SpillStop Ultra™

Dual Alarm Controller

Overfill Prevention System

MODEL 815-UD MANUAL

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GARNET
INSTRUMENTS LTD.

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CHAPTER 1 - OVERVIEW

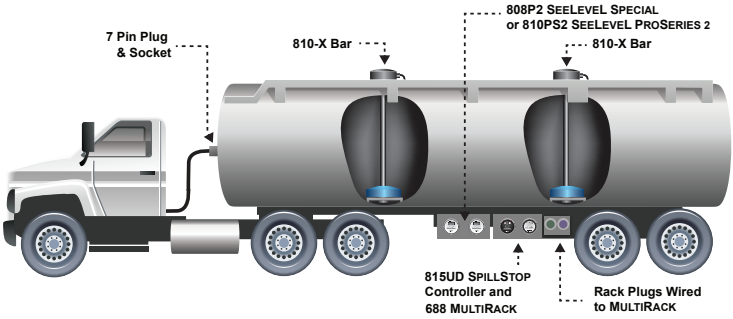
Congratulations on purchasing the Garnet Instruments' Model 815 SpillStop Ultra ™ Dual Alarm Controller Overfill Prevention System. The SpillStop™ represents the state of the art in spill control for crude oil and chemical hauling. The SpillStop™ is designed to work in conjunction with a Garnet Model 810PS2 SeeLevel ProSeries™ or a Model 808P2 SeeLevel Special™ system to assist the truck operator with truck tank overfill protection in applications where the fluid is loaded with a PTO driven pump.

The 815UD system is designed as an emergency backup system. The operator should still be responsible for loading and unloading of the tank, but in the event that the operator is unable to shut down loading when the tank is full, the 815UD system will prevent a spill.

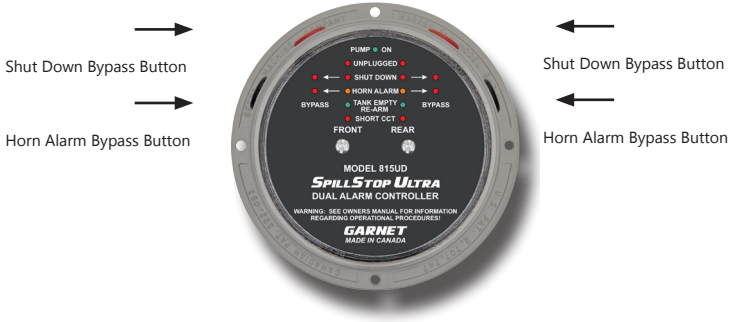
The 815UD is easy to install and operate, and is designed to withstand the rigors of mobile applications. The Model 817 Truck Gauge Programmer is used to set the alarm points in the 810PS2 SeeLevel ProSeries™ or the 808P2 SeeLevel Special™ gauge, which are programmed with the horn alarm and shutdown points. The system can shut down hydraulically operated loading pumps. A horn alarm is provided to warn of an impending shut down condition.

CHAPTER 2 - FEATURES AND OPERATION

The following figure shows the basic components and connections of the SPILLSTOP for a tractor trailer application. A body truck application would be similar except that the 7 pin plug & socket would not be required since the tank is never disconnected from the truck.



The SPILLSTOP consists of two main components: the controller on the truck, and the gauge module is built in to the SeeLeveL displays.



The 815UD alarm controller monitors and displays the alarm status of the gauges, and activates a horn if the fluid level in either truck tank is at the full point, and shuts off the pump if a spill is imminent. The 815UD controller accommodates two compartments.

WARNING: The SpillStop Ultra Dual is intended as an emergency backup system only, and is not intended as a substitute for operator diligence during the loading process.

The operation for each compartment of the SpillStop Ultra Dual during the loading operation is as follows: When the tank is empty, the green EMPTY/RE-ARM indicator is on, the horn is off, and the pump is allowed to run. As the fluid level starts to rise, the EMPTY/RE-ARM indicator goes out. When the horn alarm point is reached, the yellow HORN ALARM indicator comes on and the horn is activated with a 1 second on, 1 second off cycle. Depressing the horn alarm BYPASS at this point lights the red horn alarm bypass indicator and silences the horn. If the fluid level continues to rise and reaches the engine shutdown point, the red SHUT DOWN indicator will come on and the pump will be shut off. Depressing the shutdown BYPASS at this point lights the red shutdown bypass indicator and allows the pump to be restarted. When any of the BYPASS switches are depressed, the associated alarm indicator remains on even though the alarm function has been suppressed; this reminds the operator that the fluid level situation which triggered the alarm still exists. As the tank is unloaded the alarm indicators will go out when the fluid level drops below the alarm points, and the bypasses will be cleared (the system is re-armed) when the EMPTY/RE-ARM indicator comes back on. This automatic feature means that there is no need for the operator to re-arm the system, removing the possible operator error of forgetting to re-arm. If the tank is not filled to the alarm point, the system can still be bypassed to prevent sloshing from sounding the horn or shutting down the engine during driving. If the tank is to be filled from more than one location, the alarms can be bypassed during driving between loading sites, and the system manually re-armed to re-establish spill protection for the second load. Re-arming is done by pressing both of the BYPASS buttons at the same time for two seconds.

The SpillStop Ultra has a number of convenience and safety features built into it. When the tank is empty, the bypasses will not work, preventing accidental bypassing before loading. Delays are incorporated into the system to prevent electrical noise or momentary bad connections from disrupting operation. A short circuit in the wiring to the gauge, or plugging the SpillStop plug into the trailer lighting socket, lights the red SHORT CIRCUIT indicator and shuts down the pump. An open circuit in the wiring to the gauge, or a disconnection of the plug to the trailer, lights the red UNPLUGGED indicator, sounds the horn, and shuts down the pump. The alarms from an unplugged situation can be bypassed to allow operating the tractor without the trailer connected. The pulse signal between the gauge and the controller cannot

be corrupted by poor connections or moisture in the wiring; if the signal is too badly degraded it defaults directly to an open or short circuit condition. A failure of the SeeLeveL or SeeLeveL Special gauge causes the controller to default to the horn alarm and shut down condition. The controller will operate at truck voltages from 8 to 16 volts, and draws less than 1/8 amp so it can operate from any convenient 12 volt circuit. The controller is also fully weatherproof, so it can be mounted outside of the cab of the truck.

CHAPTER 3 - INSTALLATION GUIDE

Refer to the appropriate wiring diagram during installation of the SpillStop system. A wiring diagram is in chapter 4, more are available on our website at www.garnetinstruments.com.

Follow these instructions for a tractor trailer installation:

1. Pick a spot for the 815UD controller to be mounted. It can be inside or outside of the cab, but it should be mounted on the truck, rather than the trailer. The only situation where the controller can be mounted on a trailer is where the loading pump is also located on the trailer so that the shutdown wiring does not need to go through a plug. In this case the 12 volt power should be generated at the trailer, or a loss of power to the trailer should result in the shutdown of the loading pump. Do not mount the controller where it can be kicked and it should be easy to see and out of direct road spray. It is recommended that the controller be mounted close to the PTO control.
2. Mount the display enclosure using the mounting flange holes, being certain to shim the enclosure away from the mounting surface with the spacers provided to allow water drainage. **Broken display enclosures caused by water freezing behind the enclosure are NOT covered by warranty.**

IMPORTANT: When connecting wiring, all connections should be soldered.

3. Mount a standard 7 pin socket to the front of the trailer and a 7 pin plug and cable from the tractor.
4. A single wire needs to be connected between the green wire of the rear compartment's 808P2 or the grey wire of the rear 810PS2 and the yellow wire of the 815UD SpillStop Ultra controller through the 7 pin socket. The green wire from the front compartment's 808P2 or the grey wire of the front 810PS2 is connected to the blue wire of the 815UD, again going through the 7 pin socket. From inside the displays, seal the wire entry into the SeeLevel enclosure with RTV silicon rubber. Make sure that the RTV fully surrounds the wire where it goes though the fitting.
5. Connect both of the 808P2 or 810PS2 and the 815UD SpillStop Ultra controller to the same chassis ground using each displays ground wires. Verify the truck and trailer are grounded together through the 7 pin plug.

6. Connect the 815UD controller red wire to a 12 volt source. This 12 volt source should be an ignition source so the truck battery is not drained when the truck is off.
7. Locate an electrical shutoff switch (such as the key switch) in the truck. Break the connection to the switch and connect the two wire ends to the contact terminals (#30 & #87) of the auxiliary ESD relay (supplied). Connect one of the auxiliary ESD relay coil terminals (#86) to the 12 volt source and the other coil terminal (#85) to the green wire in the controller. It is a good idea to mount the auxiliary ESD relay close to the existing shutoff wiring to minimize any extra wire length in the truck shutoff circuit.
8. Connect the PTO sense relay (supplied) to the green wire as shown in the wiring diagram. Use a standard clearance lamp (not supplied) as the PTO indicator light. The PTO sense relay functions so that the ESD (Engine Shutdown) relay cannot operate unless the PTO is engaged. This prevents the engine from being accidentally shutdown if fluid sloshing occurs and raises the float above the engine shutdown point.
9. Connect the orange 815UD controller wire to the truck's electrical horn switch (or button). Make sure that grounding this connection will cause the horn to sound. This connection is normally to the horn relay coil, not to the horn itself.
10. Program the alarm points in the gauges. Program alarm #1 as SHUT DOWN at the point where the engine or pump should be shut down. Program alarm #2 as SHUT DOWN at the point where the horn alarm should come on. Program alarm #3 as SHUT DOWN at the point where the tank is considered empty, normally a few inches off the bottom. Do not program the empty point right at the bottom, since any buildup of debris on the anchor will prevent the system from clearing the bypasses. See the 808P2 or 810PS2 manual for programming details.

Example: The tank is 58 inches high, with a bottom reading of 4.6 inches. Suggested points would be alarm #1 at 55 inches, alarm #2 at 53 inches, and alarm #3 at 6 inches.

WARNING: To properly determine the shutdown point, raise the SeeLeveL float to the top of the tank, and then lower the float by at least one inch. Record this point as the shutdown value. **Ensure that the truck operator is aware of this value. Ensure that this value and the empty reading are recorded in the provided area in the operator's manual. The truck operator must be given the owners manual upon delivery with all front page data filled in.**

11. Put the cover back on the SeeLeveL gauge, and test the system for proper operation by lifting the float. As the float is raised, the horn should turn on first, and then the engine or pump should shut off with the float at least one inch below the top of the tank. Bypass the horn and shutdown and ensure that the bypasses are removed with the float at least one inch above the bottom of the tank.

Follow these instructions for a body truck installation:

1. Pick a spot for the SpillStop Ultra controller to be mounted. It can be inside or outside of the cab. Do not mount the controller where it can be kicked and it should be easy to see and out of direct road spray. It is recommended that the controller be mounted close to the PTO control.
2. Mount the display enclosure using the mounting flange holes, being certain to shim the enclosure away from the mounting surface with the spacers provided to allow water drainage. **Broken display enclosures caused by water freezing behind the enclosure are NOT covered by warranty.**

IMPORTANT: When connecting wiring, all connections should be soldered.

3. A single wire needs to be connected between the green wire of the rear compartment 808P2, the grey wire of the rear 810PS2 and the yellow wire of the 815UD SpillStop Ultra controller. Also connect the green wire of the front 808P2, the grey wire of the front 810PS2 and the blue wire of the 815UD SpillStop Ultra controller. From inside the displays, seal the wire entry into the SeeLeveL enclosure with RTV silicon rubber. Make sure that the RTV fully surrounds the wire where it goes though the fitting.
4. Connect all of the 808P2 or 810PS2 grounds and the black wire of the 815UD SpillStop Ultra controller to the same chassis ground.
5. Connect the 815UD controller's red wire to a +12 volt source. This +12 volt source should be an ignition source so the truck battery is not drained when the truck is off.
6. Locate an electrical shutoff switch (such as the key switch) in the truck. Break the connection to the switch and connect the two wire ends to the contact terminals (#30 & #87) of the auxiliary ESD relay (supplied). Connect one of the auxiliary ESD relay coil terminals (#86) to the 12 volt source and the other coil terminal (#85) to the green wire in the controller. It is a good idea to mount the auxiliary ESD relay close to the

existing shutoff wiring to minimize any extra wire length in the truck shutoff circuit.

7. Connect the PTO sense relay (supplied) to the green wire as shown in the wiring diagram. Use a standard clearance lamp (not supplied) as the PTO indicator light. The PTO sense relay functions so that the ESD (Engine Shutdown) relay cannot operate unless the PTO is engaged. This prevents the engine from being accidentally shutdown if fluid sloshing occurs and raises the float above the engine shutdown point.
8. Connect the 815UD controller's orange wire to the truck's electrical horn switch (or button). Make sure that grounding this connection will cause the horn to sound. This connection is normally to the horn relay coil, not to the horn itself.
9. Program the alarm points in the gauges. Program alarm #1 as SHUT DOWN at the point where the engine or pump should be shut down. Program alarm #2 as SHUT DOWN at the point where the horn alarm should come on. Program alarm #3 as SHUT DOWN at the point where the tank is considered empty, normally a few inches off the bottom. Do not program the empty point right at the bottom, since any buildup of debris on the anchor will prevent the system from clearing the bypasses. See the 808P2 or 810PS2 manuals for programming details.

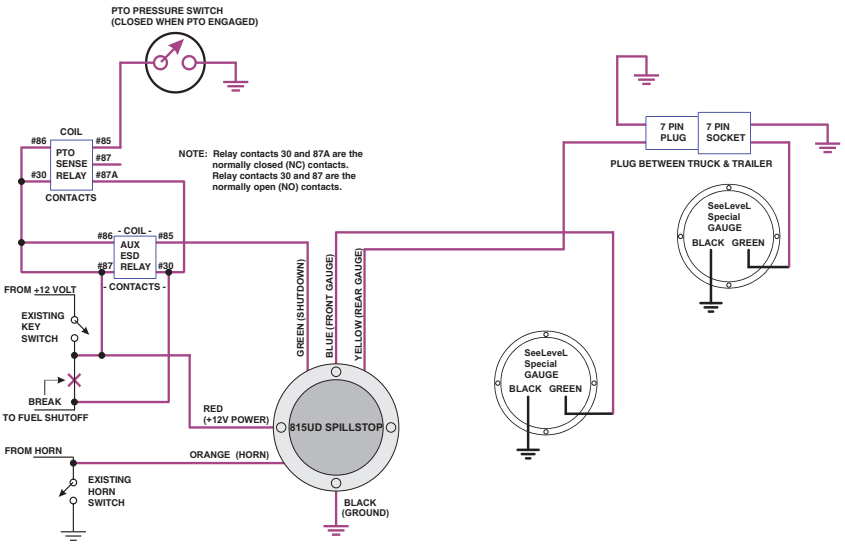
Example: The tank is 58 inches high, with a bottom reading of 4.6 inches. Suggested points would be alarm #1 (shutdown) at 55 inches, alarm #2 (horn) at 53 inches, and alarm #3 (reset) at 6 inches.

WARNING: To properly determine the shutdown point, raise the SEELEVEL float to the top of the tank, and then lower the float by **at least one inch.** Record this point as the shutdown value. **Ensure that the truck operator is aware of this value. Ensure that this value and the empty reading are recorded in the provided area in the operator's manual. The truck operator must be given the owners manual upon delivery with all front page data filled in.**

10. Put the cover back on the SEELEVEL gauge, and test the system for proper operation by lifting the float. As the float is raised, the horn should turn on first, and then the engine or pump should shut off with the float at least one inch below the top of the tank. Bypass the horn and shutdown and ensure that the bypasses are removed with the float at least one inch above the bottom of the tank.

CHAPTER 4 - WIRING DIAGRAM

815UD WIRING DIAGRAM-BODY TANK WITH PUP



More wiring diagrams are available at: www.garnetinstruments.com

Wiring Guide

Wire Color	Operation
Yellow	Rear gauge signal line
Blue	Front gauge signal line
Green	Shutdown output
Orange	Horn alarm output
Black	Ground
Red	+12VDC
White	Front shutdown bypass
Purple	Front horn alarm bypass
Grey	Rear horn alarm bypass
White/Blue	Rear shutdown bypass

CHAPTER 5 - TROUBLESHOOTING GUIDE

IF problems are encountered, check the following:

1. Is the controller getting at least 8 volts?
2. Are all the wires properly connected, with no short circuits?
3. Are the 808P2 or 810PS2 SEELEVEL gauges working properly?
4. Are the 808P2 or 810PS2 SEELEVEL gauges programmed properly?
5. If the horn is not sounding, does the horn itself work?

To test the various components, substitute a known good component to see if the rest of the system is working. If the engine will not start, ground the green wire from the controller. If the engine still does not start, the problem is in the relay or associated wiring. If the engine now starts, and the controller indicates no shutdown alarm (or is bypassed), then the controller is bad. If the horn will not sound, ground the orange wire from the controller. If the horn still does not sound, the problem is in the horn or associated wiring. If the horn now sounds, and the controller indicates a horn alarm that is not bypassed, then the controller is bad.

CHAPTER 6 - SERVICE AND WARRANTY INFORMATION

The warranty will apply only if the warranty card shipped with the equipment has been returned to Garnet Instruments Ltd.

Garnet Instruments Ltd. warrants equipment manufactured by Garnet to be free from defects in material and workmanship under normal use and service for a period of one year from the date of sale from Garnet or an Authorized Dealer. The warranty period will start from the date of purchase or installation as indicated on the warranty card. Under these warranties, Garnet shall be responsible only for actual loss or damage suffered and then only to the extent of Garnet's invoiced price of the product. Garnet shall not be liable in any case for labor charges for indirect, special, or consequential damages. Garnet shall not be liable in any case for the removal and/or reinstallation of defective Garnet equipment. These warranties shall not apply to any defects or other damages to any Garnet equipment that has been altered or tampered with by anyone other than Garnet factory representatives. In all cases, Garnet will warrant only Garnet products which are being used for applications acceptable to Garnet and within the technical specifications of the particular product. In addition, Garnet will warrant only those products which have been installed and maintained according to Garnet factory specifications.

LIMITATION ON WARRANTIES

These warranties are the only warranties, expressed or implied, upon which products are sold by Garnet and Garnet makes no warranty of merchantability or fitness for any particular purpose in respect to the products sold. Garnet products or parts thereof assumed to be defective by the purchaser within the stipulated warranty period should be returned to the seller, local distributor, or directly to Garnet for evaluation and service. Whenever direct factory evaluation, service or replacement is necessary, the customer must first, by either letter or phone, obtain a Returned Material Authorization (RMA) from Garnet Instruments directly. No material may be returned to Garnet without an RMA number assigned to it or without proper factory authorization. Any returns must be returned freight prepaid to: Garnet Instruments Ltd, 286 Kaska Road, Sherwood Park, Alberta, T8A 4G7. Returned warranted items will be repaired or replaced at the discretion of Garnet Instruments. Any Garnet items under the Garnet Warranty Policy that are deemed irreparable by Garnet Instruments will be replaced at no charge or a credit will be issued for that item subject to the customer's request.

If you do have a warranty claim or if the equipment needs to be serviced, contact the installation dealer. If you do need to contact Garnet, we can be reached as follows:

CANADA
Garnet Instruments Ltd.
286 Kaska Road
Sherwood Park, AB T8A 4G7
CANADA
email: info@garnetinstruments.com

UNITED STATES
Garnet Technologies Inc.
201 M&M Ranch Road
Granbury, TX 76049
USA
email: info@garnettechnologiesinc.com

NOTES: