Load Ranger 2.4 GHz RF Module Retrofit Quick Start Guide

This quick start guide contains condensed instructions of installing 2.4 GHz RF module retrofit kits in the wheel weigh pad and Ai-1 indicator.

For full instructions regarding retrofit and configuration, see *Load Ranger Technical Manual (PN 214194)*.

📝 *NOTE: Fully charge wheel weigh pad and Ai-1 indicator before proceeding.*

⚠️ *CAUTION: Wear grounding wrist strap when working inside the Load Ranger to protect components from electrostatic discharge (ESD).*

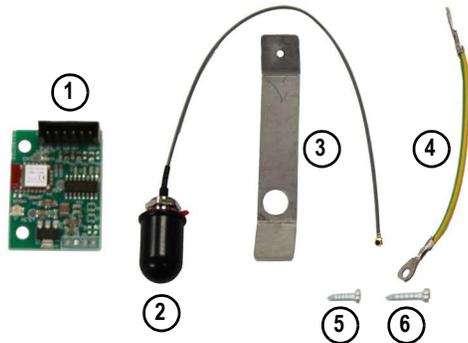## 1. Replace Radio Module in Wheel Weigh Pad

Figure 1. Retrofit Kit (212110)

Item No.	Description
1	2.4GHz Radio Frequency Module
2	Antenna (with O-ring)
3	Antenna Support plate
4	Ground wire
5	Phillips screw, M3 x 6 screw
6	Phillips screw, M3 x 9 self-tapping screw

1. Turn off wheel weigh pad and disconnect power cable.
2. Position wheel weigh pad with bottom facing up.
3. Remove two protection plate bolts, then remove plate (Figure 2).
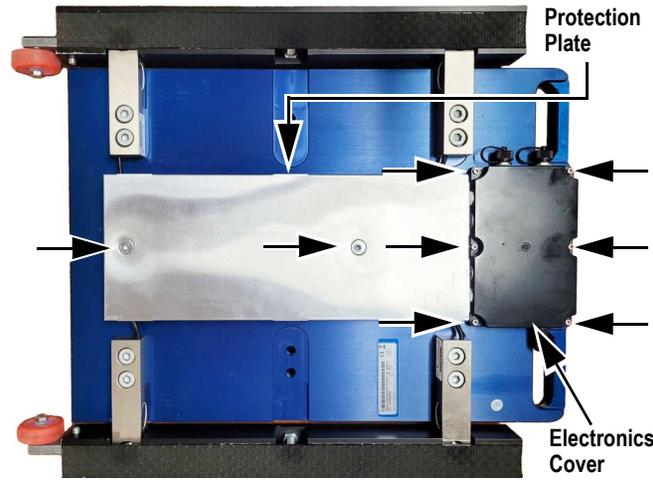4. Remove six electronics cover mounting bolts, then open electronics cover (Figure 2).

Figure 2. Protection Plate and Cover Mounting Bolts

5. Remove antenna, power cable and Bluetooth® module cabling.
6. Remove Bluetooth® module mounting screw, then Bluetooth® module.
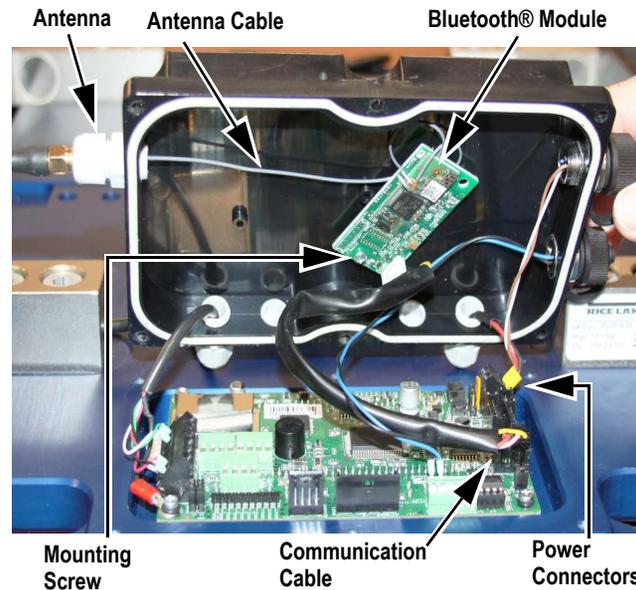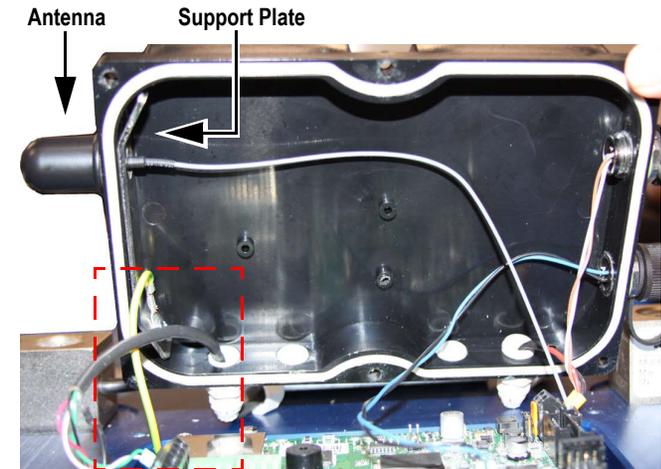

Figure 3. Existing Hardware Removal

7. Remove jam nut and adhesive protector film from new antenna, then slide black O-ring along cable and push into adhesive.
8. Insert new antenna into cover while threading into support plate.
9. Secure ground to support plate with M3 x 6 screw.
10. Remove CPU board Phillips mounting screw and O-ring from CPU board mounting hole closest to support plate.
11. Secure ground to CPU board mounting hole with previously removed Phillips screw and O-ring.
12. Secure ground to hole in antenna support plate with Phillips screw.

Figure 4. Antenna and Ground Wire Installation

13. Secure RF module (Bluetooth® module mounting location) with Philips screw.
14. Connect communication cable to RF module and CPU board COM2 TTL, antenna cable to RF module and power cable to CPU board.
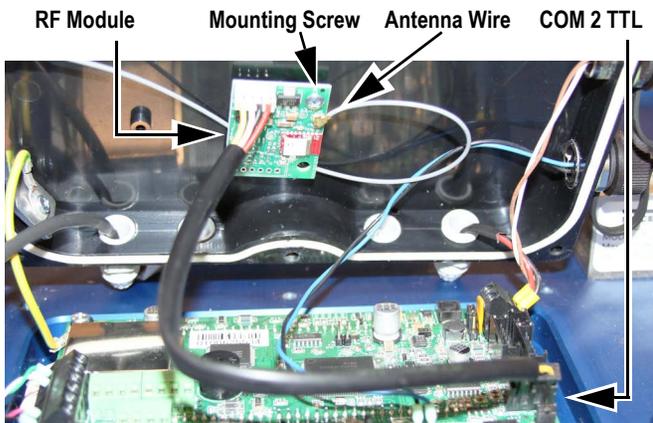
RF Module   **Mounting Screw**   **Antenna Wire**   **COM 2 TTL**

Figure 5. RF Module Installation

15. Repeat for remaining wheel weigh pads.

2. Replace Radio Module in Ai-1 Indicator

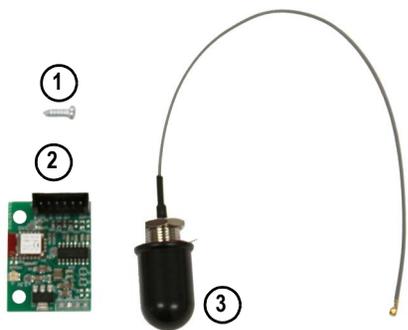*Figure 6. Ai-1 Indicator RF Retrofit Kit Parts (212111)*

Item No.	Description
1	Phillips screw, 2.9 x 9.5 self-tapping screw
2	2.4GHz Radio Frequency Module
3	Antenna

1. Turn off device and disconnect power cable.
2. Position Ai-1 indicator with bottom facing up.
3. Remove four cover mounting bolts, then remove cover.

Figure 7. Ai-1 Indicator Cover Mounting Bolts

4. Disconnect battery cabling and Bluetooth® radio cabling.
5. Remove existing antenna.
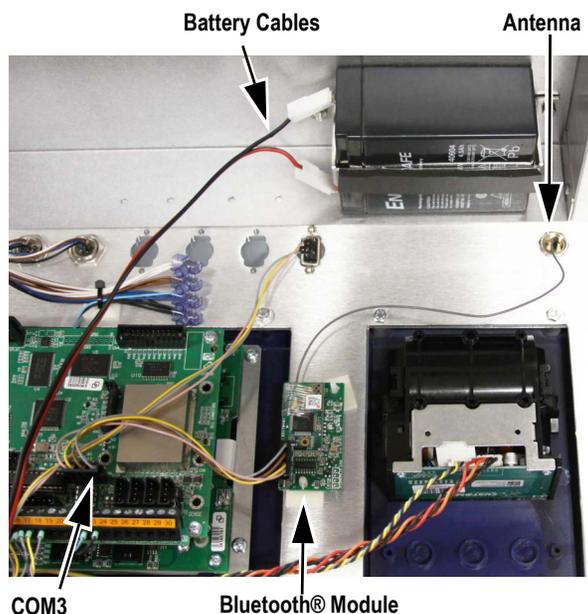6. Remove Bluetooth® module mounting screw, then Bluetooth® module.

Battery Cables   **Antenna**

COM3   **Bluetooth® Module**

Figure 8. Removing Bluetooth® Module

7. Remove jam nut and adhesive protector from antenna.
8. Insert antenna wire through antenna mounting hole on front of cover then push antenna firmly in mounting hole.
9. Secure antenna with jam nut on inside of enclosure.

Antenna Outside of Enclosure   **Jam Nut Inside of Enclosure**

Figure 9. Install Antenna

10. Install new RF module in same location as Bluetooth® module.
11. Connect communication cable to CPU board COM3 and RF module J3, antenna cable to RF module and reconnect battery cables.
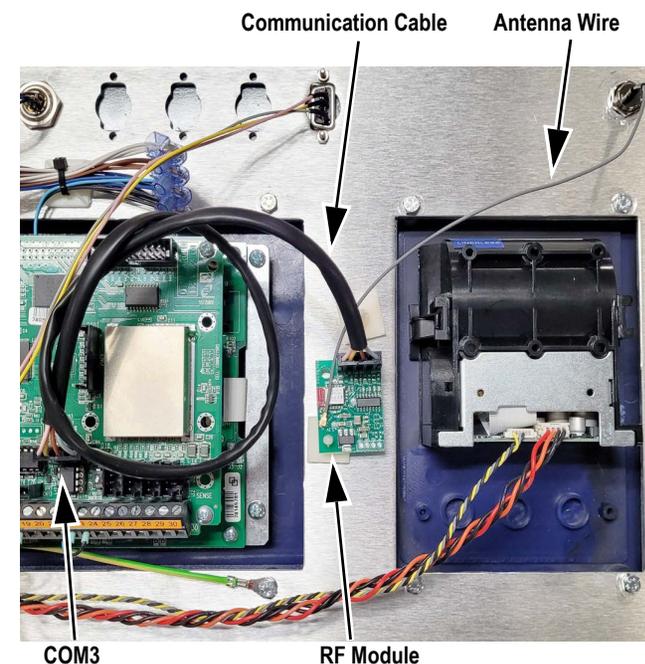
Communication Cable   **Antenna Wire**

COM3   **RF Module**

Figure 10. Install RF Module

12. Reinstall rear cover and handles with four bolts.

3. Update Firmware

In order for wheel weigh pads and Ai-1 indicators originally supplied with Bluetooth® modules to use RF modules, their firmware must be updated.

⊙ **IMPORTANT: Firmware update supports Windows 10 and 11 computers.**

📝 **NOTE: Firmware update duration varies; plan for approximately five to ten minutes for a wheel weigh pad and 25 to 45 minutes for an Ai-1 Indicator.**

1. Download 2.4GHz Load Ranger firmware from: https://www.ricelake.com/firmware

2. Unzip firmware file (files for Ai-1 and indicator wheel weigh pad are included):

📝 **NOTE: The Ai-1 indicator's firmware file name starts with EGT while the wheel weigh pad's firmware file name starts with Dfw.**

3. Attach a serial cable to the Ai-1 indicator's serial port and connect free end to computer.

📝 **NOTE: The Ai-1 indicator's serial port is located on the front panel.**
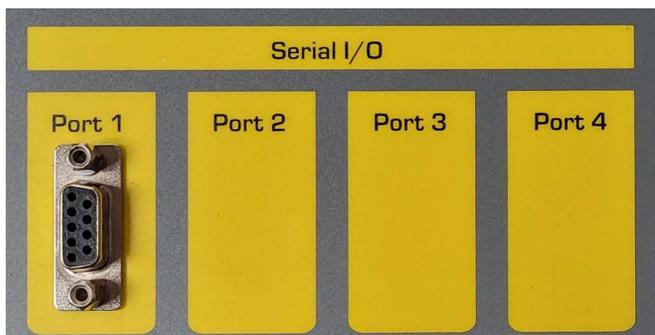

Figure 11. Ai-1 Indicator Serial Port

4. Turn on Ai-1 indicator.

5. Run Ai-1 indicator firmware executable.

6. Select a serial port number from the drop-down menu.

7. Enable the **USB->COM** check box, if using a USB to serial converter.
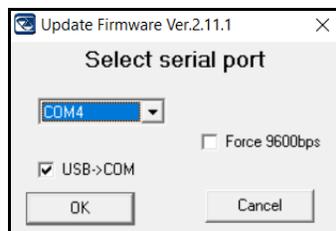
8. Select **OK**.

Figure 12. Firmware Update Configuration Window

9. A connection status indicator displays until a connection between the computer and Ai-1 indicator is established.
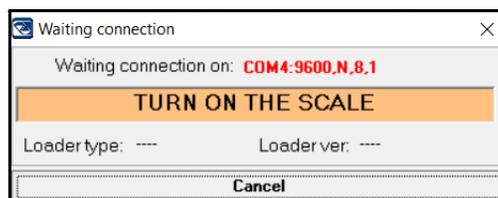

Figure 1-1. Connection Status Window

10. Once communication is established, a firmware update status window displays.
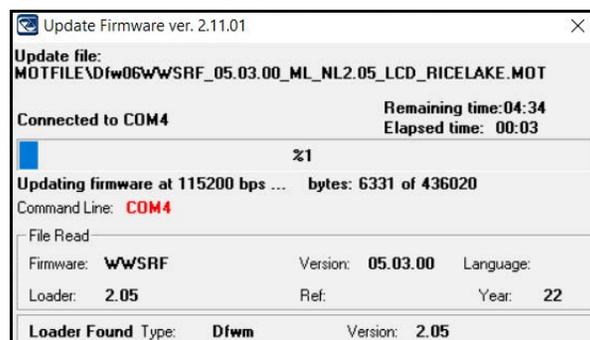

Figure 2. Firmware Update Status Window

11. When firmware has been updated, a success prompt displays.

12. Select **OK** to close the window.

Figure 3. Firmware Success Prompt

13. After firmware update is completed, allow device to reboot if it power cycles.

14. Power off Ai-1 indicator and remove serial cable.

15. Attach a serial cable to the wheel weigh pad's serial port and connect free end to computer.

📝 **NOTE: The wheel weigh pad's serial port is located inside the electronics cover on the CPU board.**

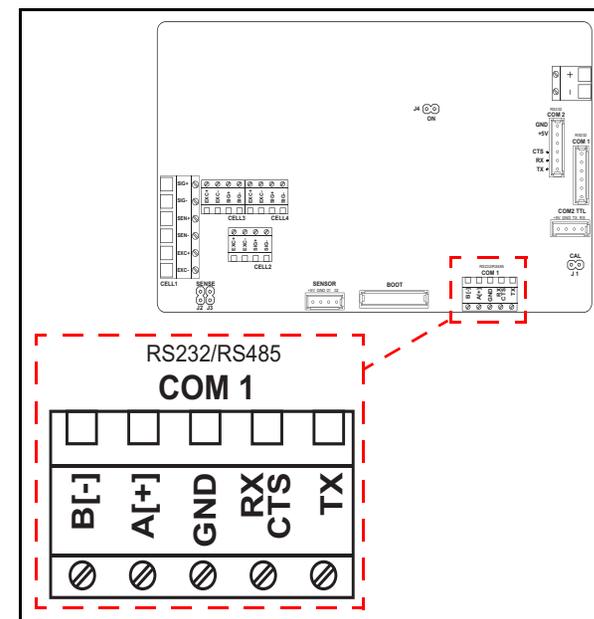*Figure 4. Wheel Weigh Pad Serial Port*

16. Run wheel weigh pad firmware executable.

17. Repeat steps Step 7 through Step 14.

18. Reinstall wheel weigh pad's cover and protection plate with previously removed hardware (Figure 2 on page 1).

19. Repeat steps Step 15 through Step 18 for remaining wheel weigh pads.

4. Default Wheel Weigh Pad

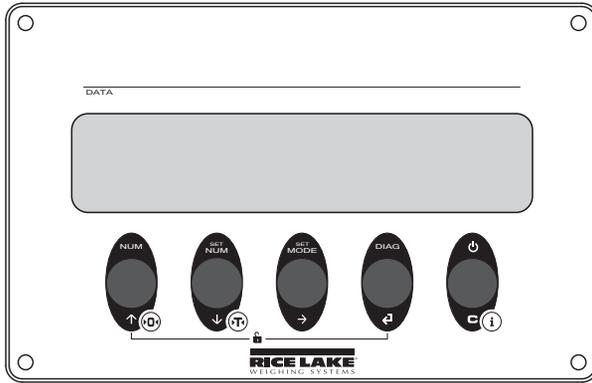Wheel weigh pads must be defaulted after firmware update is applied.

Figure 5. Wheel Weigh Pad Controls

1. Press ⊂ to turn on the first wheel weigh pad.
2. Press ↓ during startup. *tECh* flashes, then *CAL* displays.
3. Press ↑. *AduAnC* displays.
4. Press ↵. *CAL.PAr* displays.
5. Press ↑. *dFLt.t* displays.
6. Press ↵. *SUrE?* displays.
7. Press ↵ to default the wheel weigh pad. *WA.it* displays while process runs, then *CAL.PAr* displays.
8. Press ⊂ two times to back out of the menu. *SAuE?* displays.
9. Press ↵. *StorE* briefly displays, then *CAL* displays. See *Load Ranger Technical Manual (PN 214194)* to recalibrate the wheel weigh pad.
10. Repeat for remaining wheel weigh pads.

5. Setup Wheel Weigh Pad

1. Press ⊂ to turn on the first wheel weigh pad.
2. Press ↓ during startup. *tECh* flashes, then *CAL* displays.
3. Press ↓ repeatedly until *SEr.iAL* displays.
4. Press ↵ to enter the *Serial* menu. *id* displays.
5. Press ↵ to enter the ID settings.
6. Press ↑ or ↓ to increase or decrease the selected digit and press → to move between the digits to enter the pad ID number.

> 📝 *NOTE: The first Pad ID number must be 01 and the remaining pad ID numbers must increment in ascending numeric order. Example: 01, 02, 03. Do not configure two pads with the same ID number.*
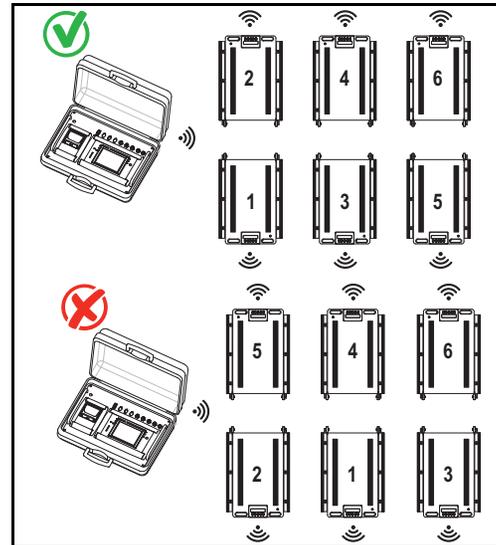

Figure 6. Wheel Weigh Pad Positioning

7. Press ↵. *Con.rF* displays.
8. Press ↓ until repeatedly *rAd.io* displays.
9. Press ↵. *rF* displays.
10. Press ↑ or ↓ until *On* displays.
11. Press ↵. *r.chAn* briefly displays.
12. Use arrows to enter a channel number.

> 📝 *NOTE: The default channel number is 27. The wheel weigh pad channel number must match the Ai-1 indicator channel number it will pair with. The Ai-1 indicator supports channels 00 - 38. If using multiple groups of Ai-1 indicators and wheel weigh pads, the channel numbers must be unique for each group.*

13. Press ↵. *OH* briefly displays then *bAud* displays.
14. Press ⊂ until wheel weigh pad resets.
15. Repeat for remaining wheel weigh pads.

6. Setup Ai-1 Indicator and Pair Wheel Pads

1. Turn off all wheel weigh pads.

2. Press ⏻ to turn on the Ai-1 indicator.

3. During startup, press the upper right corner of the screen when the logo displays to enter the *Technical Setup* menu.

Figure 7. Touch Upper Right Corner of the Display

4. Press ⬇ to go to second *Setup menu* page.

5. In the second page, press Serial ports . *Serial Port* menu displays.

6. Press Radio frequency interface . *Radio Frequency interface* displays.

7. Press Channel .

8. Enter the required channel number.

📝 *NOTE: The default channel number is 27. The wheel weigh pad channel number must match the Ai-1 indicator channel number it will pair with. The Ai-1 indicator supports channels 00 - 38. If using multiple groups of Ai-1 indicators and wheel pads, the channel numbers must be unique for each group.*
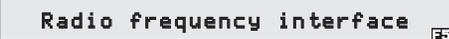

Figure 8. Channel Keyboard

9. Press OK . A *Channel* prompt displays.

Figure 9. Channel Success Prompt

10. Press OK to close the prompt and return to the *Radio Frequency interface* menu.

11. Press ⬅ twice.

12. Press ⬆ once.

13. Press Calibration .

14. Press Scale selection 1 scale/s .

15. Press Number of scales 1 . *Number of Scales* menu displays.

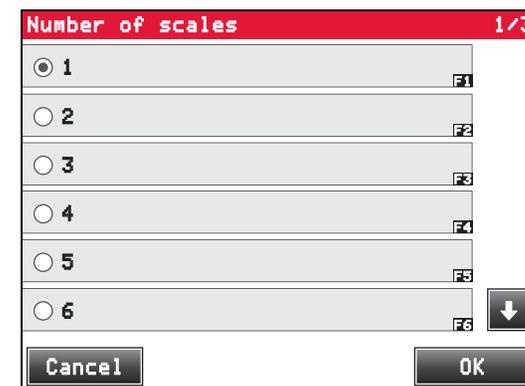16. Select the number of wheel weigh pads to be used.

Figure 10. Number of Scales Configuration

OK

18. Ensure all wheel pads have been configured following the steps in section 5, are turned on.

19. Press `WWS configuration` `F3` .

20. Press `Get WWS configuration` `F2` .

21. *Gravity value setting* pop-up displays.

22. Enter the gravity value for the area the wheel weigh pads will be used.

```
Gravity value setting
                    9.80390
          9.75001 ~ 9.84999
   1      2      3      /     Esc
   4      5      6      *
   7      8      9      -     BkSp
   C      0             +     OK
```
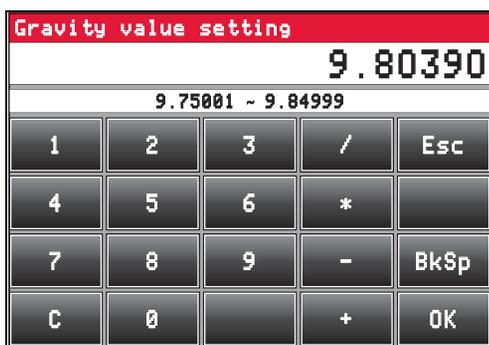
Figure 11. Set Gravity Value

23. Press `OK` to close pop-up and continue.

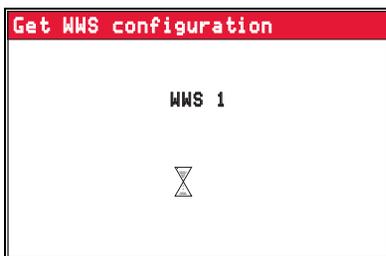24. *Get WWS configuration* pop-up displays. Wait while configuration information is retrieved from wheel weigh pads.

```
Get WWS configuration

         WWS 1

           ⧗
```

Figure 12. Get WWS configuration Pop-Up

25. Once configuration information is retrieved, the configuration session terminates.

```
Get WWS configuration

   Configuration terminated
        successfully

           OK
```

Figure 13. Get WWS configuration Pop-Up

26. Press `OK` to close the pop-up.

27. Press `Esc` .

28. Setup changed pop-up displays.

```
Technical setup

        Setup changed.
Save changes before restart the
          indicator?

  Cancel      No      Yes
```

Figure 14. Setup Changed Pop-Up

29. Press `Yes` to save settings and complete setup.

30. (**Optional**) If indicator and wheel weigh pad units are different, a pop-up may display to update units.
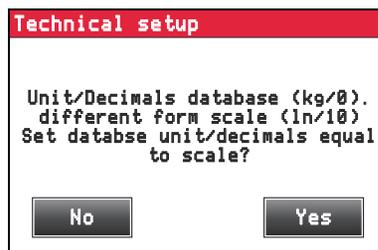
```
Technical setup

   Unit/Decimals database (kg/0).
    different form scale (ln/10)
   Set databse unit/decimals equal
             to scale?

      No               Yes
```

Figure 15. Different Unit Pop-Up

31. Press `Yes` to match units, or `No` exit without changing.

32. The indicator reboots to *Weigh* mode.