Healthweigh™

Medical/Health Scales

Installation & Operation Manual

RICE LAKE™ WEIGHING SYSTEMS
Commitment Beyond Measurement®

ISO 9001 REGISTERED

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Contents

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About This Manual

The Healthweigh™ line of scales is used in hospitals, nursing homes, clinics, doctor's offices and fitness clubs. This manual covers the various models of the Healthweigh line and is intended to familiarize the user with the model's specifications, setup, calibration, operation, maintenance and troubleshooting of each unit.

The various Healthweigh products covered in this manual include:

- Physician Scale
- Handrail Scale
- Wheelchair Scale (photo not shown)
- Platform Scale (photo not shown)
- Chair Scale

Some sections of this manual, like basic calibration, configuration, troubleshooting, maintenance, warranty, and applicable certifications are identical for each Healthweigh scale since they all use the same indicator. The user will be referred to those sections individually.

Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at **www.ricelake.com/health**.

Figure 0-1. The Healthweigh Line of Scales

As with all types and models of the Healthweigh line and to prevent injury to patients and damage to your scale, please follow these instructions carefully:

- Do not transport the scale while the platform is loaded.
- Do not drop the scale or subject it to violent shocks.
- For accurate weighing, the scale must be placed on a flat, stable surface.
- For accurate weighing, verify proper operation according to the procedure described in this manual.
- Do not use around flammable liquids.
- Operation at other voltages and frequencies than specified could damage equipment.

AC Power Connections

The Healthweigh line of scales has a 120 VAC adaptor or 230 VAC adaptor to use when power is readily available. The AC power adaptor plugs into the back of the indicator as shown in Figure 0-2.

Figure 0-2. AC Power and RS-232 Connection Site

The AC adaptor, when not in use, plugs into the back housing of the Healthweigh indicator. Figure 0-2 shows that location.

The Healthweigh line of scales is capable of running its internal sealed lead-acid rechargeable battery if no additional power source is available. Battery life is approximately 75 hours. If the *LO Bat* indicator is showing on the display, recharge battery or connect scale to an AC power source as soon as possible for accurate weighing.

RS-232 Connections

The Healthweigh line of scales is equipped with an RS-232 interface port which enables the unit to be connected to a PC. By using the RS-232 port, weight retrieval information including units of measurement can be sent to the PC.

Figure 0-2 shows the RS-232 port location. An optional RS-232 cable (PN 100719) is available should you choose to use RS-232 capabilities.

Further information on RS-232 communications refer to Section 9 on page 21.

1.0 Physician Scale

The Healthweigh physician scale is available in three different styles which include:

- Eye Level
- Waist Level
- Floor Level

Figure 1-1. Physician Scale Model - (Floor Level Shown)

Each scale is designed to provide accurate, reliable and repeatable weight measurements and has features that enable a fast and convenient weighing process. The eye and waist level model scales are also designed with a large hook handle and two heavy-duty rear wheels for easy portability.

1.1 Scale Setup

Scale setup is basically the same for all three models of the Healthweigh physician scale.

Tools needed for setup include:

- 6 mm hex Allen key (included)
- 4 mm hex Allen key (included) - needed for height rod only

Use the following steps to set up the scale.

1. Remove the scale out of the packaging material that it came in.
2. Unfold and set upright.
3. Tighten the hex screw head very firmly into the hinge at the base of the scale using the 6 mm Allen key to help stabilize the scale.
4. Assemble the height/measuring rod (for the eye level model only).

   Insert the rod into the pillar base slot and feed the screw into the hole. Using the 4 mm Allen key, tighten the height rod to the scale from the back.
5. For AC operation, connect the AC adaptor cable to the back of the indicator and the AC adaptor plug to a power source.

All Healthweigh scales with the same indicator automatically use the rechargeable batteries to go into recharge mode when the AC adaptor is connected to a power source. When the battery is completely recharged, the LED changes from red to green color as shown in Figure 1-2.

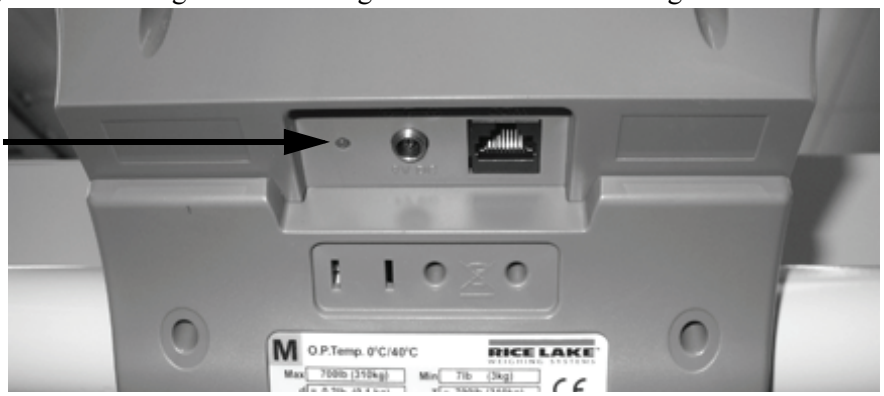


Figure 1-2. LED Light Location

6. To check for scale alignment, put the scale on a flat surface and look at the round spirit level on the base of the scale. The scale is aligned when the air bubble is immediately in the center of the circle. If the air bubble is not centered, unscrew and adjust the scale legs until the air bubble is centered. Ensure that the scale is not resting on its wheels that are used for portability.

2.0 Handrail Scale

The handrail scale is designed for weighing bariatrics and ensures sound accurate weighing information. A non-skid platform paired with side rails assists persons who need extra support and safety. The scale is set up to use motion sensing weighing technology, to determine the actual weight of a moving patient. The weight is displayed on the indicator and can be displayed in pounds or kilograms.

Figure 2-1. Handrail Scale

2.1 Scale Setup

Tools needed for setup include:

- 6 mm hex Allen key (included)

Use the following steps to set up the scale.

1. Remove the scale out of the packaging material that it came in.
2. Unfold and set upright.

Figure 2-2. Set up Sides to a Vertical Position

3. Screw in all four legs.
4. Attach the wrap-around rails.
5. Tighten the hex screw head using the 6 mm Allen key to stabilize the scale.
6. For AC operation, connect the AC adaptor cable to the back of the indicator and the AC adaptor plug to a power source.

   The rechargeable batteries automatically go into recharge mode when the AC adaptor is connected to a power source. When the cable is inserted into the power source, the LED lights up red. When the battery is completely recharged, the LED changes from red to green color as shown in Figure 1-2 on page 4.

3.0 Wheelchair Scale

The Healthweigh wheelchair scale is a user-friendly, quality scale, designed for safe weighing of the handicapped and mobility challenged individuals. Movement compensating technology ensures sound, accurate weighments. The scale has roll on ramp access, and a non-skid rigid platform and two rear heavy duty wheels for easy manueverability.

Figure 3-1. Wheelchair Scale (with handrail and without handrail models 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. Section 8.0.3 on page 20 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.

3.1 Scale Setup

Tools needed for setup include:

- 6 mm hex Allen key (included)

Use the following steps to set up the digital wheelchair scale.

1. Take the scale out of the packaging.
2. Unfold into a horizontal position.

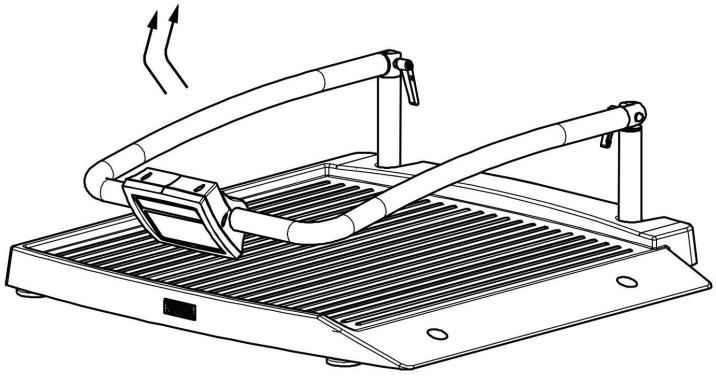


Figure 3-2. Unfold Scale Base

3. Screw in all four legs.
4. Tighten the four screws using the 6 mm Allen key to stabilize the scale.
5. For AC operation, connect the AC adaptor cable into the back of the indicator and the AC adaptor plug to a power source.

   The rechargeable batteries automatically go into recharge mode when the AC adaptor is connected to a power source. When the cable is inserted into the power source, the LED lights up red. When the battery is completely recharged, the LED changes from red to green color as shown in Figure 1-2 on page 4.

4.0 Platform Scale

The Healthweigh platform scale is designed for weighing animals or people and has a non-skid rigid platform for safe weighing. Movement compensating technology ensures sound, accurate weighments.

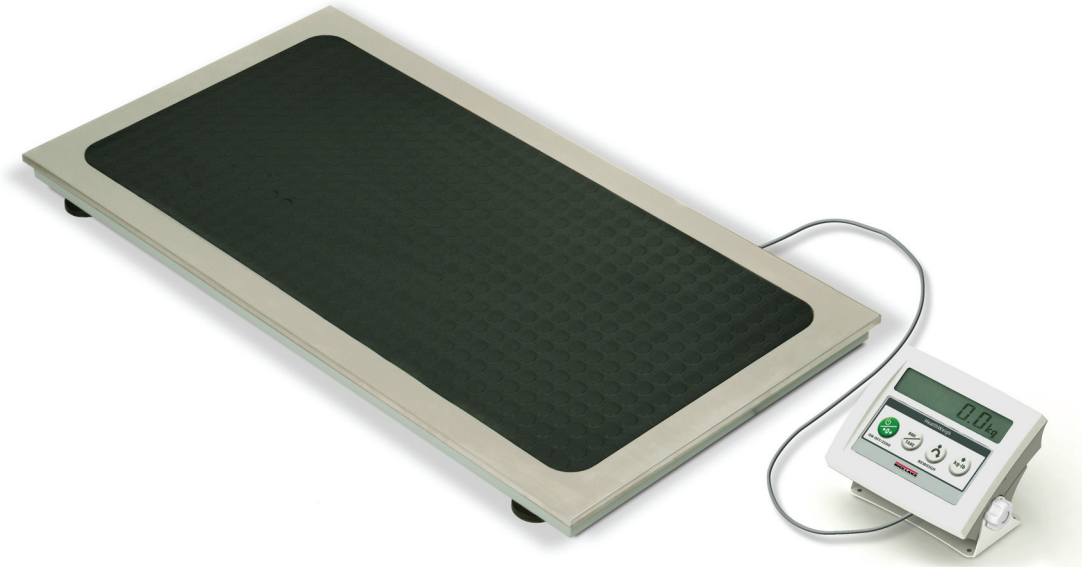


Figure 4-1. Platform Scale

The Healthweigh platform scale comes with a large stand-alone LCD display that can be set on a table, floor, or mounted on a wall using a built in bracket for mounting.

4.1 Scale Setup

No tools are needed to set up the Healthweigh digital platform scale. It comes complete out of the box.

For AC operation, connect the AC adaptor cable into the back of the indicator and the AC adaptor plug to a power source.

The rechargeable batteries automatically go into recharge mode when the AC adaptor is connected to a power source. When the cable is inserted into the power source, the LED lights up red. When the battery is completely recharged, the LED changes from red to green color as shown in Figure 1-2 on page 4.

5.0 Chair Scale

The Healthweigh chair scale is an easy to handle, quality scale designed for safe and convenient weighing of patients. Advanced motion-sensing technology compensates for any movement during the weighing process, ensuring sound, accurate weighing information.

The scale includes a durable rigid plastic (basic model) or a padded seat (premium model). Both models come with arm supports that fold up for easy entry or exit. Also included are two large wheels and a handrail for easy mobility.

Figure 5-1. Chair Scales (basic model and premium models shown)

5.1 Scale Setup

Use the following steps to set up the Healthweigh chair scale.

1. Remove the ready assembled chair scale out of its packaging.
2. For AC operation, connect the AC adaptor cable to the back of the indicator and the AC adaptor plug to a power source.

   The rechargeable batteries automatically go into recharge mode when the AC adaptor is connected to a power source. When the cable is inserted into the power source, the LED lights up red. When the battery is completely recharged, the LED changes from red to green color as shown in Figure 1-2 on page 4.
3. To check scale alignment, put the scale on a flat surface and look at the round spirit level on the bean at the back of the scale. The scale is aligned when the air bubble is immediately in the center of the circle. If the air bubble is not centered, unscrew and adjust the scale legs until the air bubble is centered.

6.0 Scale Configuration

Options and parameter setup are done through the scale configuration section and is used for setting values and various parameters and options that are essential for the functioning of the system. Entry into this mode is possible only when the scale is turned off.

6.1 Numeric Data Entry

Use the **Kg-Lb** key to change the numeric data entry while setting up the various configuration parameters and while in calibration mode.

Use the following steps:

1. Press and hold the **Kg-Lb** key, the rightmost digit on the display will begin to increment.
2. Release the **Kg-Lb** key to stop the increments.
3. A double click on the **Kg-Lb** key will cause the right hand digit to move one place to the left.
4. Repeat steps 1-3 until the desired number is reached.

6.2 Programming Mode

To get into the programming modes, hold the **Kg-Lb** key and the **On-Off/Zero** key simultaneously until *IDENT* appears on the display.

To change from one parameter to the next, you must press once on the **REWEIGH** key.

To change the value of the parameter, use the **Kg-Lb** key.

From the *SAVE* phase: press the **REWEIGH** key to exit and save the modified date. *DONE* appears for one or two seconds followed by *Start* and the display enter into weighing mode and is ready to start the weighing process.

Various parameters can be set up while in programming mode.

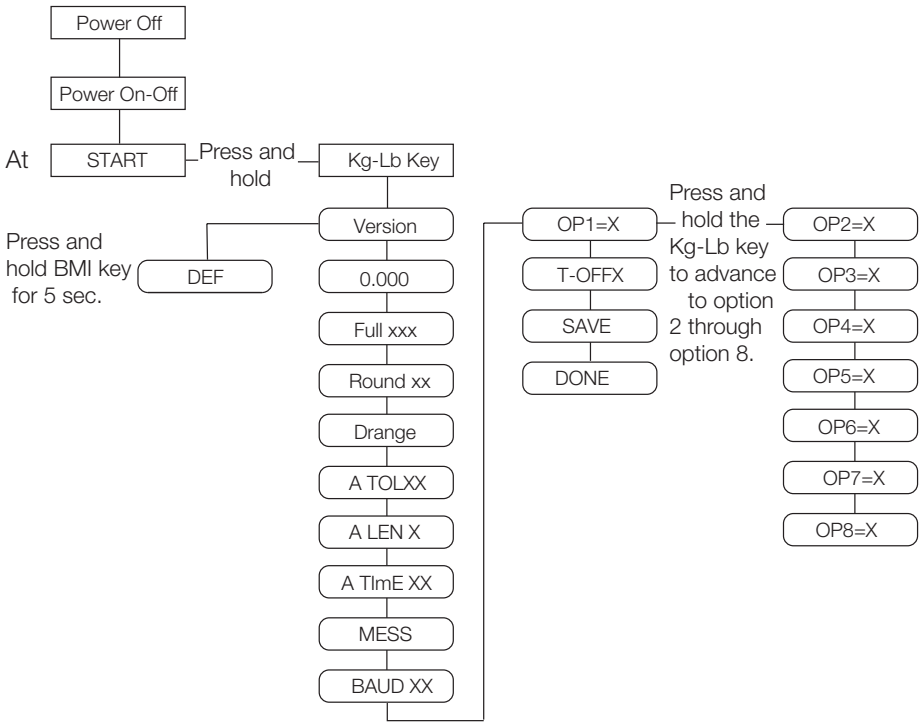


Table 6-1. Programming Mode Menu Structure

The following table lists the various display messages and sequence when setting up the scale.

NOTE: <-> means that you can toggle between two keys.

Step		Function	Display	Available Parameters
1	With the scale turned off, simultaneously press the **On-Off/Zero** and **Kg-Lb** key.	Enters into programming mode	StArt	Scale automatically advances to Step 2.
2		Indentifies the software ID	IdEnt<->**11135**	Press the **REWEIGH** key to advance to the next function.
3		Allows selection of decimal point setting	dOt<->000.0 Default = **0.0**	To change the position of the decimal point, press the **Kg-Lb** key to toggle through the various options. To advance to the next function, press the **REWEIGH** key.
4		This indicates the maximum allowed weight. Any weight above this value will cause *StOP* to appear on the display while in the weighing mode.	FULL<->XX.XXX Default= **600 Lb**	Use the numeric data entry (explained in Section 6.1 on page 11) to change the value. To advance to the next function, press the **REWEIGH** key.
5		Display divisions	rOUnd<->XXXX Default = **0.2 Lb**	To change the display divisions, press the **Kg-Lb** key to toggle through the various options. 0.2, 0.5, 1.0, 2.0, 5.0, 10.0, 20.0. To advance to the next function, press the **REWEIGH** key.
6		Double ranges limit	drAnGe <-> **0**	This parameter is preset from the factory. To advance to the next function, press the **REWEIGH** key.
7		Weight algorithm initial tolerance	A tOL <-> **0**	This parameter is preset from the factory. To advance to the next function, press the **REWEIGH** key.
8		Weight algorithm initial exponent	A LEn <-> **8**	This parameter is preset from the factory. To advance to the next function, press the **REWEIGH** key.
9		Weight algorithm maximal exponent	A t INE <-> **10**	This parameter is preset from the factory. To advance to the next function, press the **REWEIGH** key.

Table 6-2. Programming Mode Menu

Step		Function	Display	Available Parameters
10		Message style on weight algorithm	MESS <-> **WEIGH**	This displays the message that will show on the indicator display. To change the message, press the **Kg-Lb** key. WEIGH, LIVE, - - - - - - - - - - - - To advance to the next function, press the **REWEIGH** key.
11		This allows for setting the baud rate of the RS-232 connection	BAUd <-> Default - **9600**	To change the baud rate, use the numeric data entry as shown in Section 6.1 on page 11. To advance to the next function, press the **REWEIGH** key.

Table 6-2. Programming Mode Menu

Step		Function	Display	Available Parameters
12		**Optional features** Option 1 allows the selection of unit of measure (UOM) in calibration and programming.	OP1 = **1**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. OP1 = Unit of measure (UOM) in calibration and programming. 0=Kg **1=Lb**
		Option 2 allows the scale to work only in Kg.	OP2 = **0**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. **0=Disable** 1= Enable This option works only if Option 3 is disabled
		Option 3 allows the scale to work only in Lb.	OP3 = **0**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. **0=Disable** 1=Enable
		Option 4, the scale must be stable to show a Kg or Lb weight reading. You can enable or disable this.	OP4 = **0**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. **0=Disable** 1=Enable **Note:** *won't show lb or kg until the scale is at a standstill.*
		Option 5 allows for live or dynamic weighing	OP5 = **0**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. **0=Disable** 1=Enable
		Option 6 allows you to either enable or disable the hold function on the scale	OP6 = **1**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. 0=Disable **1=Enable**

Step		Function	Display	Available Parameters
		Option 7 allows you to either enable or disable the baby scale function.	OP7=**0**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. **0=Disable** 1=Enable
		Option 8 allows you to choose between 9 volts and 6 volts	OP8 = **1**	Hold the **Kg-Lb** key for browsing through the options. Double click on the **Kg-Lb** key to change the options value or to advance to the next function, press the **REWEIGH** key. 0=9 volts **1=6 volts**
13		Determines the automatic shut off time when the scale is not in use. Options are between one and 20 minutes. This is used when the unit is battery operated.	t-OFF <-> **5**	Press and hold the **Kg-Lb** key to scroll through the furthest right hand digit on the display (0-9). If you want a value from 10 to 19, with the display sitting at 1, double press the **Kg-Lb** key and 10 appears. Press and hold the **Kg-Lb** key to begin scrolling 10-19. If you want a value of 20, with the display sitting at 2, double press the **Kg-Lb** key and 20 will appear. To advance to the next function, press the **REWEIGH** key.
14			StArt or SAvE	If no changes were made in the parameters the display will automatically show *StArt* and then returns to normal weighing mode. If a parameter was changed, the display will show *SAvE* then press **REWEIGH** to save the new parameters.

Table 6-2. Programming Mode Menu

7.0 Scale Calibration

Before you can calibrate the scale, verify and set all scale parameters which are noted in Section 6.0, Scale Configuration.

To do a calibration on the Healthweigh line of scales, the scale must be turned off. Once the scale is turned off, press the **Kg-Lb** + **REWEIGH** + **On-Off/Zero** keys simultaneously. Hold those keys until *LOAD* appears on the display alternating with the suggested weight for calibration.

NOTE: *The calibration weight must be no less than 60 lb (28 kg) and no more than 300 lb (135 kg).*

The following chart illustrates the calibration procedure.

Step		Function	Display	Available Parameters
1	With the scale turned off, simultaneously press and hold the **Kg-Lb**, **On-Off/Zero**, and **REWEIGH** keys.	Enters into calibration mode	StArt	The scale automatically advances to Step 2.
2		Sets the value of the calibration weight you are going to use for calibrating the span value of the scale.	LOAd <-> XXX.X	Use the numeric data entry (explained in Section 6.1 on page 11) to set a calibration weight. To advance to the next function, press the **REWEIGH** key.
3			CLEAr	Clear the platform and be sure of the scale's stability. To advance to the next function, press the **REWEIGH** key.
4			- - - - - PUT<->XXXX	Place the requested weight on the scale. This will display for a few seconds. To advance to the next function, press the **REWEIGH** key.
5			CAL FAC tOr <-> X.XXX	This will be displayed for a few seconds and shows the current calibration factor. To advance to the next function, press the **REWEIGH** key.
6			SAvE	The scale displays that it has saved that calibration value. Remove the calibration load from the tray. To advance to the next function, press the **REWEIGH** key.
7			dONE	To save the new calibration, press the **REWEIGH** key.
8			StArt	Press the **ZERO** key to exit without saving the calibration.

Table 7-1. Calibration Menu

8.0 Scale Operation

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

8.0.1 Weighing

Use the following steps to weigh a person.

1. Press the **On-Off/Zero** key to turn on the scale and *0.0* will appear on the display.
2. Ask the patient or person to step onto the scale. The display shows *WEIGH*, then the person's weight, and beeps to indicate the end of the weighing process.
3. To reweigh, press the **REWEIGH** key.
4. To change the display from Kg to Lb and vice-versa, press the **Kg-Lb** key.
5. To turn off the scale, press and hold the **On-Off/Zero** key for at least three seconds.

8.0.2 Using the Body Mass Index (BMI) Function

Body mass index (BMI) is the relationship between weight and height associated with body fat and health risk. It is a reliable indicator of body fatness for people and even though BMI does not measure body fat directly, research has shown the BMI correlates to direct measures of body fat. BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems for adults.

Calculating BMI is one of the best methods for population assessment of overweight and obesity. Because calculation requires only height and weight, it is inexpensive and easy to use for clinicians and for the general public.The calculation is based on the following formulas:

Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of 703.

Example: weight = 150 lbs, height = 5'5 (65")

Calculation: $[150 \div (65)^2] \times 703 = 24.96$

The standard weight status categories associated with BMI ranges for adults are shown in the following table.

BMI	Weight Status
Below 18.5	Underweight
18.5 - 24.9	Normal
25.0 - 29.9	Overweight
30.0 and Above	Obese

Table 8-1. Standard Weight Status

The following examples show weight ranges, the corresponding BMI ranges and the weight status categories for a sample height.

Height	Weight Range	BMI	Weight Status
5'9"	124 lbs or less	Below 18.5	Underweight
	125 lbs to 168 lbs	18.5 to 24.9	Normal
	169 lbs to 202 lbs	25.0 to 29.9	Overweight
	203 lbs or more	30 or higher	Obese

Table 8-2. BMI Ranges and Weight Status Example

Use the following steps in determining the BMI.

1. To use the BMI function, weigh the patient as described in Section 8.0.1 and then press the **BMI** key if weighing in Lbs. The default height of (5 feet) appears on the display. Use the up or down arrows to increase the feet height by one foot increments). Press the **BMI** key again to display inches (default is 7.0 inches) Again, use the up or down arrows to increase or decrease the inches height by 0.5" increments. The final height value will be displayed as ie: 5-07.5 = 5' 7.5".

2. If you are weighing in Kgs, the default will be 170.0 cm. Use the up or down arrows to increase or decrease by 0.5 cm increments.
3. To see the patient's calculated BMI, press the **BMI** key again. The BMI appears.
4. To cancel the BMI display, press the **BMI** key.

8.0.3 Using the Tare Function

You can use the tare function for deducting an extra weight (such as a wheelchair, or medical equipment attached to the patient) in a weighing operation.

Use the following steps to use the tare function.

1. With the scale set to *0.0*, place the extra load on the scale. The display shows *WEIGH* and then the weight of the load.
2. Press and hold the **TARE** key for three seconds. The display returns to 0.0 and *TARE* appears on the left side of the display.
3. Remove the load from the scale. The weight of the load appears with a negative symbol to the left of it.
4. Ask the patient to step onto the scale with the load. The display then shows the patient's weight without the weight of the load.
5. The weight of the load remains stored in memory, so you can continue to weigh patients who are carrying the same tare weight. For example, when using the same wheelchair for weighing more than one patient.
6. To cancel the tare weight, remove all weight from the scale, and press the **TARE** key again. *TARE* then disappears from the display and the display returns back to *0.0*. The tare weight is also cancelled when the scale is turned off.

Use the following steps to enter a tare without placing that item on the scale. An example of this would be if you've got a patient in a wheelchair and the wheelchair has a known weight (has been tagged) you can enter that weight manually.

1. With the scale set to *0.0*, press and hold the **TARE** key so that the tare display comes up and then defaults to *33.0 Lb (15.0 Kg)*.
2. Use the up or down arrows to scroll through to get the known weight of the wheelchair for example. Once the known weight is reached, press the **TARE** key one more time and it will remember that weight.
3. Then you can accurately weigh the patient.

9.0 RS-232 Communication

The Healthweigh scale line comes with an RS-232 port which enables weight and unit of measure data to be transmitted for full integration into electronic medical records or for diagnostic testing of the battery life, load cells, etc. The scale will only transmit data upon receiving the proper command set.

You can test the command set and review the scales' response using either PROCOMM Plus or the Healthweigh files found on our web site, **www.ricelake.com/health**. If using PROCOMM Plus, we recommend you set up "hot" keys for the commands. Refer to Table 9-1 for a listing of those commands.

Healthweigh scales use an Escape Protocol for communicating between the scale and the PC using serial port 1. An Escape Protocol is where the escape <ESC> is used to indicate that there is a command following and not just data.

Table 9-1 lists a complete list of ESC commands that are used with the Healthweigh line of scales.

Command/ Response	ESC Character	ESC value with Parameters	Description
Reading	R	R	This value tells the PC that the scale is sending a reading. Immediately following this will be the value that is sent Example: <ESC>R<ESC>E <ESC>R<ESC>W0200.5<ESC>Nm<ESC>E
Weight	W	Wnnn.n	This is the patient's weight (ie: W0200.5 means 200.5 lb). If the scale is overloaded, the scale will return the value of 999.9.
Units	N	Nc	This indicates in which unit the values have been taken (m=metric, c=constitutional
End of Packet (EOP)	E	E	This indicates that the end of the command/data packet has been reached
Diagnostics (request)	A	Accc	This is the request for a diagnostic test on certain parts of the scale such as the battery life, loadcells, etc. • AD value (ADC) = E06=AD is too high, E07=AD is too low • Overload (OVL) = E10 • Battery (BAT) = E4U= (Bat ok) or E4L (Bat Low, but still usable - 1 bar left on the indicator • Calibration information OK (CAL) = E11=Calibration was not okay and the user needs to recalibrate.
Diagnostics (response)	Z	Zccc	This will be the response to the diagnostics done on the scale. Values will include any 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	This is to set the value of the scale's global settings <ESC>CUOM=m<ESC>E will set the unit of measurment to KG • Unit of measurement (metric or constitutional) (UOM) = c (m or c)

Table 9-1. RS-232 Communication Parameters

If you're using the Healthweigh files, please follow the instructions below.

1. Go to www.ricelake.com/health and download the Rswin.exe and Inbar.ini files located in the downloads section of the web site and download them to your computer.
2. Ensure that the scale is connected to the computer via RS-232 cable.

3. Double click on the Rswin.exe file and the following screen appears.

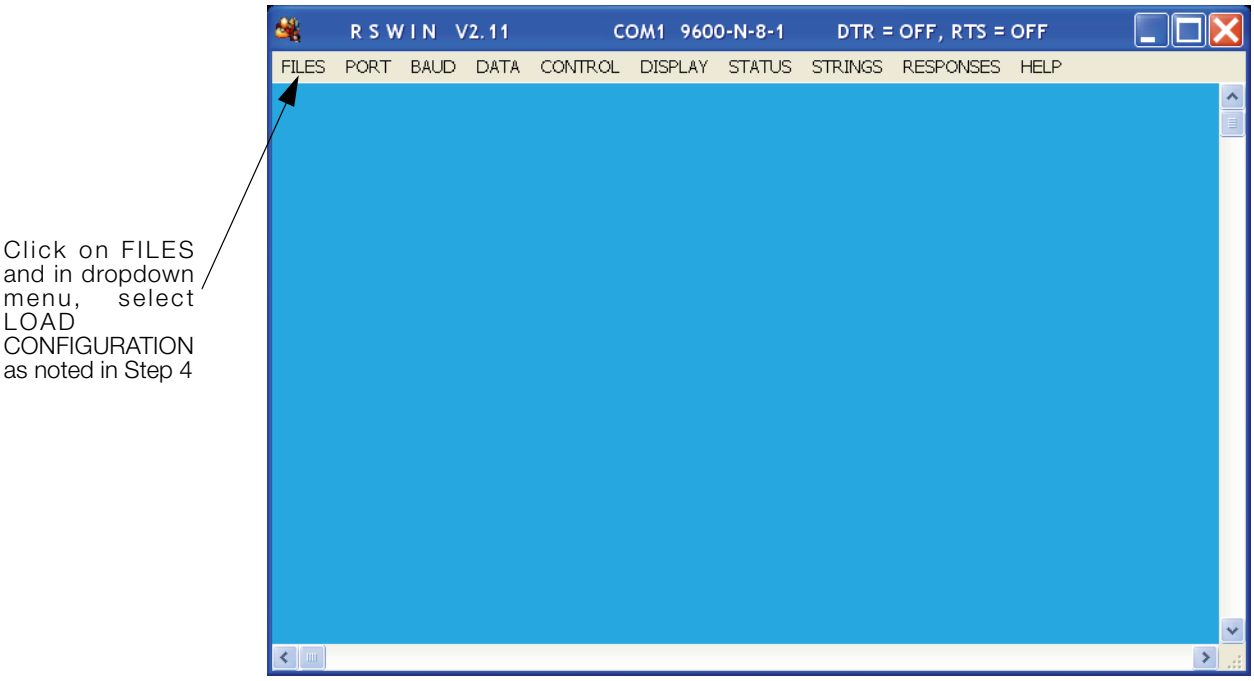


Figure 9-1. Rswin Main Screen

4. Click on *FILES* and in the dropdown menu, select *LOAD CONFIGURATION*. At this time double click on the file, Inbar.ini.
5. Click on *STRINGS* and the following screen appears.

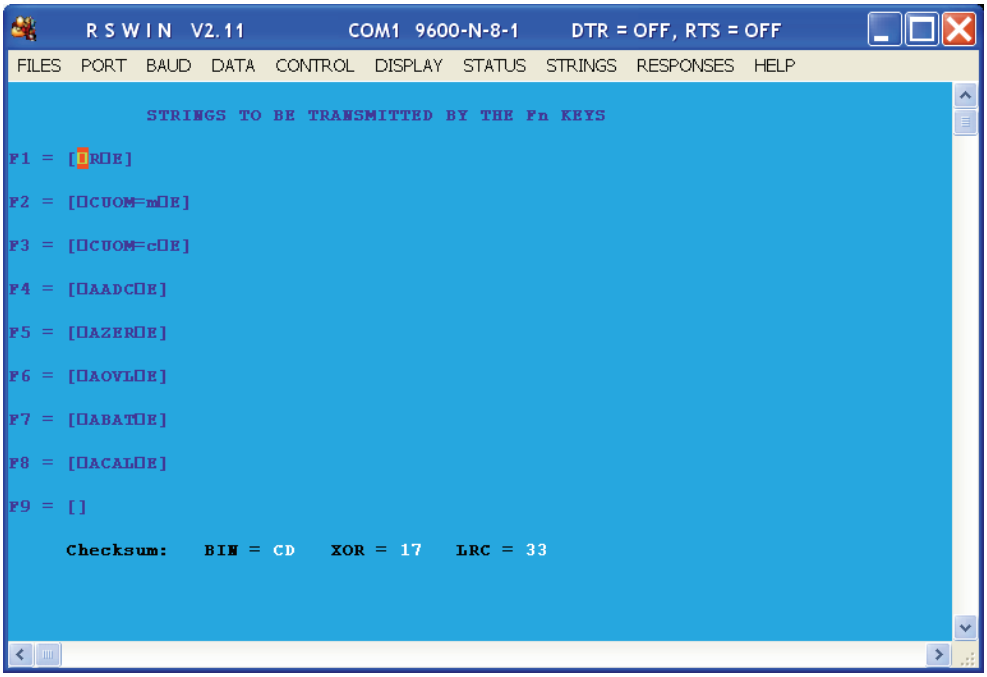


Figure 9-2. Strings to be Used in the RS-232 Transmission

This screen is showing that the function keys are already pre-programmed with command sets. For example, pressing the F1 key is the same as sending <ESC>R<ESC>E.

6. Click on *DISPLAY* and in the drop down menu, select either *HEX* or *ASCII*.

Examples of what you would see in the HEX screen are shown in Figure 9-3.

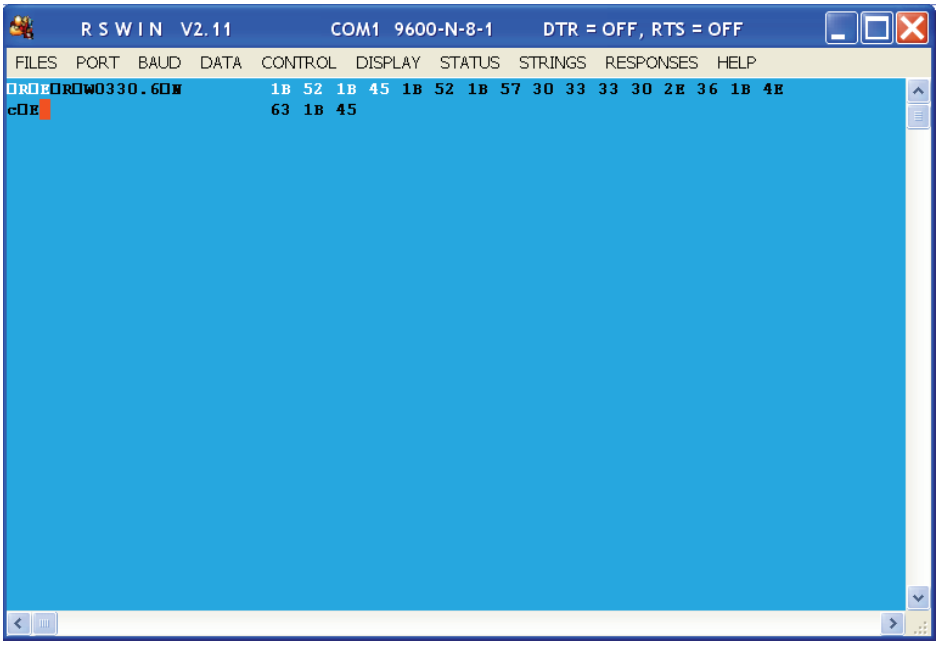


Figure 9-3. HEX Screen Example

Examples of what you would see in the ASCII screen are shown in Figure 9-4.

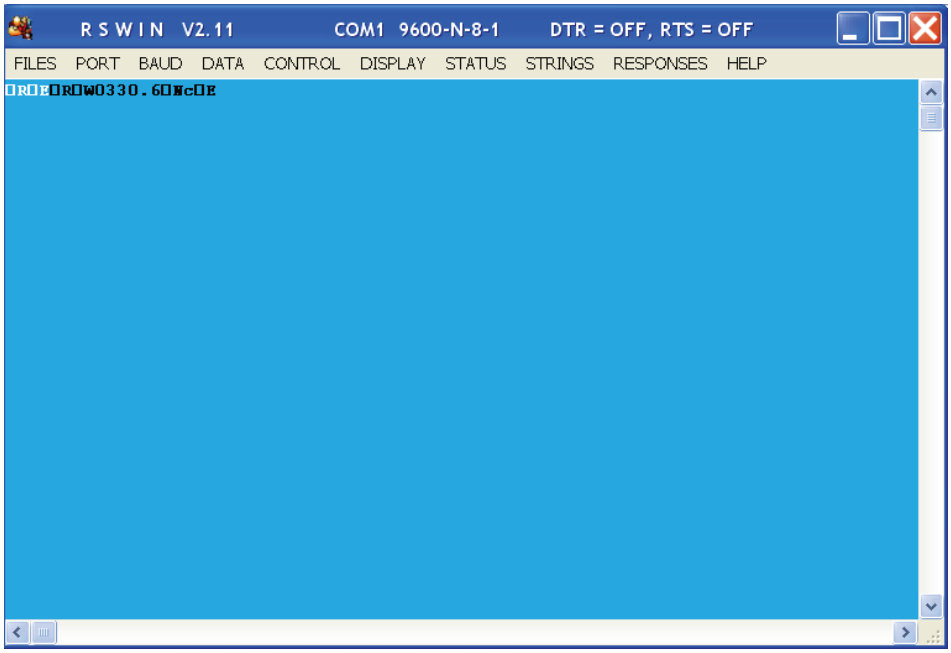
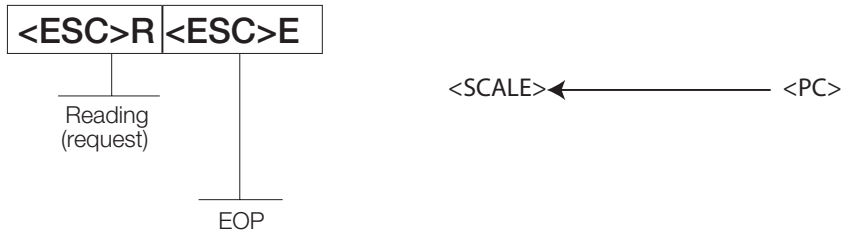


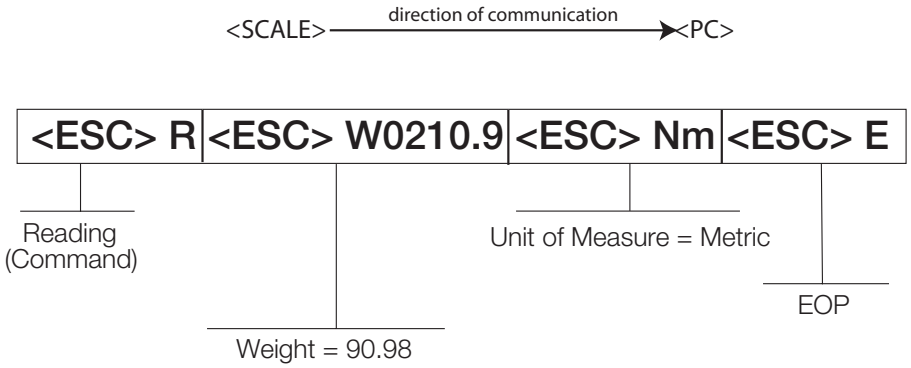
Figure 9-4. ASCII Screen Example

9.1 Sample and Explanation of ESC Protocol

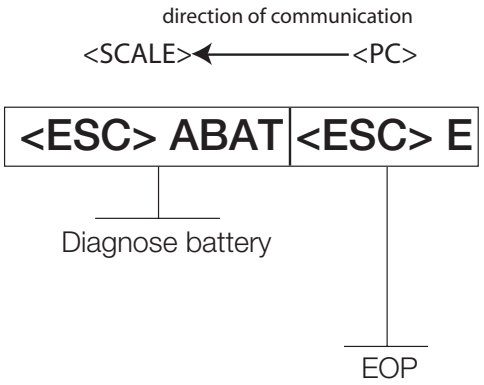
When the scale measures weight and sends this over the communications line to the PC, the string will look like this.

<SCALE> --------<PC>

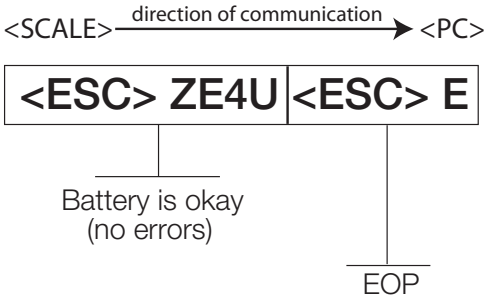




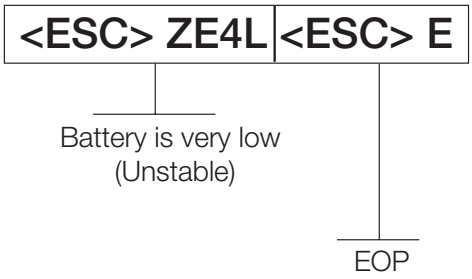
When the user wants to diagnose any problems with the scale, the operator will have to ask the scale to send the error data (if any exists). This is done with the Diagnostics (request) command and will look like this:



If the battery is okay, the scale will reply with the following value:



If the battery is critically low, it will reply with:



10.0 Troubleshooting & Testing

Refer to the following instructions 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 using the spirit level on the platform and begin the weighing process again.
	Scale is out of calibration	Check the weight with a known weight value.
	Improper tare	Place the patient on the scale. Press **REWEIGH**. Once the weight of the item is displayed, press **TARE**. Place the patient back on the scale. Press the **REWEIGH** button again.
Weighing is performed but the display shows *WEIGH* and *REWEIGH* every few seconds; the weighing process takes too long and no weight is displayed	The patient is not sitting still	Ask the patient to be still.
The display shows a *STOP* message	The load on the scale exceeds the capacity of the scale (220 kg)	Remove the excess weight and use the scale according to manufacture's specs.
The display shows *LO Bat* message	The battery is low	Recharge the battery.
The display shows Err message as detailed in the table below		
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.
Err 7	Mathematical error; division by zero. Cannot calculate calibration factor.	This error will show when trying to calibrate the unit with no calibration weight on the unit.
Calibration settings are messed up	Pushed the wrong keys	In the programming mode, press and hold the **BMI** key for five seconds when the software version is displayed. The display shows *DEF* (default) and all scale settings default back to factory default settings. When complete, press the **REWEIGH** key to get back to the beginning menu.

Table 10-1. Troubleshooting Table for the Healthweigh Scale Line

10.1 Test Mode

The test mode menu is a special mode used for checking three very important parameters which are useful in knowing the system's state and for troubleshooting. Entry into this mode is possible only when the scale is turned off. To access the test mode parameter, press and hold the **REWEIGH** + **On-Off/Zero** keys simultaneously until middle arrows appear in the display.

The test mode has three parameters. They are:

- Weighing
- Internal count
- Battery indication.

Alternating between the parameters is performed by pressing the **REWEIGH** key.

Press the **Kg-Lb** key to zero the scale in weighing mode.

Press the **Kg-Lb** + **REWEIGH** to exit weighing mode.

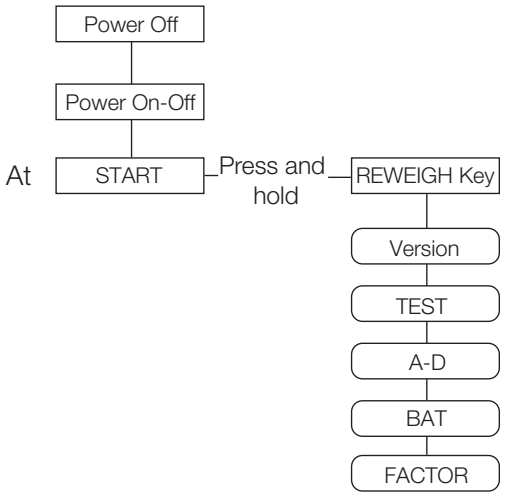


Figure 10-1. Test Mode Menu Structure

Table 10-2 lists the various display messages when testing the scale.

NOTE: <-> means that you can toggle between two keys.

Step		Function	Display	Available Parameters
1	With the scale turned off, simultaneously press the **REWEIGH** and **On-Off/Zero** keys.	This enters into the test mode of the scale.	StArt	The scale automatically advances to Step 2.
2		Identifies the software ID	IdEnt <-> **11135**	Press the **REWEIGH** key to advance to the next function.
3		Shows the current weight value	tESt <-> 0.0	To advance to the next function, press the **REWEIGH** key.
4		Shows the current A/D count	A-d <-> XXXX	To advance to the next function, press the **REWEIGH** key.

Table 10-2. Test Mode Menu

Step		Function	Display	Available Parameters
5		Checks for current battery level	bAt <-> XXX or nO bAt	If the *nO bAt* is displayed, there are not batteries in the unit. To advance to the next function, press the **REWEIGH** key.
6		This function sends the unit back into test mode again to cycle through the menus again.	FACtOr <-> XXXXX	Go through the menu system again or to exit test mode, press the **REWEIGH** and **Kg-Lb** key simultaneously or turn off the indicator.

Table 10-2. Test Mode Menu

11.0 Maintenance

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

11.1 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, abuse, etc.
2. Inspect the condition of the AC adaptor for cord cracking or fraying or for broken or bent prongs.

11.2 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 into cleaning or other liquid solutions.
3. Do not use Isopropyl alcohol or other solutions to clean the display surface.

12.0 Healthweigh Specifications

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

Battery Type
Sealed lead acid battery

Battery Use
75 hours
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

Capacity and Graduation
Digital Physician Scale

550lb (250kg)	0.2lb (100g)

Digital Handrail Scale

700lb (310kg)	0.2lb (100g)

Digital Wheelchair Scale

700lb (310kg)	0.2lb (100g)

Digital Platform Scale

600lb (270kg)	0.2lb (100g)

Digital Chair Scale

600lb (270kg)	0.2lb (100g)

Certifications and Approvals
RoHS Compliant

13.0 Healthweigh Limited Warranty

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

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

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

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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