BINTRAC®

Bin Weighing System Troubleshooting Guide

HerdStar®

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Overview

This guide covers the trouble shooting of the BinTrac system. Anyone responsible for programming and operating the BinTrac system should also read the BinTrac Installation and BinTrac Operator's Manual.

This symbol means the text has extra importance since it is describing the importance of a feature or explaining a step to which you should pay close attention to avoid problems, or to which safety is a concern.

Components

A BinTrac system consists of a number of basic components:

BinTrac Indicator

This is the main unit of the BinTrac system. The BinTrac Indicator communicates with the Smart Summing Boxes to register the weight of feed in the bins. The feed level is computed and displayed on the LED bar graph. One bin indicator can display up to four feed bins.

Load Cell Bracket

Four or more load cell brackets allow the BinTrac Monitor to accurately measure the feed level in your bins. The Smart Summing Box averages the signals from all brackets to minimize errors that could result from voids (holes) in the feed.

Smart Summing Box

The Smart Summing Box sums the readings of the loadcells connected to it and communicates this summed value to the BinTrac Indicator. The Smart Summing Box has built in surge and lightning protection for the loadcells at the expense of itself.

BinTrac Power Supply

This provides the power for the BinTrac system. The power supply converts the line voltage to 12VDC.

Remote Radio

A Remote Radio connects to a BinTrac Indicator. It provides wireless communications for a local HerdStar Area Network between the BinTrac Indicator and a Communications Hub.

Base Radio

A Base Radio connects to a Communications Hub. It provides wireless communications for a local HerdStar Area Network between the Communications Hub and Remote Radios.

Communications Hub

A Communications Hub connects the on-site communications service (Dialup, DSL, or Cellular) to the local HerdStar Network allowing BinTrac Indicators to be remotely monitored.

BinTrac Remote Display

A BinTrac Remote Display is a standard BinTrac Indicator configured as a Remote Display. A hardwire cable must connect the Remote display to the BinTrac Indicator.

RS-232 Interface

A RS-232 interface converts HerdStar's proprietary communications interface to a commonly used RS-232. This provides a means for a PC or other serial type device to interface with the BinTrac System.

Identifying Problem

Clearly identify the device causing a problem before replacement of parts.

- Is BinTrac Indicator blank?
- Is the BinTrac Indicator displaying an inaccurate weight reading?
- Is the BinTrac Indicator displaying an Error message?
- Is the BinTrac Indicator not reporting BinLink or BinTrac.com?
- Is the Site not reporting to BinLink or BinTrac.com?

BinTrac Indicator Blank

BinTrac Indicator weight display and tank level indicators are all off. This can be caused by loss of power to the unit, disconnected or broken wires, or damaged equipment.

- Reset Problem
  - A brown out condition can sometimes cause a problem with reset and startup of an Indicator. Disconnect power to the devices with 20 seconds delay before reapplying the power.
- Loss of Power
  - Inspect the electrical outlet for the BinTrac Power Supply. Ensure it is making a good electrical connection.
  - Verify the breaker or GFI for the electrical outlet is not tripped.
- Measure Input Voltage from BinTrac Power Supply
  - Disconnect +12 and -12 PWR wires within BinTrac Indicator and measure input power. Input power should read between 11.5 to 12.5 VDC. If no voltage is detected, BinTrac Power Supply may be defective.
- Inspect all cabling between power supply, indicator, and smart summing boxes to make sure it has not been damaged.
- Disconnect components until defective component is located that is shorting power.
  - Disconnect Smart Summing Boxes and cycle power
  - A damaged BinTrac Indicator Disconnect +12 and -12 PWR connects in BinTrac Indicator and measure Smart Summing Boxes Verify the electrical outlet the BinTrac Power Supply is plugged into is in good condition.

Inaccurate Weight Readings

Inaccurate weight readings, large fluctuating readings, weight not changing, or “Error” message, can be caused by obstructions and binding, incorrect user programmed settings, a problem within the Smart Summing Box, or a problem with a loadcell.

Binding and Obstructions

Slow weight shifts or not returning to zero is frequently symptoms of a binding or obstruction problem.

- *Check for binding of brackets and/or bin legs. Ensure there is approximately ¼” clearance between the leg and the bracket.*

- *Check for loose bolts. Inspect bolts connecting bracket to bin leg and C-Channel to loadcell.*
- *Check for material under the bin leg. Small rocks between the bin leg and the concrete can cause inaccurate readings.*

Incorrect user programmed settings

Scale appears to be functioning properly although weight readings are not correct can be the result of incorrect user programmed settings.

- *Confirm Rated Output – should match the average Output recorded on each loadcell.*
- *Confirm Capacity – equals the total capacity of all loadcell summed together.*
- *Confirm Zero – bin may have been zeroed when not empty.*

Smart Summing Box

Small fluctuations in weight can be caused by a problem with the Smart Summing Box.

- *Inspect for moisture and or foreign material.*
- *Inspect for loose wires and connections.*

Loadcell

Wild fluctuating weights, or a weight that does not change, or a negative weight reading, or "Error" are common indications of a loadcell problem.

- *Inspect loadcell connections within Smart Summing Box. A wire that is not seated properly within the loadcell connector can cause misreadings.*
- *Check for cut or pinched loadcell wires.*
- *See "**Loadcell Troubleshooting Procedures**"*

BinTrac Error Messages

no.bin

This error message indicates that the BinTrac Indicator is not communicating with the Smart Summing Box of the indicated bin.

- *Disable bins that do not have an associated Smart Summing Box and bin.*
- *Verify wiring between Smart Summing Box and BinTrac Indicator is correct and has not been damaged.*
- *Verify Smart Summing Box has been programmed as the correct bin.*
    - *Verify Smart Summing Box dip switch settings are set for their selected bin (A,B,C,or D).*
    - *Verify that two Smart Summing Boxes are not programmed as the same bin as this will cause no.bin error for both.*
- *Inspect Smart Summing Box for flashing light.*
    - *A steady flashing light indicates the Smart Summing Box has power and is operating correctly.*
    - *An irregular flashing light indicates the Smart Summing Box has power but is unable to communicate with the BinTrac Indicator.*
        - *Confirm all wires are tight and secure.*
        - *Confirm dipswitches are set correctly.*
        - *Communications port on Summing Box or BinTrac Indicator may have been damaged.*
            - *If BinTrac Indicator is displaying no.bin for other connected bins, replace indicator.*
            - *Replace summing box*
    - *No Light indicates the Smart Summing Box does not have adequate power or has been damaged.*
        - *Confirm all wires are tight and secure.*
        - *Verify 12VDC is available to the Smart Summing Box.*
        - *Locate a shorted loadcell that could be shorting power within Smart Summing Box.*
- *If more than a single bin is displaying no.bin, isolate the problem Smart Summing Box by removing all connects except to a single Smart Summing Box.*

Error

This error message indicates the weight reading exceeds the five digit display. This can be caused by invalid programmed settings, a loadcell not correctly plugged into a connector in the Smart Summing Box, a defective loadcell causing a large weight reading, or a defective Smart Summing Box.

- *Confirm all programmed settings are correct*
    - *Verify Zero is valid and in-range. A large incorrect zero can cause this.*
    - *Verify Capacity has been correctly programmed.*
- *Open summing box and inspect loadcell connections.*
    - *Verify connector is properly aligned with its associated header.*
    - *Verify wires are properly seated in each connector.*
- *Confirm Summing Box is clean and dry. Long-term moisture in a Summing Box can cause inaccurate readings.*

- *Check Loadcells See **"Loadcell Troubleshooting Procedures"***

o-LoAd

This error message indicates the weight reading of the bin exceeds 150% of its rated capacity.

- *Check for binding of brackets*
- *Bin has been overloaded, remove material from bin and inspect for yielding.*

no.con

This error message indicates that this device has been programmed as a Remote Display device and is unable to communicate with the BinTrac Indicator.

- *Verify that this indicator is intended to be a Remote Display as configured in Setup Configuration. This error message more often appears when a Bin Indicator was accidently programmed as a Remote Display unit.*
- *Verify wiring is correct between BinTrac Indicator and BinTrac Remote Display.*

no.PUL

This error message indicates that the BinTrac Indicator has been programmed for a PULSE output and is unable to communicate with the HouseLink WP.

- *If this system does not have a HouseLink WP, set the programmable PULSE parameter within the "Intr" configuration settings to "0" for disabling this feature.*
- *Verify HouseLink WP configuration dipswitches are properly set.*
- *Inspect wiring between BinTrac Indicator and HouseLink WP and other Smart Summing Boxes are correct.*

BinTrac Indicator Not Reporting to BinLink or BinTrac.com

BinTrac Indicator logs and records information that is reported back to BinLink or BinTrac.com when a communications connection is made through a connection service (phone line, internet, or cellular). This service is assumed good if other devices on this site are reporting. If no device is reporting at a site, see "Site Not Reporting to BinLink or BinTrac.com". Check the following for a BinTrac Indicator device not reporting:

BinTrac Indicator Settings

- Verify BinTrac Indicator is powered and functioning.
- Verify BinTrac Indicator has not been replaced and new serial number has not been reported to BinTrac technical support for data collection.
- Verify all BinTrac Indicators have unique Station IDs. If any two have the same Station ID, one or both may not report.
- Verify all BinTrac Indicators have not been setup for Data Broadcast mode.
- Is BinTrac Indicator displaying an out of range weight or "Error" message. A reading that is out of range, will appear as not reporting on BinTrac.com. See causes for Inaccurate Weight and "Error" message.

Remote Radio Communications Connections

- Verify Remote Radio is powered and In-Range light is annunciated.
    - If power light is not lit, check wiring and connection.
    - If In-Range light is not lit for all Remote Radios, verify Base Radio has power and is functioning.
- Verify poor communications is not caused by interference with Radios from another site.
    - Disconnect site Base Radio.

- Inspect all Remote Radios. If IN-Range light is annunciated, disconnect power and change radio channel number. Reapply power and repeat if IN-Range light is still lit. Once a unused channel is found, change all site radios to the same channel number.
- Verify wiring and connections are correct and good between BinTrac Indicator and Remote Radio.

Hardwired Communications Connections

- Verify proper wiring connections, wire gauge size (18awg for long runs), and maximum length (1000ft).
- Identify possible defective BinTrac Indicator. One Indicator can corrupt communications with all other Indicators. Disconnect all but one BinTrac Indicator and verify connection. Disconnect and connect next BinTrac Indicator and verify connection. Repeat for remaining Indicators.

Site Not Reporting to BinLink or BinTrac.com

Only when “no” BinTrac Indicator devices are reporting to BinLink or BinTrac.com would site communications normally be checked. If any BinTrac Indicator devices are reporting see “BinTrac Indicator Not Reporting to BinLink” or “BinTrac.com.”

- Check CommHub
  - Verify CommHub has power.
  - Cycle power on CommHub and wait 4 minutes before checking communications. CommHub scans for all connected devices on power-up which can take up to 4 minutes. During this time a connected Base Radio Transmit light will flicker.
- Verify Base Radio power light is annunciated.
- Check Site Communications
  - Check Phone Line
    - If phone line selector is being used, verify Stick has power and phone line is properly connected.
    - Verify phone line has dial-tone if phone is available.
    - Dial site number followed by *4 after line starts ringing if phone line selector (Stick) is used and verify CommHub picks up the line.
  - Check Cellular Unit
  - Check Internet

Loadcell Troubleshooting Procedures

The procedures below outline the steps for identifying and locating a defective loadcell. Procedure 1 is most commonly used and quickest, although Procedure 2 can be used for better analysis and for determining even loading across all loadcells.

1. Check for cut loadcell cables.
2. Check connections in Smart Summing Box.
3. Check for debris under bin legs.
4. Check for binding between bracket and bin legs.

Procedure 1: Quick Loadcell Inspection

1. Record/Note Current Weight Reading on BinTrac Indicator.
2. Disconnect a single loadcell from Smart Summing Box.
3. Observe for change in weight display. If weight change is significant and/or more stable, note this loadcell as possible defect.
4. Reconnect loadcell if symptoms did not change.
5. Repeat for remaining loadcells.
6. Replace loadcell that when disconnected provides the most accurate reading or proceed to Comprehensive Loadcell Inspection Procedure.

Note: If a defective loadcell is located, by unplugging it, the scale system will continue to function until time is available to replace the defective loadcell.

Procedure 2: Comprehensive Loadcell Inspection

1. Record/Note Current Weight Reading on BinTrac Indicator
2. Disconnect all but number one loadcell within Smart Summing Box.
3. Record weight reading.
4. Disconnect loadcell and connect next loadcell and repeat for all remaining loadcells.
5. Review weight readings.
6. Variations in readings can be caused by offset loading within bin, improper lifting screw tension.
    a. Inspect loading within bin matches loadcell reading variations.
    b. Examine bracket assembly and lifting screw tension.
        i. If reading is low and others beside it are high, tighten screw slightly.
        ii. If reading is high and others beside it are low, loosen screw slightly.
        iii. If reading is out of range, replace loadcell.
        iv. Repeat individual readings inspection and adjustments return to Step 2.
7. Reconnect all loadcells except for known defective one.
8. Repeat procedure if weight reading is not accurate.

Note: If a defective loadcell is located, by unplugging it, the scale system will continue to function until time is available to replace the defective loadcell.

Loadcell Replacement Procedure

Preparation:

1. Identify defective loadcell
2. Trace defective loadcell cable back to summing box and mark strainrelief.
3. Open Summing Box and unplug defective loadcell.
4. Verify weight reading is corrected with loadcell unplugged.
5. Temporarily plug replacement loadcell into recently removed loadcell connector.
6. Weight reading may be shifted depending on the weight within the bin, but still should be a displayable reading.
7. Unplug replacement loadcell and proceed to loadcell removal.

Loadcell Removal:

1. Place shims under defective loadcell bin leg.
2. Free loadcell cable from bracket and bin leg cutting cable ties.
3. Disconnect loadcell from within Summing Box if not done within Preparation.
4. Remove inside nut of cable liquid-tight strain relief.
5. Remove loadcell cable including liquid-tight strain relief from summing box.
6. Mark Position of A-Frame Lifting Bolt with marker.
7. Count and record the number of turns needed to remove lifting bolt from top of loadcell.
8. Remove bolts connecting C-Channel to bin leg.
9. Remove Loadcell and C-Channel Assembly from A-Frame bracket.
10. Remove bolt connecting C-Channel to Loadcell. Locktite has been used on this bolt which may require extra force in its removal.

Replacement:

1. Thread Loadcell cable through the left (viewing from the front) A-Frame slotted bracket opening and route with other cables up to Summing Box.
2. Remove mounting nut from liquid-tight strain relief and separate it from the cable, removing it over the loadcell connector plug.
3. Place loadcell connector plug through enclosure opening and place liquid-tight mounting nut back over plug and tighten.
4. Plug Loadcell into Summing Box and verify readings are not out of range as was done in Preparation.
5. Partially thread C-Channel bolt through C-Channel into loadcell .
6. Apply Locktite to C-Channel bolt.
7. Continue threading C-Channel bolt until end of bolt is flush with inside opening of loadcell (just fully treaded).
8. Place Loadcell C-Channel Assembly into A-Frame bracket.
9. Bolt legs to C-Channel making sure nuts have been securely tightened.
10. Thread Lifting Bolt into top of Loadcell tightening the same number of turns as when removed. As loadcell begins carrying weight, loadcell may want to turn.
11. A block may be required to prevent loadcell from turning and pinching cable against bracket.
12. Verify weight is correct.
13. Remove shims from under bin leg.
14. Make a drip loop on the outside of the A-Frame bracket slotted opening with the loadcell cable.
15. Using cable ties, tie remaining loadcell cable to bin leg and other cables.

BinTrac Indicator Replacement Procedure

1. Record Old Indicator Settings: (Press and hold BIN key until "Setup" appears. Press Down  Arrow key until the desired parameter is displayed and then press Bin key again to view.)
    a. Enabled Bins: _____ (Enabled bins are solid on, disabled are flashing)
    b. Station Id: _____

	Bin A	Bin B	Bin C	Bin D
Rated				
Capacity				
Full				
Zero				

2. Remove Power from Old Indicator
3. Replace BinTrac Indicator
4. Program new BinTrac Indicator with information as recorded in step 1.
5. If unit is connected to BinTrac.com, contact HerdStar with the new BinTrac Indicators Serial Number to ensure data collection is not interrupted.

Reset BinTrac Indicator Procedure

1. Record Indicator Settings: (Press and hold BIN key until "Setup" appears. Press Down  Arrow key until the desired parameter is displayed and then press Bin key again to view.)
    a. Enabled Bins: _____ (Enabled bins are solid on, disabled are flashing)
    b. Station Id: _____

	Bin A	Bin B	Bin C	Bin D
Rated				
Capacity				
Full				
Zero				

2. Remove Power from BinTrac Indicator.
3. Wait 20 seconds.
4. Press and hold both Up  and Down  Arrow keys when reapplying power.
5. Verify unit has reset if all Bins are enabled and all set to defaults 60,000 Capacity, 60,000 Full.
6. Repeat starting at step 2 if unit did not reset properly.
7. Enter recorded information and unit will be back to normal operation.