TERMINAL OVERFILL / RACK CONTROL ADD-ON GUIDE

FOR FINCH III TRUEFILL SYSTEMS

Use this guide after the base FINCH III hardware installation, configuration, and operator setup are complete.

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TERMINAL OVERFILL FEATURE OVERVIEW

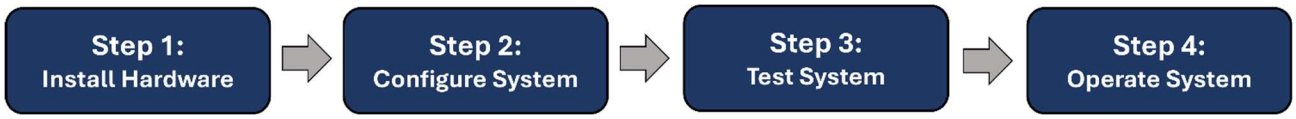
Before You Start

This document is an add-on guide for customers using Terminal Overfill/Rack Control with FINCH III.

Before completing the steps in this guide, confirm the base FINCH III system has already been installed and configured using the following documents, which can be found from Titan Logix's Help Center:

- FINCH III Hardware Installation Guide
- FINCH III Configuration Guide
- FINCH III Operator Guide

Installation & Commissioning Workflow



This guide only covers the additional hardware, configuration, testing, and operating behavior required for Terminal Overfill. This is described in the table below under Terminal Overfill Add-On.

Step	BASE SYSTEM – Complete First	TERMINAL OVERFILL ADD-ON
Step 1: Install Hardware	Install the FINCH III, TD100s, probes, and required base system wiring using the FINCH III Hardware Installation Guide.	Install the Optic Booster to the FINCH III Optic terminal block and connect the API socket wiring.
Step 2: Configure System	Complete the base FINCH III configuration using Titan Install and Titan Portal.	Enable Rack Control in Titan Install and confirm the HH/SPILL set points for each compartment.
Step 3: Test System	Confirm the base FINCH III system is operating correctly.	Test Terminal Overfill using an approved truck tester.
Step 4: Operate System	Follow the FINCH III Operator Guide for standard operation.	Understand how FINCH III changes rack permit status during HH, SPILL, faults, and other non-permissive conditions.

NOTE

Additional resources, troubleshooting articles, and videos can be found through Titan Logix's Help Center: **help.titanlogix.com**

Supported Hardware for Terminal Overfill Add-On

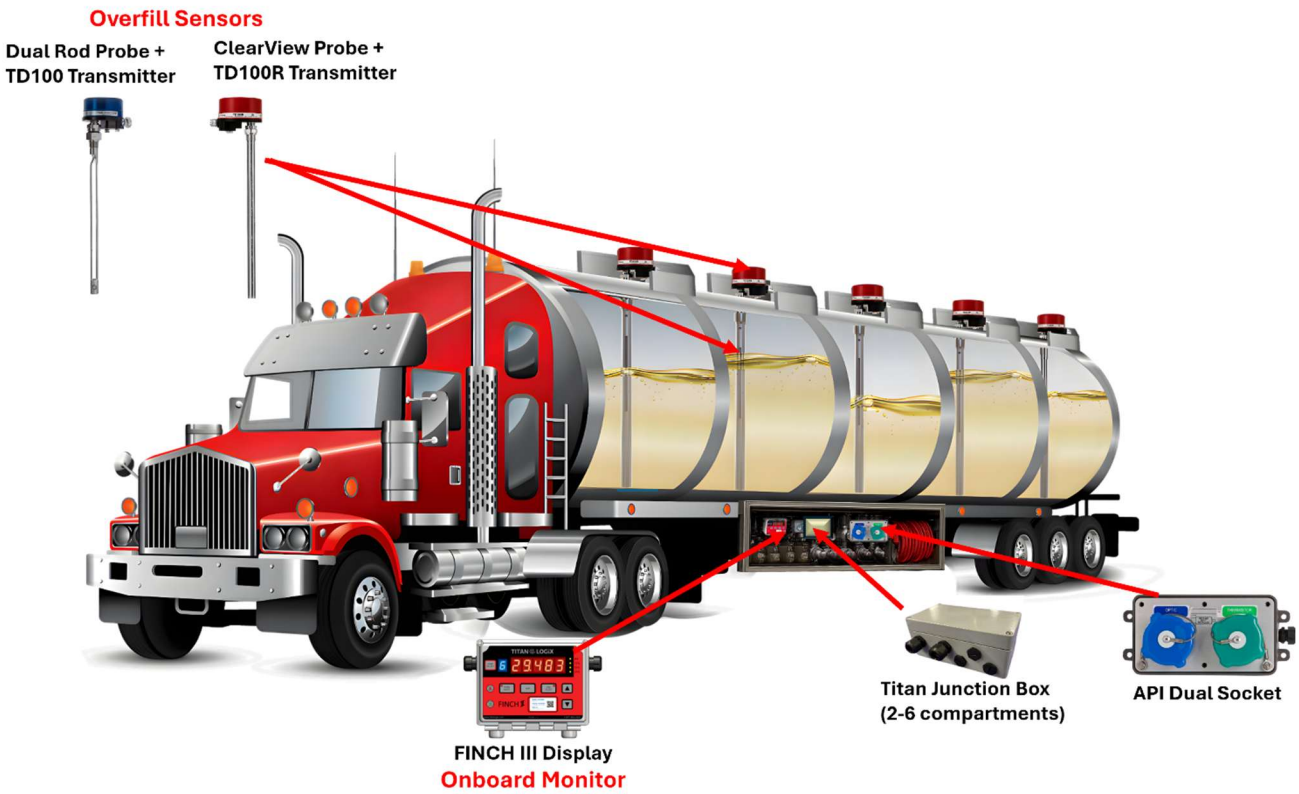
The Titan TrueFill system uses the **FINCH III display** as the onboard monitor for terminal overfill protection. When Terminal Overfill, also referred to as Rack Control, is enabled, the FINCH III connects to the truck's **API rack loading socket** and controls whether the loading rack is permitted to load the truck.

The FINCH III is designed **for fail-safe rack loading operation**. A permissive signal is only provided when the FINCH III system is powered on and all required system checks have passed. If the FINCH III display or connected Titan hardware loses power, the permissive signal is removed and loading will not be allowed to continue.

Before allowing loading at the rack, the FINCH III confirms the following:

- No HH or SPILL rack shutdown condition is active on any compartment.
- No unexpected level movement is detected, such as a transmitter reading jumping from mid-tank directly to 2Lo or SPILL.
- No transmitter or FINCH III system error is active.
- The FINCH III is not connected to Titan Install or in update mode. (Showing RCONN or in Update mode)
- All required compartments are confirmed and all transmitters are properly assigned.

If any of these conditions are not met, the FINCH III changes the rack status to non-permissive and loading is stopped until the condition is resolved.



Additional Hardware Required for Terminal Overfill

NOTE

The Optic Booster and API sockets are not included in all TrueFill solution kits. To order these components through Titan Logix, contact sales@titanlogix.com and use the part numbers listed below.

Optic Booster	API Sockets
 The Optic Booster is installed into the FINCH III Optic terminal block. It is required for API optic rack loading applications and for compatibility with approved truck testers. **Part Number:** 3002-0154	 An API socket wired to the FINCH III display. Any industry-approved API sockets are compatible with FINCH III, as long as the Optic Booster is also used. **Part Number:** • **US:** FINCH III SOCKETS US • **CANADA:** FINCH III SOCKETS CA

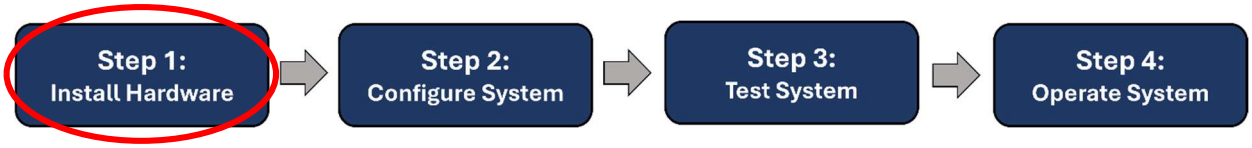
API Socket Rack Signals Overview

The API socket is the connection point between the truck and the loading rack. The loading rack looks for a valid return signal before allowing product to load.

When the FINCH III system is in a normal operating state, the rack receives a permissive signal and loading is allowed. If the FINCH III detects an alarm, fault, or rack shutdown condition, the rack receives a non-permissive signal and loading is stopped.

FINCH III > API Optic Signal	FINCH III > API Thermistor Signal
An Optic Booster is required when using an API optic socket. The rack sends a signal to the truck through the optic socket and expects a valid return signal. • If the FINCH III system does ***NOT*** detect any issues and no rack shutdown condition is active, the signal is returned to the rack and loading is allowed. The FINCH III Rack Status LED will be **GREEN**. • If the FINCH III detects a rack shutdown condition, the return signal is interrupted. The rack interprets this as non-permissive and loading is stopped. The FINCH III Rack Status LED will be **RED**.	**No additional hardware** is required for the FINCH III thermistor output. The FINCH III generates the signal required by the thermistor socket. • If the FINCH III system is healthy and no rack shutdown condition is active, the rack receives a permissive signal and loading is allowed. The FINCH III Rack Status LED will be **GREEN**. • If the FINCH III detects a rack shutdown condition, the FINCH III changes the signal to a non-permissive state. The rack interprets this as a stop-loading condition. The FINCH III Rack Status LED will be **RED**.

STEP 1: INSTALL ADD-ON HARDWARE



PREREQUISITE

Before installing the Optic Booster or API socket wiring, ensure the FINCH III is powered off and the base hardware installation has been completed according to the FINCH III Hardware Installation Guide.

When using Titan Logix's FINCH III for terminal overfill, an Optic Booster **must** be installed to ensure rack and truck tester compatibility.

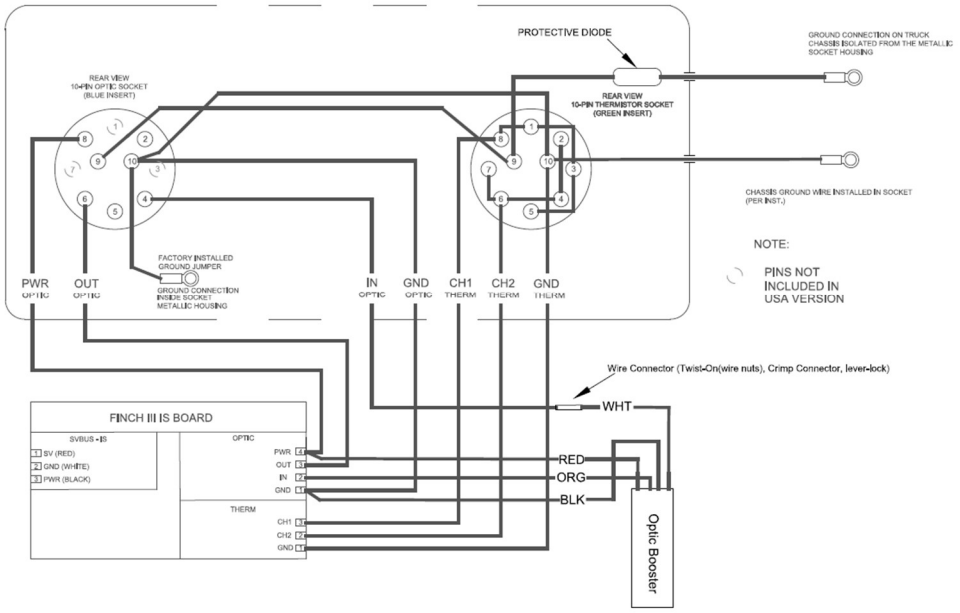
Installing the Optic Booster

1. Open the FINCH III by removing the two screws on the front panel.

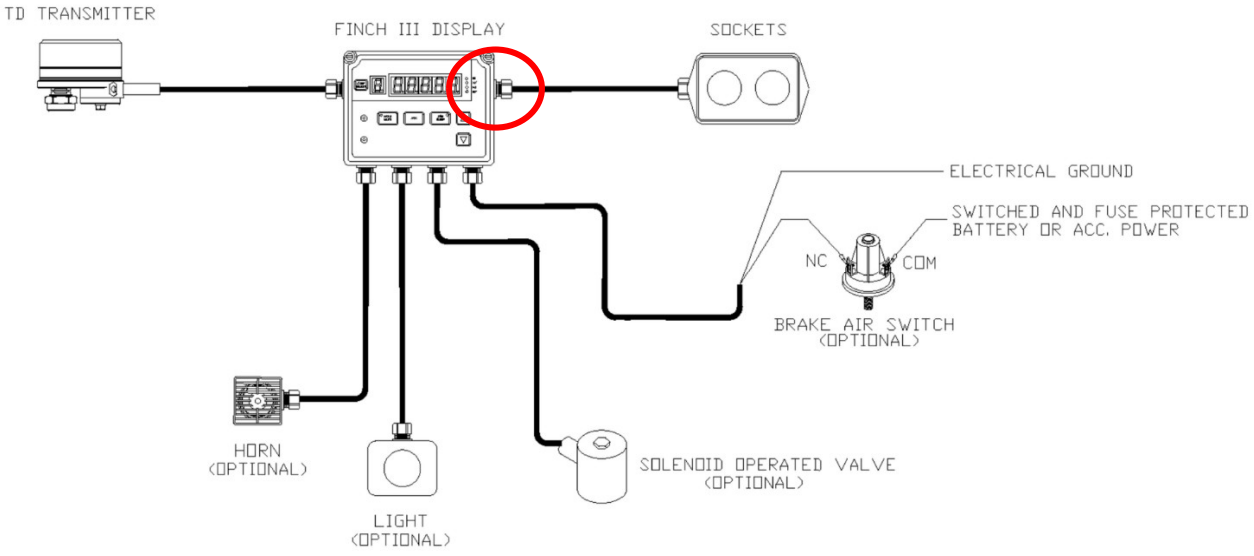
2. The FINCH III display is made up of two PCB boards, the main PCB board which is located on the door, and an Intrinsically Safe (IS) PCB board within the base of the FINCH display box.

3. Unscrew the three screws from the aluminum panel from the Intrinsically Safe (IS) PCB board within the base of the FINCH display box.

4. Follow the wiring diagram below to wire the Optic Booster into the Optic terminal block on the PCB board.

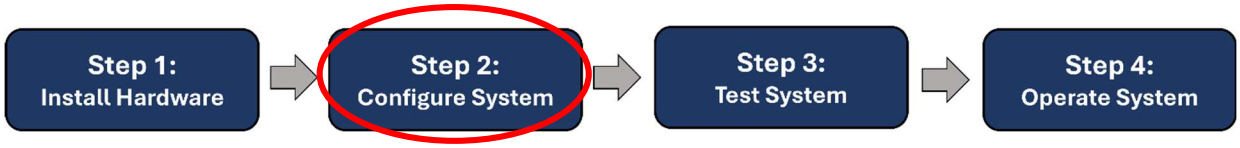


5. Insert the API Socket wiring through the black strain relief on the right side of the display.
6. Connect the wires to the correct Optic and/or Thermistor terminal blocks on the FINCH III Intrinsically Safe board.



7. Once the wiring is complete, install the aluminum panel back on the FINCH III, close the FINCH III door and tighten the screws.
8. Once all wiring is complete and the hardware is installed on the vehicle, power on the FINCH III and verify normal startup.

STEP 2: CONFIGURE TERMINAL OVERFILL



PREREQUISITE

Complete the base FINCH III configuration using the **FINCH III Configuration Guide** before completing the Rack Control steps below.

Terminal Overfill configuration has two required steps:

- A. Confirm the HH and SPILL set points for each compartment (using Titan Portal and Titan Install)
- B. Enable Rack Control on the FINCH III using Titan Install

A. Configuring your Strapping Table for each Compartment

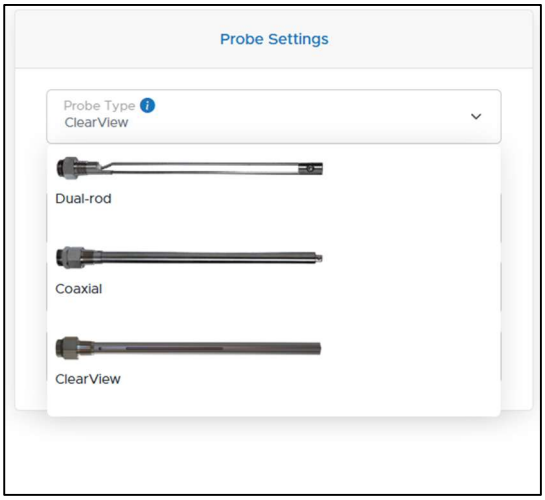
Titan recommends using the SPILL alarm on each compartment's strapping table as the rack loading shutdown point. The SPILL alarm (second set point) from the Titan system typically aligns closer to what you would be used to from an Optic probe length that has traditionally been used for terminal overfill.

The typical optic probe is usually around 5 to 7 inches long, which aligns with the SPILL alarm (second set point), which can be adjusted depending on the probe used in each compartment.

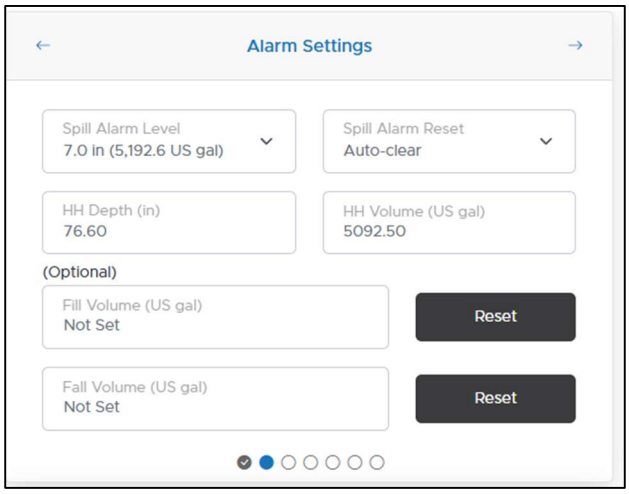
Titan recommends using the HH alarm (first set point) as an early warning alarm when rack loading. The HH alarm set point should be set low enough to give the operator time to respond before the SPILL/rack shutdown point is reached.

Using Titan Portal, ensure following is correctly configured when building your strapping table:

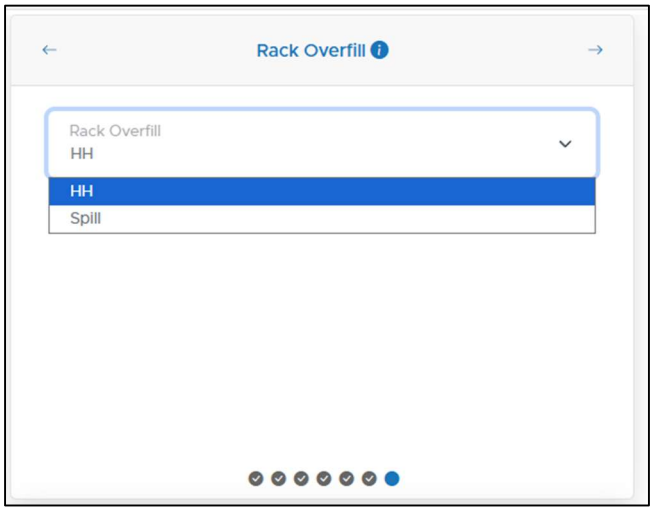
1. Select the correct probe type from the drop-down field.



2. Fill out the maximum compartment length for safe fill capacity from the Alarm Settings section. The SPILL alarm is only adjustable when using a Coaxial or ClearView overfill sensor probe. The HH alarm can be set by selecting the depth or volume fields.



3. Select HH or Spill from the Rack Overfill drop-down menu to determine when the non-permissive signal will be sent to the loading rack.

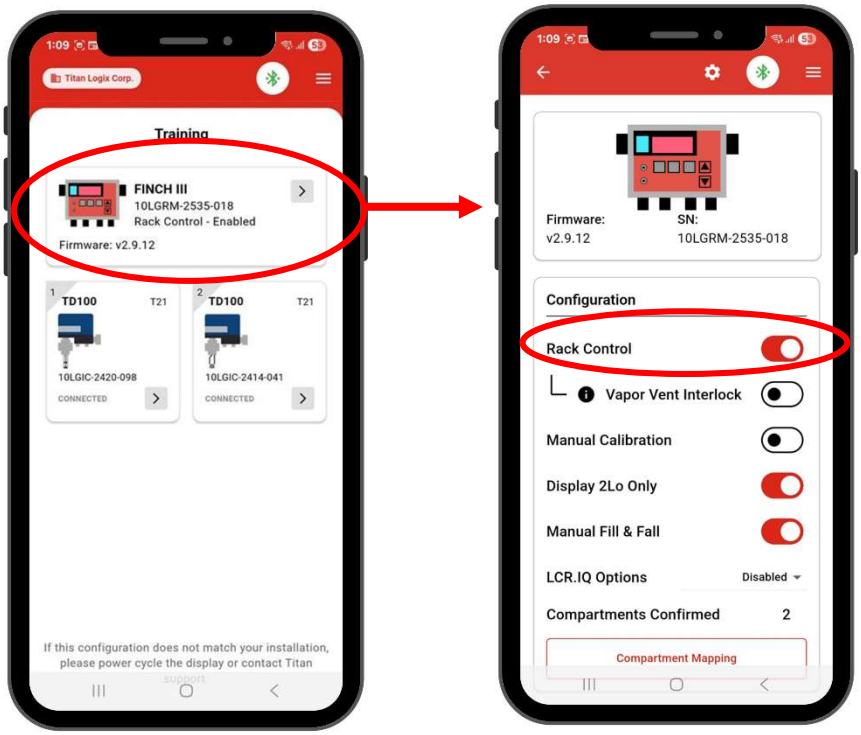


4. Save the strapping table in Titan Portal once all of the fields are filled out.

5. When configuring each transmitter using Titan Install, ensure you have selected the correct strapping table to reflect the rack loading features used while building your chart using Titan Portal.

B. Configuring your FINCH III Display

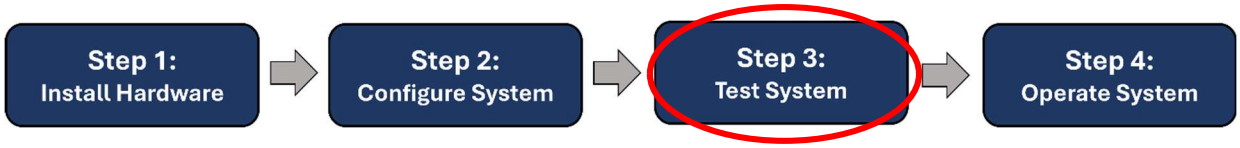
1. Using Titan Install, scan the QR code to connect to FINCH III.
2. Tap the FINCH III tile on the main configuration page.
3. Tap **Rack Control** to enable this feature.



4. Tap Save to save the configuration for this FINCH III.
5. Disconnect Titan Install from the FINCH III.

Your Titan System is now ready to be tested with an approved truck tester.

STEP 3: TEST TERMINAL OVERFILL



PREREQUISITE

Refer to the **FINCH III Hardware Guide** on the Titan Logix Help Center for standard FINCH III testing. This section **only** explains how Rack Control changes the rack permit state during Terminal Overfill operation.

Truck testers and rack/terminal monitors require a minimum returned pulse width from the onboard monitor (FINCH III).

The Optic Booster installed into the FINCH III optic terminal block ensures the return signal meets the required pulse width for compatible rack/terminal monitors and truck testers.

NOTE

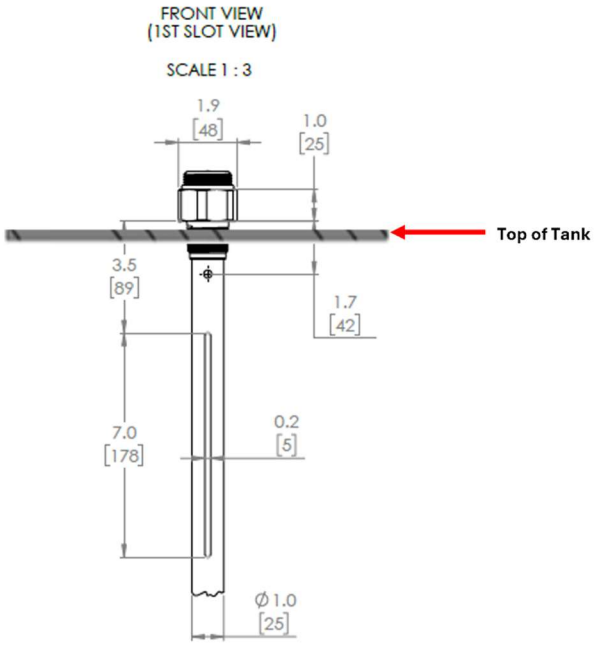
Testing requirements are based on **EN13922:2020**, Tanks for transport of dangerous goods — Service equipment for tanks — Overfill prevention systems for liquid fuels.

High-level Functional Checklist

Verification Step	Expected Result
Connect the approved truck tester to the API socket.	Truck tester connects normally.
Confirm FINCH III is in a normal operating state.	Rack Status LED is **GREEN**.
Run the truck tester sensor test.	Truck tester passes.
Trigger or simulate a non-permissive condition. (Wet Test)	Rack Status LED turns **RED** and the tester shows non-permissive.
Clear the condition according to HH or SPILL behavior.	Rack permit returns to permissive only after the required reset condition is met.

Verification Test (Wet Test)

1. Access the top of the ClearView probe from the inside of the tank compartment.
2. Locate the vertically cut slot at the top of the probe. These slots provide access to the inner rod to test the overfill prevention alarm.



3. Insert a test wire into one of the vertical slots of the probe, making good contact with the center rod, and starting at the lower end of the vertically cut slots.

	**NOTE** Any substitute can be used for a test wire, including a thin screwdriver, coat hanger, bare wire, etc.

4. Drag the test wire up the length of the vertical slot, maintaining contact with the inner rod, until the overfill prevention alarm is triggered. The distance between the top of the tank and the point where the alarm is triggered indicates the depth measurement for the overfill prevention alarm.
5. When the overfill alarm is triggered, the rack control indicator light on the FINCH III display will appear **RED**, sending a non-permit signal to the rack. The FINCH III display will automatically display the compartment for which the alarm was triggered, and the HH or SPILL alarm will flash on the display.
6. Remove the test wire from the vertically cut slot. If a HH alarm is present on the FINCH III display, press the ACK button to clear the alarm. A SPILL alarm will automatically clear once the wire is removed from the vertically cut slot and the FINCH III is power cycled.
7. The rack control indicator light will appear **GREEN** and a permit signal will be sent to the rack.
8. Repeat this process for each compartment.

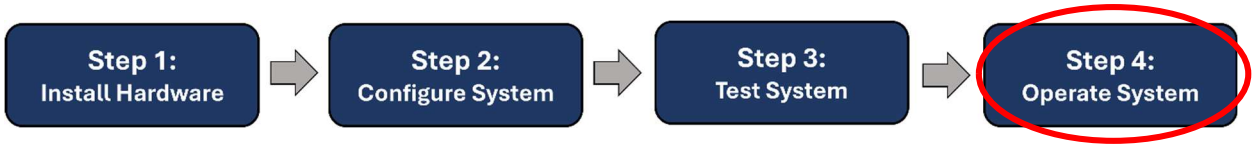
Approved Truck Testers

Below are the truck testers that Titan Logix has verified with an API socket connected directly to our FINCH III display using our Optic Booster wired directly into the display.

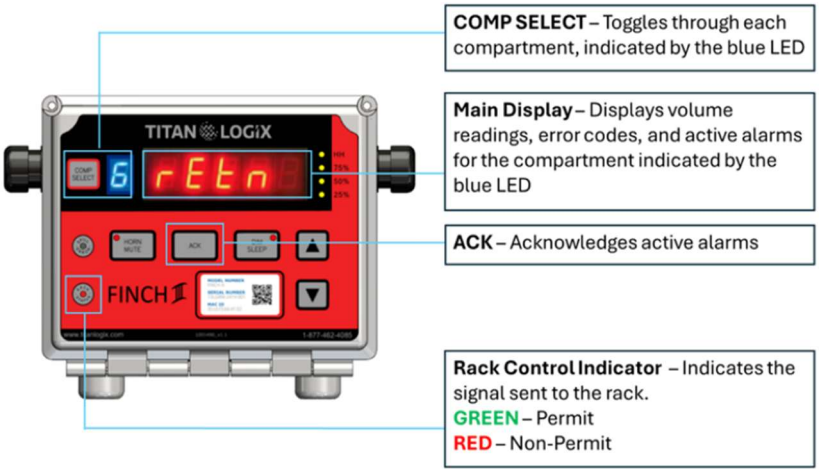
Titan Logix has verified the following truck testers with a Titan-approved Optic Booster installed in the FINCH III display, wired to an API socket:

Manufacturer	Approved Truck Tester	Image
Dixon	Dixon FloTech FT555	
Scully	Scully Mobile Truck Tester	
Scully	Scully Universal Truck Tester	

STEP 4: OPERATE SYSTEM



!	**PREREQUISITE** Refer to the **FINCH III Operator Guide** on the Titan Logix Help Center for standard FINCH III operation. This section **only** explains how Rack Control changes the rack permit state during Terminal Overfill operation.



How FINCH III Controls Rack Loading

The rack shutdown behavior is determined by the HH or SPILL set points configured for each compartment in the strapping table.

Permissive = loading allowed	If the FINCH III *doesn't detect any issues* rack status will be permissive (rack loading is allowed). The Rack Status LED on the front panel of the FINCH III will be **GREEN**.
Non-permissive = loading halted	If the FINCH III *detects any issues* the rack status will be non-permissive (rack loading is halted). The Rack Status LED on the front panel of the FINCH III will be **RED**.

SPILL Rack Shutdown Set Point (Recommended Option)

- HH acts as an early warning for the operator that they are getting close to the SPILL / Rack Shutdown point.
- The HH alarm can be acknowledged by pressing the ACK button on the FINCH III display. The Rack Permit state **remains permissive** (**GREEN**).
- When any compartment reaches its SPILL set point, the FINCH III sends a non-permissive signal to the socket and the rack loading is halted (rack is "bumped").
- The SPILL alarm cannot be cleared by pressing the ACK button on the FINCH III.
- Product must be lowered below the SPILL set point AND the FINCH III must be power cycled to clear the alarm and reset the signal to permissive.

HH Rack Shutdown Set Point

- When a compartment reaches HH, the FINCH III sends a non-permissive signal to the socket and the rack loading is halted (rack is “bumped”).
- Press the ACK button on the FINCH III display clears the alarm from the display. It does NOT reset the Rack Permit status on the FINCH III.
- To reset the Rack Permit status on the FINCH III, product must be lowered in the compartment to below the HH set point.
- Once this is completed, the Rack permit signal resets within 60 seconds.

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Service and Repair

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