property or possible injury to yourself or to others.

On the Symbols Used in This Manual

The symbols below are used in this manual or on the product to indicate precautions that must be followed to prevent possible injury or damage to property. Take the time to understand these symbols before reading the rest of the manual.

\Lambda WARNING	▲ CAUTION				
This symbol marks warnings that should be read before use to prevent serious injury or death.	This symbol indicates where caution should be exercised to avoid possible injury to you or to others, or damage to property.				

Symbols Used in This Manual

The following symbols are used in this manual.

	This symbol is used to indicate cross-references to relevant information in this manual or other documentation.
Ó	This symbol marks items that should be confirmed before an operation (or action) is performed.
	This symbol marks definitions of terms and other useful information.
(Note)	This symbol marks supplementary information.

WARNING	CAUTION
 Do not use this product in the presence of flammable gas, explosives, or corrosive substances, in areas exposed to high levels of moisture or humidity, in poorly ventilated areas, or near flammable materials. Do not connect or check the product while the power is on. Installation and connection should be performed only by a qualified technician. Do not bend, pull, damage, or modify the power or connecting cables. Do not touch the products internal parts. Connect the earth terminal to ground. Should the product overheat, or should you notice an unusual smell, heat, or unusual noises coming from the product, turn off the power immediately. Do not turn on the power in the event that it has received a strong physical shock as the result of a fall or other accident. 	 Do not leave the product in an enclosed area or in areas in which it would be exposed to direct sunlight or vibration. Do not touch the product when your hands are wet. When unplugging the product, pull on the plug rather than the cord. Because some charge remains after the power has been cut, do not touch the input or output terminals for ten seconds after the product has been turned off. When connecting peripherals to the product, adjust the product's initial settings (parameter settings) to suit the peripheral. Turn off the power before connecting the product to other devices. Connection should be performed following the connection diagram. Before turning the equipment on (or when beginning operations), be sure that you can turn the power off immediately in the event that an abnormality should occur. The product can only be repaired, modified, or disassembled by a qualified technician.

Do not obstruct the product's air vents or other openings.

Chapter 1 General specifications

1-1. General description

This product is a motorized stage controller with built-in micro-stepping driver for 5-phase stepping motors.

1-2. Specifications

Power supply	Single phase 1	00 - 240V (+/-10%) 50 / 60 Hz
Apparent power	100VA	
Ambient condition	Operating temp	perature 0 to 40 degrees Celsius
	Humidity 20 to	80 %RH (no condensation)
Outer dimension	H=81mm	
	W=145mm	
	D=205mm	(Excluding protrusions)
Weight	Approx. 2kg	

1-3. Operations and interfaces

Operating switches	Power ON/OFF switch Positioning switches,
	Return to origin switch, Emergency stop switch,
	Rotary encoder switch with push-in function
Serial interfaces	RS-232C (D-sub 9 pins female connector (#4-40))
External I/O	D-sub 25 pins female connector (M2.6)
STAGE	D-sub 15 pins female connector (M2.6)

1-4. Input / Output terminals

Power input terminal	Inlet type IEC 320 C13
Emergency stop signal input terminal	External screw terminal connector

1-5. Serial communications

A serial communication with RS-232C connection is available. Use straight cable (Male connector – Female connector) when connecting to PC. (Sigma Koki P/N: RS232C/STR or equivalent) [Controller side connecter: D-sub 9 pins female connector (#4-40 screw)]

1-6. Other specifications

• Conforming standards

EU RoHS compliant

∧ 1-7. Cautions

- Do not use the product for purpose other than motorized stage operation.
- The chassis may get heated when operated for long time and high duty.
- Do not use the product in areas exposed to dust or vibration.

1-8. GIP-101A system diagrams

GIP-101A with built-in stepping motor drivers is suitable controller to assemble an inexpensive and space-efficient system with stepping motor type motorized stages (LAC*, OSMS, SGSP, TAMM, HPS, HDS series etc.) and standard cables. It includes a variety of controls with I / O signals.

Lens Positioners Computer LAC* series RS232C (9P) Stage cable D15RP-CA Serial Cable RS232C/STR Stepping motor type Motorized stage **GIP-101A** Stage cable D15D15A-CA Stepping motor type OSM series AC power cable (3m) I / O controlled External system AC100V - AC240V

1-9. Accessories

- STOP terminal connector plug
- AC 100V power cable (for Japan domestic use)

Chapter 2 Function description 2-1. Nomenclature



2-2. Functions

1	Power switch	Power on when this switch is turned ON,
		Power off when this switch is turned OFF.
2	Return to origin switch	Make "Return to origin" movement
3	Emergency stop button	Immediately stop the motorized stage. Uses same signal line with "⑦ Stop signal connector.
4	Operation knob	Motorized stage is driven to extent that this knob is turned. When rotated right and left while pushing the knob, the motorized stage is driven at high speed, according to the angle of the knob.
5	Position selecting switch	It is used to drive the motorized stage to memorized position.
6	I / O connector	The motorized stage is driven to the memorized position according to I / O signals.
7	Stop signal connector	The controller normally operates in "Short circuit" condition. The motorized stage immediately stops in "Open circuit condition". Uses same signal line as button "③ Emergency stop button". "Return to origin" procedure is required before restart. This function is effective regardless of the setting of the "Operation mode switch". memorized position.
8	Operation mode switch	Used to select the operation mode. RS232C Operated from PC via serial interfaces. FRONT PANEL Operated by buttons and switches placed in front panel. I / O Operated by signals from I / O connector.
9	RS232C connector	Connector is used for serial communication with PC.
10	Stage driving connector	Connection for cable to the motorized stage.
(1) (12)	Earth terminal AC connector	Connection for external electrical ground. Input power is AC100-240V(+/-10%) (50/60Hz). Use standard IEC 320 C13 cord set.

Chapter 3 Basic Operations

The basic operations needed to position motorized stages are outlined below, with cross-references to the sections of the manual in which these operations are described in detail.



3-1. Connecting to Motorized Stage

The controller can be connected to a variety of different motorized stages with stepping motors using appropriate cables.

3-1-1. Connecting to Motorized Stage

First, connect the Controller to the motorized stages. For connection between the controller and the motorized stage, use standard "DMINIS-CA" series or "DBCS-15" series cables or equivalent. Connect the D-sub 15-pin male (M2.6) to STAGE connector on the rear panel of the controller, and connect other end of the cable to the motorized stage.

(Caution) Turn off the controller power, while connecting the motorized stage.

3-1-2. Connecting Power Cable

Connect the power cable to the AC IN connector on the rear panel of the controller to plug the cable into an outlet.

(Caution) For your safety, connect the earth terminal to ground.

3-1-3. Connecting Stop Signal

Connect the dedicated connector plug to "Stop signal connector". The controller normally operates in "Short circuit" condition. The motorized stage immediately stops in "Open circuit condition".

Refer to following circuit diagram for stop signal input.



(Caution) Turn off the controller power, while connecting the stop signal input.

3-2. Change the Controller Setting

3-2-1. Checking the Controller Setting

Adjust the driver switches located on the bottom of the controller to set the current levels appropriate to the connected motorized stage as specified in the manual included with the motorized stage.

The switches can be accessed as shown in Fig. 3-2-1 by removing the panel's (4) screws at bottom of the controller (marked as \triangleright).

Please refer to the following explanations when setting the switches.

(Caution)

- Set all switches before turning on the power.
- Turn off the controller power while changing the controller settings. (New settings become effective and memorized when turning on the power.)
- Do not remove the screws not marked as



① Micro-step setting (M) (Setting the built-in driver)

Micro-step angle per pulse = Basic step angle (full-step angle) / number of divisions (Basic step angle is rotation angle per pulse at "full-step")

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

② Driving Current Settings (RUN) (Setting the built-in driver)

Current settings for motor rotation can be set by adjusting the position of the RUN rotary volume as shown in the following chart.

The required driving current depends on the stage to be used. (see stage manual for appropriate value).

SW No.	0	1	2	3	4		5		6	7
Current (A)	0.35	0.44	0.52	0.59	0.6	67	0.7	5	0.83	0.9
		8	9	А	В	C		D	E	F
		0.98	1.05	1.12	1.19	1.2	7	1.34	1.4	1.48

③ Stop Current Settings (STOP) (Setting the built-in driver)

The motor stop amperage can be set by adjusting the position of the STOP rotary volume as shown in the following chart. The figures in this chart are given as a percentage (%) of the RUN amperage.

The stop current is factory-set to 5 (50%).

SW No.	0	1	2	3	4			5	6	7	
Current (%)	25	30	35	41	45	5	5	50	55	59)
		8	9	А	В	(C	D	Е		F
		63	67	71	75	7	9	83	87	9) 1

Shaded fields are factory default setting.

④ Setting Switch A (SW 10)

SW10 SW#	Name	Functio	on						
1	232C baud rate bit 1	10-1	OFF	OFF	ON	ON			
2	232C baud rate bit 2	10-2	4800	9600	19200	38400			
3	Delimiter setting bit 1	10-3 10-4	OFF OFF	OFF ON	ON OFF	ON ON			
4	Delimiter setting bit 2		CR+LF	CR	LF	Not Used			
5	Fixed to OFF								
6	Fixed to OFF								
7	Memory protect	ON: Memory write disabled OFF: Memory write enabled							
8	Rotary knob lock	ON: Operation knob disabled OFF: Operation knob enabled							

⑤ Setting Switch B (SW 11)

Be sure to check SW-1, -2 before setting F-value.

SW11 SW#	Name	Function
1	Half-up	F value increased by 1.5 times (see section ⑥, SW12)
2	Slow down	F value reduced to 1/10 (see section ⑥, SW12)
3	Knob direction reversed	ON: Reversed direction movement made by the knob rotation. OFF: Normal direction movement made by the knob rotation.
4	Backlash correcting direction reversed	ON: Backlash correcting direction is opposite from the knob direction. OFF: Backlash correcting direction is same with the knob direction.
5	For reserve (Fixed to OFF)	
6	Polarity reversed	ON: Origin sensor and Origin proximity sensor is not jumper wired. OFF: Origin sensor and Origin proximity sensor is jumper wired.
7	For reserve (Fixed to OFF)	
8	For reserve (Fixed to OFF)	



Shaded fields are factory default setting.

6 F-value setting (SW 12)

Maximum speed (F) is set with this switch. (Refer to figure 3-2-2)

The value set here and the value set at SW14 "⑦ Pulse Multiplication Factor" are both multiplied to obtain the pulse rate (PPS) sent out to the micro-step driver. The maximum number of pulses acceptable by the built-in driver is 500K PPS. Make sure that "⑥ F-value" x "⑦ Pulse Multiplication Factor" does not exceed 500K PPS.

SW11-1(Half-up)		OFF	ON	OFF	ON
SW11-2(Slow down)		OFF	OFF	ON	ON
	0	500	750	50	75
	1	1000	1500	100	150
	2	2000	2500	200	250
	3	3000	3500	300	350
	4	4000	4500	400	450
	5	5000	5500	500	550
	6	6000	6500	600	650
SW12	7	7000	7500	700	750
SW#	8	8000	8500	800	850
	9	9000	9500	900	950
	А	10000	10500	1000	1050
	В	11000	12000	1100	1200
	С	13000	14000	1300	1400
	D	15000	16000	1500	1600
	Е	17000	18500	1700	1850
	F	20000	22000	2000	2200



⑦ Pulse Multiplication Factor setting (SW 14)

The switch is used to set the number the pulse numbers are multiplied by.

6 F-value setting

9 Pulses for one rotation setting

 S-value setting
 Backlash correction value setting
 Above parameters are multiplied by a factor set by this switch and obtain pulse numbers (PPS) sent out to the micro-step driver. It is recommended to use same value as "1 Micro-step Setting".

SW No.	0	1	2	3	4	5	6	7	8
Multiple factor	x1	x2	x4	x5	x8	x10	x20	x40	X80
			9	А	В	С	D	E	F
			X16	x25	x50	x100	x125	x200	x250

(Caution) The memorized coordinate is limited from -1,000,000 to +15,000,000. Do not use too large multiple factor that exceeds this limit.

(8) R-value setting (SW 13)

Acceleration / Deceleration time (R) is set. (Refer to figure 3-2-2)

										<u> </u>			/		
SW No.		0		1		2	3	4	4	Į	5	6		7	
Set value(msec)	14	20	Ę	50		100	120	1	50	18	80	20	0	250	
		8		9		Α	В		С		D		E	F	
		30	0	350)	400	500		600		700	8	00	100	0

(9) Pulses for one rotation setting (SW 15)

"0" is used for linear stages and other settings are used for rotation stages. For rotation stages, set pulse number for one rotation at full-step operation. Use values determined by the stage to be used.

(Set 72,000 for OSMS-**YAW series rotation stages.)

The value entered here multiplied by "⑦ Pulse Multiplication Factor" become "total pulse per rotation" sent out to the built-in driver.

SW No.	0	1	2	3	4	5	6	7	8
Set value	Linear Type	Factory Default	30000	36000	72000	144000	_	—	-
								1	
			9	A	В	С	D	E	F
			_	_	_				_

(Caution) "⑦ Pulse Multiplication Factor" x "⑨ Pulses for rotation" is limited from -1,000,000 to +15,000,000.

Difference between linear and rotation type stages

There are two different motorized stage types, which are "linear type" and "rotation type".

- Schematic image of rotation type is left side of below figure.
 When sequential positions of 0 to 11 exist, the position next to 11 is 0 (11 is before 0). Because maximum and the minimum position are located side by side, moving between 0 and 11 is possible. However, controller needs to recognize pulse number per one rotation with SW 15 setting.
- Schematic image of linear type is right side of below figure. At position before 0 and position after **1**1, there are limits. The movement exceeding these limits is not possible.



① S-value % setting (R 50) This parameter defines S-value by % of F-value, which have set at (6). (Refer to figure 3-2-2, 3-2-3) Turning the rotary resistor to fully left position correspond to 0%. Turning the rotary resistor to fully right position correspond to 50%. (1) Backlash compensation (R 51) Turning the rotary resistor to fully left position correspond to "no backlash compensation". Make adjustment of this parameter by checking actual movement. The value set here multiplied by "7 Pulse Multiplication Factor" become total compensation value sent out to the built-in driver. (12) Knob sensitivity (R 52) This parameter defines adjustment sensitivity of the operation knob at the front panel. Turning the rotary resistor to the right increases sensitivity (= make larger movement). The setting does not get effect of "(7) Pulse Multiplication Factor". (Caoution) The motorized stage will not function properly if these settings are incorrect. *Basically use same setting for (1) and (7)The positions of the stage are calculated from (9) Pulses for one rotation, 6 F-value multiplied by 7 Pulse Multiple Factor sent out to the built-in driver and divided by ① Micro-step setting. *Memorize the position after setting accomplish. By setting the ⑦ Pulse Multiplication Factor and ① Micro-step setting the same, (9) Pulses for one rotation, (6) F-value and (1)Backlash compensation are all multiplied by ⑦ Pulse Multiple Factor and registered in the controller as position parameter. If the value different from ① Micro-step setting is used, pulses per one rotation mismatches and cause incorrect positioning. Controller Position information Operation knob 6 F-value Built-in 9 Pulse per rotation /(1) Micro-step (10) S-value X (7) Multiplier division Motorized Stage (11) Backlash Compensation

Fig. 3-2-4 Setting Diagram

3-3. Input power of controller

3-3-1. Movement after input power

If controller was correctly set, ORIGIN switch and POSITIONING switch will light up for 1 second. High speed blinking or no lighting means the settings are incorrect.

3-3-2. Operation of motorized stage

Turn Operation mode switch (CONT) to FRONT PANEL in order to control motorized stage. Turn on main Power switch.



Move to origin

Press Return to ORIGIN switch. ORIGIN switch will light up the stage will move to origin position and stop. (Lamp of origin switch will light up.) Note: After turning on the power or pressing the STOP switch, pressing a POSITION switch will start the Move to Origin. After this is completed, the POSITION switches will behave normally.

•Using the Operation knob

Turn left or right Operation knob to move the motorized stage (Motorized stage will move according to angular degree when you turn left or right while pressing Operation knob at the same time.

The setting of sensitivity of Operation knob and moving direction of Operation knob is according to "3-2 Change the Controller Setting" When

turn Operation knob ^CControl changing switch (CONT) to FRONT PANEL and "SW10-8: Rotary knob lock"

Movement using the positioning switches

[Move to a position]

After pressing a positioning switch, the motorized stage will move to the position that was memorized for that switch.

[Memorizing a position]

Move the stage to the location to be memorized using the manual operation knob. Press a Positioning switch (1-5) and hold it until it stops blinking.

When the light changes from blinking to on, the position is memorized,

For best repeatability, make the final adjustment to the manual operation knob using only clockwise rotation. This will maximize the benefit of the

backlash compensation. (Note: refer to backlash correction)

(Caution)

*If the motorized stage is a linear type, do not make memorize a position close to a limit sensor. The motorized stage might reach to limit sensor due to backlash correction function and the motorized stage will not stop at correct position.

If it is necessary to set a position near limit sensor, minimize the backlash correction value in order to avoid the motorized stage reaching to limit sensor.

*Memorized positions can be only be set over the range of

-1,000,000 ~ +15,000,000 absolute value. Please note that if Pulse

multiple setting (SW14) is high, Positioning memory might go

beyond a range of -1,000,000 ~ +15,000,000.

The next time the positioning switch (1-5) is pressed, the motorized stage will move to the memorized position.

Note that the Positioning switches will be only be active when the "Control switch (CONT)" is set to FRONT PANEL.

The memorized locations remain stored when the power is turned off. Stopping of motorized stage is able to reset and also able to set a prevent reset by turning ON "SW 10 - 7: Memory protect".

Stop movement

Pressing the STOP switch will immediately stop any stage motion. If the stage is moving when the STOP button is pressed, the stored location will no longer be accurate. A move to ORIGIN will need to be performed before normal operation can continue. Note that pressing a Positioning switch after pressing the STOP switch will perform the move to ORIGIN, after which the positioning switches will operate normally.



3-4. Others

3-4-1. Operation using external I/O

To operate the controller using the external I/O, turn Operation switch (CONT) to I/O (Computer control and the manual operation knob will be inoperative.)

The Positioning buttons (1-5) will still operate.

After pressing a position button, the motorized stage will move to the memorized position and the READY signal will be output. (refer to Drawing 3-4-2 for the command timing chart).

Refer to "Drawing 3-4-3 I/O connector signal circuit " for the connecting to the external I/O.

- (Caution) Beside I/O mode despite of Operation changing switch (CONT), READY signal is also output.
- (Caution) The position switches cannot be programmed when the controller is in I/O mode. Please set positioning memory by referring to "3-3-2 Operation of motorized stage".
- (Caution) The connection of external I/O, voltage during ON is +24 V \pm 10% and 0 to 0.1 V during OFF. Please do not use the I/O connector beside Pin of I/O connector +24 V of 16,18,20,22,24.





1. Power ON status
Do not input or output regarding to movement 5 second after power on.
2. Input origin command (input ≥ 0.2 second)
Start operating the motorized stage after return to Origin when READY output is ON.
3. Input origin command again
Restart to operate the motorized stage after return to Origin when READY output is ON.
Repeat the movement same as 2.
4. Input position command 1 (input ≥ 0.2 second)
Start movement of motorized stage when READY output OFF
READY output become ON after moving to Command position 1
(After stopping, if you turn Operation knob, READY output will change to OFE.)
5 Input positioning command 1 again
No change (It is different from Origin command and remains unmoved)
6 Input positioning command 2 (for the case of continuously input)
Start movement of motorized stage when READY output is OEE
PEADY output become ON after movement to command position 2
7 Input positioning command 1 while status of input positioning command 2 is ON
Indefinite (do not input 2 position commands at the same time)
Indefinite (do not input 2 position commands at the same time)
In case of meterized stage is stepping, there will be no change
In case of motorized stage is stopping, there will be no change.
9. Input stop command during moving (Open input)
READ Fourput is continuously OFF when motorized stage stop (Please do an error processing
to upper level by timer.)
The recomment of materized store is storted when DEADX sutput is OEE
After resument to resume and resition 2. DEADY output is OFF.
After movement to command position 2, READY output is ON.
Start movement of motorized stage immediately when READY output is OFF.
Alter movement to command position 1, READY output is ON.

Memo

If Stop command is input, READY output will not change to ON. Even though Operation changing switch (CONT) has I/O signal, Stop switch of Panel is effective on constant basis.



3-4-2. Operation with a serial interface

Operate with a serial interface. Switch operation mode (CONT) to RS232C position to operate the controller using the serial interface.

(Caution) Interface is sensitive to noise. Please keep away from the power line, and keep cable less than 3m.

Please connect the RS232C according to the "Table 3-4-1 RS-232C connector pin assignments". Please use the RS232C/STR cable which is made by Sigma-koki or an equivalent one (straight, male-female, inch screw).



Table 0 4 4					
1 able 3-4-1	RS-2320	connector	pin	assignme	ents

Pin Number	Assign
2	TXD
3	RXD
5	GND

The serial communication parameters that are supported are shown below. Refer to "Table3-4-2 Serial command list" for a list of supported commands. ·Setting the serial communication

 Baud rate:
 4800, 9600, 19200, 38400 (Set by SW10-1/-2)

 Data bits:
 8

 Parity:
 None

 Stop bit:
 1

 Flow control:
 None

(Caution) There is no flow control.

['] There is a risk of abnormal communication if you send the commands continuously.

The format of serial commands

The protocol is one command to one response type.

Command string · · · reception

Response string · · · Transmission

For commands other than status commands, the response string is "OK", if the communication is normal. Otherwise it will be "NG". Status commands will respond with data instead of the "OK", or NG.

command	symbol	sample	description	response				
Control (drive)	Control (drive) command1							
Mechanical origin	Н	H:1[CR][LF]	Move to mechanical origin point					
Position No.	В	B:1[CR][LF]	Set position No. to move to	Normal:				
Pulse Number for relative moving	М	M:1-P100 [CR][LF]	Set axis, direction and pulse number	OK				
Pulse Number for absolute moving	Α	A:1-P100 [CR][LF]	Set absolute coordinate to move to	Abnormal: NG				
Jog moving	J	J:1[CR][LF]	Move at the minimum speed					
Drive command	G	G:[CR][LF]	Start to move					
Control (setting	Control (setting) command2							
Electrical (logical) origin	R	R:1[CR][LF]	Set the present point as a electrical(logical) origin					
Slow down and stop	L	L:1[CR][LF]	Stop or slow down and stop	Normal:				
Emergence stop	L:E	L:E[CR][LF]	Stop movement of motor	OK				
Speed setting	D	D:1S100F1000R50 [CR][LF]	Set S,F,R	Abnormal:				
Motor free/ hold	С	C:11[CR][LF]	Set motor ON/OFF	NG				
Set position memory	Р	P:B2+P1000 [CR][LF]	Set position memory					
 confirmation co 	mmand							
Status 1	Q	Q:[CR][LF]	Return the present position data					
Status 2 ! !:[CR]		!:[CR][LF]	Return B(busy)/R(ready)					
Inner information ? ?:1[CR][LF]		?:1[CR][LF]	Confirm the inner information	(12), (14), (15)				

Table3-4-2 Serial command list

(The command sample assumes that the delimiter setting is [CR][LF])

(Caution)

Only the "Q" and "!" command are effective when the operating mode switch is not set to RS232C.

(Caution)

- The counter number and action can not be sure if the pulses that it traveled are over the regulated value, especially when it is driven by Jog command. Please note that it is not stopped by LS signal when using "J" command to rotate.
- The address will be changed automatically within a revolution when stopped after command "M, A, J" to rotate.

Commands are sorted as below.

- (1) Control (Drive) command 1
- (2) Control (Setting) command 2(3) Confirmation command

(1) Control (Drive) command 1

1) H command	Mechanical origin
[Parameter]	axis name
[r aramotor]	Axis name "1" or "W"
[Function]	Find the mechanical origin of stage and make the that
	position the origin.
[Note]	While searching for the origin, no command is accepted
	except stop commands and confirmation commands.
	Speed and the time of acceleration and deceleration
	are the latest data which are set. There is no
	deceleration when searching out limit sensor. There is
	an error and searching origin is not run when motor
[Sampla]	neid excitation is off.
[Sample]	H:1 searching for mechanical origin
	(set origin) (H: W is the same)
(2) B command	Position No
[Parameter]	
[[unation]	Button No "1", "2", "3", "4", "5"
[Function]	choose the memorized position to move to. These
	It must be followed by a "G:" command Backlash
	compensation will be applied when positioning. If the
	origin has not been set, then this command will execute
	the H command.
[Note]	If running this command several times without running
	G command, the latest B command or "Pulse Number
	for relative moving" or "Pulse Number for absolute
	moving " is effective. And the setting will be ineffectual
	after running the command such as Mechanical origin
	or Jog moving or stop (emergence stop). There is an
	error if running this command when motor field
[Comple]	excitation is off.
[Sample]	B:1 choosing No 1 position
	G Drive command
(3) M command	Pulse number for relative motion
[Parameter]	axis + direction + displacement
[Axis No "1" or "W"
	Direction
	"+" moving forward + direction
	"-" moving Forward – direction
	Displacement "P" and "value".
	The value must be between +/-16, 777, 214.

[Function] [Note]	This is the command to set axis and direction for relative travel. It must be followed by a "G:" command. It moves with acceleration and deceleration. The travel is specified with a pulse number. There is no a backlash compensation when positioning. If running this command several times without running G command, the latest B command or "Pulse Number for relative moving" or "Pulse Number for absolute moving " is effective. And the setting will be ineffectual after running the command such as Mechanical origin or Jog moving or stop (emergence stop). There will be an error if the coordinatie is not between (+/-16, 777,					
	214) after runn	ing. There is an error if running this				
	command when	motor field excitation is off.				
[Sample]	M:1+P1000	set to move 1000 pulses in the + direction				
	G:	Drive command				
④ A command	Pulse n	umber for absolute motion				
[Parameter]	axis No + directio	on + displacement				
	Axis	No "1" or "W"				
	Urection "+"	moving forward + direction				
	"_"	moving forward – direction				
	Displacement	"P" and "value"				
	The value must b	be between +/-P100, 000, 000				
Actual number of	(It is 9 digits exce	ept sign and P)				
[Function]	 This is the command to set axis and direction, to move to an absolute position. It must be followed by a "G:" command. It moves with acceleration and deceleration The travel is specified with a pulse number. It can be moved to the electrical (logical) origin with this command. There is no a backrush compensation when positioning. If running this command several times without running G command, the latest B command or "Pulse Number for relative moving" or "Pulse Number for absolute moving " is effective. And the setting will be ineffectual after running the command such as Mechanical origin or Jog moving or stop (emergence stop). There will be an error if the coordination is not between (+/-16, 777, 214) after running. 					
[Note]						
[Comple]	command when	motor field excitation is off.				
[Sample]	A:1+P1000					
	set to m	ove 1000 pulses in the + direction				
	G: Drive co	ommand				

5 J command	J	og moving					
[Parameter]	axis No +	direction					
	Axis No	"1" or	- "W"				
	Direction	"+" "_"	moving forward + direction moving forward – direction				
[Function]	Command to drive stage at the low speed (S) continuously (constant speed). It must be followed by a "G:" command.						
[Note]	This command will be cancelled if running other driving commands such as "Pulse Number for relative moving" without running "G:" command. There is an error if running this command when motor field excitation is off						
[Sample]	-						
	J:1+ s G: D	et Jog mover Prive commar	ment in + direction nd				
(6) G command	L	Prive comma	and				
[Parameter]	None						
[Function]	Execute the	ne motion pre	eviously entered and stop after				
	the comm	and is compl	eted.				
[Note]	There is an error if you issue the command not after the commands like "Pulse Number for relative/absolute						

moving " or Jog moving or position No command.

Drive command

Please issue a new drive instruction after this command. There is an error if you run this command without new drive instruction. It will end the command normally even if the specified travel value is zero. There is an error if running this command when motor field excitation is off.

[Sample]

G:

(2) Control command 2 (Setting system)						
⑦ R command	Return to electronic (logical) origin					
[Parameter]	Axis name Axis name "1" or "W" Name of axis to operate Set the stopping position as coordinate origin					
[Function]	Set the stopping position as coordinate origin. When turn ON power, the position becomes origin ("0" display) position. When this command is executed, the display value is "0". (Set by RS-232C only)					
[Note]	Running this command with neither jogging nor the homing operation performed causes an error.					
[Sample]	R:1 Set the electronic (logical) origin					
8 L command	Deceleration and Stop Command					
[Parameter]	Axis name					
[Function]	Axis name "1" or "W" Name of axis to operate When this command is executed, the stage decelerates and stops.					
[Note]	This command is effective only when the stage is operated by a Relative/Absolute move pulse count set command, Positioning set command, Origin command. If the stage is not operated, this command finishes normally without the stop operation. During jogging, this command stops the jog operation.					
[Sample]						
	L:1 Stops axis drive					
(9) L:E comman	d Emergency stop					
[Function]	This command stops all stages immediately, whatever					
	the conditions.					
[Sample]	L:E Stop immediately					
1 D command	Speed settings					
[Parameter]	Axis name + Minimum speed + Maximum speed + Acceleration/Deceleration time Axis name "1" or "W" Name of axis to operate Minimum Speed "S" + number Set a number from 1-500,000 (PPS) Maximum Speed "F" + number Set a number from 1-500,000 (PPS) Acceleration/Deceleration time "R" + number Set a number from 1-1,000 (mS) Note that the minimum speed (S) must be less than or					
[Function]	equal to the maximum speed (F). The minimum speed (S), maximum speed (F), and acceleration/deceleration time (R) are set according to					
	the SPEED SEL memory switches when the power is turned on. This command allows you to change these initial settings. (Set by RS-232C only)					

continuously, the last run this command is effective.

D : 1S100F1000R50 Speed setting

g S=100PPS F=1000PPS R=50mS

(1) C Command	1	Motor F	Free/⊢	lold		
[Parameter]	Axis nam	e + ope	rating	mod	le	
	Axis nam	е	"1" or	"W"	Name of axis to operate	
	Operating	g mode	"0"		Deenergize (OFF)	
			"1"	E	nergize (ON)	
[Function]	This com	mand is	s used	to e	xcite the motor or to turn	
	excitation	off. Th	e oper	atior	n of this content makes it	
	possible f	to move	e (rotat	e) st	tages manually. The options	
	available	are 0: f	ree mo	otor,	and 1: excitation (hold	
	motor).					
	(Set by R	S-232C	conly)			
[Note] If deenergized (OFF) the current position b					urrent position becomes	
	undefined. Even when energized (ON), perform the					
	homing operation, or run the Electronic (Logical) Zero					
	Set Command. In some case, the status is busy and					
	cannot operate when apply C:10 command. (C:11 is					
	applicable	e even v	when s	statu	is is busy.)	
[Sample]						
	C:10 [Deenerg	gize (N	/lotor	r Free)	

12 P Command	Positio	n Memory		
[Parameter]	Button name + Position			
	Button name Position	"1", "2", "3" "Ρ" and "nι	, "4", "5" Imber"	
	Number range o	f -P1,000,00	00~+P15,000,000	
[Function]	All buttons can be set a position memory by absolute coordinate.			
[Note]	In case of pulse	multiple sett	ing is high, it might over	
	the range of - P	1,000,000 t	o + P 15,000,000. In case	
	of rotation type setting, please add position.			
[Sample]				
	P:B1+P1000	Position of	button switch number 2	

Control command 2 (Setting system)					
① Q command	Status1				
[Parameter]	None				
[Function]	On receipt of this command, the controller returns the coordinates for each axis and the current state of each stage.				
[Noto]	Nono				
[Note] [Sample]	None				
	Q:				
	- 100, AKC1, ACK2, ACK3 Data returned				
Axis c	oordinate number				
ACK1	X: Command or parameter errors				
ACK1	K: Command received normally				
ACK2	L: LS detect				
	K: Normal stop				
ACK3	B:(BUSY)L,Q,! Commands can be received				
	R:(READY) all commands can be received				
* Coordinate values for axis have a fixed length of ten digits, including					
symbols. (Sym	bols are left-aligned, coordinates values right-aligned)				

(3)

(Caution) If operation mode switch (CONT) is not set to RS-232C, only Q and ! command are effective. Please note that L command is not received.

<pre>① ! command</pre>	Status2	2			
[Parameter]	None				
[Function]	On receipt of this stage operating s ACK3 will return	s command, the controller returns the status. If the setting is not RS232C, by BUSY.			
[Note]	None				
[Sample]	ŀ				
ACK3		Data returned			
ACK3	B:(BUSY)L,Q,! R:(READY)	Commands can be received all commands can be received			
(Caution) If operation mode switch (CONT) is not set to RS-232C, only Q and ! command are effective. Please note that L command is not					

received.

(15) ? command	Request for internal information
[Parameter]	None
[Function]	On receipt of this command, the controller returns the stage operating status.
[Note]	None

[Sample]

?: [Parameter]

[Parameter] 1 2 3 4 5 V R	[Data returned] Memory Coordinates value of Position number 1 Memory Coordinates value of Position number 2 Memory Coordinates value of Position number 3 Memory Coordinates value of Position number 4 Memory Coordinates value of Position number 5 Version numbers Pulse number per one rotation	[Examples] +1000 +2000 +3000 +4000 +5000 V2.00 +30000
C	Position of CONT switch	0(= pulse) 1(= RS232C) 2(= I/O)
BT	Position specified value information	2(= Position 2) 0(= Undefined)
ORG	Checking status of origin	0(= Before origin) 1(= After origin)

Warranty period of this product is 1 year after shipment.

During warranty period, if the defective caused from our responsibility, please return the product to us. The repair or replacement of parts will be done by free of charge. However, in regard to an indirect damage or a damage as a result caused from delivery (including lost earnings), it is considered to not to be covered under warranty. In addition, the corresponding defective as following below will be not under warranty.

- 1. In case the repair, remodeling and etc. is not done by our company.
- 2. In case defective cause is not by a reason of hardware. (Effect of vibration etc.)
- 3. In case of the conditions of using, storage environment and etc of the product is deviated from the description on quotation.
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Со	ntrol set table m	ting (Setting emo	F-value setting (SW12) B	Pulse multiple factor (SW14) 7	Rotation setting (SW15) 9	R-value setting (SW13) 8		
							(R50) (R50) (R50) (R50) (R50) (R50)	
	2 Drive currint setting Set							
	Name			S/N				
	GIP-101A			0		0 "		
	Name		Symbol	Setting range	Default value	Setting value		
1	Micro-step se	etting	М	0 - F	8			
2	Driving curre	nt setting	RUN	0 - F	5			
3	Current down	n stop setting	STOP	0 - F	5			
		232C baud rate BIT1	SW10-1	ON/OFF	OFF			
		232C baud rate BIT2	SW10-2	ON/OFF	ON			
		Delimit setting BIT1	SW10-3	ON/OFF	OFF			
(4)	Setting	ng Delimit setting BIT2		ON/OFF	OFF			
Ŭ	switch A	OFF fix	SW10-5	OFF	OFF			
		OFF fix	SW10-6	OFF	OFF			
		Memory protect	SW10-7	ON/OFF	OFF			
		Rotary knob	SW10-8	ON/OFF	OFF			
		Half up	SW11-1	ON/OFF	OFF			
		SIOW DOWN Knob direction	SVV11-2	UN/UFF	OFF		ł	
		reverse	SW11-3	ON/OFF	OFF			
(5)	Setting	Backlash correction	SW11-4	ON/OFF	OFF			
٢	switch B	(Backup OFF fix)	SW11-5	OFF	OFF			
		Progression, origin, reversal	SW11-6	OFF	OFF			
		Maintain OFF fix	SW11-7	OFF	OFF			
		Maintain OFF fix	SW11-8	OFF	OFF			
6	F -value sett	ing	SW12	0~F	5		1	
$\overline{\mathcal{O}}$	Pulse multipl	e setting	W14	0 - F	8			
8	8 R-value setting		SW13	0 - F	6		1	
9	One rotation	setting	SW15	0 - F	0		1	
1 S-value % setting		R50	0 - 10	3		Left position at most as 0		
1	Backlash cor	rrection amount	R51	0 - 10	5		Left position at most as 10	
(12)	Operation kn	ob sensitivity	R52	0 - 10	5		1 memory as 1	
(1)	Onerstica		CONT	RS232C				
(13)	(13) Operation mode switch			FRONT PANEL	<u> </u>			

