Valley View Partners Fertilizer Truck

Wireless Control Manual

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Rev	Description of change(s)	Date	Initials
A	Initial Release	05-07-20	EL
B	Change notation for trucks (Semi-Trailer and Fertilizer Trailer)	08-03-20	EL
C	Exchange Joystick X-axis output	08-26-20	EL
D	Added information for the Manifold pressure input parameter.	09-09-20	EL

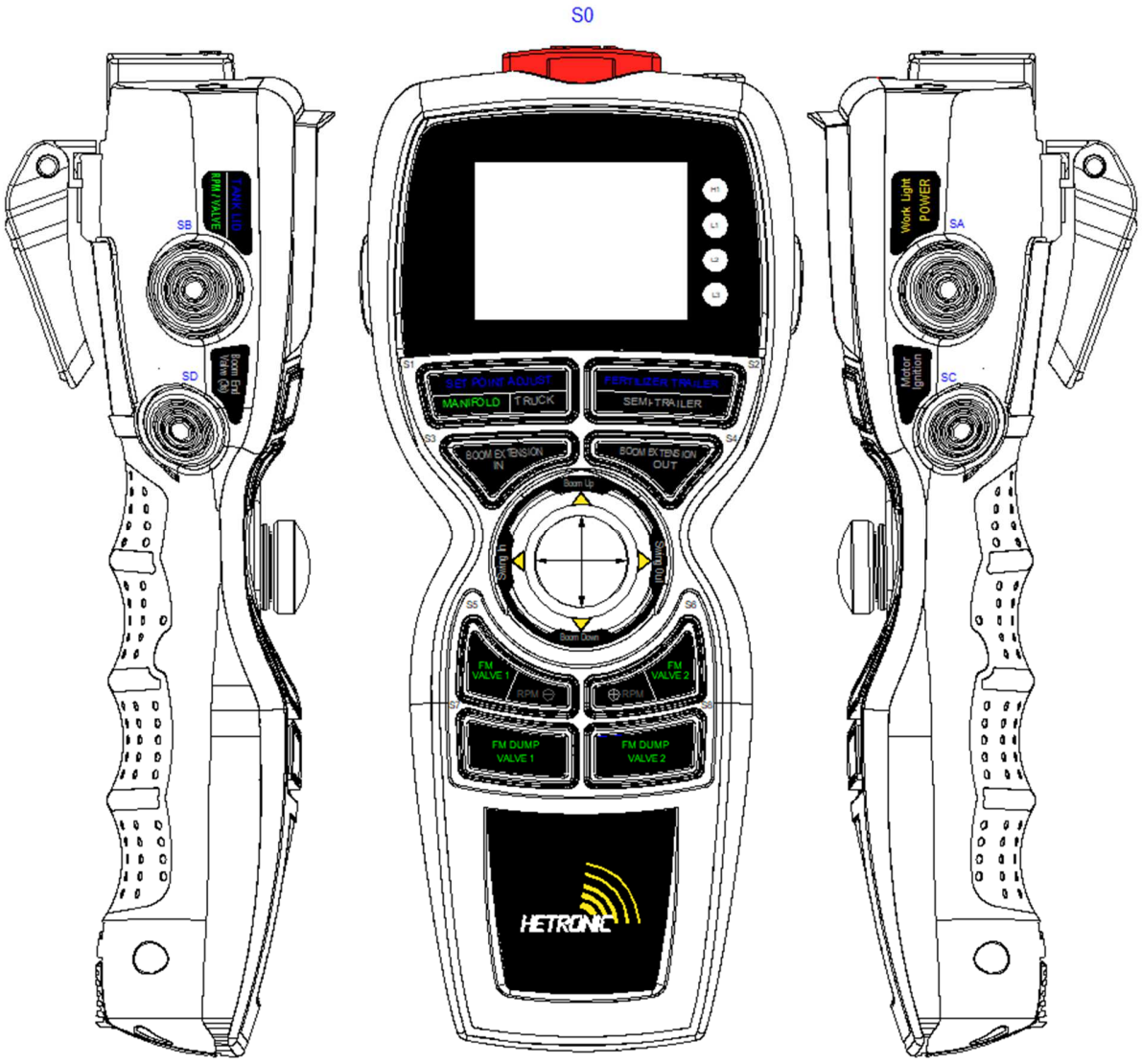
*(Revisions should be tracked using letters starting with 'A')

Table of Contents

Overview

The wireless control system consists of Ergo-S V1 transmitter controlling 2 MLC receivers mounted on a Semi-Trailer and a Fertilizer Trailer. The system can remotely control the loading of fertilizer from the Semi-Trailer to the Fertilizer Trailer and shuts off automatically when a preset level is reach. The tank level on each truck are monitored separately and displayed in the transmitter screen. The automatic shutoff of the loading is only possible when both receivers are powered ON. Other than the loading auto shutoff, other functions can be operated individually without the other receiver (OFF).

Control Transmitter



Functional I/O

A. Semi-Trailer

Control Outputs:

Function	RX1 Pinout	Remarks
Starter	44 (Out2)	12VDC
Ignition	39 (Out11)	12VDC / Active Low
Boom End Valve	34 (Out4)	Latch (Open=12V / Close=0V)
Control RPM +/-	45 (PMW1A)	0-5VDC / 4-steps
Swing Out	60 (Out17 / PWM2B)	12VDC
Swing In	46 (Out16 / PWM2A)	12VDC
Boom Up	47 (Out18 / PWM3A)	12VDC
Boom Down	61 (Out19 / PWM3B)	12VDC
Boom Extension In	48 (Out20 / PMW3A)	12VDC
Boom Extension Out	62 (Out21 / PWM3B)	12VDC
Work light	33 (Out3)	Latch (ON=12V / OFF=0V)
Camera Power	2 (Out13)	12VDC when Tx is turned ON
Manifold Valve 1	49/63 (Out5/6)	12VDC
Manifold Valve 2	64/50 (Out7/8)	12VDC
Dump Valve 1	37 (Out9)	12VDC
Dump Valve 2	36 (Out10)	12VDC
Manual RPM Disable	55(Out12)	12VDC when Tx is turned ON and started

Feedback Inputs:

Function	RX1 Pinout	Remarks
Tank Level	27 (User In2)	4-20mA (4mA=0gal; 20mA=7500gal)
Actual RPM	25 (User In4)	0-80Hz (1Hz = 60RPM; 80Hz = 4800RPM)
Trailer Power (Volt)	36 (User In8)	0-30V
Manifold Pressure	25 (User In9)	0.5-4.5V (0.5V = 0PSI ; 4.5V = 150PSI

B. Fertilizer Trailer

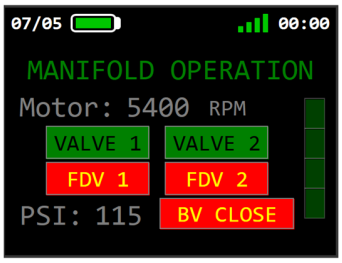
Control Outputs:

Function	RX2 Pinout	Remarks
Tank Cover	33 (Out3)	Latch (Open=12V / Close=0V)
Work light	44 (Out2)	Latch (ON=12V / OFF=0V)

Feedback Inputs:

Function	RX2 Pinout	Remarks
Tank Level	28 (User In1)	4-20mA (4mA=0gal; 20mA=1600gal)

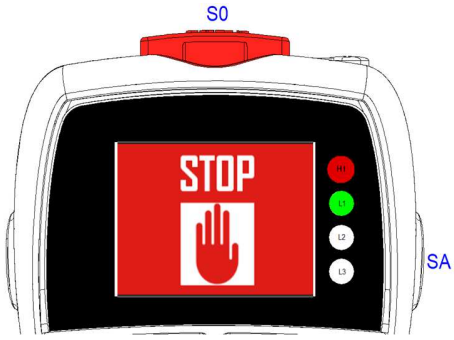
Transmitter Display Screens

Screen	Remarks
	SEMI-TRAILER SCREEN
	FERTILIZER TRAILER SCREEN
	MANIFOLD OPERATION SCREEN
	WARNING SCREEN Displayed 3minutes after Boom End Valve is opened, in Semi-Trailer or Manifold Screen.
	EMERGENCY STOP Displayed when Transmitter E-Stop button (S0) is activated
	COMMUNICATION ERROR Displayed in the following instances: 1. When transmitter loss communication (control or feedback) with the receiver. 2. After de-activating transmitter E-Stop (S0), and system is not started.

Operation

A. Power ON/OFF

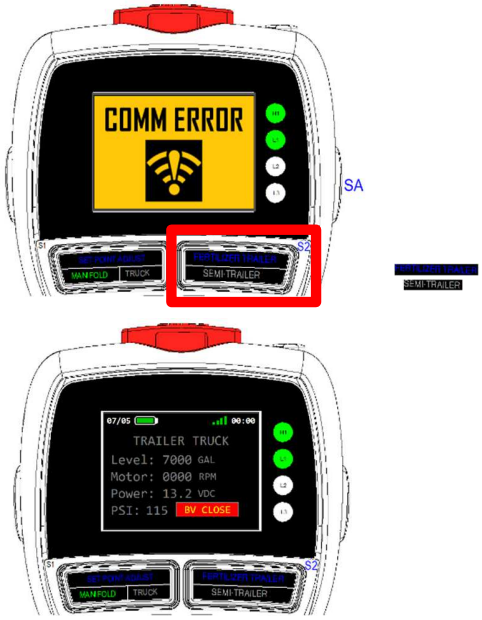
1. To power ON, press button SA. Display will show Emergency Stop Screen, LED H1 will blink red and LED L1 will turn solid green.
2. To power OFF, activate E-stop button S0 the press button SA for 2 seconds.



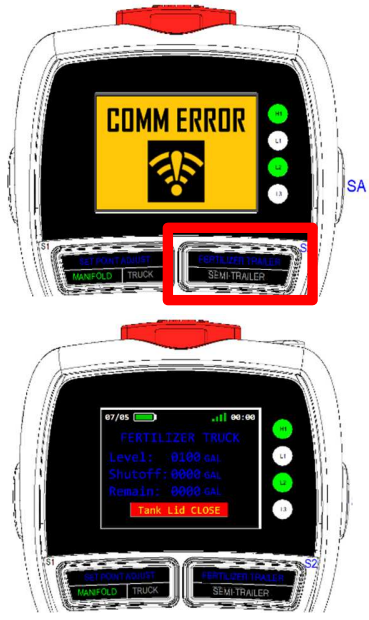
B. Connecting to Semi-Trailer Receiver (RX1) or Fertilizer Trailer Receiver (RX2)

1. Deactivate (pull-up) E-Stop button S0, LCD will display Communication Error Screen, LED H1 will blink green and LED L1 is solid green.
2. Select the receiver to connect by pressing button S2, LED L1 will turn ON (solid green) for RX1 and LED L2 will turn ON (solid green) for RX2.
3. After selecting the receiver, press button SA, the LCD will show the screen for the selected receiver. The receiver selection can be change between RX1 and RX2 by pressing button S2.

RX1 Selected (Semi-Trailer)



RX2 Selected (Fertilizer Trailer)



C. Semi-Trailer Operation (Trailer Screen)

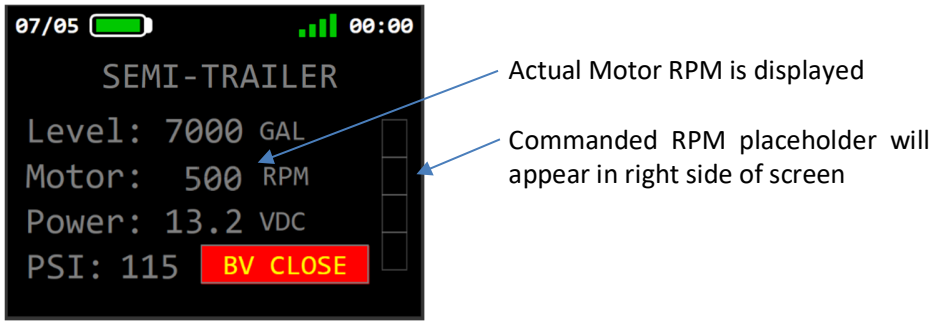
1. Engine Start and Stop

The Engine can be started in 2 modes using button SC:

Bump Start – Press button SC momentarily, the Ignition (OUT11/Active Low) and Engine Starter (OUT2) will be activated for 5 seconds or until the Engine is started, actual input RPM (User Input4) is above 400RPM. Engine RPM (Motor) will be displayed in screen and commanded RPM placeholder will appear on the right side of the screen. If the Engine failed to start, within 5 seconds, the Ignition (OUT11/Active Low) will be deactivated.

Press/Hold Start – If the Engine cannot be started in Bump Start Mode, the Press/Hold Start Mode can be used to run the starter for longer period up to 8 seconds. Press and Hold button SC for up to 8seconds, the Ignition (OUT11/Active Low) and Engine Starter (OUT2) will be activated for 8 seconds or until the Engine is started, actual input RPM (User Input4) is above 400RPM. Engine RPM will be displayed in screen and commanded RPM placeholder will appear on the right side of the screen. If button SC is hold for more than 8seconds and the engine failed to start, within 8 seconds, the Ignition (OUT11/Active Low) will be deactivated.

Semi-Trailer Screen when Engine is started successfully:

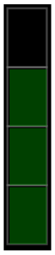
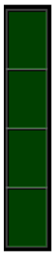


If the engine was started and button SC is pressed, the engine ignition will be deactivated (OUT11/Active Low) and engine will stop.

2. Engine (Motor) RPM Control

The Engine RPM can only be controlled or adjusted when the engine was started. The RPM is controlled by pressing button S6 (RPM +) or button S5 (RPM -). The RPM control is 4steps supplying variable 0-5V (RX1 / PWM1A) to the motor RPM control. A separate output (OUT12) will disable the manual RPM control on the motor engine.

4-Step RPM Control

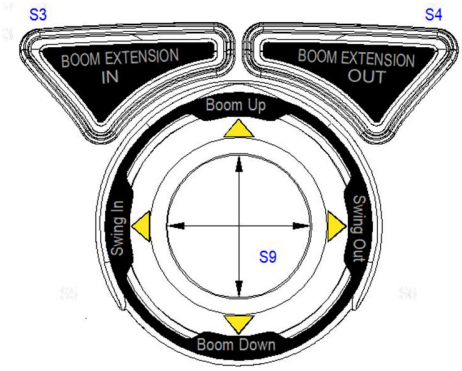
	IDLE	25%	50%	75%	100%
PWM1A Output	0V	1.25V	2.5V	3.75V	5V
Commanded RPM Placeholder					

RPM commanded settings will be maintained even when changing screen by pressing button S2 (Fertilizer Screen).

Pressing E-Stop or button SC will kill (stop) the engine and RPM reset to idle.

3. *Boom Operation*

The Boom operation is controlled by Joystick S9 and buttons S3 and S4.
The Boom can also be operated in both the Manifold and Fertilizer Screens.



Function	RX1 Pinout
Swing Out	60 (Out17 / PWM2B)
Swing In	46 (Out16 / PWM2A)
Boom Up	47 (Out18 / PWM3A)
Boom Down	61 (Out19 / PWM3B)
Boom Extension In	48 (Out20 / PMW3A)
Boom Extension Out	62 (Out21 / PWM3B)

4. *Boom End Valve*

The Boom End valve (OUT4) can be operated with button SD, only when engine is started. Press and hold button SD for 3 seconds to Open or Close, the status of the valve is shown on the screen.

If the Boom End Valve is open and the engine is killed, it will close after 2seconds.

When Boom End Valve is open and there is no activity (idle) detected for 1minute, the screen will automatically change to Fertilizer Screen.

After 3 minutes that the Boom End Valve is opened, it will trigger a WARNING SCREEN to check the Fertilizer tank level, see Warning Screen section for detail.

5. ***Work light***

The Semi-Trailer work light (OUT3) can be turned ON and OFF with button SA. There is a 2 seconds delay when turning off. The semi-trailer work light can only be operated (ON/OFF) in Semi-Trailer and Manifold Screens.

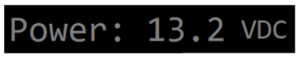
6. ***Screen Monitors***

The following parameters are monitored, and their values are displayed on the screen:

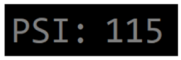
Tank Level: shows the remaining fertilizer volume (User In2), 0~7500 gallons

Motor RPM: shows the actual engine RPM (User In4), 0~4800RPM

Motor Power: shows the current battery voltage (User In8), 0~15VDC



Manifold Pressure: shows the actual manifold pressure (User In9), 0~150PSI



D. Warning Screen

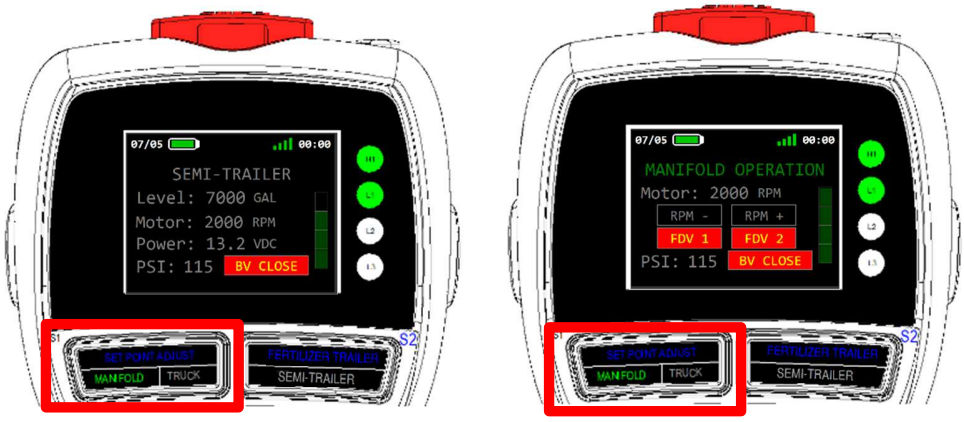
This screen will be displayed 3 minutes after the Boom End Valve is opened.
It has a 30 seconds timer to automatically switch to Fertilizer Trailer Screen when no action.

Ignore – Press button S1 to ignore and continue with current activity.
Check – Press button S2 to switch to Fertilizer Screen.

All functions, except work light (button SA) are disabled in this screen

E. Manifold Valve Operation

When in Semi-Trailer Screen, the Manifold Screen can be displayed by pressing button S1. Button S1 will to toggle selection between Semi-Trailer Screen and Manifold Screen



1. *RPM Control*

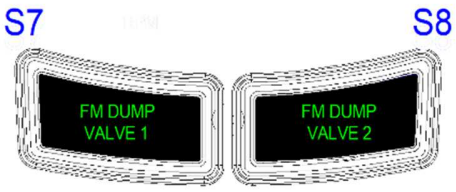
RPM can be controlled in this screen the same way as in Semi-Trailer Truck Screen.

2. *Boom End Valve*

The Boom End Valve can be controlled in this screen the same way as in Semi-Trailer Truck Screen.

3. *Dump Valve 1 and 2*

The Dump Valves can be controlled individually with buttons S7 (Dump Valve 1) and S8 (Dump Valve 2). Press button for 1 second to OPEN and release button to CLOSE. Both Valves can be opened at the same time. Valve status is displayed on the screen.

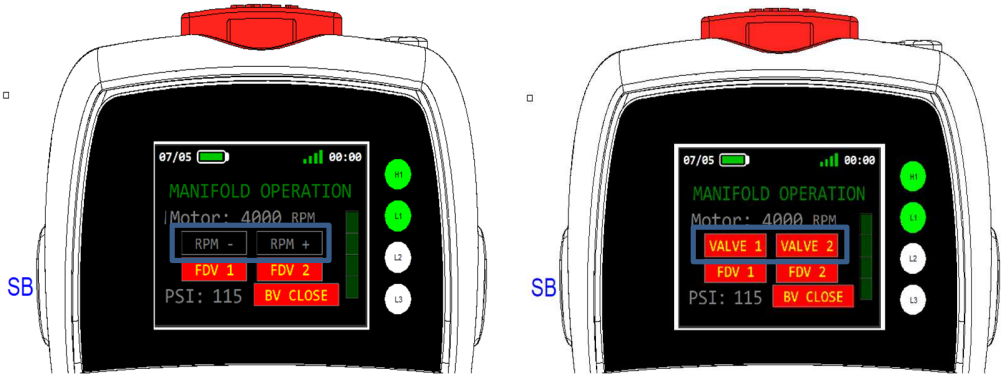


Valve CLOSE	Valve OPEN
FDV 1 FDV 2	FDV 1 FDV 2

4. *Manifold Valves 1 and 2*

By default, buttons S5 and S6 controls the RPM, but in Manifold screen this could be changed to control the Manifold Valves by pressing button SB. Pressing button SB will toggle control of button S5/S6 between RPM and Manifold Valves, the screen show what function is controlled.

RPM Control **Valve Control**



The Manifold Valves can now be controlled individually with buttons S5 (Manifold Valve 1) and S6 (Manifold Valve 2). Press button for 1 second to OPEN and release button to CLOSE. Both Valves can be opened at the same time when the engine is ON, otherwise only one valve can be open at a time. Valve status is displayed on the screen.

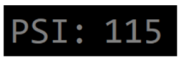
Valve CLOSE	Valve OPEN
VALVE 1 VALVE 2	VALVE 1 VALVE 2

5. *Screen Monitors*

The following parameters are monitored, and their values are displayed on the screen:

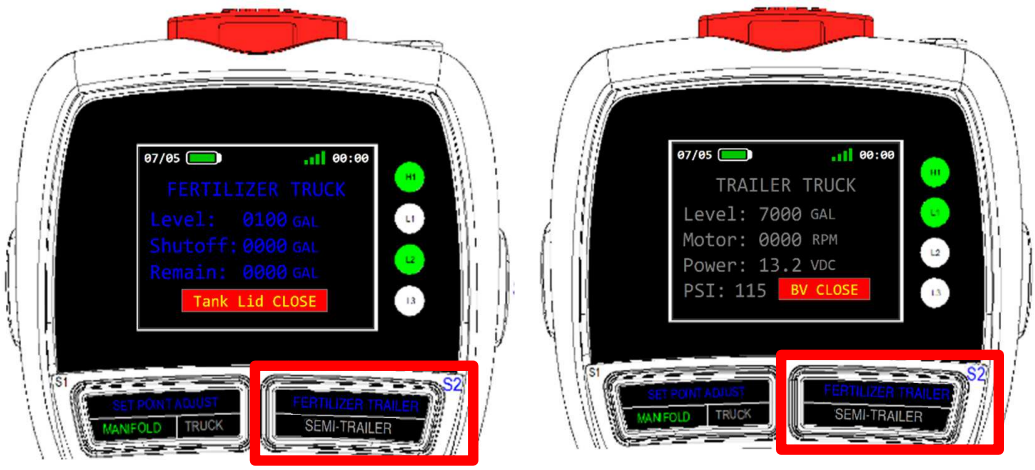
Motor RPM: shows the actual engine RPM (User In4), 0~4800RPM

Manifold Pressure: shows the actual manifold pressure (User In9), 0~150PSI



F. Fertilizer Trailer Operation

The Fertilizer Trailer be selected to be controlled by pressing button S2. The receiver selection can be change between RX1 and RX2 by pressing button S2.



1. *Fertilizer Trailer Tank Lid*

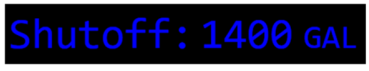
The Tank lid (OUT3) can be operated (Open/Close) with button SB. Press button to Open or Close, the status of the valve is shown on the screen.

2. *Work Light*

The Fertilizer Trailer work light (OUT2) can be turned ON and OFF with button SA. There is a 2 seconds delay when turning off. The Fertilizer Trailer work light can only be operated (ON/OFF) in Fertilizer Trailer screen and independent from the Semi-Trailer work light.

3. *Tank Shutoff Point*

The Tank Shutoff point sets the tank level that when it is reach, the system will automatically idle the motor, shuts the ignition in 5seconds and close the Boom End Valve. The shutoff point can be set with button S1, it will increment by 200gallons, up to max set of 1600gallons, when the button is pressed. The shutoff level is displayed on the screen. When the shutoff point is not set (0000gal), the automatic engine shutoff is not activated.



4. *Screen Monitors*

The following parameters are monitored, and their values are displayed on the screen:

Tank Level: shows the actual fertilizer volume (User In1), 0~1600 gallons

Remain: shows remaining volume until auto shutoff is triggered (difference between shutoff level and actual level) or remaining until tank is filled to capacity (1600gal) when Shutoff is not set.