

150-10-7

*Digital Floor Level Scale
Software Revision 11454*

Technical Manual



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

1.0 Introduction

The Rice Lake Digital Floor Level Scale is efficiently designed to provide accurate, reliable and repeatable weight measurements. The large stand alone indicator can be placed on a table or floor and has a sturdy built-in bracket for wall mounting.



Manuals and additional resources are available from the Rice Lake Weighing Systems website at www.ricelake.com

Warranty information can be found on the website at www.ricelake.com/warranties

Safety Signal Definitions:



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



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



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



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

General Safety



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



Failure to heed could result in serious injury or death.

Do not drop the scale or subject it to violent shocks.

For accurate weighing, the scale must be placed on a flat, stable surface.

Do not transport the scale while someone is standing on it.

Weight exceeding the maximum capacity (550 lb/250 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.

Only use power adapters supplied by or purchased from Rice Lake Weighing Systems. The use of a power adapter not from Rice Lake Weighing Systems voids the warranty.

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.

Use the scale only to determine weight of people while standing.

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.

2.0 Scale Assembly

2.1 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:

- Scale base and indicator
- Manual
- Serial cable 9.5' with female DB9 and RJ45 connectors
- AA batteries (6)

2.2 Repacking

If the Rice Lake Digital Floor Level Scale must be returned any reason, it must be properly packed with sufficient packing materials in the original carton. Whenever possible, use the original carton when shipping the scale back.

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

2.3 Setting Up Your Scale

Move the scale into the area where the weighing process will occur. Place the scale on a hard, level surface for the most accurate weighments.

2.3.1 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. Remove the battery cover panel of the new display by turning the screw of the battery cover counter clockwise.



Figure 2-1. Uninstall Battery Cover Panel

2. Insert batteries into battery compartment of the new display.



Figure 2-2. Battery Chamber

3. Secure the battery cover panel of the new display by turning the screw clockwise.



Figure 2-3. Secure Battery Cover Panel



Note

***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%.***

2.3.2 AC Power Connections

Use the optional 120 VAC or 230 VAC adapter (PN 133077) when power is available. The optional AC power adapter plugs into the back of the indicator. Rice Lake Weighing Systems offers optional AC adapters. Using an unauthorized adapter supplied by Rice Lake Weighing Systems voids all warranties.

Connect the optional AC power source shown in [Figure 2-4](#).

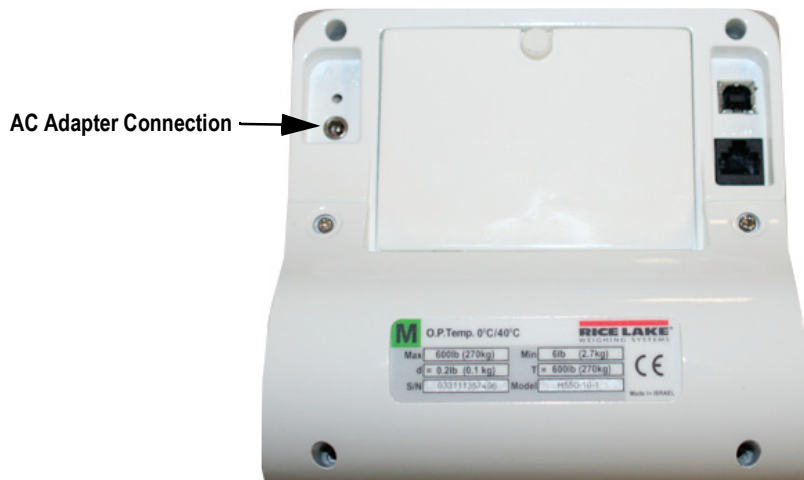


Figure 2-4. Power Connection

Leveling the Scale

Use the level bubble to check for level and adjust feet as needed.

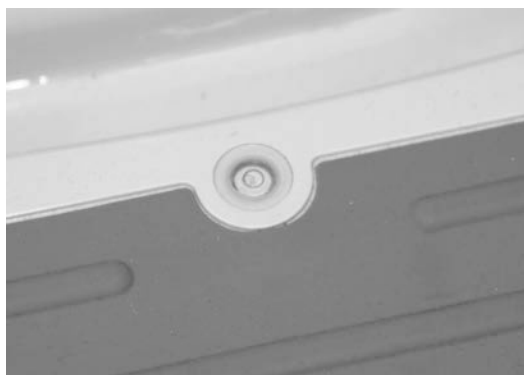


Figure 2-5. Bubble Indicates Scale Is Level



Note

On a flat surface, adjust scale feet until the bubble indicates that the scale is level.

3.0 Scale Operation

The unit display has 10-front panel keys (Figure 3-1).



Figure 3-1. Front Panel Display Keys

3.1 Key Descriptions

Key functions are described in Table 3-1.

Key	Name	Function
On/Off	On/Off	Powers the scale on or off
Print LB/KG	Print LB/KG	Sends data out from the RS-232 port; Allows to toggle between kilograms and pounds providing that it is enabled in Configuration mode; Cannot toggle while in the BMI mode
Zero	Zero	Clears the weight off the scale and returns it to zero after three seconds; Only functions if the current weight is stable and zero, up to 2% of max weight
Hold Release	Hold Release	Displays most current weight value on the display; a second press releases the weight value; Not active while in BMI mode
BMI	BMI	Enables access to the BMI (Body Mass Index) function; only works if there is a locked weight on the display and the BMI function is turned on in the Configuration mode
TARE	TARE	Used to subtract the weight off the scale, example: oxygen tank, other equipment
CLEAR	CLEAR	Returns to normal weighing when the BMI value is being displayed; While in BMI mode, the height display causes the value to return to the default of 190.0 cm, 5', 7.5"
ENTER	ENTER	Used to accept height in BMI mode; Accepts the value of the parameter last entered and moves to the next stage; press during scale start up to enter ID display (pre-parameter mode)
Up Arrows	Up Arrows	Adjusts height input (0.5"/0.5 cm) while in BMI mode; Adjusts the value of the flashing digit/number
Down Arrows	Down Arrows	Adjusts height input (0.5"/0.5 cm) while in BMI mode; Adjusts the value of the flashing digit/number

Table 3-1. Key Functions



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

3.2 Weighing

Use the following steps to weigh.

1. Press  to turn on the scale. **0.0** prompts along with **ZERO** on the display.
2. When the patient steps on the scale the display shows the weight of the patient. The **LOCK** annunciator is on in the upper display and beeps to indicate the end of the weighing process.
3. Press  to change the display from kg to lb.
4. To turn off the scale, press and hold  until **OFF** prompts.

3.3 Hold/Release Function

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

1. Press  to turn on the scale. **0.0** prompts along with **ZERO** on the display.
2. Press  when the patient is on the scale.
3. The weight and **HOLD & LOCK** annunciators remain on the display when the patient steps off the scale.
4. Press  again to return to zero.



Note Pressing  will not work while in Hold/Release function.



Note Pressing  prior to the patient getting on the scale will also work.

3.4 Preset Tare

Use the following steps to use the Preset Tare.

1. Press  to turn on the scale. **0.0** prompts along with **ZERO** on the display.
2. Place wheelchair on the scale.
3. Press  until the display returns to **0.0** and **NET** prompts on the display.
4. Remove the wheelchair from the scale. The weight will prompt with a negative symbol to the left of it.
5. Seat the patient in a wheelchair. The display identifies the patient weight. The **NET** annunciator is still active. The weight of the wheelchair remains stored in memory.
6. Repeat [Step 5](#) to cancel the tare weight, press and hold  until **NET** disappears from the display and the display turns back to **0.0** and **GROSS** prompts.



Note Tare weight is also canceled when the scale is turned off.

3.5 Toggle Tare

Use the following steps to use the Toggle Tare function.

1. Press  when the weight is set to **0.0**. The default values prompts while **0.0** is flashing (default is programmed to be 33.0 lb/15.0 kg) on the display.
2. Use  and  to adjust the value. Press  to start the tare function. The **NET** annunciator turns on instead of the **GROSS** annunciator.

3.6 Using the Body Mass Index (BMI) Function

Use the following steps in determining the BMI.

3.6.1 LB Mode

1. Ensure that the scale is at zero.
2. Have the patient step on the scale to obtain a weight.
3. The **LOCK** annunciator is illustrated on the display.
4. Press . The **BMI** and **FT/IN** annunciators are lit on the display and a default value of 5' and 7.5" (5-07.5) is flashing.
5. Press  or  to adjust the height value.
6. Press .
7. The BMI value and **BMI** annunciator is shown on the display. Press  to return to the **Weighing** mode and the BMI function will be turned off.

3.6.2 KG Mode

1. Ensure that the scale is at zero.
2. Have the patient step on the scale to obtain a weight.
3. The **LOCK** annunciator is illustrated on the display.
4. Press . The **BMI** and **CM** annunciators are lit on the display and a default value of 170.0 cm (170.0) is flashing.
5. Use  and  to adjust the height value.
6. Press .
7. The BMI value and **BMI** annunciator is shown on the display. Press  to return to the **Weighing** mode or step off the scale and the BMI function will be turned off.

4.0 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.

4.1 Configuration Mode

Use the following steps to enter into **Configuration** mode.

1. Ensure the scale is turned off.
2. Turn the scale on by simultaneously pressing  and . Continue to hold both keys until **ld** appears. The unit cycles through its startup function and continues to display the software version.
3. Access the setup switch located in the back of the scale to enter the setup parameters for the scale. Use a small paper clip, small screwdriver or other similar object to press the setup switch ([Figure 4-1](#)).



Figure 4-1. Setup Switch Location

4. Once the setup switch is pressed, **PROG** displays.
5. Scale can be configured using a series of menus accessed through the front panel when the scale is in **Setup** mode.



Figure 4-2. Top Level Menu

6. Press  to advance to the desired menu.
7. Press  and advance in the manual to the related menu selection for further instructions.

4.2 Programming Mode Menu

Various parameters can be set while in **Programming** mode (Figure 4-3).

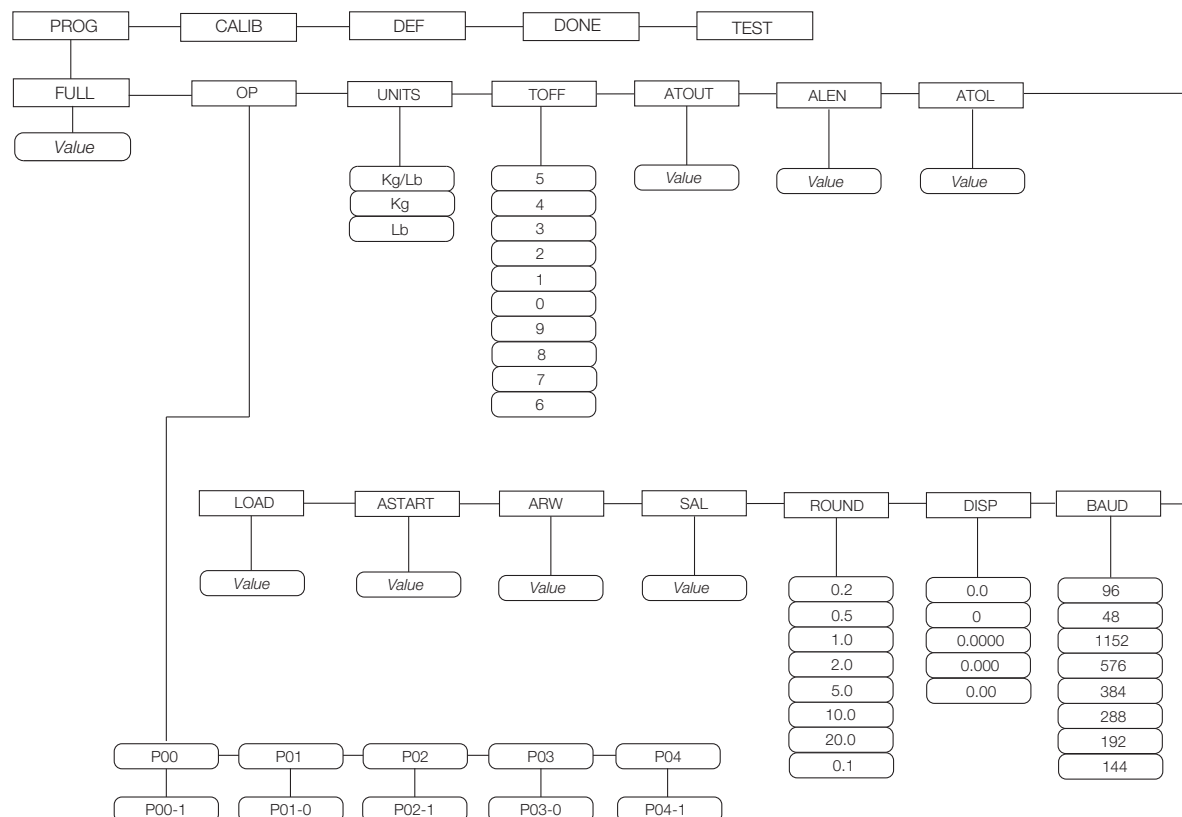


Figure 4-3. Programming Mode Menu Structure

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 (550 lb)	The display toggles between a numeric value and FULL; If you do not want to change the value, press the BMI key to move to the next setting; Example: from FULL to LOAD. If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. Press BMI key to move to the left. 4. Use the Up/Down arrow keys to increment/decrement numbers. 5. Press BMI key again to move to the left 6. Use the Up/Down arrow keys to increment/decrement numbers. 7. When done press ENTER key to move to the next parameter (LOAD).
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 LOAD; If you do not want to change this value, press the BMI key to move to the next setting; Example: from LOAD to ASTART; If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. Press BMI key to move to the left. 4. Use the Up/Down arrow keys to increment/decrement numbers. 5. When done, press ENTER key to move to next parameter (ASTART).

Table 4-1. Configuration Mode Menu

Parameter	Description	Choices	Steps
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 ASTART ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from ASTART to ARW; If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. Press BMI key to move to the left. 4. Use the Up/Down arrow keys to increment/decrement numbers. 5. When done, press ENTER key to move to the next parameter (ARW).
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 ARW ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from ARW to SAL; If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. Press BMI key to move to the left. 4. Use the Up/Down arrow keys to increment/decrement numbers. 5. When done, press ENTER key to move to the next parameter (SAL).
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 SAL ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from SAL to ROUND; If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. When done, press ENTER key to move to the next parameter (ROUND).
ROUND	Scale Resolution — Values in kg: 1, 2, 5, 10, 20, 50, 100 Values in lb: 1, 2, 5, 10, 20, 50, 100, 200	0.2 0.5 1.0 2.0 5.0 10.0 20.0 0.1	The display toggles between a numeric value and ROUND ; The decimal point location is set to the DISP parameter display decimal point location; If you do not want to change this value, press the BMI key to move to the next setting; Example: from ROUND to DISP; If you want to change the value, use the following steps; 1. Press ENTER key to change value. 2. Press the Up/Down arrow keys to change the available parameters. 3. When done, press ENTER key to move to the next parameter (DISP).
DISP		0.0 0 0.0000 0.000 0.00	The display toggles between a numeric value and DISP ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from DISP to BAUD; If you want to change the value, use the following steps; 1. Press ENTER key to change value. 2. Use the Up/Down arrow keys to change the available parameters. 3. When done, press ENTER key to move to the next parameter (BAUD).
BAUD	Baud rate	96 48 1152 576 384 288 192 144	Indicator display illustrates first two digits of baud rate only; The display toggles between a numeric value and baud; If you do not want to change this value, press the BMI key to move to the next setting; Example: from BAUD to ATOL; If you want to change the value, use the following steps 1. Press ENTER key to change value. 2. Use the Up/Down arrow keys to change the available parameters. 3. When done, press ENTER key to move to the next parameter (ATOL).
ATOL	Algorithm initial tolerance — Maximum value is 255. Values above 255 will not let you proceed and will return to the previous value.	Value (10)	The display toggles between a numeric value and ATOL ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from ATOL to ALEN; If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. Press the BMI key to move to the left. 4. When done, press ENTER key to move to the next parameter (ALEN).

Table 4-1. Configuration Mode Menu (Continued)

Parameter	Description	Choices	Steps
ALEN	Algorithm initial exponent — Maximum value 10. Values above 10, will not let you proceed and will return to the previous value.	Value (8)	The display toggles between a numeric value and ALEN ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from ALEN to ATOUT; If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. When done, press ENTER key to move to the next parameter (ATOUT).
ATOUT	Algorithm maximal exponent — Maximum value is 15. Values above 15, will not let you proceed and will return to the previous value.	Value (10)	The display toggles between a numeric value and ATOUT ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from ATOUT to TOFF; If you want to change the value, use the following steps; 1. Press ENTER key to change value starting with the right most digit. 2. Use the Up/Down arrow keys to increment/decrement numbers. 3. Press BMI key to move to the left. 4. Use the Up/Down arrow keys to increment/decrement numbers. 5. When done, press ENTER key to move to the next parameter (TOFF).
TOFF	Auto off timer — Measured in minutes; 0 = always on; Maximum is 9 minutes; When using an external power supply, this parameter is irrelevant	5 4 3 2 1 0 9 8 7 6	The display toggles between a numeric value and TOFF ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from TOFF to UNITS; Press the ENTER key to move to the next parameter; (UNITS); If you want to change the value, use the following steps; 1. Press the ENTER key to change values. 2. Use the Up/Down arrow keys to change the available parameters. 3. When done, press ENTER key to move to the next parameter (UNITS).
UNITS	Units — Selects the unit of measure; It can be either Kg/Lb, Kg only or Lb only	KG/LB KG LB	The display toggles between unit of measurements and UNIT ; If you do not want to change this value, press the BMI key to move to the next setting; Example: from UNITS to OP; If you want to change the value, use the following steps; 1. Press the ENTER key to change values. 2. Press the Up/Down arrow keys to change the value. 3. When done, press the ENTER key to move to the next parameter (OP).
OP	Binary options: OP0 — Live weighing options (0=disable, 1=enable) OP1 — Communication protocol (0=ESC, 1=maintenance) OP2 — BMI menu (0=disable, 1=enable) OP3 — RTC power (0=disable, 1=enable) OP4 - Semi-Auto-Live — (0=disable, 1=enable) OP5 - Full calculation — (0=spatial, 1=multiply by (0=disable, 1=enable) OP6 - Tare - (0=disable, 1=enable) OP7 - Bat type — (0=dry batteries, 1=rechargeable batteries) OP8 — OIML mode - (0=disable, 1=enable	OP0 OP1 OP2 OP3	The display toggles between a binary option and POO-0 ; If you do not want to change this value, press the BMI key to move to the next settings If you want to change the value, use the following step 1. Press ENTER to change parameters. 2. Use the Up/Down arrow keys to select the display value you want to change. 3. Press BMI key to move the flashing cursor a. Use the Up/Down arrows to change the value. b. Press the BMI key to move the flashing cursor. 4. Press ENTER key to save all of the display parameters. SAVE appears on the display. 5. Press ENTER key again and DONE appears indicating that you are now done entering all of the parameters of the scale.
Press the BMI key to cycle back to the top level menu choices, ie: PROG/CALIB/DEF/DONE/TEST			

Table 4-1. Configuration Mode Menu (Continued)

4.3 Default Menu

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

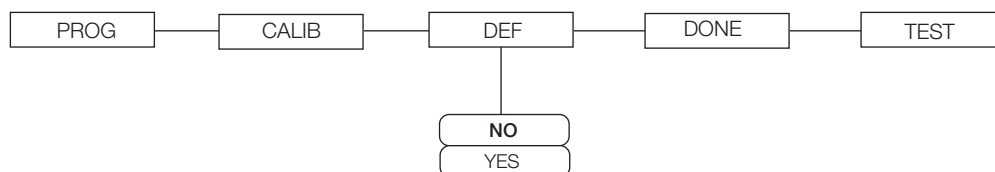


Figure 4-4. Default Menu

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

1. Press . The display shows a default value of **NO**.
2. To change to **YES**, use and to adjust the value.
3. Press and the display shows **DONE**.
4. Press to return to PROG/CALIB/DEF/DONE/TEST upper level menu.



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

4.4 Scale Calibration

Use the following steps to calibrate the scale.

1. Press and simultaneously to power on the scale.
2. The unit cycles through its startup function and continues to display the software version. Continue to hold both keys until **Id** appears.
3. Access the setup switch located in the back of the scale to enter the setup parameters for the scale. Use a small paper clip, small screwdriver or other similar object to press the setup switch (Figure 4-1 on page 8).
4. **Prog** displays. Press to toggle along the parameter menu.
5. **Calib** displays and enter the calibration parameters.
6. Press 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 or . Once a unit is selected, press and the right most digit will be flashing.
7. To change the calibration load value, press or to increment/decrement the flashing digit.
8. Use to move the flashing digit to the left or right.
9. Once all the digits have been entered, press and **Clear** displays.
10. Make sure the scale platform is clear of weight and press again then **=====** displays.
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 . **=====** displays then **Save** displays.

13. Press  again and the display indicates **Done**.
14. Press  three times to exit back out to the top level **Done** parameter.
15. Press  to return to **Weigh** mode.
16. To exit calibration without changing zero or span existing calibration, press , then press .

4.5 Test Menu

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

1. Press  and  simultaneously to power on the scale until **ID** flashes.
2. Press  again.
3. Continue to press  to scroll through the various menu items.
4. Once complete, press  again then **Done** displays.
5. Press  to start the weighing process.

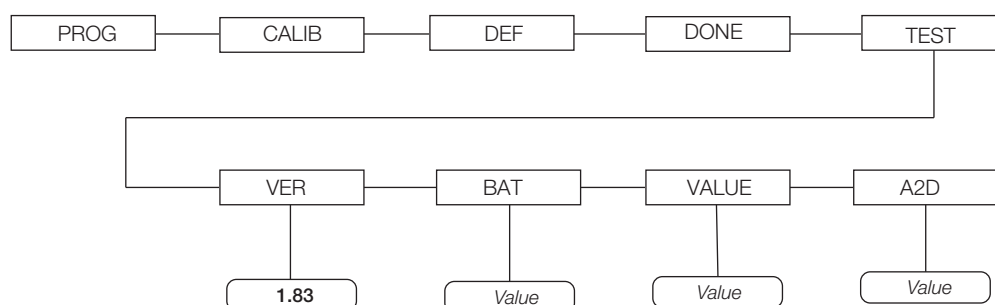


Figure 4-5. Test Menu

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 4-2. Test Menu

5.0 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 5-6 on page 17](#) 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

5.1 Pushbutton Keypad Print

With a stable, in-range weight, press and hold  for at least three seconds, or until the scale emits two quick beeps.



Note If the scale does not beep after five seconds, release  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

Examples:

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

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

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><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><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.

5.2 Communication Protocols

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

5.2.1 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 5-1 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 5-1. Escape Protocol Commands

Table 5-2 lists the ESC characters that will be used.

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

Table 5-2. ESC Characters

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

Table 5-3. Scale Global Values List and Identifiers

Samples of Escape Protocol

Figure 5-1 and 7-2 show what the diagrams will look like on the PC as the scale measures weight and sends over this communications line:

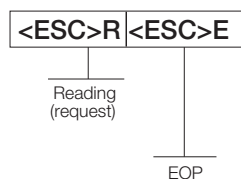


Figure 5-1. Sample of Escape Protocol

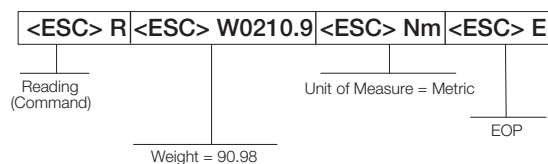


Figure 5-2. Sample of Escape Protocol

When the user wants to diagnose the problems on the scale, it looks like the Figure 5-3 and 7-4.

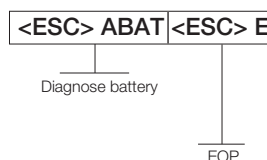


Figure 5-3. Diagnose the Escape Protocol Diagram

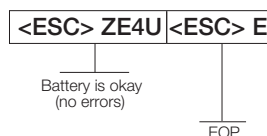


Figure 5-4. Diagnose Battery Protocol Diagram (Battery is Okay)

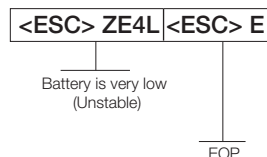


Figure 5-5. Diagnose Battery Protocol Diagram (Battery Unstable)

5.2.2 Maintenance Protocol

Table 5-4 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 5-4. Maintenance Protocol Commands

5.3 USB Connection

The Rice Lake Digital 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 5-6](#).

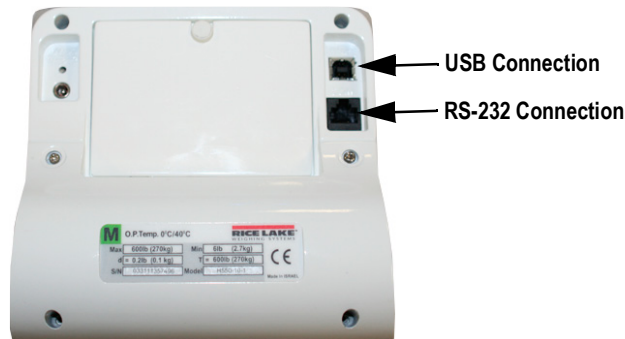


Figure 5-6. USB Connection Port and RS-232 Connection Port

Connecting software and downloads will be addressed by the IT department and may vary. 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**.

1. Select **Software**.
2. Select **Get Downloads**.
3. Select **Download** to download the driver. Selecting a download will prompt a download notification.
4. **Found New Hardware Wizard** prompts.



Figure 5-7. Found New Hardware Wizard

5. Follow the prompts to complete installation.

6. Select **No, not this time** then select **Next**.



Figure 5-8. No, Not This Time

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

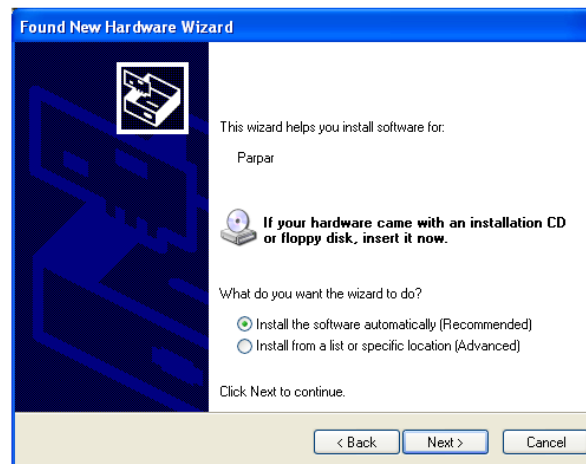


Figure 5-9. Install The Software Automatically

8. Allow the driver to install.

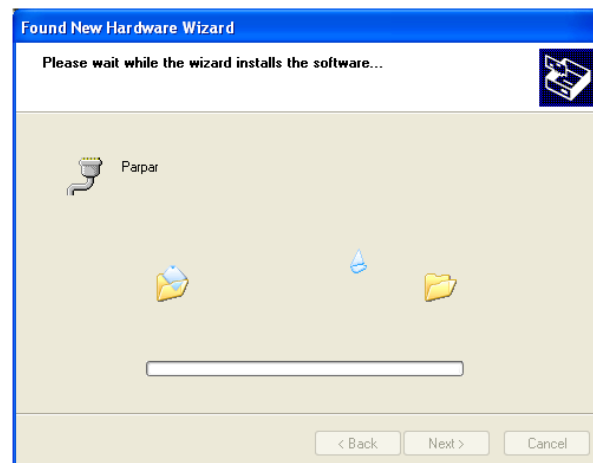


Figure 5-10. Software Installation

9. **Completing the Found New Hardware Wizard** prompts when installation is complete. Select **Finish**.

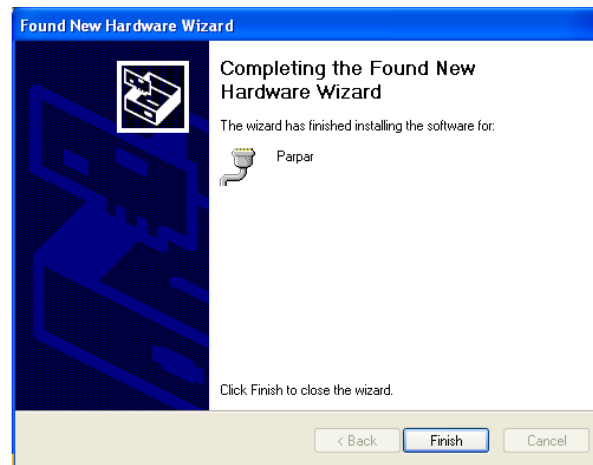


Figure 5-11. Finish Installation

10. To verify the installation, view the driver information in **Device Manager**.

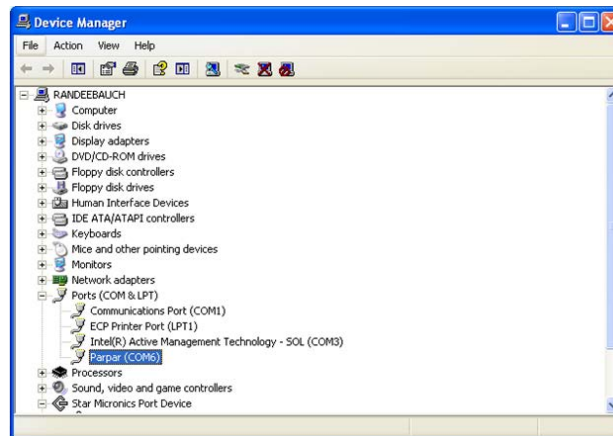


Figure 5-12. Driver Selection

6.0 Maintenance

The following section provides instructions for maintaining and cleaning the unit.

6.1 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.

6.2 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.



Do not use isopropyl alcohol or other solutions to clean the display surface.

6.3 Troubleshooting

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

Symptom	Possible Cause	Corrective Action
Scale does not turn on	Dead battery	Replace battery or connect to AC power
	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 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 a <i>STOP</i> message	The load on the scale exceeds the capacity of the scale	Remove the excess weight and use the scale according to manufacture specifications
The display shows <i>LO Bat</i> message	The battery is low	Replace batteries
The display shows Err message 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 usable; 1 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 6-1. Troubleshooting Table

7.0 Warranty

Rice Lake Weighing Systems (Rice Lake) warrants that all Rice Lake brand equipment and systems properly installed by an Authorized Reseller or original equipment manufacturer (OEM) will operate per written specifications as confirmed by the Authorized Reseller/OEM and accepted by Rice Lake. All systems and components are warranted against defects in materials and workmanship for two (2) years from the date of shipment from Rice Lake, unless otherwise stated in the product catalog or manual.

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

- Upon discovery by the customer of such non-conformity, Rice Lake will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to Rice Lake for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in the publication, "Protecting Your Components from Static Damage in Shipment," available from Rice Lake Equipment Return Department.
- Examination of such equipment by Rice Lake confirms that the non-conformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair, or improper testing. Rice Lake shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than Rice Lake or its duly authorized repair agents.
- Cutting the load cell cable will void the warranty.
- Rice Lake will have a reasonable time to repair or replace the defective equipment. The customer is responsible for shipping the product to Rice Lake. Rice Lake is responsible for shipping the product back to the customer.
- In no event will Rice Lake be responsible for travel time or on-location repairs, including assembly or disassembly of equipment. Nor will Rice Lake be liable for the cost of any repairs made by others.
- On all intrinsically safe equipment, any field repair or modifications voids any and all warranties expressed or implied and void F.M. approval.
- Any loose hardware, screws, washers or non-ESD bags of hardware stored inside indicator will void warranty. This could cause harm to repair technician or damage CPU board.
- If just the board is sent in for repair, the serial number of the product the board is from should accompany the board.

These warranties exclude all other warranties, expressed or implied, including without limitation warranties of merchantability or fitness for a particular purpose. Neither Rice Lake nor Authorized Reseller will, in any event, be liable for incidental or consequential damages at the point of use.

Rice Lake and the customer agree that Rice Lake's sole and exclusive liability here under is limited to repair or replacement of such goods. In accepting this warranty, the customer waives any and all other claims to warranty.

Should the seller be other than Rice Lake, the customer agrees to look only to the seller for warranty claims.

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

8.0 Specifications

Power

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

Battery Type

6-AA size Alkaline batteries

Battery Use

25 hours continuous use

Automatic power-off can be configured

Data Communications

RS-232 with RJ45 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

Floor Level Scale

550 lb x 0.2 lb (250 kg x 0.1 kg)

Dimensions (W x L x H)

Platform Dimensions

14.5" x 14.5" x 3"

Certifications and Approvals

RoHS Compliant



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