APPLICATION
GUIDE

TPI (Turbine Pump Interface) Guide

Using Franklin Fueling Systems Series Fuel Management System

Contents

What is TPI?

Turbine Pump Interface (TPI) is a communication protocol and parameter programming subset that allows the T5 series Fuel Management Console to control several FE Petro™ intelligent pump control relays. The primary function of TPI is to act as a Fuel Management solution in order to govern the product levels in the storage tanks.

As a secondary function TPI can monitor controller running conditions and record controller generated alarms.

Required Components

- T5 series console (TS-5, TS-550, TS-5000, TS-550 evo, TS-5000 evo)
- Three or 4 conductor shielded cable
- FE Petro™ Controllers
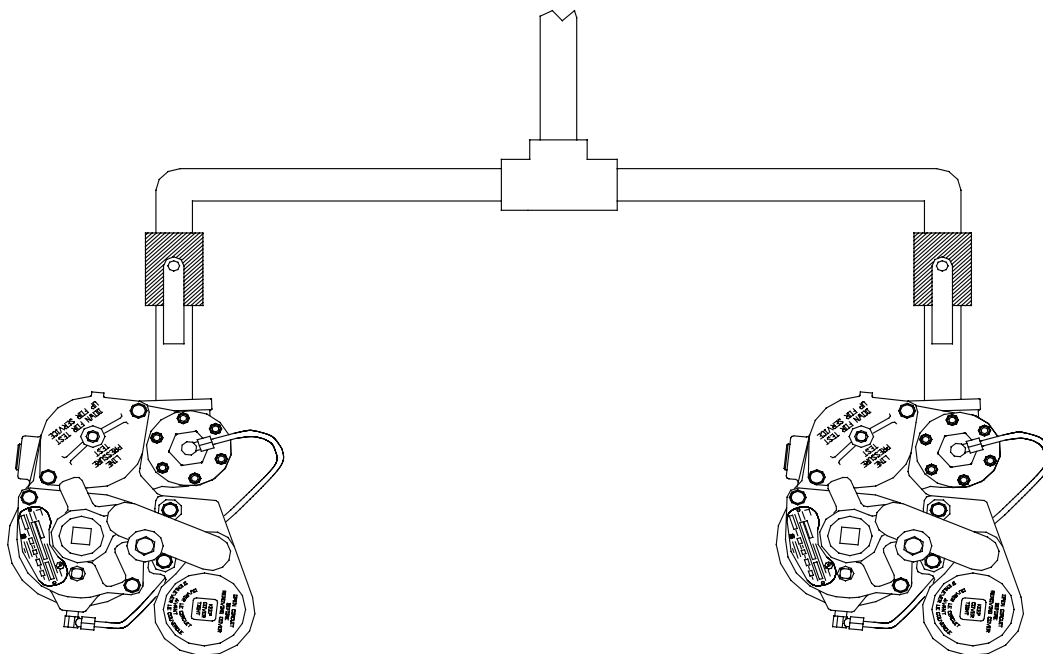 - STP-SCI
  - MagVFC
  - EcoVFC
  - STP-SCIII

Figure 1: STPs with Individual MLDs

TPI Modes

Using TPI's Fuel management capabilities requires having submersible pumps in each of the like product tanks. The discharge fuel lines for each of the like product tanks must be line-manifolded together.

TPI can be used with several combinations of line leak detectors including multiple Mechanical Leak Detectors (MLDs) (Figure 1). For proper leak detection to occur, the STPs must not turn on at the same time. Preventing the STPs from starting at the same time is controlled by the TPI application.

TPI can also be used with INCON™ Electronic Line Leak Detection the TS-LS500. This setup requires one transducer per product line. For either of the above scenarios all FE Petro™ Submersible Turbine Pumps should be equipped with the Standard Check Valve 400988931 or the 400988934 for Alcohol Gas and Biofuel applications.

Standard Check Valves will not relieve until line pressure exceeds 40 PSI, which is above the operating range of most pumps. Exceptions to this may include the High Pressure pumps. Additional system information may be needed before TPI can be recommended when a High Pressure pump is involved.

Modes

With the pumps line manifolded there are 3 different modes that the system can be configured in:

- Leveling
- Priority
- None

Each mode is designed to manage the fuel levels in a particular way in order to achieve the desired goal of the consumer. It is important to speak with the consumer to address what his/her particular needs are before choosing a group to be configured.

Leveling

Leveling mode works by controlling the priority of the STP controllers in order to mimic a syphon manifolded tank system. In a Leveling group the tank with the most fuel will be given priority by TPI to that controller over all others. The Tank with the most fuel is determined by percentage full, this means that you can effectively level two tanks of different diameter and they should approach empty at the same time, if a delivery does not occur.

Leveling traditionally worked by "stair stepping" two or more tanks toward empty. The system would prioritize the highest percentage full tank in the group first.
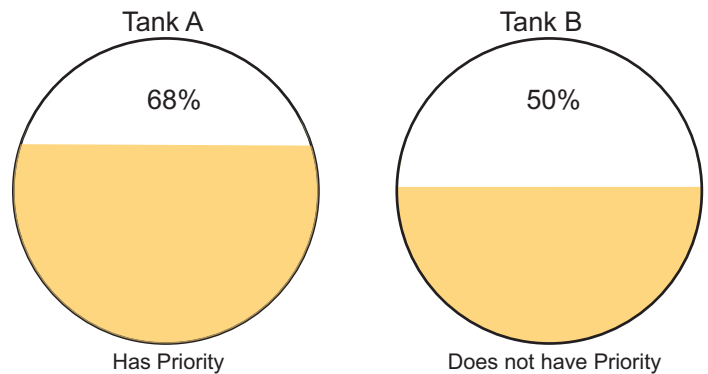

Figure 2: Leveling Example 1

Tank A in the example above has a higher percentage of product than Tank B, therefore it will have priority until it reaches a lower level and all handles switches have been hung up for at least 30 seconds.
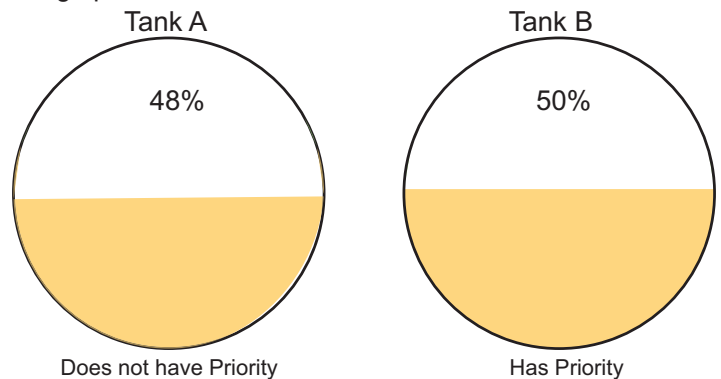
Figure 3: Leveling Example 2

This stair stepping continues until the tanks reach empty or until a tank receives a delivery. The percentage full are normally kept to within a few percent of each other with this method.
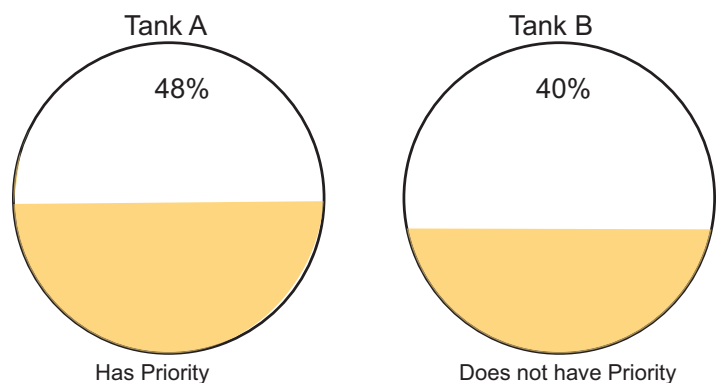
Figure 4: Leveling Example 3

Adjust Priorities Option (TS-550evo only)

Within Leveling mode, there is an optional selection of *Adjust Priorities*. The Standard Leveling function will choose the controller of priority with each new dispenser hook signal. When *Adjust Priority* is set to **Yes**, the priority of controllers can change during an active dispenser hook signal, which improves the functionality of Leveling Mode at extremely busy sites.

Note: The Adjust Priorities Option has the following minimum software requirements;

TS-550 evo Software Release 2.6.X.XXXX

3

Priority

With priority mode each tank will have priority until it reaches a pre-programmed percentage at which time it will switch to the next tank.
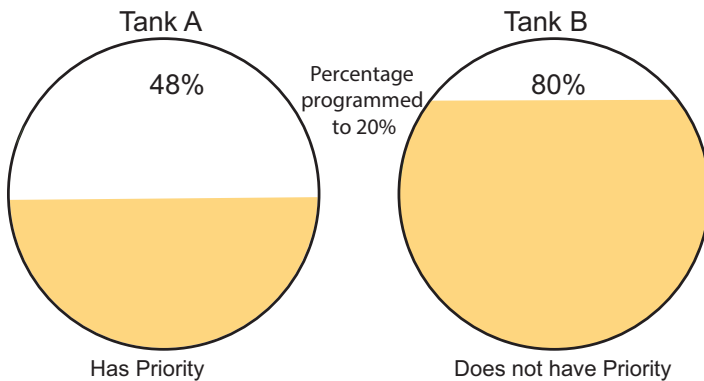
Figure 5: Priority Example 1
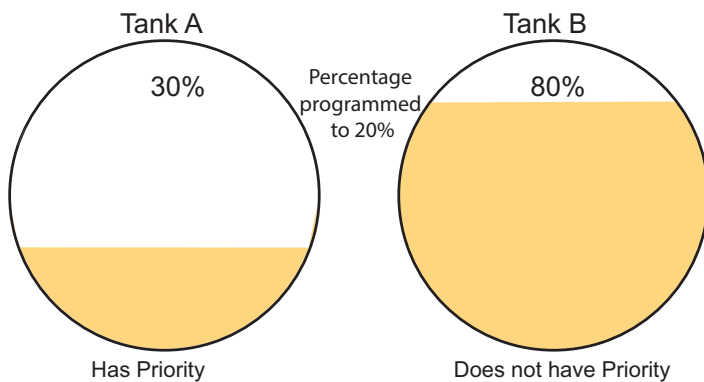
Figure 6: Priority Example 2
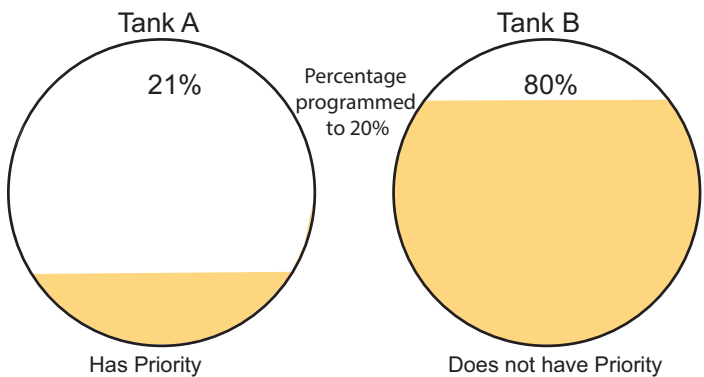
Figure 7: Priority Example 3

In Priority Mode Tank A retains priority until it reaches the user-definable priority percent, in this example we are using the default 20% (Figure 7). When Tank A reaches 20% it will transfer priority to Tank B which will maintain priority until it reaches 20%
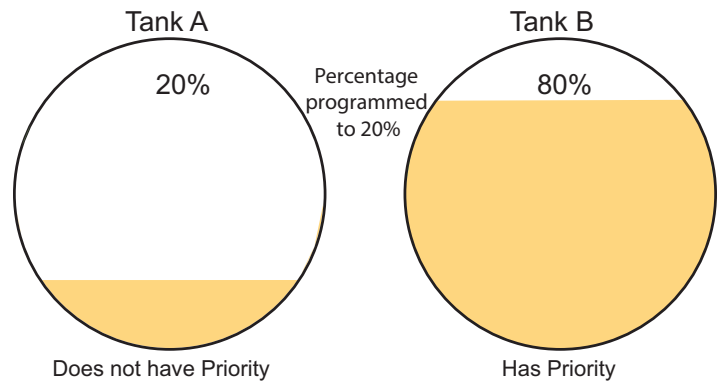
Figure 8: Priority Example 4

If all tanks reach the programmed priority percent without a delivery they will automatically switch into leveling mode. The tanks remain in leveling mode until a delivery in one of the tanks is detected or until they run out of available fuel supply.

None

The None mode is used when the consumer desires neither the Leveling or Priority mode but still wishes to use Master/Slave or Alternating sub modes, which are defined below.

Master/Slave

Master / Slave can be used with any of the three modes, Leveling, Priority or None. With Master / Slave in the Leveling or Priority mode, the T5 Series Console will first turn on the pump that has priority when a demand occurs. If the pump controller indicates that more fuel is needed (typically around 40 gpm for STP-SCI controllers or the PL indication on the Mag / EcoVFC) the system will turn on the next pump in sequence to assist.

Enabling Master / Slave allows the system to compensate for increased fuel consumption during high volume periods, but can also minimize the efficiency of Priority or Leveling modes. Since both the Leveling and Priority modes work by prioritizing tanks, if multiple pumps are running then levels should drop in all operating tanks thus negating the priority or leveling mode until all handles switches have been hung up for at least 30 seconds.

In the None Mode, the controller with the lowest address will be given priority as the master in the group and the second controller will only ever turn on when the first controller needs assistance.

Alternating

The Alternating sub mode is only available when the None Mode is selected. This mode will swap between pumps every time all handle switches have been deactivated for at least 30 seconds. This mode is typically used when multiple pumps are in one tank and is used as a way of extending the life expectancy of the pump motor assembly. The Alternating sub mode can be used in conjunction with Master/Slave sub mode.
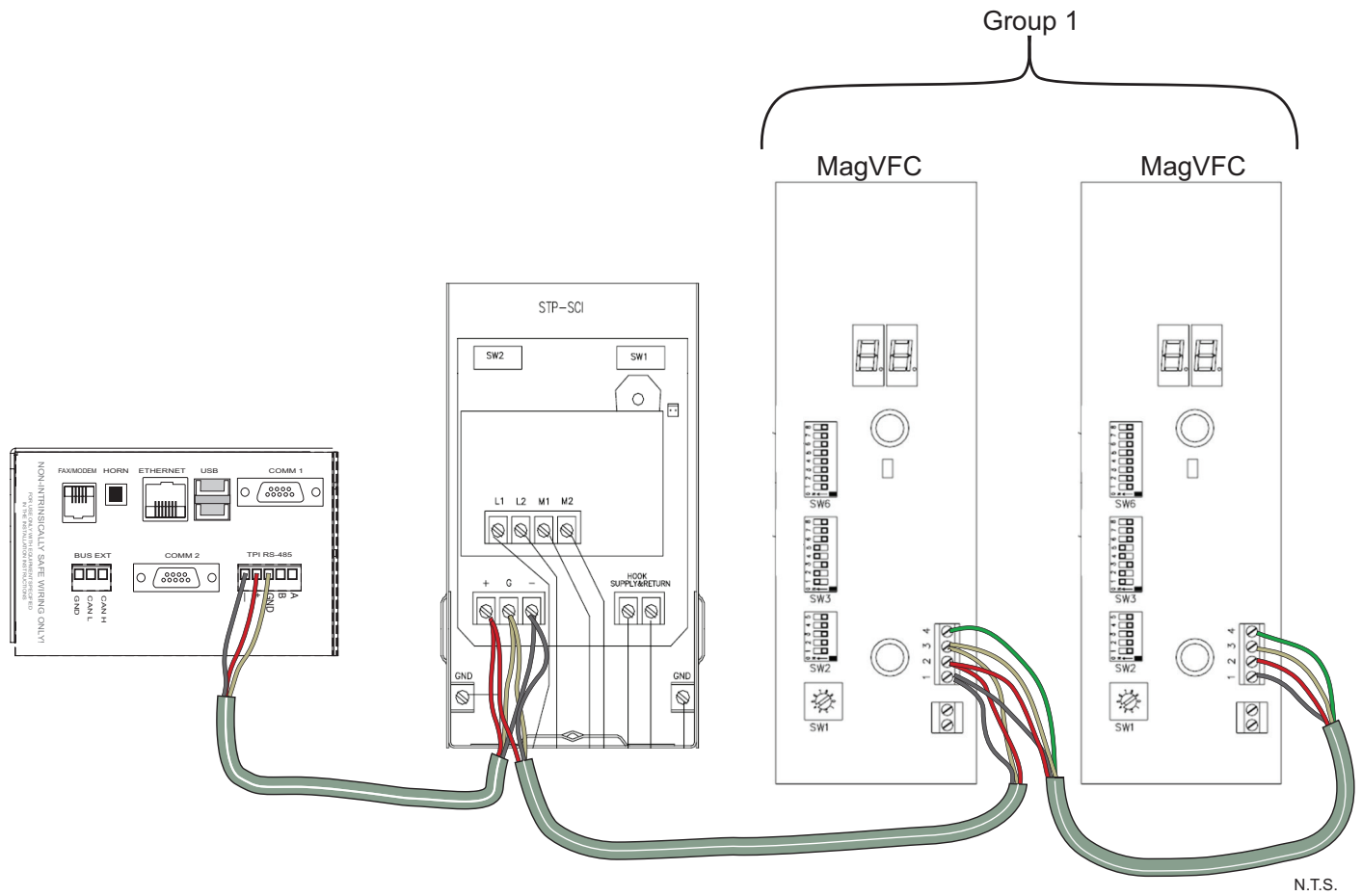
Figure 9: Component Wiring

Wiring and Address Settings

The FE Petro pump controllers are connected to the T5 series console via a three conductor shielded cable. This cable is daisy-chained between each controller. The wires connect to three terminals; a positive (+), a negative (–) and a ground (gnd).

On the T5 Series Console, the TPI port has 5 total spaces. The first two terminals (A and B) are not used for TPI applications. The wiring is then daisy-chained like color to like color throughout all pump control relays to the corresponding terminals (+ - gnd).

For EcoVFCs and MagVFCs that are functioning in a Group scenario (Leveling, Priority, None) the #4 (**F**requency) terminal should be connected between the two VFCs. This allows for Frequency data to be transferred.

Each controller is then given a specific address that the console uses to recognize that individual controller. The T5 Console can be configured for a maximum of 31 controllers with any variation of controllers acceptable. The controllers themselves may have restrictions with how many can be configured due to dip switch limitations. Within the TPI relationship the T5 Console always acts as a Master and all of the controllers are slaves. Being the Master means that the T5 Console is addressed as 0, the controllers should therefore be addressed starting at Slave 1.

STP-SCI

The STP-SCI Smart Controllers are used to control fixed speed 4" Submersible Turbine Pumps with horsepower ratings from 1/3 to 2hp. For use with TPI the STP-SCI can be left in a default setting with the exception of the address switches located on the SW1 switch bank. The SW1 switch bank is located in the upper right hand corner of the logic board.
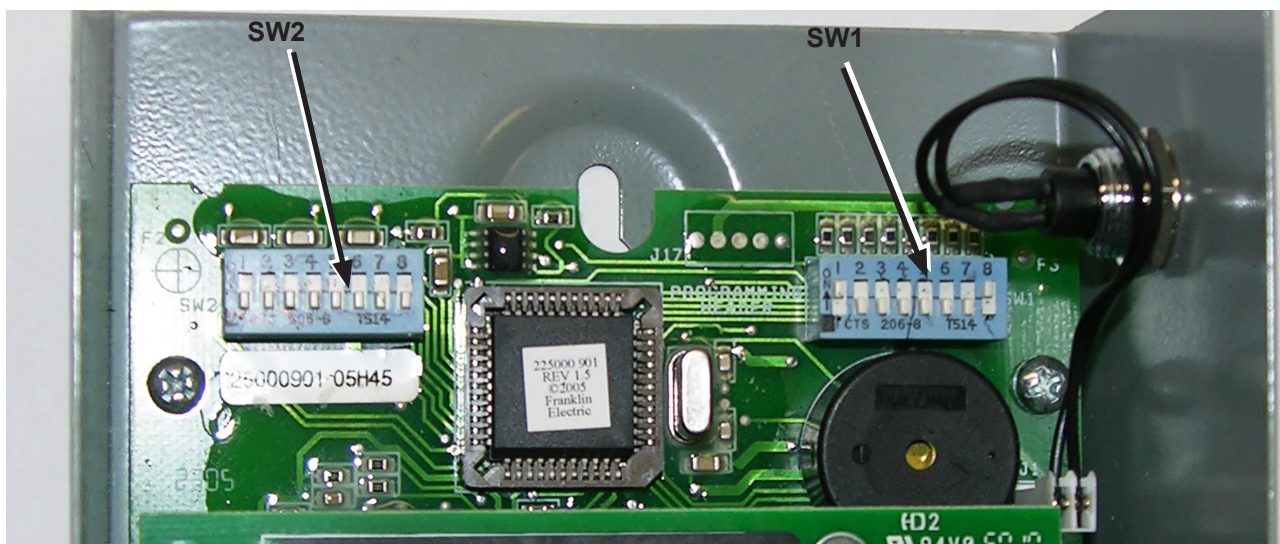
Figure 10: STP-SCI DIP Switch Locations

The SW1 dip switch settings allow for up to 31 STP-SCI controllers.

STP-SCI SW1 Switch Settings					
Address	**Pole 1**	**Pole 2**	**Pole 3**	**Pole 4**	**Pole 5**
Slave - 1	**On**	Off	Off	Off	Off
Slave - 2	Off	**On**	Off	Off	Off
Slave - 3	**On**	**On**	Off	Off	Off
Slave - 4	Off	Off	**On**	Off	Off
Slave - 5	**On**	Off	**On**	Off	Off
Slave - 6	Off	**On**	**On**	Off	Off
Slave - 7	**On**	**On**	**On**	Off	Off
Slave - 8	Off	Off	Off	**On**	Off
Slave - 9	**On**	Off	Off	**On**	Off
Slave - 10	Off	**On**	Off	**On**	Off
Slave - 11	**On**	**On**	Off	**On**	Off
Slave - 12	Off	Off	**On**	**On**	Off
Slave - 13	**On**	Off	**On**	**On**	Off
Slave - 14	Off	**On**	**On**	**On**	Off
Slave - 15	**On**	**On**	**On**	**On**	Off
Slave - 16	Off	Off	Off	Off	**On**

Slave - 17	**On**	Off	Off	Off	**On**
Slave - 18	Off	**On**	Off	Off	**On**
Slave - 19	**On**	**On**	Off	Off	**On**
Slave - 20	Off	Off	**On**	Off	**On**
Slave - 21	**On**	Off	**On**	Off	**On**
Slave - 22	Off	**On**	**On**	Off	**On**
Slave - 23	**On**	**On**	**On**	Off	**On**
Slave - 24	Off	Off	Off	**On**	**On**
Slave - 25	**On**	Off	Off	**On**	**On**
Slave - 26	Off	**On**	Off	**On**	**On**
Slave - 27	**On**	**On**	Off	**On**	**On**
Slave - 28	Off	Off	**On**	**On**	**On**
Slave - 29	**On**	Off	**On**	**On**	**On**
Slave - 30	Off	**On**	**On**	**On**	**On**
Slave - 31	**On**	**On**	**On**	**On**	**On**

Multiple Controllers

When connecting the RS 485 communication cable to 5 or more STP-SCI controllers, a 120 Ω or 121 Ω, ¼ Watt resistor must be added across the + and - of the RS 485 terminals of the TPI RS-485 of the T5 series console. The Franklin Fueling Systems MagVFC Variable Speed Controllers are not impacted.

When a communication cable is daisy-chained to 5 or more STP-SCI controllers and power is turned off on one controller, the communication between controllers can be lost. When this occurs all the controllers will, by default, function as stand-alone controllers. If no dispenser hook signal is wired to the STP-SCI controllers, they will not turn on the STP. The resistor will ensure communication is maintained.

One resistor is all that is required, it can be installed on any controller or at the T5 series console. FFS recommends installing the resistor at the T5 series console.
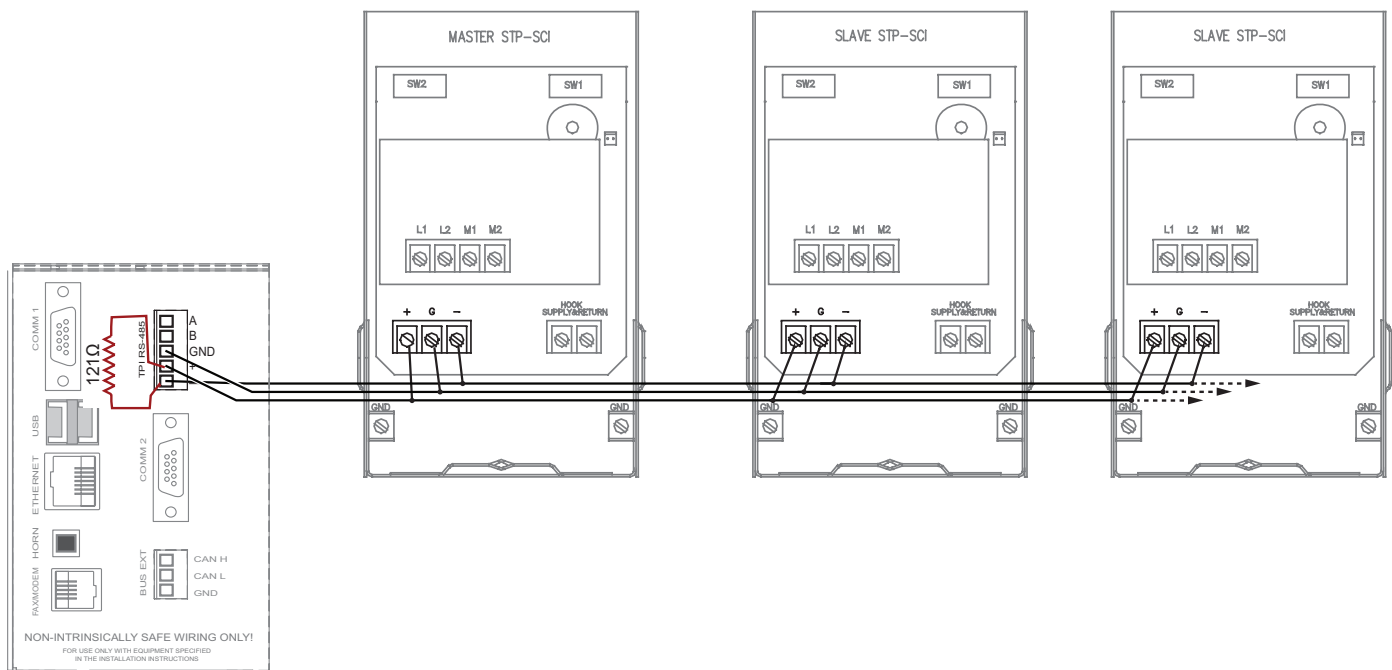

Figure 11: Schematic of Resistor Installed

MagVFC

The MagVFC is used to control the 4" variable speed STP's, which range from 2 to 4 hp. When using TPI, a few dip-switch changes are needed on the SW2 and SW3. If using INCON™ ELLD:

- SW3 pole 1 should be in the on position.
- SW3 pole 2 should be set for the product type, On for Gas off for Diesel.
- SW3 pole 3 should be left off.
- SW3 poles 4 and 5 should be set according to piping restriction.
- SW3 pole 6 should be set to pump horsepower, On for 4hp Off for 2hp.
- SW3 pole 7 can be turned off as TPI will automatically reset after a delivery when an underload occurs.
- SW3 pole 8 should remain off.

The SW2 pole should be set for the correct address setting similarly to the STP-SCI controllers. The MagVFC can be addressed for up to 31 controllers.

Native MagVFC Communication Addressing: SW2 (see Figure 11 for location of switch)
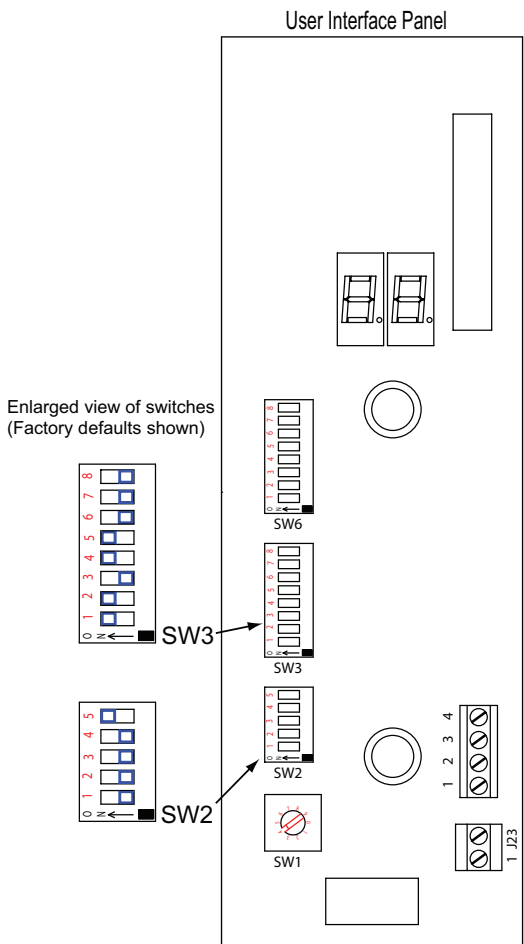
Figure 11: MagVFC Switch Locations

Address	Pole 1	Pole 2	Pole 3	Pole 4	Pole 5
Slave - 1	**On**	Off	Off	Off	Off
Slave - 2	Off	**On**	Off	Off	Off
Slave - 3	**On**	**On**	Off	Off	Off
Slave - 4	Off	Off	**On**	Off	Off
Slave - 5	**On**	Off	**On**	Off	Off
Slave - 6	Off	**On**	**On**	Off	Off
Slave - 7	**On**	**On**	**On**	Off	Off
Slave - 8	Off	Off	Off	**On**	Off
Slave - 9	**On**	Off	Off	**On**	Off
Slave - 10	Off	**On**	Off	**On**	Off
Slave - 11	**On**	**On**	Off	**On**	Off
Slave - 12	Off	Off	**On**	**On**	Off
Slave - 13	**On**	Off	**On**	**On**	Off
Slave - 14	Off	**On**	**On**	**On**	Off
Slave - 15	**On**	**On**	**On**	**On**	Off
Slave - 16	Off	Off	Off	Off	**On**
Slave - 17	**On**	Off	Off	Off	**On**
Slave - 18	Off	**On**	Off	Off	**On**
Slave - 19	**On**	**On**	Off	Off	**On**
Slave - 20	Off	Off	**On**	Off	**On**
Slave - 21	**On**	Off	**On**	Off	**On**
Slave - 22	Off	**On**	**On**	Off	**On**
Slave - 23	**On**	**On**	**On**	Off	**On**
Slave - 24	Off	Off	Off	**On**	**On**

STP-SCIII

The STP-SCIII is used to control the 6" fixed speed STP's, which range from 3 to 5 hp and requires that the STP-SCIII requires 110 VAC to the hook terminals for the relay to close. The communication signal supplied by the TPI is not enough to engage the relay. Therefore a Relay module is needed to control a separate 110 VAC source for the hook signals. The relay is wired as Normally Open and programmed as inverted. The STP will turn off if the gauge loses power.
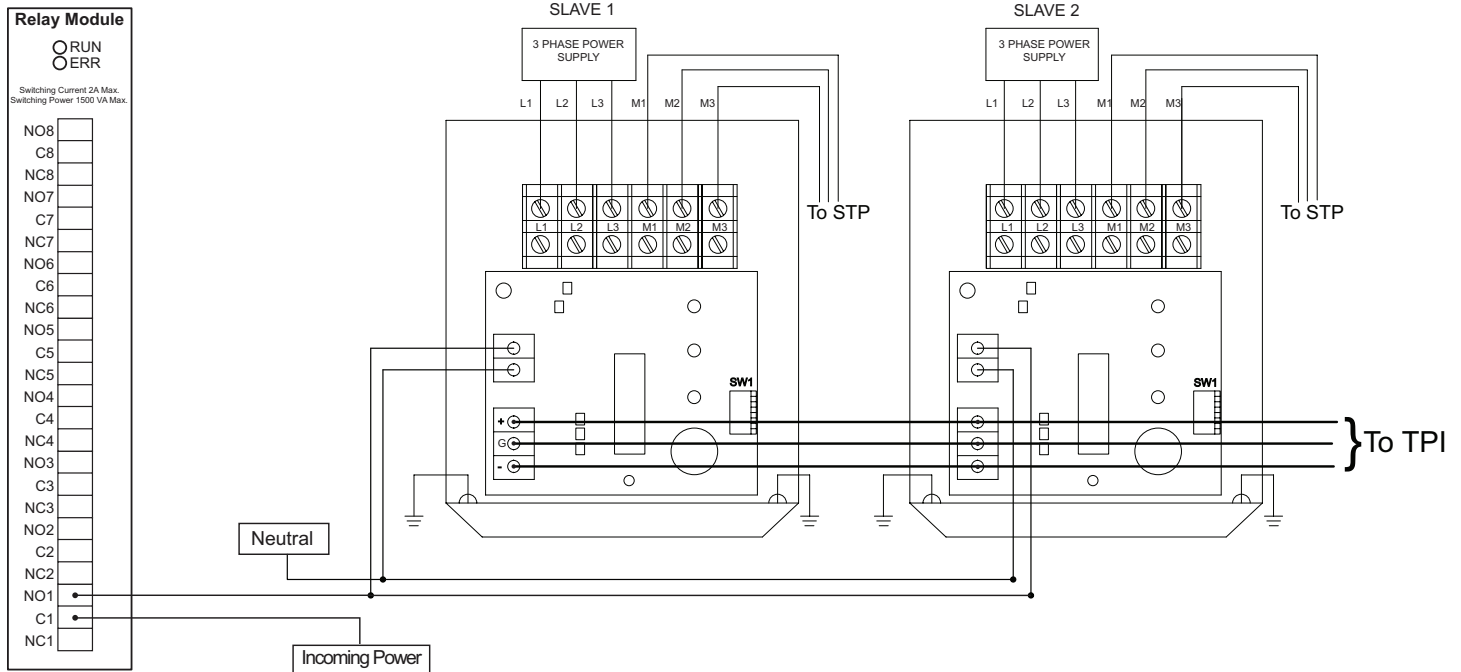
Figure 12: STP-SCIII connections

The STP-SCIII switches should be set as Slave (Dip Switch 1 off).
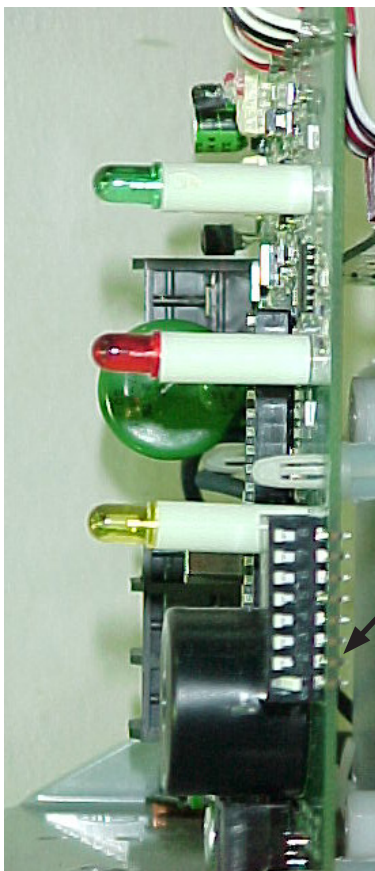
SW1: Set Pole 1 to OFF

Figure 13: STP-SCIII SW1 Location
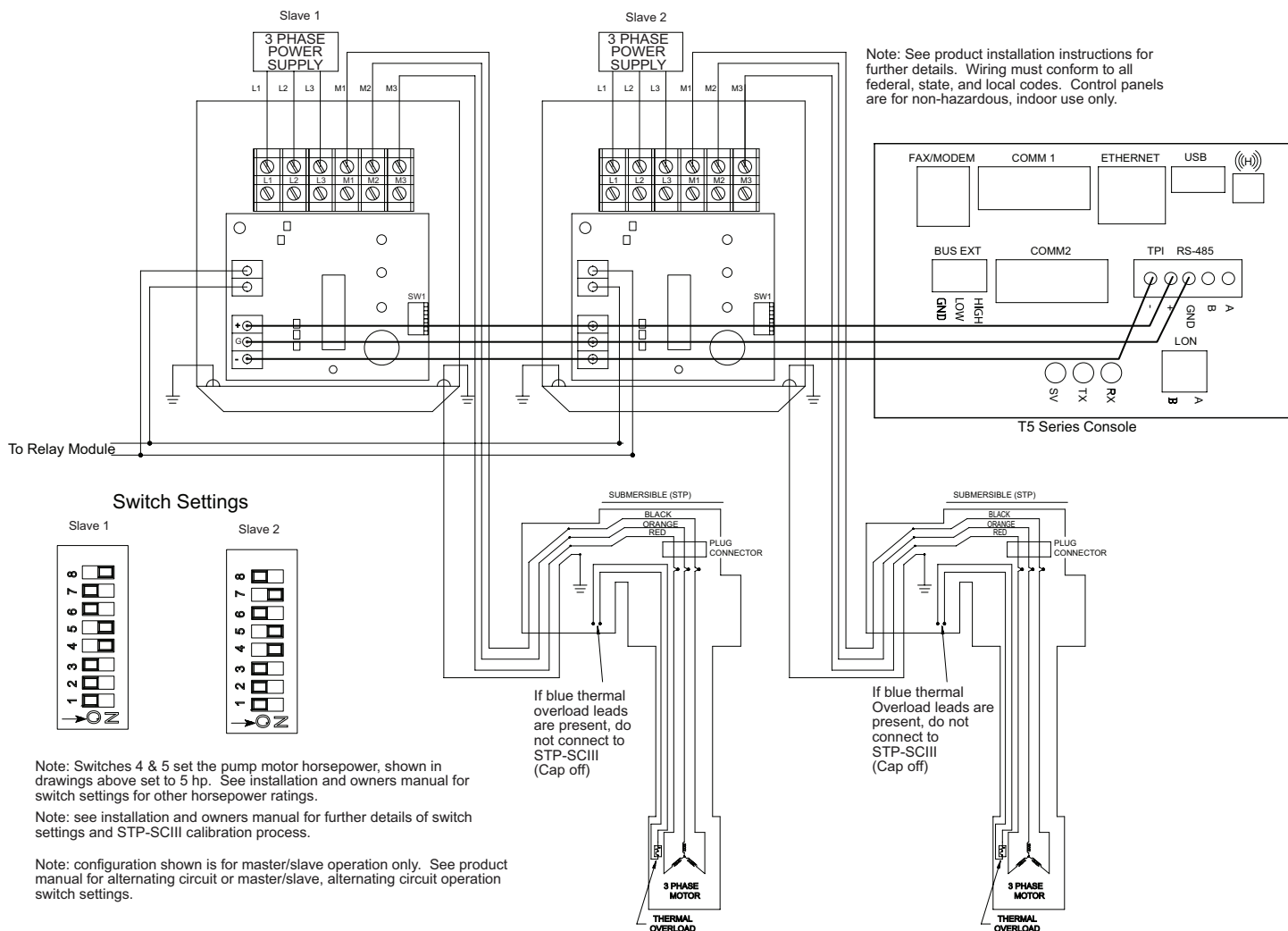
Figure 14: STP-SCIII/STP/T5 Console Wiring Schematic

The STP-SCIII is also limited on the number of like controllers it can be linked with. The Maximum number of STP-SCIII controllers is seven.

STP-SCIII DIP-Switch Address Selection			
Address	**Position-6**	**Position-7**	**Position-8**
Slave-1	Off	Off	On
Slave-2	Off	On	Off
Slave-3	Off	On	On
Slave-4	On	Off	Off
Slave-5	On	Off	On
Slave-6	On	On	Off
Slave-7	On	On	On

When using the TPI the system can use up to 31 of any combination of pump controllers. With this in mind, if there is a very large site with a mixture of controllers, the address programming should start with the STP-SCIII's.

TPI Programming

After wiring the controllers and setting the Dip Switch settings for each of the controllers the next step is to program the T5 Series Console. The programming can be done through either the touchscreen or through the web browser. The following steps will take you through the programming sequence

1. In the Setup Parameters with edit mode enabled, navigate to the Power Supply module. TPI Communication is under RS-485 and TS-TPI, both of which need to be enabled for TPI to work.

4-20mA Input Modules	»		...	...
Power Supply				
Low Voltage Inputs	»		...	...
TS-TPI		Enable Interface	Yes	

2. After enabling TS-TPI, on the Web version you will enter controllers or select A for autocalibration. On the touchscreen you can select controllers and then the gear in the upper right corner for autocalibration. For EVO consoles if this is a new installation running the Franklin Auto Setup Tool (FAST) will do this process for you. In order for either the Autocalibration or FAST to work your controllers and wiring must all be connected and setup correctly.

Autocalibration —

TS-TPI		Enable Interface	Yes
Controllers	A	...	...
Groups		Number of groups	0

3. Once Autocalibration finishes, the T5 console will automatically set the number of controllers, the address of the controllers and the type of the controller. The first option under each controller will be the **Name**. This is a user-defined parameter and is used to identify the controller in programming, status menus and reports. Therefore it will be important to be as descriptive as possible when filling in this parameter. (Names high-lighted below)

Controllers	A	Number of controllers	3
Controller 1		Name	Unleaded SCI
		Enabled	Yes
		Type	Smart I
		Address	1
		Group	0
		Tank	0
		Height	5.00 in
		Number of inputs	0
Controller 2		Name	Diesel North MagVFC
		Enabled	Yes
		Type	Mag/Eco
		Address	2
		Group	0
		Tank	0
		Height	5.00 in
		Number of inputs	0
Controller 3		Name	Diesel South MagVFC
		Enabled	Yes
		Type	Mag/Eco
		Address	3
		Group	0
		Tank	0
		Height	5.00 in
		Number of inputs	0

4. If you have pumps which are line-manifolded together, you will put them in the same **Group**. For example, if you have two Diesel pumps (Diesel North and Diesel South) you will set each of them in Group 1. If you have a second set of line-manifolded pumps they would be set into Group 2. You can continue this for up to 15 groups.

Controller 2		
	Name	Diesel North MagVFC
	Enabled	Yes
	Type	Mag/Eco
	Address	2
	Group	1
	Tank	0
	Height	5.00 in
	Number of inputs	0
Controller 3		
	Name	Diesel South MagVFC
	Enabled	Yes
	Type	Mag/Eco
	Address	3
	Group	1
	Tank	0
	Height	5.00 in
	Number of inputs	0

5. The next setting is **Tank**, each Pump can be associated with a particular tank. By setting this parameter the T5 console will then track the probe's float movement which is used for Leveling and Priority mode as well as certain alarm conditions.

Controller 1		
	Name	Unleaded SCI
	Enabled	Yes
	Type	Smart I
	Address	1
	Group	0
	Tank	1
	Height	5.00 in
	Number of inputs	0
Controller 2		
	Name	Diesel North MagVFC
	Enabled	Yes
	Type	Mag/Eco
	Address	2
	Group	1
	Tank	2
	Height	5.00 in
	Number of inputs	0
Controller 3		
	Name	Diesel South MagVFC
	Enabled	Yes
	Type	Mag/Eco
	Address	3
	Group	1
	Tank	3
	Height	5.00 in
	Number of inputs	0

6. The **Height** parameter is a setting used to define the height of the pump motor assembly off of the bottom of the tank. This setting is used to locate the pump motor off of the bottom of the tank which was set under the Tank parameter. This information is used to set certain alarm parameters.

Controller 1	Name	Unleaded SCI
	Enabled	Yes
	Type	Smart I
	Address	1
	Group	0
	Tank	1
	Height	**5.00 in**
	Number of inputs	0
Controller 2	Name	Diesel North MagVFC
	Enabled	Yes
	Type	Mag/Eco
	Address	2
	Group	1
	Tank	2
	Height	**5.00 in**
	Number of inputs	0
Controller 3	Name	Diesel South MagVFC
	Enabled	Yes
	Type	Mag/Eco
	Address	3
	Group	1
	Tank	3
	Height	**5.00 in**
	Number of inputs	0

7. **Inputs** include any signal that you use to turn on or turn off the pump. Typically inputs include the AC-Inputs (Hook signals) for the grade. If using ELLD, you will have a minimum of two inputs, one input is the AC-Input module and the correct channel. The second input would be the 4-20mA module and the appropriate transducer channel.

Sensors may also be set as inputs if you would like to initiate pump shutdown upon sensor activation. For Grouped controllers you will only need to supply inputs to 1 of the controllers in the group.

Controller 1		Name	Unleaded SCI
		Enabled	Yes
		Type	Smart I
		Address	1
		Group	0
		Tank	1
		Height	5.00 in
		Number of inputs	2
	Input 1	Type	AC Input Module
		Channel	Unleaded Hook
	Input 2	Type	4-20mA Input Module
		Channel	Unleaded ELLD
Controller 2		Name	Diesel North MagVFC
		Enabled	Yes
		Type	Mag/Eco
		Address	2
		Group	1
		Tank	2
		Height	5.00 in
		Number of inputs	2
	Input 1	Type	AC Input Module
		Channel	Diesel Hook
	Input 2	Type	4-20mA Input Module
		Channel	Diesel ELLD
Controller 3		Name	Diesel South MagVFC
		Enabled	Yes
		Type	Mag/Eco
		Address	3
		Group	1
		Tank	3
		Height	5.00 in
		Number of inputs	0

8. The **Groups** parameters can be configured after the controller settings are set. In the previous example we placed the two Diesel controllers into Group 1. Under the group menu you can select Group 1 and name it, example Diesel Group. Set the Mode and other parameters as discussed above in the Mode section of this document.

Groups		Number of groups	1
	Group 1	Name	Group 1
		Mode	Leveling
		Adjust Priorities	Yes
		Master/Slave	No
		Fault Shutdown	No

TPI Setup

Group Name				Parameter Name	Parameter Default	Description	Max Value
Power Supply							
	RS-485						
		TS-TPI		Enable Interface	(Yes)	Enables TS-TPI options.	Yes/No
			Controllers A*	Number of Controllers	(2)	Number of controllers to be connected	31
			Controller 1	Name	Unlead Pump 1	Given Name of the pump controller	abc#
				Enabled	(Yes)	Enables the controller.	Yes / No
				Type	(Mag/ECO)	Type of controller used	Variable Frequency Smart 3 phase smart Smart I Mag / Eco unknown
				Address	(1)	Unique address of the controller	30
				Group	(0)	Controller group number (if a member of a group)	15
				Tank	(1)	Tank associated with controller	48
				Height	(5.00 in)	Approximate distance of pump motor from tank bottom	#
				Number of Inputs	(1)	Number of inputs that will activate controller	32
			Input 1	Type	AC Input Module	Select module that contains the input	Modules listed
				Channel	Disp. 1/2 Unleaded	Specific input that will activate the controller	12
			Controller 2	Name	Unlead Pump 2	Given Name of the pump controller	abc#
				Enabled	(Yes)	Enables the controller.	Yes / No
				Type	(Mag/ECO)	Type of controller used	Variable Frequency Smart 3 phase smart Smart I Mag / Eco unknown
				Address	(1)	Unique address of the controller	30
				Group	(1)	Controller group number (if a member of a group)	15
				Tank	(1)	Tank associated with controller	48
				Height	(5.00 in)	Approx. distance of pump motor from tank bottom	#
				Number of Inputs	(1)	Number of inputs that will activate controller	32
			Input 1	Type	AC Input Module	Select module that contains the input	Modules listed
				Channel	Disp. 1/2 Unleaded	Specific input that will activate the controller	12
			Groups	Number of Groups	(1)	Number of groups for the controller	15
			Group 1	Name	Group 1	Given name of the group	abc#
				Mode	None	Select controller mode	None, Leveling, Priority
				Master/Slave	(No)	Enables Master/Slave mode	Yes / No
				Alternating	(No)	Enables Alternating mode	Yes / No
				Fault Shutdown	(No)	Enables shutdown on controller fault	Yes / No

* When in the Edit mode of Setup, an A will appear for AutoConfigure. When the AutoConfigure Option is used, the tank gauge will locate all of the controllers that are properly wired in the system and identify them.

TPI Status/Control and Report Generation

There are two different pages that can be viewed via either the touchscreen or the computer interface once the pumps are communicating (Page 16).

The first pages is the FMS Pump Status. This page displays current and historical information regarding the operation and setup of the pump controllers. This page will display the Pump Controller name, if the pump is enabled or disabled, a green Status light will be displayed if everything is operational or a red light if there is a condition that needs attention.

Parameter Descriptions

Parameter	Description
Status	A green indicator shows that the pump is enabled
Pump On	A green indicator shows that the pump is running.
Address	This relates to the addressed Dip Switches for the particular controller
Controller Type	Lists type of pump controller used (Mag / EcoVFC, SCI, 3 Phase Smart)

Voltage	The existing incoming voltage for the controller. If this number is very large then pump communication has most likely been lost.
Calibration Voltage	This is only applicable to the STP-SCI and STP-SCIII controllers. This number indicates the voltage at the time of calibration. Since power consumption is based on voltage, it is suggested to compare this reading to the current voltage. If there is a significant difference between these two numbers the pump controller should be recalibrated.
Current	This is the present consumption of electricity as measured in amps. It is important to note that the FMS Pump Status page, as viewed from the web tool, is a static snap shot. If it is desired to see continuous updates then the Auto Refresh button must be selected in the upper right of the screen.
Calibration Current	This is the current draw at the time of calibration. If the Voltage and Calibrated voltage are the same and running dead head results in a different number between the Current and Calibrated Current readings it would indicate an issue.

High Calibrated Current could indicate an improper calibration, it was most likely done with flow. This would require the controller to be recalibrated. If the calibrated current is approximately ½ of the Service Factor amp rating for the motor, then the calibration was done correctly and the resulting difference between the two amp draws could indicate an obstruction on the intake of the motor.

If the Current amp draw is higher than the Calibration Current at dead head, then it is an indication that the pump has an issue. There could be a leak in the system causing flow to occur, a small electrical short to ground or an issue with the motor. |
| **Temperature** | This shows the current temperature of the Mag / EcoVFC. If this number is high and the high-temperature alarm is on, it could indicate inadequate air flow or temperature control in the room it is located in. It could also indicate possible issues within the Mag / ECOVFC. |
| **Software Revision** | On the Mag/ECOVFC and the STP-SCI this displays the revision number of the controller. |

On the web tool the bottom half of the page is devoted to the Dip Switch settings on each controller. You can remotely tell which switches are turned on by the green dots.

System FMS VRM Setup   Auto Refresh
Status Alarms Control Compliance Reports   01/15/2015 12:48:18
Tanks Lines Sensors Pumps

Parameter	Unleaded MagVFC	Midgrade SCI	Premium SCI	Diesel SCIII	E85 SCI
	ENABLED	ENABLED	ENABLED	ENABLED	ENABLED
Status	●	●	●	●	●
Pump On	◔	◔	◔	◔	◔
Address	1	2	3	4	5
Controller Type	Mag/Eco	Smart I	Smart I	3 Phase Smart 208/380V	Smart I
Voltage	208	208	208	208	208
Calibration Voltage		208	208		208
Current	0	0	0	0	0
Calibration Current		10	10		10
Temperature	140				
Software Revision	118	105	105		105
Controller Switch Settings					
Product Type	Gas				
Pipe Compensation	Comp 3 Most				
Horse Power	4 KW				
Start Pressure Increase	◔				
Auto Restart	◔	◔	◔		◔
Alternate Circuit	◔	◔	◔	◔	◔
Extended Run	●	●	●		●
Fault Shutdown	◔	◔	◔		◔
Master-Slave	◔	◔	◔	◔	◔
Old VFC Mode	◔				
Fault Read Out		◔	◔		◔
ByPass		◔	◔		◔

The second page with pump information is the FMS Pump Control page. This page has less information and is constantly updating. The main feature on this page is to enable remotely forcing a Software or Hardware Reset of the Controller for testing purposes. The resetting is done via the web tool by clicking the desired controller.

System FMS VRM Setup
Status Alarms Control Compliance Reports   01/15/2015 13:02:07
Tanks AutoCal Lines Pumps

Parameter	Unleaded MagVFC	Midgrade SCI	Premium SCI	Diesel SCIII	E85 SCI
	ENABLED	ENABLED	ENABLED	ENABLED	ENABLED
Status	●	●	●	●	●
Pump On	◔	◔	◔	◔	◔
Address	1	2	3	4	5
Controller Type	Mag/Eco	Smart I	Smart I	3 Phase Smart 208/380V	Smart I
Software Revision	118	105	105		105
Software Reset	☐	☐	☐	☐	☐
Hardware Reset	☐	☐	☐	☐	☐

TPI Specific Alarms

Alarm	Description
Pump Communication Alarm	The T5 Series Console cannot establish communication to the specified pump control relay. **Action** – Verify TPI Address settings and pump control Dip Switch settings are correct for all controllers. Verify that wiring is correct. Power cycle controller. Attempt to use alternate address settings.
Communication Alarm	The T5 series console can see the controller is present, but the controller is not responding to commands. **Action**- Isolate the single controller from the other controllers in the system. Add controllers back into the daisy chain one at a time. Follow all other steps as laid out in the Pump Communication Alarm code.
Clogged Intake	The Controller specified has indicated a dry run condition. The T5 series console has checked the probe level for the specified tank and found it to be higher than the programmed pump height. This indicates that the dry run condition is most likely not caused by a lack of product. Instead the most likely culprit is an obstruction clogging the intake. **Action** – If an STP-SCI or STP-SCIII controller is the one reporting the dry run condition, verify that proper calibration was done. If there is a question about the validity of the calibration, the controller should be recalibrated. The float may be stuck within the riser and the tank could run dry while the T5 Console sees it as full. In this instance, you would knock the float back into the tank and work with a fuel supplier to obtain product. If the alarm returns after the above actions were taken, follow the site's normal procedures to remove obstructions such as rags that may be floating in the tank.
Pump in Water	The T5 Series Console has detected that the water level for the specified tank that the control is linked to has risen to within 2 inches of the programmed pump height. The Console will shut the pump down at this time to avoid pumping water. **Action** – Identify the cause of the high water condition and correct it. Verify that the pump height setting is correct. For Controllers that are in Groups, the second pump will begin to run before the Controller goes into Pump in Water alarm.
High or High High Product Alarms	When the T5 Console goes into a High Product Alarm, the Controller in alarm is granted Priority over all other controllers in the group. This is designed to begin pumping down the tank as soon as possible. If the T5 Console goes into High High Product Alarm, the Master/Slave functionality will be disabled to allow for a more rapid drop in the affected tank.

Alarm Code List

For more alarm conditions and recommended actions see the list below:

TPI Alarms

Capacitor Failing	TPI	The STP controller is reporting a capacitor failure.	Refer to the applicable Smart controller Installation guide for details.
Clogged Intake	TPI	The STP controller has reported a dry run condition but the associated tank shows a product level above the intake.	Ensure proper programming of the TPI and calibration of the Smart Controller. If correct, check for an obstruction on the PMA.
Communication Failure	TPI	Communication from the TPI to the STP controller has failed. The Console is seeing the controller but the controller is not responding to commands.	Verify all wiring connections. Call Franklin Fueling Systems Technical Services Department for support.
Controller Type Error	TPI	The programmed controller type does not match what the console is detecting.	Verify proper programming of the TPI as well as the Smart controller type and address.
Dry Tank	TPI	The STP Controller has reported a dry run condition and the tank level is at or below the programmed intake.	Ensure proper programming of the TPI and calibration of the Smart Controller. If correct, add fuel.
Extended Run	TPI	The STP controller is reporting an extended run condition.	Refer to the applicable Smart Controller Installation guide for details.
Hardware Fault	TPI	The STP controller is reporting is reporting a hardware fault condition.	
High Temperature	TPI	The STP controller is reporting a high temperature condition.	
Locked Rotor	TPI	The STP controller is reporting a locked rotor rating.	
Not Calibrated	TPI	The STP controller is reporting that it has not been calibrated.	
Open Circuit	TPI	The STP controller is reporting an open circuit condition.	
Over Speed	TPI	The STP controller is reporting an over speed condition.	
Over Voltage	TPI	The STP controller is reporting an over voltage condition.	
Pump Communication Fail	TPI	Communication from the TPI to the STP controller has failed.	Check all wiring connections and ensure that there is power supplied to the Smart Controller.
Pump In Water	TPI	The water level has risen to within 3 inches of the programmed intake level.	Ensure proper programming of the TPI and calibration of the Smart Controller. If correct, have water removed from the tank
Relay Fault	TPI	The STP controller is reporting a relay fault error.	Refer to the applicable Smart Controller Installation guide for details.
Short Circuit	TPI	The STP controller is reporting a short circuit condition.	
Unbalanced Load	TPI	The STP controller is reporting an unbalanced load condition.	
Unbalanced Voltage	TPI	The STP controller is reporting an unbalanced voltage condition.	
Under Voltage	TPI	The STP controller is reporting a voltage level under 200VAC.	
Under Load	TPI	The STP controller is reporting an underload condition.	
Unknown Fault	TPI	The STP controller is reporting an unknown fault code.	Check fault condition on Smart controller and contact Franklin Fueling Systems Technical Services for more information

Unused Page

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