

Operations Manual



Automated Fuel
Maintenance
System



FTI-5A
SINGLE TANK

FUEL TECHNOLOGIES INTERNATIONAL

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 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 re-program 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.

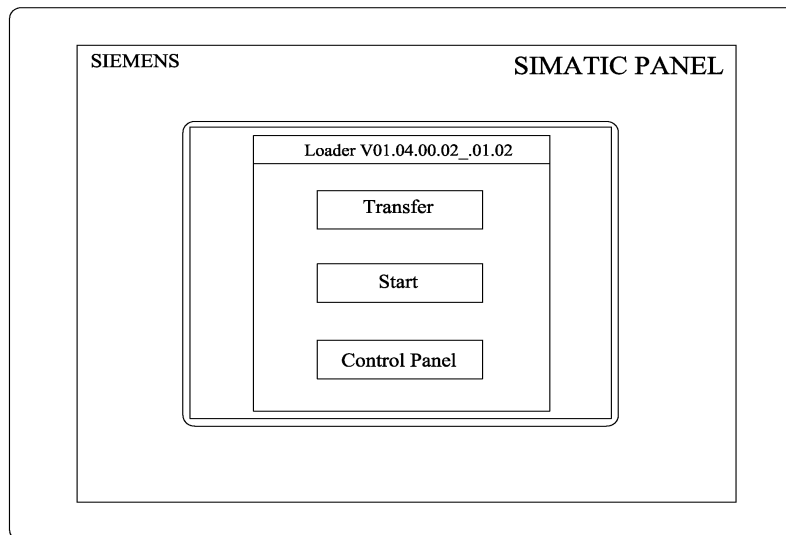
Installation Precautions:

MODEL FTI-5A SINGLE TANK HAS NO PROTECTION AGAINST THERMAL EXPANSION OF THE FUEL LINES. IF THE FUEL LINES ARE INSTALLED WITHOUT PRESSURE RELIEF, DAMAGE MAY OCCUR TO THE PUMP, MOTOR OR FILTERS.

INSTALLER SHOULD PREVENT ANY CLOSED LOOP WITH THE FTI-5A SYSTEM IN THE MIDDLE.

FTI WILL NOT BE RESPONSIBLE FOR ANY DAMAGE DUE TO EXCESSIVE LINE PRESSURE CAUSED BY THERMAL EXPANSION

Controller Set-Up with the Touch Screen



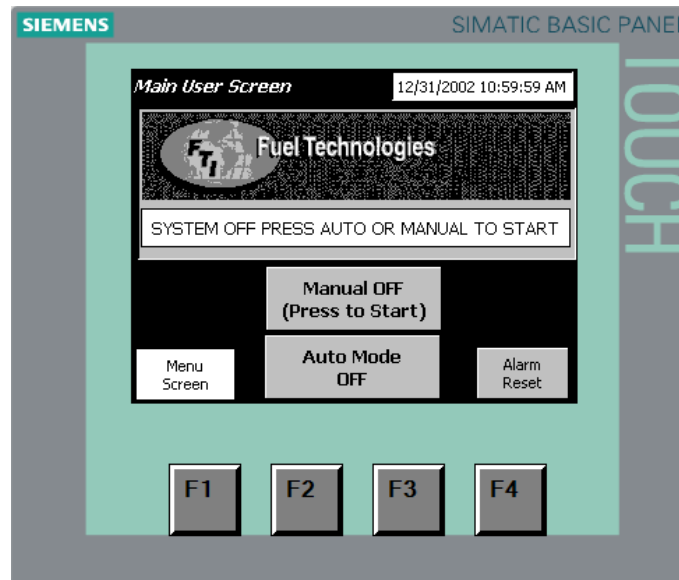
Once the Fuel Management System is installed, you're ready to program the controller.

When you apply power to the system, the display will go through a boot up sequence, and the screen above will appear for a few seconds. **DO NOT PUSH ANY BUTTONS ON THIS SCREEN.**

IF YOU DO PUSH A BUTTON ON THIS SCREEN, TURN THE POWER OFF AND THEN BACK ON TO RE-BOOT THE CONTROLLER.

Wait until this screen above changes to the default **Main Operations Screen** (next page).

Default Start-Up Screen



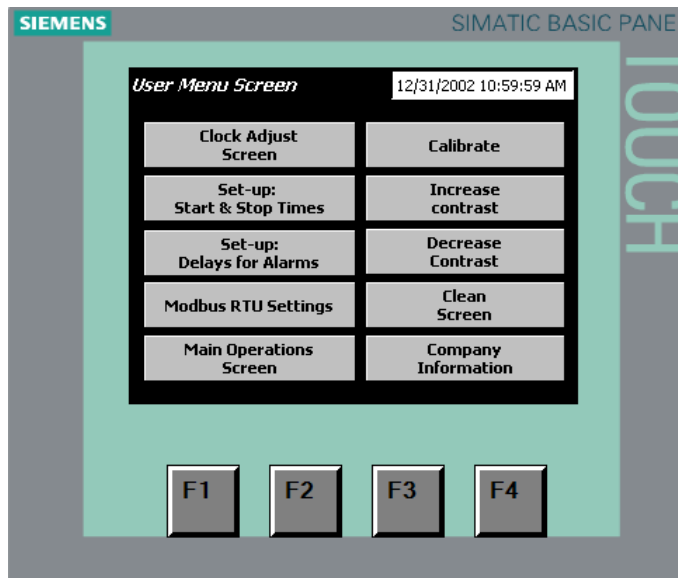
The screen above is the Main Operations Screen.

From this screen You Can:

1. Go to the Menu Screen.
2. Switch from Auto Mode to Manual Mode.
3. Reset all alarms. (Alarm Reset button only shows when system is in alarm mode)
4. Turn system On & Off in Manual Mode.
5. Put system in Auto Mode.
6. Buttons F1, F2, F3 and F4 are inactive at this time.

To Set-Up the Controller Press the Menu Screen Button.

Menu Screen



The screen above will appear.

This is the screen to access all system functions.

From the left hand column you can:

1. Adjust the clock.
2. Set-up start and stop times.
3. Set-up delays for alarms to trip.
4. Set-up Modbus RTU Settings.
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. Increase the contrast on the screen.
3. Decrease the contrast on the screen
4. Clean the screen.
5. Look up Fuel Technologies company information.

From the Menu Screen Press the Company Information Button

Company Information Screen



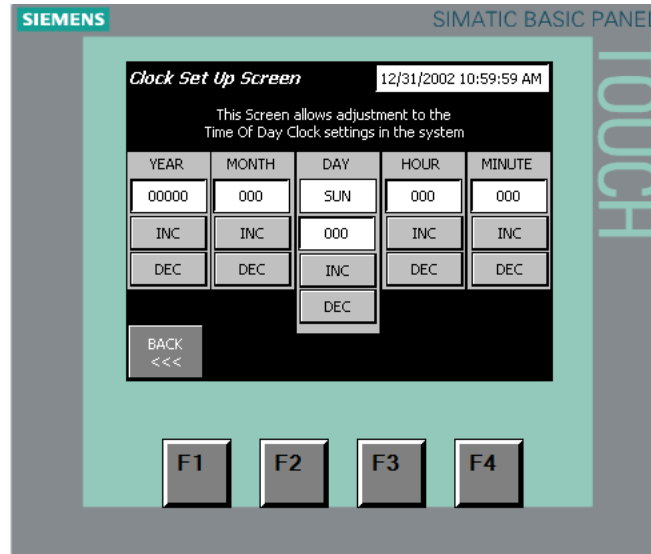
The screen above is the **Company Information Screen**.

This is where you can look up Fuel Technologies International

1. Mailing Address
2. Website information
3. Switch to the Main Screen.
4. Switch to the Menu Screen.

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

Clock Adjust Screen

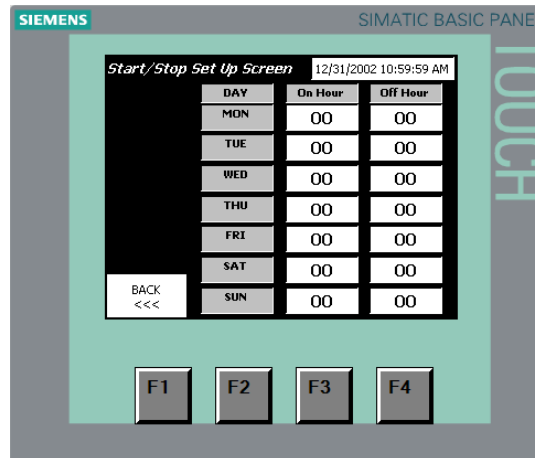


The screen above will appear.

1. Start on the left column under **Year**; press the **(INC) Increase** or **(DEC) Decrease Button** until the correct year appears.
2. Do the same for the **Month, Day, Hour** and the **Minute**.

When Completed Press the BACK Button,
Then press the Set-up: Start & Stop Times Button

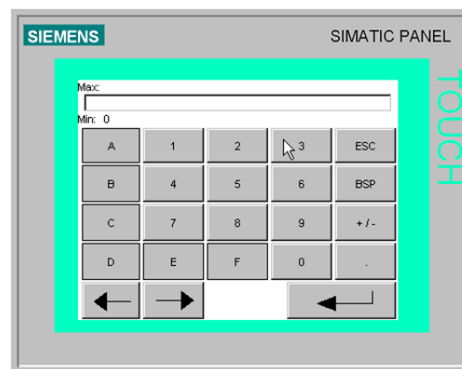
Select Day of the Week to Run & the Start and Stop Times.



1. Locate the row for the day of the week you want the system to run, then touch the "00" white box.
2. The key board screen below will appear.
3. Press the number/numbers for the **On Hour** you want the system to start. The clock setting numbers are military style (1-23 Hours). E: 9=9AM, 13=1PM
4. When you push a button on the key board, the number will show in the upper right hand text box.
5. To enter your selection push the **large arrow button** located at the bottom right of key board.
6. If you select the wrong number use the BSP button to back space (erases numbers selected)
7. Repeat the process for the **Off Hour** time.

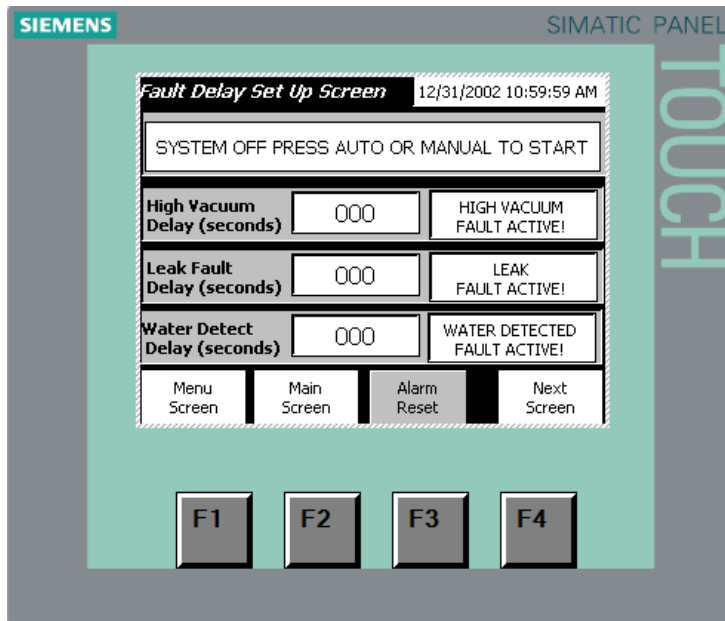
How to estimate the Run Time Hours

1. The recommended amount of fuel to clean is 20-25% of the tank per week.
2. Example: 20% of a 4,000 Gallon Tank = 800 gallons.
3. Then take the pump size: 5 GPM (gallons per minute) x 60 minutes = 300 gallons per hour.
4. Then divide 300 (gallons per hour) into 800 gallons (20% of tank) = 2.66 hours per week.
5. Round up to 3 hours per week.



Press the BACK Button. Then press the Set-up Delays for Alarms

Set-up Delays for Alarms to Trip



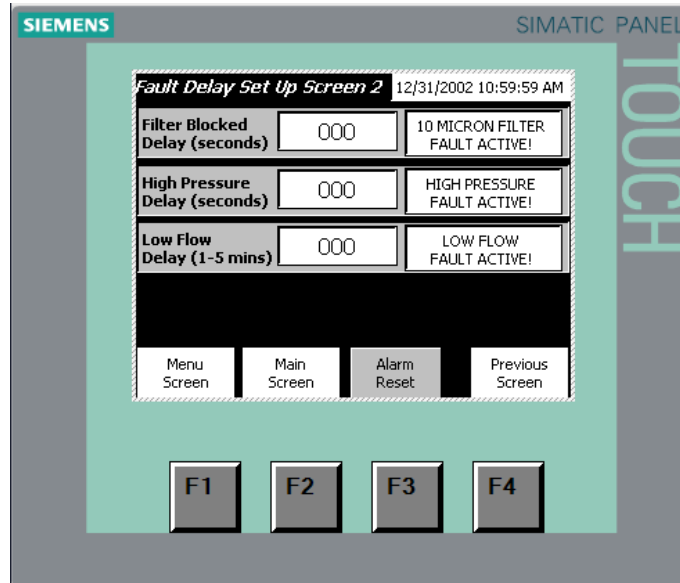
The screen above will appear.

If you have special circumstances that require you to ***delay the alarms from going off*** then continue with this step, if not skip forward to the bottom of this page. **All of the alarm descriptions will show up on the right hand window as shown, and also on the Main Operations Screen.**

Here you can delay:

1. **High Vacuum Alarm Delay:** This signals the operator that the strainer is plugged or there is something plugged in the supply fuel line.
2. **Leak Fault Alarm Delay:** This signals the operator that there is a leak in the cabinet.
3. **Water Detect Alarm Delay:** This signals the operator that the collection bowl on the water separator is full.
4. To adjust the settings, touch or press the number in the box as described for the key board on page 9.

Set-up Delays for Alarms to Trip Screen 2



The screen above will appear.

If you have special circumstances that require you to **delay the alarms from going off** then continue with this step, if not skip forward to the bottom of this page.

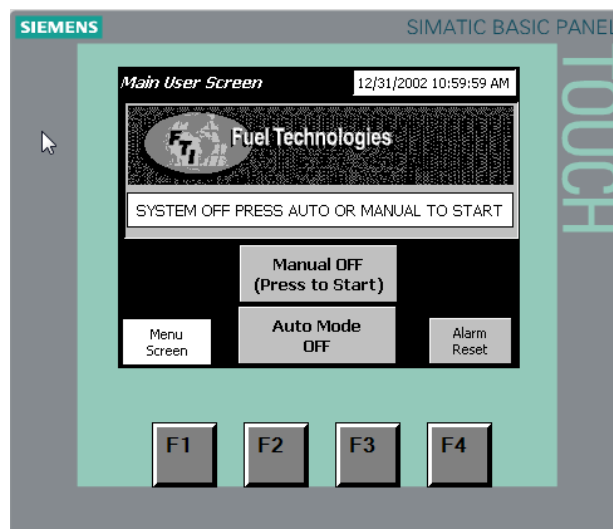
Here you can delay:

1. **1, 3 & 10 Micron Filter Blocked Alarm Delay:** This signals the operator that the 1 Micron , 3 Micron or the 10 Micron filter is plugged. This will delay the alarms for both the 1 Micron , 3 Micron and 10 Micron filters. **(Go to this screen to see which of the 3 filters are in alarm)**
2. **High Pressure Alarm Delay:** This signals the operator that there is high pressure within the cabinet or outside of the cabinet. Possible causes are: closed ball valve, broken solenoid or EBV.
3. **Low Flow Alarm Delay:** This signals the operator that the fuel has stopped flowing and the pump is continuing to run. (Loss of Prime)
4. To adjust the settings, touch or press the number in the box as described for the key board on page 9.

When Completed Press the Main Screen Button

Main Operations Screen

1. You can Access the **Menu Screen**
2. You can select **Manual Mode** to run system or **Auto Mode** to run system per the **Start** and **Stop** times.
3. In **Manual Mode** the system will stand idle. (Put in Manual Mode for servicing the filters)
4. You can turn the system on and off in **Manual Mode**. Press the **Manual Off Button** to turn on. Press the same button now labeled **Manual On** to turn off.
5. In **Auto Mode** the system will stand idle until the **Start Time** you entered begins. To stop **Auto Mode** while the system is running, press the Auto Mode Button and the system will go into standby.



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 text box above the **Manual Off** Button)

There is also a Alarm Reset Button on the Set-Up Delays for Alarms screen.

(Both Reset buttons show when system is in alarm mode, otherwise they are **hidden**)

Note: The system will switch to **Manual Mode** off for safety reasons 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 the filter), turn system on manually to check for leaks. Then reset to **Manual Mode** or **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
HIGH VACUUM FAULT Replace Strainer & Reset	Vacuum Switch Gauge Action: Check strainer, or the supply line for blockage.
WATER DETECTED FAULT Drain and Reset	Water Level Sensor @ Separator Action: Drain water from the water separator.
LEAK DETECTED FAULT	Leak Sensor: Leakage has occurred within the cabinet area.
MOTOR OVERLOAD FAULT Reset on touch screen. Reset Motor Overload.	This will occur if pump/motor is over heated or over-loaded. Action: Find cause and repair. 1. Press the touch screen RESET button and then; 2. Press the RESET button on the Motor Overload inside of the control panel.
10 MICRON FILTER FAULT 10 Micron filter plugged	10 Micron Differential Switch Gauge Action: Replace 10 Micron filter
SYSTEM HIGH PRESSURE High set point reached (45 PSI)	System High Pressure Gauge, caused by blockage in the system or return line. Action: Locate reason for excessive pressure and repair.
1 MICRON FILTER FAULT 1 Micron filter plugged	1 Micron Differential Switch Gauge Action: Replace 1 Micron filter
LOW FLOW FAULT Loss of Prime	Low set-point on Pressure Gauge Action: Locate reason for loss of prime and repair.
3 MICRON FILTER FAULT 3 Micron filter plugged	3 Micron Differential Switch Gauge Action: Replace 3 Micron filter

RUNNING MANUAL MODE

From the Main Operations Screen, press the **Manual Off** button, this will turn the system **ON** and it will begin to pump fuel through the system. Pressing the same button now labeled **Manual On** button will turn the system **OFF**.

RUNNING AUTO MODE

To switch to Auto Mode, press the **Auto Mode Off** button.

The controller will 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 Active** button. (This should be done before performing maintenance tasks, such as changing filters, draining separators, etc.) To resume operation, press the **Auto Mode Off** button. The system will now resume with the pre-programmed schedule.