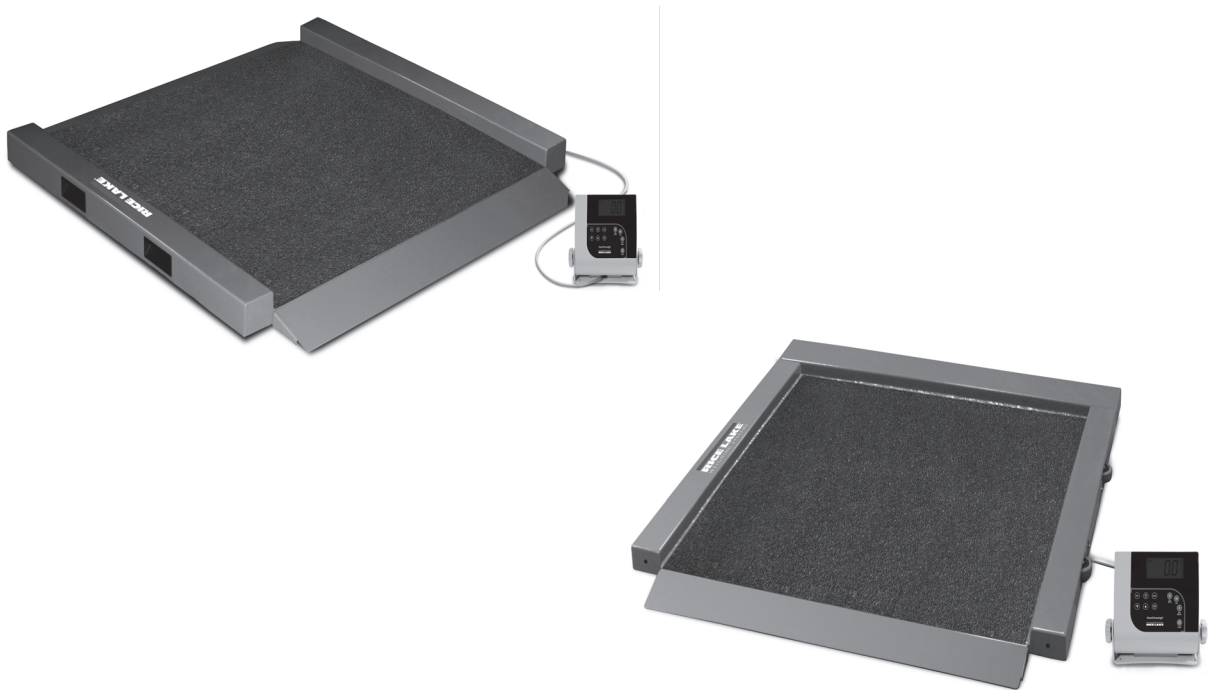


# Rice Lake Wheelchair Scale

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*RL350 Series*  
*Software Revision 11439*

## Technical Manual





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Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at [www.ricelake.com](http://www.ricelake.com) or obtained by calling 715-234-9171 and asking for the training department



*Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit [www.ricelake.com/webinars](http://www.ricelake.com/webinars).*

# 1.0 Introduction

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The Rice Lake Wheelchair Scale is a heavy-duty scale that easily accommodates wheelchairs with its large platform size and easy-access ramp in either a single ramp (RL-350-5) or dual ramp model (RL-350-6). It provides exceptional performance in applications where typical wheelchair scales are not large enough to meet the needs of the patient.

The Rice Lake Wheelchair Scale is a fully electronic, low profile floor scale that measures 34 in x 34 in (.86 m x .86 m), and has a capacity up to 1000 lb (450 kg). The Rice Lake Wheelchair uses four corner-mounted, alloy steel shear beam load cells, with the cells recessed into the frame channels for protection. The Rice Lake Wheelchair Scale offers two integrated handles and wheels for ease of portability.

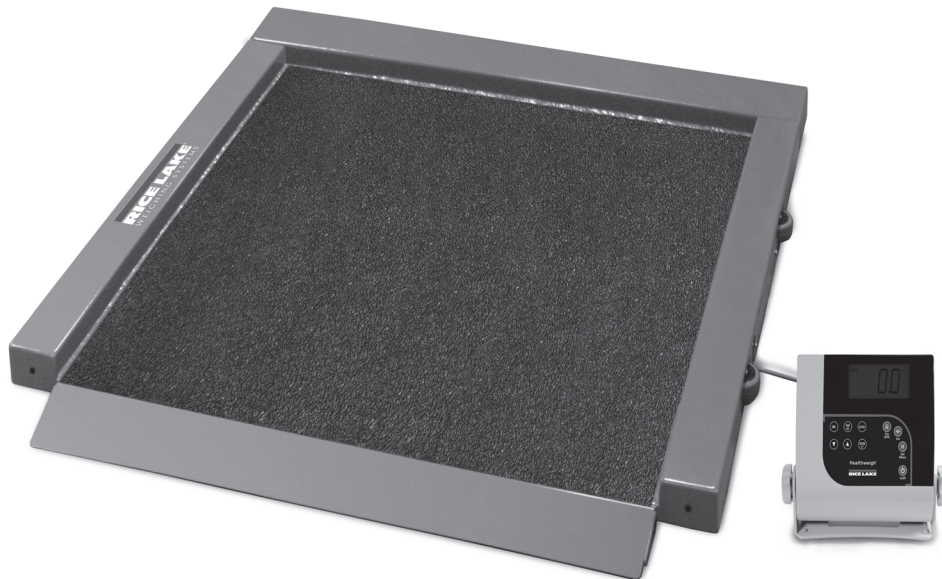
Load cell cables are run through the main channels, and held down with replaceable cable ties near each corner, eliminating the possibility of cable damage in portable applications.

The adjustable feet are used to allow leveling the scale to make up for minor floor irregularities. Two of the four feet sit inside the foot keeper plates located on the front of the ramp.

The Rice Lake Wheelchair Scale comes equipped with an anti-slip rubber surface on the scale platform and a large 1" LCD indicator display. The indicator comes with six AA batteries and has an optional AC adapter available.



This manual can be viewed and downloaded from the Rice Lake Weighing Systems web site at [www.ricelakehealth.com](http://www.ricelakehealth.com). Technical information on this product and other medical products are also available on the Rice Lake Weighing Systems website.



*Figure 1-1. Rice Lake Wheelchair Scale (350-10-5 Model Shown)*

The scale is set up to use motion sensing technology, to determine actual weight of a moving patient. The weight can be displayed in either pounds or kilograms and you can enter a tare weight. The Scale Operation section on page 9 of this manual explains the scale operation and how to obtain a tare weight.

## 2.0 Safety

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There are certain precautions that should be taken to prevent personal injury to the user and damage to your scale.

### 2.1 Safety Signals

#### Safety Signal Definitions:



*Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.*



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



**Important**

*Indicates information about procedures that, if not observed, could result in damage to equipment.*

### 2.2 Safety Precautions



*Do not operate or work on this equipment unless you have read and understand instructions in the manual. 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. Proper care is your responsibility.*



*Before attempting to operate this unit, make sure every individual who operates or works with this unit has read and understands the following safety information. Please follow these instructions carefully.*

- Do not drop the scale or subject it to violent shocks.
- For accurate weighing, the scale must be placed on a flat, stable surface.
- Do not transport the scale while someone is standing on it.
- Weight exceeding the maximum capacity (1000 lb/450 kg) may damage your scale.
- Operating at voltages and frequencies other than specified could damage the equipment.
- If the *LO Bat* indicator activates, for accurate weighing, replace the batteries or connect the scale to an AC power source as soon as possible.
- To avoid cross contamination, the scale should be cleaned regularly.
- Avoid contact with excessive moisture.
- Do not allow minors (children) or inexperienced persons to operate this scale.
- Do not jump up and down on the scale.
- Do not use in the presence of flammable materials.
- Do not make alterations or modifications to the scale.
- People with disabilities, or who are physically frail, should always be assisted by another person when using this scale.
- Do not use the scale on slippery surfaces, such as a wet floor.
- Do not use this scale when your body/feet are wet, such as after taking a bath.

## 3.0 Scale Setup

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The following sections describe the correct installation procedures when installing the Rice Lake Wheelchair Scale.

### 3.1 Unpacking Your Scale

The Rice Lake Wheelchair Scale comes shipped in a wooden two piece box. Place the unopened box in an open area that has ample room for unpacking the scale.

Recommended tools needed to set up your scale include:

- Scissors or box cutters
- Small Phillips screwdriver

Using scissors or a box cutter, cut the strapping bands that secure the box together. Lift off the top cover. Immediately after opening the box, visually inspect your scale to ensure all parts are included and undamaged.

Parts contained in the shipping box include:

- Rice Lake Wheelchair Scale
- This manual
- Parts box which contains the indicator display

### 3.2 Repacking

If the Rice Lake Wheelchair Scale must be returned for modification, calibration or repair, it must be properly packed with sufficient packing materials. Whenever possible, use the original box when shipping the wheelchair scale back.



**Note** *Damage caused by improper packaging is not covered by the warranty.*

### 3.3 Setting Up Your Scale

Use the following steps to set up the Rice Lake Wheelchair Scale.

1. Locate the operation manual and set aside as it will provide instructions on the proper scale setup.
2. Using two people, remove the scale off of the shipping platform that it came in as shown in Figure 3-1.



*Figure 3-1. Un-box the Scale*

3. Move the scale into the area where the weighing process will occur. It's recommended to place the scale on a hard, level surface for the most accurate weighments. Thin carpeting is often acceptable but not recommended.

4. Stand the scale on its side so that the plastic packaging material can be removed.



*Figure 3-2. Remove Plastic Wrapping off of Scale*

### **3.4 Scale Feet Adjustment**

The scale feet are shipped attached to the scale. Adjustments need to be made in order for the scale to sit properly on the floor.

1. There must be adequate clearance between the scale base and the floor so screw each foot out counter clockwise two full turns. This will ensure that there is enough clearance between the scale base and the floor.



*Figure 3-3. Backing Out the Scale Feet*



- Carefully unwrap the load cell cable located on the underside of the scale. It will run out the underside of the scale.



Figure 3-4. Unwrap the Cable from the Underside of the Scale

- Gently set the scale base down to the floor. There should be minimal clearance between the scale base and the floor without having the scale base actually touching the floor.



**Note** *Not having clearance around the scale base will create inaccurate weighments.*

- It's also important to make sure that the scale is completely level. Gently press down on all corners of the scale base to ensure that there are no high spots or rocking of the scale base.



**Note** *An un-level base will produce inaccurate weight readings.*

### 3.5 Cable Connections

Ten feet of 4-wire cable to connect the scale to the weight indicator is supplied with each scale.



**Note** *The cable is pre-installed from the factory.*

The cable must be routed to the indicator in a manner that will protect the cable from damage. Cabling should exit the underside of the scale on the portable wheel side of the scale and not the ramp side(s). 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.

Cable should exit underside of the scale on the wheeled side of scale.

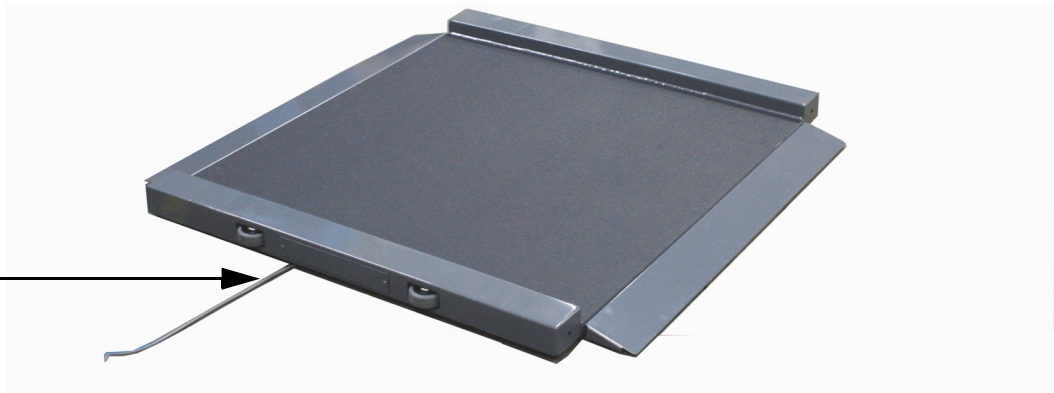


Figure 3-5. Indicator Cable Exiting the Side of the Scale Platform

- When the interface cable is protected and in its final position, complete connections to the indicator as described in Section 4.0.

## 4.0 Indicator Setup

To protect the indicator during transit, the indicator is shipped in a separate box inside the main shipping container. The following sections apply to indicator connections and setup.

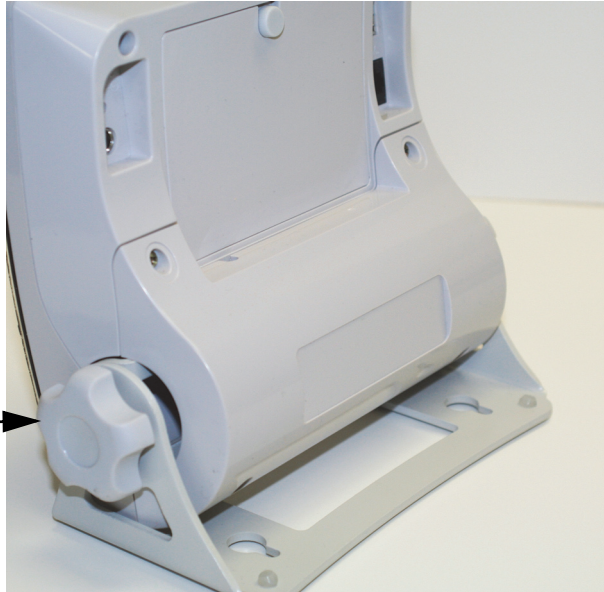
### 4.1 Load Cell Connections

The scale comes with ten feet of load cell cable which comes from the bottom of the scale (shown in Figure 3-5). The load cell cable must be connected to the indicator display.

To gain access to the load cell connection point, do the following:

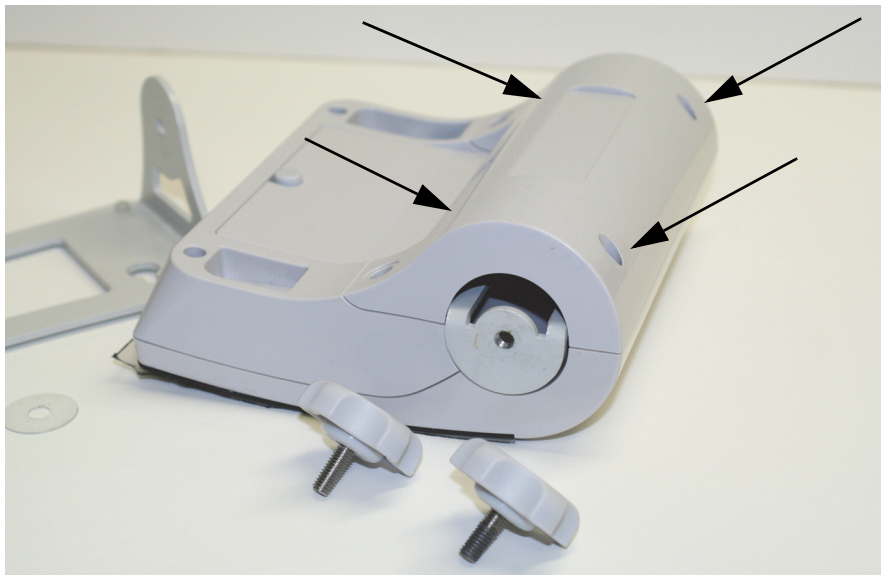
1. Unscrew and remove the tilt stand bracket from the indicator.

Unscrew tilt stand knobs and remove tilt stand from indicator



*Figure 4-1. Remove Tilt Stand From Indicator*

2. Remove the four back retaining screws as shown in Figure 4-2 and remove the back cover to the indicator.



*Figure 4-2. Remove Back Cover of Indicator*

3. Figure 4-3 illustrates where the load cell connection point is located.

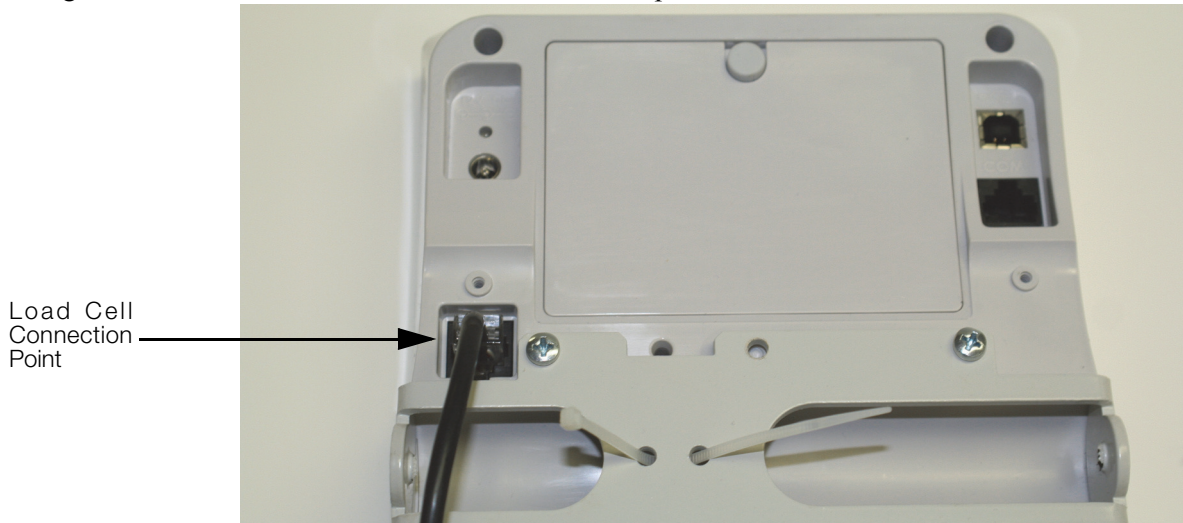


Figure 4-3. Load Cell Connection Point

Plug the end of the load cell cable into the load cell connection point shown in Figure 4-3. There will be a “click” when the load cell cable has been properly seated into the connection point.

Replace the back cover on the indicator with the four back retaining screws and re-attach to the tilt stand.

## 4.2 Inserting Batteries

The six AA batteries that come with the scale offer an average of 25 hours of continuous use.

To install the batteries,

1. Open the battery chamber cover by loosening the thumbscrew.
2. Insert batteries into the battery chamber as shown in Figure 4-4.



Figure 4-4. Battery Chamber

3. Close the battery chamber.

If an external power supply or USB power supply is connected, the battery flag on the display is turned off.

When using battery or USB power supply, the backlight power is deducted to 60%.



**Note** To maintain battery longevity we recommend you charge it on a regular basis rather than waiting until it is fully discharged.

### 4.3 AC Power Connections

Use the optional 120 VAC adapter or 230 VAC adapter to use when power is available. The AC power adapter plugs into the back of the indicator as shown in Figure 4-5.

Connect the optional AC power source here



*Figure 4-5. Power Connection Site*

## 5.0 Scale Operation

The display has various front panel keys. They are shown below and their function is described in Table 5-1.



Figure 5-1. Front Panel Display Keys








Key	Name	Function
 On/Off	On/Off	Switches the scale on or off.
 Print LB/KG	Print LB/KG	Print — A long key press will send data out from the RS-232 port. LB/KG — A short key press allows the user to toggle between kilograms and pounds providing that it's enabled in configuration mode. There is no toggling while in the BMI mode.
 Zero	Zero	Clears the weight off the scale and returns it to zero after three seconds. It works only if the current weight is stable and zero up to 2% of full weight.
 Hold Release	Hold Release	Hold & Release — The first press holds the most current weight value shown on the display. A second press releases the weight value shown. This key is not active while in BMI mode.
	BMI	Enables the user to access the BMI (Body Mass Index) function. This key only works if there is a locked weight shown on the display and the BMI function is turned on in the configuration mode.
	TARE	Used to subtract the weight off the scale, example: oxygen tank, other equipment.
	ENTER	Used to accept height in BMI mode. Accepts the value of the parameter last entered and moves to the next stage. A long press of the <b>ENTER</b> key during the scale's start up process will enter the ID display (pre-parameter mode).

Table 5-1. Key Functions



Key	Name	Function
	Up/Down Arrows	Used to adjust height input (0.5 in/0.5 cm) while in BMI mode. Adjusts the value of the flashing digit/number.

Table 5-1. Key Functions (Continued) (Continued)

 **Important** The keys on the front panel display are very sensitive so only a gentle pushing motion is required to obtain results.

## 5.1 Weighing

Use the following steps to weigh a person.

1. Press the **On/Off** key to turn on the scale and *0.0* will appear on the display along with *ZERO* on the upper display.
2. When the person steps on the scale the display shows the person's weight. The *LOCK* annunciator is on in the upper display and beeps to indicate the end of the weighing process.
3. To change the display from kg to lb and vice-versa, press the **LB/KG** key.
4. To turn off the scale, press and hold the **On/Off** key until *OFF* appears on the display.

## 5.2 Hold/Release Function

Use the following steps to use the Hold/Release function.

1. When the person is on the scale, press the **Hold/Release** key.
2. When the person steps off the scale, the weight and the *HOLD & LOCK* annunciator will remain on the display.
3. At this stage the **Zero** key will not work. The only way to return to zero from here is to press the **Hold/Release** key one more time.



**Note** Pressing the **Hold** key prior to a person getting on the scale will also work.

## 5.3 Preset Tare

Use the following steps to use the Preset Tare.

1. When the weight is set to *0.0*, place the extra load on the scale. Press the **TARE** key until the display returns to *0.0* and *NET* appears on the display.
2. Remove the extra load from the scale. The weight will appear with a negative symbol to the left of it.
3. Ask the patient to step on the scale with the extra weight. The display shows the patient's weight. The *NET* annunciator is still on. The weight of the extra load remains stored in memory.
4. To cancel the tare weight, press and hold the **TARE** key until *NET* disappears from the display and the display turns back to *0.0* and *GROSS* appears. Tare weight is also canceled when the scale is turned off.

## 5.4 Toggle Tare

Use the following steps to use the Toggle Tare function.

1. When the weight is set to 0.0, press the **TARE** key.
2. The default tare value is displayed (default is programmed to be 33.0 lb/15.0 kg), while the zero is flashing.
3. Use the **Up/Down** arrow keys to adjust the value.
4. Press **ENTER** to start the tare function and the *NET* annunciator will be turned on instead of the *GROSS* annunciator.

## 5.5 Using the Body Mass Index (BMI) Function

Use the following steps in determining the BMI.

### LB Mode

1. Ensure that the scale is at zero.
2. Have the person step on the scale to obtain a weight.
3. The *LOCK* annunciator is illustrated on the display.
4. Press the **BMI** key. The BMI and FT/IN annunciators are lit on the display and a default value of 5 feet and 7.5 inches (5-07.5) is flashing.
5. Use the **Up/Down** arrow keys to adjust the height value, and press the **ENTER** key to move to the next step.
6. The BMI value and BMI annunciator is shown on the display. Press **CLEAR** to return to the weighing mode and the BMI function will be turned off.

### KG Mode

1. Ensure that the scale is at zero.
2. Have the person step on the scale to obtain a weight.
3. The *LOCK* annunciator is illustrated on the display.
4. Press the **BMI** key. The BMI and CM annunciators are lit on the display and a default value of 170.0 cm (170.0) is flashing.
5. Use the **Up/Down** arrow keys to adjust the height value, and press the **ENTER** key to move to the next step.
6. The BMI value and BMI annunciator is shown on the display. Press the **CLEAR** key to return to the weighing mode or step off the scale and the BMI function will be turned off.

## 6.0 Scale Configuration

Options and parameter setup are done through the scale configuration section and is used for setting values, parameters, and options that are essential for the functioning of the scale. Access to the setup switch is located under the tilt stand cover. Use a Phillips head screwdriver to remove the four screws holding the cover in place. (shown in Figure 6-1— left photo).

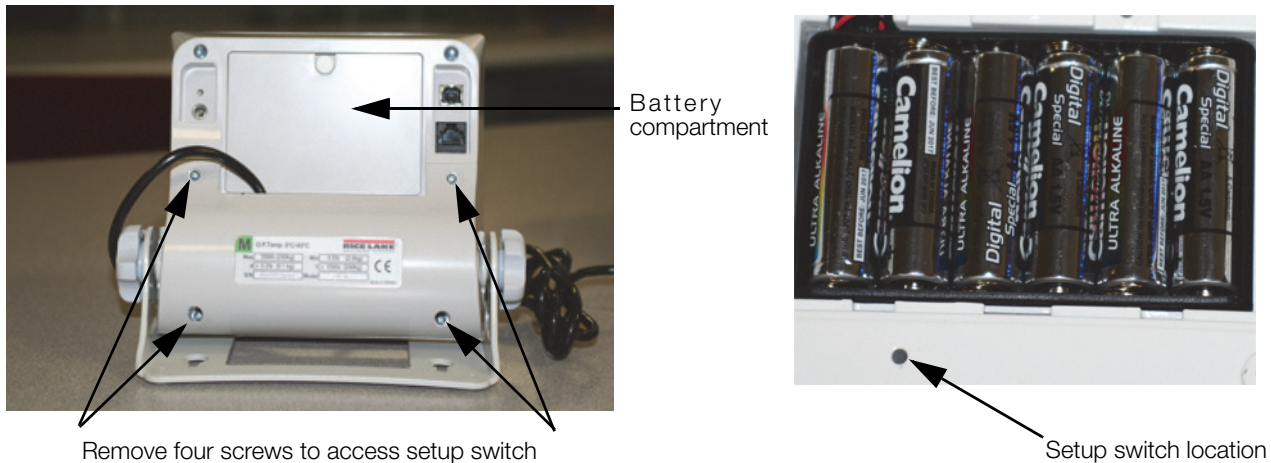


Figure 6-1. Setup Switch Location

Use the following steps to enter into configuration mode.

1. Make sure the scale is turned off.
2. Turn the scale on by simultaneously pressing the **On/Off** key and the **ENTER** key.
3. Continue to hold both keys until *Id* appears. The unit cycles through its startup function and continues to display the software version.
4. Access the recessed setup switch located in the back of the indicator. You can use a small paper clip, small screwdriver or other similar object to press the setup switch.
5. Once the setup switch is pressed, *PROG* appears on the display.
6. The scale can be configured using a series of menus accessed through the front panel when the scale is in setup mode.



Figure 6-2. Top Level Menu

7. Press the **BMI** key to advance to the desired menu.
8. Press the **ENTER** key and advance in the manual to the related menu selection for further instructions.



## 6.1 Programming Mode Menu

Various parameters can be set while in programming mode.

Those parameters are shown in Figure 6-3.

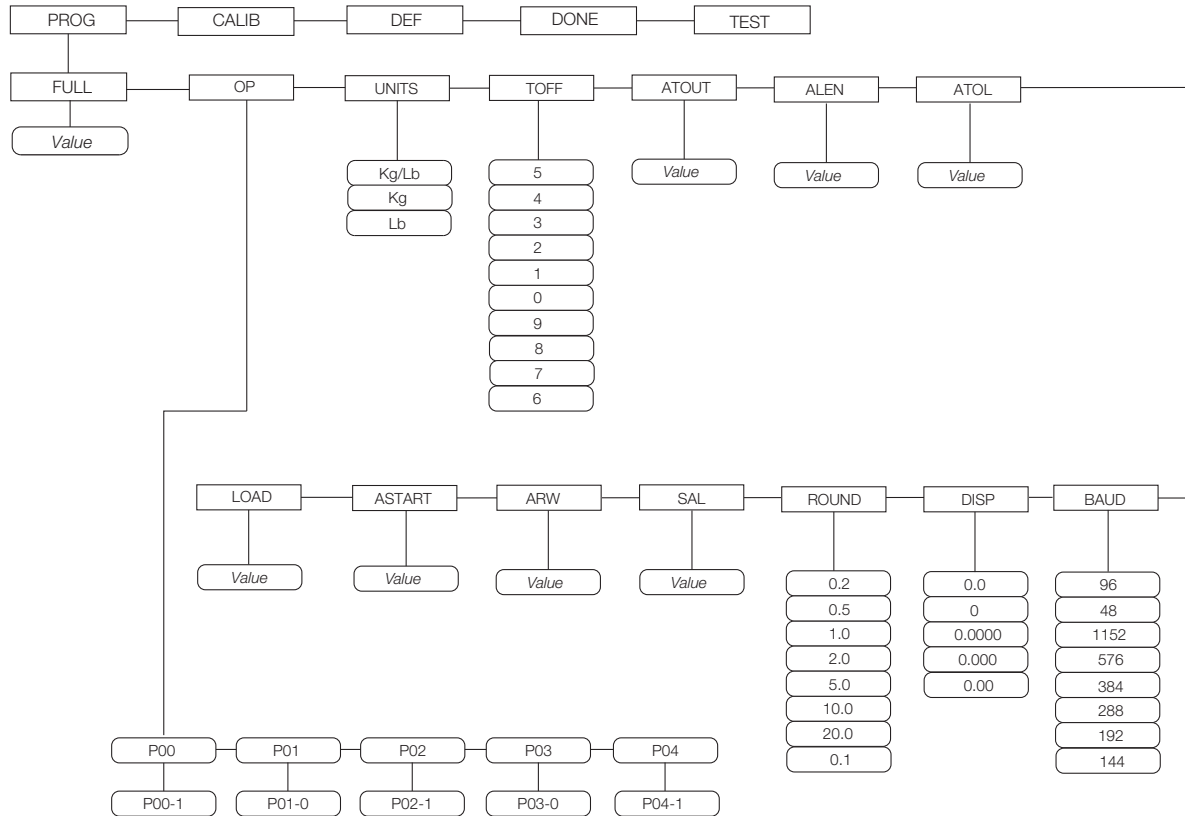


Figure 6-3. Programming Mode Menu Structure

Table 6-1 lists the various display messages and sequence when setting up the scale.

Parameter	Description	Choices	Steps
FULL	Full capacity of the scale	Value (1000 lb)	<p>The display toggles between a numeric value and <i>FULL</i>. If you don't want to change the value, press the <b>BMI</b> key to move to the next setting. Example: from FULL to LOAD. If you want to change the value, use the following steps.</p> <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. Press the <b>BMI</b> key to move to the left.</li> <li>4. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>5. Press the <b>BMI</b> key again to move to the left</li> <li>6. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>7. When done press the <b>ENTER</b> key to move to the next parameter (LOAD).</li> </ol>

Table 6-1. Configuration Mode Menu

Parameter	Description	Choices	Steps
LOAD	This is the amount of weight applied during calibration. Can also be changed in the calibration menu.	Value (200 Lb)	The display toggles between a numeric value and <i>LOAD</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from <i>LOAD</i> to <i>ASTART</i> . If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. Press the <b>BMI</b> key to move to the left.</li> <li>4. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>5. When done, press the <b>ENTER</b> key to move to the next parameter (<i>ASTART</i>).</li> </ol>
ASTART	Weight process start limit — Maximum (full capacity)/10. Determine when the weight algorithm starts (when the "----" is displayed), below this value the scale will show live weight.	Value (2.0)	The display toggles between a numeric value and <i>ASTART</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from <i>ASTART</i> to <i>ARW</i> . If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. Press the <b>BMI</b> key to move to the left.</li> <li>4. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>5. When done, press the <b>ENTER</b> key to move to the next parameter (<i>ARW</i>).</li> </ol>
ARW	Auto Reweigh — Restarts the weight algorithm if the weight changed by more than this value.	Value (4.0 Lb)	The display toggles between a numeric value and <i>ARW</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from <i>ARW</i> to <i>SAL</i> . If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. Press the <b>BMI</b> key to move to the left.</li> <li>4. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>5. When done, press the <b>ENTER</b> key to move to the next parameter (<i>SAL</i>).</li> </ol>
SAL	Semi Auto Live — This value is the interval between weight displays during the algorithm process.	Value (0.5)	The display toggles between a numeric value and <i>SAL</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from <i>SAL</i> to <i>ROUND</i> . If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. When done, press the <b>ENTER</b> key to move to the next parameter (<i>ROUND</i>).</li> </ol>

Table 6-1. Configuration Mode Menu (Continued)

Parameter	Description	Choices	Steps
ROUND	Scale Resolution — Values in kg: <b>1</b> , 2, 5, 10, 20, 50, 100 Values in lb: 1, <b>2</b> , 5, 10, 20, 50, 100, 200	<b>0.2</b> 0.5 1.0 2.0 5.0 10.0 20.0 0.1	The display toggles between a numeric value and <i>ROUND</i> . The decimal point location is set to the DISP parameter display decimal point location. If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from ROUND to DISP. If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value.</li> <li>2. Press the <b>Up/Down</b> arrow keys to change the available parameters.</li> <li>3. When done, press the <b>ENTER</b> key to move to the next parameter (DISP).</li> </ol>
DISP		<b>0.0</b> 0 0.0000 0.000 0.00	The display toggles between a numeric value and <i>DISP</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from DISP to BAUD. If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value.</li> <li>2. Use the <b>Up/Down</b> arrow keys to change the available parameters.</li> <li>3. When done, press the <b>ENTER</b> key to move to the next parameter (BAUD).</li> </ol>
BAUD	Baud rate	<b>96</b> 48 1152 576 384 288 192 144	Note: Indicator display illustrates first two digits of baud rate only. The display toggles between a numeric value and baud. If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from BAUD to ATOL. If you want to change the value, use the following steps <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value.</li> <li>2. Use the <b>Up/Down</b> arrow keys to change the available parameters.</li> <li>3. When done, press the <b>ENTER</b> key to move to the next parameter (ATOL).</li> </ol>
ATOL	Algorithm initial tolerance — Maximum value is 255. Values above 255 will not let you proceed and will return to the previous value.	<i>Value (10)</i>	The display toggles between a numeric value and <i>ATOL</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from ATOL to ALEN. If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. Press the <b>BMI</b> key to move to the left.</li> <li>4. When done, press the <b>ENTER</b> key to move to the next parameter (ALEN).</li> </ol>
ALEN	Algorithm initial exponent — Maximum value 10. Values above 10, will not let you proceed and will return to the previous value.	<i>Value (8)</i>	The display toggles between a numeric value and <i>ALEN</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from ALEN to ATOUT. If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. When done, press the <b>ENTER</b> key to move to the next parameter (ATOUT).</li> </ol>

Table 6-1. Configuration Mode Menu (Continued)

Parameter	Description	Choices	Steps
ATOUT	Algorithm maximal exponent — Maximum value is 15. Values above 15, will not let you proceed and will return to the previous value.	Value (10)	The display toggles between a numeric value and <i>ATOUT</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from ATOUT to TOFF. If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change value starting with the right most digit.</li> <li>2. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>3. Press the <b>BMI</b> key to move to the left.</li> <li>4. Use the <b>Up/Down</b> arrow keys to increment/decrement numbers.</li> <li>5. When done, press the <b>ENTER</b> key to move to the next parameter (TOFF).</li> </ol>
TOFF	Auto off timer — Measured in minutes. 0 = always on. Maximum is 9 minutes. When using an external power supply, this parameter is irrelevant.	5 4 3 2 1 0 9 8 7 6	The display toggles between a numeric value and <i>TOFF</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from TOFF to UNITS. Press the <b>ENTER</b> key to move to the next parameter. (UNITS). If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change values.</li> <li>2. Use the <b>Up/Down</b> arrow keys to change the available parameters.</li> <li>3. When done, press the <b>ENTER</b> key to move to the next parameter (UNITS).</li> </ol>
UNITS	Units — Selects the unit of measure. It can be either Kg/Lb, Kg only or Lb only.	<b>KG/LB</b> KG LB	The display toggles between unit of measurements and <i>UNIT</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. Example: from UNITS to OP. If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press the <b>ENTER</b> key to change values.</li> <li>1. Press the <b>Up/Down</b> arrow keys to change the value.</li> <li>2. When done, press the <b>ENTER</b> key to move to the next parameter (OP).</li> </ol>
OP	Binary options: OP0 — Live weighing options (0=disable, 1=enable) OP1 — Communication protocol (0=ESC, 1=maintenance) OP2 — BMI menu (0=disable, 1=enable) OP3 — RTC power (0=disable, 1=enable) OP4 - Semi-Auto-Live — (0=disable, 1=enable) OP5 - Full calculation — (0=spatial, 1=multiply by (0=disable, 1=enable) OP6 - Tare - (0=disable, 1=enable) OP7 - Bat type — (0=dry batteries, 1=rechargeable batteries) OP8 — OIML mode - (0=disable, 1=enable)	OP0 OP1 OP2 OP3	The display toggles between a binary option and <i>POO-0</i> . If you don't want to change this value, press the <b>BMI</b> key to move to the next setting. If you want to change the value, use the following steps. <ol style="list-style-type: none"> <li>1. Press <b>ENTER</b> to change parameters.</li> <li>2. Use the <b>Up/Down</b> arrow keys to select the display value you want to change.</li> <li>3. Press the <b>BMI</b> key to move the flashing cursor. <ol style="list-style-type: none"> <li>3a. Use the <b>Up/Down</b> arrows to change the value.</li> <li>3b. Press the <b>BMI</b> key to move the flashing cursor.</li> </ol> </li> <li>4. Press the <b>ENTER</b> key to save all of the display parameters. <i>SAVE</i> appears on the display.</li> <li>5. Press the <b>ENTER</b> key again and <i>DONE</i> appears indicating that you are now done entering all of the parameters of the scale.</li> </ol>
	Press the <b>BMI</b> key to cycle back to the top level menu choices, ie: PROG/CALIB/DEF/DONE/TEST		

Table 6-1. Configuration Mode Menu (Continued)

## 6.2 Default Menu

The default menu is used to return the scale back to its factory settings and is shown in Figure 6-4.

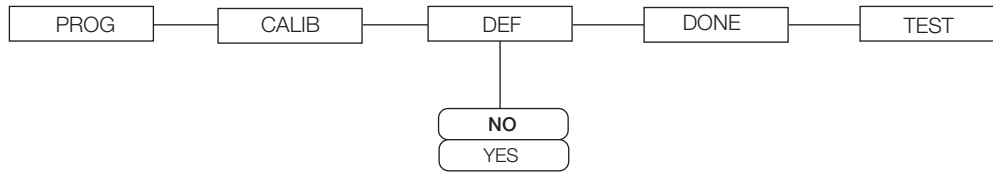


Figure 6-4. Default Menu

Use the following steps to return the settings back to their factory default.

1. Press the **ENTER** key. The display shows a default value of *NO*.
2. To change to *YES*, press the **Up/Down** arrow keys.
3. Press the **ENTER** key and the display shows *DONE*.
4. Press the **BMI** key to return to *PROG/CALIB/DEF/DONE/TEST* upper level menu.



**Note** Selecting *YES* and pressing the **ENTER** key will reset to factory defaults settings without changing the calibration and will return you to weigh mode.

## 6.3 Scale Calibration

Use the following steps to calibrate the scale.

1. Turn on scale by pressing the **On/Off** key and the **ENTER** key simultaneously.
2. The unit cycles through its startup function and continues to display the software version. Continue to hold both keys until *ld* appears.
3. Access the setup key located in the back of the scale to enter the setup parameters for the scale. You can use a small paper clip, small screwdriver or other similar object to press the setup key.

Setup switch location  
on back of indicator.

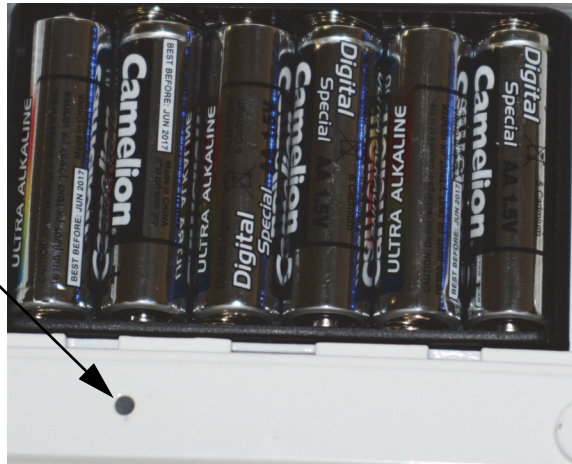


Figure 6-5. Setup Switch Location on Back of Indicator

4. *Prog* appears on the display. Press the **BMI** key to toggle along the parameter menu.
5. *Calib* appears on the display and enter the calibration parameters.
6. Press the **ENTER** key and a numeric value is displayed which represents the amount of weight that is used for calibration. *Lb* will be flashing. To switch between *lb* and *kg*, press the **Up/Down** arrow keys on the display. Once a unit is selected, press **ENTER** and the right most digit will be flashing.
7. To change the calibration load value, use the **Up/Down** arrow keys to increment/decrement the flashing digit.

8. Use the **BMI** key to move the flashing digit to the left or right.
9. Once all the digits have been entered, press the **ENTER** key and *Clear* is displayed.
10. Make sure the scale platform is clear of weight and press the **ENTER** key again and ===== is displayed.
11. A request to put the chosen load on the platform is displayed by *Put xxx.xx*.
12. Put the chosen weight on the platform and press the **ENTER** key. ===== is displayed and then *Save*.
13. Press the **ENTER** again and the display indicates *Done*.
14. Press the **BMI** key three times to exit back out to the top level *Done* parameter.
15. Press the **ENTER** key to return to weigh mode.

To exit calibration without changing zero or span existing calibration, press the **CLEAR** key, then the **BMI** key.

## 7.0 Test Menu

To access the *TEST* menu, use the following steps.

1. Turn the scale on by pressing the **On/Off** key and the **ENTER** key simultaneously until *ID* flashes.
2. Press the **ENTER** key again.
3. Continue to press the **BMI** key to scroll through the various menu items.
4. Once complete, press the **BMI** key again and *Done* is displayed.
5. Press the **ENTER** key to start the weighing process.

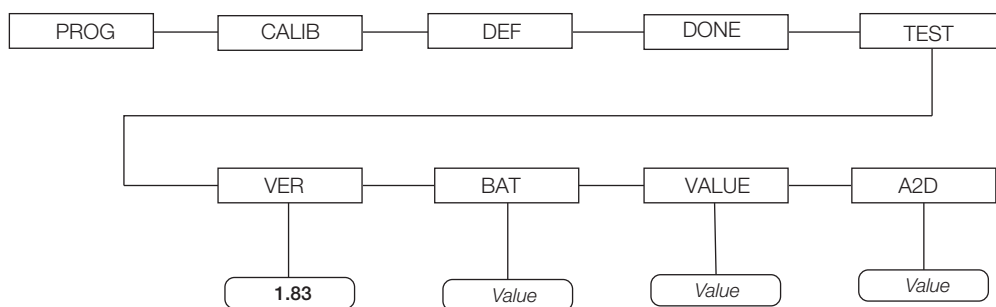


Figure 7-1. Test Menu

Test Menu		
Parameter	Choice	Description
VER	Value	Displays the current software version.
BAT	Value	Displays the current battery level.
VALUE	Value	Displays the actual value.
A2D	Value	Displays the actual raw counts of the scale.

Table 7-1. Test Menu

## 8.0 RS-232 Communication

---

The scale comes with an RS-232 port which enables weight data to be transmitted to other equipment, such as a computer or printer. The RS-232 cable with DB-9 connector (PN 100719) is available from Rice Lake Weighing Systems. Figure 6-1 shows the RS-232 connection location.

The RS-232 parameters are 9600 baud (selectable in the programming mode), 8 data bits, 1 stop bit, no parity and no handshaking.

There are three methods of communication:

- Pushbutton keypad print
- Standard remote protocol
- Escape protocol

### 8.1 Pushbutton Keypad Print

With a stable, in-range weight, press and hold the **Kg-Lb/Print** key for at least three seconds, or until the scale emits two quick beeps. Note that if the scale does not beep after five seconds, then release the button as the weight was either in motion, or out of range.

- If displaying weight and not BMI, the scale will send out the following 21 character string:

```
xxxxxxxx<SP>uu<SP>mmmm<SP><CR><LF>
```

Where:

xxxxxxxx is the weight with decimal point and “ - “ sign, if negative, uu is the unit (lb or kg).

mmmm is the mode (gross or net)

Examples:

```
-10 Lb net = <SP><SP><SP><SP>-10.0<SP>lb<SP><SP>Net<SP><SP><SP><CR><LF>
```

```
10 Lb gross = <SP><SP><SP><SP><SP>-10.0<SP>lb<SP>Gross<SP><CR><LF>
```

- In BMI mode (displaying the BMI value), the scale will send out the following data:

```
GROSS WEIGHT    215.0 LB
TARE WEIGHT      0.0 LB
NET WEIGHT       215.0 LB
PATIENT HEIGHT  6-01.0 FT
PATIENT BMI      28.4
```

## 8.2 Communication Protocols

The Rice Lake Digital Wheelchair Scale has two communication protocols, escape and maintenance protocol.

### 8.2.1 Escape Protocol

An escape protocol is where the escape (0X1B or ASCII 27) is used to indicate that there is a command following. On the PC side there must be a listener created by the vendor that will interpret this protocol. This listener must also take care of all the issues regarding data integrity, etc. to make sure that the data that was sent and received is valid.

Two examples include:

- Scale initiated communication
- PC initiated communication

Table 8-1 is what can be sent across communications lines.

PC Initiated	ESC Value
Request current values/settings	R
Diagnostics	A
Send scale control messages	C
PC Initiated	ESC Value
Send single reading	R
Send diagnostic response	

Table 8-1. Escape Protocol Commands

Table 8-2 lists the ESC characters that will be used.

Name	ESC character	ESC value with parameters	Description
Reading	R	R	Tells the PC that the scale is sending a reading. Immediately following this is the value that is sent. Example: <ESC><R>ESC><W0200.0<ESC>Nm<ESC>E
Weight	W	Wnnn.n	Is the patient weight (example: W02000 means 200.0). If the scale is overloaded or under loaded, the scale will return the value 999.99.
Height	H	Hnnn.n	Patient height
BMI	B	Bnn.n	Patient BMI
Units	N	Nc	Indicates in which unit the values have been taken (m=metric, c=constitutional).
End of Packet (EOP)	E	E	Indicates that the end of the command has been reached.
Diagnostics (request)	A	Accc	A request for a diagnostic test on certain parts of the scale (such as battery life, load cells).
Diagnostics (response)	Z	Zccc	This will be the response of the diagnostics done on the scale. Values will include error codes to indicate what is wrong with the scale, or all zeros (Z000) to indicate that all is well.
Control (set a value)	C	Cccc=c	Sets the value of the scale's global settings. Example: <ESC><CUOM=m><ESC><E will set the unit of measurement.

Table 8-2. ESC Characters

Name of Control	Identifier	Unit
Unit of Measure (metric or constitutional)	UOM	c (m or c)

Table 8-3. Scale Global Values List and Identifiers



**Samples of Escape Protocol**

Figure 8-1 and 7-2 show what the diagrams will look like on the PC as the scale measures weight and sends over this communications line:

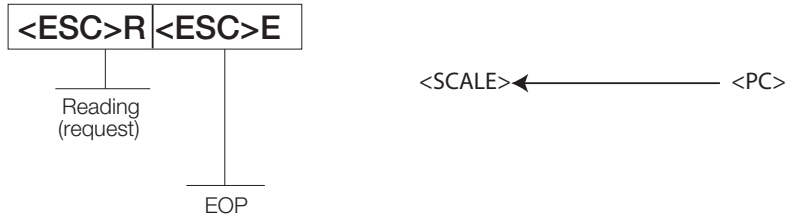


Figure 8-1. Sample of Escape Protocol

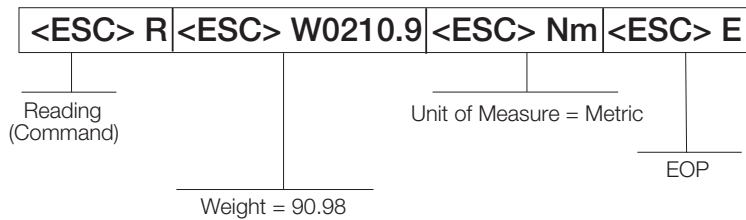


Figure 8-2. Sample of Escape Protocol

When the user wants to diagnose the problems on the scale, it looks like the Figure 8-3 and 7-4.

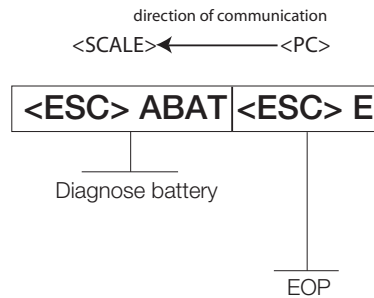


Figure 8-3. Diagnose the Escape Protocol Diagram

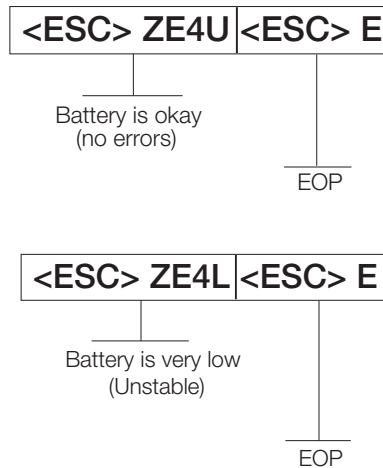


Figure 8-4. Diagnose Battery Protocol Diagram

### 8.2.2 Maintenance Protocol

Table 8-4 lists the maintenance protocol commands.

Command	Definition
R	Reboot
V	Firmware ID + development version
W	Current weight
A	Current AD
Z	Zero the scale
F	Show flash values (used for the first flash process)
L	USB On/Off (not available on USB communication)

Table 8-4. Maintenance Protocol Commands

### 8.3 USB Connection

The Rice Lake Wheelchair Scale has the capability of connecting to a PC using a USB connection and a USB cable (not included). That connection location is shown in Figure 8-5.



Figure 8-5. USB Connection Port

Connecting software and downloads should be addressed by your IT department and can vary depending on what type of computer platform you're using. Basic information on USB driver installation using Windows® is described in the following steps and serves only as an example. The USB driver can be downloaded from the Rice Lake Weighing Systems website at the following location; <http://ricelake.com/software.aspx>

Select Medical/Health Scales Downloads/Software and Get Downloads. Opening any product, will show a USB Driver download. Click on *Download* to open and download the driver to your computer.

1. The graphic below shows the window that pops up when the USB cable is connected to the indicator and the scale is turned on.

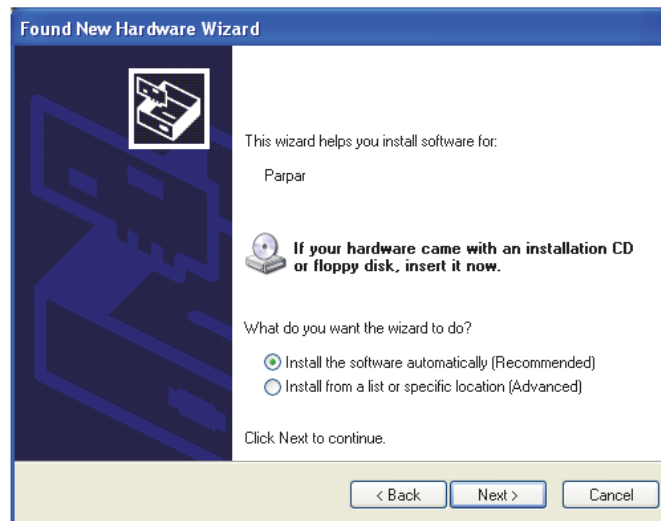


Follow the on screen prompts to navigate through the screens shown below.

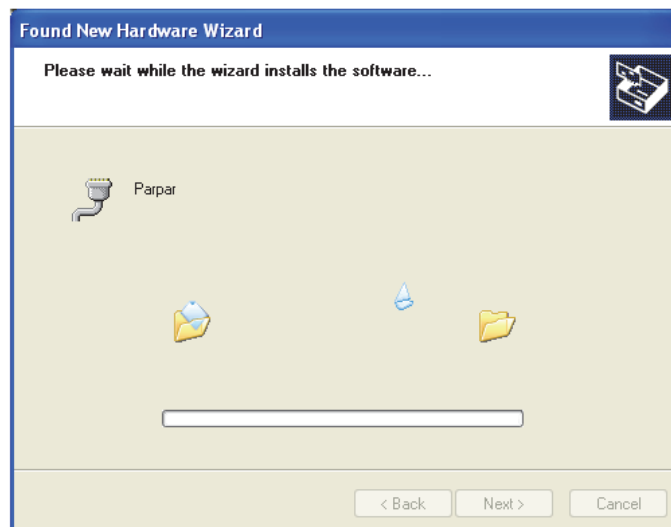
2. Select *No, not this time* and then select **Next**.



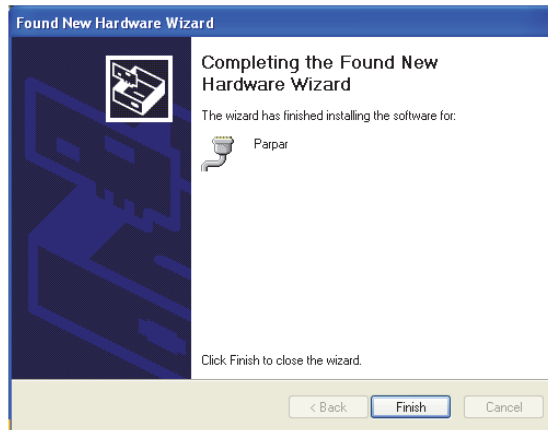
3. Select *Install the software automatically* then select **Next**.



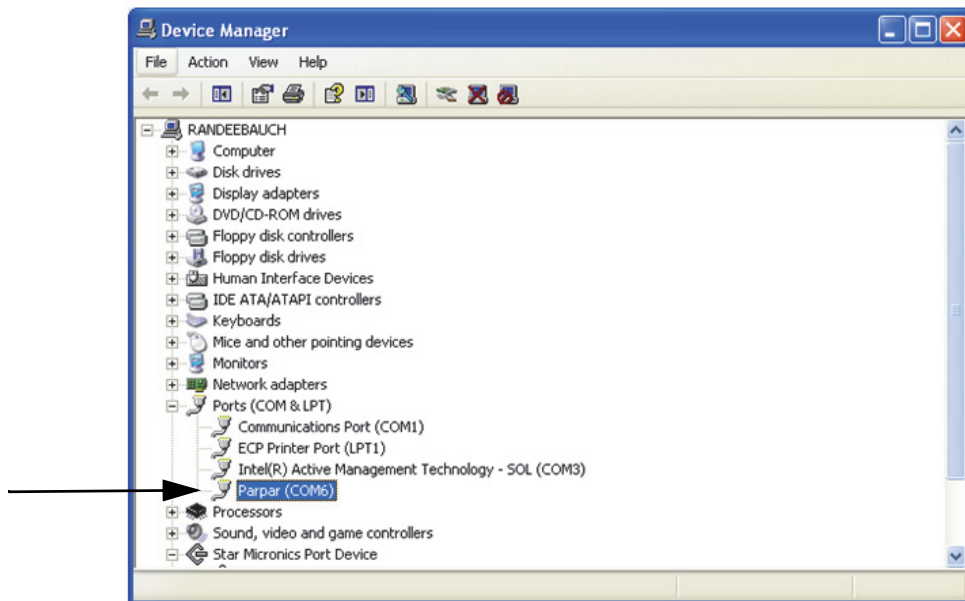
4. The following screen appears while the driver is installing on to your system.



- The following screen appears when installation is complete. Click on **Finish**.



- If you want to verify the installation, you can view the driver by looking at the device manager of your system.



- To print a ticket using the USB driver, open the software driver (shown above) and the port assigned to that driver is displayed.
- Ensure that the USB cable is properly connected and the unit is on.
- Another terminal type program (such as Hyperterminal) needs to be opened and connected through the USB driver to the indicator to be able to see the information being sent to the PC. A port needs to be established so select the port that is assigned to Parpar and print the ticket. The following example tickets will print.

PATIENT WEIGHT	84.4 7b	WEIGHT
----------------	---------	--------

GROSS WEIGHT	84.4 7b	BMI
TARE WEIGHT	0.0 7b	
NET WEIGHT	84.4 7b	
PATIENT HEIGHT	4ft 07.0in	
PATIENT B.M.I	19.6	



**Note** A single print ticket has four spaces after the "patient weight" and only one space between weight and lb in the examples shown above. Then seven <CR><LF> after.

## 9.0 Maintenance

### 9.1 Transporting & Storing the Scale

For ease of portability, the Rice Lake Wheelchair Scale comes with two built-in handles and wheels. This allows the user to transport the scale from one location to another. Use the following steps to transport the scale or to store it.

1. Carefully pick up the scale by standing on the side **opposite** of the wheels, where the cabling comes out from the bottom of the scale platform.

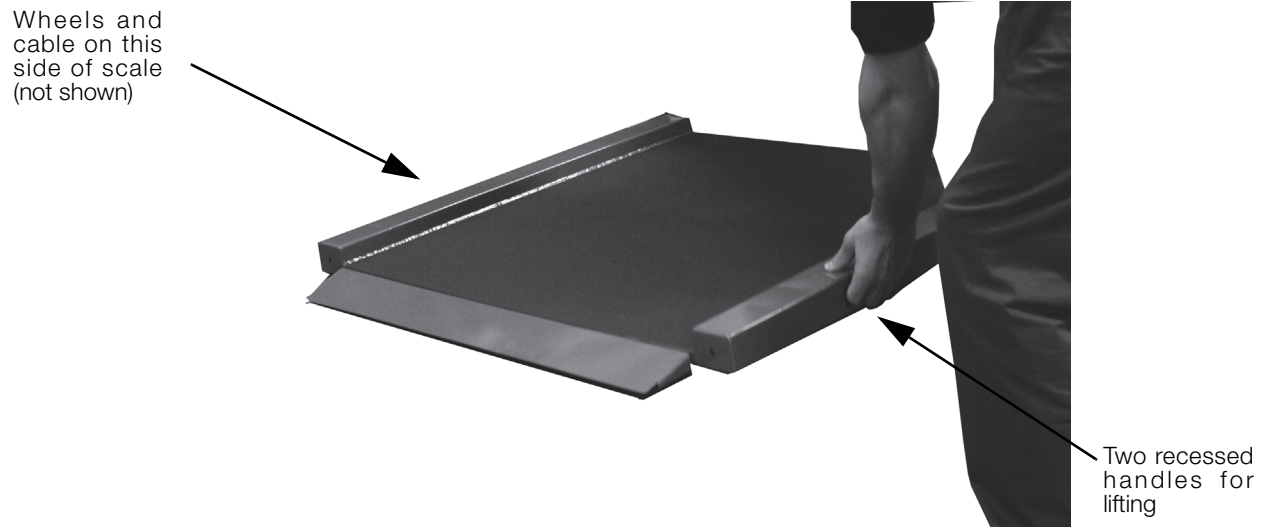


Figure 9-1. Pick up Scale Using Handles

2. With scale upright, wrap cable around brackets on underside of scale and hang indicator on bracket.
3. The scale can now be rolled to another location.



Figure 9-2. Roll Away For Transporting or Storage

# 10.0 Troubleshooting and Testing

Refer to the following to check and correct any failure before contacting service personnel.

Symptom	Possible Cause	Corrective Action
Scale does not turn on.	Dead battery	Connect the scale to a power source.
	Faulty electrical outlet	Use a different electrical outlet.
	Bad power supply	Replace adaptor.
Questionable weight or the scale does not zero.	External object is interfering with the scale.	Remove the interfering object from the scale.
	Display did not show 0.0 before weighing.	Help the patient off the scale, zero the scale and begin the weighing process again.
	Scale is not placed on a level floor.	Ensure the scale is level and begin the weighing process again.
	Scale is out of calibration.	Check the weight with a known weight value.
The display shows E messages as detailed below.		
E06	Identifier — ADC	A/D is too high.
E07		A/D is too low.
E10	Overload	Scale has been overloaded. Remove load from scale.
E4L	BAT	Battery low but still useable — One bar left on the indicator display.
E4U		Battery low and unstable — no bars left on the indicator display.
E11	CAL	Calibration Error — recalibrate the scale again.
Err 2	Low saturation state (low A/D)	The load cell is not connected properly. Check the cables and mechanical connections. If the problem persists, replace the set of load cells.
Err 3	High saturation state (high A/D)	See Err 2.
Err 6	Unstable weight. Cannot calibrate.	Check the load cells' mechanical surroundings and see that nothing touches them and that the cables are properly welded.
SAT	Damaged load cell cable	Replace load cell cable.

Table 10-1. Troubleshooting Table for the Rice Lake Scale Line

# 11.0 Scale Specifications

---

## Load Cell Excitation

Rated Excitation: 10 VDC

Maximum Excitation: 15 VDC

## Grade Level Requirements

The supporting surface for the four feet of the scale must be level within 1/4 inch of horizontal.

## Nominal Scale Height

3.0 inch (76 mm)

## Approvals



## 11.1 Indicator Specifications

### Power

120 VAC-9VDC-50Hz / 230 VAC-9VDC-50Hz

### Battery Type

6 AA size Alkaline batteries

### Battery Use

25 hours continuous use

Automatic power-off can be configured

### Environmental

Operating Temperature

50 to +104°F (14 to 40°C)

Storage Temperature

32 to 158°F (0 to 70°C)

Humidity

85% relative humidity

### Certifications and Approvals

RoHS Compliant

# For More Information

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## System Manuals

- *RL-350 Series Wheelchair Scale Operating Manual*, PN 162469

## Literature

- *Wheelchair Scales, 4 Color*, PN 115157

## Web Site

- <http://www.ricelakehealth.com>

## Contact Information

### Hours of Operation

Knowledgeable customer service representatives are available 6:30 a.m. - 6:30 p.m. Monday through Friday and 8 a.m. to 12 noon on Saturday. (CST)

### Telephone

- Sales/Technical Support 800-472-6703
- Canadian and Mexican Customers 800-321-6703
- International 715-234-9171

### Immediate/Emergency Service

For immediate assistance call toll-free 1-800-472-6703 (Canadian and Mexican customers please call 1-800-321-6703). If you are calling after standard business hours and have an urgent scale outage or emergency, press 1 to reach on-call personnel.

### Fax

Fax Number 715-234-6967

### Email

- U.S. sales and product information at [prodinfo@ricelake.com](mailto:prodinfo@ricelake.com)
- International (non-U.S.) sales and product information at [intlsales@ricelake.com](mailto:intlsales@ricelake.com)

### Mailing Address

Rice Lake Weighing Systems

230 West Coleman Street

Rice Lake, WI 54868 USA



# Rice Lake Wheelchair Scale Limited Warranty

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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.**

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**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.**

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U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0) 88 2349171

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