

# Digital Wheelchair Scale w/ Seat

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350-10-4

*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

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## 1.0 Introduction

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The Rice Lake 350-10-4 Wheelchair Scale with seat is a user-friendly, quality scale, designed for safe weighing of the handicapped and mobility challenged individuals. Movement compensation technology ensures sound, accurate weighments. The scale has roll on ramp access and a comfortable seat.

The scale has a non-skid rigid platform and two rear heavy duty wheels for easy maneuverability.



*Figure 1-1. Digital Wheelchair Scale with Folding Seat (Model 350-10-4)*

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 a tare weight can be entered. The Scale Operation section on page 8 of this manual explains the scale operation and how to obtain a tare weight.

The wheelchair scale has a unique folding feature that enables easy transportation and simplifies assembly, avoiding the need for field wiring and recalibration. All that is required is to open the packaging and unfold the scale.



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 these products and other medical products are available on the Rice Lake Weighing Systems web site.

## 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:



**Warning**

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



**Caution**

*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.*



**Warning**

*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 sitting/standing on it.
- Weight exceeding the maximum capacity (1000 lb/453 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 Assembly

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### 3.1 Unpacking Your Scale

Place the unopened box in an open area that has ample room for unpacking the scale.

Parts contained in the shipping box include:

- The scale
- This manual
- Small box containing AA batteries (6) and scale feet.

### 3.2 Repacking

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



**Important** *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 Digital Wheelchair Scale with seat.

1. Locate the manual from inside the box and set aside as it will provide instructions on the proper scale removal and set up.
2. 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 fine but not recommended.
3. Using two people, remove the scale out of the packaging material that it came in by lifting the scale out of the box by the scale base.



**Note** *DO NOT lift the scale out of the box by its handle as this can cause the hinges to break.*

### 3.4 Attaching the Feet to the Scale

The Rice Lake Digital Wheelchair Scale comes with four feet that must be attached to the scale base for proper operation. The four feet are located in the parts box in the original shipping box. Prior to laying the scale base on the floor, use the following steps to attach the feet to the scale.

1. Screw the four round feet clockwise into the scale base as shown in Figure 3-1.



Figure 3-1. Screw Feet Into the Scale Platform

2. There must be adequate clearance between the scale base and the floor to screw each foot out counterclockwise two full turns. This will ensure that there is enough clearance between the scale base and the floor.
3. 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. Figure 3-2 shows the width of a finger being slid between the scale base and the floor.



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



Figure 3-2. Have a Minimal Amount of Clearance Between the Scale Base and the Floor

4. It is 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 Handle Setup

1. Loosen the handles and unfold and set upright (handles shown in Figure 3-3).
2. Tighten the two hinges on the wheelchair scale by rotating the two handles. This will secure the handrail mounted indicator.



*Figure 3-3. Secure the Handrail by Tightening the Durable Hinges*

3. The wheelchair scale with seat comes fully assembled (as shown in Figure 3-4).



*Figure 3-4. Wheelchair Scale with Seat in an Upright Position*

4. To open the chair, gently pull up on the seat portion of the scale and pull down on the legs so that they straighten out and rest on the scale platform.



*Figure 3-5. Secure Bracket*

5. Ensure the retaining bracket is secure (as shown in Figure 3-5).



**Warning**

*The retaining bracket must click into place. If it doesn't click it may not be secure and any weight applied to it may cause it to collapse.*

6. The chair is ready to weigh patients while open and on the platform.



*Figure 3-6. Chair Extended Down, Ready for Weighing Patients*

### 3.6 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 3-7.



Figure 3-7. 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%.

### 3.7 AC Power Connections

Use the optional 120 VAC or 230 VAC adapter when power is available. The optional AC power adapter plugs into the back of the indicator as shown in Figure 3-8.

Connect the optional AC power source here.



Figure 3-8. Power Connection

## 4.0 Scale Operation

The Rice Lake Digital Wheelchair Scale with seat display has various front panel keys as shown in Figure 4-1.



Figure 4-1. Front Panel Display Keys

### Key Descriptions

Table 4-1 describes each of the key functions.








| Key   | Name         | Function   |
|---|--------------|--|
| <br>On/Off        | On/Off       | Switches the scale on or off.  |
| <br>Print LB/KG  | Print LB/KG  | Print — A long key press will send data out from the RS-232 port.<br>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. |
| <br>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.  |
| <br>Hold Release | Hold Release | Hold & Release — The first press holds the most current weight value shown on the display.<br>A second press releases the weight value shown.<br>This key is not active while in BMI mode.   |
| <br>BMI          | 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.   |
| <br>TARE         | TARE         | Used to subtract the weight off the scale, example: oxygen tank, other equipment.  |
| <br>CLEAR        | CLEAR        | Allows the user to return to normal weighing when the BMI value is being displayed.<br>While in BMI mode, the height display causes the value to return to the default of 190.0 cm, 5 ft, 7.5 in.  |

Table 4-1. Rice Lake Digital Wheelchair Scale Key Functions



| Key   | Name           | Function   |
|---|----------------|--|
|  | ENTER          | Used to accept height in BMI mode.<br>Accepts the value of the parameter last entered and moves to the next stage.<br>A long press of the <b>ENTER</b> key during the scale's start up process will enter the ID display (pre-parameter mode). |
|  | Up/Down Arrows | Used to adjust height input (0.5 in/0.5 cm) while in BMI mode.<br>Adjusts the value of the flashing digit/number.  |

Table 4-1. Rice Lake Digital Wheelchair Scale Key Functions



**Caution**

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

The scales have the capability of performing different operations beyond just calculating weight. The various operating instructions are described below.

## 4.1 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.

## 4.2 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.

## 4.3 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.

## 4.4 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.

## 4.5 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 steps off the scale and the BMI function will be turned off.



## 5.0 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 5-1— left photo).



Remove four screws to access setup switch



Setup switch location

Figure 5-1. 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 *ld* 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 5-2. 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.

## 5.1 Programming Mode Menu

Various parameters can be set while in programming mode.

Those parameters are shown in Figure 5-3.

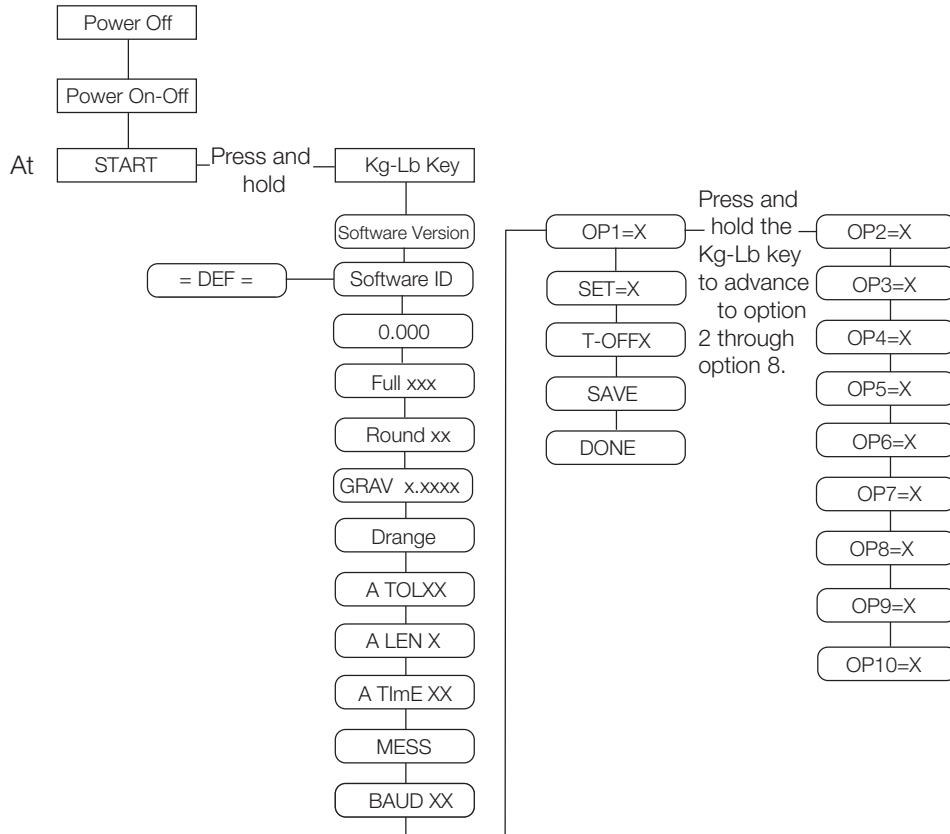


Figure 5-3. Programming Mode Menu Structure

Table 5-1 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 <i>FULL</i> to <i>LOAD</i>. 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 (<i>LOAD</i>).</li> </ol> |

Table 5-1. 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 5-1. Configuration Mode Menu (Continued)

| Parameter | Description  | Choices   | Steps   |
|-----------|--|---|---|
| ROUND     | Scale Resolution —<br>Values in kg: <b>1</b> , 2, 5, 10, 20, 50, 100<br>Values in lb: 1, <b>2</b> , 5, 10, 20, 50, 100, 200                | <b>0.2</b><br>0.5<br>1.0<br>2.0<br>5.0<br>10.0<br>20.0<br>0.1 | The display toggles between a numeric value and <i>ROUND</i> .<br>The decimal point location is set to the DISP parameter display decimal point location.<br>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.<br><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><br>0<br>0.0000<br>0.000<br>0.00                    | The display toggles between a numeric value and <i>DISP</i> .<br>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.<br><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><br>48<br>1152<br>576<br>384<br>288<br>192<br>144    | Note: Indicator display illustrates first two digits of baud rate only.<br>The display toggles between a numeric value and baud.<br>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.<br>If you want to change the value, use the following steps<br><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 —<br>Maximum value is 255.<br>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> .<br>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.<br><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 —<br>Maximum value 10.<br>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> .<br>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.<br><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 5-1. Configuration Mode Menu (Continued)

| Parameter  | Description   | Choices   | Steps  |
|--|---|---|--|
| ATOUT  | Algorithm maximal exponent<br>— Maximum value is 15.<br>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> .<br>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.<br><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.<br>0 = always on.<br>Maximum is 9 minutes.<br>When using an external power supply, this parameter is irrelevant.  | <b>5</b><br>4<br>3<br>2<br>1<br>0<br>9<br>8<br>7<br>6 | The display toggles between a numeric value and <i>TOFF</i> .<br>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.<br>Press the <b>ENTER</b> key to move to the next parameter. (UNITS).<br>If you want to change the value, use the following steps.<br><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><br>KG<br>LB                              | The display toggles between unit of measurements and <i>UNIT</i> .<br>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.<br><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:<br>OP0 — Live weighing options (0=disable, 1=enable)<br>OP1 — Communication protocol (0=ESC, 1=maintenance)<br>OP2 — BMI menu (0=disable, 1=enable)<br>OP3 — RTC power (0=disable, 1=enable)<br>OP4 - Semi-Auto-Live — (0=disable, 1=enable)<br>OP5 - Full calculation — (0=spatial, 1=multiply by (0=disable, 1=enable)<br>OP6 - Tare - (0=disable, 1=enable)<br>OP7 - Bat type — (0=dry batteries, 1=rechargeable batteries)<br>OP8 — OIML mode - (0=disable, 1=enable) | OP0<br>OP1<br>OP2<br>OP3                              | The display toggles between a binary option and <i>POO-0</i> .<br>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.<br><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.<br/>3a. Use the <b>Up/Down</b> arrows to change the value.<br/>3b. Press the <b>BMI</b> key to move the flashing cursor.</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 5-1. Configuration Mode Menu (Continued)

## 5.2 Default Menu

The default menu is used to return the scale back to its factory settings and is shown in Figure 5-4.

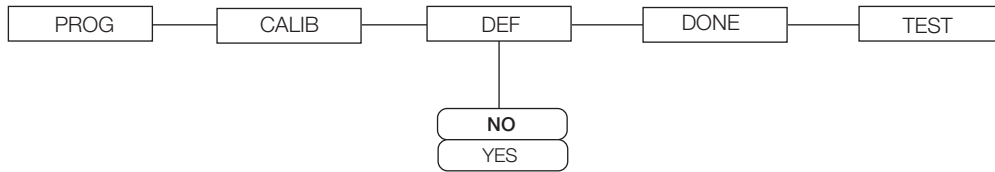


Figure 5-4. Default Menu

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.

## 5.3 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. 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.

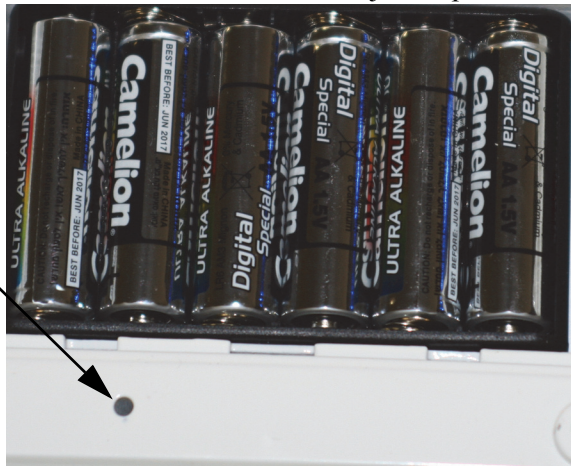


Figure 5-5. Setup Switch Location on Back of Indicator

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.

## 6.0 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.

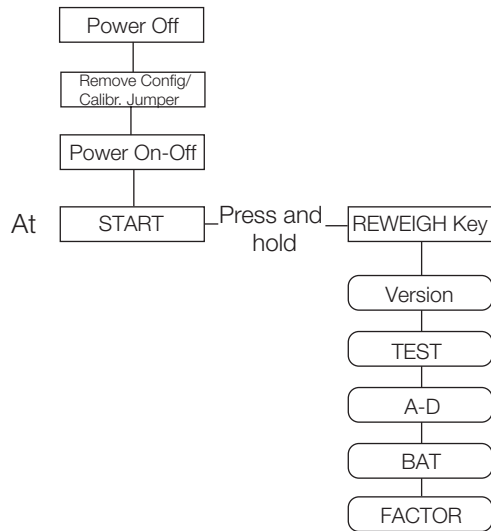


Figure 6-1. Test Menu

| 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 6-1. Test Menu

## 7.0 RS-232 Communication

---

The scale comes with an RS-232 port that 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 7-5 on page 21 shows where the RS-232 connection is.

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
- Escape protocol
- Maintenance protocol

### 7.1 Pushbutton Keypad Print

With a stable, in-range weight, press and hold the **LB/KG/Print** key for at least three seconds, or until the scale displays *PRINT*. 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>mmmmm<SP><CR><LF>

Where:

xxxxxxxx is the weight with decimal point and " - " sign, if negative uu is the unit (lb or kg).  
mmmmm is the mode (gross or net)

Example:

60.1 KG= <PATIENT><SP><WEIGHT><SP>-60.1<SP>KG<SP><CR><LF>

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

|                |          |
|----------------|----------|
| PATIENT WEIGHT | 60.1 KG  |
| PATIENT HEIGHT | 170.0 CM |
| PATIENT BMI    | 20.8     |

Example in KG:

<PATIENT><SP><WEIGHT><SP>-60.1<SP>KG<SP><CR><LF>  
<PATIENT><SP><HEIGHT><SP>-170.0<SP>CM<SP><CR><LF>  
<PATIENT><SP><B><SP><M><SP><I><SP><SP><SP><20.8<SP><SP><SP><SP><CR><LF>

Example in LB:

<PATIENT><SP><WEIGHT><SP>132.4<SP>LB<SP><CR><LF>  
<PATIENT><SP><HEIGHT><SP>-5-07.5<SP>FT<SP><CR><LF>  
<PATIENT><SP><B><SP><M><SP><I><SP><SP><SP><20.4<SP><SP><SP><SP><CR><LF>

In case of under weight or over weight, the word *Under* or *Over* will be sent correspondingly.

## 7.2 Communication Protocols

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

### 7.2.1 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 7-1 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 7-1. Escape Protocol Commands

Table 7-2 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:<br><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=constititutional).  |
| 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:<br><ESC><CUOM=m><ESC><E will set the unit of measurement.   |

Table 7-2. ESC Characters

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

Table 7-3. Scale Global Values List and Identifiers

**Samples of Escape Protocol**

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

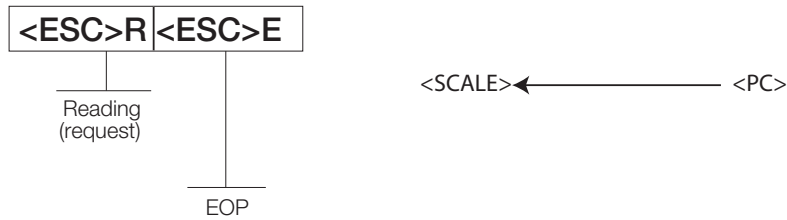


Figure 7-1. Sample of Escape Protocol

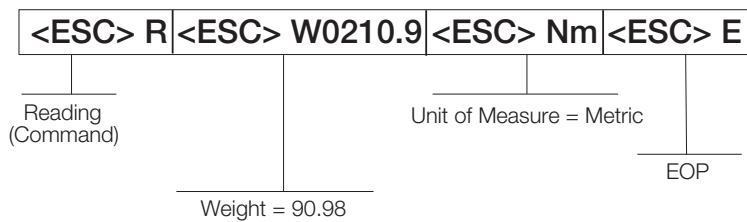


Figure 7-2. Sample of Escape Protocol

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

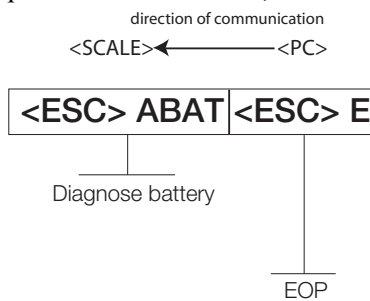


Figure 7-3. Diagnose the Escape Protocol Diagram

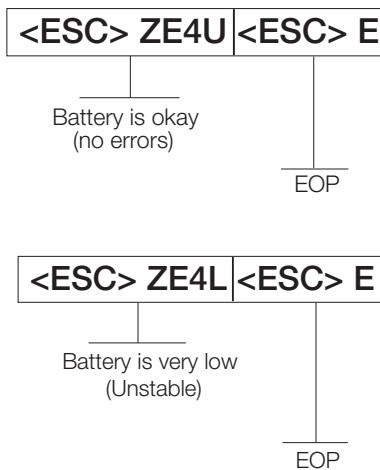


Figure 7-4. Diagnose Battery Protocol Diagram



## 7.2.2 Maintenance Protocol

Table 7-4 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 7-4. Maintenance Protocol Commands

## 7.3 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 7-5.



Figure 7-5. 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://www.ricelake.com/software.aspx>

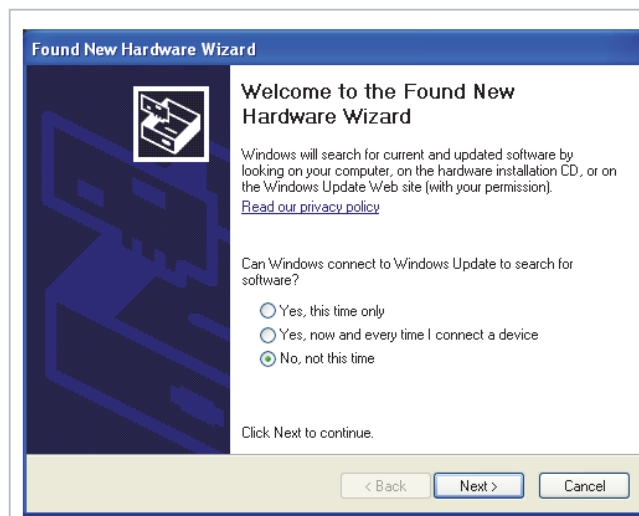
Select Medical/Health Scales, Software and Get Downloads. Opening any product will show a USB Driver download. Click on *Download* to open and download the driver to your computer.

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.

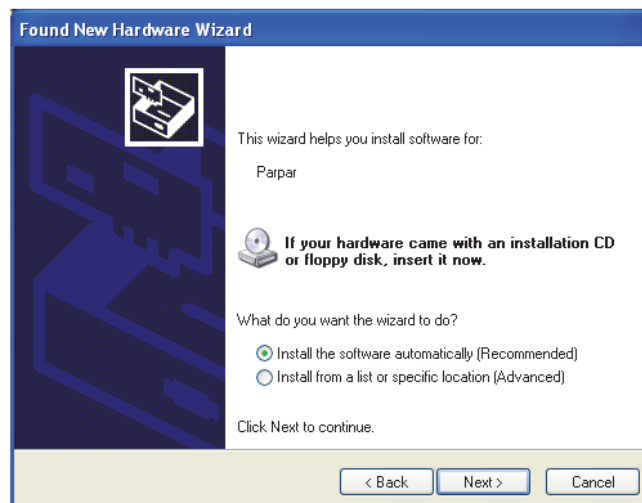


Follow the screen prompts to navigate through the screens below.

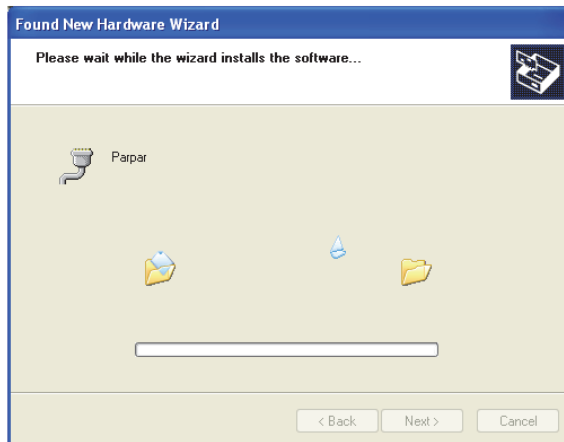
2. Select *No, not this time* and then select **Next**.



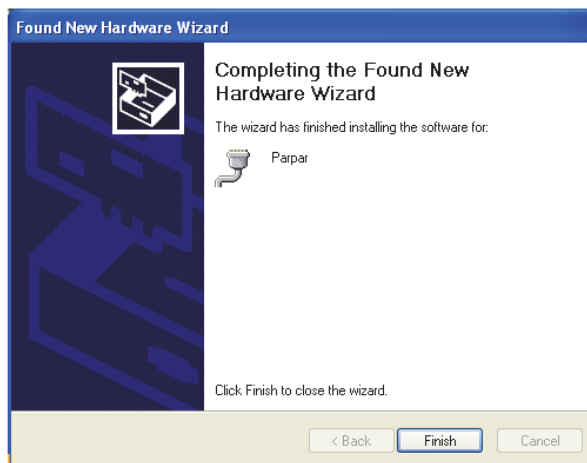
3. Select *Install the software automatically*, then select **Next**.



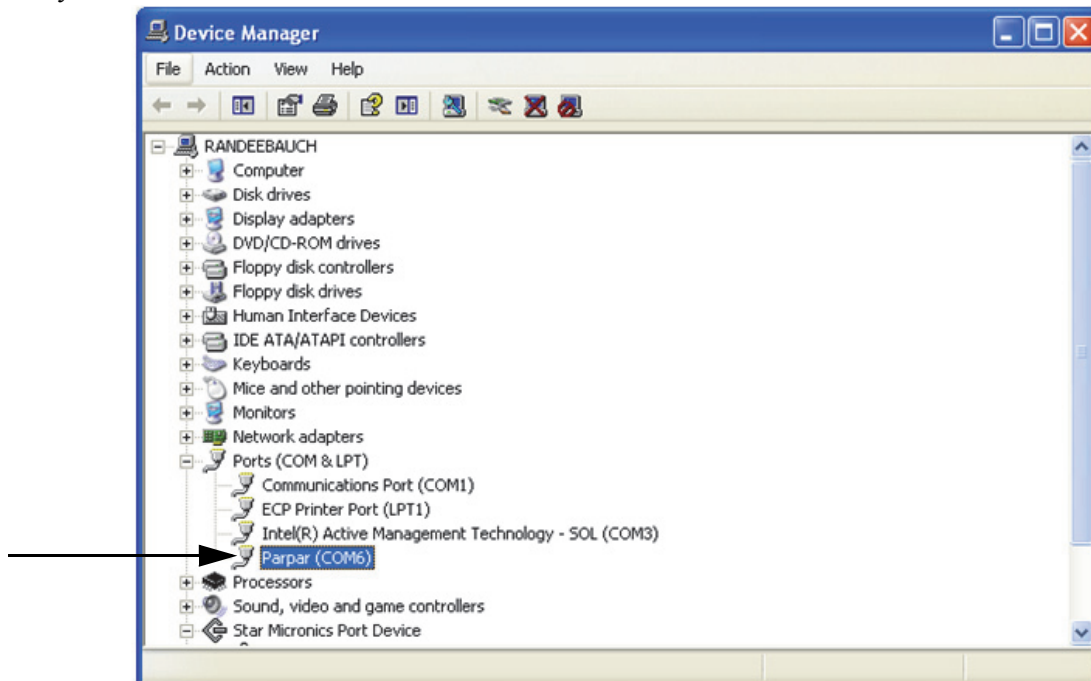
4. The following screen appears while the driver is installing on to your system.



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



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



7. To print a ticket using the USB driver, open the software driver (shown above) and the port assigned to that driver is shown.
8. Ensure that the USB cable is properly connected and unit is on.
9. 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 lb          WEIGHT
```

```
GROSS WEIGHT 84.4 lb          BMI  
TARE WEIGHT 0.0 lb  
NET WEIGHT 84.4 lb  
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.*

## 8.0 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 adapter.  |
| 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                               | AD too high   |
| E07   |  | AD 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 8-1. Troubleshooting Table for the Rice Lake Scale Line

## 9.0 Maintenance

The following section provides instructions for maintaining and cleaning the Rice Lake line of scales. Maintenance operations other than those described in this section should be performed by qualified service personnel.

### 9.1 Basic Maintenance

Before the first use of the scale and after periods of non-use, check the scale for proper operation and function. If the scale does not operate correctly, contact qualified service personnel.

Go through the following steps for basic maintenance.

1. Check the overall appearance of the entire scale for any obvious signs of damage.
2. Inspect the condition of the AC adapter for cord cracking or fraying or for broken or bent prongs.

### 9.2 Cleaning

Proper care and cleaning is essential to ensure a long life of accurate and effective operation. Before beginning the cleaning process, disconnect the scale from the AC power source.

1. Clean all external surfaces with a clean, damp cloth or tissue. Mild soap and water solution may be used. Dry with a clean soft cloth.
2. Do not immerse the scale in cleaning or other liquid solutions.
3. Do not use isopropyl alcohol or other solutions to clean the display surface.

# 10.0 Rice Lake Digital Wheelchair Scale Specifications

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## Power

120 VAC-9VDC-60Hz / 230 VAC-9VDC-50Hz

## Battery Type

6 AA size Alkaline batteries

## Battery Use

25 hours continuous use

Automatic power-off can be configured

## Data Communications

RS-232 with RJ-45 jack

USB Connection

Selectable baud rate, default - 9600

8 bits

No parity

1 stop bit

No handshaking

## Environmental

Operating Temperature

50 to +95°F (10 to 35°C)

Storage Temperature

32 to 122°F (0 to 50°C)

Humidity

85% relative humidity

## Capacity and Graduation

Wheelchair Scale w/ Seat

1000 lb (453 kg) 0.2 lb (0.1 kg)

## Certifications and Approvals

RoHS Compliant



## Dimensions

Platform Dimensions

48.5 in W x 29.5 in L x 2.3 in H

# For More Information

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## System Manuals

- *350-10-4 Digital Wheelchair Scale with Seat Operation Manual*, PN 151806

## 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
- Canada and Mexico Customers 800-321-6703
- International 715-234-9171

### Fax

- Fax Number 715-234-6967

### Email

- U.S. sales and product information at [proinfo@ricelake.com](mailto:proinfo@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 Digital 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 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'S 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.**

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