

HydrX™ Fuel Conditioning System

Setup & Operation Manual - FCC Control

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Introduction

Overview	1
----------------	---

FCC Setup

Auto Run Time Overview	3
Auto Run Time Setup	3
Cycle Time Parameters Overview	4
Cycle Time Parameters Screen.....	4
Conditioner Tank Settings Screen.....	5
Conditioner Processing Cycles Overview	6
Conditioner Processing Cycles Screen	6
Filter End of Life (EOL) Overview	7
Filter EOL (End of Life) Notes:	7
Filter EOL Settings Screen	7
ATG Device Mapping Overview	8
ATG Device Mapping Screen	8

Service

FCC Service Home Screen	9
New Filter Button	9
Fill Button.....	9
Auto Cycle Button.....	10
Auto Cycle Notes.....	10
Auto Drain Button	10
Filter Performance Screen	11
Water Collection Screen	11
Service Counter Screen	12
Operational Mode History Screen	12
FC Comm Diagnostic Screen	13
FC Probe Comm Diagnostic Screen	13
Fault Diagnostic One Screen	13
Fault Diagnostic Two Screen	14
ATG Sensor Data	14
FCC Software Upgrade	15
FCC Clock Setup	16

TLS-4xx Setup

Install HydrX Fuel Conditioning System Software	18
HydrX Mag Probe Setup	18
HydrX Pressure Sensor Setup	19
External Input Setups	19
FCC Switch Contact Setup.....	19
Diesel Pump Switch Hook Setup.....	20
Relay Setup (Output Relay that will engage the STP)	21
Pumps and Lines Setup	22
Pump Setup.....	22
Line Setup	23
Custom Alarms Setup	24
Fuel Conditioner Setup	25

Operation

HydrX System Maintenance Alerts.....	27
General Troubleshooting	28
Troubleshooting Tips.....	29
Comm Fault.....	32

HydrX System Specifications and Default Settings

Specifications	33
Recommended HydrX Fuel Conditioning Controller Settings	34

Figures

Figure 1.	HydrX Fuel Conditioning Controller Front Display	2
Figure 2.	FCC Display Home Screen	2
Figure 3.	Auto Run Time Screen	3
Figure 4.	Data Entry	3
Figure 5.	Data Entry Keypad Popup	4
Figure 6.	Cycle Time Parameters Screen	4
Figure 7.	Conditioner Tank Settings Screen	5
Figure 8.	Conditioner Processing Cycles Screen	6
Figure 9.	Filter EOL Settings Screen	7
Figure 10.	ATG Device Mapping Screen	8
Figure 11.	FCC Service Home Screen	9
Figure 12.	Filter Performance Screen	11
Figure 13.	Water Collection (Hour/Day) Screen	12
Figure 14.	Water Collection (Month/Year) Screen	12
Figure 15.	Service Counters Screen	12
Figure 16.	Mode Cycle History Screen	13
Figure 17.	FC Pressure Sensor Diagnostic Screen	13
Figure 18.	FC Probe Diagnostic Screen	13
Figure 19.	Fault Diagnostic One Screen	14
Figure 20.	Fault Diagnostic Two Screen	14
Figure 21.	ATG Sensor Data Screen	14
Figure 22.	FCC USB Ports	15
Figure 23.	FCC Software Upgrade Screen	15
Figure 24.	Accessing Maintenance Screen	16
Figure 25.	Maintenance Screen	16
Figure 26.	System Mode Top Page	16
Figure 27.	Main Menu Page	17
Figure 28.	Clock Set Page	17
Figure 29.	Accessing TLS-4xx Probe Setup Screen	18
Figure 30.	Accessing TLS-4xx Line Pressure Sensor Setup Screen	19
Figure 31.	TLS-4xx External Input Setup Screen For FCC Switch Contact	19
Figure 32.	Relay Setup Screen	21
Figure 33.	Pumps Setup Screen	22
Figure 34.	Line Setup Screen	23
Figure 35.	Line Setup Screen - Last Page	24
Figure 36.	Custom Alarms Setup Screen Example	24
Figure 37.	TLS-4xx Fuel Conditioner Setup Screen	25
Figure 38.	TLS-4xx HydrX Overview Screen	26
Figure 39.	Main Menu Screen	29
Figure 40.	Self Diag. Screen	29
Figure 41.	I/O Screen	30
Figure 42.	IN OUT Screen	30
Figure 43.	TLS-4xx HydrX Overview Screen	31

Introduction

Overview

The Veeder-Root HydrX system has been designed to help maintain diesel underground storage tanks (UST) and their fuel contents in optimal condition by continuously removing water as well as filtering fuel. As the HydrX system is removing water, it is preventing the establishment of an environment that supports the development of bacterial colonies that, left unchecked, will foul fueling system components, such as, check valves, shear valves, filters and nozzles causing equipment down time and loss of business. The bacteria that thrive in these very specific conditions, where they access nutrients from fuel at the fuel water interface, will also create acids in the UST that contribute to corrosion and possible long-term failure of fueling system components, including, submersible turbine pump (STP) columns, shear valves or other ferrous components within the fueling system.

Along with direct water removal, the HydrX system provides a multi-stage filtration system and provides a means for continuous “polishing” of the UST fuel contents. The multi-stage filters provide a combined 25-micron (um) particle filter with a coalescing element that separates any entrained water from the fuel. In addition, a second element provides a fine water separation as well as another 25-micron (um) filtration barrier. This second stage prevents any possibility of returning emulsified fuel and water back to the UST. A novel water intake device (WID) provides direct access to water at the tank bottom at it's farthest reaches. As water is removed from the tank bottom, only clean fuel is returned through the multi-stage filtering. The unique configuration of the WID and filtering provides long life for the filter element as well as providing the cleanest, “driest” fuel that protects the critical flash point and cetane rating of the fuel product necessary for today's high performance diesel engines.

The HydrX system is comprised of several components that operate together to provide optimal water removal and intelligent cycle control while minimizing impact to site operations. Intelligent cycle control continuously monitors the HydrX system and determines the best strategy for water removal while managing the STP to minimize run time while providing the required time to remove water and clean fuel in the UST. In addition, the intelligent cycle control prioritizes line and tank testing to maintain site compliance. If water is not collected over the course of a daily Auto Cycle, the HydrX system will halt processing until a new delivery into the tank occurs. HydrX components include:

- TLS-4xx (TLS-450PLUS or TLS4 with TLS-XB)
- HydrX Fuel Conditioner Controller (FCC)
- HydrX Fuel Conditioner (FC)
- Water Intake Device (WID)
- Guide Tube and Guide Tube Riser
- HydrX software feature (P/N 332972-032)
- Software version 9R or later

The HydrX Fuel Conditioning Controller (FCC) is installed in a non-hazardous location and it operates in combination with a TLS-4xx Automatic Tank Gauge (ATG) using existing USM interfaces to Veeder-Root protocol digital devices as well as switched pump control via UIOM relays (see Figure 1).

This setup manual assumes the FCC is installed and wired both to the TLS-4xx and the HydrX Fuel Conditioner according to the instructions in the HydrX Installation Manual 577014-446.

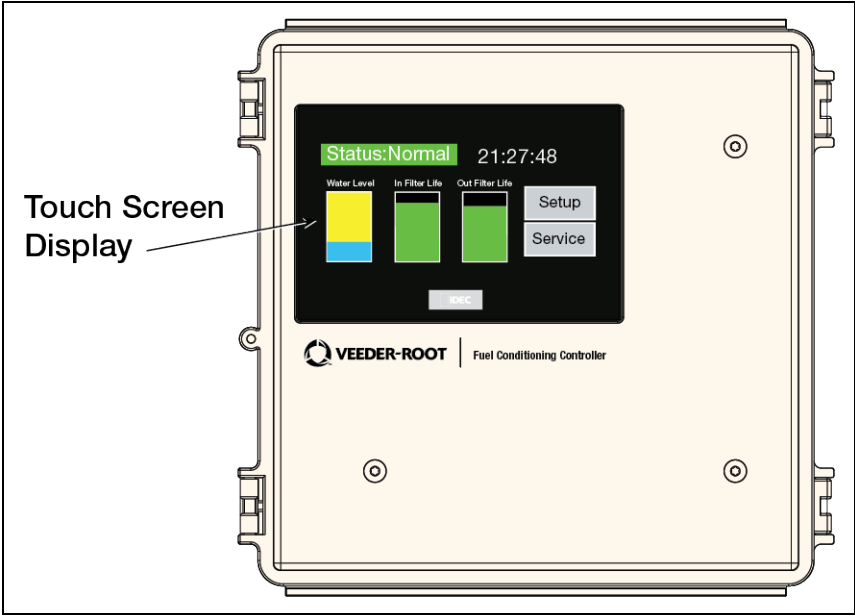


Figure 1. HydrX Fuel Conditioning Controller Front Display

The FCC display has a touch screen which is used to enter HydrX setup parameters, view operating status, manually initiate system tasks, and check system history logs. The FCC display home screen is shown in Figure 2.

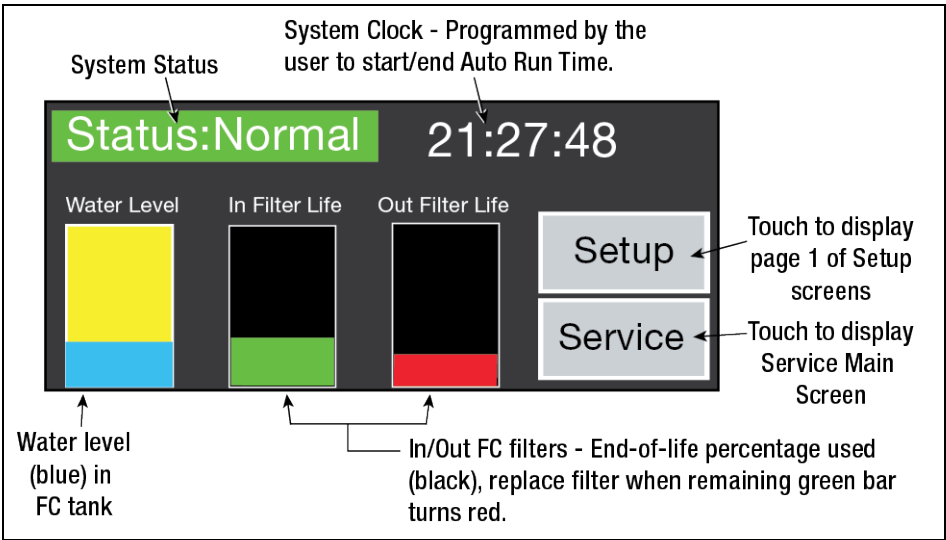


Figure 2. FCC Display Home Screen

FCC Setup

Touch the **Setup** button on the Home screen to begin the FCC setup procedure and display the Auto Run Time screen (see Figure 3).

Auto Run Time Overview

Auto Run Time is a user adjustable setting that tells the FCC which hours the HydrX can run the STP and is typically programmed for quiet hours or overnight shutdowns when sales are slow, or a site is closed for business.

NOTICE The System only runs for the duration of the programmed start and end hours if water is being removed, or on new system startup, or if a delivery occurs in the tank in which HydrX is installed.

If water extraction and any required fuel circulation ends before the programmed Auto Run end time, the HydrX goes into an idle state.

Auto Run Time Setup

1. Touch the **Setup** button on the Home screen to display the Auto Run Time screen (see Figure 3).

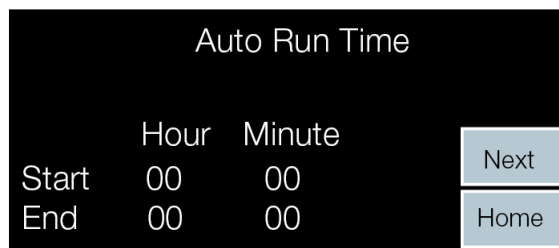


Figure 3. Auto Run Time Screen

2. Touch the Start **Hour** field to display the number keypad and enter the hour (24 hour format) you wish to start the HydrX Auto Run Time. To start the FCC auto cycle at midnight, program this value to 00 hour and 00 minute. Start time can be any value between 00 hour 00 minute and 23 hour 59 minute. Recommended Start/End Auto Run time is 00:00 to 08:00.

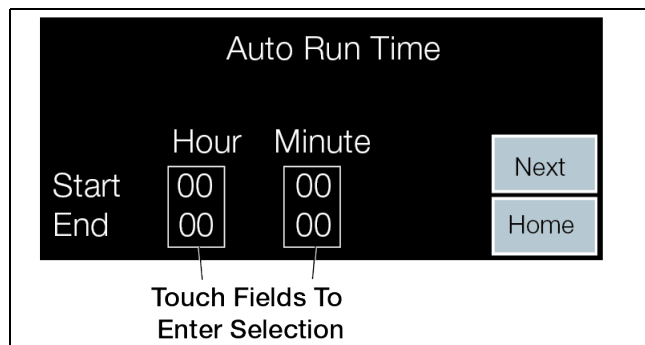


Figure 4. Data Entry

3. To use the keypad, touch a number to enter that value. Touch **CLR** to clear a field's entry, touch **CAN** to cancel a keypad selection, and touch **ENT** to enter a keypad selection into the associated field and close the keypad.

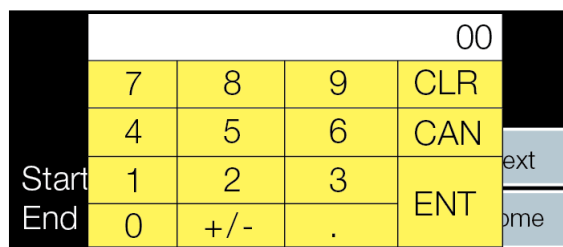


Figure 5. Data Entry Keypad Popup

4. Touch the Start **Minute** field and enter the minutes of the Start Hour, e.g., 00.
5. Touch the End **Hour** field to program the FCC ending hour in 24 hour format.
6. Touch the End **Minute** field and enter the minutes of the FCC ending hour.

Cycle Time Parameters Overview

NOTICE The Cycle Time and Conditioner Processing Cycle parameters described below include typical, recommended or required settings. These parameters should initially be set as outlined below and modified only after observing site operations and the HydrX systems water loading behavior and fuel quality. While highly configurable for any unique site conditions or operating requirements, the values below will provide acceptable performance in most circumstances while balancing STP running hours. Reducing run time, while lowering the utilization of the STP, can reduce water extraction efficiency. Conversely, more water can be removed or more fuel can be polished at the expense of running the STP.

Cycle Time Parameters determine how long each operating sequence in the FCC runs. All cycle time parameters are user settable and break down into four discreet settings: Fill Time, Sweep Time, Vacuum Time and Polish Time.

Cycle Time Parameters Screen

1. Touch the **Next** button to display the Cycle Time Parameters screen (see Figure 6).

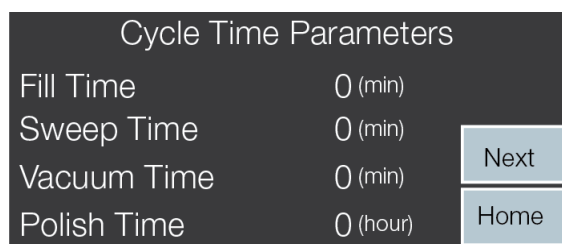


Figure 6. Cycle Time Parameters Screen

2. **Fill Time** - is the amount of time used to fill HydrX after the system has been installed or the filters have been serviced. This is a 2-stage cycle. The duration of each stage is determined by 'Fill Time setting'. During stage 1 clean fuel is fed from the STP through the inlet filter and returned to the tank through the WID. During stage 2 the housing is under vacuum and fuel enters through the WID, passes through the outlet filter and returns to the tank ullage space through the WID riser. Fill time is typically set to 15 minutes.
3. **Sweep Time** - is used to reverse flow through the WID by using pressure from the STP to push fuel to the bottom of the tank. This pushes any standing water towards the lowest point in the tank for more efficient pick up as well as clearing any potential clogs that may have built up from vacuuming the tank bottom. This is typically set to 2 minutes.

4. **Vacuum Time** - is the amount of time used to vacuum from the bottom of the UST. This is the primary means for extracting water from the tank. While customers are dispensing fuel, the system will also enter vacuum mode for the duration of the dispense. Typically set to 15 minutes.
5. **Polish Time** - is the amount of time that the user allows for circulating fuel through HydrX. Polishing simply recycles fuel from the UST at a rate of approximately 6 gallons per minute (gpm) or 360 gallons per hour (gph). Any entrained water and fine water droplets are continuously separated from the fuel in this process as well as any particulate or contamination down to 25 micron (um) in size. Polish time is typically set to 4 hours, however, this value can be increased or decreased to balance STP run time against a site operator's specific needs for fuel cleanliness.

NOTICE At high through-put sites receiving 1 or more deliveries per day, it is recommend that polish time be set to 1 hour.

Conditioner Tank Settings Screen

Conditioner Tank Settings provide information to the FCC needed to control the maximum drain time (spill protection) for the auto drain function as well as holding capacity and height to volume conversion.

1. Touch the **Next** button to display the Conditioner Tank Settings screen (see Figure 7).

Conditioner Tank Settings	
Drain Time	0 (min)
Extended Drain	0 (sec)
Tank Volume	0.00 (gal)
Volume/Inch	0.0000 (gal)

Next

Home

Figure 7. Conditioner Tank Settings Screen

2. **Drain Time** - is the maximum time the STP is allowed to run if the HydrX probe doesn't reach a 0 gallon, minimum, drain. This prevents the pump from running excessively to help avoid spills or accidental discharges if a drain out is not completed, for any reason. Touch the **Drain Time** field and select the time in minutes to drain HydrX, This should be set to 10 minutes.
3. **Extended Drain** - is a fine adjustment that lets the drain extend briefly to allow water to clear below the FC measuring probe's lower detection limit of 0.75". Touch the **Extended Drain** field to select an extra amount of time in seconds to continue the draining process. Default is 0 seconds.

NOTICE Unlike the drain time, which shuts down the pump once the water level reaches 0", this setting allows the pump to run the programmed amount of time after the water float has touched bottom on the HydrX Fuel Conditioner (FC) tank. This setting should be limited to 30 seconds, maximum, to prevent any possibility of spilling fuel or ejecting excessive amounts of fuel into the waste water.

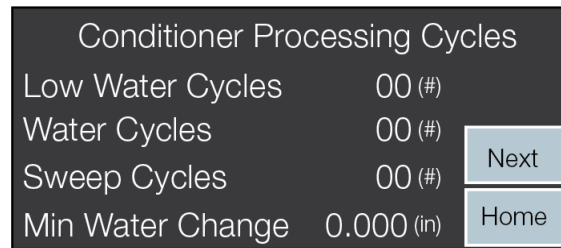
4. **Tank Volume** - is the maximum volume of water that HydrX can hold before indicating that a drain out is required. This is typically set to 5 for model 500D and 2.5 for model 250D.
5. **Volume/Inch** - is the height to volume conversion used by the FCC for the 5 gallon tank in the Fuel Conditioner. Touch the **Volume/Inch** field and enter the required value of 0.3536 gallons per inch (with 5 gallons in the FC tank, the water height measured in the tank will be 14.14").

Conditioner Processing Cycles Overview

Conditioner Processing Cycles are FCC settings that limit the number of times the FCC runs the STP for water extraction in it's different operating modes as described below.

Conditioner Processing Cycles Screen

1. Touch the **Next** button to display the Conditioner Processing Cycles screen (see Figure 8).



Conditioner Processing Cycles	
Low Water Cycles	00 (#)
Water Cycles	00 (#)
Sweep Cycles	00 (#)
Min Water Change	0.000 (in)

Next

Home

Figure 8. Conditioner Processing Cycles Screen

2. **Low Water Cycles** - limits the number of vacuum cycles used by the FCC to determine that water is not being extracted when the HydrX probe float is below it's 0.75" minimum detection limit and the float is resting on the bottom. This is typically set to 4 cycles and typically higher than Water Cycles limit used when the float is off the bottom. See Water Cycles below.
3. **Water Cycles** - limits the number of vacuum cycles used by the FCC to determine that water is not being extracted when the HydrX probe float is above it's 0.75" minimum detection limit and the float is off the bottom. This is typically set to 2 cycles.
4. **Sweep Cycles** - limits the number sweeps intended to move any standing water along the tank bottom to the lowest point. Sweeping improves the overall water collection efficiency of HydrX by encouraging water to move to the end vacuum point that is optimized for water extraction as well as keeping the lines clear from debris buildup in the WID. This is typically set to 2 cycles. A Sweep cycle combines a sweep period, as programmed by the sweep time parameter, with a vacuum period, as programmed by the vacuum time parameter. The combined sweep and vacuum intervals count as a single sweep cycle.
5. **Min Water Change** - provides the minimum height change in the HydrX probe's water float. If the water float does not meet this minimum change criteria, the FCC logic will determine that water is not being extracted and will move on to the next cycle or mode. This is typically set to 0.05".

Filter End of Life (EOL) Overview

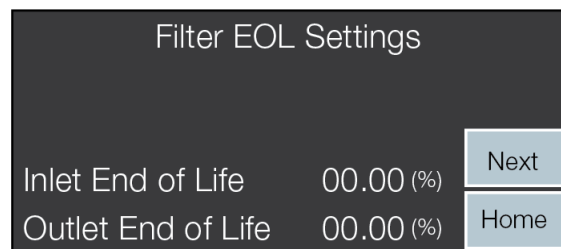
Filter End of Life (EOL) Settings tell the HydrX FCC the maximum pressure drop (loss) across each filter element as well as when to signal the user that a filter change is required based on percent life remaining. An increasing pressure drop indicates loss of flow through the filter due to element clogging. HydrX filters have high surface area, long life elements. Due to cost and disruption caused by element servicing, filter replacement kits include both inlet and outlet filters which should be replaced at the same time.

Filter EOL (End of Life) Notes:

1. Filters should always be replaced in pairs followed by a New Filter Cycle to maximize performance and minimize risk of reduced water removal protection.
2. To avoid reduced or lost performance caused by loss of flow into the HydrX Fuel Conditioner, the Inlet End of Life recommended setting is 5%. Technically, this can be set to 0%, however, the amount of time between a remaining life of 5% and 0% is not material with respect to the cost of the filter replacement or potential loss of protection.
3. To avoid reduced or lost performance caused by loss of vacuum in the HydrX Fuel Conditioner, the Outlet End of Life recommended setting is 5%. Technically, this can be set to 0%, however, the amount of time between a remaining life of 5% and 0% is not material with respect to the cost of the filter replacement or potential loss of protection.

Filter EOL Settings Screen

1. Touch the **Next** button to display the Filter EOL Settings screen (see Figure 9).



Filter EOL Settings	
Inlet End of Life	00.00 (%)
Outlet End of Life	00.00 (%)

Figure 9. Filter EOL Settings Screen

2. **Inlet End of Life** - is the percentage value of remaining filter life that the HydrX will signal the user that the inlet filter must be replaced. This is typically set to 5% to prevent any possibility of contamination or system degradation caused by completely clogged filter elements.
3. **Outlet End of Life** - is the percentage value of remaining filter life that the HydrX will signal the user that the outlet filter must be replaced. This is typically set to 5% to prevent any possibility of contamination or system degradation caused by completely clogged filter elements.

ATG Device Mapping Overview

ATG Device Mapping Tells the HydrX FCC about the physical locations of the devices within the TLS ATG. As probes, sensors and the Fuel Conditioner, they are assigned physical locations, like probe 1, probe 2, LPR 1, LPR 2, Fuel Conditioner 1, etc. This section defines where to locate the devices used by the FCC when communicating with the TLS and inquiring device data.

ATG Device Mapping Screen

1. Touch the **Next** button to display the ATG Device Mapping screen (see Figure 10).

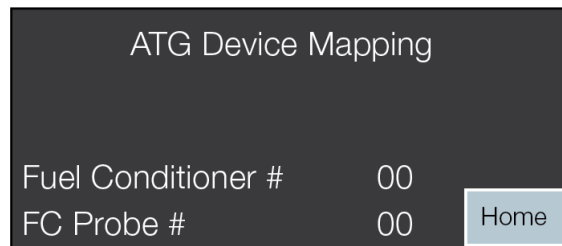


Figure 10. ATG Device Mapping Screen

2. **Fuel Conditioner #** - For single HydrX Fuel Conditioner configurations, this should be programmed to 1.
3. **FC Probe #** - is the probe located in the fuel conditioner housing and is the same number as programmed into the TLS when configuring the FC devices and settings. If the fuel conditioner probe is mapped into the TLS as the eighth probe and then assigned to the FC during setup, this value would be programmed as 8.

NOTICE Reference “TLS-4xx Setup” in this manual for detailed programming instructions.

4. Touch the **Home** button to return to the Home screen (see Figure 2).

Service

The HydrX FCC includes service mode screens that support maintenance, operations and diagnostics for performance monitoring or servicing the system. Principle service controls and indicators are described in this section.

FCC Service Home Screen

Touch the Service button on the FCC Home Screen to display the Service main screen (see Figure 11).

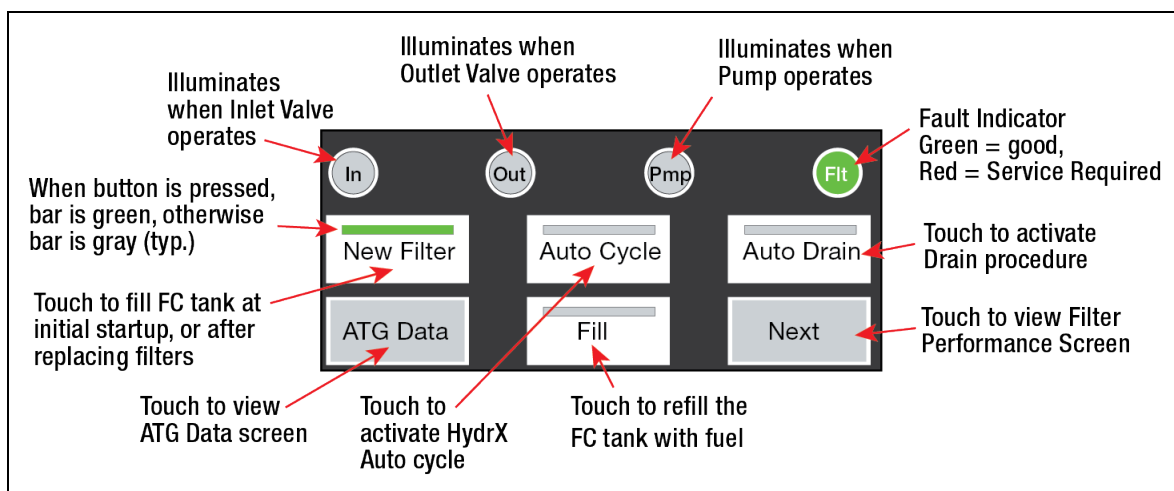


Figure 11. FCC Service Home Screen

New Filter Button

When a system is first started, after installation and connection to the STP, or after the filters are replaced, touching the New Filter button fills the Fuel Conditioner tank with fuel. A New Filter Cycle includes the time programmed as Fill Time followed by a vacuum interval, determined by the programmed Fill Time, to completely fill and de-aerate the tank. During the New Filter Cycle, the inlet and outlet filter pressures are independently measured and stored as reference values that are used to calculate filter life. Inlet filter pressure is measured during the pressurized interval, essentially at pump pressure. Outlet filter pressure is measured during the vacuum interval. As the filters accumulate debris and clog, the pressure changes from this reference value, the pressure difference indicating remaining filter life.

New Filter Cycle Notes:

1. A complete New Filter Cycle consists of a pressurized fill interval, determined by programmed fill time, plus a vacuum interval, determined by programmed fill time. Assuming a typical 15 minute fill time, the New Filter Cycle interval is 30 minutes.
2. **Only** run a New Filter Cycle during initial system startup or after filter replacement. Running a New Filter Cycle on used filters may not provide accurate filter life calculation.

Fill Button

A Fill Cycle is used for troubleshooting alarms or hardware failures and to refill the housing with liquid following any service that requires the unit to be opened without replacing the filters. Touching the Fill button refills the Fuel Conditioner tank with fuel.

Fill Cycle Notes:

1. A complete Fill Cycle consists of a pressurized fill interval, determined by the programmed fill time, plus a vacuum interval, determined by programmed fill time. Assuming a typical 15 minute fill time, the total fill interval is 30 minutes.
2. Initial pressures (PO values) are not altered during the Fill Cycle. Current pressure (P) and filter life (%) update at the end of the Fill Cycle.

Auto Cycle Button

Touching the Auto Cycle button on the front panel of the FCC will activate an Auto Cycle, if an Auto Cycle is not already in progress.

Auto Cycle Notes

1. Except for new system startup, an Auto Cycle is run when the following conditions are met:
 - a. Water has been collected in the previous day. And,
 - b. The FCC is within the auto start and auto end times. Or,
 - c. A delivery has occurred. And,
 - d. The FCC is within the auto start and auto end times. Or,
 - e. An Auto Cycle can also be manually started and will run provided conditions A or C are true.
2. An Auto Cycle always runs after initial system startup without regard to any prior water removal.
3. Any Auto Cycle interval is held pending due to any of the following conditions:
 - a. A line test is in progress
 - b. A tank leak test is in progress
 - c. A delivery is in progress and the HydrX is running a delivery polish cycle
4. An Auto Cycle will not run due to any of the following conditions:
 - a. The Fuel Conditioner requires a water drain service
 - b. The Fuel Conditioner requires a filter service
 - c. A line test shutdown on the line assigned to the fuel conditioner
 - d. A tank test shutdown on the tank assigned to the fuel conditioner
 - e. A line LPR fault on the line assigned to the fuel conditioner
 - f. A tank probe fault on the tank assigned to the fuel conditioner
 - g. A communication failure between the FCC and ATG
 - h. Failure of any HydrX sensor (either probe or pressure sensor)
5. An Auto Cycle always starts with water cycles, followed by sweep cycles, followed by polish cycles. The rules for vacuum and sweep cycles are defined in notes 6 - 8 below.
6. The Low Water Cycles setting is the number of consecutive vacuum cycles without water removal when the Fuel Conditioner float is on the bottom of HydrX.
7. The Water Cycles setting is the number of consecutive vacuum cycles without water removal when the Fuel Conditioner float is not on the bottom of HydrX.
8. The Sweep Cycles setting is the number of consecutive combined sweep and vacuum cycles without water removal after the FCC has completed vacuum only cycles.
9. For the cycle types defined by notes 6 – 8, the counter value decrements when water is not extracted. If water is extracted, the counter does not decrement or is reset to it's programmed setting until the consecutive number of cycles are run without water removal.

Auto Drain Button

This function automatically operates the STP to eject water from HydrX via a Veeder-Root 330020-880 Water Drain Kit, or similar. After coupling the kit to HydrX, the user touches the FCC Auto Drain button to initiate the

HydrX drain sequence. The P/N 330020-880 kit includes a nozzle to control the flow out of the HydrX. The FCC continuously monitors the water level in the FC housing and, once the HydrX probe water float reaches the bottom, or the programmed Drain Time has expired, automatically shuts down the STP.

Filter Performance Screen

The Filter Performance screen displays the read-only HydrX inlet and outlet filter status (see Figure 12). 'PO' is the pressure measured by the HydrX FCC when a filter is new or has been replaced. 'P' is the current pressure as measured by the HydrX FCC that indicates if the filter is clogging which diminishes filter life. '%' is the percent of remaining filter life. This screen displays all relevant filter information, including:

- Inlet and Outlet filter reference pressures, PO. This is the pressure measured through the filter at initial system startup or after filter replacement and represents the filter pressure at 100% life capacity.
- Inlet and Outlet filter current operating pressure, or P. The reference pressure, PO, for each filter minus the current operating pressure is the pressure drop that coincides with the programmed filter parameters, Inlet Life Pressure and Outlet Life Pressure, respectively.
- Inlet and Outlet filter life (%) shown as a remaining percentage.

NOTICE A service signal is sent to the TLS once the percent remaining life is less than or equal to the programmed Inlet or Outlet End of Life setting. For example, if the FCC is programmed to signal at 5% life remaining, when the inlet or outlet filter calculation result is 5%, or less, the filter replacement signal is set.

Filter Performance			
	Inlet	Outlet	
PO	0.00 (psi)	0.00 (psi)	Home
P	0.00 (psi)	0.00 (psi)	
%	0.0 (%)	0.0 (%)	Next

Figure 12. Filter Performance Screen

1. Touch the **Home** button to return to the FCC Home screen (see Figure 2).
2. Touch the **Next** button to display the next service screen.

Water Collection Screen

The HydrX FCC accumulates a set of water collection statistics to help users understand the conditions when water is entering or collecting in their UST. Statistics are arranged in the following groups:

- Current and Last Hour accumulation, Current and Last Day accumulation (see Figure 13).

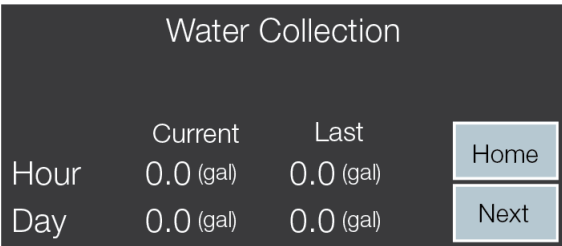


Figure 13. Water Collection (Hour/Day) Screen

- Current and Last Month accumulation, Current and Last Year accumulation (see Figure 14).

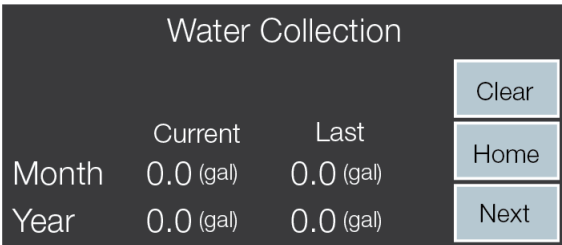


Figure 14. Water Collection (Month/Year) Screen

Monitoring patterns in these distributions can help users identify if water is collected in gradual condensing type conditions, dropped with deliveries, i.e., correlating daily accumulations to ATG deliveries or ingress after wet weather periods in either daily or monthly accumulations.

Touch the **Clear** button to reset the accumulations to zero.

Service Counter Screen

The FCC includes non-resettable service counters that count water drain outs and filter changes (see Figure 15).

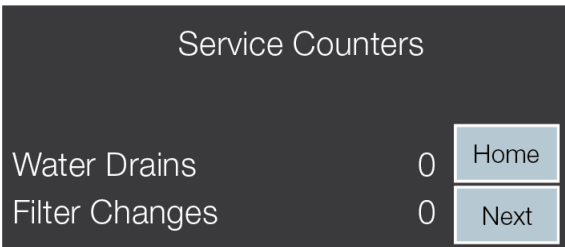


Figure 15. Service Counters Screen

Operational Mode History Screen

The FCC maintains a running history of both the number of times and the amount of time the system has been in each of its operational modes (see Figure 16). Time and counter values are reset at the start of an Auto Cycle.

	H : M : S	#	
Auto Mode	00 00 00	00	
Vacuum	00 00 00	00	
Sweep	00 00 00	00	Home
Polish	00 00 00	00	Next

Figure 16. Mode Cycle History Screen

FC Comm Diagnostic Screen

The FCC displays read-only communications diagnostic counters of serial communications between the FCC and ATG Fuel Conditioner (FC) functions (see Figure 17).

FC Comm Diagnostic		
Read	0	Home
Used	0	
Errors	0	Next

Figure 17. FC Pressure Sensor Diagnostic Screen

FC Probe Comm Diagnostic Screen

The FCC displays read-only diagnostics counters of serial communication with the FC Mag Probe (see Figure 18). These counters only function during Auto Drain.

FC Probe Comm Diagnostic		
Read	0	Clear
Used	0	
Errors	0	Home

Figure 18. FC Probe Diagnostic Screen

Touch the **Clear** button to reset the counters to zero in both FC comm diagnostic screens.

Fault Diagnostic One Screen

The FCC displays date and time stamps for Power, Drain and Filter fault events (the last one) as well as cumulative counters for each event type.

Fault Diagnostic One		
yy/mm/dd hh:mm ####		
Power	00 00 00 00 00	0
Drain	00 00 00 00 00	0
Filter	00 00 00 00 00	0

Figure 19. Fault Diagnostic One Screen

Touch the **Home** button to return to the FCC Home screen (see Figure 2).

Fault Diagnostic Two Screen

The FCC displays date and time stamps for Comm, Pressure and Vacuum fault events (the last one) as well as cumulative counters for each event type.

Fault Diagnostic Two		
yy/mm/dd hh:mm ####		
Comm	00 00 00 00 00	0
Press	00 00 00 00 00	0
Vac	00 00 00 00 00	0

Figure 20. Fault Diagnostic Two Screen

Touch the **Clear** button to reset the date/time stamps and event counters to zero in both Fault Diagnostic screens. Touch the **Home** button to return to the FCC Home screen (see Figure 2).

ATG Sensor Data

Touch the **ATG Data** button to display read-only HydrX parameters from the Fuel Conditioner Mag Probe and pressure sensor readings that are sent from the TLS-4xx (see Figure 21). Touch the **Home** button to return to the FCC Home screen (see Figure 2).

ATG Sensor Data	
Water Height	0.00 (in)
Temperature	0.00 (deg)
Pressure	0.00 (psi)

Figure 21. ATG Sensor Data Screen

FCC Software Upgrade

⚠ WARNING



To avoid electric shock do not touch any wiring terminals inside the FCC while performing this procedure.

1. If you have a FCC upgrade thumb drive with the software upgrade already on it, go to Step 3.

Visit <https://www.veeder.com/us/hydrx-software-download> to ensure the FCC is running the latest revision of software upon installation.

2. If you have downloaded the FCC software onto a PC, insert a thumb drive into your PC and copy the HGDATA01 directory from your PC location to the root directory of the thumb drive (typically drive labeled D:).

NOTICE

The USB is formatted as FAT32, so, your PC operating system must support the FAT32 file system to copy this file. Newer versions of MAC OS support this, but you should make certain if you are copying from a MAC. Specify that it is OK to overwrite the contents.

3. Open the door of the FCC and with the power to the FCC On, plug the upgrade thumb drive into the FCC USB2 port on the rear of the FCC Display (see Figure 22).

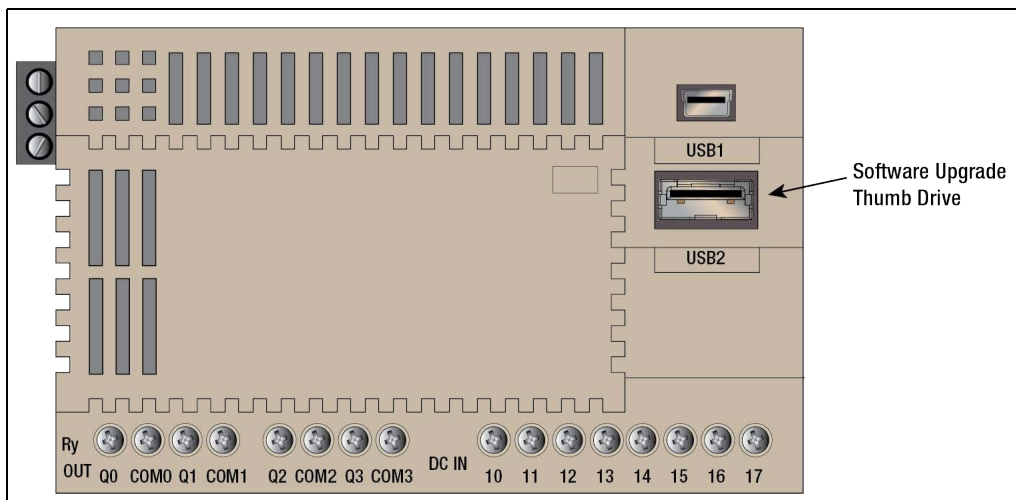


Figure 22. FCC USB Ports

4. When the Confirmation screen displays, touch the **Download Proj.** button to install the software upgrade (see Figure 23).

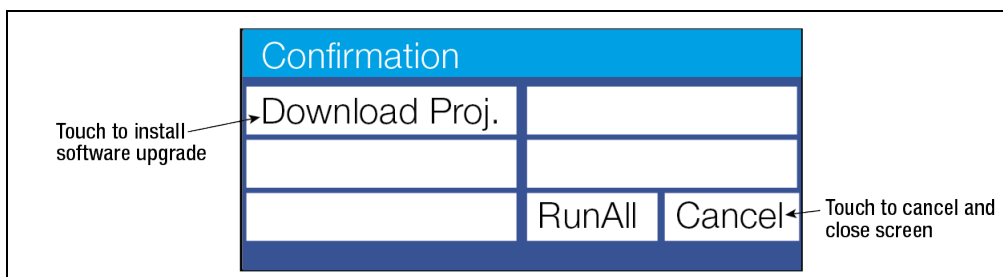


Figure 23. FCC Software Upgrade Screen

5. The FCC will go through a series of steps loading the project contents into its memory. Wait for the Confirmation screen to return then touch **Cancel** to return to the Home screen (see Figure 2).

- 6. The new code and user interfaces are loaded on your FCC. Remove the thumb drive and close and secure the FCC cover.

FCC Clock Setup

To set the FCC internal clock on initial startup follow the steps below.

- 1. Touch the upper left corner of the FCC display status bar and press it until the Maintenance screen appears (see Figure 24).

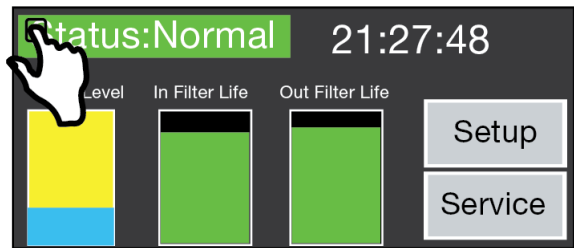


Figure 24. Accessing Maintenance Screen

- 2. When the Maintenance screen appears touch the System Mode button to open the System Mode top page.

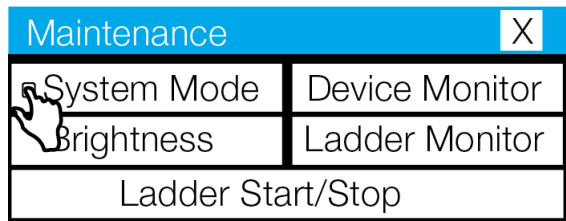


Figure 25. Maintenance Screen

- 3. On the System Mode Top Page, touch the Main Menu button (see Figure 26).

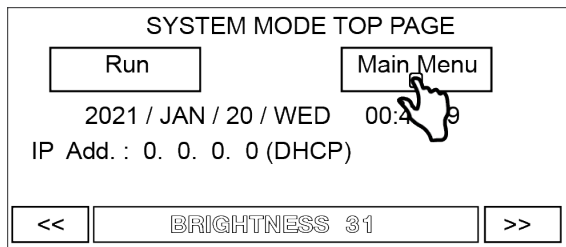


Figure 26. System Mode Top Page

4. On the Main Menu page touch the Clock Setting button open the Clock Set page (see Figure 27)

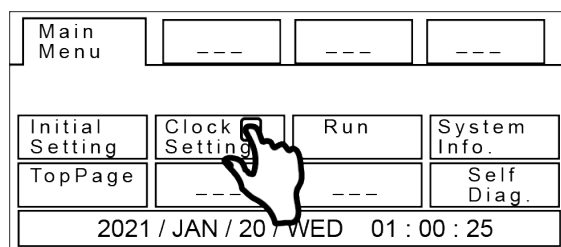


Figure 27. Main Menu Page

5. On the Clock Set page, observe the button functions in Figure 28 to reset the date and time. Touch the number buttons to enter date/time.

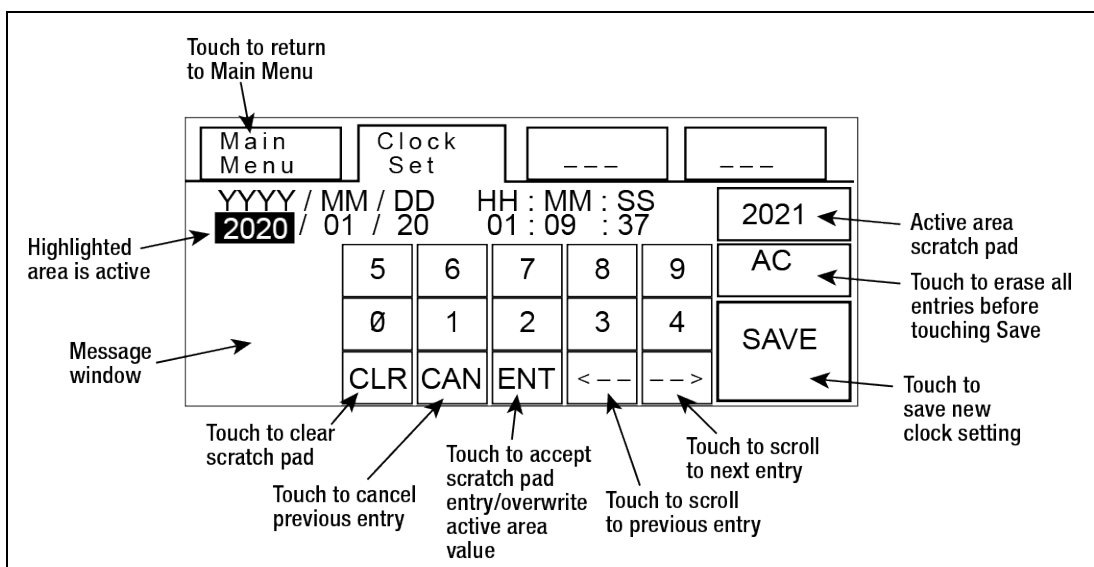


Figure 28. Clock Set Page

6. After saving the date and time, touch the Main Menu button to return to the Main Menu page, then touch the Run button on that page return to the FCC Home Page.

TLS-4xx Setup

Install HydrX Fuel Conditioning System Software

The TLS-4xx ATG must have Version 9R or later system software and have the HydrX System 'In-Sump Fuel Conditioner' software feature installed. If necessary, install the In-Sump Fuel Conditioner software feature as described in the TLS-4xx Board And Software Replacement/Upgrade manual P/N 577014-076 or using the TLS-4xx Online Help.

HydrX Mag Probe Setup

1. Touch **Setup>Devices** to enter Device setup. If the Probe setup screen is not visible, open the Setup Devices Index and touch the **Probe** button to open the Probe setup screen.

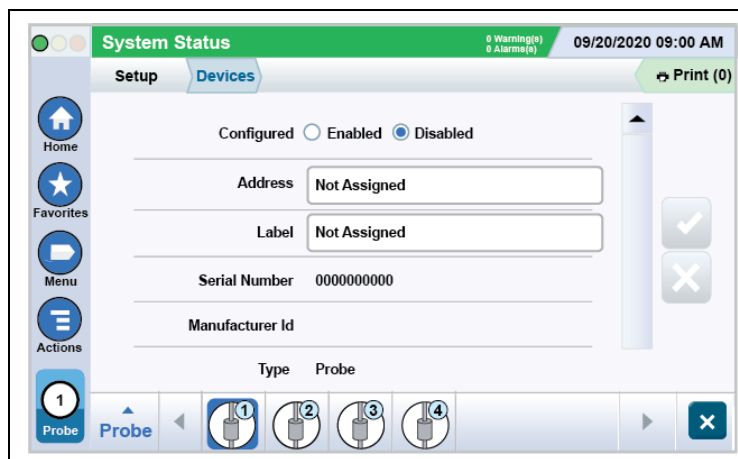


Figure 29. Accessing TLS-4xx Probe Setup Screen

2. Touch the **Enabled** radio button to configure this probe.
3. Touch the **Address** field and select the address of the probe connected to the FC, e.g., B1:S1:1.
4. Touch **Label** field and enter a description of this mag probe (up to 20 alphanumeric characters) that will appear on the console screens and in reports, e.g., HydrX 1 Mag Probe.
5. **Serial Number** - is a read only value.
6. **Type** - is a read only value.
7. **Float Type** - is a read only value.

HydrX Pressure Sensor Setup

1. Open the Setup Devices Index and touch the **Line Pressure Sensor** button to open the Line Pressure Sensor setup screen.



Figure 30. Accessing TLS-4xx Line Pressure Sensor Setup Screen

2. Touch the **Enabled** radio button to configure this pressure sensor.
3. Touch the **Address** field and select the address of the pressure sensor connected to HydrX, e.g., B1:S1:2.
4. Touch **Label** field and enter a description of this sensor (up to 20 alphanumeric characters) that will appear on the console screens and in reports, e.g., HydrX 1 Pressure Sensor.
5. **Serial Number** is a read only value.

External Input Setups

FCC Switch Contact Setup

1. Go to the **Menu>Setup>Devices** screen, open the Setup Devices Index and touch the **External Input** button to open the External Input setup screen (Figure 31).

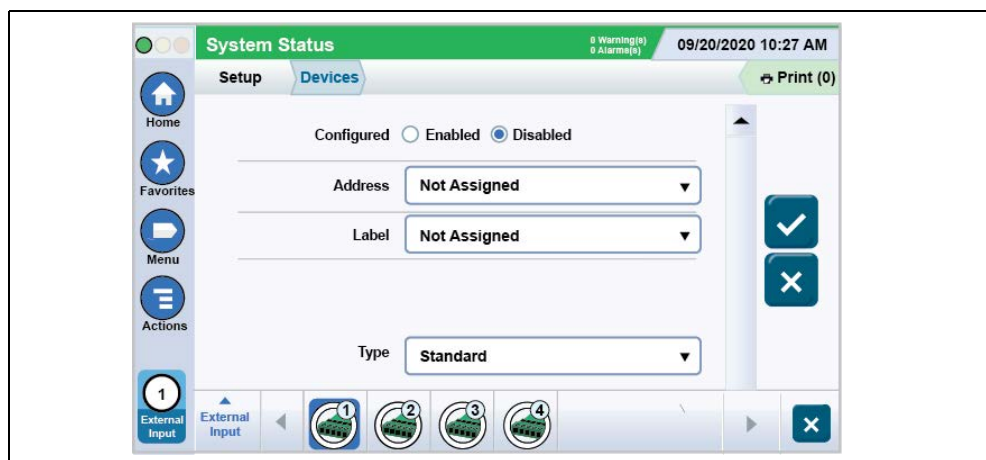



Figure 31. TLS-4xx External Input Setup Screen For FCC Switch Contact

2. Select the External Input you want to configure for the FCC switch contact.
3. Touch the **Enabled** radio button to configure this External Input.
4. Touch the **Address** field and select the address of the relay connected to the FCC terminals 11/12 in wiring diagrams.


NOTICE External Inputs connected to the IOM Module will display the following possible address codes in the Address Field: B1:Sx:X, where Sx is the slot in which the IOM Module is installed (from 1 to 4) and X is the connector Input which is wired to the Diesel Input (from 10 to 14). Reference HydrX Installation manual, P/N 577014-446.

5. Touch **Label** field and enter a description of this relay (up to 20 alphanumeric characters) that will appear on the console screens and in reports, e.g., 'HydrX Service'.
6. Touch the **Type** field and select 'Standard' (On/Off state is determined by assigned alarms or warnings).
7. Touch the **Orientation** field and select 'Normally Closed'.
8. Touch the check key  to accept the selections.

Diesel Pump Switch Hook Setup

1. On the External Input screen (Figure 31), select the External Input you want to configure for the diesel pump switch hook.
2. Touch the **Enabled** radio button for the External Input you want to configure.
3. Next, select the address for the High Voltage External Input that the Diesel Switch Hook is connected to on the IOM Module (labeled PUMP/PUMP RETURN [NEUTRAL] in wiring diagrams).

NOTICE External Inputs connected to the IOM Module will display the following possible address codes in the Address Field: B1:Sx:X, where Sx is the slot in which the IOM Module is installed (from 1 to 4) and X is the connector Input which is wired to the Diesel Input (from 10 to 14). Reference HydrX Installation manual, P/N 577014-446.

4. Touch the **Label** field and enter a description of the relay that will appear on the console screens and in reports, e.g. Diesel Switch Hook Input
5. Touch the **Type** field and select '**Pump Sense**'
6. Touch the **Orientation** field and select '**Normally Open**'
7. Touch the check key  to accept the selections.

Relay Setup (Output Relay that will engage the STP)

1. Go to the **Menu>Setup>Devices** screen, open the Setup Devices Index and touch the **Relay** button to open the Relay setup screen.

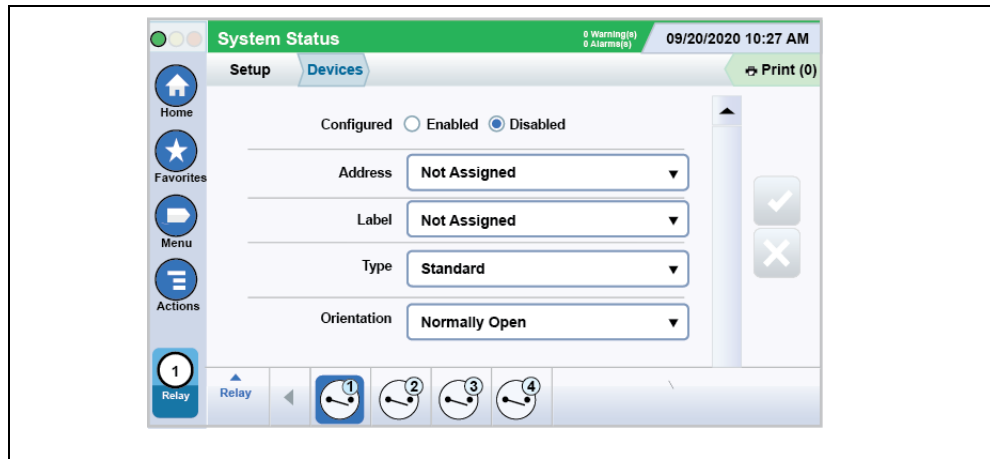



Figure 32. Relay Setup Screen

2. Select the Relay you want to configure on the lower horizontal section of the screen
3. Touch the **Enabled** radio button to enable the Relay you want to configure.
4. Next, select the **Address** for the High Voltage Relay Output that is wired to the Diesel Relay or pump controller that will engage or turn on the Diesel STP (labeled LINE/PUMP OUTPUT in wiring diagrams).

NOTICE Relays connected to the IOM Module will display the following possible address codes in the Address Field: B1:Sx:X, where Sx is the slot in which the IOM Module is installed (from 1 to 4) and X is the connector Output which is wired to the Diesel Relay (from 5 to 9)

5. Touch the **Label** field and enter a description of the relay that will appear on the console screens and in reports, e.g. Diesel Pump Relay
6. Touch the **Type** field and select 'Pump Control Output'.
7. Touch the **Orientation** field and select 'Normally Open'.
8. Accept the rest of the screen defaults and touch the check key  to accept the selections.


Pumps and Lines Setup

Pump Setup

1. Go to **Menu>Setup>Pump and Lines**, open the Setup Devices Index and touch the **Pumps** button to open Pump setup screen.



Figure 33. Pumps Setup Screen

2. Touch the lower left hand corner where it shows **Pump 1** and select the Pump along the bottom horizontal section of the screen for the Pump you want to configure.
3. Touch the **Enabled** radio button to enable the Pump you want to configure.
4. Touch the **Label** field to identify the Pump you are going to configure e.g. Diesel Pump.
5. Touch the **Mode** field and select '**TLS Pump Control**'.
6. Touch the **Tank** field and select the tank with this Diesel Pump.
7. Touch the **Pump Control** field and select the Relay that was previously configured in **Devices>Relay** for the Diesel Pump.
8. Touch the **Pump Sense** field and select the External Input that was previously configured in **Devices>External Input** for the Diesel Switch Input.
9. Accept the rest of the screen defaults and touch the check key  to accept the selections.

Line Setup

NOTICE The Lines setup may differ depending if the site is running DPLLD or not. Both sets of instructions will be shown below:

1. Go to **Menu>Setup>Pump and Lines**, open the Setup Devices Index and touch the **Line** button to open the Line setup screen.

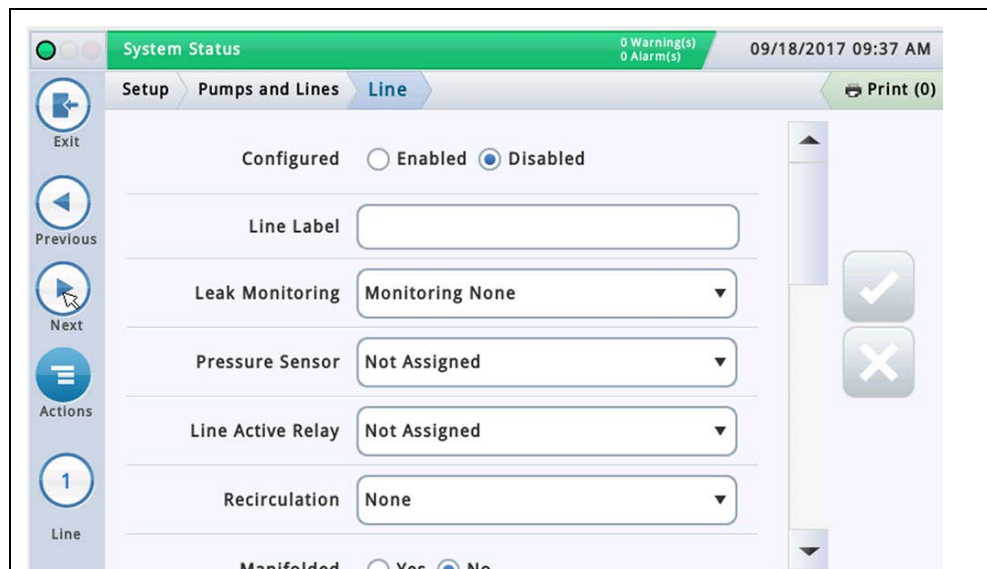



Figure 34. Line Setup Screen

2. Touch the lower left hand corner where it shows **Line 1** and select the Line along the bottom horizontal section of the screen for the Line you want to configure.
3. Touch the **Enabled** radio button for the Line that you want to configure.
4. Touch the **Line Label** field to identify the Line you are going to configure e.g. Diesel Line
5. Touch the **Leak Monitoring** field and select (Monitoring PLLD) if the site is using DPLLD, or, select (Monitoring None) if the site has No DPLLD
6. Touch the **Pressure Sensor** field and select the (LPR Sensor) if the site is using DPLLD, or, select (Not Assigned) if the site has No DPLLD.
7. Leave the Recirculation field at None unless this option is installed.
8. The **Line Active Relay**, **Manifolded**, **Dispense Mode**, **Active Switchover**, **Switchover Volume Threshold** and **Switchover Height Threshold** fields can be programmed for a site with DPLLD depending on the DPLLD application at the site. If no DPLLD, these screens can be left at their default values.
9. In this page of Line setup screens (see Figure 35), all configured Pumps will display in the left hand column for all pumps that were configured for each product. Identify the Pump that was configure in the previous Pumps menu for the Diesel Product and touch the Right Hand arrow next to the Diesel Pump to move the Diesel Pump to the right hand Selected Pumps column.
10. Touch the check key  to accept the selections.

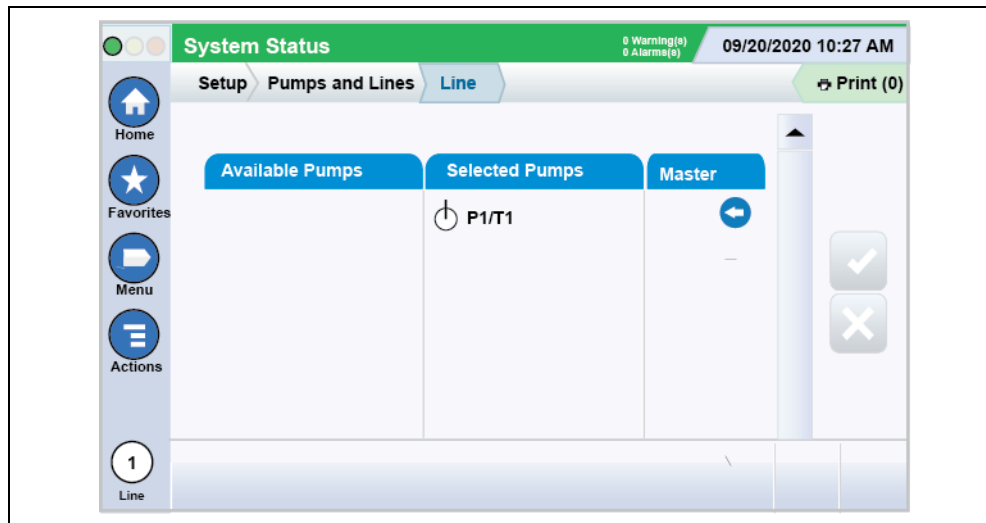


Figure 35. Line Setup Screen - Last Page

Custom Alarms Setup

1. Touch **Setup>Custom Alarms>Devices** to display the Custom Alarms Setup screen to create a custom alarm label that will identify the external input assigned to the Fuel Conditioner.

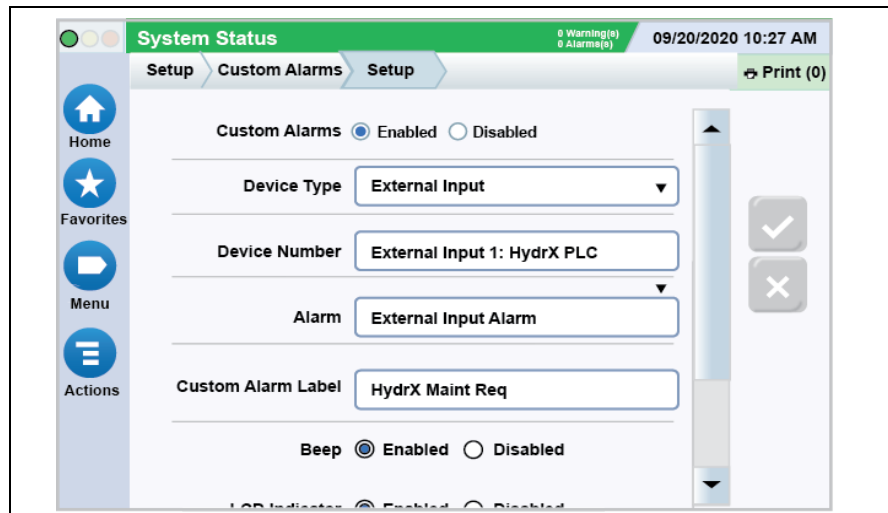



Figure 36. Custom Alarms Setup Screen Example

2. Touch the **Device Type** field and select '**External Input**'.
3. Touch the **Device Number** field and select the specific device, e.g., the low voltage external input channel to which the Fuel Conditioner Controller is connected.
4. Touch the **Alarm** field and select '**External Input Alarm**'.
5. Touch the **Custom Alarm Label** and enter a label for this alarm, e.g., 'HydrX Maint Req'.
6. Accept the rest of the screen defaults and touch the check key  to accept the selections.

Fuel Conditioner Setup

1. Touch **Menu>Setup>Fuel Conditioner** to display the Fuel Conditioner Setup screen (see Figure 37)

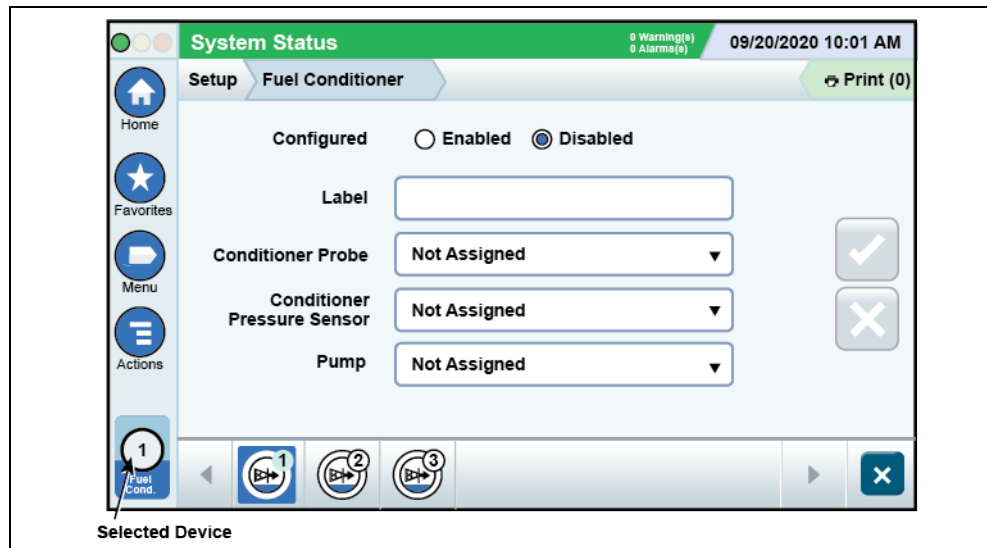



Figure 37. TLS-4xx Fuel Conditioner Setup Screen

2. Touch the **Enabled** radio button to configure this Fuel Conditioner.
3. Touch the **Label** field to enter a name for this device, e.g. 'HydrX 1'.
4. Touch the **Conditioner Probe** field to assign the mag probe in this Fuel Conditioner.
5. Touch the **Conditioner Pressure Sensor** field to assign the pressure sensor in this Fuel Conditioner.
6. Touch the **Pump** field to assign the diesel pump connected to this Fuel Conditioner.
7. Touch the check key  to accept the selections.

Operation

Operation and service of the HydrX system is controlled from the FCC front panel following the instructions discussed in this manual. The TLS-4xx HydrX overview screen allows the user to view the current status of the HydrX system only.

To view the current status of the HydrX Fuel Conditioning System, touch **Menu>Overview>Fuel Conditioner** (see Figure 38).

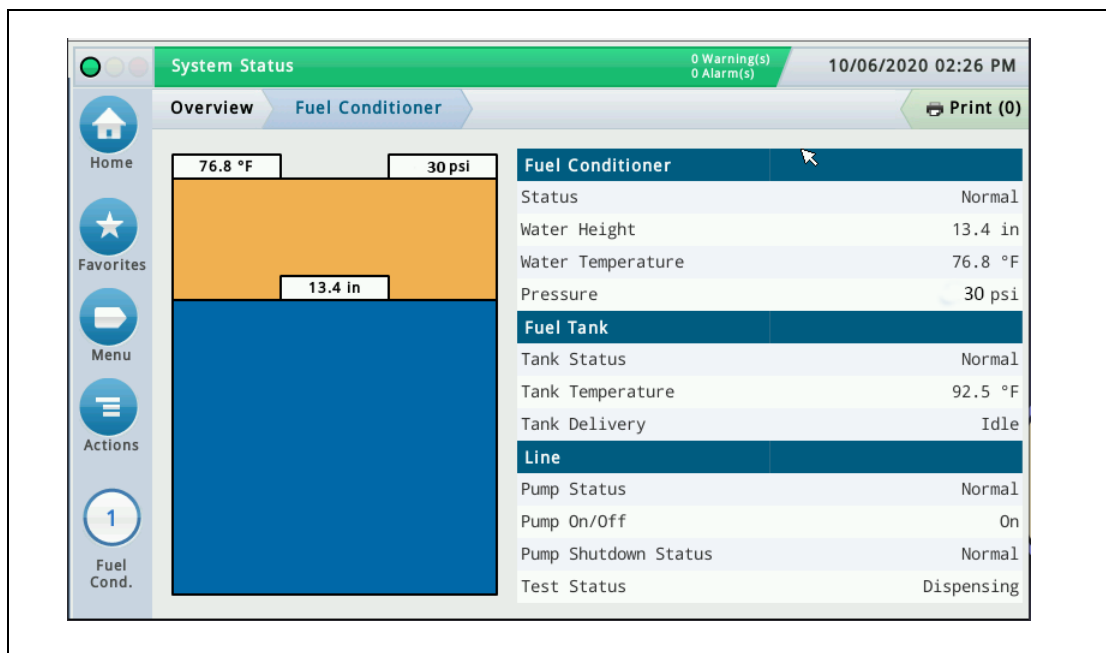


Figure 38. TLS-4xx HydrX Overview Screen

HydrX System Maintenance Alerts

FCC Display Message	TLS-4xx Status Message	Cause	Action
Status: Drain	User programmed custom alarm, i.e., "HydrX Service"	HydrX water collection tank full	Drain tank (refer to Manual 577014-474).
		HydrX "Tank Volume" set to 0	Set proper Tank Volume, Refer to page 5 of this manual.
Status: Filter	User programmed custom alarm, i.e., "HydrX Service"	HydrX filter at end of life (EOL)	Run 'Fill Cycle', if alarm persists, move to next action step.
			Replace filters (refer to Manual 577014-473).
			Filter EOL% settings (page 7) can be lowered to continue operation; however, a system operating with filters below 5% life will quickly produce subsequent filter alarms due to filter loading characteristics.
Status: Comm	User programmed custom alarm, i.e., "HydrX Service"	Persistent communications errors between HydrX and ATG	Check serial cable connection.
			Check ATG serial settings.
			Test serial cable continuity.
		HydrX Mag Probe or Pressure Sensor out	Check ATG for probe or sensor out alarm.
			Check wiring on HydrX probe or pressure sensor.
			Replace HydrX Mag Probe or Pressure Sensor as outlined in manual 577014-469 or 577014-470 respectively.
Status: Pressure Fault	Pressure Fault	Insufficient Pressure	Check that pressure for New Filter Cycle is at least 15 psi.
			Ensure current filter life% is above EOL% set by user.
			Run 'Fill Cycle'. After running 'Fill Cycle' check 'Filter Life' on FCC controller.
			Verify line HydrX is assigned to is enabled and not in alarm.
			If P or PO inlet is negative, verify inlet and outlet valves are wired correctly.
			Check STP pressure at HydrX adapter port.
			Follow Pressure fault advanced troubleshooting guide on page 29 of this manual.

FCC Display Message	TLS-4xx Status Message	Cause	Action
Status: Vacuum Fault	Vacuum Fault	Insufficient Vacuum	For New Filter Cycle check that vacuum is > -1.25 psi.
			For New Filter Cycle check that vacuum is < -10 psi.
			For Filter Cycle check that vacuum is > -1.25 psi.
			For Filter Cycle check that vacuum is < -13 psi.
			Run 'Fill Cycle'. After running 'Fill Cycle' check 'Filter Life' on FCC controller.
			Verify line to which HydrX is assigned is enabled and not in alarm.
			If P or PO outlet pressure is positive, verify inlet and outlet valves are wired correctly.
			Verify that HydrX siphon cartridge screen is not clogged (ref. manual 577014-478).
			Check STP pressure at HydrX adapter port.
		Vacuum Leak	Run 'Fill Cycle'. After running Fill Cycle, vacuum level should hold below -0.75 psi.
			Check drain valve seated.
			Check for loose hose connections.
			Check filter cover o-rings.
			Follow advanced vacuum fault trouble-shooting guide on page 29 of this manual.
	HydrX Probe Out (TLS-450PLUS)	FC Mag probe inoperative	Replace FC mag probe (refer to Manual 577014-469).
	HydrX Sensor Out (TLS-450PLUS)	FC Pressure sensor inoperative	Replace FC pressure sensor (refer to Manual 577014-470).

GENERAL TROUBLESHOOTING

1. Ensure that the STP pump circuit breaker is turned On.
2. Ensure that the handle on STP adapter ball valve is pointing in the correct direction of flow. You can verify this by the curved arrow on the handle. The arrow should be pointing to the pump port and the port that the HydrX hose is connected to.
3. Ensure that there are no alarms on the ATG that could possibly prevent the pump from turning on (i.e. DPLLD Gross Line Fail or Pump Shutdown Alarm).
4. Look in the Diesel STP Sump for any signs of visible leaks around the filter caps and hose connections and ensure that flaretite seals were connected on each hose connections.

5. Check the HydrX Filter Performance screen on the FCC to ensure that the filters are not clogged. If there is a large discrepancy between Initial and Last Pressure, the HydrX filters could be clogged.
6. Close the STP adapter ball valve and remove both filters. Make sure that the plastic wrapping was removed from the outside of each filter and then ensure that both filters are seated properly in the bottom of each filter compartment. The opening on the bottom of each filter is keyed to the bottom of each filter compartment. You may need to rotate the filter to get it to align with the bottom of the filter compartment. Once aligned, press the filter down to seat it fully (reference manual 577014-473 for correct filter installation).
7. Turn off the submersible pump power, close STP adapter ball valve and then remove, inspect, and clean or replace the siphon cartridge on the top of the HydrX manifold (refer to Manual 577014-478 for Siphon Cartridge servicing instructions)
8. Inspect the drain valve to ensure it is not stuck open.

TROUBLESHOOTING TIPS

Accessing FCC Manual Control

1. Go to the Self Diag. screen on the FCC as follows:
 - a. Touch and hold the upper left corner of the FCC display status bar (about 3 seconds) until the Maintenance screen appears.
 - b. When the Maintenance screen appears touch the **System Mode** button (see Figure 25).
 - c. On the System Mode Top Page screen, touch the **Main Menu** button (see Figure 26).
 - d. On the Main Menu screen touch the **Self Diag** button (see Figure 39)

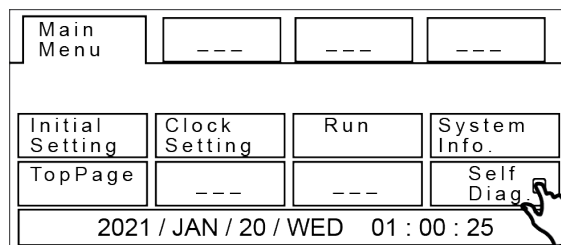


Figure 39. Main Menu Screen

- e. On the Self Diag screen touch the **I/O** button (see Figure 40)

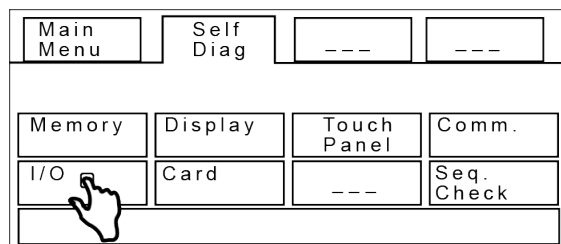


Figure 40. Self Diag. Screen

- f. On the I/O screen touch the **IN OUT** button (see Figure 41)

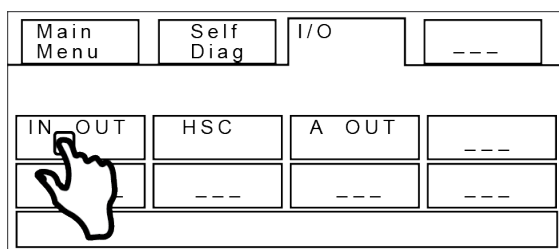


Figure 41. I/O Screen

- g. On the IN OUT screen (see Figure 42) in the D_OUT number buttons, touch:
- 0-to energize the inlet valve
 - 1-to energize the outlet valve
 - 2-to energize the pump hook
 - 3-To test the FCC alarm

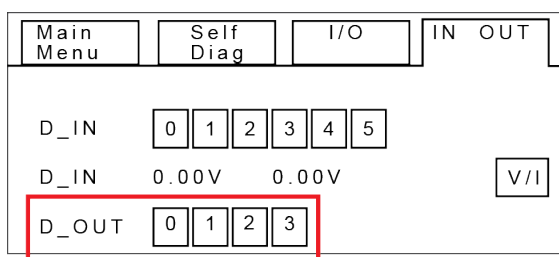


Figure 42. IN OUT Screen

Pressure Fault Actions

The HydrX system requires a 15 psi reading on its pressure sensor for system startup with new filters. If pressure is lower than 15 psi the following steps can be taken.

1. Enter the FCC Self Diag. screen (see Figure 40) by following the steps in “Accessing FCC Manual Control” above
2. At the D_OUT buttons on the IN OUT screen (see Figure 42), touch 0 and 2. If the pressure is still below 15 psi, de-energize the devices and verify general troubleshooting steps have been followed before continuing.

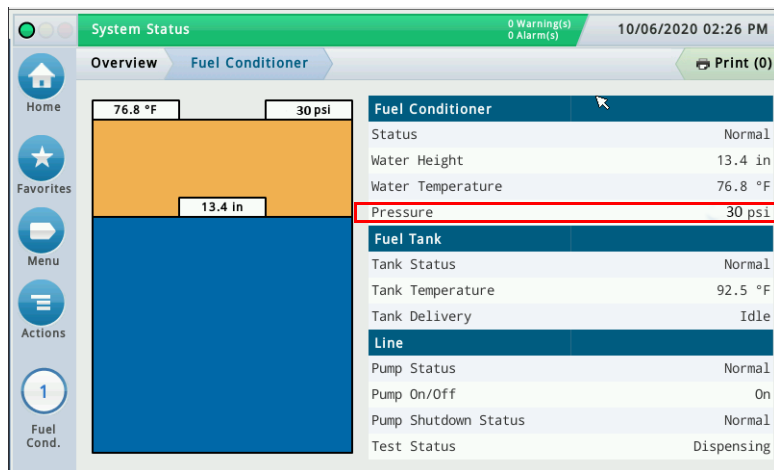


Figure 43. TLS-4xx HydrX Overview Screen

- If adequate pressure cannot be generated, the STP adapter containing the ball valve and check valve must be inspected:



WARNING

The STP breaker must be locked out and tagged before removing the pump adapter for inspection.



- Inspect the ball and check valve for any debris that may be restricting flow
- Verify that the ball valve is opening fully.
- Re-install pump adapter and repeat Step 2 to check pressure.

Vacuum Fault Actions

The HydrX system requires a minimum vacuum level of -1.25 psi on its pressure sensor for startup with new filters. If at least

-1.25 psi cannot be generated the following steps can be taken.

- Enter the FCC Self Diag. screen by following the steps in "Accessing FCC Manual Control" above.
- Turn on the STP and Outlet Valve (Touch 0 and 1 on the IN OUT screen). Observe the Pressure reading in the Fuel Conditioner tab on the TLS-4xx HydrX Overview>Fuel Conditioner screen (see Figure 43).
- If the vacuum level cannot reach at least -1.25 psi, de-energize the devices and verify general troubleshooting steps have been followed before continuing.
- Excessive Vacuum. If at system startup, the HydrX pressure sensor is reading more than -10 psi vacuum, an alarm will be generated. This is generally due to a blockage in or damage to the WID.
 - The pump adapter ball valve must be closed and power source to the HydrX locked before removing the WID for inspection.
 - If damage such as kinked tubing or excessive debris is corrected, repeat step 1 after power is restored to check vacuum levels.
- Vacuum Loss during Idle Periods. 30 minutes after each HydrX cycle, a leak check is performed on the fuel conditioner housing. Under normal circumstances the housing will hold a vacuum of around -1.5 psi during idle periods. If after 30 minutes from the last HydrX cycle the vacuum in the housing is between -0.75 and 0 psi, an alarm will be generated. This indicates that there is a small leak in the system. At system startup verify that the general troubleshooting steps have been followed.

- a. If no leaks are visually present and the system cannot hold vacuum during idle periods the following steps can be followed:
 - Run a Fill or New Filter cycle. Setting "fill time" to 3 minutes allows for quicker troubleshooting.
 - After running a complete Fill or New Filter Cycle, the clear tubing on the WID should be filled with fuel. Any presence of bubbles or air cavities indicate a leak in the WID. This can be checked at the end of the cycle after closing the pump adapter ball valve and locking out the STP. Visually inspect tubing by removing the (3) 1/4" bolts securing the WID to the guide tube and raising the WID so the tubing is visible. If any significant air leaks are present, contact technical support for further action.
- b. Uneven or obstructed valve sealing surfaces can also cause slow leaks in the system that will cause it to fail the idle leak check.



▲WARNING - Close the pump adapter ball valve and lock out/tag the submersible breaker.



- Ensure that outlet valve (round body) was not accidentally loosened during installation. Loosen valve coil nut and snug valve body by turning the knurled valve body clockwise.
 - If the valve body was loose, tighten the coil nut and re-enable the system by unlocking the STP breaker, opening the pump adapter ball valve and running a fill or new filter cycle. If the outlet valve body was tight, continue with the following steps.
- c. Debris accumulated in the valve seats can also cause slow vacuum loss. This generally applies to systems that have been in service for an extended period of time, however, can be an issue with highly contaminated retrofit sites or construction debris in new installations.



▲WARNING - Close the pump adapter ball valve and lock out/tag the submersible breaker.



- Remove the siphon cartridge from the HydrX manifold and inspect the screen. If heavy debris is present on this screen and siphon cavity, the inlet valve sealing surfaces may also contain similar debris.
- If debris is present the inlet valve and cavity can be removed and cleaned by loosening the inlet valve (square body) coil nut, removing the conduit, loosening the 4 inlet valve mounting Allen screws and carefully removing the valve body and diaphragm assembly.
- All surfaces of the valve body, operator and cavity should be cleaned and free of heavy debris. The valve cavity can be cleaned easily by flushing fluid through the siphon cavity and out the inlet valve cavity.

6. If all of the previous steps have been taken contact Veeder-Root Technical Support for further instructions.

Comm Fault

1. The comm parameters for the PLC are 9600, odd, 1, 7. Ensure that the com parameters set on the TLS-4xx comm port are set to the correct serial port and match the PLC parameters.
2. Ensure the serial connectors are inserted in the serial ports on the PLC and TLS-4xx all the way and are screwed into place.
3. If the serial connectors are inserted properly and the comm parameters are programmed properly on the TLS-4xx serial port, replace the Ethernet cable that connects both serial ports. Ensure it is a standard Ethernet cable and not a crossover cable.

HydrX System Specifications and Default Settings

Specifications

Attribute	Rating	Unit	Comment
Filtration			
Multi-Stage Filtration			
Inlet Type:	Particle plus Coalescing media		
Outlet Type:	Fine water separation		
Filtration:	25 micron (all elements)	mm	
Water Holding Capacity			
FC Tank:	5	gal	
Electrical			
Two Class 1 Valves:	Rated 120 Vac, 60 Hz, 7.3 W UL listed CLASS 1, DIV. 1 GROUP D Hazardous Locations Reference UL File E37780		Switched AC power provided by HydrX Fuel Conditioning Controller, rated 120 Vac, 5 A
Two Intrinsically Safe Circuits:	Rated 12.6 Vdc, 0.196 A, 0.62 W UL listed CLASS 1, DIV. 1 GROUP D Hazardous Locations Reference UL File MH11766		Intrinsically safe DC power provided for HydrX Fuel Conditioner Probe and Pres- sure Sensor by TLS-4xx ATG
Performance			
Flow Rate - Pressurized:	6	gpm	Nominal rating, varies with pump pres- sure and filter life
Flow Rate - Vacuum:	0.6	gpm	Nominal rating, varies with pump pres- sure and filter life
Maximum Rated Operating Pressure:	50	psi	Proof pressure rated 5X, 250 psi maxi- mum
Environmental			
Operating Temperature - Maximum:	122	°F	
Operating Temperature - Minimum:	-40	°F	
Storage Temperature - Maximum:	156	°F	
Storage Temperature - Minimum:	-40	°F	
Operating Humidity:	95	% RH	

Recommended HydrX Fuel Conditioning Controller Settings

Category	Setting	Units	Min.	Max.	Comment
Auto Run Time					
Start	00:00	HH:MM	0	24	24 hour format. NOTE: If start and end are both set to 0:00 auto cycle will not run.
End	08:00	HH:MM	0	24	
Cycle Time Parameters					
Fill Time	15	Minutes	3	30	If a value is entered and ??? is returned, verify setting is within min/max value range.
Vacuum time	15	Minutes	3	60	
Sweep Time	2	Minutes	2	10	
Polish Time	4 ¹	Hours	0	6	If a value is entered and ??? is returned, verify setting is within min/max value range. NOTE: If polish is set to 0, system will polish only while a delivery is in progress.
Conditioner Tank Settings					
Drain time	10	Minutes	5	10	
Extended Drain	0	Seconds	0	60	
Tank Volume	5.00	Gallons	0	5	
Volume/Inch	0.3536	Gallons/Inch	0.3536	0.3536	Gallons per inch is determined by bowl geometry and must always be set to 0.3536.
Conditioner Processing Cycles					
Low Water Cycles	4	Cycles	1	10	Number of contiguous cycles where detected water change is less than the 'Minimum Water Change' setting and the FC water float is reading 0.
Water Cycles	2	Cycles	1	10	Number of contiguous cycles where detected water change is less than the 'Minimum Water Change' setting and the FC water float is reading <0.
Sweep Cycles	2	cycles	1	10	Number of contiguous cycles where detected water change is less than the 'Minimum Water Change' setting after alternating sweep and vacuum cycles.
Minimum Water Change	0.05	Inches	0.05	0.25	Minimum change in FC water float height used to evaluate if water is being extracted from UST.
ATG Device Mapping					
Fuel Conditioner	1, 2, 3, ... ²		1	15	Always set to 1 if only one HydrX system is installed. Additional HydrX units will receive subsequent numbers.
FC Mag Probe	1, 2, 3, ... ³		1	15	User specified by ATG settings (FC probe address).

¹If the HydrX is running at a busy site that may receive more than 1 delivery per day, the default setting for the Polish Cycle may need to be changed from 4 hrs to 1 hr. This will give the HydrX more quiet time during the day to run vacuum cycles while people are dispensing fuel as well as allow any immersed water in the fuel (that may have come in via a delivery) to separate out and drop to the bottom of the tank. Having the Polish cycle running for 4 hrs at a site that gets lots of deliveries, will override any vacuum cycles during dispensing.

²HydrX unit assignment.

³HydrX FC Mag Probe assignment.

