

# **CX1011/CX1012**

Easy Programming  
Software

## **Instruction Manual**



Thank you for purchasing the CX1011/CX1012.  
CX1011/CX1012 is the software for soldering program compatible to  
the table-top type robot (IAI-made TTA-A4 series).  
The contents of CX1011 and CX1012 are the same except for  
the language on the package.  
This manual includes instruction of the software and for the  
table-top type robot (IAI-made TTA-A4 series).  
Please read the manual carefully before operating the CX1011/CX1012.  
Please keep this manual readily accessible for reference.



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# 1. PACKING LIST

Please check to make sure that all items listed below are included in the package.

## 1-1 Parts composition

Easy programming software (CX1011/CX1012) is soldering program software compatible with table-top type robot (IAI-made TTA-A4 series).

Easy programming software (CX1011/CX1012) is included with the HAKKO HU-100 set.

### 1-1-1 Packing list

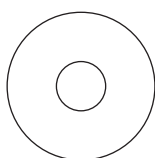
	Part name	Part No.	HAKKO HU-100		Content information
			Set	QTY	
①	Easy programming software	CX1011/ CX1012	○	1	p. 2
②	Cleaner	CX1003	○	1	p. 2
③	Table-top type robot (IAI-made TTA-A4 series)	-	○	1	p. 3
④	HAKKO FU-500	-*	○	1	p. 4
⑤	HAKKO FU-601	-*	○	1	p. 4
⑥	Soldering unit mount	CX1008	○	1	p. 5
⑦	Iron fixing base	CX1005	○	1	p. 5
⑧	Solder reel base	CX1006	○	1	p. 5
⑨	Cleaner base	CX1007	○	1	p. 5
⑩	Jig table	CX1009	○	1	p. 5

\* Part No. for HAKKO FU-500 and FU-601 changes at destination.

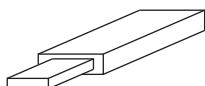
Part No.		Specifications
④	⑤	
FU500-12X	FU601-32X	220V 3 wired cord & American plug for Thailand
FU500-13X	FU601-33X	220V 3 wired cord & American plug
FU500-14X	FU601-34X	220V 3 wired cord & Chinese plug
FU500-15X	FU601-35X	220V 3 wired cord & European plug
FU500-16X	FU601-36X	220V 3 wired cord but no plug
FU500-17X	FU601-37X	230V 3 wired cord but no plug
FU500-18X	FU601-38X	230V 3 wired cord & BS plug
FU500-19X	FU601-39X	240V 3 wired cord but no plug

## 1-1-2 ① Easy programming software (CX1011/CX1012)

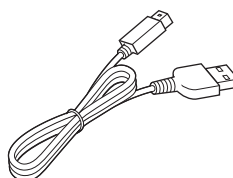
Easy Programming Software (CD-ROM) .....	1	Quick user guide (PC software)	
License dongle .....	1	Japanese / English / Chinese .....	1 each
USB cable .....	1	Quick user guide (Installation and Connection)	
Cable tie .....	1	Japanese / English / Chinese .....	1 each



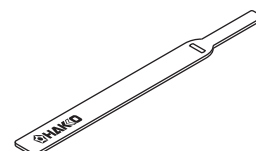
**Easy programming software**  
(CD-ROM)



**License dongle**



**USB cable**



**Cable tie**

### CD-ROM contents

- Easy programming software (Japanese)
- Easy programming software (English)
- Easy programming software (Chinese)
- USB driver for table-top type robot (TTA-A4 series)
- Setting file for USB connector
- Setting file for RS-232C connector (9 pin)
- Instruction manual (this booklet)

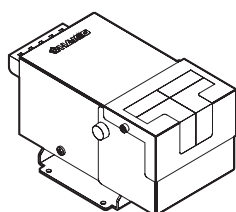
\* Instruction manual for the language of Japanese, English, Chinese, Korean and Thai can be downloaded from the following URL, HAKKO Document Portal.



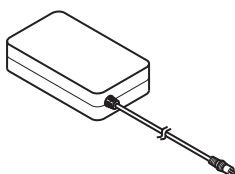
<https://doc.hakko.com>

## 1-1-3 ② Cleaner (CX1003)

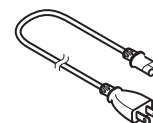
CX1003 Cleaner .....	1	Power cord (for cleaner) .....	1
AC adapter .....	1	Instruction manual (for cleaner) .....	1



**Cleaner**  
(CX1003)



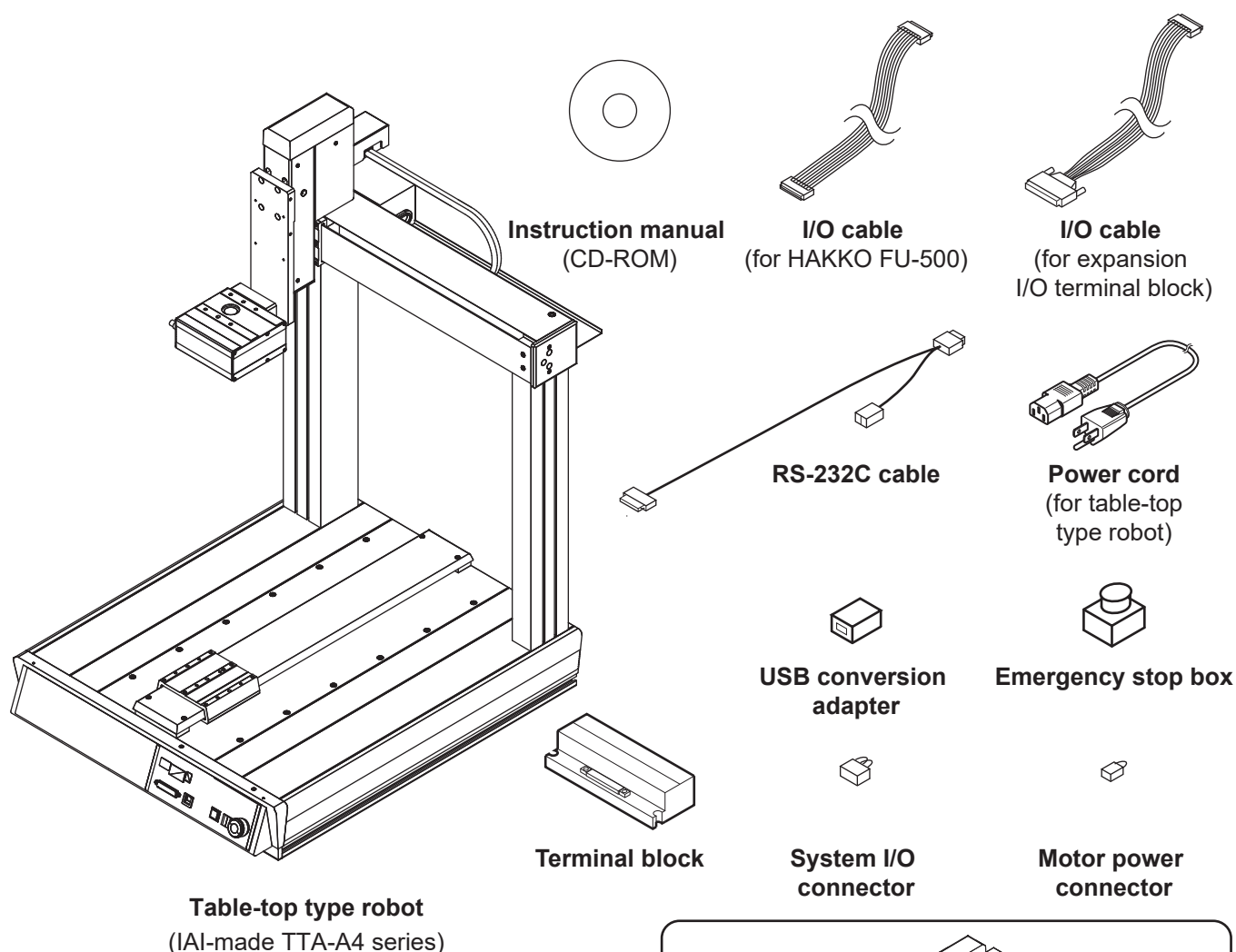
**AC adapter**



**Power cord**  
(for cleaner)

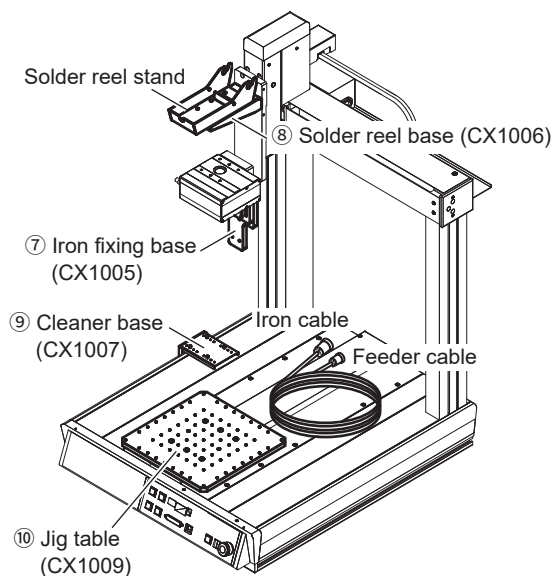
### 1-1-4 ③ Table-top type robot (IAI-made TTA-A4 series)

Table-top type robot (IAI-made TTA-A4 series) .....	1	Power cord (for table-top type robot) .....	1
Instruction manual CD-ROM .....		USB conversion adapter .....	1
(for table-top type robot (IAI-made TTA-A4 series) ....)	1	Emergency stop box .....	1
I/O cable (for HAKKO FU-500) .....	1	Terminal block .....	1
I/O cable (for expansion I/O terminal block) .....	1	System I/O connector .....	1
RS-232C cable .....	1	Motor power connector .....	1



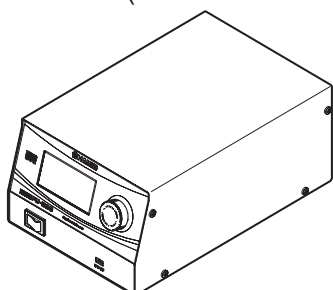
- ⑦ Iron fixing base (CX1005)
- ⑧ Solder reel base (CX1006)
- ⑨ Cleaner base (CX1007)
- ⑩ Jig table (CX1009)

These four parts are attached to the  
③ Table-top type robot (IAI-made  
TTA-A4 series) at the time of shipment.

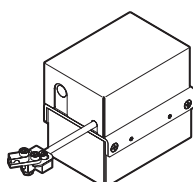


## 1-1-5 ④ HAKKO FU-500\*1

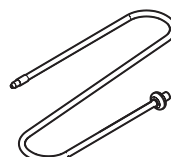
HAKKO FU-500 .....	1	Solder reel stand*3 .....	1
Feeder unit .....	1	Feeder cable (5m)*3 .....	1
Tube unit (for ø0.3 to 1.0 mm) .....	1	Power cord (for HAKKO FU-500) .....	1
Tube unit (for ø1.2 to 1.6 mm) .....	1	Instruction manual (for HAKKO FU-500) .....	1



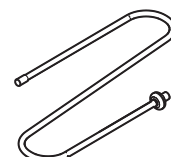
**HAKKO FU-500**



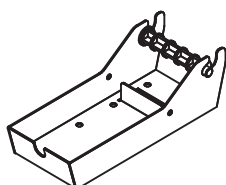
**Feeder unit**



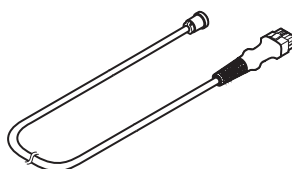
**Tube unit**  
(for ø0.3 to 1.0 mm)



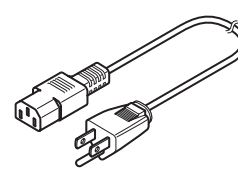
**Tube unit**  
(for ø1.2 to 1.6 mm)



**Solder reel stand**



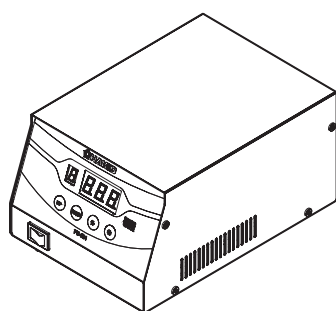
**Feeder cable**



**Power cord**  
(for HAKKO FU-500)

## 1-1-6 ⑤ HAKKO FU-601\*2

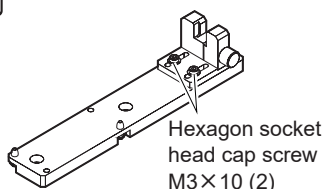
HAKKO FU-601 .....	1	Iron cable (5m)*3 .....	1
HAKKO FU-6002 .....	1	Connecting cable .....	1
Flux protector .....	1	Power cord (for HAKKO FU-601) .....	1
Iron unit fixing assembly .....	1	Heat-resistant pad .....	1
Tip adjustment jig unit .....	1	Instruction manual (for HAKKO FU-601) .....	1
Feeder unit attachment screw .....	2		



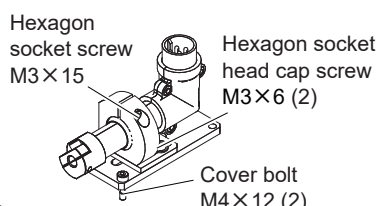
**HAKKO FU-601**



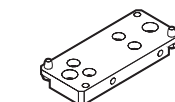
**Flux protector**



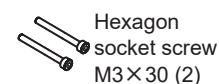
**Tip adjustment jig unit**



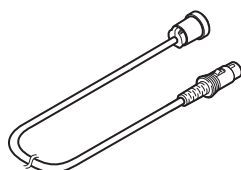
**HAKKO FU-6002**



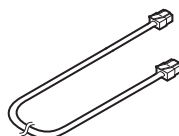
**Iron unit**  
fixing assembly



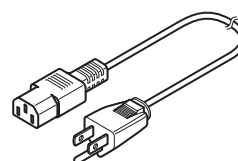
**Feeder unit**  
attachment screw



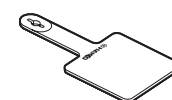
**Soldering iron cable**



**Connecting cable**



**Power cord**  
(for HAKKO FU-601)



**Heat-resistant pad**

\*1 The solder feed pulley unit, solder feed guide set, and fluoroplastic tube are sold separately.

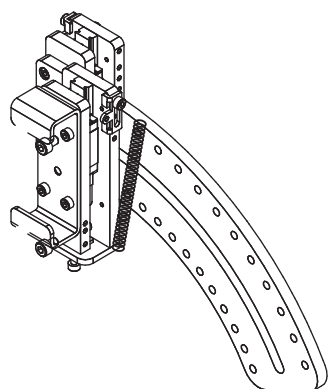
See "11. Parts list" of the HAKKO FU-500 instruction manual.

\*2 The tip is sold separately. See "Tip styles" of the HAKKO FU-601 instruction manual.

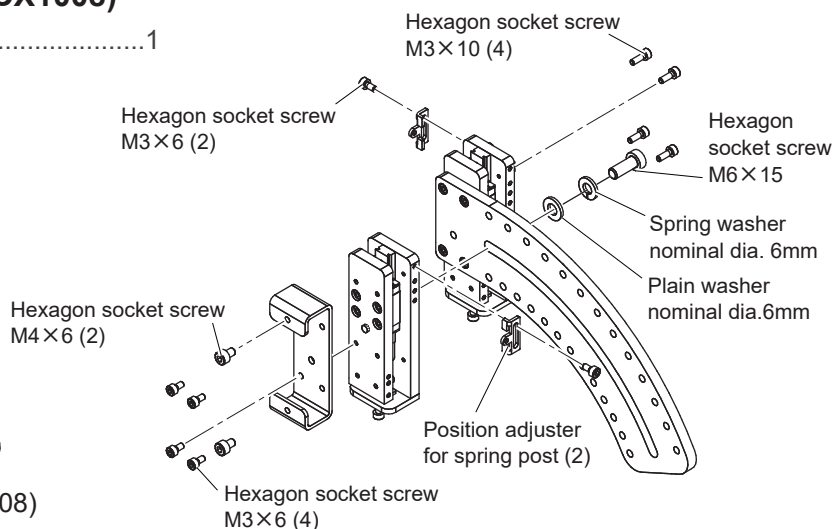
\*3 In HAKKO HU-100, this part is shipped already mounted on the table-top type robot (IAI-made TTA-A4 series)

### 1-1-7 ⑥ Soldering unit mount (CX1008)

CX1008 Soldering unit mount .....1

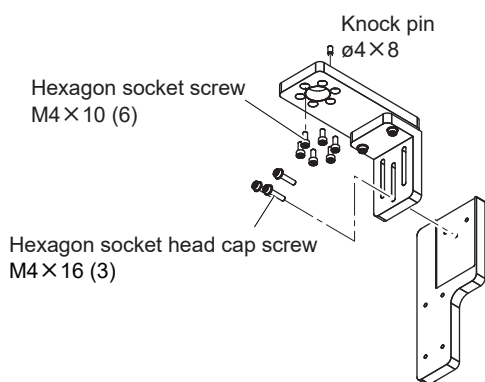


**Soldering unit mount (CX1008)**



### 1-1-8 ⑦ Iron fixing base (CX1005)\*4

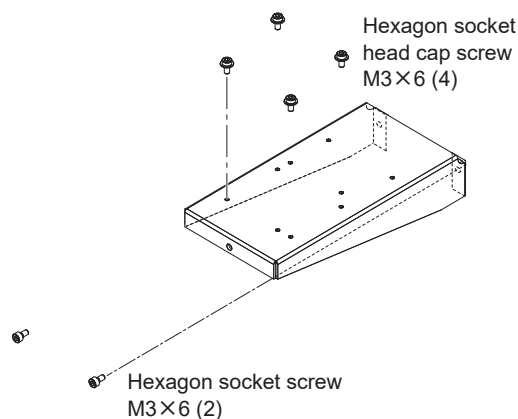
CX1005 Iron fixing base .....1



**Iron fixing base (CX1005)**

### 1-1-9 ⑧ Solder reel base (CX1006)\*4

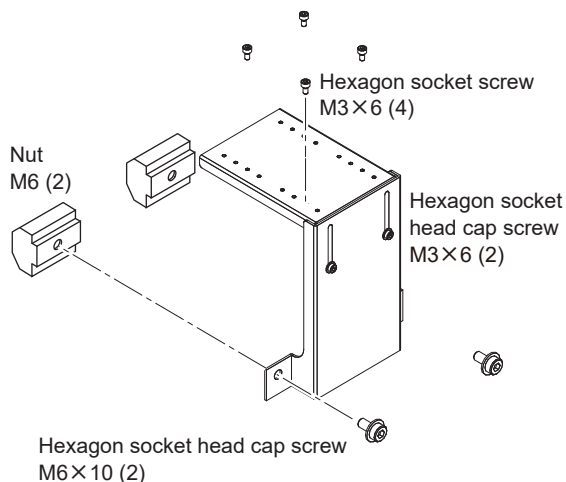
CX1006 Solder reel base .....1



**Solder reel base (CX1006)**

### 1-1-10 ⑨ Cleaner base (CX1007)\*4

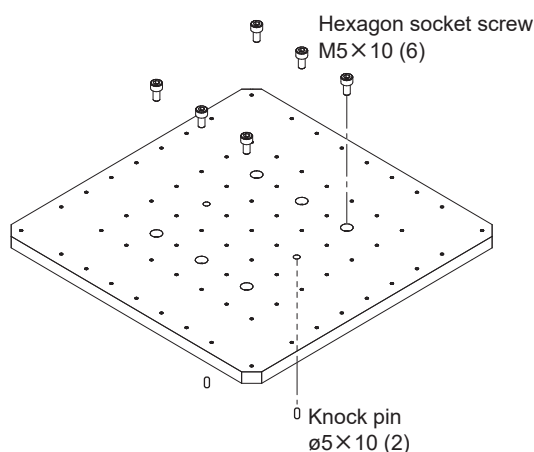
CX1007 Cleaner base .....1



**Cleaner base (CX1007)**

### 1-1-11 ⑩ Jig table (CX1009)\*4

CX1009 Jig table .....1



**Jig table (CX1009)**

\*4 In HAKKO HU-100, these parts are shipped already mounted on the table-top type robot (IAI-made TTA-A4 series).

## 2. SPECIFICATIONS

### 2-1 Specification of each devices

#### ●Lead and payload capacity of table-top type robot (IAI-made TTA-A4 series)

Axis	Lead	Stroke	Speed	Repeatable position accuracy	Payload capacity
X axis	24mm or equivalent	400 mm	1~800 mm/sec	±0.02 mm	20 kg
Y axis	24mm or equivalent	400 mm	1~800 mm/sec	±0.02 mm	—
Z axis	12mm	150 mm	1~400 mm/sec	±0.02 mm	—
θ axis	—	±200 degree	600 degree/s	±0.01degree	—

#### NOTE :

For repeated positioning accuracy and transportable mass, refer to “1.2 Mechanical Specifications” in “Chapter 1 Specifications Check” of the instruction manual for table-top type robot (IAI-made TTA-A4 series).

#### ●Table-top type robot (IAI-made TTA-A4 series)

Power supply	AC 100~240V 50/60Hz
Power consumption	290W
Dimensions	601 (W) × 747 (D) × 934 (H) mm
Weight	50 kg

#### ●HAKKO FU-500

Station	
Power consumption	35W
Dimensions	145 (W) × 230 (D) × 100 (H) mm
Weight	2.3 kg
Feeder unit	
Weight <sup>*1</sup>	800 g
Solder diameter (mm) <sup>*2</sup>	0.3 0.5 0.6 (0.65) 0.8 1.0 1.2 1.6

\*1 With the solder feed pulley unit, the solder feed guide set and the fluoroplastic tube

\*2 Up to 1kg bobbin of solder can be used.

#### ●HAKKO FU-601

Station	
Power consumption	300W
Temperature range <sup>*1</sup>	50~500°C
Temperature stability	± 5°C at idle temperature
Output Voltage	AC 29V
Dimensions	145 (W) × 211 (D) × 107 (H) mm
Weight	4 kg
HAKKO FU-6002	
Power consumption	260W (29V)
Tip to ground resistance	< 2 Ω
Tip to ground potential	< 2 mV
Cord length	3 m
Total length <sup>*2,3</sup>	168 mm
Weight <sup>*2</sup>	134 g (173 g <with iron unit fixing assembly>)

\*1 The temperature was measured using the FG-101.

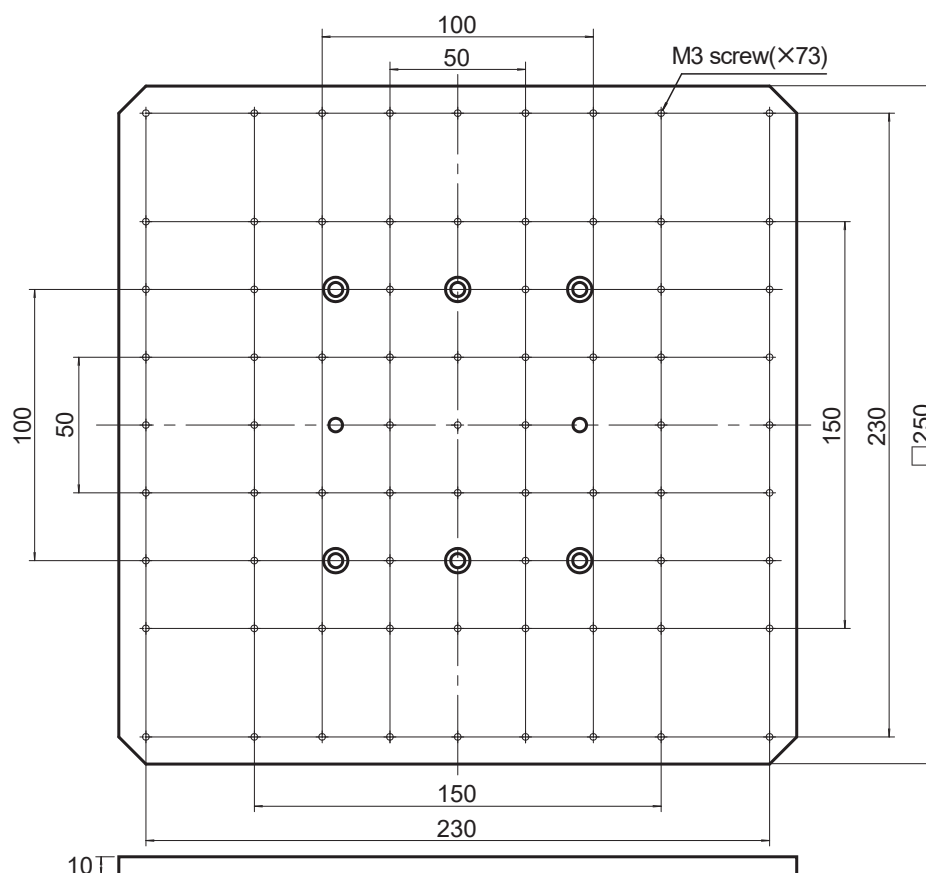
\*2 With 4XD tip

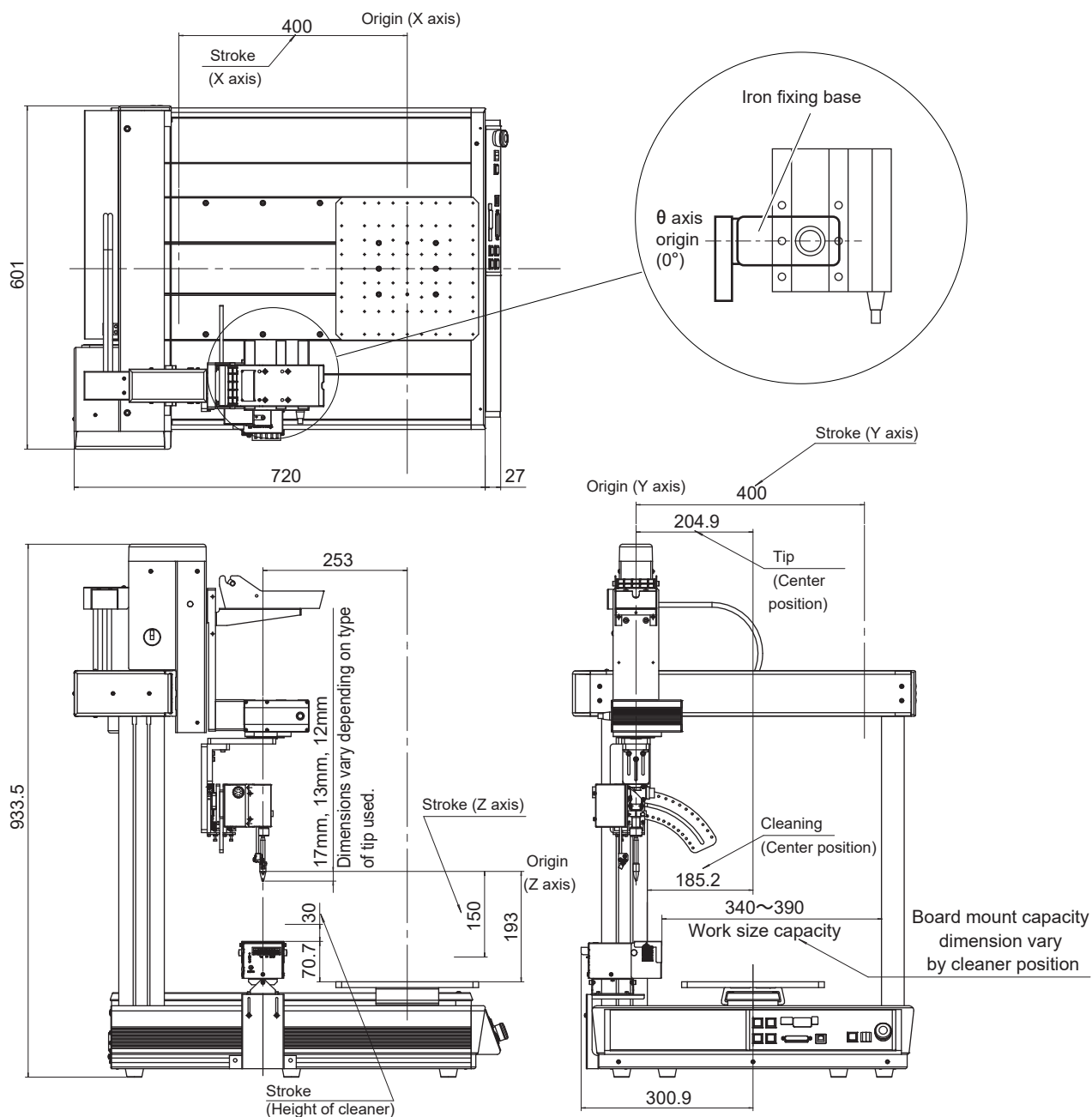
\*3 The dimension can be adjusted in range of ±5mm.

HAKKO FU-500 and FU-601 are protected against electrostatic discharge.

### 2-2 Dimensions of table-top type robot (IAI-made TTA-A4 series)

Jig table





**NOTE:**

For specifications other than the stroke and dimensions, read “Chapter 1 Specifications Check” of the instruction manual for table-top type robot (IAI-made TTA-A4 series). For the specifications for HAKKO FU-500, HAKKO FU-601 and CX1003, read “2. Specifications” of each instruction manual.

Note that specifications and appearance are subject to change without notice.

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## 2-3 Operating environment for easy programming software

The following system is required to run this software.


Compatible OS	Windows 7, Windows 8, 8.1, Windows 10
Computer and compatible keyboard	Personal computer which runs on Windows OS and its compatible keyboard
Media reading drive	CD-ROM drive
Supported robot	Exclusive for TTA-A4 series robot made by IAI*1
USB port	Necessary to run Easy programming software


\*1 The specification of the robot is HAKKO original. Please contact HAKKO when necessary.

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## 3. WARNINGS, CAUTIONS AND NOTES

Warnings, cautions and notes are placed at critical points in this manual to direct the operator's attention to significant items.

 **WARNING** : Failure to comply with a WARNING may result in serious injury or death.

 **CAUTION** : Failure to comply with a CAUTION may result in injury to the operator, or damage to the items involved.

### **WARNING**

- Carrying the table-top type robot (IAI-made TTA-A4 series) should be done by at least 2 people, or a hand cart or a hand lift should be used.
- When working by 2 or more persons during transferring or installing, clarify the superior-subordinate relationship and call out to each other checking the safety to prevent contact and falling accidents.
- Contact with the table-top robot (IAI-made TTA-A4 series) during operation may cause accidents resulting in death or serious injury. While the robot is operating or is in stand-by, take safety measures (providing a safety protective fence, etc.) to prevent people from entering the operating range of the table-top type robot (IAI-made TTA-A4 series)  
\*Safety protective fence ... If a safety protective fence is not provided, be sure to indicate the operating range.
- Do not use this robot near explosive, flammable gas or materials.
- Do not touch the metallic part near the iron tip.
- Call surrounding people's attention to the "danger of a high temperature object"

- If an accident occurs, or if there is imminent danger of an accident occurring, immediately push the emergency stop button (button of the emergency stop box).
- In order to stop the unit emergently if a danger condition occurs, perform work within the range where you can reach the emergency stop button or place the emergency stop box near you.
- Never let persons other than repairing engineers disassemble, repair, or modify this unit.
- Place the table-top type robot (IAI-made TTA-A4 series) on a flat surface.  
In order to avoid turning-over and falling accidents, hold and secure this unit firmly.
- Before replacing parts or repairing, disconnect the power plug, and wait until the iron tip is sufficiently cooled down.
- Do not use the unit near children or infants.

To prevent accidents or damage, be sure to observe the following:

## **CAUTION**

- Since holding the plastic part may cause the unit to be broken, be careful not to hold the plastic part.
- Do not apply strong shock to this product.
- For safety, wear personal protective equipment, such as safety gloves and goggles, earplugs, and a hard hat, as needed.
- When installing this unit, make sure to keep a work space wide enough to perform maintenance and inspection work safely.
- Be sure to connect to ground. For the grounding method for the table-top type robot (IAI-made TTA-A4 series), refer to “3.4.5 Ground wiring” of “Chapter 3 Wiring” of the instruction manual for the table-top type robot (IAI-made TTA-A4 series).
- Maintain enough lighting to perform work safely (JIS Z9110 : 300-750 lux).
- Be aware that the unit may fail to perform adequately in hot, humid climates, or in highland or cold regions. As for range of specifications, refer to “1.3 Product check” in “Chapter 1 specifications check” of instruction manual for table-top type robot (IAI-made TTA-A4 series).
- Do not allow the unit to become wet, or use it with wet hands.
- If abnormal heating, smoking, odor, or sound are detected from this product, immediately stop the operation and turn off the power switch.
- Always turn off the power switch when suspending or finished using the unit.
- Be sure to hold the plug when inserting or removing the iron cord.
- Do not place the power cord near heated place, oil, or sharp objects.
- Do not forcibly bend, pull, or twist the power cord.
- Do not use the unit if the power cord or plug is damaged, or if the plug fits loosely into the power outlet.
- When the electromagnetic brake is switched off, the Z axis will fall down and may be dangerous. When switching off the electromagnetic brake, be sure to support the Z axis.
- While using the unit, do not do anything which may cause bodily harm or physical damage.

### **NOTE:**

Please read and understand “Safety Precautions for Our Products” of Instruction Manual of table-top type robot (IAI-made TTA-A4 series) and “3. Warnings, cautions and notes” of Instruction Manual of HAKKO FU-500, FU-601 or CX1003 before operating the product.

## 4. PART NAMES

### 4-1 Table-top type robot (IAI-made TTA-A4 series)

(Front view)

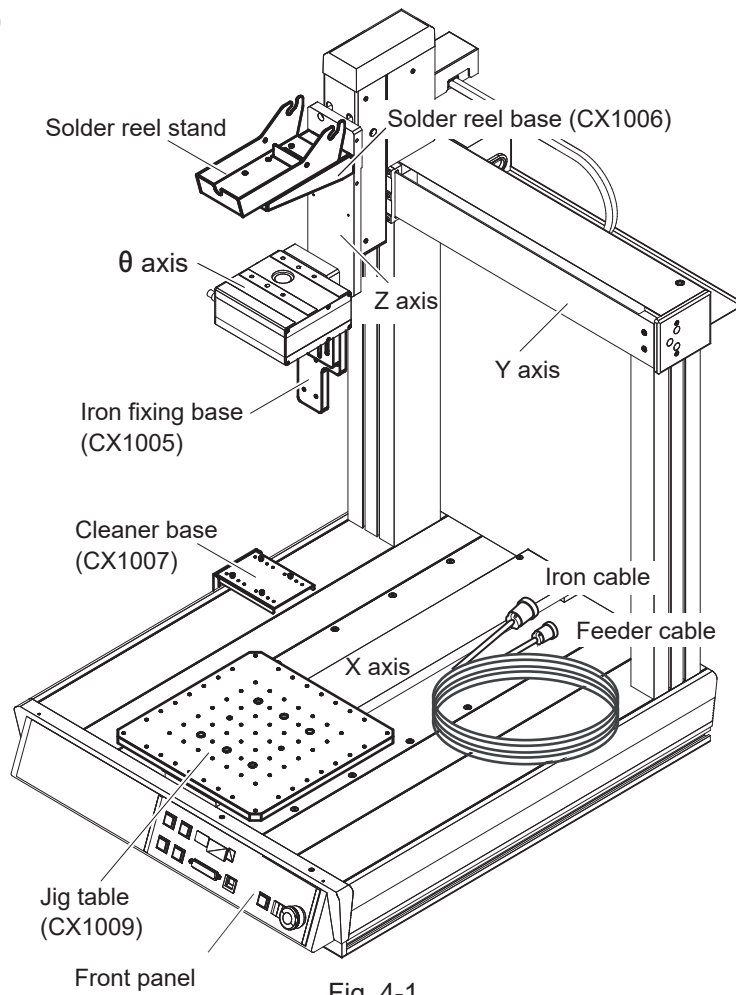


Fig. 4-1

(Rear view)

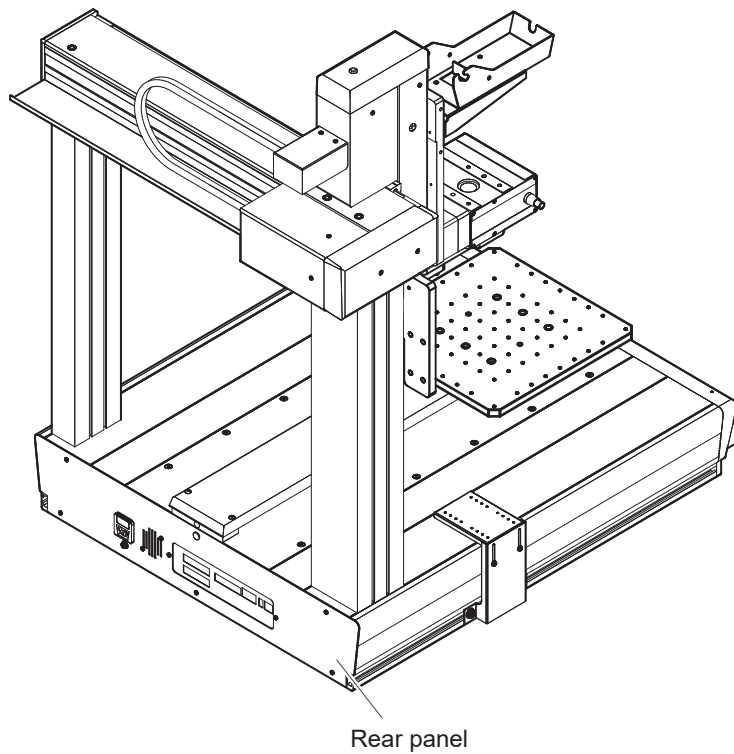


Fig. 4-2

## 4-1-1 Front panel

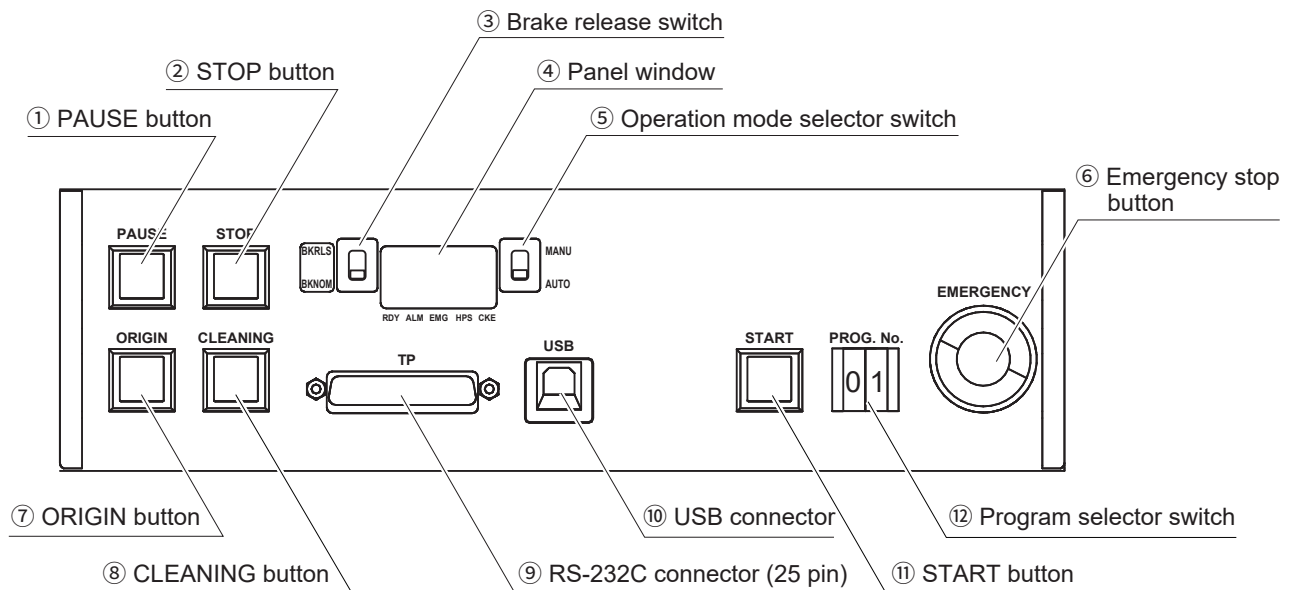


Fig. 4-3

### ① PAUSE button

Button to temporarily pause the program currently running. Pressing this button again will cause the program to continue.

In the paused condition, pressing other buttons will have no effect.

### ② STOP button

Button to stop the program currently running. When STOP button is pressed, the program will be stopped and reset after 1 sequence has been completed.

### ③ Brake release switch

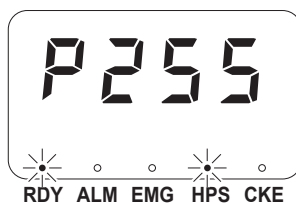
In the BKNOM position (down), the electromagnetic brake is on. Normally, the switch would be set to BKNOM (down). Moving the switch to the BKRLS position (up) switches off the electromagnetic brake.

#### **⚠ CAUTION**

When the electromagnetic brake is switched off, the Z axis will fall down and may be dangerous. When switching off the electromagnetic brake, be sure to support the Z axis.

### ④ Panel window

This shows the status of the table-top type robot (IAI-made TTA-A4 series). When the display is as shown in Fig. 4-4, program operation is possible.



Program operation is possible.

Fig. 4-4

The meaning of the LEDs under the panel window is shown in Table 4-1.

Table 4-1

Name	Color	Description
RDY	Green	Program operation is possible.
ALM	Orange	Error greater than the operation release level, such as a software limit error, etc. has occurred.
EMG	Red	Emergency stop box (button) has been pressed.
HPS	Green	Return to origin completed.
CKE	Orange	-

For detailed information about each LED, see “Names and functions of each part” in the instruction manual for the table-top type robot (IAI-made TTA-A4 series).

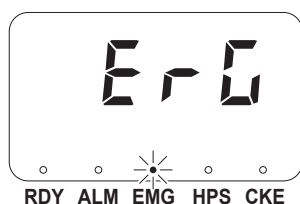
⑤ Operation mode selector switch

When using Easy Programming Software, the mode should always be set to AUTO.  
The software cannot be used in MANU mode.

⑥ Emergency stop button

Sets emergency stop condition. To release, turn clockwise or pull.

When the emergency stop button is pressed, the panel window will be as shown in Fig. 4-5.



Emergency stop condition

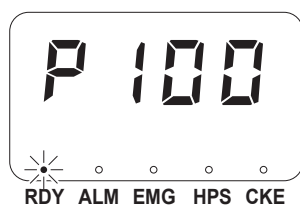
Fig. 4-5

⑦ ORIGIN button

Button to return robot to origin. The axes will move in the order of Z axis →  $\theta$  axis → X + Y axes.

Always return robot to origin after switching power on. For origin position, see p.6 of “2-2 Dimensions of table-top type robot (IAI-made TTA-A4 series)” in “2. Specifications”.

While robot is returning to origin, the panel window will be as in Fig. 4-7.



During return to origin

Fig. 4-7

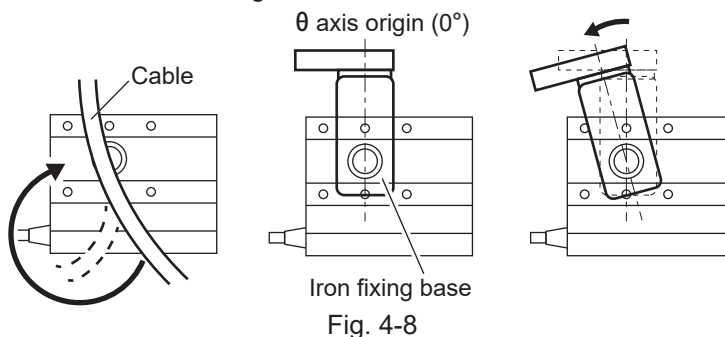


Fig. 4-8

**⚠ CAUTION**

When the  $\theta$  axis is turning while returning to origin, there is a danger that the cable may become wrapped in while it is turned.

If there is a risk of the cable becoming wrapped in, immediately press the emergency stop button and turn the Iron fixing base counterclockwise so that it is a little past the origin ( $0^\circ$ ) of the  $\theta$  axis when viewed from above, and then press the ORIGIN button again (See Fig. 4-8).

⑧ CLEANING button

Clean the soldering iron tip using the CX1003 (cleaner).

The cleaner position and cleaning method can be set using the Easy Programming Software.

See p. 69-73 of “7-3 Setting the cleaner” in “7. How to use”.

During cleaning, the panel window will be as shown in Fig. 4-9.



Fig. 4-9

⑨ RS-232C connector (25 pin)

D-sub 25 pin connector. Used for connecting the table-top type robot (IAI-made TTA-A4 series), PC, and the emergency stop box via RS-232C cable, conversion adapter, and USB cable.

For the connection method, see p.51 of “Connection Example 1” in “5-3 Connecting with PC” of “5. Installation and Connection”.

⑩ USB connector

Connector for using a USB cable to connect the table-top type robot (IAI-made TTA-A4 series) and PC. For the connection method, see p.51 of “Connection Example” 2 in “5-3 Connecting with PC” in “5. Installation and Connection”.

⑪ START button

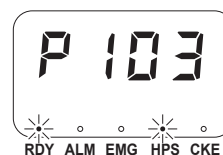
When the START button is ON, the soldering program selected using ⑤ Program selector switch will be started. While the program is running, the panel window will be as shown in Fig. 4-6.



Fig. 4-6

**NOTE:**

When soldering program is controlled from the Easy Programming Software, the panel window will show “P103”.



⑫ Program selector switch

A switch to select the program number to operate from the program stored in the table-top type robot (IAI-made TTA-A4 series). Selectable program number is from 01 to 10.

When “START button” is pressed ON, the selected soldering program number will start.

**NOTE :**

Program No. can be controlled also from external devices.

See p.106 of “Control from external devices” in “7-5 Detailed setting” in “7. How to Use”.

## 4-1-2 Rear panel

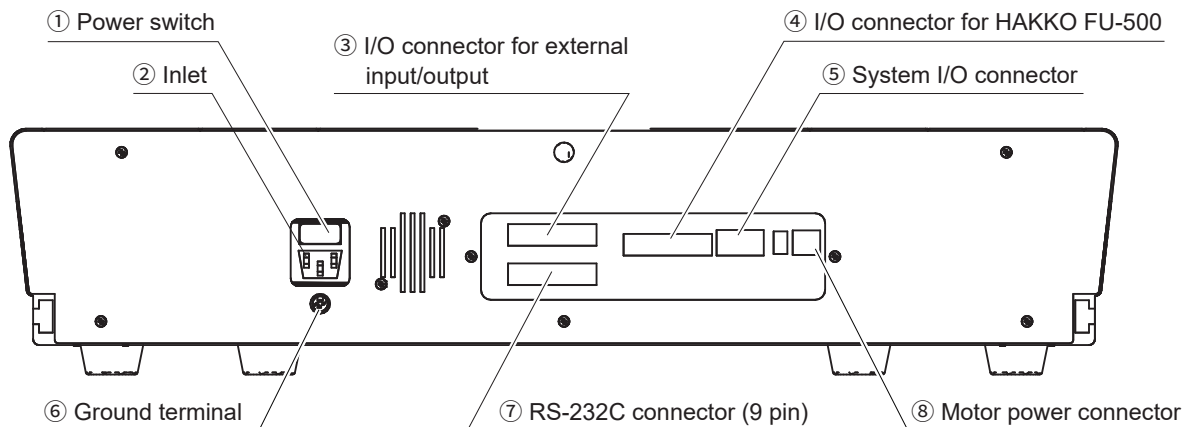


Fig. 4-10

### ① Power switch

Switch for switching main power ON/OFF.

### ② Inlet

Connector for connecting power cord.

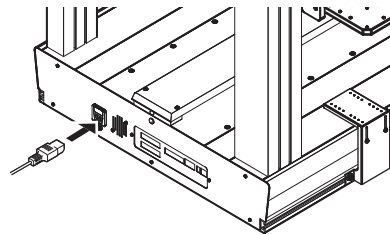


Fig. 4-11

### ③ I/O connector for external input/output

I/O connector for external input/output. Used to associate input signals and output signals when running the program. The output signal time can be set in “Options” in the settings of the Easy Programming Software.

For the pin layout for wiring, see p.54 of “5-4-2 Connection of I/O connector for external input/output” in “5. Installation/Connection”.

See p.105 of “Setting output time” in “7-5 Detailed setting” in “7. How to use”.

Used when an external program device is connected to the terminal block included with the table-top type robot (IAI-made TTA-A4 series).

### ④ I/O connector for HAKKO FU-500

Connector for connecting HAKKO FU-500 and CX1003.

For the pin layout for wiring, see p.53 of “5-4-1 Connection of I/O connector for HAKKO FU-500” in “5. Installation and Connection”.

### ⑤ System I/O connector

Connector for plugging in the system I/O connector (12 pin) included in the table-top type robot (IAI-made TTA-A4 series) set. The system will not operate if the connector is not connected.

System I/O connector wiring layout

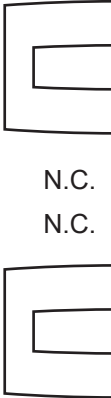
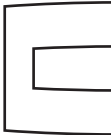
	Signal name	Pin number	
N.C.	ENBS2-	1	Enable contact output 2
N.C.	ENBS2+	2	Enable contact output 2
	ENBS1-	3	Enable contact output 1
	ENBS1+	4	Enable contact output 1
	ENBOUT	5	Enable 24V output
	ENBIN	6	Enable input
N.C.	EMGS2-	7	Emergency stop contact output 2
N.C.	EMGS2+	8	Emergency stop contact output 2
	EMGS1-	9	Emergency stop contact output 1
	EMGS1+	10	Emergency stop contact output 1
	EMGOUT	11	Emergency stop 24V output
	EMGIN	12	Emergency stop input

Fig. 4-12

#### NOTE:

By changing the wiring layout of the emergency stop contact output, an external emergency stop device can be installed. (For wiring layout examples, see p.52 “\*How to set up an external stop device” in “5-3 Connecting with PC” in “5. Installation and Connection”.)

### ⑥ Ground terminal

Terminal for grounding the table-top type robot (IAI-made TTA-A4 series) main body.

#### ⚠ CAUTION

For details about items for the table-top type robot (IAI-made TTA-A4 series) not described in this manual, see “Names and functions of Each part”, “Chapter 2: Installation”, and “Chapter 3: Wiring” in the instruction manual for the table-top type robot (IAI-made TTA-A4 series).

### ⑦ RS-232C connector (9 pin)

D-sub 9 pin connector for connecting table-top type robot (IAI-made TTA-A4 series) and PC using an RS-232C cable. For the connection method, see p.51 of “Connection Example 3” in “5-3 Connection with PC” in “5. Installation and Connection”. To use this connection method, a new setting file must be installed.

### ⑧ Motor power connector

Inlet for the motor power connector (2 pin) included in the table-top type robot (IAI-made TTA-A4 series) set. If the connector is not connected, the motor will not operate.

Motor power connector wiring layout


	Signal name	Pin number	
	MPO	1	Motor drive power supply output
	MPI	2	Motor drive power supply input

Fig. 4-13

## 4-2 Easy Programming Software screens

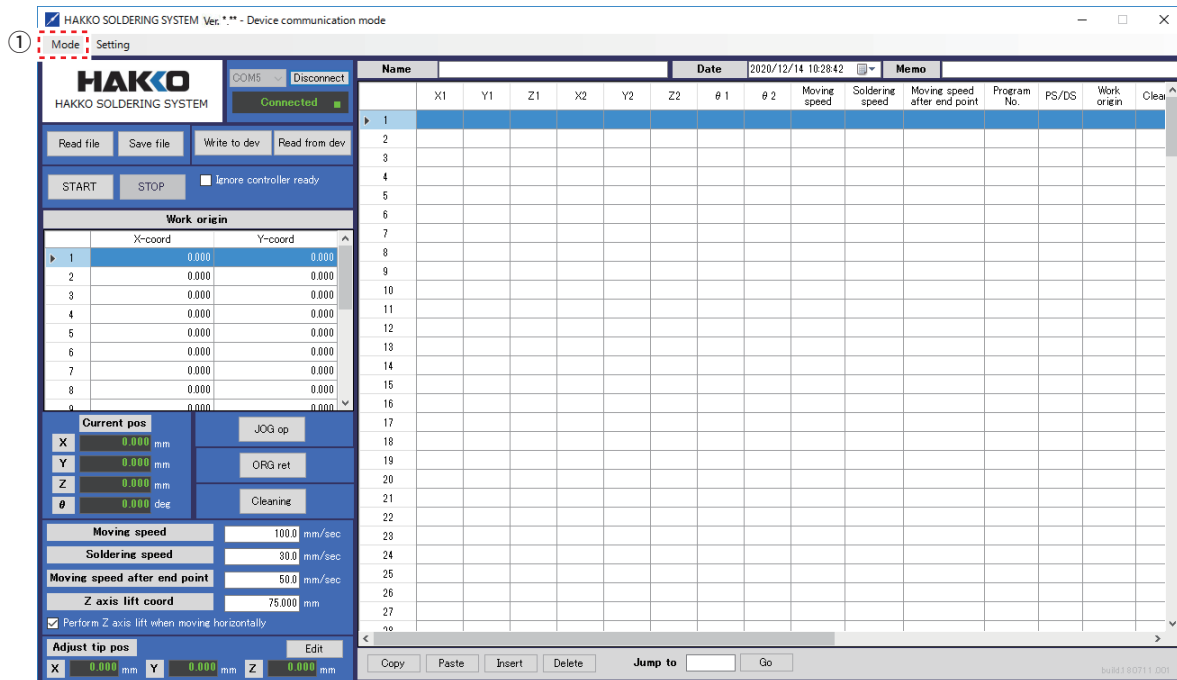


Fig. 4-14

### ① Mode selection

#### Device communication mode

Mode which the soldering program can be written to the device.  
The number of program which can be written is from 1 to 10.  
Soldering settings of maximum 240 points can be set in a single soldering program.

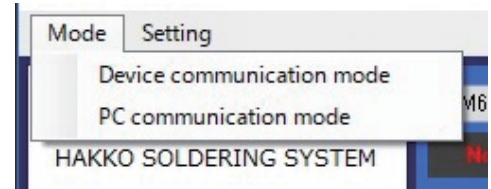


Fig. 4-15

#### PC communication mode

Mode for running a soldering program from PC when the robot is connected to PC.  
Use this mode when running soldering programs with more than 240 points.  
It is not possible to write soldering programs to the table-top type robot (IAI-made TTA-A4 series) in PC communication mode. Save the soldering program on the PC as a CSV file.

### ② Settings

#### Option

When Option is clicked in Fig. 4-16, the Option screen shown in Fig. 4-18 will be shown.

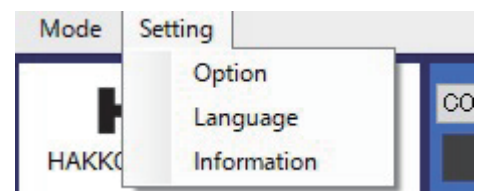


Fig. 4-16

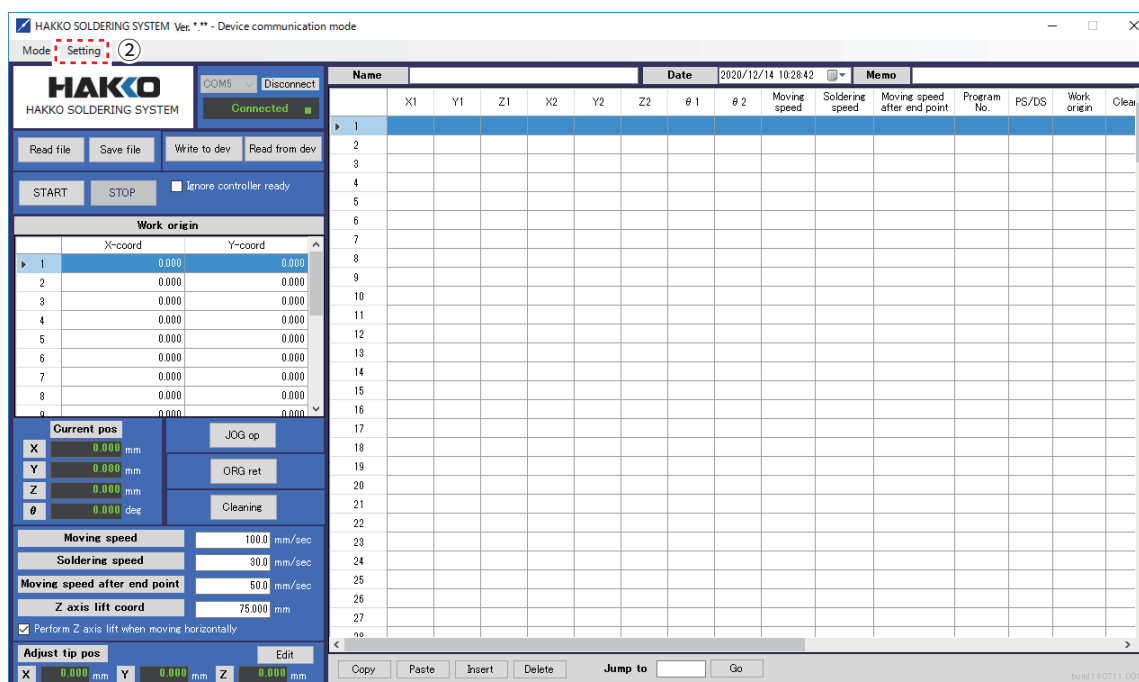


Fig. 4-17

- (1) Cleaning by air
- (2) Cleaning by brush

- Operate (ON/OFF)
- This is the setting for coordinates of start point/end point (X/Y axis: 0 to 400 mm/ Z axis: 0 to 150 mm/θ axis: -200 to 200 degrees), cleaner time (cleaning time: 0 to 99.9 sec), and movement speed (moving speed: 1 to 800 mm/sec) when cleaning. (See Fig. 4-18.)

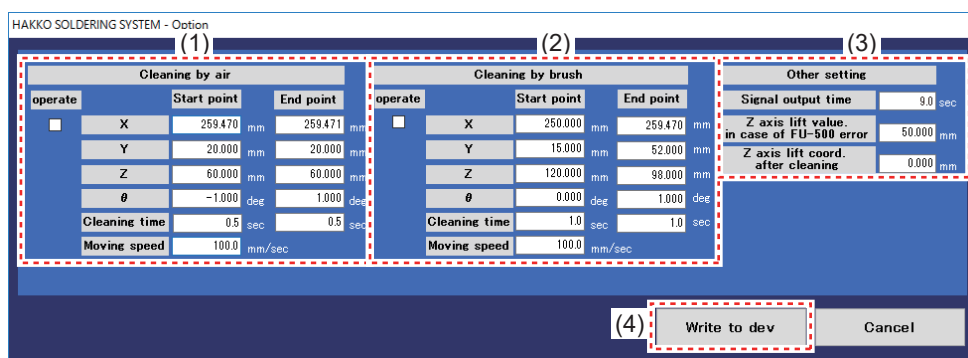


Fig. 4-18

- (3) Other setting

- Signal output time (0.1 to 9.9 sec)  
This is the setting for signal output time from table-top type robot (IAI-made TTA-A4 series) to external device.
- Z axis lift value in case of FU-500 error (0 to 150 mm)  
This is the setting of Z axis lift coordinate in case an error occurs to HAKKO FU-500.
- Z axis lift coord. after cleaning (Z axis: 0 to 150 mm)  
This is the setting for the tip coordinate after cleaning.

See p.105 of “\*Control from external devices” in “7-5 Detailed setting” in “7. How to use” for the setting method.

- (4) Clicking Write to device writes the settings to the robot. Since these settings are written to the memory of the table-top type robot (IAI-made TTA-A4 series), it is necessary to perform the settings for each

#### Language

Clicking Language will enable the language to be set to Japanese, English, or Chinese (Traditional) as shown in Fig. 4-19.

The contents of the screens will change to be shown in the selected language.

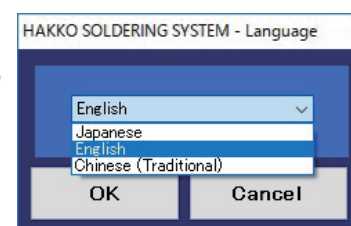


Fig. 4-19

### Model setting

From the main screen, go to [Settings], then open [Model Settings].

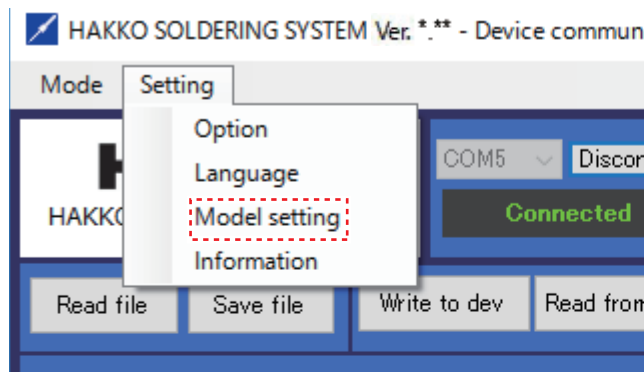


Fig. 4-20

Under Model Settings, set the stroke and the number of programs that can be registered.

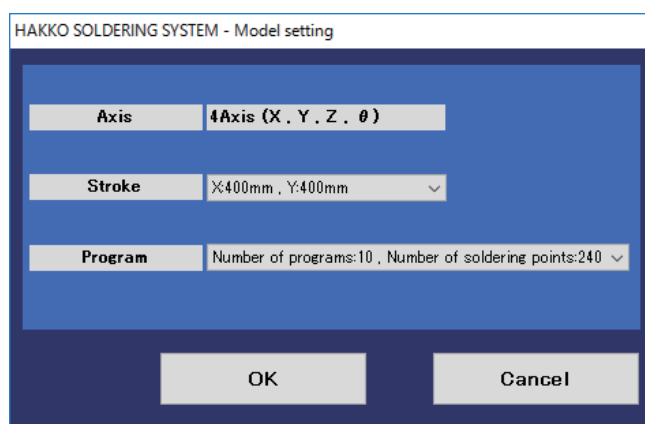


Fig. 4-21

Select the stroke according to your robot's specifications.

Example: For HU100-81Z, choose a stroke of 400×400.

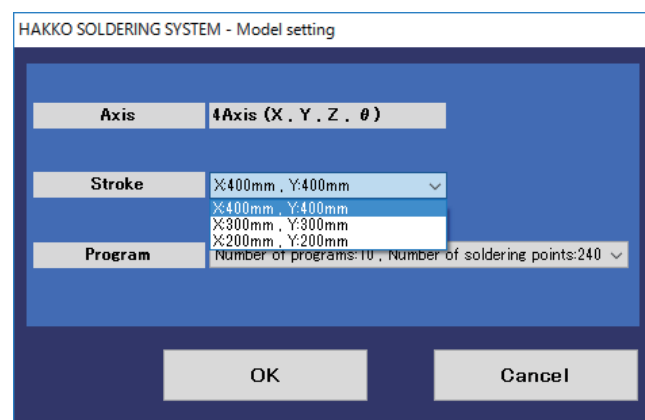


Fig. 4-22

Select the number of programs that can be registered.  
(A large number of soldering points can be registered if the number of registered programs is reduced.  
A large number of registered programs can be registered if the number of soldering points is reduced.)

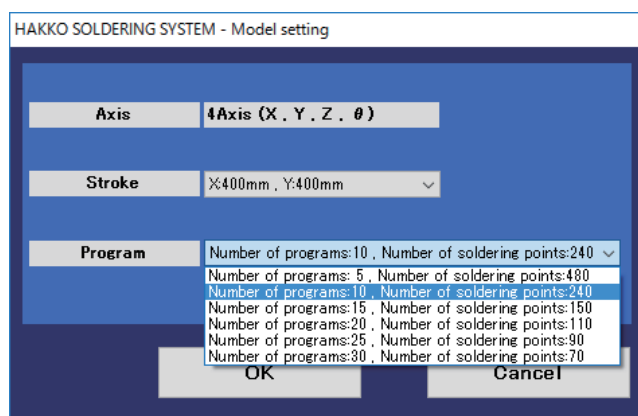


Fig. 4-23

### Information

Shows version information.

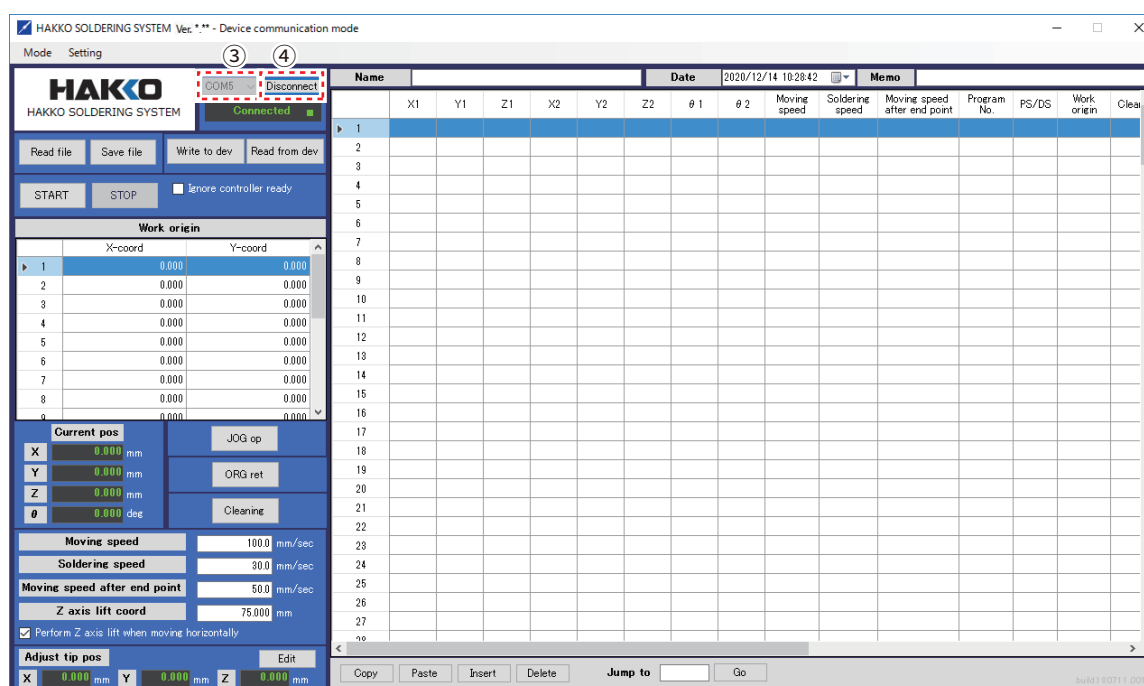


Fig. 4-24

### ③ COM\*\*

Port number when the table-top type robot (IAI-made TTA-A4 series) and PC is connected by USB cable. When connecting, select the COM port assigned by PC.

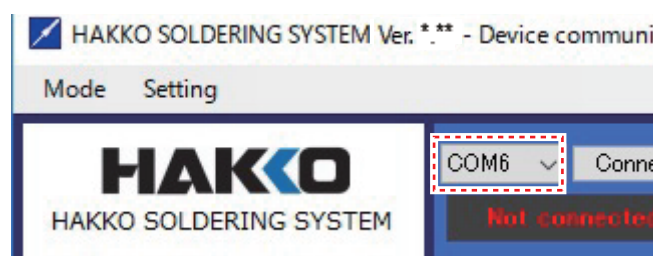



Fig. 4-25

### ④ Connect/Disconnect

When the power is switched on, and the table-top type robot (IAI-made TTA-A4 series) and PC is connected. See p.51 of “5-3 Connection with PC” and p.52-54 of “5-4 Connection with HAKKO FU-500 or external device” in “5. Installation and Connection” for setting examples), clicking Connect will cause Connected to be shown (see Fig. 4-27).

#### NOTE:

When connected, “” is blinking (see Fig. 4-27).

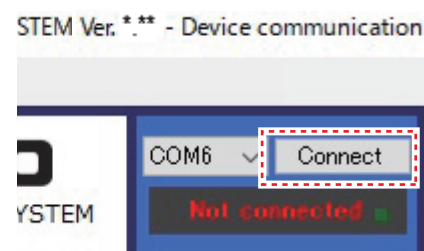


Fig. 4-26

Clicking Disconnect while Connected will cause the program to the disconnected (not connected) condition.

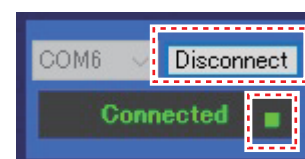


Fig. 4-27

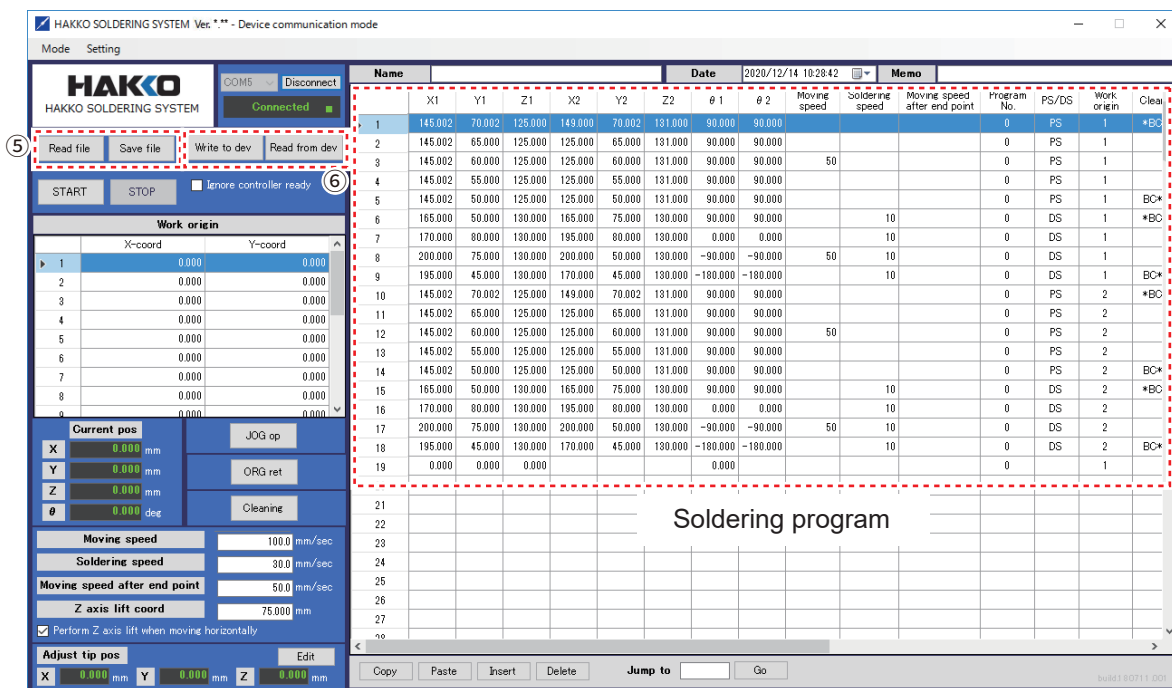


Fig. 4-28

⑤ Read file

When Read file is clicked, soldering programs stored in a CSV file can be read. The program will appear on the screen as shown in Fig. 4-28.

One line shows the soldering program setting for 1 point.

Save file

When Save file is clicked, the created soldering program will be saved as a CSV file.

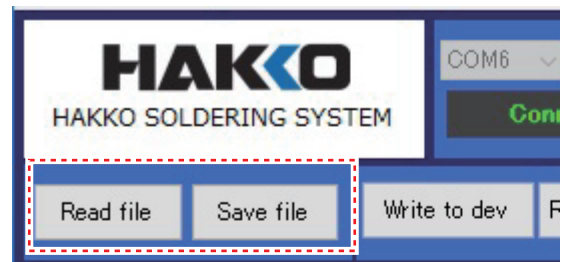


Fig. 4-29

⑥ Write to device

When Write to dev is clicked, the created soldering program will be written to the table-top type robot (IAI-made TTA-A4 series).

The program being written can be set from number 01 to 10 and a single program can contain soldering settings up to 240 points.

Read from device

When Read from dev is clicked, the created program stored in the table-top type robot (IAI-made TTA-A4 series) will be read. The program will appear on the screen as shown in Fig. 4-28.

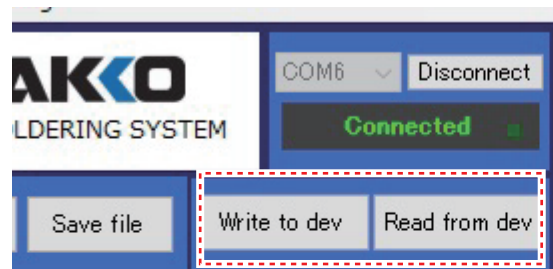


Fig. 4-30

**NOTE:**

Write to device and Read from device is shown when in Device communication mode.

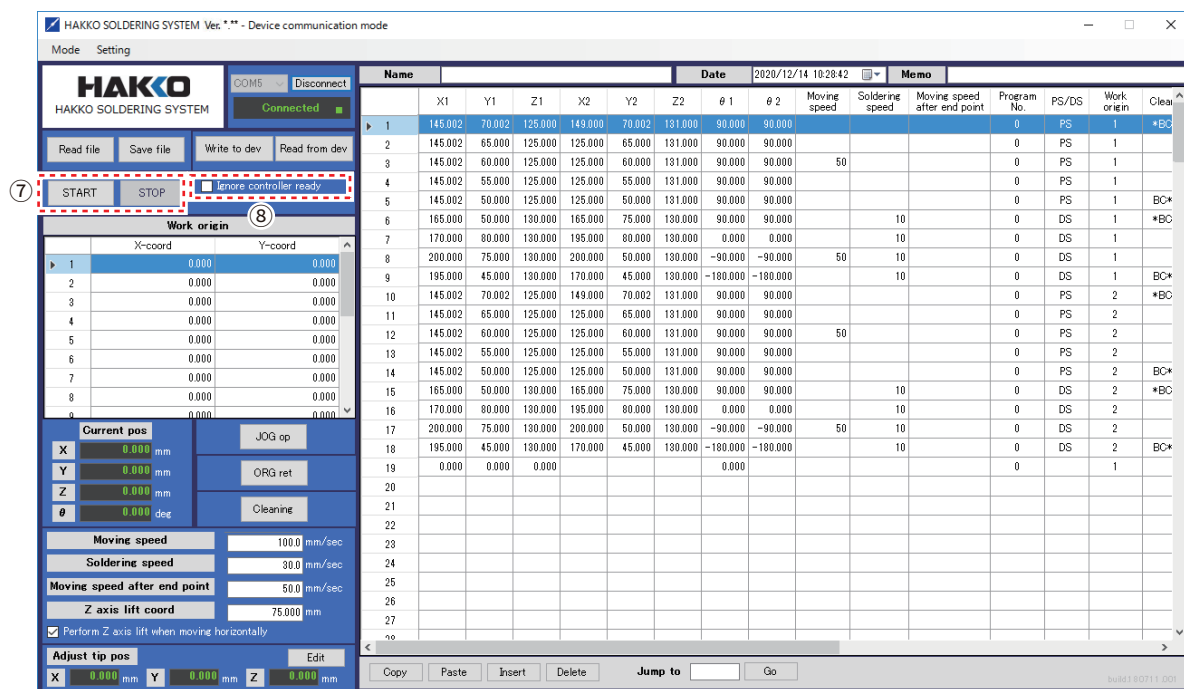


Fig. 4-31

#### ⑦ START

When START is clicked, the soldering program created using Easy Programming Software will start from the commands sent by PC.

#### STOP

When STOP is clicked, the soldering program currently running is stopped. Program operation will be stopped after 1 sequence has been completed and the program is reset.

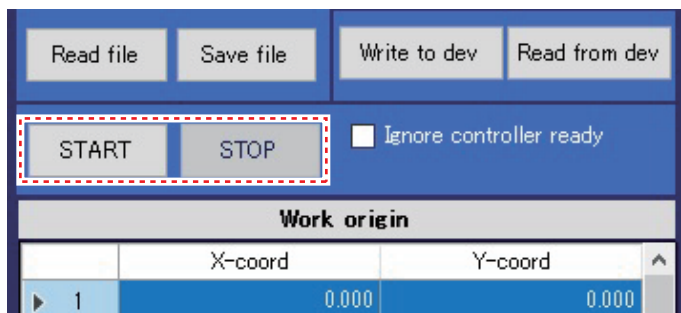


Fig. 4-32

#### ⑧ Ignore controller ready

When the checkbox is checked, it will enter mode that will not communicate with HAKKO FU-500.

#### NOTE:

Used for checking the position information of the device alone etc. for operation test.

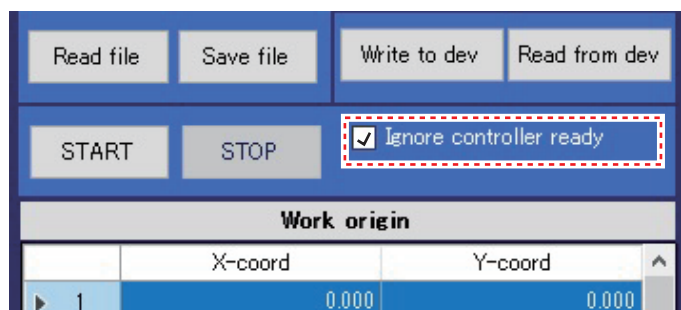


Fig. 4-33

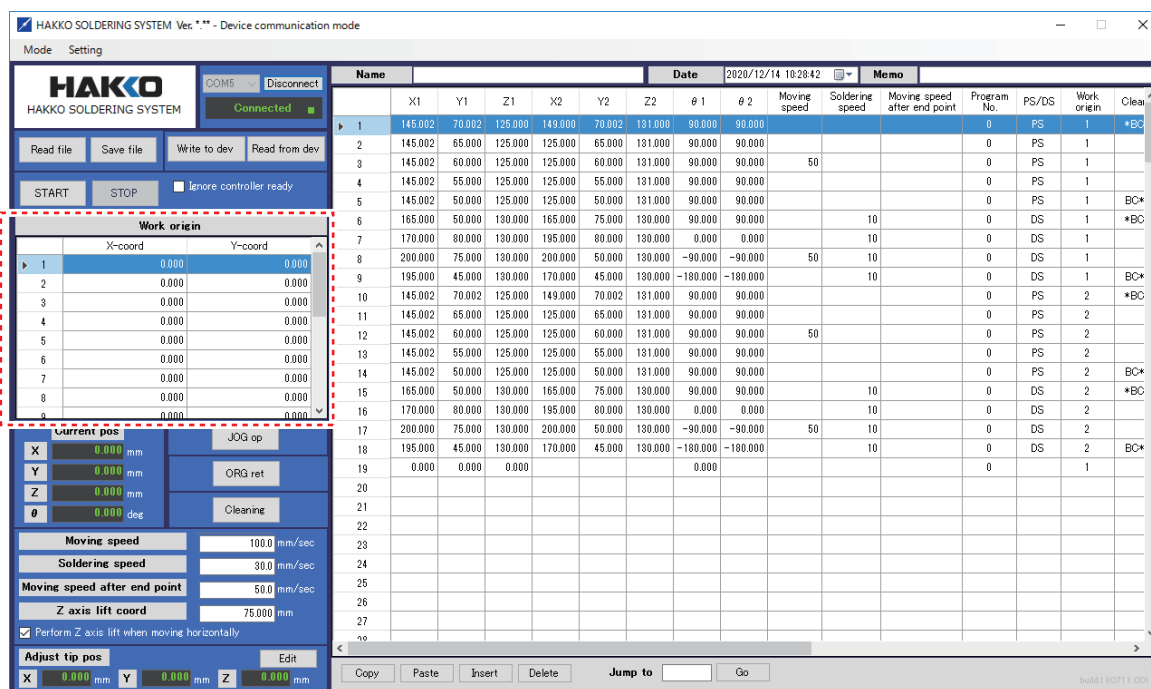


Fig. 4-34

⑨ Work origin X/Y axis (20 points)

The soldering program can be run offsetting the input values from the origin of the table-top type robot (IAI-made TTA-A4 series).

For the origin point of the X/Y axis, see p.6 of “2-2 Dimensions of table-top type robot (IAI-made TTA-A4 series)” in “2. Specifications”. For detailed information on use, see p.81 of “\*Work origin point” in “7-4-1 How to set PS (point soldering)” in “7-4 Creating soldering program” in “7. How to use”.

Work origin		
	X-coord	Y-coord
1	0.000	0.000
2	0.000	0.000
3	0.000	0.000
4	0.000	0.000
5	0.000	0.000
6	0.000	0.000
7	0.000	0.000
8	0.000	0.000
9	0.000	0.000

Fig. 4-35

**CAUTION**

Operation at coordinates exceeding the range of the origin point or stroke cannot be performed.

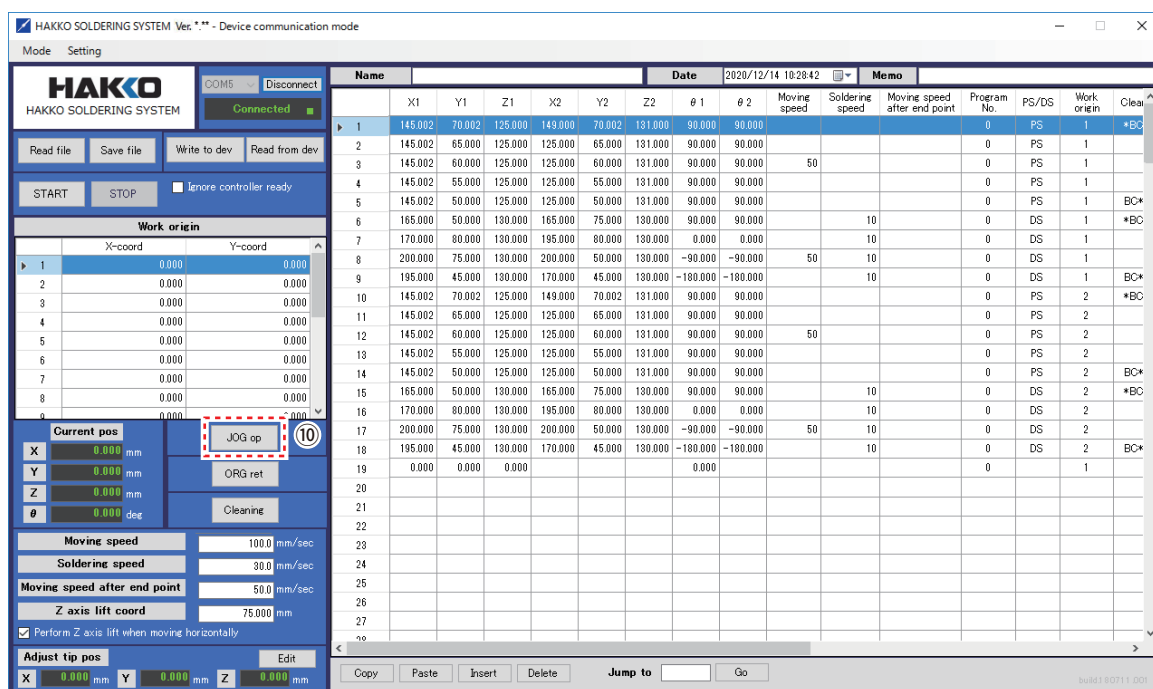


Fig. 4-36

#### ⑩ JOG operation

When JOG op is clicked, the operation screen for JOG operation will open (See Fig. 4-38). For detailed information on use, see p.62-68 of “7-2 JOG operation” in “7. How to use”.

#### ⚠ CAUTION

In order to open the JOG operation screen, return to origin must be performed first after the power is switched on.



Fig. 4-37

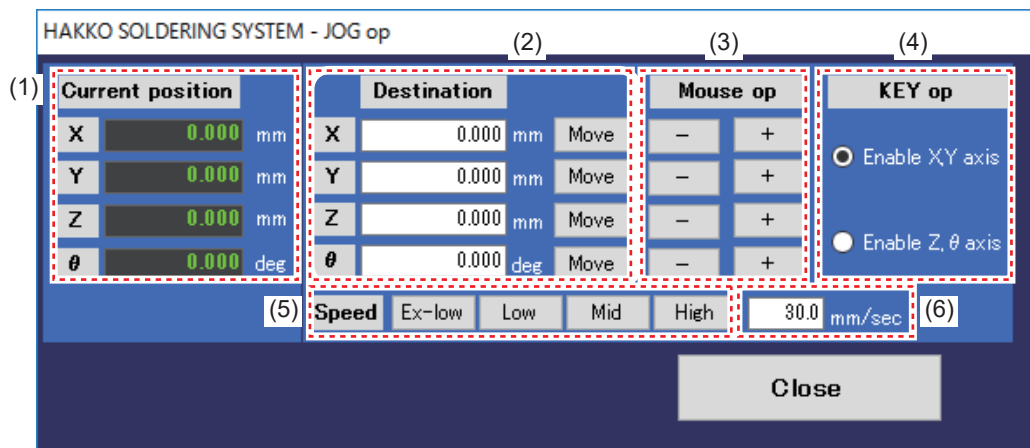


Fig. 4-38

- (1) The current coordinates are displayed.
- (2) When values are input for the coordinates and Move is clicked, the axis will move to the input coordinates.

### **⚠ CAUTION**

**When Move is clicked, movement will be performed automatically until the axis reaches the input coordinates. If there is a risk of contact, etc., press the emergency stop button immediately.**

- (3) When + or – is pressed using the mouse, the axis will move while the button is held pressed.
- (4) When ▲, ▼, ◀, or ▶ is pressed, the axis which is checked will move while the key is held pressed.  
(See Fig. 4-39 to 4-41 for movement directions when using the mouse or key operation.)
- (5) Ex-low: 5 mm/sec; Low: 30 mm/sec; Mid: 100 mm/sec; High: 200 mm/sec; Input: 1 to 800 mm/sec
- (6) Input: 1 to 800mm/sec.

Movement direction X/Y axis  
Keys in ( ) shows movement direction  
when performing key operation.

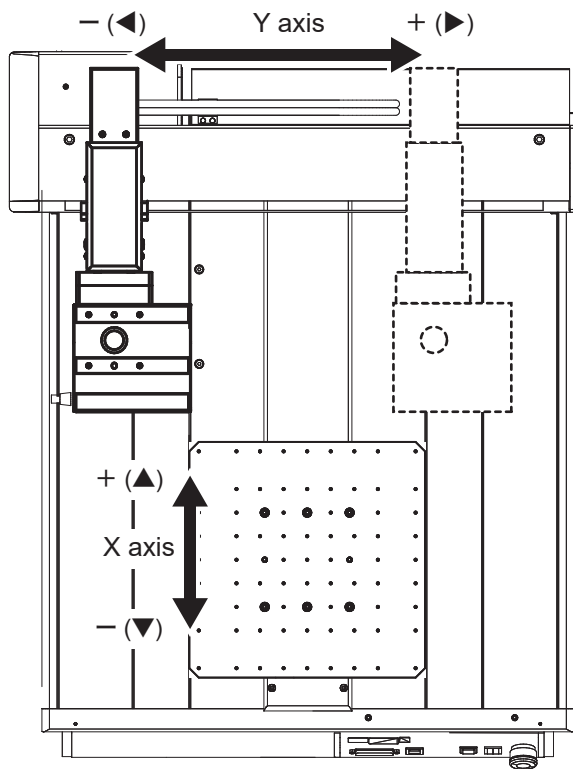


Fig. 4-39

Movement direction Z/θ axis  
Keys in ( ) shows movement direction  
when performing key operation.

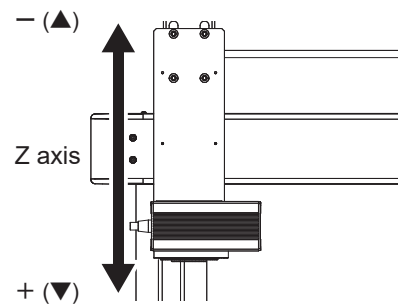


Fig. 4-40

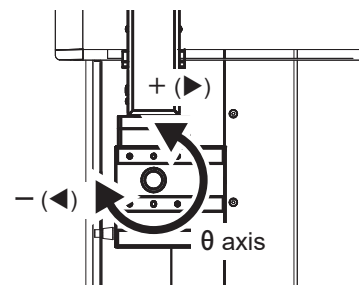


Fig. 4-41

### **NOTE:**

When “Perform Z axis lift when moving horizontally ” is checked ON, judgment to lift the Z axis to the lift coordinate before moving the X, Y, and θ axis will be performed.  
See p.62 and p.63 of “7-2-1 Basic JOG operation” in “7-2 JOG operation” in “7. How to use” for details on Z axis lift.

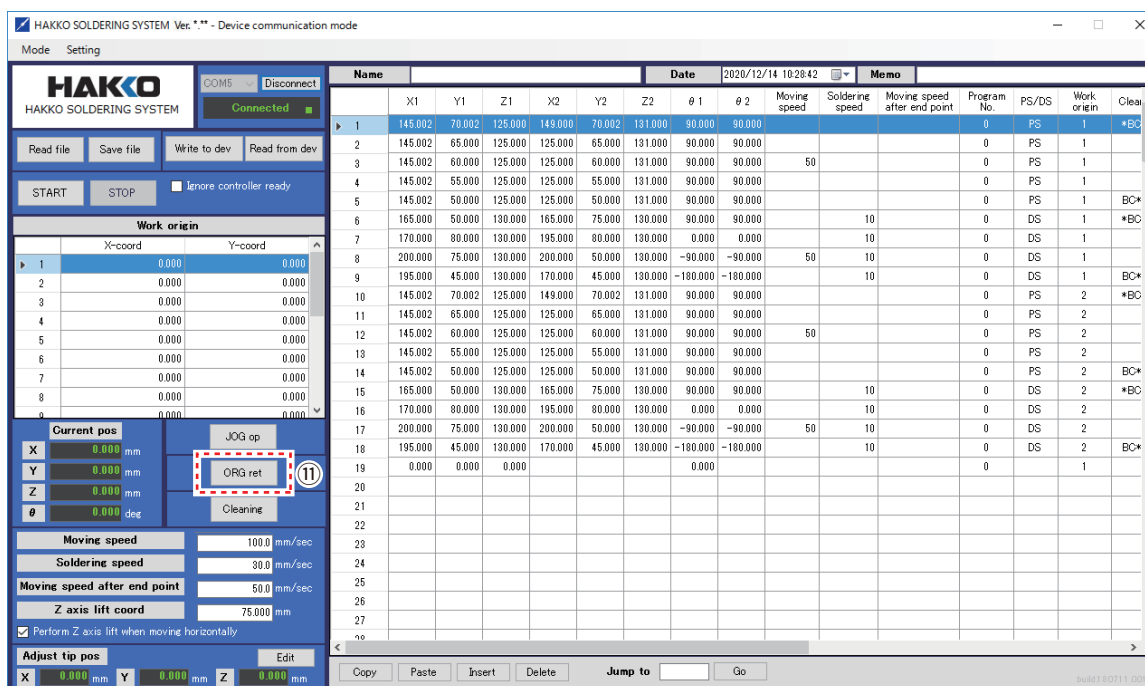


Fig. 4-42

⑪ Return to origin

When ORG ret is clicked, the soldering iron of the table-top type robot (IAI-made TTA-A4 series) will move to origin. The axes will move in the order of Z axis → θ axis → X+Y axis.

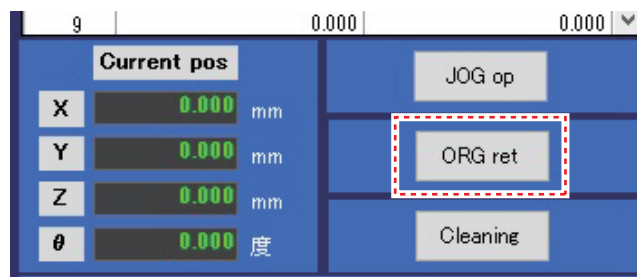


Fig. 4-43

**CAUTION**

When the θ axis is turning while returning to origin, there is a danger that the cable may become wrapped in while it is turned.

If there is a risk of the cable becoming wrapped in, immediately press the emergency stop button and turn the Iron fixing base counterclockwise so that it is a little past the origin (0°) of the θ axis when viewed from above, and then click ORG ret again (See Fig. 4-44).

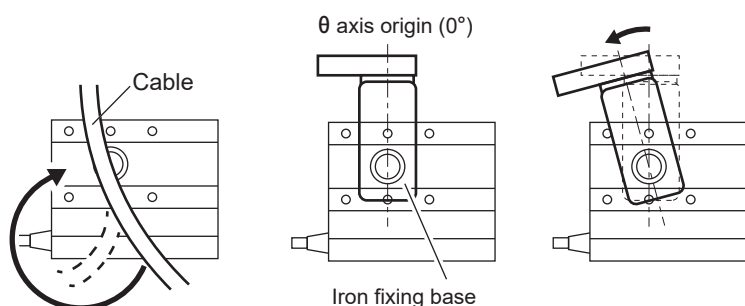


Fig. 4-44

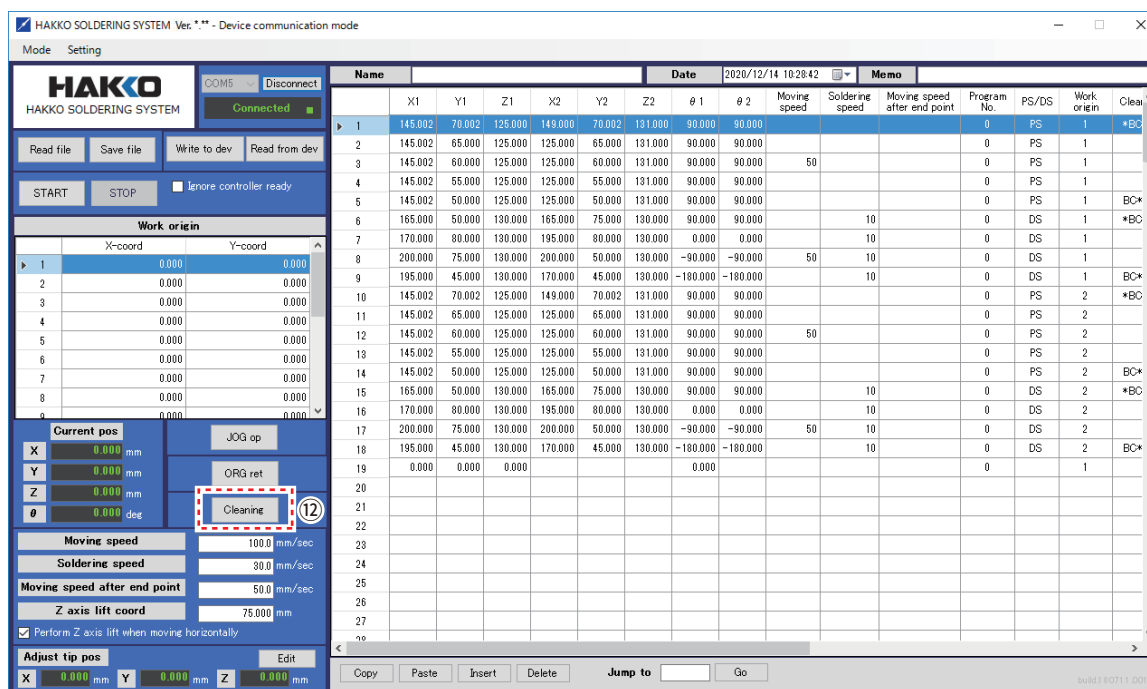


Fig. 4-45

#### ⑫ Cleaning

When Cleaning is clicked, the soldering iron of the robot will move to the set cleaning position and cleaning will be performed.  
See p.69-73 of “7-3 Setting the cleaner” in “7. How to use” for the setting method,.

There are two cleaning methods: Air and Brush

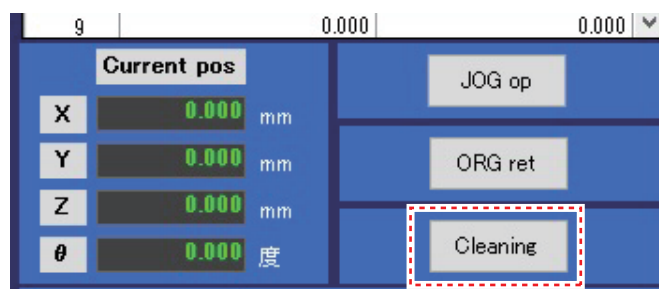


Fig. 4-46

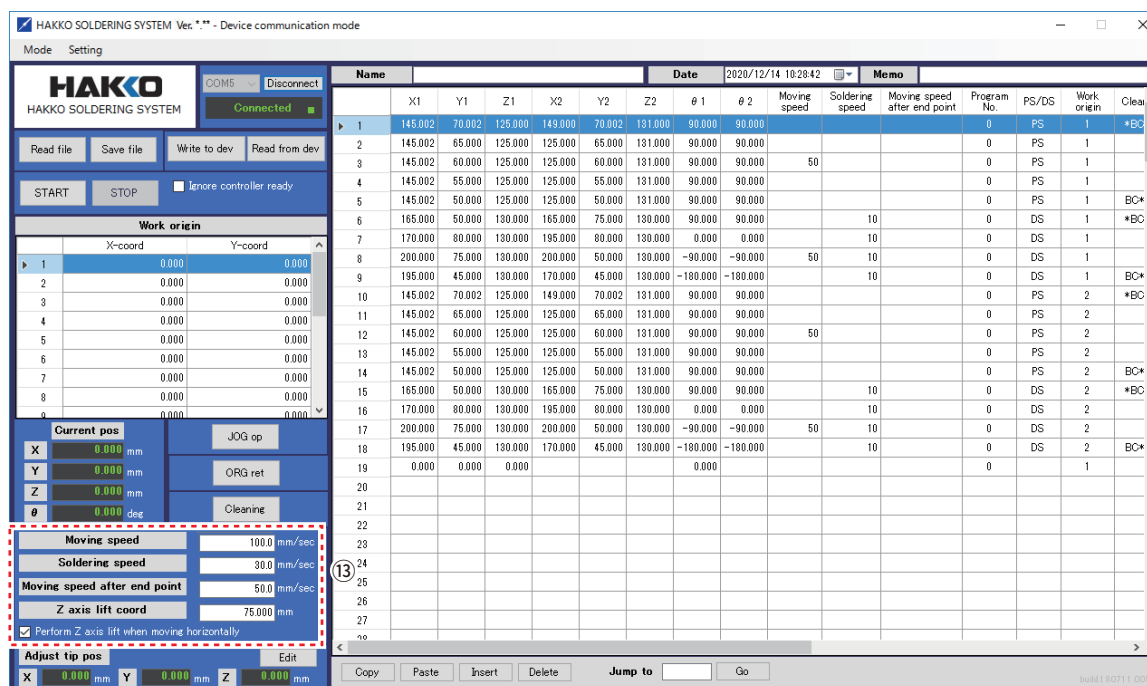


Fig. 4-47

- ⑬ The Moving speed, Soldering speed, Z axis lift coordinate, and Perform Z axis lift when moving horizontally checks are setting values for the entire program. See p.61 of “7-1 Basic operation” in “7. HOW TO USE” for the setting method.

#### Moving speed

(Settable range: 1 to 800 mm/sec)  
Sets the movement speed of the each axis.

#### Soldering speed

(Settable range: 1 to 800 mm/sec)  
Sets the soldering movement speed during primary solder and secondary solder.

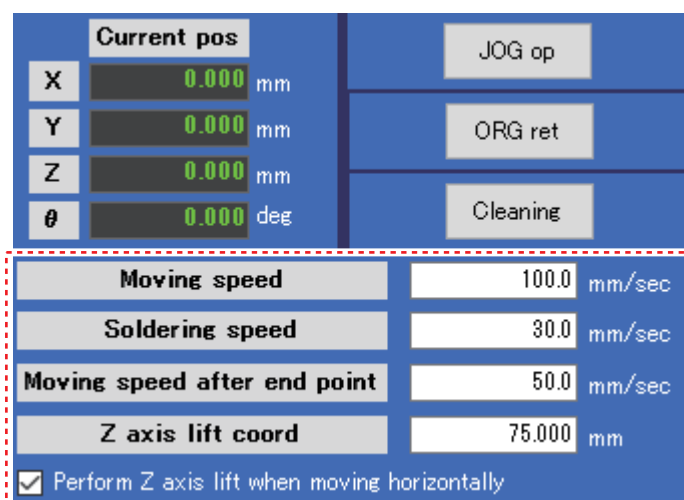


Fig. 4-48

**Z axis lift coordinate** (Settable range: 0.000 to 150.000mm)

☒ Perform Z axis lift when moving horizontally

The Z axis lift coordinate is the coordinate set to avoid contact with projecting parts on the work during horizontal movement.

For axis movement, moving of the X, Y, and  $\theta$  axes is performed before moving the Z axis. When Perform Z axis lift when moving horizontally is checked, judgement to lift the Z axis to the lift coordinates before moving the X, Y, and  $\theta$  axis will be performed.

- Current Z axis coordinate is higher than the Z axis lift coordinate  
Z axis movement is performed after X, Y, and  $\theta$  axis movement.

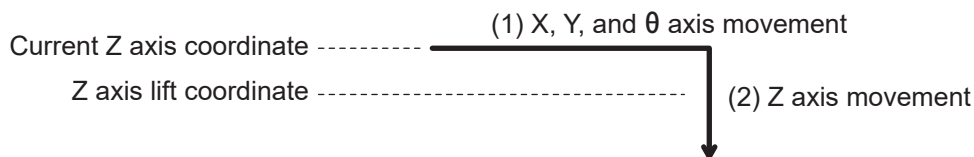


Fig. 4-49

- Current Z axis coordinate is lower than the Z axis lift coordinate  
After movement to the Z axis lift coordinate, X, Y, or  $\theta$  axis movement is performed, followed by Z axis movement.

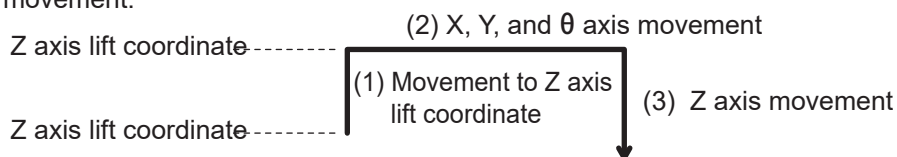


Fig. 4-50

### **⚠ CAUTION**

**When checkboxes are unchecked for fine positioning, be very careful not to come in contact with surrounding parts. Also, when operation is finished, be sure to check the checkboxes again.**

### **NOTE:**

For detail operation of Z axis lift, see p.62 and p.63 of “7-2-1 Basic JOG operation” in “7-2 JOG operation” in “7. How to use”.

**Moving speed after end point**

Moving speed after end point can set the speed of the soldering iron tip movement from the end point location. It is recommended to set this to a speed slower than the speed of movement, as solder splashes can occur if the soldering iron tip is moved away at a high speed.

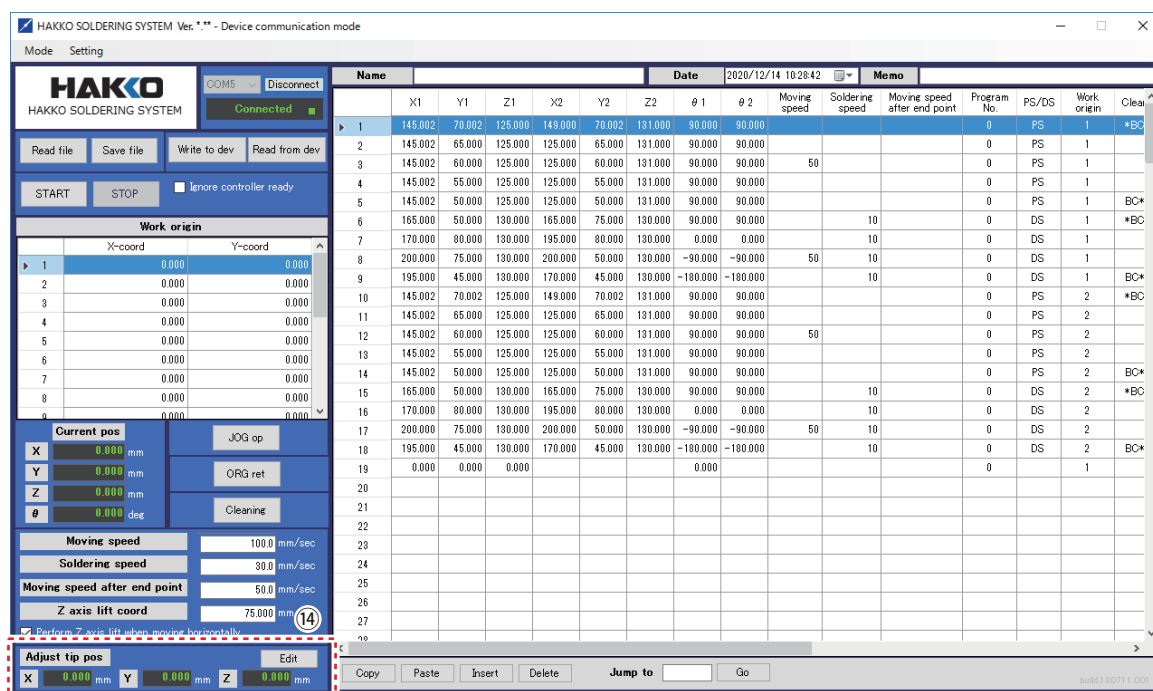


Fig. 4-51

⑭ Adjust tip position

When the soldering iron tip is worn and the dimensions have changed, tip position adjustment can be applied to adjust the soldering iron tip position without changing the coordinates.

See p.108-114 of “\* Adjust tip position” in “7-5 Detailed setting” in “7. How to use” for the setting method.

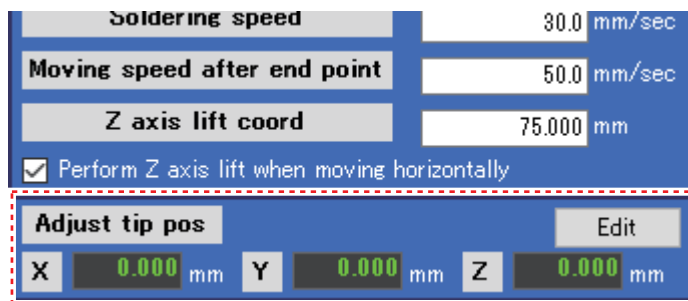


Fig. 4-52

Since the setting is written to the memory of the table-top type robot (IAI-made TTA-A4 series), it is necessary to perform the setting for each table-top type robot (IAI-made TTA-A4 series) unit.

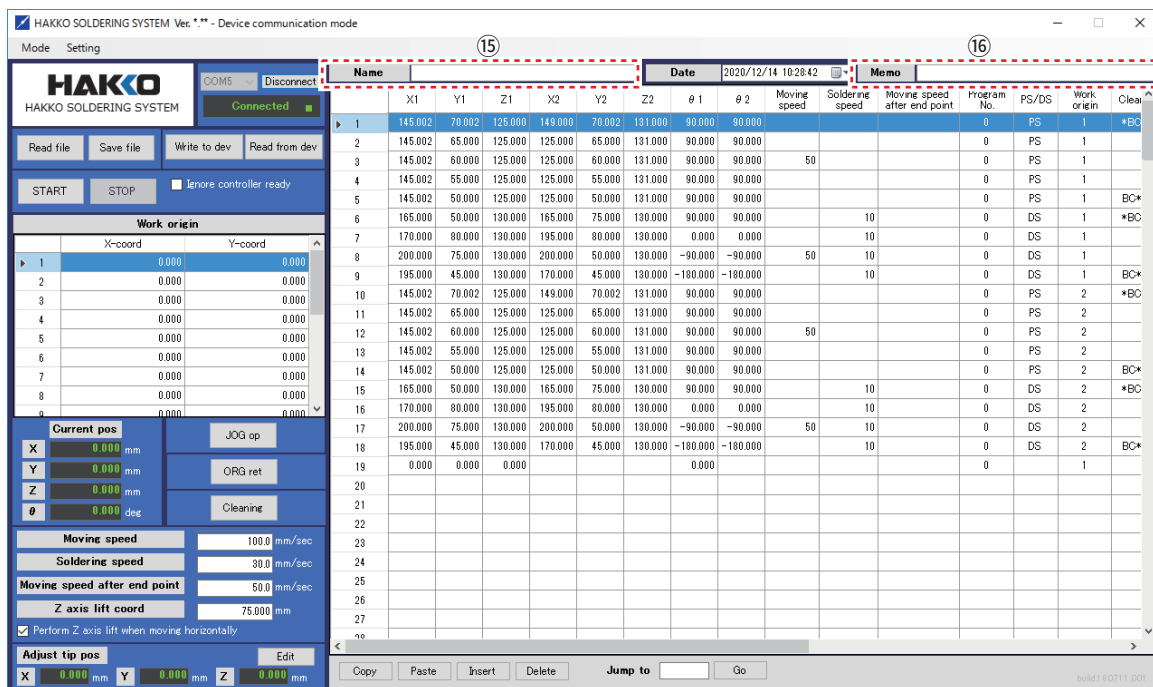


Fig. 4-53

⑮ Name

Space for inputting the (soldering) work name. The input information is stored in a CSV file. The information can also be written to the table-top type robot (IAI-made TTA-A4 series).

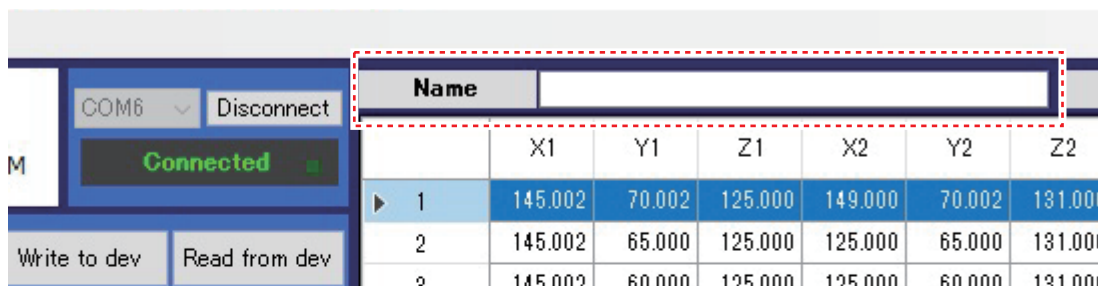


Fig. 4-54

⑯ Memo

Space for inputting information such as the type of tip or solder to use, etc. The input information is stored in a CSV file.

The information cannot be written to the table-top type robot (IAI-made TTA-A4 series).

Date	2020/12/14 10:28:42									
	Memo									
	theta 1	theta 2	Moving speed	Soldering speed	Moving speed after end point	Program No.	PS/DS	Work origin	Clear	
00	90.000	90.000				0	PS	1	*BC	
00	90.000	90.000				0	PS	1		
00	90.000	90.000				0	PS	1		

Fig. 4-55

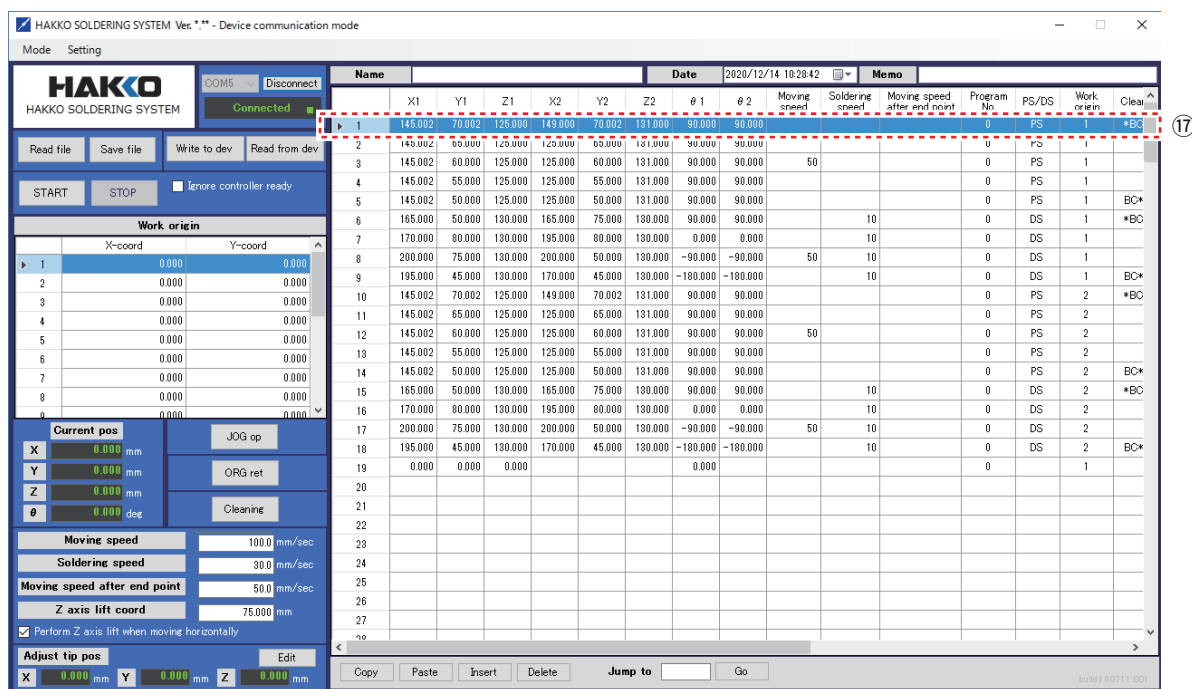


Fig. 4-56

# ⑰ Edit Point

For performing settings for soldering points.

When the line to be edited is double-clicked, the Edit Point screen (Fig. 4-58) opens.

Line No. is displayed at the upper left of the Edit Point screen.

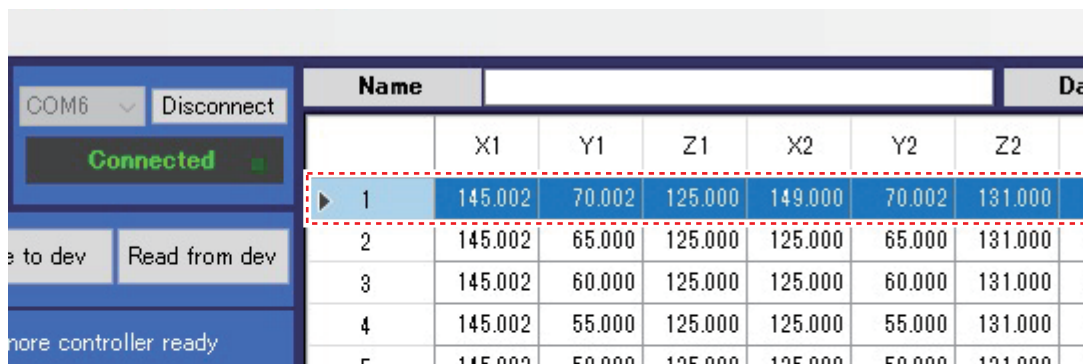


Fig. 4-57

HAKKO SOLDERING SYSTEM - Edit point

(1) Point name

NO. 1

(2) Switch

	Start point	End point
X	145.002 mm	149.000 mm
Y	70.002 mm	70.002 mm
Z	125.000 mm	131.000 mm
θ	90.000 deg	90.000 deg

(3) Soldering mode: ☒ PS ☐ DS ☐ None

Program No. 0

Work origin 1

Cleaning: ☐ Cleaning by air ☒ Cleaning by brush

☒ Before soldering ☐ After soldering

Move back to: ☒ Start point ☐ Z axis lift

I/O setting: Display Without setting

Moving speed: mm/sec

Soldering speed: mm/sec

Moving speed after end point: mm/sec

Z axis lift coord: mm

Use current pos (4)

Move OK Cancel

Fig. 4-58

(1) Point name

Space for inputting a name such as the part to be soldered, etc. for the soldering work. The input information is stored in a CSV file.

The information cannot be written to the table-top type robot (IAI-made TTA-A4 series).

(2) Start point (X/Y: 0 to 400mm, Z: 0 to 150mm, θ: -200 to 200 degrees)

Start point in PS mode: This is the coordinates for performing presoldering. (primary feed of HAKKO FU-500)

Start point in DS mode: This is the coordinates for start position of drag soldering. (secondary and tertiary feed of HAKKO FU-500)

(3) End point (X/Y: 0 to 400mm, Z: 0 to 150mm, θ: -200 to 200 degrees)

End point in PS mode: This is the coordinates of the soldering point. (secondary and tertiary feed of HAKKO FU-500)

End point in DS mode: This is the coordinates for end position of drag soldering.

For how to set each mode, see p.76 “7-4-1 How to set PS (point soldering)”, p.89

“7-4-2 How to set DS (drag soldering)”, and p.98 “7-4-4 How to set None (P.W.B. ejecting position)” in “7-4 Creating soldering program” in “7. How to use”.

(4) Use current pos

Applies the coordinates after adjusting position using JOG operation.

When the characters of Start point or End point are clicked, the clicked characters will turn red.

Use current position applies the coordinates to the red character setting. (In Fig. 4-58, the coordinates would be applied to the end point.)

HAKKO SOLDERING SYSTEM - Edit point

NO. 1 Point name

(5) Switch Start point End point

	Start point	End point
X	145.002 mm	149.000 mm
Y	70.002 mm	70.002 mm
Z	125.000 mm	131.000 mm
$\theta$	90.000 deg	90.000 deg

Use current pos

Soldering mode ☒ PS ☐ DS ☐ None

Program No. 0

Work origin 1

Cleaning ☐ Cleaning by air ☒ Cleaning by brush

☐ Before soldering ☐ After soldering

Move back to ☒ Start point ☐ Z axis lift

I/O setting Display Without setting

Moving speed mm/sec

Soldering speed mm/sec

Moving speed after end point mm/sec

Z axis lift coord mm

Move OK Cancel

Fig. 4-59

(5) Switch

When Switch is clicked, the screen will switch between start point coordinate input screen and offset input screen.

Offset amount (1 to 100 mm) is a function to set start point by inputting distance from the end point. See p.79 of “•Alternative way to set start point (Offset input)” in “7-4-1 How to set PS (point soldering)” in “7-4 Creating soldering program” in “7. How to use” for the setting method.

NO. 1 Point name

Switch Start point End point

	Start point	End point
X	145.002 mm	149.000 mm
Y	70.002 mm	70.002 mm
Z	125.000 mm	131.000 mm
$\theta$	90.000 deg	90.000 deg

Use current pos

Switch Start point End point

offset value 5 mm

	Start point	End point
X	144.000 mm	149.000 mm
Y	70.000 mm	70.002 mm
Z	131.000 mm	131.000 mm
$\theta$	90.000 deg	90.000 deg

Use current pos

Fig. 4-60

**CAUTION**

The offset amounts that can be input is limited depending on the position of each axis. It is not possible to move beyond the stroke of each axis.

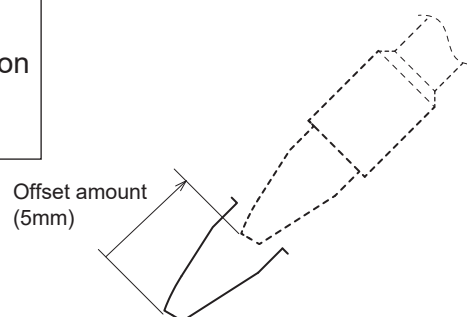


Fig. 4-61

HAKKO SOLDERING SYSTEM - Edit point

NO.	1		Point name		
Switch	Start point		End point		
X	145.002 mm		149.000 mm		
Y	70.002 mm		70.002 mm		
Z	125.000 mm		131.000 mm		
$\theta$	90.000 deg		90.000 deg		
Use current pos					
Moving speed				mm/sec	
Soldering speed				mm/sec	
Moving speed after end point				mm/sec	
Soldering mode			<input checked="" type="radio"/> PS <input type="radio"/> DS <input type="radio"/> None (6)		
Program No.			0 (7)		
Work origin			1 (8)		
Cleaning			<input type="checkbox"/> Cleaning by air <input checked="" type="checkbox"/> Cleaning by brush <input checked="" type="radio"/> Before soldering <input type="radio"/> After soldering		
Move back to			<input checked="" type="radio"/> Start point <input type="radio"/> Z axis lift		
I/O setting			Display Without setting		
Z axis lift coord					
mm					
Move			OK   Cancel		

Fig. 4-62

(6) Soldering mode

PS: Point soldering will be performed.

DS: Drag soldering will be performed.

When DS is selected, solder will be fed continuously from the start point to the end point.

None: Movement-only process.

For how to set each mode, see p.76 “7-4-1 How to set PS (point soldering)”, p.89

“7-4-2 How to set DS (drag soldering)”, and p.98 “7-4-4 How to set None (P.W.B. ejecting position)” in “7-4 Creating soldering program” in “7. How to use”.

(7) Program number (0 to 99)

Select the HAKKO FU-500 solder feed program number.

For the program setting method, see “● Selecting Program Set” of “6. Operation” of the instruction manual for HAKKO FU-500.

**⚠ CAUTION**

In the parameter set of HAKKO FU-500, the “S-U mode (selecting slide unit connecting mode)” needs to be set to Ext mode. See “● Selecting Parameter Set” of “6. Operation” of the instruction manual for HAKKO FU-500.

(8) Work origin (1 to 20)

Select the work origin point in the top screen. Soldering work will be performed at the offset position of the selected work origin.

For details on the work origin, see p.81 of “\* Work origin” in “7-4-1 How to set PS (point soldering)” in “7-4-1 How to set PS (point soldering)” in “7. How to use” on .

HAKKO SOLDERING SYSTEM - Edit point

NO.	1		Point name		
Switch	Start point		End point		
X	145.002 mm		149.000 mm		
Y	70.002 mm		70.002 mm		
Z	125.000 mm		131.000 mm		
θ	90.000 deg		90.000 deg		
Use current pos					
Soldering mode			<input checked="" type="radio"/> PS <input type="radio"/> DS <input type="radio"/> None		
Program No.			0		
Work origin			1		
Cleaning			<input type="checkbox"/> Cleaning by air <input checked="" type="checkbox"/> Cleaning by brush <input checked="" type="radio"/> Before soldering <input type="radio"/> After soldering		
Move back to			<input checked="" type="radio"/> Start point <input type="radio"/> Z axis lift		
I/O setting			Display Without setting		
Moving speed		mm/sec	Z axis lift coord		
Soldering speed		mm/sec			
Moving speed after end point		mm/sec			
Move		OK		Cancel	

Fig. 4-63

(9) Cleaning

Select the cleaning type and timing.

Cleaning by air: Cleaning is performed using an air compressor.

Cleaning by brush: Cleaning is performed using the brush of cleaner (CX1003).

Before soldering/After soldering: Selects whether to perform cleaning work before soldering or after soldering.

For setting, see p.69-73 of “7-3 Setting the cleaner” in “7. How to use”.

(10) Move back to

Select the destination to move the tip after completing soldering.

Start point: The soldering iron tip will move to the start point coordinates.

Z axis lift: The soldering iron tip will move to the Z axis lift coordinates.

When Soldering mode is set to DS (drag soldering), only Z axis lift can be selected.

**HAKKO SOLDERING SYSTEM - Edit point**

NO.  Point name

Switch	Start point	End point
X	<input type="text" value="145.002"/> mm	<input type="text" value="149.000"/> mm
Y	<input type="text" value="70.002"/> mm	<input type="text" value="70.002"/> mm
Z	<input type="text" value="125.000"/> mm	<input type="text" value="131.000"/> mm
θ	<input type="text" value="90.000"/> deg	<input type="text" value="90.000"/> deg

Soldering mode ☒ PS ☐ DS ☐ None

Program No.

Work origin

Cleaning ☐ Cleaning by air ☒ Cleaning by brush

☒ Before soldering ☐ After soldering

Move back to ☒ Start point ☐ Z axis lift

**I/O setting** **Display** Without setting (11)

Moving speed  mm/sec

Soldering speed  mm/sec

Moving speed after end point  mm/sec

Z axis lift coord  mm

Fig. 4-64

#### (11) I/O setting

When display is clicked, the screen of Fig. 4-65 will open.

Setting screen for performing signal control using an external device. INPUT is for signals input from external devices, and OUTPUT is for signals output from the table-top type robot (IAI-made TTA-A4 series). For setting how to set output signal, See p.105 of “\* Control from external devices” in “7-5 Detailed setting” in “7. How to use”.

INPUT ON: The soldering is performed when signal becomes ON.

INPUT OFF: The soldering is performed when signal becomes OFF.

OUTPUT ON: The signal will become ON when soldering has been completed.

OUTPUT OFF: The signal will become OFF when soldering has been completed.

**HAKKO SOLDERING SYSTEM - Point I/O setting**

NO.  Point name

INP1 INP2 INP3 INP4 INP5 INP6 INP7 INP8 INP9 INP10

OUT1 OUT2 OUT3 OUT4 OUT5 OUT6 OUT7 OUT8 OUT9 OUT10

OUT11

Fig. 4-65

HAKKO SOLDERING SYSTEM - Edit point

NO.	1		Point name		
Switch	Start point		End point		
X	145.002 mm		149.000 mm		
Y	70.002 mm		70.002 mm		
Z	125.000 mm		131.000 mm		
θ	90.000 deg		90.000 deg		
Use current pos					
Soldering mode			<input type="radio"/> PS <input type="radio"/> DS <input type="radio"/> None		
Program No.			0		
Work origin			1		
Cleaning			<input type="checkbox"/> Cleaning by air <input checked="" type="checkbox"/> Cleaning by brush <input type="radio"/> Before soldering <input type="radio"/> After soldering		
Move back to			<input type="radio"/> Start point <input type="radio"/> Z axis lift		
I/O setting			Display Without setting		
Moving speed		mm/sec	Z axis lift coord		mm
Soldering speed		mm/sec			
Moving speed after end point		mm/sec			
Move		OK		Cancel	

Fig. 4-66

- (12) The input values for moving speed, soldering speed, and Z axis lift coordinate in Fig. 4-62 are setting values for each individual point.

These value are not necessary, and could be left blank in the point edit screen.

If values are input for in the point edit screen, priority will be given to the input value for that point. See p.86 of “7-4-1 How to set PS (point soldering)” in “7-4 Creating soldering program” in “7. How to use” for the setting method.

**Moving speed** (1 to 800 mm/sec)

Sets the movement speed for the each axis.

### ⚠ CAUTION

**If the moving speed is set to a high value, there is a risk of contact with parts causing the part to break. Be careful not to drastically increase the speed.**

**Soldering speed** (1 to 800 mm/sec)

Sets the soldering movement speed between primary soldering and secondary soldering.

**Z axis lift coordinate** (Settable range: 0.000 to 150.000 mm)

The coordinate set to avoid contact with projecting parts on the work during horizontal movement after soldering work has been completed.

### NOTE:

For detail operation of Z axis lift, see p.62 and p.63 “7-2 JOG operation” of “7. How to use”.

**Moving speed after end point**

Moving speed after end point can set the speed of the soldering iron tip movement from the end point location. It is recommended to set this to a speed slower than the speed of movement, as solder splashes can occur if the soldering iron tip is moved away at a high speed.

HAKKO SOLDERING SYSTEM - Edit point

NO. 1 Point name

Switch

Start point End point

X 145.002 mm 149.000 mm

Y 70.002 mm 70.002 mm

Z 125.000 mm 131.000 mm

θ 90.000 deg 90.000 deg

Use current pos

Soldering mode ☒ PS ☐ DS ☐ None

Program No. 0

Work origin 1

Cleaning ☐ Cleaning by air ☒ Cleaning by brush

☒ Before soldering ☐ After soldering

Move back to ☒ Start point ☐ Z axis lift

I/O setting Display Without setting

Moving speed mm/sec

Soldering speed mm/sec

Moving speed after end point mm/sec

Z axis lift coord mm

Move (13) OK Cancel (14)

Fig. 4-67

(13) Move

When Move is clicked, the axes will move to the start point or end point. The axes will move to the active point shown in red characters.

As in Fig. 4-67, when end point is red, the axes will move to the end point.

When the characters of start point or end point are clicked, the clicked characters will turn red.

**⚠ CAUTION**

**When Move is clicked, movement will be performed automatically until the axis reaches the input coordinates. If there is a risk of contact, etc., press the emergency stop button immediately.**

(14) OK/Cancel

When OK is clicked, the edited information will be applied and the screen will return to the top screen. If necessary item has not been input, a warning message will appear and the screen will not return to the top screen.

When Cancel is clicked, the edited information will not be applied and the screen will return to the top screen. The edited information will be lost.

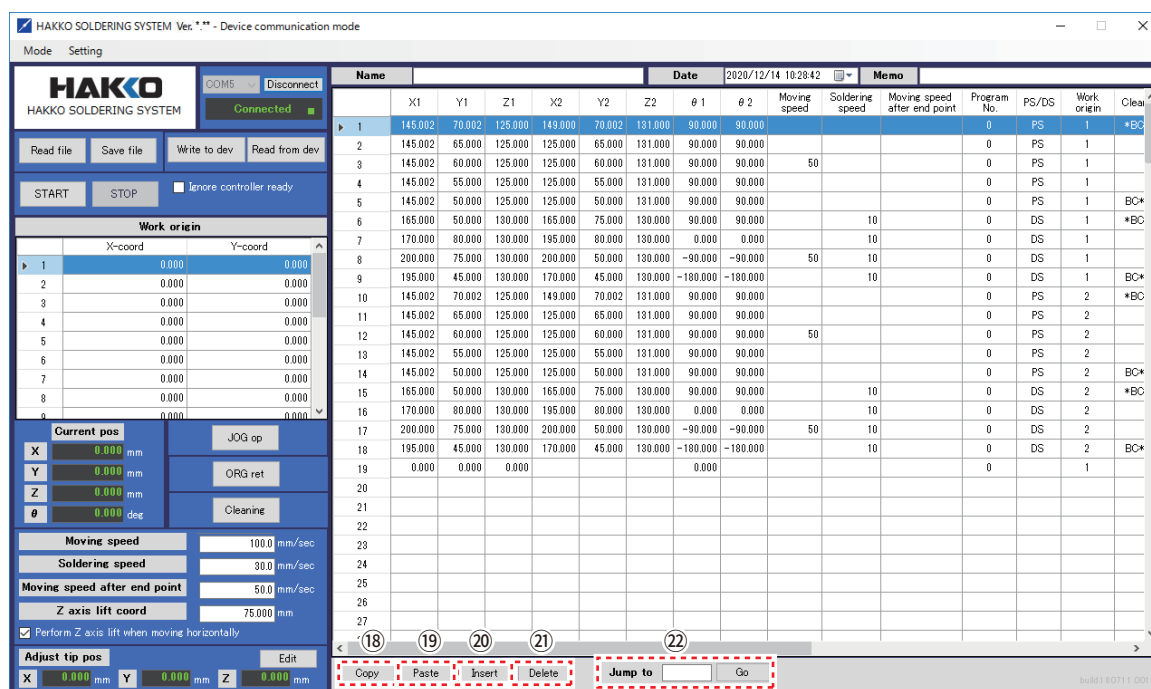


Fig. 4-68

Fig. 4-68 is shown when software is in Device communication mode.

- ⑮ Copy  
Copies the information of the soldering point of the selected row.
- ⑯ Paste  
Pastes the soldering point information copied using ⑮ to the selected row.
- ⑰ Insert  
Inserts a row.
- ⑱ Delete  
Deletes the selected row.
- ⑳ Jump to  
Input the row number to jump.  
Go  
Jumps to the input row.

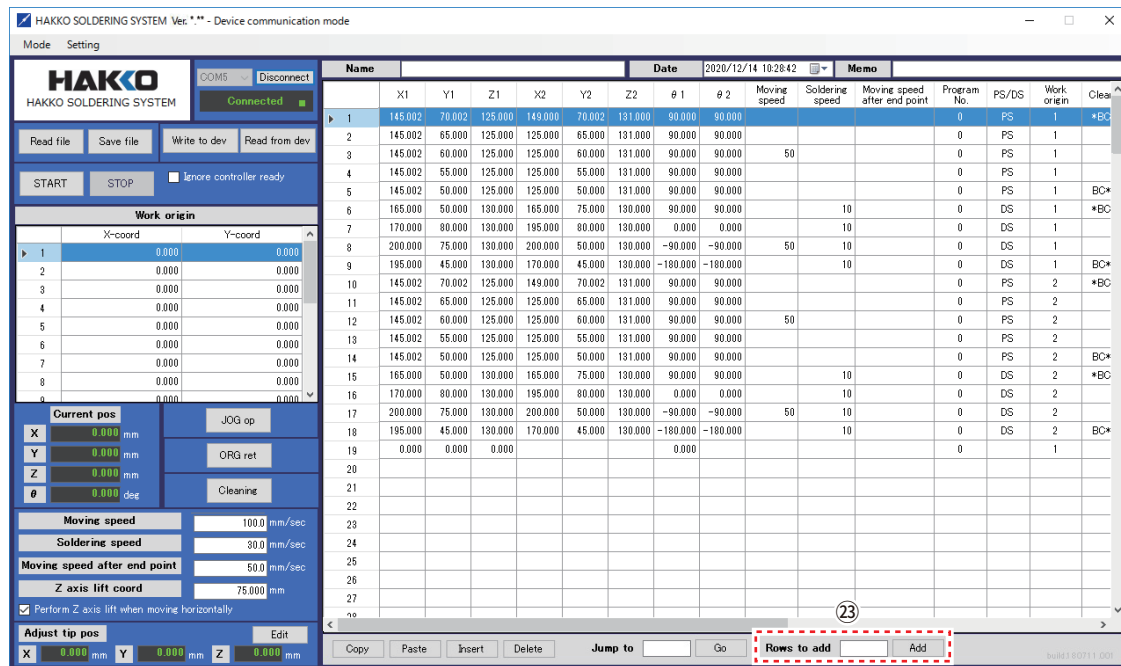


Fig. 4-69

Fig. 4-69 is shown in PC communication mode.

②③ Rows to add

Input the number of rows to be added.

Add:

Adds the input number of rows to add.

In PC communication mode, rows can be added up to a maximum of 99999 rows.

# 5. INSTALLATION AND CONNECTION

## 5-1 Installation

Place the table-top type robot (IAI-made TTA-A4 series) on a level surface.

### **⚠ WARNING**

- Carrying the table-top type robot (IAI-made TTA-A4 series) should be done by at least 2 people, or a hand cart or a hand lift should be used.
- When working by 2 or more persons during transferring or installing, clarify the superior-subordinate relationship and call out to each other checking the safety to prevent contact and falling accidents.
- In order to avoid turning-over and falling accidents, hold and secure the unit firmly.

### **⚠ CAUTION**

Since holding the plastic part may cause the unit to be broken, be careful not to hold the plastic part.

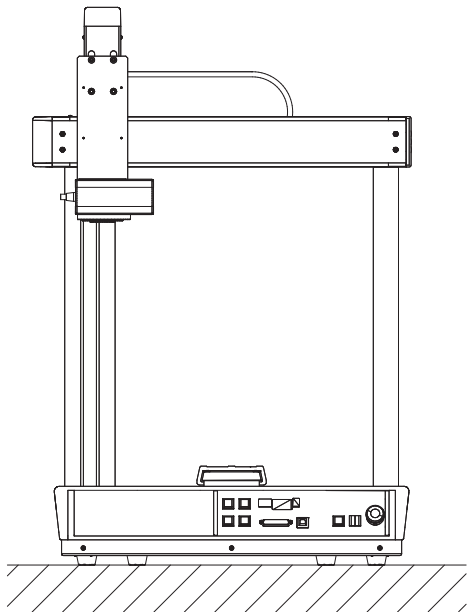


Fig. 5-1

### **⚠ CAUTION**

Be sure to connect to ground. For the grounding method of the table-top type robot (IAI-made TTA-A4 series), refer to “3.4.5 Ground wiring” of “Chapter 3 Wiring” of the instruction manual for the table-top type robot (IAI-made TTA-A4 series).

## 5-2 Mounting on table-top type robot (IAI-made TTA-A4 series)

**NOTE:**

The parts shown below are already attached to the table-top type robot (IAI-made TTA-A4 series) at the time of shipment.

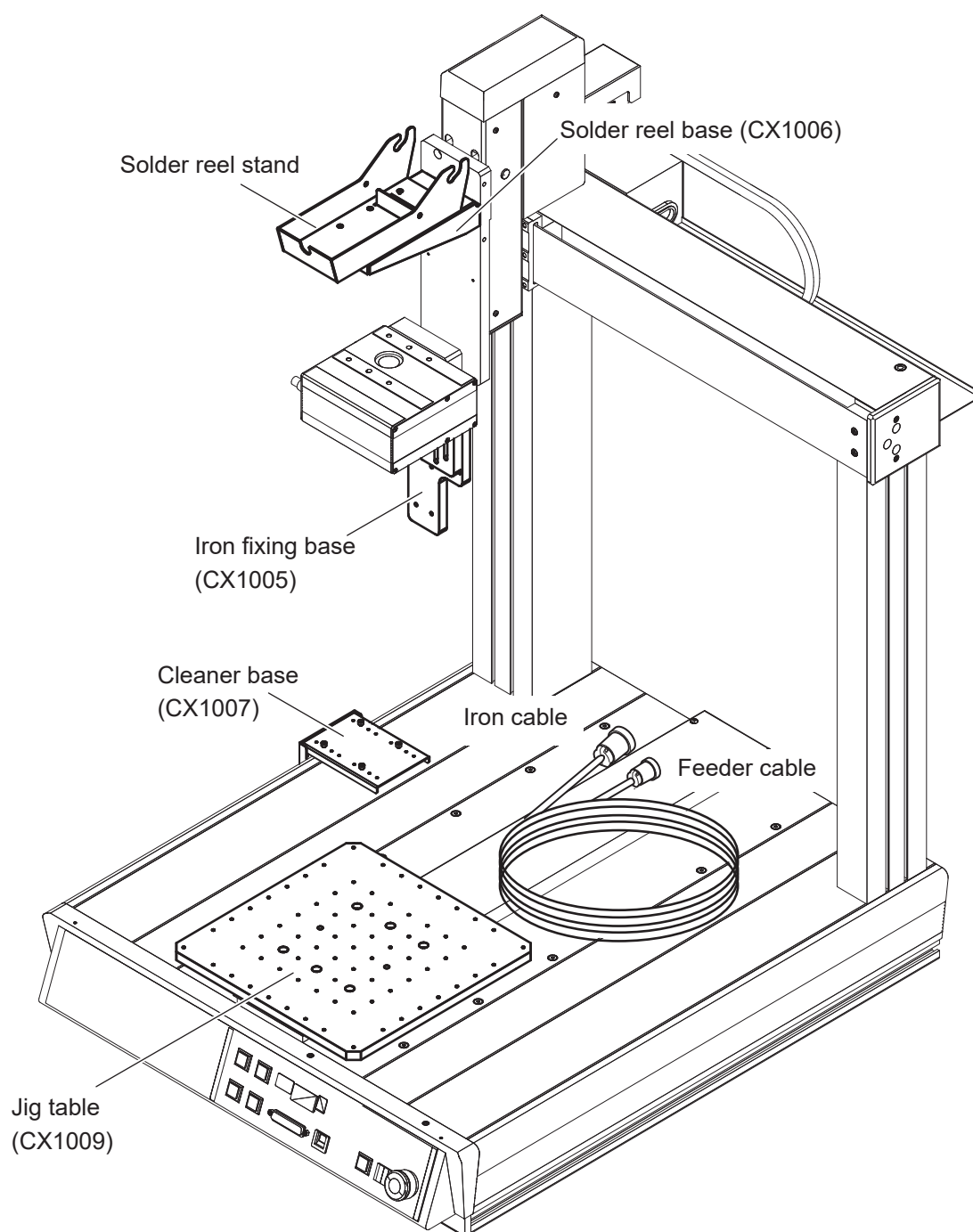


Fig. 5-2

### 5-2-1 Attachment of system I/O connector and motor power supply connector

- ① Attach the system I/O connector and the motor power supply connector.

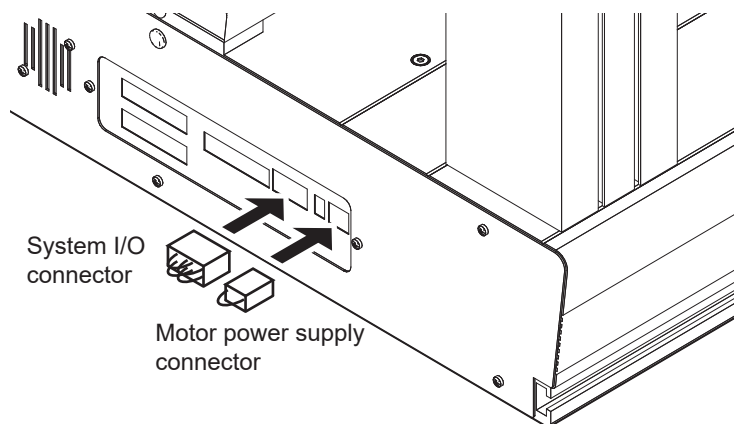


Fig. 5-3

#### **⚠ CAUTION**

Unless two connectors are plugged in, the unit will not operate.  
Be sure to plug in these connectors before use.

### 5-2-2 Attachment of the soldering unit mount and feeder unit

- ① Attach the soldering unit mount (CX1008) to the iron fixing base (CX1005).

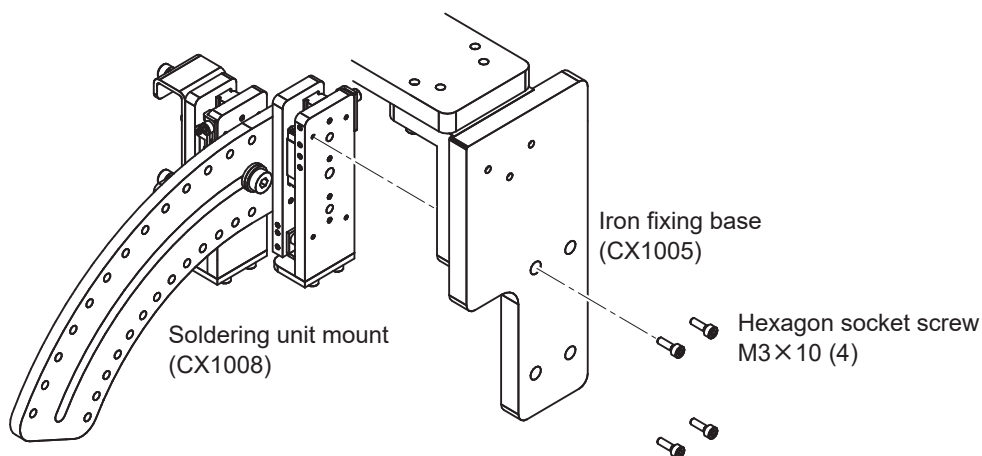


Fig. 5-4

- ② Remove the iron unit fixing assembly attached to the HAKKO FU-6002 (HAKKO FU-601 set).

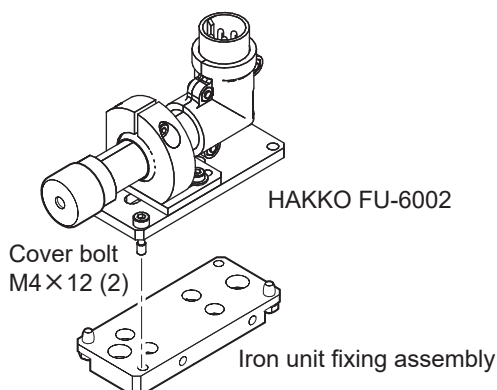


Fig. 5-5

### \*Soldering Unit Mount (CX1008)

HAKKO FU-6002 and feeder unit (CX1010) may be mounted on the soldering unit mount (CX1008) angled adjusting by 5 degrees each.

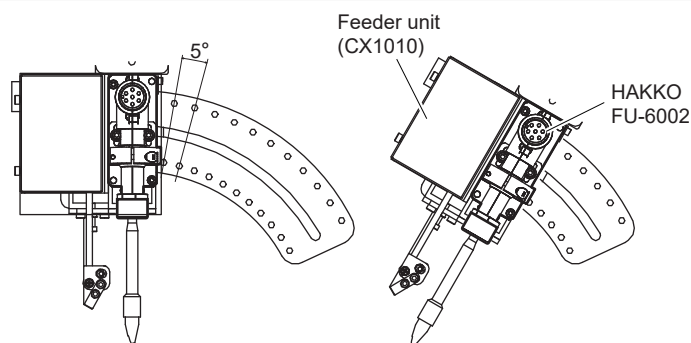


Fig. 5-6

Ex) Mount in 30° angle

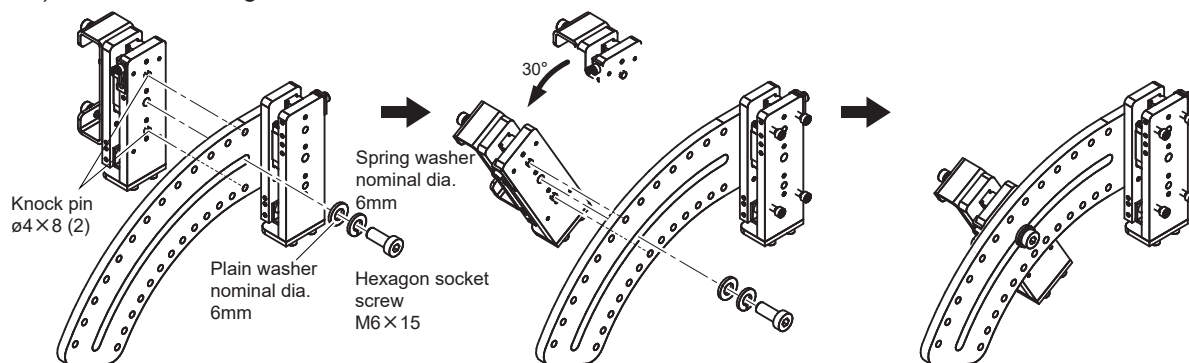


Fig. 5-7

### ⚠ CAUTION

When changing the angle, be sure that two knock pins is inserted into the mounting hole.

### Setting position of the tension spring

Tension spring is attached on both sides of the soldering unit mount (CX1008).

When changing the mounting angle of HAKKO FU-6002 and feeder unit (CX1010), change the setting position of the tension spring to adjust the pressure when the tip contacts the work.

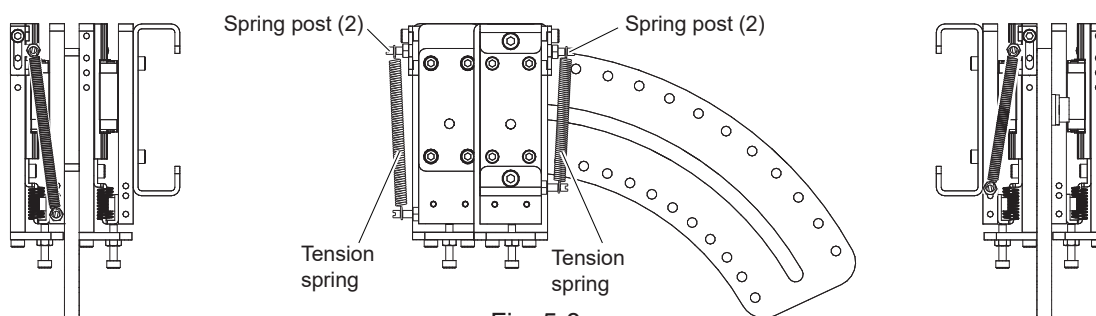


Fig. 5-8

When seen from front, the tension spring on the left side is the tension spring to support soldering unit mount (CX1008), feeder unit (CX1010), HAKKO FU-6002, and the tension spring on the right side is to support feeder unit (CX1010), HAKKO FU-6002.

Attach the spring post to the holes for spring post, and the tension spring to the spring post.

### NOTE:

By attaching the position adjuster for spring post, fine adjustment of the pressure when the tip contacts the work can be performed.

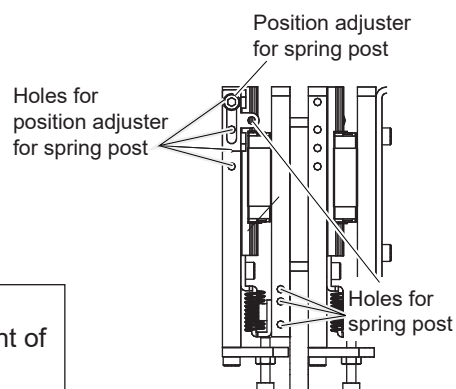


Fig. 5-9

- ③ Attach the iron fixing assembly to the soldering unit mount (CX1008).

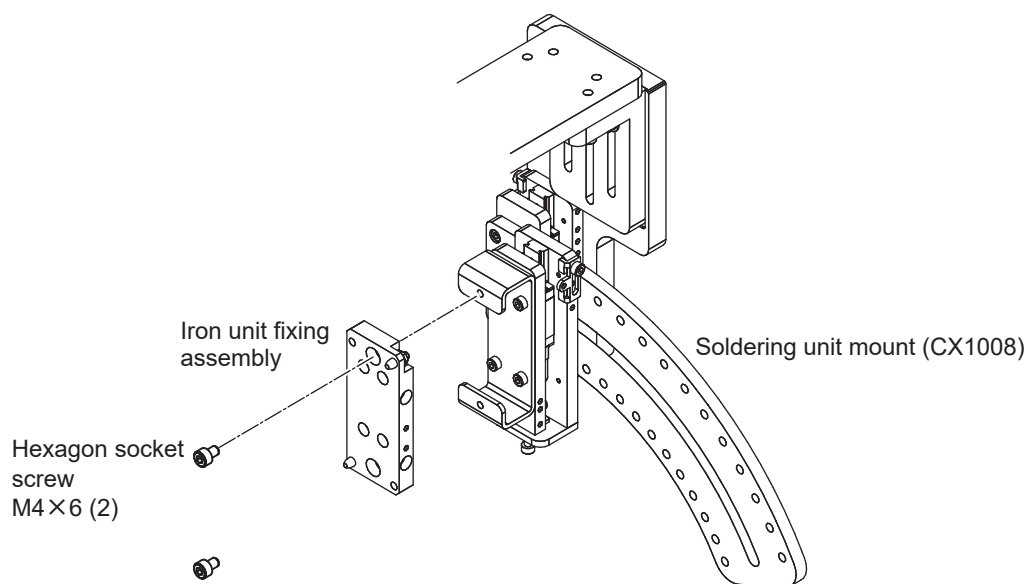


Fig. 5-10

- ④ Assembling the feeder unit (CX1010) in HAKKO FU-500.

Install the tube unit, the solder feed pulley unit, the solder feed guide set and the fluoroplastic tube. Tighten the screws shown in the figure below.

Feed solder through the tube unit and supply to the feeder unit (CX1010).

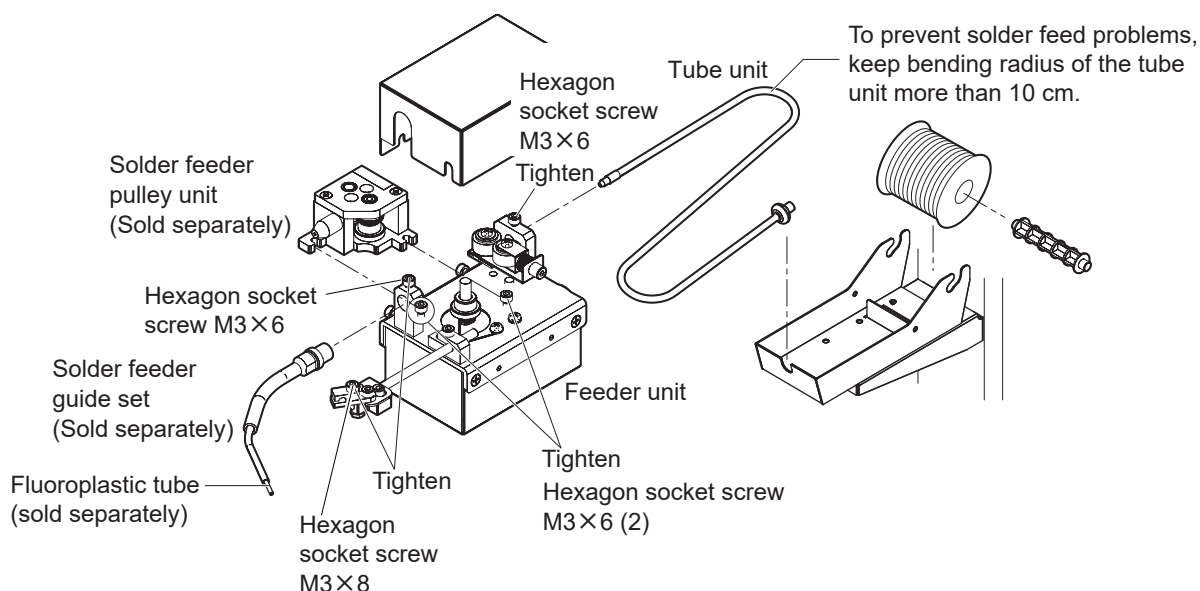


Fig. 5-11

### ⚠ CAUTION

- Do not touch any screws other than the hexagon socket screws indicated in this manual. Be careful not to overtighten the screws.
- Attachment of the fluoroplastic tube and positioning of the solder feeder guide set needs adjustment.  
See "Adjusting the solder feed position" of the HAKKO FU-500 instruction manual.
- The attachment of the solder feed pulley unit for  $\varnothing 0.3$  mm solder (BX1000) is different.  
See "How to set solder" instructions included in the BX1000.

When all parts are assembled, the position of the parts will be as shown below.

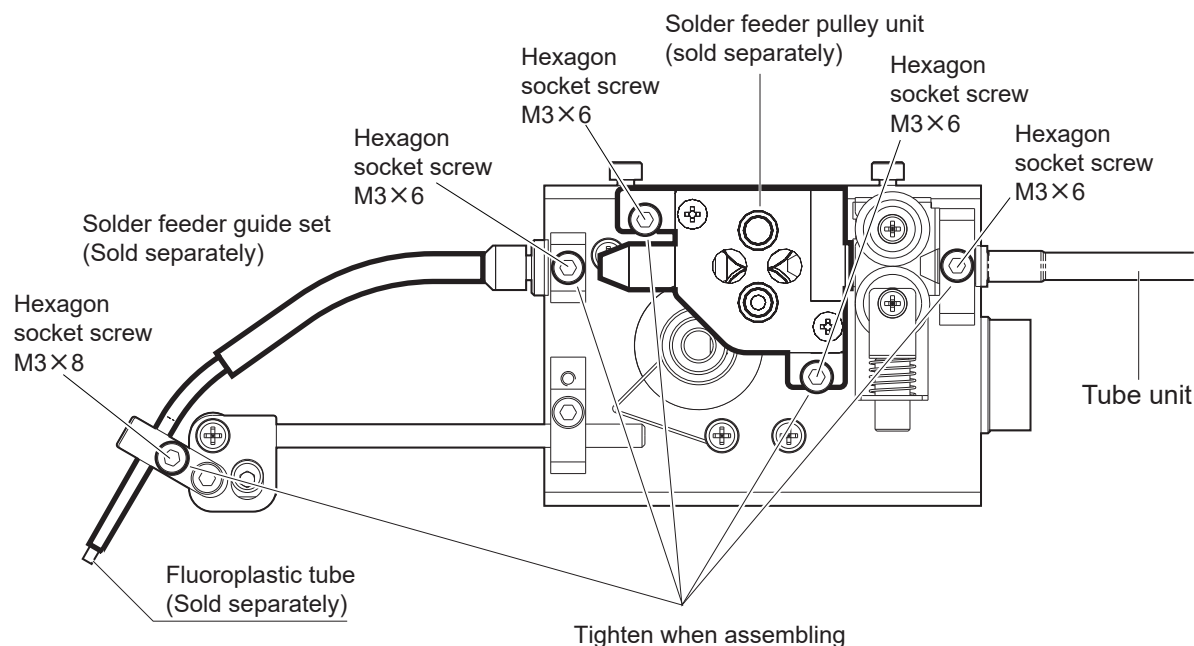


Fig. 5-12

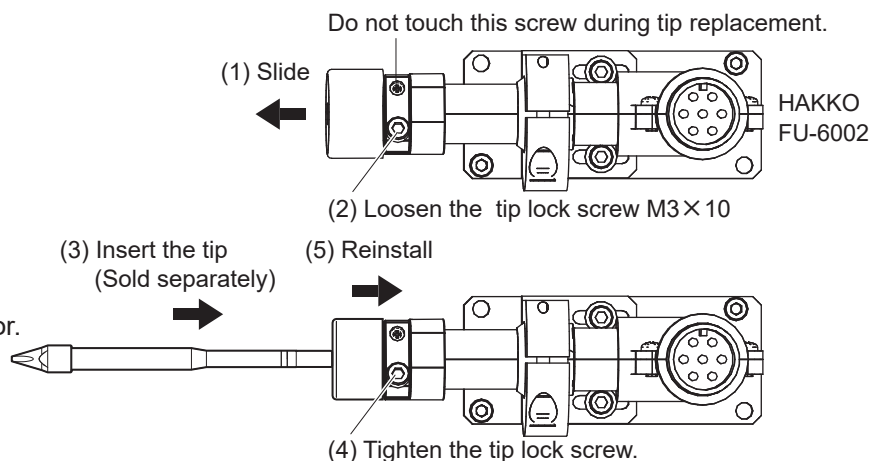
- ⑤ Attach the soldering iron tip (sold separately) to the HAKKO FU-6002 included with the HAKKO FU-601.

**CAUTION**

Let the soldering iron cool before replacing the tip.  
When replacing while the tip is still hot, always use the heat-resistant pad.

- (1) Slide off the flux protector.
- (2) Loosen the tip lock screw.

- (3) Inserting the tip.
- (4) Tighten the tip lock screw.
- (5) Cover it with the flux protector.



Status when tip is attached

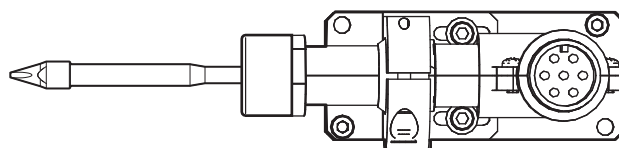


Fig. 5-13

**CAUTION**

- Make sure that there is no clearance between the tip and the hole of the flux protector.
- When new tip is attached, adjustment of the tip position is necessary (See following page).

## \*How to position the tip

- (1) To axially turn the shaft of the tip, loosen the positioning screw (a).  
To move the soldering iron in the longitudinal direction, loosen the positioning screw (b).  
Tighten the screws after determining the tip position balancing with your work object.

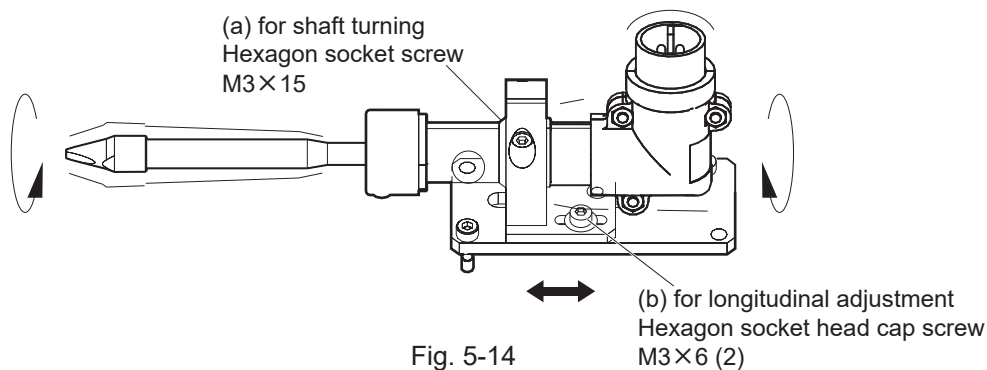


Fig. 5-14

- (2) Loosen the following screws (c) and (d) and place the HAKKO FU-6002 on the tip adjustment jig with the positioning pins aligned.

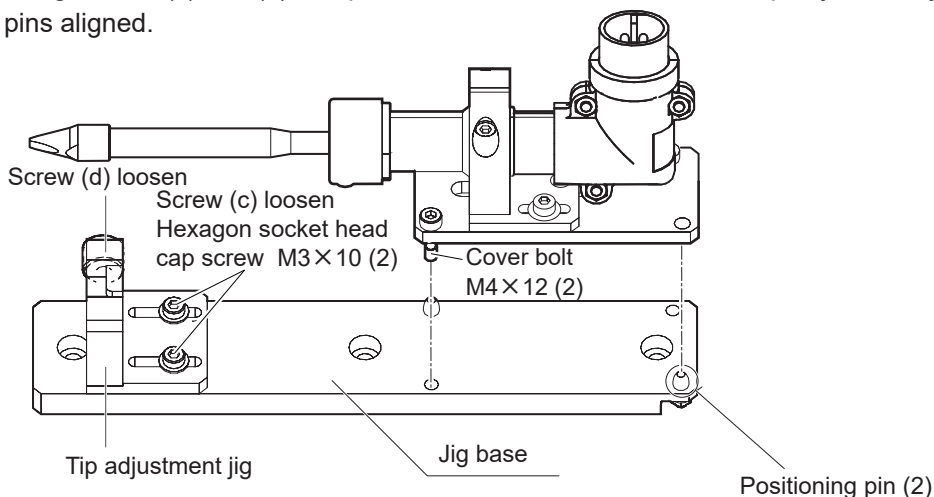


Fig. 5-15

- (3) Align the D-cut face of the tip with the pocket in the fixed side.  
Move the tip adjustment jig until the tip is fully inserted as shown in the following figure.  
This position will be the reference point. Re-tighten the two screws (c)  
To prevent the upward movement and misalignment of the tip, tighten the screw (d) while pressing the tip from the top  
Unless when the type of workpiece is changed, do not move the jig except for the movable side.  
After the reference point has been set, remove the HAKKO FU-6002 from the tip adjustment jig.

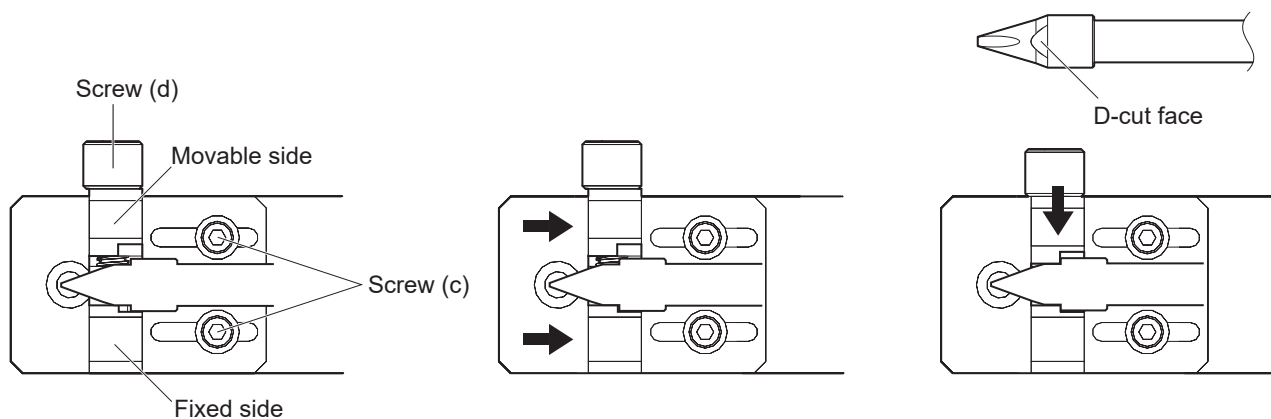


Fig. 5-16

**NOTE:**

There are marking on the side of the tip adjustment jig unit.

The tip ends are classified into 12 mm, 13 mm and 17 mm. While referring to this marking, adjust the position of the jig fixture.

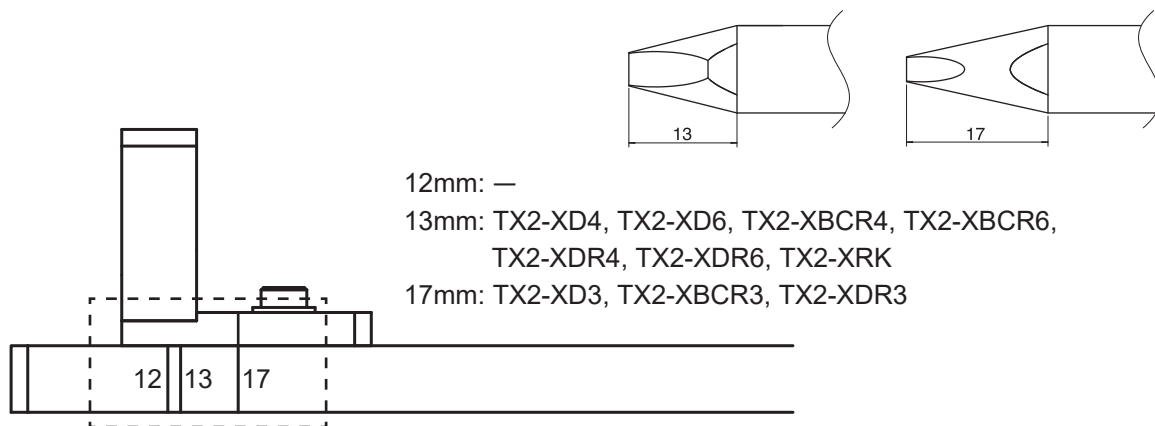


Fig. 5-17

- ⑥ Attach the feeder unit (CX1010) and HAKKO FU-6002 to the iron unit fixing assembly.

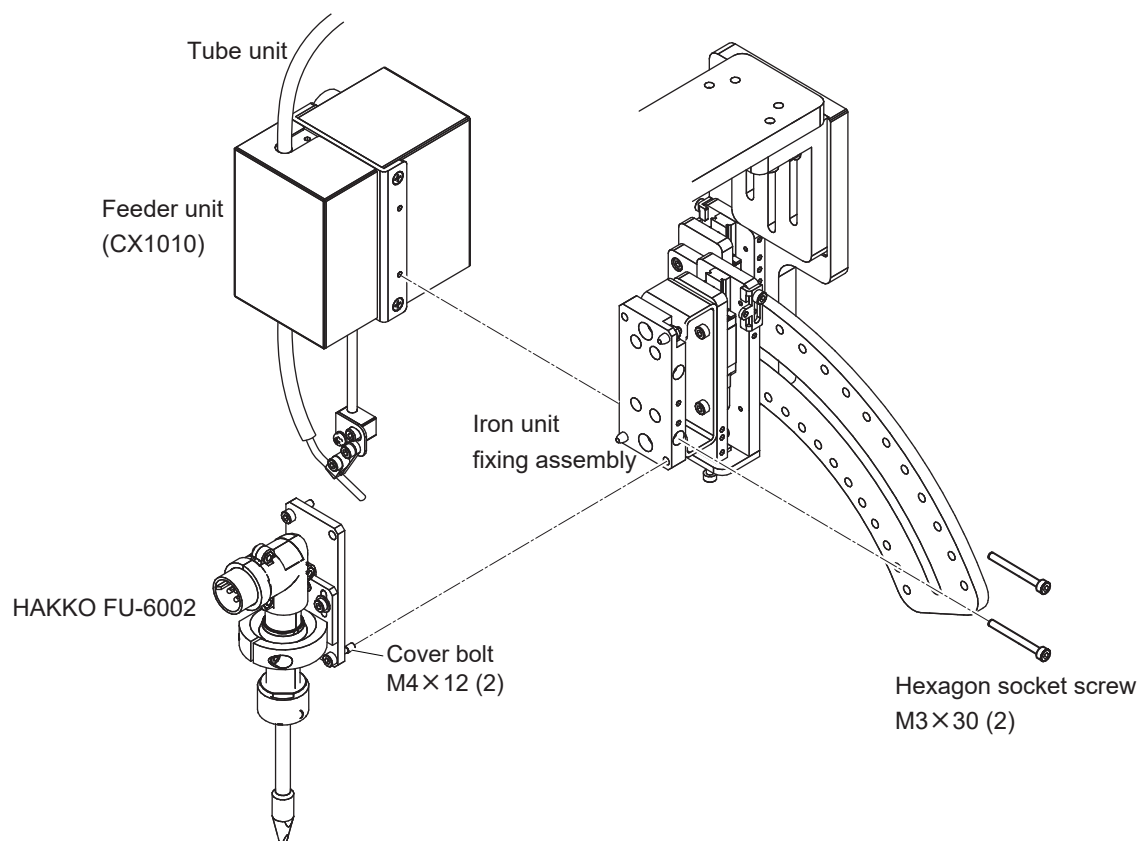


Fig. 5-18

### 5-2-3 Connection of cable and cord

- ① Use the feeder cable to connect the HAKKO FU-500 to the feeder unit (CX1010) and the connecting cable (HAKKO FU-601 set) to connect the HAKKO FU-601 to the HAKKO FU-500.

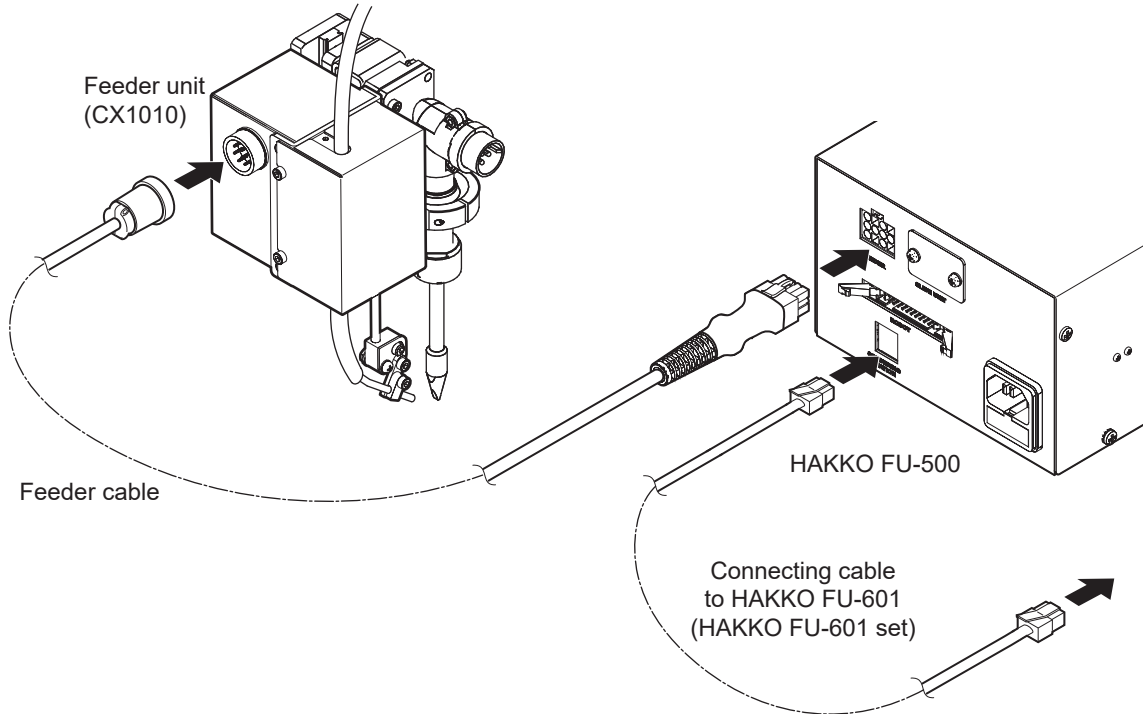


Fig. 5-19

- ② Connect the HAKKO FU-601 and HAKKO FU-6002 using the iron cable.

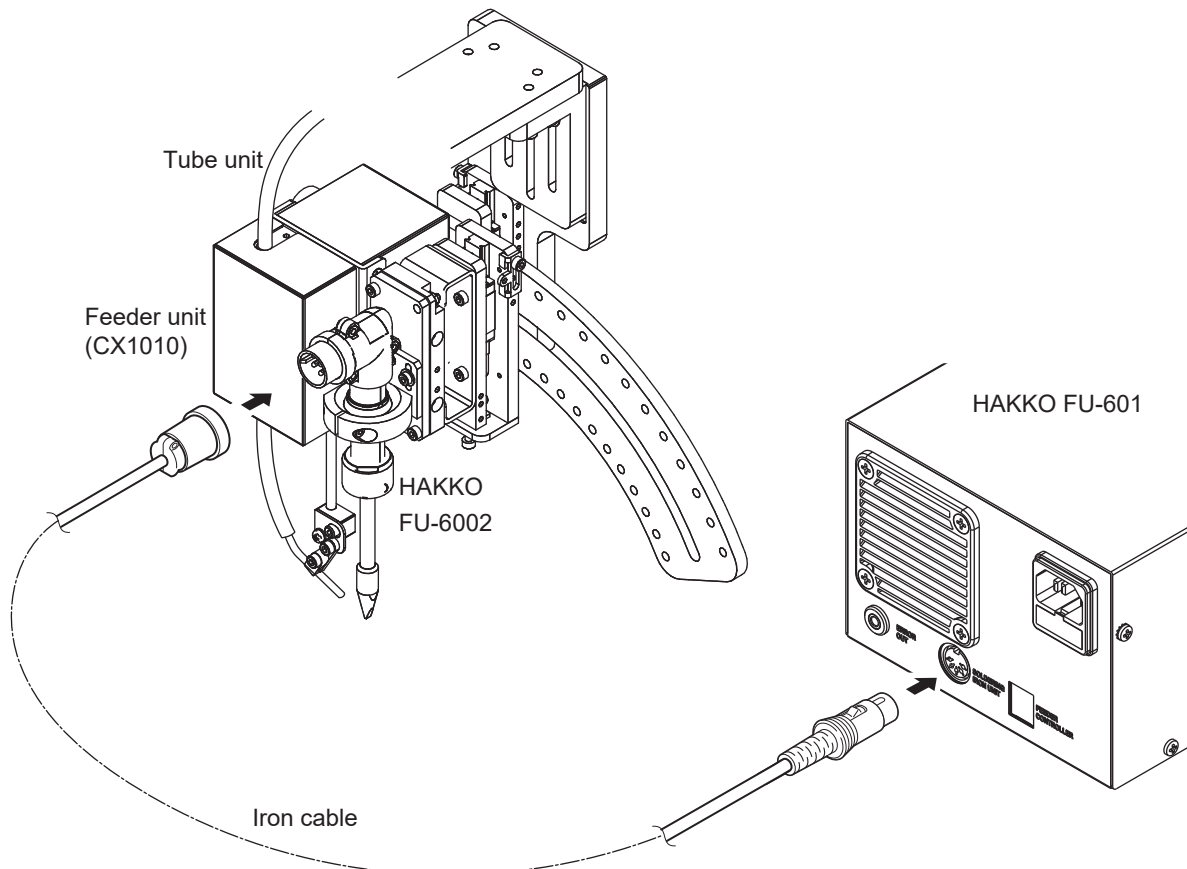


Fig. 5-20

## 5-2-4 Attaching the cleaner (CX1003)

Attach the cleaner (CX1003) to the cleaner base (CX1007).

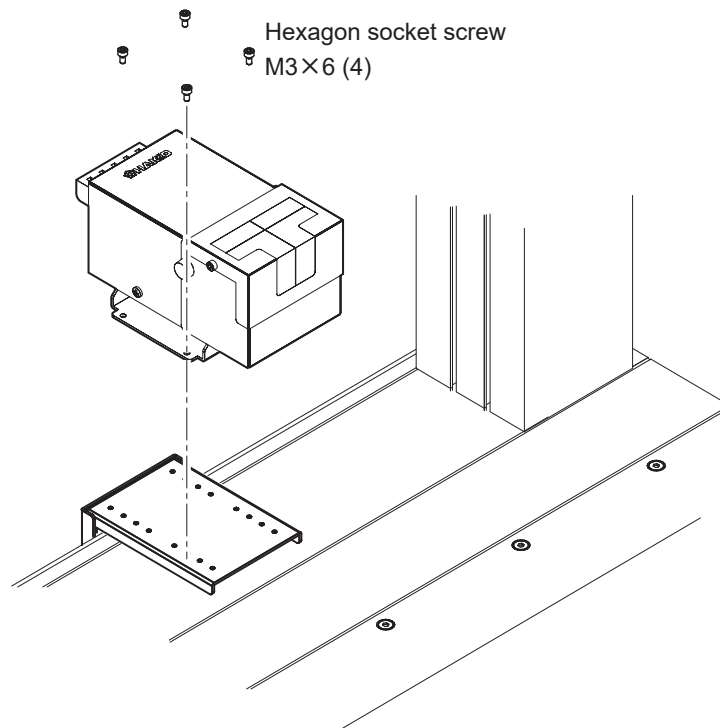


Fig. 5-21

### NOTE:

When the cleaner is connected to the table top type robot (IAI-made TTA-A4 series), set the selector switch to side "1". See the following for connection in Fig. 5-22.  
(For details, refer to the CX1003 instruction manual.)

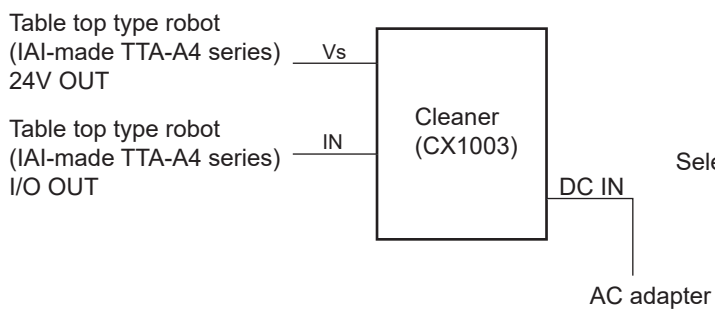


Fig. 5-22

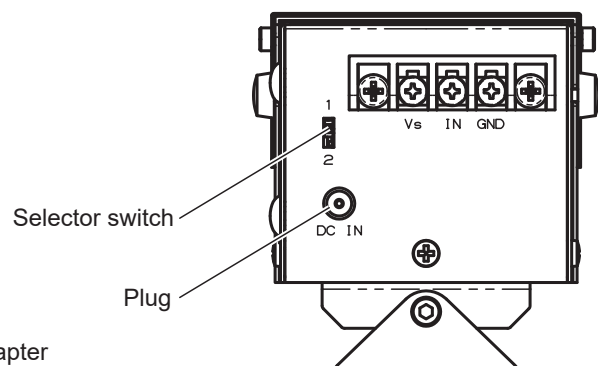


Fig. 5-23

## 5-3 Connecting with PC

Connection example 1)

Connecting using a USB cable, USB conversion adapter, RS-232C cable, and emergency stop box.

Table-top type robot  
(IAI-made TTA-A4 series)

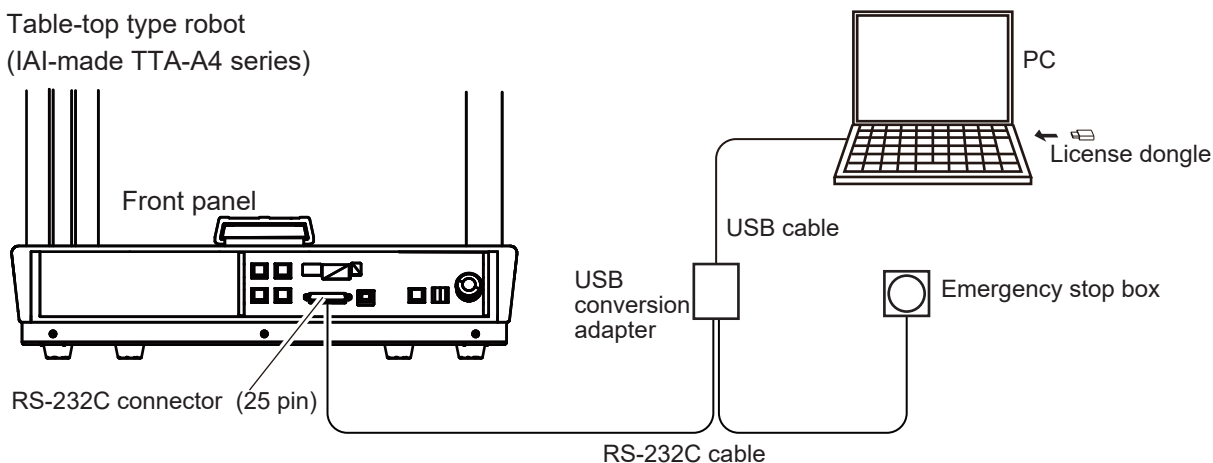


Fig. 5-24

### ⚠ CAUTION

When operating from PC away from the table-top type robot (IAI-made TTA-A4 series), always be sure to place the emergency stop box close to the operator where it can be pressed immediately if a problem occurs.

Connection example 2)

Connecting using a USB cable

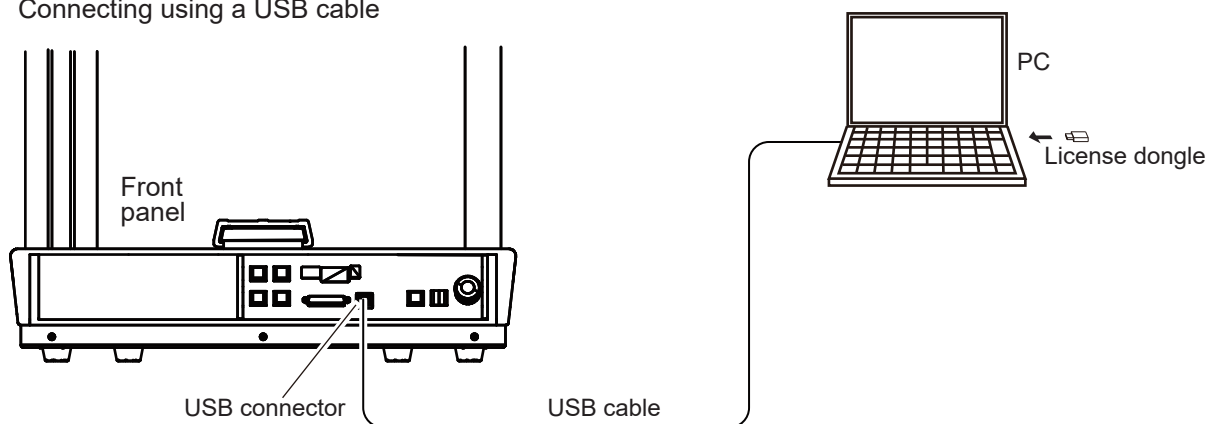
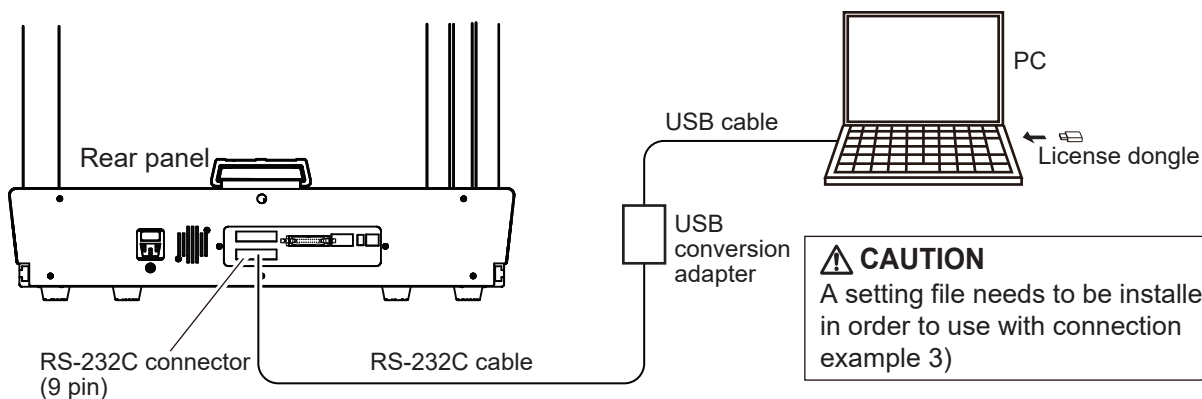


Fig. 5-25

Connection example 3)

Connecting using a USB cable, USB conversion adapter, and RS-232C cable.



### ⚠ CAUTION

A setting file needs to be installed in order to use with connection example 3)

Fig. 5-26

### \*How to set external emergency stop device

In Connection examples 2 and 3, emergency stop box is not connected.

If operating away from the emergency stop button of the robot main unit, wire the system I/O connector as shown in the lower right figure and install a emergency stop device externally.

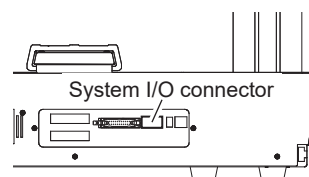


Fig. 5-27

#### Factory setting

Signal name	Pin No.	
N.C.	ENBS2-	1 Enable contact output 2
N.C.	ENBS2+	2 Enable contact output 2
	ENBS1-	3 Enable contact output 1
	ENBS1+	4 Enable contact output 1
	ENBOUT	5 24V output for enable
	ENBIN	6 Enable input
N.C.	EMGS2-	7 Emergency stop contact output 2
N.C.	EMGS2+	8 Emergency stop contact output 2
	EMGS1-	9 Emergency stop contact output 1
	EMGS1+	10 Emergency stop contact output 1
	EMGOUT	11 24V output for emergency stop
	EMGIN	12 Emergency stop input

#### Emergency stop device installed

Signal name	Pin No.	
N.C.	ENBS2-	1 Enable contact output 2
N.C.	ENBS2+	2 Enable contact output 2
	ENBS1-	3 Enable contact output 1
	ENBS1+	4 Enable contact output 1
	ENBOUT	5 24V output for enable
	ENBIN	6 Enable input
N.C.	EMGS2-	7 Emergency stop contact output 2
N.C.	EMGS2+	8 Emergency stop contact output 2
	EMGS1-	9 Emergency stop contact output 1
	EMGS1+	10 Emergency stop contact output 1
	EMGOUT	11 24V output for emergency stop
	EMGIN	12 Emergency stop input

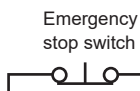


Fig. 5-28

## 5-4 Connection with HAKKO FU-500 and external device

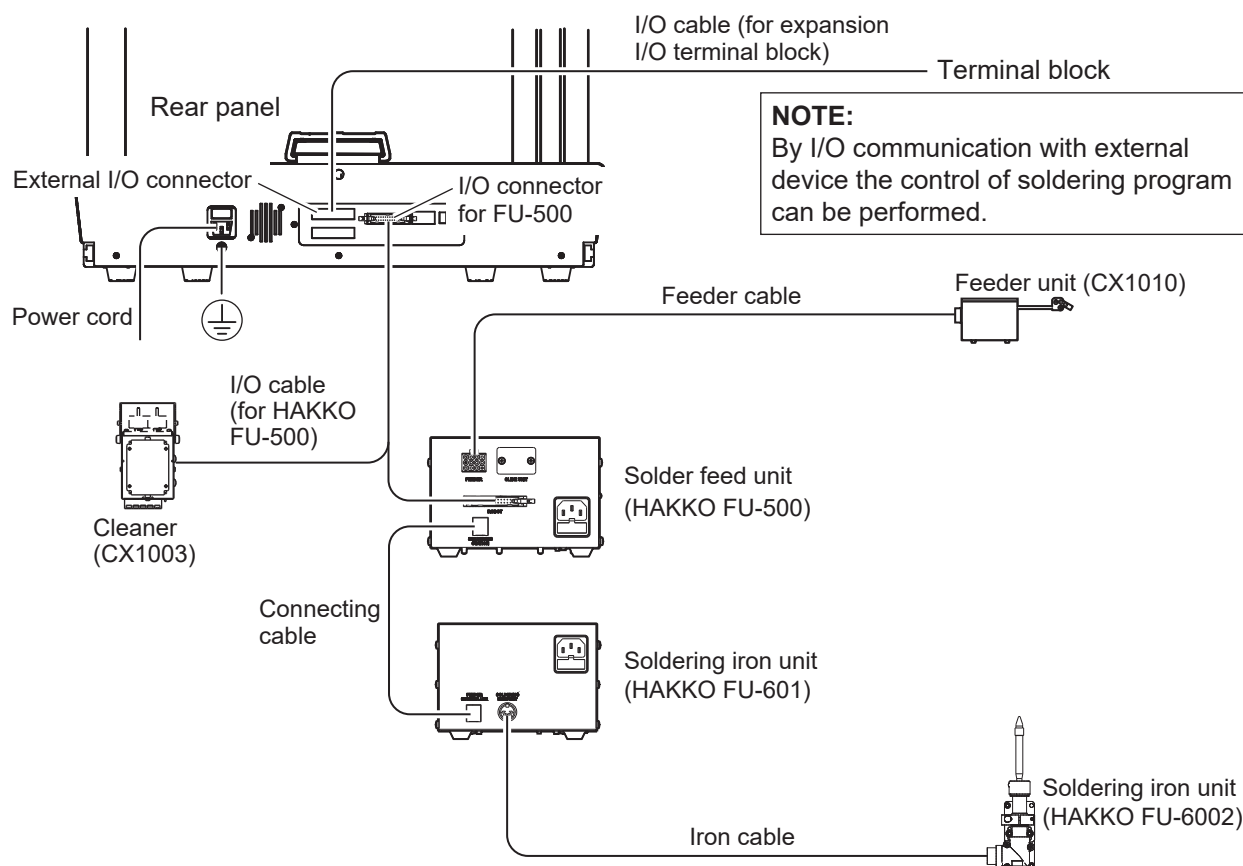


Fig. 5-29

#### NOTE:

See p.53 of “5-4-1 Connection of I/O connector for HAKKO FU-500” and p.54 of “5-4-2 Connection of I/O connector for external input/output” for the wiring diagram of the I/O cable.

## 5-4-1 Connection of I/O connector for HAKKO FU-500

The pin layout for connecting HAKKO FU-500 and cleaner (CX1003) are shown below.

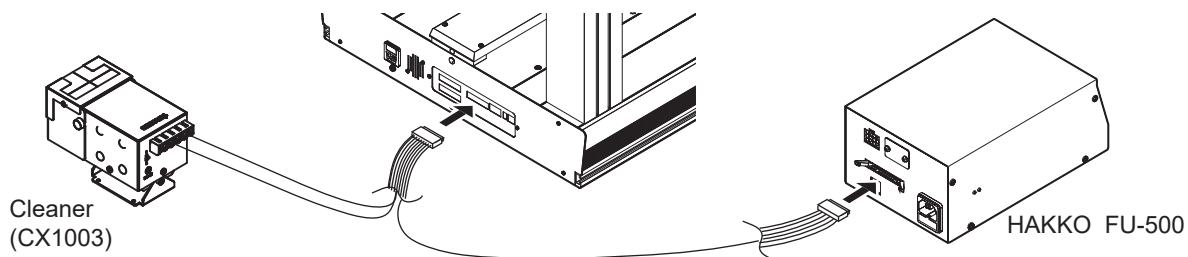


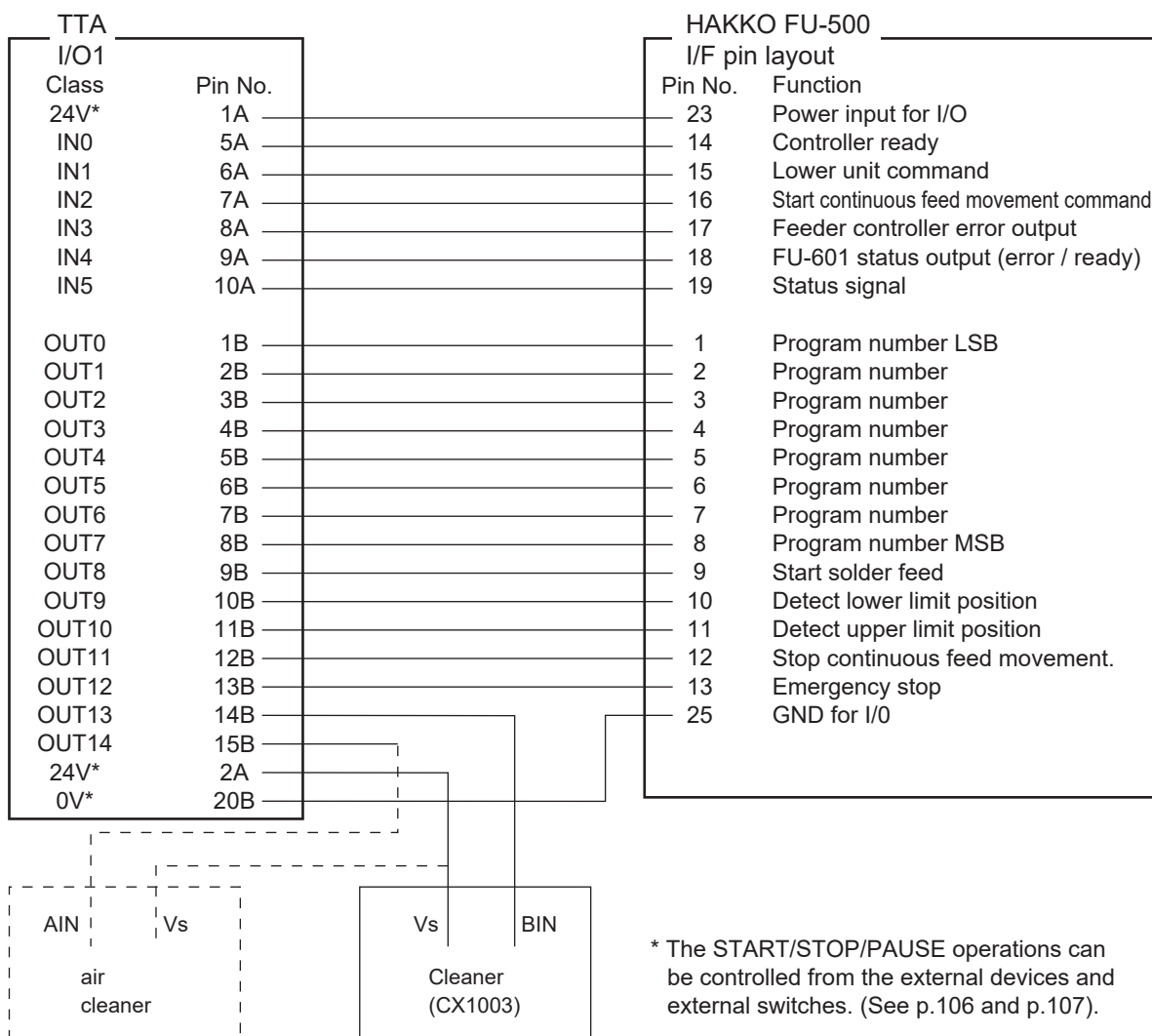
Fig. 5-30

### NOTE:

For input/output circuitry, see instruction manual of table top type robot (IAI-made TTA-A4 series) "1.3.1 Standard I/O Input and Output Interface" (NPN) of "Chapter 1 Specifications Check".

### NOTE:

"24V" and "0V" indicate 24V power supply input when the service power supply output is set to OFF, and 24V power supply output when the service power supply output is set to ON. Also, when the service power supply is set to ON, do not supply power from an external power source.



\* The START/STOP/PAUSE operations can be controlled from the external devices and external switches. (See p.106 and p.107).

Fig. 5-31

## 5-4-2 Connection of I/O connector for external input/output

This is an I/O connector for external input/output. When correlating with input/output signals to run the program, connect the connector using the terminal block included in the robot (IAI-made TTA-A4 series) set.

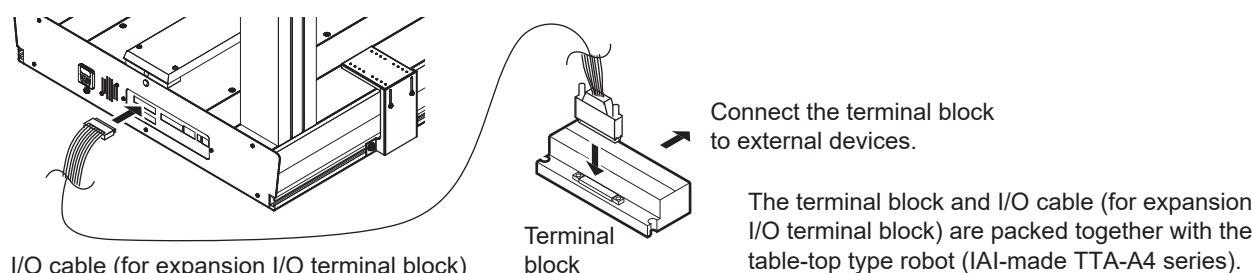


Fig. 5-32

### NOTE:

For input/output circuitry, see instruction manual of table-top type robot (IAI-made TTA-A4 series) "1.3.3 Extension I/O Input and Output Interface" of "Chapter 1 Specifications Check"

TTA I/O2		Terminal block	
Class	Pin No.	Pin No.	Function
24V	1A	A1	24V
24V	2A	A2	24V
-	3A	A3	-
-	4A	A4	-
IN0	5A	A5	IN1
IN1	6A	A6	IN2
IN2	7A	A7	IN3
IN3	8A	A8	IN4
IN4	9A	A9	IN5
IN5	10A	A10	IN6
IN6	11A	A11	IN7
IN7	12A	A12	IN8
IN8	13A	A13	IN9
IN9	14A	A14	IN10
IN10	15A	A15	Stop
IN11	16A	A16	Pno_bit0
IN12	17A	A17	Pno_bit1
IN13	18A	A18	Pno_bit2
IN14	19A	A19	Pno_bit3
(IN15)	20A	A20	-
OUT0	1B	B1	OUT1
OUT1	2B	B2	OUT2
OUT2	3B	B3	OUT3
OUT3	4B	B4	OUT4
OUT4	5B	B5	OUT5
OUT5	6B	B6	OUT6
OUT6	7B	B7	OUT7
OUT7	8B	B8	OUT8
OUT8	9B	B9	OUT9
OUT9	10B	B10	OUT10
OUT10	11B	B11	OUT11
OUT11	12B	B12	OUT12
OUT12	13B	B13	OUT13
OUT13	14B	B14	OUT14
(OUT14)	15B	B15	-
(OUT15)	16B	B16	-
-	17B	B17	-
-	18B	B18	-
0V	19B	B19	0V
0V	20B	B20	0V

Running signal  
Yellow light signal  
Green light signal

Fig. 5-33

### \*Signal light lightning patterns

Connecting the signal light to the robot allows for the light to be used to visually determine the status of the robot.

Status number		1	2	3	4	5
Status details		When program is not running (includes JOG and movement)	When program is running (includes DRY RUN, return to origin, and cleaning)	Temporary stop during program operation (PAUSE)	Temporary stop due to FU-601 error (NOT READY) during program operation	When program is not running (during FU-500 error - feeder/illegal input)
OUT12	Running	×	○	○	○	×
OUT13	Yellow light	○	×	○	○	◎
OUT14	Green light	×	◎	◎	◎	×

○ : Lit   ◎ : Blink   × : Off

# 6. INSTALLATION

## 6-1 Installation of Easy Programming Software

**When installing this software, be sure to log in by the user having the Administrator right.**

- ① Insert the CD-ROM containing the Easy Programming Software into the CD-ROM drive of PC.
- ② The data contents in the CD-ROM are displayed.  
The Easy Programming Software for each language (Japanese, English, Chinese (Traditional)) is included separately in 3 folders of DISK 1. Select the language to be installed and open the folder.



Fig. 6-1

**NOTE:**

If the data contents are not displayed even after inserting the CD-ROM, select the CD-ROM from the Explorer to start up the program.

- ③ Double-click “setup.exe”.

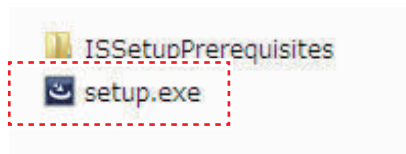


Fig. 6-2

- ④ Click “Next”.



Fig. 6-3

- ⑤ The “Software License Agreement” screen is displayed.

Check the details of the “Software License Agreement”. After reading thoroughly, put a checkmark on the “I accept the terms in the license agreement”, and click “Next”.

**⚠ CAUTION**

When this software is installed or used, it is recognized that you agree with the “Software License Agreement”. If you do not agree with the “Software License Agreement”, you cannot use this software.

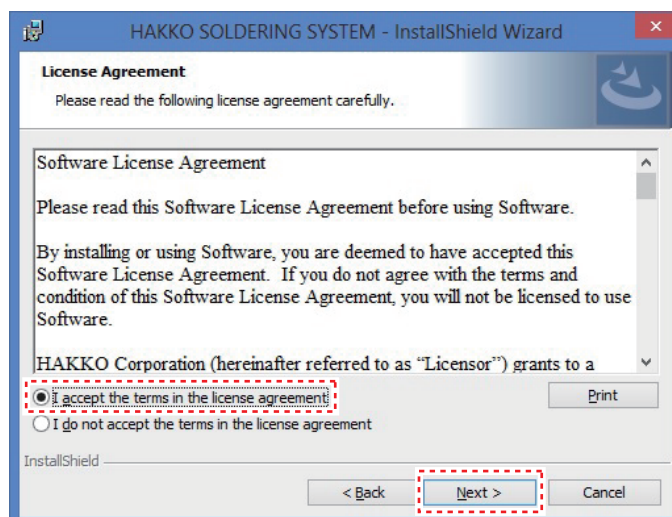


Fig. 6-4

- ⑥ Input the user information.

After inputting the information, click “Next”.

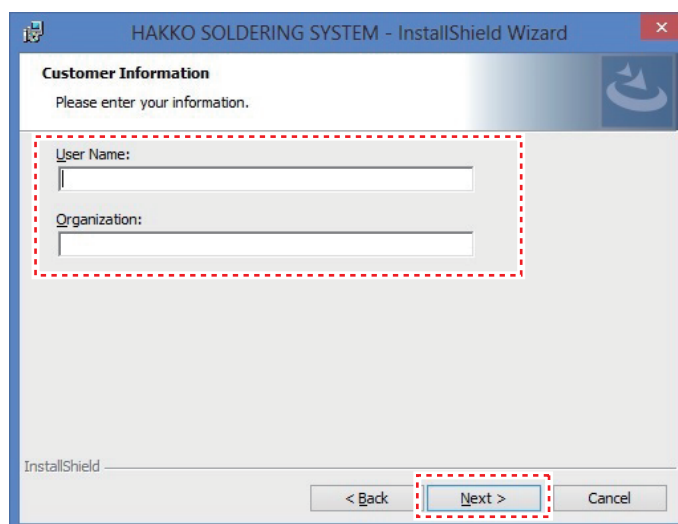


Fig. 6-5

- ⑦ Click “Install”.

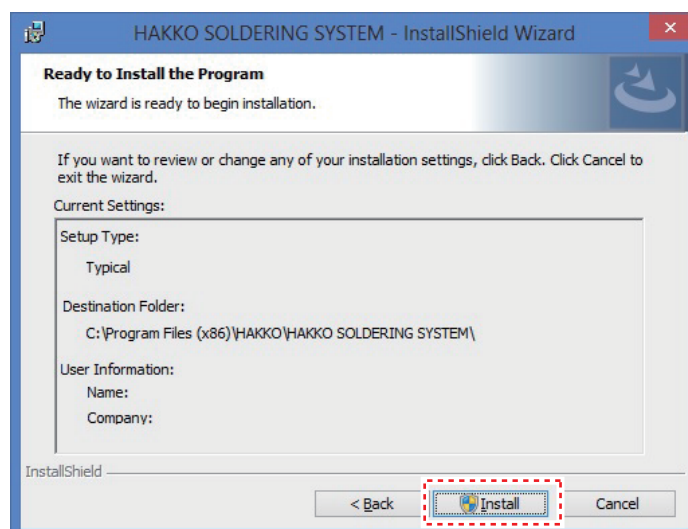


Fig. 6-6

- ⑧ When the installation completion screen is displayed, click “Finish”.

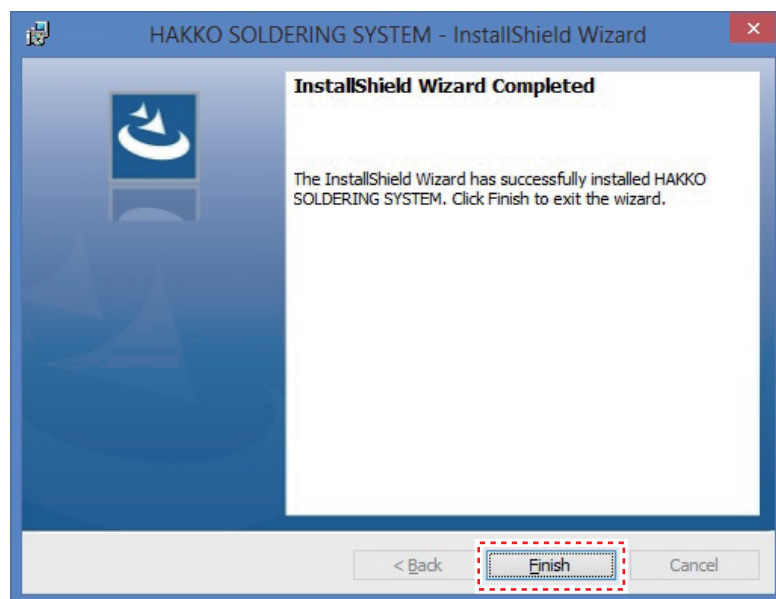


Fig. 6-7

## 6-2 Installation of USB driver

- ① Connect the PC to the table-top type robot (IAI-made TTA-A4 series).

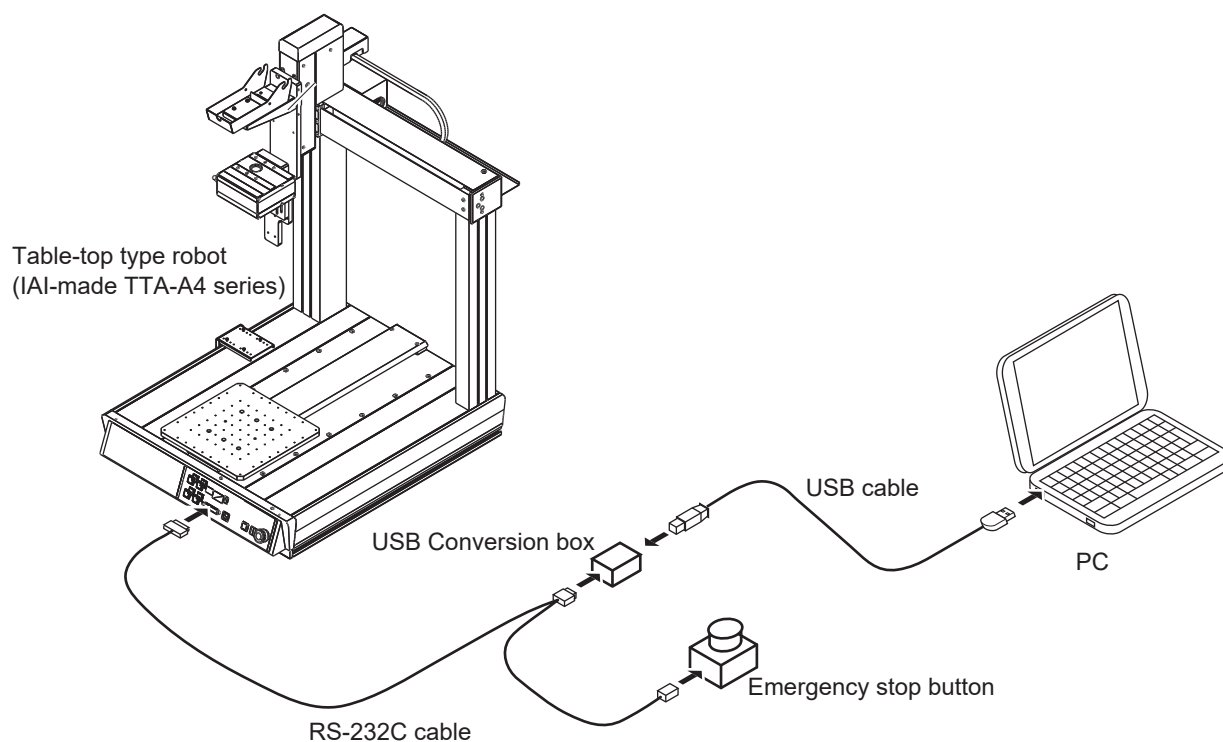


Fig. 6-8

Compatible OS

Windows 7, Windows 8, 8.1, Windows 10

- ② Run the IAI\_Install.exe file.



Fig. 6-9

- ③ Click the USB driver for the IAI controller.  
If the driver is pre-installed, skip ④ and ⑤.

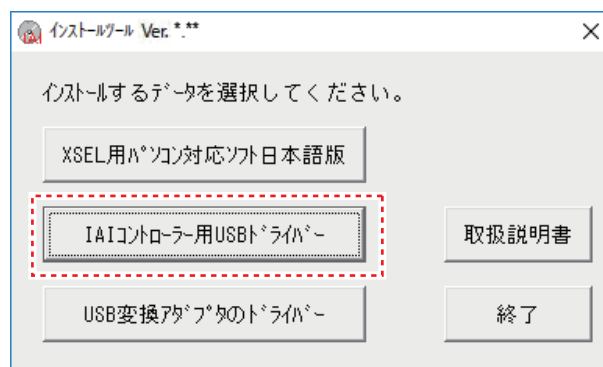


Fig. 6-10

- ④ Click [Next].

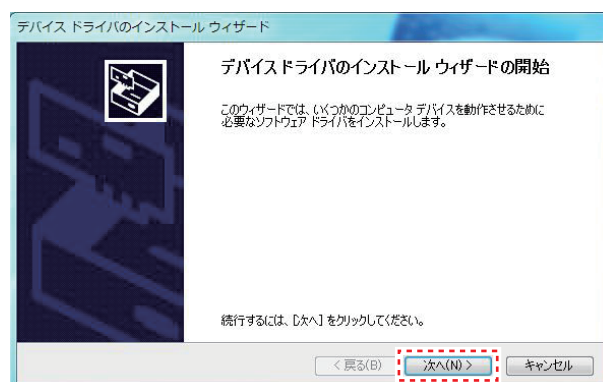


Fig. 6-11-1

- ⑤ Click [Finish].

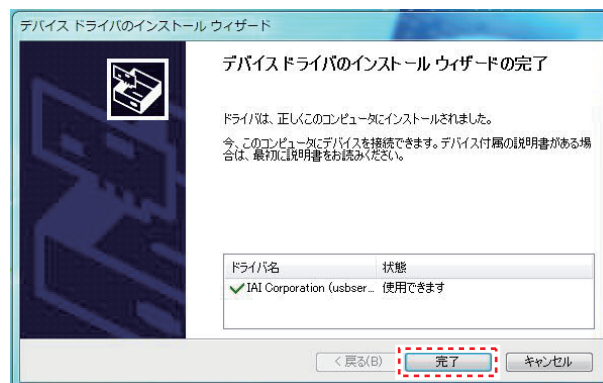


Fig. 6-11-2

⑥ Installation Location

Set where to install, and click “Install”.

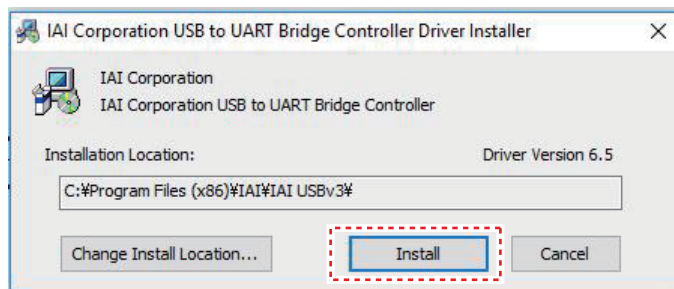


Fig. 6-12

⑦ Start Installing

PC is installing while “Scanning” is displayed.

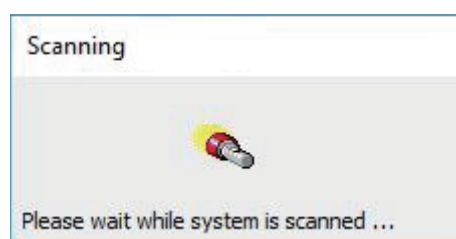


Fig. 6-13

⑧ Installation Completed

Click “OK”.

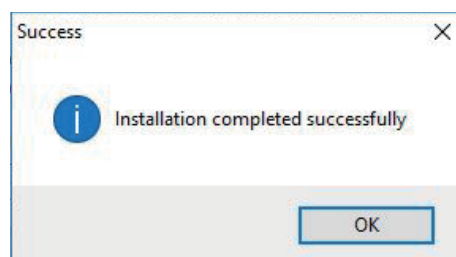


Fig. 6-14

**\*Deletion of application**

1. Select the “Uninstall program” by selecting “START” → “Control panel” → “Program” from the task bar.  
If the “All control panel items” is displayed, select the “Program and function”.
2. Select an application to be deleted from the list for “Currently installed programs” and click the “Uninstall and delete”.
3. After completion of deletion, close the window and restart the PC.

Before updating the application to the latest version, delete the old version in advance.

# 7. HOW TO USE

## 7-1 Basic operation

At first, check that all devices are correctly connected and powered ON. See p.50 of “5-3 Connection with PC” and p.51 of “5-4 Connection with HAKKO FU-500 and external devices” in “5. Installation and connection”) Boot up the PC and insert the license dongle into the USB connector. Start up the Easy Programming Software.

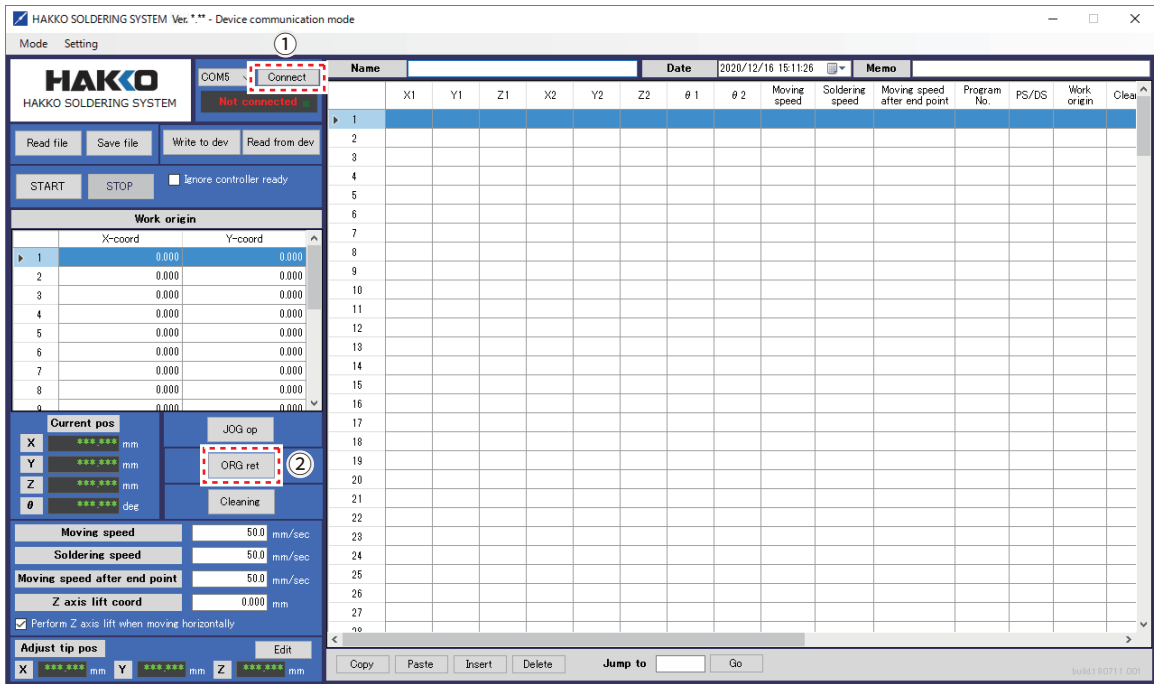


Fig. 7-1

- ① Click “Connect” and connect to the table-top type robot (IAI-made TTA-A4 series).
- ② Click “ORG ret”. After completion of origin return, the panel window display of the table-top type robot (IAI-made TTA-A4 series) is changed as shown in Fig. 7-2.

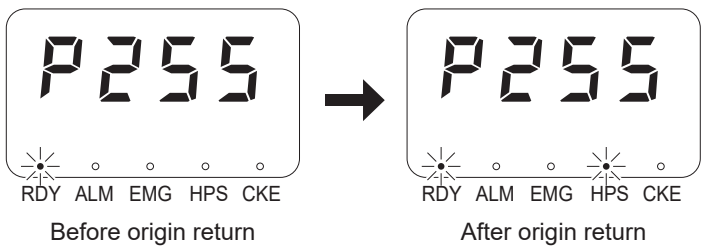


Fig. 7-2

**CAUTION**  
If the HPS is not lit (origin return is not made), other programs do not operate.

**CAUTION**  
When the  $\theta$  axis is turning while returning to the origin, there is a danger that the cable may become wrapped in while it is turned. If there is a risk of the cable becoming wrapped in, press the emergency stop button and turn the soldering iron mounting base counterclockwise so that it is a little past the origin ( $0^\circ$ ) of the  $\theta$  axis when viewed from above, and then click the “ORG ret” again.

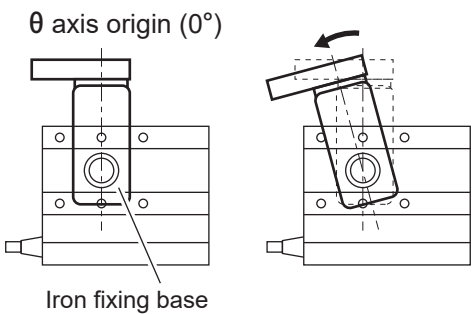


Fig. 7-3

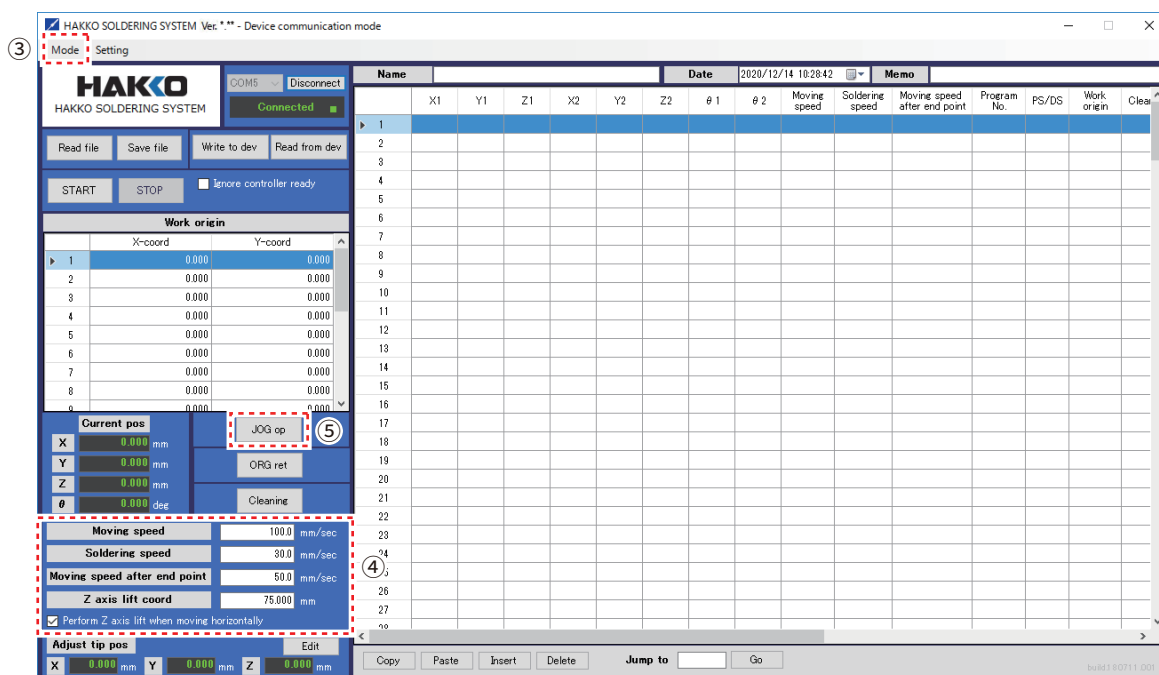


Fig. 7-4

- ③ Pull down Mode menu and select either of “Device communication mode” and “PC communication mode”.

#### Device communication mode

The “Device communication mode” is a mode to allow you to write created soldering programs in devices. Number of writable programs is 1 to 10.

One soldering program allows you to set up to 240 soldering points.

#### PC communication mode

The “PC communication mode” is a mode to run soldering programs from the PC.

It may be selected when running program for more than 240 soldering points.

In the “PC communication mode”, soldering programs cannot be written to the table-top type robot (IAI-made TTA-A4 series). Save the created soldering programs by CSV file in the PC.

- ④ Set the “Moving speed”, “Soldering speed” and “Z axis lift cord”.

The values set for “Moving speed”, “Soldering speed”, “Z axis lift cord”

and “Perform Z axis lift when moving horizontally” on the top screen are effective throughout the program.

**Moving speed** (Settable range: 1 to 800 mm/sec)

Setting for moving speed of each axis between soldering points.

**Soldering speed** (Settable range: 1 to 800 mm/sec)

Setting for soldering movement speed between primary soldering and secondary soldering

**Z axis lift coord** (Settable range: 0.000 to 150.000 mm)

The Z axis lift coordinate is the coordinate set to avoid contact with projecting parts on the work during horizontal movement.

For axis movement, movement of the X, Y, and  $\theta$  axes is performed before moving the Z axis.

When “Perform Z axis lift when moving horizontally” is checked ON, judgment to lift the Z axis to the lift coordinate before moving the X, Y, and  $\theta$  axis will be performed.

See p.62 and p.63 of “7-2-1 Basic JOG operation” in “7-2 JOG operation” in “7. How to use” for details on Z axis lift.

- ⑤ Click the “JOG op” to open the JOG operation screen.

## 7-2 JOG operation

### 7-2-1 Basic JOG operation

When the “Perform Z axis lift when moving horizontally” is checked, judgment of whether to lift the Z axis to the lift coordinates before moving each axis will be performed.

When the Z axis before movement is lower than the Z axis lift coordinate, movement to the Z axis lift coordinate is always performed before movement of axis.

**NOTE:**

When the Z axis before movement is already same or higher than the Z axis lift coordinate, it will slide horizontally.

Ex) When moving rightward by JOG operation:

When the check box  
is checked ON

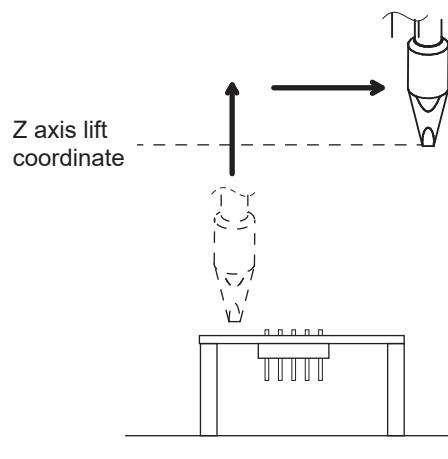


Fig. 7-5

When the check box  
is checked OFF

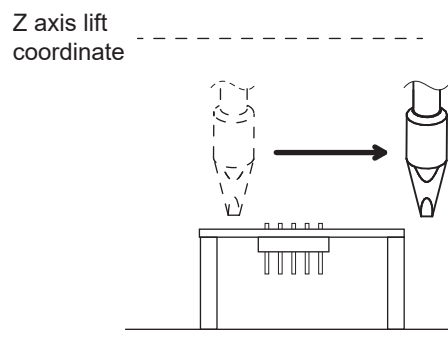


Fig. 7-6

**⚠ CAUTION**

When the check box was checked OFF to perform fine adjustments, make sure to check the box ON after finishing adjustment. There is danger of contact if operated without checking the check box.

The Z axis lift coordinate allows to set the lift operation when there is a danger of contact to projecting objects. When “Perform Z axis lift when moving horizontally” is checked ON, the Z axis lift is performed every time.

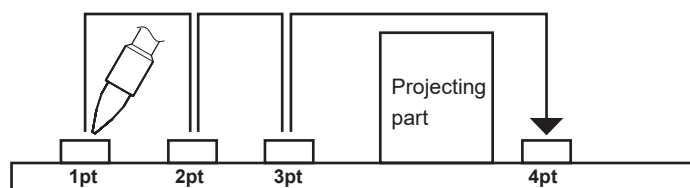


Fig. 7-7

If the check is OFF, it will move without performing Z axis lift.

Performing different value of Z axis lift on certain point is also possible when editing single point.

In Fig. 7-8, the axis moves to 3rd point in that state.

When there is projection as in Fig. 7-8, editing the Z axis lift coordinate of the 4th point on Edit point screen will perform Z axis lift before that point.

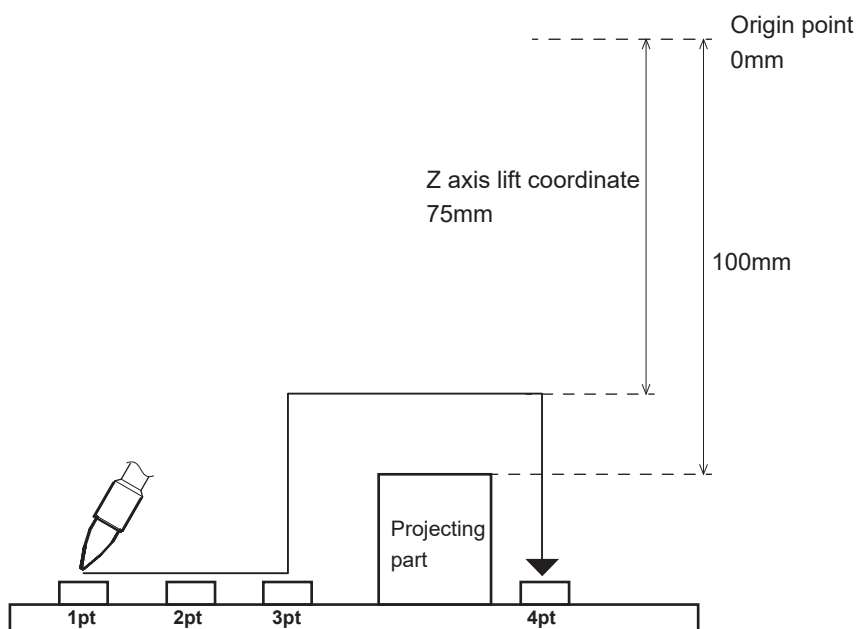


Fig. 7-8

**NOTE:**

Input value of Z axis coordinate on the 4th point when avoiding the projection between the 3rd and 4th point.

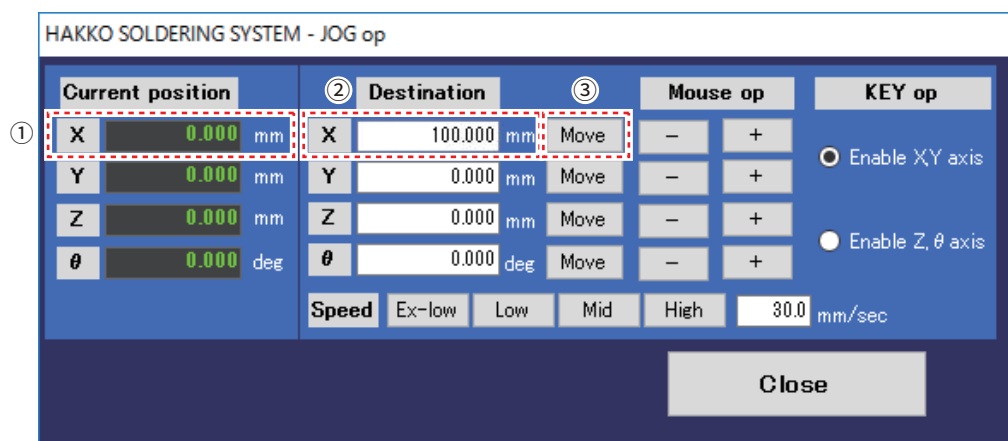


Fig. 7-9

For each axis movement such as soldering position adjustment, operate using the JOG operation screen. The following 3 ways of operation shown in Ex1) through Ex3) are available.

Ex1) Moving the X axis to 100 mm coordinate.

(Input data on the destination coordinate and click “Move” to perform axis movement.)

- ① Check the current coordinate.
- ② Input “100 mm” as coordinate of destination in X axis.
- ③ Click “Move”.

The X axis automatically moves to the input coordinate.

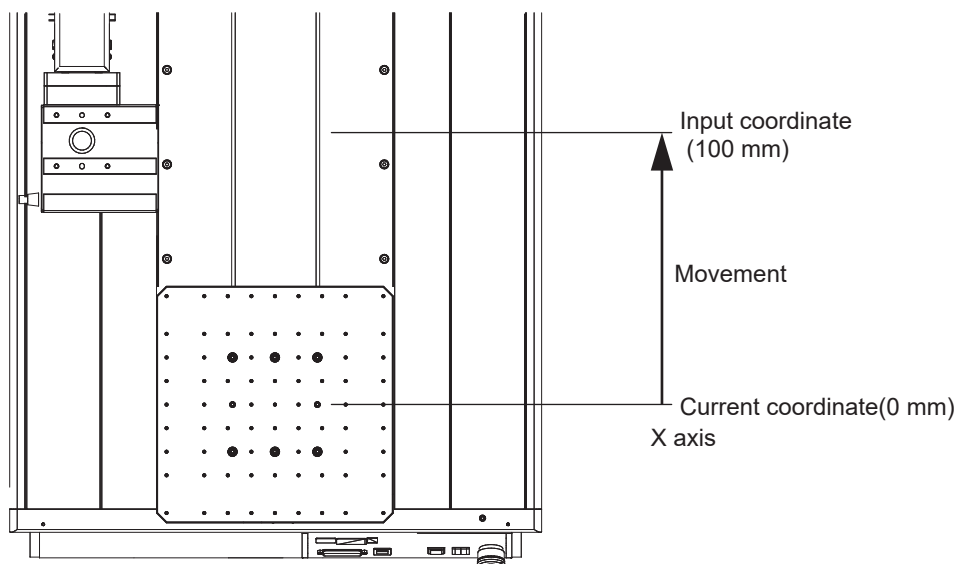


Fig. 7-10

#### ⚠ CAUTION

When Move is clicked, movement will be performed automatically until the axis reaches the input coordinates. If there is a risk of contact, etc., press the emergency stop button immediately.

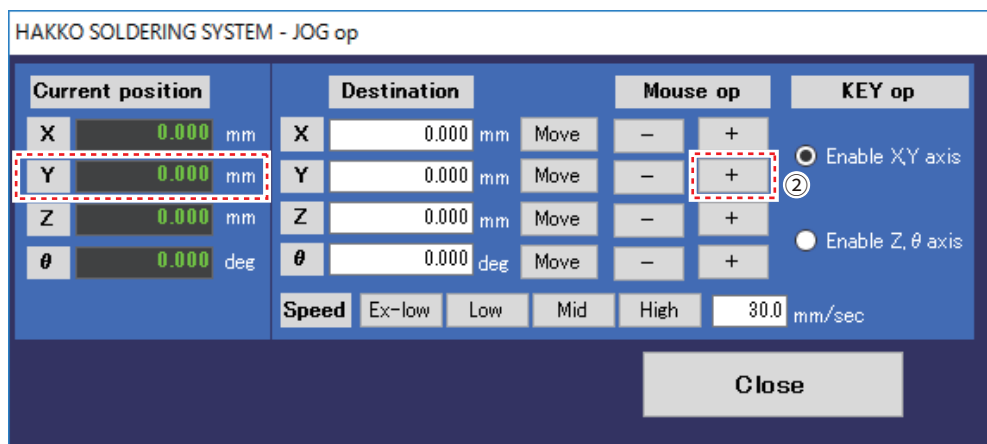


Fig. 7-11

Ex2) Move the Y axis from 0 mm to 100 mm.  
(Mouse operation)

- ① Check the current coordinate.
- ② Press the “+” of Y axis in the mouse operation.  
While pressing, the Y axis is moved.  
When releasing, the Y axis is stopped.
- ③ The coordinate is displayed in the current position.

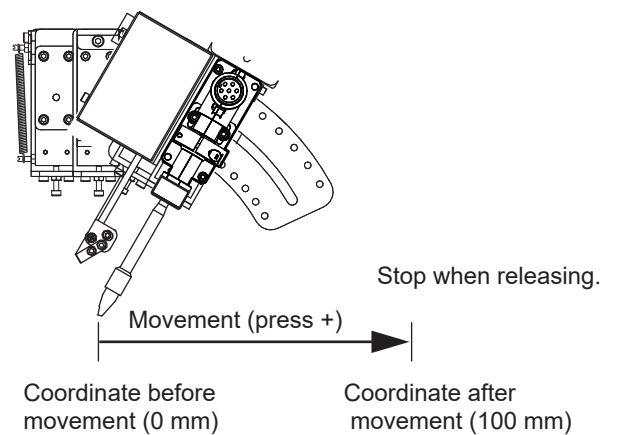


Fig. 7-12

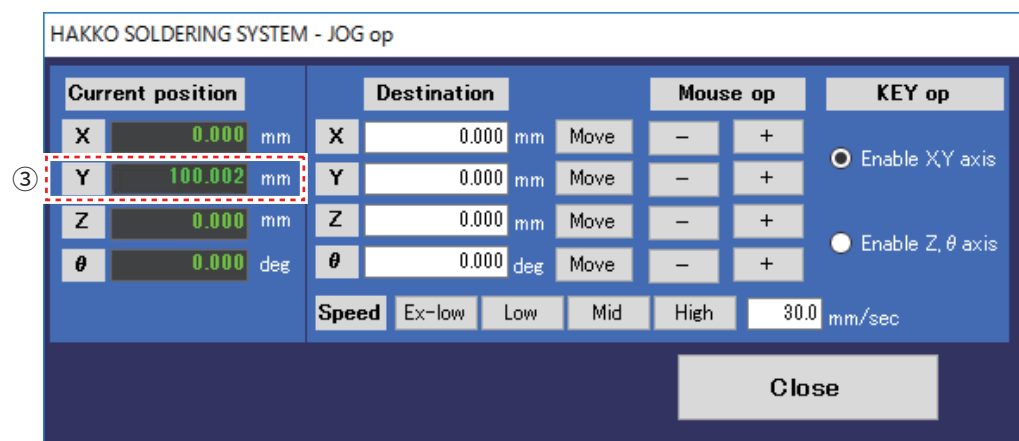


Fig. 7-13

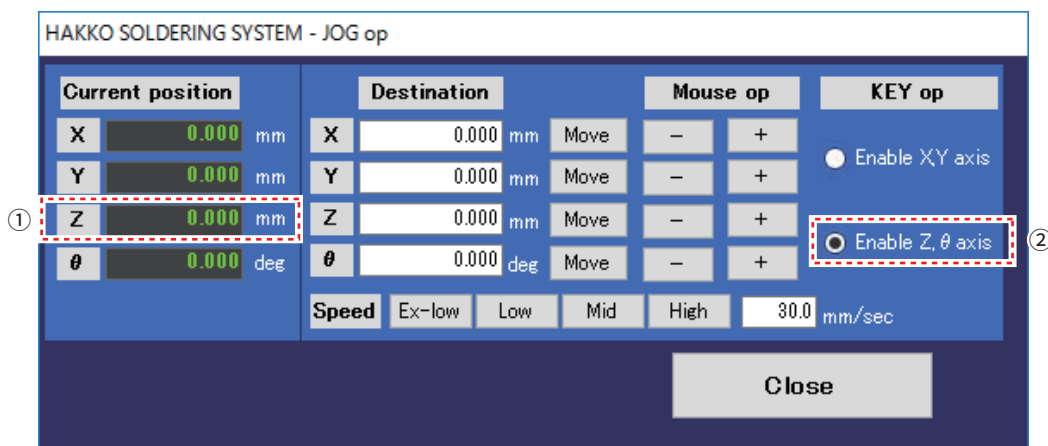


Fig. 7-14

Ex3) Move the Z axis from 0mm to 65mm  
(KEY operation)

- ① Check the current coordinate.
- ② Select "Enable Z, θ axis"
- ③ Press "▼" using the keyboard.  
(See Fig. 7-16)  
Z axis will move while pressing.  
Z axis will stop when released.
- ④ The coordinate is displayed in the current position.

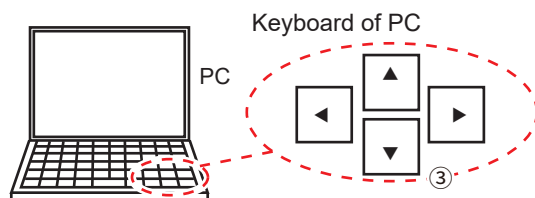


Fig. 7-16

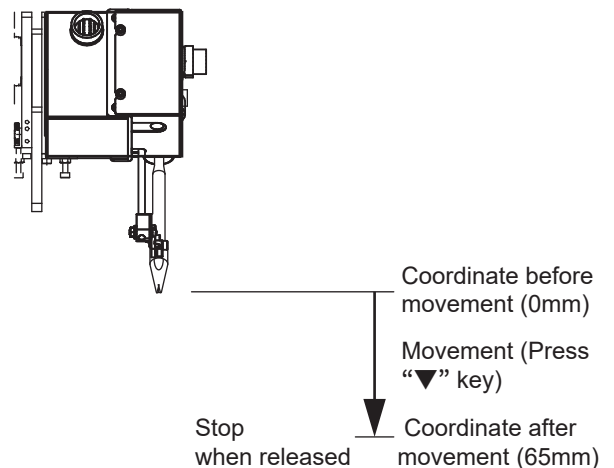


Fig. 7-15

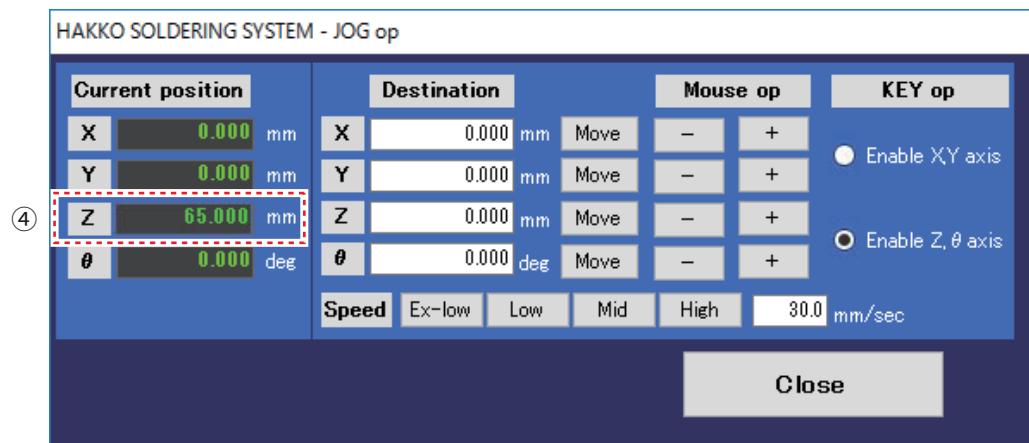


Fig. 7-17

## 7-2-2 Tip position adjustment by JOG operation

Ex) Position the tip to coordinate in Fig. 7-19

- ① When the coordinate of the soldering point is known, input the coordinate and click Move (See Fig. 7-18).

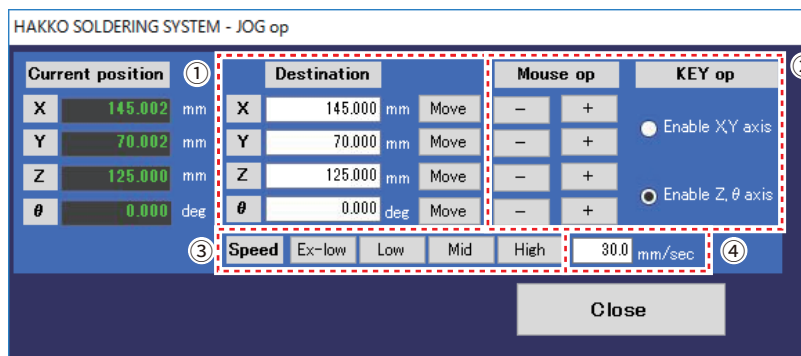


Fig. 7-18

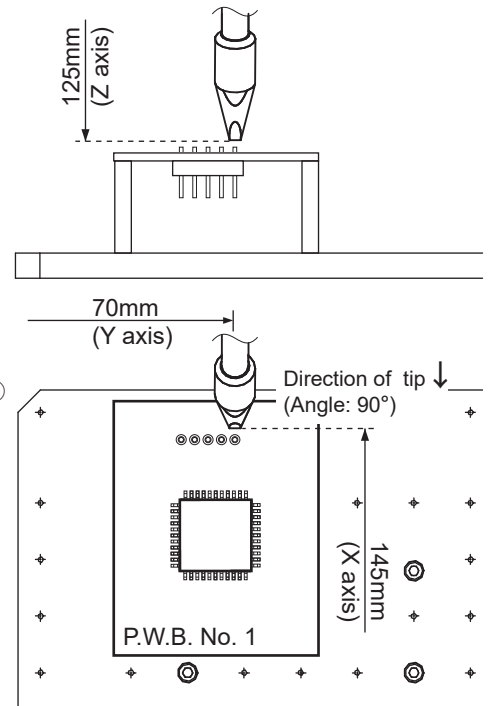


Fig. 7-19

- ② If the coordinate is not identified, move the tip near the soldering point by mouse operation and KEY operation.

### \*Selection of speed

The speed is selected from the following 4 types:

- ③ **Ex-low** : 5 mm/sec, **low** : 30 mm/sec, **mid** : 100 mm/sec, **high** : 200 mm/sec

- ④ In addition to the above 4 type of speed, it is possible to set arbitrary speed by inputting value.  
Set range is from 1 to 800 mm/sec.

When making a big move as shown in Fig. 7-20, select Mid or High speed.

In the case of fine adjustment as shown in Fig. 7-21, select Ex-low or adjust the speed by inputting small values such as 1 mm/sec or the like.

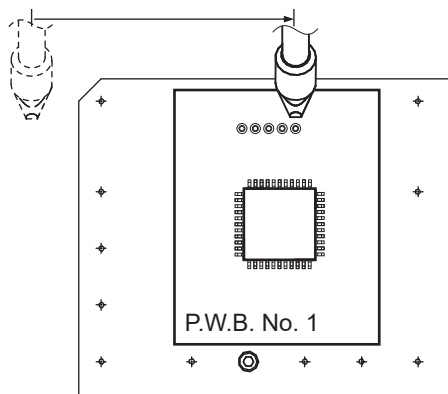


Fig. 7-20

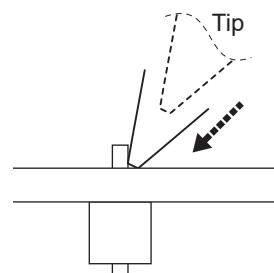


Fig. 7-21

- ⑤ Uncheck the “Perform Z axis lift when moving horizontally” on the top screen.

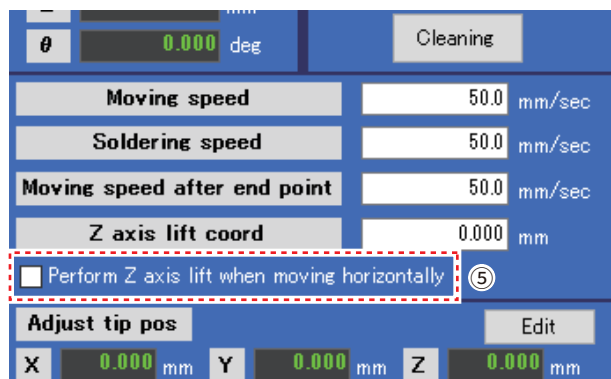


Fig. 7-22

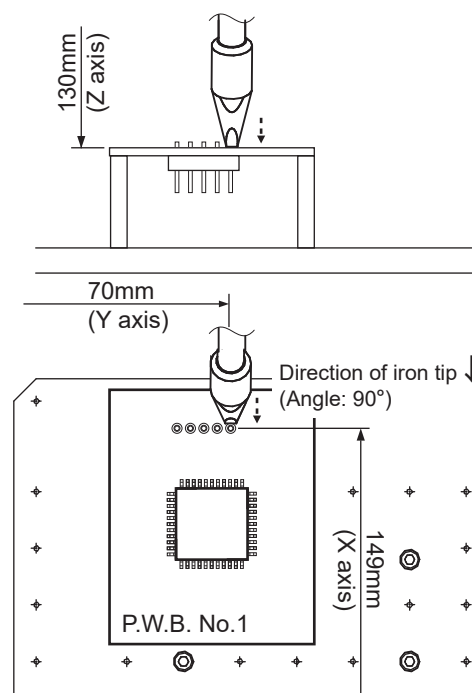


Fig. 7-23

- ⑥ Perform fine adjustment by mouse operation and KEY operation so that the tip is positioned at the soldering point (see Fig. 7-23). When positioning is completed, the coordinate of the soldering point is displayed on the current position shown in Fig. 7-24.

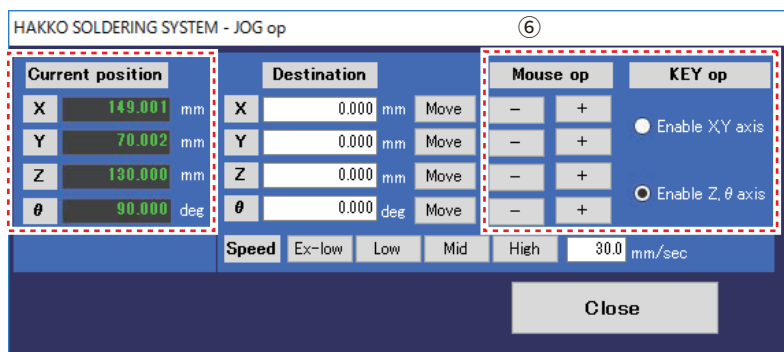


Fig. 7-24

**NOTE:**

For fine adjustment, select Ex-low or adjust the speed by inputting small values such as 1 mm/sec or the like.

**NOTE:**

If the checkbox is checked ON, it will perform Z axis lift every time when there is a move to X, Y and  $\theta$  axis, making it impossible to perform fine adjustments.  
For detail operation of Z axis lift, see p.62 and p.63 of “7-2-1 Basic JOG operation” in “7-2 JOG operation” in “7. How to use”.

### 7-3 Setting the cleaner (CX1003)

#### ⚠ CAUTION

After learning JOG operation, be sure to set the cleaning position before other operation.

Set the cleaning position of the installed cleaner (CX1003).

To have the tip cleaned thoroughly, It is possible to add movement and angle to the cleaning process such as movement of **start point → end point → start point**

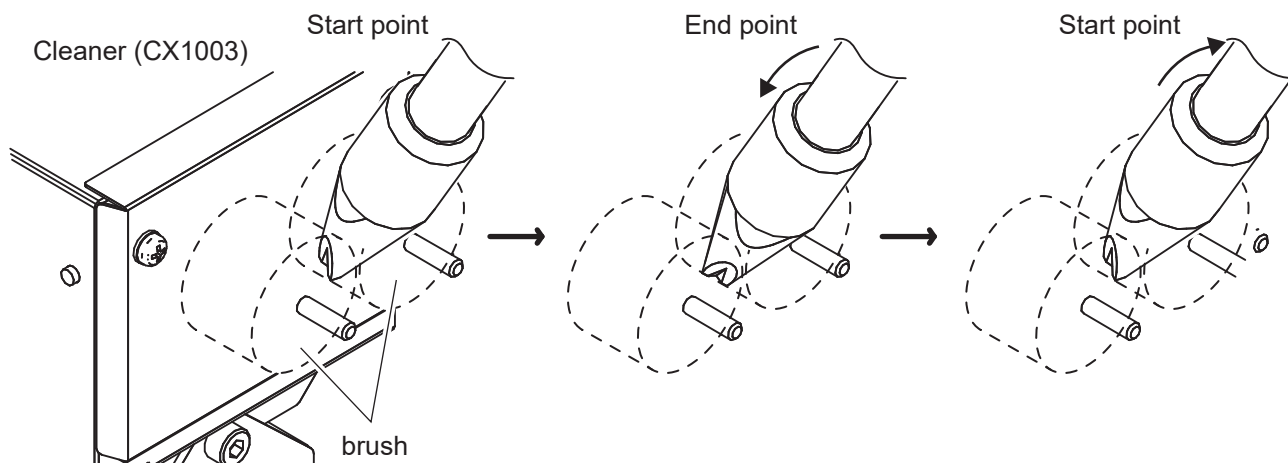


Fig. 7-25

#### Ex) Setting of start point and end point coordinates

Use the JOG operation screen and move the axes to the position where cleaning is operated. Set the start point adjusting the cleaning position depending on the tip shape and dimensions.

- Click the “JOG op” to open the JOG operation screen (See Fig. 7-27). Move the axis by mouse operation to the position where the tip comes in contact with the cleaner.

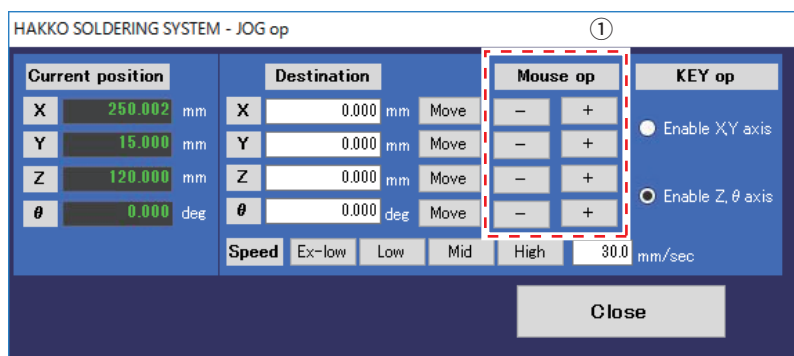


Fig. 7-27

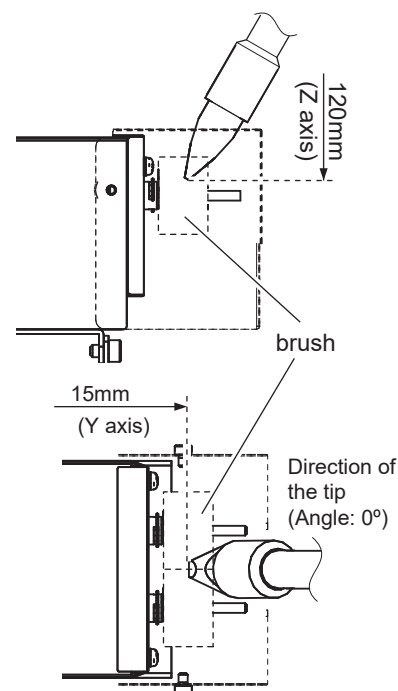


Fig. 7-26

Cleaning coordinate is example only.  
Please set according to the actual position.

- After the coordinate of each axis is determined, pull down “Setting” on the top screen and open the option screen.

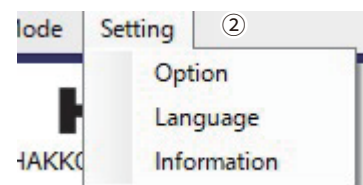


Fig. 7-28

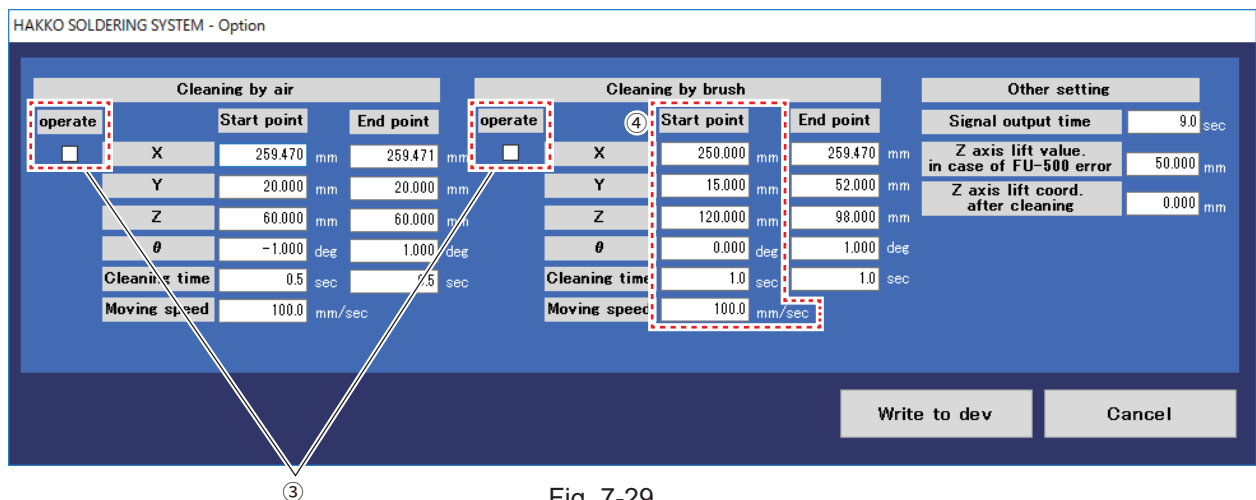


Fig. 7-29

③ Operate ON/OFF

Turn the “Operate” checkbox ON to move the jig table as in the X coordinate during cleaning.  
Turn the “Operate” checkbox OFF to keep the jig table in the same position during cleaning.

④ Input the positioned cleaning coordinate determined in ① in the start point of cleaning by brush.

The Y axis is set at the position 15 mm away from the origin and the Z axis is set at the position 120 mm away from the origin.  
The  $\theta$  axis is position at  $0^\circ$  which is same as the origin.

The cleaning time is set to 1 sec.  
With this setting, cleaning is performed at the start point coordinate for 1 sec.

The moving speed shows the moving speed during cleaning.  
The moving speed is set to 100 mm/sec here.

If the cleaner (CX1003) is placed on the jig table, the X axis (front-rear direction) also needs to be set.

Table 7-1 (Start point)

X axis	250.000mm*
Y axis	15.000mm
Z axis	120.000mm
$\theta$ axis	0.000°
Cleaning time	1.0 sec.
Moving speed	100mm/sec

\* Since X axis coordinate is the movement of jig table, the input value will not effect the cleaning operation as long as the cleaner (CX1003) is not on the jig table. Input any desired value as the movement of the jig table.

The end point is set to clean the part of the tip where it could not be cleaned only with the start point coordinate, by changing the angle and position.

⑤ Perform axis movement so that the brush comes in contact with a place that needs to be cleaned besides the start point coordinate. When coordinate positioning is completed, the cleaning coordinate (end point) is displayed on the current position in Fig. 7-31.

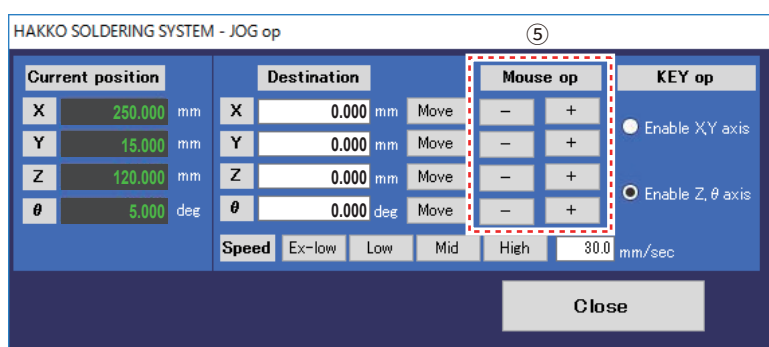


Fig. 7-31

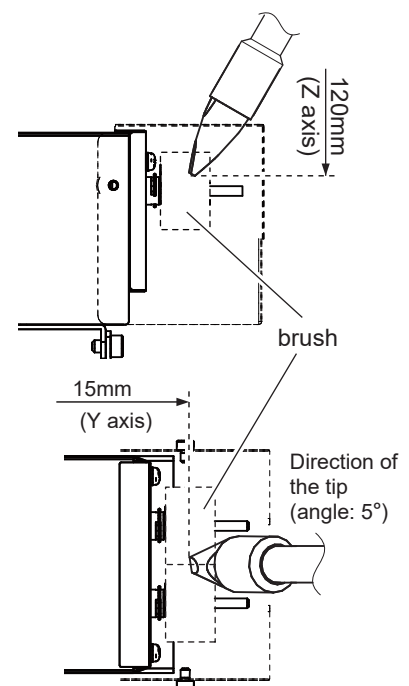


Fig. 7-30

- ⑥ Input the positioned cleaning coordinate determined in ⑤ in the end point of cleaning by brush.

HAKKO SOLDERING SYSTEM - Option

Cleaning by air				Cleaning by brush				Other setting	
operate		Start point	End point	operate		Start point	End point	Signal output time	
<input type="checkbox"/>	X	259.470 mm	259.471 mm	<input type="checkbox"/>	X	250.000 mm	250.000 mm		9.0 sec
	Y	20.000 mm	20.000 mm		Y	15.000 mm	15.000 mm	Z axis lift value. in case of FU-500 error	50.000 mm
	Z	60.000 mm	60.000 mm		Z	120.000 mm	120.000 mm	Z axis lift coord. after cleaning	0.000 mm
	$\theta$	-1.000 deg	1.000 deg		$\theta$	0.000 deg	5.000 deg		
	Cleaning time	0.5 sec	0.5 sec		Cleaning time	1.0 sec	1.0 sec		
	Moving speed	100.0 mm/sec			Moving speed	100.0 mm/sec			

⑧ Write to dev | Cancel

Fig. 7-32

The Y axis is set at the position 15 mm away from the origin and the Z axis is set at the position 120 mm away from the origin. The  $\theta$  axis is set at 5°.

The cleaning time is set to 1 sec.

With this setting, cleaning is performed at the end point coordinate for 1 sec.

Table 7-2 (end point)

X axis	250.000mm*
Y axis	15.000mm
Z axis	120.000mm
$\theta$ axis	0.000°
Cleaning time	1.0 sec.
Moving speed	100mm/sec
Z axis lift value. after cleaning	0.000mm

\* Since X axis coordinate is the movement of jig table, the input value will not effect the cleaning operation as long as the cleaner (CX1003) is not on the jig table.

Input any desired value as the movement of the jig table.

- ⑦ Z axis lift coord. after cleaning  
Input the Z axis lift coordinate of the tip after cleaning and set its position.

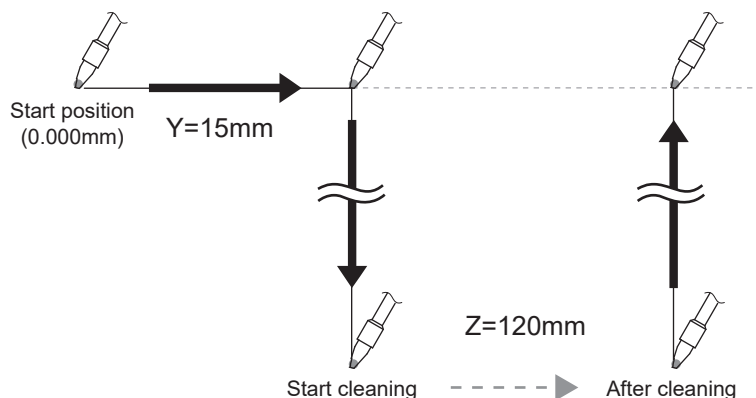


Fig. 7-33

When cleaning is performed in the setting shown in table 7-1, 7-2, cleaning by brush is operated as shown in Fig. 7-34.

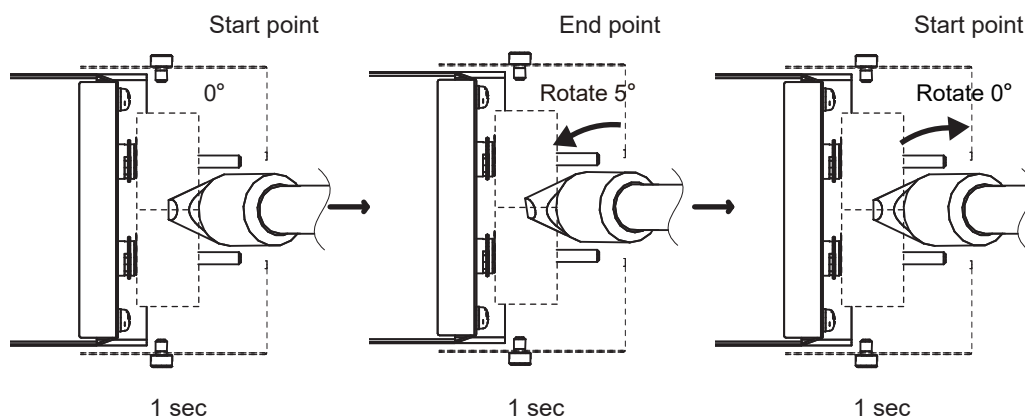


Fig. 7-34

⑧ After setting is completed, click “write to dev” and the setting is written to table-top type robot (IAI-made TTA-A4 series). If you do not intend to fix this setting, click “Cancel”.

⑨ In the Option screen, beside the cleaner (CX1003) included in the set, air cleaner could also be set. See Fig. 7-35 for wiring of the air cleaner from the table-top type robot (IAI-made TTA-A4 series).

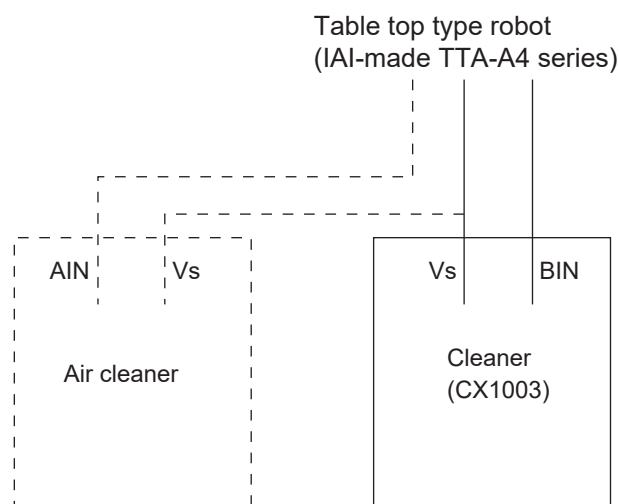


Fig. 7-35

Ex) Using both cleaning by air and cleaning by brush

Clicking “Cleaning” on the top screen (Fig. 7-36) or pressing the “CLEANING” button (Fig. 7-37) of the table-top type robot (IAI-made TTA-A4 series) will perform both cleaning in the order of cleaning by air → cleaning by brush.

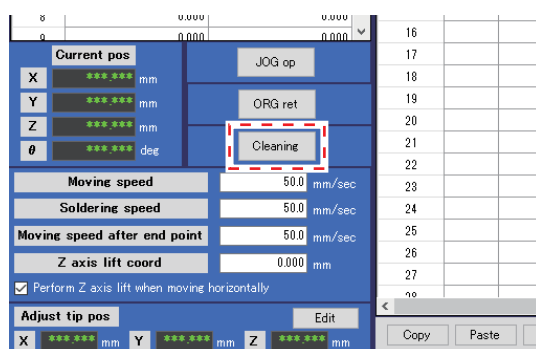


Fig. 7-36

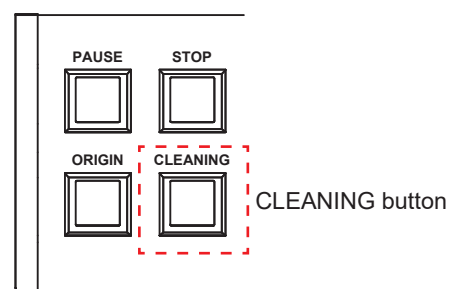


Fig. 7-37

Ex) Setting cleaning by each point

Selection of cleaning by air and/or cleaning by brush for certain point are possible in the Edit point screen.

See p.82 of “⑱ Select the type of cleaning and timing” in “7-4-1 How to set PS(point soldering)” in

“7-4 Creating soldering program”.

Ex) Setting cleaning by brush only

Input 1 second to the “start point” and “end point” of the cleaning time of Cleaning by brush.

Input “0” to the “start point” and “end point” of the cleaning time of Cleaning by air.

Cleaning by air will be canceled with this setting. (Refer to Table 7-3 for cleaning time.)

HAKKO SOLDERING SYSTEM - Option

Cleaning by air				Cleaning by brush				Other setting	
operate		Start point	End point	operate		Start point	End point		
<input type="checkbox"/>	X	259.470 mm	259.471 mm	<input type="checkbox"/>	X	250.000 mm	250.000 mm	Signal output time	9.0 sec
	Y	20.000 mm	20.000 mm		Y	15.000 mm	15.000 mm	Z axis lift value. in case of FU-500 error	50.000 mm
	Z	60.000 mm	60.000 mm		Z	120.000 mm	120.000 mm	Z axis lift coord. after cleaning	0.000 mm
	θ	-1.000 deg	1.000 deg		θ	0.000 deg	5.000 deg		
	Cleaning time	0.0 sec	0.0 sec		Cleaning time	1.0 sec	1.0 sec		
	Moving speed	100.0 mm/sec			Moving speed	100.0 mm/sec			

Write to dev Cancel

Fig. 7-38

Table 7-3

	Start point	End point
X axis	259.470mm	259.471mm
Y axis	20.000mm	20.000mm
Z axis	60.000mm	60.000mm
θ axis	-1.000°	1.000°
Cleaning time	0.0 sec	0.0 sec
Moving speed	100mm/sec	100mm/sec

If AIN and BIN is connected opposite in the wiring shown in Fig. 7-35, cleaning by brush will operate with the cleaning by air setting, and cleaning by air will operate with the cleaning by brush setting.

## 7-4 Creating soldering program

The following explains the steps to create a soldering program using the sample board (2 pieces) shown in Fig. 7-39 in order of Table 7-4.

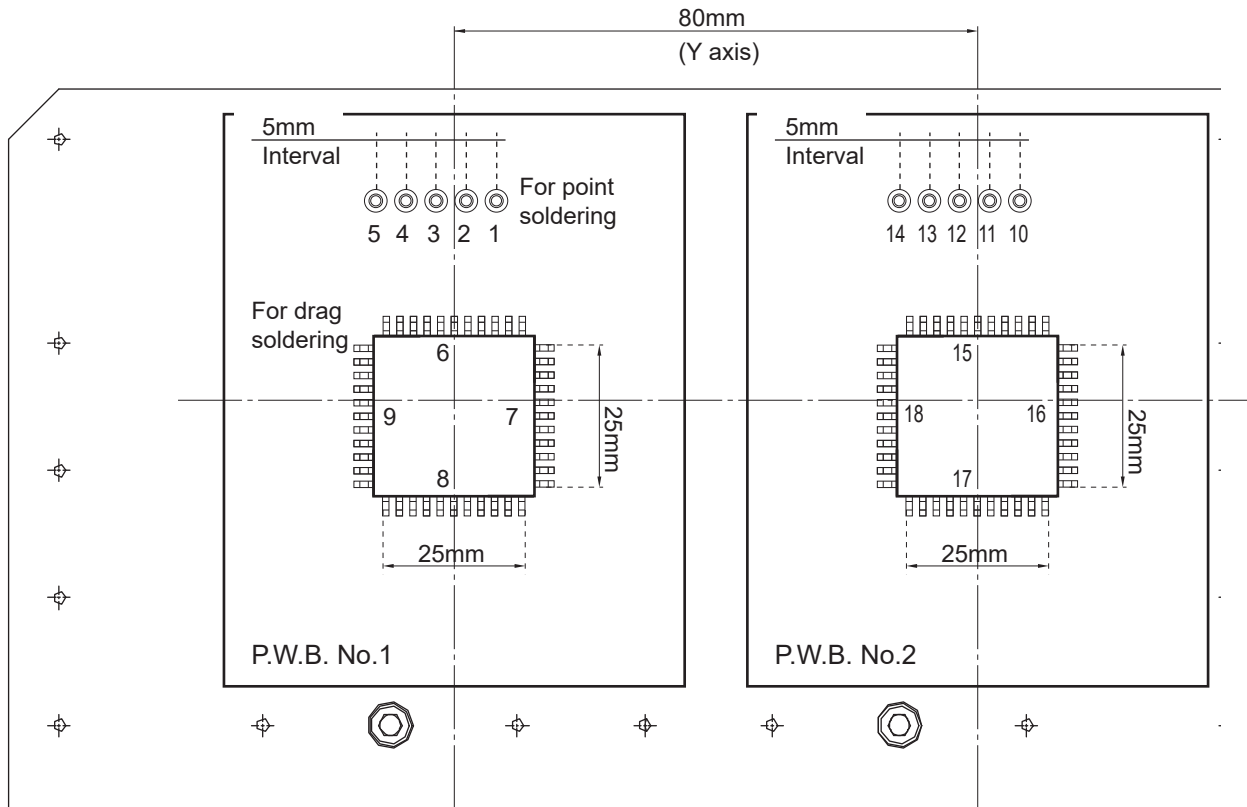


Fig. 7-39

Table 7-4

Order	Types of soldering	P.W.B. No.
1	PS (point soldering)	1
2	PS (point soldering)	1
3	PS (point soldering)	1
4	PS (point soldering)	1
5	PS (point soldering)	1
6	DS (drag soldering)	1
7	DS (drag soldering)	1
8	DS (drag soldering)	1
9	DS (drag soldering)	1
10	PS (point soldering)	2
11	PS (point soldering)	2
12	PS (point soldering)	2
13	PS (point soldering)	2
14	PS (point soldering)	2
15	DS (drag soldering)	2
16	DS (drag soldering)	2
17	DS (drag soldering)	2
18	DS (drag soldering)	2
19	Eject	-

Using the sample P.W.B No. 1 in the previous page, how to program is explained in order starting from the PS program setting of the first point.

#### 7-4-1 How to set PS (point soldering)

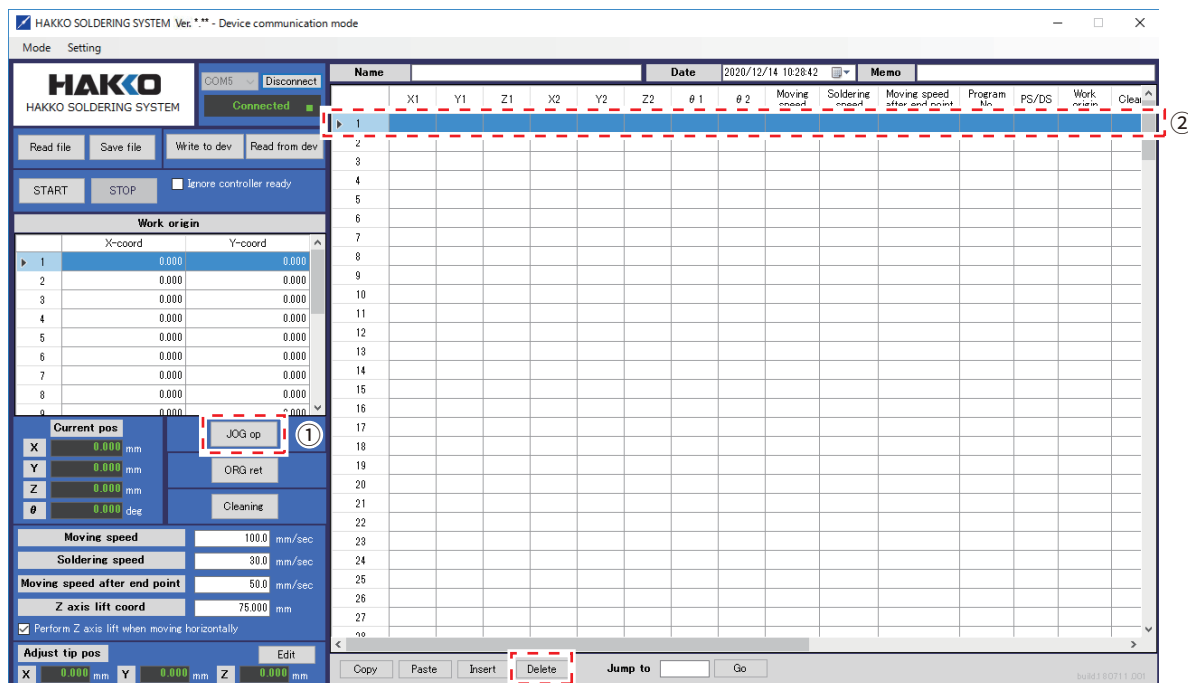


Fig. 7-40

At first, check that all devices are correctly connected and powered ON.

See p.51 of “5-3 Connection with PC” and p.52 of “5-4 Connection with HAKKO FU-500 and external devices” in “5. Installation and connection”.

Boot up the PC and insert the license dongle into the USB connector.

Start up the Easy Programming Software. Click “Connect” and perform return to origin.

- ① Click “JOG op” to open the JOG operation screen.
- ② Double-click the 1st line to open the “Edit point” screen shown in Fig. 7-42.  
It is also possible to create by selecting an arbitrary line.

#### NOTE:

If programs are written in the 1st and 3rd lines, even if performing program operation from the 1st line, the program in 3rd line does not operate. Select the 2nd line with no program written, and click delete.

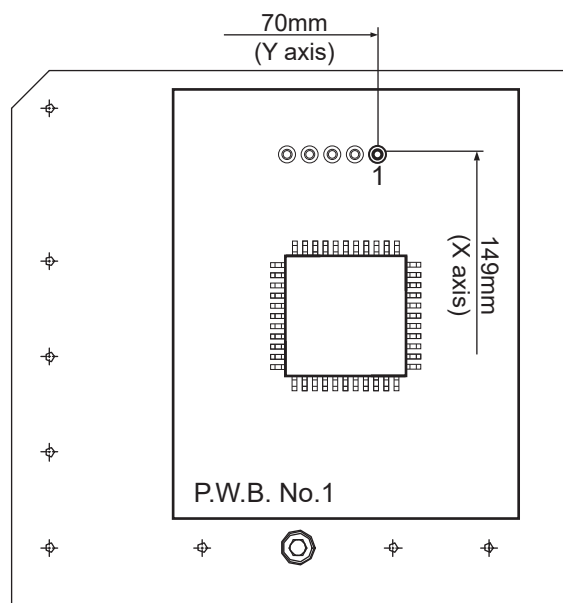


Fig. 7-41

HAKKO SOLDERING SYSTEM - Edit point

NO.	1		Point name			③
Switch	Start point	End point	Soldering mode	④		
X		mm		mm		
Y		mm		mm		
Z		mm		mm		
$\theta$		deg		deg		
Use current pos			Program No.			
			Work origin			
			Cleaning	<input type="checkbox"/> Cleaning by air <input type="checkbox"/> Cleaning by brush <input checked="" type="radio"/> Before soldering <input type="radio"/> After soldering		
			Move back to	<input checked="" type="radio"/> Start point <input type="radio"/> Z axis lift		
			I/O setting	Display   Without setting		
Moving speed		mm/sec	Z axis lift coord			
Soldering speed		mm/sec				
Moving speed after end point		mm/sec				
Move			OK		Cancel	

Fig. 7-42

③ Input a name for part to be soldered in the Point name.

④ Select "PS" for Soldering mode.

## • Setting the end point and start point of the first point. (PS)

### ⑤ Determine position of the end point coordinate.

The end point coordinate of PS mode is the soldering points (secondary and tertiary solder feeding positions of HAKKO FU-500).

Align the tip to the soldering position using the JOG operation screen.

(1) Move the tip close to the soldering point using mouse operation.

(2) Uncheck the “Perform Z axis lift when moving horizontally” on the top screen.

#### NOTE:

If the checkbox is checked ON, it will perform Z axis lift every time when there is a move to X, Y and  $\theta$  axis, making it impossible to perform fine adjustments. See p.62 and p.63 of “7-2-1 Basic JOG operation” in “7-2 JOG operation” for details on Z axis lift.

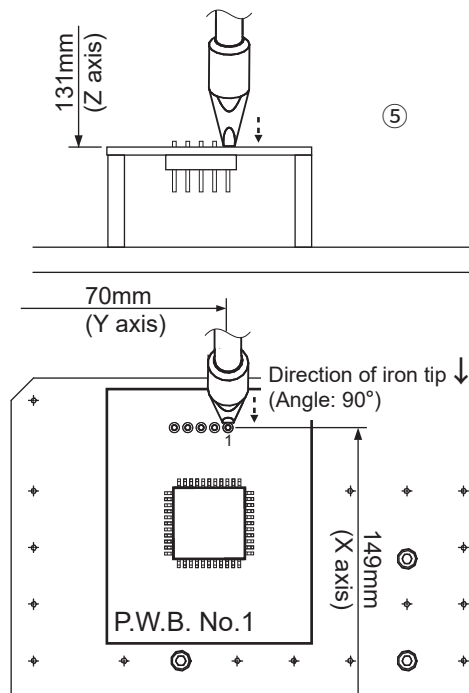


Fig. 7-43

(3) Align the tip to the soldering point by performing fine adjustment.

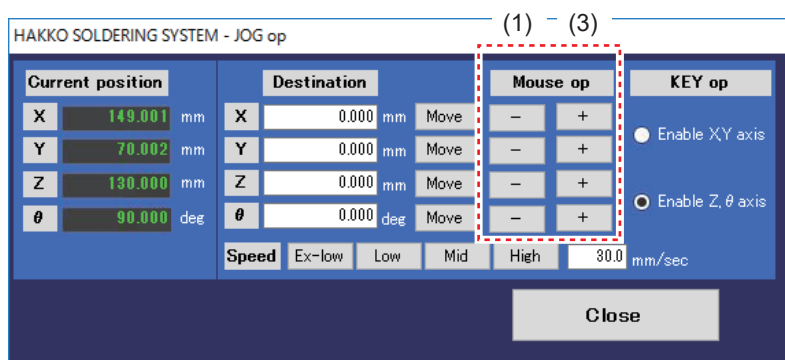


Fig. 7-44

### ⑥ Click “End point” on the Edit point screen.

Character of “End point” turns red, showing that end point is active for edit.

### ⑦ Click “Use current pos”.

⑧ Inputting values of the end point coordinate positioned by JOG operation in ⑤ is completed by the above-mentioned steps.

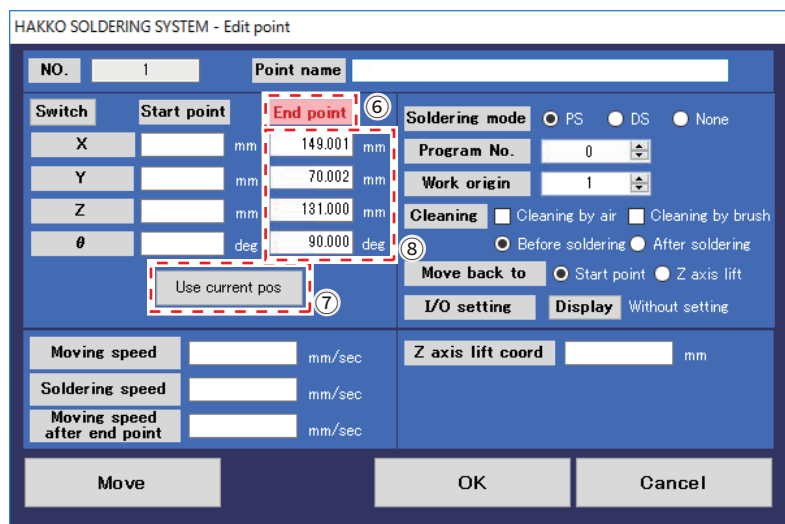


Fig. 7-45

- ⑨ Determine position of the start point coordinate. The start point coordinate of PS mode is a position for pre-soldering (primary soldering of HAKKO FU-500). Set the pre-soldering (start point) close to the soldering point (end point) so that the flux and solder does not deteriorate.

Align the tip to the pre-soldering position using the JOG operation screen.

- (1) If the check box of “Perform Z axis lift when moving horizontally” is checked OFF from setting the end point coordinate, continue to perform fine adjustment. If the check box is checked ON, uncheck it. Using the mouse operation of the JOG operation screen, adjust the position of the tip to pre-soldering point.

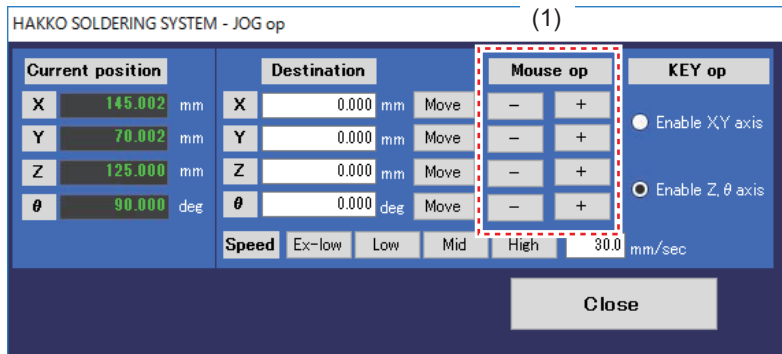


Fig. 7-47

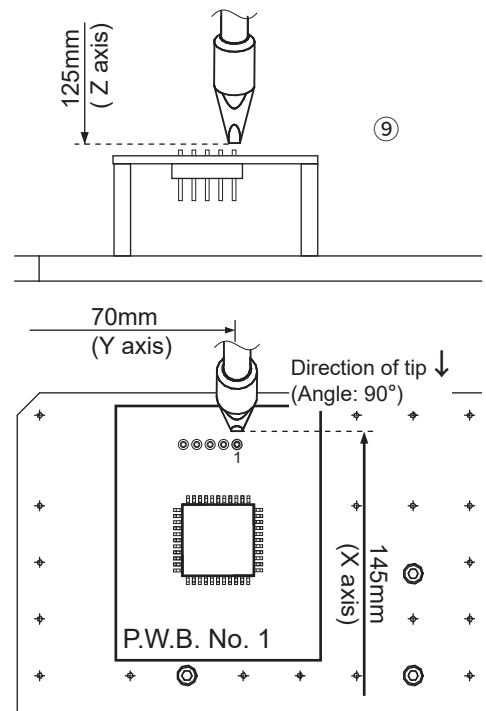


Fig. 7-46

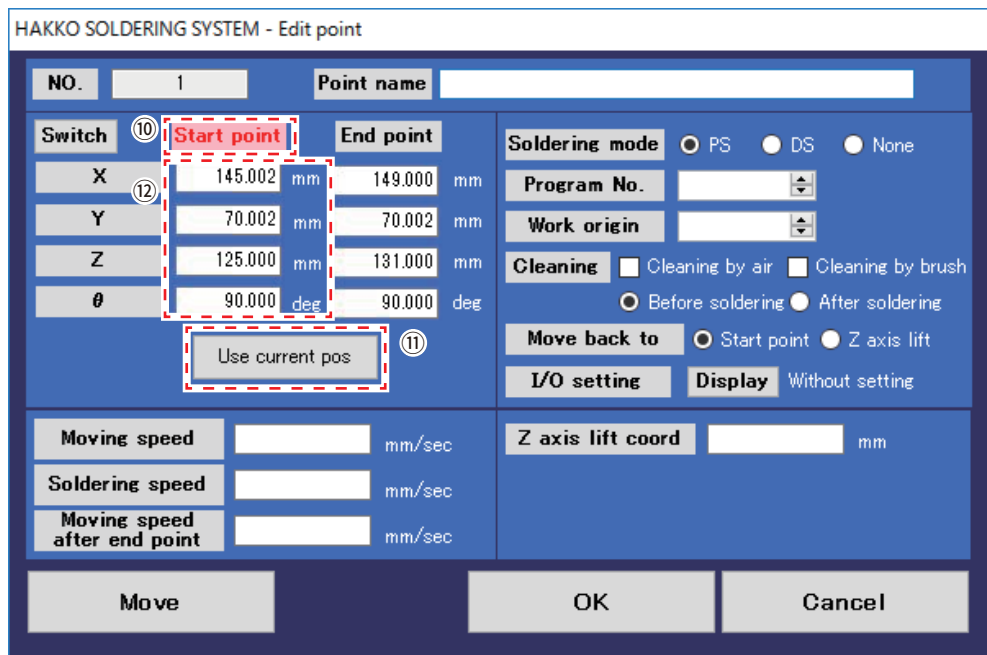


Fig. 7-48

- ⑩ Click “start point” of the Edit point screen.  
Character of “Start point” turns red, showing that start point is active for edit.
- ⑪ Click “Use current pos”
- ⑫ Inputting values of the start point coordinate positioned by JOG operation in ⑨ is completed by the above-mentioned steps.

## • Alternative way to set start point (Offset input)

Offset is a feature to set the start point by inputting distance values (offset amount) from the end point.

Fig. 7-49

### ⑬ Switch

Click “switch” to switch the screen of start point input from coordinate to offset amount as shown in Fig. 7-49.

### ⑭ Determine position of end point coordinate

The coordinate shown uses the example coordinate set in p.77 of “Setting the end point and start point of the first point”.

### ⑮ Input offset amount

Input value to offset from the end point in the “offset value”.

Ex) Input 5mm as offset value.

The point shown in Fig. 7-50 will be the start point.

The steps other than the inputting the offset value is same as p.77 of “Setting the end point and start point of the first point”.

#### NOTE:

Only the moving distance from the end point could be set in offset input. If the tip contacts other surrounding components using this offset setting, switch to coordinate input. Coordinate input allows fine positioning of the tip by inputting values to each axis (XYZθ).

#### ⚠ CAUTION

Offset input could not be done other than PS (point soldering) mode.

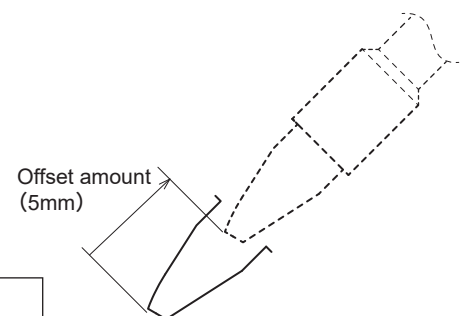


Fig. 7-50

HAKKO SOLDERING SYSTEM - Edit point

NO. 1 Point name

Switch	Start point	End point
X	145.002 mm	149.000 mm
Y	70.002 mm	70.002 mm
Z	125.000 mm	131.000 mm
$\theta$	90.000 deg	90.000 deg

Use current pos

Soldering mode ☒ PS ☐ DS ☐ None

Program No. 0

Work origin 1

Cleaning ☐ Cleaning by air ☐ Cleaning by brush

☒ Before soldering ☐ After soldering

Move back to ☒ Start point ☐ Z axis lift

I/O setting Display Without setting

Moving speed mm/sec

Soldering speed mm/sec

Moving speed after end point mm/sec

Z axis lift coord mm

Move OK Cancel

Fig. 7-51

- ⑩ Select the solder feeding program No. of HAKKO FU-500

For HAKKO FU-500 program setting method, see “●Selecting Program Set” of “6. Operation”, HAKKO FU-500 Instruction Manual. Select No. 00 here.

### CAUTION

When setting the HAKKO FU-500, it is necessary to set the parameter setting of “S-U Mode (Selecting a slide unit connection mode)” to “Ext Mode (external)” in advance. For further details, see the “●Selecting Parameter Set” of “6. Operation”, HAKKO FU-500 Instruction Manual.

- ⑪ Select the work origin.

When running the soldering program, the values set in the selected work origin are offset. Select work origin 1 here. (See “\*Work origin” on Page 80 for example of use.)

HAKKO SOLDERING SYSTEM Ver. 1.11 - Device communication mode

Mode Setting

HAKKO HAKKO SOLDERING SYSTEM

COM5 Disconnect Connected

Read file Save file Write to dev Read from dev

START STOP Ignore controller ready

Work origin

	X-coord	Y-coord
1	0.000	0.000
2	0.000	0.000
3	0.000	0.000
4	0.000	0.000
5	0.000	0.000
6	0.000	0.000
7	0.000	0.000
8	0.000	0.000
9	0.000	0.000

Current pos

X	145.002 mm
Y	70.002 mm
Z	125.000 mm
$\theta$	90.000 deg

JOG op ORG ret Cleaning

Name	Date	Memo
X1	Y1	Z1
X2	Y2	Z2
$\theta$ 1	$\theta$ 2	Moving speed
Soldering speed	Moving speed after end point	Program No.
PS/DS	Work origin	Clean

Work origin  
(20 lines)

Fig. 7-52

## \*Work origin

With reference to the origin of the robot (IAI-made TTA-A4 series), it is possible to run the program by offsetting the input values.

Example of use)

- ① When same three P.W.B.s are arranged as shown in Fig. 7-53, measure the distance between the reference points of the 1st P.W.B. and the 2nd P.W.B., and the distance between the reference points of the 1st P.W.B. and the 3rd P.W.B.. Set the work origin of the P.W.B. No. 1 to (X coordinate: 0 Y coordinate: 0).
- ② When the distance between the reference points is the values in Fig. 7-53, input values to the work origin 2 and 3 as in Fig. 7-54. By setting the work origin, the program for the 1st P.W.B. can be used.

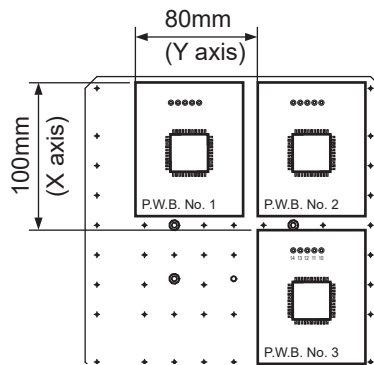


Fig. 7-53

Distance between P.W.B. No. 1 and P.W.B. No. 2

Work origin		
	X-coord	Y-coord
1	0.000	0.000
2	0.000	80.000
3	100.000	80.000
4	0.000	0.000
5	0.000	0.000
6	0.000	0.000
7	0.000	0.000
8	0.000	0.000
9	0.000	0.000

Distance between P.W.B. No. 1 and P.W.B. No. 3

Fig. 7-54

- ③ After completing creating soldering program for P.W.B. No. 1, copy the soldering program for P.W.B. No. 1. When pasting the copied program, a dialog window will open asking for the work origin (see Fig. 7-55). In case of P.W.B. No. 2, select work origin 2, in case of P.W.B. No. 3, select work origin 3.

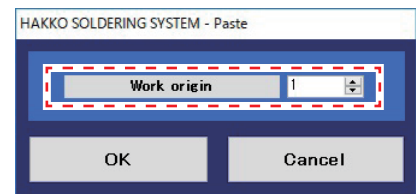


Fig. 7-55

- ④ Clicking the "START" button performs soldering of the P.W.B. No. 2 and P.W.B. No. 3 at the same position as the P.W.B. No. 1 with input values offset.

### ⚠ CAUTION

Settable range of work origin are 0 to 400 mm on both X axis and Y axis. Note that values cannot be set in negative direction from the reference P.W.B..

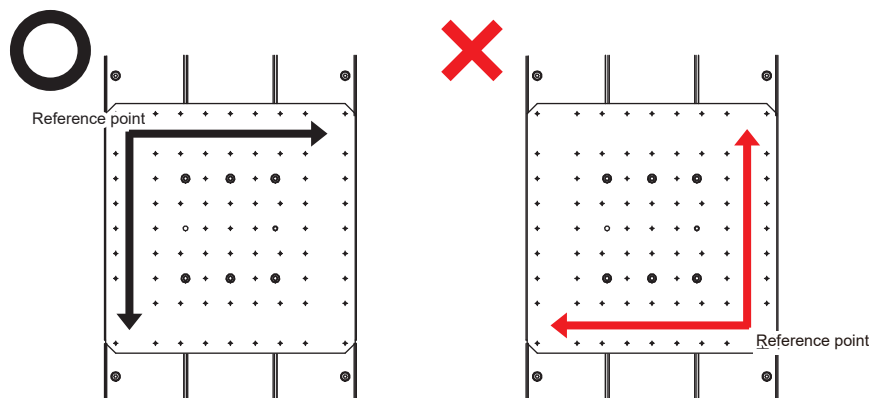


Fig. 7-56

HAKKO SOLDERING SYSTEM - Edit point

NO.	1		Point name		
Switch	Start point		End point		
X	145.002	mm	149.000	mm	
Y	70.002	mm	70.002	mm	
Z	125.000	mm	131.000	mm	
$\theta$	90.000	deg	90.000	deg	
Use current pos					
Soldering mode			<input checked="" type="radio"/> PS <input type="radio"/> DS <input type="radio"/> None		
Program No.			0		
Work origin			1		
Cleaning			<input type="checkbox"/> Cleaning by air <input checked="" type="checkbox"/> Cleaning by brush		
			<input checked="" type="radio"/> Before soldering <input type="radio"/> After soldering		
Move back to			<input checked="" type="radio"/> Start point <input type="radio"/> Z axis lift		
I/O setting			Display Without setting		
Moving speed		mm/sec	Z axis lift coord		
Soldering speed		mm/sec			
Moving speed after end point		mm/sec			
Move		OK		Cancel	

Fig. 7-57

- ⑱ Select the type of cleaning and timing.

Select the cleaning type depending on the cleaner connected, and select the timing when to perform cleaning.

Check the check box of the type of cleaning used. It can be selected from air or brush, and also both types can be selected.

If the check box of Cleaning by air and Cleaning by brush is both checked ON, the cleaning is performed in order of cleaning by air→cleaning by brush.

The timing to perform cleaning is selected either before soldering or after soldering.

Since this is setting the first soldering point now, cleaning by brush before soldering is selected.

Clicking “Cleaning” on the top screen or pressing the “CLEANING” button of the table-top type robot (IAI-made TTA-A4 series) will perform both cleaning in the order of cleaning by air →cleaning by brush.

Setting of the cleaner is set from the menu in the top screen, select Option in Setting menu. See p.69-73 of “7-3 Setting the cleaner (CX1003)” in “7. HOW TO USE” for details.

HAKKO SOLDERING SYSTEM - Edit point

NO.	1		Point name		
Switch	Start point		End point		
X	145.002 mm		149.000 mm		
Y	70.002 mm		70.002 mm		
Z	125.000 mm		131.000 mm		
θ	90.000 deg				
Use current pos			movement after end point		
			<input checked="" type="radio"/> Start point <input type="radio"/> Z axis lift		
			Move back to <input checked="" type="radio"/> Start point <input type="radio"/> Z axis lift		
			I/O setting Display Without setting		
Moving speed			mm/sec		
Soldering speed			mm/sec		
Moving speed after end point			mm/sec		
			Z axis lift coord mm		
Move			OK Cancel		

Fig. 7-58

- ①⑨ Selection of movement destination after end point (Move back to)  
 The movement after end point (after soldering) is selected from start point or Z axis lift.

Ex) When start point is selected.

When “Start point” is selected, the tip is moved to the start point coordinate after soldering (See Fig. 7-59).

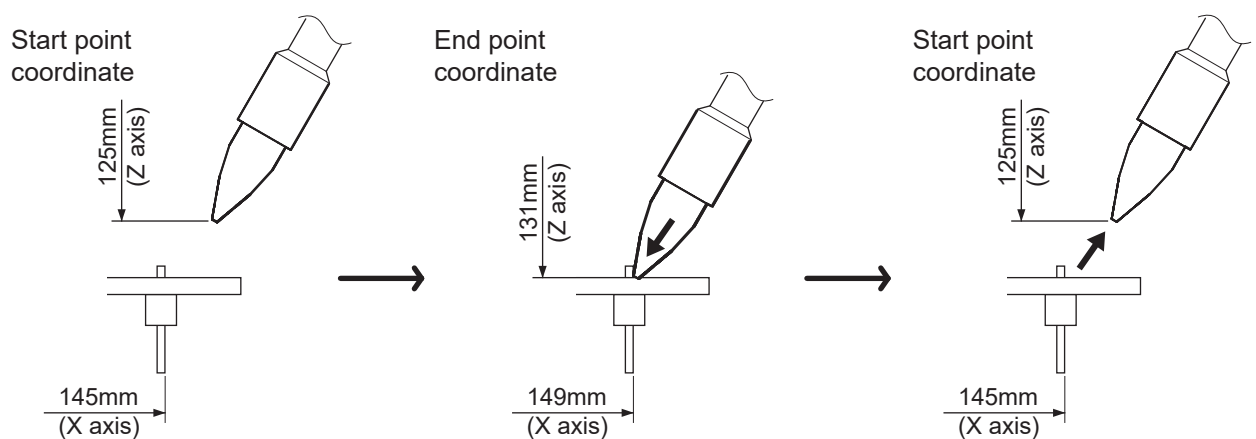


Fig. 7-59

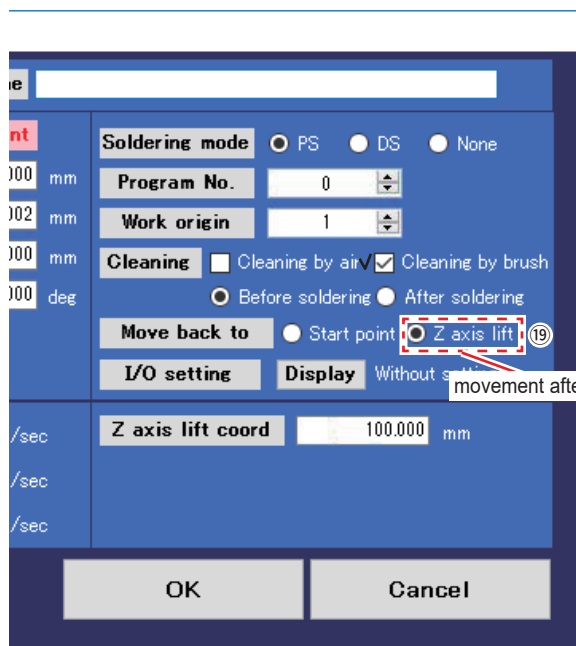


Fig. 7-60

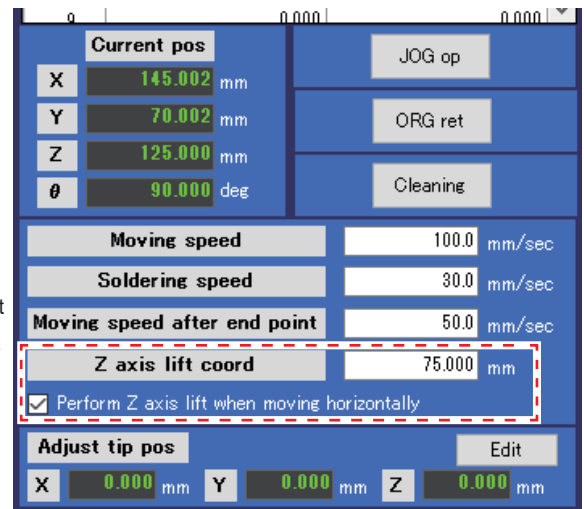


Fig. 7-61

Ex) When Z axis lift is selected

When “Z axis lift” is selected as in Fig. 7-61, the tip is moved to the Z axis lift coordinate (set in the top screen, see Fig. 7-62) after soldering.

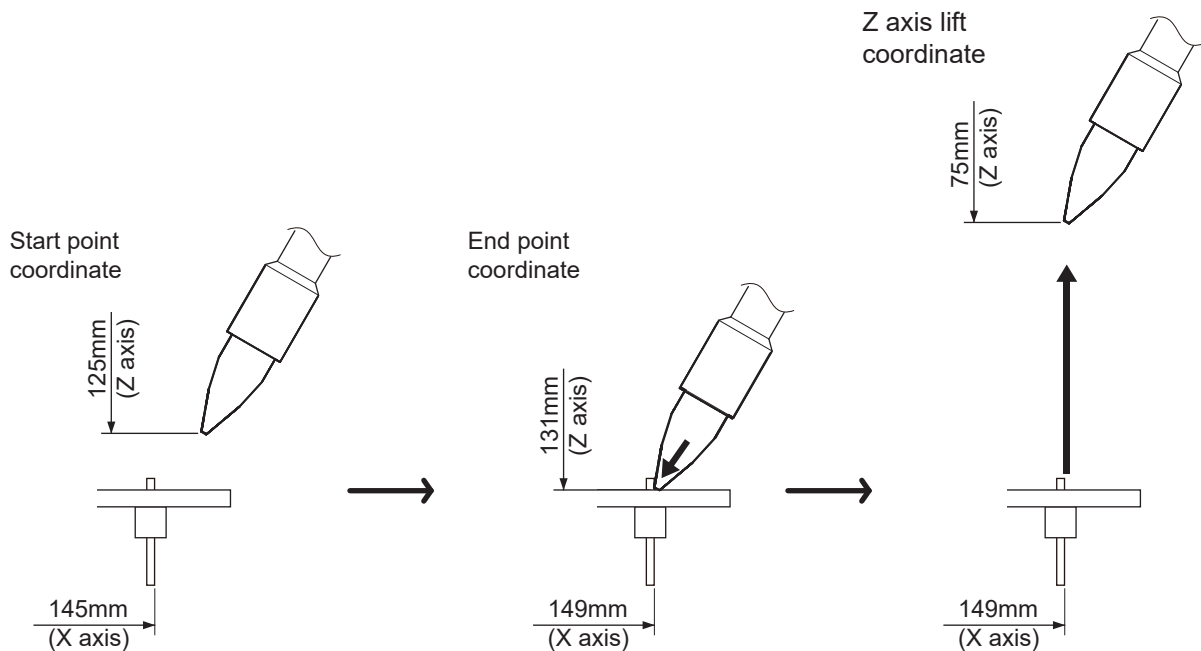


Fig. 7-62

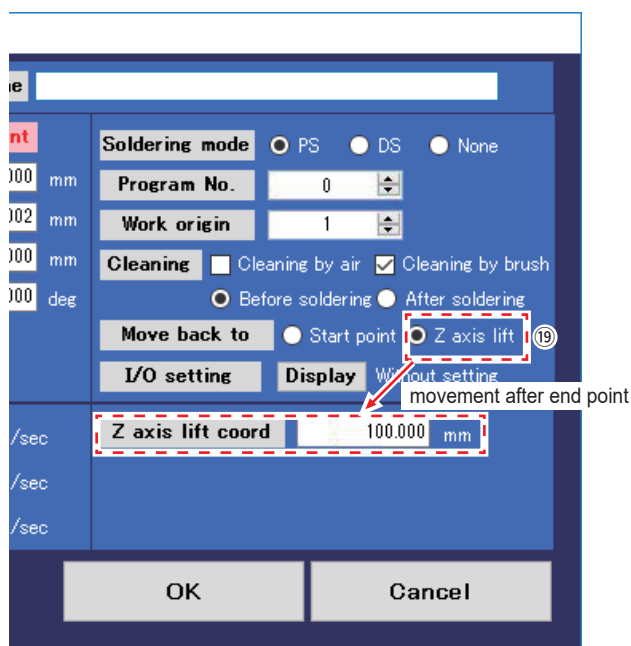


Fig. 7-63

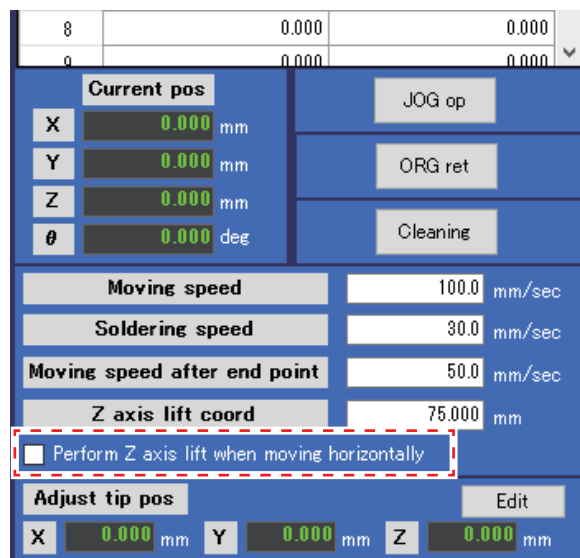


Fig. 7-64

Ex) When setting individually

When values are input in the Z axis lift coordinate on the Edit point screen as shown in Fig. 7-63, the tip is moved for the values inputted in the Edit point screen.

Regardless of the check box “Perform Z axis lift when moving horizontally” on the top screen as shown in Fig. 7-64 is ON or OFF, the value in the Z axis lift coordinate of the Edit point screen as shown in Fig. 7-63 are given priority, and performs Z axis lift on the point with value input.

#### CAUTION

If “Perform Z axis lift when moving horizontally” on the top screen is checked OFF and there is no value input in the Edit point screen, the Z axis lift is not performed and may be dangerous. When running the program, always check the check box ON for “Perform Z axis lift when moving horizontally”, or input Z axis lift coordinate in the Edit point screen.

#### CAUTION

Since it is necessary to press the tip against the soldering points, it can damage the components/board depending on their shapes when performing Z axis lift. Select either Z axis lift or start point coordinate, whichever is appropriate with consideration of shapes of components, etc.

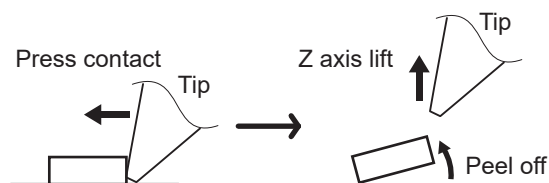


Fig. 7-65

HAKKO SOLDERING SYSTEM - Edit point

NO.	1		Point name		
Switch	Start point	End point	Soldering mode <input checked="" type="radio"/> PS <input type="radio"/> DS <input type="radio"/> None		
X	145.002 mm	149.000 mm	Program No. 0		
Y	70.002 mm	70.002 mm	Work origin 1		
Z	125.000 mm	131.000 mm	Cleaning <input type="checkbox"/> Cleaning by air <input checked="" type="checkbox"/> Cleaning by brush		
$\theta$	90.000 deg	90.000 deg	<input type="radio"/> Before soldering <input type="radio"/> After soldering <input checked="" type="radio"/> Move back to Start point <input type="radio"/> Z axis lift		
Use current pos			I/O setting Display Without setting		
Moving speed		mm/sec	Z axis lift coord		
Soldering speed		mm/sec			
Moving speed after end point		mm/sec			
Move			<div> <div>OK</div> <div>Cancel</div> </div>		

Fig. 7-66

- ②① Set the “Moving speed”, “Soldering speed” and “Z axis coord”.

When values are input in the “Moving speed”, “Soldering speed” and “Z axis lift coordinate” of the Edit point screen, the setting here is given priority than the settings on the top screen (See Fig. 7-67). Even when “Perform Z axis lift when moving horizontally” on the top screen is unchecked, if values are input in the Z axis lift coord on the Edit point screen, Z axis lift is performed.

**Moving speed** (Settable range: 1 to 800 mm/sec)  
Set the moving speed of each axis between points.

**Soldering speed** (Settable range: 1 to 800 mm/sec)  
Set the moving speed between primary and secondary soldering.

**Z axis lift coord** (Settable range: 0.000 to 150.000 mm)

Set the coordinate to prevent tip from coming into contact with projecting parts on work during horizontal movement. The Z axis moves usually after movement of X, Y,  $\theta$  axes.

**NOTE:**

If the checkbox is checked ON, it will perform Z axis lift every time when there is a move to X, Y and  $\theta$  axis, making it impossible to perform fine adjustments. See p.62 and p.63 of “7-2-1 Basic JOG operation” in “7-2 JOG operation” for details on Z axis lift.

Here, no value is inputted, and the value in the top screen is reflected.

- ②① Clicking the “OK” completes the soldering point setting at the 1st point.  
If you do not intend to fix this setting, click “Cancel”.

8	0.000	0.000	
9	0.000	0.000	
Current pos		JOG op	
X	0.000 mm	ORG ret	
Y	0.000 mm	Cleaning	
Z	0.000 mm		
$\theta$	0.000 deg		
Moving speed		50.0	mm/sec
Soldering speed		50.0	mm/sec
Moving speed after end point		50.0	mm/sec
<input checked="" type="checkbox"/> Z axis lift coord		0.000	mm
<input checked="" type="checkbox"/> Perform Z axis lift when moving horizontally			
Adjust tip pos		Edit	
X	0.000 mm	Y	0.000 mm
Z	0.000 mm		

Fig. 7-67

## • Setting from 2nd to 5th points (PS)

- Following the procedures of the 1st point, create program for the 2nd through the 5th point.



Here, change the setting in each point as below.

3rd point: moving speed to **50mm/sec**

4th point: Z axis lift coordinate to **50.000mm**

5th point: check cleaning by brush and select after soldering.

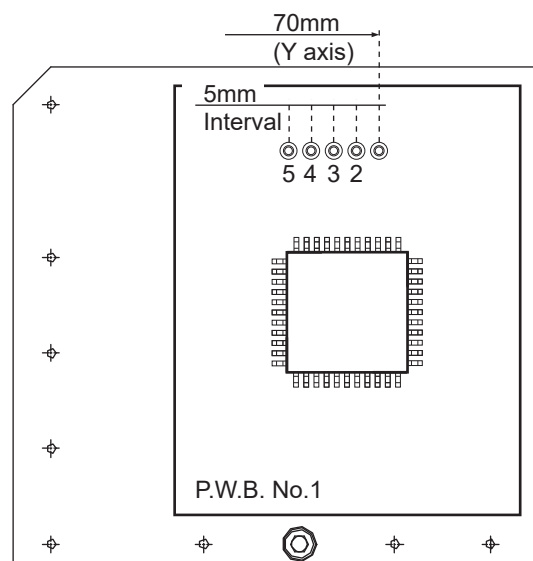


Fig. 7-68

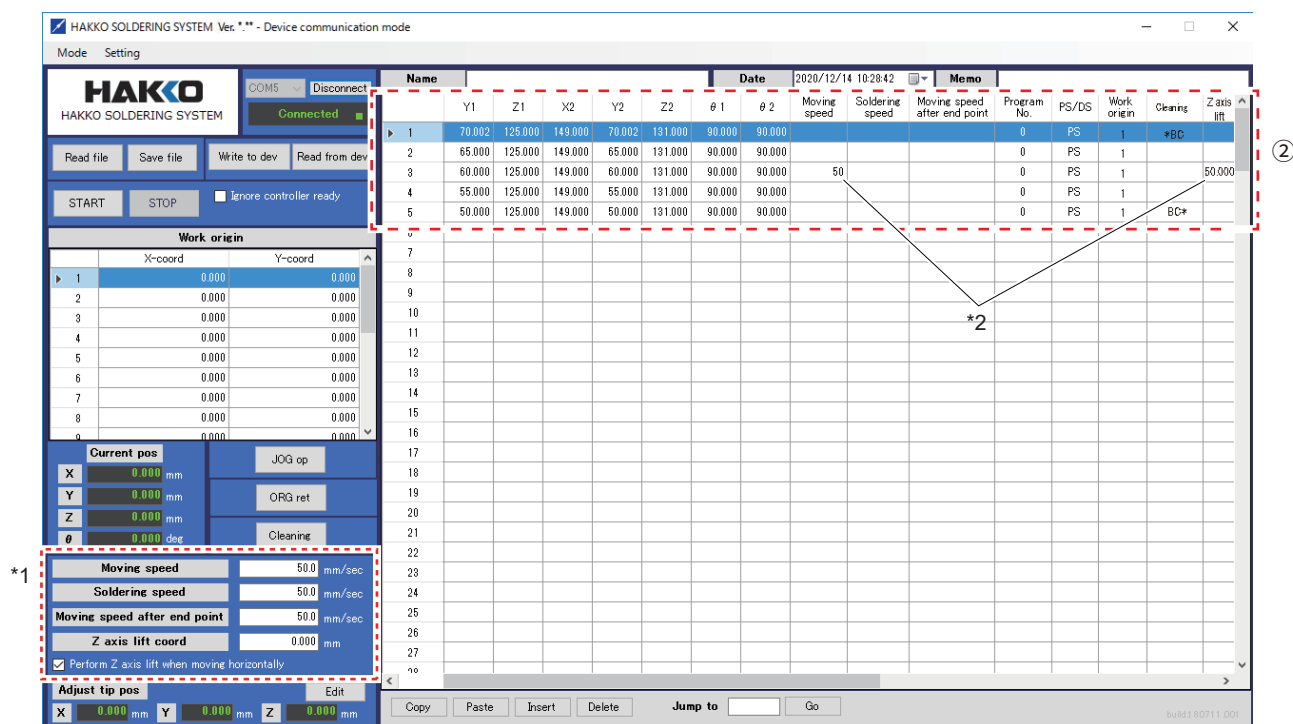


Fig. 7-69

Table 7-5

	X1 Start pt (mm)	Y1 Start pt (mm)	Z1 Start pt (mm)	X2 End pt (mm)	Y2 End pt (mm)	Z2 End pt (mm)	θ1 Start pt (deg)	θ2 End pt (deg)	Moving speed *1 (mm/sec)	Soldering speed *1 (mm/sec)	Program No.	PS/ DS	Work Origin	Z axis lift coord *1 (mm)	Cleaning
1	145	70	125	149	70	131	90	90	100	30	0	PS	1	75.000	Before
2	145	65	125	149	65	131	90	90	100	30	0	PS	1	75.000	-
3	145	60	125	149	60	131	90	90	50 <sup>*2</sup>	30	0	PS	1	75.000	-
4	145	55	125	149	55	131	90	90	100	30	0	PS	1	50.000 <sup>*2</sup>	-
5	145	50	125	149	50	131	90	90	100	30	0	PS	1	75.000	After

\*1 When value is not set in the Edit point screen, the value in the top screen is reflected (See Fig. 7-69).

\*2 When value is set in the Edit point screen, the value in the Edit point screen is reflected (See Fig. 7-69).

- After creating program to the 5th point, the top screen will be as Fig. 7-69, showing setting of point soldering to the fifth line.

Further on from program line 6, creating program of the first point for drag soldering is explained.

## 7-4-2 How to set DS (drag soldering)

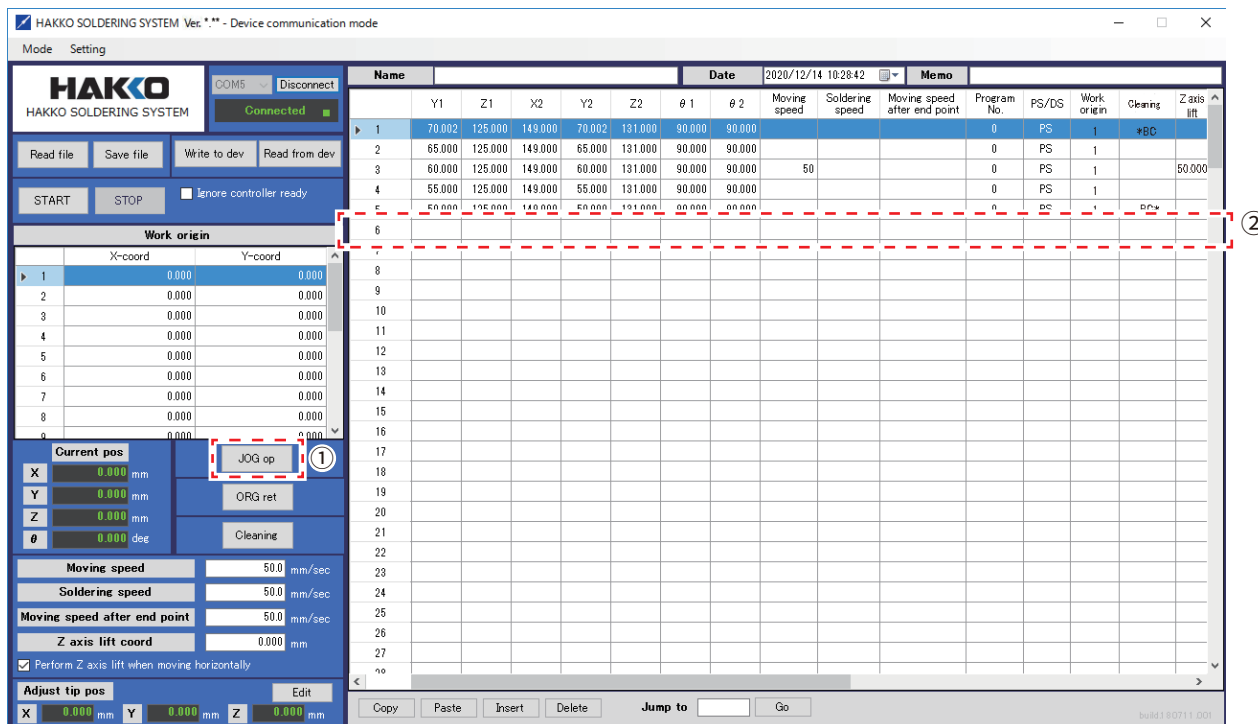


Fig. 7-70

- ① Click the “JOG op” to open the JOG operation screen.
- ② Double-click the 6th line to open the Edit point screen shown in Fig. 7-72.

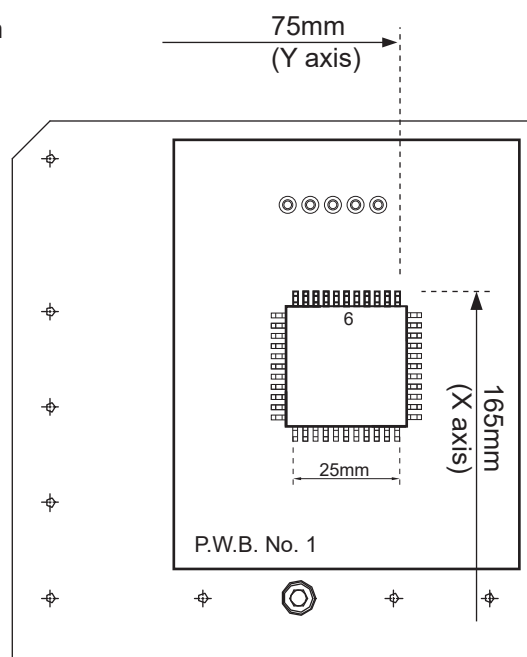


Fig. 7-71

HAKKO SOLDERING SYSTEM - Edit point

NO.	6		Point name		③
Switch	Start point	End point	Soldering mode	<input type="radio"/> PS <input checked="" type="radio"/> DS ④ <input type="radio"/> None	
X		mm	Program No.		
Y		mm	Work origin		
Z		mm	Cleaning	<input type="checkbox"/> Cleaning by air <input type="checkbox"/> Cleaning by brush	
$\theta$		deg	<input checked="" type="radio"/> Before soldering <input type="radio"/> After soldering		
Use current pos			Move back to	<input type="radio"/> Start point <input checked="" type="radio"/> Z axis lift	
			I/O setting	Display	Without setting
Moving speed		mm/sec	Z axis lift coord		mm
Soldering speed		mm/sec			
Moving speed after end point		mm/sec			
Move		OK		Cancel	

Fig. 7-72

③ Input a name of part to be soldered in the Point name.

④ Select “DS” as soldering mode.

## • Setting the start point and end point of the first point. (DS)

- ⑤ Determine position of the start point coordinate. The start point coordinate of DS mode is the position of drag soldering point (secondary and tertiary solder feeding positions of HAKKO FU-500). Using the JOG operation screen, move the tip to the start position of drag soldering of the work (Fig. 7-73).

Align the tip to the start position of drag soldering using the JOG operation screen.

- (1) Move the iron tip to the drag soldering start position by mouse operation.
- (2) Uncheck the “Perform Z axis lift when moving horizontally” on the top screen.

### NOTE:

If the checkbox is checked ON, it will perform Z axis lift every time when there is a move to X, Y and  $\theta$  axis, making it impossible to perform fine adjustments. See p.62 and p.63 of “7-2-1 Basic JOG operation” in “7-2 JOG operation” for details on Z axis lift.

- (3) Perform fine adjustment to align the iron tip with the soldering point.

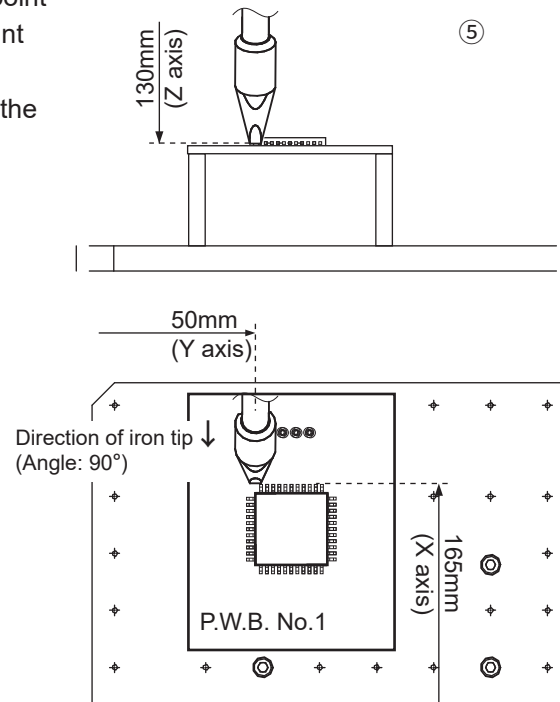


Fig. 7-73

Fig. 7-74

- ⑥ Click the “Start point” on the Edit point screen.  
Character of “Start point” turns red, showing that start point is active for edit.
- ⑦ Click “Use current pos”.
- ⑧ Inputting values of the start point coordinate positioned by JOG operation in ⑤ is completed.

- ⑨ Determine position of the end point coordinate.  
The end point coordinate of DS mode is the position of drag soldering point. Using the JOG operation screen, move the tip to the end position of drag soldering of the work.

Align the tip to the end position of drag soldering using the JOG operation screen.

- (1) If the “Perform Z axis lift when moving horizontally” on the top screen is unchecked during setting of end point coordinate, continuously perform fine adjustment. If it is checked, uncheck it again. Align the tip to the end position of drag soldering using the mouse operation on the JOG operation screen.

- ⑩ Click “End point” on the Edit point screen.  
Character of “End point” turns red, showing that end point is active for edit.

- ⑪ Click “Use current pos”.

- ⑫ Inputting values of the end point coordinate positioned by JOG operation in ⑨ is completed.

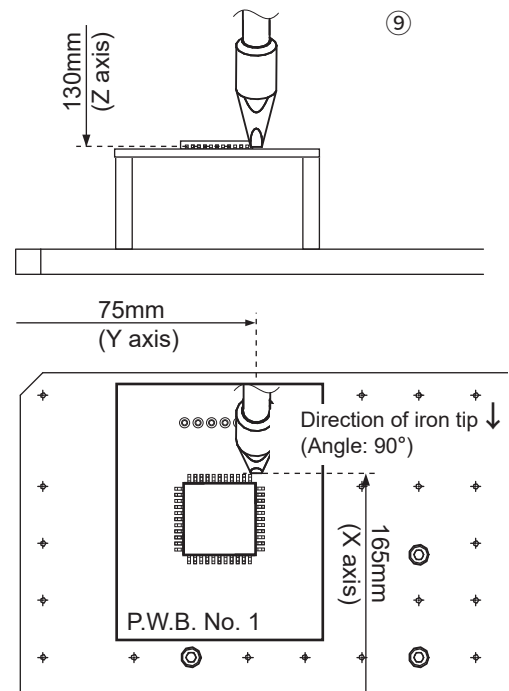


Fig. 7-75

Fig. 7-76

- ⑬ For setting of “Program No.”, “Work origin” and “Cleaning”, see p.75 of “7-4-1 How to set PS (point soldering). Also for DS (drag soldering), set the cleaning of 1st point before soldering.

- ⑭ When DS is selected for soldering mode, only “Z axis lift” could be selected as a movement destination after end point (Move back to).  
When drag soldering, the coordinate input in the Z axis lift coordinate is the position of primary soldering. The standard position of the Z axis lift coordinate can be set in the Z axis lift coord in the top screen. When setting the Z axis lift by each point, input value to the Z axis lift coordinate on the Edit point screen.

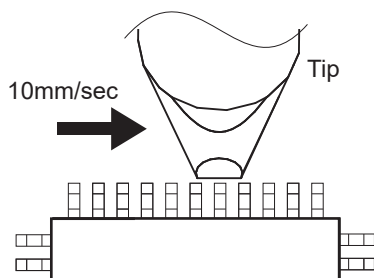
HAKKO SOLDERING SYSTEM - Edit point

NO.	6		Point name		
Switch	Start point		End point		
X	165.000	mm	165.000	mm	
Y	50.000	mm	75.000	mm	
Z	130.000	mm	130.000	mm	
θ	90.000	deg	90.000	deg	
Use current pos					
Moving speed			mm/sec		
Soldering speed	10.0		mm/sec		
Moving speed after end point			mm/sec		
Move			<div> <div>OK</div> <div>Cancel</div> </div>		

**Soldering mode** ☐ PS ☒ DS ☐ None  
**Program No.** 0  
**Work origin** 1  
**Cleaning** ☐ Cleaning by air ☒ Cleaning by brush  
☐ Before soldering ☐ After soldering  
**Move back to** ☐ Start point ☒ Z axis lift  
**I/O setting** **Display** Without setting  
**Z axis lift coord** mm

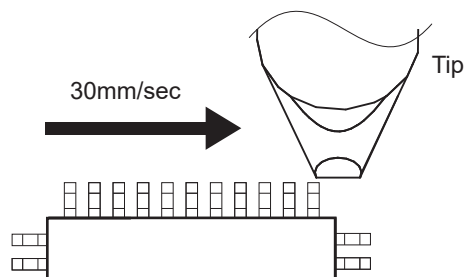
Fig. 7-77

- ⑮ When changing speed of drag soldering by each point, input value to the soldering speed in the Edit point screen



- ⑯ Click “OK” and complete one setting of DS (drag soldering).  
If you do not intend to fix this setting, click “Cancel”

- ⑰ The basic soldering speed of drag soldering can be set by the soldering speed in the top screen.

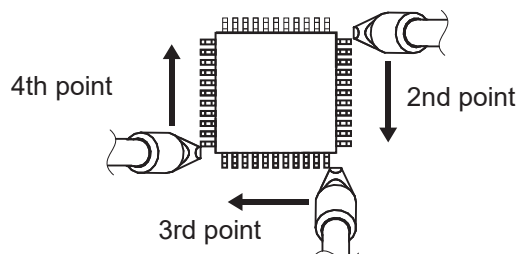


Current pos		JOG op
X	165.000 mm	ORG ret
Y	75.000 mm	Cleaning
Z	130.000 mm	
θ	90.000 deg	
Moving speed	100.0	mm/sec
Soldering speed	30.0	mm/sec
Moving speed after end point	50.0	mm/sec
Z axis lift coord	75.000	mm
<input checked="" type="checkbox"/> Perform Z axis lift when moving horizontally		
Adjust tip pos		Edit
X	0.000 mm	Y 0.000 mm Z 0.000 mm

Fig. 7-78

## • Setting from 2nd to 4th points (DS)

- Following the procedures of the 1st point, create DS (drag soldering) program for the 2nd through the 4th point.



Here, change the setting in each point as below.

3rd point: moving speed to **50mm/sec**

4th point: Z axis lift coordinate to **50.000mm**

4th point: check cleaning by brush and select after soldering.

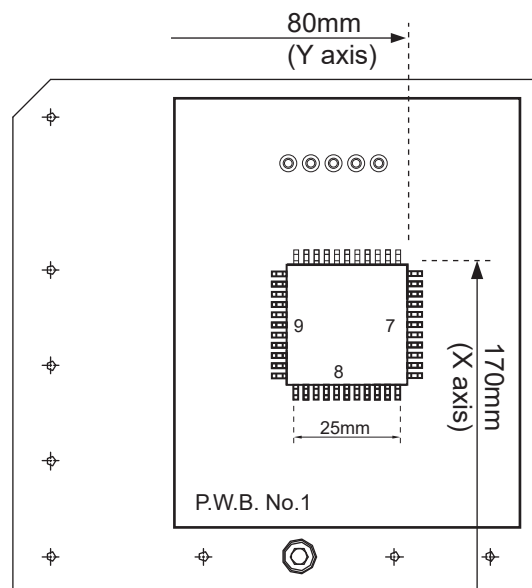


Fig. 7-79

Fig. 7-80

Table 7-6

	X1 Start pt (mm)	Y1 Start pt (mm)	Z1 Start pt (mm)	X2 End pt (mm)	Y2 End pt (mm)	Z2 End pt (mm)	θ1 Start pt (deg)	θ2 End pt (deg)	Moving speed *1 (mm/sec)	Soldering speed *1 (mm/sec)	Program No.	PS/ DS	Work Origin	Z axis lift coord *1 (mm)	Cleaning
6	165	50	130	165	75	130	90	90	100	10 <sup>-2</sup>	0	DS	1	75.000	Before
7	170	80	130	195	80	130	0	0	100	10 <sup>-2</sup>	0	DS	1	75.000	-
8	200	75	130	200	50	130	-90	-90	50 <sup>-2</sup>	10 <sup>-2</sup>	0	DS	1	75.000	-
9	195	45	130	170	45	130	-180	-180	100	10 <sup>-2</sup>	0	DS	1	50.000 <sup>-2</sup>	After

\*1 When value is not set in the Edit point screen, the value in the top screen is reflected (See Fig. 7-80).

\*2 When value is set in the Edit point screen, the value in the Edit point screen is reflected (See Fig. 7-80).

- After creating 4th point of DS soldering, the top screen should show lines filled in to the ninth line as in Fig. 7-80, showing setting of point soldering and drag soldering.

Next, applying the same program to plural P.W.B.s is explained.

### 7-4-3 Copying the soldering program

When two P.W.B.s are arranged on the conditions shown in Fig. 7-81, the soldering program for the P.W.B. No. 1 can be applied to the P.W.B. No. 2.

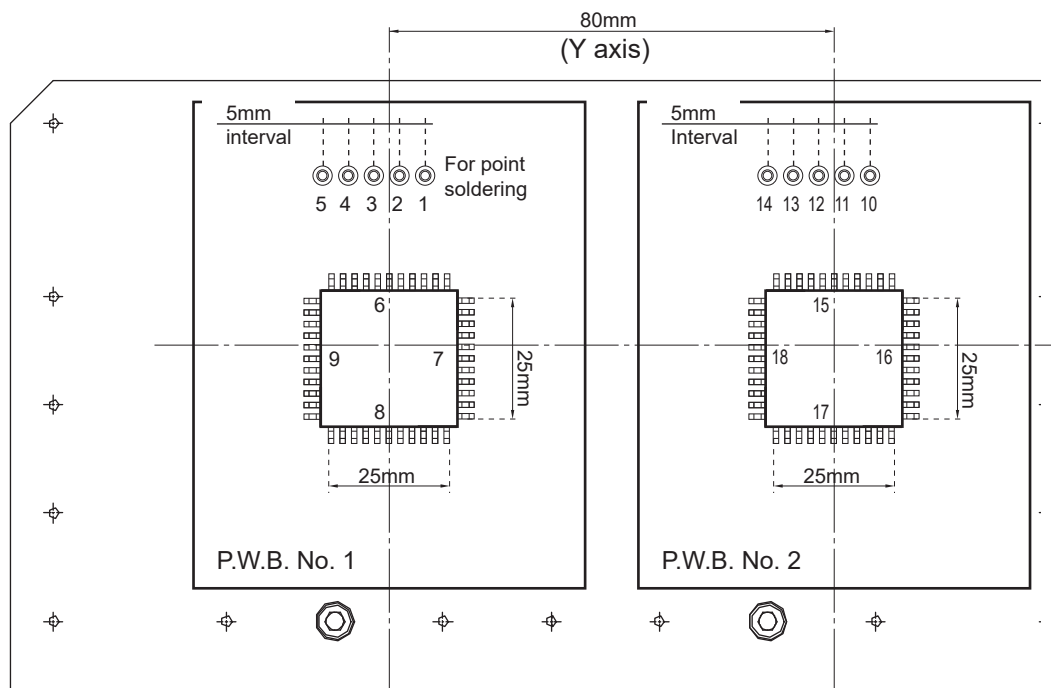


Fig. 7-81

- ① Set the work origin. The work origin for the P.W.B. No. 1 is in line 1 (X coordinate: 0, Y coordinate: 0).

The screenshot displays the HAKKO SOLDERING SYSTEM software interface. The 'Work origin' section is highlighted, showing the X-coord and Y-coord set to 0.000. The 'Current pos' section shows the X, Y, Z, and θ coordinates. The 'Moving speed' section shows the moving speed, soldering speed, and moving speed after end point. The 'Adjust tip pos' section shows the X, Y, and Z coordinates. The table below shows the coordinates for the work origin and the points on the P.W.B. No. 1.

Name	X1	Y1	Z1	X2	Y2	Z2	θ 1	θ 2	Moving speed	Soldering speed	Moving speed after end point	Program No.	PS/DS	Work origin	Clear
1	145.002	70.002	125.000	149.000	70.002	131.000	90.000	90.000				0	PS	1	*BC
2	145.002	65.000	125.000	125.000	65.000	131.000	90.000	90.000				0	PS	1	
3	145.002	60.000	125.000	125.000	60.000	131.000	90.000	90.000	50			0	PS	1	
4	145.002	55.000	125.000	125.000	55.000	131.000	90.000	90.000				0	PS	1	
5	145.002	50.000	125.000	125.000	50.000	131.000	90.000	90.000				0	PS	1	BC*
6	165.000	50.000	130.000	165.000	75.000	130.000	90.000	90.000		10		0	DS	1	*BC
7	170.000	80.000	130.000	195.000	80.000	130.000	0.000	0.000		10		0	DS	1	
8	200.000	75.000	130.000	200.000	50.000	130.000	-90.000	-90.000	50	10		0	DS	1	
9	195.000	45.000	130.000	170.000	45.000	130.000	-180.000	-180.000		10		0	DS	1	BC*

Fig. 7-82

- ② The distance between the P.W.B. No. 1 and P.W.B. No. 2 is 0 mm in X axis direction and 80 mm in Y axis direction.  
Input these values in the work origin 2.

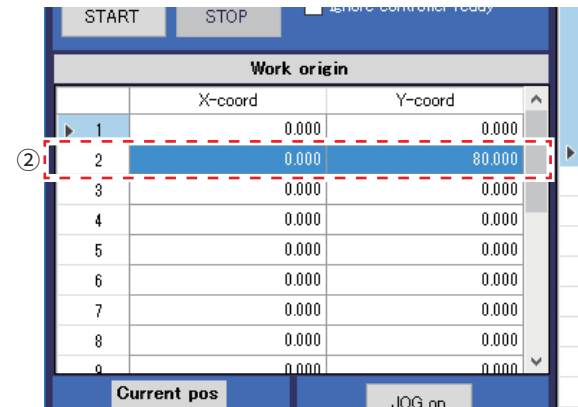


Fig. 7-84

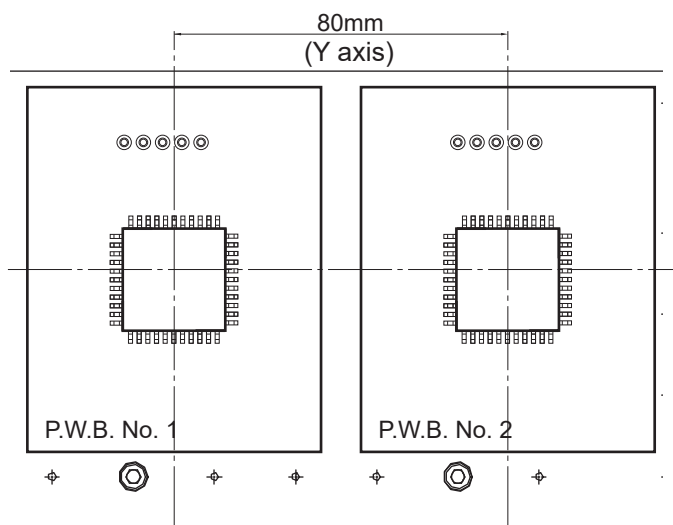
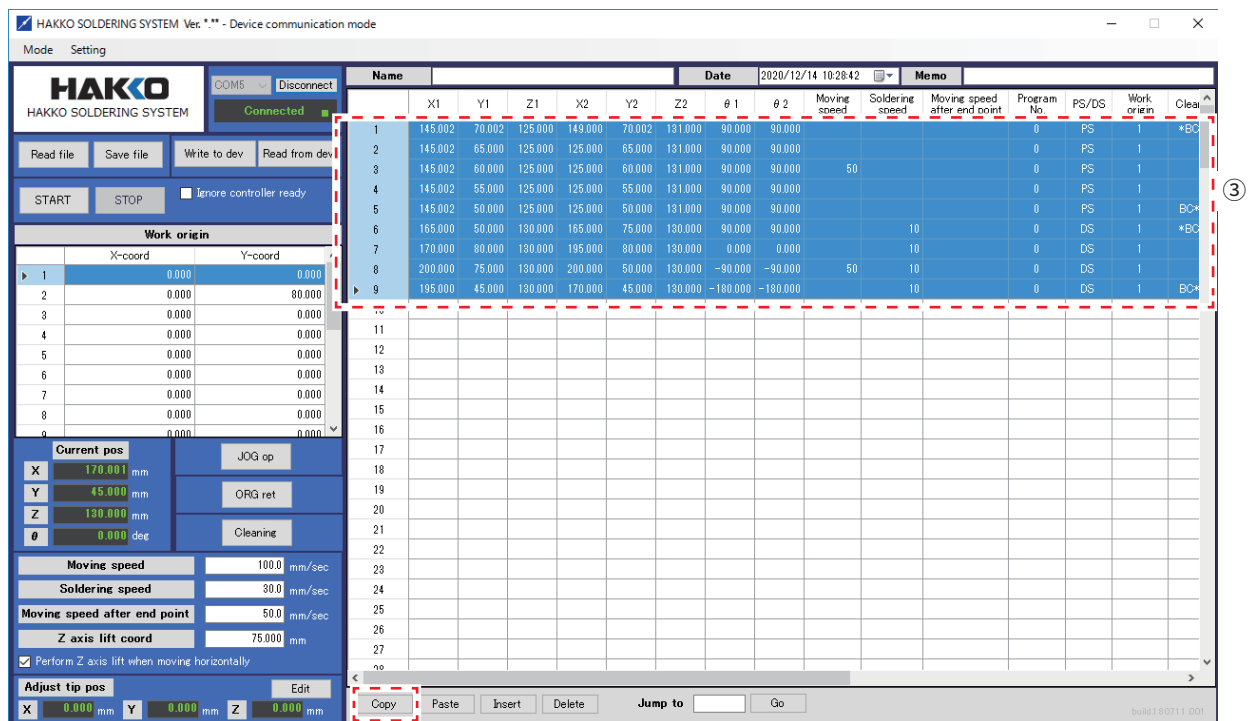


Fig. 7-83

- ③ Select from line 1 to line 9  
(Click line 1 and line 9 while pressing the SHIFT key of the keyboard, or click and drag up to line 9.)
- ④ Click “Copy”.



④

Fig. 7-85

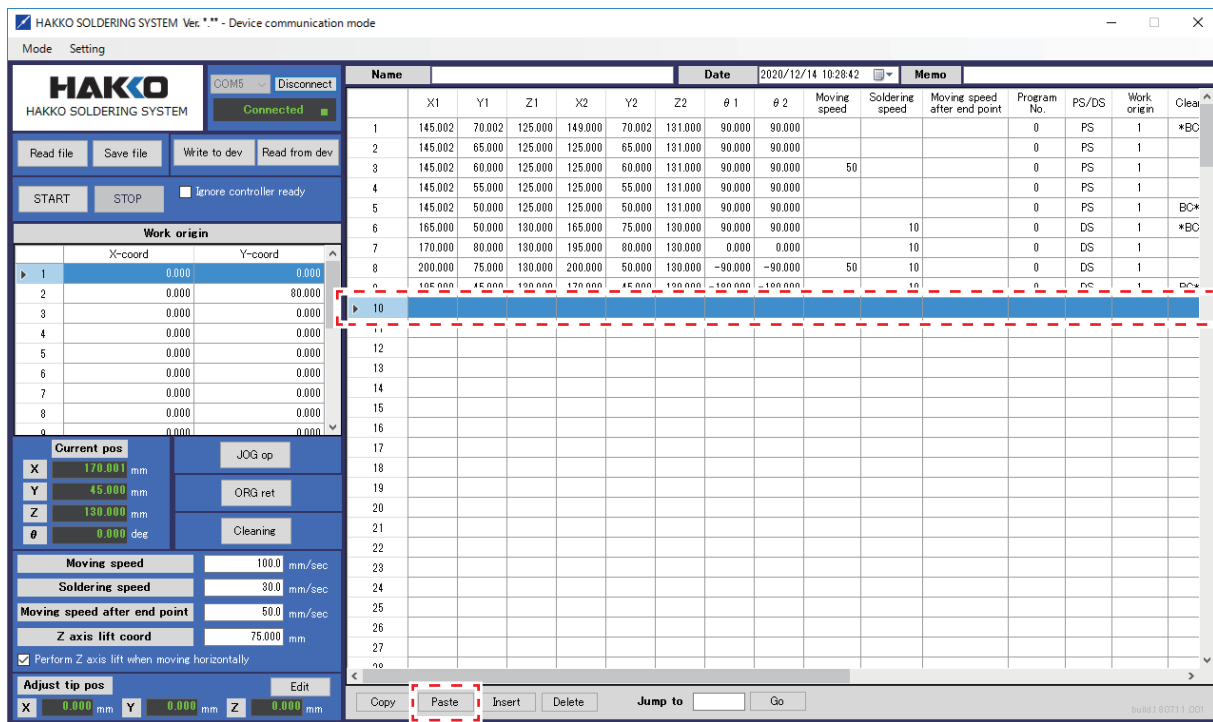


Fig. 7-86

- ⑤ Click line 10.
- ⑥ Click “Paste”.
- ⑦ A window dialog will open. Select work origin “2”.
- ⑧ Click “OK” and copy is completed.  
If you don't want to copy, click “Cancel”.

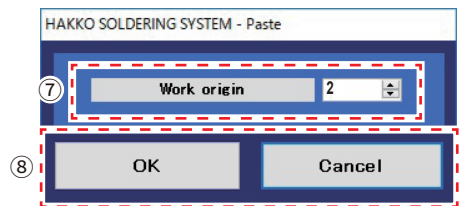


Fig. 7-87

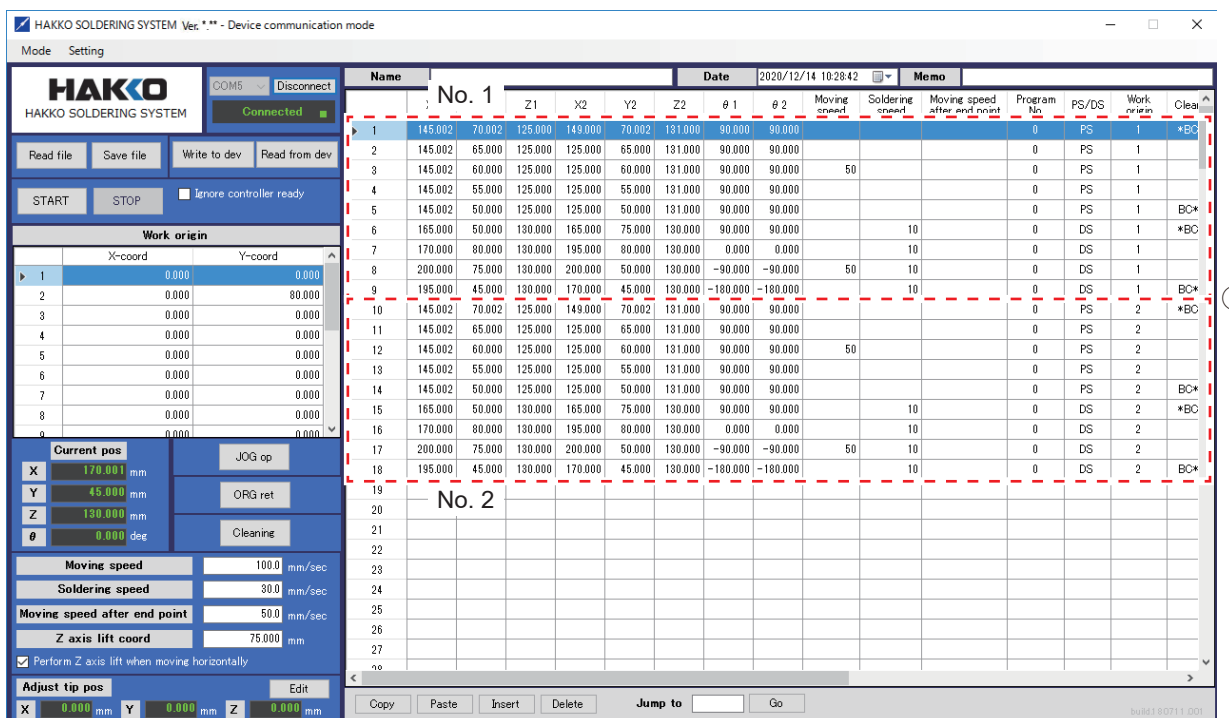


Fig. 7-88

- ⑨ Soldering program for two sample P.W.B.s is now completed.

Finally, ejecting the P.W.B. is explained.

#### 7-4-4 How to set None (P.W.B. ejecting position)

The None setting is for removing the P.W.B. moving the jig table forward.

To remove the P.W.B safely, the following procedure set all axes returning to origin (See Fig. 7-89).

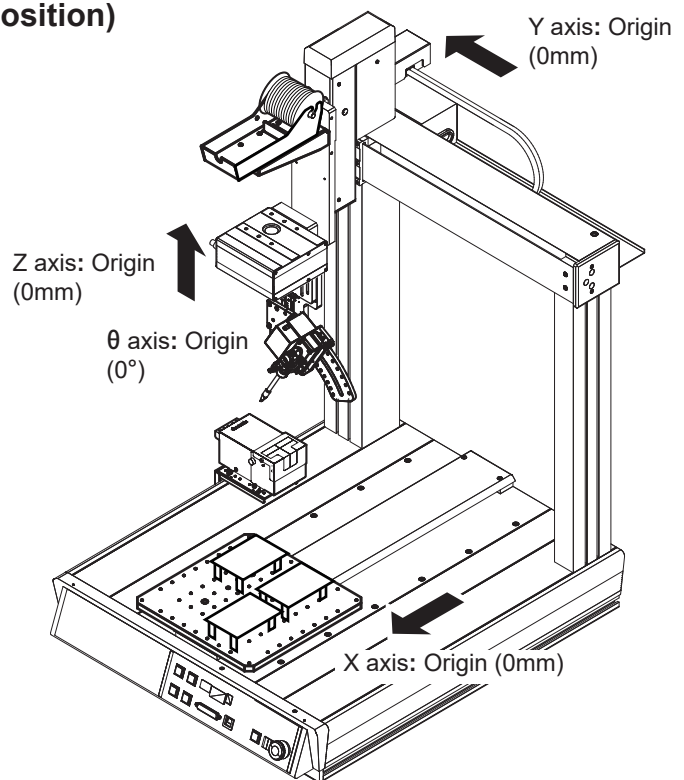


Fig. 7-89

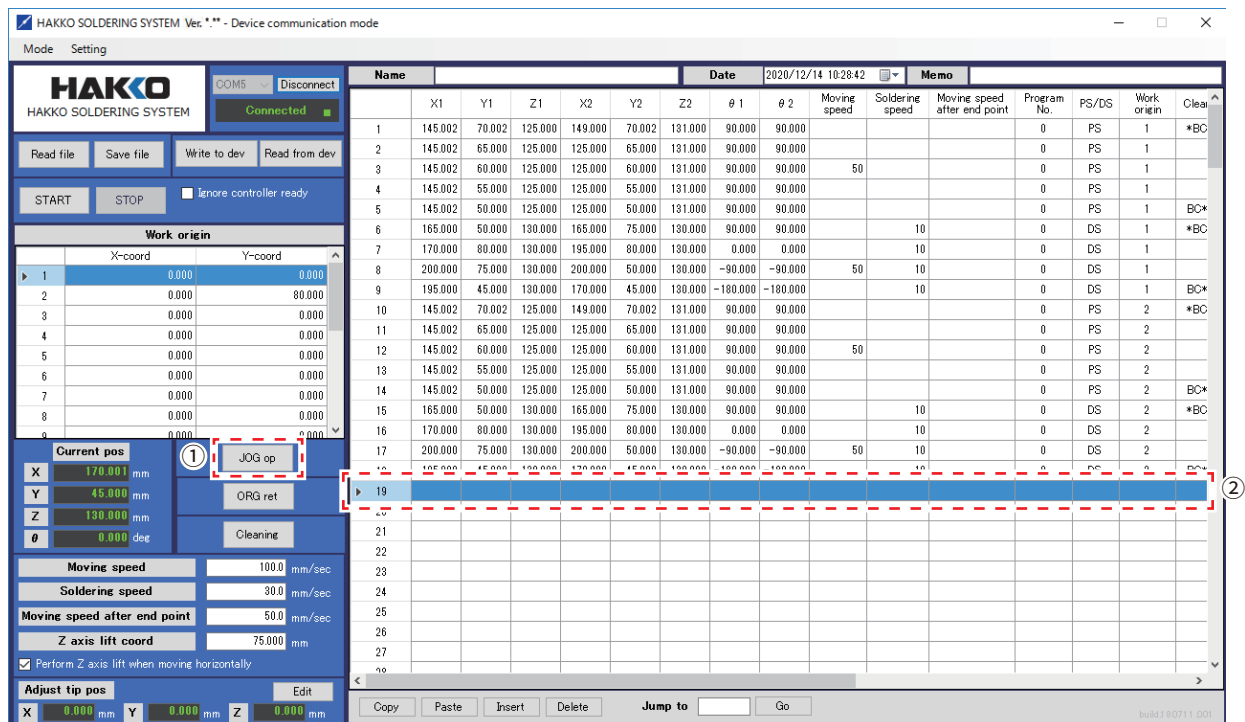


Fig. 7-90

① Click “JOG op” to open the JOG operation screen.

② Double-click line 19 to open the Edit point screen in Fig. 7-91 (see next page).

- ③ Select the soldering mode “None”.

Fig. 7-91

- ④ Position the coordinate for ejecting the P.W.B.. Using the JOG operation screen, set the coordinate to the ejecting position.

Here, the start point coordinate is set as below (See Fig. 7-93).

Fig. 7-92

- ⑤ Click the “Start point” on the Edit point screen. Character of “Start point” turns red, showing that start point is active for edit.
- ⑥ Click “Use current pos”.
- ⑦ Inputting values of the coordinate positioned by JOG operation in ④ is completed.

Fig. 7-93

- ⑧ Select Work origin.

HAKKO SOLDERING SYSTEM - Edit point

NO. 19 Point name

Switch Start point End point

X 0.000 mm mm

Y 0.000 mm mm

Z 0.000 mm mm

θ 0.000 deg deg

Use current pos

Soldering mode ☐ PS ☐ DS ☒ None

Program No. 1

Work origin 1 ⑧

Cleaning ☐ Cleaning by air ☐ Cleaning by brush

☒ Before soldering ☐ After soldering

Move back to ☒ Start point ☐ Z axis lift

I/O setting Display Without setting

Moving speed 100.0 mm/sec

Soldering speed 30.0 mm/sec

Moving speed after end point 50.0 mm/sec

Z axis lift coord 75.000 mm

Move ⑨

OK Cancel

Fig. 7-94

- ⑨ If the soldering mode is set to "None", setting is completed here. Click "OK".  
If you do not intend to fix this setting, click "Cancel".

**NOTE:**

Program No. is not necessary when "None" is selected for soldering mode.

HAKKO SOLDERING SYSTEM Ver. 1.11 - Device communication mode

Mode Setting

HAKKO SOLDERING SYSTEM

COM5 Disconnect

Connected

Read file Save file Write to dev Read from dev

START STOP ☐ Ignore controller ready

Work origin

	X-coord	Y-coord
1	0.000	0.000
2	0.000	80.000
3	0.000	0.000
4	0.000	0.000
5	0.000	0.000
6	0.000	0.000
7	0.000	0.000
8	0.000	0.000
9	0.000	0.000

Current pos

X 0.000 mm Y 0.000 mm Z 0.000 mm

θ 0.000 deg

JOG op

ORG ret

Cleaning

Moving speed 100.0 mm/sec

Soldering speed 30.0 mm/sec

Moving speed after end point 50.0 mm/sec

Z axis lift coord 75.000 mm

☒ Perform Z axis lift when moving horizontally

Adjust tip pos

X 0.000 mm Y 0.000 mm Z 0.000 mm

Edit

Name	X1	Y1	Z1	X2	Y2	Z2	θ 1	θ 2	Moving speed	Soldering speed	Moving speed after end point	Program No.	PS/DS	Work origin	Clear
1	145.002	70.002	125.000	149.000	70.002	131.000	90.000	90.000				0	PS	1	*BC
2	145.002	65.000	125.000	125.000	65.000	131.000	90.000	90.000				0	PS	1	
3	145.002	60.000	125.000	125.000	60.000	131.000	90.000	90.000	50			0	PS	1	
4	145.002	55.000	125.000	125.000	55.000	131.000	90.000	90.000				0	PS	1	
5	145.002	50.000	125.000	125.000	50.000	131.000	90.000	90.000				0	PS	1	BC*
6	165.000	50.000	130.000	165.000	75.000	130.000	90.000	90.000		10		0	DS	1	*BC
7	170.000	80.000	130.000	195.000	80.000	130.000	0.000	0.000		10		0	DS	1	
8	200.000	75.000	130.000	200.000	50.000	130.000	-90.000	-90.000	50	10		0	DS	1	
9	195.000	45.000	130.000	170.000	45.000	130.000	-180.000	-180.000		10		0	DS	1	BC*
10	145.002	70.002	125.000	149.000	70.002	131.000	90.000	90.000				0	PS	2	*BC
11	145.002	65.000	125.000	125.000	65.000	131.000	90.000	90.000				0	PS	2	
12	145.002	60.000	125.000	125.000	60.000	131.000	90.000	90.000	50			0	PS	2	
13	145.002	55.000	125.000	125.000	55.000	131.000	90.000	90.000				0	PS	2	
14	145.002	50.000	125.000	125.000	50.000	131.000	90.000	90.000				0	PS	2	BC*
15	165.000	50.000	130.000	165.000	75.000	130.000	90.000	90.000		10		0	DS	2	*BC
16	170.000	80.000	130.000	195.000	80.000	130.000	0.000	0.000		10		0	DS	2	
17	200.000	75.000	130.000	200.000	50.000	130.000	-90.000	-90.000	50	10		0	DS	2	
18	195.000	45.000	130.000	170.000	45.000	130.000	-180.000	-180.000		10		0	DS	2	BC*
19	0.000	0.000	0.000				0.000					0		1	
20															
21															
22															
23															
24															
25															
26															
27															
28															

Copy Paste Insert Delete Jump to Go

Fig. 7-95

The program from point soldering, drag soldering and ejecting for two P.W.B.s No. 1 and No. 2 is completed by the above steps.

Finally, saving the created soldering program, and writing it to the table-top type robot (IAI-made TTA-A4 series) is explained

## 7-4-5 Save Program and Write to device

### • Saving the Program

- ① Click “Save file”.

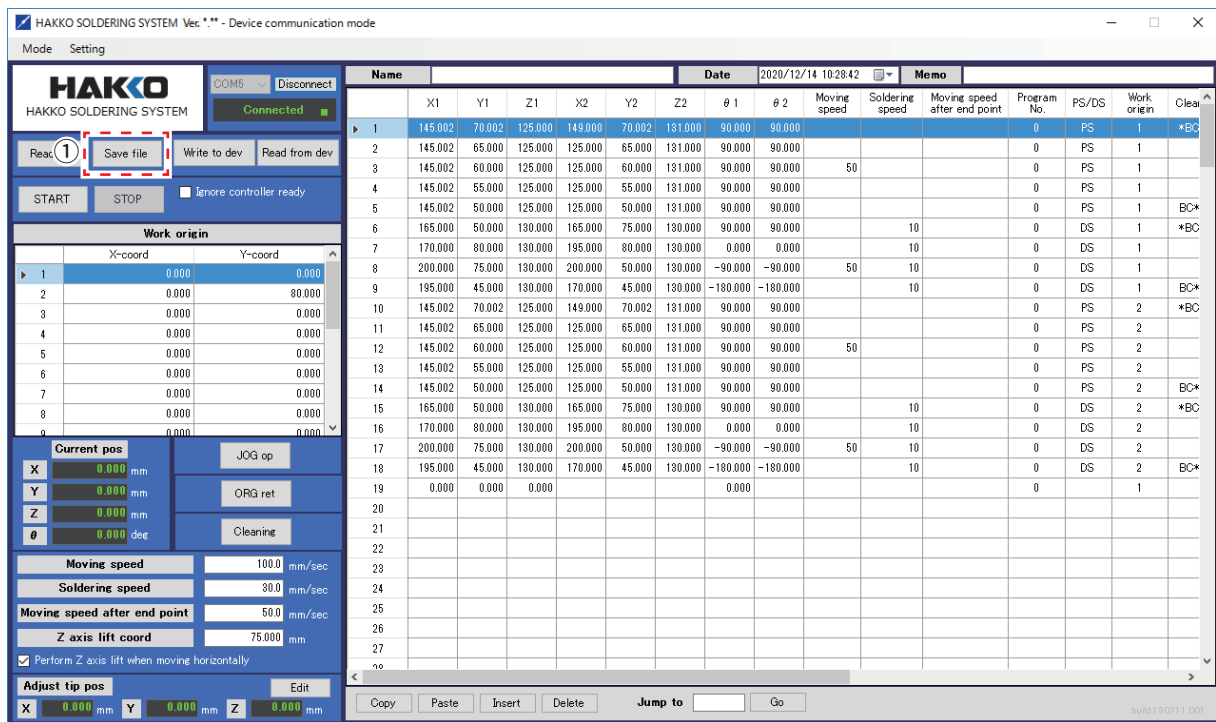


Fig. 7-96

- ② Select where to save file.
- ③ Input file name. It is convenient for searching when file name is same as work name.
- ④ Click “Save”. If you do not intend to fix this setting, click “Cancel”.

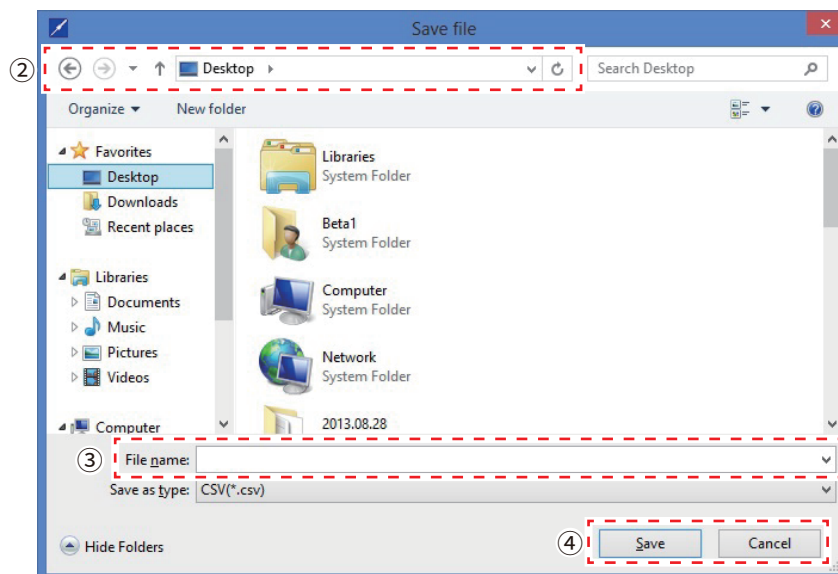


Fig. 7-97

Here, writing the created program to program No. 1 of the device (robot) is explained.

- Write to device

- ① Click “Write to dev”.

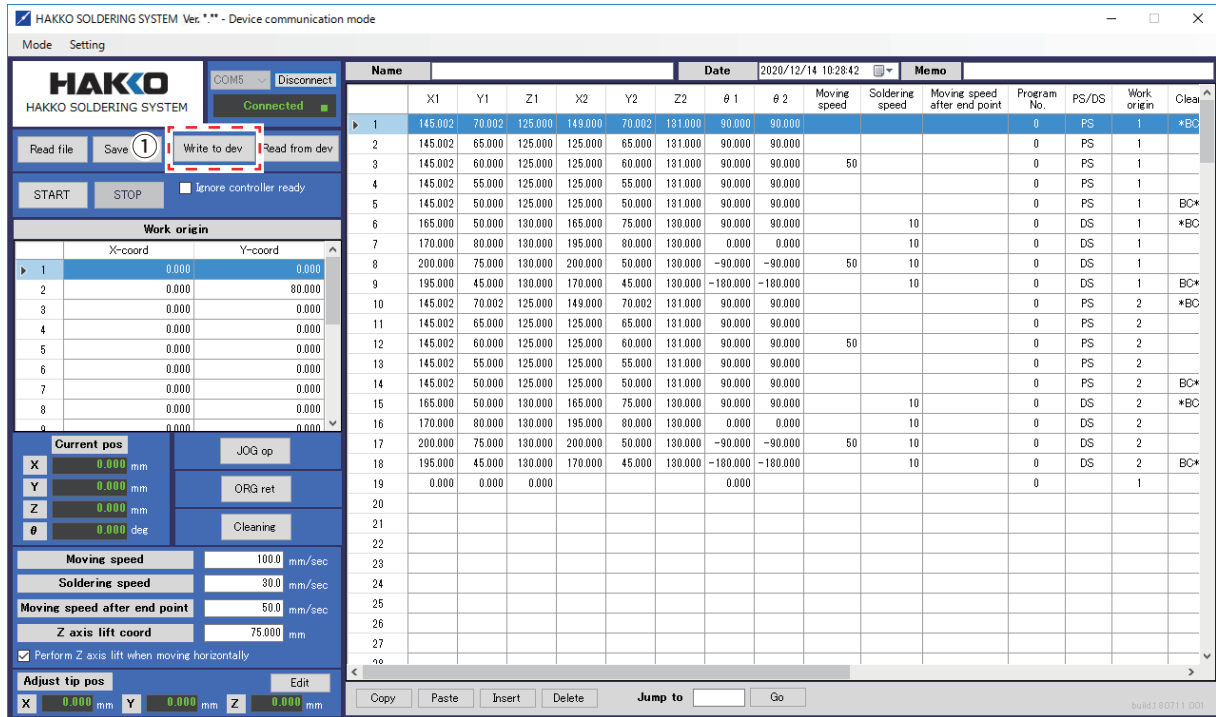


Fig. 7-98

- ② Select the program No. for write to program No..  
Select “1”.

- ③ Click “Run”.

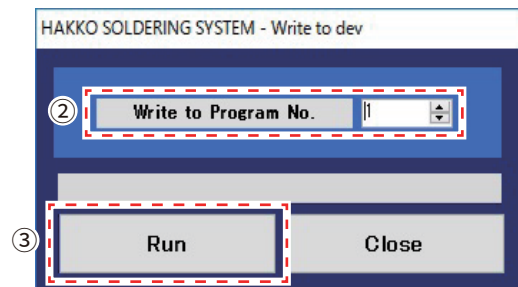


Fig. 7-99

Saving and writing the created soldering program are completed.

## 7-5 Detailed setting

The Easy Software Programming Software has several functions to allow you to perform detailed setting. Making the best use of these functions allows you to control the soldering program in detail.

### \*Control from external devices

There are roughly two functions for I/O setting.

- ① Control signals with I/O setting from external devices.
- ② Perform program operation by designating the program No. from external devices .

#### ① I/O setting

INPUT is an input signal from external devices and OUTPUT is an output signal from the table-top type robot (IAI-made TTA-A4 series).

HAKKO SOLDERING SYSTEM - Edit point

NO. 1 Point name

Switch	Start point	End point
X	145.000 mm	149.000 mm
Y	70.000 mm	70.000 mm
Z	125.000 mm	131.000 mm
θ	90.000 deg	90.000 deg

Use current pos

Soldering mode ☒ PS ☐ DS ☐ None

Program No. 0

Work origin 1

Cleaning ☐ Cleaning by air ☐ Cleaning by brush

☒ Before soldering ☐ After soldering

Move back to ☐ Start point ☒ Z axis lift

**I/O setting** **Display** Without setting

Moving speed mm/sec

Soldering speed mm/sec

Moving speed after end point mm/sec

Z axis lift coord mm

Move OK Cancel

Fig. 7-100

#### I/O setting

Clicking “Display” displays the screen shown in Fig. 7-101.

HAKKO SOLDERING SYSTEM - Point I/O setting

NO. 1 Point name

INP1 INP2 INP3 INP4 INP5 INP6 INP7 INP8 INP9 INP10

OUT1 OUT2 OUT3 OUT4 OUT5 OUT6 OUT7 OUT8 OUT9 OUT10

OUT11

OK Cancel

Fig. 7-101

## \*Control from external devices

Control by input signals (INPUT)

Setting example) 1st point: Input signal to INPUT 1 from external device is ON (See Fig. 7-102).

2nd point: Input signal to INPUT 1 from external device is OFF (See Fig. 7-103).

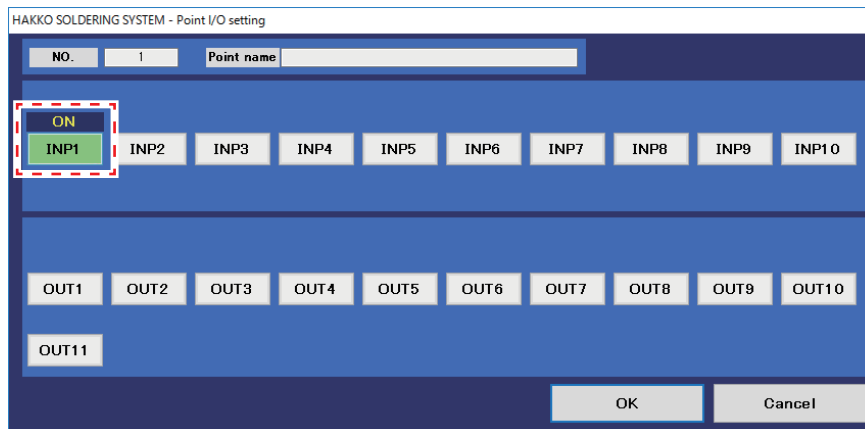


Fig. 7-102

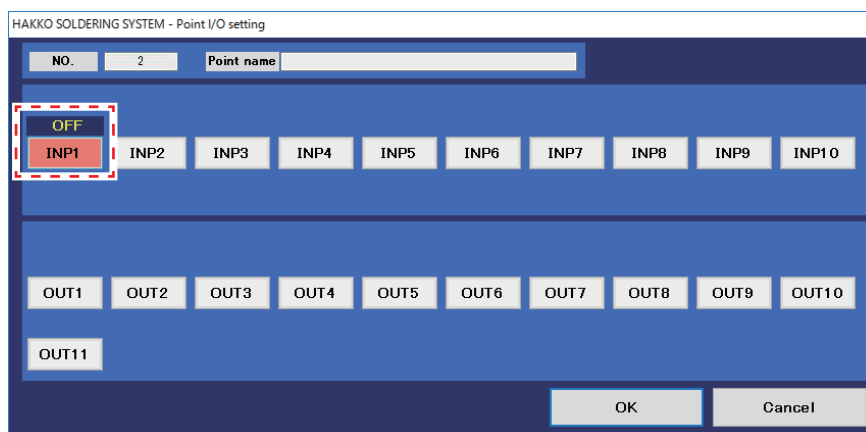


Fig. 7-103

- (1) When the input signal to INPUT 1 from an external device is ON, soldering at the 1st point is performed.
- (2) When the input signal to INPUT 1 from an external device is OFF after the 1st point is completed, soldering at the 2nd point is performed (See Fig. 7-104).

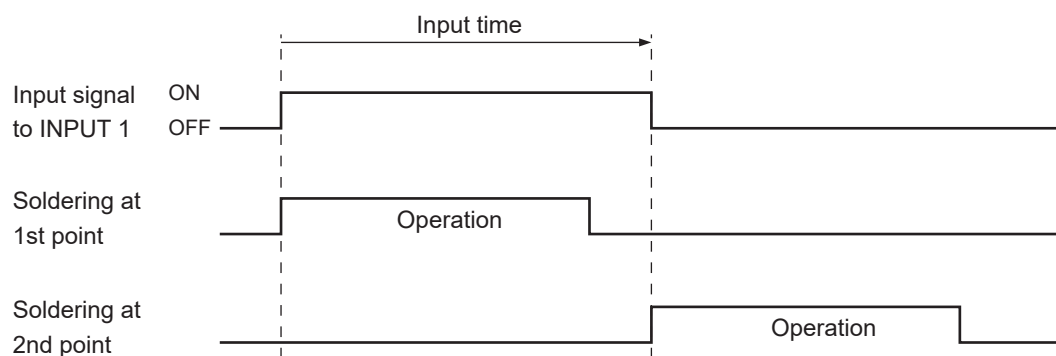


Fig. 7-104

## \*Control from external devices

Control by output signal (OUTPUT)

Setting example) 1st point: After soldering, output signal from OUTPUT 1 to external device is ON  
(See Fig. 7-105).

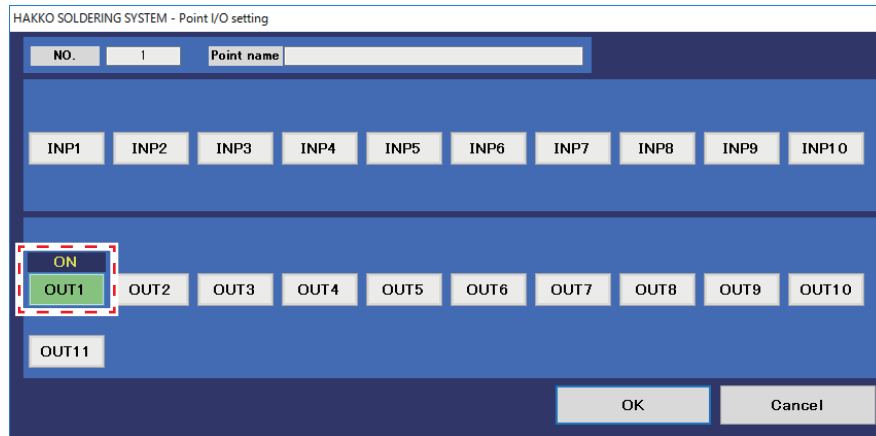


Fig. 7-105

- (1) When soldering at the 1st point is completed, the output signal (OUTPUT 1) from the table-top type robot (IAI-made TTA-A4 series) to external device is ON.  
During the time being set, the output signal remains ON.

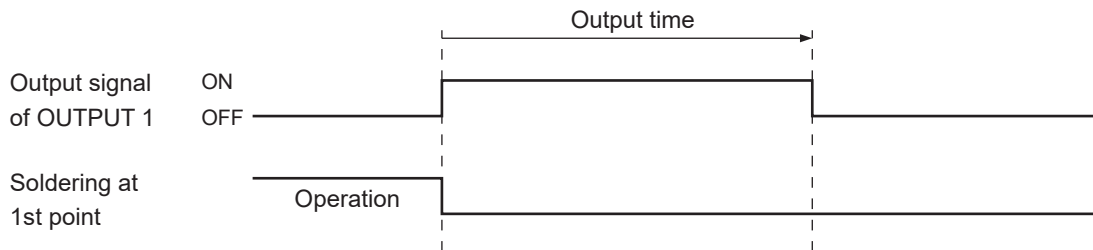


Fig. 7-106

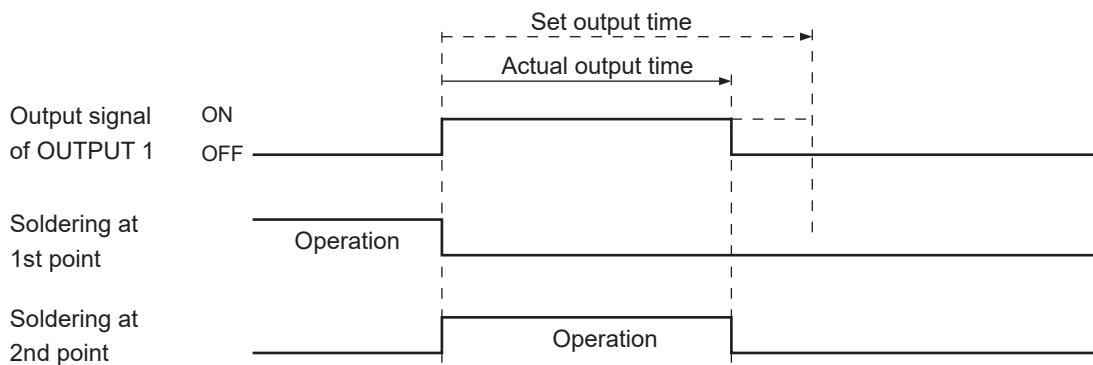


Fig. 7-107

### NOTE:

If the soldering time of the next point is shorter than the set output time, the output signal is turned OFF after soldering is completed (See Fig. 7-107).

### \*Control from external devices

For both input/output, the setting will be “and” setting.

When the “INP1”, “INP2” and “INP3” are set to ON as shown in Fig. 7-108, soldering is performed only if all INPUT 1 to 3 signals are turned ON.

Fig. 7-108

For further details for signal input/output, see “Program operation” of “Chapter 4 Operation” of Instruction Manual of the table-top type robot (IAI-made TTA-A4 series).

Fig. 7-109

#### Other setting

Select Setting from the menu of the top screen, and open Option screen.

- Setting of output signal time (signal output time: 0.1 to 9.9 sec)  
Setting example) Set the output signal time to 9.0 seconds  
Input “9.0” to the “Signal output time” in “Other setting” column.
- Z axis lift value in case of FU-500 error  
Setting of Z axis lift value in case of FU-500 error (Amount of lift : 0 to 150mm)  
This is to set the amount of lifting the tip, after the operation stops whenever an error occurs to FU-500. (Amount of lift from the occurrence of error.)  
Setting example) Set the Z axis lift value in case of FU-500 error to 50.000 mm  
Input “50.000” to “Z axis lift value in case of FU-500 error”.
- Z axis lift coord. after cleaning  
For Z axis lift coord. after cleaning, see page 71, “7-3 Setting the cleaner (CX1003)”

## \*Control from external devices

- ② Program operation by designating the program No. from external devices.

The I/O connector for external input/output has functions to stop the program from external devices and execute the program by designating the program No. from external devices.

### NOTE :

When the program No. is designated from external devices, the program No. set from external devices is executed regardless of setting of program selector switch on the front panel.

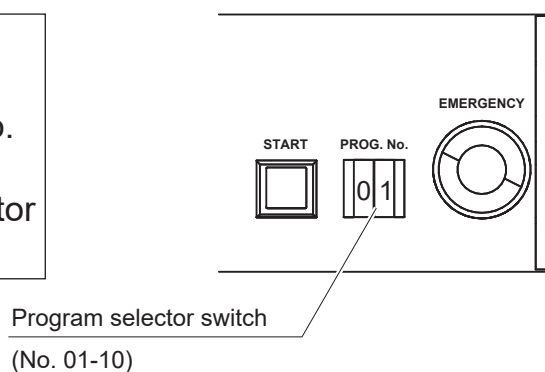


Fig. 7-110

For further details for pin information, see p.54 of “5-4-2 Connection of I/O connector for external input/output” in “5. Installation and connection”.

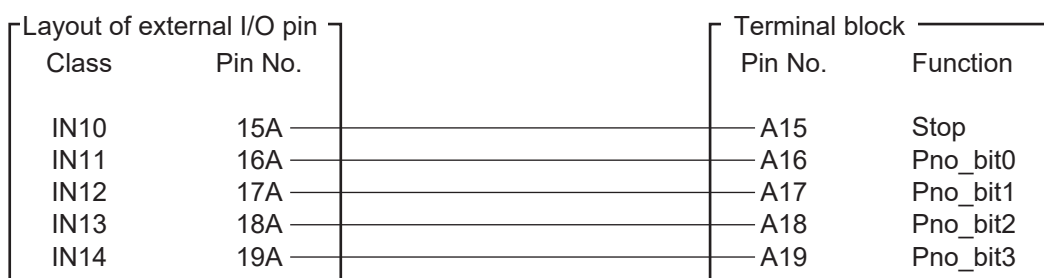


Fig. 7-111

### Example of use 1)

The condition where the input signal from external devices to A15 is turned ON, is the same condition as where the “STOP button” is pressed, which causes the program to stop.

Table 7-7

### Example of use 2)

When input signal from external devices to A18 is turned ON, pressing the “START button” executes program No. 4.

Combination of pins enables programs No. 01 to 10 to be allocated. The allocation is done as shown in Table 7-7. Combinations other than what shown are invalid.

No.	A16	A17	A18	A19
01	ON			
02		ON		
03	ON	ON		
04			ON	
05	ON		ON	
06		ON	ON	
07	ON	ON	ON	
08				ON
09	ON			ON
10		ON		ON

## \*External START/STOP/PAUSE

③ Ports which input operation are externally possible.

Signal Name	Pin No.
START	11A
STOP	12A
PAUSE	13A
0V	19B

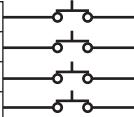


Fig. 7-112 (1)

The same START/STOP/PAUSE operations as those of the switches on the front panel.

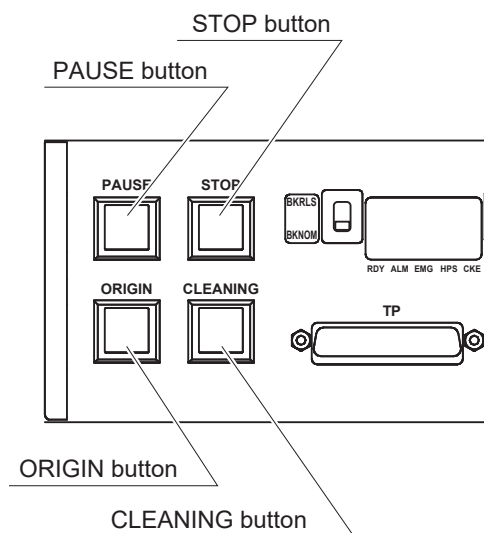


Fig. 7-112 (2)

## \*Adjust tip position

Using this adjust tip position function allows to perform soldering without changing the program when the tip gets worn and its dimension changes.

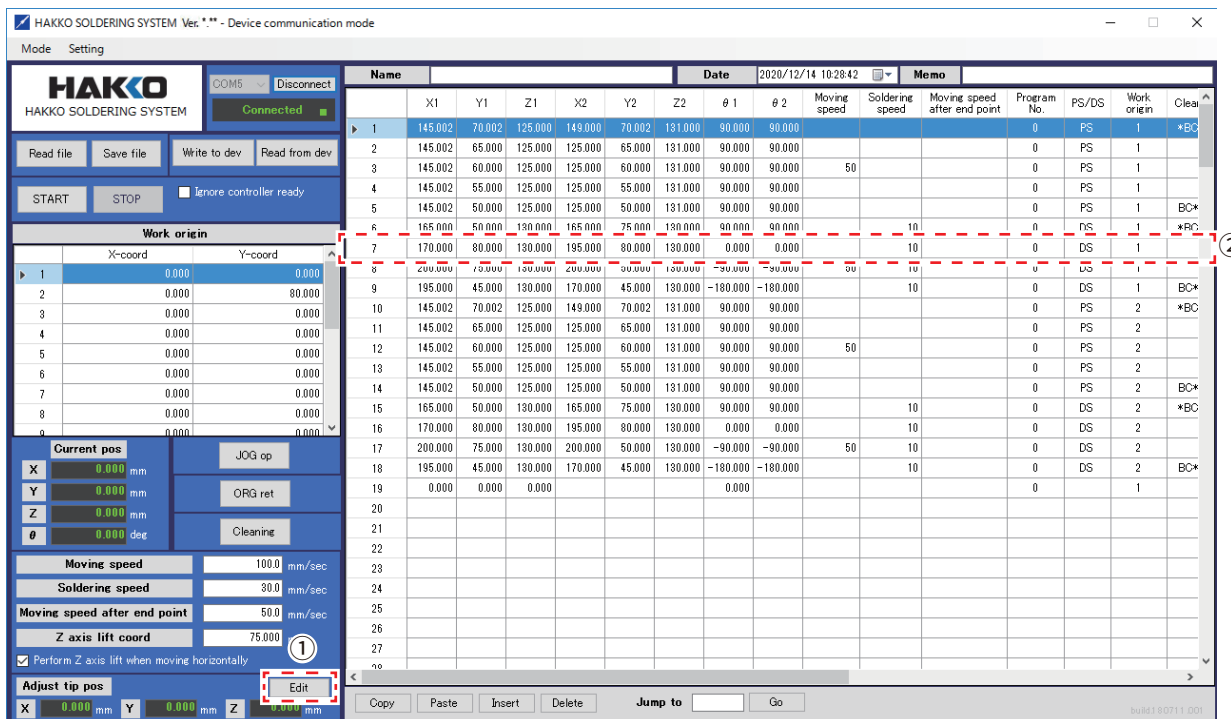


Fig. 7-113

- ① Click "Edit" on the top screen.  
Input dialog for tip adjustment value will open  
(See Fig. 7-114).

### NOTE:

It would be easier to figure out the amount of adjustment if a line of soldering point with  $\theta$  axis set to 0 degree is selected.

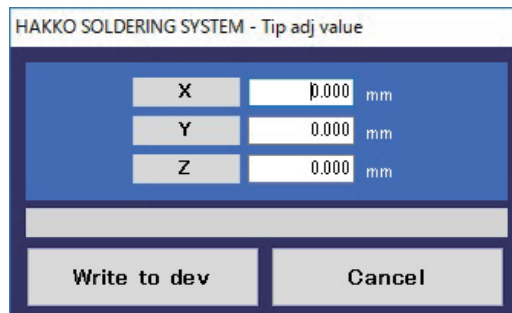


Fig. 7-114

- ② Here, the seventh line is double-clicked to perform tip position adjustment (See Fig. 7-115).

## \*Tip position adjustment applicable range

Soldering iron tip position revision is not applicable for JOG operation and work origin movement. Please note that the specifications of applicable range will differ depending on the software version.

Table 7-8

Applicable range	Up until Ver.1.03	Ver.1.04
Auto mode	○	○
Simulation mode	×	○
Program coordinate movement	×	○
Cleaner operation	×	○
JOG operation	×	×
Work origin movement	×	×

○: Applicable    ×: Not applicable

**\*Adjust tip position**

HAKKO SOLDERING SYSTEM - Edit point

NO.	7		Point name		
Switch	Start point		End point		
X	170.000 mm	195.000 mm			
Y	80.000 mm	80.000 mm			
Z	130.000 mm	130.000 mm			
θ	0.000 deg	0.000 deg			
Use current pos					
Moving speed				mm/sec	
Soldering speed			100.0	mm/sec	
Moving speed after end point				mm/sec	
Soldering mode			<input type="radio"/> PS <input checked="" type="radio"/> DS <input type="radio"/> None		
Program No.			0		
Work origin			1		
Cleaning			<input type="checkbox"/> Cleaning by air <input type="checkbox"/> Cleaning by brush		
③			<input checked="" type="radio"/> Before soldering <input type="radio"/> After soldering		
Move back to			<input type="radio"/> Start point <input checked="" type="radio"/> Z axis lift		
I/O setting			Display Without setting		
Z axis lift coord					
mm					
Move			④		
OK			Cancel		

Fig. 7-115

③ In the Edit point screen, the original coordinate of the end point is set.

④ Click “Move”. Confirm current worn tip position with the coordinate in ③.

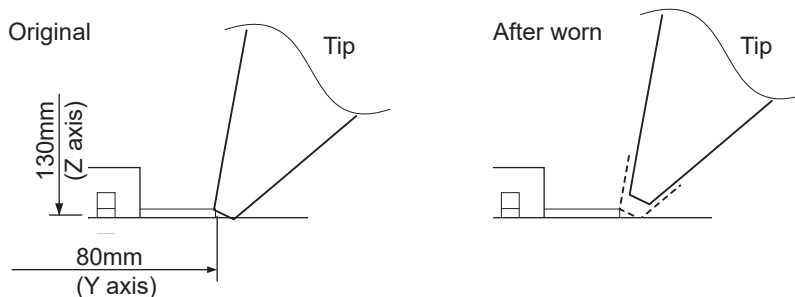


Fig. 7-116

⑤ Open JOG operation screen (See Fig. 7-118).

8	0.000	0.000	
9	0.000	0.000	
Current pos		⑤	
X	170.001 mm	JOG op	
Y	80.001 mm	ORG ret	
Z	130.000 mm	Cleaning	
θ	0.000 deg		
Moving speed		100.0 mm/sec	
Soldering speed		30.0 mm/sec	
Moving speed after end point		50.0 mm/sec	
Z axis lift coord		75.000 mm	
<input checked="" type="checkbox"/> Perform Z axis lift when moving horizontally			

Fig. 7-117

## \*Adjust tip position

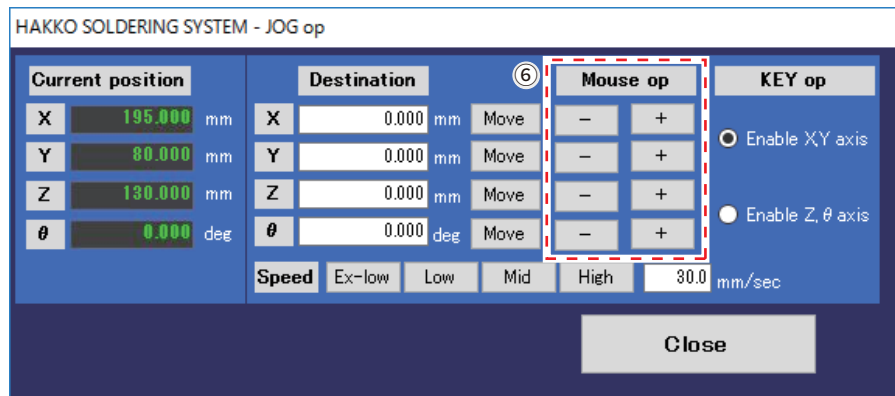


Fig. 7-118

- ⑥ Using the mouse operation, adjust the worn tip to position where it can perform soldering.
- ⑦ Check the difference from the original end point.

Table 7-9

	Original	After adjustment	Difference
X axis	195.000mm	195.000mm	0mm
Y axis	80.000mm	79.000mm	-1mm
Z axis	130.000mm	131.000mm	1mm

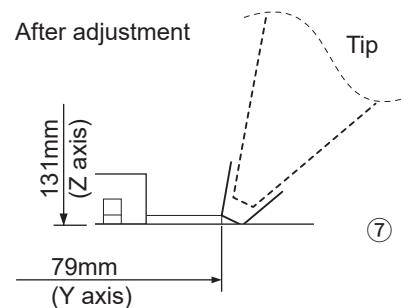


Fig. 7-119

- ⑧ Input the difference as the tip adjustment value.
- ⑨ Click “write to dev” to write to the memory in table top type robot (IAI-made TTA-A4 series). This setting is necessary for each table top type robot (IAI-made TTA-A4 series). If you do not intend to fix this setting, click “Cancel”.

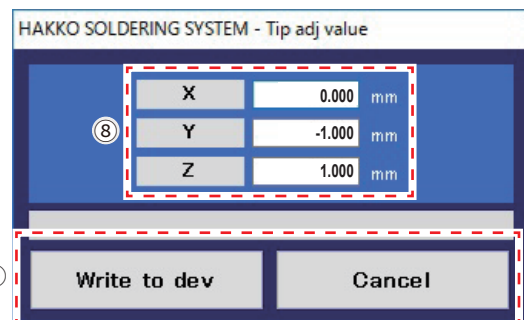


Fig. 7-120

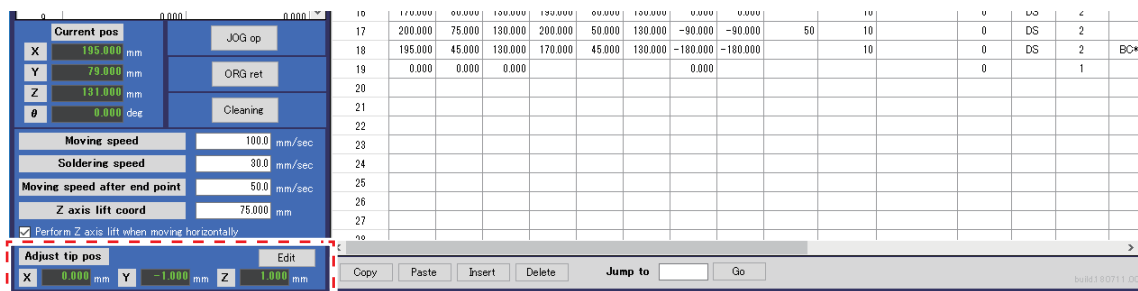


Fig. 7-121

Writing is completion.

## \*Adjust tip position

When changing to new tip

When changing from worn tip to new tip, if the adjustment value is continuously used with the new tip, it may damage the component pin. When changing to new tip, make sure to return the adjustment value to “0”.

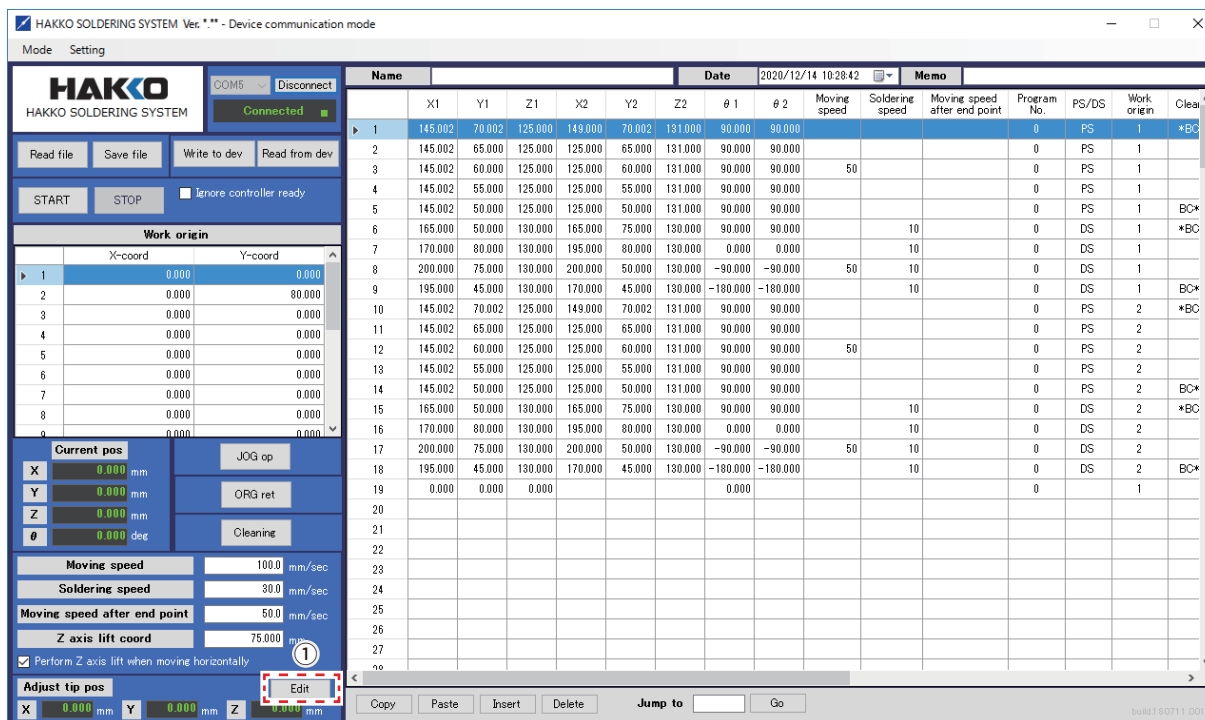


Fig. 7-122

- ① Click “Edit” on the top screen. Input dialog for tip adjustment value will open.
- ② Change all adjustment value to “0”.
- ③ Click “Write to dev” to write to the memory in table top type robot (IAI-made TTA-A4 series).

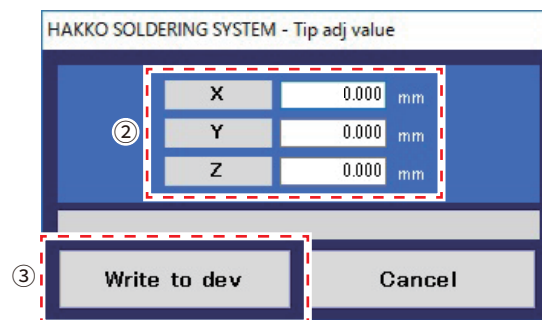


Fig. 7-123

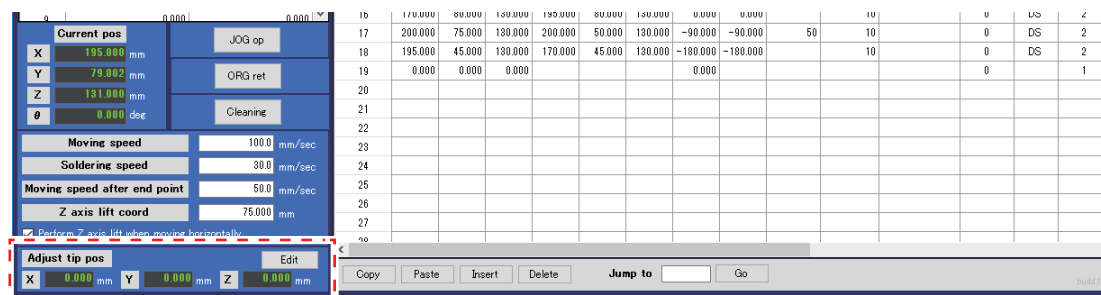


Fig. 7-124

## \*Adjust tip position

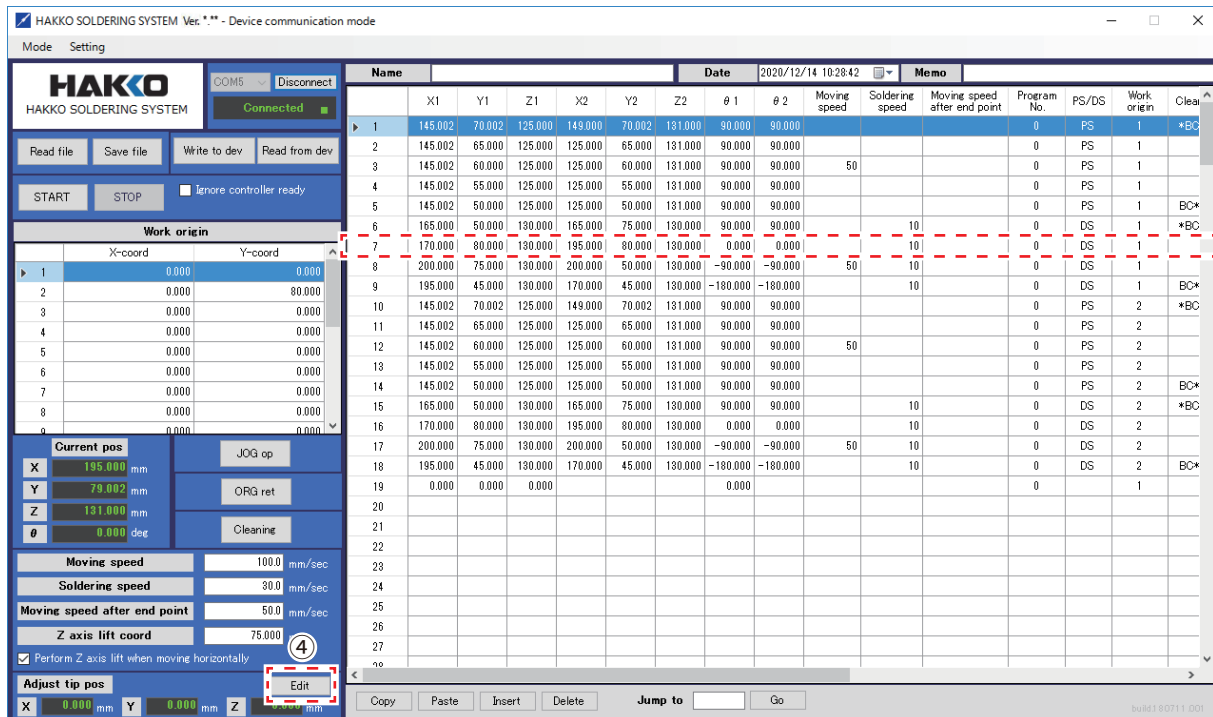


Fig. 7-125

Tip has individual difference due to tolerance even when the tip is new.

The following explains the order to adjust tip position for new tip.

- ④ Click “Edit” on the top screen.  
Input dialog for tip adjustment value will open  
(See Fig. 7-126).

The dialog box titled 'HAKKO SOLDERING SYSTEM - Tip adj value' contains three input fields for X, Y, and Z coordinates, each with a value of 0.000 mm. At the bottom, there are two buttons: 'Write to dev' and 'Cancel'.

Fig. 7-126

- ⑤ Double-click the seventh line of the soldering program  
(See Fig. 7-127).

**\*Adjust tip position**

HAKKO SOLDERING SYSTEM - Edit point

NO. 2 Point name

Switch Start point End point

Switch	Start point	End point
X	170.000 mm	195.000 mm
Y	80.000 mm	80.000 mm
Z	130.000 mm	130.000 mm
θ	0.000 deg	0.000 deg

Use current pos

Soldering mode ☐ PS ☒ DS ☐ None

Program No. 0

Work origin 1

Cleaning ☐ Cleaning by air ☐ Cleaning by brush

☒ Before soldering ☐ After soldering

Move back to ☐ Start point ☒ Z axis lift

I/O setting Display Without setting

Moving speed mm/sec

Soldering speed mm/sec

Moving speed after end point mm/sec

Z axis lift coord mm

Move OK Cancel

Fig. 7-127

⑥ In the Edit point screen, the original coordinate of the end point is set.

⑦ Open JOG operation screen (See Fig. 7-129).

Current pos

X	195.000 mm
Y	80.001 mm
Z	130.000 mm
θ	0.000 deg

JOG op

ORG ret

Cleaning

Moving speed 100.0 mm/sec

Soldering speed 30.0 mm/sec

Moving speed after end point 50.0 mm/sec

Z axis lift coord 75.000 mm

Fig. 7-128

## \*Adjust tip position

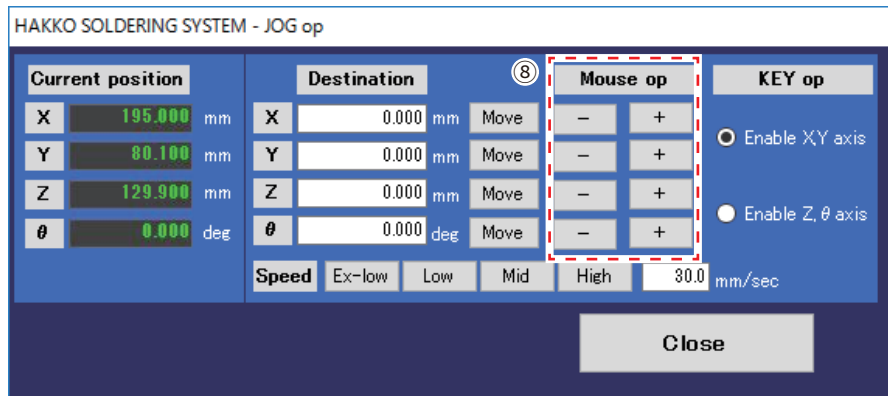


Fig. 7-129

- ⑧ Using the mouse operation, adjust the replaced tip to position where it can perform soldering.
- ⑨ Check the difference from the original end point.

Table 7-10

	Original	After adjustment	Difference
X axis	195.000mm	195.000mm	0mm
Y axis	80.000mm	80.100mm	0.1mm
Z axis	130.000mm	129.900mm	-0.1mm

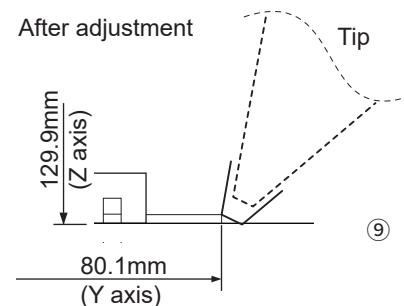


Fig. 7-130

- ⑩ Input the difference as the tip adjustment value.
- ⑪ Click “write to dev” to write to the memory in table-top type robot (IAI-made TTA-A4 series). This setting is necessary for each table-top type robot (IAI-made TTA-A4 series).  
If you do not intend to fix this setting, click “Cancel”.

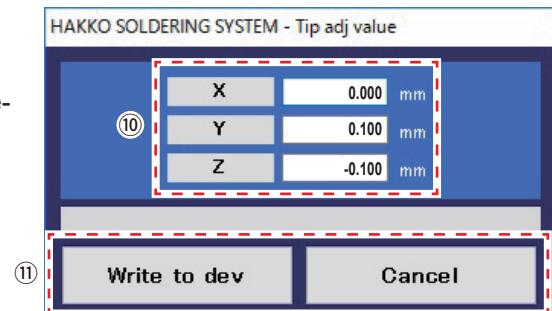


Fig. 7-131

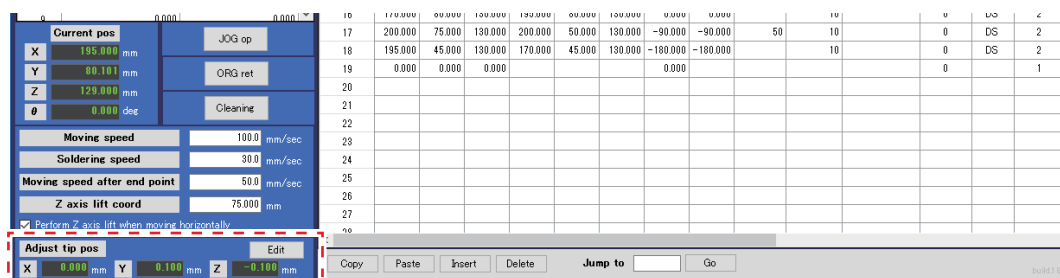


Fig. 7-132

Writing is completion.

## 7-6 Operating the Program (Commands from PC)

Soldering programs can be executed by commands both from the Easy Programming Software and the table-top type robot (IAI-made TTA-A4 series). If there are many soldering points (240 points or more), perform operation from PC. If soldering points are less than 240 points, it is possible to execute programs from both sides.

First, executing a soldering program by operation from PC is explained. At first, check that all devices are correctly connected and powered ON. (See p.51 of “5-3 Connection with PC” and p.52 of “5-4 Connection with HAKKO FU-500 and external devices of “5. Installation and connection”).

Boot up the PC and insert the license dongle into the USB connector.

Start up the Easy Programming Software.

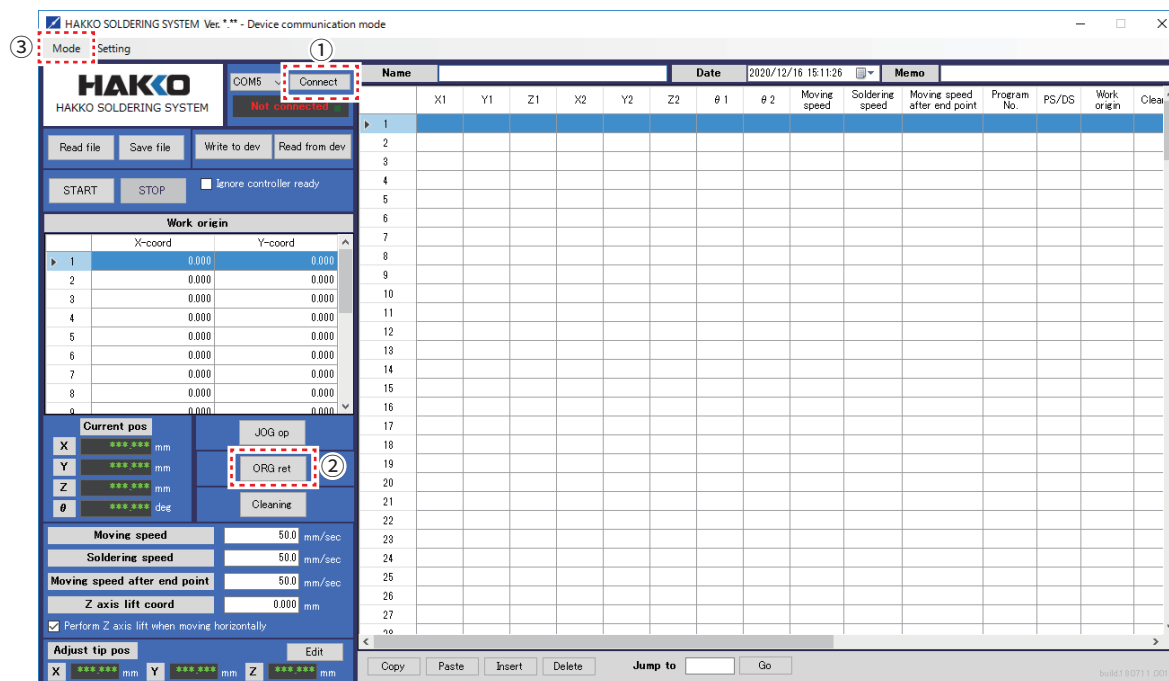


Fig. 7-133

- ① Click “Connect” and connect to the table-top type robot (IAI-made TTA-A4 series).
- ② Click “ORG ret”. After completion of origin return, the panel window display of the table-top type robot (IAI-made TTA-A4 series) is changed as shown in Fig. 7-134.

### ⚠ CAUTION

- If the HPS is not lit (origin return is not made), other programs do not operate.
- When the  $\theta$  axis is turning while returning to the origin, there is a danger that the cable may become wrapped in while it is turned.

If it seems like there is a risk of the cable becoming wrapped in, press the emergency stop button and turn the soldering iron mounting base counterclockwise so that it is a little past the origin ( $0^\circ$ ) of the  $\theta$  axis when viewed from above, and then click the “ORG ret” again.

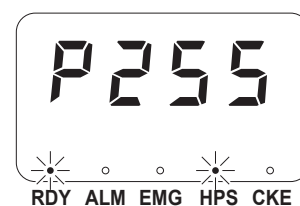


Fig. 7-134

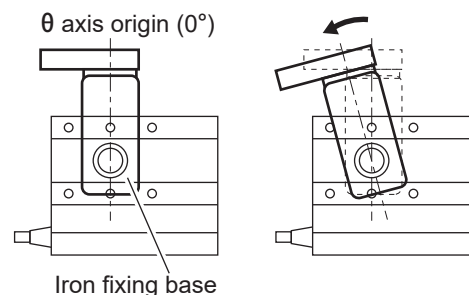


Fig. 7-135

- ③ Pull down “Mode” menu and select either of “Device communication mode” and “PC communication mode”. It is possible to send commands from PC in whichever mode.

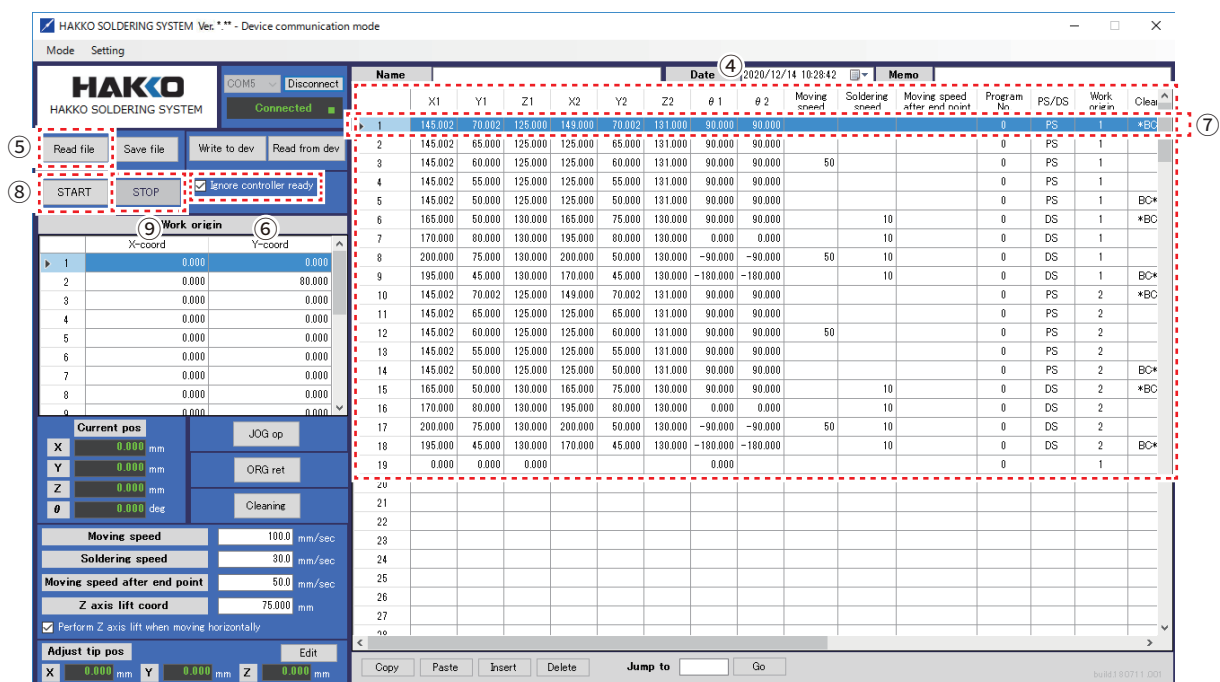


Fig. 7-136

④ Operate will be explained using the program created in “7-4 Creating soldering program”.

⑤ Click “Read file” and read the saved CSV file.

⑥ Check “Ignore controller ready” ON, and simulate the movement if the programmed position is correct before actual soldering.

When “Ignore controller ready” is checked ON and “START” is clicked, it will execute without communicating with HAKKO FU-500.

### ⚠ CAUTION

Always keep the emergency stop box close by for risk of danger.

⑦ Select the line to start soldering.

Perform this when selecting the point to start soldering.

⑧ Click “START”.

The program is operated. Check if the tip do not contact other object, and if the speed is appropriate.

⑨ When the program is completed, it will stop. The screen will go back to the first line of the soldering program.

When stopping while the program is running, press “STOP”.

Here, performing actual soldering is explained.

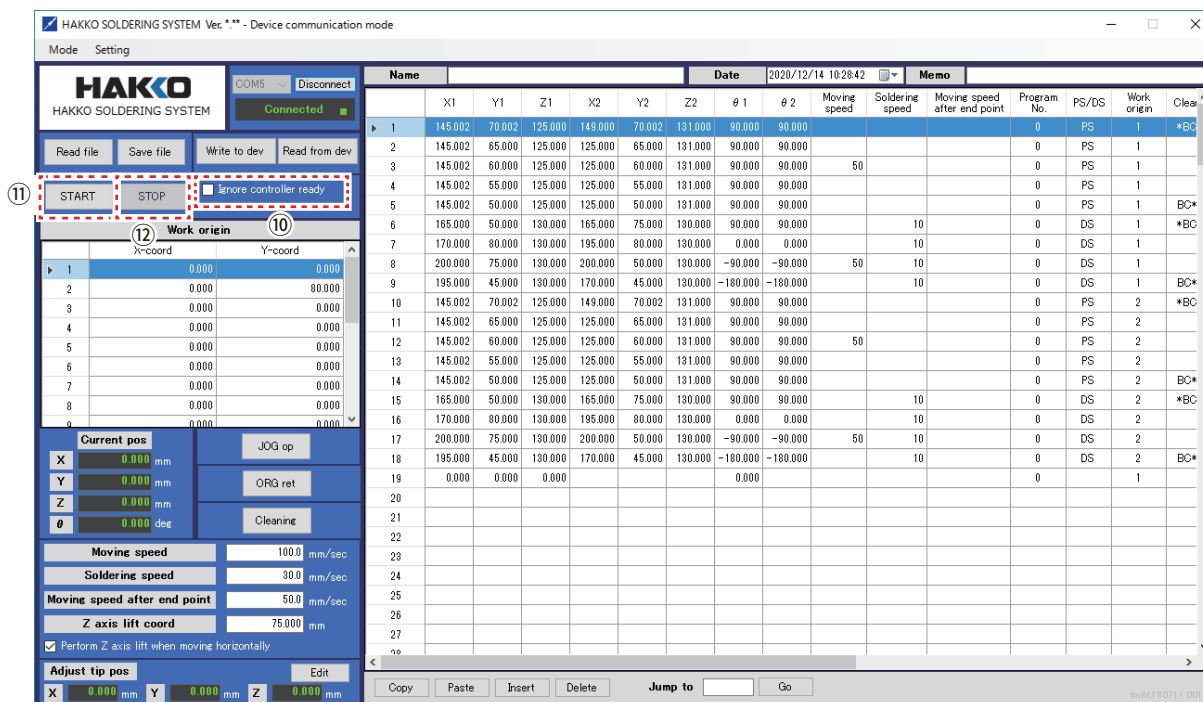


Fig. 7-137

Confirm that the power of HAKKO FU-500 and FU-601 is turned ON.

Confirm that the power of table top type robot (IAI-made TTA-A4 series) is turned ON.

### CAUTION

- Always keep the emergency stop box close by for risk of danger.
- To be prepared for FU-500 error, please set the “Z axis lift value. in case of FU-500 error”. See page 105, “other setting” in “\*Control from external devices” of “7-5 Detailed setting” for the way of setting.

⑩ Uncheck “Ignore controller ready”.

⑪ Click “START”.

Soldering program is operated. When changing the starting soldering point, select the line before clicking “START”.

### CAUTION

When controlled from external devices, if the INPUT information from external device and the INPUT information of the program do not match the line selected, it will not move even if “START” is clicked.

⑫ When the program is completed, it will stop. The screen will go back to the first line of the soldering program. When stopping while the program is running, press “STOP”.

## 7-7 Operating the Program

### (Commands from table-top type robot (IAI-made TTA-A4 series))

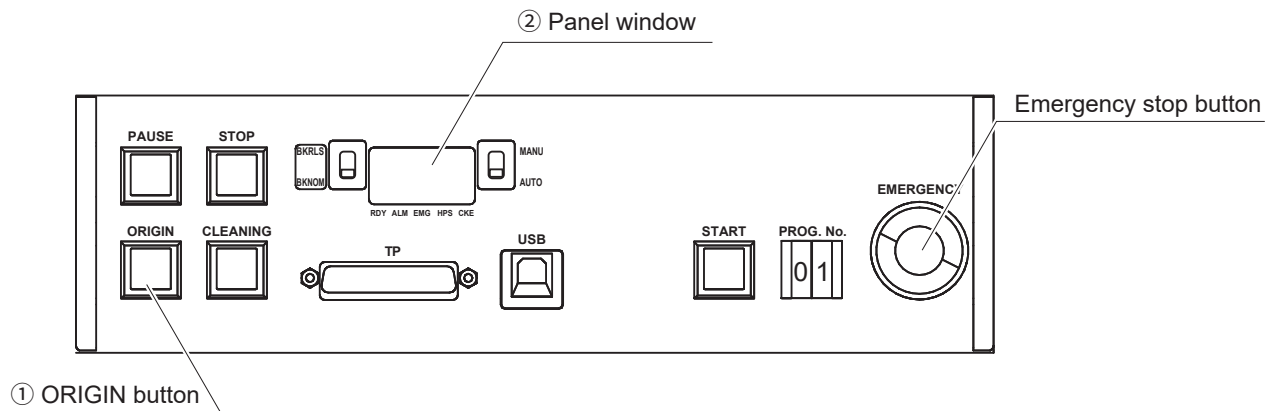


Fig. 7-138

- ① After turning the power ON of the table-top type robot (IAI-made TTA-A4 series), press the “ORIGIN” button. The tip will move to origin.
- ② After completion of origin return, the panel window display of the table-top type robot (IAI-made TTA-A4 series) is changed as shown in Fig. 7-139.

#### ⚠ CAUTION

- If the HPS is not lit (origin return is not made), other programs do not operate.
- When the  $\theta$  axis is turning while returning to the origin, there is a danger that the cable may become wrapped in while it is turned.

If it seems like there is a risk of the cable becoming wrapped in, press the emergency stop button and turn the soldering iron mounting base counterclockwise so that it is a little past the origin ( $0^\circ$ ) of the  $\theta$  axis when viewed from above, and then press the “ORIGIN” button again.

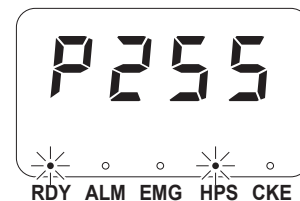


Fig. 7-139

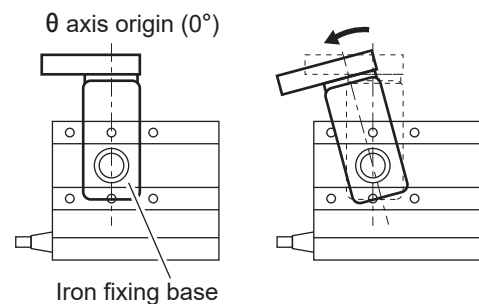


Fig. 7-140

## Write the created soldering program in the table-top type robot (IAI-made TTA-A4 series)

- ① Click “Write to dev”.

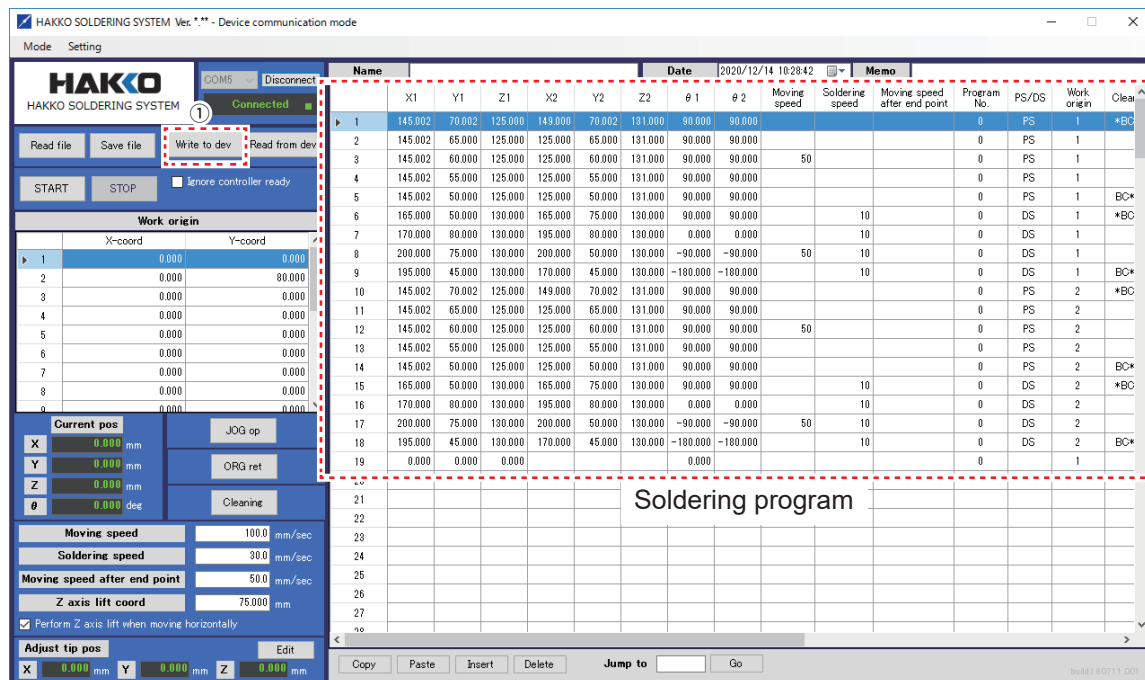


Fig. 7-141

- ② Select the write to program number.  
Select “1”.
- ③ Click “run”.

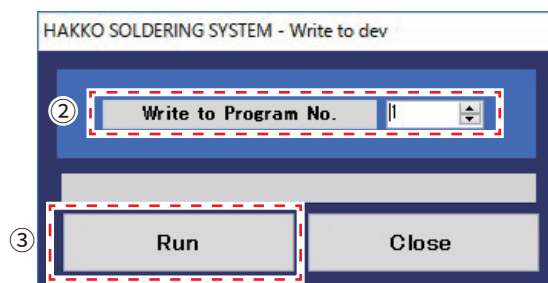


Fig. 7-142

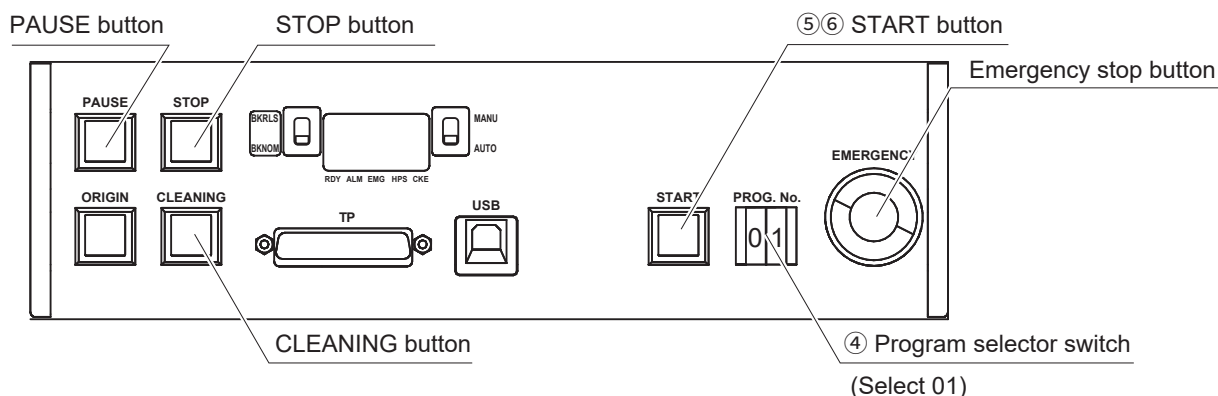


Fig. 7-143

- ④ Select the target program No. 01 by the program selector switch.
- ⑤ In order to check if the program is correctly written to the table top-type robot (IAI-made TTA-A4 series), perform simulation first.  
Change the mode of HAKKO FU-500 to “Simulation Mode”.  
When the START signal is received on this condition, the same operation as the Auto Mode is performed, however, the motor does not operate and does not feed solder. For further details, see “●Selecting Simulation Mode” of “6. Operation” of the Instruction Manual of HAKKO FU-500.

Press the “START” button on this condition.

Check if the tip does not contact other object, and if the speed is appropriate.

### ⚠ CAUTION

Immediately press the emergency stop button when there is a risk of danger.

- ⑥ After checking the position, change the mode of HAKKO FU-500 to “Auto Mode”.

Pressing the “START” button performs soldering according to the set details of the selected program.

To stop the program temporarily, press the “PAUSE” button

To stop the program, press the “STOP” button

Pressing the “CLEANING” button performs cleaning in the order of cleaning by air → cleaning by brush.

Setting of cleaning is set in the option screen of Easy Programming Software.

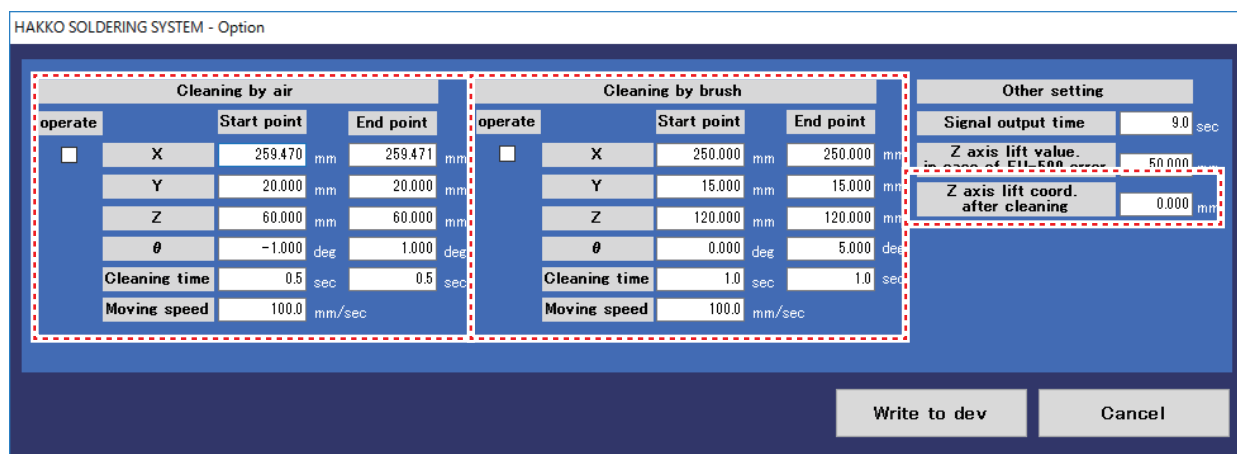


Fig. 7-144

## The soldering program created in this instruction manual

The following are the program created from the steps of “7-4 Creating soldering program” to “7-7 Operating the Program”.

	X1 Start pt (mm)	Y1 Start pt (mm)	Z1 Start pt (mm)	X2 End pt (mm)	Y2 End pt (mm)	Z2 End pt (mm)	θ1 Start pt (deg)	θ2 End pt (deg)	Moving speed (mm/sec)	Soldering speed (mm/sec)	Program No.	PS/ DS	Work Origin	Z axis lift coord (mm)	Cleaning
1	145	70	125	149	70	131	90	90	100	30	0	PS	1	75.000	Before
2	145	65	125	149	65	131	90	90	100	30	0	PS	1	75.000	-
3	145	60	125	149	60	131	90	90	50	30	0	PS	1	75.000	-
4	145	55	125	149	55	131	90	90	100	30	0	PS	1	50.000	-
5	145	50	125	149	50	131	90	90	100	30	0	PS	1	75.000	After
6	165	50	130	165	75	130	90	90	100	10	0	DS	1	75.000	Before
7	170	80	130	195	80	130	0	0	100	10	0	DS	1	75.000	-
8	200	75	130	200	50	130	-90	-90	50	10	0	DS	1	75.000	-
9	195	45	130	170	45	130	-180	-180	100	10	0	DS	1	50.000	After
10	145	70	125	149	70	131	90	90	100	30	0	PS	2	75.000	Before
11	145	65	125	149	65	131	90	90	100	30	0	PS	2	75.000	-
12	145	60	125	149	60	131	90	90	50	30	0	PS	2	75.000	-
13	145	55	125	149	55	131	90	90	100	30	0	PS	2	50.000	-
14	145	50	125	149	50	131	90	90	100	30	0	PS	2	75.000	After
15	165	50	130	165	75	130	90	90	100	10	0	DS	2	75.000	Before
16	170	80	130	195	80	130	0	0	100	10	0	DS	2	75.000	-
17	200	75	130	200	50	130	-90	-90	50	10	0	DS	2	75.000	-
18	195	45	130	170	45	130	-180	-180	100	10	0	DS	2	50.000	After
19	0	0	0	-	-	-	0	-	100	30	-	-	1	75.000	-

This is the end of creating the soldering program and its operation steps.  
Read each section carefully and care for appropriate and safe use of the product.

## 8. MAINTENANCE

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Performing periodic and proper maintenance will extend product life.

### WARNING

- Be sure to set the power switch to OFF before performing maintenance of the table-top type robot (IAI-made TTA-A4 series).
- The tip of the HAKKO FU-601 soldering iron gets hot, so sufficient care should be taken while working. Unless otherwise instructed, always turn the power switch OFF and disconnect the power plug before performing any maintenance procedure. Also for HAKKO FU-500 and cleaner (CX1003), always turn the power switch OFF, and disconnect the power plug when performing maintenance.

The maintenance items for each product are as follows:

#### ● **Table-top type robot (IAI-made TTA-A4 series)**

For details regarding maintenance of the table-top type robot (IAI-made TTA-A4 series), refer to "Chapter 7: Maintenance and Inspection" of the instruction manual for the table-top type robot (IAI-made TTA-A4 series).

#### ● **Solder feed unit (HAKKO FU-500)**

If solder or flux adhered on any part of the feeder unit of the solder feed unit, clean it off using a brush or other appropriate tool. For details regarding maintenance, refer to "7. Maintenance" of the instruction manual for HAKKO FU-500.

#### ● **Soldering iron unit (HAKKO FU-601)**

Maintenance should be performed on the soldering iron tip and soldering iron unit.

For details regarding maintenance, refer to "8. Maintenance" of the instruction manual for HAKKO FU-601.

#### ● **Cleaner (CX1003)**

For details regarding maintenance of the cleaner, refer to "5. Maintenance" of the instruction manual for CX1003.

#### ● **Iron fixing base (CX1005), Soldering unit mount (CX1008), $\theta$ axis**

If solder or flux adhered on the iron fixing base (CX1005), soldering unit mount (CX1008), or  $\theta$  axis, clean it off with a brush or alcohol. If solder or flux gets on any other part, clean it off in the same way using a brush or other appropriate tool. The iron fixing base or jig table may become distorted or scratched due to drop or contact with other parts.

If the distortion or scratches are severe, remove the iron fixing base (CX1005) or jig table (CX1009) and replace it with a new one. Cautions that should be observed during replacement are stated on the next page.

## 8-1 Maintenance of table-top type robot (IAI-made TTA-A4 series) attachments

### • Iron fixing base (CX1005)

The iron fixing base (CX1005) is equipped with a positioning knock pin to align the  $\theta$  axis and the iron fixing base (CX1005).

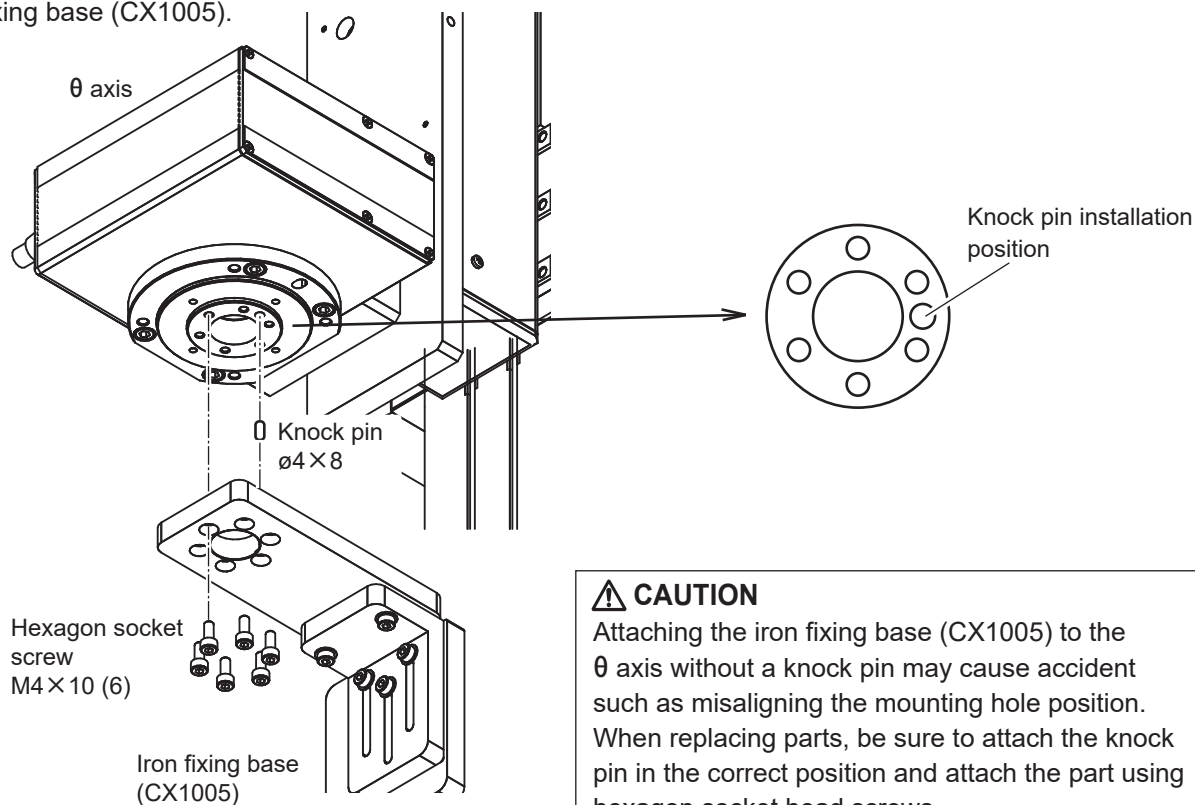


Fig. 8-1

#### **CAUTION**

Attaching the iron fixing base (CX1005) to the  $\theta$  axis without a knock pin may cause accident such as misaligning the mounting hole position. When replacing parts, be sure to attach the knock pin in the correct position and attach the part using hexagon socket head screws.

### • Jig table (CX1009)

The jig table (CX1009) is also equipped with a positioning knock pin.

When attaching, insert knock pins in the 2 locations indicated below and attach the jig table (CX1009).

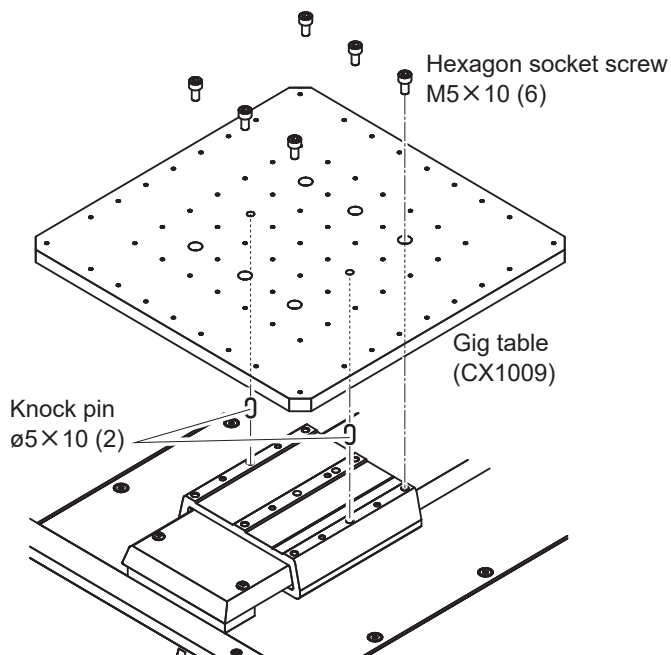


Fig. 8-2

### • Soldering unit mount (CX1008)

If the spring of the soldering unit mount (CX1008) is deteriorated or broken, replace the soldering unit mount (CX1008) with a new one.

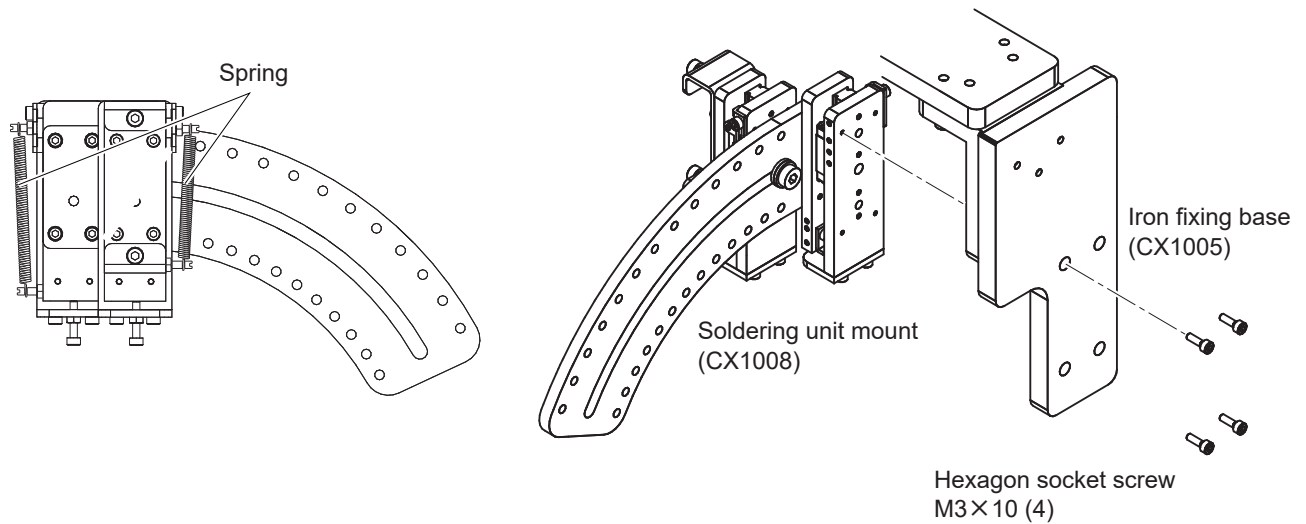


Fig. 8-3

### • Solder reel base (CX1006), Solder reel stand

When reattaching after performing maintenance, be careful for the mounting position of the solder reel stand. If it is attached in the wrong position, the solder reel base (CX1006) could not be attached to the table-top type robot.

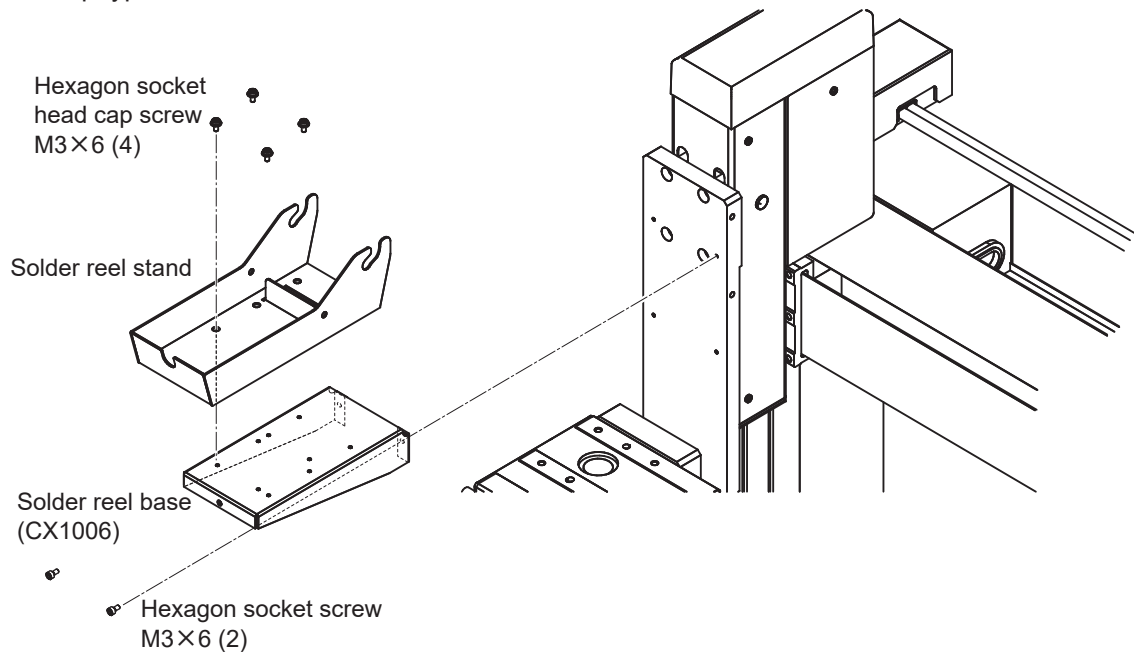


Fig. 8-4

- **Cleaner base (CX1007)**

If positioning was not performed when removing the cleaner base (CX1007), it will be necessary to perform setting of the cleaning position when reattaching the cleaner base. See p. 69-73 of “7-3 Setting the cleaner” in “7. How to use” for the setting method.

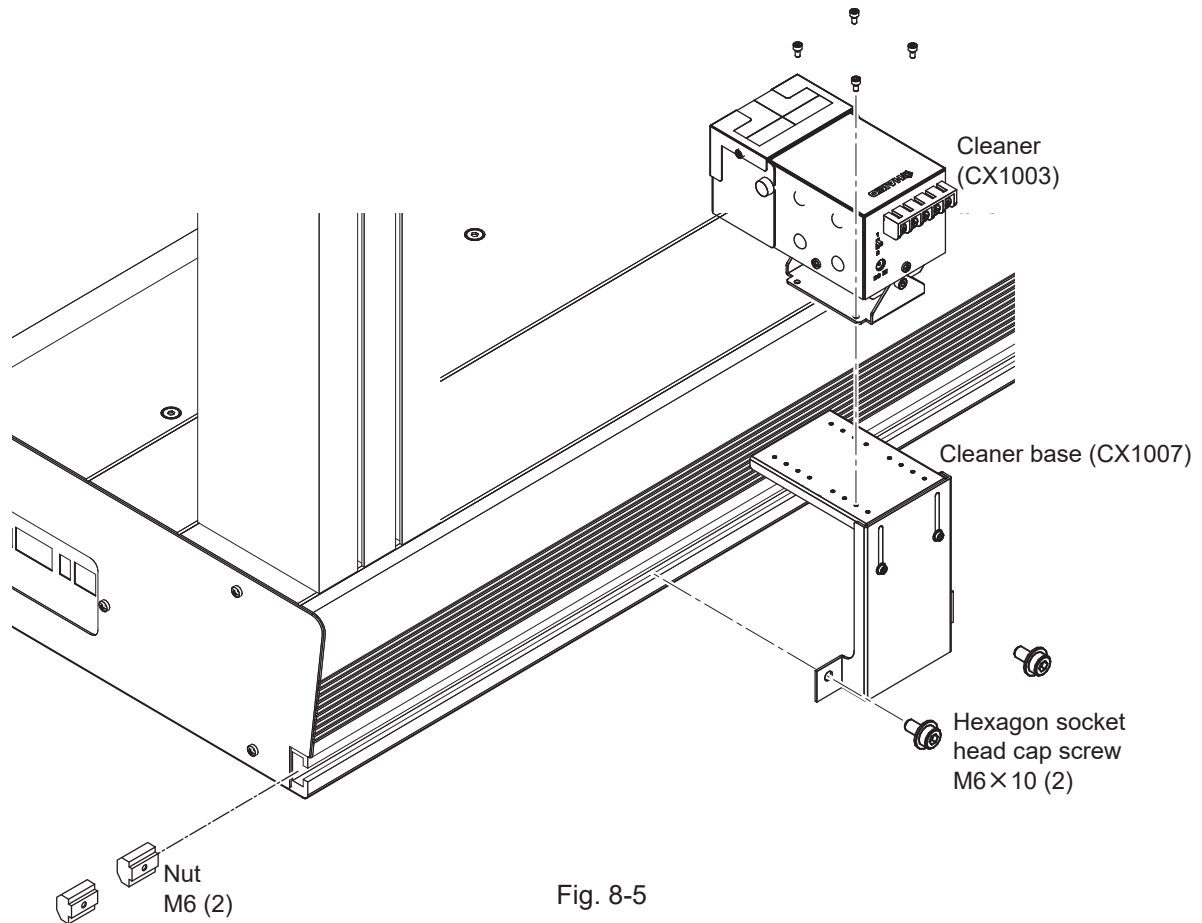


Fig. 8-5

**⚠ CAUTION**

For information on how to use the cleaner, refer to the instruction manual for CX1003.

**⚠ CAUTION**

Many parts use hexagon socket head screws in different dimensions. When replacing parts, be careful to keep the screws for each part separate and to not mix the screws.

## 9. ERROR MESSAGES

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Error will be displayed when the table-top type robot (IAI-made TTA-A4 series), solder feeding unit, or soldering iron unit caused problem resulting in operation stop.

### ● **Table-top type robot (IAI-made TTA-A4 series)**

For the table-top type robot, error will be displayed on the panel window of the front panel. For further details of error messages, refer to “4.2.2 Display on the panel window” of “Chapter 4 Operation” and “Chapter 6 Error message table” of the instruction manual of the table-top type robot.

### ● **Solder feeding unit (HAKKO FU-500)**

For the solder feeding unit, error will be displayed on the setting display LCD. For further details of error messages, refer to “8. Error messages” of the instruction manual for HAKKO FU-500.

### ● **Soldering iron unit (HAKKO FU-601)**

In the soldering iron unit, error will be displayed on the setting display. For further details of error messages, refer to “10. Error messages” of the instruction manual for HAKKO FU-601.

# 10. TROUBLESHOOTING

## ● Table-top type robot (IAI-made TTA-A4 series)

Symptom	Cause	Solution
Robot does not work even if power switch is set to ON.	Power cord is not connected properly.	Connect power cord properly.
Program does not work.	HPS is not lit. (Is not returned to origin.)	Return robot to origin.
	Program number is set to 11 or higher.	Set program number to a value from 01 to 10.
	PAUSE button is pressed.	Release PAUSE button.
	Mode is set to MANU.	Set mode to AUTO.
	Emergency stop button is pressed.	Release emergency stop button.
	System I/O connector is disconnected.	Connect system I/O connector.
	Motor power connector is disconnected.	Connect motor power connector.
	HAKKO FU-500 is showing an error message.	Correct error condition.
	HAKKO FU-500 is not connected.	Connect HAKKO FU-500 properly. (See p.53 of “5-4-1 HAKKO FU-500 I/O connector connection”.)
	HAKKO FU-500 power switch is set to OFF.	Set power switch to ON.

### NOTE:

For other problems, refer to “Section 6: Error list” in the instruction manual for the Table-top type robot (IAI-made TTA-A4 series).

## ● Easy Programming Software

Symptom	Cause	Solution
Easy Programming Software does not start.	License dongle is not inserted.	Insert the license dongle.
Software does not connect even when Connect is clicked.	Table-top type robot (IAI-made TTA-A4 series) and computer are not properly connected.	Properly connect the table-top type robot (IAI-made TTA-A4 series) and computer. (See p.51 of “5-3 Connect with computer”.)
	The power switch of table-top type robot (IAI-made TTA-A4 series) is set to OFF.	Set power switch to ON.
	Emergency stop button is pressed.	Release emergency stop button.
Program does not run even when START is clicked.	The status is shown Disconnected.	Click Connect and connect the robot and computer.
	Robot hasn't returned to origin.	Click Return to origin.
	HAKKO FU-500 is showing an error message.	Correct error condition.
	HAKKO FU-500 is not connected.	Connect HAKKO FU-500 properly. (See p.53 of “5-4-1 HAKKO FU-500 I/O connector connection”.)
	HAKKO FU-500 power switch is set to OFF.	Set power switch to ON.
Solder is not fed.	“Ignore controller ready” is checked.	Uncheck “Ignore controller ready”.

## ● HAKKO FU-500

Symptom	Cause	Solution
Solder is not fed properly/"Solder feed error" is displayed.	Solder clogging has occurred.	Remove the clogged solder.
	Solder has run out.	Supply new solder.
	Solder or flux has adhered to the cutting blade or pulley.	Clean off the solder or flux using a brush or alcohol.
	Tube unit or Fluoroplastic tube is very dirty, worn out, or damaged.	If they have become very dirty, worn out, or damaged, replace with new parts.
	Tube unit is bent too sharply.	Make the bend radius less sharp.
	The end of the Fluoroplastic tube or the inside of the feeder tube is clogged with flux.	Use a brush or alcohol to clean out the clog.
	Parts such as the solder feed pulley unit, etc. do not match the solder diameter being used.	Change to parts that match the solder diameter (See "11. Parts list" in the instruction manual for the HAKKO FU-500).

### NOTE:

For other problems or detailed maintenance, refer to "7. Maintenance" or "9. Troubleshooting" in the instruction manual for the HAKKO FU-500.

## ● HAKKO FU-601

Symptom	Cause	Solution
HAKKO FU-601 does not work even if power switch is set to ON.	Power cord is not connected properly.	Connect power cord properly.
	Fuse is blown.	After checking the cause of the blown fuse, replace the fuse.
Tip does not get hot and S-E is displayed.	Tip is not firmly inserted.	Fully insert the tip.
	There is a broken wire in the soldering iron cord.	Refer to "9. Inspection" in the instruction manual for the HAKKO FU-601.
Solder does not stay on the tip.	The heater or sensor is broken.	Set the temperature to an appropriate value.
	Tip temperature setting is set too high.	Clean off the oxidation.
Tip temperature is too high.	There is oxidation on the tip.	Clean off the oxidation.
	Soldering iron cable is broken.	Refer to "9. Inspection" in the instruction manual for the HAKKO FU-601.
Tip temperature is too low.	There was a mistake in inputting the offset value is not correct.	Input the offset value correctly.
	There is oxidation on the tip.	Clean off the oxidation.
Error is displayed.	The offset value is not correct	Input the offset value correctly.
	-	Refer to "10. Error messages" in the instruction manual for the HAKKO FU-601, and solve the cause of the error.

### NOTE:

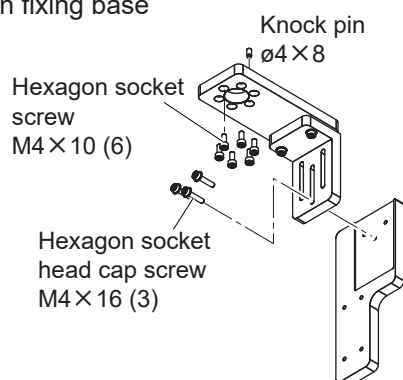
For detailed maintenance and inspection, refer to "8. Maintenance" or "9. Inspection" in the instruction manual for the HAKKO FU-601.

# 11. PARTS LIST

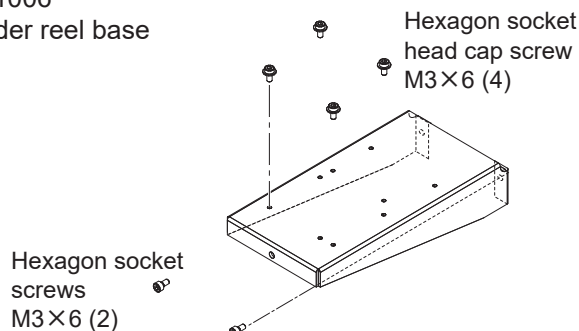
## ● Table-top type robot

Part No.	Part name	Specifications
CX1005	Iron fixing base	
CX1006	Solder reel base	
CX1007	Cleaner base	
CX1008	Soldering iron mounting head	
CX1009	Jig table	
CX1011/CX1012	Easy programming software	With USB cable
BX1040	USB cable	

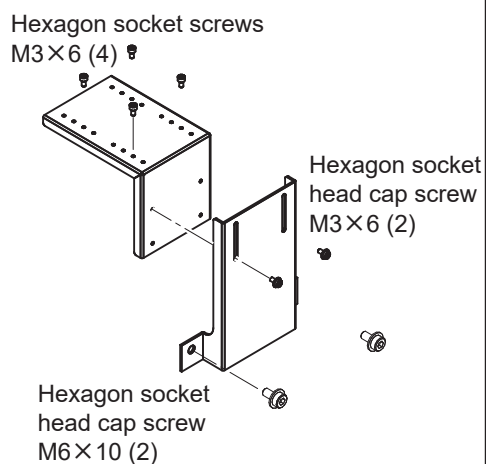
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Iron fixing base



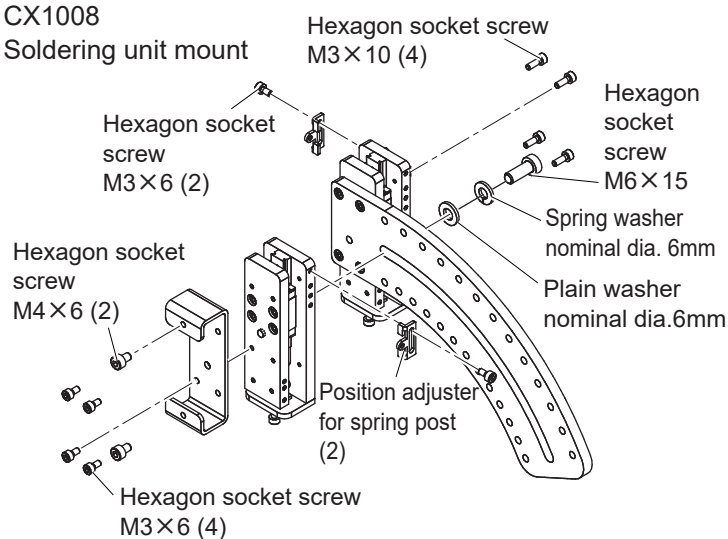
**CX1006**  
Solder reel base



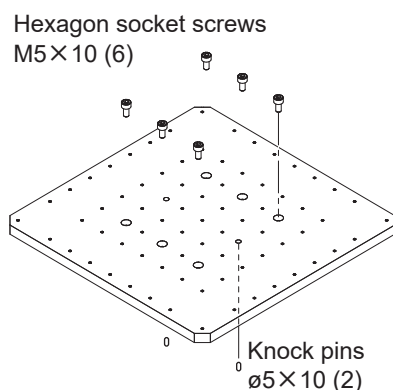
**CX1007**  
Cleaner base



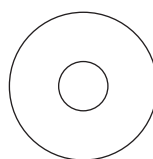
**CX1008**  
Soldering unit mount



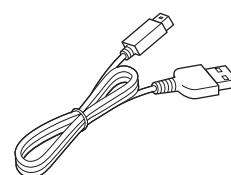
**CX1009**  
Jig table



**CX1011/CX1012**  
Easy programming  
software



**BX1040**  
USB cable





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