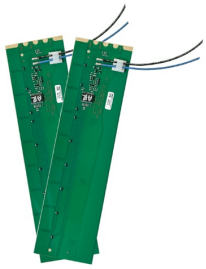
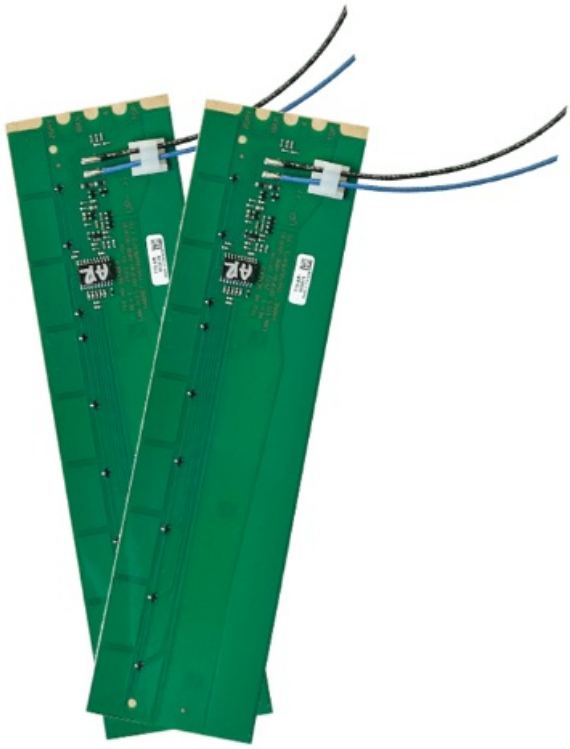


Garnet Instruments 710-JS SeeLeveL Holding Tank Monitor Instruction Manual

Contents

Garnet Instruments 710-JS SeeLeveL Holding Tank Monitor



Product Information

Specifications

- **Model**: 710-JS, 710-ES, 710-SS
- **Manufacturer**: Garnet Instruments Ltd.
- **Resolution**:
  - **710-JS:** 1/4
  - **710-ES**: 3/8
  - **710-SS**: 1/2
- **Compatible tanks:**
  - **710-JS:** 5 to 7.5 high tanks (not stackable)
  - **710-ES:** 5.5 to 14 high tanks (up to 26 with double-stacked senders)
  - **710-SS:** 7 to 18 high tanks (up to 34.5 with double-stacked senders)
- **Mounting**: Outside of holding tanks
- **Compatibility**: Plastic or polyethylene holding tanks with water-soluble fluids (not compatible with metal holding tanks)

Product Usage Instructions

Installation Information

The installation for the complete system consists of the following steps:

1. Mounting the display inside the RV
2. Cutting and mounting the senders to the sides of the tanks
3. Connecting the wiring
4. Programming the display

Note: Before installing the senders, the display should be installed first. Refer to the Display Installation Guide and User Manual for the model you've purchased for all installation and connection details. All documentation can be found in the Resource Library on our support page.

Tools and equipment required:

- Wire cutters/stripper
- Wire crimper
- Scissors or hole punch
- Acetone/rubbing alcohol
- Duct tape or tie-wraps for securing wires
- Non-aggressive tape (painters, masking)
- Electrical tape
- Butt connectors

Determine Best Configuration & Location

Sender Placement
The senders should be placed on a flat area on the side of the tank, ensuring that the whole width of the sender is in contact with the side of the tank.

INTRODUCTION

The SeeLeveL Senders 710-JS, 710-ES, 710-SS are used with SeeLeveL II Tank Monitoring systems that can monitor either two, three or four tanks.

- The 710-JS sender is 6″ high (not including tabs) and has a resolution of 1/4″. This model can measure tanks from 5″ to 7.5″ high tanks and cannot be stacked. The higher resolution is optimal for low-profile tanks.
- The 710-ES sender is 12″ high (not including tabs) with a resolution of 3/8″ and can measure tanks from 5.5″ to 14″ high with a single sender, and up to 26″ with double-stacked senders.
- The 710-SS sender is 16″ high (not including tabs) and has a resolution of 1/2″. This model can measure tanks from 7″ to 18″ high with a single sender, and up to 34.5″ with double-stacked senders. The senders are mounted on the outside of the holding tanks and can be stacked to fit taller tanks. They work on most plastic or polyethylene holding tanks that contain water-soluble fluids. They are not compatible with metal holding tanks. See more information about sender lengths on page 3. The communication protocol used between our senders and displays is proprietary allowing us to control the accuracy and functionality of our systems ensuring our customers experience reliable operation.

SAFETY SYMBOLS INFORMATION

NOTE: expands on information for any procedures.

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

INSTALLATION INFORMATION

The installation for the complete system consists of mounting the display inside the RV, cutting and mounting the senders to the sides of the tanks, connecting the wiring, and programming the display.

This manual provides information on how to install the SeeLeveL 710-JS, 710-ES, and 710-SS senders.

NOTE: The new 710-AR, 710-ES2 can be combined with old sender models 710-ES, 710-JS, 710-SS. Before senders are installed the display should be installed first.

Refer to the Display Installation Guide and User Manual for the model you've purchased for all installation and connection details. All documentation can be found from the Resource Library found on our support page: **https://www.garnetinstruments.com/support/**

Tools and equipment required:

- Wire cutters/stripper
- Wire crimper
- Scissors or hole punch
- Acetone/rubbing alcohol
- Duct tape or tie-wraps for securing wires
- Nonaggressive tape (painters, masking)
- Electrical tape
- Butt connectors

DETERMINE BEST CONFIGURATION & LOCATION

Sender Placement

The senders will need to have a flat area on the side of the tank large enough so the whole width of the sender is in contact with the side of the tank. Make sure that any metal is at least 1" away from either side, top and bottom of the sender, and at least 2" away from the face of the sender.

Some tanks may have irregular shapes. DO NOT wrap the corners over the top or bottom of the tank. See placement examples to the right.

CAUTION: Bending the sender sharply will damage the circuit on the sender.

Sender Configuration
To determine which sender configuration you need, measure the height of your tanks, then find out the measurable space (see following page). The measurable space is the “ideal” position of the sender on the tank. This will determine what length the senders should be. If a sender is too long, it will need to be cut. The following table has recommended senders and configurations for various tank heights.

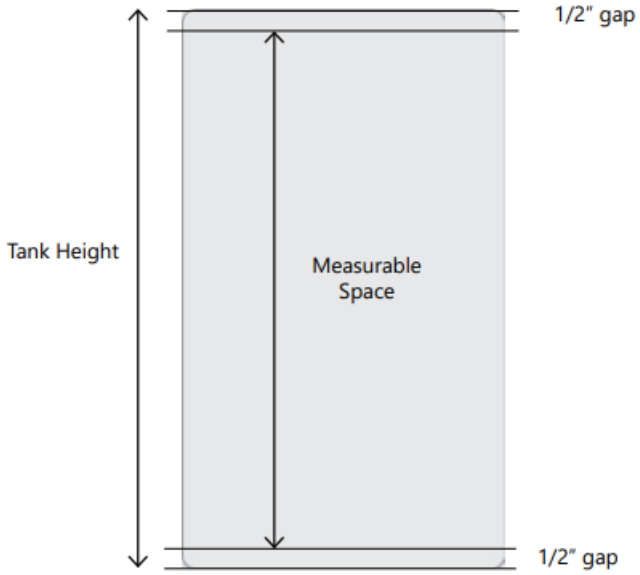
Tank Height	**Sender Options**	
	Best Resolution	**Other Possible**
5” – 5.5″	710-JS single	–
5.5” – 7”	710-JS single	710-ES single
7” – 13”	710-ES single	710-SS single
13” – 17”	710-ES stacked	710-SS single
17” – 25”	710-ES stacked	710-SS stacked
25” – 34”	710-SS stacked	–

CAUTION: 710-JS Senders cannot be double-stacked. DO NOT mix sender types when stacking senders.

DETERMINE MEASURABLE SPACE ON TANKS

Find Measurable Space
Measure the height of the tank from top to bottom then determine measurable space.

- The minimum gap is 1/4″, however, we recommend that the senders be installed 1/2″ from the top and 1/2″ from the bottom of the tank. Depending on the characteristics of the tank the gap can be a little more or less (see note below and installation tips on page 12). This gap ensures that the sender can read properly through the tank wall as the corners or rounded edges of the tanks can be too thick for the sender to read through.
- Subtract the gap space from the overall tank height. This will result in your measurable space. Use the calculation formula at the right.



NOTE: Although the recommended gap at the top and bottom of the tank is 1/2″ the minimum gap can be 1/4″. The maximum gap for the 710-JS is 3/4″, the 710-ES is 1″, and the 710-SS is 1.25″. See the recommended sender options table on page 2.

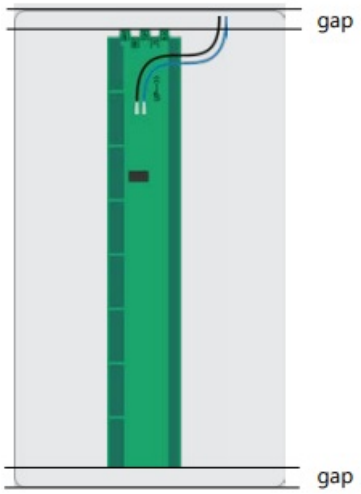
CAUTION: Installing a sender outside of the recommended measurable space may affect your readings.

NOTE: This is not a static formula that can be used on every tank. With some fresh tanks, the outlet for the pump feed may sit more than 1 inch above the bottom of the tank. Your water pump may begin to suck air before the tank is completely empty. In these cases, you want to install the fresh tank sender above the outlet for the pump feed. This will ensure that the monitor reads “0” before the pump begins to suck air.

Single configuration

1. Measure the height of the tank.
2. Tank height = _____
3. Calculate the recommended measurable space as follows:

Tank height – top gap – bottom gap = measurable space. *See note regarding gap recommendations.

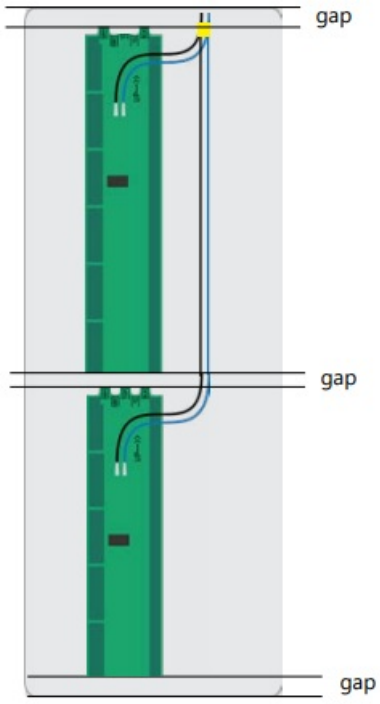


NOTE: If senders do not fit full height of the tank, to optimize the level you can justify sender location to be either closer to the top or bottom, depending on the type of liquid (Fresh or Grey/Black).

- FRESH = closer to bottom as it is preferable that this tank is not empty!
- GREY/BLACK = closer to top as it is preferable that these tanks are not full!

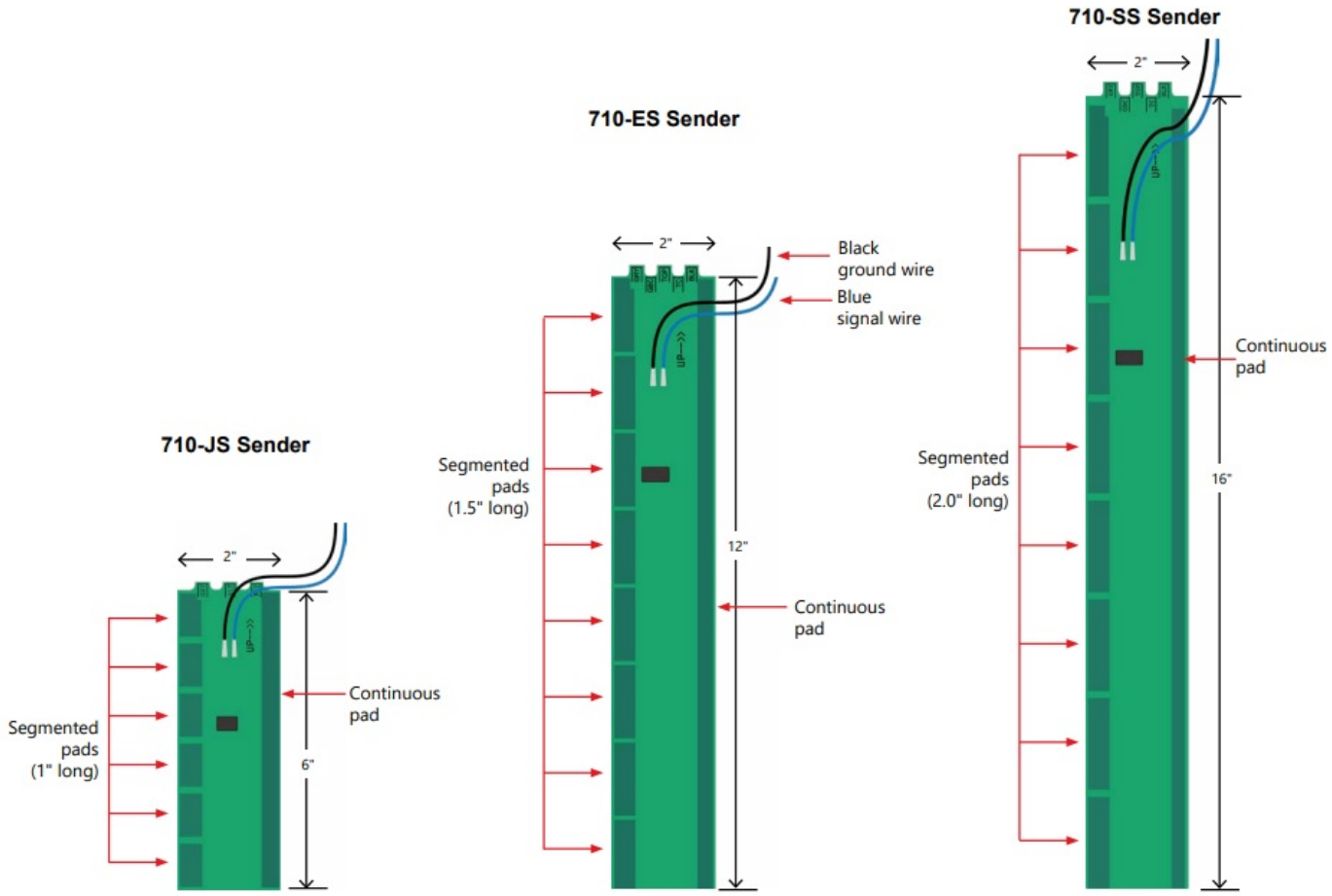
Stacked configuration
Two senders may be required for taller tanks and additional senders may be purchased for this application. There needs to be a gap of 1/16” to 1/8” between the double stacked senders. Calculate what the total length of measurable space for both senders will be:

1. Measure the height of the tank.
2. Tank height = _____
3. Calculate the recommended measurable space
4. Tank height – top gap – bottom gap – middle gap = measurable space. *See note regarding gap recommendations.



NOTE: Both senders in a double-stacked configuration should be approximately the same length.

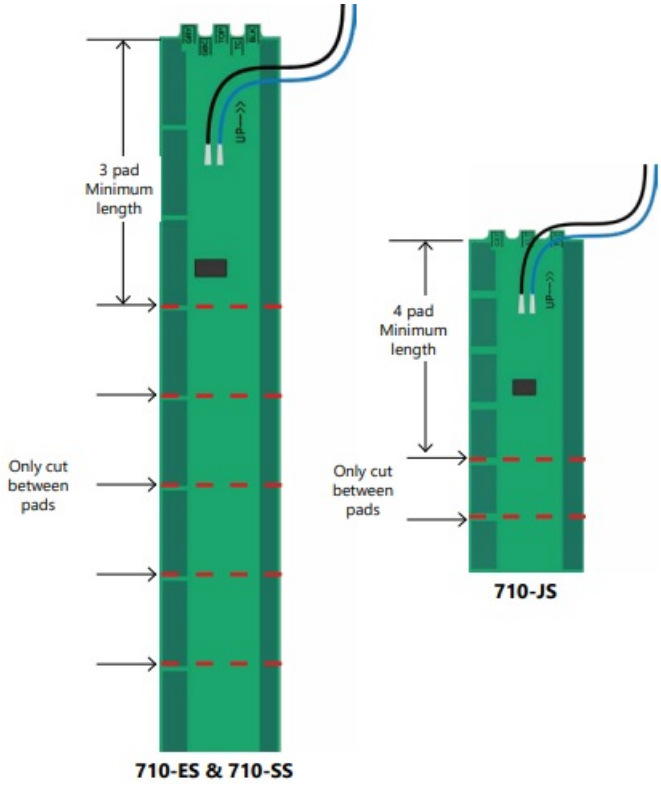
SENDER SPECIFICATIONS



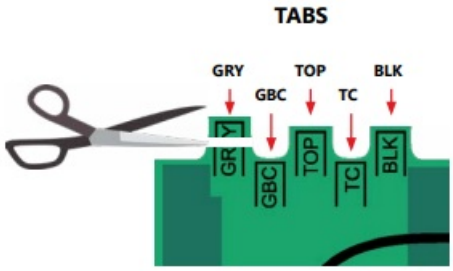
CUTTING SENDERS

The senders need to be cut to the required length to match the height of the measurable space of the tank.

The cut must be between the sender segmented pads. Senders have a minimum length they can be cut. The minimum length for the 710-ES and 710-SS is after the first three segmented pads and the 710-JS minimum is four segmented pads. Once this has been determined, cut the sender with a pair of scissors.



PROGRAMMING THE SENDERS



Senders are programmed by cutting off the tabs at the top of each sender to tell it which tank it will be mounted on, or if in a stacked configuration, whether they are on the top or bottom. A pair of scissors or a hole punch can be used to cut the sender tabs.

The senders can be programmed for FRESH, GREY, BLACK, and GALLEY tanks. The tabs are labeled at the top to show you which tab or tabs to cut for which tanks. Cut the middle tab labeled “TOP” for double-stacking senders (top sender only).

For examples of programming for each tank types refer to the table at the bottom and the illustrations on the next page.

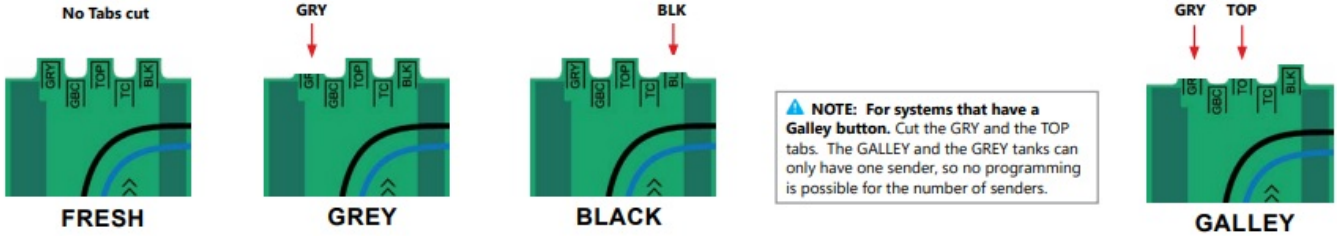
TANK TYPE	**TABS TO CUT**
FRESH	No tab cut
GREY	GRY
BLACK	BLK
GALLEY	GRY + TOP
FRESH TOP	TOP
GREY TOP	GRY + TOP
BLACK TOP	BLK + TOP
GALLEY TOP	see note

NOTE: For systems that have a Galley button. Cut the GRY and the TOP tabs. The GALLEY and the GREY tanks can only have one sender, so no programming is possible for the number of senders.

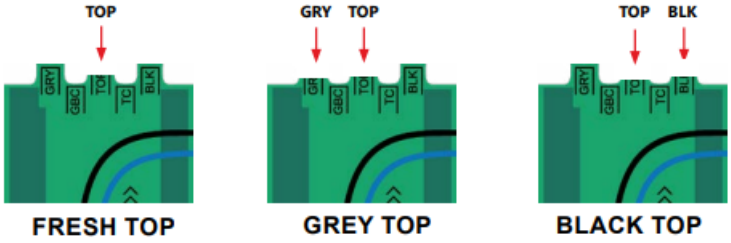
PROGRAMMING THE SENDERS 710-ES AND 710-SS

Senders tabs to cut for single sender or bottom sender if double-stacked.

NOTE: For systems that have a Galley button. Cut the GRY and the TOP tabs. The GALLEY and the GREY tanks can only have one sender, so no programming is possible for the number of senders.



For a double-stacked tank configuration, the top sender requires an additional tab to be cut.

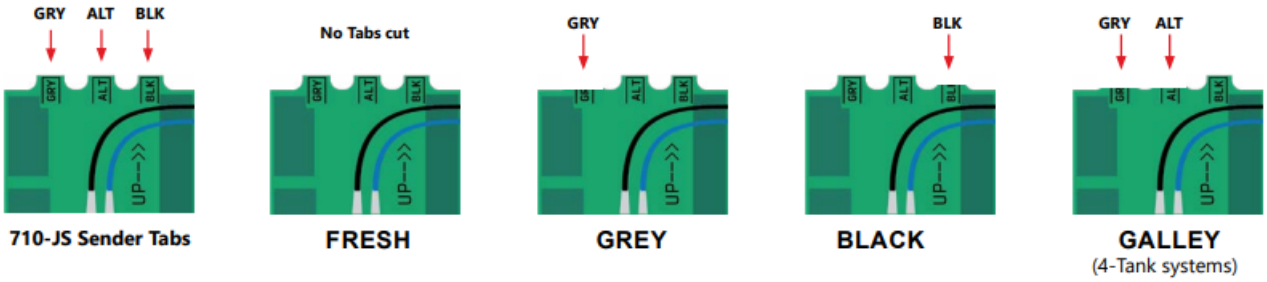


Examples for correcting cuts made in error.

CAUTION: TABS CUT IN ERROR If the “GRY” tab has been removed and it should be a black tank sender, or if the “BLK” tab has been removed and it should be a grey tank sender, then cut out the recessed grey-black correction tab that says “GBC” next to it. This reverses the effect of the grey and black tabs. If either the “GRY” or “BLK” tabs have been removed and it should be for a fresh tank, then remove the other “GRY” or “BLK” tab. When both the “GRY” and “BLK” tabs are removed, it becomes a fresh tank sender.

PROGRAMMING THE SENDER 710-JS

Senders tabs to cut for single senders.



CAUTION: 710-JS Senders cannot be double-stacked.

Examples for correcting cuts made in error.

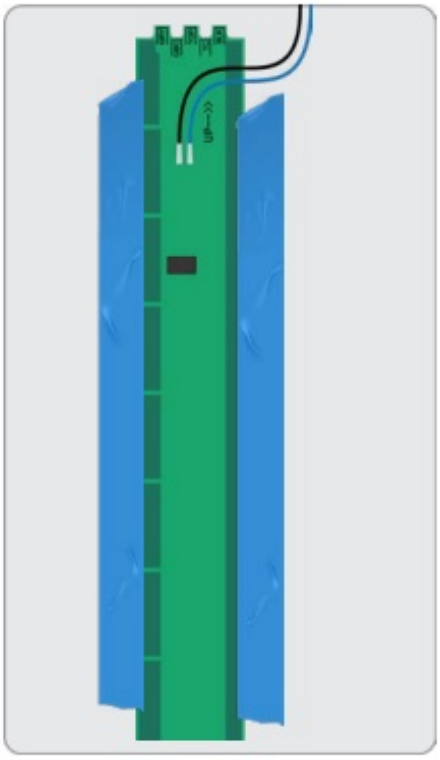
Clean the tank

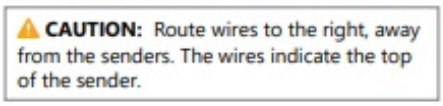
- Clean area thoroughly where the sender will be mounted making sure there is no dust, grease and oil.
- Acetone or rubbing alcohol will remove sticky residue.

Temporarily tape sender on tank

CAUTION: DO NOT SKIP THE FOLLOWING STEPS. Removing the sender from the tank after the sender has been permanently installed will cause damage to the sender that is NOT covered under warranty.

Once the sender is cut and programmed, temporarily tape the sender to the tank wall. Place a piece along the length of both sides of the sender and perform a test to verify the operation.





Use a non aggressive tape like painters tape or masking tape.

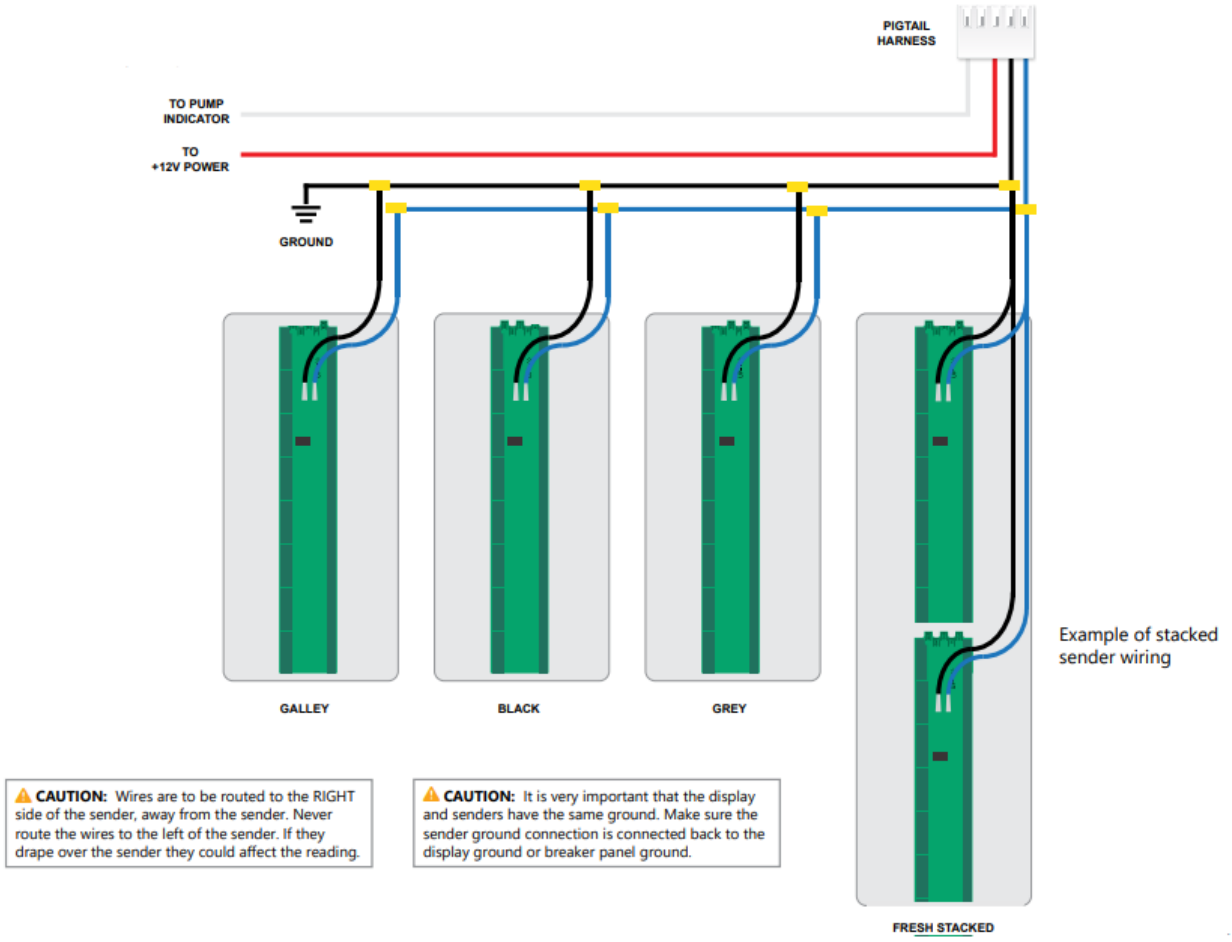
CAUTION: Route wires to the right, away from the senders. The wires indicate the top of the sender.

Use a non aggressive tape like painters tape or masking tape.

WIRING THE SENDER

Connect the wiring to the pigtail
The following diagram shows the wiring from the sender to the display pigtail. Other wiring connections may apply

for each display model. All wiring diagrams are available on the website.



CAUTION: Wires are to be routed to the RIGHT side of the sender, away from the sender. Never route the wires to the left of the sender. If they drape over the sender they could affect the reading.

CAUTION: It is very important that the display and senders have the same ground. Make sure the sender ground connection is connected back to the display ground or breaker panel ground.

SENDER TEST

Verify operation before permanently sticking the sender to the tank.

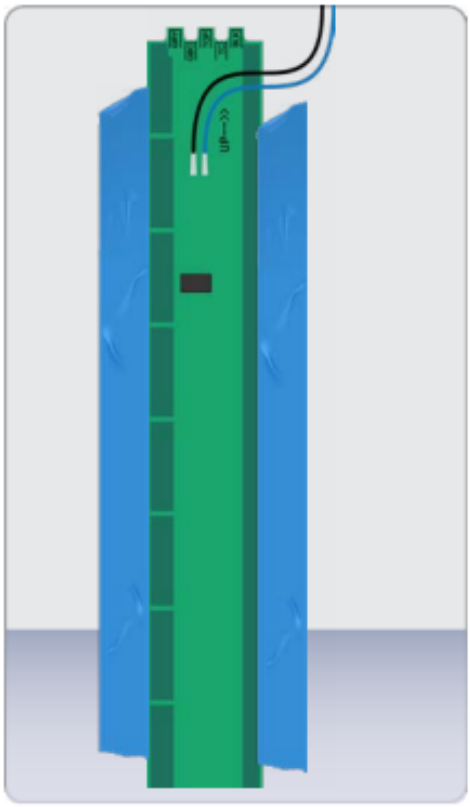
- **Tank levels operation test**

  For the initial test, have the tank at least 1/4 full of water or sewage.

  Verify that the percent level reading on the display panel looks correct.
- **FRESH** LEVEL IN PERCENT
- **Signal strength test**

  The signal power is an indication of how much signal is being transmitted through the tank wall and picked up by the receiver part of the sender.

  Typical signal power should be 50% to 60%. The gauge will work with minimum signal strength as low as 20%, but it is good to have at least 50% to 60% at installation so that there is some margin available for buildup in the tank. P00 = 100%.



Tank levels operation test

For the initial test, have the tank at least 1/4 full of water or sewage.

Verify that the percent level reading on the display panel looks correct.

Signal strength test

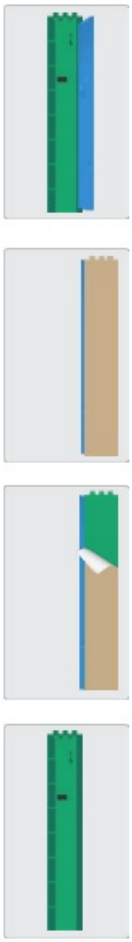
The signal power is an indication of how much signal is being transmitted through the tank wall and picked up by the receiver part of the sender.

Typical signal power should be 50% to 60%. The gauge will work with minimum signal strength as low as 20%, but it is good to have at least 50% to 60% at installation so that there is some margin available for buildup in the tank. P00 = 100%.

MOUNTING THE SENDER

Permanently adhere sender to the tank

- Once proper operation has been confirmed, the sender will be ready to permanently stick to the tank wall.
- Remove one side of the tape.
- Fold the sender over so it is still attached with one side of the tape.
- Slowly peel the backing paper off the adhesive.



CAUTION: Be careful not to bend the senders excessively or you could damage the circuits. You only have one shot at this. If you try to peel it off the tank once it is stuck the sender may be damaged by the sharp bending. Removing the sender after it's been adhered voids the warranty.

Carefully fold the sender back and press the sender down to the tank so that all of the adhesive is contacting the tank wall. Make sure there are no air gaps between the sender and the tank. Remove the other side of the temporary tape.

Secure the wires
Secure the wires with duct tape, tie wraps, or something similar so that the wires do not rattle or press against the sender, this may result in sender damage or wires breaking over time.

Apply undercoating to the senders

- On installations where the holding tank is exposed to under chassis road spray and flying rocks etc. We recommend using: 3M 03584 Professional Grade Rubberized Undercoating Gravel Guard Rocker Guard

Coating By Dominion Sure Seal

- Gorilla Glue Waterproof Patch & Seal Tape

(Frequently Asked Questions)

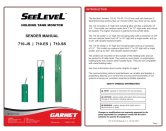
Can the senders be stacked to fit taller tanks?
Yes, the senders can be stacked to fit taller tanks. The stacking capability depends on the model:

- 710-JS: Not stackable
- 710-ES: Up to 26 with double-stacked senders
- 710-SS: Up to 34.5 with double-stacked senders

What types of tanks are compatible with the senders?

The senders are compatible with most plastic or polyethylene holding tanks that contain water-soluble fluids. However, they are not compatible with metal holding tanks.

Documents / Resources

	Garnet Instruments 710-JS SeeLeveL Holding Tank Monitor [pdf] Instruction Manual 710-JS SeeLeveL Holding Tank Monitor, 710-JS, SeeLeveL Holding Tank Monitor, Holding Tank Monitor, Tank Monitor

References

- Support – Garnet Instruments
- User Manual