SEELEVEL octane™

MULTI-COMPARTMENT FUEL TANK MONITOR

Installation & Operation Guide

MODEL 812

Printed in Canada

GARNET
Liquid management solutions, your way.

CANADA
Garnet Instruments Ltd.
286 Kaska Road
Sherwood Park, AB T8A 4G7

USA
Garnet US Inc.
5360 Old Granbury Road
Granbury, TX 76049

garnetinstruments.com
1-800-617-7384

TABLE OF CONTENTS

Click a heading in the Table of Contents to open that section. Use Back to Table of Contents link at bottom to return to TOC.

1.0 INTRODUCTION

1.1 Overview

The SeeLeveL Octane™ 812 is a powerful, multi-tank monitoring system purpose-built for trucks or trailers with multiple compartments. Capable of tracking up to six tanks simultaneously, it delivers high-accuracy liquid level readings for virtually any type of fluid, whether water, crude oil, or corrosive chemicals, that is displayed in the volumetric units of your choice.

Designed with both reliability and adaptability in mind, it features programmable alarms, including warnings and alerts for overflow, temperature, and level rise for comprehensive safety.

The system is easily configured through a free and user-friendly mobile app, allowing for quick setup and calibration in the shop and field.

Communication is seamless with support for CAN, RS485, RS232, and 4–20 mA outputs for each tank. This makes it ideal for integration into fleet or vehicle monitoring systems. With continuous data logging, the 812 provides vital insights for troubleshooting, operational oversight, and custody transfer accuracy, setting a high bar for multi-tank management.

Built for the demands of rugged, on-the-move environments, the SeeLeveL Octane™ 812 is engineered to endure the vibration, shock, and harsh conditions commonly encountered in mobile applications. Its robust design ensures reliable performance across a wide operating temperature range, making it well-suited for everything from freezing northern winters to sweltering summer hauls.

The front panel features durable controls that are easy to use while wearing gloves. It provides operators with dependable, straightforward access to system functions in tough working conditions.

1.2 Description

The SeeLeveL Octane™ 812 is designed to work with up to six 810-series sender bars, including the 810-X, 810-TX, and 810-HX models, making it highly adaptable for multi-tank configurations. Each sender bar uses magnets in the float to accurately detect liquid levels. Integrated temperature sensors in the 810-TX capture precise temperature readings.

These measurements are continuously transmitted to the Octane™ 812 through optical fiber communication, providing a safe solution for hazardous environments with no risk of electrical sparking. Once received, the Octane™ 812's display converts the level data into volumetric readings based on the strapping chart specific to your tank. It delivers reliable, real-time insight into every compartment.

With the SeeLeveL Octane™ 812, one tank level is displayed at a time on the front panel, and operators can easily toggle between tanks using the built-in selector switch. However, the system continuously scans all six connected tanks behind the scenes, ensuring that alarms and remote communication outputs remain updated in real time.

Each tank has its own dedicated set of alarms, including warnings, overflow, temperature, and rise alarms. These alarms are routed through common outputs to warn the operator and for an automatic response to halt loading. A standout safety feature is the rise alarm, which notifies the operator if a non-selected tank begins to fill during a loading operation. This feature helps to prevent accidental cross-fills.

For an expanded view, the free mobile app provides a full overview of all six tank levels simultaneously, giving operators instant visibility and deeper insight into the entire system at a glance. The mobile app uses Bluetooth® connectivity.

Installing the SeeLeveL Octane™ 812 is a straightforward process. Simply mount one sender bar, such as the 810-X, 810-TX, or 810-HX, into each compartment, secure the Octane™ 812's display in a convenient, visible location, and connect the sender bars using their fiber optic cables. From there, connect the display to the truck's 12V power supply and link it to any necessary alarm-connected devices or communication connections like CAN, RS485, RS232, and 4-20mA.

2.0 QUICK GUIDE

2.1 Operation

The sender bar is installed vertically inside each compartment. The float will move up and down as the liquid level changes, and magnets within the float allow the bar to determine the position of the float, and therefore the liquid volume. Temperature sensors within the bar (810-TX) also measure the liquid temperature, which is transmitted along with the liquid level continuously through the fiber optic cable. The liquid level is displayed continuously on the main display.

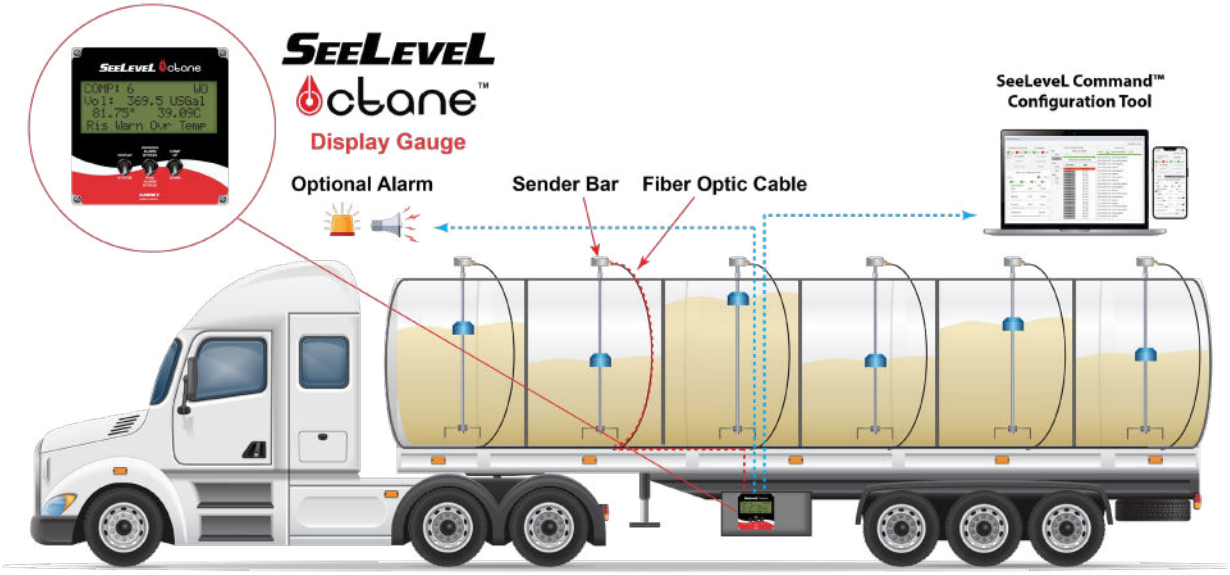


Figure 2.a Display General Operation

The SeeLeveL Octane™ 812 display panel will show the selected tank number, liquid level, and volume in your chosen units. When any alarm is triggered, it will be indicated at the bottom of the display, and its corresponding tank will have the alarm highlighted on its page view, as shown in the figure below.

2.2 Display Screen

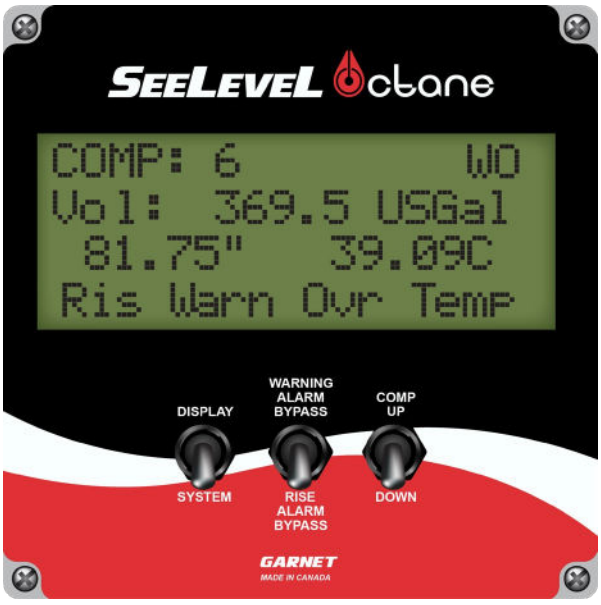


Figure 2.b Screen Example

The screen is divided into dedicated sections, as shown in the examples below:

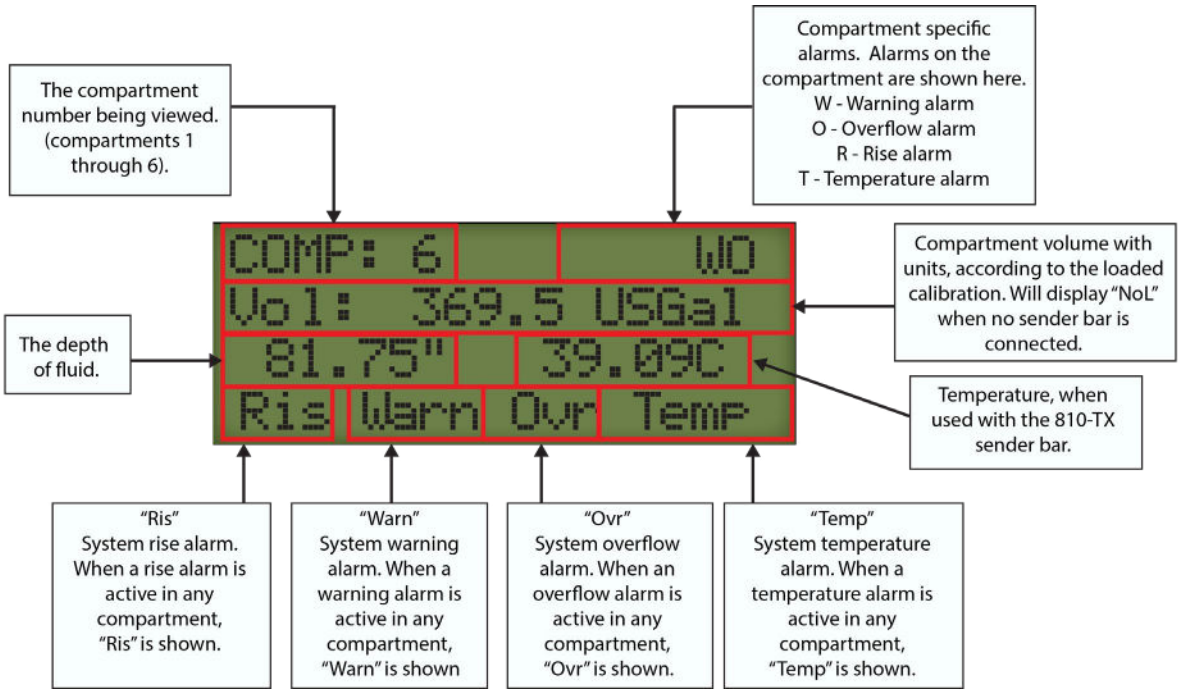


Figure 2.c Screen Diagram

The switches on the front panel operate as follows:

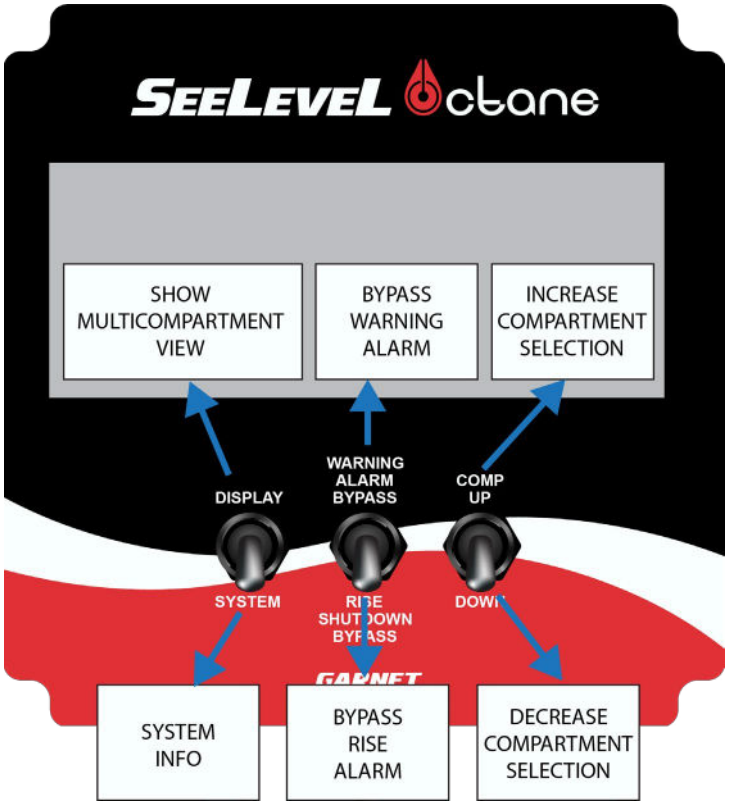


Figure 2.d Switches Diagram

2.3 Alarms

The SeeLeveL Octane™ 812 contains internal alarm points that can be set to custom levels for warning and safety alarms. The alarms activate when the liquid level is approaching its maximum level, when there is an unexpected increase in a compartment's liquid level, when the liquid temperature exceeds a set threshold, and when the compartment's level is in danger of overflowing.

As the liquid in the tank rises during loading, it will reach a user-set "**WARNING**" threshold. When this happens, the SeeLeveL Octane™ 812 triggers the "**Warning Alarm**" output. This output can be used to turn on a warning light, a horn, or a similar device. When this is active, "Warn" will flash on the bottom of the display, and a "W" will appear on the corresponding compartment view. This alarm can be bypassed by moving the middle (WARNING ALARM BYPASS) toggle switch up on the gauge. When the alarm is bypassed, it remains bypassed until the tank is emptied below the "RESET" threshold.

When the liquid level increases to the user-set "**OVERFLOW**" threshold, the "Overflow Alarm" output is triggered. This alarm can be used as an emergency shutoff signal to prevent overfilling. When this is active, "**Ovr**" will flash on the bottom of the display, and an "O" will appear on the corresponding compartment view. This alarm can be temporarily bypassed. The alarm will deactivate once the liquid level drops below the OVERFLOW level.

When the liquid's temperature exceeds a user-set "**TEMPERATURE**" threshold in a compartment that uses an 810-TX sender bar, the "**Temperature Alarm**" output is triggered. When this is active, "Temp" will flash on the bottom of the display, and a "T" will appear on the corresponding compartment view. This alarm cannot be bypassed and will only deactivate when the temperature drops below the threshold.

When the liquid level of **a non-selected** compartment (one that is not currently viewed on the display) **increases** and indicates a cross-fill is occurring, the "**RISE ALARM**" output is triggered. This alarm is only functional when the PTO input is activated by engaging the vehicle's PTO. When the alarm is active, "Ris" will flash on the bottom of the display, and an "R" will appear on the corresponding compartment view. This alarm can be bypassed by moving the middle (RISE SHUTDOWN BYPASS) toggle switch down on the gauge. The alarm is only functional when the PTO is engaged to prevent false alarms due to sloshing while driving.

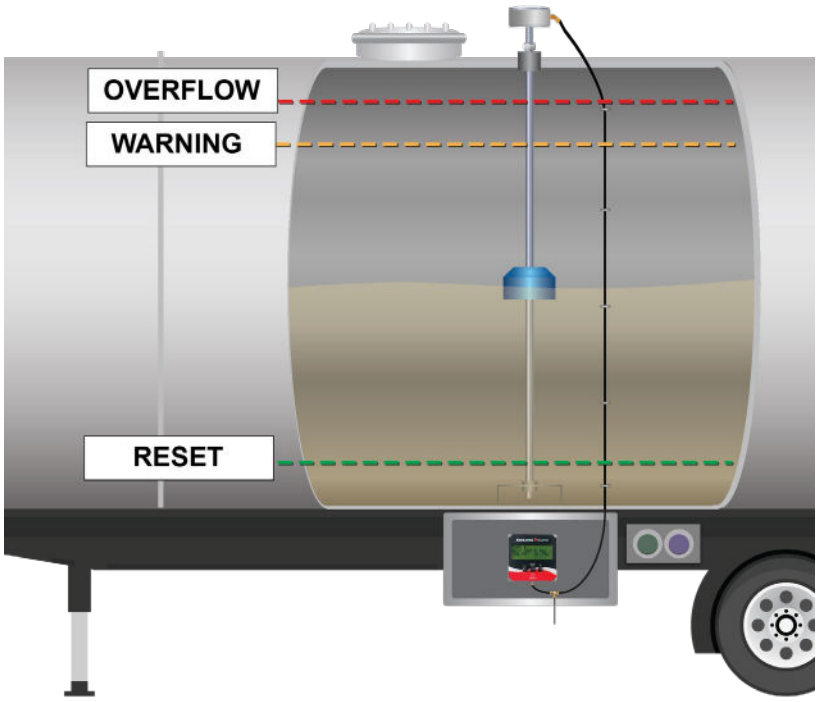


Figure 2.e Alarms Operation

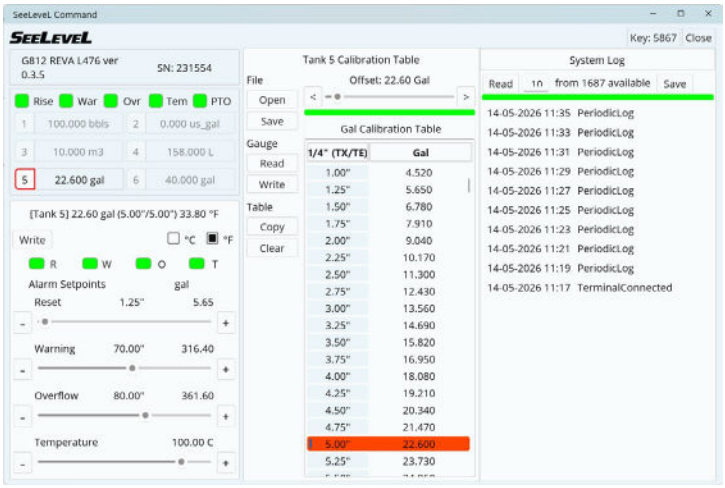
2.4 Internal Logging

The Octane contains internal memory that is used to store timestamped records of liquid levels and alarm events. By default, the Octane will store the level from each compartment once every hour. If the PTO signal is active, this rate increases to once every 2 minutes, to aid in capturing loading and unloading operations. Additionally, any change in the status of an alarm or PTO signal will trigger an event that is saved in the internal log.

This event log can be retrieved from the Octane using the free SeeLeveL Command app. It can then be saved locally to your Windows, iOS, or Android device.

2.5 Setup

The SeeLeveL Octane™ 812 companion app, SeeLeveL Command™, is available in the Apple Store and Google Play. With just a few steps, users configure alarm settings and volumetric calibration. Designed with simplicity in mind, the app does not require special tools or technical expertise. Configuration is easy, whether you're in the shop or field.



SENDER BARS

	810-X	810-TX	810-HX
			
Resolution	1/3″ (8.47 mm)	1/4″ (6.35 mm)	1/10″ (2.54 mm)
Accuracy	±5 mm (±0.2″)	±3.3 mm (±0.13″)	±2 mm (±0.08″)
Battery type	Field-Replaceable lithium battery with 10 year lifespan	Field-Replaceable lithium battery with 10 year lifespan	Field-Replaceable lithium battery with 10 year lifespan
Temp monitoring	-40°C to +90°C (-40°F to +194°F)		
Float compatibility	250-TRUCK_FLOAT Optional stainless steel	250-STAT_FLOAT Optional stainless steel	250-HX FLOAT
Comp Height	up to 87″ (221 cm)	up to 87″ (221 cm)	up to 47″ (119 cm)

3.1 Sender Bar Assembly

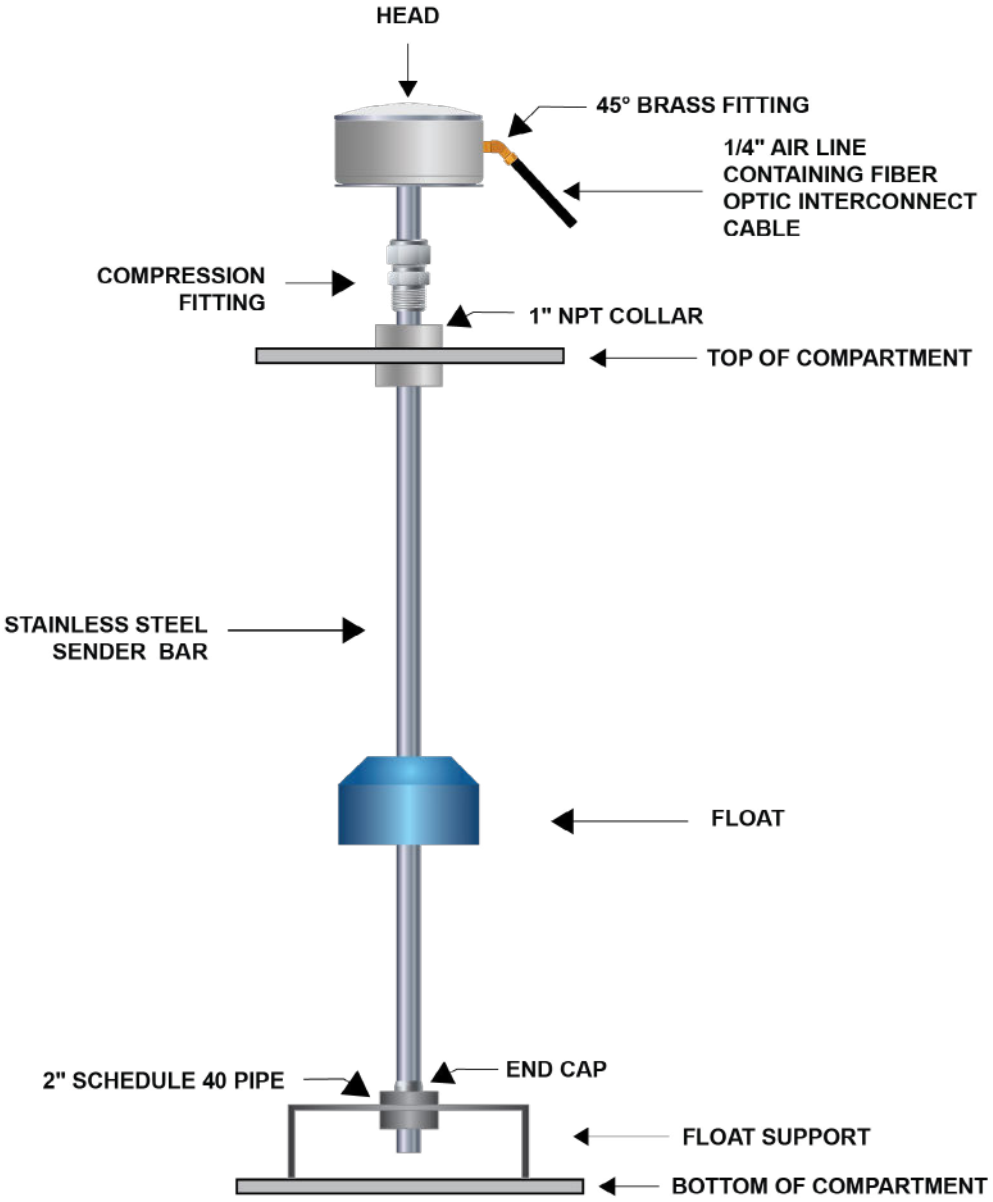


Figure 3.a Sender Bar Assembly

3.2 Compartment Preparation

3.2.1 Determine sender bar mounting position

1. Select a central location in the tank for mounting the sender bar, ensuring proximity to the compartment's midpoint and allowing space for the head at the top. *(See Figure 3.b)*
2. Ensure the float doesn't encounter any compartment baffles or obstructions.
3. Position the float where it can be accessible through the hatch to allow for service work. Do not install it behind a baffle that restricts hatch access. *(See Figure 3.c)*

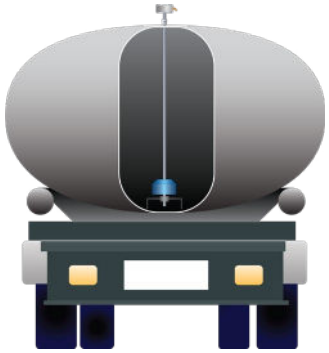


Figure 3.b Bar location - back view

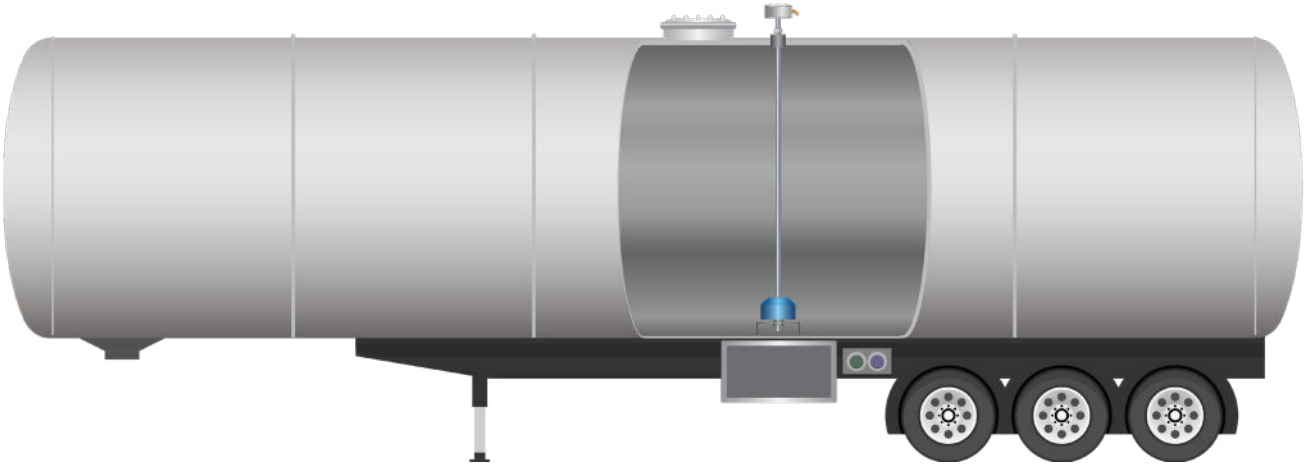


Figure 3.c Bar Location - side view

3.2.2 Install NPT Collar and Float Support

1. Drill a hole and weld the 1″ NPT collar into place at the top of the compartment. *(See Figure 3.d)*
2. Mount the float support at the bottom of the compartment. Ensure the NPT collar and float support are aligned. For float support fabrication. *(See Figure 3.e)*

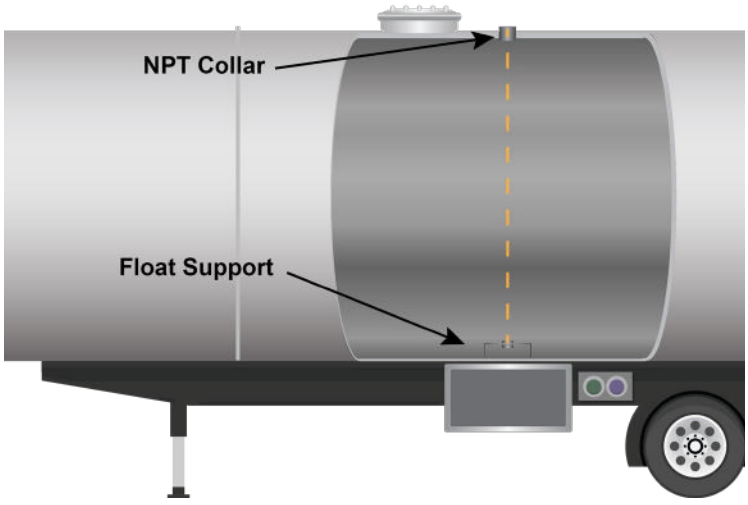


Figure 3.d Install 1" NPT Collar and Float Support

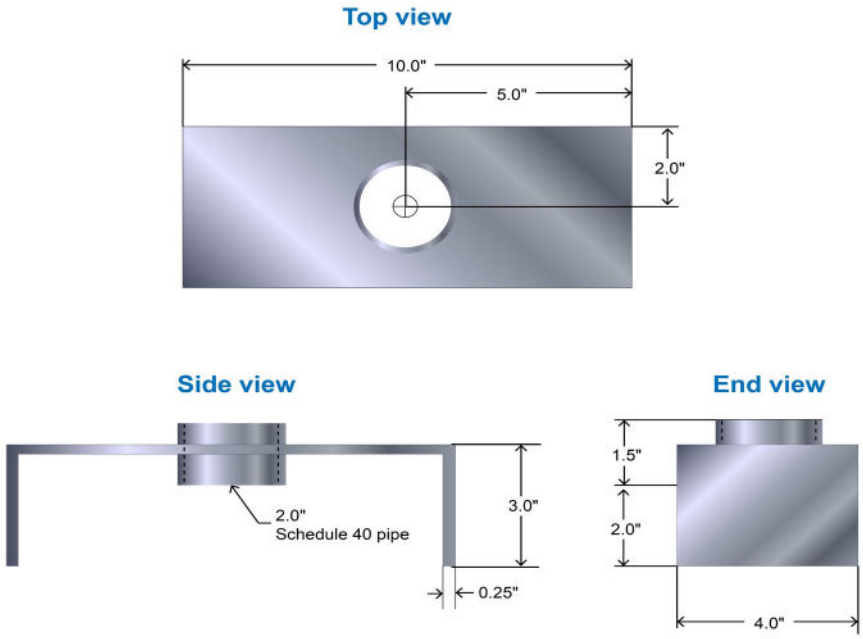


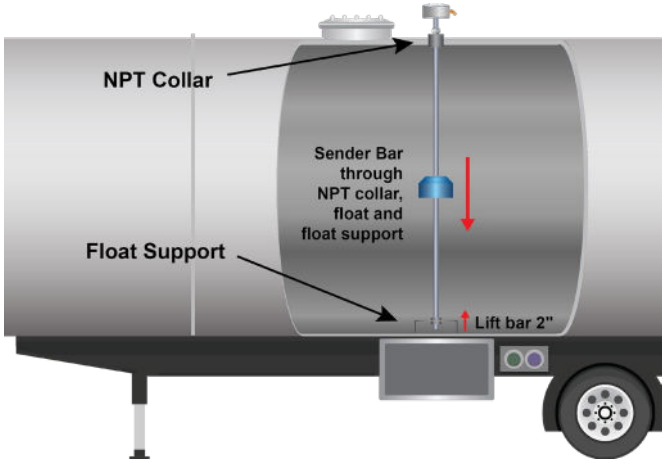
Figure 3.e Float Support Fabrication

3.2.3 Cutting the Bar

> ⚠ **NOTE:** The sender bar needs to be cut to length for specific trailers. Contact a sales or service rep for cut options. For sender bar cutting instructions, *(See Appendix A)* in this manual.
>
> It is highly recommended to contact your sales or service rep to precut the sender bar.

3.2.4 Sender Bar Installation

1. Guide the sender bar through the NPT collar, then through the float, and the float support until it rests on the bottom of the compartment.
2. Raise the bar 2" up from the bottom of the tank to accommodate tank flex that could mechanically interfere with the bottom of the bar, then tighten the compression fitting. *(See Figure 3.f)*



> ⚠ **CAUTION:** Installing the bar less than 2" from the bottom of the compartment WILL result in premature sender bar failure that is not covered under warranty.

Figure 3.f Install Sender Bar

3.3 Mount the Display

1. Select a location for the display. It should be easy to see, be out of direct road debris and spray and be protected from the rain. It is also suggested, for security reasons, to mount the display in a locked toolbox or similar enclosure. The security code shown on the display is required for programming.
2. The display enclosure may be installed using the existing holes or with optional mounting feet.
3. Make sure that the lid is not on the box when drilling to avoid damaging the display electronics. It is recommended to pre-install the air line fittings, enclosure drain and electrical wiring compression fitting before installing the display.

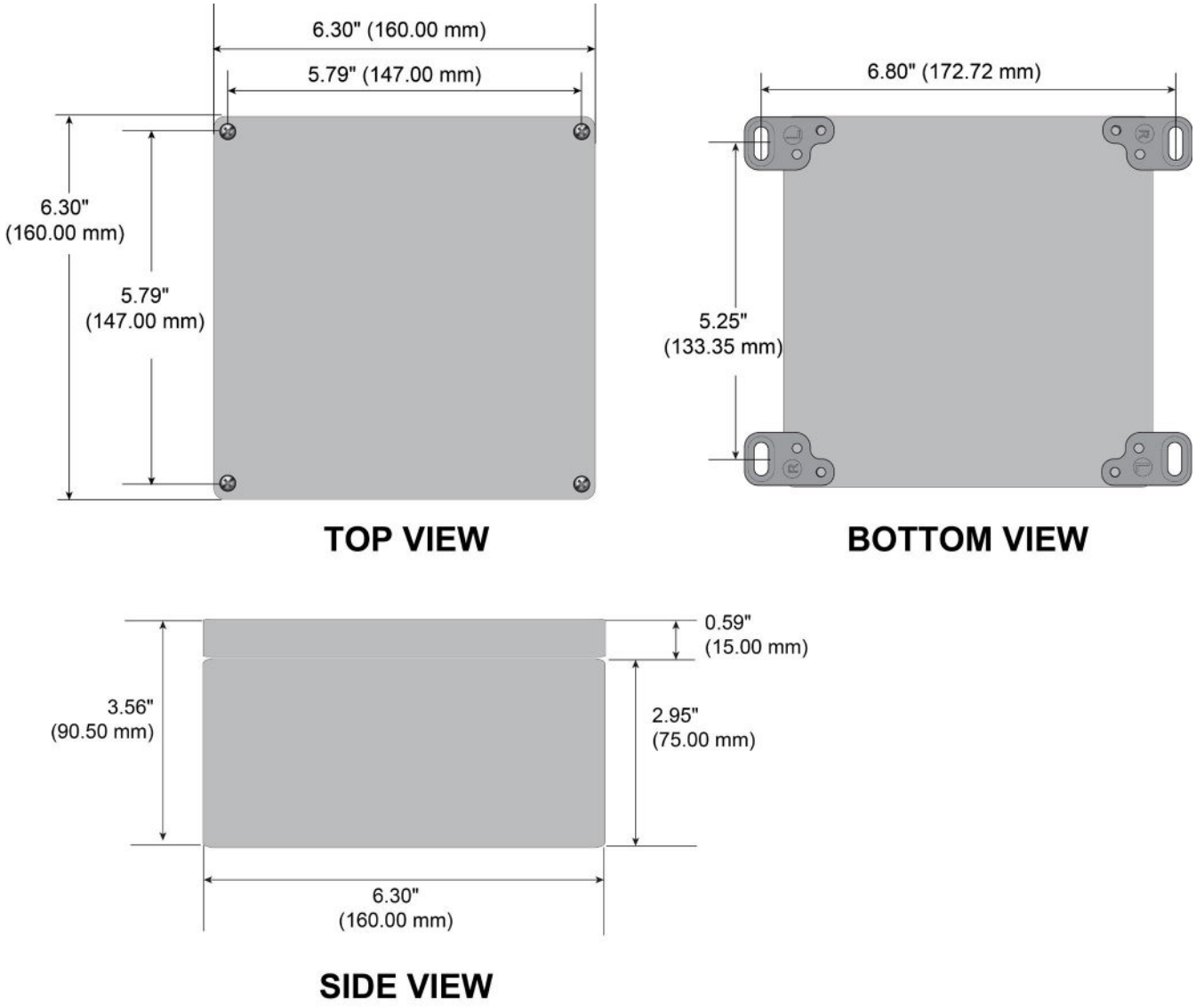


Figure 3.g Display Dimensions

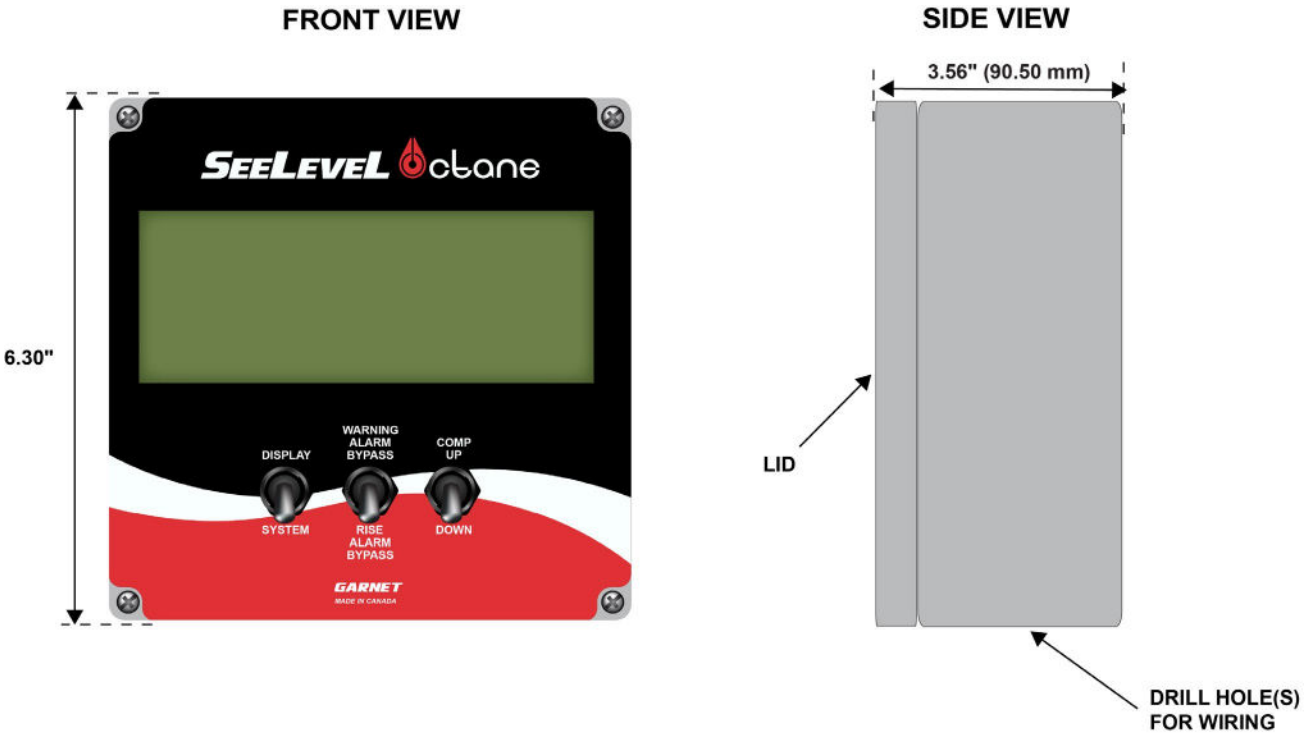


Figure 3.h Display Assembly

3.4 Air Line and Drain Fitting Installation

3.4.1 Connecting the Air Line Hose

1. For a 1 to 3 compartment system, at the lowest point in the air line, insert a T-fitting with approximately two feet of 1/4" air line hanging down to create a drain/vent for any moisture that may enter or build-up in the system.
2. For a 4 to 6 compartment system, install the air line hoses into the display and junction box.
3. For 4 to 6 compartment system, mount all air line hoses above the centerline of the junction box to ensure adequate drainage.

1-3 COMPARTMENT INSTALLATION CONFIGURATION

4-6 COMPARTMENT INSTALLATION CONFIGURATION

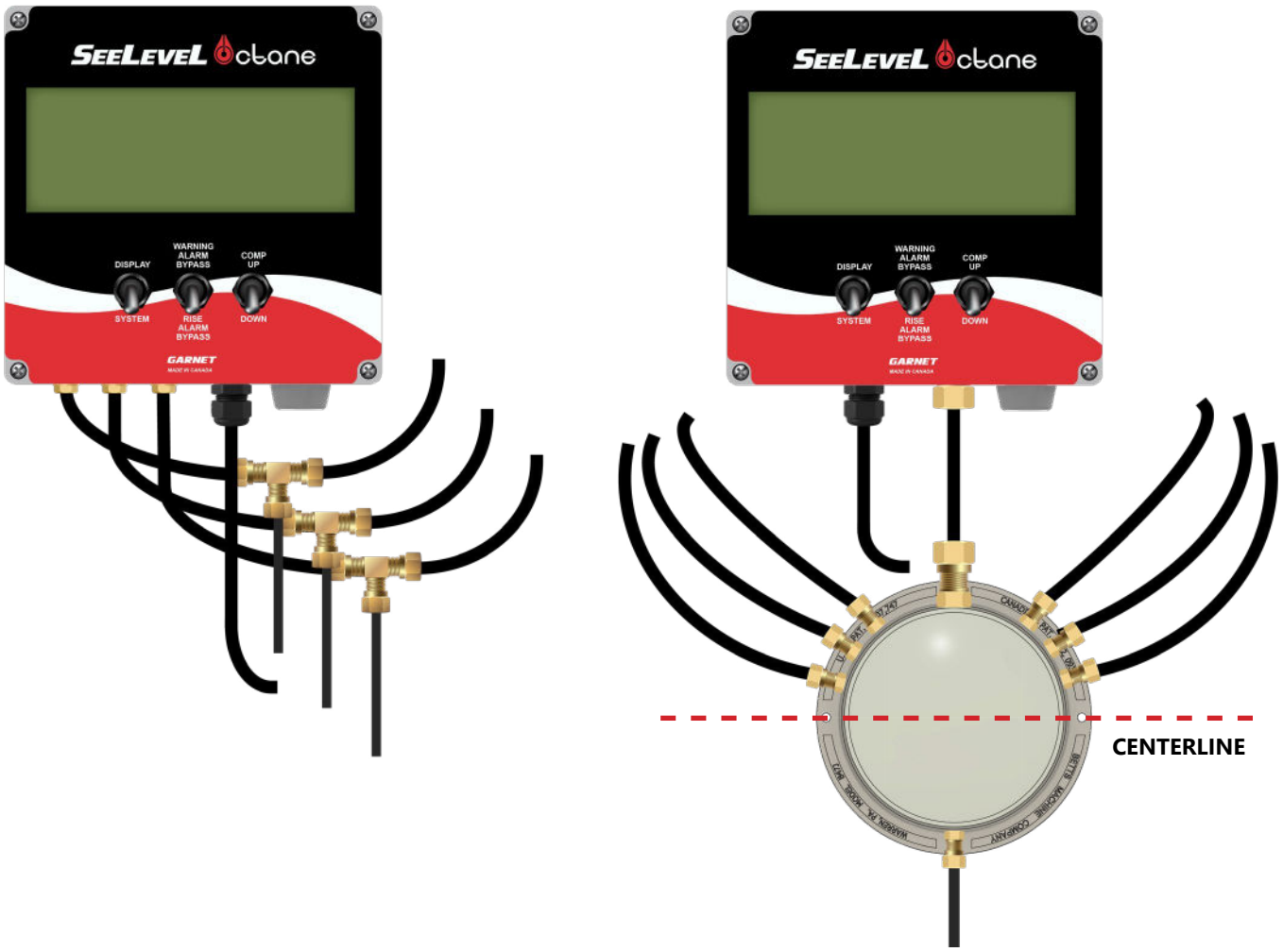


Figure 3.i Air Line Hose Options

3.4.2 Enclosure Air Line Drain Installation

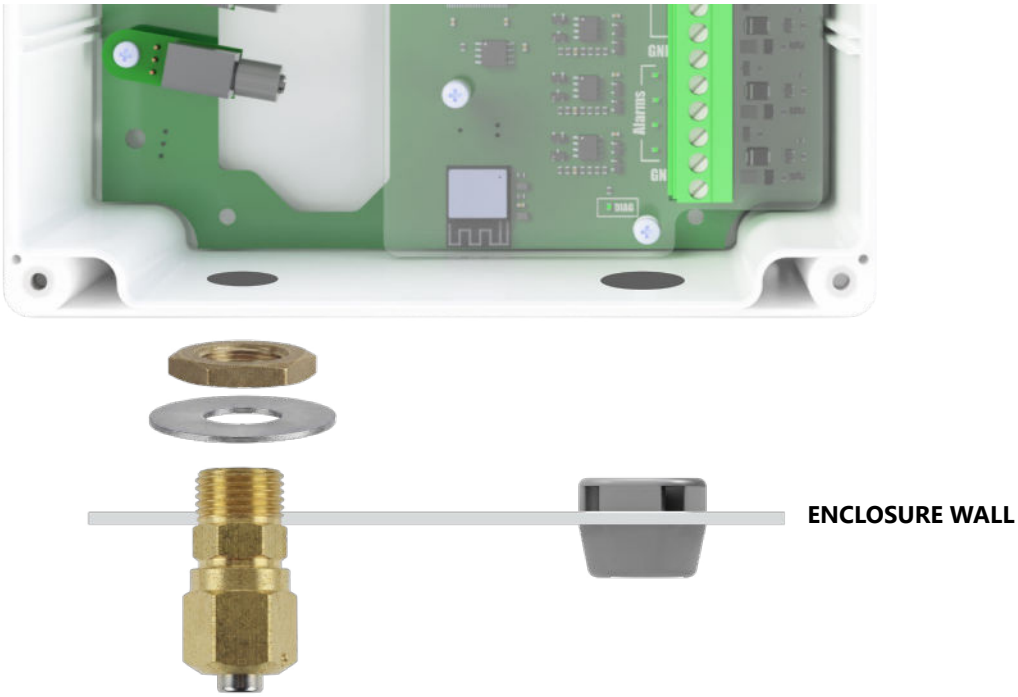
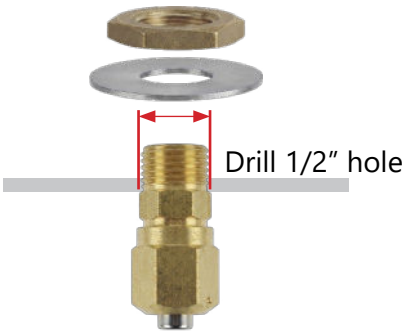
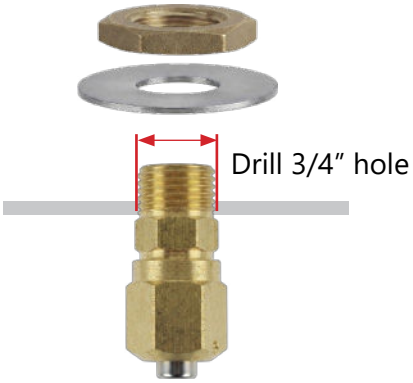


Figure 3.j Air Line Fitting and Enclosure Drain Installation Details

Enclosure 1/4" Air Line Fitting Installation



Enclosure 1/2" Air Line Fitting Installation



Enclosure Drain Installation

3.4.3 Installing the Junction Box Fittings

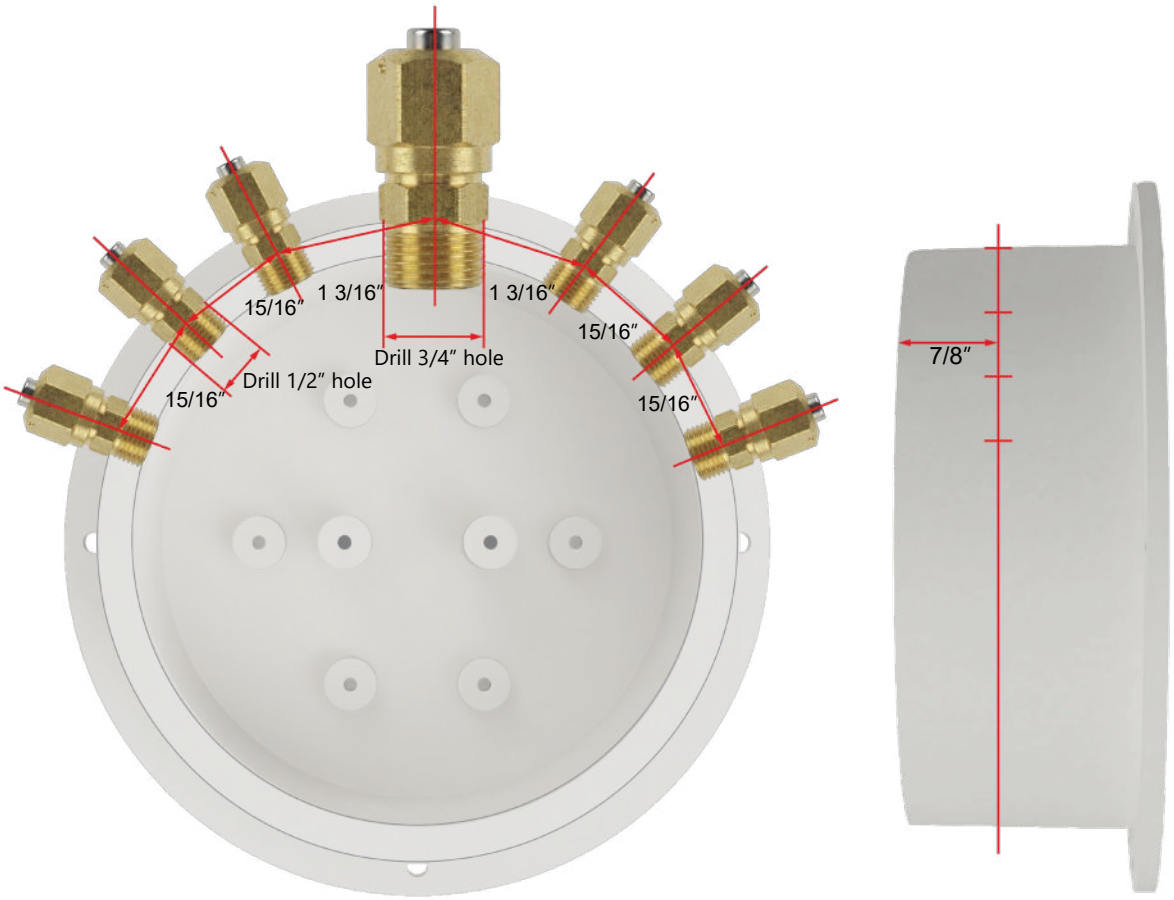


Figure 3.k Junction Box 1/2″ and 1/4″ Air Line Fitting Installation for the Optic Fibers

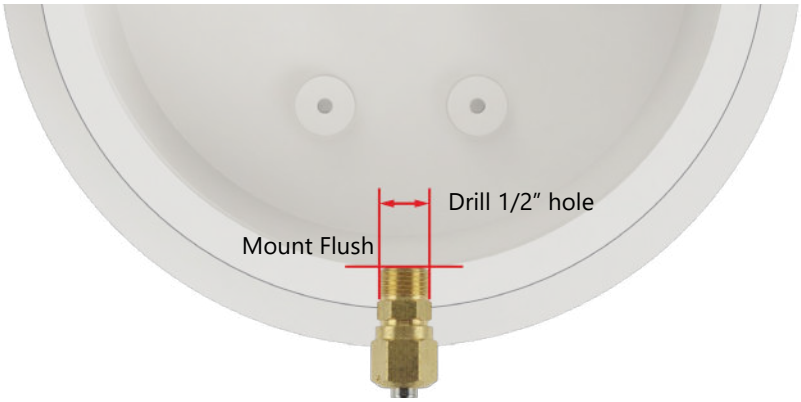


Figure 3.l Junction Box 1/4” Air Line Fitting Installation for the Drain

3.5 Install Fiber Optic Cable

3.5.1 Preparation of Fiber Optic Cable

1. Use a piece of 1/4" air line hose to protect the fiber. With the air line hose straight, insert and feed the fiber optic cable through the hose, leaving 12" extra at each end *(See Figure 3.m)*

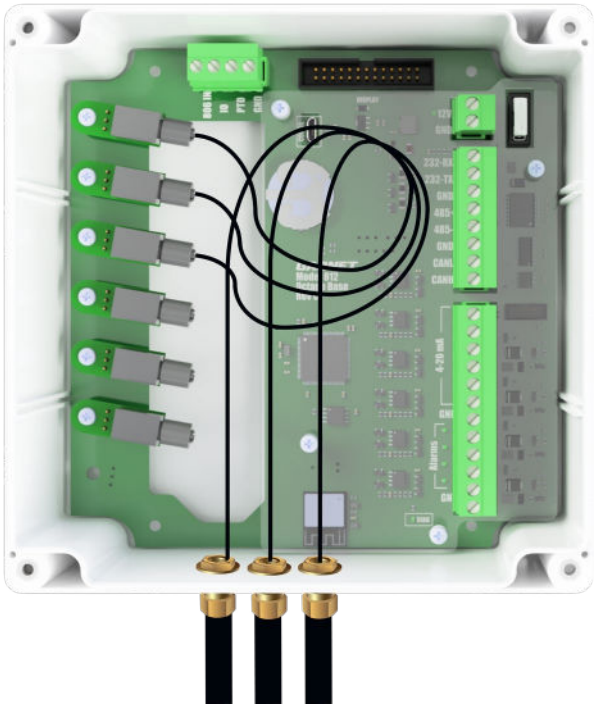
   ⚠ **CAUTION**: Maintain the largest possible radius within the enclosure. Bends should never exceed 90°; sharp bends or kinks will reduce the amount of signal passed.

Figure 3.m Fiber Optic Cable Inserted Through Air Line Hose

3.5.2 Connect the Fiber to the Display Enclosure

1. Insert the air line and fiber into the fitting.
2. Position the air line hose so it abuts the fitting.
3. Tighten the fitting.
4. Pull the fiber through the fitting.
5. Continue for all air line hoses and fibers. *(See Figure 3.n)*

1-3 COMPARTMENT AIR LINE CONFIGURATION



4-6 COMPARTMENT AIR LINE CONFIGURATION

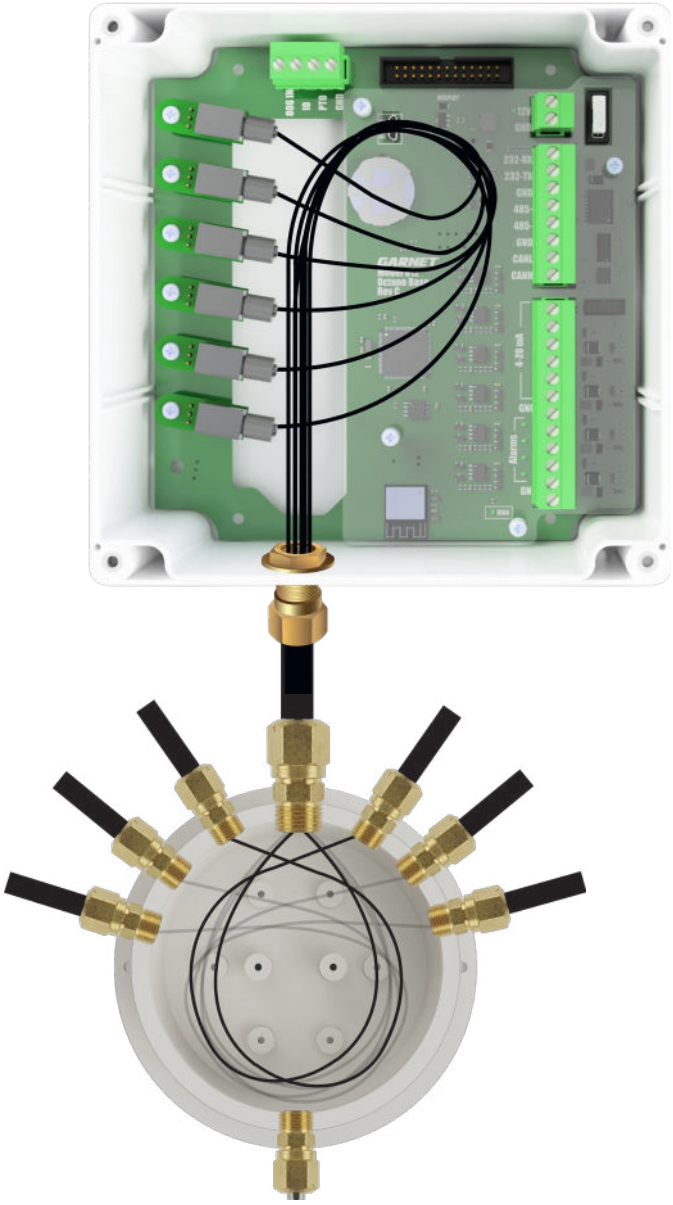


Figure 3.n Fiber Optic Cable connected to Receivers

3.5.3 Plug Fiber to the Receiver Connector

1. Loosen the collet on the optic receiver.
2. Ensure the end of the fiber is clean. Carefully insert the fiber into the optic receiver, approximately 5/8″ or 16mm.
3. Securely tighten the collet. *(See Figure 3.o to Figure 3.p)*

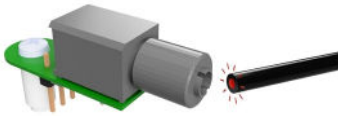


Figure 3.o Loosen the Collet

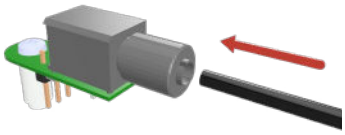


Figure 3.p Insert the Optic Fiber

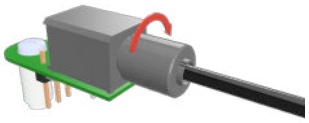


Figure 3.q Tighten the Collet

3.5.4 Install Air Line on the Tank

1. Route the 1/4″ air line from the sender bar head to the display. Avoid bends tighter than 90° and do not kink. *(See Figure 3.r)* Air line can be routed either to the side of the tank to the display *(Option 1)*, or to the back of the tank, down and then to the display *(Option 2)*.
2. Secure the air line to the tank truck or trailer.

Figure 3.r Air Line Routed from Sender Bar to Gauge

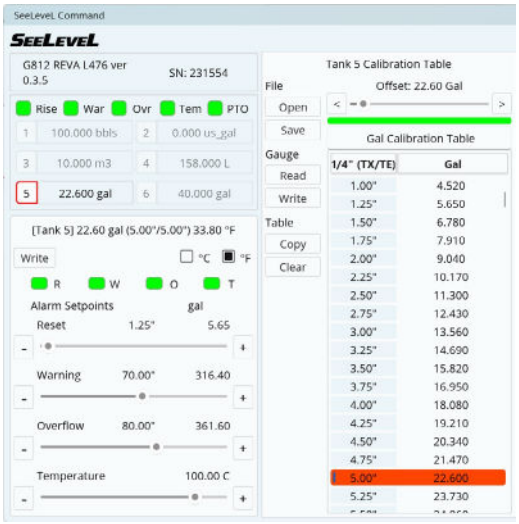
3.5.5 Connect Fiber Optic Cable to Sender Bar Head

1. Use the supplied 45°, ¼" brass fitting.
2. Remove the lid from the sender bar head enclosure
3. Insert the fiber inside the head of the bar. (Coil around inside the head once)
4. Loosen the collet (lefty-loosy, righty-tighty) on the optic transmitter.
5. Ensure the end of the fiber is clean.
6. Carefully insert the fiber into the optic transmitter, approximately 5/8" or 16mm.
7. Securely tighten the collet. *(See Figure 3.s)*

Figure 3.s *Fiber Connected into Optic Transmitter in Sender Bar Head*

3.5.6 Verification of Bar Operation

1. Connect 12VDC power and ground to the Octane display.
2. Turn on the power to the Octane display.
3. Move the float on the bar up and down to confirm proper operation. Check that the Command app or Octane screen displays a corresponding change in the reported level, which verifies the connection between the gauge and the sender. *(See Figure 3.t)*
4. Check all compartments.



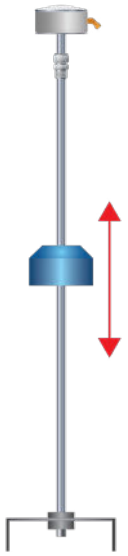


Figure 3.t ***Verifying Bar Operation***

3.6 Connections

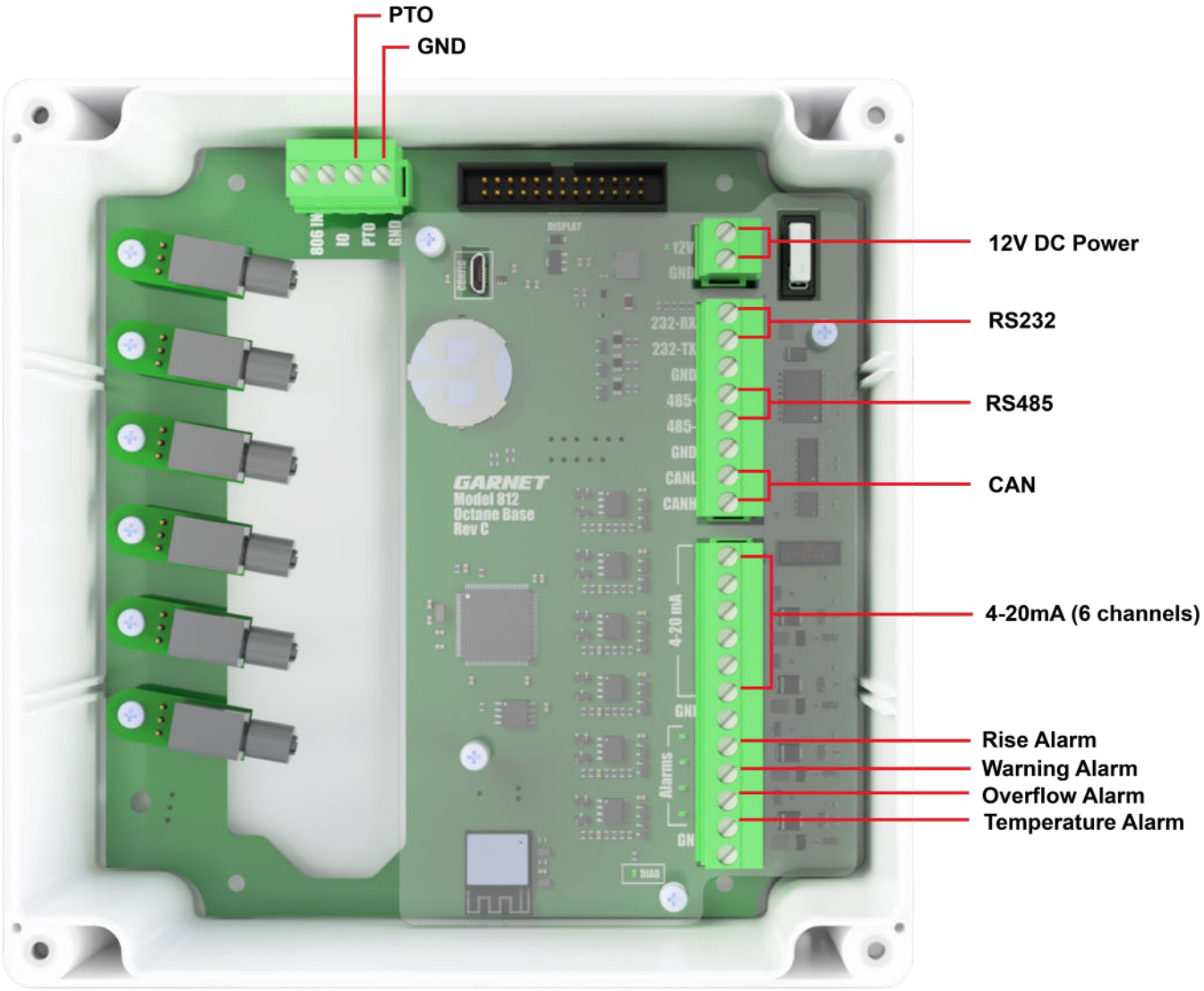


Figure 3.u Connections Diagram

> ⚠ **NOTE:** The Octane is not pre-terminated for CAN or RS485 communication. Proper resistances should be added to the bus at the installer's discretion.

3.7 Wiring Diagrams

3.7.1 Alarm Wiring

The SeeLeveL Octane™ 812 has 4 different hardware alarms for Warning, Overflow, Temperature, and Rise. Each compartment can have its own unique alarm threshold, but they all share one physical output for each alarm type. The example wiring for these alarms is shown below:

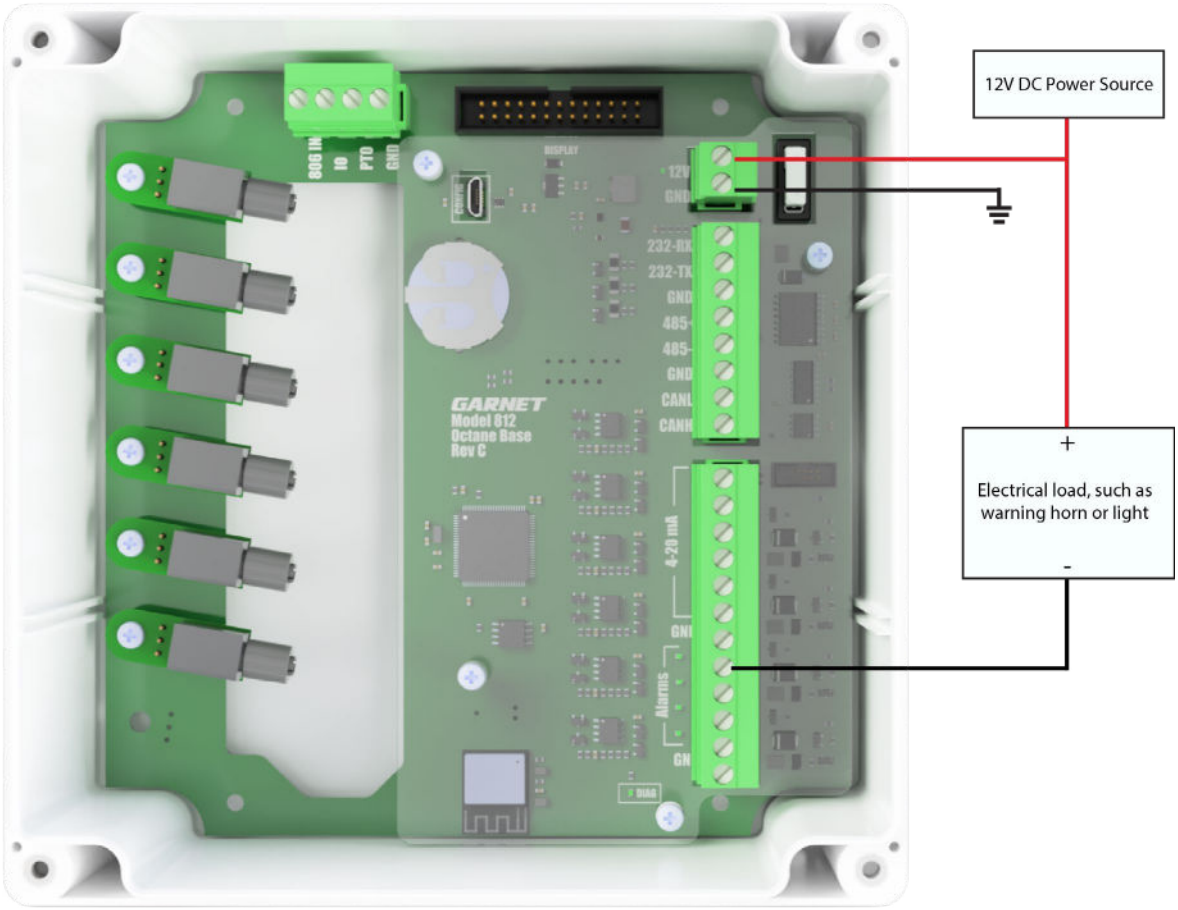


Figure 3.v Example Alarm Wiring Diagram

When an alarm threshold is triggered, the associated hardware alarm output will engage by connecting internally to ground, thereby activating the external circuit.

In the case of Temperature, Warning, and Overflow alarms, a user-programmed threshold must be crossed in order to trigger the alarm output. When an alarm is triggered, the hardware connects the alarm circuit to ground, allowing an external circuit to be triggered, such as an LED, a buzzer, or an interface with a SCADA or PLC system.

In the case of the Rise alarm, it is only triggered when a level other than the active view is increased. This is a safety feature during load operations. To enable this feature, the PTO sense input must be active (pulled externally to GND). Refer to *(See section 2.3)* for more information on the PTO sense input.

The maximum current for each alarm circuit is 750mA before circuit protection is engaged. When the circuit protection is tripped, it will automatically reset itself after a cooling time. It is not recommended to sink more than 500mA continuously per alarm circuit. If more than 500mA is required, an external relay must be used.

ALARM FUNCTIONS

When an alarm is active, the corresponding LED on the circuit board will be solid green to indicate that it is functioning.

Alarm Pin	FUNCTION
1	Rise Alarm
2	Warning Alarm
3	Overflow Alarm
4	Temperature Alarm

3.7.2 4-20mA Wiring

The SeeLeveL Octane™ 812 contains 6 individual 4-20mA signals, one corresponding to each compartment. Each interface functions as a self-powered transmitter, as shown below. With a valid calibration programmed, 4mA corresponds to an empty compartment, and 20mA corresponds to a full compartment. The SeeLeveL Octane™ 812 adjusts between these values according to the volumetric calibration.

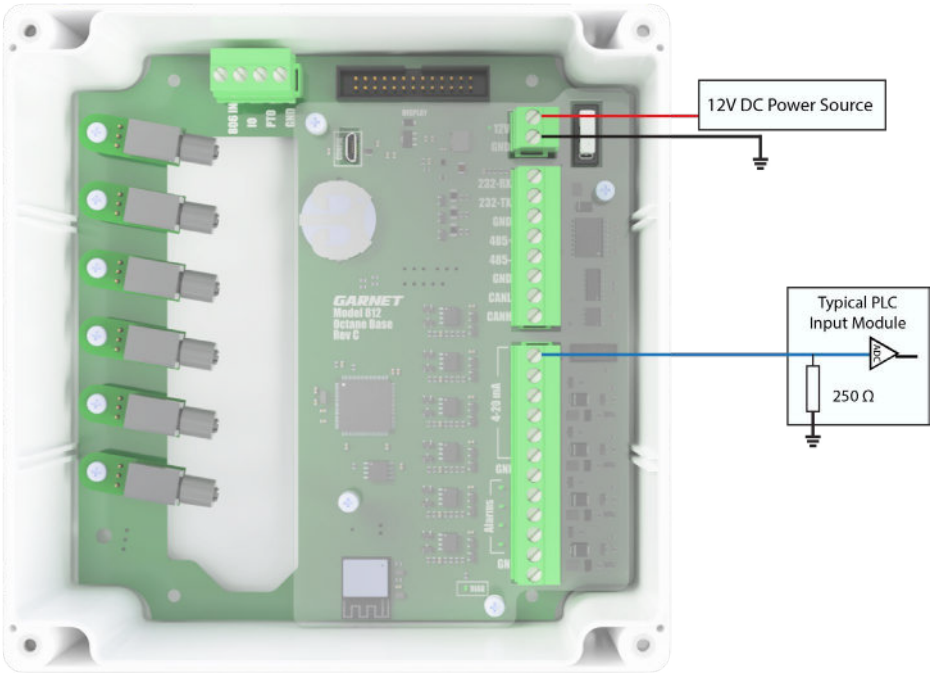


Figure 3.w Example 4-20mA Wiring Diagram

3.7.3 PTO Sense Input

The SeeLeveL Octane™ 812 has a dedicated connection for PTO (Power Take Off) sensing. This is used to tell the SeeLeveL Octane™ 812 when the PTO is active or inactive, which affects the logic of the Rise alarm and the frequency of the liquid level logging. To enable the Rise alarm (see Section 2.3), the PTO signal must be active. This means that the PTO sense input must be pulled to ground. When this occurs, the SeeLeveL Octane™ 812 will enable its Rise alarm function. The Warning, Overflow, and Temperature alarms are **not** affected by the PTO sense input.

4.1 Initial connection

Configuration and calibrating the SeeLeveL Octane™ 812 is done exclusively through the **SeeLeveL Command app**, available on Android, iOS, and Windows. After opening the app, you are presented with a list of nearby devices that are available for connection. When your SeeLeveL Octane™ 812 is powered up, you should see it listed as shown below through its Bluetooth signal. If there are several devices nearby, you can press the "**Display**" toggle switch to highlight your device in blue on the list. When you tap your device, you'll see some basic information at a glance.

Alternatively, you can connect through its internal micro-USB connection on Windows and Android devices. Use this connection when a Bluetooth signal is not available. The recommended connection method is always Bluetooth when it is available.

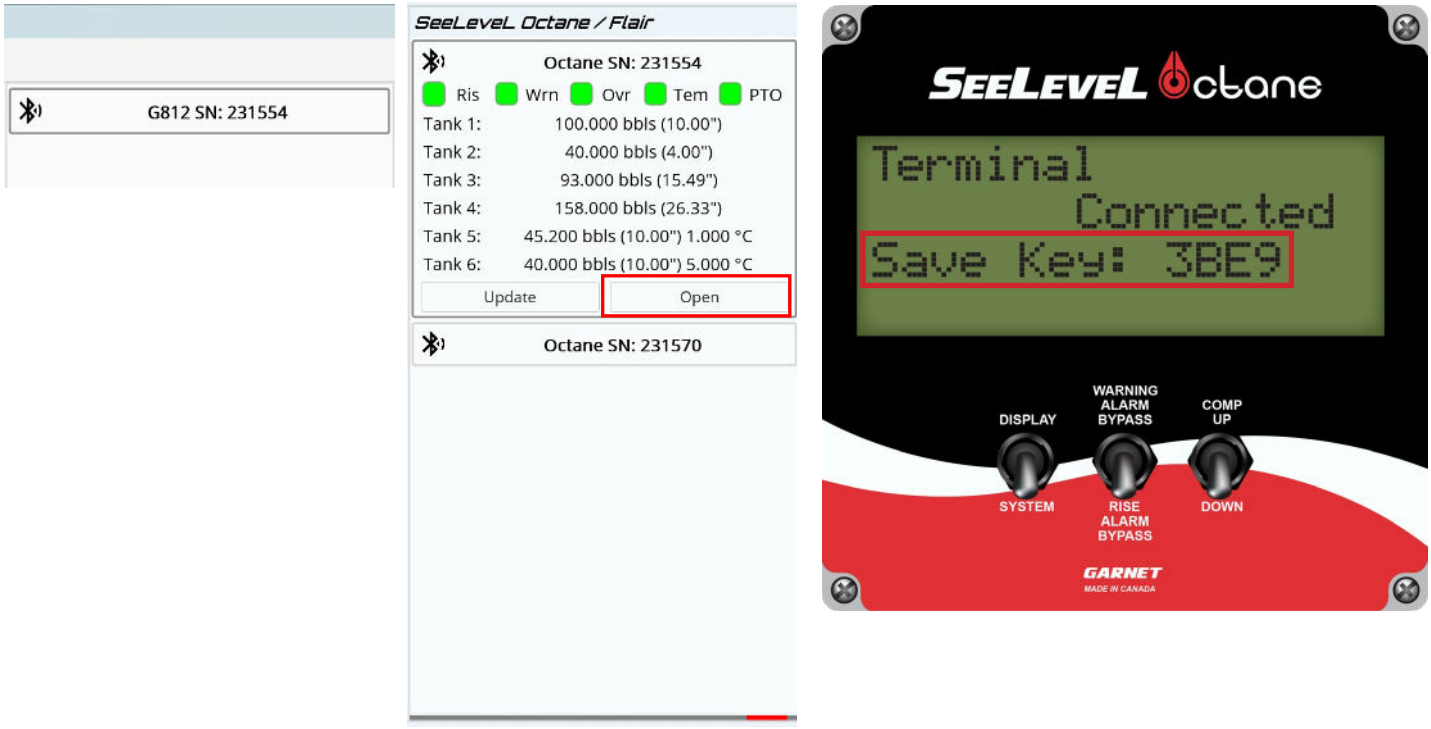


Figure 4.a Initial Connection Screen and Save Key

Tap "**Open**" to establish a connection to your SeeLeveL Octane™ 812. Once you are connected, you'll see a **save key** appear on the screen of the display. You will need this later to write anything to the SeeLeveL Octane™ 812.

4.2 Calibrating and Setting the Offset

For the display to show accurate liquid volume readings, it must be calibrated for your specific compartment. The level that the float rests at when the compartment is empty, the **offset**, is also crucial in allowing the display to translate between your compartment's unique strapping chart and the location of the float on the Sender bar.

The first step in setting up the SeeLeveL Octane™ 812 is entering a calibration and offset for each compartment, *(See Figure 4.b)* Select the compartment you'd like to set up from the list at the top left of the screen. You can read an existing calibration table from the display by pressing the "**Read**" button. The table shows incremental inch values on the left, representing the location of the float along the bar, and the corresponding liquid volume on the right.

The easiest way to load a calibration is to have a calibration file for your tank and open it with the "**Open**" button. Once this is done, the table is filled with depth and volume values, the volume unit and the bar type.

If you don't have a file, you can copy/paste columns of strapping chart values from Excel or any other spreadsheet program. Make sure to select the bar type first. This sets the inch value for each row of the table. Then, select the volume units. Bar type and volume unit are selected by pressing the buttons at the top of each column in the table. Once you have the table filled with the correct values, you can save this for reuse later.

If multiple compartments have the same calibration and bar type, you can use the "**Copy**" button to copy the entire calibration, then paste it into another compartment.

Figure 4.b Calibration Screen

The **offset** must be selected accurately for the volume reading to be correct. The **strapping** chart for your tank indicates a volume reading for every inch value from the **bottom of the compartment** to the top. The **sender** bar provides an inch value from the **bottom of the bar** to the top. Since the sender bar is cut to fit, and the float rests a few inches from the bottom of an empty compartment, an offset is necessary to compensate for this **difference**.

Record the **Save Key** that's on the screen of the display. **Enter** the Save Key in the top right corner of the Command app to allow calibration and offset value changes to be written to the display.

To set the offset, the sender bar must be installed, connected to the display, and transmitting. With an **empty** compartment, measure the height from the bottom of the compartment to the middle of the float. Then select this height value on the chart (see the highlighted **red row**) and click "**Write**" to send it to the display.

The offset has now been written, and the display shows accurate depth and volume measurements.

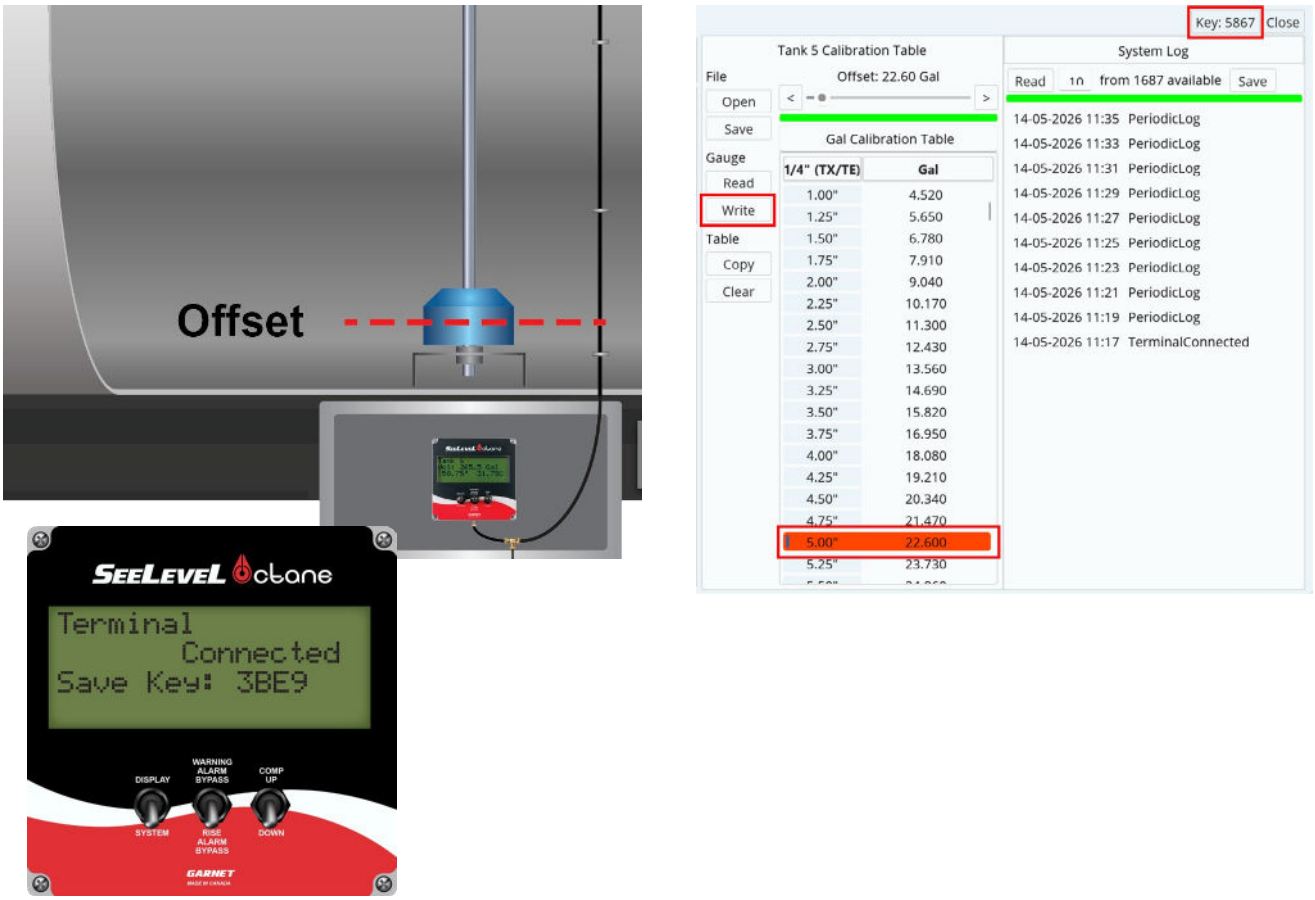


Figure 4.c Calibrating Offset

When writing a new or adjusted calibration to the display, the sender must be connected and transmitting. When writing to the display, the **selected row** (highlighted **red**) in the calibration table is set to the currently transmitted value from the sender bar.

That is why the offset **must** be set when the tank is **empty**.

4.3 Other Configuration

Other settings, such as alarm points and temperature units, are available from the settings area of the app's screen. They are easily adjusted with the sliders as shown in *Figure 4.d.*

When all settings are complete, ensure the **Save Key** is entered at the top right of the screen, and then press "**Write**".

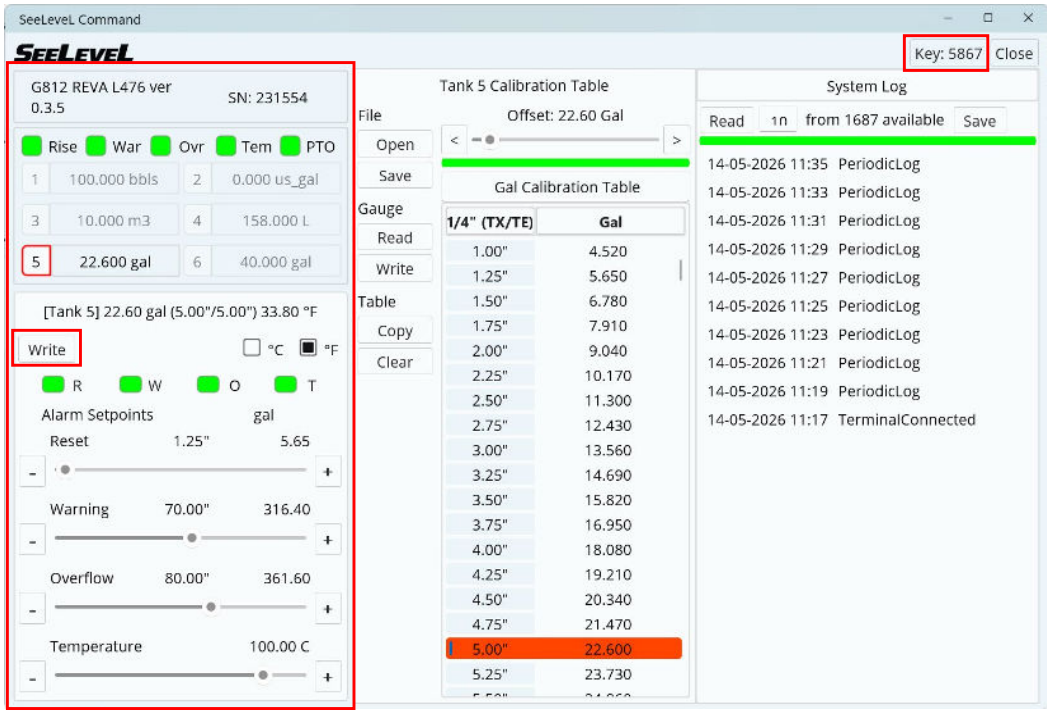


Figure 4.d Configuration Screen

4.4 Reading logs

The SeeLeveL Octane™ 812 stores a snapshot of liquid volumes and alarm data periodically, for troubleshooting and diagnostic use. A reading is automatically stored every hour or when any alarm or PTO status changes. When the PTO is active, logging is set to occur every two minutes to capture load and unload operations.

To retrieve the logs, see the Log area of the app's screen. The display stores up to 10,000 readings before it begins to overwrite the oldest reading. You can read all available events from memory, or you can **read** a specific number by entering a number in the box. For example, if you enter 10, it will only retrieve the 10 most recent logs. This can help save time, since retrieving 10,000 events over Bluetooth can take several minutes and may be unnecessary.

Once the log files have been retrieved from the display, tap the **Save** button to rename and save the log to a local .csv file

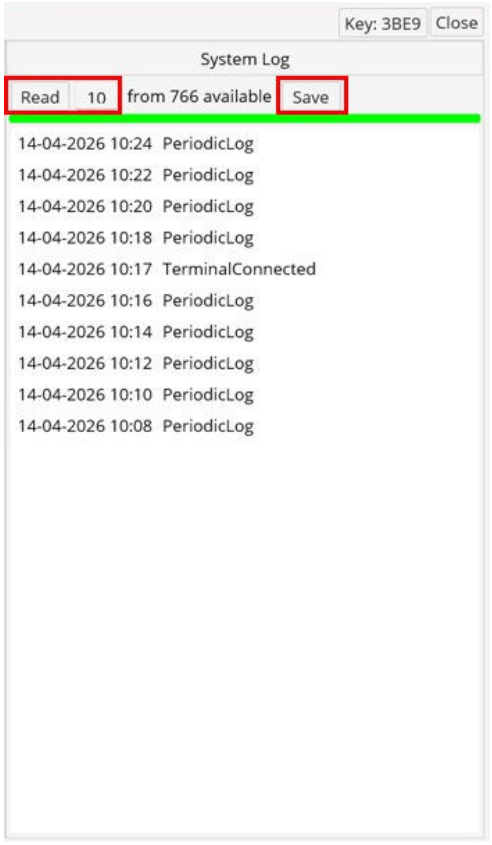


Figure 4.e Reading Logs Screen

5.0 COMMUNICATIONS

5.1 Overview

The SeeLeveL Octane™ 812 provides seamless support for communications with external devices and systems. The communications supported are RS-232, RS-285, CAN and 4-20mA signaling.

5.2 RS-232 Communication

RS-232 is a long-standing, standard protocol for serial communication between computers and external devices. It supports full-duplex communication, typically over distances up to 50 feet.

5.3 RS-485 Communication

RS-485 is a robust, serial communication standard for long distances up to 1200 m, and high speed up to 10 Mbps, in noise-prone industrial environments.

5.4 CAN bus Communication

A Controller Area Network (CAN bus) is a robust, decentralized vehicle bus standard.

5.5 4-20mA Signaling

A 4-20 mA current loop is the standard industrial analog signal for transmitting sensor data (pressure, temperature, flow) over long distances. It is highly reliable due to strong noise immunity. Refer to *(See Figure 3.w)* for more information.

6.0 MAINTENANCE AND SERVICE INFORMATION

6.1 Cleaning Display

Never spray directly at the display with a pressure washer. Cover the display if the tank is being cleaned with water pressure.

7.0 TROUBLESHOOTING GUIDE

7.1 FAQs

7.1.1 Why does my display read "NoL"?

NoL = short for No Light.

Either the Sender bar is no longer transmitting a signal, the optical fiber has come loose on one or both ends, there is a break in the optical fiber or the fiber run is too long.

The display, sender bar or optical fiber is defective.

With the fiber connected on the Sender side, remove it from the Octane side and check for a flashing red light in the fiber.

The maximum length of fiber run depends on the quality of the optical fiber, and the number of sharp turns. Typically, with both ends of the fiber well secured, a run of 300' or 91m will be fine

7.1.2 Why does my display read "BL"?

BL = bad Light condition. It means the display is not working properly or that it is not getting a strong signal from the bar.

Remove the fiber from the display. If the display continues reading BL, then the display needs to be replaced.

If it goes to NoL or Sun, then start from one end and cut a ¼" from each end of the fiber to eliminate dirty or damaged fiber ends.

Try blowing out the opto with some super duster or filtered shop air to see if it solves the problem.

7.1.3 Why does my display read "Sun"?

Sun = Sun. This message could mean the display is not working properly or that the fiber optic receiver is getting too much light.

Cut a ¼" from the end of the fiber that is plugged into the display.

If the display starts working, then the problem is solved. If not, then the display could be the issue and needs to be replaced.

Can also be caused by constant light from the bar, or the fiber is **cut** allowing actual sunlight into the fiber line.

7.1.4 How long can the fiber run be between the Octane and the Sender bar?

This depends on the quality of the optical fiber, the number of bends in the routing of the fiber, and the quality of the cut on each end. Typically, you can expect a run of 300' or 91m to be possible.

7.1.5 Why is there a "Wrong Bar" instead of volume units? A " Wrong Bar" indicates that a valid optical signal is being received by the Octane, but the type of bar being received does not match the bar type in the Octane's programmed calibration. For example, if you selected 810-X as the bar type when you loaded the calibration file but are receiving an input from an 810-TX bar, you will see a "Vol: Wrong Bar." Note: this **will** result in incorrect volume readings!	
7.1.6 Why is the Sender Bar's temperature not displayed on the screen? Only 810-TX Sender bars are equipped with temperature sensors. A temperature reading will appear alongside the liquid volume only with the 810-TX.	
7.1.7 Why is the screen blank? If the Octane is receiving the correct voltage between the 12V and GND pins, then the red LED next to the 12V label on the circuit board should be lit If not, make sure the connector is fully seated and check the 10A replaceable fuse next to the connector If it is still not powering up, there may be an internal problem with the Octane.	
7.1.8 Why does the reading jump around when the compartment is being filled? This could be an issue with the calibration chart that was programmed into the display. If the display was reading correctly and this is a new issue, then it is possibly a bar issue. Contact Service for information.	
7.1.9 Why does my display seem to be stuck on a number? Water damage can cause the display to get stuck and not show a correct reading. It could also be a damaged bar sending bad data. Damage to the head or endcap and leaking fluid into the circuit are possible causes.	
7.1.10 How to contact Service?	Call 1-800-617-7384 or email us at support@garnetinstruments.com

8.0 SYSTEM SPECIFICATIONS

DISPLAY	
Material	Weatherproof Polycarbonate
Size	Enclosure size: 160 mm wide x 160 mm high x 89 mm deep (6.3" wide x 6.3" high x 3.5" deep)
Display type	LCD
Display size	12.7 mm (½") high digits
Power	10 VDC to 16 VDC, typical current consumption is less than 350 mA.
Operating temperature	-20°C to +70°C (-4°F to +158°F) ambient. Operation will continue in -40°C to 70°C (-40°F to 158°F), but the LCD may not be visible. Internal features (logging, digital outputs, and *Bluetooth*, continue to operate)
Fuse rating	10A input power automotive fuse protection
Alarm output	Warning, Overflow, Temperature, and Rise alarms. Alarm outputs, maximum 500 mA steady-state current, up to 14 VDC.
Communication connections	CAN, 4-20mA, RS485, and RS232

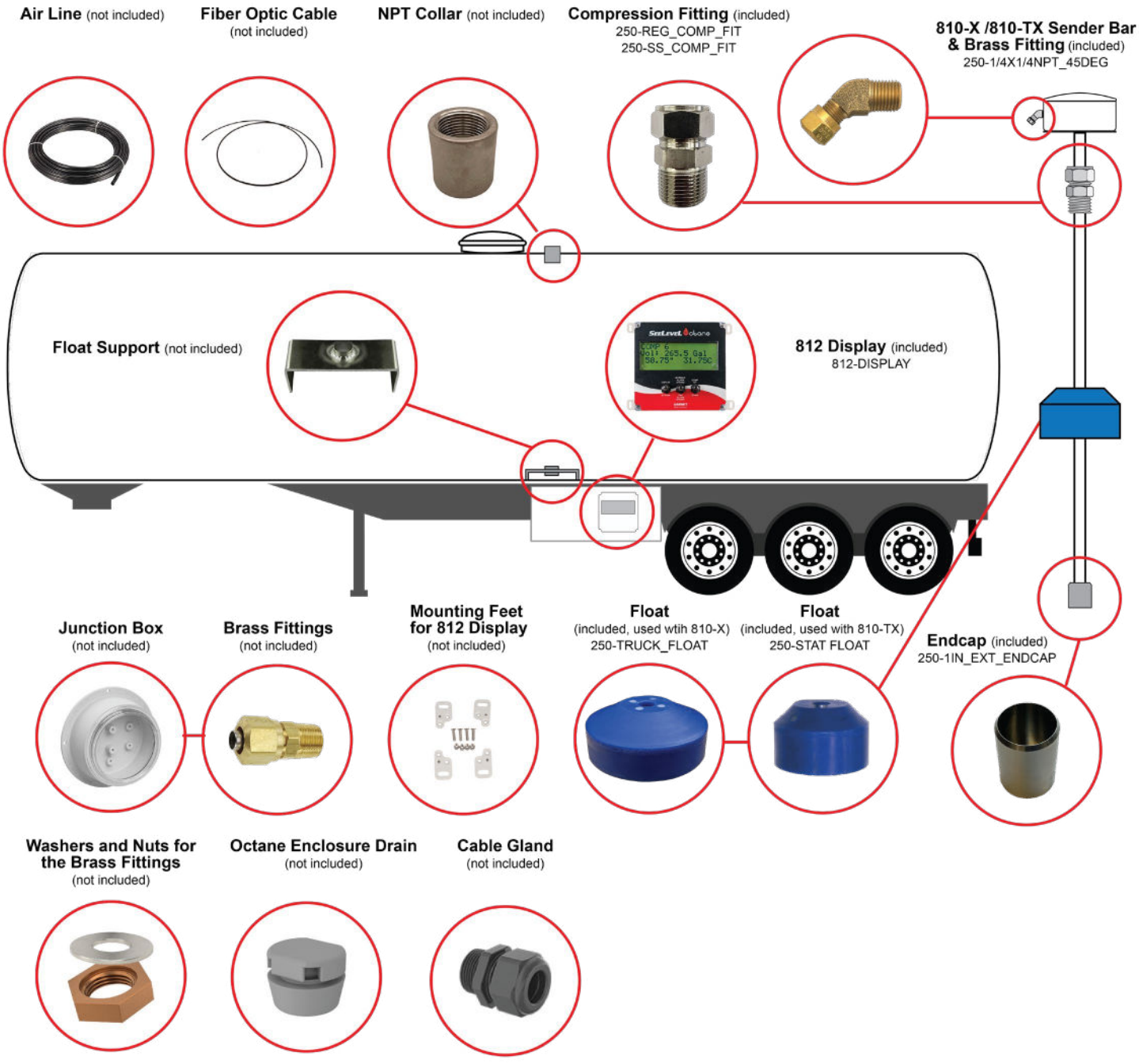
SENDER BARS	810-X	810-TX	810-HX
Resolution	1/3" (8.47 mm)	1/4" (6.35 mm)	1/10" (2.54 mm)
Accuracy	±5 mm (±0.2")	±3.3 mm (±0.13")	±2.0 mm (±0.08")
Sender Bar	Bar: 316 stainless steel seamless tube, Enclosure material: PBT plastic, lid is polycarbonate, Enclosure size: 152 mm (6") diameter, 67 mm (2 5/8") deep, Fitting: 25 mm (1") NPT male compression fitting.		
Float	Material: Medium density polyethylene.		
	Size: Cylindrical, 216 mm (8 1/2") in diameter, 89 mm (3 1/2") high.	Size: Cylindrical, 177.8 mm (7") in diameter, 101.6 mm (4") high.	Size: Cylindrical, 123.8 mm (4 7/8") in diameter, 101.6 mm (4") high.
Maximum compartment height	Compartment height up to 221 cm (87")	Compartment height up to 221 cm (87")	Compartment height up to 119 cm (47")
Battery power	Powered by a field replaceable lithium battery module with a lifetime of approx. 10 years	Powered by a field replaceable lithium battery module with a lifetime of approx. 10 years	Powered by a field replaceable lithium battery module with a lifetime of approx. 10 years
Product temperature	-40°C to +90°C (-40°F to +194°F)		

COMPLIANCE & CERTIFICATIONS	
CAN ICES:	CAN ICES-001(A)/NMB-001(A)
FCC:	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Contains FCC ID: 2AC7Z-ESPC3MINI1 Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
PROP65	This product can expose you to chemicals including Nickel and Lead, which are known to the State of California to cause cancer, and lead which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

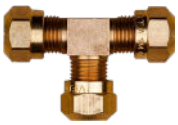
8.1 Parts List for Installation

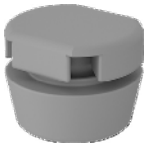
The following diagram describes all parts that may be required for the SeeLevel Octane 812 installation. Parts included in the kit are indicated by the Garnet part number.

See the table below for the required and optional parts that are not included in the kit.



The following parts are not included in the SeeLeveL Octane 812 installation kit.

Image	Description	Mfr part number	Supplier
	1/4" Air Line ¼" NPT	250-1/4IN_AIRLINE_BK	Garnet
		MIDC64BK	Haldex
	1/2" Air Line ¼" NPT	MIDC68BK	Haldex
	Fiber Optic Cable	250-OPTICAL_FIBRE	Garnet
	Float Support, Aluminum	250-ALUM_FLT_SUPP	Garnet
	Float Support, Stainless Steel	250-SS_FLT_SUPP	Garnet
	Float Support, Steel	250-STEEL_FLT_SUPP	Garnet
	1" NPT Collar, Aluminum	250-ALUM_COLLAR	Garnet
	1" NPT Collar, Stainless Steel	250-SS_COLLAR	Garnet
	1" NPT Collar, Steel	250-STEEL_COLLAR	Garnet
	¼" Air Line to ¼" NPT Brass Fitting	250-1/4X1/4_NPT	Garnet
		G7016-04-04	Green Line
	½" Air Line to 3/8" NPT Brass Fitting	G7016-06-08	Green Line
	¼" Air Line Tee Brass Fitting	G70T00-04-04	Green Line
	Washer, 18-8 Stainless Steel ASME Washer for 1/2" Screw Size, Narrow ASME Designation.	92217A540	McMaster-Carr
	Washer, 18-8 Stainless Steel Washer for 5/8" Screw Size, General Purpose, 0.688" ID, 1.500" OD.	92141A035	McMaster-Carr

	Low-Pressure Brass Threaded Pipe Fitting, Locknut, 1/4 NPSL Female.	4429K122	McMaster-Carr
	Low-Pressure Brass Threaded Pipe Fitting, Locknut, 3/8 NPSL Female.	4429K123	McMaster-Carr
	47 Series Junction Box	470026	Betts Inds.
	Mounting Feet Kit	1554FT	Hammond
	Enclosure Drain	7066K511	McMaster-Carr
	Cable Gland	As required for the wiring.	See McMaster-Carr for examples.

8.2 Safety Information

Any electrical connections or disconnects must be done in an ordinary location (i.e. not HazLoc)

8.3 Warnings and Cautions

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure. "Notes", "Cautions", and "Warnings" have been used to bring special matters to the immediate attention of the reader.

> **NOTE:** expands on information for any procedures.

> **CAUTION:** explains safety information that could cause damage to the product, including data loss.

> **WARNING:** explains dangers that might result in personal injury or death.

8.4 Notice of Limited Liability

The 812 provides real-time liquid level readings and discrete outputs at set alarm levels. When paired with an 810-TX bar the 812 also provides fluid temperature.

The 812 is designed to assist the operator during the loading and unloading, but does not absolve the operator from being responsible for the process.

The information provided in this manual describes typical installation and use cases. The end-user is responsible for ensuring the suitability of the equipment for their application.

Garnet Instruments shall not be liable for any ancillary, consequential, direct, or indirect damages arising from the use of their products. This includes, but is not limited to the loss of profits, business interruption, loss of product, product contamination, or damage to other related equipment or systems. By purchasing Garnet Instruments products or services, the customer acknowledges and accepts the terms outlined in this notice.

9.0 WARRANTY

To find warranty claim process information, refer to our support page on our website:

www.garnetinstruments.com/support/

DISCLAIMER OF WARRANTY ON HARDWARE

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 three years from the date of sale from Garnet or an Authorized Dealer. The warranty period will start from the date of purchase or installation. 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, 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 US Inc.
5360 Old Granbury Road
Granbury, TX 76049
USA
email: infous@garnetinstruments.com

APPENDIX A - SENDER BAR CUTTING INSTRUCTIONS

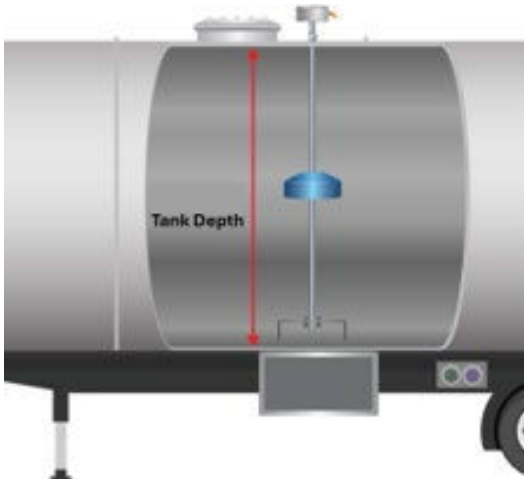
The following table describes sender bar cutting instructions and the test procedures using both the 817-USB Programmer and the SeeLeveL Octane™ 812 with the SeeLeveL Command app.

1.0 Overview

1. The tank height is measured to cut the sender bar to length.
2. The sender bar is cut to length and deburred.
3. The sender bar is tested, and normal operation is verified before installing the endcap.
4. Install the endcap and allow time for the retaining compound to cure.

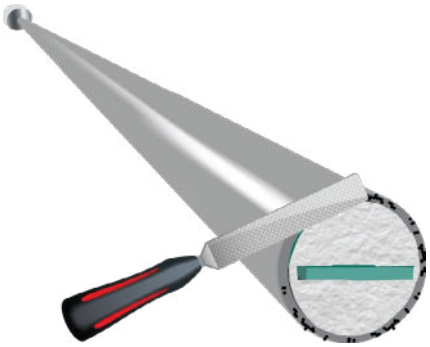
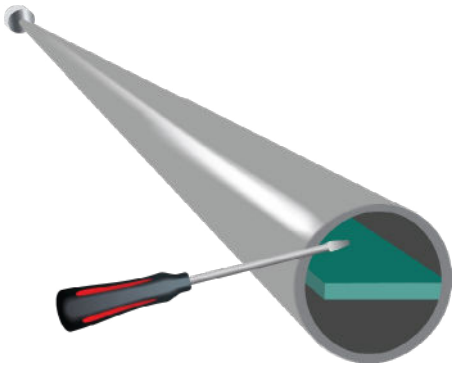
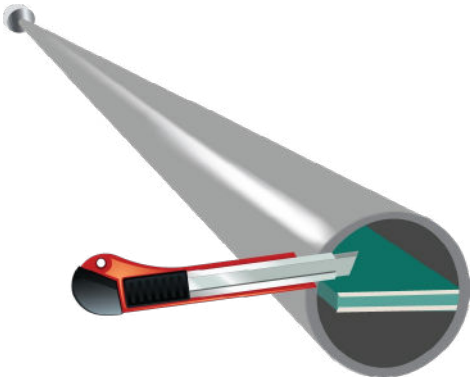
1.1 Measure the Tank Depth and Bar Length

1. Measure the depth of the compartment where the sender bar will be mounted.
2. Add 4" to that depth. This is the length from the underside of the head to the end of the bar.



1.2 Cut The Bar

1. Measure and mark the bar's length where it will be cut.
2. Slide the compression fitting onto the bar and up to the top. Secure the compression fitting to the bar with a piece of tape, such as electrical tape or duct tape.
3. Cut the bar where it is marked. Use a handsaw or a low-speed bandsaw to cut the bar. Do not use a mitre saw.

1.3 Deburr the Bar and Trim the Circuit Board 1. File the end of the bar to remove burrs from cutting. Smooth the end of the bar and remove jagged edges.	
2. Use a screwdriver or similar tool to remove ¼" of foam from the tube to expose the circuit board.	
3. Use a sharp knife to trim both edges of the circuit board to a 45-degree angle. This prevents burrs from short-circuiting the board.	

1.4 Bar Testing Using the 817-USB Programmer

1. Connect the optic fiber to the bar's head.
2. Connect the optic fiber from the bar's head into the 817-USB Programmer's black OPTO input connector.
3. Press the Shift and Bar-Test buttons to enter the Bar Test mode.

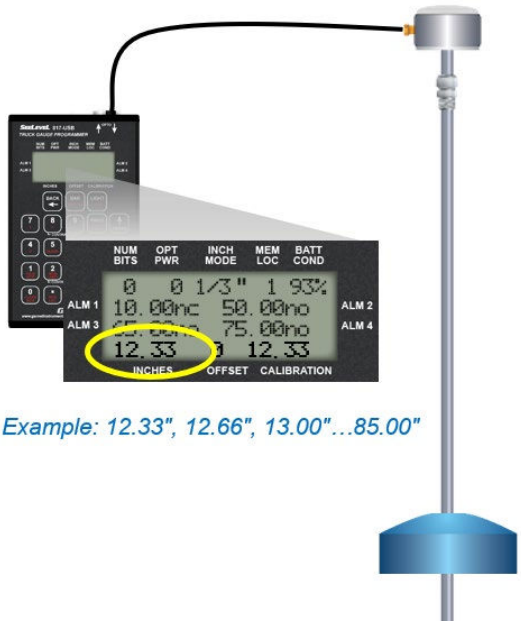
4. With the Opto pointing upward, place a magnet against both the head plate and the tube.
5. Move the float up and down the bar.
6. Correct operation is confirmed when:
   a. The float movement up and down the bar is matched by increasing and decreasing depth on the 817-USB Programmer.
   b. You see 8 to 10 consecutive depth increments without skipping values.

For example:

1/3" increments should display 0.33 / 0.66 / 1.00 / 1.33 …

1/4" increments should display 0.25 / 0.50 / 0.75 / 1.00 …

1/10" increments should display 0.10 / 0.20 / 0.30 / 0.40 …



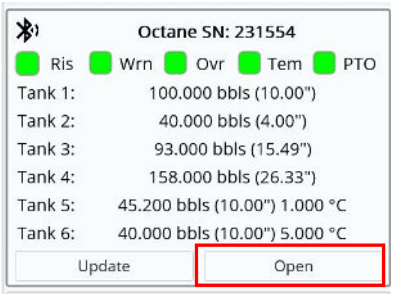
Example: 12.33", 12.66", 13.00"…85.00"

1.5 Bar Testing using the Octane Display and Command App

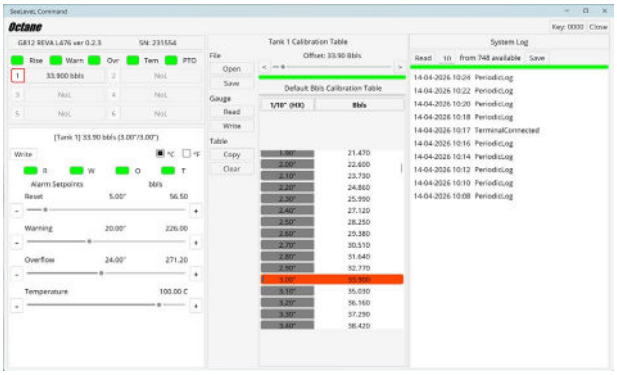
1. Connect the optic fiber from the head to the Octane 812 display.

2. Turn on the Octane 812 display and verify correct operation.
   a. The display turns on.
   b. All tanks with sender bars are displaying depth and volume. Note that calibration for the bar being tested has not been programmed yet.
   c. For the bar being tested, confirm that no error codes are displayed.
   d. For example, NoL, BL, Sun.
   e. Resolve all issues before proceeding.

3. Connect the Command app through Bluetooth to the Octane 812 display. Click the Open button to continue.

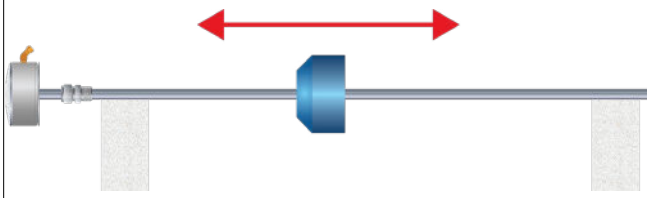


4. Set the bar type and calibrate the Octane 812 display for the connected Sender Bar.



5. Move the float from the bottom of the bar to the top to confirm proper operation.

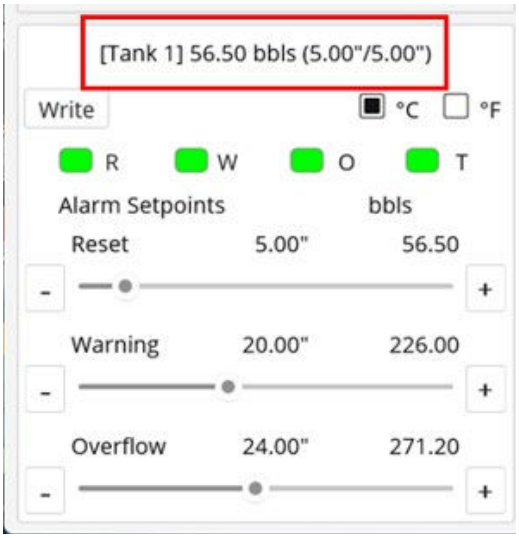
   The sender bar packaging may be used to support the bar for testing.



6. Correct operation is confirmed when:
   a. The float movement up and down the bar is matched by increasing and decreasing depth on the app.
   b. You see 8 to 10 consecutive depth increments without skipping values.

For example:

1/3" increments should display 0.33 / 0.66 / 1.00 / 1.33 ...
1/4" increments should display 0.25 / 0.50 / 0.75 / 1.00 ...
1/10" increments should display 0.10 / 0.20 / 0.30 / 0.40 ...

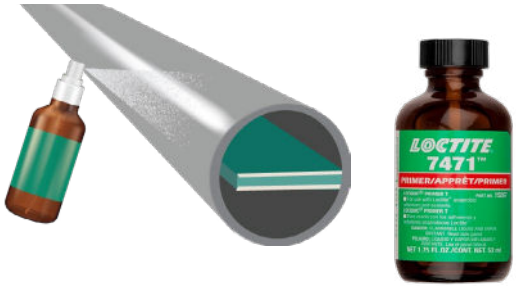


1.6 Endcap Installation

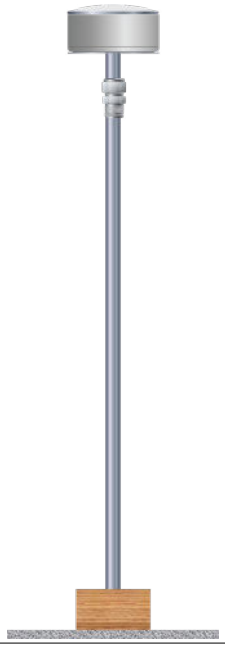
1. Clean the bar tube by applying Loctite 7070 Cleaner & Degreaser.
2. Alternatively, use Loctite 7471 Primer.
3. Wipe the tube with a cloth to clean the surface.

4. Prime the bar tube by spraying Loctite 7471 Primer onto the bar tube and inside the endcap.

   Wait 5 minutes to allow the primer time to dry before proceeding.



5. Apply Loctite 680 Retaining Compound to the bar tube and endcap as shown in the images.
   a. Apply a ring of compound around the bottom outside edge of the tube.
   b. Apply a ring of compound inside the top edge of the endcap.

6. Install the endcap by pressing it onto the bar's end. Push it on as far as possible while rotating both the bar and endcap in opposite directions. Rotating while pushing ensures an even coating of the 680 compound. If the endcap pushes back from the tube due to internal air pressure, continue to press it back on the bar while rotating the bar and endcap.	
7. Place the bar vertically and resting on the endcap until the Loctite 680 has fully cured. The temperature must be around 23 °C (73 °F) for the compound to cure properly. It is recommended to rest the endcap on a block of wood or other solid insulating material. Loctite 680 usually sets within 10 to 15 minutes, allowing initial handling once the bar and endcap have bonded. Cure time for optimal strength is typically 24 hours at the ideal temperature range of 15°C to 27°C (60 °F to 80 °F).	

APPENDIX B - CAN MAP

Octane CAN messages are sent every 200ms.

Messages are sent for each compartment 1 through 6, (TANK ID 0 – 5) with the basic and extended messages.

The CAN messages are sent automatically and without request.

RS-232 and RS-485 messages follow the same CAN packet structure and are requested when required.

CAN Message Sequence

Tank ID 0, Basic Message, 200ms pause
Tank ID 0, Extended Message, 200ms pause
Tank ID 1, Basic Message, 200ms pause
Tank ID 1, Extended Message, 200ms pause
…
Tank ID 5, Basic Message, 200ms pause
Tank ID 5, Extended Message, 200ms pause
Tank ID 0, Basic Message, 200ms pause
…

Basic Message

CAN ID	LEN
0x18FF874D	8

BYTE0								BYTE1							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Unused								Tank ID				Message ID = 00			

BYTE2								BYTE3							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
	Volume Percentage uint								Volume Units			Bar Mode			

BYTE4								BYTE5								BYTE6								BYTE7							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Volume IEEE 754 float bit numbers																															
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	23	22	21	20	19	18	17	16	31	30	29	28	27	26	25	24
IEEE 754 Floating Point Number Format																															
S	Exponent (8 bits)								Fraction (23 bits)																						
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Extended Message

CAN ID	LEN
0x18FF874D	8

BYTE0								BYTE1							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Unused								Tank ID				Message ID = 01			

BYTE2								BYTE3							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Unused				TA	OA	WA	RA	Unused					Level Mode	Temperature Unit	
Alarms: Temperature, Overflow, Warning, Rise															

BYTE4								BYTE5							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Temperature int															
LSB								MSB							

BYTE6								BYTE7							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Level uint															
LSB								MSB							

Basic Message	Extended Message
BYTE0	**BYTE0**
unused	unused
BYTE1	**BYTE1**
Bits 4 - 7: Tank ID	Bits 4 - 7: Tank ID
Bits 0 - 3: Message ID	Bits 0 - 3: Message ID
BYTE2	**BYTE2**
Bit 7: unused	Bits 4 – 7:unused
Bits 0 – 6: Volume Percentage	Bit 3: Temperature Alarm
	Bit 2: Overflow Alarm
BYTE3	Bit 1: Warning Alarm
Bit 7: unused	Bit 0: Rise Alarm
Bits 4 – 6: Volume Units	
Bits 0 – 3: Bar Mode	**BYTE3**
	Bits 3 – 7: unused
BYTE4 - BYTE7	Bits 1 – 2: Level Mode
Volume	Bit 0: Temperature Unit
	BYTE4 - BYTE5
	Temperature
	BYTE4 - BYTE5
	Level
Volume and Volume Percentage only valid for Bar Mode > Init	Temperature only valid for Bar Mode = TX or TE
	Level only valid for Bar Mode > Init

Bar Mode	**Temperature Units**
BootLoader = 0,	Celsius = 0
NoCal = 1,	Fahrenheit = 1
NoL = 2,	
Sun = 3,	**Level Mode (in)**
BL = 4,	Tenth = 0
Init = 5,	Sixth = 1
TX = 6,	Quarter = 2
X = 7,	Third = 3
HX = 8,	
TE = 9,	
Volume Units	
bbls = 0,	
us_gal = 1,	
m3 = 2,	
liters = 3,	
us_pints = 4,	
Gal = 5,	
pints = 6,	
custom = 7,	

RS-232 and RS-485 Messages

RS-232 and RS-485 use the same CAN data structure, but data is not sent unsolicited. It must be requested. The request begins with "@" and ends with the carriage return character "\r".

@20\r
Command to request the Basic Message for compartment 3 (Tank ID 2, 0-based index).

@31\r
Command to request the Extended Message for compartment 4 (Tank ID 3, 0-based index).

Example

@30\r
Command to request the Basic Message for compartment 4 (Tank ID 3).

Response format for compartment 4, Tank ID 3. The message structure is base-64 encoded from the third byte (@3, are not encoded). Responses are terminated with '\r' and is not part of the base-64 message.

Response message.
@3,ADBVOL/12EE=\r

ADBVOL/12EE Base-64 = 00 30 55 38 BF F5 D8 41 Base-16

BYTE0								**BYTE1**							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Unused								Tank ID				Message ID			
00								30							
								3				0			

BYTE2								**BYTE3**							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
	Volume Percentage uint								Volume Units			Bar Mode			
55								38							
	55								3			8			

BYTE4								**BYTE5**								**BYTE6**								**BYTE7**							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Volume IEEE 754 float bit numbers																															
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	23	22	21	20	19	18	17	16	31	30	29	28	27	26	25	24
BF								F5								D8								41							
IEEE 754 Floating Point Number Format																															
S	Exponent (8 bits)							Fraction (23 bits)																							
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0