BenchMark® LP

Low-Profile Bench Scale

Installation Manual

RICE LAKE®
WEIGHING SYSTEMS

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An ISO 9001 registered company

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The most current version of this publication, software, firmware and all other product updates can be found on our website:

www.ricelake.com

Contents

1.0 Introduction

This manual is intended for use by service technicians responsible for installing and servicing the BenchMark LP Low-Profile Bench Scale.

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

The BenchMark LP is a four-cell, low-profile scale. Features include:

- Available in sizes from 18" x 18" (.46 m x .46 m) to 36" x 36" (.91 m x .91 m)
- Capacities from 100 lb to 1000 lb (45 kg to 453 kg)
- Fully electronic low-profile load receivers
- Four corner-mounted, FM-approved planar beam load cells
- Signal-trim summing board for any necessary corner corrections, mounted under a stainless steel cover that can be sealed for Legal-for-Trade
- All models come pre-trimmed; corner corrections should not be necessary
- Load cell cables are held down with replaceable cable ties near each corner
- Adjustable feet to compensate for minor floor irregularities
- Holes located in the lower frame to be used for permanent mounting applications

1.1 Overview

Model Designations

The model identification label is located on the side of the frame. Include both model number and serial number when ordering replacement parts.

Electrical Grounding

For systems where the scale is connected to a 115 VAC circuit, the indicator must be directly connected to an earth ground with a ground interface cable of no more than 3 Ω resistance throughout its length.

Load Cells

- Four Rice Lake RLBLP (planar beam)
- Rated Excitation: 5-15 VDC

Grade Level Requirement

The supporting surface of the scale (encompassing four feet) must be level within 1/4" of horizontal.

End Load Capacity

End load capacity is 60% of full scale capacity.

Part No.	Capacity	Platform Dimensions L x W x H1 (H2*)	Torque To
97662	100 lb (50 kg)	18" x 18" x 2.63" (1.67")	50 lb per inch
97663	250 lb (125 kg)	18" x 18" x 2.50" (1.74")	125 lb per inch
97664	500 lb (250 kg)	18" x 18" x 2.69" (1.93")	125 lb per inch
97665	100 lb (50 kg)	24" x 24" x 2.66" (1.69")	50 lb per inch
97666	250 lb (125 kg)	24" x 24" x 2.83" (2.07")	125 lb per inch
97667	500 lb (250 kg)	24" x 24" x 3.02" (2.26")	125 lb per inch
97668	500 lb (250 kg)	30" x 30" x 3.02" (2.26")	125 lb per inch
97669**	1,000 lb (500 kg)	30" x 30" x 3.47" (2.70")	20 lb per foot
97670	500 lb (250 kg)	36" x 36" x 3.02" (2.26")	125 lb per inch
97671**	1,000 lb (500 kg)	36" x 36" x 3.47" (2.70")	20 lb per foot
* Height without adjustable leveling feet ** Non-NTEP or Measurement Canada Approved			

Table 1-1. Platform Dimensions and Capacity

1.2 Safety

Safety Signal Definitions:

DANGER *Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.*

WARNING *Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.*

CAUTION *Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.*

IMPORTANT *Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.*

General Safety

Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.

WARNING

Failure to heed could result in serious injury or death.

Failure to heed may result in serious injury or death.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not operate without all shields and guards in place.

Do not jump on the scale.

Do not use for purposes other then weight taking.

Do not place fingers into slots or possible pinch points.

Do not use any load bearing component that is worn beyond 5% of the original dimension.

Do not use this product if any of the components are cracked.

Do not exceed the rated load limit of the unit.

Do not make alterations or modifications to the unit.

Do not remove or obscure warning labels.

Before opening the unit, ensure the power cord is disconnected from the outlet.

Keep hands, feet and loose clothing away from moving parts.

2.0 Installation

This section provides an overview of BenchMark LP Low-Profile Bench Scale installation instructions.

2.1 Site Preparation

The scale must not be loaded beyond its capacity, even momentarily. Select a site where there is no chance of overload weights crossing the platform. Avoid areas where the scale might receive damaging side impacts from wheels or forklift tines, shock damage from falling objects or where water may damage the scale.

The interface cable between the scale and the indicator must be protected against crushing, cutting or moisture damage. If the chosen site has such potential dangers, some method of protection, such as running the cable in conduit, will be necessary.

In operation, the scale must be level within 1/4". Either choose a site where the floor is close to this standard to avoid excessive shimming, or modify the floor at the chosen site to meet this standard.

2.2 Unpacking

Immediately after unpacking, visually inspect the BenchMark LP to ensure all components are included and undamaged.

If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

Remove the four overload stops on the underside of the scale (Figure 2-1).

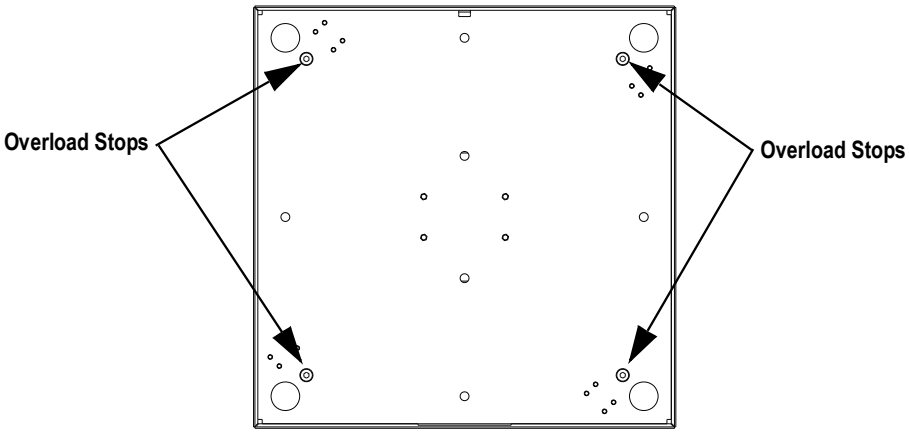

Figure 2-1. Remove Overload Stops

2.3 Assembly

1. Remove the black scale cover.
2. Remove the summing board cover in the center of the scale.
3. Wire the homerun cable (Section 2.4 on page 4).
4. Properly secure the cable with nylon ties (supplied).
5. Using the bubble level next to the summing board, ensure the scale is level.
6. Replace the black scale cover and use the four mounting screws to secure it in place.
7. If necessary, perform a corner correction (Section 3.2 on page 6).
8. Replace the summing board cover.
9. Replace the black center cover.
10. Set the stainless steel cover on the scale.

2.4 Summing Board Security

After an NTEP inspector has examined the unit, a security cable will be installed on the summing board cover. These cables prevent the summing board from being tampered with by unauthorized individuals. If these cables are removed, NTEP Certification will become void.

Figure 2-2. Summing Board Security Cable

2.5 Electrical Interface to Indicator

20' of 6-wire cable (used to connect the scale to the weight indicator) is supplied with each scale. Both ends have the wires stripped and tinned. Use the following instructions to access the summing board.

1. Remove the stainless steel platform.
2. Remove the lid in the center of the platform, revealing the summing board cover plate.
3. Remove security cables (this will void NTEP Certification).
4. Remove screws on the summing board cover plate and remove lid.

Wire Connections

Remove the summing board cover and connect the wires to the indicator terminal (Figure 2-3). To connect the indicator wires to the appropriate connectors, push in the quick connect lever with a non-conductive tool. When holding the lever, insert the appropriate wire into the exposed wire opening.

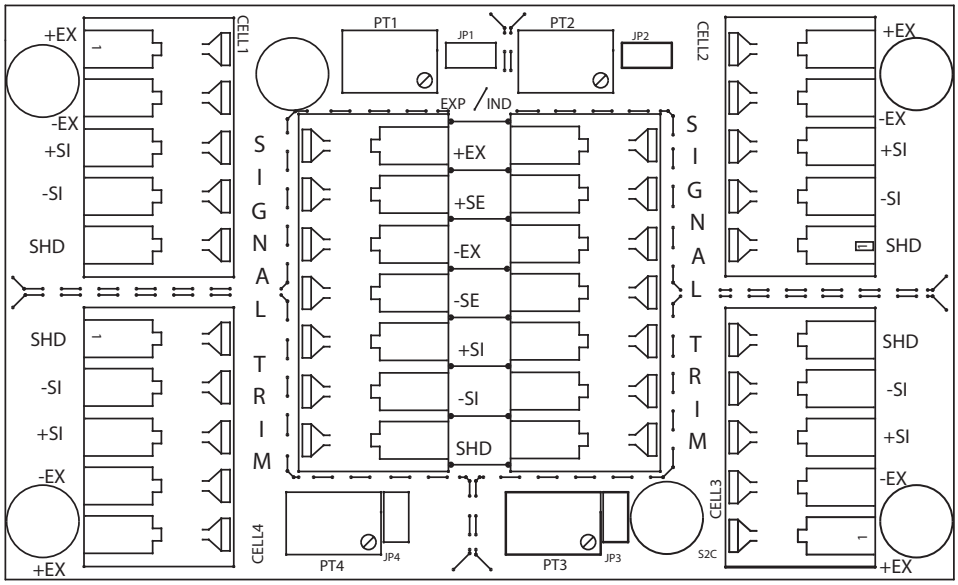

Figure 2-3. Summing Board Indicator Terminal

Cable Routing

The cable must be routed to the indicator in a manner that will protect the cable from damage. When planning cable routing, leave a loose coil of excess cable under the scale to facilitate future lifting of the scale for servicing or cleaning.

1. When the interface cable is protected and in its final position, complete connections to the indicator. See indicator installation manual for wiring information.
2. If necessary, trim corners as described in Section 3.2 on page 6.
3. Check all strain relief for tightness.
4. Secure with nylon ties.

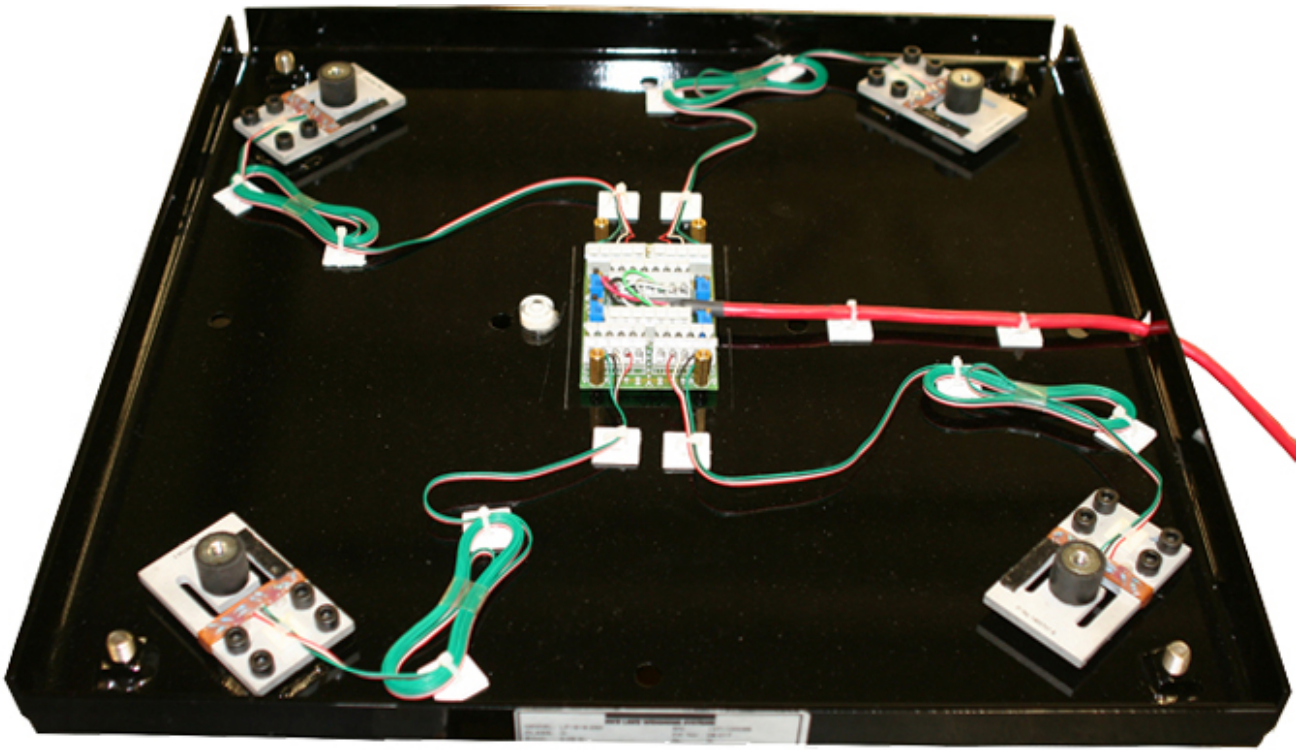

Figure 2-4. Homerun Cable Wired to Summing Board

3.0 Calibration

This section provides an overview of BenchMark LP Low-Profile Bench Scale calibration instructions.

3.1 Mechanical Adjustments

To accommodate minor floor unevenness, scale feet can be used to adjust scale height up or down a fraction of an inch.

Carefully lift each corner of the scale and adjust the feet by hand until all feet are contacting the floor equally. Be sure to support the scale while adjusting the feet. Jam nuts are supplied for locking the feet in place.

When height adjustments are complete, recheck the level of the deck with a spirit level. The deck must be level within 1/4".

3.2 Corner Correction

All assembled BenchMark LP scales are delivered with the summing board corner-trimmed. Corner trimming is only necessary after replacing a load cell.

To calibrate the scale, the output from each load cell must be matched by adjusting the signals with potentiometers at the summing board—a process known as trimming.

1. Remove the summing board cover and identify the correct load cell terminal corresponding to each corner. See Figure 4-3 on page 10 for scale deck corner numbering.
2. Calibrate the indicator (it does not need to be exact) using a test weight that is 25% of the scale capacity.

   Example: Use a 25 lb test weight for 100 lb models, or a 250 lb test weight for 1000 lb models.
3. Remove weight from the scale.
4. Zero the indicator.
5. Turn all four potentiometers fully clockwise (shaded areas of Figure 3-1) to increase the reading until a clicking sound is heard from each potentiometer. This ensures the maximum signal from each load cell.

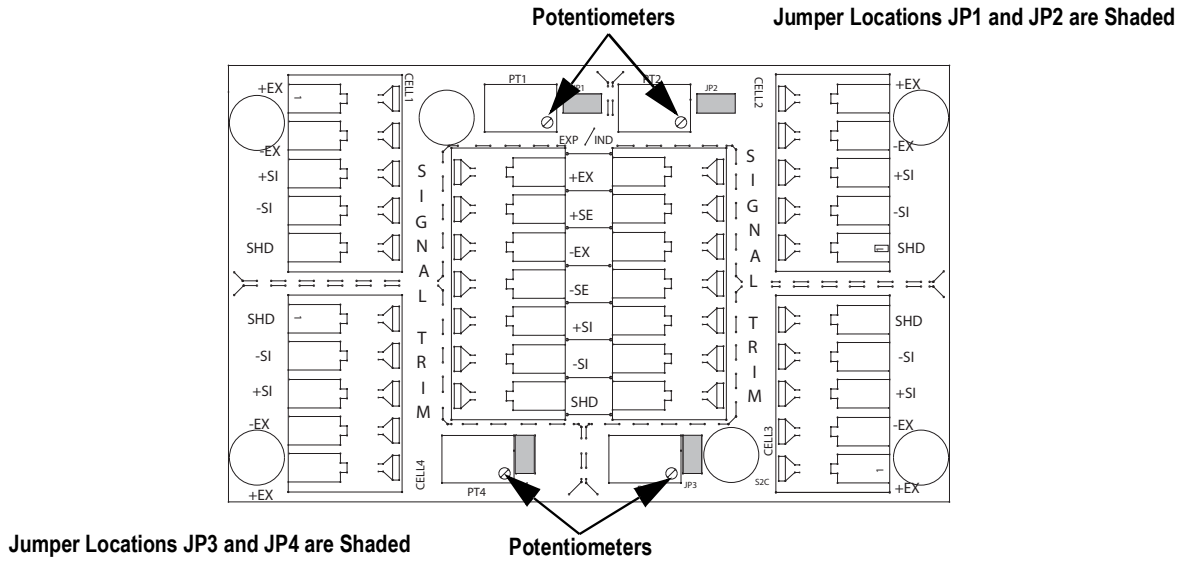

Figure 3-1. Trim Potentiometers

6. Zero the indicator and place 25% of scale capacity (using calibrated test weights) over each load cell in turn.
7. Record the value displayed on the indicator after the test weight is placed on each corner (directly over the load cell) without allowing the weight to overhang the sides. Allow scale to return to zero each time to check for friction or other mechanical issues. Select the load cell which has the lowest value as the reference point. This cell will not be trimmed.
8. Replace the same test load over each cell in turn. Using the corresponding potentiometer, trim each cell down to equal the reference load cell. As corner corrections are somewhat interactive, check all cells again for repeatability. If necessary, repeat Step 5 and Step 6.

3.3 Calibration Procedure

Refer to the indicator manual to determine correct calibration procedures.

It is recommended that the scale be exercised before calibration to be certain that everything is seated.

1. Load the scale to near capacity two or three times.
2. Ensure there is not a load on the scale, then place the indicator in its calibration mode and perform a zero calibration.
3. Place test weights on the platform (not exceeding the scale's full capacity). If several weights are used, they should be evenly distributed around the platform.
4. Perform a span calibration.

4.0 Maintenance

This section provides an overview of BenchMark LP Low-Profile Bench Scale maintenance information.

4.1 Troubleshooting

For troubleshooting details, see the following information:

Problem	Possible Cause	Solution
The system does not operate; There is nothing on the display	The power is disconnected	Check and reconnect the power
	The indicator fuse is blown	Replace the fuse; Check for the cause
	The interface cable is cut or disconnected	Repair the cable
	Signal leads are incorrectly installed at the indicator	Install the leads according to the indicator installation manual
The display stays at zero	The indicator is faulty	Service the indicator
	The load cell connections are faulty	Check the cable connections in the summing board and at the indicator
Weights display erratically	There is vibration near the scale	Remove the source of vibration, or move the scale
	The platform is not level within 1/4"	Level the scale by adjusting the feet, or by shimming (if necessary)
	The load cell or cable has water damage	Replace the load cell or cable
	There is debris under the load cells or platform	Clean under the load cells and platform
	The indicator is faulty	Use a simulator to test the indicator for stability, then service the indicator
Weights are consistently high or consistently low	The indicator is not properly adjusted to zero	Zero the indicator according to the indicator manual
	The platform is binding	Obtain adequate clearance so the platform has free movement
	The indicator is not calibrated	Calibrate according to the indicator manual; Additionally, see Section 3.3 on page 7 of this manual
	The load cells are faulty	Test the load cells, replace if necessary
	The feet are touching the deck underside	Adjust the feet downward to provide adequate clearance

Table 4-1. Troubleshooting Guide

Periodic Maintenance

The space beneath the platform must be periodically cleaned to prevent debris buildup.

IMPORTANT

Do not attempt to use scales with non-hermetically-sealed load cells in washdown applications. Water damage is a common cause of failure in non-hermetically-sealed load cells.

Use care with high pressure steam washdowns for hermetically-sealed load cells. Steam will not damage the load cells, but the elevated temperatures may cause incorrect readings until the unit cools to room temperature.

4.2 Load Cell Replacement

Replacement load cells can be ordered from Rice Lake Weighing Systems, please refer to the part numbers in Table 4-2 on page 10. See Table 1-1 on page 1 for torque settings.

1. Remove defective load cells.
2. Disconnect load cell cable from summing board and cut cable ties.

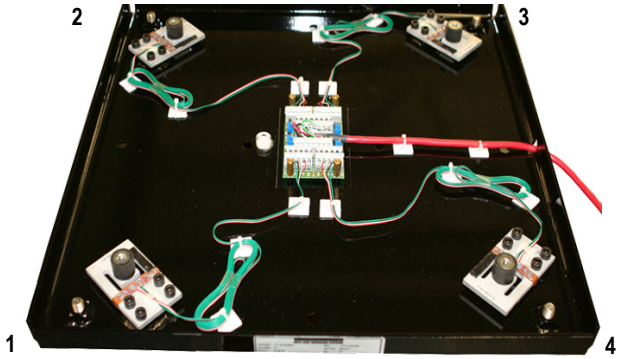

Figure 4-1. Load Cell Arrangement

3. When the cable is freed, pull the cable out of the scale.
4. Lay out each load cell near the corner where it is to be installed.
5. Attach the cable from each load cell along the frame and into the summing board as shown in Figure 4-1.

Note ***In Figure 4-1, both the scale and the summing board are viewed from the top. To verify correct load cell/summing board terminal matching, see the numbers on the terminals inside the summing board.***

6. Check that the threaded holes for the load cell screws are free of debris. Use compressed air to blow out holes as needed.
7. Position load cells with capacity label and load cell wires facing up.
8. Loosely install the hex head cap screws (provided).
9. Route the load cell cables along the frame to the summing board.
10. Secure the cable in position with the adhesive-backed cables tied supplied in the hardware kit. See Figure 4-2 for an illustration of load cell and cable placement.

IMPORTANT ***Do not cut load cell cables.***

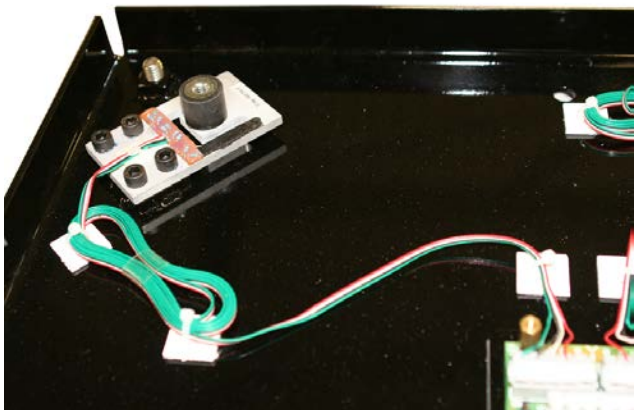

Figure 4-2. Load Cell and Wire Placement

11. Corner correction trimming and calibration is necessary after load cell replacement. Follow the instructions in Section 3.2 on page 6 and Section 3.3 on page 7.

Replacement Load Cells

Capacity of Scale	Load Mount Part No.	Load Cell Part No.
100 lbs	96823	100272
250 lbs	96824	104645
500 lbs	96825	100273
1000 lbs	96826	100274

Table 4-2. Replacement Load Cells

4.3 Wiring to Summing Board

The four load cells are each wired to their respective terminals in the summing board according to the corner numbering system shown in Figure 4-3 and the color code in Table 4-4. Feed the red cable through the hole on the side of the frame and wire to the summing board.

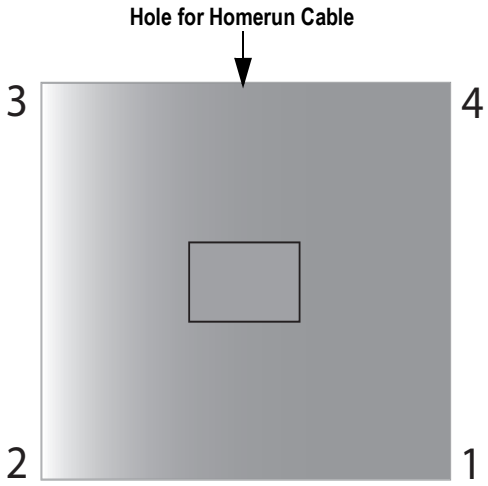

Figure 4-3. Corner Numbering (Top View)

Cable Color Code	Summing Board Terminal
Green	+ Excitation
Black	- Excitation
White	+ Signal
Red	- Signal

Table 4-3. Load Cell Cable Wiring

Cable Color Code	Summing Board Terminal
Green	+ Excitation
Yellow	+ Sense
Black	- Excitation
Blue	- Sense
White	+ Signal
Red	- Signal
SHD	Shield

Table 4-4. Homerun Cable Wiring

5.0 Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:|

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, “Protecting Your Components From Static Damage in Shipment,” available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

These warranties exclude all other warranties, expressed or implied, including without limitation warranties of merchantability or fitness for a particular purpose. Neither RLWS nor distributor will, in any event, be liable for incidental or consequential damages.

RLWS and buyer agree that RLWS’ sole and exclusive liability hereunder is limited to repair or replacement of such goods. In accepting this warranty, the buyer waives any and all other claims to warranty.

Should the seller be other than RLWS, the buyer agrees to look only to the seller for warranty claims.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

6.0 Specifications

Load Cell
IP65 aluminum

Rated Output
1.0 mV/V ± 10%

End Load Capacity
60% of full scale capacity

Cable Length
20' (6.1 m) for connecting junction box to indicator

Warranty
Two-year limited warranty

Certifications and Approvals
NTEP
CoC 08-017
Accuracy Class III; 5000 d
(Except 1000 lb capacity models)

Measurement Canada
AM-5660, Class III 5000 d
(Except 500 kg capacity models)

RICE LAKE®
WEIGHING SYSTEMS

230 W. Coleman St. • Rice Lake, WI 54868 • USA
U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0)26 472 1319