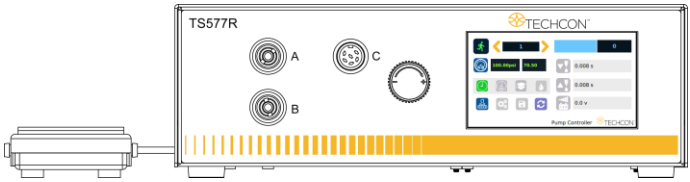
TS577R SMART CONTROLLER FOR AUGER VALVES

User Guide



CONTENTS

1. SAFETY

1.1 Intended Use:

WARNING: Use of this equipment in ways other than those described in this User Guide may result in injury to persons or damage to property. Use this equipment only as described in this User Guide.

OK International cannot be responsible for injuries or damages resulting from unintended applications of its equipment. Unintended uses may result form taking the following actions:

- Making changes to equipment that has not been recommended in the User Guide
- Using incompatible or damaged replacement parts
- Using unapproved accessories or auxiliary equipment

1.2 Safety Precautions:

- Do not operate this unit in excess of maximum ratings/settings
- Always wear appropriate personal protective clothing or apparel
- The fluid being dispensed may be toxic and/or hazardous. Refer to Material Safety Data Sheet for proper handling and safety precautions
- Do not smoke or use open flame when flammable materials are being dispensed
- This equipment is for indoor use only

2. SYMBOL DEFINITIONS

Symbol	Description	Symbol	Description
	Run (Activate)		Setup
	Input Pressure		Counter reset
	Pressure Port A&B		Firmware Upgrade
	Timed mode		Accept change
	Interrupt mode		Pressure calibration
	Teach mode		Save
	Purge mode		Reset time in Teach mode
	Dispense		IP address
	Reverse (suck back)		Cancel/exit
	Run Method		Sequence Mode
	Continous Mode		Sequence Continous Mode
	E-Stop		Change Password
	Remote Server		Input Voltage
	Login/Logout		Controller type
	Controller Mode		Robot Mode

3. SPECIFICATIONS

Size	290mm x 212mm x 98mm (11.4” X 8.3” X 3.9”)
Weight	2.98 kg (6.6lbs)
Input Voltage	24VDC
Output Voltage Range	0-24 VDC
Rated Power	15W
Air Input	100 psi (6.9 bars) Max.
Air Output	0-99.9 Psi (6.9 bar)
Pollution Degree	II
Installation Category	I
Indoor Use	Altitude up to 2,000m (6,562ft)
Operating Temperature	0˚C to 50˚C (32˚F to 122˚F)
Storage Temperature	-10˚C to 60˚C (14˚F to 140˚F)
Max. Relative Humidity	80% for temperature up to 31˚C (87.8˚F) Decreasing linearly to 50% relative humidity at 40˚C (104˚F)
Timer	0.008-99.99 seconds
Cycle Mode	Timed, Interrupt, Teach, Purge
Timing Repeat Tolerance	+/- 0.001%
Cycle Rate	900 cycles/min
Display	Touch Screen, Resitive
Meets or exceed	CE, TUV and NRTL

4. FEATURES

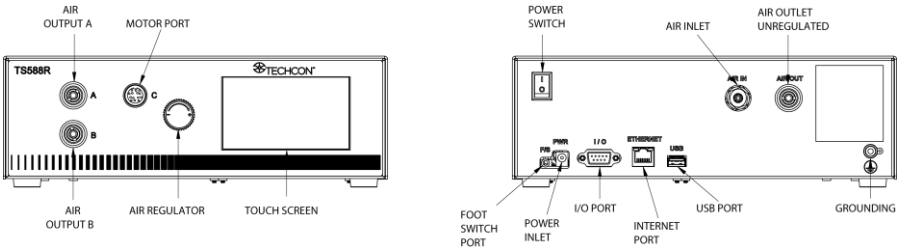


Figure 1.0

5. TO CONTROL AUGER VALVE

CAUTION: A 5-micron filter (TSD800-6) must be installed with the unit to ensure proper air filtration.

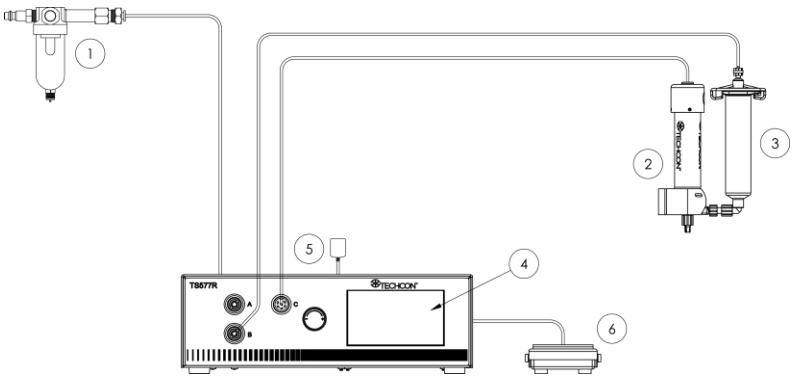


Figure 2.0

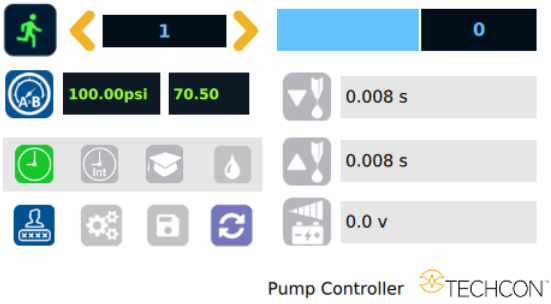
Items	Description
1	Air Filter
2	Valve (not included)
3	Syringe of material (not included)
4	Display
5	Power Adapter
6	Foot Switch

5.1 Connecting the Unit: (Refer to Figure 1.0 and 2.0)

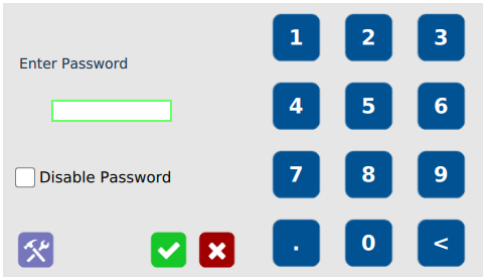
1. Connect the power cord, foot switch to the back of the unit.
2. Connect Valve air hose to Port B
3. Touch the Power switch to turn on the unit.

5.1.1 Login

1. Touch the Login icon to enter the login screen 



2. Enter “0000” in Password window



3. Touch the Check Mark icon to save and exit 

5.1.2 Pressure Calibration

Note: Pressure calibration must be performed when the unit is activated for the first time.

1. Using a pressure gauge, verify that the input pressure line is delivering approximately 100 psi

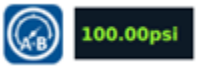
Note: If input pressure is not 100 psi, calibration will result in a mismatch between the display pressure and the actual pressure on output port A.B

2. Once you have verified input pressure, touch the Calibration icon to enter calibration screen.

3. Turn pressure adjustment knob counterclockwise until the wheel can no longer be turned.

4. Touch the 0 icon to set the pressure to 0

5. Turn pressure adjustment knob clockwise until display output pressure is 100 psi



6. Touch the 100 icon to set the pressure to 100

Warning: Do not turn knob all the way clockwise. 100 psi upper bound should be set as soon as display output pressure goes from 99 to 100 psi. Continuing to turn knob clockwise despite pressure on display already being set at 100psi will result in incorrect output pressure readings if the 100 icon were to be pressed at that time.

Note: The digital values shown at "0" and "100" icons are for reference only. The actual calibrated values will be different

7. Touch the Reboot icon to save the settings and reboot the system 

8. Wait until the system completes the rebooting sequence and the home screen is displayed

The unit's pneumatic system is now calibrated and ready to operate

5.2 Setup for Auger Valve without Encoder Motor

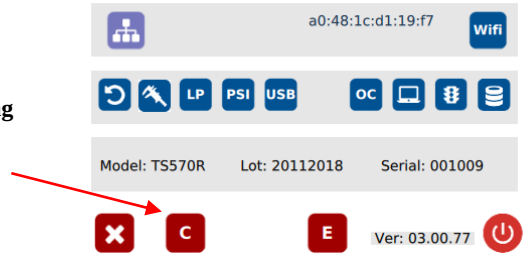
5.2.1 Seclect Controlling Mode

The TS570R can be used as a stand-alone controller or can be integrated to any robotic systems.

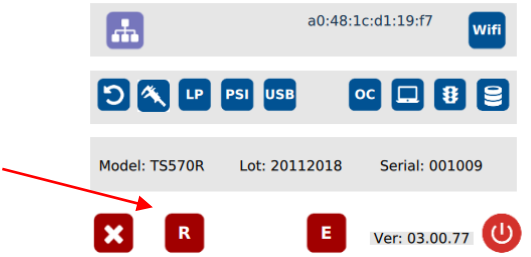
A. To use as stand-alone controller:
Go to setup screen to check for controlling mode. If the icon “C” is showing, then it is already set as stand-alone controlling mode. If the icon “R” is showing, press this icon to change to “C”

B. To use as integrated controller to robot/automation:
Press icon “C” to change to “R”

Stand-alone controlling mode



Robot mode (integrate to robotic system)



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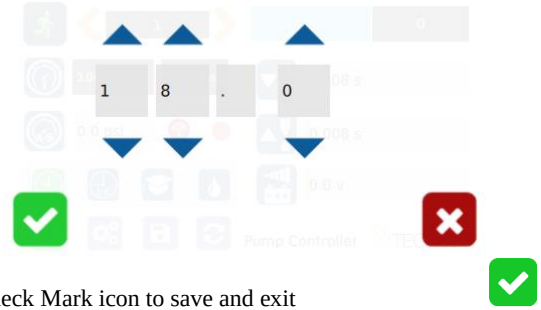
5.2.2 Voltage Input Adjustment

Note: Input voltage controls the motor speed (RPM). Higher input voltage will increase motor speed and vice versa lower input voltage will decrease motor speed. Recommended input voltage range is 5-24VDC.

1. Touch the Input Voltage Icon to enter the setup screen 

2. Touch the Up and Down arrows to set the desired input voltage. Maximum input voltage is 24VDC.

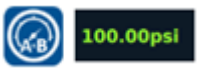


3. Touch the Check Mark icon to save and exit

5.2.3 Pressure Adjustment

Note: Pressure on port A is a contanst pressure.
Pressure on port B is synchronized with the motor signal. It only turns on when the dispense cycle is activated.

1. Output pressure on Port A and B wil be displayed in the following window:



Pressure to port A.B can be adjusted from 0 to 100 psi by rotating the pressure adjustment knob.

2. Rotate the adjustment knob in the counterclockwise direction to descrease output pressure.
3. Rotate the adjustment knob in the clockwise direction to increase output pressure.

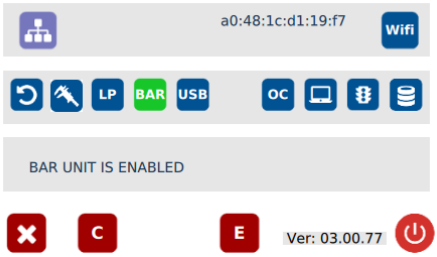
Note: To ensure output pressure to A.B matches manual pressure adjustments, please make sure pressure calibration Section 5.1.2 has been completed.

5.2.4 To Change Pressure Unit Display

Note: The default pressure unit is PSI. To change pressure unit to BAR, follow the instructions below.

1. Touch the Setup icon to enter the setup screen 

2. Touch the "BAR" icon to change pressure unit to BAR 



3. Touch the X icon to save and exit

5.2.5 Manual/Purge Dispense Cycle Setting:

1. Touch the Purge icon to select purge cycle. The Purge icon will turn to green color. 

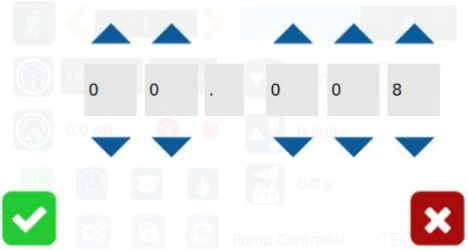
2. Press and hold down the foot switch to activate the purge dispense cycle. Alternately, touch and hold the Run icon on the display to activate the purge dispense cycle. 

5.2.6 Automatic Dispense Cycle Setting:

1. Touch the "Timed" mode icon to set the dispense time. The icon will turn to green color. 

2. Touch the "Dispense" icon to enter the setup screen 

3. Touch the Up and Down arrows to set the desired dispense time



4. Touch the Check Mark icon to save and exit 

Note: if suck back is needed, touch the "Reverse" icon to setup motor reverse time 

5. Press the foot switch to activate the "Timed" dispense cycle. Alternately, touch the Run icon to activate the "Timed" dispense cycle.

Note: The unit has an "Interrupt" mode feature. In this mode, the "Timed" dispense cycle can be disrupted if the foot switch is released and resumed when the foot switch is depressed again.

6. Touch the "Interrupt" icon to activate "Interrupt" mode. The icon will turn to green color. 

5.2.7 Teach Mode Setting

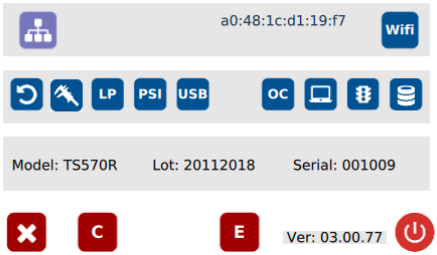
In the teach mode, the dispense time will be accumulated as long as the foot switch is depressed. This is helpful in determining the required dispense time when dispense output is known.

1. Touch the "Teach" icon to enter the teach mode 
2. Touch the "Time Reset" icon to set timer to zero 
3. Press and hold down the foot switch, the dispense time will be accumulated
4. Release the foot switch when the desired amount of fluid has dispensed
5. Touch the "Timed" icon to transfer the dispense time to "Timed" mode
6. The unit is now set to repeat this "Timed" cycle

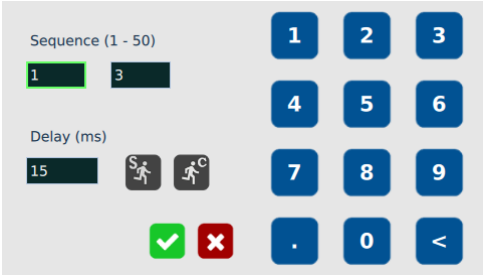
5.2.8 To run in Continous Mode

The controller can be setup to repeat the run continuously.

1. Touch the Setup icon to enter the setup screen 

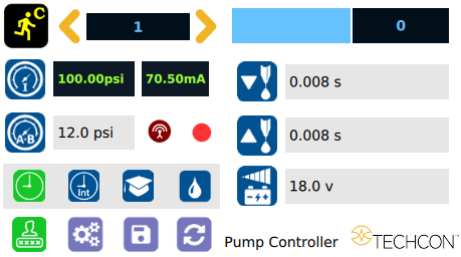


2. Touch the “Run Method” icon 



3. Enter the delay time (ex. 5000 ms)
4. Touch the “Countinous Run” icon 
5. Touch the Check Mark icon to save and exit 

The screen will look similarly to the screen below:



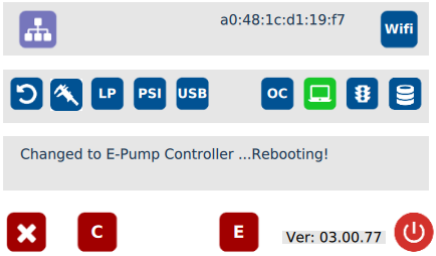
Note: If the controller is set to activate memory cell 1 and the delay time is set at 5000 ms, the controller will activate memory 1 contiuously with 5000 ms delay between each activation.

5.3 Setup for Auger Valve with Encoder Motor

Procedure to control encoder motor valve is very similar to non-encoder valve. The dispense cycle of encoder motor valve is controlled mainly through encoder counts.

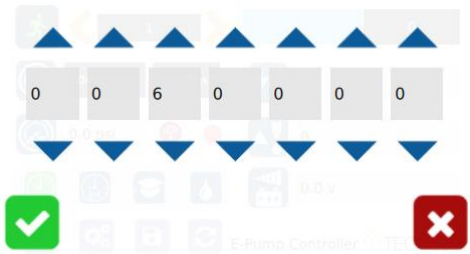
1. Touch the Setup icon to enter the setup screen 

2. Touch the Controller type icon to switch to Encoder controller "E-Pump Controller" 



3. Touch the X icon to save and exit 

4. Touch the Dispense icon to enter the setup screen 



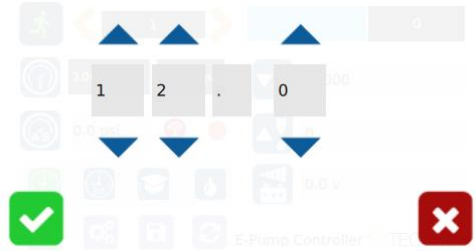
5. Touch the Up or Down arrows to set the dispense encoder count

Note: if suck back is needed, touch the "Reverse" icon to setup motor reverse encoder count 

6. Touch the Check Mark icon to save and exit 

7. Select desired dispense mode to continue (Timed, Interrupt, Teach or Purge)

8. Touch the Voltage icon to set voltage 



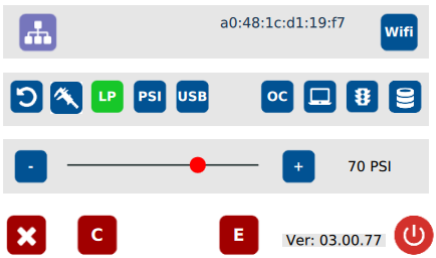
9. Touch the Up or Down arrows to set input voltage
10. Touch the Check Mark icon to save and exit 

5.4 Low Pressure Alarm Setting

Note: This controller is equipped with an adjustable "Low Pressure" alarm function. If the set pressure dropped below the "Low Pressure" setting, the controller will not activate. The "Low Pressure" setting is pre-set at the factory to 70 psi (4.8 bars). When the supplied pressure drops below 70 psi (4.8 bars) the unit will not function. The "Low Pressure" setting can be adjusted. Follow instruction below:

1. Touch the Setup icon to enter setup screen 

2. Touch the Low Pressure (LP) icon to set the desired low pressure 



3. Slide the pressure scale to set the desired low pressure threashold
4. Touch the X icon to save and exit 

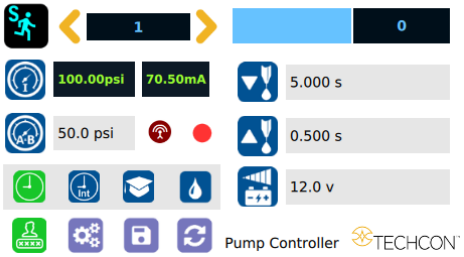
5.5 Stored Program in Memory cell

The unit has 50 memory cells to store all dispense parameters. The controller can activate all memory cells in sequence mode.

5.5.1 To Store dispense parameters

1. Touch the forward or backward arrow to select desired memory cell.

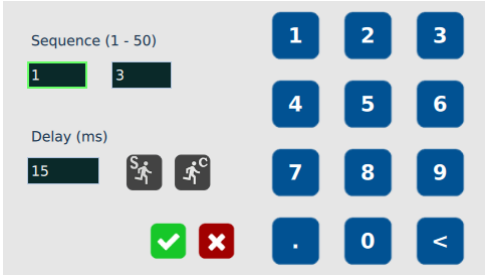
2. Enter all desired dispense parameters then touch the “Save” icon to save the data.



5.5.2 To run in Single Sequence Mode

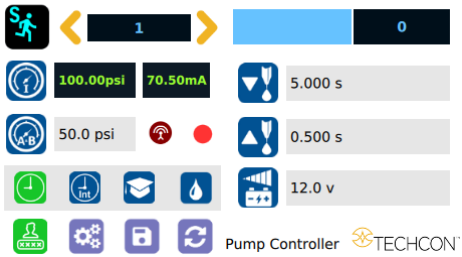
1. Touch the Setup icon to enter the setup screen

2. Touch the Run Method icon



3. Enter number of memories to be run in sequence (ex. 1 to 3)
4. Touch the “Sequence Mode” icon 
5. Touch the Check Mark icon to save and exit 

The screen will look similarly to the screen below:



Notes:

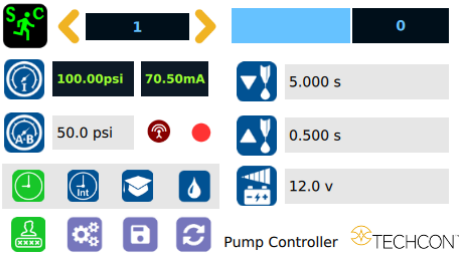
A. If there is no delay time entered in the setting, the operator has to press the foot switch or touch the Run icon after each memory cell is completed to activate the next memory cell.

B. If delay time is entered in the setting, the controller will activate the next memory cell in sequence automatically.

5.5.3 To run in Continuous Sequence Mode

1. Follow step 1 to 2 above then enter the waiting time “delay time” between each activation.
2. Touch the “Sequence Mode” icon 
3. Touch the “Continuous Mode” icon 
4. Touch the Check Mark icon to save 
5. Touch the X icon to exit 

The screen will look similarly to the screen below:



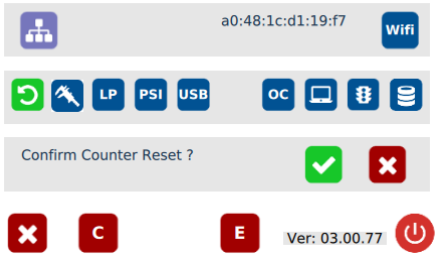
Note: If the sequence mode is set to activate memory cell 1 – 3, and the delay time is set at 5000 ms, the controller will activate memory 1 to 3 continuously with 5000 ms delay between each activation.

5.6 Cycle Counter

The cycle counter records the numbers of automatic dispense cycle being activated. Up to 999,999 cycles can be recorded. To reset the counter, follow steps below:

1. Touch the Setup icon to enter setup screen 

2. Touch the Counter Reset icon to reset counter 

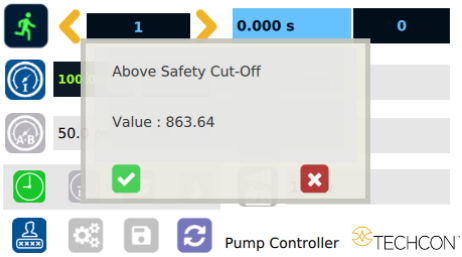


3. Touch the Check Mark icon to confirm 

4. Touch the X icon to exit 

5.7 Over Current Protection

This controller is equipped with the over current protection for motor. If the motor current is over 400 mA, the "Over Current Detected" message will apprear on the screen and the unit will be disabled.



When this issue happened, check the valve to for clogging. Clean the valve thoroughtly if necessary.

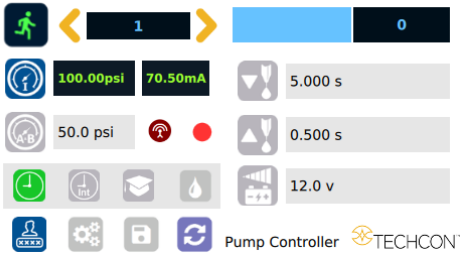
If after the valve has been cleaned and the over current is still occurred, then it is time to replace the motor.

Touch the X icon  to clear the over current message and reset the unit.

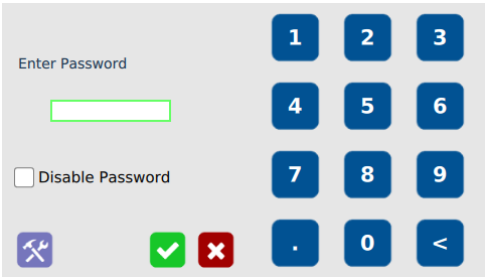
5.8 To Change Password

Note: The default password is "0000". To change password, follow the instructions below.

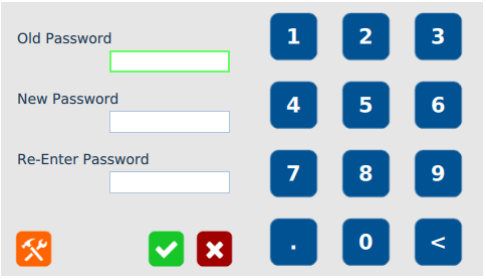
1. Touch the Login icon to enter the login screen 



2. Touch the change "Password" icon



3. Enter the old password, then enter the new password



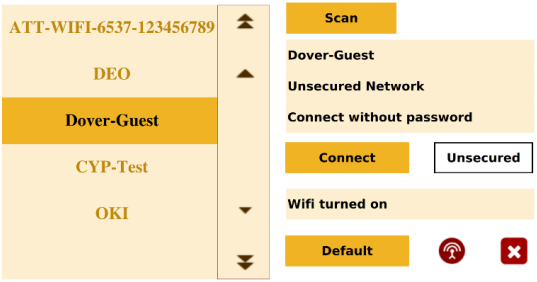
4. Touch the Check Mark icon to save 

5. Touch the X icon to exit 

5.9 To Connect to Wi-Fi network.

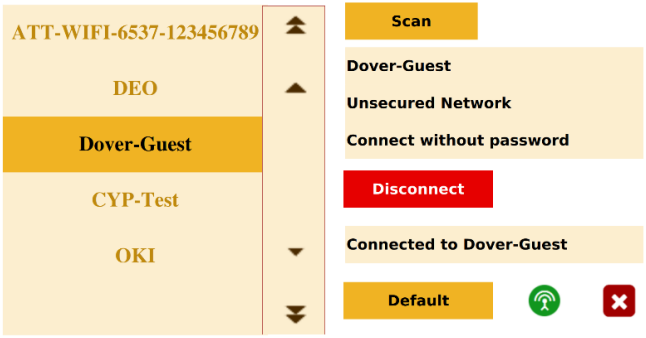
1. Connect the antenna to the Wi-Fi connector located in the back of the unit
2. Touch the Setup icon to enter the setup screen 
3. Touch the Wi-Fi icon to enter the network setup screen 

4. Touch the “Scan” tab to scan for all available networks



5. Touch the Up and Down arrows to select the desired network
6. If the selected network is an unsecured network (not password protected), touch “Connect” tab to connect.

7. Once the unit is successfully connected to the Wi-Fi network, the “Connect” tab will change to “Disconnect” and the online symbol will change to green



8. If the selected network is a secured network (password protected), first create a text file and type the network’s password, then save the file as “password.txt”
9. Copy the “password.txt” file to a blank USB thumb drive. ***Note: Do not put the “password.txt” file inside a folder***
10. Insert the USB drive to the USB port located in the back of the unit
11. Touch “Connect” tab to connect. Once the unit is successfully connected to the Wi-Fi network, remove the USB drive from the USB port
12. Touch X icon to save and exit
13. Touch the IP Address icon and the unit will show an IP address

Note: Once the unit is turned off, the Wi-Fi connection is lost. To re-connect the unit back to the same network after the unit is turned on, repeat steps 1-4 and touch the "Default" tab.

6. INTERNET of Thing (IoT)

The IoT enabled function to allow users to:

- Monitor controller/valve performance remotely
- Make parameters adjustment remotely
- Collect data
- Receive notification when errors occur from controller

This function can be accessed through wired or wireless network connection

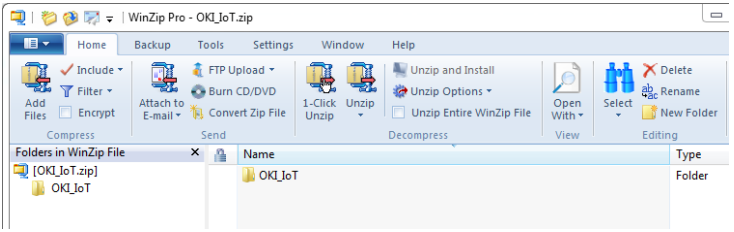
To utilize all supported functions, the controller must be log into Techcon web-base application software.

- The web-base application can be used locally or on the cloud.
- The web-base application has security features to prevent unauthorized access.

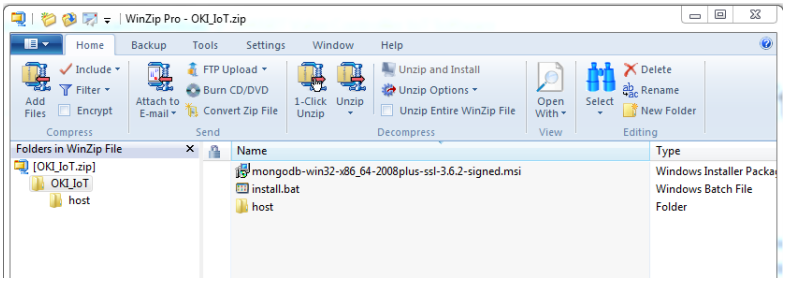
6.1 Setup Web-based Application Sofware Locally

A. Install Web-based Application software

1. Go to Techcon Website:
   http://www.techconsystems.com/en/resources/software-download/smart-valve-controller-iot-software
   and download the “OKI_IoTLAN” to your computer



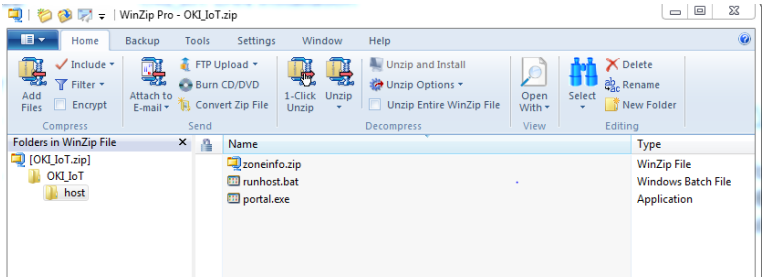
2. Open OKI_IoT folder



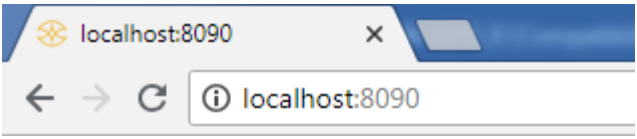
3. Double click on “install.bat” to install MongoDB
4. Make sure to select complete and uncheck Compass during the installation.
   Note: If you miss this step, you just install stuff on the machine that you don’t need and of course it will take a few minutes longer to complete the installation.

5. Open “host” folder

6. Double click on **runhost.bat**

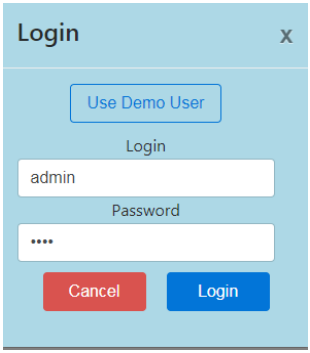


7. Open internet browser (Internet explorer, Chrome, etc…), type in localhost:8090 then press enter



The web-based application is now ready for use. The below screen will be displayed:

8. Click the “Login” button
9. Enter “admin” in the Login box
10. Enter “1001” in the Password box



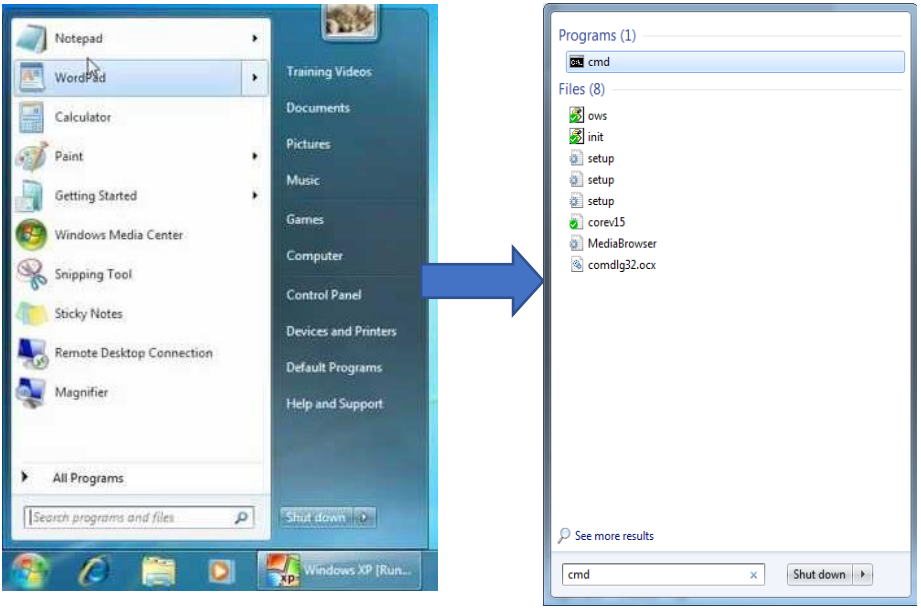
B. Register the Controller to the Web-based Application Software

To register a controller on the web-based application , the IP address of the computer that run the applicatoin must be set in the controller.

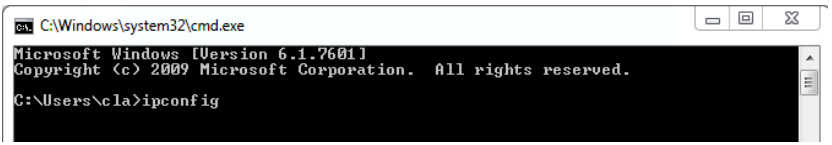
To obtain IP address

11. Click on the Window start icon 

12. Type “cmd” in the box then press enter

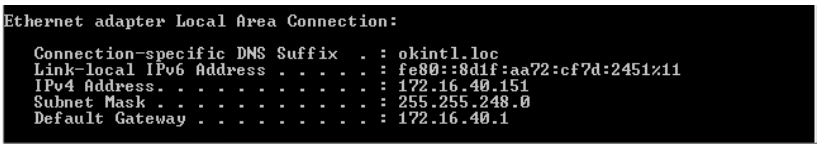


13. Type “ipconfig” then press enter



14. Record the IPv4 address shown in the “IPv4 Address” line on the above screen; For this example, the Server IP address is: 172.16.40.151

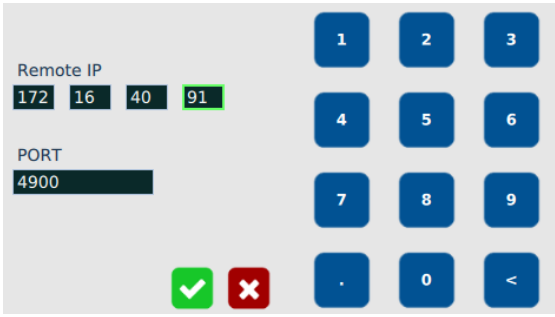
    This IP address will be entered in the controller screen



15. Connect the ethernet cable to the ethernet port of the controller

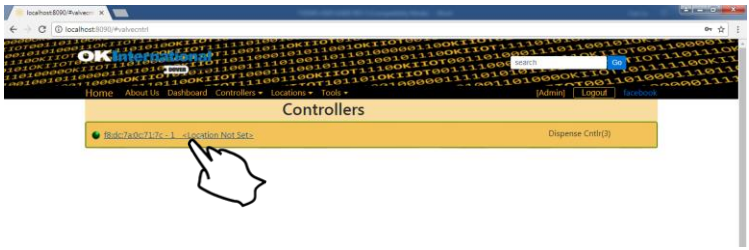
16. Go to the setup screen of the controller and touch the “Remote Server” icon 

17. Enter the IPv4 address recorded in step #14 into Remote IP address box
18. Touch the green check mark icon to save
19. The controller is now registered on the web-based application.

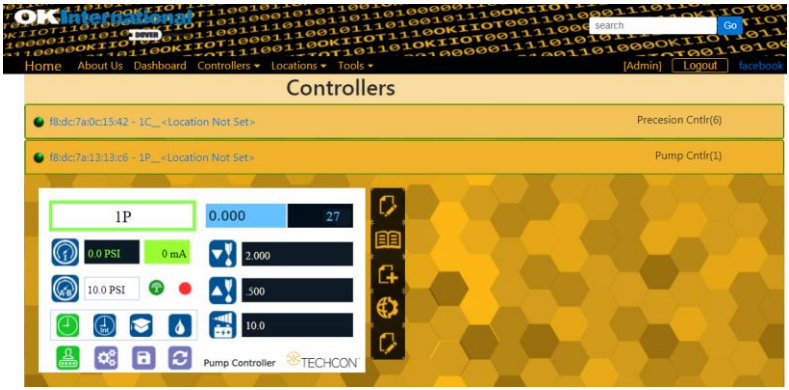


6.2 Making Parameters Adjustment from the websever

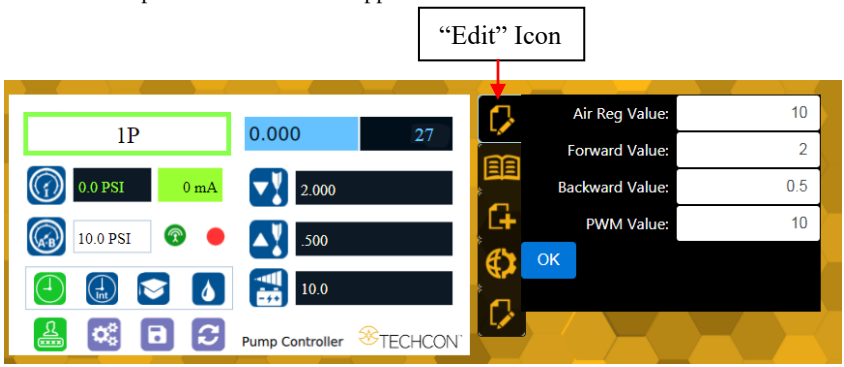
Go back to the webserver site and click on the “Controllers” menu
Click on the active controller link



The controller screen will be displayed in the webserver as shown below.
The controller parameters such as pressure and dispense time can be adjusted from the webserver.



Click on the “Edit” icon
The parameter screen will appear as shown below:



Proceed to make changes
Click “OK” button to save
The new parameter will be displayed on the controller.

6.3 Receive Notification From The Controller

The web-base application enables user to set notification when the following event occur from the controller:

- **Low pressure alarm**

  When the output pressure dropped below the set pressure, the unit will send out notification by phone text message or by email to the user.

- **“Over current” protection alarm**

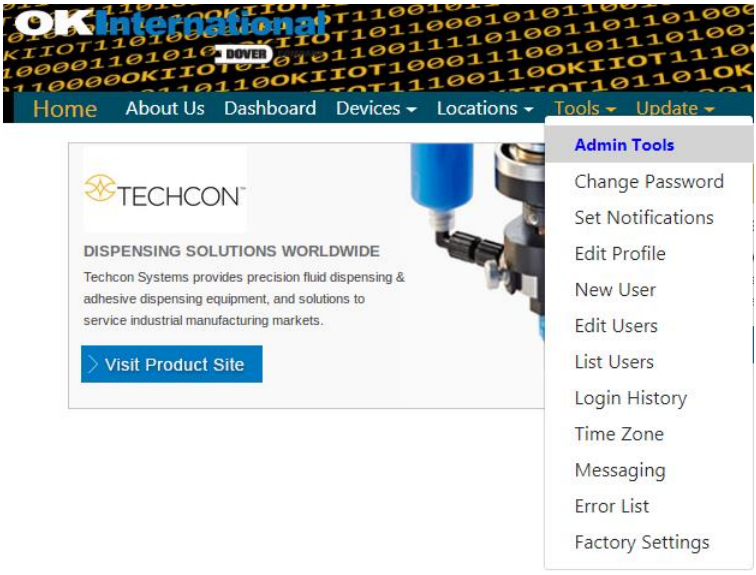
  When the motor of the valve/pump is drawing excessive current the controller will send out notification by phone text message or by email to the user.

- **Flow Rate Feedback**

  When the flow rate of the PC Pump is less than 10% of the set flow rate, the controller will send out notification by phone text message or by email to the user.

6.3.1 Setup Notification

1. Click on the Tool menu



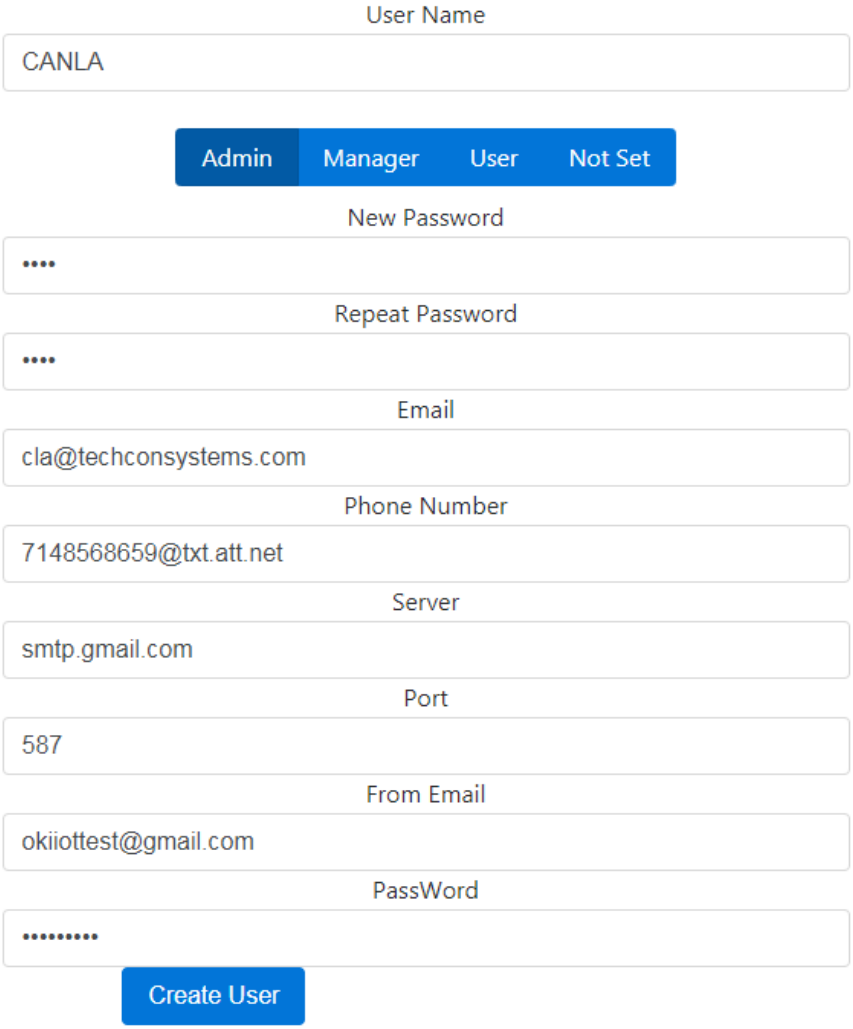
2. Select New User, fhe new user form will appear as shown below

3. Proceed to fill out the form

   User Name: Enter desired User Name

   Select "Admin"

   New Password: Enter desired password



Email: Enter email address that you want to receive notification

Phone number: Enter the phone number that you want to receive text message notification.

Note: use mobile email address (SMS address) format. Make sure to check your phone carrier for the correct format

Server: Enter your smtp server address

Port: Enter your smtp port

From Email: This is the sender email

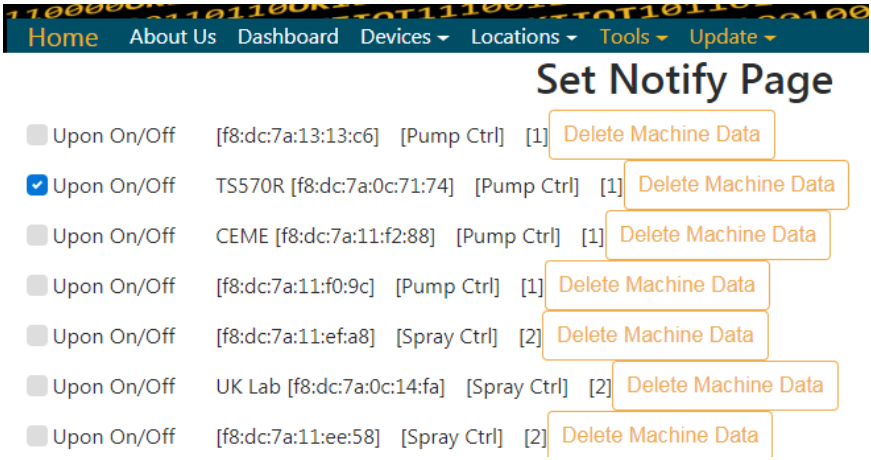
Note: Your IT staff will need to setup the sender email account. This email account can be used for multiple controllers.

Password: Enter the password for the sender email

4. After the form is completely filled out, Click "Create User"

6.3.2 Select controller to receive notification

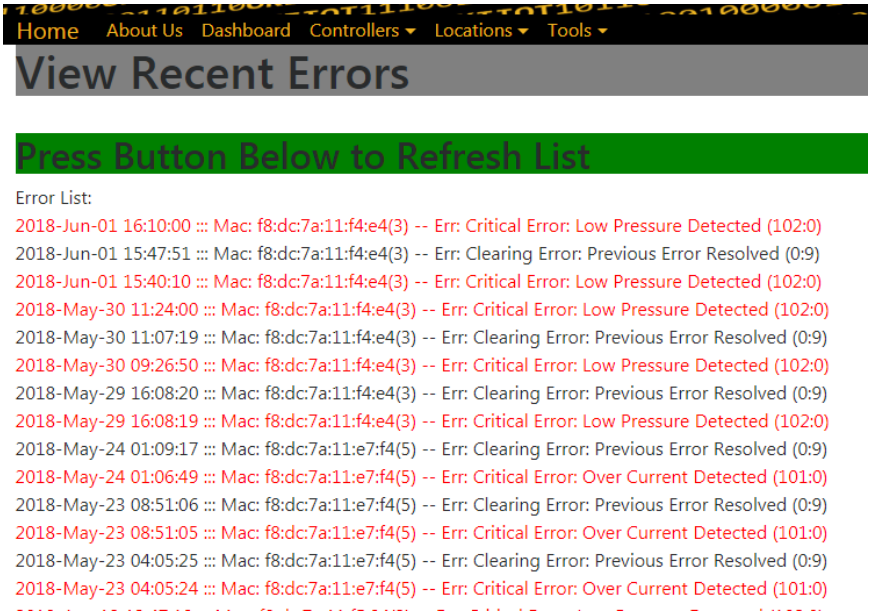
1. Click on the Tools menu
2. Select "Set Notification" from the drop-down menu
3. Select desired controllers to receive notification from by checking the box next to "Upon On/Off" (make sure the Mac address on the controller matches the Mac address on the Set Notification page)
4. Click "Update Notifications" box
5. Selected controllers will send error notifications to the registered phone or email that set in previous steps



6.3.3 View Error List

The web-based application will record errors that occurred from all controllers. To view the error list:

1. Click on the Tools menu
2. Select “Error List” from the drop-down menu
3. The error list will appear

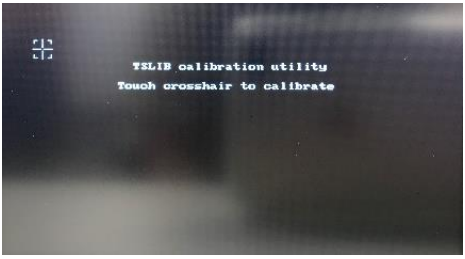


7. SOFTWARE UPGRADE

Note: For future software upgrade, follow the instructions below.

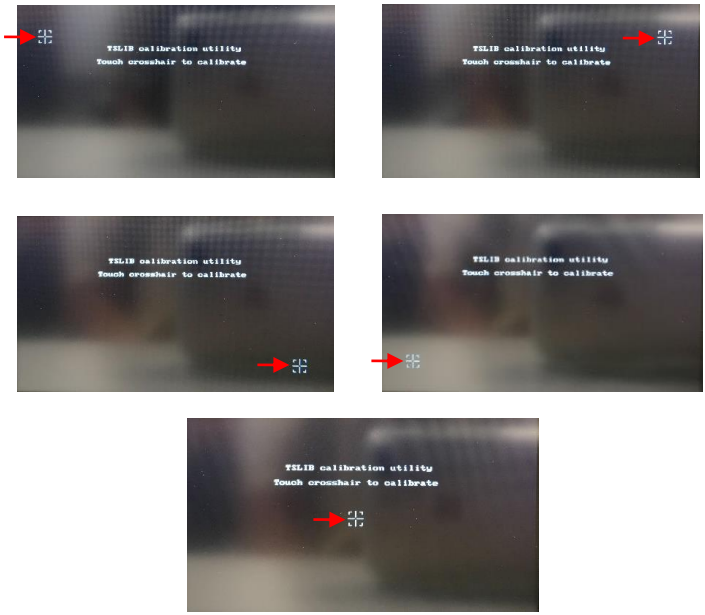
20. Download the latest software version from Techcon website and copy it to a blank USB thumb drive. ***Note: Do not put the software file inside a folder***
21. Make sure that the unit is turned off
22. Insert the USB drive to the USB port located in the back of the unit
23. Turn on the unit
24. Wait while the system is loading the new software. This process can take a few minutes

25. Wait until the system completes the software update from the USB drive and the first touch-screen calibration is displayed



26. ***Remove the USB drive from the USB port before proceeding to the next step***

27. Follow the instructions on the display to calibrate the touch screen by touching the crosshair at five different points. ***Note: In order to accurately calibrate the touch screen, it's recommended that the stylus pen is used***



28. Wait until the system completes the rebooting sequence and the home screen is displayed

29. **Repeat sections 5.1.1 and 5.1.2 to re-calibrate the air pressure**

8. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Display does not light up	• No power inputs	• Check power cord connections • Turn on power
System will not actuate	• Supplied touchure dropped below "Low Touchure" setting • Foot switch not plugged in or improperly plugged in • Defective foot switch • Broken wire or loose connection inside unit • Defective solenoid • Defective PC board • The valve motor draws over 400 mA	• Increase supplied touchure • Check foot switch connection • Foot switch needs to be repaired or replaced • Unplug power cord and disconnect air supply. Remove cover and check for broken wires or loose connections • Replace solenoid • Replace PC board • Check valve (see section 5.6)
System will not touchurize	• Insufficient air touchure • Air hoses not plugged in • Regulator defective	• Increase air supply touchure • Check connection • Replace regulator
Inconsistent dispense	• Air bubbles in material • Dispense time is too low • Needle clogged • Motor started to burn out	• De-air material • Increase dispense time • Replace needle • Replace motor

9. MAINTENANCE

The dispenser is designed and built to be relatively maintenance free. To assure trouble free operation, please follow below steps:

1. Make certain air supply is clean and dry.
2. Avoid connecting the unit to excessive moisture or solvent saturation
3. Avoid connecting air supply exceeding 100 psi (6.9 bars)
4. Use only Amyl Alcohol to clean outside surface of the main housing
5. Use only soft cloth to clean the display screen

10. LIMITED WARRANTY

OK International warrants this product to the original purchaser for a period of 2 years from date of purchase to be free from material and workmanship defects but not normal wear-and-tear, abuse and faulty installation. Defective product or subassembly and components under warranty will be repaired or replaced (at OK International's option) free of charge. Customer with defective product under warranty must contact the nearest OK International office or distributor to secure a return authorization prior to shipping the product to the assigned OK International authorized service center. For nearest OK International office or distributor contact information, please visit www.techconsystems.com. OK International reserves the right to make engineering product changes without notice.

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

Americas
OK International
10800 Valley View Street
Cytouch, CA 90630
+1 714 230 2398

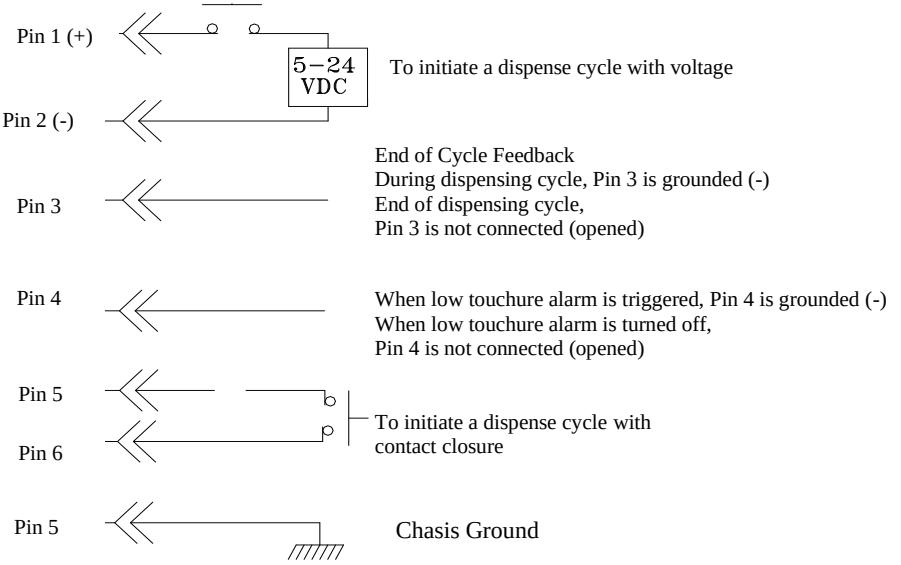
Europe
OK International
Eagle Close Chandler's Ford Ind Est
Eastleigh, Hampshire
SO53 4NF
United Kingdom
+44 2380 489 100

Asia
Dover (Shenzhen) Industrial
Equipment Manufacturing Co., LTD.
4th Floor East, Electronic Building
Yanxiang Industrial Zone, High Tech Road
Guangmin New District
Shenzhen, P.R.C
+86 21 64952662

11. I/O CONFIGURATION AND END OF CYCLE FEEDBACK

During a dispense cycle, an open collector circuit closes and remains closed while the valve is dispensing. Pin 3 and 4 can be as feedback signal to synchronize with other devices. Power from an external source is allowed to pass through the circuit to operate a 5 to 24 VDC load. Power consumption must not exceed 250 mA. The load could be a relay, solenoid, counter, LED, or any device that will operate within a 5 to 24 VDC range and a maximum of 250 mA.

Note: During the dispense cycle, pin 3 will be grounded. Please make sure the external device (your machine that controls the dispenser/controller) has the same ground as the controller.



Pin 7, 8, and 9 = Available