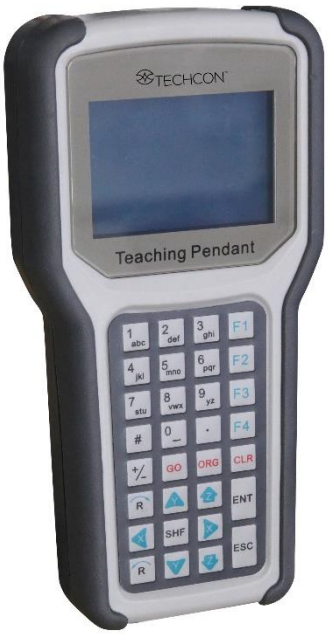
TSR2000 Series
3 Axis Dispensing Robot



Teaching Pendant User Guide

7000-5082_B

Version 1.1

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1. INTRODUCTION

Congratulations on the purchase of a Techcon Automated Dispensing Robot.

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.

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

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This manual is designed to provide information about the Techcon robot software. 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 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.

2. FUNCTIONS OF THE KEYPAD

Button	Name	Description
F1, F2, F3, F4	Function Buttons	F1 – create new file, insert drawing, start/pause a process. F2 – Edit file or stop a process or group offset. F3 – Data check and file copy. F4 – Array, parameter setting and change file name.
X, Y, Z, R	Navigation Buttons	Control jog movements of X, Y, Z and R (4th) axis
0 – 9, A – Z	Alphanumeric Buttons	To create file names and set parameters.
.	Decimal Point Button	To input decimal point.
SHF	Switch Button	Change jog speed (low, med, high), or change parameters
+/-	Front Insert Button	To insert a new point or figure at the front of a selected point.
#	Group Button	Used in group edit and parameter settings.
GO	Go Button	When displayed, press to move valve to position.
ORG	Reset Button	Return to zero position (0, 0, 0)
CLR	Delete Button	Delete a file or part of a file.
ESC	Escape Button	Cancel an operation and/or exit from current interface.
ENT	Enter Button	Download or process the current file, or save an edited file, etc.

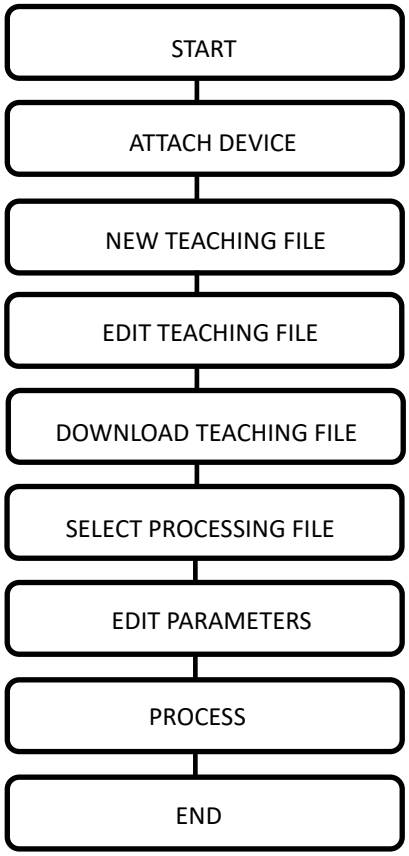
3 . CLASSIFICATION OF A POINT

The programming has many types of point. Graphic points include point, line origin, etc. Non-graphic points include delay point, clean point, etc and can refer to the following table. When inserting a “point” the operator must select to insert the point at the front or back of the selected point.

No.	Point	Type	Instruction
1	Point	Graphic	The speed between points is the “jog move speed”. Can set the lift height and delay time.
2	Line	Graphic	Includes Line start, Line middle and Line end points
3	Delay (Time)	Non-Graphic	Delay point is used to set delay time in the range of 0 – 65532ms.
4	Ref PT	Graphic	Ref PT point is a moving assistant point and is only used to move to another position and is also valid during simulated step.
5	Pause	Non-Graphic	When setting a pause point the robot will pause automatically until a start signal is sent.
6	Purge	Non-Graphic	Set the Purge point location and parameters.
7	Subroutine	Non-Graphic	Subroutine is a teaching file and can be inserted into another teaching file but cannot be edited again.
8	Output	Non-Graphic	For setting an input/output by inserting an output point.
9	Origin	Graphic	Reference point 0, 0 , 0

In the teaching pendant, the teaching file exists as points. A line is a special graphic point and has at least two points: Line-Start and Line-End. In this way it is made of segment lines. When processed it is a continual line.

4 . DISPENSING PROCESS



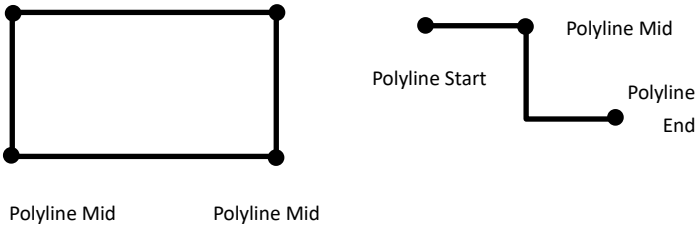
5. EXAMPLES OF TYPICAL DISPENSING PATTERNS

Dot

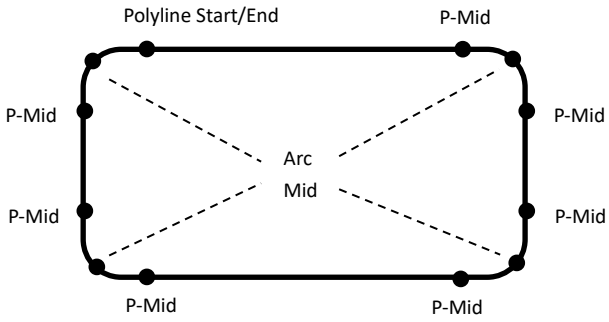
Increasing feed on time

Line

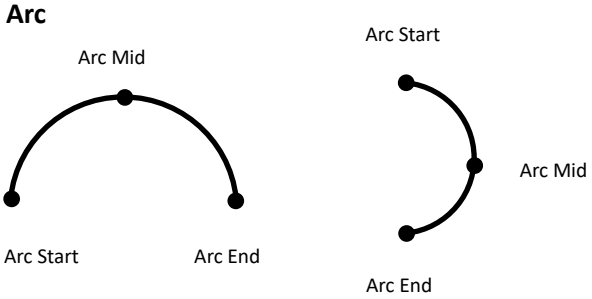
Polyline



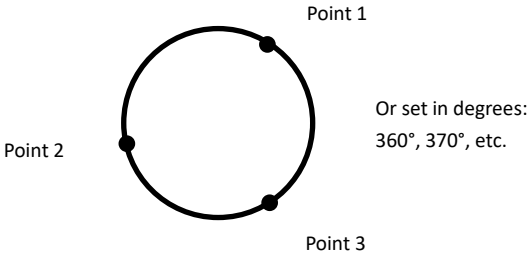
Polyline with round edges



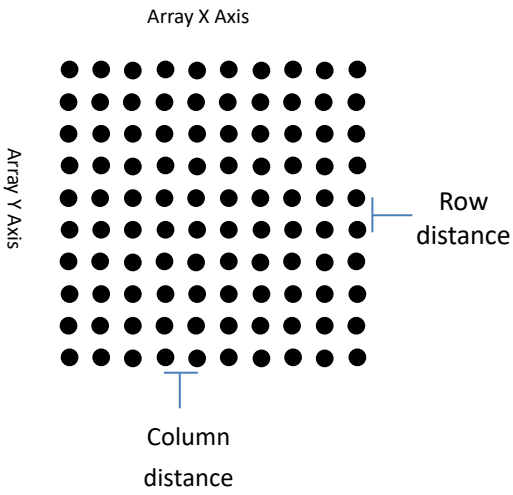
Arc



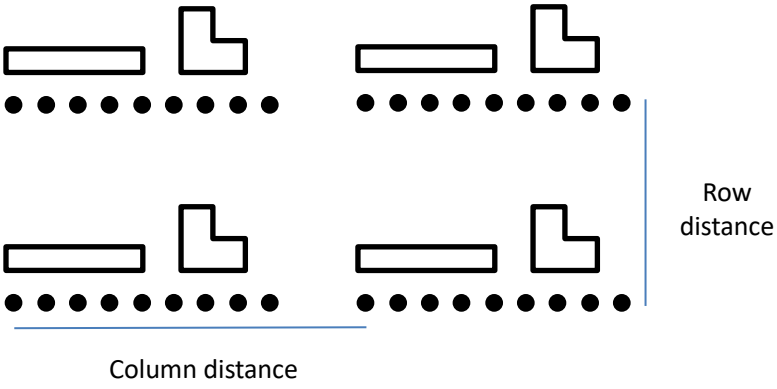
Circle



Dot (Point) Array 10 x 10

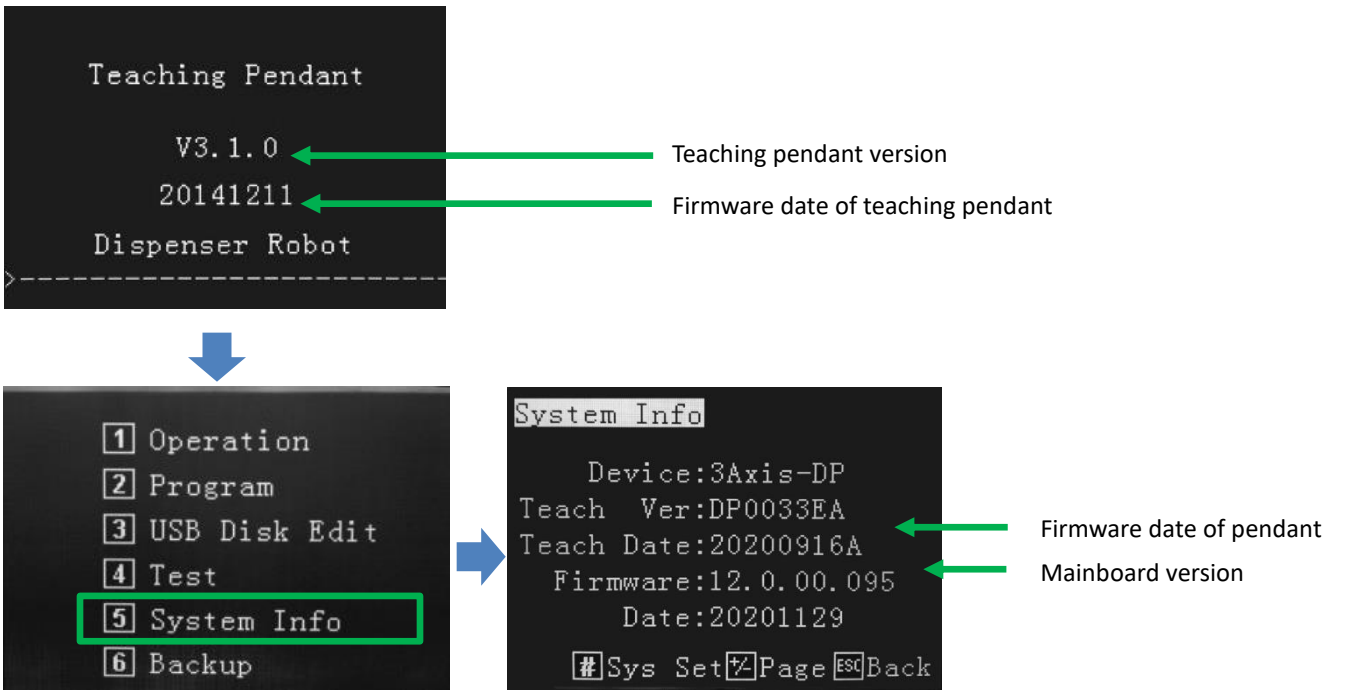


Pattern Array 2 x 2

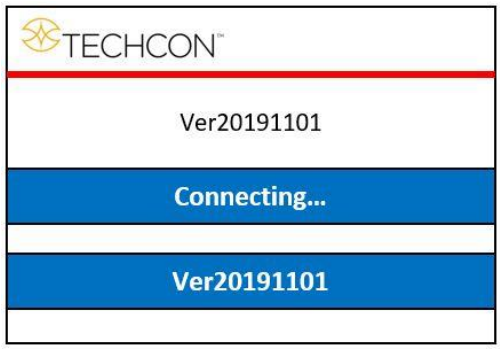


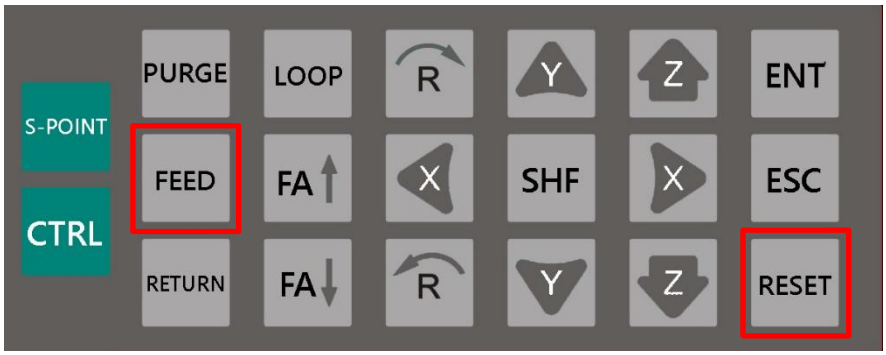
6. FIRMWARE SCREENS EXPLAINED

After connecting the teaching pendant to the robot, turn on the power switch. The system will initialize and move to the Origin (0, 0, 0) location. For a brief moment the LCD screen will display:



On the main robot front screen, whilst the teaching pendant is attached, the following information is displayed:

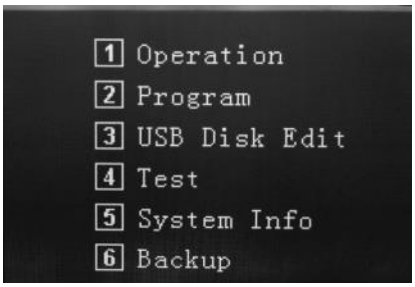




Periodic updates will be made availiable should new features be added to the robot. These updates can be performed through the teaching pendant's USB port.

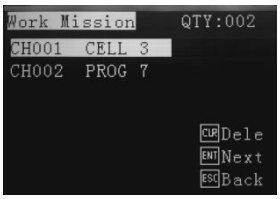
When teach pendant is connected only the FEED and RESET buttons remain active. All other buttons are disabled.

7. TEACH PENDANT MAIN SCREEN



After the robot has initialized the mian screen will be displayed.

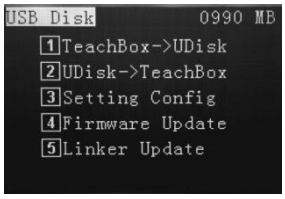
Every function of the robot is controlled through one of the 6 choices of the main screen. An overview of each section is provided below.



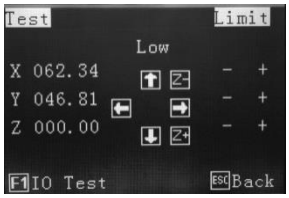
1 – Operation – Select the saved program, apply home adjust, process file, delete file, activate robot by external source (shortcut), setting purge and usage times.

This mode is to run the robot with teach pendant connected once the program has been written and saved.

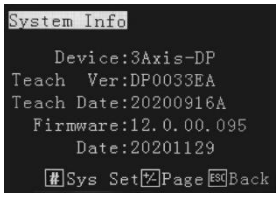
2 – Program – Create dispensing program, edit parameters, copy, delete, download.



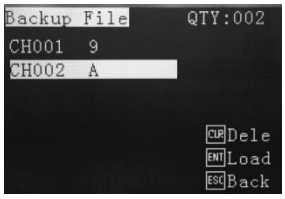
3 – USB Disk Edit – Download/Upload program to USB, system update.



4 – Test – For testing areas of the robot such as axis jogging and I/O ports.



5 – System Info – Device type, teach version, firmware version and connecting safety cover.



6 – Backup – Load teaching file from robot's memory to teaching pendant's memory, or delete the teaching file in the robot.

8. OPERATION – RUNNING A SAVED PROGRAM

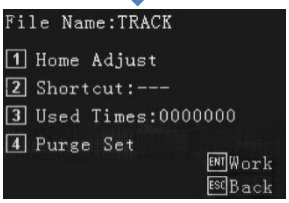
Press 1

Select program to be used and press ENT

or

Select program to be deleted and press CLR then ENT

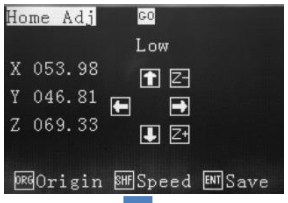
If selecting dispense cycle to load, press ENT twice.



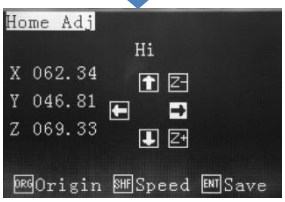
This will go to the final step

Pressing ENT once:
1 – calibrate tip position
2 – create shortcut
3 – reset counter
4 – set purge position

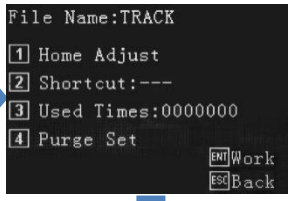
Note: Home Adjust is the process in which to adjust/offset the co-ordinates completely in cases such that: the dispensing tip has been changed or the dispensing valve has been removed and refitted. Due to very small differences from product to product or if the valve has been removed and put on at a slightly different position, the operator can calibrate the program to the new position. The entire program will offset to where the operator has set it to.



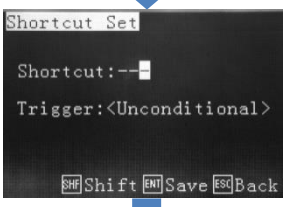
Press GO and then use alphanumeric keys or jog arrows to move to the correct location.



Press ENT

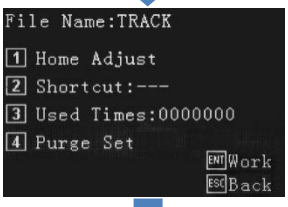


(Optional) Press 2



Change current state

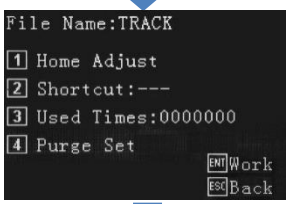
Press ENT



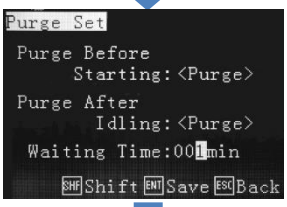
(Optional) Press 3

Change counter,

Press ENT

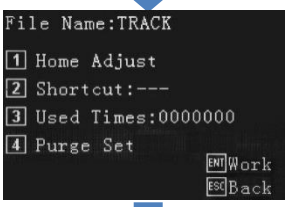


(Optional) Press 4

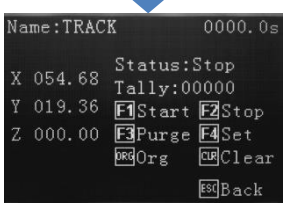


Using the # button, select if Clean is required at start or end of program, or not at all.

Press ENT



Press ENT



Press F1

This starts the dispensing cycle.

8.1 Calibrating the Dispense Tip

When a dispense tip is changed, or the valve is removed from the robot, it is normal for the tip/valve to be slightly out of the original position when reattached. By creating a physical calibration point (Ref PT), on the device or fixture, the program can be adjusted to suit the new tip position. This change will only effect the current program and not other programs stored in the memeory. All programs can have their own unique calibration position.

There are 2 ways to achieve this calibration in the x, y and z axis:

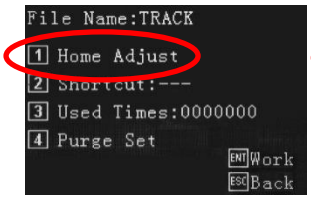
Ref Point – by inserting a "Ref PT", into the Points List, during programming. Calibration of the tip is performed at a specified place by the user, such as a conical pin or cross-hair markings, on the holding fixture.

Home Adjust – if the "Ref PT" is not inserted into the program the robot will automatically use the first dispensing location as the calibration co-ordinate.

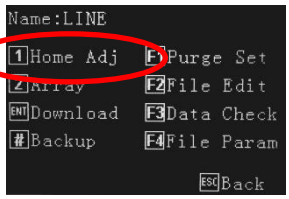
Calibration can be perfomed, at any time, by pressing **Home**, **Home Adjust** or **Home Adj**

Home Adjust can be found in the following screens:

If this function is performed in the Editing screen the program will need to be Downloaded after the Home Adjust in order for it to take effect.

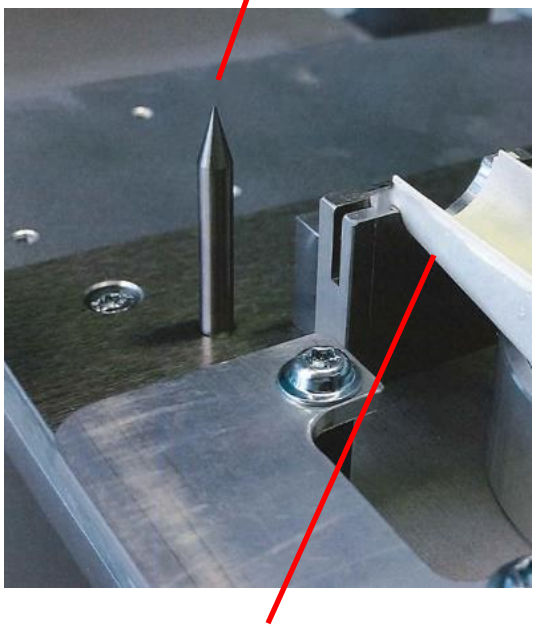


In Operation Menu

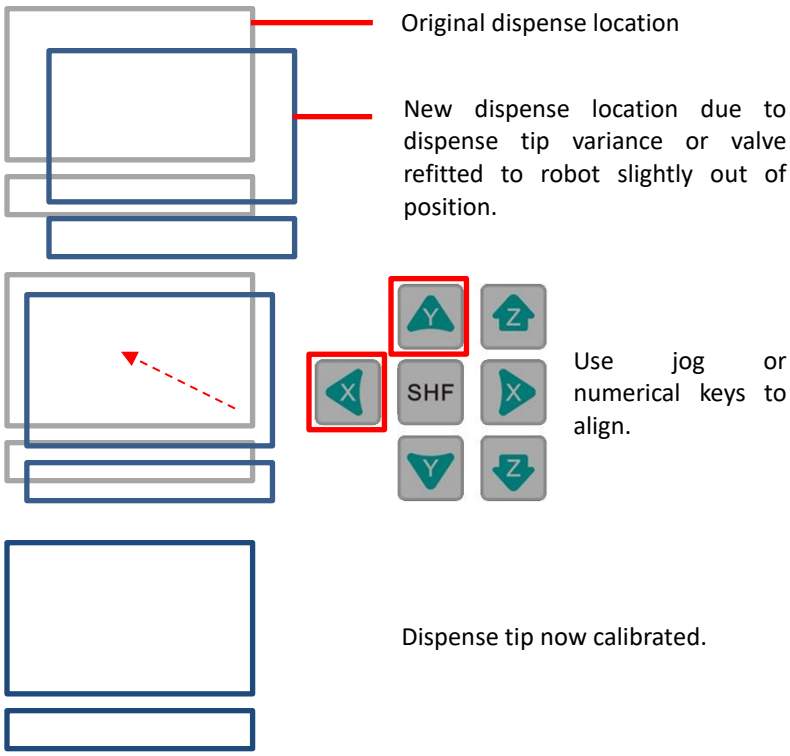


In Editing Screen

Typical calibration pin



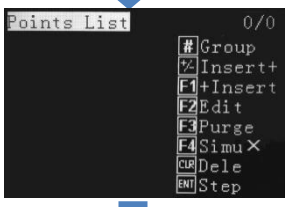
Device to be dispensed onto



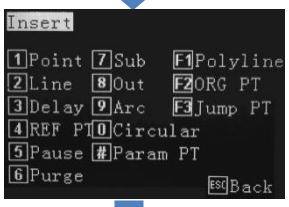
8.2 Creating the Calibration Location During Programming

Points List – This method inserts a calibration point – Ref PT – into the body of the program, which can be modified at anytime. It is also possible to modify the stored progam to include a calibration point later. The calibration point must be programmed in line position 001.

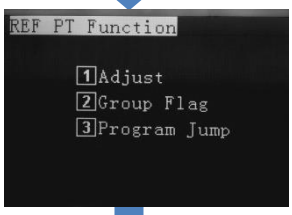
Reference Section 9.2



Press F1

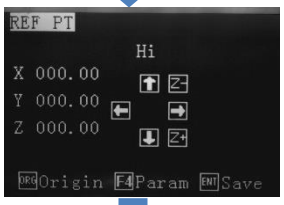


From the Insert screen, select option 4 – Mark

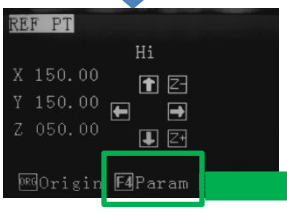


Press 1 - Adjust

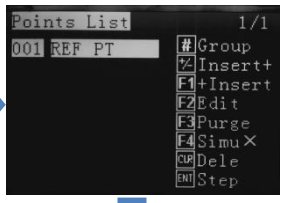
Options 2 and 3 are for future use



Use jog or alphanumeric keys to move to calibration location.

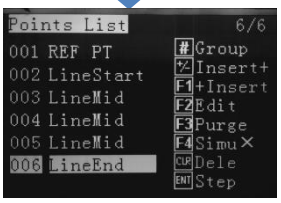


Press ENT

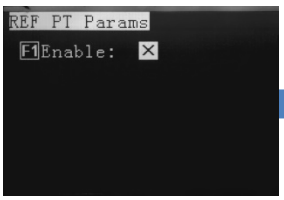


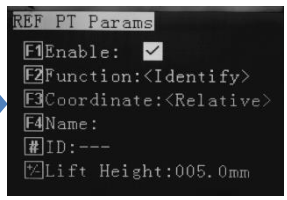
The calibration location is now set. Continue to write program by inserting the dispensing co-ordinates.

Start by pressing F1



This program consisisted of a Polyline to created a gasket (square).

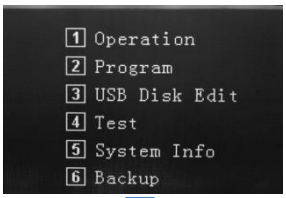




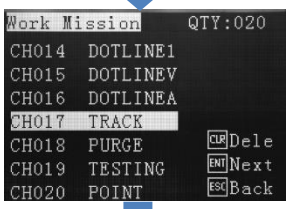
If F4 is pressed, these functions are for future use and should not be altered.

8.3 Veryfying the Calibration Location During Live Use

Operation Screen – If a calibration point (REF PT) has been stored in the program the dispense tip will move to this pin location, when **Home Adjust** is pressed. If no calibration point has been stored, in the programming, the dispense tip will move to the first dispensing location, when **Home Adjust** is pressed.

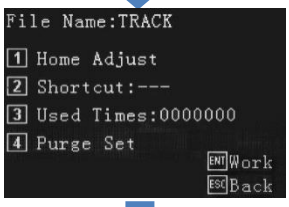


Select 1 - Program



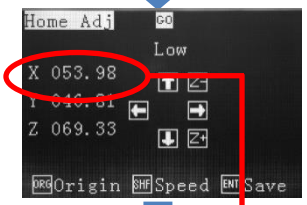
Select the program, to run.

Press ENT



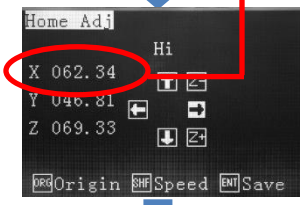
If no tip calibration is required, press ENT

If tip calibration is required, press 1 – Home Adjust



Press GO

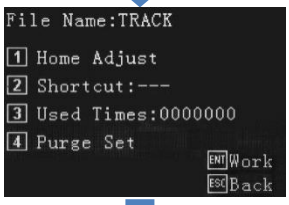
The tip will move to the Cal pin if one is stored or to the first dispensing location if a Cal point is not stored, in the programming.



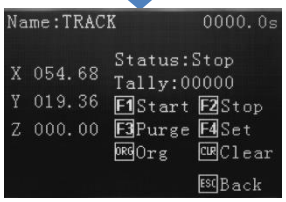
Use jog keys to correct tip position.

Press ENT

This change does not affect the original written program location.



Press ENT



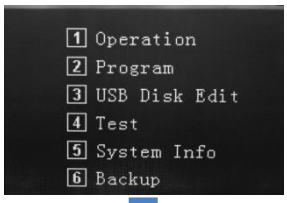
The program can be run with F1

8.4 Shortcut – communicates with external PLC when robot used as a “cell” in an in-line robot

Shortcut refers to the robot being a intergrated as a module in an in-line process. The teaching pendant instructions, below, are to set the external binary signal up for this process. The pendant would be disconnected when in live use. The signal is communicated through the rear DB37 connector.

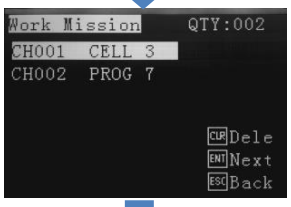
If the robot is on a bench top, being operator controlled, then the Shortcut is not used.

Select 1 - Operation



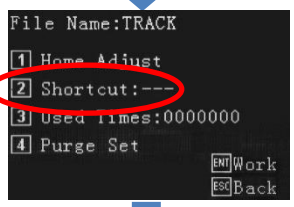
Select the progam using the arrow.

Press ENT

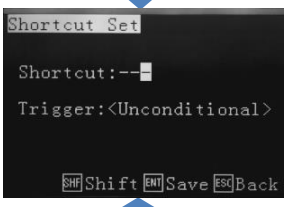


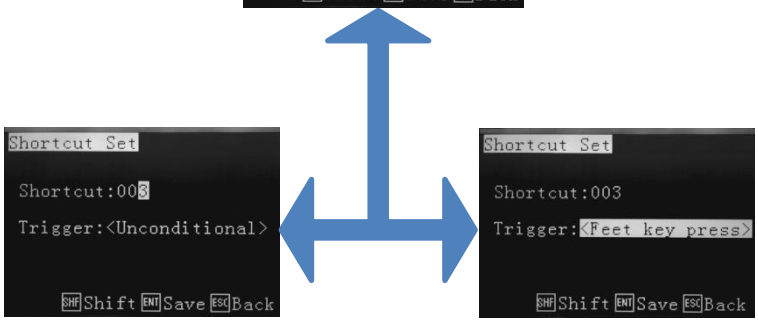
Select 2 – Shortcut

Press ENT



--- means no binary Shortcut signal set. Use numeric keys to set Shortcut binary signal (as per external PLC). If Shortcut 003 is set, the external PLC needs to send binary signal 003 to the robot.





Trigger:

Unconditional – the robot receives the external signal and completes the dispensing cycle.

Trigger:

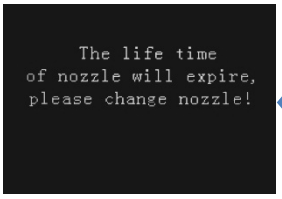
Feet key press – the robot receives the external signal but will wait for the line operator to press the the “Feed key”. When Feed key is pressed the dispensing cycle will start.

8.5 Used Times - Monitoring and Setting Usage and Visual Alarms

"Used Times" shows on the teaching pendant and robot screen (when teaching pendant is disconnected) the status of how many dispensing cycles have been dispensed. Used Times records the the accumulatively dispensed cycles/positions giving an indication of how much work the dispensing valve has achieved. If another saved program is selected then the cycle count will not start at zero but continue counting from where it left off. However, the live counter can be reset to zero on the Teach Pendant and robot screen. This feature is particluary useful if the operator needs to change the tip or wetted path, of a dispense valve, to maintain dispensing accuracy, after it has been used a certain number of cycles. The operator is able to set the top limit of dispense activations. When the robot has reached the target dispense cycles it will display the following warning on the screen:

On pendant

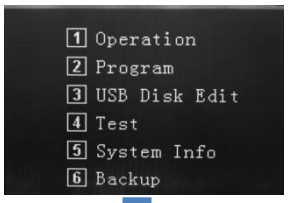
(will alarm everytime until Used Times counter is reset)



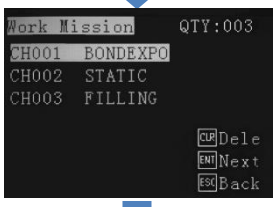
Pre-Alarm

(only if pendant attached, will pre-alarm once only).

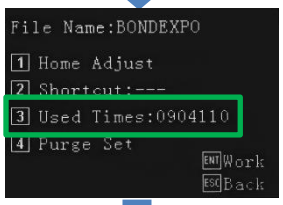
This display warns the operator to change the nozzle although the user of the robot can translate this to any internal maintenance procedure if required. Once the procedure is completed the ENT or ESC key can be pressed to calibrate the tip (**8.1 to 8.3**). Possible uses of "Please change the nozzle": Replace tip, replace disposable path, replace syringe, remove valve for maintenance, flush valve with cleaning agent, re-calibrate valve position, etc.



Press 1 – Operation.

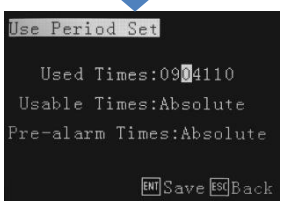


Select desired program.

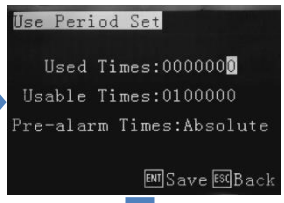


Current usuage data is displayed

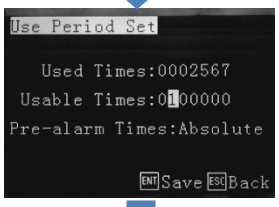
Press 3 – Used Times.



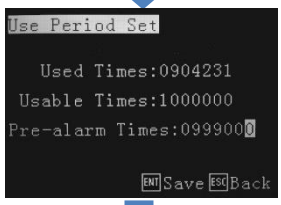
Usuage data displayed with alarm conditions. This screen shows no alarms are set and the counter will keep a running total of shots completed.



Cycles (Used Times) can be reset.

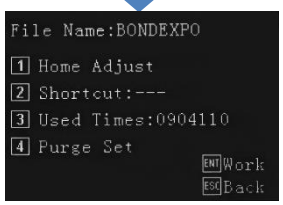


Alarm target (Usable Times) can be set.



Pre-Alarm can be set. This example has an additional screen warning 1000 cycles prior to the actual alarm.

Press ENT



Press ENT

Program is ready to dispense.

9. PROGRAMMING

9.1 Programming by Jog keys or Inputting Co-ordinates

The TSR2000 Series robot is designed to be programmed by either imputing co-ordinates (advanced user) or by using the jog keys (entry level user).

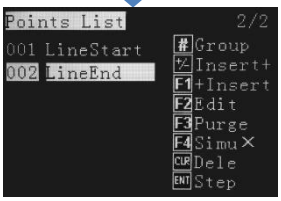
Note: All pattern creation, over the following pages, are illustrated by the entry level method

Inputting Co-ordinates – Advanced User (example of Line)

After selecting the type of dispensing (dot, line, arc…) input the X co-ordinate, using the number keys. Use the arrow keys to move down and input the Y and Z co-ordinates. When all 3 co-ordinates have been entered, press GO

The dispensing valve will move to this location. Press ENT to save the position.

Repeat above process for the Line End.



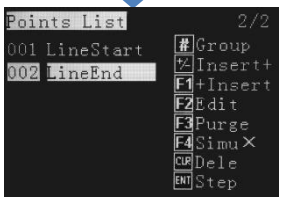
Once repeated, the Points List will show where more patterns can be inserted.

Jogging – Entry Level User (example of Line)

After selecting the type of dispensing (dot, line, arc…) use the jog keys to move to the Line Start position.

Press ENT to save the position.

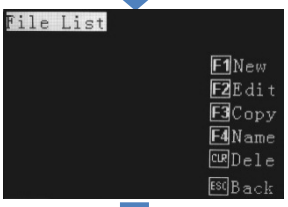
Repeat above process for the Line End.



Once repeated, the Points List will show, where more patterns can be inserted.

9.2 Creating a New Program

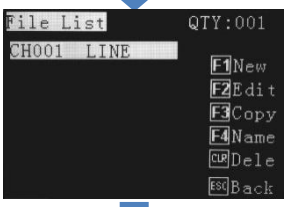
Press 2.



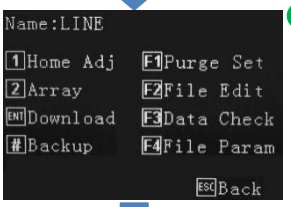
Press F1

Enter a program name.

Press ENT

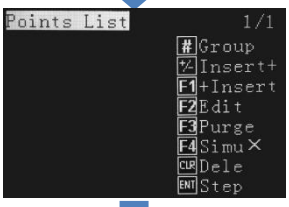


Press F2

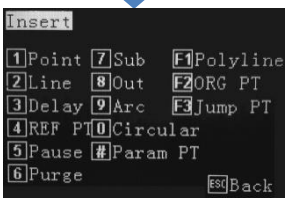


See Section 9.11 for explanation of **File Parameters**.

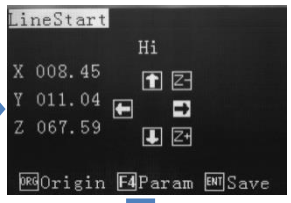
Press F2



Press F1

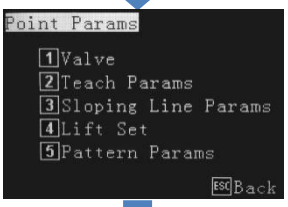


From the Insert screen, select one of the options. (for this Line example, select option 2).

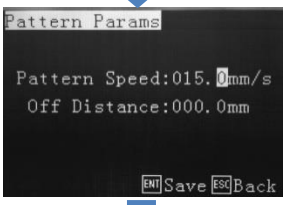


Change the move speed with the SHF key.

When line start location is reached press F4



Press 5



Use alphanumeric keys to change dispense speed. (Pattern Speed).

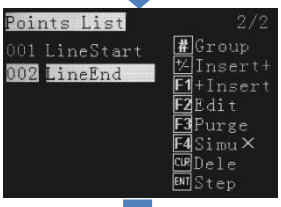
Press ENT twice

If "GO" is flashing at the top of screen,

Press GO then press ENT

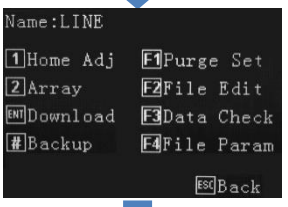
Use alphanumeric keys to move the line end location.

Press ENT



Press ESC twice.

This will go to the file processing menu

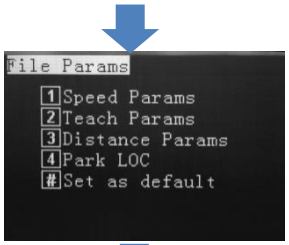


Press F4

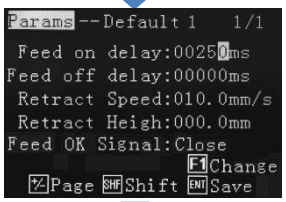
This enables changes to the file parameters.

Go to page 17

Cont. from page 16

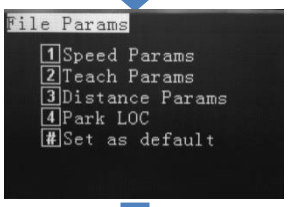


Press 3

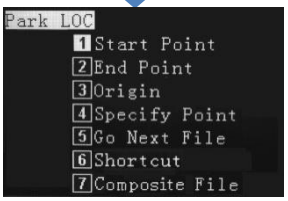


Use the alphanumeric keys to change the retract speed, retract height and feed on/feed off delay.

Press ENT



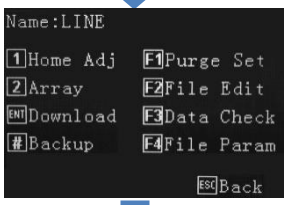
Press 4



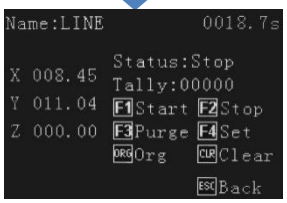
Select where the valve should go to after dispensing.

Use the alphanumeric keys to select a park location.

Press ENT then ESC

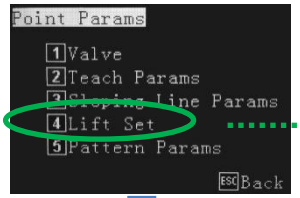


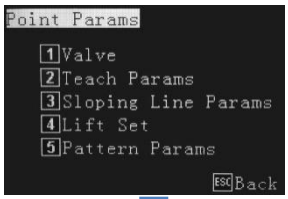
To save, press ENT

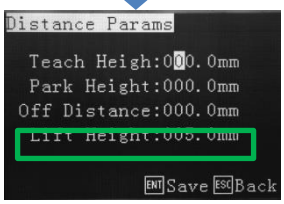


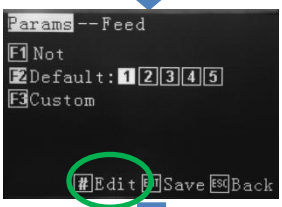
Press F1

This starts the dispensing cycle.

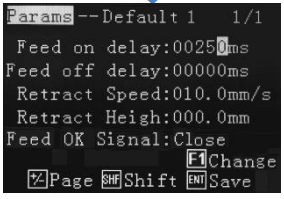








0



Understanding Lift Height and Retract Height

Lift Height - is found in the Point Parameters Menu under the the **Lift Set** option. After the dispensing cycle, the Z-axis will move up to the Lift Height at the normal moving (non-dispensing) speed of the machine. If required, a different Lift Height can be applied to any or all of the dispensing patterns, however, if the speed is set to slow this would also mean that when the robot is required to go to Origin (0, 0 ,0), the z-axis will take a long to time to home.

Retract Height - can be found within the Teach Parameters Menu. Retract Heights are applied to the Feed Slots used to created patterns. If a dot is created using Feed Slot 1 and a 2nd dot is created using the same feed slot, the same parameters will be applied to dot 2 including Retract Height. A **Retract Speed** can be applied to Retract Heights.

If Retract Height is greater than Lift Height, Retract Height Overides. If Lift Height is greater than Retract Height, Retract parameters will operate first (height and speed) then the Lift parameters will complete the up movement. If Retract and Lift Height are the same the Retract Height and Speed override the Lift Height and Speed.

9.3 How to Delete a Program

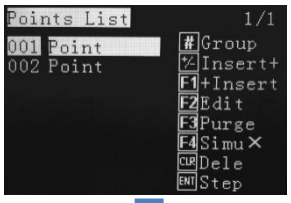
In the File List menu, select the program to delete

Press CLR

Press ENT

This confirms deletion

9.4 How to Delete a command in a Program



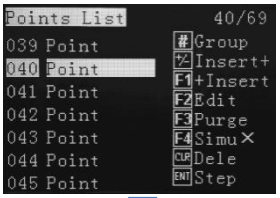
In the "Points List", within a Program, select a point in the Program to delete.

Press CLR

This confirms deletion

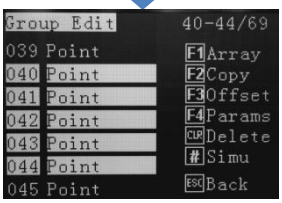
Press ENT

9.5 How to Delete Multi-Commands in a Program



Press # in the Points List.

This goes to Group Edit.



Use up/down arrow keys to select points to delete.

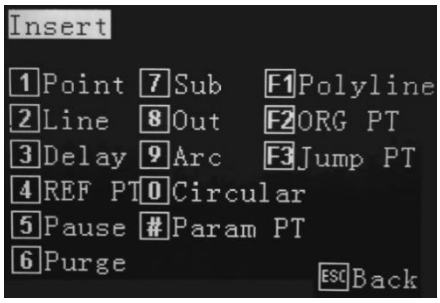
To confirm…

press ENT twice.

Press CLR then ENT

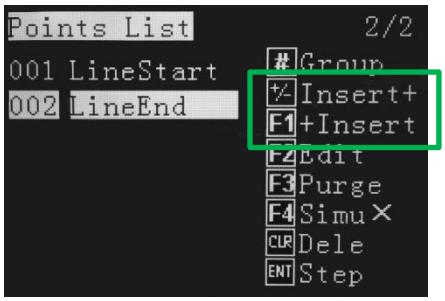
This confirms deletion.

9.6 Insert Screen



1 – a dispensing dot with fixed times applied.
2 – a line consisting of a start and end position with programmable speed.
3 – a programmed time delay from 1 location to the immediate next.
4 – Calibration Point, used when a calibration pin is fixed to the base of device fixture.
5 – robot pauses and waits for input signal or manual (F1/key box) start to run the next step.
6 – Setting a location for the valve to wait. Adding time will allow purging with fluid.
7 – insert another program, from the memory, at that specific location.
8 – turn on output signals (UV light, another dispense valve, camera, etc)
9 – an arc using 3 point programming - arc start, arc mid position and arc end, with programmable speed.
0 – a circle using 3 point programming or by inputting circle dimensions, with programmable speed.
– setting motion speeds from one dispense location to another.
F1 – a series of lines connected with no dispensing interruption, with programmable speed.
F2 – moves to origin position - 0, 0, 0 before moving to next dispensing location.
F3 – to run the front dispensing again.

9.7 Insert + / + Insert Definition

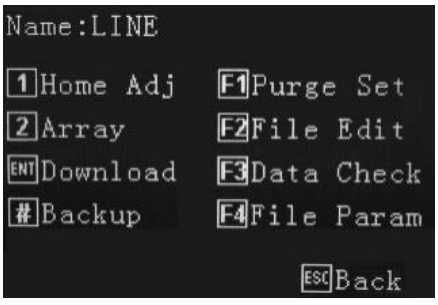


Insert + and + Insert a both methods on inserting a dispense location into the Points List.

+/- Insert + inserts the co-ordinate **above** the highlighted line.

F1 + Insert Inserts the co-ordinate **below** the highlighted line.

9.8 Processing Screen



Moves tip to calobraiton point or first location in program if no calibration point set up.

Creates simple array of program outside of program (limited edit function).

Saves the prpgram to the robot and the teaching pendant.

Creates a back up of the program.

Sets Purge.

Edit new or existing program.

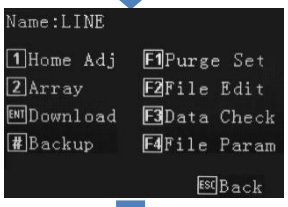
Checks the program data and will warn if any points are outside of working range.

Setting park locatons, program defaults, group speed changes.

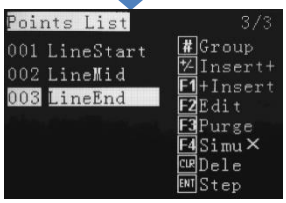
9.9 How to Edit a Program

From the File List, use the arrow keys to select the program requiring the edit.

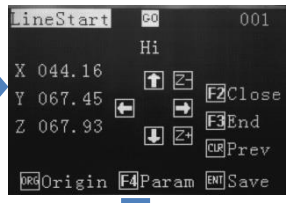
Press F2



Press F2

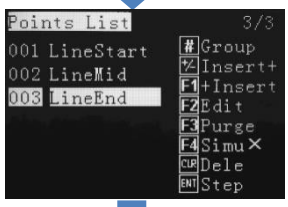


Use the arrow keys to select the part of the program requiring editing. In this case the start of the line will be increased in length. Press F2



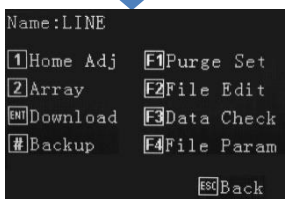
Press "GO". The robot will move to the original start position. Use either jog keys or input the new dimensions.

Press GO then ENT



Continue editing, when complete …

press ESC twice.

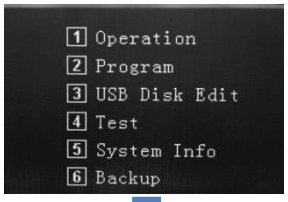


To save, press ENT

9.10 How to Copy a Program

Copying programs is generally used when a 2nd application is very similar to the first and that it is more efficient to modify an existing program instead of creating from the start.

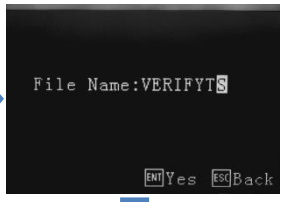
It is also quite common to use the copied program to make a qualification/verification program, of the dispensing output at the start of a shift, before making a productions run. This ensures the valve can be "dialed-in" before the use.



Reference Section 9.2 (creating a new program) or if the program is already saved/downloaded press 2.

Using the jog keys. select the program that needs to be copied.

Press F3



Give the copied program a name. If using the same name the robot will prompt for an alternative name.

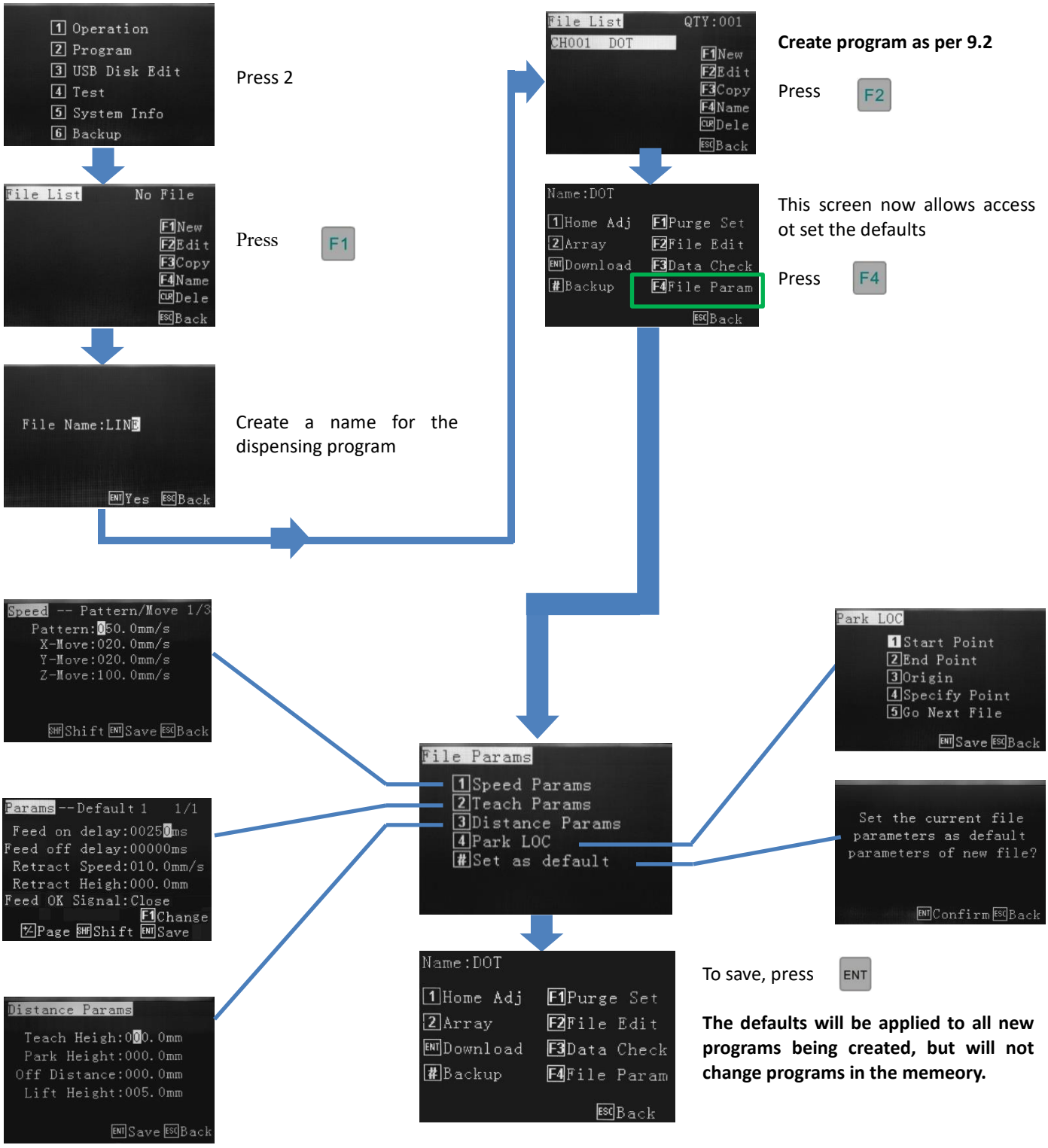
Press ENT

The copied program will be added to the File List where it can be edited.

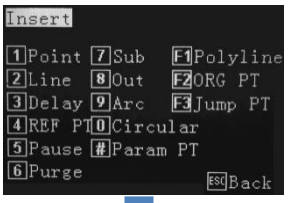
The program must be downloaded

9.11 Setting Program Defaults

The robot is set to factory default dispensing speed and movement speed. The “after dispense” location is also factory set to Origin (0, 0, 0). These factory settings will normally not be optimal for the dispensing application. All programs written will have these factory settings applied, although they can be individually edited during program creation/editing. If more than one program will be used on the robot, defaults will save time if having to change every co-ordinates speed. Any older programs, in the robots memory, will not be affected be setting defaults. Only new programs will have the defaults applied.



9.12 How to Create a Point (Dot)

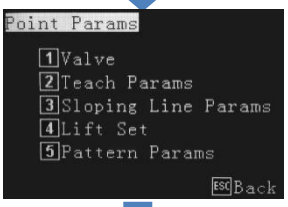


Reference Section 9.2
From the Insert screen, select option 1.

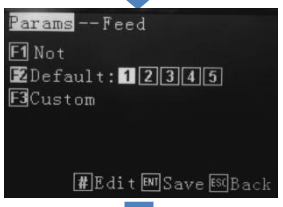
Change the move speed with the SHF key.

Press ENT at the dot location

Press F4

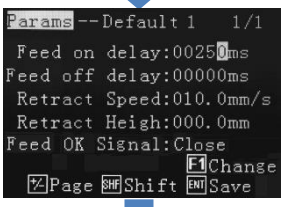


Press 2 – Teach Params



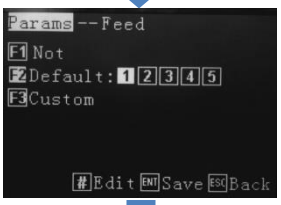
Ensure F2 is highlighted.

Press #

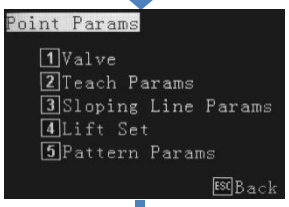


Set Feed on delay (dispensing time)
Set retract height and speed.

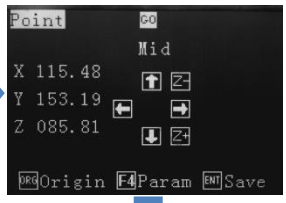
Press ENT



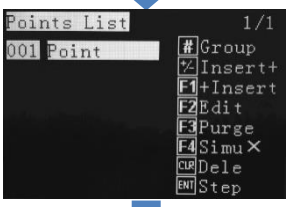
Press ENT



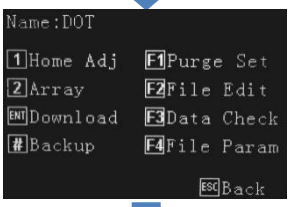
Press ENT



Press ENT

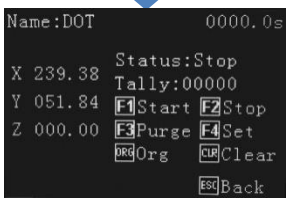


Press ESC twice



Continue to edit or…

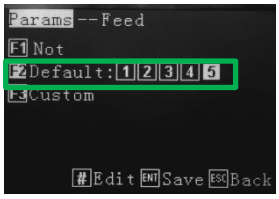
to save, press ENT



Press F1

This starts the dispensing cycle.

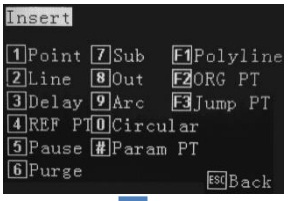
The above procedure will apply the same dispensing time (Feed On Delay) to all dots within the program. To create a different sized dot in the same program…



At the Feed screen, select any of the available feed slots (1 - 5).

The feed time can be changed by pressing #

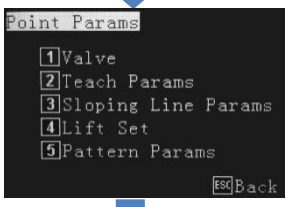
9.13 How to Create a Line



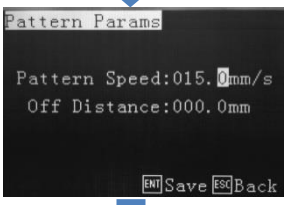
Reference Section 9.2 and 9.26. From the Insert Screen select option 2

Change the move speed with the SHF key

When line start location is reached press F4



Press 5



Use alphanumeric keys to change the dispense speed (pattern speed)

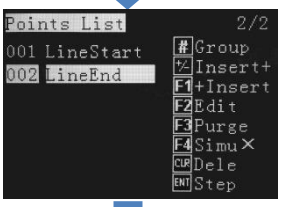
Press ENT twice

If "GO" is flashing, at the top of the screen press

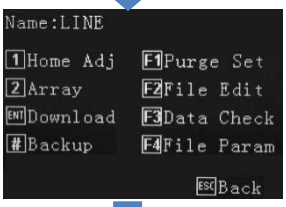
GO then press ENT

Use alphanumeric or jog keys to move the live to end location.

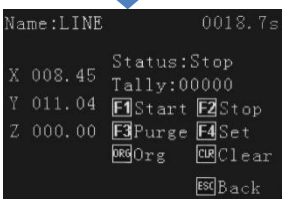
Press ENT



Press ESC twice

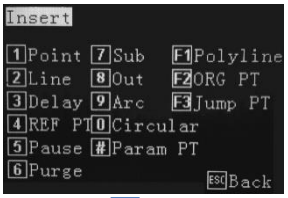


Press ENT to save

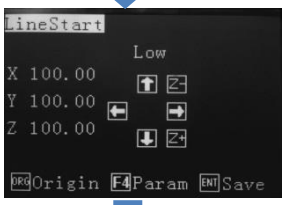


Press F1 to start

9.14 How to Create an Elevated Line

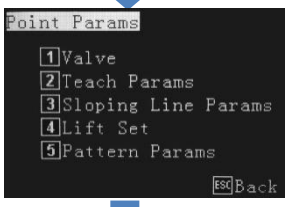


Reference Section 9.2 and 9.26
From the Insert screen, select option 2.

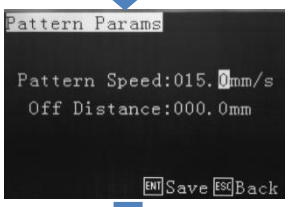


Change the move speed with the key SHF

When line start location is reached press F4

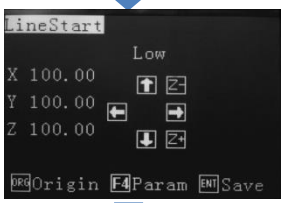


Press 5



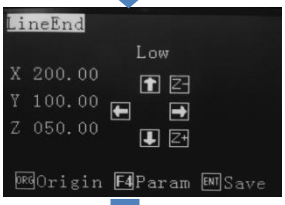
Use alphanumeric keys to change the dispense speed (pattern speed).

Press ENT twice.



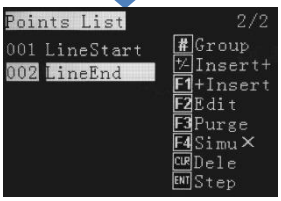
If "GO" is flashing, at the top of the screen press GO

then press ENT



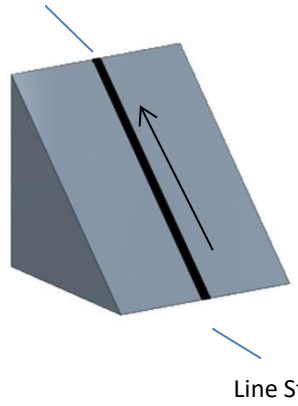
Use alphanumeric or jog keys to move the line end location.

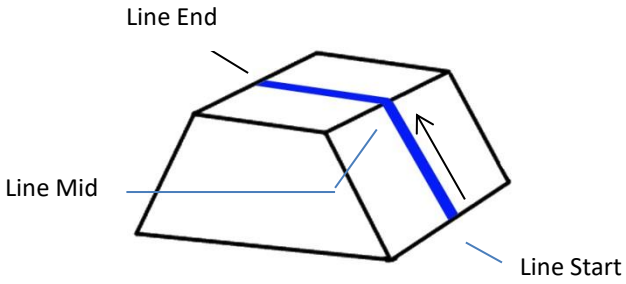
Press ENT



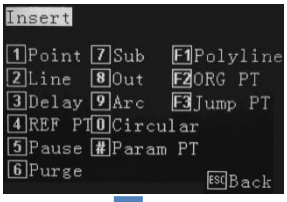
Press ESC twice

The program can now be downloaded or edited further.



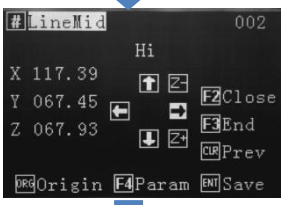


How to Create a Multiple Point Elevated Line

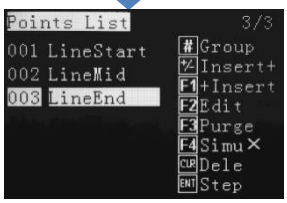


Reference Section 9.2 and 9.26

From the Insert screen, select option F1



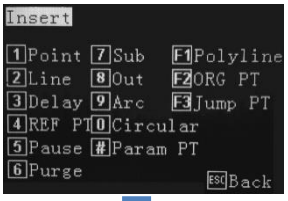
Follow the instructions in Section **9.18** for creating a Polyline.



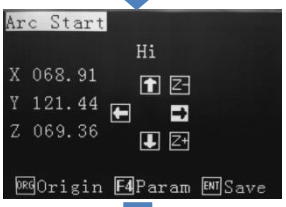
Press ESC twice

The program can now be downloaded or edited further.

9.15 How to Create an Arc

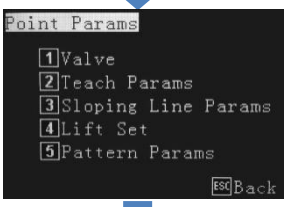


Reference Section 9.2 and 9.26. From the Insert screen, select option 9.

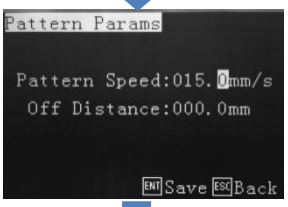


Change the move speed with the SHF key

When line start location is reached press F4



Press 5

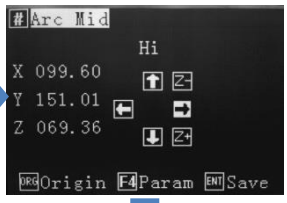


Use alphanumeric or jog keys to change dispense speed. (pattern speed)

Press ENT twice

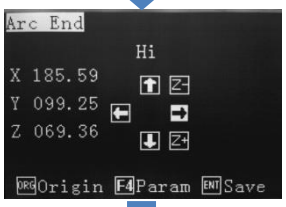
If "GO" is flashing, at the top of the screen press GO

then press ENT



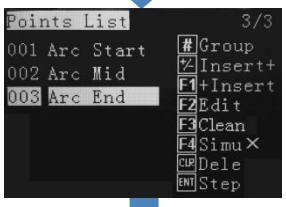
Use alphanumeric or jog keys to move to Arc mid-point location.

Press ENT

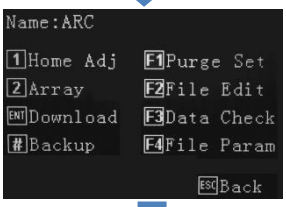


Use alphanumeric or jog keys to move to Arc end location.

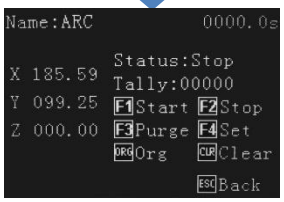
Press ENT



Press ESC twice

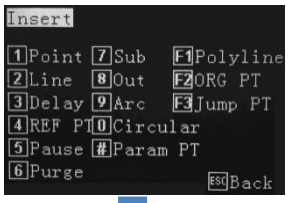


Press ENT to save

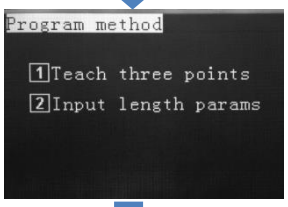


Press F1 to start

9.16 How to Create a Circle (3-Point Method)



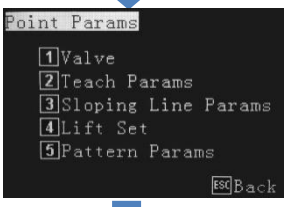
Reference Section 9.2. From the insert screen select option 0.



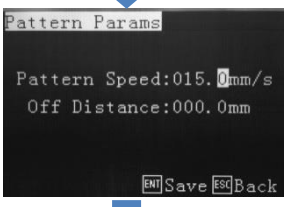
Select option 1

Change the move speed with the SHF key

When circle start location is reached press F4

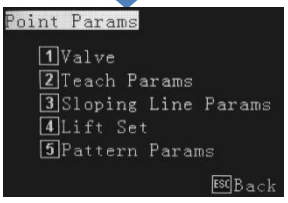


Press 5

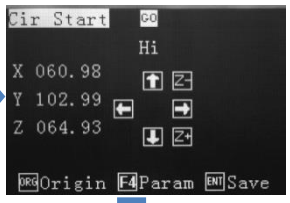


Use alphanumeric or jog keys to change dispense speed. (pattern speed)

Press ENT twice

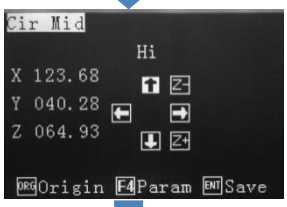


Press ENT twice



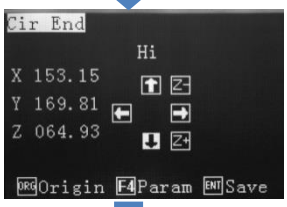
If "GO" is flashing, at the top of the screen press GO

then press ENT



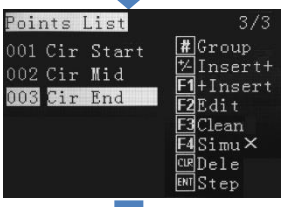
Use jog keys to move to circle mid point location.

Press ENT

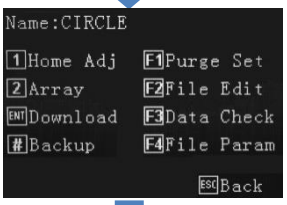


Use jog keys to move to circle mid point location.

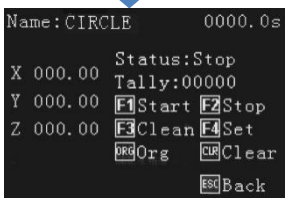
Press ENT



Press ESC twice.

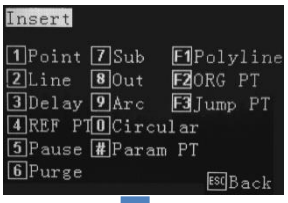


Press ENT to save.

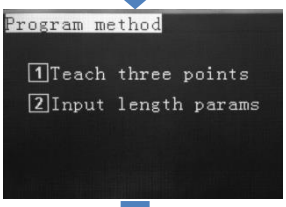


Press F1 to start

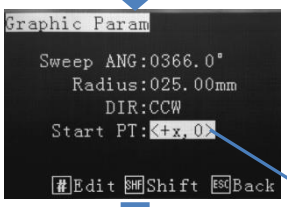
9.17 How to Create a Circle (Inputting Dimensions)



Reference Section 9.2 and 9.26. From the insert screen select option 0.



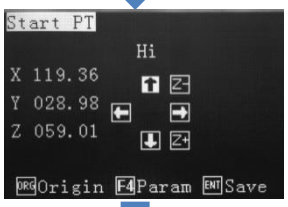
Select option 2



Use arrows to input data
Choose direction with SHF

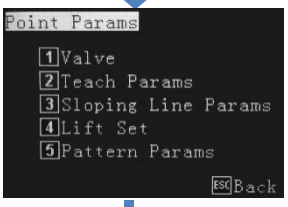
Choose start point
With SHF the press #

Refer to 9.25

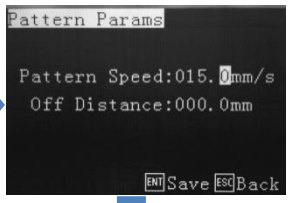


Change the move speed with the SHF key

When circle start location is reached press F4

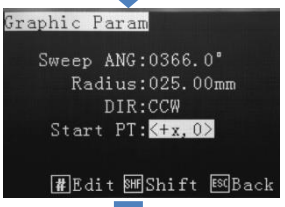


Press 5

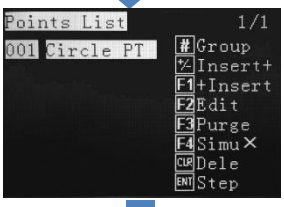


Use alphanumeric or jog keys to change dispense speed. (pattern speed)

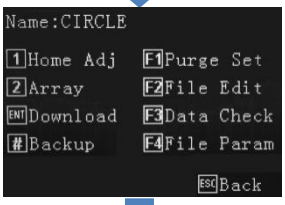
Press ENT twice



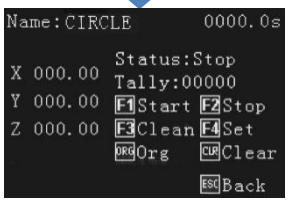
Press ENT to save.



Press ESC twice.

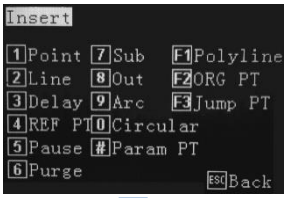


Press ENT to save.

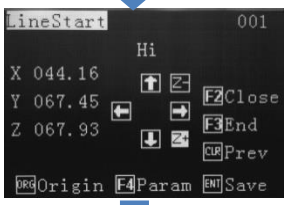


Press F1 to start.

9.18 How to Create a Polyline (Multiple Joined Lines)

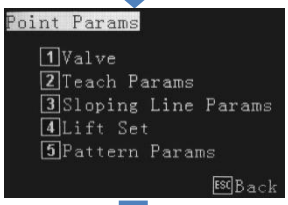


Reference Section 9.2 and 9.26. From the insert screen select option F1

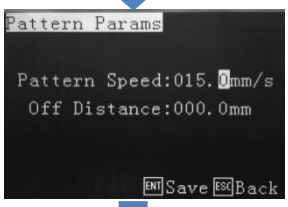


Change the move speed with the SHF key

When line start location is reached press F4

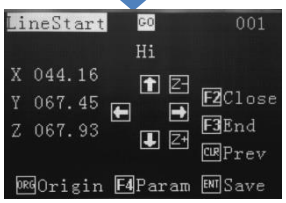


Press 5 (Repeat this speed change for every LineMid in the Points List).



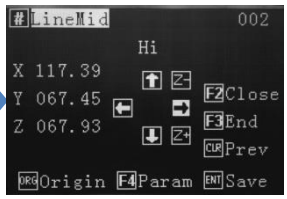
Use alphanumeric or jog keys to change dispense speed. (pattern speed)

Press ENT twice



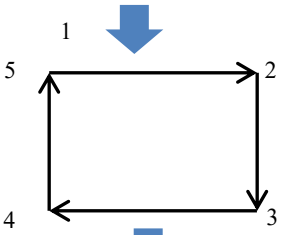
If "GO" is flashing, at the top of the screen press GO

then press ENT



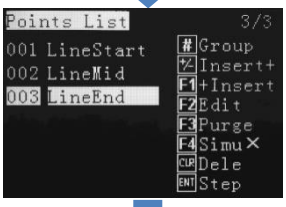
Use jog keys to move to next position.

Press ENT

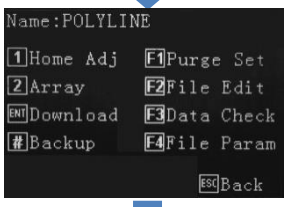


Continue moving and press ENT at location ensuring the mid lines speed are also set.

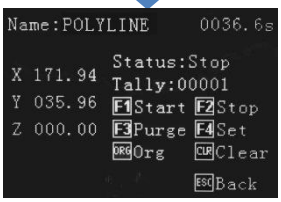
Once the pattern is completed press either F2 or F3 to Close or End the pattern.



Press ESC twice.



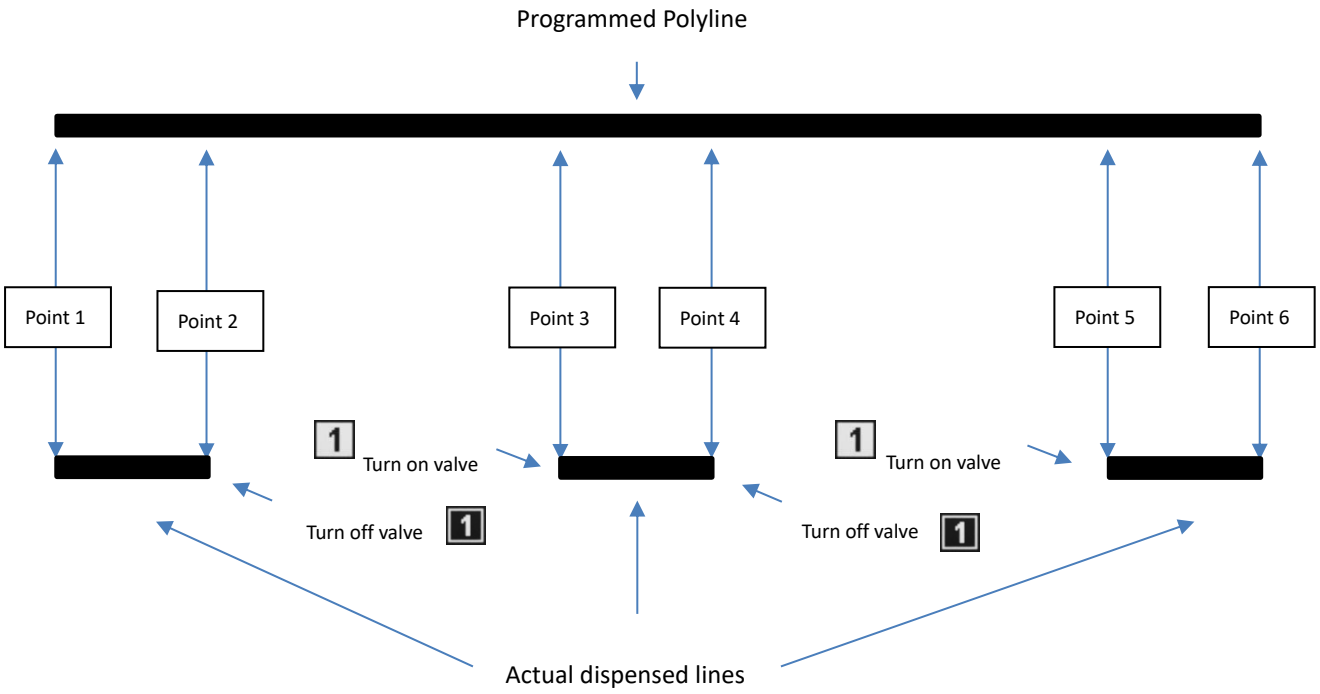
Press ENT to save.



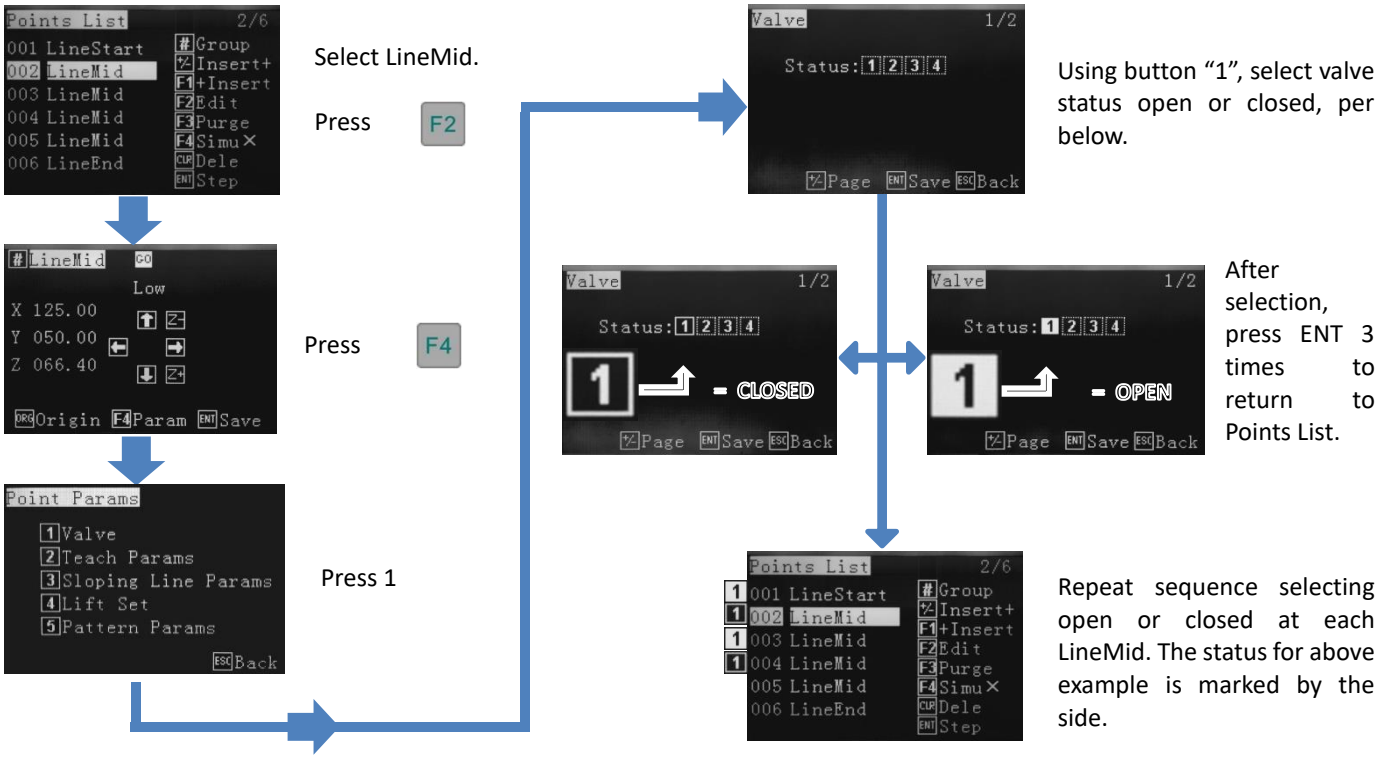
Press F1 to start.

9.19 How to Create an Interrupted Polyline Whilst Moving

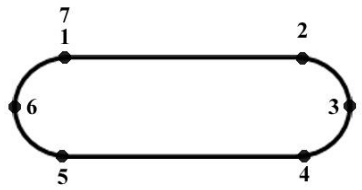
This program makes one continuous line whilst the dispensing valve is opened and closed as instructed by the robot. The dispensing valve remains at one height during the entire line. It is easier to write Polyline and "mid" positions first and change the valve open/closed status second in Edit mode. This methods helps to prevent "dog bones", at the end of the lines.



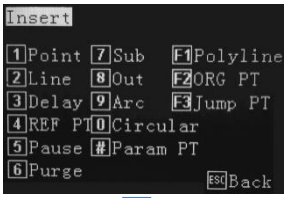
Reference section 9.18



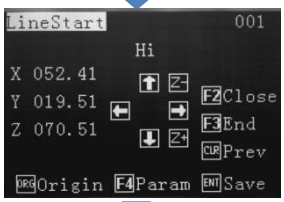
9.20 How to Create Parallel Lines Connected by Arcs



1 Line Start
2 Line Mid
3 Arc Mid
4 Line Mid
5 Line Mid
6 Arc Mid
7 End

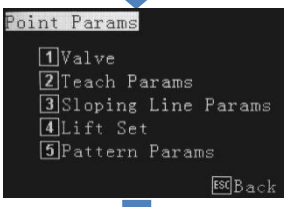


Reference Section 9.2 and 9.26. From the insert screen select option F1

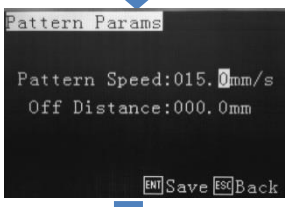


Change the move speed with the SHF key

When line start location is reached (1) press F4

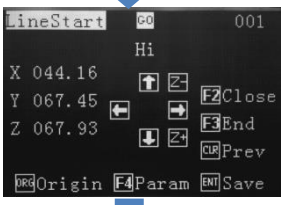


Press 5 (Repeat this speed change for every LineMid in the Points List).



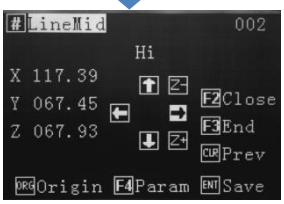
Use alphanumeric or jog keys to change dispense speed. (pattern speed)

Press ENT twice



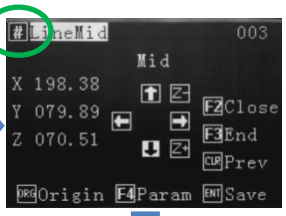
If "GO" is flashing, at the top of the screen press GO

then press ENT



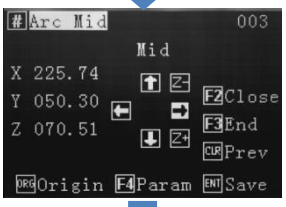
Use jog keys to move to next position (2) – repeat speed change instruction.

Press ENT

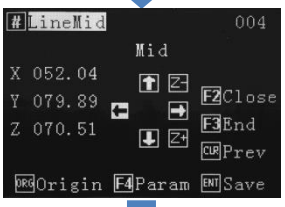


When position 3 (arc centre) reached, press #

Press



Press ENT

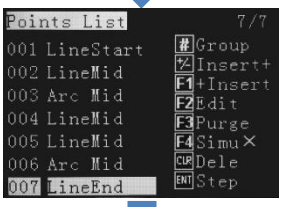


When 4th location is reached – repeat speed change instruction.

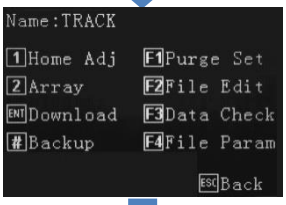
Press ENT

Repeat process for the remaining points. When final location, to complete the pattern….

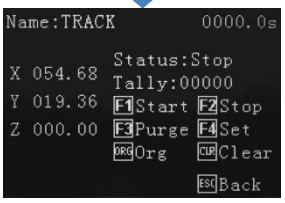
Press either F2 or F3 to Close or End the pattern.



Press ESC twice.



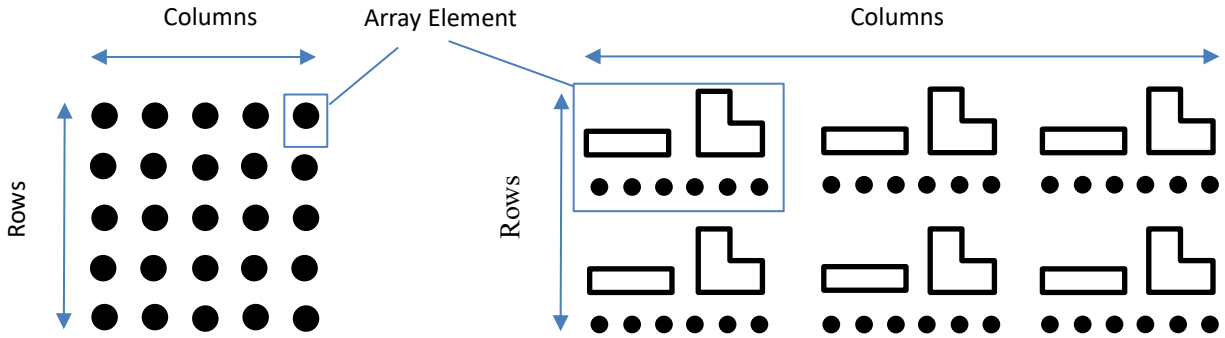
Press ENT to save.



Press F1 to start.

9.21 How to Create an Array Pattern

An Array Pattern is a series of dispensing parameters in a programmed number of rows and columns. The array can either be made up of rows and columns of dots, or rows and columns of multi-point patterns. Only 1 dot, or 1 pattern, is needed to be created and by using the Array function capability, the teaching pendant will plot the co-ordinates of each "array element".



Example of 25 (5 rows x 5 columns) bottles for filling with ink.

Example of 6 (2 rows x 3 columns) automotive switches for dispensing conductive grease onto.

There are 2 options to create an Array Pattern:

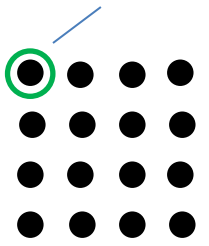
1. **Array function outside of the main program**: This is a quick and simple way to create an array. All patterns in the main program will be set in the same Array function. The co-ordinates of each point in the array are not recorded in the main program so editing is limited. **Follow Section 9.21.2**

2. **Array function within the program "Points List"**- The co-ordinates of each point in the array is recorded in the program "Points List". This function also allows multiple arrays to be created within the program with the ability to edit any point, if required. **Follow Section 9.21.5**

All array patterns will start at the top left co-ordinate first, unless set in teach mode and then any corner co-ordinate can be selected.

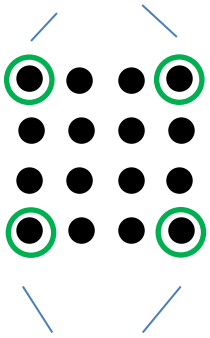
Fixed Start Point

`



In Mode: Not Teach

Optional Start Point

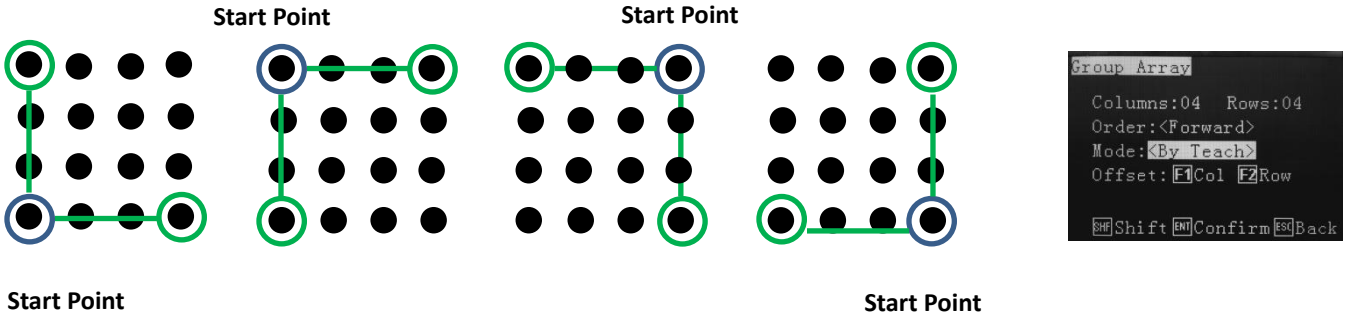


In Mode: Teach
Section 9.21.2

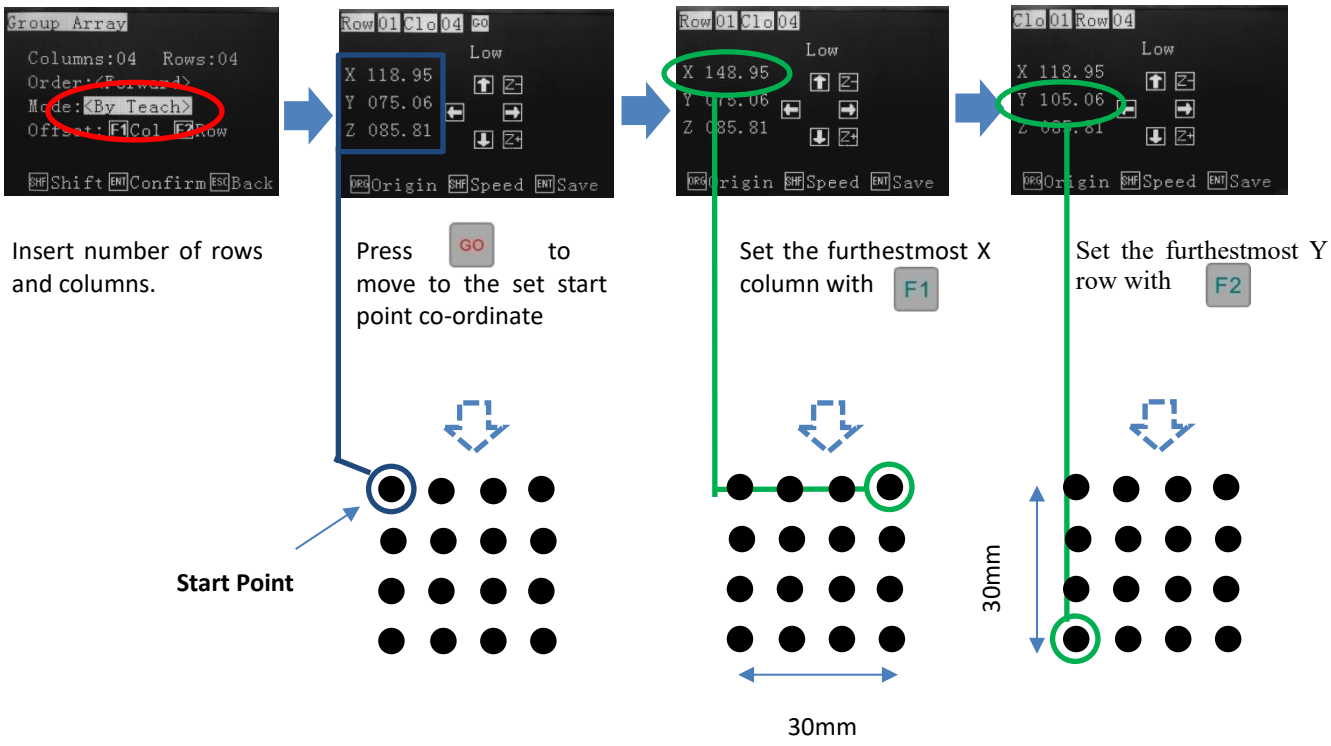
Optional Start Point

9.21.2 Array Pattern Starting Positon (can only be set in “Mode: Teach”)

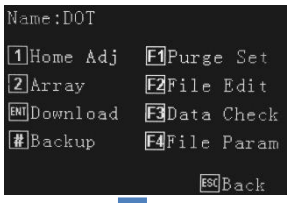
The array pattern can be started in any corner co-ordinate. The robot should be moved to the starting positon and the co-ordinate saved. The furthestmost corner should then be set in the X and Y positions. The robot will automatically plot the other array co-ordinates based on the number of rows and columns set.



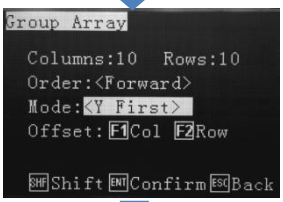
Note:
Columns: Set how many rows and columns – above example would be set to: Column: 4 Row: 4
Order: Cannot be changed
Offset: F1 Col – <u>Only</u> set the furthestmost X column. Do not set the Y co-ordinate here.
Offset: F2 Row – <u>Only</u> set the Y furthestmost Y column. Do not set the X co-ordinate here.



9.21.3 Creating Array Pattern Outside of the Program

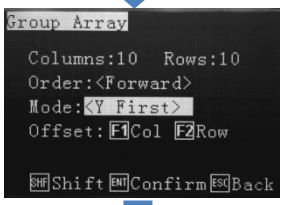


Create the array element (dot or pattern) in the Points List. On the Download screen Press 2 (Array)



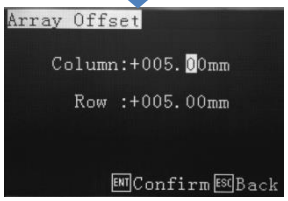
Input number of rows and columns.

Order cannot be changed.



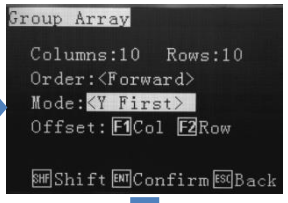
Select Mode: X First first, Y First or Teach. Press F1 and F2 to set row and column distances. For "Teach" follow instructions in 9.19.2

Press ENT

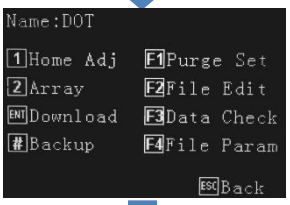


If X first or Y first was selected, input offset distances.

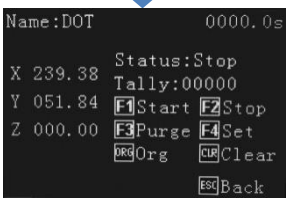
Press ENT



Press ENT to go back to the download screen.



Either, press ENT to Download and run array program or select other options.



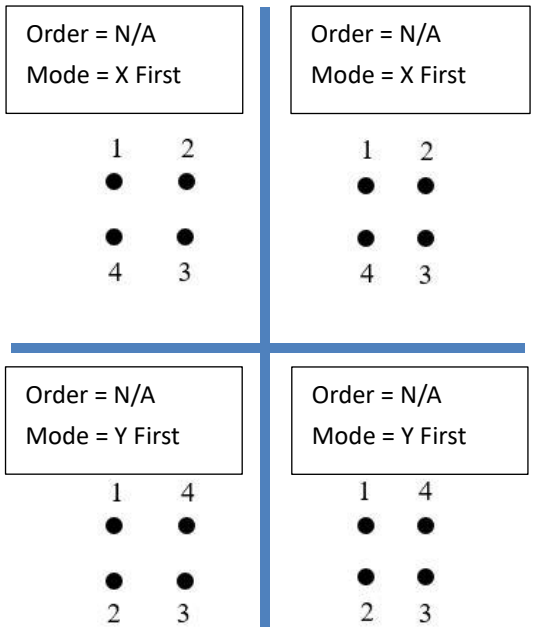
Press F1 to start.

9.21.4 Array Pattern Directional Setting

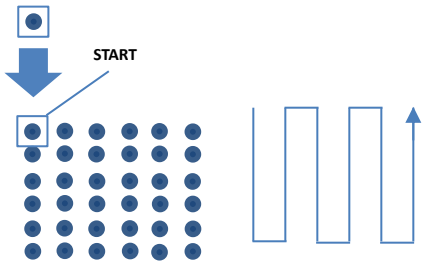
There are options to set the array pattern move direction in the Points List array:

1. Order = Reverse; Mode = X First
2. Order = Reverse; Mode = Y First

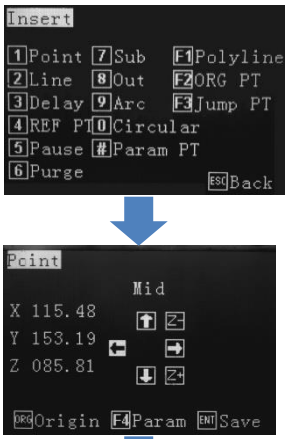
The examples below show the pattern move direction for both options. The array pattern was created with 2 rows and 2 columns.



9.21.5 Creating Array Pattern Inside the Points List – Single Point Element



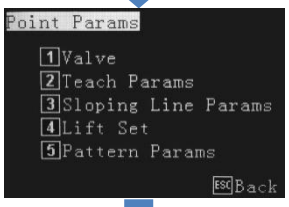
6 x 6 array to be created from a single dot element, showing start position and "Y" travel direction.



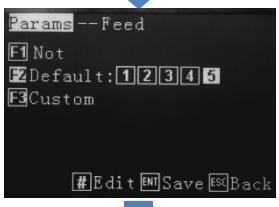
Reference Section 9.2
From the Insert screen, select option 1.

SHF Changes move speed.

Press F4

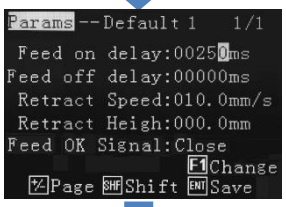


Press 2 – Teach Params



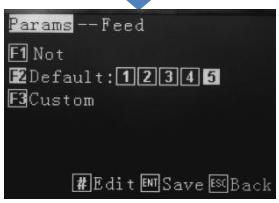
Ensure F2 is highlighted.

Press #

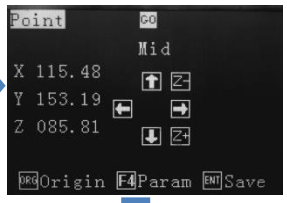


Set Feed on delay (dispensing time)Set retract height and speed.

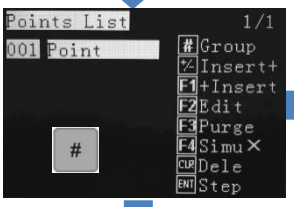
Press ENT

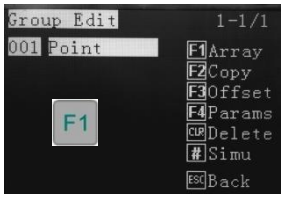


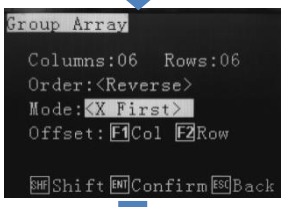
Press ENT twice.



Press ENT

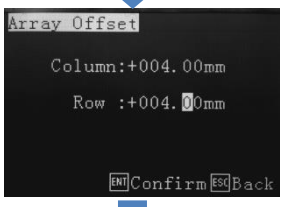






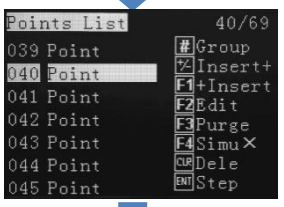
Input number of rows and columns. Order cannot be changed. Set "Mode" – dispensing direction.

Press either F1 or F2



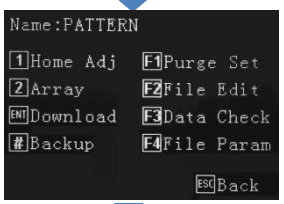
Input row and column distances.

Press ENT twice.

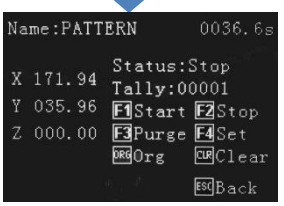


Continue editing or…

Press ESC twice.

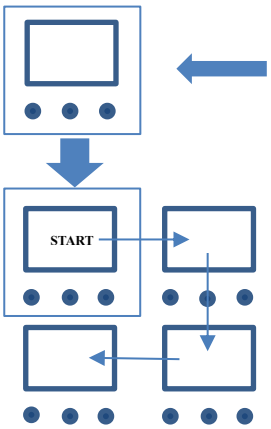


Press ENT to save.



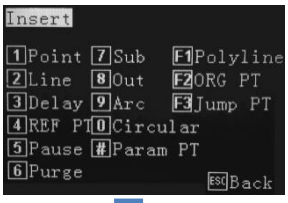
Press F1 to start.

9.21.6 Creating Array Pattern Inside the Points List – Pattern Element



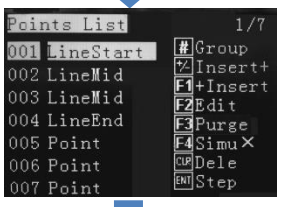
This is the pattern element to be created.

This is the 2 x 2 array to be created from the pattern element showing start position and "X" travel direction.



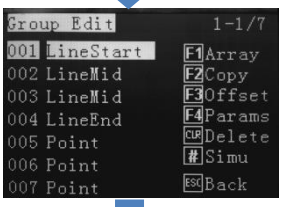
Reference Section 9.2
From the Insert screen, select option 1.

Create the pattern element.

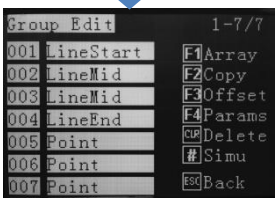


All co-ordinates are listed in the Points List.

Press #

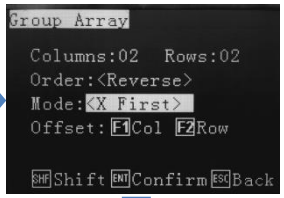


Use up/down arrow keys to select all co-ordinates.

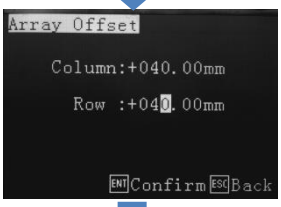


When all co-ordinates are selected press ENT

Press F1

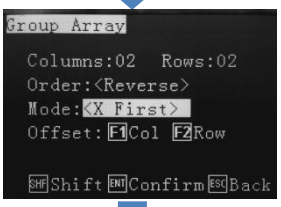


Input number of rows and columns. Order cannot be changed. Set "Mode" – dispensing direction.
Press either F1 or F2

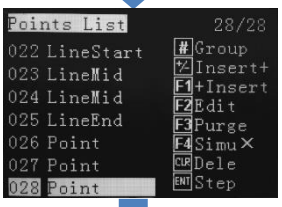


Input row and column distances.

Press ENT twice.

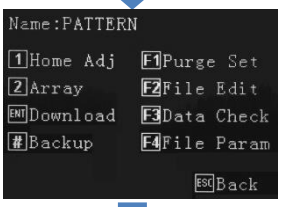


Press ENT

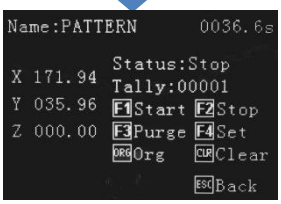


Continue editing or…

Press ESC twice.



Press ENT to save.

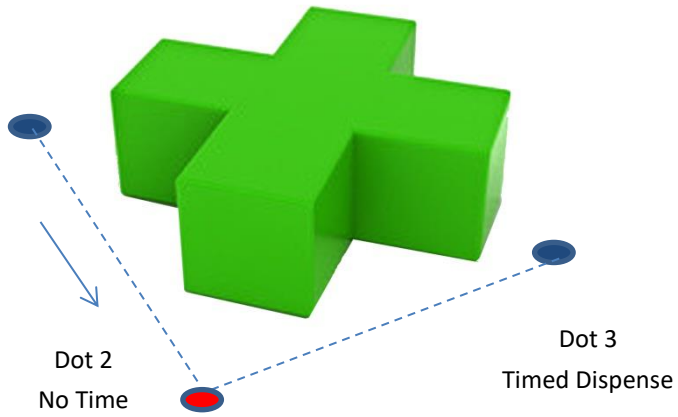


Press F1 to start.

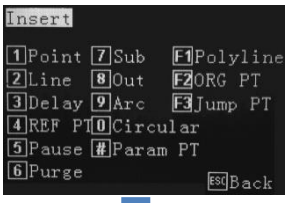
9.22 How to Move Around or Over a Tall Object

Option 1 – Move Around
Program "Points" around device.

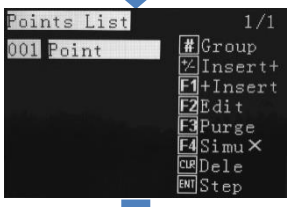
Option 2 – Move Over
Using "Lift" height to clear device height.



Option 1 – Move Around Device

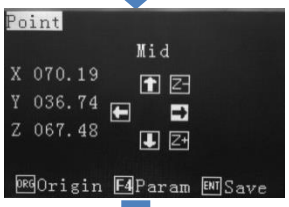


Reference Section 9.2
From the insert screen select option 1. Points will be used to create a movement, as well as dispensing co-ordinates.

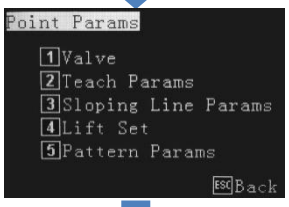


Insert Dot 1 (dispense), as per **9.12**.

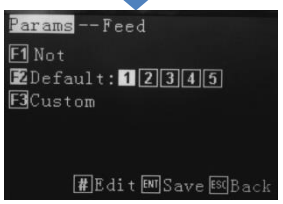
Press F2



Press F4

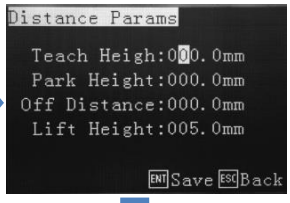


Press 2 – Teach Params

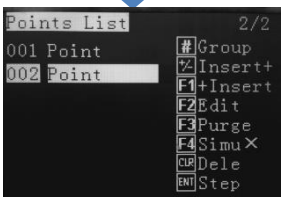


Up to 5 dispense times can be programmed and recalled. In this example Dot 1 and 3 will use slot 1. The movement Point will use the spare slot 5.

Press #

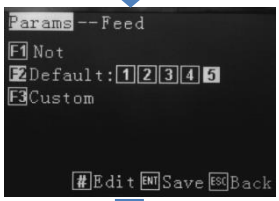


Input Feed on delay (dispense time), Retract Speed and Height for Dot 1.
Cycle through to the Points List by pressing ENT

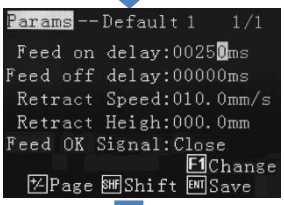


Insert move dot (Dot 2). Whilst in co-ordinate screen press "F4". Option 2 (Teach Params) allows the use of a spare Feed slot.

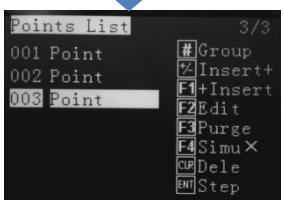
Note: dispense height of Dot 2 must be offset against the Dot 1 and 2 React Height so that Dot 2 passes through, without stopping and lowering at co-ordinate.



Press #



Input **0.0** time and **0.0** Retract Height - prevents valve from stopping at the Dot 2 thus creating the Move command. Cycle through to Points List by pressing ENTER.

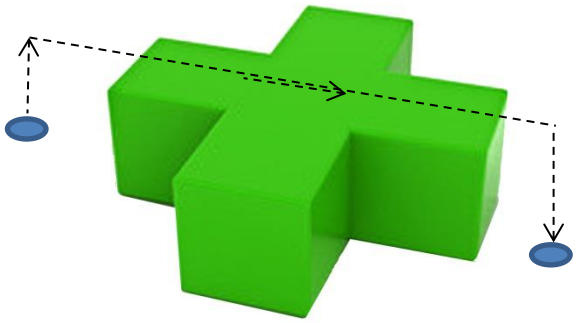


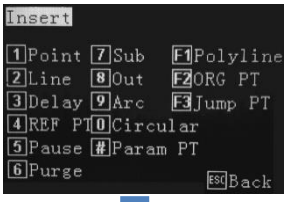
Repeat sequence for 003 Point (Dot 3). Use the same Feed slot as used for Dot 1 or antoher slot if dispense time is different.

Press F2 then F4

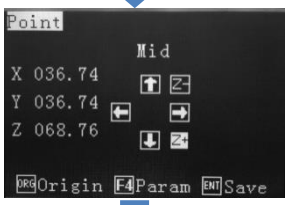
Contine to edit or download if complete

Option 2 – Move Over Device

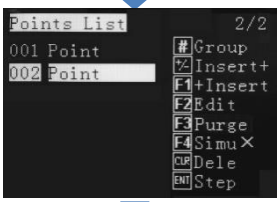




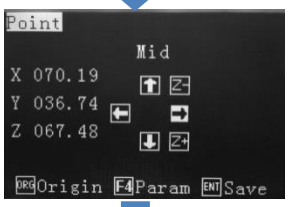
Reference Section 9.2
From the insert screen select option 1.



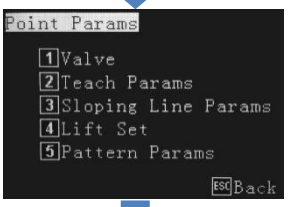
Create both points as per **Section 9.12**



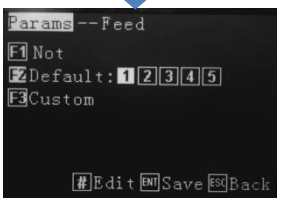
Press F2 to edit dot.



Press F4

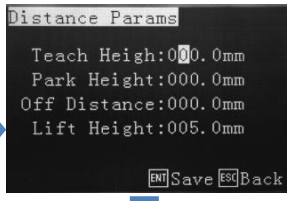


Press 2 – Teach Params

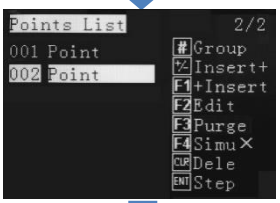


Up to 5 dispense times can be programmed and recalled. Dot 1 & 2 will use slot 1, in this example, meaning both dots will have the same dispense time.

Press #

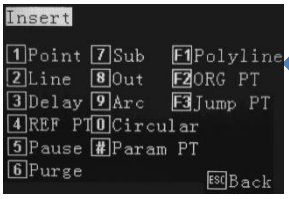


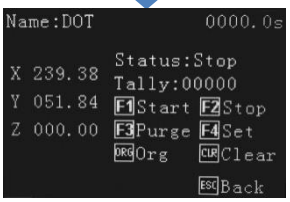
Set dispense time, for Dot 1 and/or, Retract Speed and Retract Height. **Ensure Retract Height is high enough to clear device.**



Repeat sequence for 002 Point (Dot 2). Feed slot 2 can be selected if the parameters are different, or continue to use Feed slot 1.

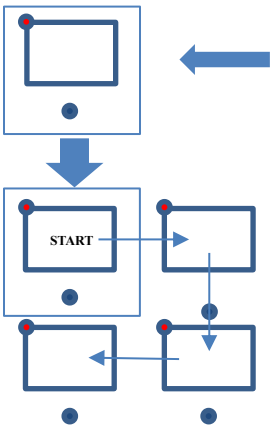
Either continue to insert patterns or press ESC twice to modify or download the program.





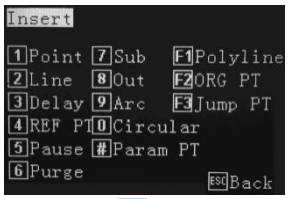
9.23 Copying and Pasting a Pattern

Copying and pasting a pattern saves the user a lot of time as only the first pattern element requires programming. Once the first element is created it can be copy and pasted as many times as required. Each individual co-ordinate will be listed in the programs Point List enabling further editing, if needed. Although the pattern can be jogged to the next pattern, it is better practice to input the true measurement using the numeric keys. User must ensure the base plate is level and true as there is is theta adjustment.



This is the pattern **element** to be created and should be written into the Points List.

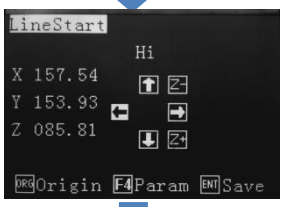
This is the full pattern to be created from the pattern element showing start position and travel direction. The red dot signifies the start location of each element.



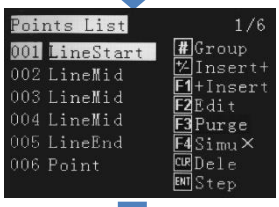
Reference section 9.2

From the Insert screen, create the very first element.

POLYLINE **9.18** + POINT **9.12**

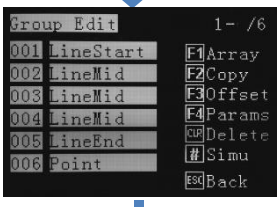


Continuing creating the pattern element.



All of Element 1's co-ordinates are listed in the Points List.

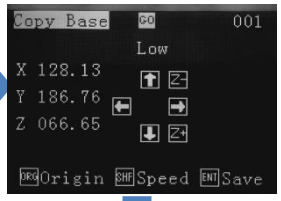
Press (Group) #



Use up/down arrow keys to select all co-ordinates of the first element.

Press ENT to confirm

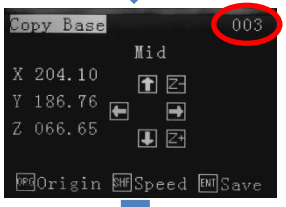
Press F2 to copy.



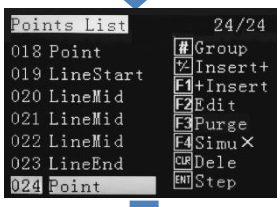
Press GO

Dispense tip will move to Element 1's (already created) start location, so does not need to be saved. Jog to each Element's start location.

Press ENT when reached ●

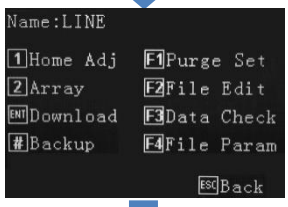


This image shows that the first 3 elements have been created. Continue until all elements are completed.

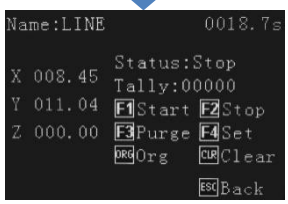


The Points list shows 24 co-ordinates – 4 Elements. When all Elements are completed…

Press ESC twice.



Press ENT to save.



Press F1 to start.

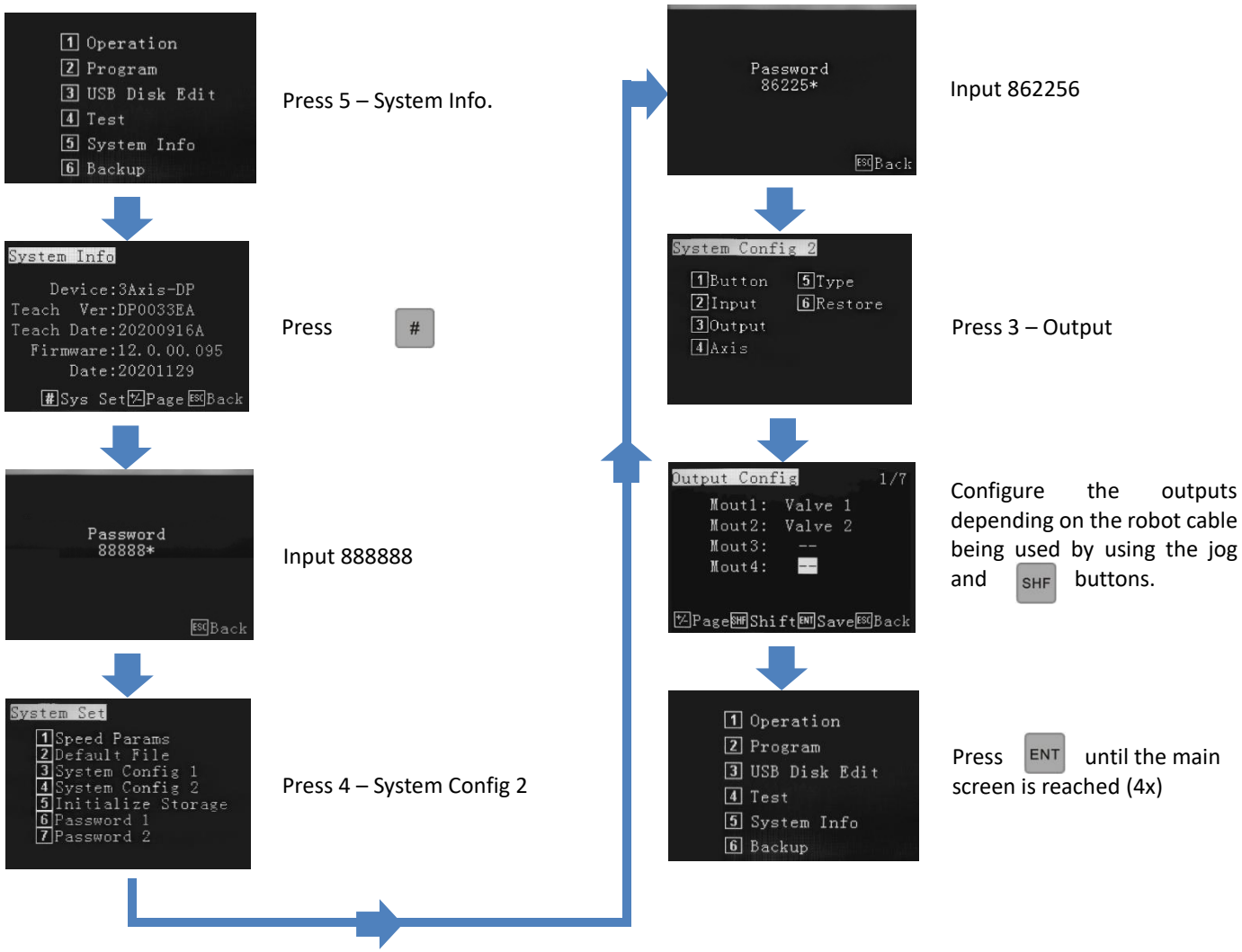
9.24 Operating up to 4 Dispensing Valves Simultaneously or Independently

The robot has the capability to operate up to 4 dispensing valves independently, by using an special interface cable. Each valve requires a separate controller to perform this function. Triggerering of each I/O signal is set in the editing screen. This example will demonstrate 2 valves dispensing different fluids, through 2 controllers, creating dots.

The robots back menu must be configured first and different cable ordered.

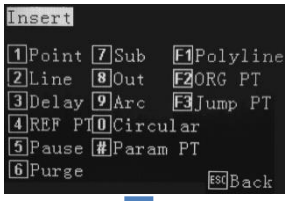
TSR-DVCABLE – Cable to activate independently 2 controllers/valves.
TSR-MVCABLE – Cable to activate independently 4 controllers/valves.
TSR-SDVCABLE – Cable to activate *simultansuouly* 2 controllers/valves.

Configuring the back menu

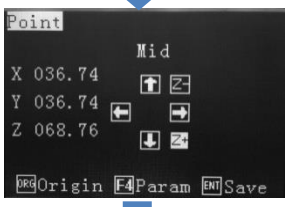


The system is now ready to operate multiple valves. Follow programming instructions on next page.

Attach a label to all equipment associated with Valve 1/Valve 2 (pressure tank, valve, controller, cables) for clear visual representation.

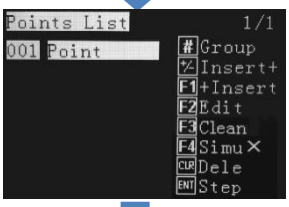


Reference Section 9.2 and 9.12
From the insert screen select option 1.



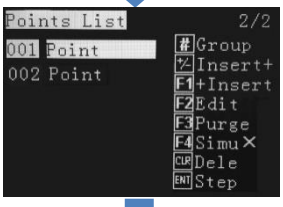
Move **Valve 1** to the dispensing location.

Press ENT



Press F1 and insert 2nd Point at **Valve 2** dispensing location.

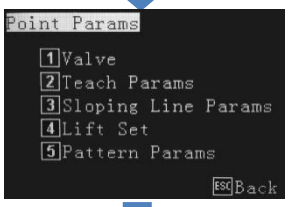
Press ENT



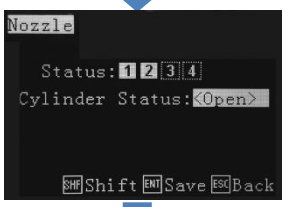
Both Points need to be edited. Highlight Point 1.

Press F2

Press F4

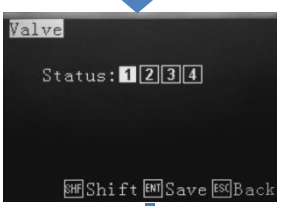


Press 1 - Valve



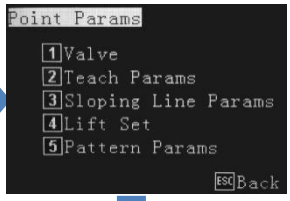
All outputs will become active that were set in the config screen and the user will need to switch on/off outputs.

3 Output Off
3 Output On

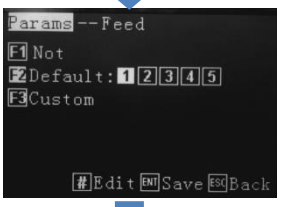


After switching off unused outputs:

Press
Press 2 – Teach Params.

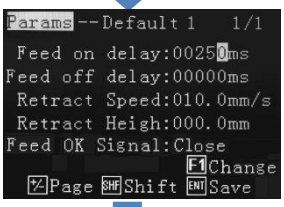


Press F2



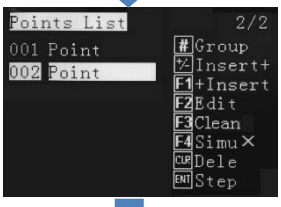
Select a Feed slot for dot 1. For this example slot 1 will be used.

Press #

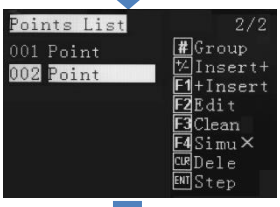


Input the dispensing time (Feed On Delay) for dot 1 along with Retract Speed and Height

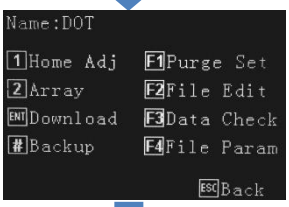
Press ENT until the Points List is shown (x4).



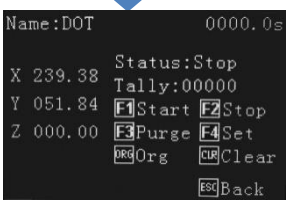
Repeat process above for Dot 2 by using Valve 2 and Feed slot 2 and setting a different Dispensing Time (Feed On Delay).



Press ESC twice



Press ENT to save.

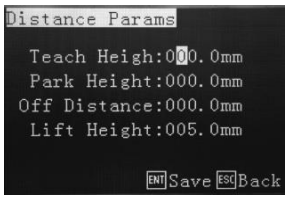


Press F1 to start.

9.25 Definition of Additional Programming Features

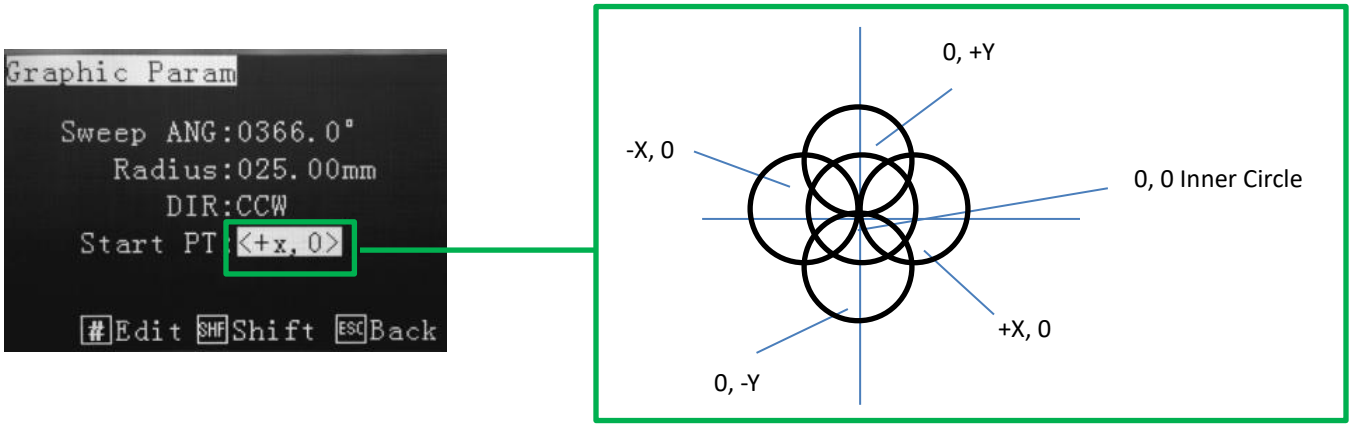
Dot Point – Feed on Delay

In the distance parameter screen, the Feed on Delay should only be used to set the dispensing time for a dot.



Circular – Start Point Definition

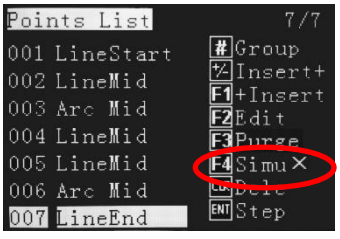
In the Graphic Parameter screen, whilst inputting circle dimensions, the Start Points are as follows, in relation the centre of the circle.



Program Step-Through

A simulated run can be performed within the points list, anytime throughout the program. Use the up/down jog keys to select where in the program the run is to be started. All co-ordinates will move at their programed speeds. To switch between Simu X and Simu **√** press F4

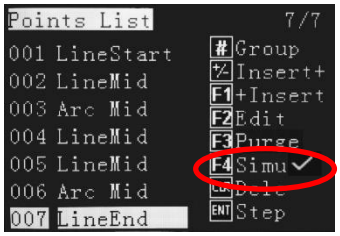
By pressing ENT the robot will move to the next location and waiti until ENT is pressed again.



Simu X Mode (dry run)

This mode will move to locations so the operator can verify the position and speed of the co-ordinates.

Editing can be performed by pressing F2 on a selected line.



Simu √ Mode (wet run)

This mode will move to locations, whilst dispensing, so the operator can verify the position, speed and dispense quality of the co-ordinates.

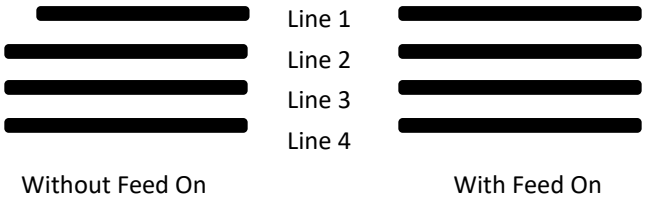
Editing can be performed by pressing F2 on a selected line.

9.26 Line Dispensing Adjustments

9.26.1 Valve Feed On Delay - Lines

When a dispensing valve has been stationary for a period of time, for example at the beginning of a dispensing program, there is a requirement for the initial dispensing to have a delay applied. This delay is usually small, such as 50-100ms, which allows the fluid to flow and adhere to the correct position at the start of the pattern. If no delay is applied, to the first dispensing location, the dispensing will be smaller than the rest or the start of the line will be without adhesive.

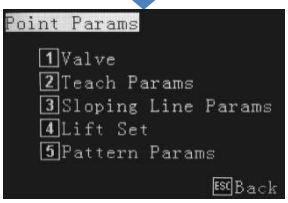
Example of line with and without feed on delay:



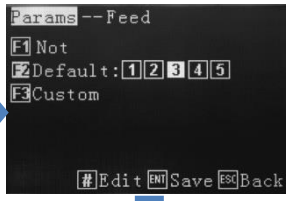
From the Line Start screen:

Press F4

To go to the Points Parameters screen.



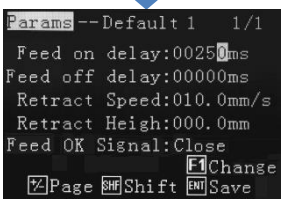
Press 2, to go to the Teach Parameters screen.



Press F2

Select an available Feed function, 1-5.

Press #



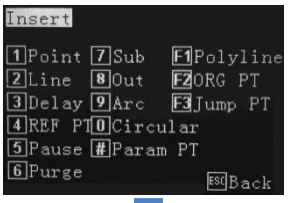
Input the Feed On delay time.

Press ENT until the Line Start screen is reached. Continue to program as normal.

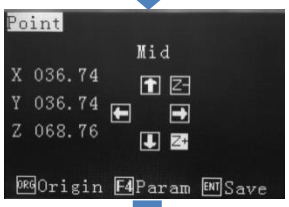
Up to 5 Feed On delay or 5 Feed Off delay times can be set per program. **Valve Feed Off Delay** is the time the robot will stay at the end of the dispensing location before moving to the next dispensing position. No fluid will be dispensed during to the Feed Off time period. Note that dots use a feed slot and could conflict will line start delay if the same slot is chosen for a dot and a line.

9.26.2 Valve Feed On Delay – Dots

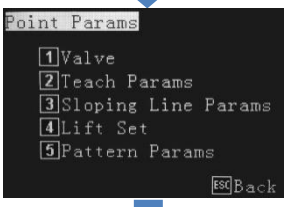
Feed on delay, for a dot, sets the dot dispensing time. Up to 5 dots sizes, set by time in ms, can be inputted per program. Feed Off delay times can be set also. **Valve Feed Off Delay** is the time the robot will stay at the end of the dispensing location before moving to the next dispensing position. No fluid will be dispensed during the Feed Off Delayt period.



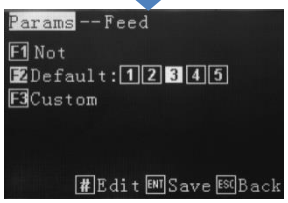
Reference sections 9.2 and 9.12
From the Insert screen, select option 1, for a point.



Move to the dots first location and press F4

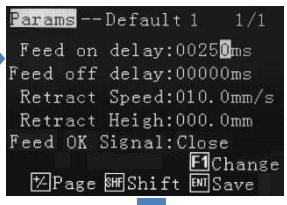


Press 2 - Teach Params



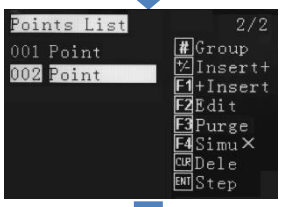
Press F2 to select an available "Feed On" function: 1-5. For a new program all 5 functions are available.

Press #

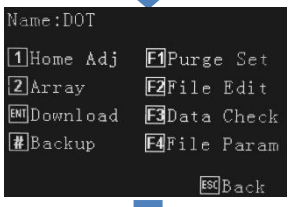


Input the dot dispensing time.

Press ENT 4 times to save location and return to the Points List.

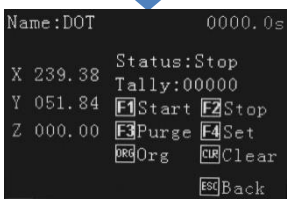


Repeat the process for additional dots, either selecting the same Feed On function or selecting a new one and inputting a different time.



File Parameters can be changed using F4

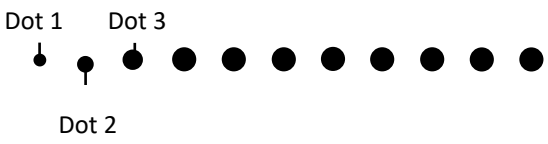
Or press ENT to save.



F1 starts the cycle.

It is common, when dispensing dots, to see that the first few dots, of a new program, are smaller than the rest, if all dots are programmed with the same dispensing time. This is due to the fluid being stationary, within the syringe or pressure tank, whilst the valve is idle. The above process can be used to program the few dots slightly longer in time to compensate but it is also common practice to dispense 2-3 test dots somewhere outside of the working area, to get the fluid moving at a normal pace.

Dots 1 -3 require more dispensing time (Feed On Delay) to achieve the same volume as the other dots, in the program.

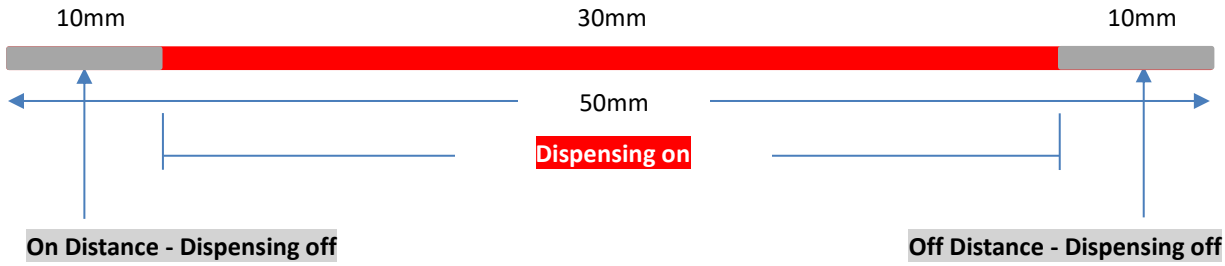


9.26.3 On/Off Distance

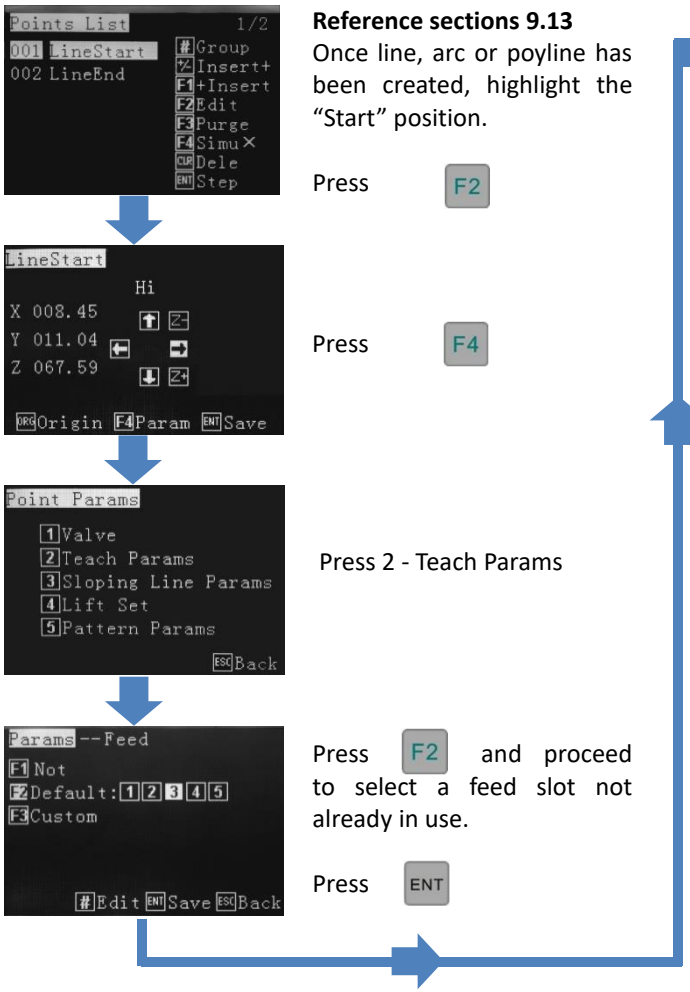
On Distance* - the robot will move for a set distance before the valve starts dispensing a line, polyline or arc.
Off Distance – the robot will move for a set distance after the valve stops dispensing a line, polyline or arc.

*On Distance status is automatically turned off and will need to be enabled when required.

This feature helps to blend in the start/end of a polyline (gasket) as well as eliminating fluid retraction tails.



The example below is to create the on/off distances for the illustration above. The operator must be aware that the on/off distances inputted are subtracted from the programmed dispensing line distance. If the dispensing line is programmed 50mm total and the On and/or Off Distance/s are programmed both to 10mm then the actual dispensing distance will be 30mm. The dispense tip will retract after the Off Distance has been completed.



Reference sections 9.13
Once line, arc or poyline has been created, highlight the "Start" position.

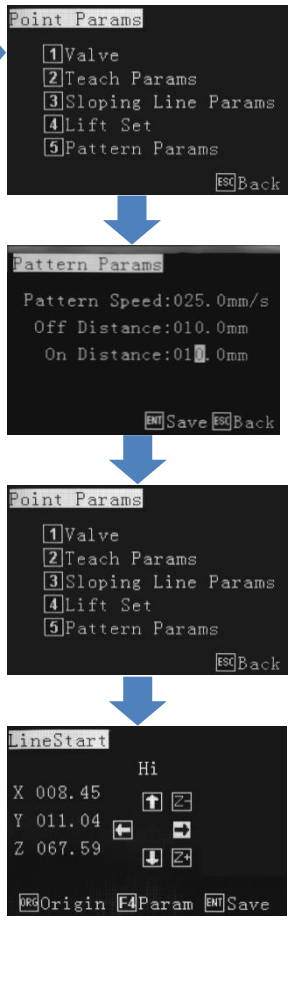
Press F2

Press F4

Press 2 - Teach Params

Press F2 and proceed to select a feed slot not already in use.

Press ENT



Press 5

Input On/Off distances

Press ENT

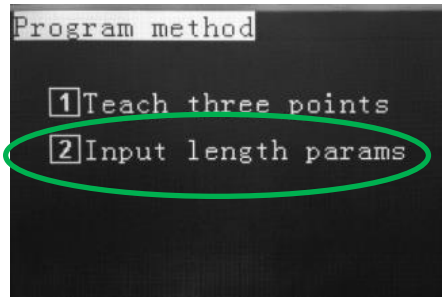
Press ENT

Press ENT

Continue, programming, editing or proceed to download.

On Distance - Circles

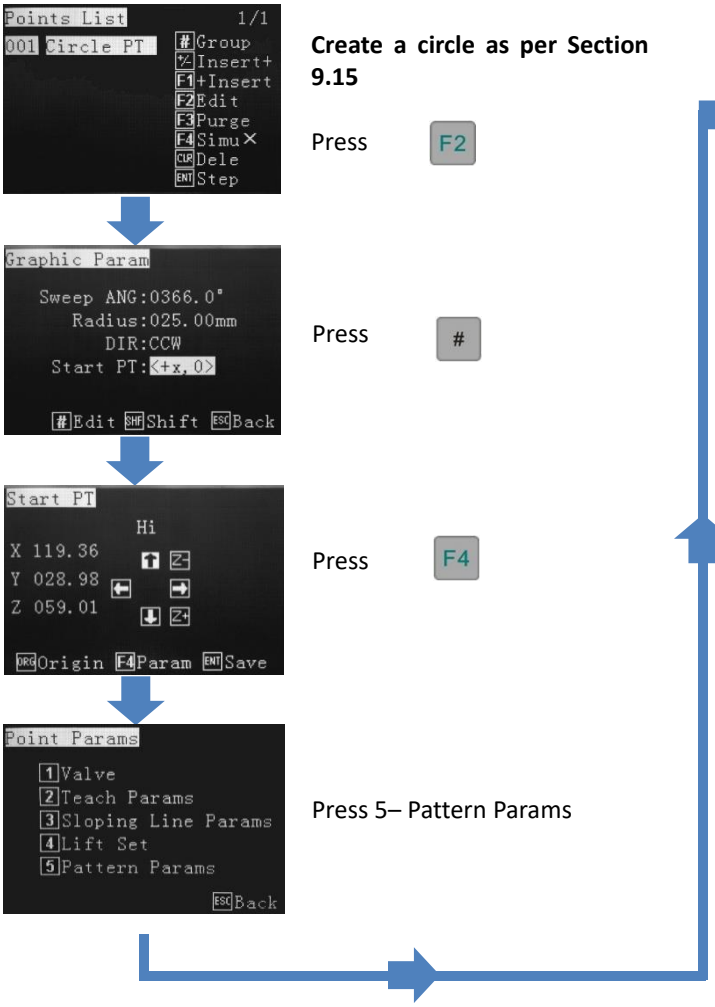
On Distance automatically shows when selecting option 2, during circle creation.



On Distance - the robot will move for a set distance before the valve starts dispensing the circle.

Off Distance – the robot will move for a set distance after the valve stops dispensing.

This feature helps to blend in the start/end of circle as well as eliminating fluid retraction tails.



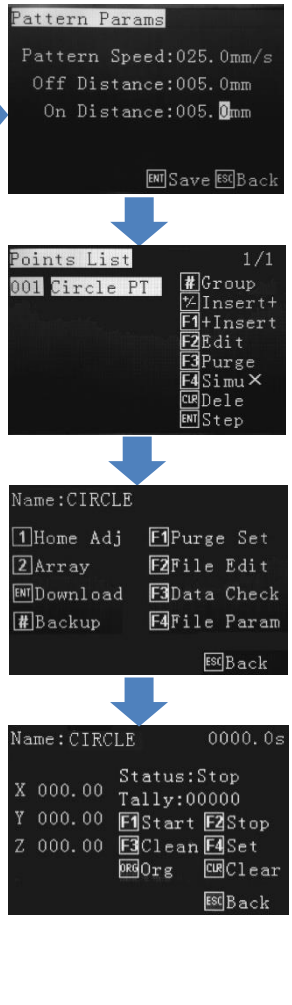
Create a circle as per Section 9.15

Press F2

Press #

Press F4

Press 5– Pattern Params



Change circle Speed
Set Off Distance, if required
Set On Distance, if required

Press ENT until taken back to the to get to Points List

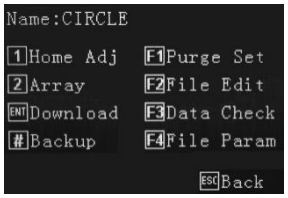
Press ESC twice.

Press ENT to save.

Press F1 to start.

Note: If the pattern is 50mm in length and a 5mm On and Off Distance is set, the actual pattern will be 40mm (**50mm – 5mm On – 5mm Off = 40mm**). On/Off Distances should be added to the pattern length during programming or during editing.

10. PROGRAM PROCESSING MENU



The Program Processing Menu screen is displayed before the program is written and again after the program co-ordinates are written and prior to Download.

press F4

1 -Home Adjust - described through Section 8.

2 -Array – described through Section 9.21.

ENT - Download - pressed once the program is written and will save a copy to the robot's and pendant's memory.

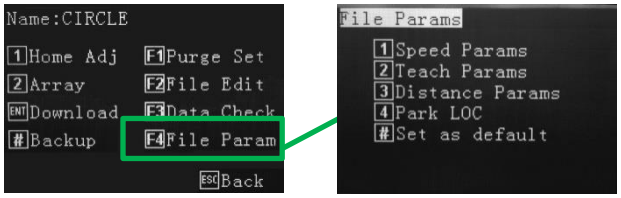
- Backup – described in Section 7.

F1 - Purge Set – future development.

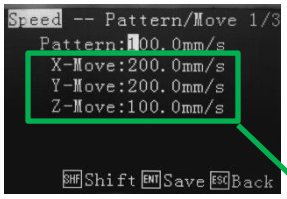
F2 - File Edit – creating or editing a file. Described in Sections 9.2 and 9.9.

F3 – Data Check – checks or co-ordinates are within the working area of the robot.

F4 - File Parameters – specific speed/movement program defaults, park position, distance parameters.

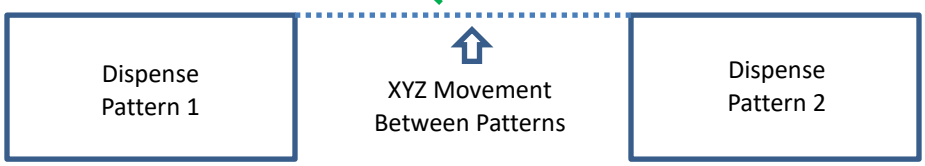


10.1 Speed Parameters:

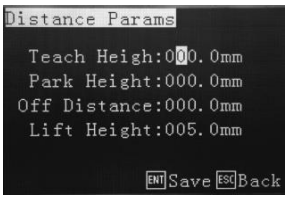


A change to the "Pattern" will apply this speed to all lines, polylines, circle and arcs, contained within the program. Individual speed changes can be changed by editing the program and selecting the co-ordinate (Line 1, Line 2), to edit.

Acceleration speeds can be changed by pressing SHF

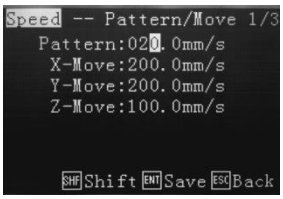


10.2 Teach Parameters:



The feed on delay relates the dispensing time for a dot. Feed off delay is the time the dispensing valve will stay at the end of the dispensing co-ordinate not dispensing, before moving to the next co-ordinate. Retract Speed is the speed of the tip retracting after a finished cycle and Retract height is the height the tip move up to after the dispensing of each position is complete, before moving to the next dispense location.

10.3 Distance Parameters:



Teach Height – during program it is usually set to 000.0, the height from moving from one point to the next is the Teach Height.
Park Height – when program is completed the Z-axis will lift to a safety height. If no co-ordinate is set the Z-axis will lift to 0 co-ordinate and back to finishing point. Before processing, the z-axis will also move to this safety point.
Off Distance – the distance at which the valve will stop dispensing **before** the finish point. Normally used when joining one line to another for a clean finish.
Lift Height – the distance the z axis will move up after a dispense cycle.
Refer to section 9.2 - Understanding Lift Height and Retract Height

Note:
Lift height = Z-retract Height, the default lift height is 5mm and can be changed in the "Distance Params" menu. The "Lift Speed" is the same speed as the Z-speed, and cannot be changed.

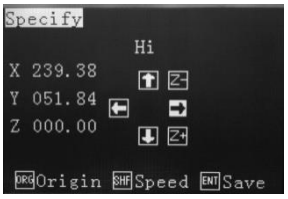
Retract height = Z-retract Height, no default setting. It can be changed in the "Teach Params" menu. The "Retract Speed" also can be set in the same menu.

If the Retract height is bigger than the lift height then the Z-retract speed will override the lift height speed.

If the Retract height is less than the lift height then the Z-retract speed will apply to the retract height first.

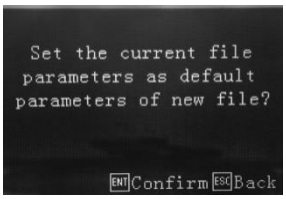
10.4 Park Location:

The Park Location is the position the dispensing tip should move to once the program has completed. For the tip to move the Start, End or Origin location, the operator must select option 1, 2 or 3. The operator to program a Specific Point, which is anywhere within the robots working area by using the same programming method used to create a dot. The operator can also choose to Go to next file be selecting option 5. This will display a File List and the next program to follow can be selected from the List. The selected next file will start dispensing once the original program has been completed.



When selecting Specify, the display requires a position anywhere in the robots working area to be selected. At the end of the dispensing program the tip will move to this specified location.

10.5 # Set as Default:



By applying this option all speeds, delay times, lift heights dot dispensing time, etc, will be applied to all new programs being created.

11. SET MENU

This display is shown once a program has been download. In the Set Menu the following can be achieved:

- Run the program by pressing 

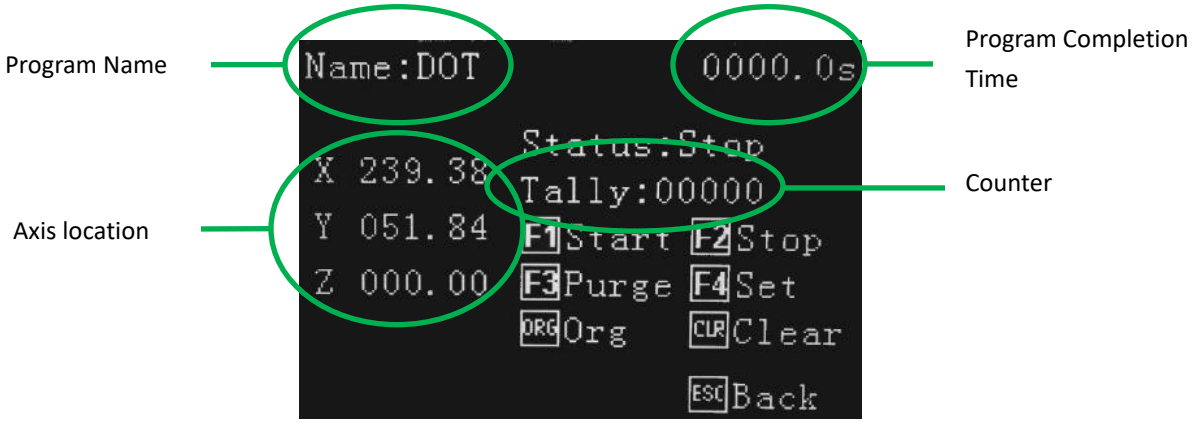
- Stop the program by pressing 

- Perform a Purge function by pressing (separate function) 

- Set up a Looping sequence by pressing 

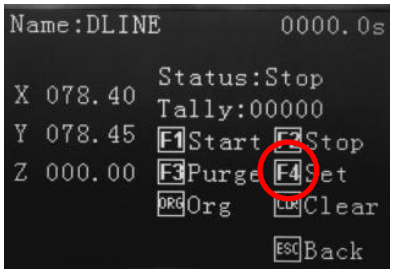
- Go to Origin location by pressing 

- Reset the program counter (Tally) by pressing 

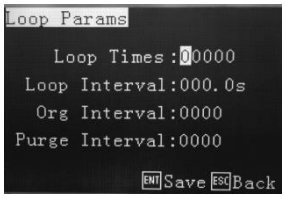


11.1 How to Set a Program to Run in a Loop

From the Program Processing Menu, which is displayed after the program has been saved,downloaded or selected, from the the Operation Menu, the following screen will be displayed.



Press F4



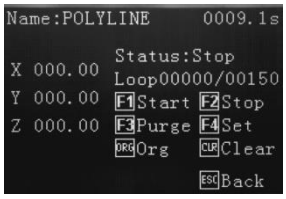
Set how many times the program is to loop. Set the time delay, which is the wait time between each repeated cycle.

Set the Origin Interval - the number of times the program will return to Origin.

Set the Purge Interval – the number of times the program performs a Purge function.

Note: The Loop, Origin and Purge functions cannot be saved as part of the program and must be set each time the robot is turned off or another program is selected.

Press ENT

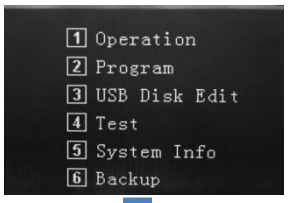


The display now shows the loop counter, ready to start. Press F1 to start the looped program.

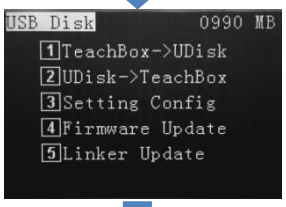
12. FILE TRANSFER

12.1 How to Transfer Program to USB Stick

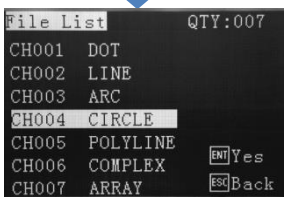
This feature is particularly useful if more than 1 robot exists at a facility and are both running the same program. By copying the program, from 1 robot to another, will save the operator time by not having to duplicate the programming. **Use 2GB or lower USB.**



Insert USB stick into teach pendant. Press 3 to go to USB menu.



Press 1.



Select program to transfer from Teach Box to USB Stick.

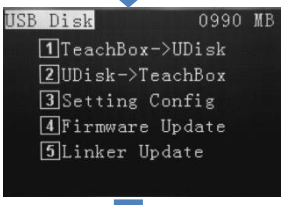
Press ENT

Continue transferring files, as above, if required.

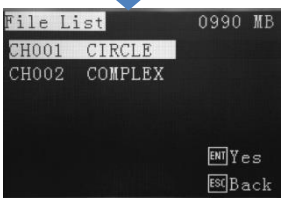
Press ESC twice to return to main menu.

12.2 How to Transfer Program from USB Stick

Press 3



Press 2



Select the program, stored on the USB stick.

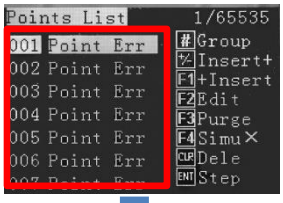
Press ENT

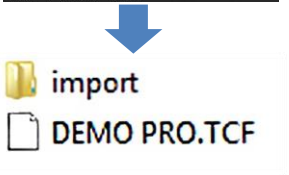
Continue transferring files, as above, if required.

Press ESC twice to go back to main menu.

An error message will be displayed if the program selected has the same name as on the robot it is transferred to. Rename the program being transferred, using the alphanumeric keypad.

Press ESC twice to return to the main menu.





For a variety of reasons, a conflict could occur, showing errors on the receiving teach pendant. In these cases the USB stick is required to have an empty “import” folder created, for successful importation. Transfer the program to the USB stick, then add the import folder from a standard computer. The receiving teach pendant will now be able to read the program.

13. TROUBLESHOOTING

LCD is displaying "Please Reset"

1 – the emergency switch has been engaged.
- Check emergency switch and if engaged release to working condition.

2 – the communication cable is not connected fully.
- Check communication cable is correctly fitted and tightened.

3 – the "Stop" button on the teaching pendent has been pressed.
- Press "ORG" to reset the robot's positioning.

4 – the teaching pendent has developed a fault.
- Contact Techcon Systems.

Displaying unusual message after power up

1 – The hardware version is not correct.
- Check the version of teaching pendant and PCB.

2 – The teaching pendant cables may have become loose or damaged.
- If the teaching pendant cannot communicate normally, or the display is a little dark, disconnect the power supply and then disconnect and reconnect the teaching pendant.
  DO NOT DISCONNECT THE TEACHING PENDANT WHILST THE POWER IS ON.

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