

# **TSR2000 Series**

## **3 Axis Dispensing Robot**



# **Hardware Instruction Manual**

Congratulations on the purchase of a Techcon Systems Automated Dispensing Robot. If you have not done so, see the installation guide provided with your system for installation instructions.

Now that your dispensing system is ready to use, take a few moments to get to know the parts of your dispensing system and software. This manual is designed to help you use the robot as quickly as possible.

We, here at Techcon Systems, hope you find this product beneficial. If you have any questions, please contact us at the details listed below:

**For Sales and Support:**

Techcon Systems Corporate Headquarters,  
10800 Valley View Street, Cypress, California, 90630, USA.  
Tel: 1-714-230-2398, Fax: 1-714-828-2001  
E-mail: [oemorders@okinternational.com](mailto: OEMorders@okinternational.com)

Techcon Systems European Corporate Office,  
Eagle Close, Chandler's Ford Industrial Estate,  
Eastleigh, Hampshire, SO53 4NF, UK.  
Tel: +44 2380 489 100, Fax: +44 2380 489 109  
E-mail: [europe-orders@okinternational.com](mailto: europe-orders@okinternational.com)



Or visit [www.techconsystems.com](http://www.techconsystems.com)

This manual is designed to provide information about Techcon Systems robot hardware. Every effort has been made to make this manual as complete and accurate as possible. There is no implied or expressed warranty as to the purpose, suitability or fitness of the information. The information is provided on an as-is basis. Techcon Systems reserves the right to improve and revise its products. This manual specifies and describes the product as it existed at the time of publication. As with any new programming software, a basic understanding of the vocabulary is necessary.

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## 1. SAFETY INSTRUCTION



### Caution about the main unit

- Only use this robot with correct rated voltage and frequency (refer to the markings on the back of equipment).
- Do not move the XY moving plate and the top head, by hand. This will protect them from damage.
- During processing, do not touch the moving parts.
- Before use, check the heating controller and pressure reduction valve have been fastened reliably (if fitted).
- Keep the unit dry. Do not use or disconnect the equipment with wet hands.
- If an emergency event occurs, press the emergency switch (red) immediately. The main unit will cut off the power and stop processing the dispensing file.



### Caution about the power cord

- This machine is equipped with a 3-wire grounding plug and must be plugged into a 3-terminal grounded socket. Do not modify the plug or use an ungrounded power socket. If an extension cord is necessary, use only a 3-wire extension cord that provides grounding.
- Do not turn on the power of the machine if any parts are damaged, especially if the power cord is damaged.



### Caution about the teaching pendant

- Do not connect the teaching pendant during a profile. When disconnecting the teaching pendant, loosen and remove the fixing screws and then pull out it, once the profile has finished.
- For protecting the teaching pendant, from damage, do not drop it on the floor or shake it intensively.

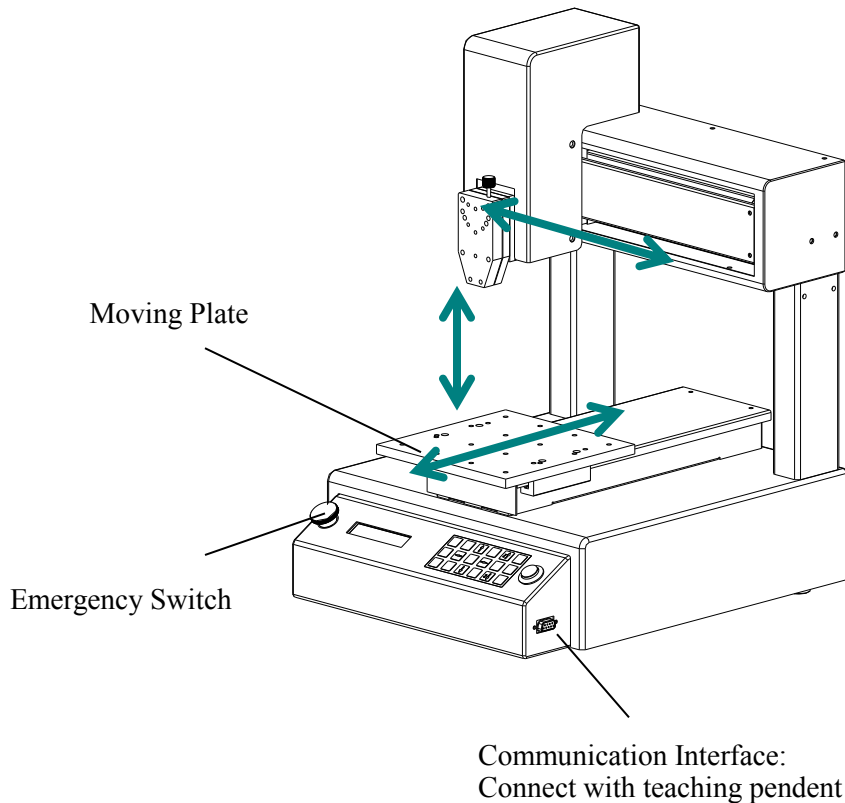


### Caution about the air supply

- Ensure the air flow is dry and clean. Select a suitable air pressure according the application. Suggested air pressure is no more than 100 psi (6.9bar).
- During use, do not over bend or over rotate the air tubes.

## 2. SUMMARY

This desktop robot is designed for the automated operation for dispensing fluid. It is a fully automatic and features a high-resolution control system with 3 axis. This unit provides the operator with easy programming instructions, increased parameters, a larger memory space and a higher speed, which highly improves productivity.



**Note:** the illustration may have some differences with each application. The dispensing equipment, such as a dispensing valve, syringe, cartridge, etc. are optional.

### 2.1 Features

- Comprehensive 3-dimensional drawing support, such as 3-dimensional linear interpolation, capabilities of teaching 3D graphics and user-defined 3D array.
- Capability to save mass files.
- User-defined array function: easy solution for mould deviation. Supports user-defined 3D array. Smoothing functions of changing speed and hi-speed trajectory whilst moving. User-definable speed parameters.
- Group function: this function allows operators to copy, delete, modify, array, and pan multi-points.
- Advanced teaching pendant that supports functions, such as array, group edit, sub-procedure, condition-call procedure etc.
- Unique merge function: easy resolution to process complex multi-layers, irregular array and non-array graphics.
- Multiple processing modes, such as single-step operation, overall processing and automatic loop processing.

## 2.2 Specifications

		Description		
Part Number		TSR2201	TSR2301	TSR2401
Power Supply		100V ~ 240V AC		
Power Consumption		80W		
Number of Controllable Axis		3 axis		
Moving Range	X axis	200mm	300mm	400mm
	Y axis	200mm	300mm	400mm
	Z axis	100mm	100mm	100mm
Speed Range	X/Y axis	0.1 ~ 600 mm/sec		
	Z axis	0.1 ~ 200 mm/sec		
Repeatability Accuracy	X/Y/Z axis	0.02mm		
Resolution	X/Y/Z axis	0.01mm		
Payload	Tool	5 Kg	7 Kg	7 Kg
	Head	4 Kg	4 Kg	4 Kg
Storage for Teaching Files		Max. 999 files & Max. 60000 bytes.		
Storage for Processing Files		Max. 255 files.		
Working Ambient	Temperature	0 ~ 40°C		
	Relative Humidity	20% ~ 90% (no condensation)		
Dimensions (W×D×H)		30.3×37.7×52.1cm	41.8×51.3×52.1cm	51.8×61.3×52.1cm

\* The specifications are subject to change without notice.

## 2.3 Unpacking and Inspection



Carefully unpack the valve and examine the items contained in the carton. These will include:

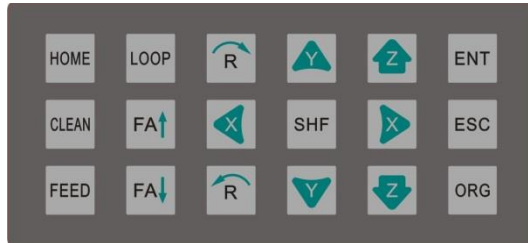
- Robot
- Teaching Pendant
- Teaching Pendant Cable
- Keybox
- Power Lead
- Hardware User Guide
- Teach Pendant User Guide
- Syringe Barrel Mounting Kit
- DB37 Connector
- TSR-VCABLE (not shown) connects robot to TS250, TS350 or TS500R

Inspect the unit for any damaged which may have occurred in transit. If such damage has occurred, notify the carrier at once. Claim for damage must be made by the consignee to the carrier, and should be reported to the manufacturer.

**2.4 Instructions about the Keypad** - the keypad, on the robot face, can be used when the teaching pendant is disconnected.



Caution: when connecting the teaching pendant with the main unit (robot), the buttons on the front panel of the unit are invalid except **START/PAUSE**, **FEED** & **ORG**. If fitting with throttling valve to control the movement of glue tube, the button **FA↑** & **FA↓** can be used.



For Further functions and detailed use of the buttons refer to the chapter 4 “off-line operation instruction”.

Button	Function Description	
X← / X→ / Y↑ / Y↓ / Z↑ / Z↓	Control the axis' coordinate	
【HOME】	Move the tip to the origin of the processing file, this can be set.	
【SHF】	Switch point processing speed, 3 level: low, middle, high	
【ENT】	Save the set parameters	
【ORG】	Reset, move the tip to the zero point (0,0,0)	
【LOOP】	Set the loop operating parameters	
【ESC】	<ol style="list-style-type: none"> <li>1. Return to file processing interface but not save the set parameters.</li> <li>2. Enter into the testing interface, test the axis's function</li> </ol>	
【FEED】	Control dispensing	
【FA↑】	N/A	N/A
【FA↓】	N/A	
	Control the R axis' coordinate	* With R axis type
【START/PAUSE】	Start or pause the processing file.	



## 2.5 Course of the File Processing

To complete a process file there needs to be three steps: **program-adjust-process**. For detailed operation refer to the “operation manual of the teaching pendant”.

**Program:** The method of teaching a program.

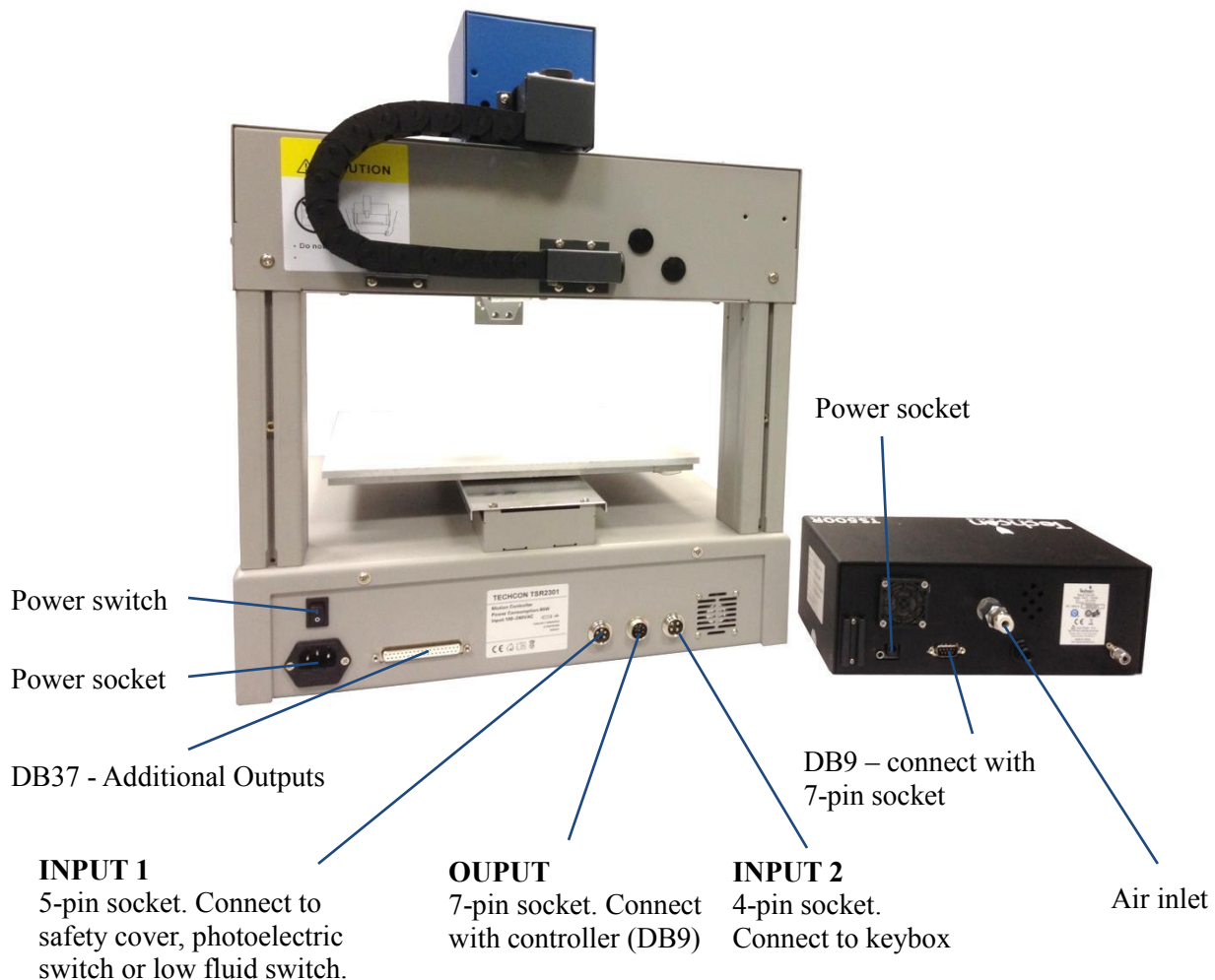
**Adjust:** Adjusting the programming file, such as origin calibration, slant array, height adjusts, file parameters adjust (including speed, acceleration, delay time, distance etc.)

**Process:** Download the program file to the system, from the teaching pendant.

The program is now complete and can be initiated.

## 3. SETUP AND CONNECTION

### 3.1 Setup



**Connecting air tubing:** directly insert the air tube into the air connector, on the back of the controller.

**Removing air tube:** press down the connector head and then pull out the air tube, from the controller.

### 3.1.1 How to Connect a (TS250 or TS350) Syringe Dispenser with Interface Cable

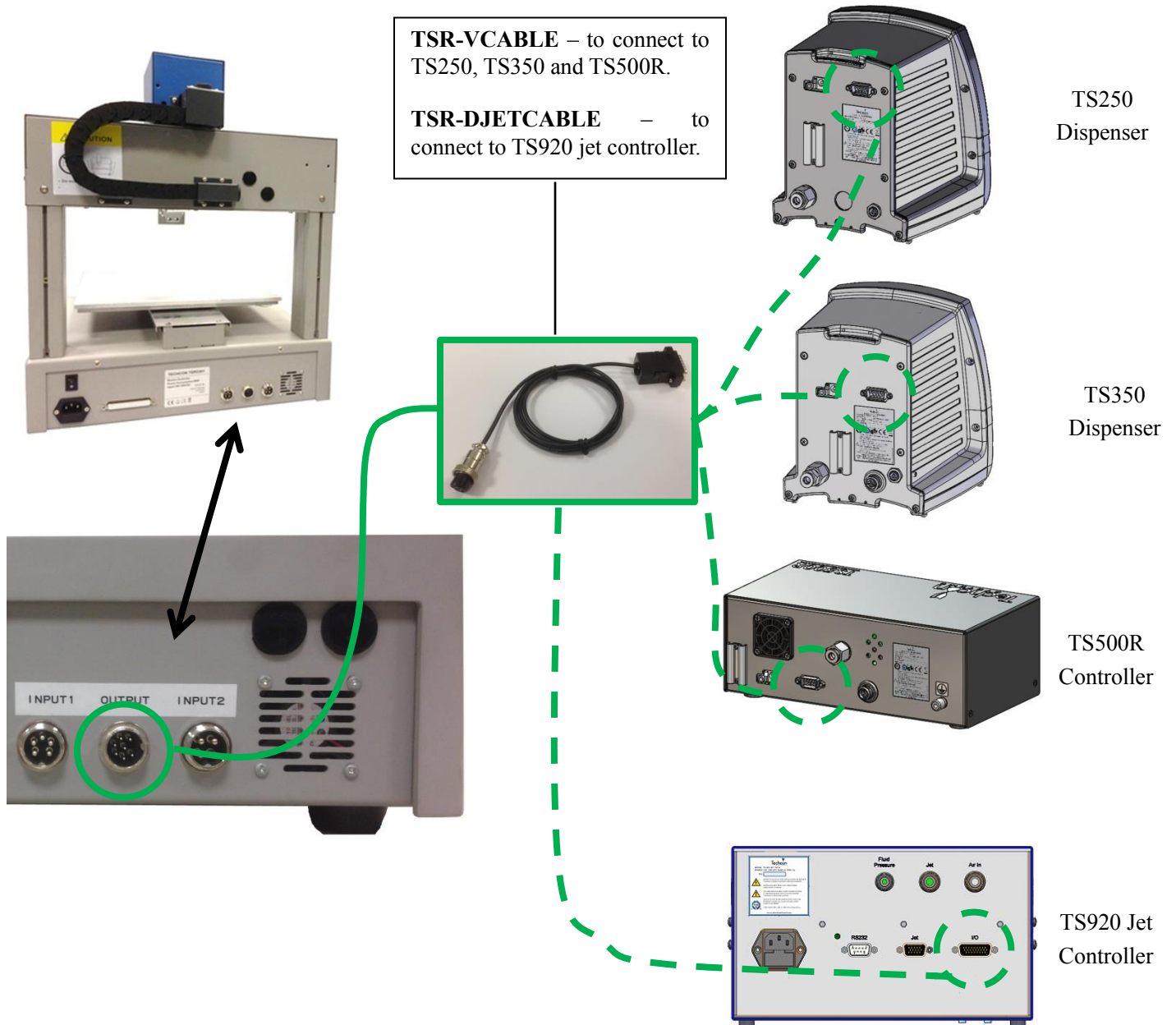
Take the supplied TSR-VCABLE and connect the round female connector to the male “OUTPUT” connector on the rear of the robot. Take the opposite end and connect the female 9 pin connector to the DB9 connector on the rear of the TS250 or TS350 Series controllers.

### 3.1.2 How to Connect a (TS500R) Valve Controller with Interface Cable

Take the supplied TSR-VCABLE and connect the round female connector to the male “OUTPUT” connector on the rear of the robot. Take the opposite end and connect the female 9 pin connector to the DB9 connector on the rear of the TS500R controller.

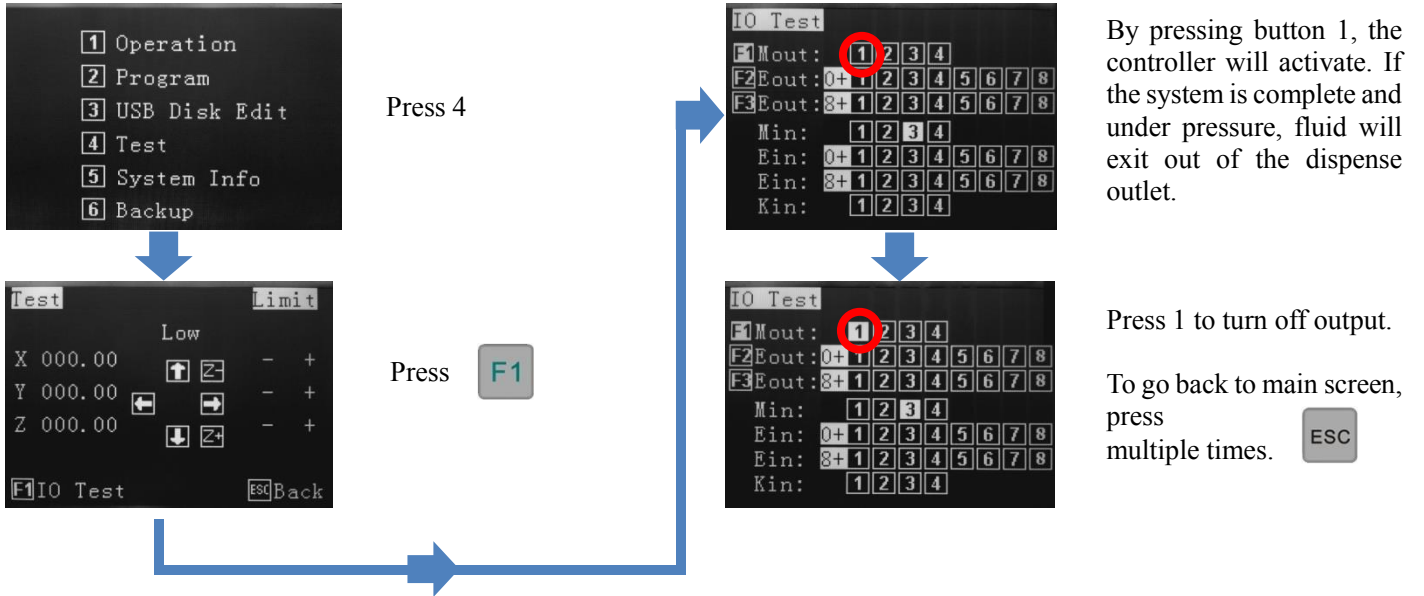
### 3.1.3 How to Connect a (TS920) Jet Valve Controller with Interface Cable

Take the optional TSR-DJETCABLE and connect the round female connector to the male “OUTPUT” connector on the rear of the robot. Take the opposite end and connect the male 26 pin connector to the rear of the TS920, jet valve controller, marked I/O.



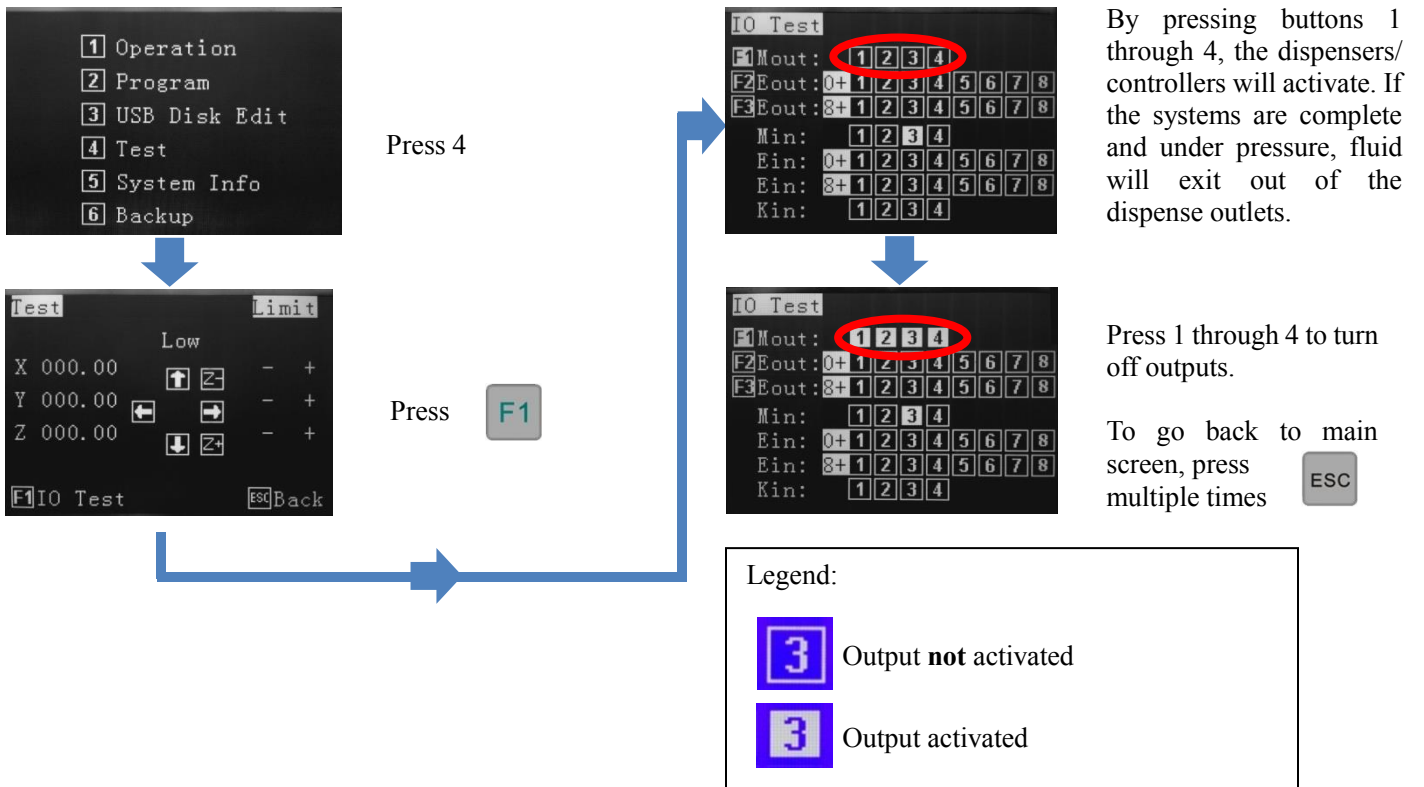
### 3.1.4 Testing the Interface Connections

#### TS250, TS350, TS500R and TS920 with TSR-VCABLE and TSR-DJETCABLE – 1 Dispense Head in Use



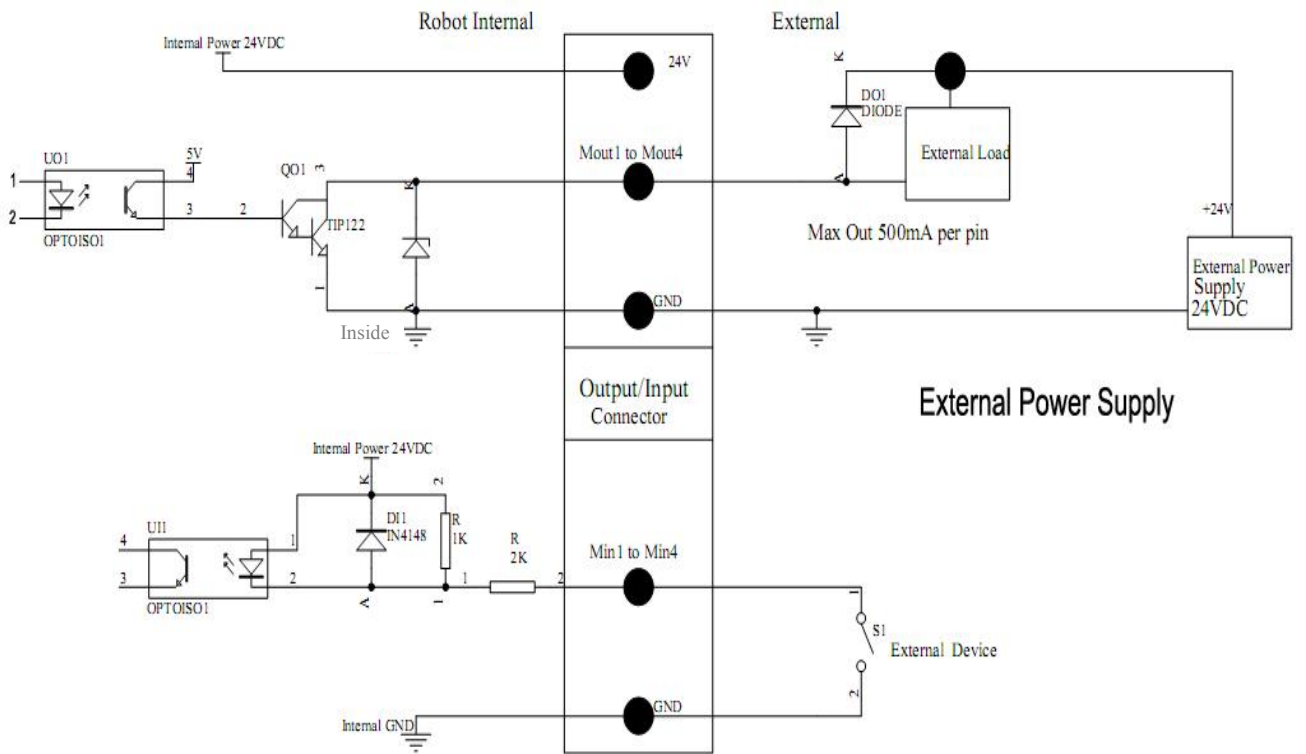
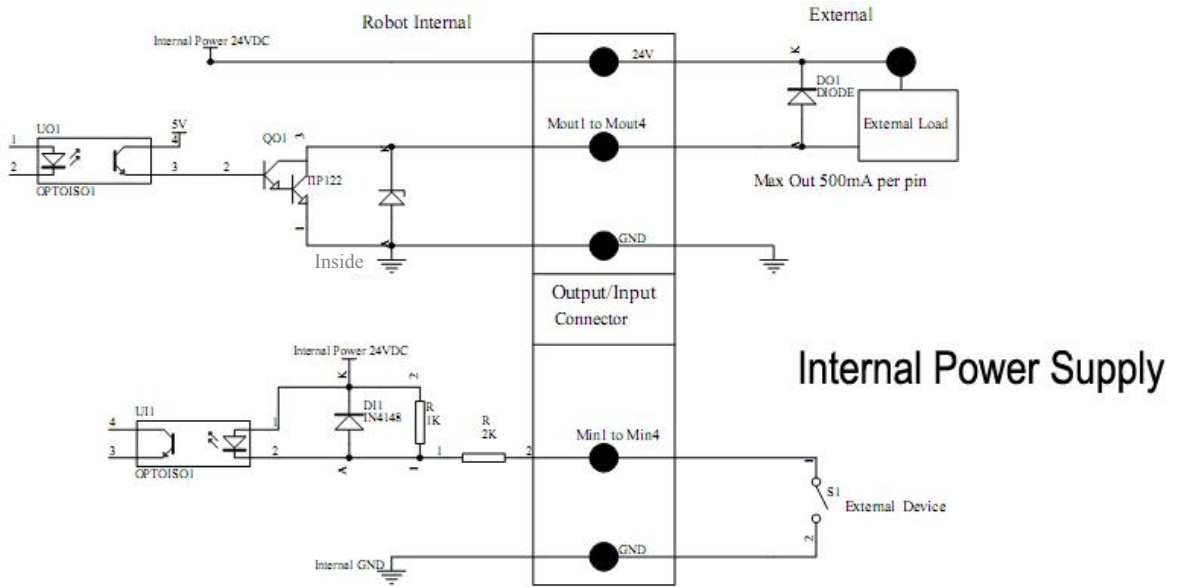
#### TS250, TS350 and TS500R with TSR-VCABLE – Multiple Dispense Heads in Use

The TSR2000 Series robot is capable of operating up to 4 dispensers/controllers during a program. An **optional** cable is made available for this function. Please contact Techcon if this specialty cable is required. Follow the instructions, below, to test the other available outputs.

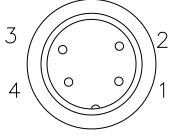


### 3.2 I/O Socket Instruction

#### 3.2.1 Circuit Diagram of I/O Socket

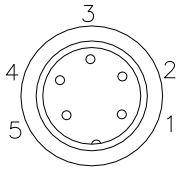


**3.2.2 Four Pin Socket “Pin Out”** - the following list describes the pin function of the four-pin socket.

Four-pin socket	Pin No.	Pin name	Instruction of pins	Application
	1	Min4	Main signal input 4	Now it's used to connect to “START/STOP” switch.
	2	GND	Ground of power supply	
	3	Min1	Main signal inputting 1	Now used to reset (ORG) signal
	4	Min2	Main signal inputting 2	Now used to connect emergency stop switch

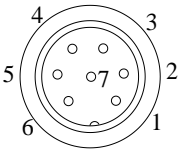
**Note:** \*If a special function is required, the input and output signal can be set again.

**3.2.3 Five Pin Socket “Pin Out”**- the following list describes the pin function of the five-pin socket. The socket can connect with a photo-electricity switch etc.

Five-pin socket	Pin No.	Pin name	Instruction of pins	Application
	1	24VDC	“+” power supply	Output signal
	2	GND	Ground of power supply	
	3	Min3	Main signal inputting 3	connect to sensor, such as photoelectric switch
	4	Ein13	External input 13	Used as alarm when lacking fluid, etc.
	5	Ein14	External input 14	Used as alarm when lacking fluid, etc.

**Note:** \*If a special function is required, the input and output signal can be set again.

**3.2.4 Seven Pin Socket “Pin Out”** - the following list describes the pins function of the seven-pin socket. By the socket, it can control the external device.

Seven-pin socket	Pin No.	Pin name	Instruction of pins	Application
	1	24V	“+” power supply	Output signal
	2	GND	Ground of power supply	
	3	Mout1	Main signal output 1, the current is less than 0.5A	Feeding signal
	4	Mout4	Main signal output 4, the current is less than 0.5A	Cylinder movement signal
	5	Min1	Reset and return to the zero position	Reset (ORG) signal
	6	Mout2	Main signal output 2, the current is less than 0.5A	Output working state signal
	7	Mout5	Main signal output 5, the current is less than 0.5A	Effective as pulse signal inputted

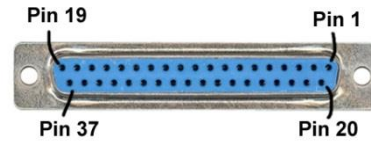
**Note:** \*If a special function is required, the input and output signal can be set again.

### 3.3 Instructions For DB37 Socket

**Note:** The DB37 socket is an optional fitting and must be ordered separately if required.

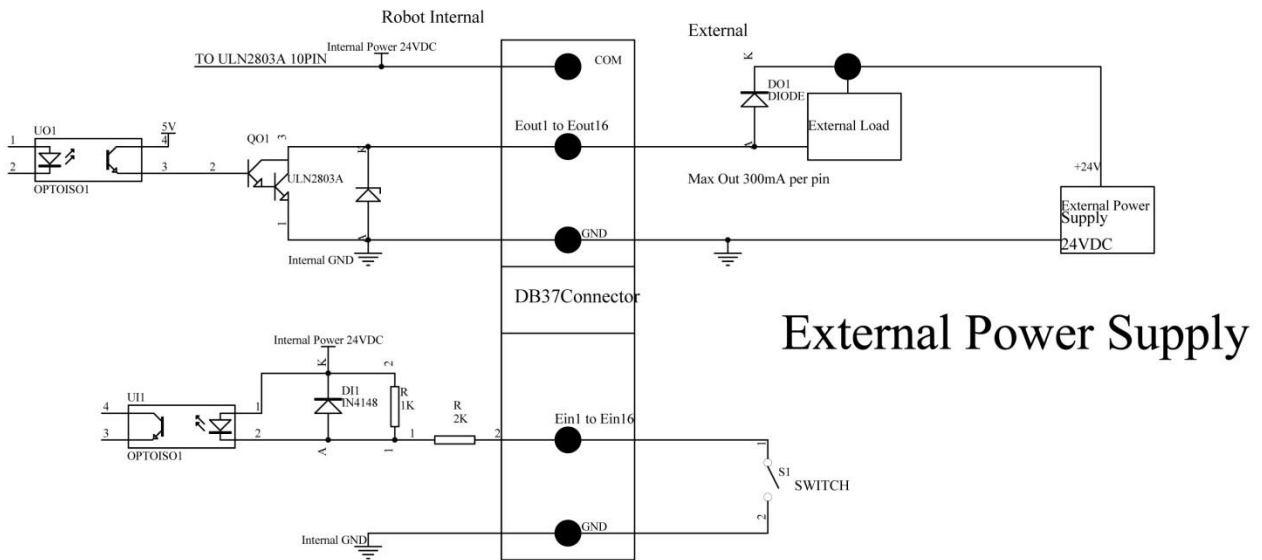
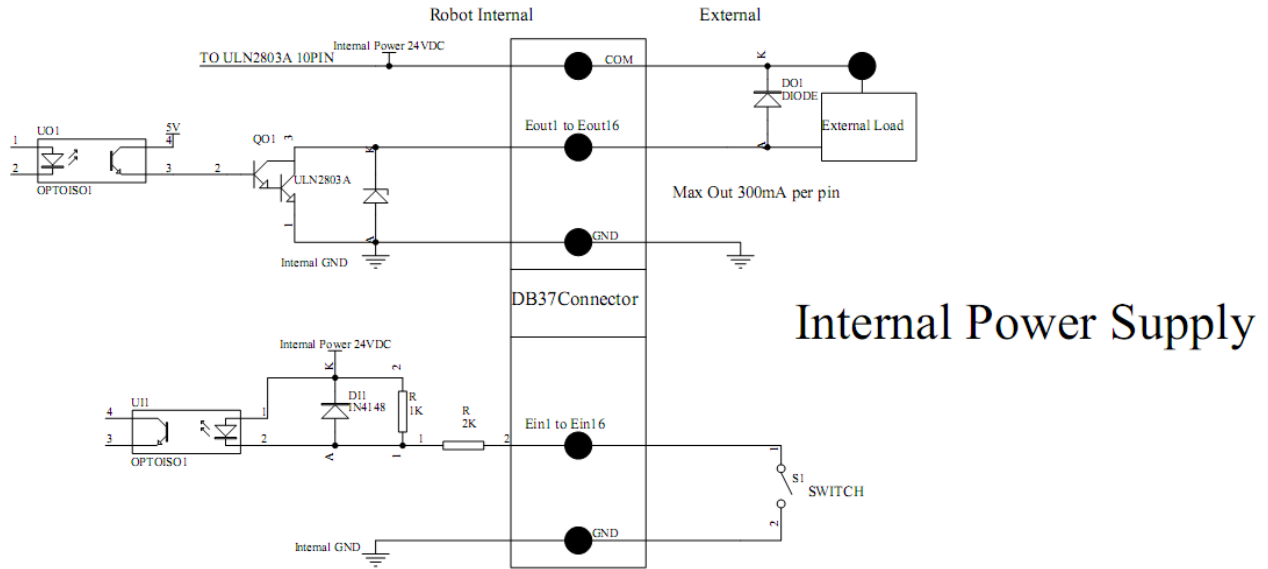
#### 3.3.1 Pin Instruction of DB37

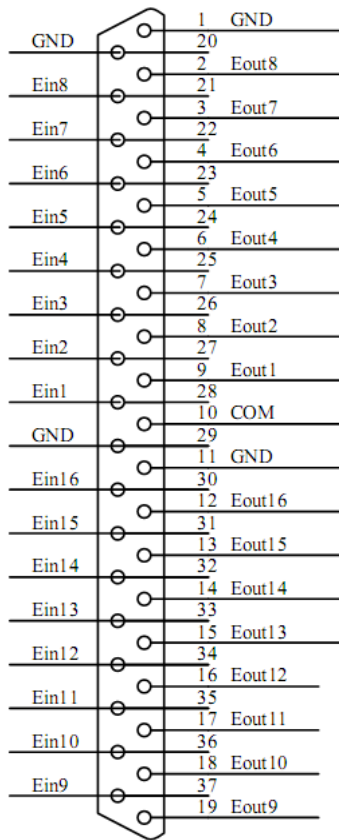
(socket of DB37)



NO.	Interface Definition DB37	Corresponding I/O pins DB37	No.	Interface Definition DB37	Corresponding I/O pins DB37
1	GND	P01	20	GND	P20
2	Eout8	P02	21	Ein8	P21
3	Eout7	P03	22	Ein7	P22
4	Eout6	P04	23	Ein6	P23
5	Eout5	P05	24	Ein5	P24
6	Eout4	P06	25	Ein4	P25
7	Eout3	P07	26	Ein3	P26
8	Eout2	P08	27	Ein2	P27
9	Eout1	P09	28	Ein1	P28
10	COM	P10	29	GND	P29
11	GND	P11	30	Ein16	P30
12	Eout16	P12	31	Ein15	P31
13	Eout15	P13	32	Ein14	P32
14	Eout14	P14	33	Ein13	P33
15	Eout13	P15	34	Ein12	P34
16	Eout12	P16	35	Ein11	P35
17	Eout11	P17	36	Ein10	P36
18	Eout10	P18	37	Ein9	P37
19	Eout9	P19			

### 3.3.2 Circuit Diagram of DB37





Plug of DB37 ( pin type)

Connection of DB37 plug

### 3.4 Instruction of Input & Output

- The following input interfaces and output interfaces are corresponding to the signal pins which are defined as “Min, Mout, Ein, Eout” at the above socket. It also corresponds to the interface at the “IO Test” display window.
- After setting, the function of IO interface can be tested at the “IO Test” display window.
- The interfaces, in the following table, can be set at the “Input Config” or “Output Config” of “System Config 2” of teaching pendant. It can define the special function for the following input & output interfaces which are corresponding to the above sockets.



### 3.4.1 IO Function Definition

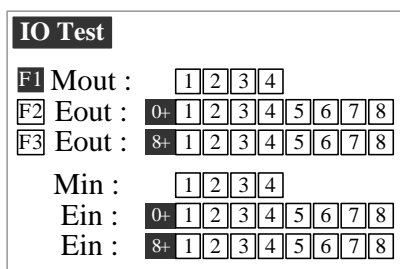
1. In the “Input Config 2” displaying window, it can set the input interface: Min1~Min4 & Ein1-8 & Ein 09~Ein16.

Input Interface	Optional Function
Min1	--, Shortcut1, Origin BTN, Test input-L, Test input-H
Min2	--, Shortcut 2, Stop BTN, Test input-L, Test input-H
Min3	--, Shortcut 3, Start BTN, Test input-L, Test input-H, Lack fault, Block fault, Temp fault, Temp\Feed fault, Upper CS, Nether CS
Min4	--, Shortcut 4, Foot BTN, Test input-L, Test input-H
Ein1~Ein8	--, Shortcut 5-259
Ein09	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Adj X-Limit, Shortcut 260, Upper CS, Nether CS
Ein10	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Adj X-Limit, Shortcut 261, Upper CS, Nether CS
Ein11	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Adj X-Limit, Shortcut 262, Upper CS, Nether CS
Ein12	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Shortcut 263, Lack fault, Block fault, Temp fault, Temp\Feed fault, Upper CS, Nether CS
Ein13	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Shortcut 264, Lack fault, Block fault, Temp fault, Temp\Feed fault, Upper CS, Nether CS
Ein14	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Shortcut 265, Lack fault, Block fault, Temp fault, Temp\Feed fault, Upper CS, Nether CS
Ein15	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Shortcut 266, Lack fault, Block fault, Temp fault, Temp\Feed fault, Upper CS, Nether CS
Ein16	--, Origin BTN, Stop BTN, Start BTN, Foot BTN, Test input-L, Test input-H, Shortcut 267, Lack fault, Block fault, Temp fault, Temp\Feed fault, Upper CS, Nether CS

2. In the “Output Config 2” display window, the input interface can be set: Mout1~Mout4, Eout09~Eout16.

Output Interface	Optional Function
Mout1~Mout4	--, Nozzle 1, Nozzle 2, Nozzle 3, Nozzle 4, Working Flag, WorkEnd Flag, Cylinder, Clean Output
Eout09~Eout16	--, Ready Flag, Alarm Flag, Working Flag, WorkEnd Flag, Cylinder, Clean Output

3. In the teaching pendant, “Eout09~Eout16” are corresponding to the “Eout8+ (0~8)” at the “IO Test” and “Output (point)” displaying window.



Mout/Eout/Min/Ein is corresponding to the “metal socket” at the back of robot. Can be test before operation.

Namely, “Eout8+ 1” is the output interface “Eou09”. “Eout8+ 2” is the output interface “Eou10”. “Eout8+ 3” is the output interface “Eou11”, etc.

### 3.4.2 IO Function Instruction

Function of Input	Function Instruction
--	N/A.
Origin BTN	Input the reset signal into the unit by corresponding signal pin, and the unit will run the reset (ORG) operation.
Stop BTN	Input the stop signal into the unit by corresponding signal pin, and the unit stops the current operation.
Start BTN	Input the start signal into the unit by corresponding signal pin, and the unit starts to work or pauses the current work.
Foot BTN	Input the foot switch signal into the unit by corresponding signal pin and the unit runs the foot switch operation and the function is similar with the “Start BTN”.
Test input-L	Input the signal “breakover ground” into the unit by corresponding signal pin and the unit comes into the testing state (cannot move and can only be programmed).

Test output-H	Input the signal “not breakover ground” into the unit by corresponding signal pin and the unit comes into the testing state (cannot move and can only be programmed).
Lack fault	Input the signal “lack fault” into the unit by corresponding signal pin and the unit comes into the process, such as stop working, alarming etc..
Block fault	Input the signal “block fault” into the unit by corresponding signal pin and the unit comes into the process, such as stop working, alarming etc..
Temp fault	Input the signal “temp fault” into the unit by corresponding signal pin and the unit comes into the process, such as stop working, alarming etc..
Temp/Feed fault	Input the signal “temp/feed fault” into the unit by corresponding signal pin and the unit comes into the process, such as stop working, alarming etc..
Upper CS	Input the signal “cylinder up sensor (in retraction state)” into the unit by corresponding signal pin and the unit judges the position of cylinder whether in retraction state.
Nether CS	Input the signal “cylinder down sensor (in reaching state)” into the unit by corresponding signal pin and the unit judges the position of cylinder whether in reaching state.
Adj X-Limit Adj Y-Limit Adj Z-Limit	It is effective only for the soldering robot and only when connecting with “9036 tip calibration device”. “Adj X-Limit” is corresponding to the “Ein09”. Input the signal by “Ein09” to calibrate the X-axis of tip. “Adj Y-Limit” is corresponding to the “Ein10”. Input the signal by “Ein10” to calibrate the Y-axis of tip. “Adj Z-Limit” is corresponding to the “Ein11”. Input the signal by “Ein11” to calibrate the Z-axis of tip. (Note: only calibrating X/Y/Z at the same time, it can calibrate the tip’s position.)
Shortcut	It is corresponding to the shortcut of processing file. The shortcut can be set in the “File Name” display window of teaching pendant. It can be used do find the required processing files quickly.
Shortcut1	Min1
Shortcut 2	Min2
Shortcut 3	Min3
Shortcut 4	Min4
Shortcut 5~259	It is corresponding to the “Ein1~Ein8”. Namely, the high & low electrical level of “Ein1~Ein8” can form 255 (1~255) kinds signal. The shortcut (5~259) is the sum of the electrical level digit add 4.

Function of Output	Function Instruction
--	Not have function.
Nozzle 1	Once the nozzle 1 comes to run the program, the output is in conducting state, or else not.
Nozzle 2	Once the nozzle 2 comes to run the program, the output is in conducting state, or else not.
Nozzle 3	Once the nozzle 3 comes to run the program, the output is in conducting state, or else not.
Nozzle 4	Once the nozzle 4 comes to run the program, the output is in conducting state, or else not.
Ready flag	When the unit comes into the normal ready state, the output is in conducting state, namely, once receiving the "START" signal, it comes to run. And it closes the output after running.
Alarm flag	When set the mode as alarming, once it detects the abnormal state, the output is in conducting state, or else not.
Working flag	When the unit comes into the working state, the output is in conducting state, or else not.
WorkEnd flag	After finishing the process, the output is keeping in conducting state 200ms, or else not.
Cylinder	Once the unit comes to run the cylinder process, the output is in conducting state, control cylinder motion, or else not.
Clean output	Once the unit comes to run the clean process, the output is in conducting state, do the clean (blowing or revolving brush), or else not.

**Note:**

- The function settings of input & output cannot be accessed by the operator. It can only be operated by the manufacturer.
- Will not give advanced information if some functions are changed.

### 3.5 Operation For First Time Use

If using the unit for the first time, the operator should test the basic functionalities.

**Step 1: Install and Test**

Before using, the operator should properly install and connect the system. The operator should test the basic functionalities of the system with the 'Test' function on the teaching pendant. Test should include if there are any problems with the axis movements towards positive or negative directions.

**Step 2: Parameters Setting**

Correctly set the global parameters and other parameters being used in the process.

Remark: Failure to properly set the parameters will cause difficulties in using the system.

**Step 3: Teaching Program**

Program a profile with teaching pendant. Refer to the instruction manual of the teaching pendant.

**Step 4: Origin Calibration & Setting the Parameters of the Teaching Pendant**

1. Origin calibration: The operator should adjust the start point when a teaching file is created for the first time.
2. Set file parameters.

**Step 5: Download & Process**

1. Download: refer to instruction manual of the teaching pendant "Teaching File Download".
2. Process: refer to instruction manual of the teaching pendant "File Processing".

## 4. OFF-LINE OPERATION INTERFACE



Caution: when connecting the teaching pendant with the main unit, the buttons on the front panel of the unit are invalid except **START/PAUSE**, **FEED** & **ORG**.

### 4.1 Off-Line Initialization

1. When the system is turned on without connecting to the teaching pendant, the LCD will enter initialization interface automatically (Refer to Fig.4-1).



Fig. 4-1: Initialization Interface

2. After 5 seconds, the initialization is complete and the system enters into the file processing interface.

### 4.2 Off- Line File Processing Interface

1. After initialization, the system will enter the “Processing Interface”. This interface is frequently used when not connected to the teaching pendant. Enter into the other settings interface through the processing interface.
2. In the circulating processing interface, the LCD will display information such as “already processed times /set processing times”.

All information showing on the LCD display are as follows:

Fig. 4-2: Processing Interface of non Loop-work

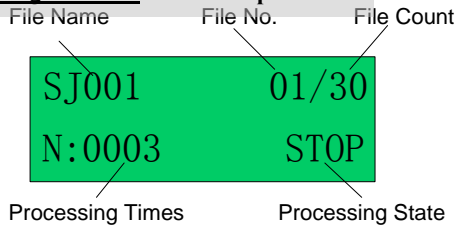
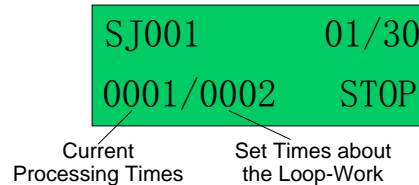


Fig. 4-3: Processing Interface of Loop-work



3. Enter the “Origin calibration Interface” by pressing the “**HOME**” button.
4. Enter the “Testing Interface” by pressing the “**ESC**” button.
5. Enter the “Loop-work Processing Work” by pressing the “**LOOP**” button.
6. In any sub-menu, return to the “File Processing Interface” by pressing the “**ESC**” button, but the set parameters will not be saved.
7. In any submenu, press the “**ENT**” button to save the set parameters and then return to the “Processing Interface”.

#### 4.2.1 Select Processing File

1. Select the processing file with the six directional buttons.
2. “**←** \ **↑** \ **Z↑**” buttons can be used to select previous file, and “**→** \ **↓** \ **Z↓**” buttons can be used to select the next file.

### 4.2.2 File Process

Press the “**START/PAUSE**” button to begin processing the selected file.  
 This button also can used to pause a file processing and then continue a file processing.

### 4.2.3 Stop the File Processing

Press “**START/PAUSE**” button or Emergency Switch to pause the processing file. **START/PAUSE**: only pauses file processing, and the file state changes from “WORK” to “PAUSE”. If pressed again, the system will continue the paused processing file and the file state changes to “WORK”.

**Emergency Switch:** Stops file processing and cuts off the power supply of the driver, the LCD displays “**EMERGENCY STOP PLEASE RESET**”. Turn the emergency switch clockwise to reset.  
 Press the “**ORG**” button to make the tip return to the zero point. After that, the emergency switch can be run again.

### 4.2.4 File Processing Count And State

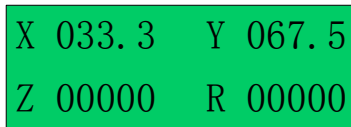
1. At the lower left corner of processing interface the processing times are displayed. Press “**SHF**” button to clear the digit to 0.
2. At the lower right corner of processing interface, the file processing state is displayed. The processing state is changing with the processing course. The file processing state shown in the table below:

**Table 4-1: File Processing State**

Work State	Remark
RESET	The system is resetting.
STOP	The process has been stopped.
WORK	Processing.
PAUSE	The process has been paused.
WAIT	Waiting time for hanging a work-piece during the loop-work process.

### 4.3 Off- Line Origin Calibration Interface

1. During the file processing, the deviation can be calibrated between the processing file and the real route by the origin calibration.
2. At the file processing interface, press “**ORG**” button to go to the origin calibration interface.



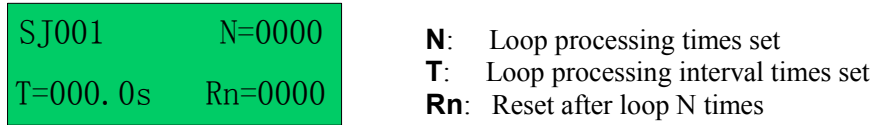
**Fig. 4-4: Origin Calibration Interface**

X/Y/Z/R displays the tips current position. “MID” means the current processing speed is in the middle.

3. **Orientation:** the nozzle will move to the origin automatically when coming into the origin calibration interface.
4. **Adjusting the tips position:** After orientation, press the arrow buttons “**←** / **→** / **↑** / **↓** / **Z↑** / **Z↓** / **R** / **R**” to adjust the tips position.
5. **Adjust the point’s speed:** click the “**SHF**” button to change the point speed, MID-LOW-HI.
6. **Calibration:** after calibration, press “**ENT**” button to save the origin change and return to the file processing interface. If press “**ESC**” button, it will not save the calibration result, and directly return file processing interface.

#### 4.4 Off- Line Loop-Work Parameter Setting Interface

1. In the loop-work parameters setting, the unit can start the process without an operator at the location.
2. Press the “**LOOP**” button at the processing interface and then enter into the “loop-work parameter setting interface”.

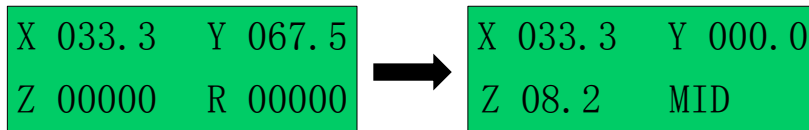


**Fig.4-5: Loop-work Parameter Setting Interface**

3. When setting, select the digit by moving the cursor under the digit. The arrow buttons “**←**” & “**→**” can move the cursor left and right and the arrow buttons “**↑**” & “**↓**” can move the cursor up and down.
4. After completing adjust, press the “**ENT**” button to save the parameters and return to the file processing interface. When the “N=0000” or “N=0001” is displayed, without loop work processing and the file only processes one time.

#### 4.5 Off-Line Testing Interface

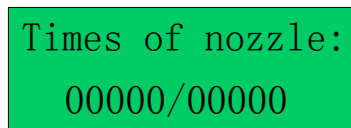
Press the **ESC** button to enter into the the testing interface. In the testing interface, common system functions can be tested if they are running correctly or not. The operating interface is as follows:



**Fig. 4-6: Testing Interface**

#### 4.6 Times of Nozzle Interface

At the testing interface, click the **ESC** button again and click the **ESC** button twice at the “Processing Interface”, it comes into the “times of nozzle” interface (Fig.4-7). At “times of nozzle” interface, displays the times of nozzle has been used and maximal limit times. The interface only can be viewed and cannot be set. Setting methods need refer “teaching pendant”. “\*\*\*\*\*/\*\*\*\*\*”: The front digits mean the used times, the latter digits mean the maximal limit times. When used times have reached the maximal limit times, the system will alarm and advise to change the nozzle. If the latter digit is “00000”, this means that it does not limit the using times of nozzle.

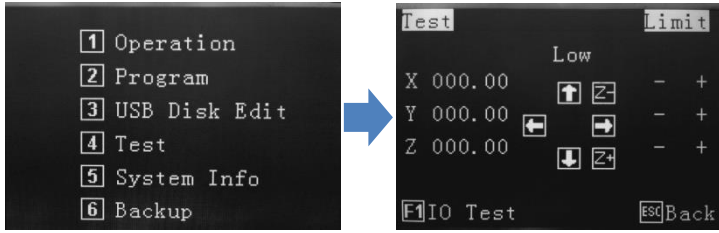


**Fig. 4-7 Times of Nozzle Interface**





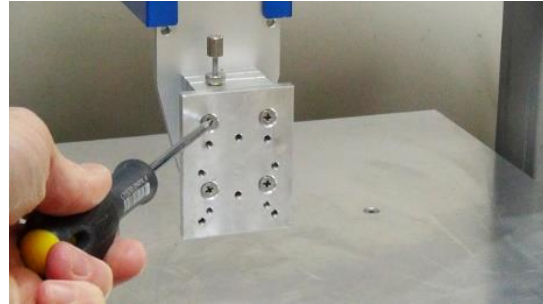
### 5.3 Syringe Mounting Bracket – Attachment



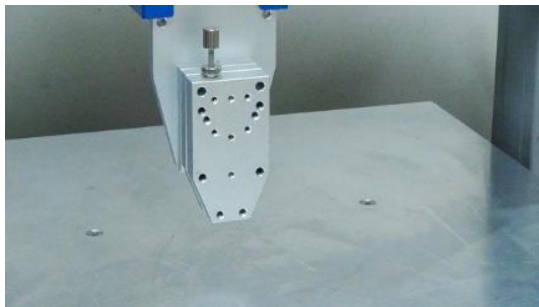
From the main screen, on the teaching pendant, press 4. Use the jog keys to move the head into a central position and lower head until there is sufficient access to the rear of the bracket. Use **SHF** button to change movement speed. Follow instructions below.



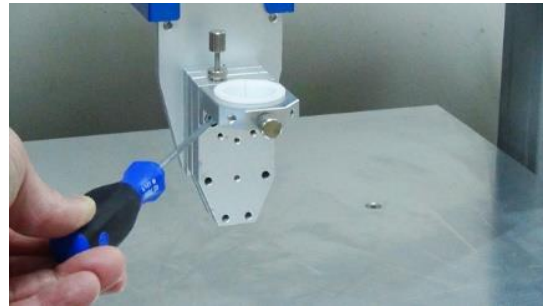
1. Move and lower head using teaching pendant.



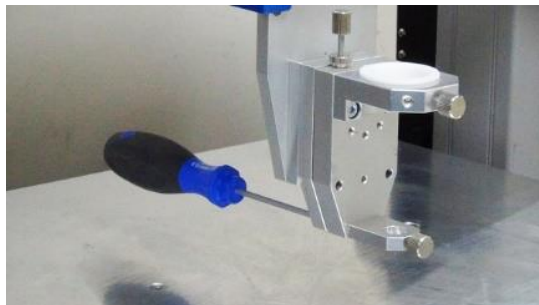
2. Remove mounting plate.



3. Secondary plate should be exposed



4. Attach attach top bracket.



5. Attach bottom bracket from behind.



6. Install syringe and lightly tighten thumb screws.

## 6. TROUBLE SHOOTING

1. The System cannot Reset after Booting.

### Emergency switch error

- Check the Emergency switch is not pressed, by mistake.
2. Z axis or X and Y axis cannot be Positioned Accurately in Processing

#### 1) Loss of steps will cause inaccurate positioning phenomenon.

Overload, excessive speed or acceleration, insufficient power supply, or mismatched motor drive would lead to the loss of steps. Please check the overload and the parameters settings. If the inaccurate positioning phenomenon disappears or remits after reducing the speed or acceleration, we can make sure the phenomenon is caused by the motor loss of steps. If inaccurate positioning phenomenon is very obvious for one axis, reduce the acceleration of the axis.

#### 2) Operation Error will cause inaccurate positioning phenomenon.

Do not reset when the work done

Make the system reset automatically after each accumulated processing error has been eliminated,)

## 7. WARRANTY

Manufacturer warrants this product to the original purchaser for a period of one (1) year from date of purchase to be free from defects in material and workmanship, but not against damages by misuse, negligence, accident, faulty installations and instructions. Manufacturer will repair or replace (at factory's option), free of charge, any component of the equipment thus found to be defective, on return of the component, "PREPAID" to the factory during the warranty period. In no event shall any liability or obligation of the Manufacturer arising from this warranty exceed the purchase price of the equipment. This warranty is only valid if the defective product is returned as a complete assembly without physical damage. The Manufacturer's liability, as stated herein, cannot be altered or enlarged except by a written statement signed by an officer of the company. In no event shall the Manufacturer be liable for consequential or incidental damages. A return authorization is required from Techcon Systems prior to shipping a defective unit to the factory.

Manufacturer reserves the right to make engineering product modifications without notice.

All returns must be issued with a Returns Authorization number, prior to return. Send warranty returns to:



Techcon Systems Corporate Headquarters,  
10800 Valley View Street, Cypress, 90630, USA.  
Tel: 1-714-230-2398, Fax: 1-714-828-2001  
E-mail: [OEMorders@okinternational.com](mailto: OEMorders@okinternational.com)

Techcon Systems European Corporate Office,  
Eagle Close, Chandler's Ford Industrial Estate,  
Eastleigh, Hampshire, SO53 4NF, UK.  
Tel: +44 2380 489 100, Fax: +44 2380 489 109  
E-mail: [europe-orders@okinternational.com](mailto: europe-orders@okinternational.com)

## *Manufacturer's Declaration of Incorporation*

Directive: Machinery Directive 2006/42/EC

Manufacturer: Dover (Shenzhen) Industrial Equipment Manufacturing Co., Ltd  
 4 Floor West, 1 Building, Tingwei Industrial Park,  
 6 Liufang Road, Boa'an District,  
 Shenzhen, China

Manufacturer Contact: OK International Ltd.  
 Ian Jennings  
 Chandlers Ford, Hampshire Tel: +44 (0) 23 8048 9000  
 England SO53 4NF Fax: +44 (0) 23 8048 9109

Declares that the product(s): Industrial Robot/Bench-top Robot

Model Numbers: TSR2201, TSR2301, TSR2401

Option Kit Model Numbers:

TSR2200-SC  
 TSR2300-SC  
 TSR2400-SC

Is intended to be incorporated into machinery or to be assembled with other machinery to constitute machinery covered by Directive 2006/42/EC.

And that the following harmonized standards and specifications have been used:

EN ISO 10218-1:2011  
 EN ISO 12100:2010  
 EN 60204-1/A1:2009

And furthermore declares that the product(s) covered by this Declaration must not be put into service until the machinery into which it is to be incorporated or of which it is a component has been found and declared to be in conformity with the provisions of directive 2006/42/EC.

Signature: Jimmy Guo  
 Jimmy Guo  
 Quality Engineer

Date: May 23<sup>rd</sup>, 2014

***Manufacturer's Declaration of Conformity***

Directive: EMC Directive 2004/108/EC

This is to certify that models: TSR2201, TSR2301, TSR2401

Equipment Description: Industrial Robot/Bench-top Robot.

Supply Voltage: 100-240V AC, 50/60Hz.

Manufacturer Contact: OK International Ltd.

Ian Jennings

Chandlers Ford, Hampshire Tel: +44 (0) 23 8048 9000

England SO53 4NF Fax: +44 (0) 23 8048 9109

Effective Date: May, 23<sup>rd</sup>, 2014Conforms to protection requirements of Council Directive 2004/108/EC, relating to  
Electromagnetic Compatibility by the application of the following EMC Standards:

EN61000-6-2:2005

EN61000-6-4:A1/2011

I, the undersigned, hereby declare that the equipment specified above conforms to the above  
Directive (s) and Standard (s).Signature: Jimmy Guo

Jimmy Guo

Quality Engineer

Date: May 23<sup>rd</sup>, 2014