



TITAN TRUEFILL

OPERATOR MANUAL

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CONTENTS

| | | |
|----------|---|-----------|
| 1 | <i>Introduction</i> | 3 |
| 1.1 | About this Manual..... | 3 |
| 1.2 | Disclaimer..... | 3 |
| 1.3 | Repair | 3 |
| 1.4 | Warranty | 4 |
| 1.5 | System Overview | 4 |
| 2 | <i>System Operation</i> | 5 |
| 2.1 | Start Up..... | 5 |
| 2.2 | FINCH III Operator Interface..... | 5 |
| | FINCH III Indicators | 6 |
| | FINCH III Buttons | 7 |
| 2.3 | Modes of Operation | 8 |
| 2.4 | System Alarms | 8 |
| | SPILL Alarm | 8 |
| | HH Alarm | 9 |
| | Fill Alarm..... | 9 |
| | Fall Alarm | 10 |
| | Retain Alarm | 10 |
| | 2Lo | 10 |
| | Error | 11 |
| 3 | <i>FINCH III Calibration</i> | 12 |
| | Manual Calibration Process | 12 |
| | Updating Strapping Table | 13 |
| 4 | <i>Error Codes & Troubleshooting</i> | 14 |
| 4.1 | FINCH III Error Codes..... | 14 |
| 4.2 | TD100 Transmitter Error Codes | 15 |

1 INTRODUCTION

1.1 About this Manual

This manual provides information specific to the Titan Logix Corp. TrueFill Solution (hereafter referred to as the Titan TrueFill) only.

A Titan Logix system must be installed, operated, and maintained in accordance with the details described ONLY in Titan Logix manuals, application notes and all other relevant publications. Any installations or operations outside the scope of this information MUST contact Titan Logix technical support for more information.

Installation and operational information pertaining to optional equipment or peripheral systems will not be included in this manual. Refer to the vendor supplied documents for more information.

It is essential that this manual be read and understood for proper installation and operation of your new Titan TrueFill system.

Please visit Titan's Help Center (help.titanlogix.com) for additional information on Titan Logix's solutions.

1.2 Disclaimer

The information in this document is subject to change without notice. Titan Logix Corp. makes no representations or warranties with respect to the contents hereof.

- Only qualified personnel familiar with the installation and operation of this equipment should install, adjust, operate, or service this equipment. Failure to observe these instructions and applicable safety and electrical regulations could result in bodily injury or loss of life.
- Unintended use, including but not limited to using the product in a way not described in the product documentation or for purposes other than those intended, may impair protection provided by this equipment.
- To maintain a Class 1, Division 2 rating, each relay must only be supplied with 8-30VDC / 3.3A max transient protected power.
- Only replace with sand filled fuses of same type and rating.
- The Titan FINCH III system requires high temperature cable.
- Cable diameter must be within 0.260" (6.6mm) to 0.545" (13.8mm) to maintain the strain relief integrity.
- Connections that could introduce additional transients into the circuit supplied by the power system are not permitted.
- The non-metallic enclosure parts of this equipment may become a spark ignition hazard in the presence of static electricity. The enclosure shall be cleaned only with a damp cloth, and the equipment shall be mounted to avoid building static electric charge from nonconductive process flow, strong air currents, or other potential charging through friction.

| | |
|---|---|
|  | <p>WARNING EXPLOSION HAZARD</p> <p>THE SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 1.</p> <p>DO NOT DISCONNECT EQUIPMENT OR REPLACE FUSE UNLESS POWER HAS BEEN SWITCHED OFF AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.</p> <p>INSTALL PER DRAWING 1001516_DME.</p> <p>MAXIMUM NON-HAZARDOUS VOLTAGE NOT TO EXCEED 30V.</p> |
|---|---|

1.3 Repair

FINCH III is an intrinsically safe associated apparatus and has no serviceable parts. Field repair of the Titan system is not recommended. Return to Titan Logix for repair. Temporary or emergency field repair of damaged or cut cables/wiring is acceptable. Replace the cable/wire at the earliest opportunity.

1.4 Warranty

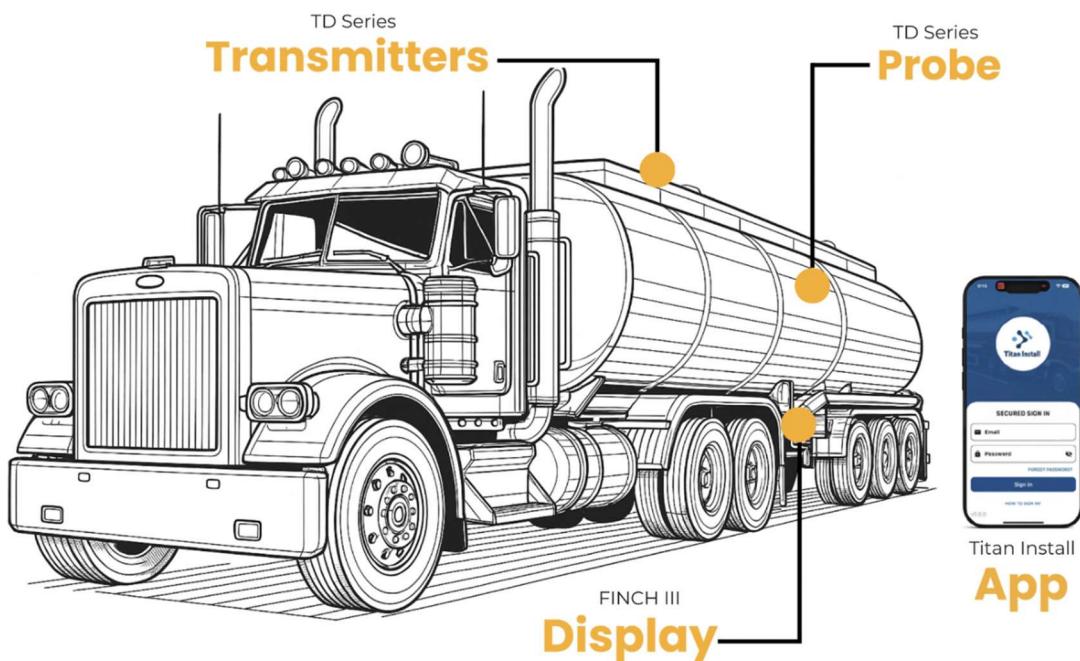
Use of unauthorized parts, improper wiring, or any non-sanctioned modifications will void the manufacturer's warranty. Always follow approved specifications and installation guidelines provided by Titan Logix Corp to maintain full warranty coverage.

1.5 System Overview

The FINCH III display is our newest part of the Titan Logix mobile liquid measurement solution.

The Titan Logix system provides best in class overfill prevention and continuous Tank Level Monitoring. Using Guided Wave RADAR (GWR) technology, the system continuously measures liquid level in the tank and transmits volume information to a display. The probe guides the RADAR pulse and reflection from the surface of the liquid. The transmitter translates this information into volume and displays it on the FINCH III. No moving parts are involved in level measurement.

The Titan TrueFill System consists of either a Red or Blue lid TD100 Transmitter, a TD Probe, a FINCH III display (with Titan Junction Box for more than 1 compartment), and our latest Titan Install and Titan Portal software platform.



2 SYSTEM OPERATION

The FINCH III display is designed to:

- Shows real-time liquid levels, alarms, and errors with a bright 5-digit LED screen.
- Work safely in hazardous locations to prevent overfill incidents.
- Control up to six TD100 transmitters for compartment monitoring.
- Control up to three high powered relays for alarming, high level shutdown and low-level prevention. These built-in relays can control lights, horns, solenoids, or other external devices based on reaching specific levels in each compartment.
- Directly connect to any standard API socket for rack control without extra devices.
- Handle outdoor conditions, although it is recommended to install it in a weather protected cabinet for best results.

2.1 Start Up

When power is applied to the FINCH III, each TD100 Transmitter and the FINCH III display will run through a short, warm-up cycle. During this boot-up process, the current FINCH firmware version will scroll across the FINCH III display every time the FINCH III is powered on.

Once the boot-up process is complete, the FINCH III display will enter its normal mode of operation. It will either show an error code/Alarm status, the liquid level inside the selected compartment, an Alarm status, or an error code.

|  | NOTE |
|---|---|
| | <p>If the FINCH III warm-up cycle completes before the TD100 Transmitters warm-up cycle, five dashes (----) will appear on the FINCH III display for a few seconds until the full boot-up process is complete. No action is required if this happens.</p> <p>If the dashes do NOT go away after the FINCH III boot-up cycle is completed, refer to help.titanlogix.com for more details on error codes and troubleshooting steps.</p> |

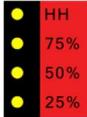
2.2 FINCH III Operator Interface

The FINCH III receives a continuous stream of information and alarm states from each connected TD100 transmitter in real-time. Volume alarm states and errors are shown on the display. Alarms can be configured to control relays and to signal or operate external devices for multiple options for fail-safe overfill prevention. The FINCH III can support up to 6 compartments.

Relays can be programmed to indicate Error, Spill and High-High alarms to external devices such as overfill prevention valves, lights, horns, and stationary loading controls. These relays can indicate a pre-set, increasing Fill or decreasing Fall level to warn of an approaching operator action while loading or unloading product.

FINCH III Indicators



| Indicator | Description |
|--|---|
| Compartment #  | <ul style="list-style-type: none"> The blue digit shows the currently selected compartment The digit automatically switches to any compartment that has any active alarms or errors (digit number is blinking when this occurs) |
| 5 Digit Display  | <ul style="list-style-type: none"> Shows volume readings, alarm messages, error codes, fill/fall settings, and calibration settings When a TD transmitter connection is not available, the display will show "----". |
| Level %  | LED lights that provide a quick visual indication of the percentage of the High-High (HH) volume of the currently selected compartment. |
| SPILL – ERROR  | <ul style="list-style-type: none"> This LED turns red and is lit up to indicate if there is a Spill alarm reached or when any Error codes appear on the FINCH display. These alarms are not acknowledgeable and require specific procedures to be followed. |
| RACK STATUS  | <p>The Rack Status option is configured when programming your system through Titan Install.</p> <p>If Rack Loading is NOT enabled:</p> <ul style="list-style-type: none"> LED Light Off: The system does not detect rack loading. <p>If Rack Loading IS enabled:</p> <ul style="list-style-type: none"> LED Light Green: Permit Status, no retained fluid detected and/or errors detected LED Light Red: Non-permit Status, Retain alarm is not acknowledged, error detected at the rack or with the Titan System, or the liquid level has reached the non-permit status in the compartment |

FINCH III Buttons



| Button | Description |
|---|--|
|  | Push this button to cycle through all the available compartments. When a compartment is selected, the 5-digit display and error/level LEDs will show information about the compartment. It is not possible to switch compartments if there is an active error alarm. The blue digit next to this button is the compartment number displayed. |
|  | The HORN MUTE button turns the HORN relay feature on and off. <ul style="list-style-type: none"> LED Light Red: when the HORN MUTE feature is enabled – the external horn will not go off, even if it is configured to based on a specific alarm. LED Light OFF: The Horn Mute feature is disabled, where an external horn will go off if this is configured. |
|  | The ACK button will clear any active alarms that can be acknowledged. Fall, Fill and High-High alarms are acknowledgeable. Once acknowledged the alarms are cleared, and any assigned relays will return to a non-alarming state. <p>All alarms (except for Spill and Error) can optionally be configured as acknowledgeable or locked until the alarm condition clears.</p> |
|  | The DIM/SLEEP LED blinks when the display is in sleep or display mode. This button adjusts the brightness level of the display as well as puts the display into sleep mode. The display has 3 brightness levels (max, medium, low) and sleep mode. <p>This button press will put the display to sleep mode after the lowest brightness setting. All acknowledgeable alarms must be cleared with the ACK button before entering sleep. Non-acknowledgeable alarms do not prevent sleep mode entrance. <ul style="list-style-type: none"> Cycles through high, medium, and low brightness as the button is pressed. If the brightness is LOW, pressing the button again will put the display into Sleep Mode. If the display is in Sleep Mode, pressing the button again will put the display into Active Mode at the highest brightness setting. The LED in the top right corner of the button will blink while in Sleep Mode. </p> |
|  | The ▲ arrow is used when setting the Fill alarm level and the Fall alarm. The Set Fill alarm mode is entered by pressing the ▲ arrow for longer than 2 seconds and then releasing. The display will flash "Fill" 3 times followed by the fill alarm volume. The volume can be adjusted by pressing the ▲ and ▼ arrows. If you hold down the button it will continuously increase the volume and after 5 seconds, it will increase in speed. <p>The Set Fall alarm mode is entered by pressing the ▼ arrow for longer than 2 seconds and then releasing. <ul style="list-style-type: none"> The ▲ arrow is used when setting the Fill alarm level. The ▼ arrow is used when setting the Fall alarm level. </p> |

2.3 Modes of Operation

The FINCH III Display has different modes of operation. The system will not allow the user to switch operating modes until all Acknowledgeable alarms have been acknowledged.

| Operation Mode | Description |
|-----------------------|---|
| Sleep Mode | <p>Sleep mode can be enabled by the operator so that all alarms are disabled, and the display remains inactive. While in sleep mode the Display DIM/SLEEP LED blinks, indicating that the alarm functions are disabled.</p> <p>Sleep mode can only be entered when all acknowledgeable alarms have been cleared, and then by pressing the DIM/SLEEP button from the lowest brightness setting. Active non-acknowledgeable alarms do not prevent sleep mode entrance.</p> <ul style="list-style-type: none"> • Blanks the display and ignores the alarms. • Press an arrow button to briefly wake the display. The display will go blank again after 30 seconds of no activity. • Entered by pressing the DIM SLEEP button when the display is in its lowest brightness setting. • Exit Sleep Mode by pressing the DIM SLEEP button. |
| Display Mode | <p>Display mode is entered by pressing the \blacktriangle or \blacktriangledown arrow button while in sleep mode.</p> <p>The display mode shows the current tank volume, as well as any unacknowledgeable error codes. The unit stays in Display Mode for 30 seconds before returning to Sleep Mode.</p> |
| Active Mode (Monitor) | <p>To enter Monitor Mode, the display enable signal must be active.</p> <p>The FINCH Display shows the current volume or “2 Lo”. Optional display of flashing “2Lo” and estimated volume is available.</p> <p>The Spill, High-High, Fill and Fall Alarms also remain active in this mode and will respond if the conditions are reached.</p> <ul style="list-style-type: none"> • Fully active mode that displays the tank's liquid level, alarms, and errors. • “2Lo” and estimated volume display • If there is a connection issue between the TD transmitter and the FINCH III, it will display five dashes “----”. • Active mode can be entered by pressing the DIM SLEEP button while in Sleep Mode. |

2.4 System Alarms

The Titan Logix system has several alarms and alerts that will respond to various liquid levels within the tank.

SPILL Alarm



This alarm may be adjusted using Titan Install App. The maximum volume for the Spill alarm is a safety feature that is set at factory and cannot be altered. This alarm may be assigned to relays. If the Spill Alarm level is reached, the FINCH III Display flashes “Spill” and the last known volume; any relays assigned to the Spill alarm will respond.

- Triggered when the liquid reaches the spill level.
- Display flashes “SPILL” until the level is reduced.
- Unable to clear this alarm by pressing the ACK button.
- Important: Do not turn off the unit while unloading, or the alarm may not reset.

Alarm Configuration:

Determined based on Probe type.

HH Alarm



The High-High alarm (HH) is set when programming the system using Titan Install.

This alarm may be assigned to the relays. When the HH alarm is triggered, the assigned relays are activated, and the display alternately flashes the current volume and "HH".

To acknowledge the alarm, press the ACK button. If the Fill or Fall alarm and the High-High alarms are triggered at the same time, they can both be acknowledged at the same time by pressing the ACK button.

- Signals the tank is at maximum safe capacity.
- The default level is 2.0" below SPILL. HH can be moved as high as 0.5" below the Spill level.
- Can clear this alarm by pressing the ACK button.

Alarm Configuration:

Set during installation or programming.

Fill Alarm



The FILL alarm can be set using Titan Install or the FINCH III display.

The Fill alarm volume can be used in filling the tank to a predetermined level and can be assigned to a specific relay. When the Fill volume is reached, the alarm is triggered, and the assigned relays are activated. The alarm will continue until it is acknowledged by pressing the ACK button.

Note:

The Fill alarm is factory-set to the HH alarm volume.

- Set to warn about filling to certain levels.
- Can clear this alarm by pressing the ACK button.

Alarm Configuration:

The FILL alarm can be set using Titan Install or the FINCH III display.

Using FINCH Display:

- Press and hold ▲ for a few seconds and then release the button. After releasing, "Fill" should flash on the display.
- After a few seconds the display will show the current Fill alarm setting.
- Use the ▲ or ▼ button to adjust the Fill alarm to the desired level.
- If you are unable to adjust the Fill alarm from the display, this option has been disabled by your administrator.

Fall Alarm

The Fall alarm can be set using Titan Install or the FINCH III display.

The Fall alarm volumes can be used in filling or draining the tank to a predetermined level and can be assigned to a specific relay. When the Fill or Fall volume is reached, the alarm is triggered, and the assigned relays are activated. The alarm will continue until it is acknowledged by momentarily pressing the ACK button.

Note:

The Fall alarm is factory-set to 0. If a value below 2Lo is set, the alarm will not be triggered. The Fill and Fall alarm settings are set independently on each compartment.

- Set to warn about unloading to certain levels.
- Can clear this alarm by pressing the ACK button.

Alarm Configuration:

The Fall alarm can be set using Titan Install or the FINCH III display.

- Press and hold ▼ for a few seconds and then release the button. After releasing, “Fall” should flash on the display.
- After a few seconds the display will show the current Fall alarm setting.
- Use the ▲ or ▼ button to adjust the Fall alarm to the desired level.
- If you are unable to adjust the Fall alarm from the display, this option has been disabled by your administrator.

Retain Alarm



- ONLY available with ClearView probe
- Set to warn about possible retained liquid in the tank.
- Can clear this alarm by pressing the ACK button.
- After Retain alarm has been acknowledged, the display will show the volume

Retain is an optional alarm that can ONLY be used with the ClearView probe. This is enabled during the programming process. When the retain alarm is active it will prevent rack loading.

Alarm Configuration:

This is during installation or programming.

2Lo



The FINCH Display can show the low level within the bottom dead band by flashing “2 Lo” and the estimated volume. The FINCH Display shows estimated tank volume to the top of the shorting block (2 ½” minimum from the bottom of the tank).

Note:

The readings within the bottom dead band are an estimate only.

NOTE:

If 2Lo appears when the compartment is equipped with the ClearView probe, it indicates that the tank is empty or that the liquid level is below the probe.

Error



The Error alarm indicates a system error. This alarm can be assigned to the relays and is combined with the SPILL alarm. This alarm will activate the relays when an error occurs on the transmitter or the display. When the cause of the error is resolved, the alarm resets. Since this alarm is self-resetting, no acknowledgment is required for this alarm.

- Signals communication or system errors.
- Automatically cleared when the issue is resolved.
- Unable to clear this alarm by pressing the ACK button.

3 FINCH III CALIBRATION

The TD100 Transmitter calibration process is only required to be completed one time, which is after the transmitter is first installed. This would also be required if the transmitter is replaced with a new one or the same transmitter is reprogrammed.

| | |
|---|--|
|  | <p>NOTE</p> <p>The manual calibration setting is lost each time the transmitter is re-programmed.</p> |
|---|--|

The calibration compensates for small differences between the programmed Offset Measurement and the actual probe height above the top of the tank. The Spill alarm level and High High alarm volume are not affected by calibration. Calibration does adjust the calculated volume that is determined from the actual liquid level in the tank. That adjustment in turn shifts the High High alarm's distance from the bottom of the tank.

Additional adjustments are **not** required again while the TD100 Transmitter is in service if it is properly installed and configured.

If a large manual calibration is required to achieve accurate measurement, it may be an indication of an installation error and requires servicing. It is recommended for the installer to verify the accuracy of the strapping table, mounting details, and verify if the correct strapping table is programmed on the correct transmitter. You are able to calibrate your system through Titan Install or through the FINCH III display.

Manual Calibration Process

Ensure the tank is completely level prior to completing these steps.

1. Fill the tank with a known quantity of fluid in that compartment, approximately 1/2 to 2/3 full.
2. Note that reported volume. This must be less than the SPILL alarm level.
3. Determine the volume with a flow meter (ensure that the flow meter is accurate and has been properly calibrated)
4. If manual calibration is required, complete the steps through:
 - **Titan Install mobile app:** Refer to the Titan Install Guide for these steps.
 - **FINCH III Display:** Complete the following steps.
5. Select the compartment to be calibrated on the FINCH III display.
6. Press and hold the following four buttons **simultaneously**: COMP SELECT, HORN MUTE, ACK, DIM SLEEP
7. Continue to hold down the four buttons until the display flashes "CAL". Then release the buttons.

| | |
|---|---|
|  | <p>NOTE</p> <p>Alternately, the FINCH III can enter Calibration mode by holding either ▲ or ▼ arrow while applying power to the display.</p> |
|---|---|



8. The unit will then show the current volume of liquid in the tank.
9. Adjust the displayed volume to match the preferred volume by pressing the ▲ or ▼ arrow until the displayed value is correct.
10. Power off your Titan System.
11. Power on the Titan System without holding any buttons on the FINCH III display.

12. Verify that the display matches the actual volume.

Updating Strapping Table

When calibrating the volume in the table lower, the volume will be limited by the highest allowable High-High alarm setting.

e.g. If the table has HH set to 0.5" below Spill, it will not be possible to shift the table lower during calibration. In this instance, the only solution is to edit the strapping table.

Correcting the strapping table requires the following steps:

- Review the tank or compartment depth chart for correct information.
- Confirm probe mounting details (tank depth, probe mounting height, riser height, sump depth)
- Program the transmitter with the correct information.
- Once the display is reading accurately, the FINCH III must be turned off and restarted for normal operation.

Also, stating to edit the strapping table is incorrect. The cause is usually incorrect measurements, programming error or the wrong calibration chart.

| | |
|---|--|
|  | NOTE When calibrating the volume in the table lower, the volume will be limited by the highest allowable High-High alarm setting. If the table has HH set to 0.5" below Spill, it will not be possible to shift the table lower during calibration. In this instance, the only solution is to edit the strapping table. |
|---|--|

4 ERROR CODES & TROUBLESHOOTING



The FINCH III will display error codes when an issue is detected with the system. The Error alarm indicates a system error. This alarm can be assigned to the relays and is combined with the SPILL alarm. This alarm will activate the relays when an error occurs on the transmitter or the display. When the cause of the error is resolved, the alarm resets. Since this alarm is self-resetting, no acknowledgment is required for this alarm.

- Signals communication or system errors.
- Automatically cleared when the issue is resolved.
- Unable to clear this alarm by pressing the ACK button.

4.1 FINCH III Error Codes

The errors listed below indicate an issue with the FINCH III.

| Error Code | Definition | Resolution |
|-------------------------|---|---|
| ----- (dashed lines) | Communication error between the TD100 Transmitter and FINCH display | Review the wiring to ensure that the wires are in the correct order |
| E0500 | Secondary FINCH III not detected | |
| E0705 | Incorrect configuration settings | Check your Fill or Fall alarm levels. Check if your relay mapping is correct. |
| E0781 | Issue with Relay 1 | Pump control relay issues. |
| E0782 | Issue with Relay 2 | Light control relay issues. |
| E0783 | Issue with Relay 3 | Horn control relay issues. |
| E0784 | Issue with Rack Control | |
| E0801 | System initialization failure | Cycle the power to the FINCH III |
| E0802 | Input voltage too low | Use a digital multimeter to check the voltage. Ensure it is greater than 8V. Look for corroded wire connections where the power cable connects. Note: The E0802 error code may be accompanied by other codes such as the E0780 . There may be multiple errors happening as a result of low or unstable power. |
| E0803 | Input voltage too high | Use a digital multimeter to check the voltage. Ensure it is less than 30V. Look for wire connection issues along the input power |

| Error Code | Definition | Resolution |
|------------|--------------|--|
| E0804 | System reset | Cycle the power to the FINCH display. Check to see if the FINCH firmware is the latest version. |

4.2 TD100 Transmitter Error Codes

The FINCH III will also display errors found with the TD100 transmitter.

| Error Code | Definition | Resolution |
|--------------|--|---|
| E0001 | Internal measurement / transmitter error too much turbulence | Move probe to less turbulent area of the tank Note: If this doesn't resolve the issue, you will need to replace your transmitter. |
| E0010 | Internal measurement / transmitter error | Update the Transmitter's Firmware . If this doesn't resolve the issue, there may be water inside your transmitter that causes it to fail. If this is the case, you will need to replace or repair the transmitter. |
| E0020 | Probe and/or transmitter connection issue | |
| E0080 | Strapping chart issue – HH alarm set to close to spill level | |
| E0081/ NOSTB | Strapping table not found on transmitter | |
| E0082 | Strapping chart issue – invalid strapping chart on startup | |
| E0083 | Strapping chart issue – invalid strapping chart during operation | |
| E0084 | Strapping chart issue – invalid strapping chart during run time | |
| E0092 | Probe and/or transmitter connection issue | Check if the shorting block is correctly installed on the probe Check if your probe is longer than the strapping table Note: This error will appear if you are connecting the transmitter right to the FINCH (without the probe) for testing purposes. |
| E0093 | Outdated transmitter firmware version and measurement error | Update the TD100 firmware to the latest version. Check probe and transmitter for damage |
| E0095 | Memory failure on transmitter | |
| E0096 | Memory failure on transmitter | |
| E0097 | Memory failure on transmitter | |
| E0098 | Memory failure on transmitter | |

| Error Code | Definition | Resolution |
|------------|---|--|
| E0800 | Communication timeout | Inspect and fix the wiring connection between the transmitter and the FINCH. Note: If this doesn't resolve the issue, you will need to replace or repair your transmitter. |
| E0901 | No transmitters found | |
| E0902 | Incomplete transmitter configuration | |
| E0903 | Communication error | |
| E0904 | Incompatible transmitter connected | |
| E0905 | Transmitter disconnected | |
| E1111 | Issue supplying power to the transmitter(s) | |

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