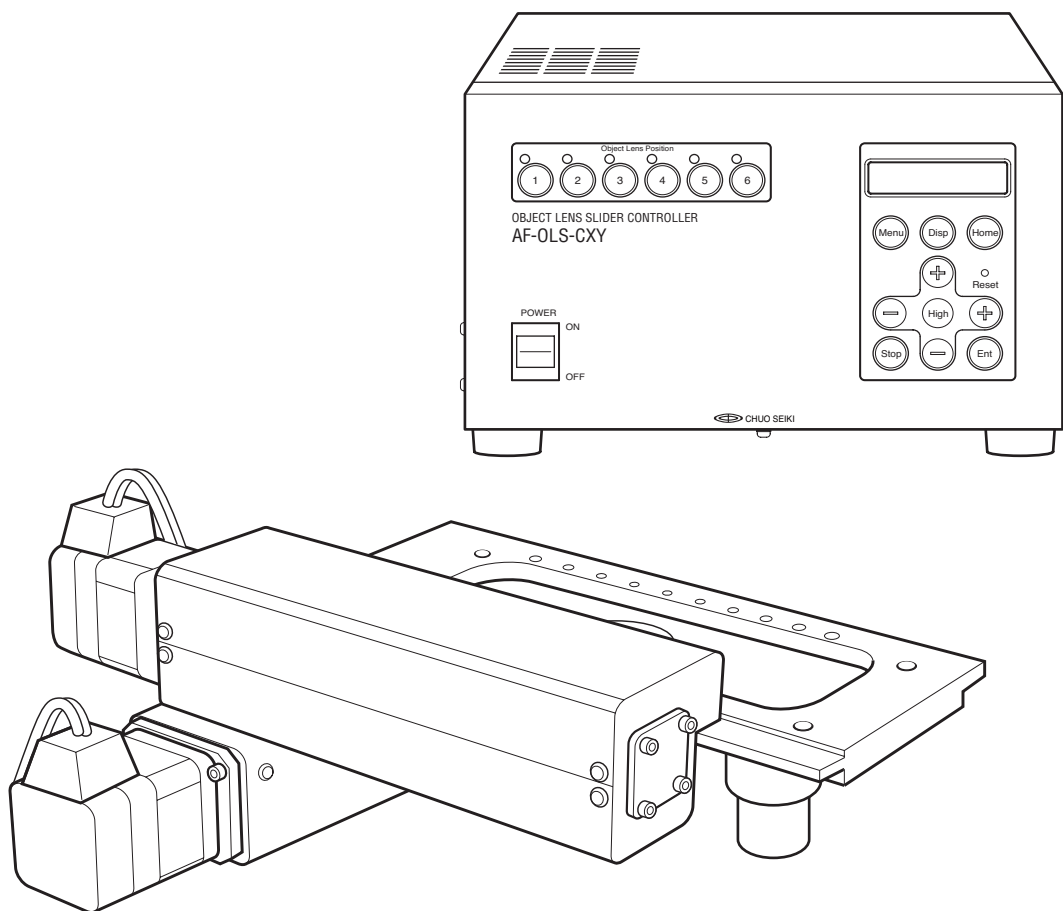


Object Lens Slider

AF-OLS-06XY

AF-OLS-06XY / AF-OLS-CXY

Instruction Manual



CHUO PRECISION INDUSTRIAL CO., LTD.

Preface

Thank you for purchasing the object lens slider (AF-OLS-06XY / AF-OLS-CXY). Please read the manual thoroughly so that the object lens slider is used correctly and safely. Furthermore, keep the manual where it can be referred to at any time in order to take full advantage of the various functions.

Features

AF-OLS-06XY is a device that enables you to replace the object lens quickly at a highly accurate level. As the position of the object lens is controlled by two-dimensional coordinates, the optical axis can be adjusted easily compared to the traditional electric revolver. In addition, the device is equipped with RS-232C and parallel I/O which allows simple remote control operation from an external device.

Combination of the Object Lens Slider and Controller

Please use the purchased object lens slider (AF-OLS-06XY) and controller (AF-OLS-CXY) in combination. As they are adjusted as a single set, proper operation cannot be guaranteed when a device of a different product number is used.

Product Configuration & Accessories

Configuration

Object lens slider (AF-OLS-06XY)	1
Controller (AF-OLS-CXY)	1

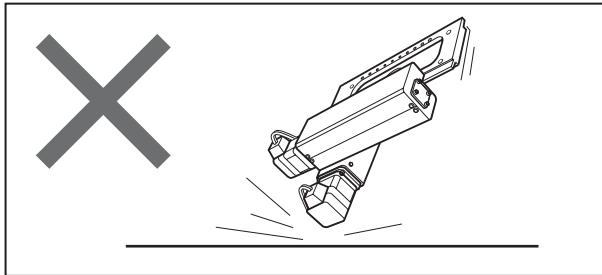
Accessories

Motor cable	2
Sensor cable	2
Power cable	1
I/O connector (57-30170R made by DDK)	1
Instruction Manual (this document)	1
Remote Control Program	1

CAUTION

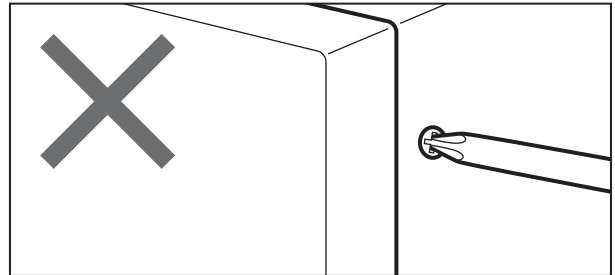
- Other than the above accessories, optical axis adjustment tools are required to attach the optical lens slider to your device. The tools must comply with the optical system you are using. Contact us if you are using our optical system, as we have tools that comply with our system. Please also consult us if you are using an optical system of a different company. Furthermore, if you are going to use remote control from an external device, a communication cable (RS-232C) to connect the computer and cable (I/O cable) to connect the external device will be required.
- The Remote Control Program must be used to perform the centering adjustment of the object lens efficiently. A computer and communication cable (RS-232C) must be available for use by the Remote Control Program. Please read the Instruction Manual for the Remote Control Program for details on using the program.

Safety Precautions



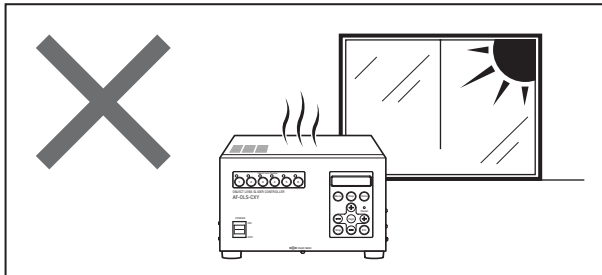
Never apply physical shock

This product is made of very precise components, so be careful not to apply physical shock or put it in places subject to vibration.



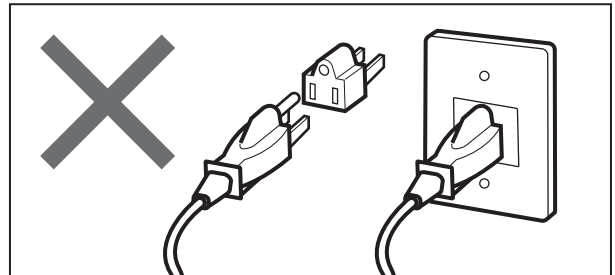
Never modify the device

Do not remove the secured panels or covers on the device, or attempt to modify the device.



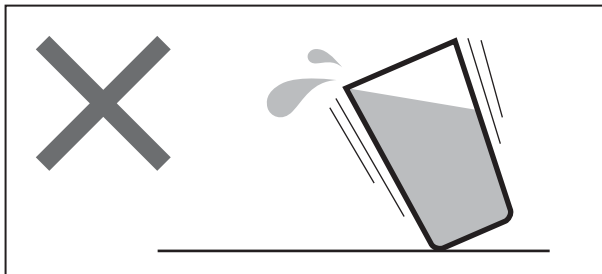
Environment

Never use the device where it is exposed to direct sunlight, or near an air conditioner or heating device where the temperature could change dramatically.



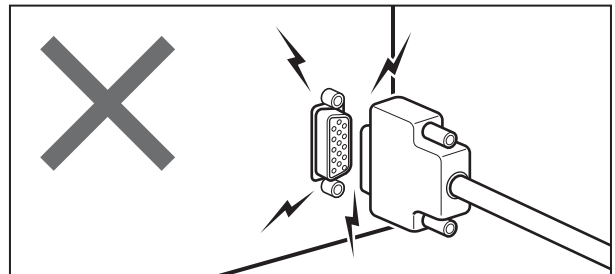
Establish a ground

Be sure to connect the AC power cable to an outlet attached with a ground.



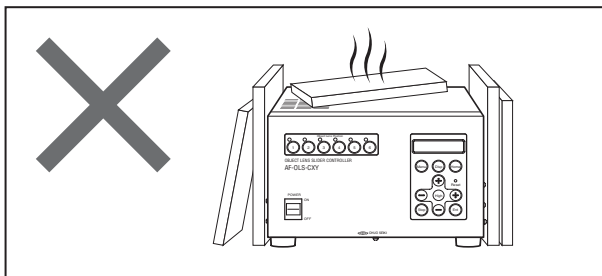
Places to avoid

Never place the device where there is a risk of contact with liquids as it could lead to serious damage.



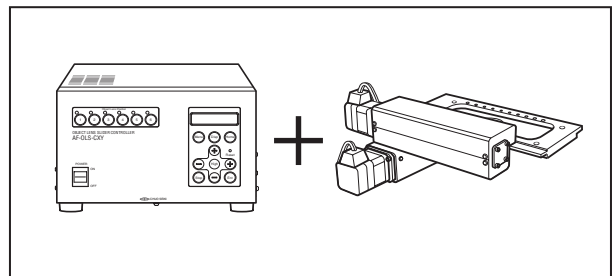
Attaching and detaching the connector

Never attach or detach the connector with the power ON as it may damage the device.



Heat-production of the controller

The controller becomes relatively hot when power is applied. Never block the air vents or use it in a place which is not well ventilated.



Using the proper set

The object lens slider and controller are adjusted as one set with the same product number. Therefore, proper operation cannot be guaranteed if one is used with another device of a different product number. Caution is required particularly if you are using more than one set.

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AF-OLS-06XY

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AF-OLS-06XY

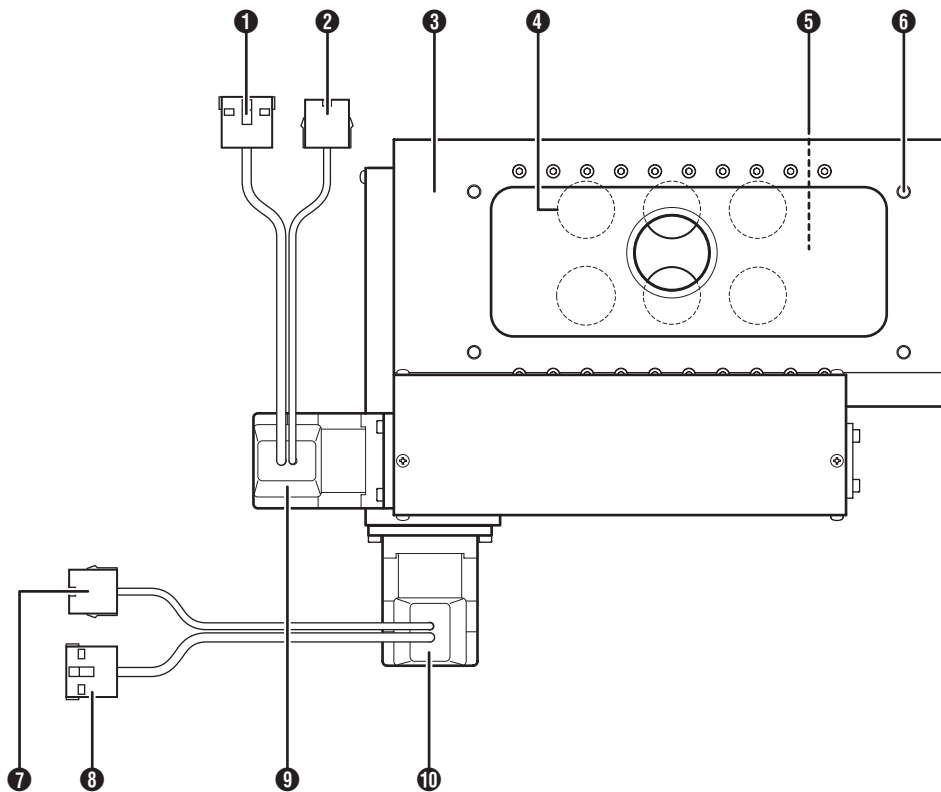
AF-OLS-06XY

Section 1

Basic Operation

1 Name & Function of Each Part

Object Lens Slider (AF-OLS-06XY)



❶ Axis-X Motor Connector

To connect to the controller's [MOTOR X] with the attached cable.

❷ Axis-X Sensor Connector

To connect to the controller's [SENSOR X] and [ENCODER X] with the attached cable.

❸ Base Plate

Base plate of the object lens slider. Four screw holes (M6 / 12mm in depth) are provided to attach to your device.

❹ Object Lens Attachment Screw

Standard: Mitsutoyo object lens screw – $\phi 26 - 36 / \text{inch}$

❺ Object Lens Attachment Table

Six object lenses can be attached. Moves in the direction of Axis X and Y upon driving the motor.

❻ Attachment Screw Holes (4 locations)

To attach to your device with screws (M6).

⚠ CAUTION

Four screw holes are required on the device to which the object lens slider is to be attached. (When initially attaching the object lens slider, a clearance of approx. 0.5mm should be established for adjusting the position.)

❼ Axis-Y Sensor Connector

To connect to the controller's [SENSOR Y] and [ENCODER Y] with the attached cable.

❽ Axis-Y Motor Connector

To connect to the controller's [MOTOR Y] with the attached cable.

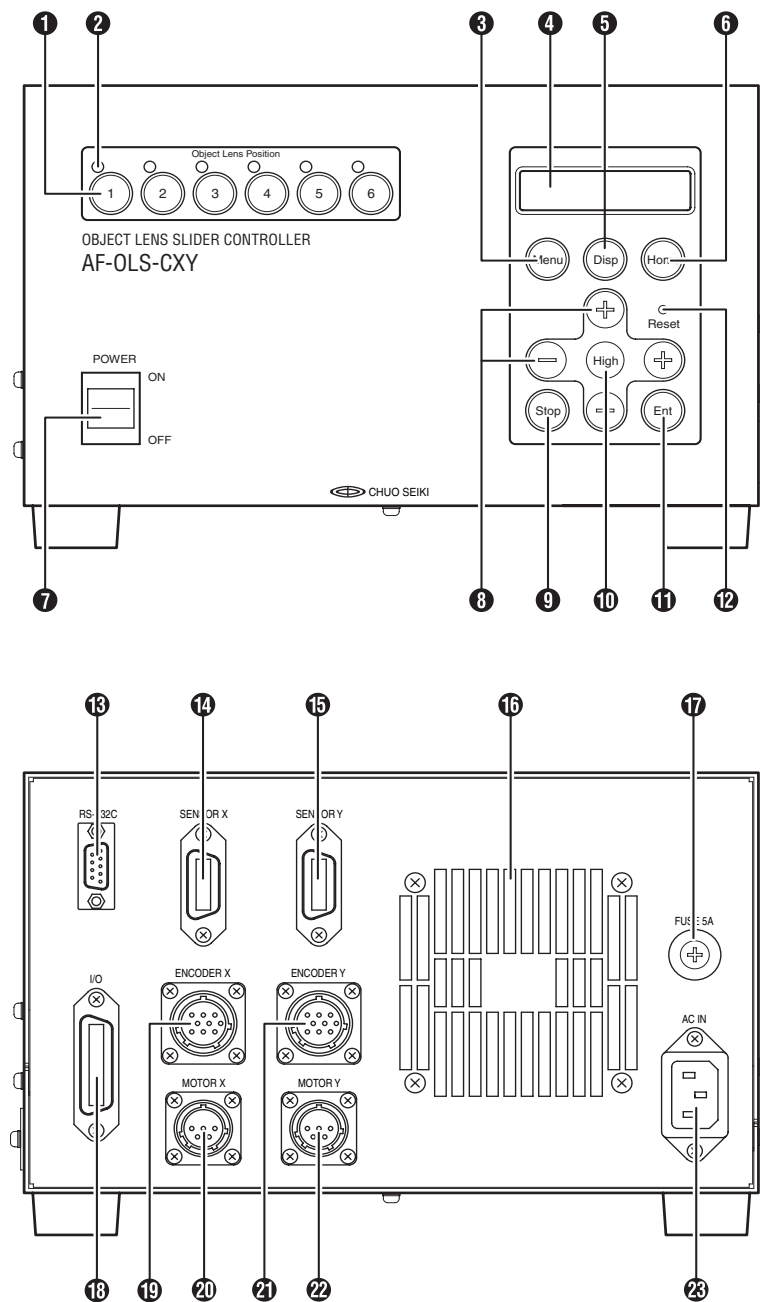
❾ Axis-X Motor

To drive Axis X.

❿ Axis-Y Motor

To drive Axis Y.

Controller (AF-OLS-CXY)



① Port Selection Key

Changes the object lens position by pressing one of the keys from [1] to [6], which moves the object lens to a preset coordinate.

② Port Position Display Lamp

Displays the current position of the object lens. Illuminates after the selected object lens moves.

③ [Menu] Key

Changes the mode. The mode selection screen appears by pressing the [Menu] key.

④ Indicator

Displays information such as the coordinate value and setup value.

⑤ [Disp] Key

Changes the unit display (pulse display / unit display). The unit display is set from the parameter.

⑥ [Home] Key

Returns to home position. (Home-return mode is entered by pressing the [Home] key.)

⑦ Power Switch

Turns the controller ON/OFF.

⚠ CAUTION

After turning OFF the power, wait at least 5 seconds before turning it ON again.

⑧ [+] [-] (Move) Keys

In JOG mode, moves in the direction of Axis X when the [+] or [-] key on the left or right is pressed and in the direction of Axis Y when the [+] or [-] key on the top or bottom is pressed.

⑨ [Stop] Key

Stops the moving stage or stops input to the indicator.

⑩ [High] Key

Moves in high speed. Moves in high speed to the designated direction by pressing the key along with Move keys during JOG mode.

⑪ [Ent] Key

Used to determine input data or used as a key to start a home-return operation.

⑫ [Reset] Switch

Resets the controller's system program when a problem occurs.

⚠ CAUTION

Memory of data such as parameter settings will also be reset and returned to the default value.

Use a sharp item such as the tip of a lead pencil (with the lead hidden) to operate the [Reset] switch.

⑬ RS-232C Connector

Controls communication in RS-232C communication format when connected to the host computer.

⑭ SENSOR X

Connect to the Axis-X sensor connector of the object lens slider with the attached cable.

⑮ SENSOR Y

Connect to the Axis-Y sensor connector of the object lens slider with the attached cable.

⑯ Cooling Fan Outlet

This is the outlet of the cooling fan. Do not allow the outlet or the inlet slits on the top and side to become clogged or blocked.

⑰ Fuse Box

Fuse type: FGB0-250V-5A (made by Fuji Tanshi)

⑱ I/O Connector

An external input terminal to connect to other devices.

⑲ ENCODER X

Connect to the Axis-X sensor connector of the object lens slider with the attached cable.

⑳ MOTOR X

Connect to the Axis-X motor connector of the object lens slider with the attached cable.

㉑ ENCODER Y

Connect to the Axis-Y sensor connector of the object lens slider with the attached cable.

㉒ MOTOR Y

Connect to the Axis-Y motor connector of the object lens slider with the attached cable.

㉓ Power Inlet

Connect to 90V AC – 260V AC (47-63Hz).

2 Installation

The method for installing this product differs according to the device you are using. This section describes the basic method for installing the product.

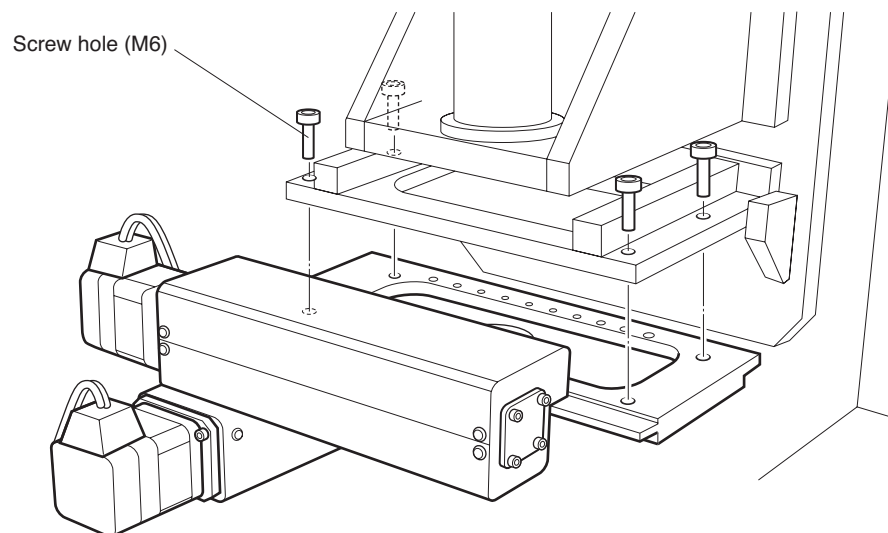
Reference:

This product is installed using the screw holes (4 locations) set on the base plate. Four screw holes are required on the device to which the object lens slider is to be attached. (When initially attaching the object lens slider, a clearance of approx. 0.5mm should be established for adjusting the position.)

Procedures for Setting the Object Lens Slider

You will need assistance from another person as the main slider unit must be supported while securing the screws. (It is recommended that the procedure up to screwing in the 4 screws tentatively is performed by two workers.)

1 Place the main object lens slider unit under the device to which it is being installed and adjust the position of the screw holes.



2 Use 4 screws (M6) and secure them

Tentatively means that the object lens slider can be moved in the amount of the screw clearance (0.5mm) with no other non-required looseness.

3 Check the connection.

Reference:

If you are connecting for the first time, do it here. (Refer to “3. Connection” (P.12) for details.)

4 Let go of the object lens slider and turn ON the controller.

CAUTION

The object lens slider may move unexpectedly when the power goes ON, so take your hands away from the object lens slider when turning the power ON.

5 Return to home position using the key on the front panel of the controller or performing communication control from the computer.

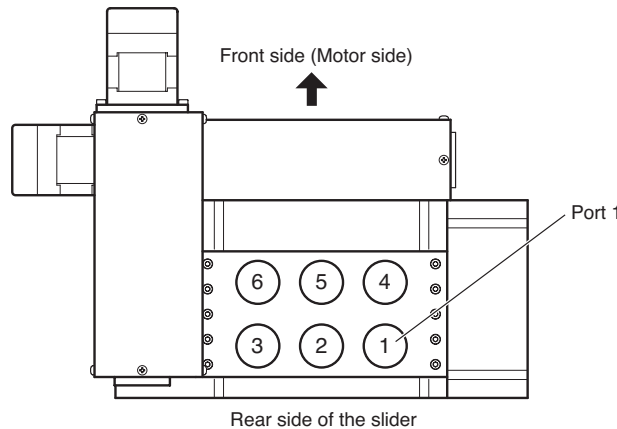
Reference:

- When returning to home position, the system is set by default so that the object lens slider will move to a position where the center of the scope cylinder and the center of the object lens attachment table overlap.
- Refer to “9. Returning to Home Position” (P.24), “16. Details of Commands (P.34), and “19. I/O Port” (P.48) for details on returning to home position.

6 Specify “Port 1” using the key on the front panel of the controller or performing communication control from the computer.

Reference:

The installed position of the object lens slider will be determined by adjusting the specified port number to the actual port position. Therefore, it is recommended that you set an object lens with the highest magnification rate to the specified port (Port 1).



7 Turn the controller OFF when the object lens slider moves to Port 1.

⚠ CAUTION

Perform the following tasks carefully according to the following instructions.

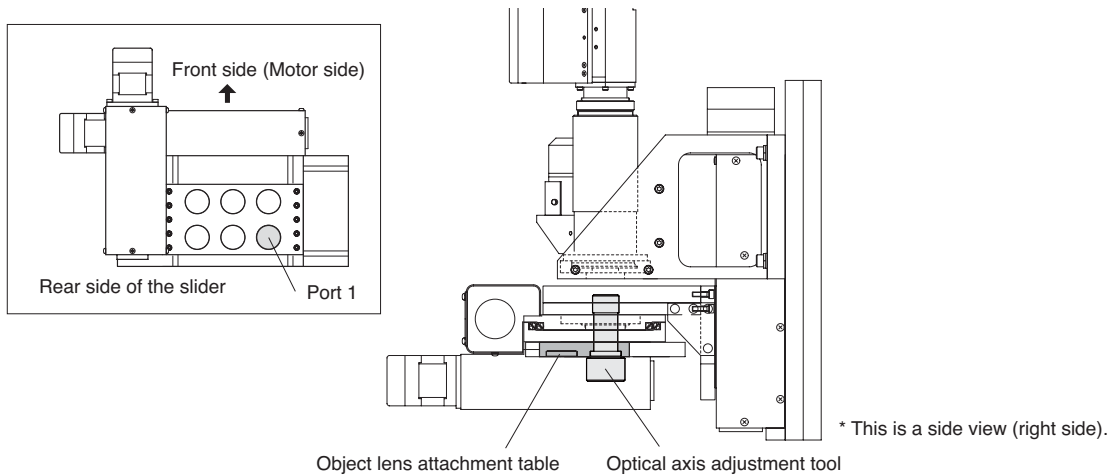
- The object lens slider may move unexpectedly and lead to an injury if you continue working with the power turned ON, so be sure to turn the controller OFF before you perform the following tasks.
- When the controller is turned OFF, table for Axis X and Axis Y on the object lens slider will move when applying even a slight amount of force. If the table for Axis X and/or Axis Y moves, the coordinates set on the controller and the actual table position go out of alignment and the center axis of the lens will be skewed.

8 Insert an optical axis adjustment tool carefully in Port 1 of the object lens attachment table.

Insert an optical axis adjustment tool carefully in the lens attachment screw section of Port 1 on the rear side of the object lens slider. If the leading end of the optical axis adjustment tool does not go smoothly into the scope cylinder of your device, hold the base plate or motor section, move the object lens slider carefully, and find a position where the tool will enter. When doing so, be careful not to move the object lens attachment table that is set with the optical axis adjustment tool.

⚠ CAUTION

If you move the lens holder section even slightly when setting the optical axis adjustment tool, stop the task and return to Step 4.



9 Make sure that the optical axis adjustment tool is inserted completely and screwed in, and then, secure the 4 screws that were set tentatively all the way in.

Do not secure one screw at a time. Secure all of them equally little by little.

⚠ CAUTION

If you move the object lens slider even slightly when securing the screws, stop the task and return to Step 4.

10 Remove the optical axis adjustment tool carefully.

Store the optical axis adjustment tool in a safe place as it will be used for adjusting positions in the future.

11 Set an object lens of high magnification in Port 1 of the lens holder.

12 Turn ON the controller and return to home position using the key on the front panel of the controller or performing communication control from the computer.

13 Specify “Port 1” and check the image on the monitor.

If the position needs to be adjusted after checking the image, perform the procedure from Step 4 to Step 13 again.

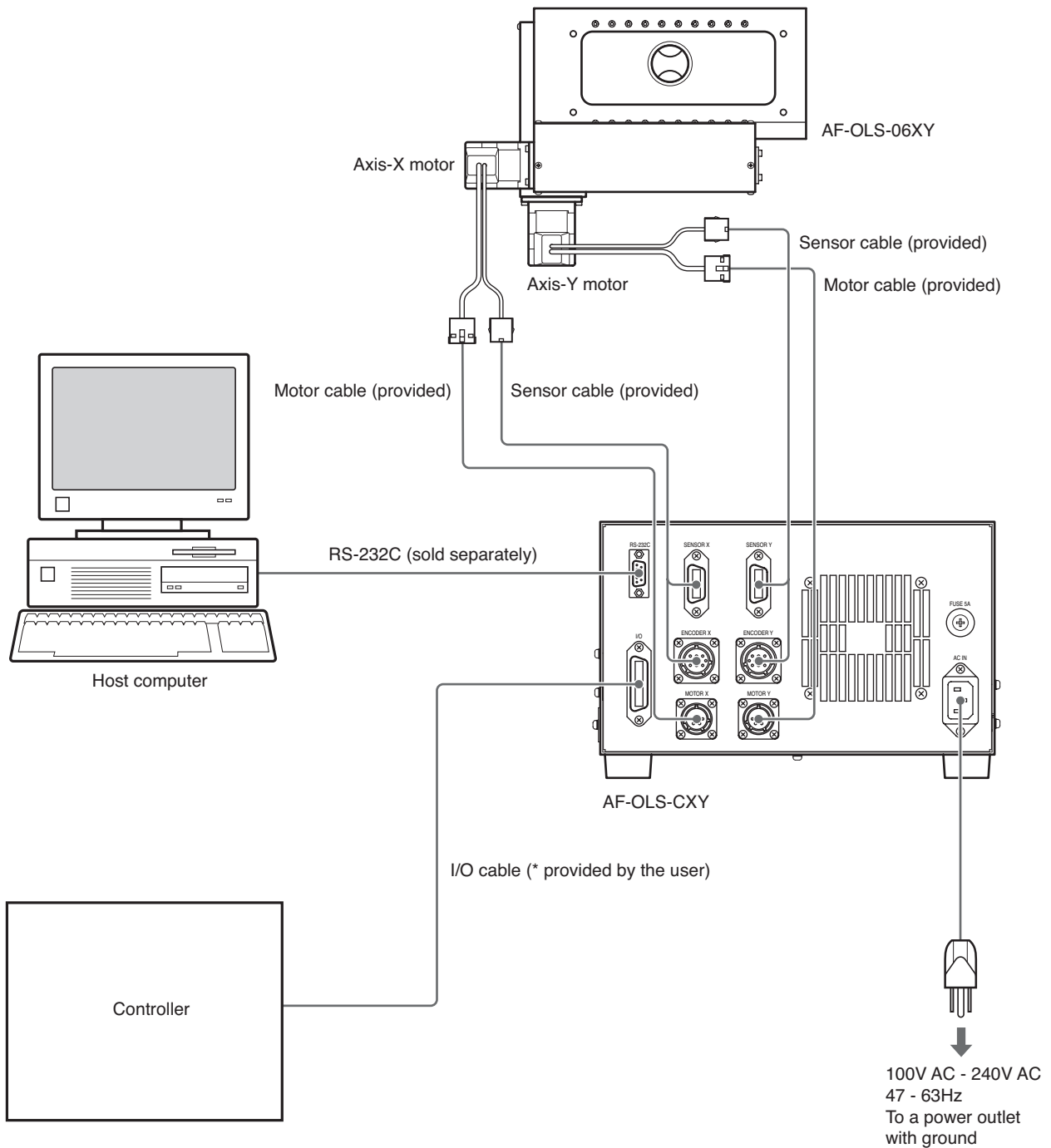
14 The installation task is completed if there is no problem with the image position.

3 Connection

Refer to the drawing below and connect the object lens slider to other devices.

CAUTION

- Plug the power cord into the power outlet after all other connections are completed.
- Be sure to make connections to other devices with the main power turned OFF. Connecting and disconnecting cables with the power ON may lead to problems or injuries.



4 Communication Setting (RS-232C) & Transition Speed Setting

This section describes the methods for setting the RS-232C communication and transition speed upon changing the lens.

IMPORTANT

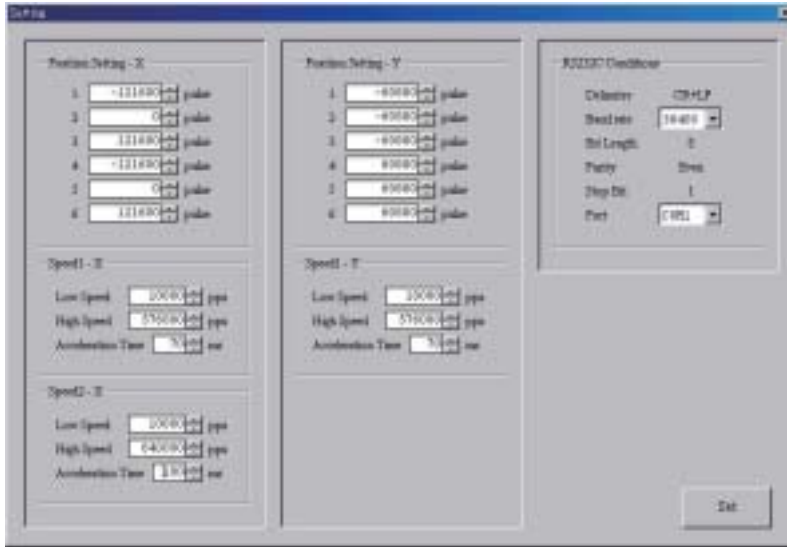
Make sure that the object lens slider, controller, and computer are connected properly and the power of all devices is turned ON. Furthermore, the Remote Control Program, “Object Lens Slider”, must be installed. Refer to the Instruction Manual for the Remote Control Program for details.

- 1 Start the Remote Control Program “Object Lens Slider”.
- 2 Click [Setting] when the main screen appears.



[Main Screen]

3 When the setup screen appears, first set the items for RS-232C communication.



[Setup Screen]

Following is a table for RS-232C communication setting in the Remote Control Program.

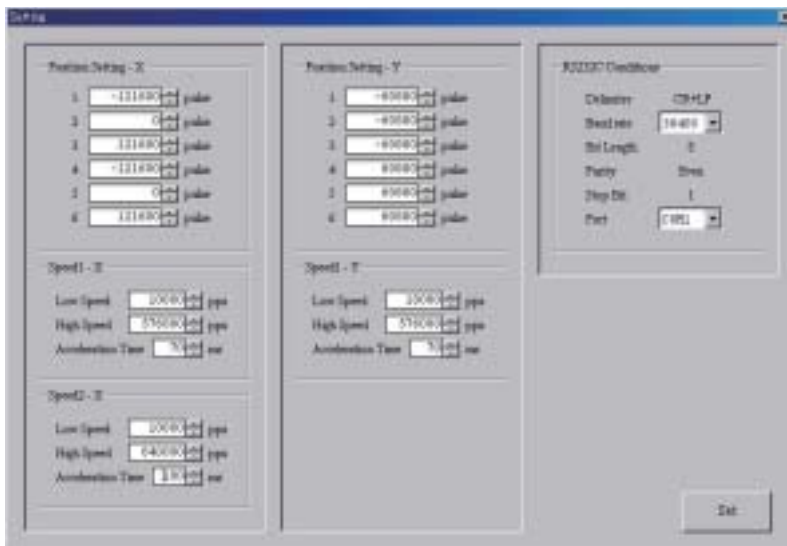
Item	Value	Remark
Delimiter	CF+LF	
Baud rate	4800/9600/19200/38400	Choose one value
Bit length	8	
Parity	Even	
Stop Bit	1	
Port	COM1 – COM16	Choose one value

IMPORTANT

Make sure that the system parameter of the controller and the above settings are matched. Refer to “Section 2. Controller” for details on setting the system parameter of the controller.

4 Click [Set] when the communication setting is completed.

The parameter set to the controller will be read when communication with the computer is properly connected which will enable you to input values in “Speed” and change the setting for “Position”.



[Setup Screen]

5 Set the speed as indicated below.

Speed 2-X

Set the transition speed for Axis X to move to a non-adjacent port in a unit of pps (pulse/second).

Speed 1-X

Set the transition speed for Axis X to move to an adjacent port in a unit of pps (pulse/second).

Speed 1-Y

Set the transition speed for Axis Y to move to an adjacent port in a unit of pps (pulse/second).

The values in the following table are default values.

	Speed 1-X	Speed 2-X	Speed 1-Y
Low Speed(*1)	10,000pps	10,000pps	10,000pps
High Speed(*2)	576,000pps	640,000pps	576,000pps
Acceleration Time(*3)	70ms	100ms	70ms

*1: Set the startup speed for the motor. (Parameter No. 01, 04)

*2: Set the speed for making transition. (Parameter No. 02, 05)

*3: Set the acceleration/deceleration speed (startup time to the set speed). (Parameter No. 03, 06)

Refer to Section 2 "Controller" for details on parameters.

For this product (AF-OLS-60XY), a transition of one step is $0.3125\mu\text{m}$.

Example of a set value and transition speed.

Setting	Transition Speed
576,000pps	180mm/sec
640,000pps	200mm/sec

5 Adjusting the Center of a Port

The center of a part is adjusted by adjusting the center (center position) of the object lens set to each port. Check the following items before making adjustments.

- Make sure that all ports are set with an object lens.
- Make sure that the Remote Control Program “Object Lens Slider” is running and that communication can be controlled from the computer.
- Make sure that patterns appropriate for adjusting positions are available and that the image can be displayed on the monitor.
- Make sure that a cross mark indicating the reference point is displayed on the monitor.

1 Click [ORG] in the main screen and return to home position.

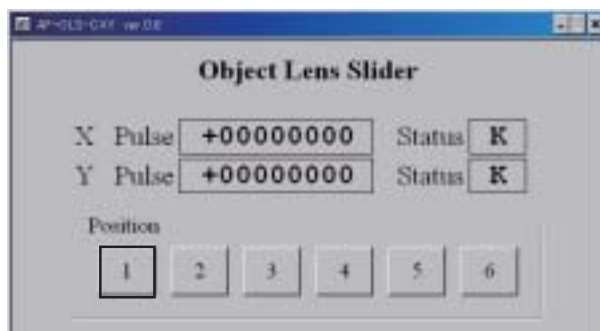
When returning to home position, the object lens slider will move to where the center of the optical axis of the scope cylinder and lens holder overlaps with the default setting.



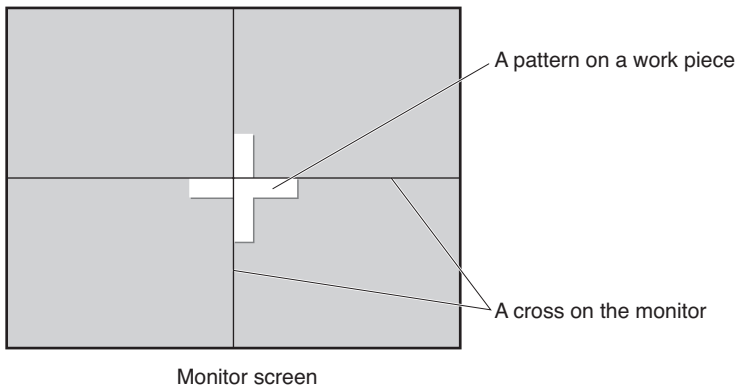
[Main Screen]

2 For [Position], click the port number specified as the reference point. (“1” is selected in the figure.)

The object lens slider will move to Port 1 and the image will appear on the monitor.



- 3 Find the reference point while checking the image and move the stage (on the side of the object subject to viewing) so that the position goes to the center of the monitor.**



- 4 Make sure that the image point and the cross on the monitor overlap and click the next port number subject to centering. ("2" is selected in the figure.)**

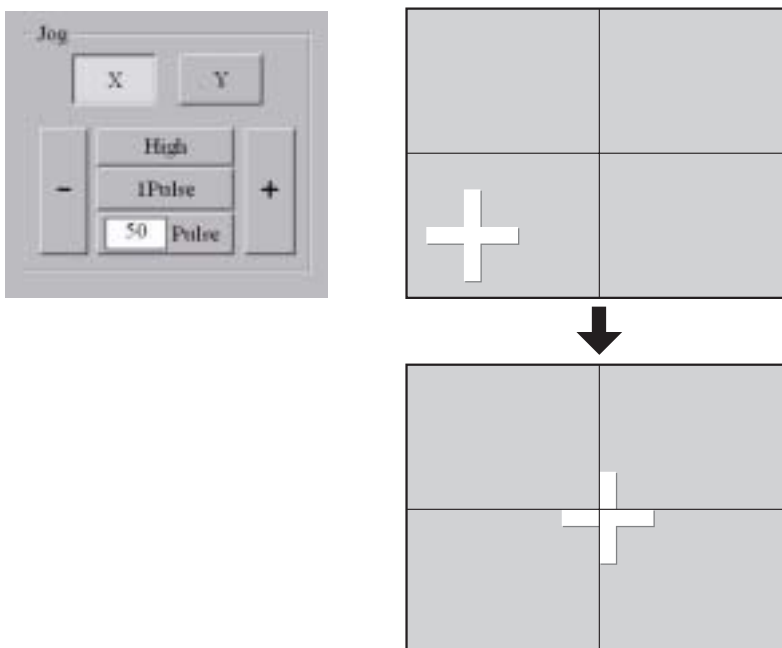
When transition to Port 2 is made properly, the color of the position pattern changes to green, the coordinates are displayed in [X Pulse] and [Y Pulse], and the image of the object lens appears on the monitor.



- 5 Find the same point in the same procedure as in Step 3. If the point and the cross on the monitor do not overlap, find [JOG] in the main screen and adjust the position.**

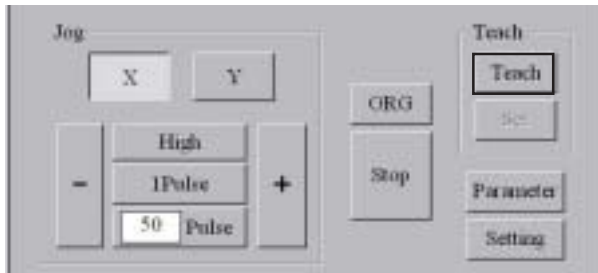
Reference:

The magnification rate is different, but you will be viewing the same position as in Step 3. If the position is skewed, move the object lens slider and adjust the position of the port.



6 Click [Teach] when the position is adjusted.

[Teach] will be in a selected status when it is clicked.



7 Click a port number to record the coordinates. (“2” is selected in the figure.) The button of “2” will change to red when it is clicked. Next, click [Set].

The current coordinate will be recorded in Port 2.



⚠ CAUTION

The coordinates will be recorded in the controller tentatively when you click [Set]. However, the recorded coordinates will be erased if the power to the controller is turned OFF in this state.

Please note that the coordinates will not be recorded unless you click [Set] in Step 9 and 10 on the following page.

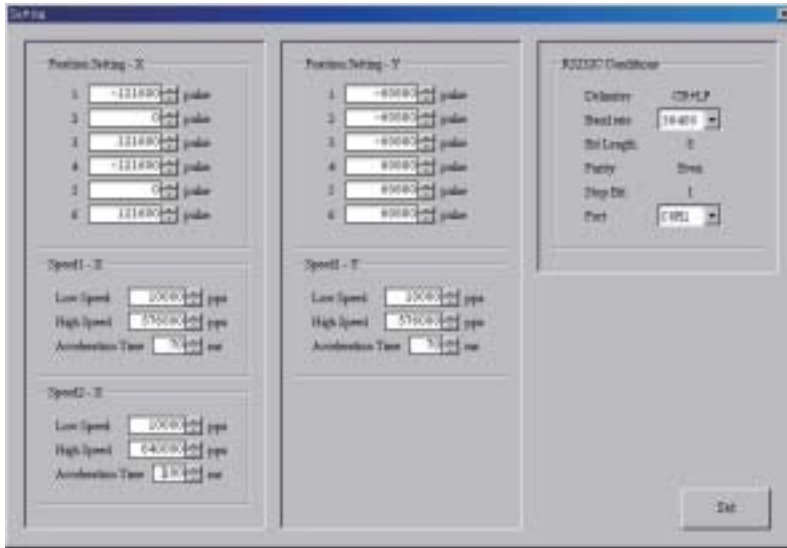
8 Repeat Step 4 to Step 7 for other ports to adjust the center of each port.

Reference:

Center adjustment is not required for the reference port (Port 1 in this example) or ports that are not set with a lens.

9 Click [Setting] when center adjustment is completed for all ports.

The setup screen displaying the coordinates for each port will appear.

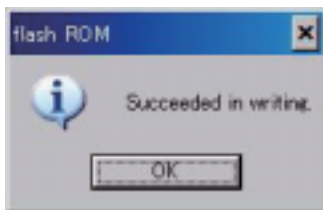


10 Click [Set] in the setup screen to record the set items.

⚠ CAUTION

The coordinates will be recorded in flash memory of the controller when you click [Set]. Note that the coordinates will not be recorded unless you click [Set].

The following dialogue will appear when the coordinates are recorded in flash memory.



AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

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AF-OLS-06XY

AF-OLS-06XY

Section 2

Controller

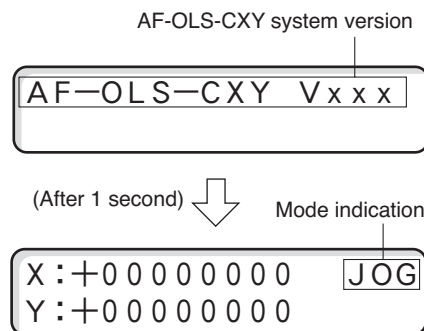
6 Indication During Power ON

When the power of the controller is turned ON, the system version will first appear (for approx. 1 sec.) and then the display will change to JOG mode.

Reference:

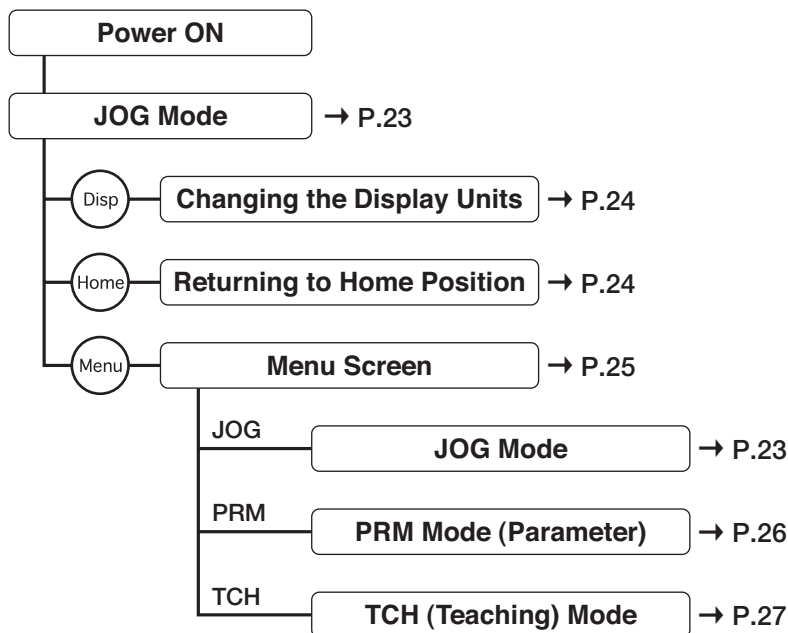
The version currently being used will appear as the system version.

"JOG" will appear on the upper-right section when JOG mode is entered. This mode enables you to change the lens using the port selection key, move in jog feed, and shift to various modes.



Mode Transition of the Controller

The following shows the mode transition of the controller. Refer to the page indicated on the right for details on the mode or menu.



7 JOG Mode

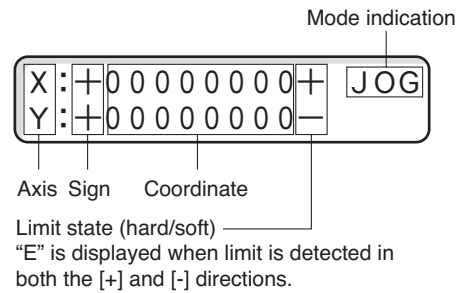
JOG Mode Screen

JOG mode is entered when the power is turned ON or when "JOG" is selected from the menu. "JOG" is displayed on the upper-right section of the screen during JOG mode.

When the current mode is one other than JOG, you can change to JOG mode by pressing [Stop].

Reference:

The above key operations may differ slightly depending on the current mode or screen.

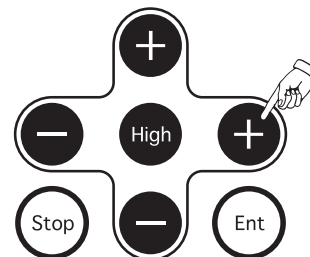


JOG Mode Operations

[+] rotates the motor in the clockwise (CW) direction (direction in which the coordinate value increase) and [-] rotates the motor in the counter-clockwise (CCW) direction (direction in which the coordinate value decrease).

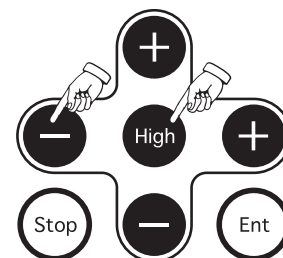
1. Low-speed jog feed

Axis X: Press [+] or [-] located on the left and right.
 Axis Y: Press [+] or [-] located on the top and bottom.
 Transition will be made at low speed while the button is pressed.
 The current value will appear on the screen.



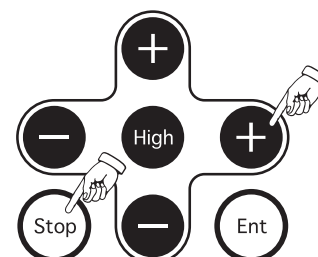
2. High-speed jog feed

When [High] is pressed during low speed transition (moving by pressing [+] or [-]), the transition will change to high speed while the [High] button remains pressed.
 If the [High] button is released and the [+] or [-] button remains pressed, the transition will return to low speed. The current value will appear on the screen.



3. Pulse feed

When [+] or [-] is pressed while pressing [Stop], transition will be made by one pulse each time [+] or [-] is pressed.
 The current value indication will increase or decrease by one pulse.



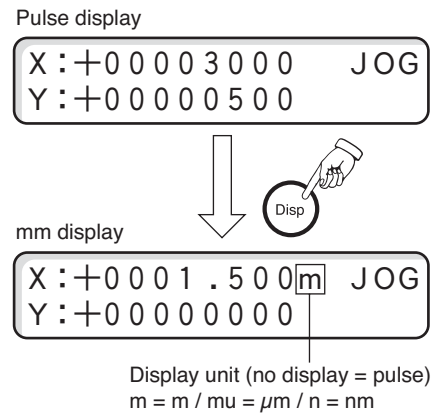
8 Changing the Display Units

The units of coordinate display can be changed from pulse to a different unit (mm/ μ m/nm). The display units are changed by pressing [Disp]. When pressed, the current coordinates will be converted and displayed in the selected units.

The units that can be changed from pulse are specified in a parameter (No. 22).

Reference:

"Pulse display only (no changes to different units)" is specified by default.



9 Returning to Home Position

- 1 Make sure that the mode is JOG mode.
- 2 Press [Home].
- 3 The Home Mode screen will appear.
- 4 Press [Ent] to start the home-return operation.
- 5 The transition will stop when the home position is detected. "0" will appear as the coordinate value and the mode will return to JOG mode.

* The home-return operation cannot be performed during a teaching operation.

When home-return offset is set

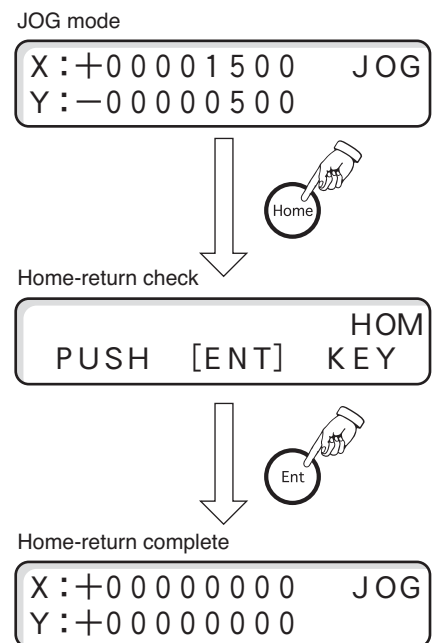
If home-return offset is set to a parameter (No. 16), transition will be made to the specified offset value after detecting the home position and the coordinate value will become "0".

When backlash correction is set

If backlash offset is set to a parameter (Mo. 19), a correction will be made when the transition is in the opposite direction to the direction for returning to home position. The backlash correction is applied in auto operation (moving to a port).

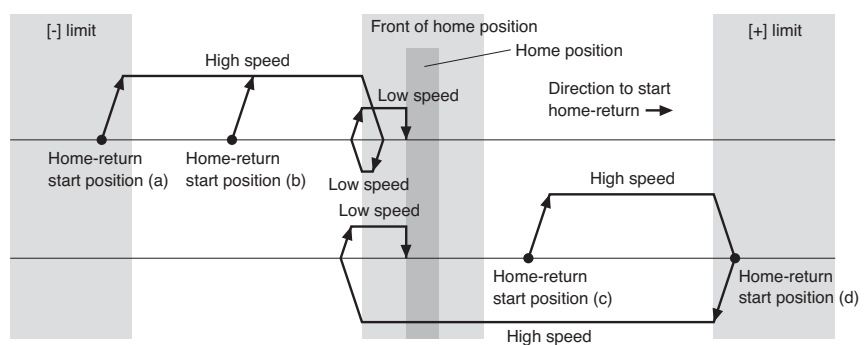
When you want to stop a stage while returning to home position

Press [Stop] to stop the home-return operation.



Sequence of returning to home position

- a: Starts from [-] limit.
- b: Starts from between [-] limit and home position.
- c: Starts from between the front of home position and [+] limit.
- d: Starts from [+] limit.



* The direction to start returning to home position is the CW [+] direction.

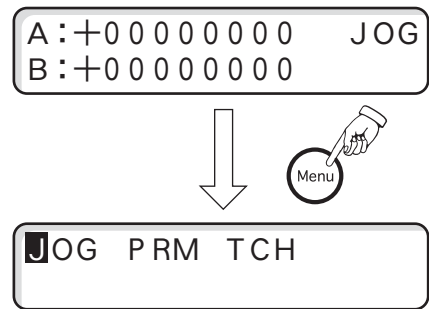
* The speed for returning to home position is the speed specified in Parameter No. 13 to 15.

10 Menu Screen

The Menu screen appears by pressing [Menu] in JOG mode. If you are in TCH mode or PRM mode, the Menu screen can be displayed by selecting [Stop] → [Menu].

Reference:

The above key operations may differ slightly depending on the current mode or screen.

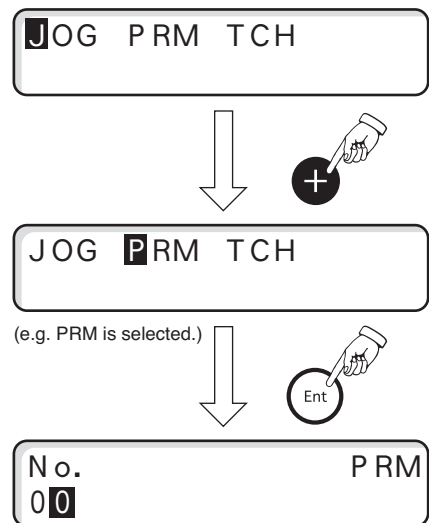


Menu Selection

- 1 JOG mode, PRM mode, and TCH mode are displayed on the Menu screen.
- 2 The cursor moves to the left and right when [+] or [-] is pressed.
- 3 Move the cursor to the target mode and press [Ent].

Reference:

Details of each mode are described below.



11 PRM Mode (Parameter Setting Mode)

Specify the parameters that are used with this product.

This section describes only the method for specifying parameters from the controller. For more details on parameters, see "Parameters" (P.29).

PRM (Parameters) Operations

- 1 Make sure that the device is in JOG mode.
- 2 Press [Menu] to display the Menu screen.
- 3 Move the cursor to "PRM" using [+] located on the side and press [Ent].
- 4 The PRM (Parameter) Setting screen will appear.
When an arbitrary number is specified to "Parameter No.", the currently specified value will appear on the right side.
A parameter is selected with the following keys.
Selecting a digit: Use [+] or [-] on the left and right.
Specifying a value: Use [+] or [-] on the top and bottom.
- 5 Select [Parameter] and press [Ent].
- 6 The cursor will move to a setup item, so specify a value.
Selecting an item: Use [+] or [-] on the left and right.
Specifying a value: Use [+] or [-] on the top and bottom.
Use the following keys to specify parameters for each axis.
Moving an entry axis forward: [Ent]
Moving an entry axis backward: [High]
- 7 Press [Ent] when the setting is completed. The cursor will move to the following item.
If you are going to continue specifying other parameters, repeat the above steps (4 to 7).
8. Press [Menu] when all parameters are specified.
A confirmation screen for "backup writing" to flash memory will appear. If you want to write into flash memory, press [Ent], and if not, press [Stop].
The specified value is valid even without writing into flash memory. However, it will return to the previous setting when the power is turned OFF/ON.
- 9 The mode will return to JOG mode.

JOG mode

```
X : +00001500 JOG
Y : -00000500 SP1
```

Menu screen

```
JOG PRM TCH
```

Selecting PRM mode

```
JOG PRM TCH
```

PRM Mode screen

```
No. PRM
00
```

Selecting a parameter number

```
No. X : 1 Y : 1 PRM
03
```

Setting a parameter

```
No. X : 1 Y : 1 PRM
03
```

Specify other axes in the same method if necessary.

Confirmation screen for writing

```
BACKUP MEMORY
WRITE OK ?
```

Write to memory with [Ent]
Set temporarily with [Stop]

12 TCH Mode (Teaching Mode)

In the TCH (Teaching) mode, move the slider in JOG mode and record each port number (1 – 6) and allocate them to an arbitrary coordinate. The slider can be moved to a recorded coordinate value by specifying a port number.

CAUTION

The default values for parameters No. 41 to No. 46 will be rewritten when you perform a teaching operation.

TCH: Recording Teach Data

The following is the method for recording teach data.

1. Select a port.

Select [TCH] in the Menu screen and press [Ent].

When the Port Selection screen appears, select port numbers 1 to 6.



Setting a value: Use the [+] or [-] located on the top and bottom.

Determining an entry: Press [Ent] to enter JOG mode in Teaching mode.

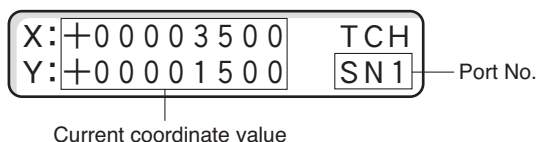
Cancelling an entry: Press [Stop] to cancel [TCH] and return to JOG mode.

2. Moving to a target coordinate

Set JOG mode in Teaching mode and move the slider to a target coordinate in JOG feed or one-pulse feed.

CAUTION

While recording teach data, you can only perform JOG feed or one-pulse feed.



3. Recording teach data

Press [Ent] at the coordinate position you want to record. The coordinate value will be recorded in parameters No. 41 to No. 46 when [Ent] is pressed. The port number can be changed with [Home]. The selection will move from SN1 to SN6 each time [Home] is pressed.

Repeat Steps 2 and 3 for other ports and teach data in the same method.

4. Ending a teach operation

Press [Menu] to end a teach operation. A confirmation screen for "backup writing" to flash ROM will appear.

BACKUP MEMORY
WRITE OK?

To record data: Press [Ent] and write into flash ROM.

To stop recording: Press [Stop] to cancel writing into flash ROM. In this case, the coordinate value will be cleared when the power goes OFF and the previous coordinate value will be reset.

Reference:

The coordinate value will be recorded temporarily until the power goes OFF. If you move a port using the port selection key, it will move to the coordinate that was just entered.

Moving to Teach Position

Move to a recorded teach position by pressing the [1] to [6] port selection key on the controller or by performing [Z: command] with communication control.

The speed for moving to an adjacent port is [Auto Speed 1] (set to parameter No. 1 – 3) and the speed for moving to a non-adjacent port is [Auto Speed 2] (set to parameter No. 4 – 6).

Furthermore, the speed right after returning to home position, or during manual operation, or for moving Axis Y is [Auto Speed 1].

CAUTION

Before moving to a teach position, make sure that the following status is entered.

- The home-return operation has been completed properly. (The teaching operation cannot be performed properly unless the home-return operation has been completed properly.)
- No axis is moving.

13 Parameters

The following is a list of parameters used with this product.

No.	Items	Setting	Default Value	Remarks
01	Auto exciting speed 1	10~1,000,000pps	10,000	Motor startup speed setting (*1)
02	Auto speed 1	10~1,000,000pps	576,000	Speed setting upon moving (*1)
03	Auto acceleration/deceleration time 1	1~1,000ms	70	Acceleration/deceleration time setting (*1)
04	Auto exciting speed 2	10~1,000,000pps	10,000	Motor startup speed setting (*2)
05	Auto speed 2	10~1,000,000pps	640,000	Speed setting upon moving (*2)
06	Auto acceleration/deceleration time 2	1~1,000ms	100	Acceleration/deceleration time setting (*2)
07	Low speed upon JOG feed	10~1,000,000pps	10,000	
08	High speed upon JOG feed	10~1,000,000pps	50,000	
09	Acceleration time upon JOG feed	1~1,000ms	100	
11	Home position front sensor logic	0: Normal open 1: Normal close	1	
13	Home-return low speed	10~1,000,000pps	1,000	Speed setting for home-return
14	Home-return high speed	10~1,000,000pps	10,000	
15	Home-return acceleration time	1~1,000ms	100	
16	Home-return offset	+16,777,215~-16,777,215 pulse	(*3)	Set separately upon delivery in combination with slider.
17	+ (CW) direction soft limit coordinate	+99,999,999~-99,999,999 pulse	0	Soft limit is invalid when set to "0".
18	- (CCW) direction soft limit coordinate	+99,999,999~-99,999,999 pulse	0	Soft limit is invalid when set to "0".
19	Backlash correction	0~999 pulse	0	Backlash correction is invalid when set to "0".
20	Speed upon backlash correction	10~100,000pps	10,000	
21	Unit change display - Resolution	10~1,000,000pps(1/10nm) Displayed value= Pulse x Resolution /10	3,125	Rewriting by communication is disabled.
22	Unit display selection	0: Pulse display (no change in unit) 1: mm display (up to 1nm) 2: μm display (up to 1nm) 3: nm display	0	Rewriting by communication is disabled.
23	Limit sensor deceleration time	1~1,000ms	50	Hard limit deceleration time setting (*4)
41	Port 1 record position	+99,999,999~-99,999,999 pulse	Axis X : -121,600 Axis Y : -60,800	Default value changes when teaching is performed.
42	Port 2 record position	+99,999,999~-99,999,999 pulse	Axis X : 0 Axis Y : -60,800	
43	Port 3 record position	+99,999,999~-99,999,999 pulse	Axis X : 121,600 Axis Y : -60,800	
44	Port 4 record position	+99,999,999~-99,999,999 pulse	Axis X : -121,600 Axis Y : 60,800	
45	Port 5 record position	+99,999,999~-99,999,999 pulse	Axis X : 0 Axis Y : 60,800	
46	Port 6 record position	+99,999,999~-99,999,999 pulse	Axis X : 121,600 Axis Y : 60,800	
51	Delimiter	0 : CR+LF 1 : CR 2 : LF 3 : CR+LF	0	When setting is changed, the new setting becomes valid when turning the power OFF/ON.
53	RS-232C communication setting	Portrait 0 : 38400 / 1 : 4800 / 2 : 9600 / 3 : 19200	0	When setting is changed, the new setting becomes valid when turning the power OFF/ON.
		Bit length 0 : L8 / 1 : L7	0	
		Parity bit 0:None / 1: Even number / 2: Odd number	1	* Rewriting by communication is disabled.
		Stop bit 0 : 1 / 1 : 2	0	
55	Stop command (L), [Stop] key stop method	0: Decelerate & stop 1: Stop immediately	0	
58	Buzzer upon key operation	0: No buzzer 1: Buzzer sounds	1	

*1 Setting for moving to an adjacent port (Axis X / Axis Y).

*2 Setting for moving to a non-adjacent port (Axis X).

*3 This is set separately in combination with the slider (and cannot be changed).

*4 When "0" is set, the acceleration speed set to parameters 03, 06, 09, and 15 is applied. Be sure to set a value below 50. An overrun error may occur if limit stop is made at 200mm/sec.

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

Section 3

Communication Control

14 Communication Control

Communication control can be performed with this product using the RS-232C communication interface.

⚠ CAUTION

Please acknowledge that we cannot respond to questions related to computer operations.

Communication Setting for Performing Communication Control

The following communication control operations can be performed from the host computer by making systematic command formats or simple programs.

- Various controls of the object lens slider movement
- Parameter settings
- Check of the sensor's operating condition and check of the status

The communication settings between the controller and host computer are also set by parameters. The parameter setting can be performed by using the controller's operation key or by controlling communication from the host computer. If you are going to set the parameter using communication control, refer to Command [P:] (P35).

The following table indicates the default values for communication settings for this product.

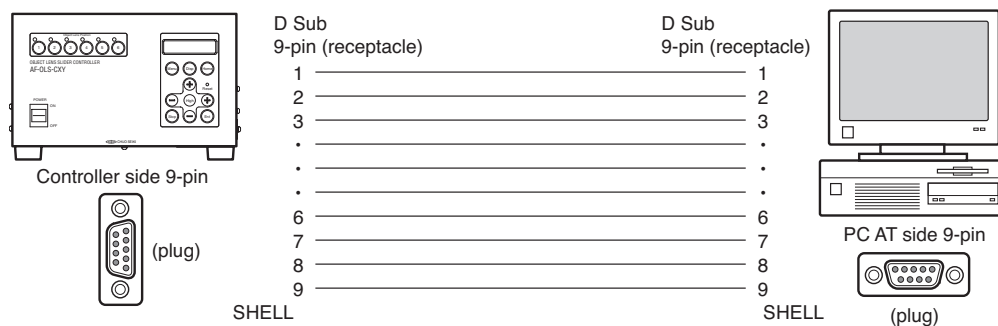
Parameter No.	Item	Setting	Default Value
51	Delimiter	0 : CR+LF 1 : CR 2 : LF 3 : CR+LF	0
53	RS-232C communication setting	Portrait	0 : 38400 1 : 4800 2 : 9600 3 : 19200
		Bit length	0 : L8 1 : L7
		Parity bit	0:PN (None) 1:PE (Even number) 2:PO (Odd number)
		Stop bit	0 : S1(1) 1 : S2(2)
			0

⚠ CAUTION

- The computer must be restarted in order to validate the changes to parameter No. 51 and No. 53.
- Communication cannot be performed properly if the communication settings are not matched with the host computer.

RS-232C Connector Specifications

The following is the connection for performing communication control with RS-232C.



The pin arrangement is the same as for standard PC AT compatible devices. For the connection cable, please use ACB-RS-2 (sold separately) or a commercially available 9-pin [female-male] all-connection straight type.

15 List of Commands

The following is a list of commands used with this product.

Command		Format	Remarks
Command Letter	Function		
F	Write to flash memory	F :	Save data in backup memory
H	Home-return	H :	Perform home-return
I	Sensor entry check	I :	Return sensor condition for stage of Axis X/Y
J	JOG feed	J : <axis><speed><direction><axis> < speed><direction>	Axis X/Y (specify axis, speed, direction)
L	Stop	L :	Stop a moving axis
M	Specify amount of pulse and movement	M : <axis><pulse><axis><pulse>	Number of pulse and feed settings for Axis X/Y
P	Write parameter	P : <parameter No.><set value>	Parameter setting
	Read parameter	P : <parameter No.>R	Return currently set value to host
Q	Status request	Q : <request content>	Request coordinate value or status
T	Record current position	T : <port No.>	Specify port number
		T : <port No.>R	Return coordinate value of specified port
Z	Specify port subject to moving	Z : < port No.>	Move to specified port
?	Version check	? :	Return system version symbol to host

* “P” or “,” (comma) is used as a command delimiter.

Command Format

[Transmission]

The structure of a command to be sent is [Command] + [Delimiter].

Command (* Length of commands differ)	Delimiter
---------------------------------------	-----------

A delimiter is either [CR+LF], [CR], or [LF] which is set to the parameter.

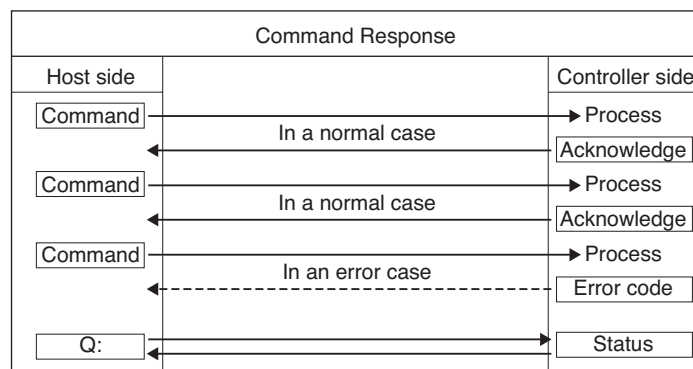
[Reply]

Processes a sent command and returns the following.

Reply data (* Some commands do not have this data)	Delimiter
--	-----------

Command Response

With communication control, an acknowledgement is always returned to a sent command. If a command is an error, it will be acknowledged and an error code will be returned. (Refer to “17. Error Code” (P40).)



* In this manual, a reply to a command is referred to as “acknowledge”. It does not mean ASCII code [06h].

Command processing time

The maximum command-processing time with this product is approximately 1ms (communication time between the host computer and controller is excluded).

16 Details of Commands

F: Command

Writes parameter to flash ROM.

- This can be executed only in JOG mode when axes are not moving.
- No commands can be received until the writing process is finished.

[Format] F:[Delimiter]

[Response] OK[Delimiter]

[Example] Transmission

F	:	Delimiter
---	---	-----------

 Command to write
Response

O	K	Delimiter
---	---	-----------



CAUTION

Be sure to execute this command when a parameter setting is changed using the P:Command. If the power is turned OFF without executing this command, the settings will not be saved.

H:Command

Returns to home position.

[Format] H:[Delimiter]

[Response] [Delimiter] * Use the Q:Command to check if the home-return operation is completed.

[Example] Transmission

H	:	Delimiter
---	---	-----------

 Command to start home-return
Response

Delimiter

I:Command

Checks the sensor status.

[Format] I:[Delimiter]

[Response] Responds with “0” or “1” in order of (Axis X+LS)(Axis X-LS)(Axis X in home position front sensor), (Axis Y+LS)(Axis Y-LS)(Axis Y in home position front sensor) [Delimiter]. “0” indicates that the sensor is not functioning and “1” indicates the sensor is inputting signals.

Example of response: 110,110

Axis X+LS=1 indicates that the sensor is inputting signals. Axis X-LS=1 indicates that the sensor is inputting signals. Axis X in front of home position=0 indicates that the sensor is not functioning. Axis Y+LS=1 indicates that the sensor is inputting signals. Axis Y-LS=1 indicates that the sensor is inputting signals. Axis Y in front of home position=0 indicates that the sensor is not functioning.

[Example] Transmission

I	:	Delimiter
---	---	-----------

 Check the sensor status
Response

1	1	0	,	1	1	0	Delimiter
---	---	---	---	---	---	---	-----------

J:Command

Performs JOG feed.

[Format] J:(Axis designation)(Speed designation)(Moving direction)<(Axis designation)(Speed designation)(Moving direction)>[Delimiter]

<> can be omitted.

(Axis designation) = X : Axis X designation
= Y : Axis Y designation

Both axes can be designated at the same time (in order of Axis X, Axis Y)

(Speed designation) = 0 : Low speed (Speed set to parameter No. 07 is applied.)
= 1 : High speed (Speed set to parameter No. 08 is applied.)
= 2 : 1 Pulse feed

(Moving direction) = + : Moves in plus direction
= - : Moves in minus direction

[Response] [Delimiter]

CAUTION

When low speed or high speed is set to speed designation, the axis will be in an activated status. Execute the L:Command (Stop) to stop the axis. To reverse the moving direction, execute the L:Command (Stop) to stop the axis first, and then reverse the direction.

[Example] Transmission 1

J	:	X	1	+	Delimiter
---	---	---	---	---	-----------

 Axis X moves in + direction in high speed

Transmission 2

J	:	X	1	+	Y	1	+	Delimiter
---	---	---	---	---	---	---	---	-----------

 Axis X & Axis Y moves in + direction in high speed

Response

Delimiter

L:Command

Stops a moving axis.

[Format] L:[Delimiter]

[Response] [Delimiter]

[Example] Transmission

L	:	Delimiter
---	---	-----------

 Command to stop an axis

Response

Delimiter

M:Command

Moves an axis by the specified pulse value. The axis moves at the speed set by parameter No. 08.

[Format] M:(Axis designation)(Moving pulse)<(Axis designation)(Moving pulse)>[Delimiter]

<> can be omitted (when only 1 axis is designated).

(Axis designation) = X : Axis X designation
= Y : Axis Y designation

Both axes can be designated at the same time (in order of Axis X, Axis Y)

(Moving pulse) = -16777215 to +16777215 (The plus mark can be omitted when the pulse is a plus value.)

[Response] [Delimiter]

[Example] Transmission 1

M	:	X	1	0	0	0	Y	1	5	0	0	Delimiter
---	---	---	---	---	---	---	---	---	---	---	---	-----------

 ... Command to move Axis X by 1000 pulse and Axis Y by 1500 pulse

Transmission 2

M	:	Y	-	5	0	0	Delimiter
---	---	---	---	---	---	---	-----------

 Command to move Axis Y by -1500 pulse

Response

Delimiter

P:Command

Reads from / Writes to a parameter.

[Format] For parameters No. 01 to 46

P:(No.)(Axis designation)(Data)<(Axis designation)(Data)>[Delimiter] For writing

P:(No.)R[Delimiter] For reading

<> can be omitted (when only 1 axis is designated).

(No.) = 01 to 46 (Specify in two digits.)

(Axis designation) = X : Axis X designation

= Y : Axis Y designation

Both axes can be designated at the same time (in order of Axis X, Axis Y)

For parameters No. 51 to 58

P:(No.), (Data) [Delimiter] For writing

P:(No.)R[Delimiter] For reading

(No.) = 51 to 58 (Specify in two digits.)

[Response] For parameters No. 01 to 46

[Delimiter] For writing

(Axis X), (Axis Y)[Delimiter] For reading

For parameters No. 51 to 58

[Delimiter] For writing

(Data)[Delimiter] For reading

For parameters No. 01, 02, 04, 05, 07, 08, 13, 14, 19 (Speed data)

(Data) = 0000010 to 1000000 (7-digit number)

For parameters No. 03, 06, 09, 15, 23 (Acceleration / deceleration time data)

(Data) = 0001 to 1000 (4-digit number)

For parameters No. 11, 12, 55, 58 (Logic, direction, stop method, buzzer sound data)

(Data) = 0 to 1 (1-digit number)

For parameter No. 16 (Home-return offset data)

(Data) = -16777215 to +16777215 (symbol + 8-digit number)

For parameters No. 17, 18, 41, 42, 43, 44, 45, 46 (Coordinate data)

(Data) = -99999999 to +99999999 (symbol + 8-digit number)

For parameter No. 19 (Backlash correction data)

(Data) = 000 to 999 (3-digit number)

For parameter No. 21 (Resolution data)

(Data) = 00000001 to 10000000 (8-digit number)

For parameter No. 22 (Unit display data)

(Data) = 0 to 3 (1-digit number)

For parameter No. 51 ([Delimiter] data)

(Data) = 0 to 2 (1-digit number)

For parameter No. 53 (Communication setting data)

(Data) = 0 to 3 (1-digit number), 0 to 1 (1-digit number), 0 to 2 (1-digit number), 0 to 1 (1-digit number)

Only communication data is returned with a comma dividing four data.

However, parameters 21, 22, and 53 cannot be rewritten by communication. For these parameters, use the front panel on the controller.

【Example 1】 Transmission 1 P : 0 1 X 1 0 0 0 0 Y 1 0 0 0 0 Delimiter ... Sets 10000 for Axis X & Y to parameter No. 01
 Transmission 2 P : 5 1 , 2 Delimiter Sets 2 to parameter No. 51
 Response Delimiter

【Example 2】 Transmission P : 1 6 R Delimiter Requests data in parameter No. 16
 Response - 0 0 0 0 3 4 7 8 , + 0 0 0 2 0 7 4 6 Delimiter ... Obtains data in parameter No. 16

⚠ CAUTION

Be sure to execute the F:Command when a parameter setting is changed using the P:Command. If the power is turned OFF without executing this command, the settings will not be saved.
 The power must be turned OFF/ON to validate the changes made to the settings for parameter No. 51 and No. 53.

Q:Command

Checks the current position and status.

[Format] Q:(Mode)[Delimiter]
 (Mode) = 0 : Current position + Status
 (Mode) = 1 : Current position
 (Mode) = 2 : Status
 (Mode) = 3 : Start port + End port + Operating time + Current position + Status

[Response] **Mode = 0**
 (Axis X current position)(Axis X status), (Axis Y current position)(Axis Y status)[Delimiter]
Mode = 1
 (Axis X current position), (Axis Y current position) [Delimiter]
Mode = 2
 (Axis X status), (Axis Y status)[Delimiter]
Mode = 3
 (Start port), (End port), (Operating time), (Axis X current position)(Axis X status), (Axis Y current position) (Axis Y status) [Delimiter]

(Start port) = 0 to 6 *Other than 1 to 6 for 0
 (End port) = 0 to 6 *Other than 1 to 6 for 0
 (Operating time) = 9999 (Time required for moving between ports, 4-digit number, Unit: ms)
 (Current position) = ±99999999 (Symbol + 8-digit number)

Status	Definition
D	Operating
K	Stopped properly
L	Stopped at limit or soft limit
H	Stopped due to home-return error
C	Overflow (Stopped after reaching max. pulse of 16777215

- 【Example 1】** Transmission `Q : 0 Delimiter` Requests current position and status
 Response `+00001234K,+00004321D Delimiter` Response
- 【Example 2】** Transmission `Q : 1 Delimiter` Request for current position
 Response `+00001234,+00054321D Delimiter` Response
- 【Example 3】** Transmission `Q : 2 Delimiter` Request for status
 Response `K, D Delimiter` Response
- 【Example 4】** Transmission `Q : 3 Delimiter` Requests start port, end port, operating time, current position and status
 Response `1,6,0432,+00012345K,-00054321D Delimiter` .. Response

⚠ CAUTION

Mode 3 is a function from system version V200. Versions prior to V200 are not equipped with this function.

T:Command

Sets the port position and reads the value.

- 【Format】** T:(Port No.)[Delimiter] Registers a port coordinate
 T:(Port No.)R[Delimiter] Reads port position coordinate
 (Port No. = 1 to 6)

- 【Response】** [Delimiter] Designation of port position
 (Axis X port position coordinate data), (Axis Y port position coordinate data)[Delimiter] Read port position
 (Port position coordinate data) =±99999999 (Symbol + 8-digit number)

When you designate a coordinate registration port with the T:Command, the current coordinate will be recorded to the parameter (41 to 46) that corresponds with the designated port number (1 to 6). However, the value will return to the previous value when the power is turned OFF/ON if it is not written with the F:Command.

- 【Example】** Transmission `T : 2 Delimiter` Registers Port No. 2 as current position
 Response `Delimiter`
- Transmission `T : 4 R Delimiter` Reads position coordinate data of Port No. 4
 Response `-00121600,+00060800 Delimiter` ... Obtains position coordinate data

Z:Command

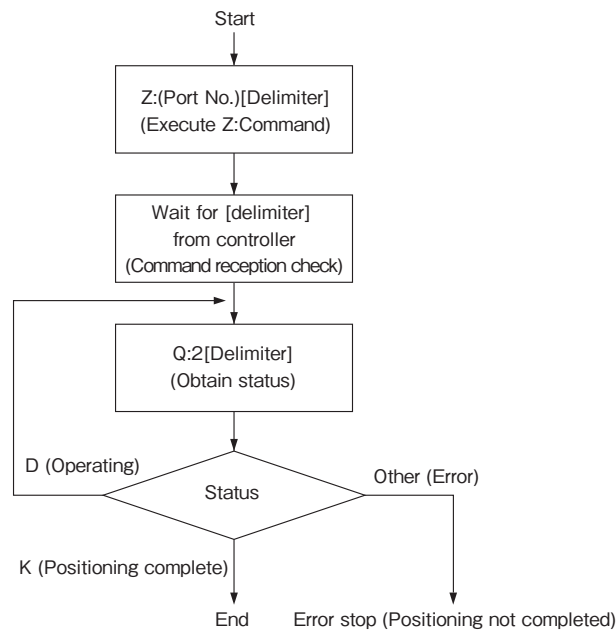
Moves to the designated port position.

[Format] Z:(Port No.)[Delimiter]
 (Port No.) = 1 to 6

[Response] [Delimiter]

* Use the Q:Command to check if the transition has been completed.

Procedure for executing the Z:Command



[Example] Transmission

Z	:	4	Delimiter
---	---	---	-----------

 Starts to move to Port No. 4
 Response

Delimiter

?:Command

Obtains the version and performs echo.

[Format] ?:[Delimiter] Obtains a version
 ?:(Character string)[Delimiter] Performs echo
 (Character string) consists of max. 64 characters.

[Response] (Version)[Delimiter] Obtains the version
 (Character string)[Delimiter] Performs echo

[Example] Transmission

?	:	Delimiter
---	---	-----------

 Obtains the version
 Response

1	0	0	Delimiter
---	---	---	-----------

 Responds with the version

Transmission

?	:	A	B	C	D	E	F	G	H	Delimiter
---	---	---	---	---	---	---	---	---	---	-----------

 ... Requests echo
 Response

A	B	C	D	E	F	G	H	Delimiter
---	---	---	---	---	---	---	---	-----------

 Echo

* Echo enables you to check if the connection with the host computer is accurate or not.

17 Error Codes

An error is returned when a command cannot be executed due to a certain problem after receiving a command from the host computer.

The response data of an error is made up of an ASCII character “!” (21h), error code indicated by one number, and a delimiter. The definition is indicated in the following table.

[Example] ! 6 Delimiter Limit detected

Error Code	Function	Cause
0	During operation	A command other than Q: or L: was executed while an axis was moving. Or not on standby in the JOG Operation screen.
1	Command grammar error	An error in the command format.
2	Set range error	An error in the set range.
3	Incorrect axis setting	Command T: or Z: was executed before returning to home position. Or an error in axis designation.
4	Too many characters	The number of characters up to receiving [Delimiter] exceeded the regulated amount.
6	Limit detection	The limit was already entered at the starting point. (Same limit as the moving direction)
8	Communication error	An error in the communication line or a driver circuit error.
9	Error other than those above	An error other than those indicated above.

AF-OLS-06XY

AF-OLS-06XY

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AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

AF-OLS-06XY

Section 4

Appennndix - Specifications - I/O Port

18 Main Specifications

Main Object Lens Slider Unit: AF-OLS-06XY

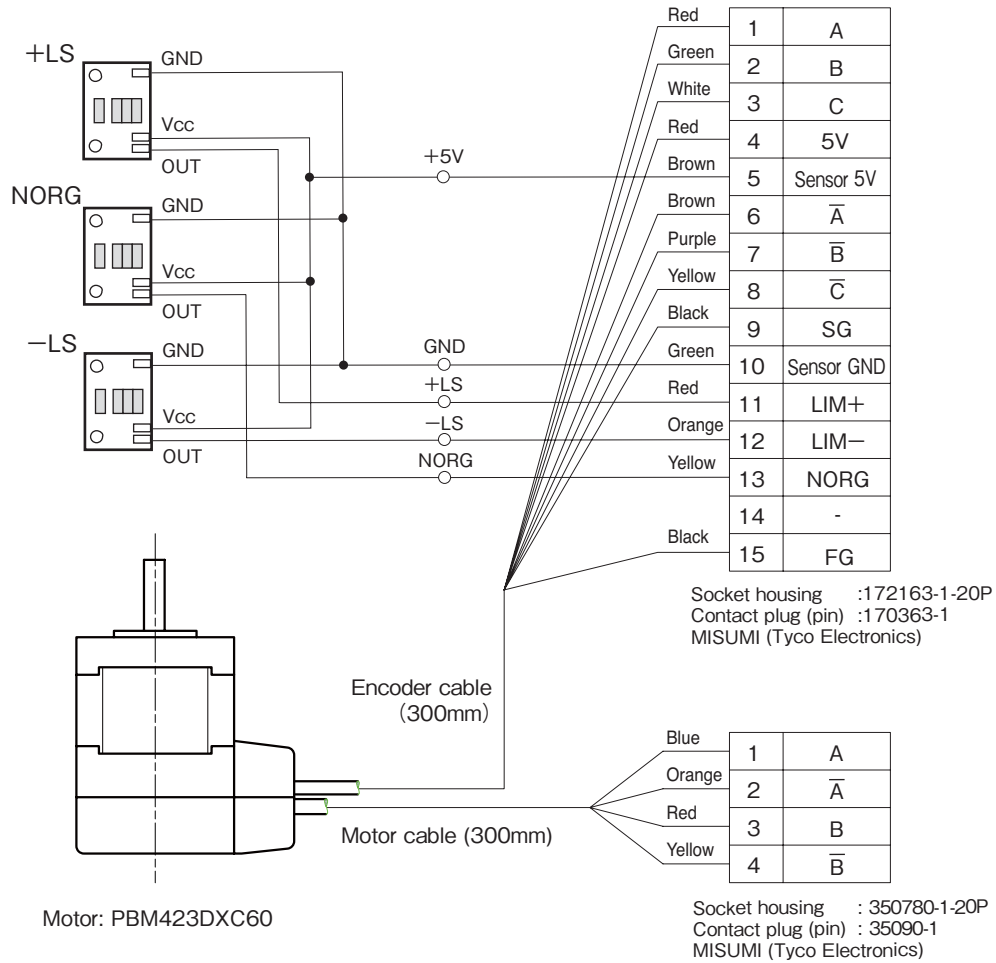
	Axis X	Axis Y
Drive method	Driven by ball screw	
Guide method	Cross roller guide	
Ball screw lead	4mm	
Ball screw diameter	φ8mm	
Resolution	0.3125 μm	
No. of ports	6 ports (3-port parallel arrangement)	
Distance between ports	38mm	
Transport time between ports	0.28sec*	
Speed	200mm/sec (upon 640kpps)*	
Stroke	76mm	38mm
Transport time for entire stroke	0.48sec*	0.28sec*
On-board mass	2.4kg	
Transport table mass	0.6kg	1.5kg
Reproducibility	±1.5 μm	
Dry mass	3.7kg	
Object lens attachment screw	Standard: φ26 - 36 / inch (Mitsutoyo Object Lens Screw)	
Measures against dust	Application of low dust-generating grease to ball screws, roller guides, and bearings. Setting anti-rust film on ball screws and roller guides.	
Motor	PBM423DXC62 (Sanyo Electric)	

* Speed and Transport time between ports depend on the control settings, on-board mass, etc.

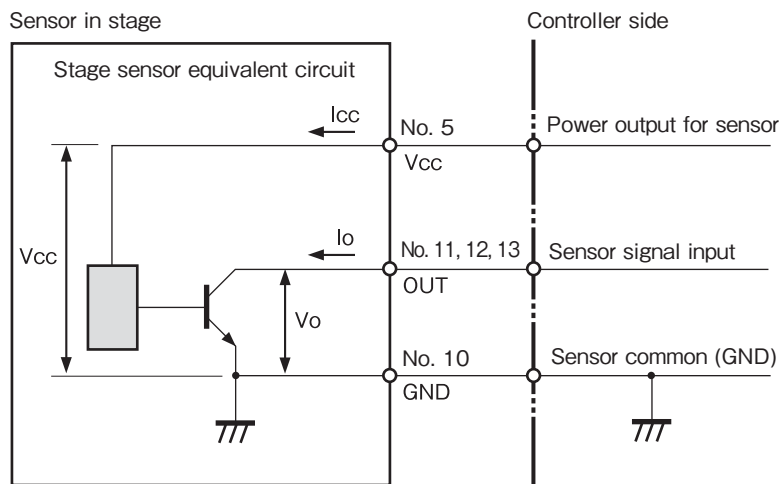
Controller: AF-OLS-CXY

Power Source	Single phase 90-260V AC (47-63Hz)
Ambient temperature / humidity	10-40°C / 20-80% (no condensation)
Outer dimensions	W254 x D390 x H150 (projection excluded)
Mass	7 kg
No. of control axes	2 axes
Control function	Operation from front panel, communication control from host computer (RS-232C), control from external controllers (PI/O), JOG operation, port operation, teach operation, home-return operation, display unit setting, parameter setting, etc.
Communicating function	RS-232C, P I/O
Limit sensor logic	Normally closed: NC
Home position front sensor logic	Normally closed: NC
Driver	PB1D002P100 (Sanyo Electric)
Power consumption	350W (max.)

Specifications of Connections on the Main Object Lens Slider Unit Side



Specifications of Limit Sensor & Sensor in Front of Home Position

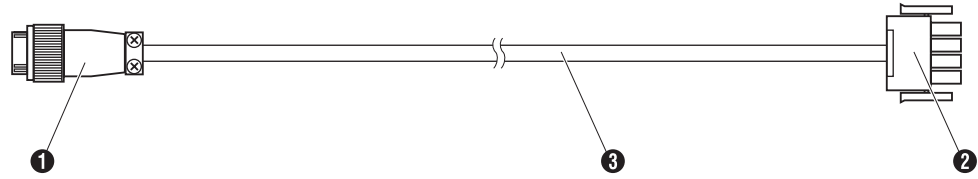


- Output format : Open collector
- Sensor power voltage (Vcc) : 5V – 24V
- Sensor consumption current (I_{cc}) : 30mA (per sensor)
- Max. voltage (V_o) : 30V
- Max. current (I_o) : 50mA

Sensor operation logic	
Limit sensor (+LS, -LS)	N.C. (normal close)
Home-position front sensor (NORG)	

Cable Specifications

Motor cable



❶ Connector on controller side

Type: SRCN6A16-10P (JAE)

❷ Connector on object lens slider side

Plug housing: 350779-1-20P

(Tyco Electronics)

Contact (receptacle): 350551-1

(Tyco Electronics)

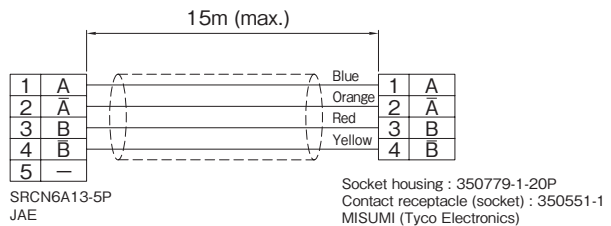
❸ Cable

Warp-resistant cable for robot

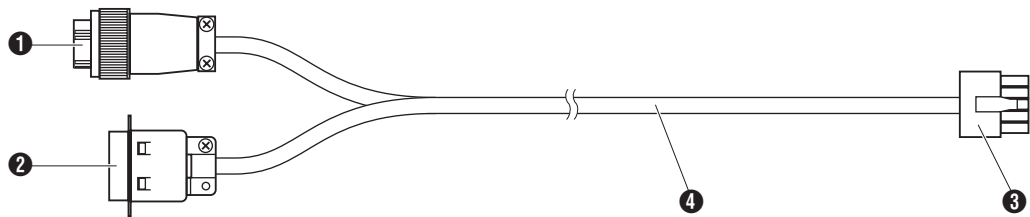
(1.25mm² x 4 w/center batch hold)

Max. length: 15m

[Connection Specifications]



Sensor cable



❶ Encoder connector (controller side)

Type: SRCN6A16-10P (JAE)

❷ Sensor connector (controller side)

Type: 57-30140R (DDK)

❸ Connector on object lens slider

Plug housing: 172171-1-20P

(Tyco electronics)

Contact receptacle (socket): 17336-1

(Tyco electronics)

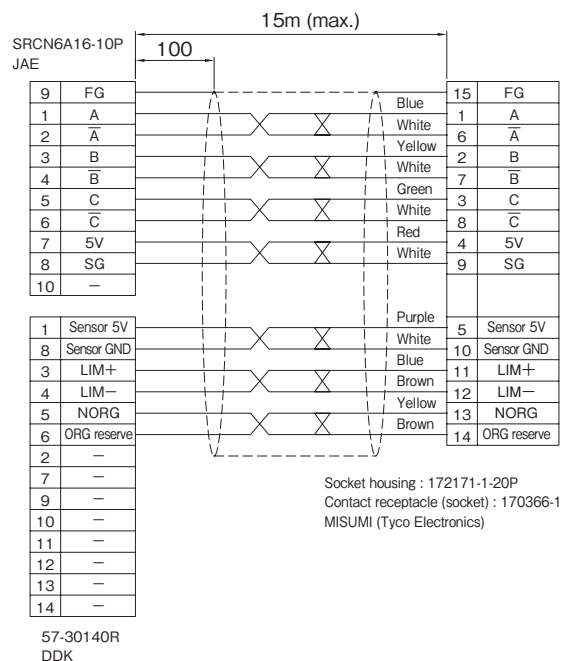
❹ Cable

Warp-resistant cable for robot

(0.3mm² x 4 w/center batch hold)

Max. length: 15m

[Connection Specifications]



⚠ CAUTION

Be sure that the specifications in the table below are observed if you are going to make a cable to connect the object lens slider and controller.

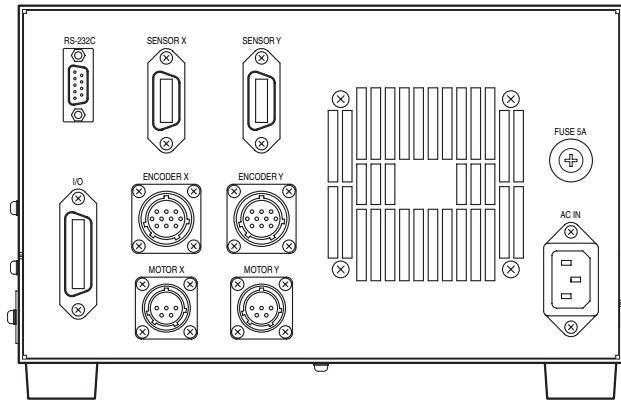
Cable	Type	Size	Max. Length
Motor cable	Jacket shielded wire	AWG18 or above	15m
Sensor cable	Twist pair jacket shielded wire	AWG22 or above	15m

* The connector section is not included in maximum length.

* Set the wires so that the device will not be affected by radio noise.

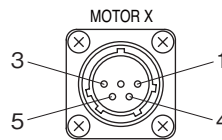
Connector Specifications

Pin allocation and the contents of the connector on the controller side are indicated in this section.



MOTOR X,Y

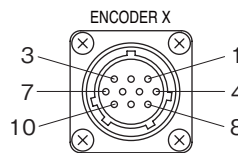
Pin No.	Content
1	\bar{A} phase
2	A phase
3	B phase
4	\bar{B} phase
5	N.C.



Connector: SRCN2A13-5S(JAE)

ENCODER X,Y

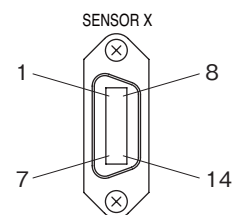
Pin No.	Content
1	A phase
2	\bar{A} phase
3	B phase
4	\bar{B} phase
5	C phase
6	\bar{C} phase
7	5V
8	GND
9	F.G.
10	N.C.



Connector: SRCN2A13-10S(JAE)

SENSOR X,Y

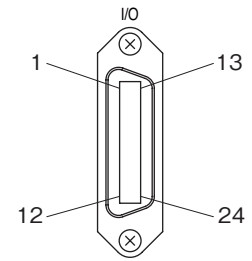
Pin No.	Content	Pin No.	Content
1	Sensor 5V	8	Sensor GND
2	Sensor 5V	9	Sensor GND
3	LIM+	10	Sensor GND
4	LIM-	11	Sensor GND
5	NORG	12	Sensor GND
6	ORG (reserve)	13	Sensor GND
7	N.C.	14	Sensor GND



Connector: 57FE-40140-20S(DDK)

I/O

Pin No.	Content	Pin No.	Content
1	EX24V	13	EX24V
2	EX24V	14	EX24V
3	POUT 0	15	POUT 1
4	POUT 2	16	POUT 4
5	POUT 4 (reserve)	17	POUT 5 (reserve)
6	POUT 6 (reserve)	18	POUT 7 (reserve)
7	PIN 0	19	PIN 1
8	PIN 2	20	PIN 3
9	POUT 4 (reserve)	21	POUT 5 (reserve)
10	POUT 6 (reserve)	22	POUT 7 (reserve)
11	EXGND	23	EXGND
12	EXGND	24	EXGND

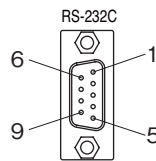


Connector: 57FE-40240-20S(DDK)

* Connector on cable side: 57-30240R (DDK) comes with this product.

RS-232C

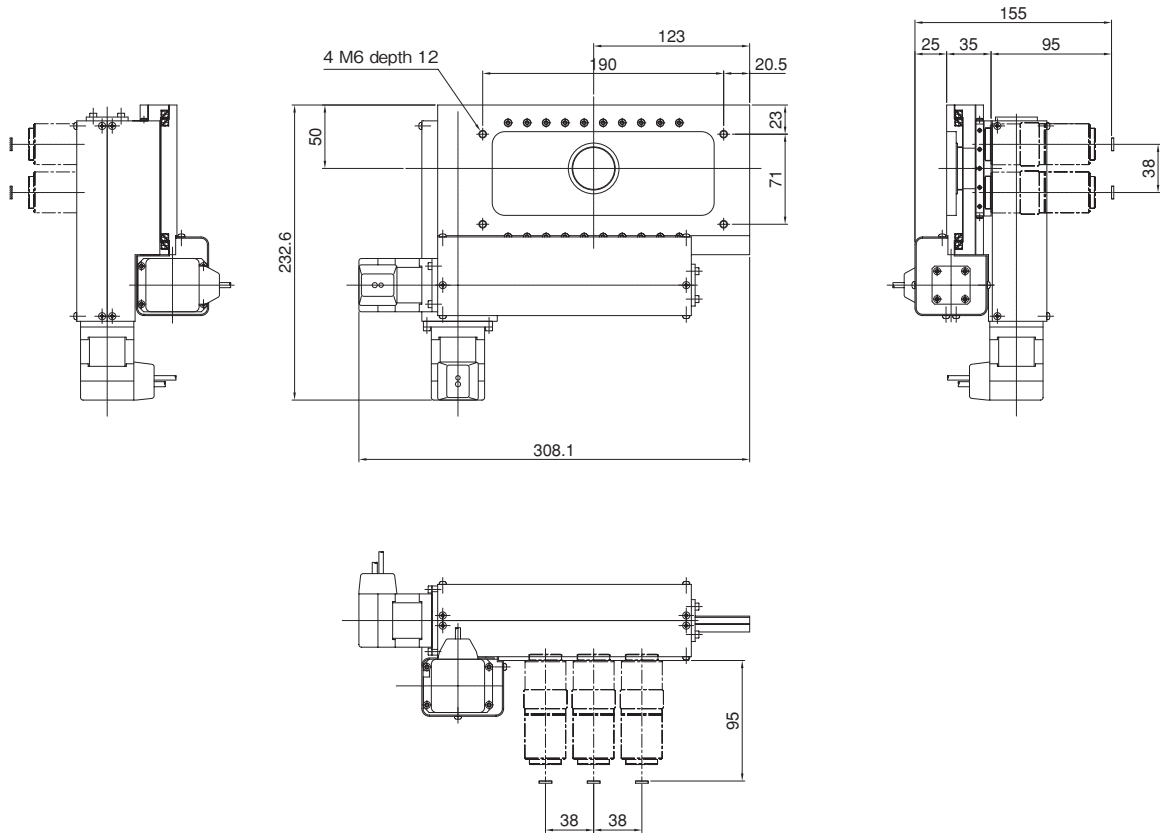
Pin No.	Content
1	N.C.
2	TXD
3	RXD
4	N.C.
5	GND
6	N.C.
7	CTS
8	RTS
9	N.C.



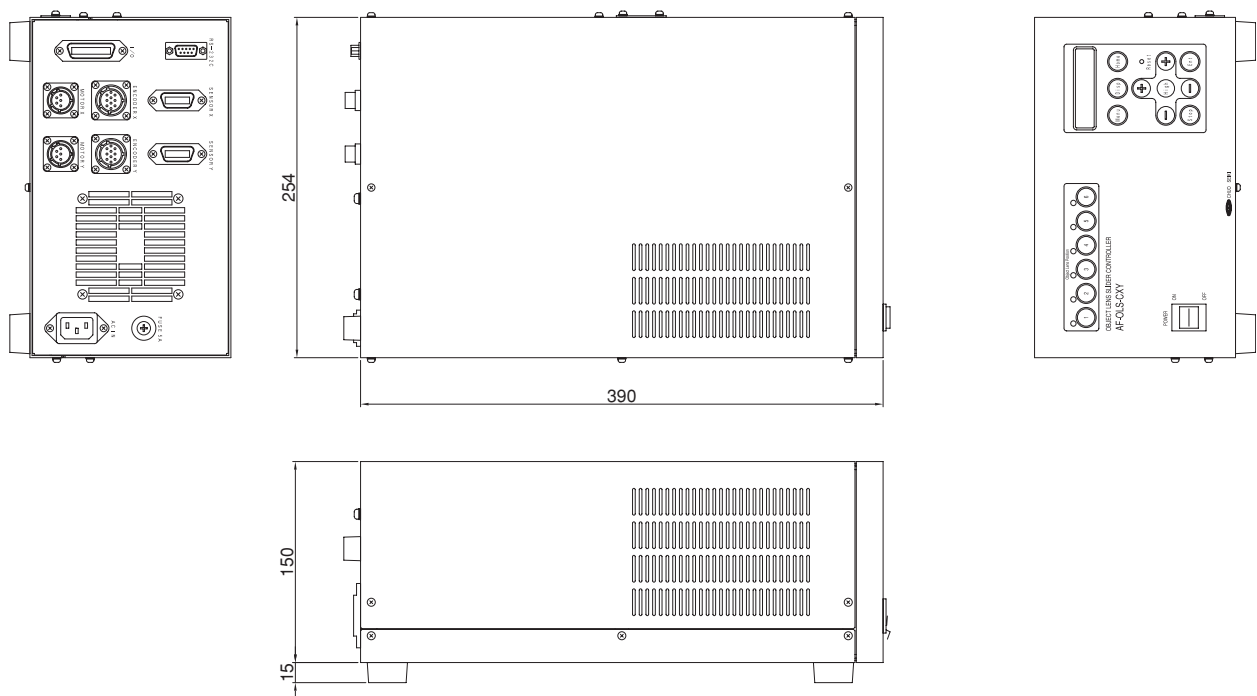
Connector: DESP-JB9PF(JAE)

Dimensional Drawing

Object lens slider



Controller



19 I/O Port

The object lens slider can be operated by remote control from an external device by using the I/O port (external input terminal). Refer to the circuit diagram on the following page for details on the circuit in the external device.

Input

IN3	IN2	IN1	IN0	Content
OFF	OFF	OFF	OFF	Not used
OFF	OFF	OFF	ON	Start transition to Port 1
OFF	OFF	ON	OFF	Start transition to Port 2
OFF	OFF	ON	ON	Start transition to Port 3
OFF	ON	OFF	OFF	Start transition to Port 4
OFF	ON	OFF	ON	Start transition to Port 5
OFF	ON	ON	OFF	Start transition to Port 6
OFF	ON	ON	ON	Not used
ON	OFF	OFF	OFF	Start home-return
Other than above				Not used

The value may change by performing sampling every 1ms. The input value is one obtained which did not change after sampling 4 times continuously (by 4ms).

Output

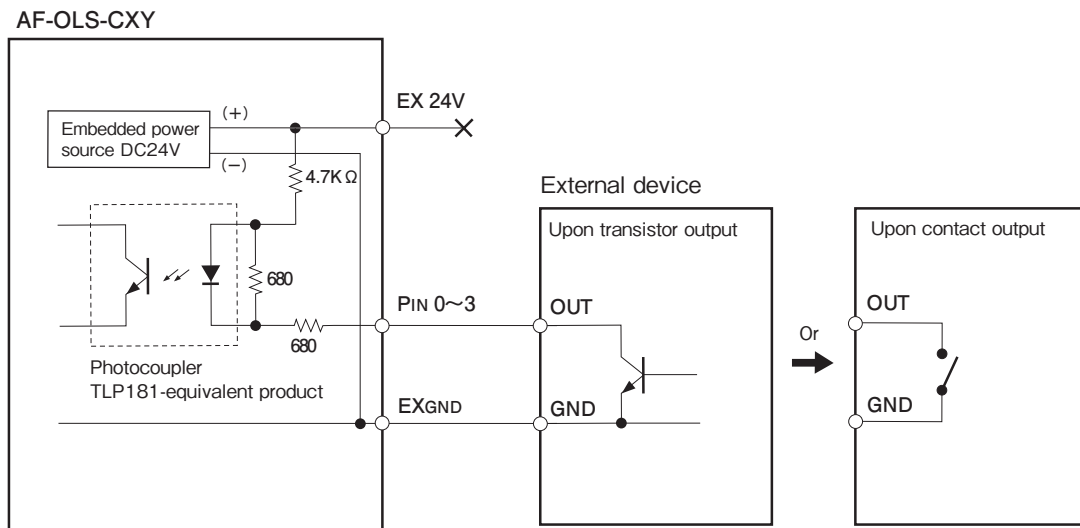
OUT3	OUT2	OUT1	OUT0	Content
OFF	OFF	OFF	OFF	While moving or at a position other than a port position (home-return not completed)
ON	OFF	OFF	OFF	While moving or at a position other than a port position (home-return completed)
ON	OFF	OFF	ON	Output Port 1 position
ON	OFF	ON	OFF	Output Port 2 position
ON	OFF	ON	ON	Output Port 3 position
ON	ON	OFF	OFF	Output Port 4 position
ON	ON	OFF	ON	Output Port 5 position
ON	ON	ON	OFF	Output Port 6 position
OFF	ON	ON	ON	Driver alarm
Other than above				Not used

OUT3 indicates home-return status. OFF means home-return is not completed and ON means home-return is completed. The status becomes OFF when the driver alarm occurs.

For output, perform sampling every 1ms. Make sure that the same value can be obtained after sampling 4 times continuously (by 4ms) and use the value as the output value.

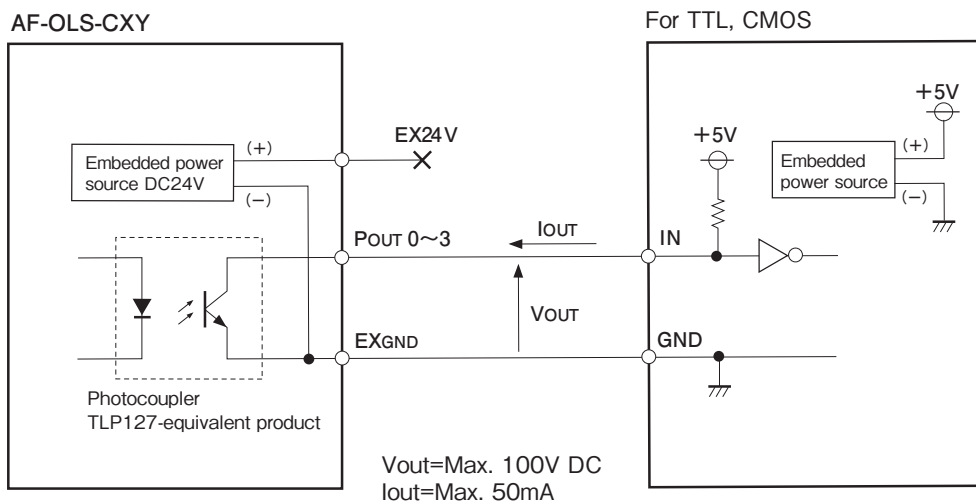
I/O: I/O Circuit Specifications

Input: Pin 0-3

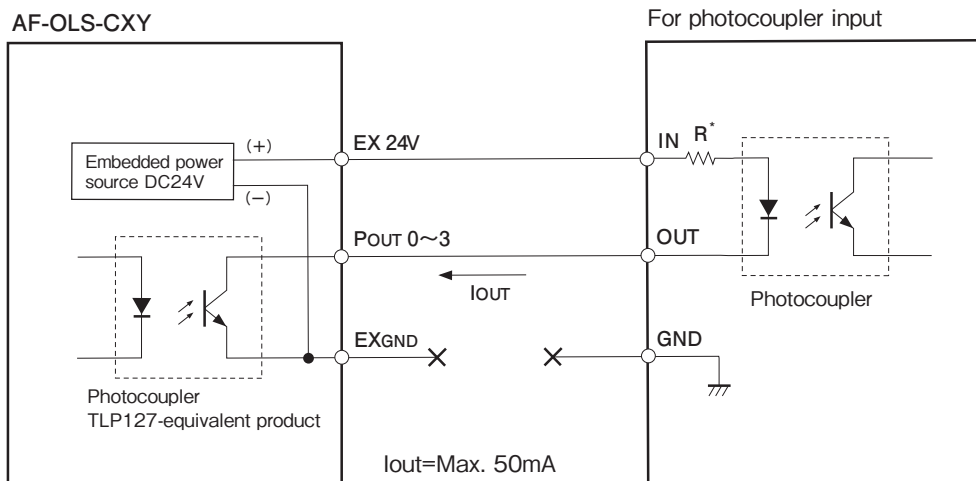


Output: Port 0-3

[Example 1]




[Example 2]



*1 R indicates current limitation resistance on the light-producing side of the photocoupler. Adjust the resistance of R so that it does not exceed the maximum rated current of the photocoupler.

20 Periodic Safety Inspections

Please inspect the items listed below periodically in order to secure safety when using the product.

 When performing inspections, turn OFF the power of the main unit and make sure that the power cable is unplugged from the outlet. For items that must be performed with the power ON, be extremely careful of electric shock.

Inspected Portion	Contents	Corrective Action
All cables	There should be no bent, scratched, or cut portions.	If the cable has any irregularities, it must be replaced. Please consult the store where you purchased the product.
Connector & terminal	There should be no loose, bent, or damaged portions.	If a connector is loose, plug it in securely. Bent or damaged connectors and terminals must be replaced. Please consult the store where you purchased the product.
Object lens slider, controller	There should be no abnormal sound, abnormal smell, smoke, or abnormal heating.	If an irregularity is detected, stop the operation immediately, unplug the power cord, and consult the store where you purchased the product.
Controller	The vent slot should not be clogged with dust, etc.	Clean the main unit periodically.
	The case should not be loose.	Secure loose screws.

CAUTION

If abnormal sound, abnormal smell, smoke, or abnormal heating is detected emanating from the object lens slider or controller, stop the operation immediately and unplug the power cord from the outlet, otherwise, it may result in a fire, burn, or electric shock.

Then consult the store where you purchased the product.

21 Warranty, Repair, etc.

1. Warranty & Repair

Warranty

If, by any chance, the product breaks down during the warranty period, we will fix the product free of charge based on the regulations indicated below.

Regulations on Free Warranty

The warranted period is one year from the time of delivery.

- 1) The product will be fixed at no cost if the problem occurred under normal operating conditions that are described in the Instruction Manual and the precautions described on the labels on the product were observed.
- 2) A fee is charged in the following circumstances even during the warranted period.
 - Problems that were caused by improper usage, or faulty repair/modification.
 - Damage caused by dropping the product after purchase.
 - Damage caused by a natural calamity such as a fire, earthquake, flood, lightning, etc., or by pollution or abnormal voltage.
 - When the damage is determined by Chuo Precision in advance not to be within the warranty range.
 - When a problem occurs because the backup memory (Flash ROM) was rewritten more than the specified number of times.

Repair During the Warranted Period

- Please contact Chuo Precision or the store where you purchased the product.

Repair After the Warranted Period

- Please contact Chuo Precision or the store where you purchased the product even when the warranted period has expired. Depending on the level of damage, the damage may be repaired for a fee.
- The majority of maintenance parts will be available for a minimum of six years after production is ended. We may not be able to provide support after this term has passed. Furthermore, please acknowledge that we may not be able to fulfill this condition depending on the circumstances of the parts manufacturers.

2. Maintenance

Embedded Flash Memory

This product (Controller) uses flash memory to save parameters and programs. Flash memory can normally be rewritten 100 thousand times. Rewriting may be disabled when exceeding this limit. In such a case, the controller must be replaced. Chuo Precision will replace the controller for a fee, so please contact the store where you purchased the product.

Maintenance

To clean the main unit or control sections, apply acid-free detergent to a soft cloth, wring it sufficiently, and wipe the dirty portions.

3. Environmental Requests

When the product is not used

Be sure to turn OFF the power when the controller or host computer is not being used. Furthermore, if you do not plan to use the machine for a long period of time, unplug the power cable from the outlet.

Disposing of the product, accessories, and packing materials

Dispose of the object lens slider, controller, and cables as non-flammable waste (industrial waste). In addition, dispose of the boxes, padding materials, and plastic bags that contained the product and its parts according to local regulations.

The contents of this manual are subject to change without notice. In addition, we may reform the product itself without notice.

Object Lens Slider Instruction Manual Ver. 1.2

Apr 10, 2013 ADV.



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