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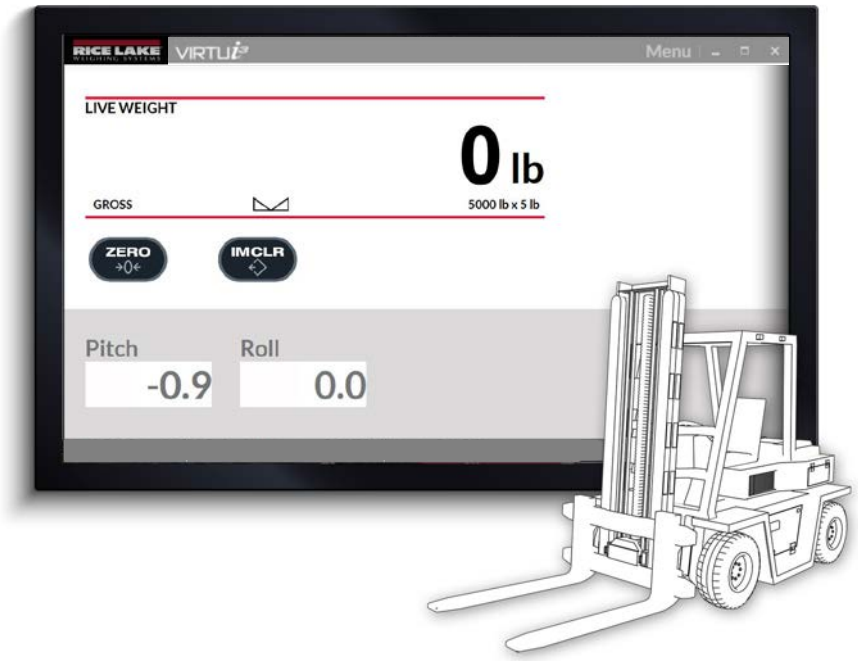
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VIRTUi®3 for Windows®

Forklift Scale PC Program

Technical Manual



November 24, 2020

RICE LAKE WEIGHING SYSTEMS

PN 192745 Rev C

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1.0 Introduction

VIRTUi®3 for Windows® provides a user interface for the CLS forklift scale. It is a virtual indicator utilizing a device that may already be present in an application. VIRTUi3 provides the user access to weight indication, calibration, configuration and diagnostics all in one package. This manual will aid in the installation of the software in addition to understanding all of the utilities.

Manuals and additional resources are available from the Rice Lake Weighing Systems website at www.ricelake.com

Warranty information can be found on the website at www.ricelake.com/warranties

1.1 Overview

The VIRTUi3 PC program is used to interface with the Rice Lake Weighing Systems' CLS Series junction box. It is used to display weight information, calibrate, configure and get real time diagnostics.

A Windows PC VIRTUi3 server runs in the background and communicates with a CLS Series junction box. Its primary function is to support the VIRTUi3 client application along with having the ability to send EDP commands for printing tickets and reports.

1.1.1 Features

- Virtual indicator: Field streams live weight or final "capture in motion" weight depending on scale configuration
- Zero key, print key (static and in-motion modes), in-motion clear key (in-motion mode)
- Pitch and roll angles displayed
- Visual step-by-step calibration procedure
- Testing and diagnostics menu for field testing
- Emulates command/response format of the CLS protocol from the junction box
- Available EDP command server for customer use

1.1.2 System Requirements

- Windows 8.1*, Windows 10* or equivalent Windows Server operating system
- 1.6 GHz processor or faster
- 100 MB HD space needed for installation
- Microsoft.NET framework 4.6.2 (included with installer)
- 8 GB ram or greater
- 1 available serial port connection to digital weight indicators
- Optional printer

Note ***Supports both 32 bit and 64 bit versions.***

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2.0 Installation

The following sections describe installation procedures for VIRTUi3.

2.1 Server Installation

The VIRTUi3 server runs in the background and communicates with the CLS forklift junction box. The server streams weight data through an applicable port and has the ability to process some EDP commands.

1. Place the disc into the PC or navigate to the location where the downloaded zipped files are unzipped before running.
2. Open the installation folder.
3. Double click ***VIRTUI3.Server.Installer.exe***. This places all of the required prerequisites on the system. The following installation screen displays.

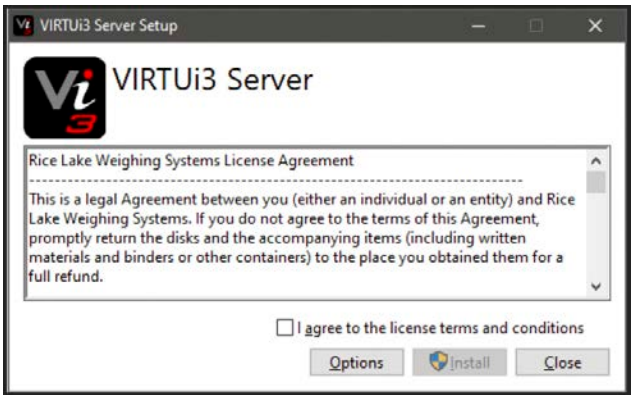


Figure 2-1. VIRTUi3 Server Installation Screen

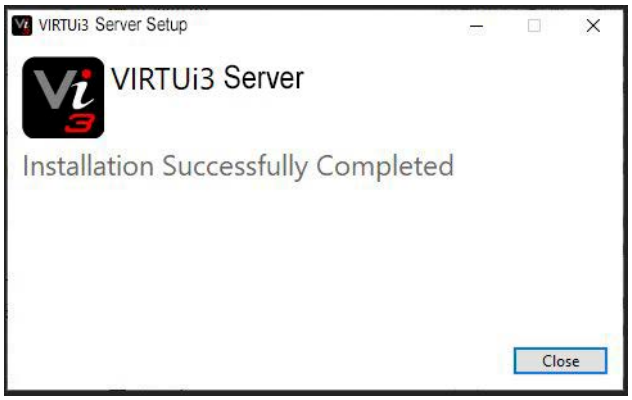


Figure 2-2. VIRTUi3 Server Installation Confirmation Screen

Once installed, the VIRTUi3 server creates the following services:

- Web server on ***port 9015*** used by VIRTUi3 client application
- Single frame server on ***port 30355***
- Stream frame server on ***port 30356***
- Print ability using configured ***port 10000***

IMPORTANT ***Ensure listed ports are not being used by other services and/or blocked by firewalls.***

2.2 Client Installation

The VIRTUi^3 client displays live data when connected and configured to the junction box.

1. Place the disc into the PC or navigate to the location where the downloaded files were unzipped.
2. Open the installation folder.
3. Double click ***VIRTUI3.Client.Installer.exe***. This places all of the required prerequisites on the system. The following installation screen displays.

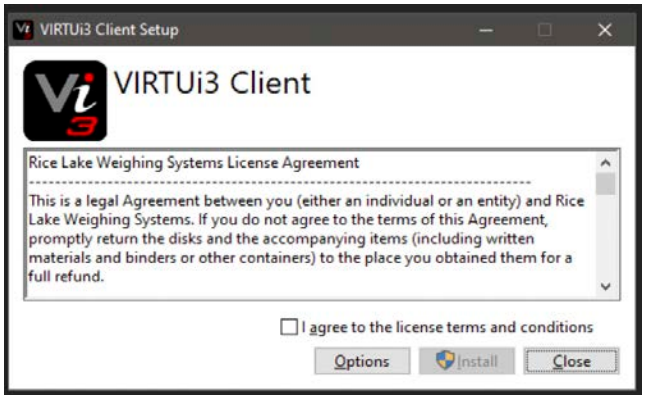


Figure 2-3. VIRTUi^3 Client Installation Screen

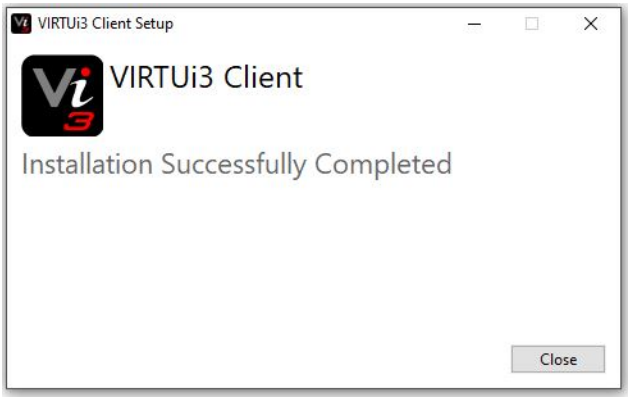


Figure 2-4. VIRTUi^3 Client Installation Confirmation Screen

2.3 Junction Box Serial Port Configuration

The junction box port type must be set to **CMD**.

Note ***Ensure ECHO is set to OFF.***

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3.0 Operation

This section describes the user interface of the VIRTUi3 client, once installed and fully configured.

3.1 VIRTUi3 User Interface

Launch the VIRTUi3 client application to display the forklift scale user interface (shown in Figure 3-1).

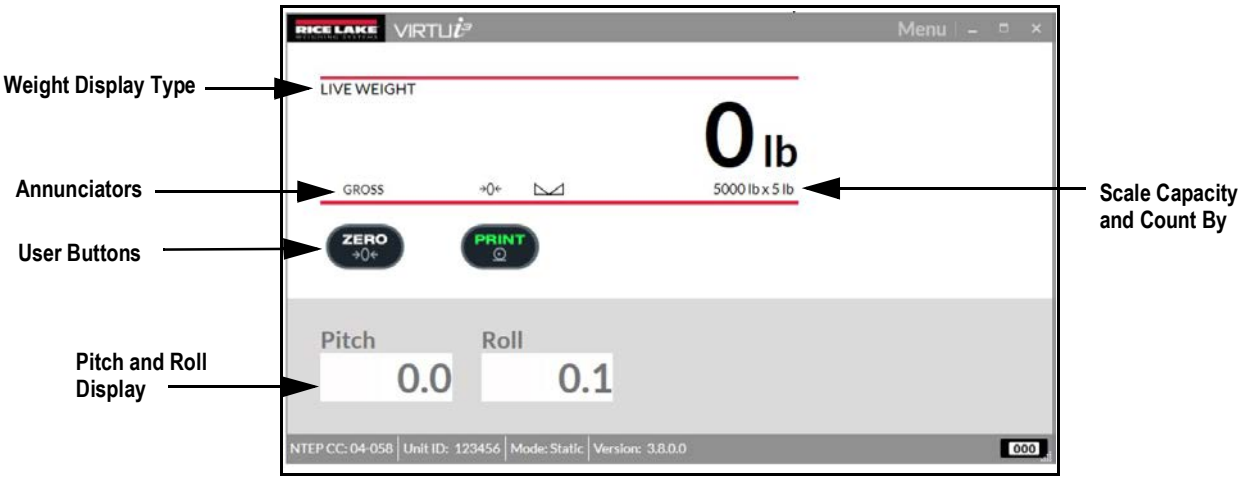


Figure 3-1. VIRTUi3 Main Screen for Static

The user interface is divided into three areas:

- Weight display area
- User buttons
- Pitch and roll angles

Live data displays when connected to the junction box.

The additional ribbon at the bottom of the screen displays the version number, the current mode distinguishes if the user interface is in static mode or in-motion and the unit ID number which is entered during the calibration process (Section 5.0 on page 13).

3.1.1 Weight Display

The weight display area displays either live weight or final weight and is distinguished by a prompt in the top left corner of the display area. A valid weight is represented as ***+/-999999***. An invalid weight displays as ***Invalid***. Various other scale error state conditions are represented in the weight display area.

Annunciators

Annunciators indicate live weight, final weight, gross mode, net mode, center of zero, stability and angle condition.

Scale Capacity and Count By

The capacity and count by is displayed in the bottom right corner of the weight display area.

3.1.2 User Buttons

User buttons perform the following scale functions:

- 

- zeros the scale
- 

- recaptures the final weight (in-motion mode only)
- 

- prints the ticket

3.1.3 Diagnostic Event

A ***Diagnostic Cell Overload Event*** condition displays when a diagnostic event is triggered in the junction box. See Section 6.0 on page 23 for more information.

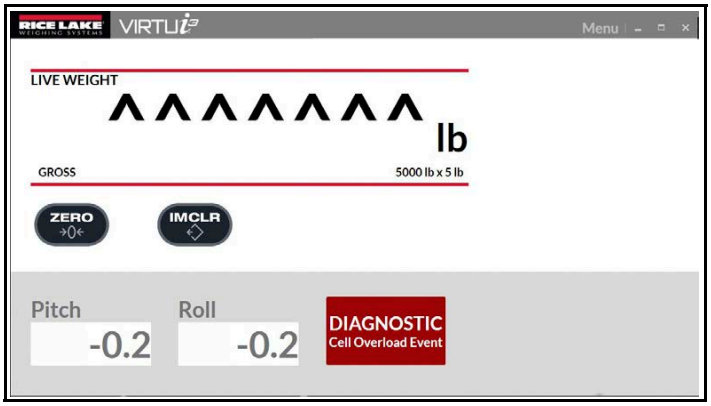


Figure 3-2. Diagnostic Event Message

3.1.4 Pitch and Roll Display

The pitch and roll display area shows the live pitch and roll angle data received from the junction box. A valid angle data is represented as **+/-99.9**.

Calibrating the pitch and roll is explained in Section 5.0 on page 13.

3.2 VIRTUi^3 Mini for Static Mode

Click on the highlighted button on the bottom right hand side of the user interface to launch the VIRTUi^3 Mini which can satisfy Legal for Trade NTEP requirements. This enables the operator to run other applications while still being able to display live weight information.



Figure 3-3. Launch VIRTUi^3 Mini By Pressing on Highlighted Button

The following display of the VIRTUi^3 Mini for static mode is re-sizable.

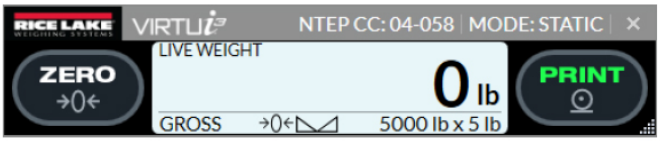


Figure 3-4. Mini Display for Static Mode

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3.3 VIRTUi3 Mini for In-motion Mode

The VIRTUi3 mini indicator supports the in-motion forklift scale and shows the following user interface when launched with the junction box setup for an in-motion forklift scale. The following are examples of how the VIRTUi3 Mini looks on different size displays and can be resized to a predetermined minimum and maximum height and width.



Note

The resizing icon allows the user to adjust the live weight display by pulling the display to the preferred size.

Figure 3-5. Live Weight Display Examples

3.4 Ticket Printing

Printing a weigh ticket is only supported when the user interface displays the PRINT key. A printout can be initiated by pressing the **Print** key. The key will turn green to assist the operator in determining if the current weight information will result in a print transaction. Configure the printer port by modifying the Printer Communications settings in the options menu.

4.0 Menu Choices

Various parameters can be accessed by clicking on **Menu** located in the application tool bar.



Figure 4-1. Menu Tool Bar Location

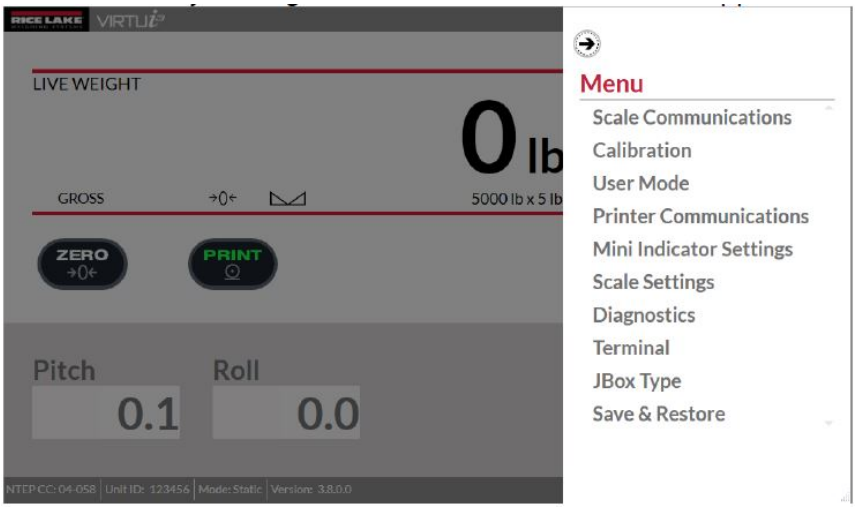


Figure 4-2. Menu Drop Down Options

4.1 Scale Communications

Set the scale port settings by selecting *Scale Communications* in the menu choices.

1. Select the Com Port, Baud Rate (9600), Data Bits (8), Stop Bits (1) and Parity (None).
2. Press Connect.
3. Press → to close out of the screen.

Note ***Select COM-None, under Com Port settings to release the port and press*** Connect

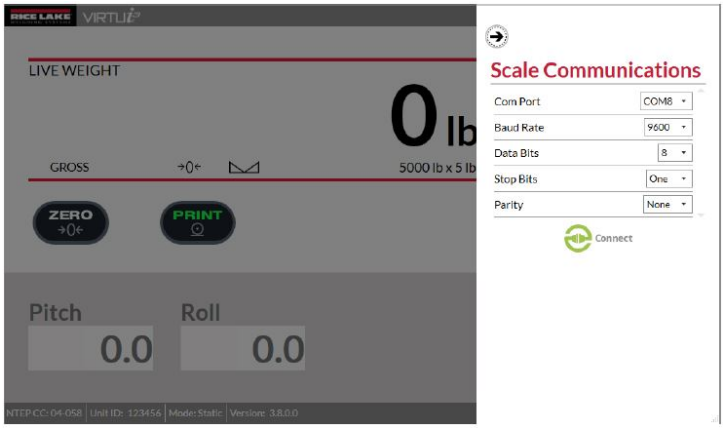


Figure 4-3. Options Menu - Scale Communications

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4.2 Calibration

See Section 5.0 on page 13 for Calibration procedures.

4.3 User Mode

The junction box operates in various modes which are identified by a three digit number, ie: 100, 200, 600. These user modes allow an array of configuration parameters that are predefined to be changed in one step. Select the User Mode setting by selecting *User Mode* in the menu choices.

Those levels are defined as:

- Level 100 (1xx) modes include variations of a static scale
- Level 200 (2xx) modes include variations of an in-motion scale
- Level 600 (6xx) modes include variations of a static scale compatible with the CLS-680.
- Other levels are customer or application specific

Note ***Forklift scales and junction boxes ordered for In-Motion use are factory configured prior to shipping and do not require PassCalc setting.***

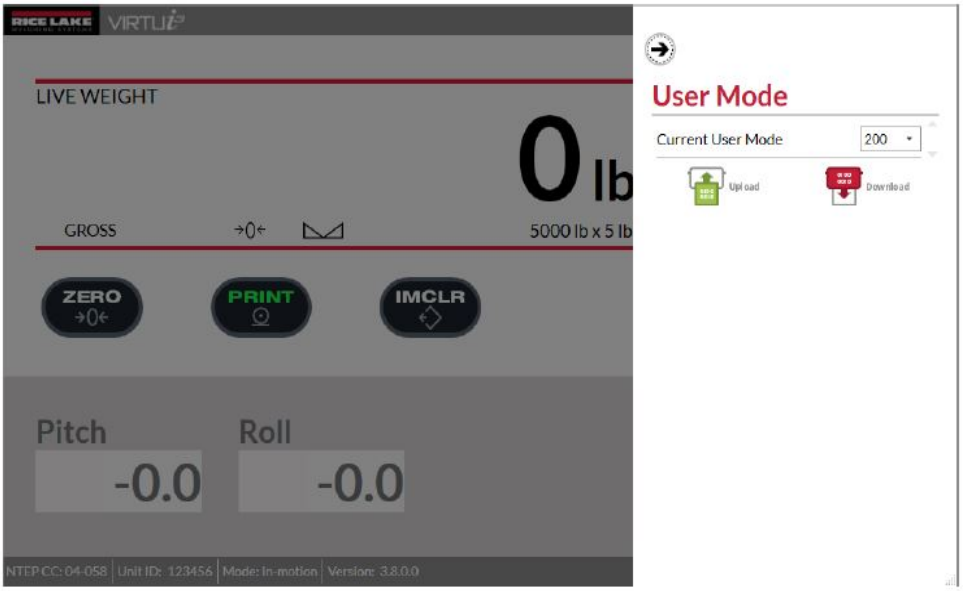


Figure 4-4. User Mode

Certain modes require the junction box to be unlocked prior to setting them. The junction box only needs to be unlocked once. After that, the user can change modes without having to unlock the unit again. To unlock the junction box mode, use the following.

1. Access the User Mode from the dropdown Menu parameter along the top user ribbon.
2. Phone into Rice Lake Weighing Systems and provide the displayed PASSCALC Seed.
3. Enter the PASSCALC Result provided by Rice Lake Weighing Systems.
4. Click the associated **Upload** button next to the PASSCALC seed.
5. The user interface will refresh and display unlocked if successful.

Note ***The unit must be in setup mode to do this general setting.***

Once the In-Motion forklift mode is unlocked, the junction box can be switched between Static and In-Motion modes.

4.4 Printer Communications

Set Printer Communications settings by selecting *Printer Communications* in the menu choices.

Set the ticket printer port setting (serial or TCPIP) using the drop down Port Type menu.

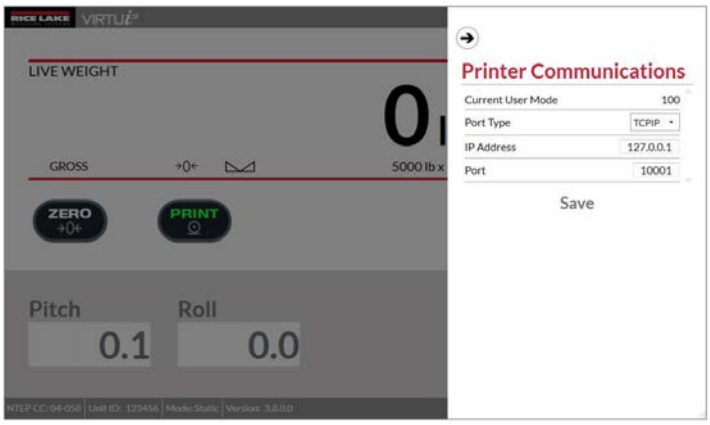


Figure 4-5. Printer Communications

4.5 Mini Indicator Settings

Set the mini indicator settings by selecting the *Mini Indicator Settings* in the menu choices .

Launch With Mini Indicator

To launch the mini indicator enable this setting first by checking the Launch box (Figure 4-6)

Force Position

Enable the Force Position checkbox (Figure 4-6) to force positional and size constraints for the mini indicator when it is launched. Use the following steps to find the required settings.

1. Disable the Force Position setting in the mini indicator settings option tab.
2. Launch the mini indicator to update the adjusted size and position settings.
3. Close the mini indicator to update the adjusted size and position settings.
4. Enable the Force Position setting in the mini indicator settings options tab (Figure 4-6).

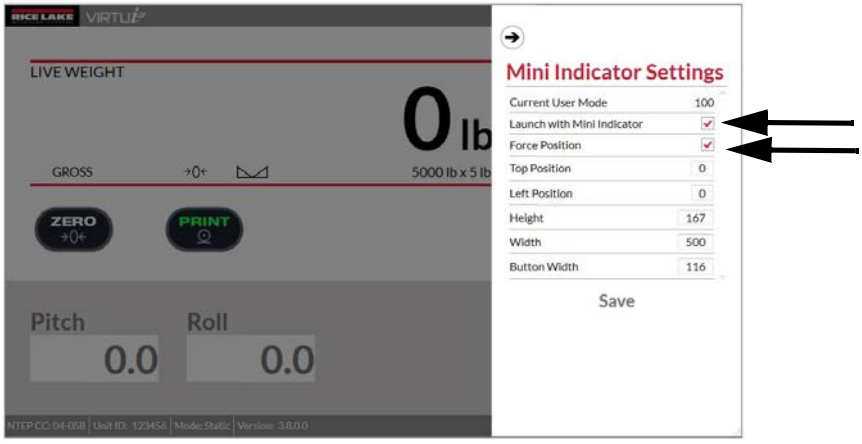


Figure 4-6. Options Menu - Mini-Indicator Settings

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4.6 Scale Settings

Configure the scale settings by selecting *Scale Settings* in the menu choices. Adjust the required settings followed by pressing **Upload** to update the junction box.

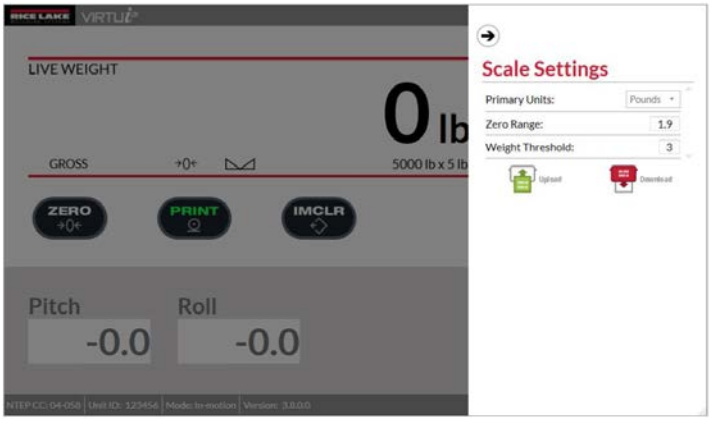


Figure 4-7. Scale Settings

Setting	Description
Primary Units	Identifies between pounds or kilograms (read only)
Zero Range	Specifies the range within which the scale can be zeroed
Weight Threshold	Specifies the minimum number of display divisions required to capture final weight

Table 4-1. Scale Settings Descriptions

4.7 Diagnostics

See Section 6.1 on page 23 for diagnostic troubleshooting descriptions.

4.8 Scale Terminal

The scale terminal allows the end user to interact with the scale via EDP commands.

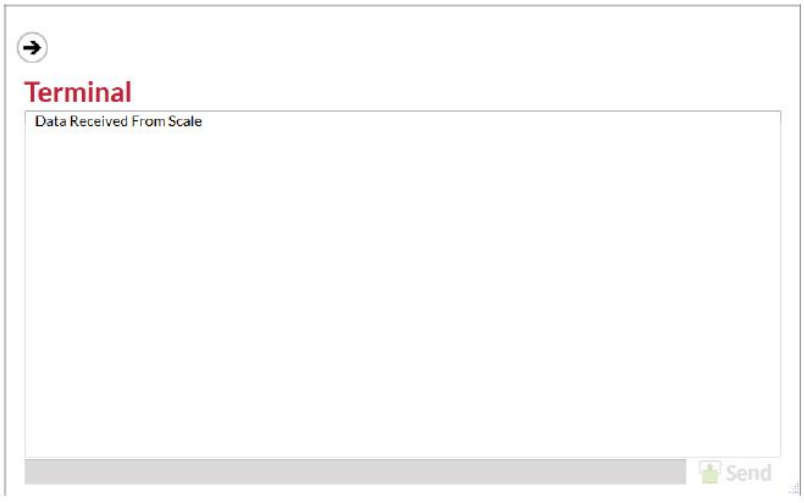


Figure 4-8. Scale Terminal Settings

The scale terminal can send an EDP command to the junction box and receive associated responses.

4.9 Junction Box Type

Certain user modes require the junction box to be unlocked prior to setting them. The junction box needs to be unlocked only once after which the user modes can be changed without the need to unlock again. Perform the following steps to unlock the junction box type.

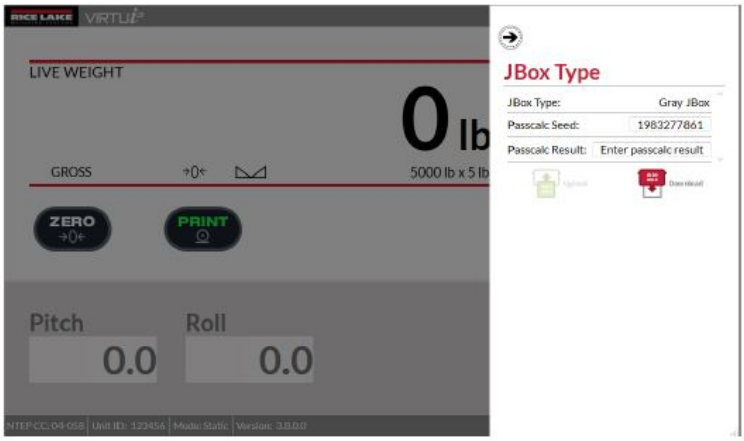


Figure 4-9. Junction Box Type

4.10 Save and Restore Settings

Access the ***Save and Restore*** settings menu by going to the drop down menu under the Menu tool bar.

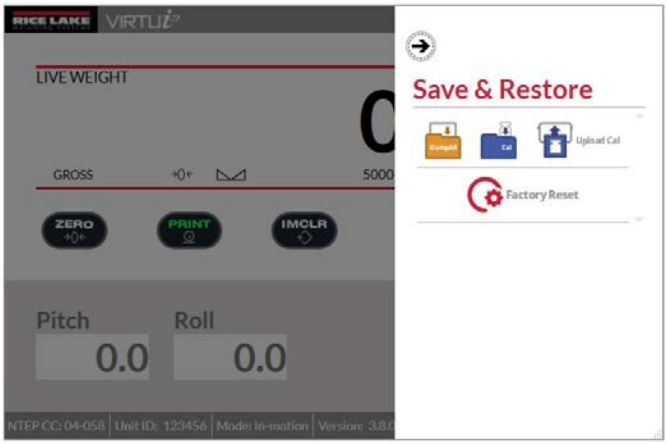


Figure 4-10. Save and Restore

Using the Save & Restore setting allows the user to save a dump all command response to a file and save/restore junction box calibration settings.



Figure 4-11. Save and Restore Settings

- 

saves the DUMPALL EDP command response to a file (.txt)
- 

save the DUMP.CAL EDP command response to a file (.cal)

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-  uploads data from a selected calibration file (.cal) to the junction box
-  restores factory defaults for calibration and configuration settings

A configuration service warning is displayed prior to restoring factory defaults.

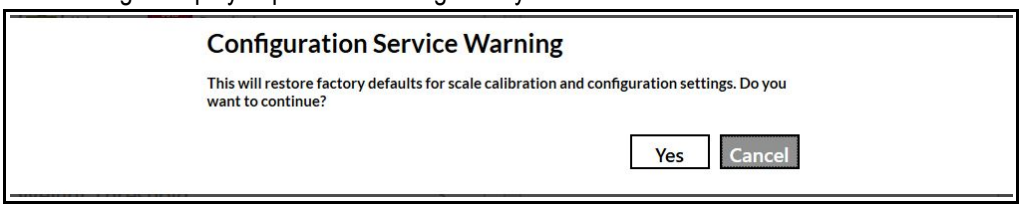


Figure 4-12. Configuration Service Warning

 ***Unit must be in setup mode to restore factory defaults.***

5.0 Calibration

The CLS forklift must be properly calibrated to get accurate readings. A slight percentage variation can result in inaccurate weights. Calibration is accomplished by using a two point calibration. Once the two point calibration is complete, a pitch offset calibration and linear calibration can follow as needed.

5.1 Calibration Overview

Use the following steps to calibrate the CLS forklift.

1. Enter Serial Number of CLS forklift.
2. Level the scale and calibrate the pitch and roll.
3. Perform a zero calibration.
4. Perform a two point calibration.
   - Enter the test weight value
   - Calibrate cell #1
   - Calibrate cell #2
   - Rezero (optional)
5. Perform pitch offset calibration (option for static mode).
6. Multi-point linear calibration (optional)
   - Enter the test weight value
   - Calibrate linear point #1
   - Repeat additional multi points if desired
7. Finish and save.

5.1.1 Calibration Preparation

IMPORTANT ***There are several important tips that should be noted prior to calibrating the CLS In-Motion Forklift Scale.***

- ***The test weights used to calibrate the CLS Forklift scale cannot be greater than 2500 lb***
- ***Use a level to ensure the forklift tines are level prior to calibration***
- ***Exercise the load cells prior to calibration by lifting weights***
- ***Follow calibration sequences in order, otherwise errors will occur***

5.1.2 Devices Used for Lifting of Calibration Weights

There are many techniques and devices used for lifting the test weights during the calibration process. For the best performance, Rice Lake Weighing Systems recommends the following methods and devices.

Two Pair of Straps, Slings, Chains, Fork Sleeves with Hooks

The use of two straps, chains or fork sleeves with hooks are recommended methods used to lift weights during the calibration process. Place the devices on each fork before zero calibration step. For best performance, devices used to lift the weight should be less than 10-20 lb each.

One Single Strap Sling, Chain, Fork Sleeve with Hook

The use of a single device requires the known weight of the device to be added during the calibration process.

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5.2 Calibration Process Using VIRTUi3 Virtual Indicator

Scale calibration can be performed during runtime by accessing the calibration flyout menu via the application top tool bar (Figure 4-1 on page 7). The calibration menu provides access to calibration wizards two point and linear calibration and the ability to rezero the scale.

Press Calibration to enter the calibration menu.

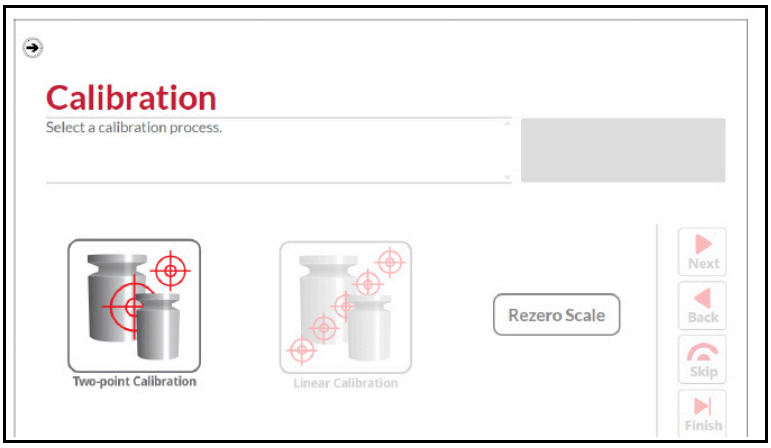


Figure 5-1. Calibration Menu

Select a calibration process.

- Two point calibration 
- Linear calibration , see Section 5.2.3 on page 19

Note ***If both calibration boxes are grayed out in Figure 5-1, that indicates that there is no connectivity.***

5.2.1 Rezero Scale

The rezero scale key allows the user to rezero the scale after it's calibrated.

5.2.2 Two Point Calibration

At minimum, a two point calibration process is required. The two point calibration process requires a known weight to be loaded on each fork independently. By loading each fork with a known weight, the scale acquires both the span calibration and trim values to account for differences between each fork.

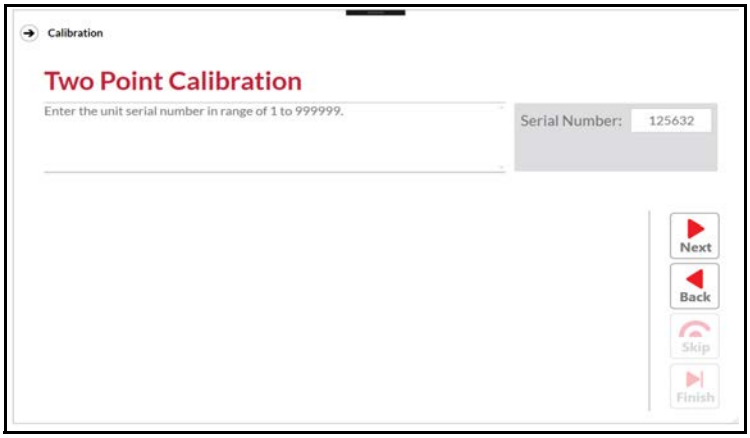


Figure 5-2. Enter Serial Number

1. Enter the unit serial number between 1 - 999999 and press Next.

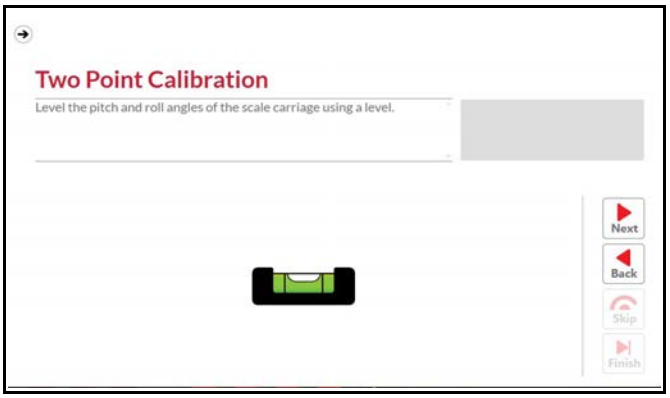


Figure 5-3. Level Scale Carriage

2. Level the pitch and roll angles of the scale carriage using a level.
3. Press Next.

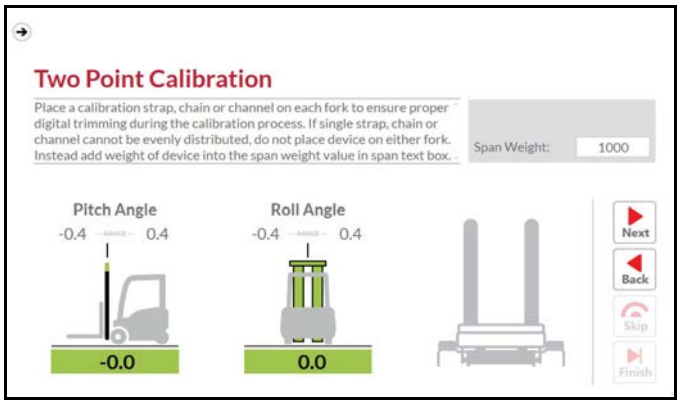


Figure 5-4. Add Span Weight Value

4. Place a calibration strap, chain or channel across both forks to ensure proper digital trimming during the calibration process. If a single strap, chain or channel cannot be placed across both forks, the user should then enter the total of the device and calibration weight into the span weight value in the span text box.
5. Press Next.

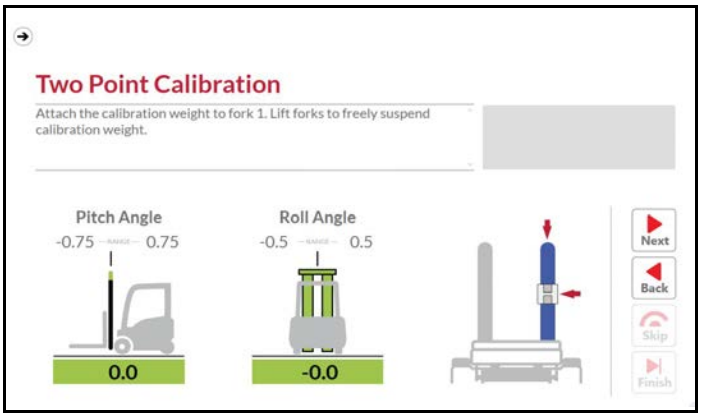


Figure 5-5. Add Weight to Fork 1

6. Attach the calibration weight to fork 1. Lift the forks to freely suspend the calibration weight.

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7. Press Next.

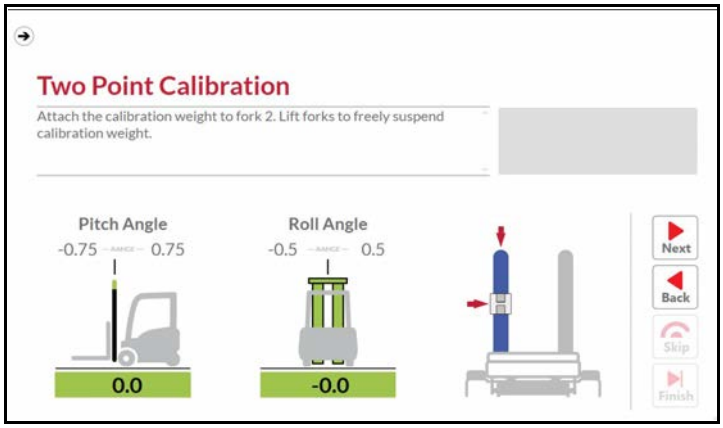


Figure 5-6. Add Weight to Fork 2

8. Attach the calibration weight to fork 2. Lift the forks to freely suspend the calibration weight.
9. Press Next.

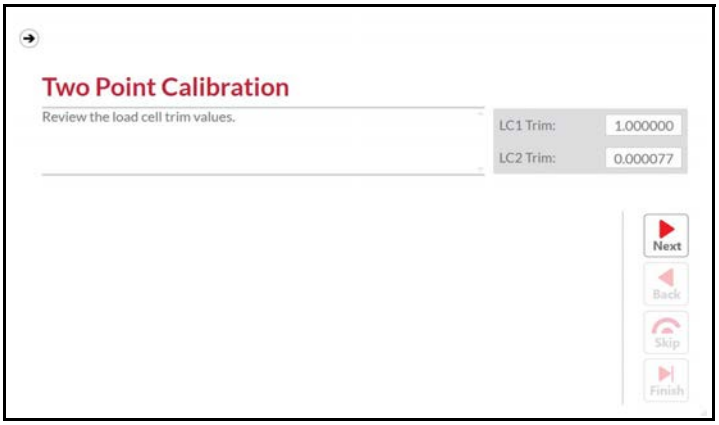


Figure 5-7. Review Load Cell Trim Values

Note ***At this point the two point calibration is complete. Use → to return back to the weight indication . Press Next to perform the pitch off-set calibration process. This is required for in-motion and optional for static applications.***

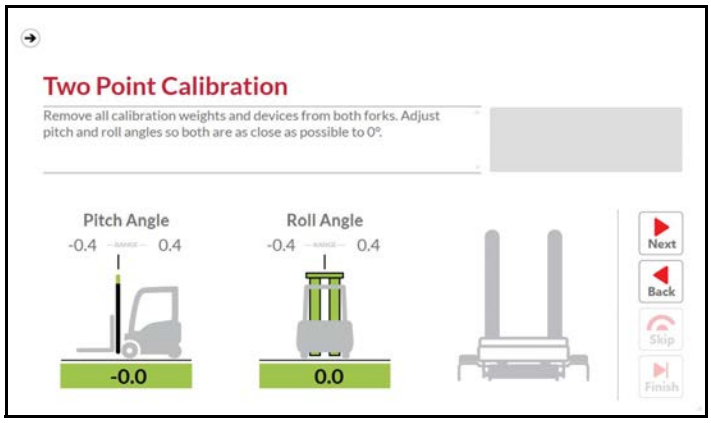


Figure 5-8. Remove Calibration Weights

10. Remove all calibration weights and devices from both forks. Adjust pitch and roll angles so both are as close as possible to 0°.
11. Press Next.

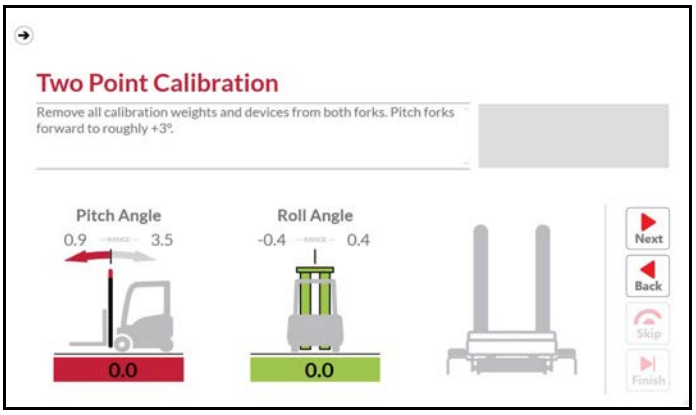


Figure 5-9. Pitch Forks +3º

12. Remove all calibration weights and devices from both forks. Pitch forks forward to roughly +3º.
13. Press Next.

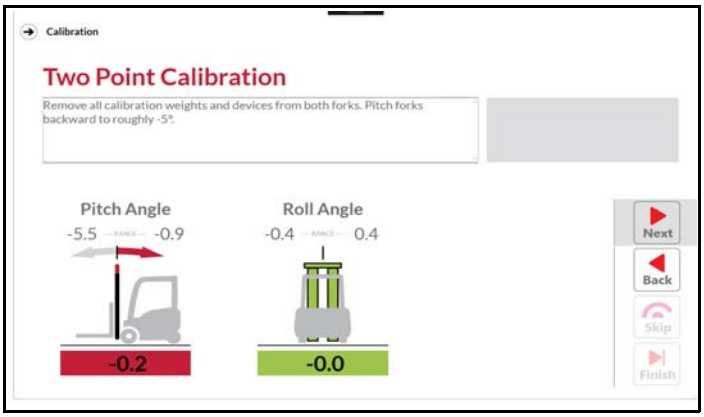


Figure 5-10. Pitch Forks -5º

14. Remove all calibration weights and devices from both forks. Pitch forks backward to roughly -5º.
15. Press Next.

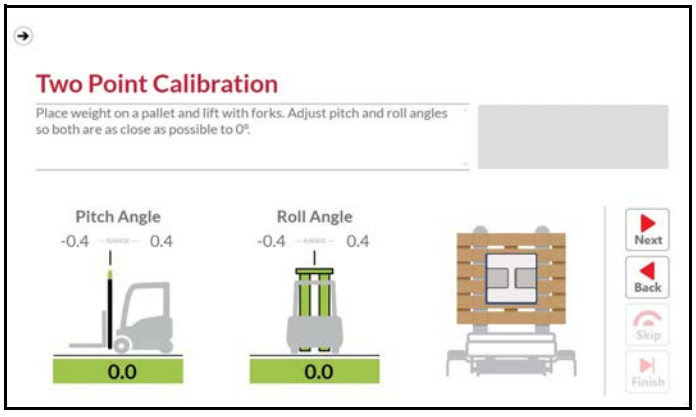


Figure 5-11. Bring Angles Close to 0º

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16. Place weight on a pallet and lift with forks. Adjust the pitch and roll angles so both are as close as possible to 0°.
17. Press Next.

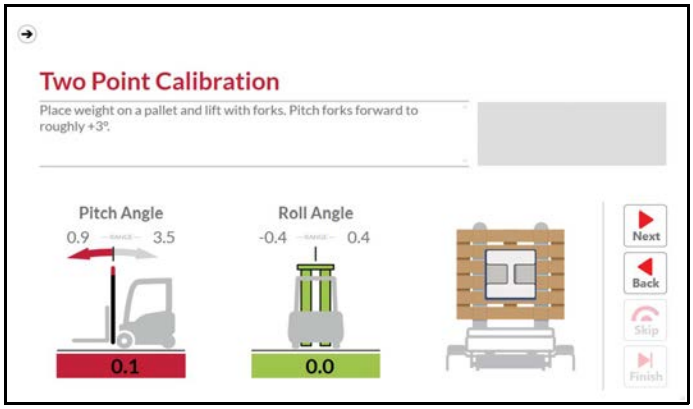


Figure 5-12. Pitch Forks +3°

18. Place weight on a pallet and lift with forks. Pitch the forks forward to roughly +3°.
19. Press Next.

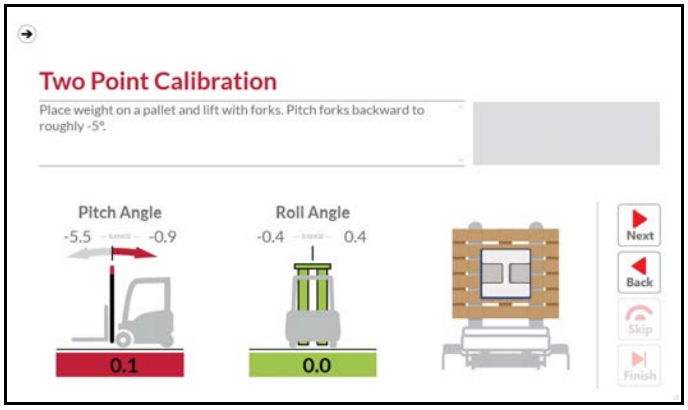


Figure 5-13. Pitch Forks -5°

20. Place weight on a pallet and lift with forks. Pitch the forks backward to roughly -5°.

Note ***The pitch offset calibration is complete.***

21. Press Next to move onto the 5 point linearization calibration process.

5.2.3 Linear Point Calibration

Following the two point calibration (is required), is a procedure to learn the characteristics of the scale while attached to the forklift. This is accomplished by moving the forklift mast forward and back one with no weight followed with the same process for a loaded lift. It is also recommended to follow the two point calibration with a multi point calibration (optional). This process allows two to five known weights to be calibrated as linear points.

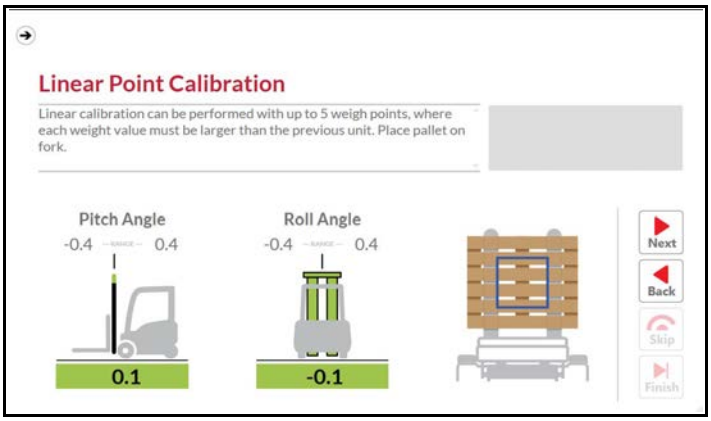


Figure 5-14. Linear Calibration Start

Linear calibration can be performed with up to 5 weigh points, where each weight value must be larger than the previous weight.

1. Place a pallet on the forks.
2. Press Next.

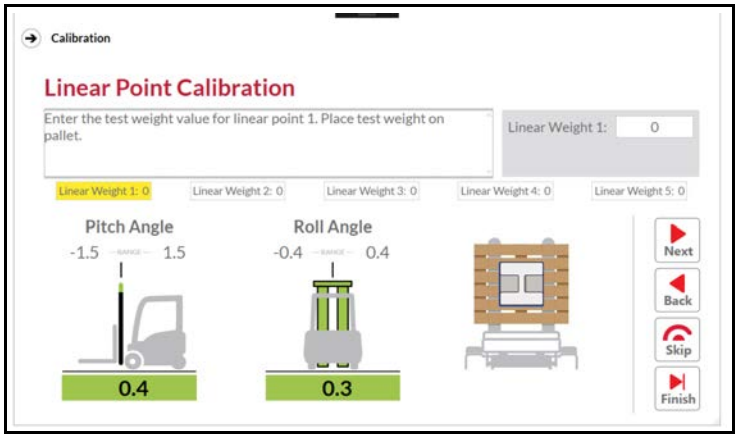


Figure 5-15. Linear Point 1

3. Enter the test weight value for linear point 1.
4. Place a test weight on the pallet.
5. Press Next.

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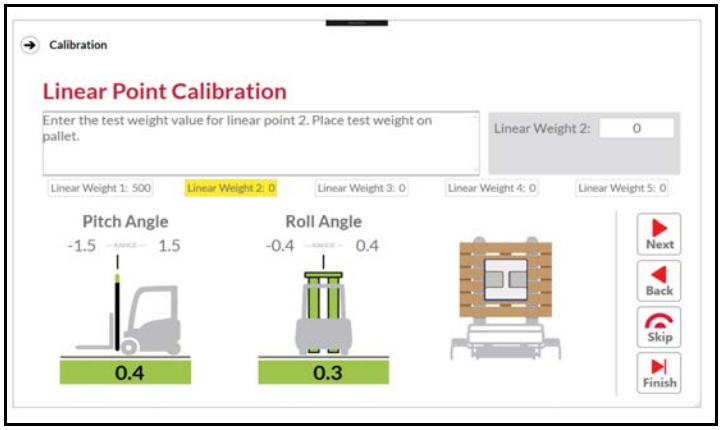


Figure 5-16. Linear Point 2

6. Enter the test weight value for linear point 2.
7. Place a test weight on the pallet.
8. Press Next.

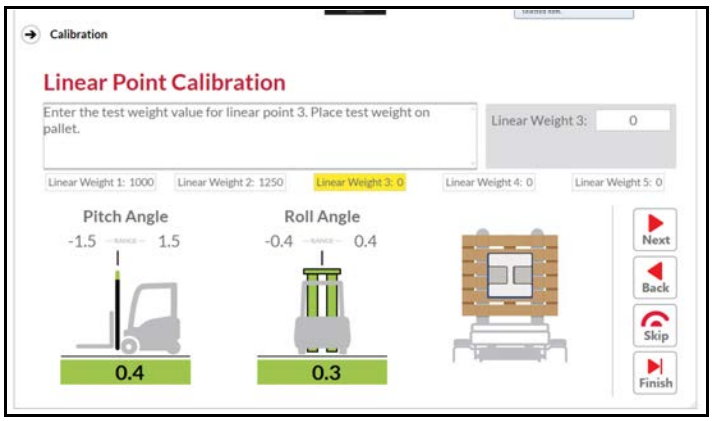


Figure 5-17. Linear Point 3

9. Enter the test weight value for linear point 3.
10. Place a test weight on the pallet.
11. Press Next.

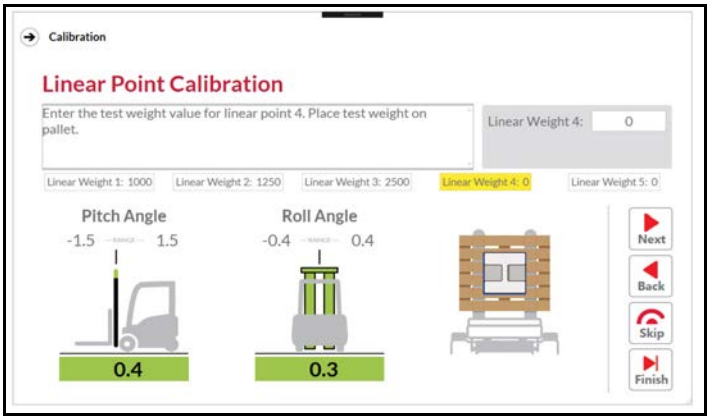


Figure 5-18. Linear Point 4

12. Enter the test weight value for linear point 4.
13. Place a test weight on the pallet.
14. Press Next.

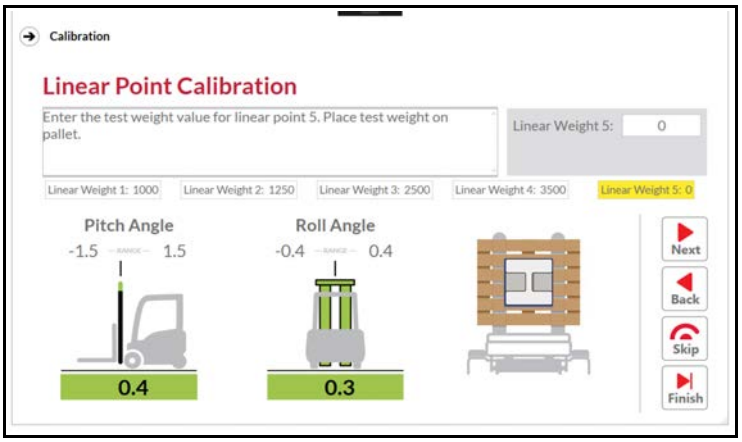


Figure 5-19. Linear Point 5

15. Enter the test weight value for linear point 5.
16. Place a test weight on the pallet.
17. Press Next.

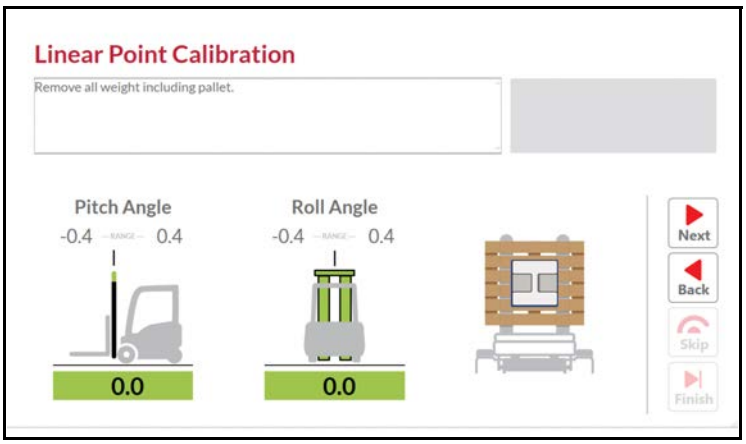


Figure 5-20. Remove All Weight

18. Remove all weight, including the pallet.

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19. Press Next.

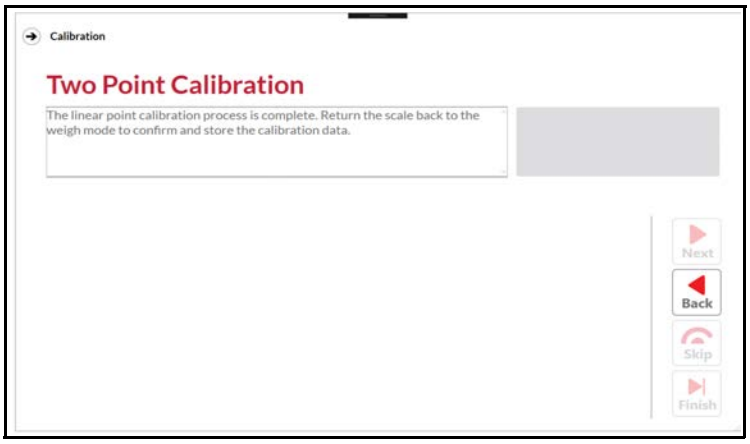


Figure 5-21. Linear Calibration Process Complete

The linear point calibration process is complete. Return the scale back to the weight mode to confirm and store the calibration data.

6.0 Appendix

6.1 Diagnostic Menu

Access the Diagnostic Menu using the Menu drop down at the top of the screen. Diagnostics provides relevant data from the connected junction box. There are two possible ways to access the diagnostic menu. Under normal operation, the diagnostic menu can be displayed via the button in the application tool bar. If a diagnostic event occurs, a red button appears next to the roll angle display box, which when pressed, displays the diagnostic menu.

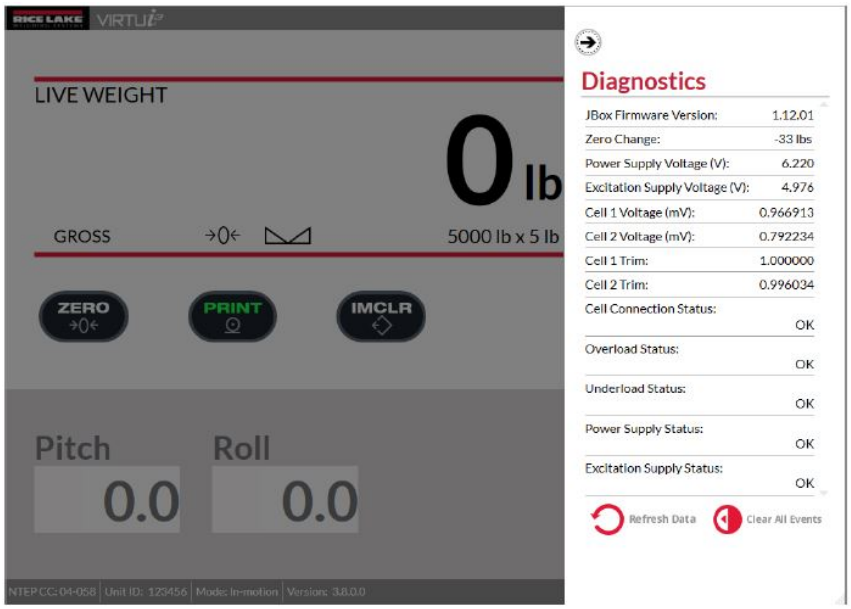


Figure 6-1. Diagnostics Menu

6.2 Error Messages

The following are possible error messages that will display.

6.2.1 Failed Connections

Invalid displays when the indicator fails to connect or parse data.



Figure 6-2. Invalid Connection

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6.2.2 Invalid Angle Data

The pitch and roll display boxes show the live pitch and roll angle data received from the junction box. A valid angle data is represented as +/-99.9. An invalid data point is represented as Invalid.

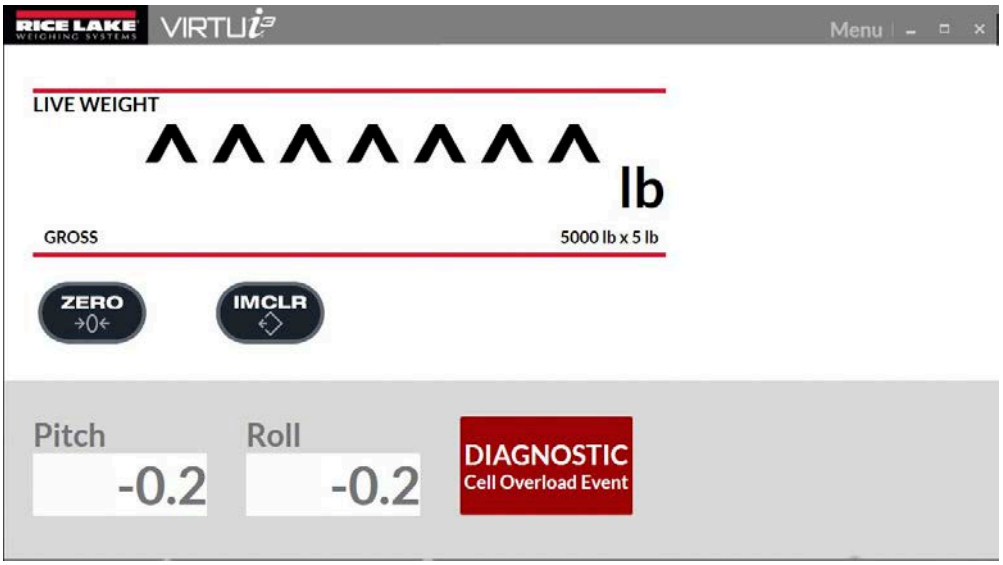


Figure 6-3. Cell Overload Warning

6.3 Junction Box Firmware Update

The junction box firmware update tool is a stand alone application that is launched via the program files menu. Prior to using the firmware update tool, the user needs to connect to the comm port ***COM-None*** via the Scale Communications menu. Then close VIRTUi3 Client to release the junction box communication port. Follow the user instructions in the application.

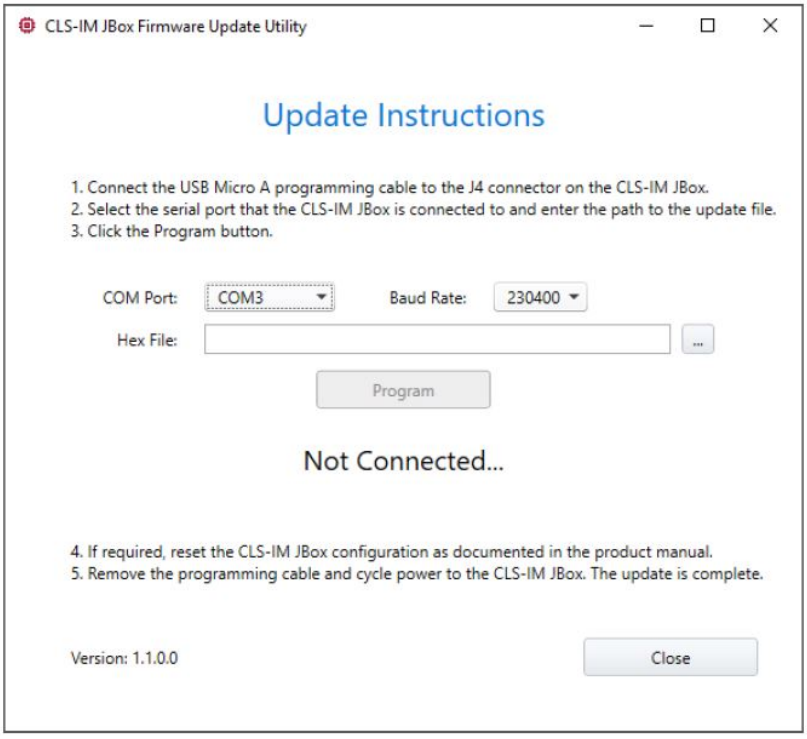


Figure 6-4. Firmware Update Screen

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