Operations Manual

Automated Fuel Maintenance System

FTI-10A & 20A

FM APPROVED

FUEL TECHNOLOGIES INTERNATIONAL

Replacement Manuals Available on Website: www.fueltechnologiesinternational.com

Controller Programming
And Operating Instructions

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Introduction

This manual assumes the system is installed and ready for operation. If the system has not yet been installed, please refer to the Installation manual for instructions.

Overview

FTI Fuel Monitoring and Maintenance Systems are designed for ease of use. Once installed, the system will operate automatically to the schedule you program into it. The schedule should be determined by your specific needs, fuel and tank conditions, weather, etc. and can be changed at any time***. It is recommended to filter approximately 20% of the tank per week.*** (If you are not sure what your optimum schedule might be, your FTI representative can assist you).

Your FTI system will maintain all data input by you, such as the time, run time hours, and number of tanks, etc. ***This will last for up to 100 hours without power. After that, the data will have to be re-entered.***

If the system is in auto mode and stopped for any reason, it will resume the schedule during the 1st hour, when the interruption is complete. You can also switch to manual mode at any time. The system will resume with the preprogrammed schedule when put back into auto mode during the 1st hour. **After the 1st hour reprogram the start time.**

Depending on the condition of the fuel to be maintained, you may initially be changing filters more frequently than expected. Your FTI system will stop operation and signal you when filters are full. It will also let you know which particular filter should be changed, and will resume the program when restarted after the filter is replaced. As the fuel quality progressively increases, you will notice a dramatic drop in filter usage.

In cases of ***Serious Contamination***, it is recommended that you have your ***Fuel Polished*** prior to initial use of your FTI system. Since the FTI system is proactive, continued use prevents the fuel from deteriorating again and maintains a healthier environment to protect both the fuel and the tank.

<u>INSTALLATION PRECAUTIONS:</u>

IF POWER TO THE FTI CONTROL PANEL IS TO BE TURNED OFF AFTER IT IS INSTALLED, THEN THE INSTALLER SHALL PROVIDE FOR THERMAL EXPANSION PROTECTION.

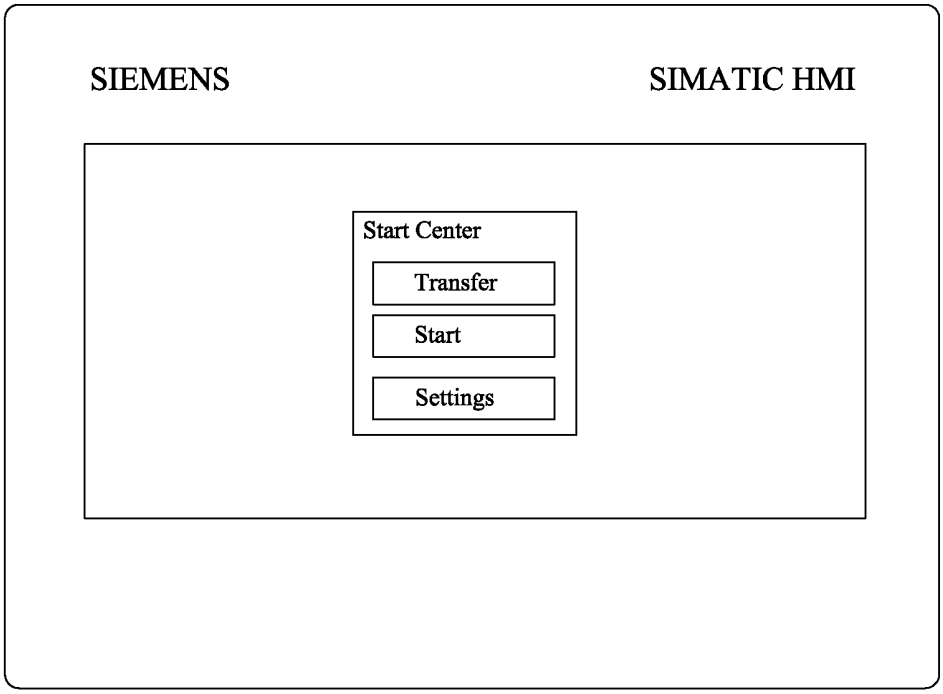
ALL MANUAL BALL VALVES SHALL REMAIN OPEN. THIS WILL ALLOW FUEL THERMAL EXPANSION TO FLOW BACK TO THE FUEL TANK.

THE FTI CONTROL PANEL WILL AUTOMATICALLY OPEN ALL ELECTRICALLY CONNECTED VALVES WHEN THE FTI PRESSURE SWITCH GAUGE REACHES 45 PSI. THIS WILL OPEN AND CLOSE ALL SUPPLY AND RETURN LINE VALVES CONNECTED TO THE FTI CONTROL PANEL 24/7, ONE TANK AT A TIME.

THIS FEATURE OPERATES AUTOMATICALLY ONLY WHEN POWER IS ON AND THE CONTROL PANEL IS SET TO AUTO MODE OFF OR MANUAL OFF MODES.

FTI WILL NOT BE RESPONSIBLE FOR ANY THERMAL EXPANSION DAMAGE DUE TO EXCESSIVE PRESSURE.

Controller Set-Up with the Touch Screen



Once the Fuel Management System is installed, you're ready to program the controller.

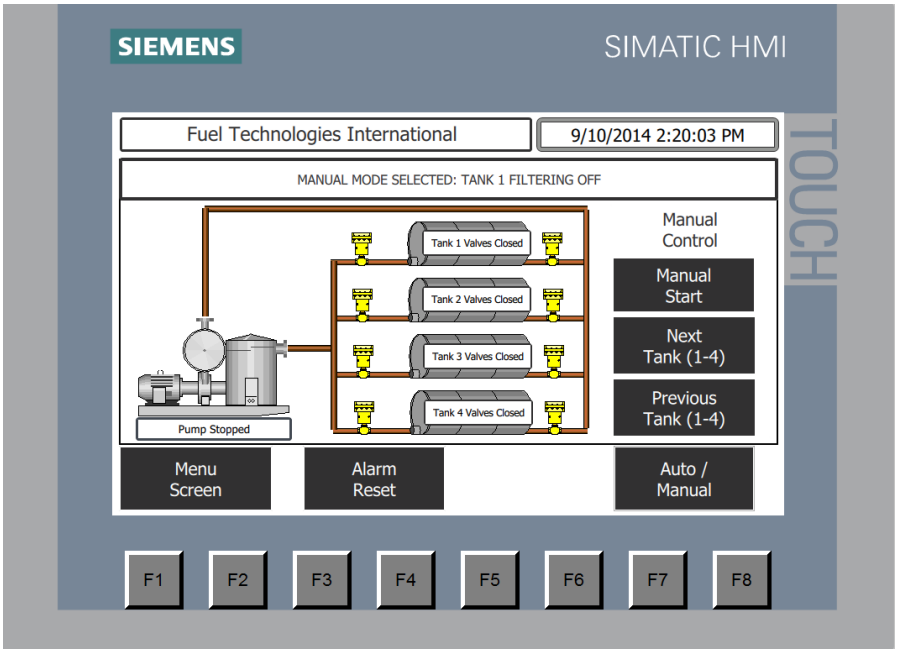
When you apply power to the system, the display will go through a boot up sequence, and the screen above will appear for apx. 10 seconds**.**

1. TRANSFER button is used to download the program to the touch screen.
2. START button is used to start the boot sequence after doing any adjustments.
3. **SETTINGS** button is where some settings can be changed, such as: sounds, transfer, network, display, contrast and **SCREEN SAVER**
4. **It is recommended to set your Touchscreen Screen Saver to 2 hours to prolong the life of the screen.**

In the settings section there are some settings that may need your attention. Most of the time nothing needs to be adjusted.

After going through the settings, press START and the system will continue to boot.

Default Start-Up Screen

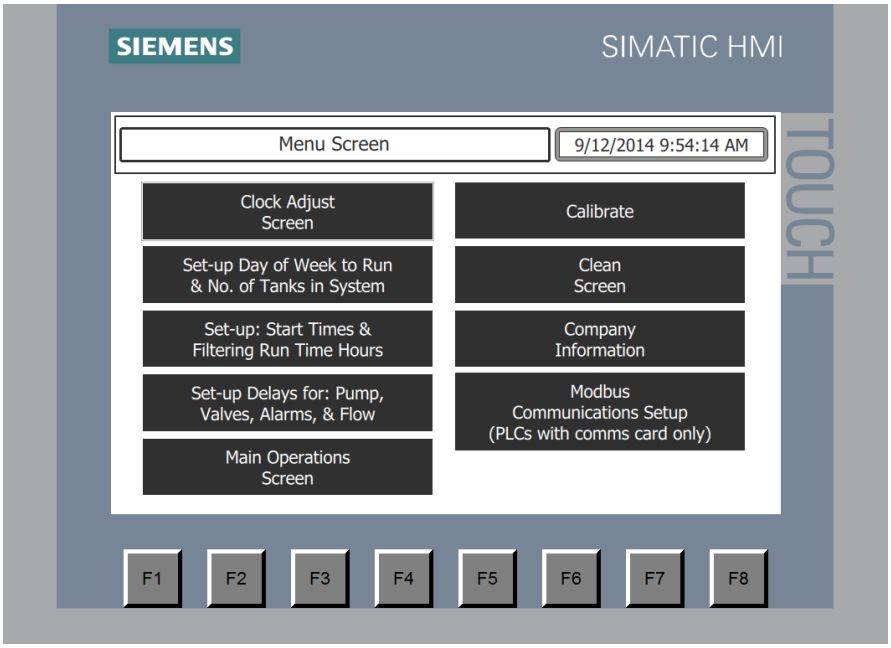


<u>The screen above is the Main Operations Screen.</u>

From this screen You Can:

1. Go to the Menu Screen.
2. Switch from Auto Mode to Manual Mode.
3. Reset All Alarms.
4. Turn system On & Off in Manual Mode.
5. The **Next Tank Button** & the **Previous Tank Button** only appear when the number of tanks selected is greater than one.
6. The F1-F8 buttons are not used at this time.

Menu Screen



The screen above will appear.

This is the screen to access all system filtering selections.

From the left hand column you can:

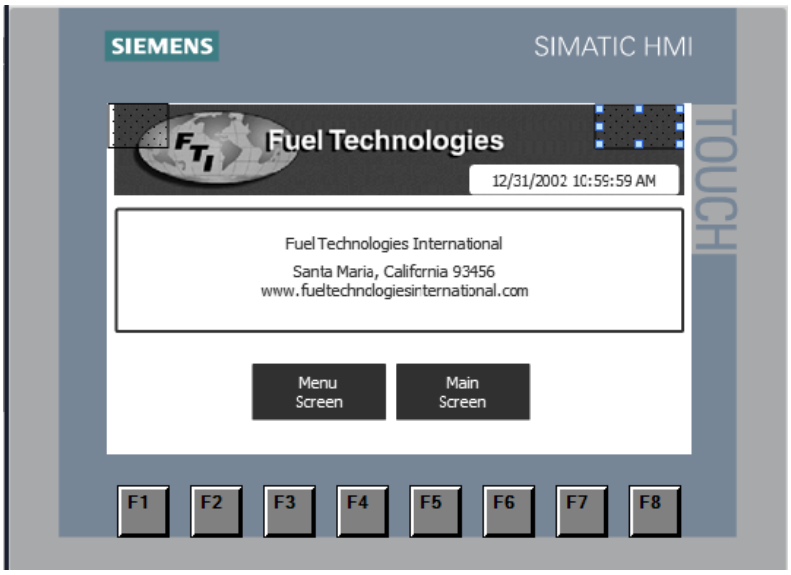
1. Adjust the clock.
2. Set-up which days of the week to run, & the number of tanks (1-4) plumbed to the FTI system.
3. Set-up daily filtering start times, & filtering run time hours.
4. Set–up delays for: Pump to Start, Auto pressure relief (Valves to Open & Close), Alarms to Trip, & Low Flow Alarm to Trip.
5. Access the main operations screen, from where you can manually turn system on and off.

From the right hand column you can:

1. Re-calibrate the screen.
2. Clean the screen.
3. Look up Fuel Technologies company information.
4. Access the Modbus Communications Setup button. This button will not function without the Modbus Module. (Modbus RTU RS485 is sold as an option)

From the Menu Screen Press the Company Information Button

Company Information Screen

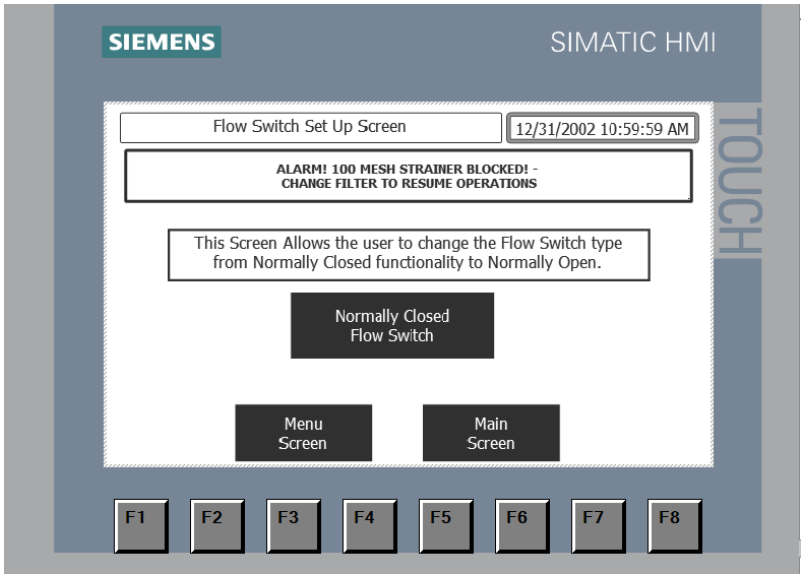


The screen above is the ***Company Information Screen***.

This is where you can look up Fuel Technologies International:

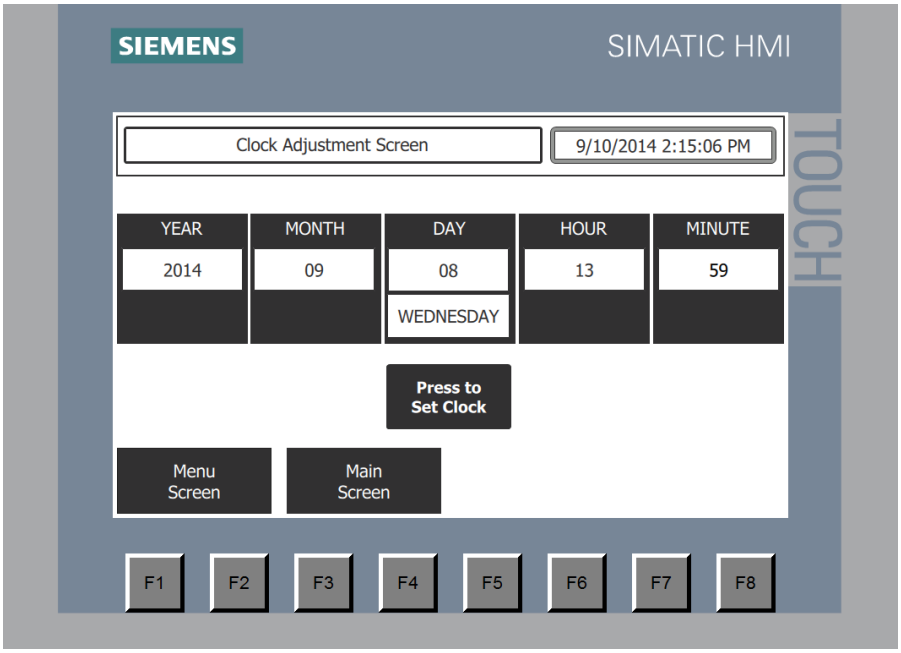
1. Mailing Address and Website info

2. Open up the Flow switch adjustment screen. Here you can switch the Flow Switch between normally open and normally closed. There is a hidden button in the upper right hand corner. Touch the upper right corner in the black area. A dotted button will appear. (see dotted button above) Hold the button for 5 seconds. The screen below will appear.



Next Press the Menu Screen Button, Then the Clock Adjust Button.

Clock Adjust Screen



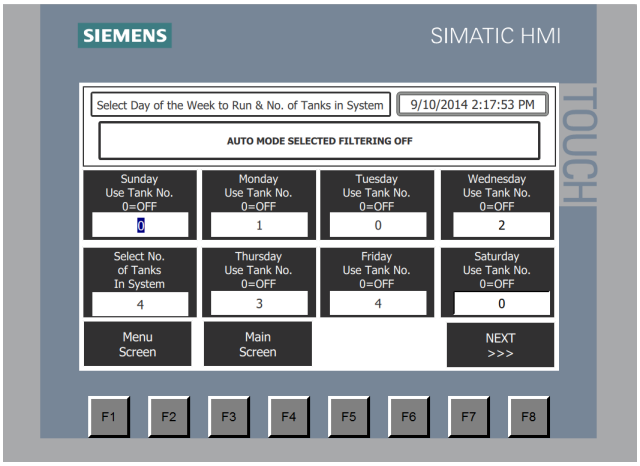
The screen above will appear.

1. Start on the left column under ***Year***; press the white box area and enter the year.
2. Do the same for the ***Month, Day, Hour*** and the ***Minute***.
3. After all 5 settings are entered push the **"Press to set clock"** button. This will enter your settings. The 5 settings in the white boxes will not change with the real time. The real time is in the upper right hand corner. To change settings, just enter the changes and press the set clock button.

When Completed Press the Menu Screen Button,

Then the: Set-up Day of Week to Run & No. of Tanks in System Button

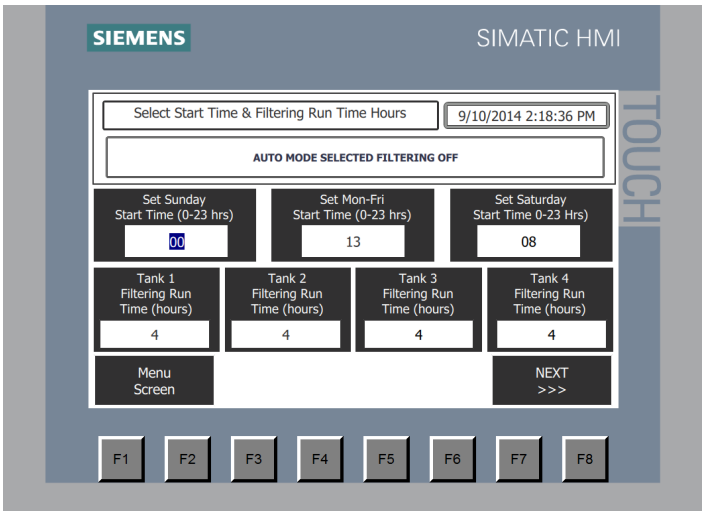
Select Day of the Week to Run & Number of Tanks in your System



1. First decide the number of tanks plumbed to the system (1-4). This system is capable of filtering up to four tanks.
2. To Set-up the number of Tanks, touch or press the number in the box. The **keyboard screen below** will appear.
3. Then press the number 1, 2, 3 or 4, and then the ***large arrow button***. ↵ (same as enter key) If you select the wrong number use the arrow button ← to back space (erases numbers selected)
4. Then you need to decide what days of the week you want your system to run, & which tank you want to filter on each day.
5. To select the day of the week to run, touch or press the number in the day of week box. Input tank 1-4, then the press the ***large arrow button***.
6. The example screen above shows a 4 Tank System, with a filtering schedule as follows: Tank 1 on Monday, Tank 2 on Wednesday, Tank 3 on Thursday, & Tank 4 on Friday.

Press the Next >>> Button

Set-Up Tank Filtering Start Times & Run Time Hours



The screen above will appear.

1. First decide which day & time of day to start the filtering process.
   (To adjust, touch or press the number in the box as described on page 9.)
2. You can select only one start time for (Sunday), one start time for (Monday – Friday), and one start time for (Saturday)
3. The clock settings are (1-23) hours.

   A. Above Example: Set Saturday start time 8 = 8AM

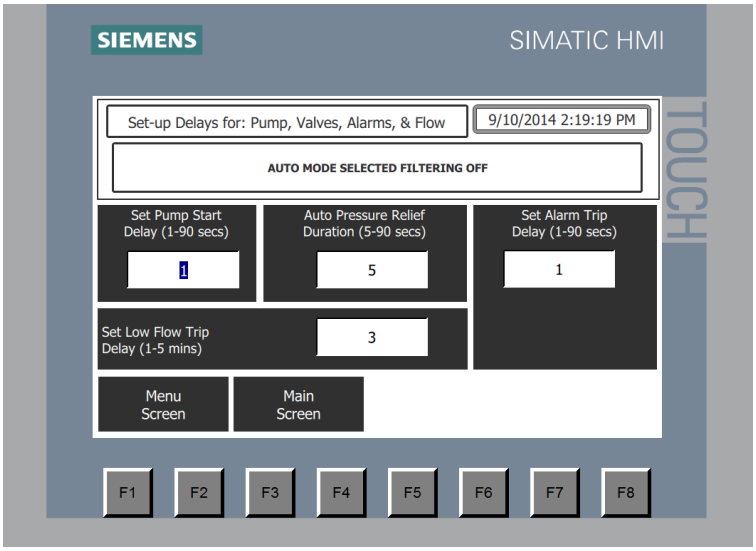
   B. Above Example: Set Mon.-Fri. start time 13 = 1:00 PM

Then proceed to Set-up the Filtering Run Time in Hours:

1. On the same screen you can select the run time hours to filter your fuel.
   (The recommended is 20-25% of the tank per week.)
2. Example: 20% of a 20,000 Gallon Tank = 4000 gallons.
3. Then take the pump size: 20 gallons a minute pump x 60 minutes = 1200 gallons an hour.
4. Then divide 1200 (gallons an hour) into 4000 gallons (20% of tank) = 3.33 hours per week.
5. Round up to 4 hours per week.
6. The screen above will only show the number of tanks in your system that you selected in the set-up Numbers of tanks screen (Tank 1, Tank 2, Tank 3, or Tank 4).
7. Above Example: Above screen shows a 4-tank system, filtering all 4 tanks for 4 hours ea.

When Completed Press the Next Button

Set-up Delays for: Pump, Valves, Alarms and Flow



The screen above will appear.

If you have special circumstances that require you to ***delay the pump to start***, ***delay the valves to open and close*** (multi-tank systems), ***delay the alarms from going off***, or ***change the low flow alarm delay***, then continue with this step, if not skip forward to the bottom of this page.

Here you can delay:

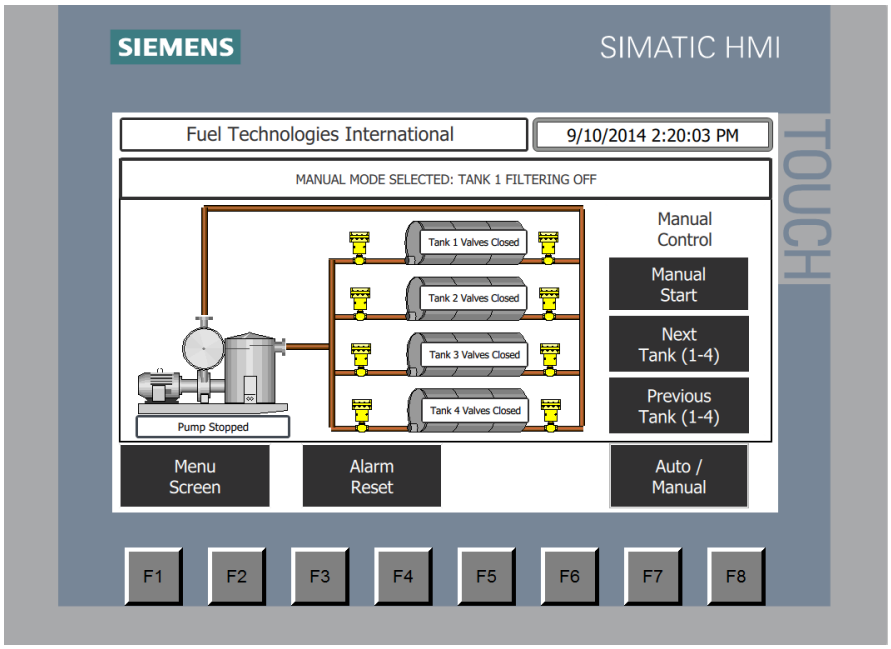
1. The pump from turning on by 1-90 seconds.
   (When using ACTUATED BALL VALVES, the pump will need to be delayed allowing valves to open before pump is turned on. Adjust the pump delay start seconds to the ball valve opening time.)
2. Auto Thermal Expansion Pressure Relief: (Set the seconds to the time it takes to fully open the actuated ball valves.) Set the solenoid or electric actuated ball valves delay from closing by 5-90 seconds. (multi-tank systems)
3. The alarms from going off by 1-90 seconds.
4. The low flow alarm (1-5 minutes – default is 3 minutes) this is a Flow or No Flow alarm.
   (The flow is monitored by the low set-point on the pressure gauge.)
5. To adjust all settings, touch or press the number in the box as described on page 9.

   (The low flow alarm task is to protect the pump in case it has lost its prime. The pump will run for the time selected and then it will shut off and sound an alarm to notify maintenance personal the fuel supply line is dry)

When Completed Press the Main Screen Button

Main Operations Screen

1. Here you can select ***Auto Mode*** or ***Manual Mode*** by pressing the ***Auto/Manual Button.*** Auto mode will run your system automatically by the ***Start & Run Times*** you have entered.
2. In ***Manual Mode*** the system will stand idle. (Put in Manual Mode for servicing the filters)
3. You can turn the system on and off in ***Manual Mode***. Press the ***Manual Start Button*** to turn on. Press the same button now labeled ***Manual Stop*** to turn off.
4. When you set-up more than one tank there will be extra buttons labeled ***Next Tank (1-4)*** and ***Previous Tank (1-4),*** use these buttons to scroll to tanks 2, 3, & 4.



How to Cancel System Alarms

First read the Alarm Description on the screen, and then push the ***Alarm Reset Button*** to stop the alarm and reset the system. (Alarm description will appear in the MANUAL MODE SELECTED box above)

Note: The system will return to the previously selected mode when alarm status is reset. Be sure the system is in ***Manual Mode,*** and is not running, before attempting any maintenance operations. This is to avoid leakage or other possible hazards. Once maintenance has been performed (such as changing filters), turn system on manually to check for leaks. Then reset to ***Auto Mode*** and resume the scheduled program.

You Have Now Completed the Controller Set-Up

ALARM MESSAGE DESCRIPTIONS

If a problem is detected in the following areas, the system will stop filtering, display the appropriate alarm message on the screen, and will sound an audible alarm to alert the operator. The alarm consists of a sequence of steady high-pitched beeping sounds that continue until the operator pushes the reset button and corrects the problem.

Touch-Screen Alarm Messages	**Alarm Locations & Action required to fix the problem**
100 Mesh Strainer Blocked Change Filter & Reset	Vacuum / Strainer Gauge **Action:** Check inlet strainer and supply line valves
10-Micron Filter Blocked Change Filter & Reset	10 Micron Gauge **Action:** Change 10 Micron Filter
3-Micron Filter Blocked Change Filter & Reset	3 Micron Gauge **Action:** Change 3 Micron Filter
1-Micron Filter Blocked Change Filter & Reset	1 Micron Gauge **Action:** Change 1 Micron Filter
Over Pressure Check Valves & Reset	System Pressure caused by blockage in the system or return line. Possible Causes: 1. Failed Solenoid valve, Ball valve, Relief valve, or Check valve. 2. Auto Pressure Relief: The FTI control panel will open & close all electrically actuated valves 24/7, one tank at a time. If the pressure builds up and purging does not relieve all of the pressure, adjust the auto pressure relief delay to match your valve opening time in seconds. This feature is to purge thermal expansion pressure build up in the fuel lines. ***Action:*** 1. Cancel error, restart system and locate reason for high pressure 2. Eliminate thermal expansion with pressure relief valve.

Continued on next page

ALARM MESSAGE DESCRIPTIONS (continued)

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Touch-Screen Alarm Messages	**Alarm Locations & Action required to fix the problem**
High Water Level Drain and Reset	Water Level Sensor ***Action:*** Drain water from water separator.
System Leak Repair Leak & Reset	Leak Sensor: Leakage has occurred within the cabinet area. ***Action:*** Locate and repair leak in the cabinet
Generator Running Filtering Off	This is a 24V DC dry contact to be used with Gen Set Run Relay. It will shut off the filtration system while the generator is running. (See wiring Diagram for electrical connection). ***Action: This contact is only used when the FTI system is sharing the Same Fuel supply line as the Gen Set. It will turn FTI system off When the Gen Set turns on. (Do not schedule filtration system run Times on the same day of Gen Set testing).***
Motor Overload Reset Overload & Reset Panel	This will occur if pump/motor is over heated or over loaded. ***Action:*** Find cause and repair. 1. Push the touch screen reset and then; 2. Push the reset button on the overload inside of the control panel
Low Flow Alarm	This alarm will trip if the fuel flow stops while the pump is running. ***Action:*** Find out why pump prime was lost and repair.

RUNNING MANUAL MODE

To switch to ***Manual Mode***, press the ***Auto / Manual Button*** until the display reads:

MANUAL MODE SELECTED - TANK 1 FILTERING OFF

Once in ***Manual Mode***, pressing the ***Manual Start Button*** will turn the system ***ON*** and it will begin to pump fuel through the system. Pressing the same button now labeled ***Manual Stop Button*** will turn the system ***OFF***.

If you have a multiple tank system and want to isolate a particular tank, press the ***Next Tank (1-4) Button*** until the display reads the tank number you wish to process. Then press the ***Manual Start Button*** to start the system.

RUNNING AUTO MODE

To switch to Auto Mode, press the ***Auto / Manual Button*** until the display reads:

AUTO MODE SELECTED - AUTO MODE – FILTERING OFF

The controller will now execute the schedule programmed earlier by you.

NOTE: IF POWER IS INTERRUPTED FOR ANY REASON THE PREVIOUS MODE SETTING (AUTO OR MANUAL) WILL COME BACK ON. IF IN AUTO MODE, AND THE POWER GOES OFF FOR ANY LENGTH OF TIME DURING THE SCHEDULED RUN TIME.THE SYSTEM WILL RESUME WITH THE PRE-PROGRAMMED SCHEDULE WHEN PUT BACK INTO AUTO MODE DURING THE 1ST HOUR. **AFTER THE 1ST HOUR RE-PROGRAM THE START TIME.**

INTERRUPTING AUTO MODE

To stop the system while running in ***AUTO MODE***, press the ***Auto / Manual Button*** until the screen says ***"Manual"***. (This should be done before performing maintenance tasks, such as changing filters, draining separators, etc.) To resume operation, press the ***Auto / Manual Button*** until ***"Auto"*** appears on the display. The system will now resume with the preprogrammed tasks.