Teaching Pendant
DTS-2 Series
User Manual

DELTA

Smarter. Greener. Together.

Preface

Thank you for using this product. This explanatory information provides users with contents that must be followed in order to safely operate the robot. It contains information related to the Delta four-axes industrial robot series.

This product is applicable to

- Electric Control Box DCS-1B00-CA Configuration

General Precautions

Before operating the robot, please read the contents of this Guide carefully in order to ensure your safety, including:

- Human Machine Interface Operational Functions and Descriptions
- Testing and Maintenance
- Troubleshooting

Taking into account the working environment and the operator safety, we will provide special training for persons working with different types of robots. This Manual can be used as a reference by the following users:

- System Integration Designer
- Installation Staff
- Testing and Tuning Staff
- Maintenance or Inspection Staff
- Equipment Operator

Please read this Manual carefully before operating in order to ensure proper usage. In addition, it is also required to place this Manual in a safe location for easier referencing whenever required. The following items must be followed before you have finished reading this Manual:

- The installation environment must have no steam, corrosive gas, or flammable gas.
- Do not disassemble the Teaching Pendant or modify internal wiring while the power is connected.
- Please ensure that the emergency stop device of the Teaching Pendant can be enabled at any time before powering it on for operations.

If you still have questions concerning the usage, please contact a

dealer or our Company's Customer Service Center.

Safety Precautions

Delta robots can be controlled by the DRAStudio software installed on computers, or by using the handheld human machine DTS-2xM series to operate the controller in order to control the robot. The robot itself uses the latest control architecture, including the function of high-speed computing capability controller which can control the robot more precisely and allow robots to perform precise actions. The handheld human machine cannot be detached from the controller for remote operations. For the safety of users, please pay attention to the safety of the working environment, and set protective railings around this robot to ensure user safety during operations. Delta robots can be used for industrial applications, and it is recommended to install in the junction box (electrical control box) environments indicated in the User's Guide (the controller, cables, and motors must be installed in accordance with UL Environment Class 1 minimum installation environment requirements). During the acceptance inspection, installation, wiring, operation, maintenance, and inspection, please observe the following safety precautions at all times.

Meaning of "Danger", "Warning", and "Prohibition" Signs:

DANGER	■ Please use a matching servo drive and servo motor according to the specified methods otherwise it may result in fire or equipment failure.
WARNING	■ Means a potential hazard. If you fail to comply, it may cause medium personnel injury or lead to serious product damage or even breakdown.
STOP	■ Means an action that is absolutely prohibited. If you fail to comply, it may lead to product damage or even breakdown and cannot be used any longer.
Acceptance Inspection **DANGER**	■ Please use the robot according to the specified methods otherwise it may result in fire or equipment failure.
Installation Notes **DANGER**	■ Use of this product in locations exposed to substances such as steam, corrosive gas, and flammable gas, etc. is prohibited, and otherwise it may cause electrical shocks or fire.
Precautions for Operation **WARNING**	■ Please read this Manual carefully before using in order to ensure proper usage and the safety of the maintenance staff. ■ Do not wear loose clothes, ties, rings, or bracelets, and wear protective nets to protect long hair. These things can become easily caught in the machine by accident and cause injuries to the staff or other dangers during operations.

	■ Please turn off the power, isolate the power properly and wait for the robot to stop completely when the robot is no longer in use before you leave. ■ Please confirm that there is no one inside the railings before operating the robot and performing operations. ■ Do not laugh or talk to other workers while operating the robot; such wrong behavior may result in a collision of the robot or injuries to other workers. ■ Please do not stand within the moving range of the robot when teaching the robot for the first time in order to prevent accidents from occurring due to one's being unfamiliar with the operations. ■ Please use slow speed operations when operating the robot manually for the first time, otherwise being unfamiliar with the operations may result in damage to the robot due to impact or causing injuries to other workers. ■ If the teaching pendant cable on the controller needs to be removed, please do so when the power is completely cut, otherwise the Teaching Pendant may be damaged. ■ Configure the setting values according to the user parameters before operating the robot. If not adjusted to the specified value, the robot may become uncontrollable during operations or even malfunction. Confirm whether or not the emergency stop device can be enabled at any time before operating the robot. When you power on the robot, make sure that the robot does not move due to mechanical momentum or other reasons.
STOP	■ Touching of any rotating robot components during robot operation is strictly prohibited, otherwise it may cause personal injuries. ■ Do not randomly make any changes to any components on our Company's handheld Teaching Pendant, including the emergency stop and enable switch. Doing so will lower the safety performance and level, and even lose the safety protection. ■ Short-circuiting of any safety protection signals on the controller is strictly prohibited, otherwise our Company will not be held responsible for any work accidents that may occur. ■ When operating the robot all personnel are prohibited from standing close or within the robot working range; doing so will cause injuries to the workers. ■ Do not unplug any cables on the controller while the robot is operating; doing so will cause damage to the controller.
DANGER	■ In order to prevent accidents from happening, please detach the fixtures, etc. of the robot first so they are in a separated state, and then perform the first test operation. Beware that after you operate the servo motor and the robot, any errors in operation can not only cause damage to the robot, but also result in injuries to the workers. Strongly Suggested: Test if the robot is operating normally under load-free conditions first and then connect the power to avoid unnecessary hazards. ■ Do not touch the control box during operations in order to prevent burns or electric shocks because of high temperatures.

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Maintenance and Inspection ![STOP hand symbol]	■ Do not touch the controller and the inside of the robot, otherwise it may cause electric shocks. Do not disassemble the handheld human-machine when the power is ON, otherwise it may cause electric shocks and damage the handheld human-machine. Do not touch the wiring terminals within 30 minutes after turning off the power as residual voltage may cause electrical shocks. Do not modify the wiring while the power is ON; otherwise it may result in electric shocks or injuries to the workers. Only trained and qualified electric personnel may perform the installation, wiring, repair, and maintenance of this robot.
Circuit Wiring ![WARNING triangle symbol]	■ Remove the terminal socket from the servo driver when performing wiring. Only insert one cable into the cable insertion port of the terminal socket. Do not allow the wiring and neighboring cables short circuit when inserting the cable. Check whether or not the wiring is correct before connecting the power.
![STOP hand symbol]	■ Do not turn the power on and off frequently. If there is the need to turn the power ON and OFF continuously, please control it to a minute or more before flipping the switch each time.

Basic Check

Test Item	Test Content
General Testing	The screws at the parts connecting the human machine interface and equipment should be checked regularly to see if they are loose. If the human machine interface is placed at a location with hazardous gas or lots of dust, the hazardous gas should be prevented.
Pre-operation Check (control power not supplied)	Check whether the wiring is correct, otherwise it might malfunction. Check whether there are conductive objects, such as screws or metal sheets, or flammable objects inside the human machine interface. When electronic instruments used around the human machine interface have electromagnetic interference, please use instrument adjustment to decrease the electromagnetic interference. Please confirm whether the voltage level of the human machine interface's power supply is correct.
Pre-run Check (control power already supplied)	Whether the power lamp is displayed. Whether the robot actions are normal when operated. If the human machine interface has abnormalities, please contact the dealer or our Company's customer service center.

The composition of this guide is as shown below

Chapter 1 Basic Operation Interface of the Teaching Pendant

This chapter explains the connection notices and methods for the Teaching Pendant, and explains the buttons and switch functions needed for operations.

Chapter 2 Teaching Pendant Tab Operations and Instructions

This chapter explains the instructions for Teaching Pendant operations and functions.

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1. Human Machine Interface

1.1. Hardware Interface

Specification Item		Specification Content
Display	**Panel Type**	7" TFT LCD (65535 colors)
	Resolution	800 x 480 pixels
	Display Range	154.08 x 85.92mm
Auxiliary Key		21 Function Keys
Operating Temperature		0 - 40 Degrees
Storage Temperature		-10 - +60 Degrees
Dimensions W x H x D (mm)		257.4 x 170.3 x71.8 (including the bulging emergency stop and hook parts)
Weight		750g (not including cables)

NOTE:

1. Definition of the Half-life Period of the Back-light Module: The half-life period refers to when the brightness of the back-light drops to half of the maximum brightness level under maximum drive current.
   The usage life marked is an estimated value under a working environment of 25 degrees with normal humidity.

2. Isolation Circuit Tolerance Specifications: Able to bear 1 minute of 1500V high-voltage surges.

3. Certifications for some models are being applied; please consult regional agents for details on certified models.

1.2. Brief Introduction to the Operation Environment

Only brief explanations for the Teaching Pendant are provided here; for complete explanations for the operation environment, please refer to the User's Guide of the control box.

- An emergency stop button with 2 NC contacts is used for the safety connector. The first set of NC contact is connected to Pin1 and Pin2, and the second set of NC connectors is connected to Pin3 and Pin4. If users already connected the safety gate signal to Pin5, Pin6, Pin7, and Pin8, functions such as Jog, Goto, GoHome, and execute project programs can be executed without having to press the Deadman Switch behind the Teaching Pendant while the safety gate is closed. To perform teaching with the Teaching Pendant while the safety gate is open, the Deadman Switch behind the Teaching Pendant must be pressed in order to perform teaching.

- To create a simple T1 mode fixture by yourself, input 0V (connect the 0V pin of DC Output) for Pin1 and Pin3 of SystemDI/O; please refer to the control box guide for details.
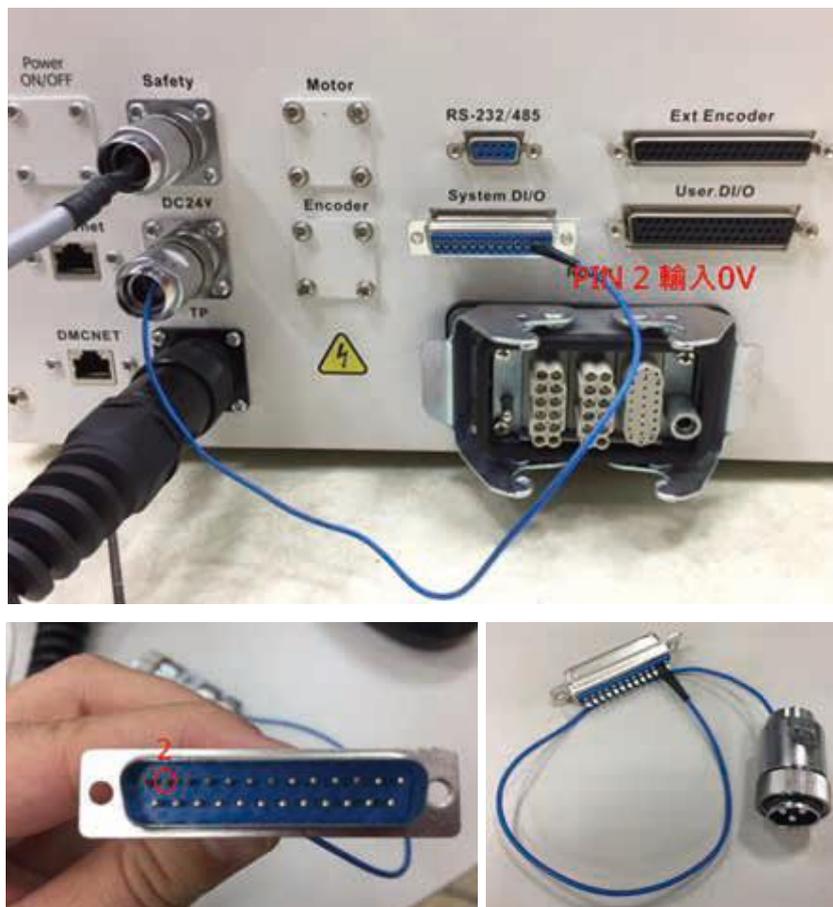
Figure 1-1 Electric Control Box T1 Simple Wiring Diagram

1.3. Teaching Pendant Hardware Button Functions

The hardware interface structure of the handheld Teaching Pendant is mainly divided into touch screen and physical buttons, as shown in Figure 1-2, Figure 1-3, and Figure 1-4.

- Touch Screen Functions Include: Robot arm operating status, connection status, robot language editing, point information display/teach, system related parameter settings, and system information display, etc., as shown in Figure 1-2.

- Physical Button Functions Include: Jog, auto run, pause/resume, stop, page switch button, select/adjust knob, emergency stop (E-Stop), and Teaching Pendant power lamp.

Physical Buttons	Function Description	Executable Page
RUN	Press and hold this button with the second stage of the three-stage operating button simultaneously for 2 seconds to automatically execute the currently running program.	Edit/RL
PAUSE RESUME	Press and hold this button with the second stage of the three-stage operating button simultaneously to pause or resume the currently running program.	Edit/RL
STOP	Press and hold this button with the second stage of the three-stage operating button simultaneously to stop the currently running program.	Edit/RL
+	Press and hold this button with the second stage of the three-stage operating button to move the axis in the positive direction.	All pages
−	Press and hold this button with the second stage of the three-stage operating button to move the axis in the negative direction.	All pages
↑	Pressing this button will return it to the previous page; it is used on the point page, program directory page, and RL editing page.	Edit/RL, Points
↓	Pressing this button will return it to the next page; it is used on the point page, program directory page, and RL editing page.	Edit/RL, Points

Emergency Stop Switch: Located at the top of the handheld Teaching Pendant front side (Figure 1-2); it is the safety switch while operating the robot arm.

- When an emergency occurs, pressing the emergency stop button on the handheld Teaching Pendant under any operation mode will stop robot operations immediately.

- Three-stage Operation Button (enable switch): Located on the back of the handheld Teaching Pendant (Figure 1-3); it is the safety switch while operating the robot arm.

- The three-stage operation button is divided into the following 3 statuses according to the different levels of strength used to press the switch. If accidents happen, the operator will not be pressing within the normal range.

Pressing Status	Operating Status	Robot Status
Pressed With Normal Force (stage two)	On	Can be Operated Manually
Not pressed or pressed with a weaker force that is less than the normal pressing force.	Off	Stopped and Cannot be Operated
Pressed With Excessive Force	Off	Stopped and Cannot be Operated

The functions of the three-stage operation button will differ based on the operation mode and whether safety equipment is set (Note 1 and Note 2), as listed below:

1. Under Auto Mode: The handheld Teaching Pendant cannot be operated; it only has display functions. The three-stage operation buttons have no function.

2. Under T1 and T2 Mode:
   Setting Safety Equipment: Releasing or tightly pressing the three-stage operation button will stop the robot from operating.
   Safety Equipment Set: When the safety equipment is disconnected, the user must press and hold down the three-stage operation button at stage two in order to perform operations. Releasing or tightly pressing the three-stage operation button will stop robot operation immediately and display a warning; on the other hand, if safety equipment is activated normally, the three-stage operation button has no function.

Note: When personnel are in the safety equipment adjusting the robot, please place a warning sigh or notification board to notify personnel outside that the robot arm is currently being adjusted, and that personnel outside must not operate the robot or its peripheral equipment so that the personnel inside the safety equipment will not be in danger of getting stuck.

Note 1: Safety equipment refers to safety fences, safety grating, or other safety facilities.
Note 2: Pin connection for the safety equipment is performed through the safety connector of the control box; for detailed explanation on the wiring please refer to the User's Guide of the control box.

- SD Card Slot: Located at the bottom of the handheld Teaching Pendant (Figure 1-4); it is used to update the firmware of the handheld Teaching Pendant. Please use a 16GB capacity SD card with speed class 10 and supporting SDHC.

Figure 1-2 Boot Screen

Figure 1-3 Back of the Handheld Teaching Pendant
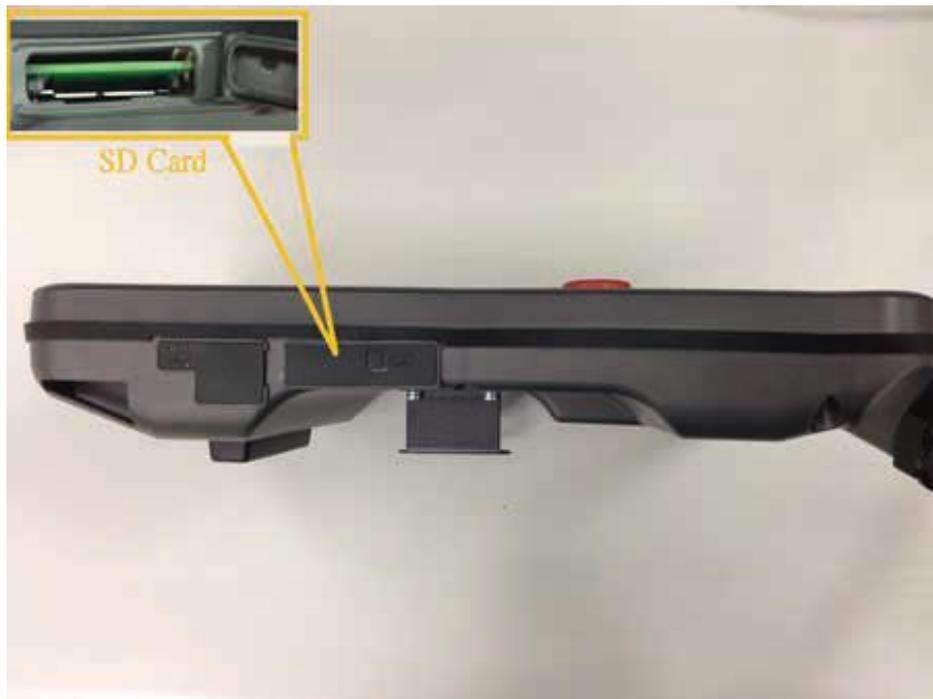
Figure 1-4 SD Card Slot of the Handheld Teaching Pendant

1.4. Touch Screen

The touch screen structure is divided into the menu bar on the left, the arm status monitor on the top, the jog information surveillance and tab page to the right, and their respective functions are as follows:

Figure 1-5 Touch Screen Structure

- Menu Bar:

Display tab switch button, includes robot process edit/RL (Edit/RL), execute (Execution), points (Points), jog (Jog), IO (DI/O), servo (Servo), information (Info), and system (System).

Component Appearance	Function Description
主頁	Pressing this component will switch the screen to the main screen and switch the menu bar to the first page; the color of this component will be highlighted in black when switching is complete.
V	Pressing this component will switch the menu bar to the next page.
Λ	Pressing this component will switch the menu bar to the previous page.
編輯/程序	Pressing this component will switch the screen to the robot process edit/run screen; the color of this component will be highlighted in black when switching is complete.
執行	Pressing this component will switch the screen to the execution screen; the color of this component will be highlighted in black when switching is complete.
點位	Pressing this component will switch the screen to the point information screen; the color of this component will be highlighted in black when switching is complete.
吋動	Pressing this component will switch the screen to the jog setting screen; the color of this component will be highlighted in black when switching is complete.
I/O i/o	Pressing this component will switch the screen to the IO surveillance screen; the color of this component will be highlighted in black when switching is complete.
伺服	Pressing this component will switch the screen to the Servo ON/OFF screen; the color of this component will be highlighted in black when switching is complete.
資訊	Pressing this component will switch the screen to the information display screen; the color of this component will be highlighted in black when switching is complete.
系統	Pressing this component will switch the screen to the system setting screen; the color of this component will be highlighted in black when switching is complete.

- Arm Status Surveillance Bar:

Servo On/Off: Allows surveillance of the Servo On/Off status, or press the button to switch the Servo On or Off.

Component appearance	Function Description
ON	Shows that currently the arm motor is Servo On; press this button to switch the motor to Servo Off
OFF	Shows that currently the arm motor is Servo Off; press this button to switch the motor to Servo On.

Alarm State: Monitors the alarm status of the current system.

Component appearance	Function Description
(bell icon)	Shows that no alarm has occurred for the current system; press this button to switch to the Alarm Info page.
(red bell icon)	Shows that an alarm has occurred in the system; at this time the button will be displayed in red. Press this button to switch to the Alarm Info page.

Privilege Login: Press the key button and enter the privilege password to login.

Privilege Log Out: The log out button on the main page can be pressed to make the handheld Teaching Pendant only have surveillance functions.

Component appearance	Function Description
(key icon)	Press this button and enter the password to login; different functions can be used according to the privilege classifications.
登出	Press this button to logout privilege and make the handheld Teaching Pendant only have surveillance functions.

Program/Number: Displays the program name and number of the opened program.

Component appearance	Function Description
專案:	Users can define program names manually or call existing program names.
編號:	Corresponding Number

Arm Operating Status: Displays the current executing process status of the arm.

Component appearance	Function Description
停止	Shows that currently the arm has no processes running.
執行	Shows that the arm is currently running a process.
中斷點	Shows that currently the arm process execution is in step mode and paused.
暫停	Shows that currently the arm process execution is paused.

Mode Display: Displays the current T1 and Auto mode.

Component appearance	Function Description
T1	• T1 Mode: Jog synthesis speed cannot exceed 250mm/s. • In this mode, the Teaching Pendant/DRAStudio can be operated but processes cannot be run with IO.
Auto	• Auto Mode • In this mode, the Teaching Pendant cannot be operated, DRAStudio can be operated, and processes can be run with IO.

TP Operation Mode: Can be set to Enable or Disable.

Component appearance	Function Description
	Disable Teaching Pendant Mode: This mode means that the Teaching Pendant cannot operate the robot, and DRAStudio can operate the robot; click this icon to switch to Enable the Teaching Pendant Mode.
	Enable Teaching Pendant Mode: This mode means that the Teaching Pendant can operate the robot, and DRAStudio cannot operate the robot; click this icon to switch to Disable the Teaching Pendant Mode.

Jog Information Bar: Displays the current user coordinate number (U0), tool coordinate number (T0), Joint Mode, Cart Mode, User Mode, or Tool Mode. Click the information bar to switch between different Jog Modes.

Component appearance	Function Description
U0 T0	Displays User Frame ID and Tool Frame. U0 means that the current User Frame ID is 0; T0 means that the current Tool Frame ID is 0.
Joint Mode	Shows that the current arm jog mode is in the Joint Mode.
Cart. Mode	Shows that the current arm jog mode is in the Cartesian Mode.
User Mode	Shows that the current arm jog mode is in the User Mode.
Tool Mode	Shows that the current arm jog mode is in the Tool Mode.
X 0.000	Current X-axis position of the arm; the unit is mm.
Y 0.000	Current Y-axis position of the arm; the unit is mm.
Z 0.000	Current Z-axis position of the arm; the unit is mm.
RZ 0.000	Current RZ-axis position of the arm; the unit is degrees.
J1	Current Joint 1 position of the arm; the unit is puu.
J2	Current Joint 2 position of the arm; the unit is puu.
J3	Current Joint 3 position of the arm; the unit is puu.
J4	Current Joint 4 position of the arm; the unit is puu.

Physical Buttons: Descriptions of each button.

Component appearance	Function Description	Executable page
RUN	Press and hold this button with the second stage of the three-stage operating button simultaneously for 2 seconds to automatically execute the currently running program; the running status will be displayed as [RUNNING icon].	Edit/RL
PAUSE RESUME	Press and hold this button with the second stage of the three-stage operation button simultaneously to pause or resume the currently running program; the running status will display as [PAUSE icon]; press it again to continue executing the running program and the running status will be displayed as [RUNNING icon].	Edit/RL
STOP	Press and hold this button with the second stage of the three-stage operating button simultaneously to stop the currently running program; the running status will be displayed as [STOP icon].	Edit/RL
+	Press and hold this button with the second stage of the three-stage operating button to move the axis in the positive direction.	All pages
−	Press and hold this button with the second stage of the three-stage operating button to move the axis in the negative direction.	All pages
↑	Pressing this button will return to the previous page.	Edit/RL, Points
↓	Pressing this button will return to the next page.	Edit/RL, Points

2. Tab Operations and Function Usage Descriptions

2.1. Main Screen (Main)

The main screen will be displayed first once the handheld Teaching Pendant is turned on, as shown in Figure 2.1. This page displays the version information of the Teaching Pendant and logout user privileges, and it can switch the handheld Teaching Pendant into surveillance mode.

Figure 2-1 Main Screen - Not Logged In

Component appearance	Function Description
Version: V1.00.01.00	Displays Teaching Pendant Version Information
登出	Press this button to logout from the user privilege and switch the handheld Teaching Pendant to the surveillance mode.

Click the login button (🔑) and enter the privilege password (Figure 2-2); the operation screen for that privilege will be displayed and the robot mode will be switched to T1 (🔵). Please refer to the Mode Select signal in the electric control guide, and then switch the Teaching Pendant operation mode to Enable (🟢), as shown in Figure 2-3. Now the various functions and operations can be performed.

Figure 2-2 Main Screen - Enter Privilege Password

Figure 2-3 Main Screen - Logged In (robot operation mode T1, TP operation mode Enable)

2.2. Robot process edit/RL

This screen can execute the add program, open program, save program, process edit, and run. The screen before a program is opened is as shown in Figure 2.4; at this time a new program must be created (2.2.1) or open an old program (2.2.2) to edit or run the robot process. The operating procedure is as follows:

Figure 2-4 Process Edit/Process - No Program Opened

Figure 2-5 Process Edit/Process - Program Opened

Component appearance	Function Description	Executable page
新增專案	Create New Program; file name must not include spaces and symbols.	Edit/RL
開啟專案	Open Created Program	Edit/RL
儲存專案	Saves Current Program; contents saved include process and regional point information.	Edit/RL
單步執行	Pressing and holding this button 單步執行 with the second stage of the three-stage operating button simultaneously will run the robot process in steps; one step of the process will be run each time it is pressed. 單步執行 or program 單步執行 can be executed after pausing; when 單步執行 is running, the running status will be	Edit/RL
編輯RL	Users can use 編輯RL to manually write or modify process instructions.	Edit/RL
執行行數 0	User executed RUN, the executing row number will display which instruction it is currently executing; step execution, the execution row number shows the next instruction about to be executed.	Edit/RL

2.2.1. New Program

The process to create a new program is as follows:

1. 新增專案 Button, Figure 2-6
2. Enter New Program Name. The file name of this example is a test; the file name must not include spaces and special symbols, Figure 2-7.
3. Click on OK to create a new program; the screen when completed is as shown in Figure 2-8. The program name and number will be displayed on top of the information bar on the screen.
4. Once the program is created, process writing and the local point teaching of this program can be executed.
5. 儲存專案, saves the current program; contents saved include process and regional point information.

Figure 2-6 Robot Process Edit/RL - New Program

Figure 2-7 Robot Process Edit/RL - Program Name Entered

Figure 2-8 Robot Process Edit/RL - Create New Program Completed

2.2.2. Opening Old Programs

The process to opening an old program is as follows:

1. 開啟專案 Button, Figure 2-9

2. Click on the program file name to open, test.

3. Opened screen, the program name and ID will be displayed on top of the information bar on the screen; projects originally saved in the program will also be called, as shown in Figure 2-10.

4. Once the program is opened, process writing can be executed.

5. 儲存專案, saves the current program; contents saved include process and regional point information.

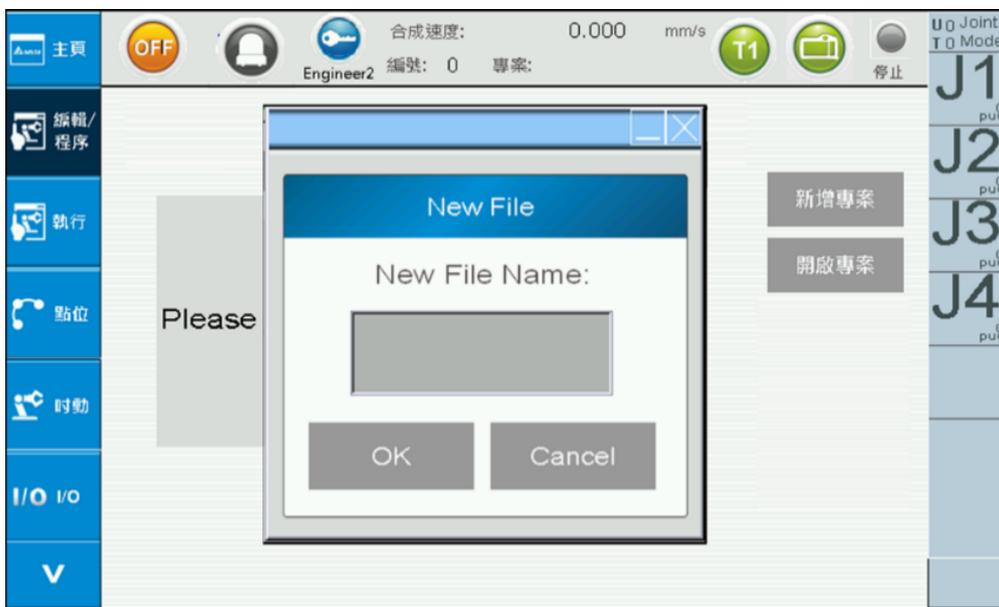**Figure 2-9 Robot Process Edit/RL - Open Program**

Figure 2-10 Robot Process Edit/RL - Program Opened

2.2.3. Edit Process

Processes can be edited once a program is created or opened; the handheld Teaching Pendant provides convenient editing buttons. Figure 2-10 is used as the example to explain the operating order:

1. Write Program in RL Editor Figure 2-11

2. There are two ways to write programs:

   Method 1: 編輯RL can be used to write programs manually; please refer to Figure 2-12 for the process,

   Method 2: Click the instruction type on top of the RL display (action, I/O, logic), Figure 2-13; steps are as follows:

   a. 邏輯 , While will appear below < or > can switch to the next page of instructions.

   b. While 插入

   c. The While instruction will be added to the instruction screen.

   d. 動作 , ServoOn , and other instructions will appear below, click < or > to switch to the next page of instructions.

   e. Press 插入 after the RobotServoOn screen appears.

   f. The RobotServoOn instruction will be added to the instruction screen.

* Remark 1: Clicking on Insert or Replace on the instruction screen will add the instructions or replace that row of instructions, as shown in Figure 2-14.

* Remark 2: If users cannot find the proper instruction, please use 編輯RL and users can enter valid instructions manually.

3. 刪除行 to delete, Figure 2-15.

4. RUN , if there is syntax error, the run status will change from running to stopped.

5. Step run allows pre-debugging row by row; if there is syntax error, the run status will change from running to stopped.

Figure 2-11 Robot Process Edit/RL - Select Input Position
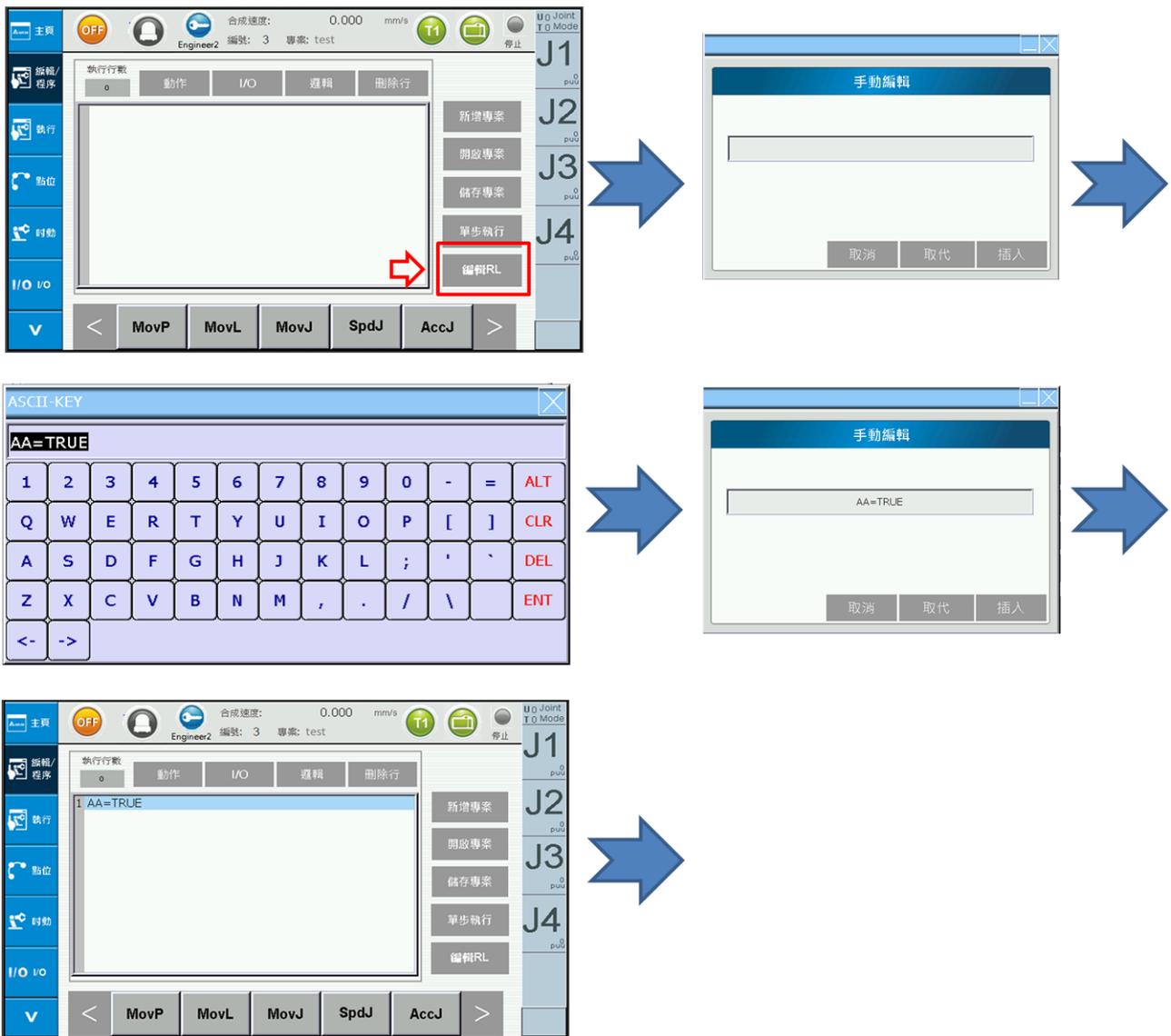
Figure 2-12 Robot Process Edit/RL - User Edit Manually
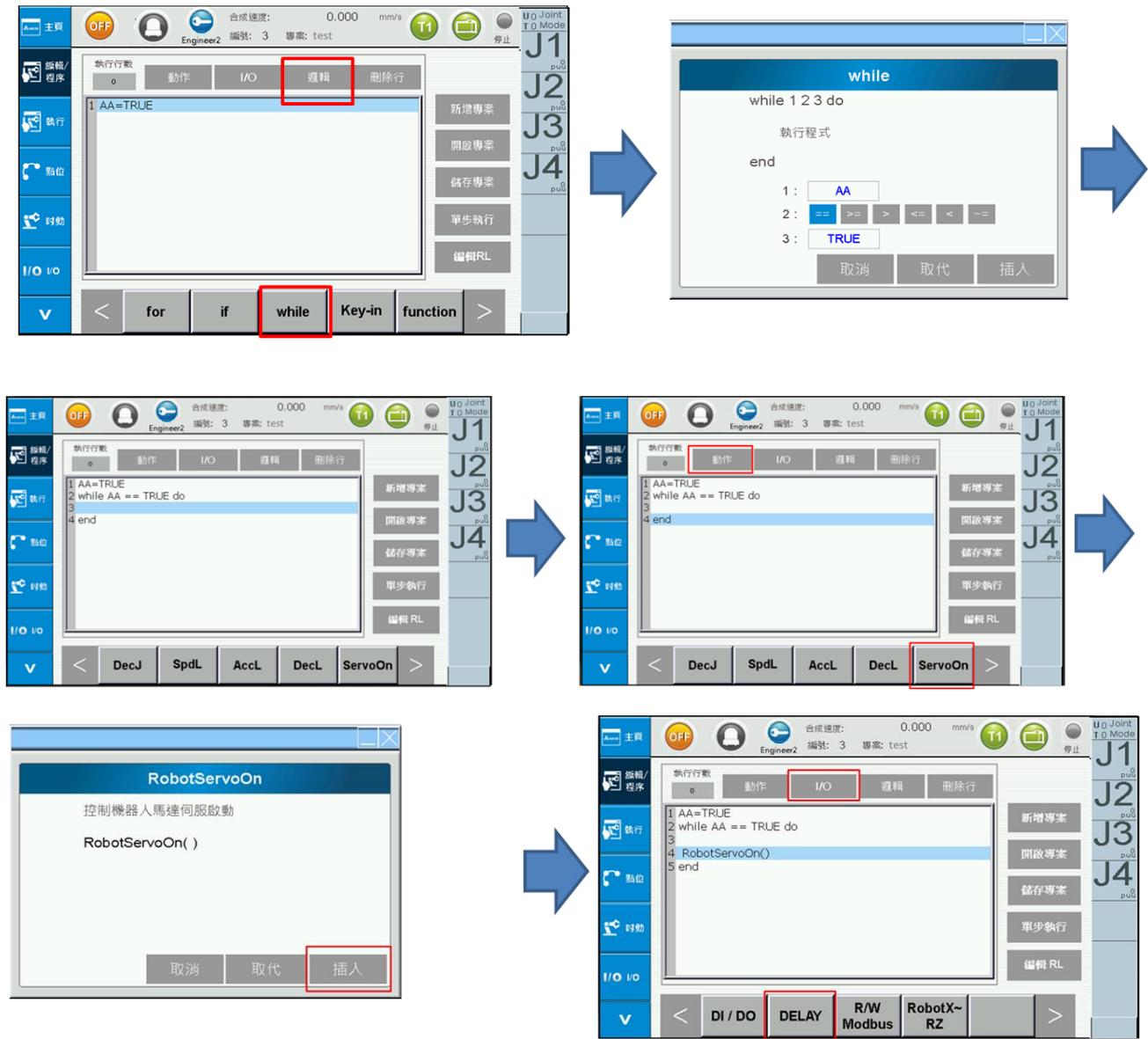
Figure 2-13 Robot Process Edit/RL - Write Program by Selecting Instructions
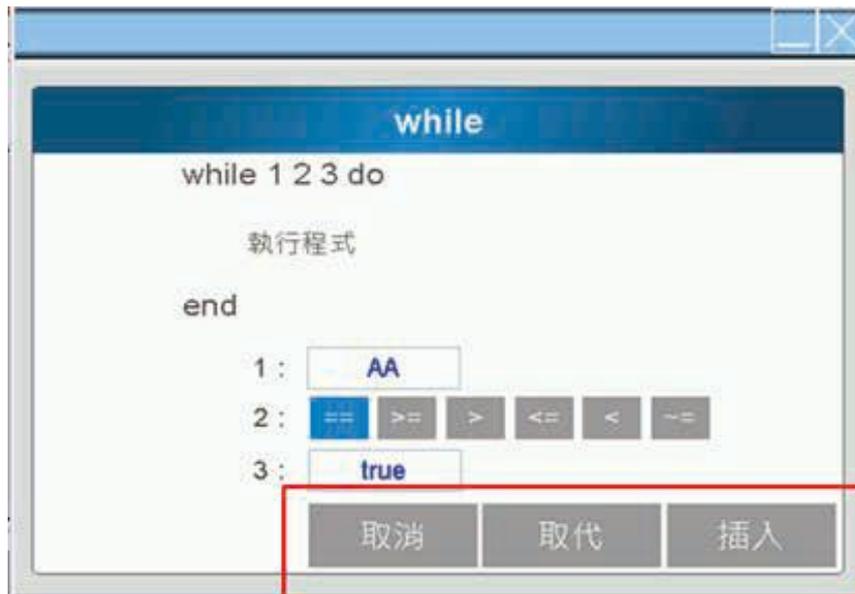
Figure 2-14 Robot Process Edit/RL - Users Can Select Cancel, Replace, or Insert

Figure 2-15 Robot Process Edit/RL - Delete Row

2.4. Execution

This page allows users not to have to reopen programs; this page will record the number of the last program run and the current process run status. Users can execute RUN, PAUSE/RESUME or STOP directly.

Figure 2-16 Robot Process Run - Run Screen

2.5. Point information

The point information page provides five functions, which are: Global point operation, local point operation, UserFrame, ToolFrame, and Work Space settings. Click on the corresponding function to switch between the corresponding operating screen, as shown in Figure 2-17. The descriptions are as follows.

Figure 2-17 Point Data

Component appearance	Function Description
全域	Global Point Screen Operating Component
區域	Local Point Screen Operating Component
使用者座標	User Coordinates Screen Operating Component
工具座標	Tool Coordinates Screen Operating Component
工作空間	Work Space Screen Operating Component

2.5.1. Global Point

Click on the pull-down menu and switch to Global Point operations and the point table will display the global point of the controller, as shown in Figure 2.18. At this time points can be taught, MovP can be used to move to the specified point (Go MovP), MovL can be used to move to the specified point (Go MovL) and Lift can be used to move to the specified point (Go Lift); instructions are as follows:

Figure 2-18 Point Information - Specify Global Point

Component appearance	Function Description
教點	1. First select the target point information, as shown in Figure 2-18. 2. Press this button to record the information on the current position of the arm to the selected point, and save it to the corresponding memory address of the controller.
Go MovP	1. First select the target point information, as shown in Figure 2-18 2. Press and hold this button with the second stage of the three-stage operation button simultaneously and the arm will move to the target position using MovP. Release the button or three-stage operations button to stop the action.
Go MovL	1. First select the target point information, as shown in Figure 2-18 2. Press and hold this button with the second stage of the three-stage operation button simultaneously and the arm will move to the target position using MovL. Release the button or three-stage operations button to stop the action
Go Lift	1. First select the target point information, as shown in Figure 2-18 2. Press and hold this button with the second stage of the three-stage operation button simultaneously and the arm will move to the target position using Lift. Release the button or three-stage operations button to stop the action
編輯點位	1. First select the target point information, as shown in Figure 2-18 2. Press this button to change this point information manually.
索引： 1	Users can input the index of the local point in index, this number must be <1000.
<	Switch the point display information; display information on X, Y, Z, and RX, as shown in Figure 2-18.
>	Switch point display information; display information on RY, RZ, Posture, Tool Frame ID (TF), and User Frame ID (UF), as shown in Figure 2-18.
⬆	Physical button, press this button and the point table will return to the previous page, as shown in Figure 2-18.
⬇	Physical button, press this button and the point table will return to the next page, as shown in Figure 2-18.

2.5.2. Local Point

Local point operations for a program can only be performed after an old program is opened or a new program is created. Take Figure 2-19 for example, the example performs operation to the local point of the file name test. Users can perform point teaching to the point table, move to specific points using Go MovP, Go MovL, or Go Lift, and save the local point information into the controller. Instructions are as follows:

Figure 2-19 Point Information - Local Point of the Test Program

Component appearance	Function Description
儲存	Press this button to save all of the local points in the current program into the controller, as shown in Figure 2-19.
教點	First click the target point information. For example, in Figure 2-19, choose 1005 as the Index for example, when users press this button, the information of the current position of the arm can be recorded to the selected point.
Go MovP	1. First select the target point information; for example, in Figure 2-19, choose 1005 as the Index for example. 2. Press and hold this button with the second stage of the three-stage operation button simultaneously and the arm will move to the target position using MovP. Release the button or three-stage operations button to stop the action.
Go MovL	1. First select the target point information; for example, in Figure 2-19, choose 1005 as the Index for example. 2. Press and hold this button with the second stage of the three-stage operation button simultaneously and the arm will move to the target position using MovL. Release the button or three-stage operations button to stop the action
Go Lift	1. First select the target point information; for example, in Figure 2-19, choose 1005 as the Index for example. 2. Press and hold this button with the second stage of the three-stage operation button simultaneously and the arm will move to the target position using Lift. Release the button or three-stage operations button to stop the action

編輯點位	1. First select the target point information; for example, in Figure 2-20, choose 1005 as the Index for example. 2. Press this button to change this point information manually.
新增點位	Press this button to add a local point entry at the last row of the local point table.
索引： 1001	Users can input the index of the local point in index, this number must be >1000.
<	Switch point display information; display information on X, Y, Z.
>	Switch point display information; display information on RX, RY, RZ, Posture, Tool Frame ID (TF), and User Frame ID (UF).
⬆	Physical button, press this button and the point table will return to the previous page.
⬇	Physical button, press this button and the point table will return to the next page.

Figure 2-20 Point Information - Users Set the Local Point Parameters Manually

2.5.3. User Coordinates Settings

The user coordinate is not a fixed coordinate; it is a coordinate defined by the user, therefore this coordinate can be defined at any position, such as on the workpiece or workbench.

The user coordinate is taught using the three point method; this is a coordinate teaching method that enters the original of the user coordinate, the X point along the positive X axis (+Xaxis), and the Y point selected from the XY plane point (+Yaxis), and uses the coordinate values of these three points on Cartesian coordinates to calculate the conversion relationship between these user coordinates and the Cartesian coordinates.

2.5.3.1.   Operation Order to Set User Coordinates

1. Enter the User Frame ID; users can set 9 sets of user coordinates (1-9); ID 0 is the system's Cartesian coordinate and cannot be changed.

2. Set User Frame as Orthogonal/Non-Orthogonal and Inclined/Non-Inclined

- Orthogonal/Non-orthogonal: Set whether the X direction and Y direction of the coordinate is orthogonal; currently only Orthogonal is available.

- Inclined/Non-inclined: Set whether the coordinate plan XY is inclined; currently only Non-inclined is available

3. Set User Coordinate Original
i.   Move the Arm to the User Coordinate Original Position
ii. Click on Original on the Screen (Figure 2-21)
iii. 教點 Record Original Position

4. Set the X point of the user coordinate along the positive X axis direction.
i.   Move the arm to the X point of the user coordinate along the X axis direction.
ii. Click on the + X axis on the screen (Figure 2-22).
iii. 教點 Record Coordinate Position of the Second Point

5. Set the point of the user coordinate along the XY plane direction.
i.   Move the arm along the XY plane of the user coordinate and select any point to define the positive Y direction.
ii. Click the XY plane on the screen (Figure 2-23).
iii. 教點 Record Coordinate Position of the Third Point

6. 設定 to save the set user coordinate data to the MS controller.

7. The order of the operations to read user coordinate settings is as follows:
i.   Enter User Frame ID
ii. Press to display the setting values for the user coordinates.

Figure 2-21 Point Information - User Coordinate Original Setting
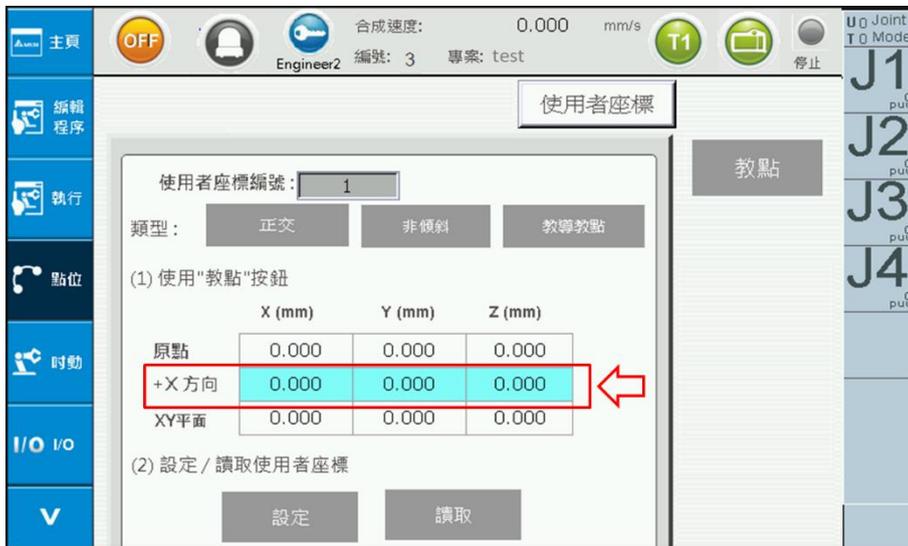

Figure 2-22 Point Information - User Coordinate +X direction Point Setting
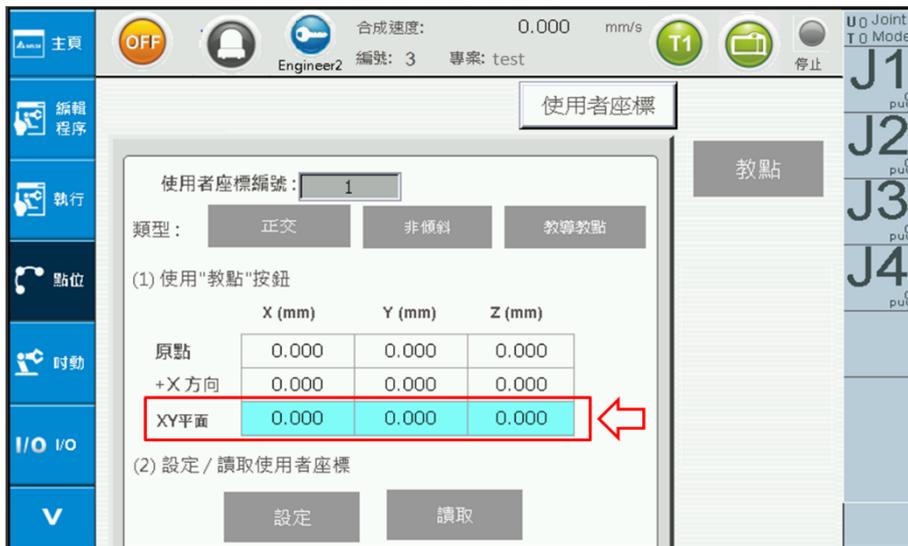

Figure 2-23 Point Information - User Coordinate XY Plane Point Setting (determine +Y direction)

2.5.3.2.　Point teaching operation order can be entered manually when setting user coordinates.

1. Enter the User Frame ID, users can set 9 sets of user coordinates (1-9).

2. Set User Frame as Orthogonal/Non-Orthogonal and Inclined/Non-Inclined

• Orthogonal/Non-orthogonal: Set whether the X direction and Y direction of the coordinate is orthogonal; currently only Orthogonal is available.

• Inclined/Non-inclined: Set whether the coordinate plan XY is inclined; currently only Non-inclined is available

3. 　輸入教點　, Figure 2-24

4. To set the original and the +X direction and XY plane of the user coordinates, manually enter the X, Y, and Z coordinate values respectively, Figure 2-25, users must beware whether the coordinate values set are within the reasonable range.

5. 　設定　, save the completed user coordinate information to the controller.

6. The order of the operations to read user coordinate settings is as follows:

i. Enter User Frame ID

ii. Press 　讀取　 to display the setting values for the user coordinates.

Figure 2-24 Point Information - Enter Teaching Point Screen

Figure 2-25 Point Information - Enter Point Information Respectively

2.5.4. Tool Coordinates Settings

This page is used to perform ToolFrame related settings (Figure 2-27), including Tool Size and Tool Orientation settings. Instructions are as Follows:

1. Enter the Tool Frame ID, users can set 9 sets of tool coordinates (1-9); the one with ID 0 is the system's earth coordinate and cannot be changed.

2. Set Tool Size

   Tool frame translation refers to defining a new end position for the robot; users can define it on their own according to different tools. The use of tool frame translation is done by entering the width/height/angle parameters of the tool to reset the end position of the robot on the frame. There are two setting methods:

A. Direct Input

Enter the tool size information in the ToolSize field: Height, Width, Angle; the representation of these three parameters are as shown in Figure 2-26. Users can enter the Height, Width, and Angle in Figure 2-27 and ▢ save this tool size information into the controller. Press ▢ to acquire the tool size information for the current ID.

B. Calibration

i. Press Figure 2-27 ▢ to switch to the calibration screen, as shown in Figure 2-28.

ii. Users can teach 3-8 points; press P1-P8 ▢ to record the current point.

iii. ▢ (Calculate) to calculate the Tool Size Width and Angle; if the error is too big, press Select ▢ to calculate the new Tool Size Width and Angle. Repeat this action until the error is within an acceptable range.

iv. Enter the Height; it must be a positive value. This height is the Z value of the calibration points (P1-P8).

v. ▢ will set the Tool Size Height, Width, and Angle; ▢ will acquire the Tool Size

information of this ID.

vi. [icon] will switch the screen to the Jog screen, switch the mode to [Tool], and set the Tool Frame ID to the ID taught by the user, Figure 2-29. Rotate the Z-axis and it can be discovered that the end point of the Teaching Tool is used for rotation, as shown in Figure 2-30.

vii. Return to the tool size Teaching screen, Figure [返回] can return to the main screen for tool setting, as shown in Figure 2-27.

3. Set Tool Orientation

Tool frame rotation refers to defining new XYZ faces for the end position for the robot; users can define it on their own according to different tools. The use of tool frame rotation is by setting calibration to reset the XYZ face of the end position of the robot.

A. Pressing [設定] in Tool Orientation will enter the Tool Orientation setting screen (Figure 2-31).

B. Set the original point of the tool orientation, the point on the X-axis direction and the point on the Y-axis direction, as defined in Figure 2-32.

i. Move the robot to the original point [教點].

ii. Move the robot to the point on the +X direction (+Xaxis) and press [教點].

iii. Move the robot to the point on the +Y direction (+Yaxis) and press [教點].

C. press [設定] to calculate the related values (Pitch, Roll, Yaw) of Tool Orientation and write the results into the controller; press [讀取] to acquire the Tool Orientation information (Pitch, Roll, Yaw) of the current ID.

D. [icon] will switch to the Jog screen; change the mode to [Tool], and set the tool coordinate ID to the ID taught by the user, as shown in Figure 2-29. During Jog operation, the moving direction of XYZ will change to the directions taught, as shown in Figure 2-32.

E. Return to the Tool Orientation screen, Figure 2-31, press [返回] to return to the Tool Frame setting main screen, as shown in Figure 2-27.
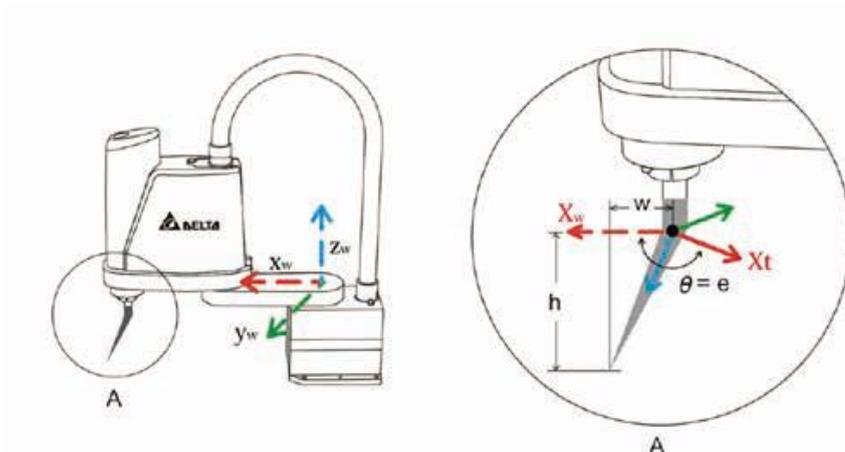

Figure 2-26 Tool Size Icon: Height, Width, Angle

Figure 2-27 Point Information - Tool Coordinate Setting

Figure 2-28 Point Information – Tool Size Calibration

Figure 2-29 Select the tool frame ID with the points taught in the jog screen.
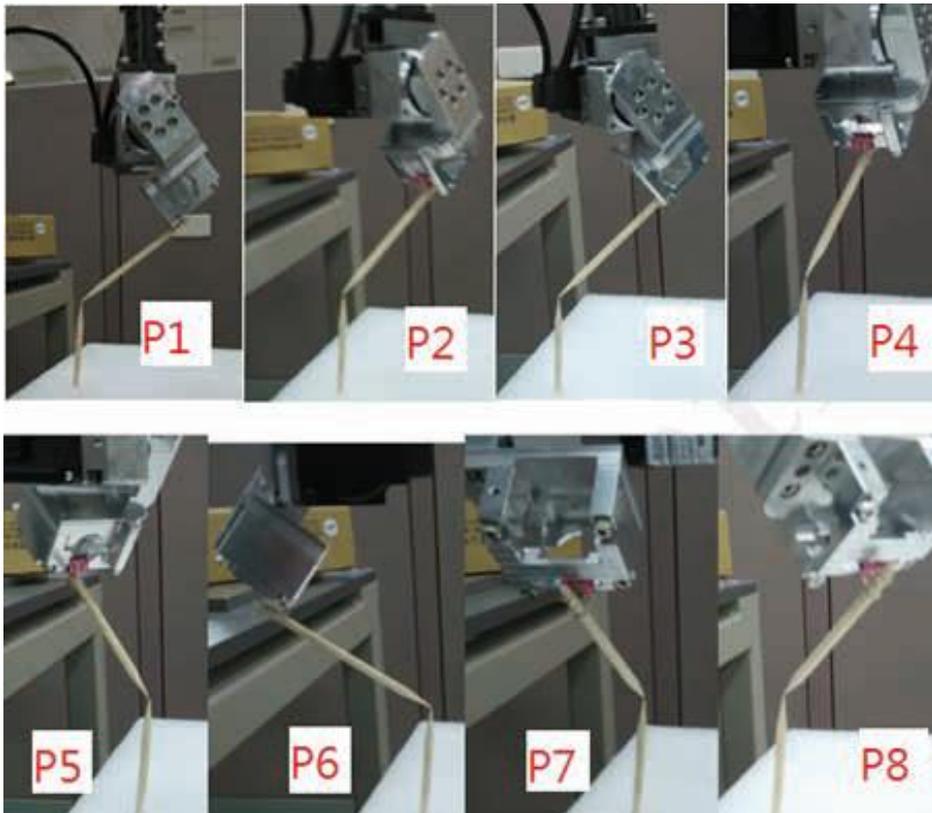

Figure 2-30 Point Information – Tool Size Calibration (Points P1-P8)

Figure 2-31 Point Information - Tool Orientation Calibration
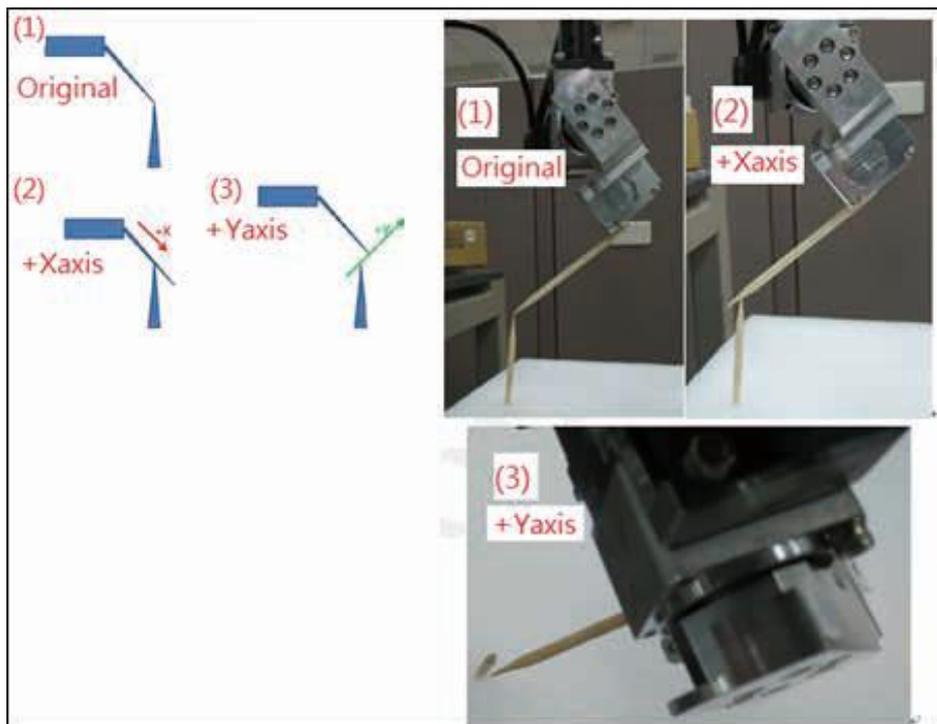

Figure 2-32 Point Information - Tool Direction Calibration Setting

2.5.5. Work Space Setting

This page can perform Work Space related settings, as shown in Figure 2-33, including the setting of the working or non-working range. The order of the operation to set the Work Space is as follows:

1. Enter the Work Space ID; 10 sets can be set (1-10).

2. Select Cylinder or Cuboid as the working range area.

3. Select whether the working area is a Restricted Area or a Working Area.

4. Enter the cylinder or cuboid range information.
A. Cylinder range calibration, as shown in Figure 2-33.
i. Move the robot position to the top center of the cylinder.
ii. Press 教點 to teach the center position.
iii. Manually enter the cylinder Radius and Column Height.
B. Rectangle range calibration, as shown in Figure 2-34.

i. Move the arm position to the P0 position and click on the P0 field on the screen, and then press 教點 to teach the position.

ii. Move the arm position to the PX position and click on the PX field on the screen, and then press 教點 to teach the position

iii Move the arm position to the PY position and click on the PY field on the screen, and then press 教點 to teach the position; the rectangle height must also be set when setting the PY point. The PY point can be higher than P0 or lower than the P0 point.

5. Click on the pull-down menu and set as Enable to enable the working range for this ID; set as Disable to disable the ID working range.

6. 設定 can set the working range for this ID; 讀取 can acquire the working range information of this ID.

7. 關閉工作空間 to enable the working range check function; once successfully enabled it will switch to 開啟工作空間.

8. 開啟工作空間 to enable the working range check function; once successfully enabled it will switch to 關閉工作空間.

9. 資訊 to check the usage status of WorkSpace ID 1-10.

After enabling the working range check function, Alarm (AL82D) will appear when the working range was exceeded under Continuous mode; to cancel the working range check function, the robot must first be moved within the working range. 重置警報 will appear when the working range is exceeded under Jog mode, and it can be used to release the alarm.
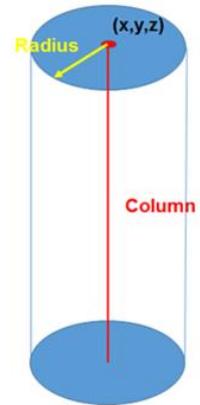
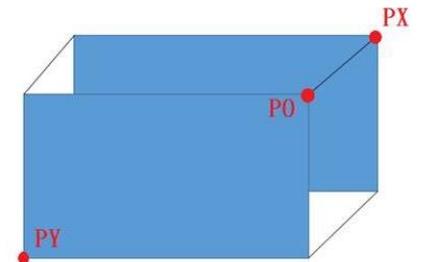**Figure 2-33 Point Information - WorkSpace Setting (Cylinder Range Calibration)**

Figure 2-34 Point Information - WorkSpace Setting (Cuboid Range Calibration)

2.6. Jog setting

Jog related settings can be performed on the Jog page, including speed, distance, mode switch, and hand wheel, as shown in Figure 2-35. Descriptions are as follows:

1. Speed Setting:
   There is Low Speed, Mid Speed, High Speed, or it can be entered directly; the unit is percentage.

2. Distance Setting: Moving distance that can be set include short, mid, long, continuous; if the mode is set as joint mode Joint, the unit is puu; for Cartesian coordinates mode Cartesian, User coordinates mode User, or Tool coordinates mode Tool, the unit is mm.

3. Mode Setting: The mode can be switched between Joint mode Joint, Cartesian mode Cartesian, User coordinates mode User, and Tool coordinates mode Tool.

To perform jog operation to the robot arm, the physical jog button (+ or −) and the second stage (Figure 1-2) of the three-stage operating button must be pressed and held down simultaneously to move the arm. Moving the arm through jog movement can be used on any page.

Figure 2-35 Jog Setting

2.7. IO Monitor (DI/O)

This page monitors the System IO; green light means ON and yellow light means OFF, as shown in Figure 2.36. Each IO will display the current IO usage status.

Figure 2-36 IO Surveillance - System IO

This page monitors the User IO; green light means ON and yellow light means OFF, as shown in Figure 2.37. Each IO will display the current IO usage status.

Figure 2-37 IO Surveillance - User IO

Remark: When the Teaching Pendent is in offline mode, settings cannot be operated on this screen; only surveillance is allowed.

2.8. System information (Info)

The information tab includes alarm messages, controller messages, robot information, and Modbus information.

2.8.1. System Alarm Information (Alarm Info)

When MS has errors, the alarm status on top of the screen will use a red icon 🔔 to notify users; users can press the red icon 🔔 directly to enter the alarm message screen (as shown in Figure 2-38), or click information ℹ️ 資訊 in the main menu to the left to enter the alarm message 📄 page to learn about the error message (Figure 2-39). After the error is eliminated, press to release the alarm, and the alarm status will change from red to gray 🔔.

Figure 2-38 System Arm Information Diagram

Figure 2-39 System Alarm Information - Alarm Information

2.8.2. Controller Information (Controller Info)

This page displays controller related version information, as shown in Figure 2-40.

Figure 2-40 Controller Information

2.8.3. Modbus Information (Modbus Info)

2.8.3.1.　　Modbus Information (Read and Write)

This page displays the Modbus information; the default is the write Modbus address information screen, Figure 2-41. Users can enter the Modbus address manually from 0x1000 to 0x1FFF; the value representation is decimal or hexadecimal, the selected value length is Word or Double Word, input value, select which data entries, and finally press write or read. An example is as shown in the figure below:

Figure 2-41 Modbus Information – Default Screen

This page displays user written Modbus address information, Figure 2-42. Users can enter the Modbus address manually from 0x1000 to 0x1FFF, the selected value length is Word or Double Word, the value representation is decimal or hexadecimal, input value, select which data entries to read, and finally press 寫入 to write the values into the controller.

Figure 2-42 Modbus Information – Users Can Write Modbus Address Information Manually

This page displays user read Modbus address information, Figure 2-43. Users can enter the Modbus address manually from 0x1000 to 0x1FFF, the selected value length is Word or Double Word, the value representation is decimal or hexadecimal, select which data entries to read, and finally press 讀取 to read the values from the controller.

Figure 2-43 Modbus Information – Users Can Read Modbus Address Information Manually

2.8.3.2. Modbus Information (Read Function Only)

This page displays user read Modbus address information, Figure 2-44. Users can enter the Modbus address manually from 0x0000 to 0x1FFF, the selected value length is Word or Double Word, the value representation is decimal or hexadecimal, select which data entries to read, and finally press 讀取 to read the values from the controller.

Figure 2-44 Modbus Information – Users Can Only Read the Modbus Address Information

2.9. System Setting (System)

This page allows original point related operations, controller IP related information display and setting, and other settings, as shown in Figure 2-45.

Figure 2-45 System Setting - Original Reset

2.9.1. Original Operation (Home)

Press 原點復歸 to switch to the original point operation screen (Home); this page allows performing of

original reset (GoHome), as shown in Figure 2-45 return to robot origin (GoHome).

1. All Axes: GoHome is performed for all axes; to execute this option, the second stage of the three-stage operating button must be pressed simultaneously. Once GoHome is completed, the button will return to its original status.

2. Individual Axes: GoHome is performed for a single axis; to execute this option, the second stage of the three-stage operating button must be pressed simultaneously. Once GoHome is completed, the button will return to its original status.

2.9.2. Controller IP

Press 控制器 IP to switch to the Controller IP (Controller) screen; the current controller IP address can be acquired and set from this page, as shown in Figure 2-46.

Steps to acquire the current controller IP are as follows:

1. Connecting a controller to the Teaching Pendant will automatically read the IP address, subnet mask, and default gateway of the current controller; the acquired IP will be displayed in the IP field, Figure 2-47.

Steps to setting the controller are as follows:

1. First Select 編輯

2. The last number of the IP field can be changed by the user manually, Figure 2-48.

3. 設定 will change the IP to 處理中..., when setting is complete, the button will change back to 設定.

4. The DRAStudio software can be used to check whether the current IP setting is correct.

Figure 2-46 System Setting - Controller IP

Figure 2-47 System Setting - Get Controller IP

Figure 2-48 System Setting - Set Controller IP

2.9.3. Other

2.9.3.1.　　Select Language

This page allows setting of the language; available languages include Traditional Chinese, Simplified Chinese, and English, Figure 2-49.

Figure 2-49 System Setting – Other

2.9.3.2.　　Joint Rotation Count Operation

The rotation range for the rotation axis of the DRS model is plus and minus one circle (which is two circles); the same position may be reached by clockwise or counterclockwise rotation. Through the number of turns displayed on the Joint Rotation Count, the position on the number of turns can be known while teaching points.
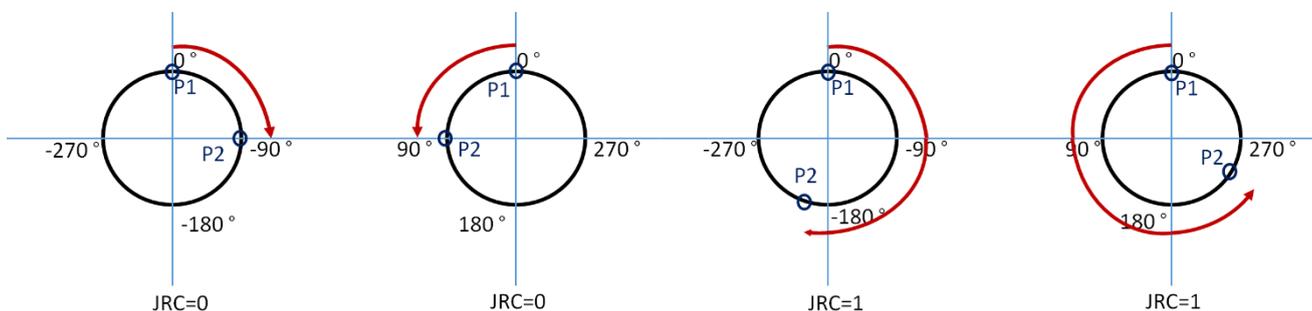

Figure 2-50 Illustration of the Number of Times the Rotation Axis Rotated

角度	-540(含) ~ -360(不含)	-360(含) ~ -180(不含)	-180(含) ~ +180(不含)	+180(含) ~ +360(不含)	+360(含) ~ +540(不含)	+540(含) ~ +720(不含)
圈數數值	2	1	0	1	2	3

Figure 2-51 The Number of Times the End Axis Rotated

Figure 2-52 Illustration of the DRS Model Rotation Axis

Users can enter 0-4 through JRC Operation to switch between different modes, as shown in Figure 2-53. The following four modes are all compared with the 0° origin position of the rotation axis. In Figure 2-54, JRC_Active will display the axis rotation operation mode for each point at that moment.
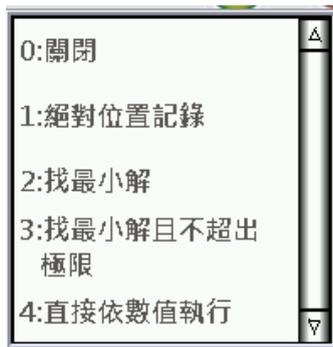

Figure 2-53 System Setting – Select Axis Rotation Operation Mode


Figure 2-54 System Setting – Select Axis Rotation Operation Mode

When 0 is entered in JRC_Active of the DRS four-axis model and **UserFrame** is used to teach points, the rotation axis uses within -180°- 180° of the origin point position to rotate to the target position, as shown in Figure 2-55. The rotation angle of each target point reached will not e**xceed -180°-180° . When 0 is entered in the DRS five-axis model, it functions the same as mode 1.**
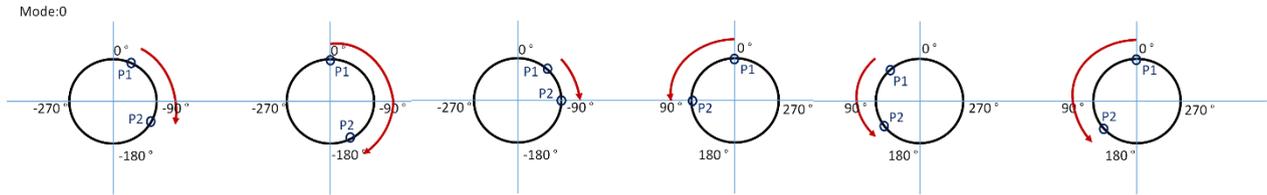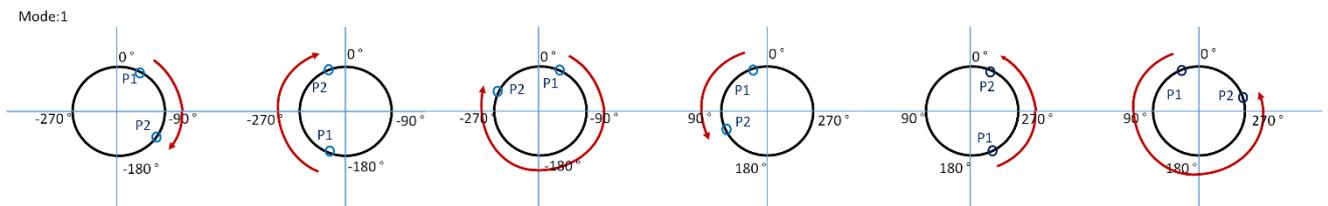

Figure 2-55 Joint Rotation Count function mode 0 uses UserFrame to teach points.

When 0 isentered to JRC_Active, if UserFrame was not used to teach points, the arm will move according to the point information entered and will not refer to the number of rotations recorded for the rotation axis, as shown in Figure 2-56. **When the five-axis model is in mode 0, it functions the same as mode 1.**
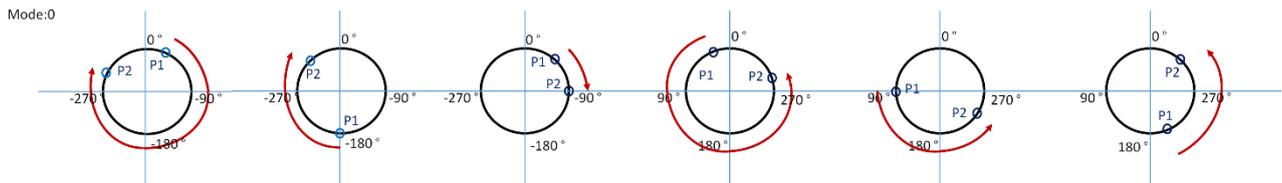
Figure 2-56 Joint Rotation Count function mode 0 does not use UserFrame to teach points

When 1 is entered in JRC_Active, the rotation axis will move to the target point according to the rotation direction preset by the user, as shown in Figure 2-5. However, the user set the rotation axis path to reach the target point, this set of moving path will be used for the next movement.

Figure 2-57 Joint Rotation Count Function Mode 1

When 2 is entered in JRC_Active, the rotation axis will rotate to the target position using the minimum distance, as shown in Figure 2-58. The current position rotates the rotation axis of the arm according to the minimum distance to the target position, but if the current position of the rotation axis is close to the limit angle, as shown where Alarm is labelled in Figure 2-58, if the rotation axis moves to the target using minimal movement on the P1 position, it will exceed the limit, and the system will display a warning message and stop the arm movement.
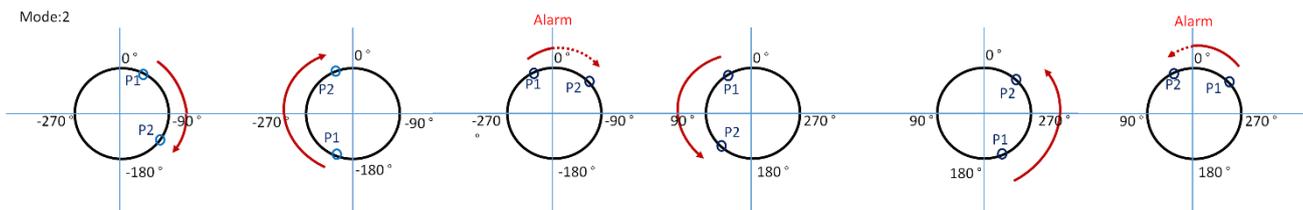

Figure 2-58 Joint Rotation Count function Mode 2

When 3 is entered in JRC_Active, the rotation axis will rotate to the target position using the minimum distance while not exceeding the limit range, as shown in Figure 2-59. From the P1 position, it will move to the target point without exceeding the limit range. If the current position of the rotation axis is close to the limit angle, it will rotate to the target position without exceeding the limit. But when using mode 3, beware whether the pipeline and mold set will cause problems while rotating.
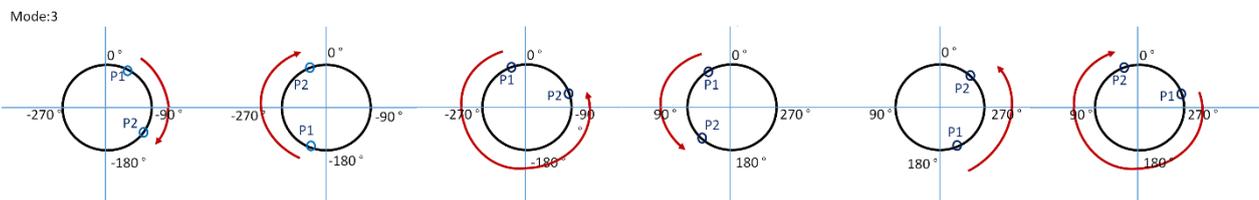

Figure 2-59 Joint Rotation Count Function Mode 3

When 4 is entered in JRC_Active, the Joint Rotation Count function will be disabled; the arm will move according to the point information entered and will not refer to the recorded number of times the rotation axis has rotated, as shown in Figure 2-60. Mode 4 only supports DRS four-axis models and DRS five-axis models.
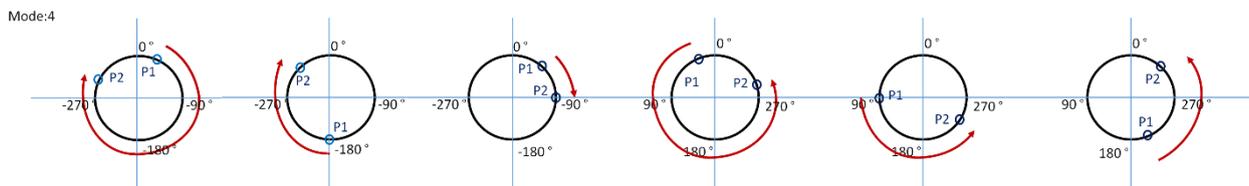

Figure 2-60 Joint Rotation Count Function Mode 4

2.10.Servo Setting

This page allows performing of servo motor On/Off, including all-axis servo On/Off and individual servo On/Off; servo On/Off displays the current status of the robot arm, as shown in Figure 2-61.

1. ServoOn/Off For All Axes

A.   Figure 2-61 伺服關閉 can execute all-axis servo On.
(ServoOn); when the action is successful, it will change to 伺服開啟, and will display as Figure 2-62.

B.   Figure 2-62 伺服開啟 can execute all-axis servo Off.
(ServoOff); when the action is successful, it will change to 伺服關閉, and will display as Figure 2-61.

Figure 2-61 Servo Setting – All-axis Servo Off

Figure 2-62 Servo Setting – All-axis Servo On

2. Individual Servo On/Off (Servo On/Off); take the J1 axis for example.

A.   Figure 2-64 第一軸 can execute first axis servo On

B.   (ServoOn); when the action is successful, it will change to 第一軸, and will display as Figure 2-63.

C.   Figure 2-63 第一軸 can execute first axis servo Off

D.   (ServoOff); when the action is successful, it will change to 第一軸, and will display as Figure 2-64.

Figure 2-63 Servo Setting – First Axis Servo On

Figure 2-64 Servo Setting – First Axis Servo Off

2.11.External Axis

When power is connected to the Teaching Pendant, it will automatically detect whether there are external axis components. If the robot has an external axis connected, the left menu will display external axis options (Figure 2-65). Information of the external axis will be displayed here (Figure 2-66).

Figure 2-65 External Axis Button

2.11.1.　　External Axis Information

Take this page for example, it shows that the external axis detected that station 1 is connected to external A2 motor, and station 2 is connected to external IO (32DI/32DO).

Figure 2-66 External Axis Information

Values (hexadecimal) returned by external devices are as follows:

0: Not Connected

1: Servo Drive A2-F Series

2: Servo Drive M-F Series

3: ASD-DMC-RM32NT (remote expansion module with 32 DO, transistor output)

4: ASD-DMC-RM64NT (remote expansion module with 64 DO, transistor output)

5: ASD-DMC-RM32PT (remote expansion module with 16 DI/16 DO, transistor output)

6: ASD-DMC-RM32MN (remote expansion module with 32 DI, NPN/PNP)

7: ASD-DMC-RM64MN (remote expansion module with 64 DI, NPN/PNP)

8: ASD-DMC-RM04PI-MODE2 (remote expansion step four-axis module PDO mode)

9: ASD-DMC-RM04PI-MODE1 (remote expansion step four-axis module SDO mode)

A: ASD-DMC-RM04AD (remote expansion module with 4 sets of analog input)

B: ASD-DMC-RM04DA (remote expansion module with 4 sets of analog output)

C: HMCRIO3232RT5 (remote expansion module with 32 DI/32 DO, relay/transistor output)

11: Servo Drive A2-F Series

2.11.2.　　Jog

External A2 motor, the operation mode can be switched to External through the Jog screen (red frame); the point information to the right will display the current information of the external axis. This page can also set the rotation distance and speed of the external motor.
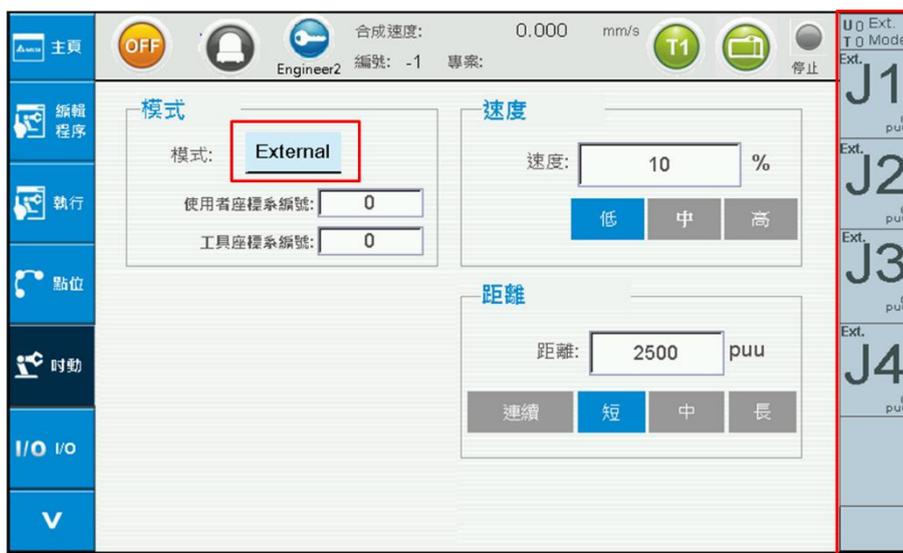

Figure 2-67 External Axis Jog

2.11.3. Servo Switch

The external axis servo switch and the servo switch of this machine (robot) are different. Therefore, in the servo tab, click the external axis servo On/Off; the first axis of the external axis for the three-axis machine and four-axis machine represents station 1; the second axis of the external axis represents station 2 and so on. The first axis of the external axis for the five-axis machine represents station 2; the second axis of the external axis represents station 3 and so on. The servo must be On in order to perform jog.

Figure 2-68 External Axis Servo Switch

Figure 2-69 External Servo Switch - External First Axis Servo On

2.11.4.   Point Teaching

To perform point teaching, jog, or Goto to the external axis, the mode must be switched to External; pressing external axis point teaching will enter the external axis information into the table. Field X represents the value for the external first axis, and Y represents the value of the external second axis and so on. The value in the table is represented using 1/1000 of the actual value; the Coor field displays Ext., and Unit field displays 1000puu; please refer to Figure 2-70 and Figure 2-71.

When performing Ext. Go, it must be switched to the external axis to run, and the three-stage operation button must also be pressed simultaneously. For example, to run the external first axis, it means switching to external axis J1.

Figure 2-70 External Axis Point - Point Table (1)

Figure 2-71 External Axis Point - Point Table (2)

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