DS7100

Handrail Scale

User Manual

MAN0359 – Rev 6 Doran Scales, Inc. www.doranscales.com

Section 1. Unpacking and Care

Thank you for purchasing a Doran scale. This product has been designed with the highest level of technology. We are dedicated to delivering a superior product that will provide many years of trouble free service.

As an ISO9001 registered company, Doran Scales is dedicated to delivering products built with strict compliance to our high quality standards. If you have any questions regarding your scale, please contact Doran Scales, Inc.

Unpacking

Carefully remove the scale from the shipping carton. If you notice any shipping damage, notify the shipper immediately. Be sure to retain all shipping materials in case the scale must be shipped elsewhere.

Cautions and Warnings

Normal care should be taken when handling and using this product. Improper handling or abuse can damage the scale and result in costly repairs that may not be covered by the warranty. Please observe the following precautions to ensure years of trouble free service from your new scale.

- Do not use sharp objects to press any of the buttons.
- Do not pick up the scale by the indicator or cables.
- Do not use the scale if it is damaged in any way.
- Do not leave patients unattended on the scale.
- Do not exceed the scale capacity.
- Do not drop the scale.
- Do not drop objects on the scale.
- When transporting, do not hit other objects, walls or doorframes with the scale.

Care & Cleaning

With reasonable care, this product will last for many years. Here are some tips to care for your scale. Failure to comply with these guidelines may void the warranty.

- This scale will withstand typical cleaning methods and chemicals that are used in healthcare environments. This includes but not limited to cleaners that contain sodium hypochlorite (bleach), hydrogen peroxide and alcohol.
- Do not get water inside the indicator or platform.
- Do not immerse in water or any liquid.
- Do not use strong solvents or abrasive cleaners as this can damage the touch panel or other plastic parts.

Preventive Maintenance

- Examine the scale periodically for damage and wear and tear before use.
- If the scale is damaged, check calibration of the scale and safety before use.
- Check calibration annually and calibrate if necessary.
- Remove batteries during long periods of non-use.

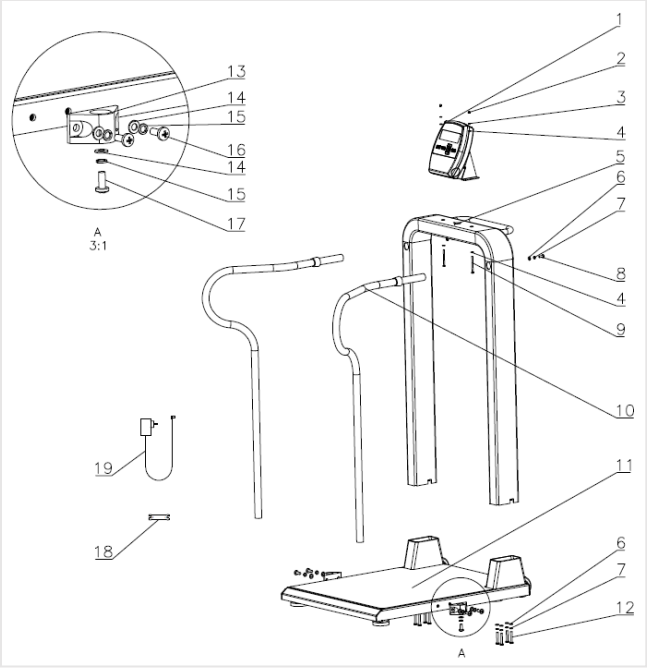
Moving Scale

The scale has two wheels at the rear of the scale platform. Grasp the handle at the rear of the scale and tilt the scale back towards you until only the wheels contact the floor. Use these wheels when moving the scale to prevent damage.

Assembly Instructions

Before assembly, ensure you have all the components below. If any items are missing, contact Doran Scales. Please be careful to follow all instructions. Improper assembly may void the warranty. If you notice any shipping damage, notify the shipper immediately. Be sure to retain all shipping materials in case the scale must be shipped elsewhere.

Component List

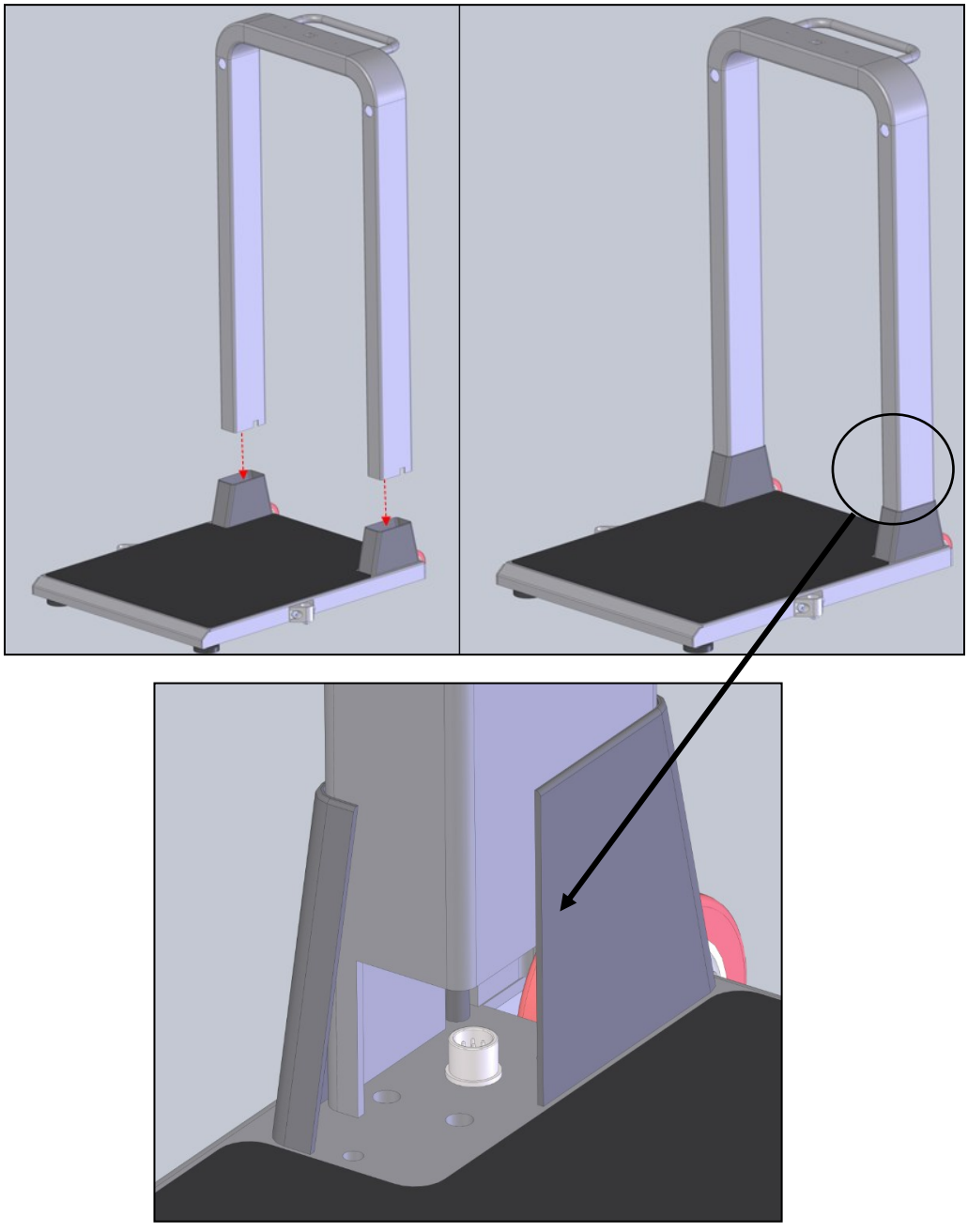


1. Indicator
2. (2) M4 Acorn Nuts
3. (2) M4 Spring Lock Washer
4. (4) M4 Washer
5. Tower
6. (10) M6 Washer
7. (10) M6 Spring Lock Washer
8. (2) Handrail Tower Bolts (M6 x 16)
9. (2) Indicator Bolts (M4 x 60)
10. (2) Handrails
11. Platform
12. (8) Tower Bolts (M6 x 40)
13. (2) Handrail Holders
14. (6) M8 Washer
15. (6) M8 Spring Lock Washer
16. (4) Handrail Holder Bolts (M8 x 20)
17. (2) Handrail Platform Bolts (M8 x 20)
18. Foot (F) and Indicator (I) Nut Adjustment Tool
19. Power Transformer (XFR0035 or XFR0082)

1. Carefully remove the scale from the shipping carton. Be sure to locate the bag of hardware containing items listed above.

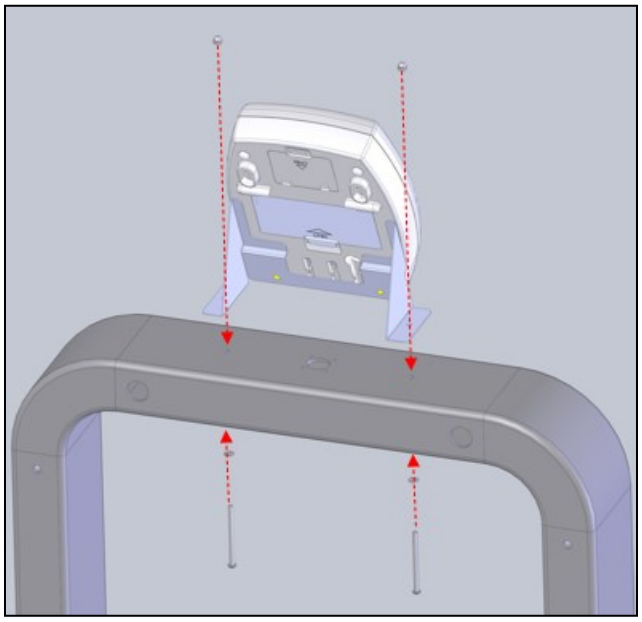
2. Locate the base of the Tower (5) near the Platform (11). Connect the cable from the base of the Tower (5) to the connector inside the plastic tower receptacle on the Platform (11). Push the connector into place until a click is heard. DO NOT force the connector in place, it is keyed and can only be connected when inserted properly. Tug gently on the cable to ensure a proper connection has been made.

3. Insert the Tower (5) into the Platform (11) blue plastic trim caps. Carefully pull the wire harness from the top of the Tower (5) as the tower is inserted into the blue plastic trim caps to prevent pinching the cable between the Tower (5) and the Scale platform (11).

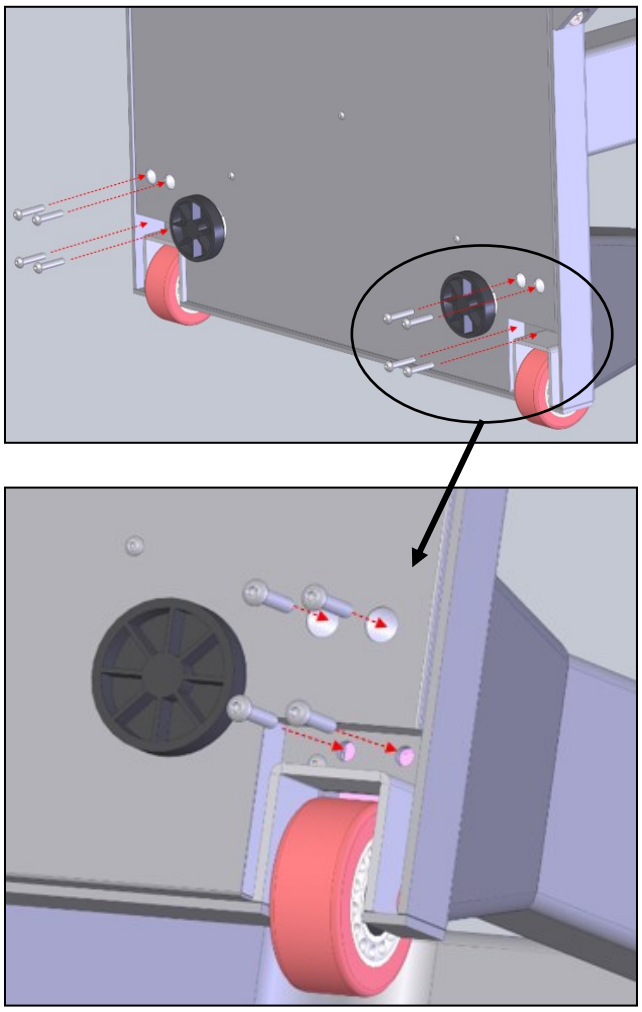


4. Connect the cable at the top of the Tower (5) to the rear of the indicator (1). Push the connector into place until a click is heard. DO NOT force the connectors in place, it is keyed and can only be connected when inserted properly. Tug gently on the cable to ensure a proper connection has been made.

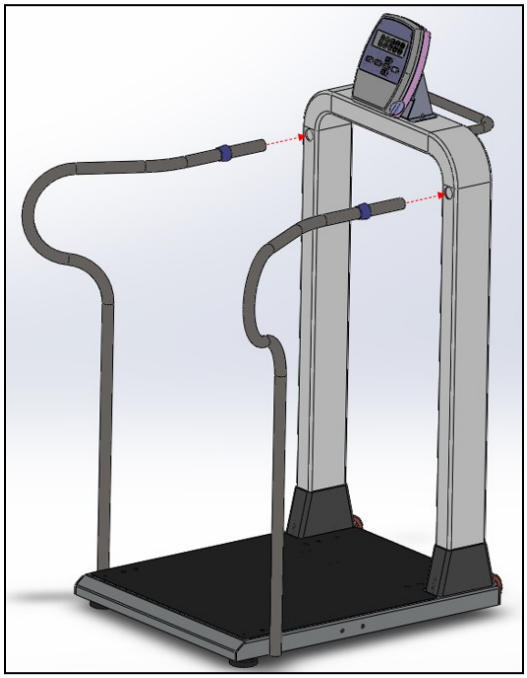
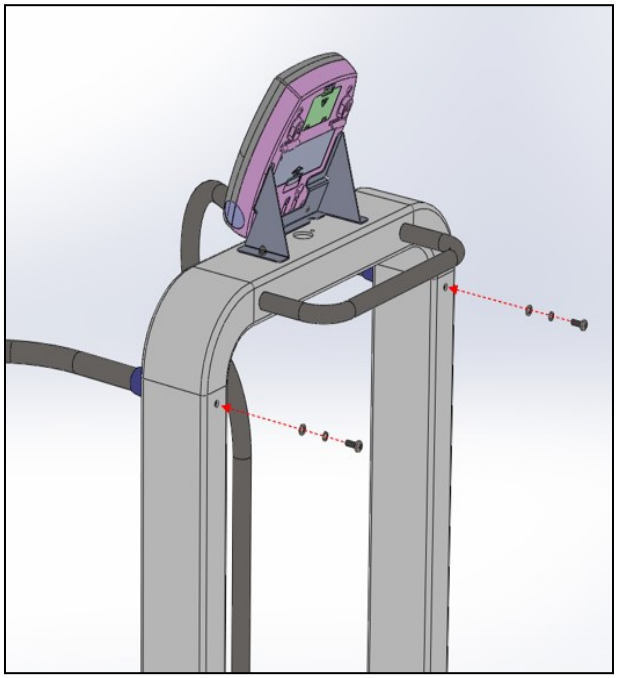
5. Fasten the indicator to the tower using the indicator bolts (9) washer (4) and lock washers (3) from the bottom of the Tower (5). Fasten to the top of the Tower (5) using the acorn nuts (2). The acorn nuts can be tightened with the Adjustment Tool (18) with the end marked I.



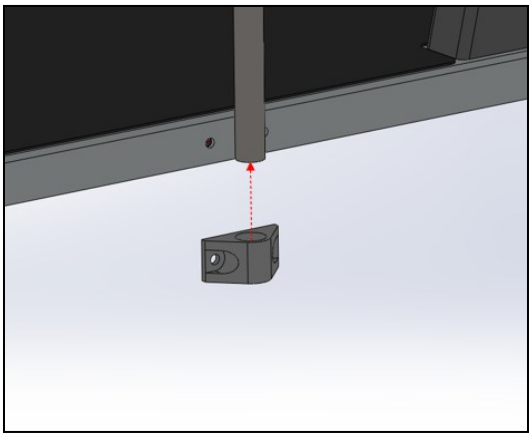
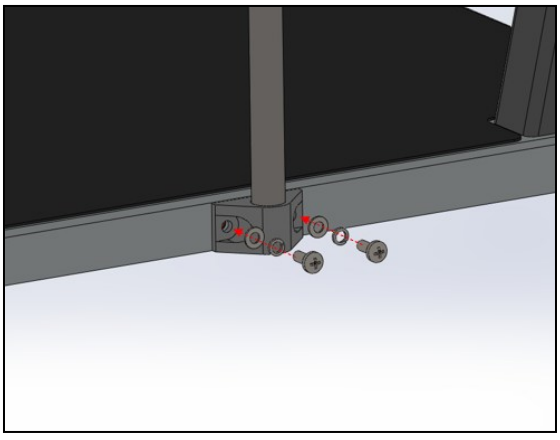
6. Lean the scale backwards so that the Tower (5) is resting on the floor. Insert a lock washer (7) and then a washer (6) onto the tower bolt (12). Insert each bolt but do not tighten completely until all eight bolts are installed.



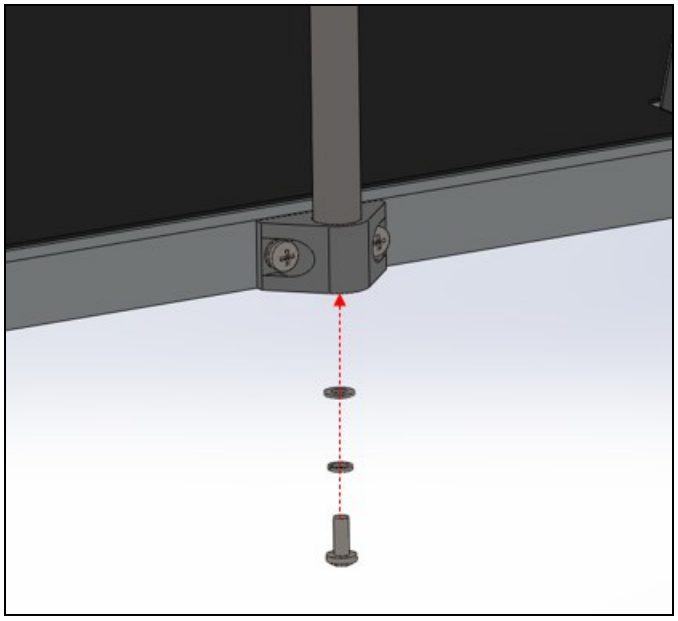
7. Insert the Handrails (10) into the holes of the Tower (5). Insert the handrail tower bolts (8), lock washer (7) and washer (6) into the rear of the Tower (5) but do not fully tighten.

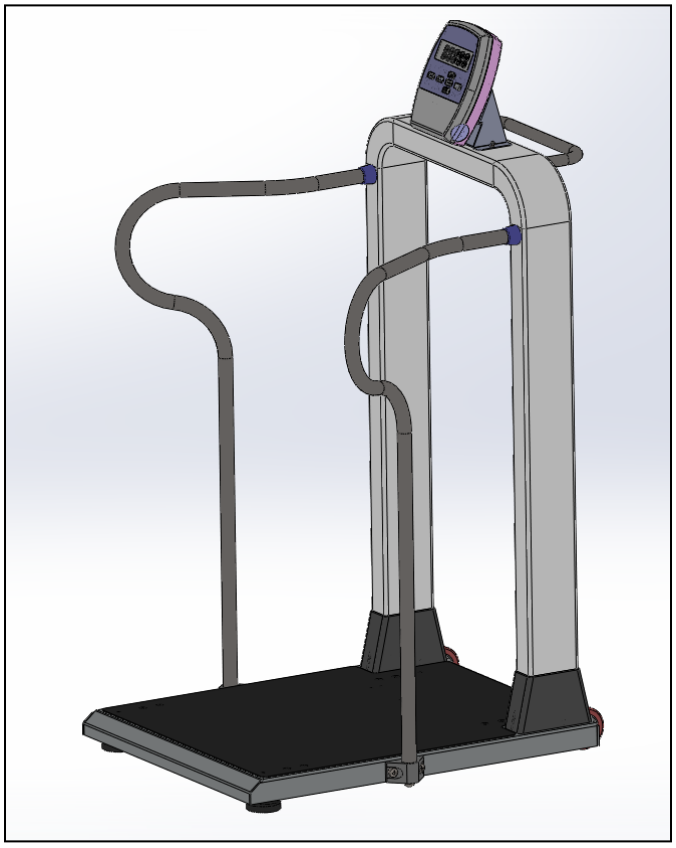
8. Insert the Handrail Holders (13) from the bottom of the handrails (10) and insert the Handrail Holder Bolts (16), lock washer (15) and washer (14) but do not fully tighten.

9. Insert the Handrail Platform Bolts (17), lock washer (15) and washer (14) from the bottom of the holders to fix the handrails.



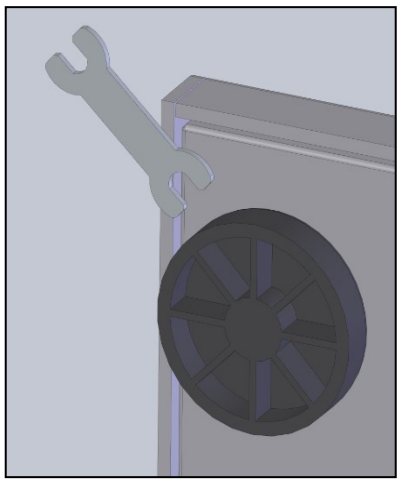
10. Once all handrail bolts are in place, tighten all bolts in Step7-9 fully.

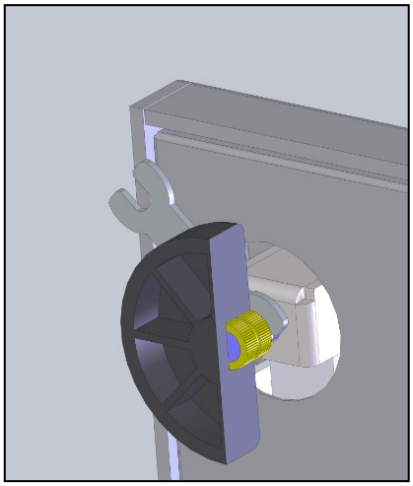


11. Stand on the scale platform and press Zero before weighing patients.

Leveling Scale
If the scale is to be used in a permanent location, it is recommended to level the scale. Leveling the scale will provide a stable weighing surface and optimal accuracy. To level the platform, use the Foot Adjustment Tool provided with the scale. Insert the wrench into place and twist the foot to change the height while grasping the wrench.

After leveling the scale, press Zero.





Section 2. Battery Operation

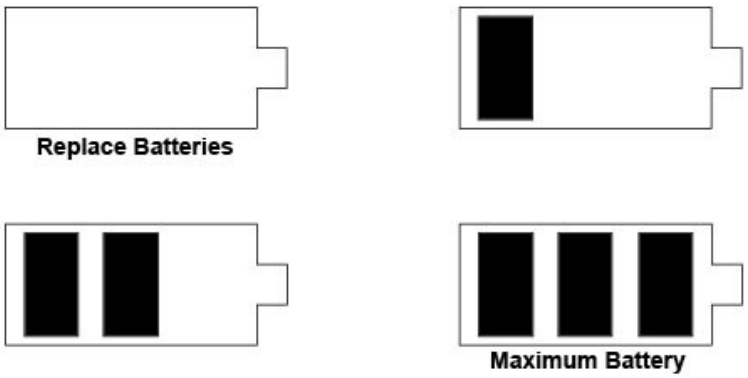
Battery Installation

The indicator can be powered by a set of six AA alkaline batteries. These batteries can perform over 25,000 weighments of typical use with the standard Automatic Shutoff Timer settings.

The battery compartment is located on the backside of the indicator. Press the locking tab to release battery compartment cover. Completely remove all the batteries from the indicator and install the new set of batteries. Be sure the batteries are oriented properly. Reinstall the battery compartment cover to complete the battery installation.

Battery Indicator

The battery indicator displays the remaining battery life available. A low battery status is also indicated by two beeps when a weight is held (If Parameter bH is set to on.) This indicator will not be displayed if the scale is powered by its wall transformer.



Section 3. Scale Operation

Fig. 3 Front Panel

Display Pushbuttons

The Model DS7100 controls consist of UNITS, ZERO, REWEIGH, ▲, ▼, and BMI buttons. The display is used to provide weight indications and operator messages indicating scale operation.

Power On/Off

Press the ZERO button to turn on the indicator. Press and hold the ZERO button for 3 seconds to turn off the indicator. The indicator has an adjustable Automatic Shutoff Timer that will turn off the indicator when not in use.

Zero

When the ZERO button is pressed, the scale will reset to zero weight. This feature can be used to zero out any weight not desired to be part of the patient weight. The current BMI entry will be changed back to a 0.0 value.

Units

Press the UNITS button to toggle between lb and kg weighing units. The current unit will be displayed to the right of the weight digits. *NOTE: The UNITS button can be locked or unlocked by pressing and holding UNITS for 5 seconds. An "L on" message is displayed when button is locked and "L oFF" when unlocked.*

Reweigh

To reinitiate the weighing process, press REWEIGH. This will allow a new measurement to be taken without the patient having to leave the platform.

BMI

With the held weight being displayed, press the BMI button to enter the height of the patient. Adjust the value by using the ▲ or ▼ buttons. *NOTE: Select the Height units by pressing the UNITS button to toggle between the height in inches or centimeters. The scale will exit this mode if no buttons are pressed within 30 seconds.*

Display Annunciators

The display annunciators will indicate the scale status.

Motion

When the scale senses motion, MOTION will be indicated. Once motion ceases, a stable reading will be displayed.

Stable Hold

Indicates a stable weight has been achieved and held on the display. This indicates an accurate weight has been achieved. *Note: Weights below 4.5 pounds will not be held.*

Average Hold

Indicates that the weight held on the display is a result of averaging several weights due to excessive motion on the scale. *Note: Weights below 4.5 pounds will not be held. The Average Hold weight may be slightly less accurate than a Stable Hold weight.*

Displaying an Average Hold weight instead of a Stable Hold weight will speed the weighment process for patients that are not able to remain still. The Average Hold weight will differ from the patient's actual weight based upon the severity of the motion caused by the patient while on the scale. Although this weight may be less accurate than a Stable Hold weight, the deviation from the patient's actual weight will be minimal.

The time required for the Average Hold to engage is based upon the Average Aperture parameter. See the Parameter Setup section for configuration instructions.

Battery Indicator
The battery indicator displays the remaining battery life. See the battery operation section for detailed information. *NOTE: The battery Indicator will be disabled when using an external power supply.*

Software Number and Revision display
Pressing and holding the REWEIGH button for 3 seconds will perform a display test. The software number, "Sw 179", and the revision, "r 3.6" (or higher), are displayed first. After displaying the revision, the scale enters a "switch test" mode where the keys can be pressed to verify their operation. If no keys are pressed for 10 seconds, the scale will perform a display test and return to its normal mode of operation.

Weighing a Patient

1. Turn on the indicator by pressing the ZERO button.
2. The indicator will perform a startup zero.
3. The indicator will momentarily display dashes, "-----", followed by 0.0.
4. Patient stands on the scale platform.
5. The display will scroll dashes until the patient's weight is captured.
6. The indicator will beep (if enabled) and then hold the weight on the display until the scale turns off.

Zero Operation

1. Place item to be zeroed on the scale platform.
2. Press ZERO. The scale will display a zero weight. If the item is removed, the stable negative weight will automatically be zeroed after 3 seconds.

BMI Operation

1. With the held weight displayed, press the BMI button to enter the height value. Height entry starts at 5: 6.0 or 168.0, representing 5 foot 6 inches or 168 centimeters. *NOTE: Height units can be changed by pressing the UNITS button.*

2. Press the ▲ button to increase or the ▼ button to decrease the value. When the correct value is displayed, press the BMI button to enter the value and exit. *NOTE: A menu timer will exit out of this entry mode if no buttons are pressed within a 30 second time period.*

Reweigh Operation

1. With the patient standing on the scale platform, press REWEIGH to reinitiate the weighing process.
2. The display will scroll dashes until the patient's weight is captured.
3. The indicator will beep (if enabled) and hold the weight on the display until the scale turns off.

Section 4. Data Communications

RS-232 Communications Port

The indicator is equipped with an RS-232 communications port. The RS-232 connection is located on the back of the indicator behind the top access cover. An optional RS-232 cable is available. Insert the phone style connector into the receptacle on the indicator housing and connect the 9-pin connector to your computer or printer.
Note: This option may reduce battery life.

Basic understanding of RS-232 data communications is needed when setting up the indicator to communicate with a printer or PC. When setting up an RS-232 communications system, there are two concerns which affect the configuration of that system. These are:

- Baud Rate
- Data Bits and Parity

The baud rate determines how fast the data is sent from the scale. The sending and receiving units must be set to the same baud settings. Refer to the **For.** parameter for details.

The indicator's data bits, parity and stop bits are set when configuring the **For.** parameter. The receiving units must match the scale setting for proper communication.

USB Communications Port

The indicator is equipped with a USB communications port. The USB connection is located on the back of the indicator behind the top access cover. An optional USB cable is available. Follow the instructions included with the option to install all necessary drivers.

Once the USB drivers are installed on your PC, insert the USB connector into the receptacle on the indicator and connect the other end of the cable to your computer.

Doran F0 protocol (F0) (9600, 8N1)		
Command (RXD) Computer to Scale	**Scale Output Responds (TXD)** Scale to Computer	**Description**
Z or z		Zero the scale (if in motion, scale will wait until stable, then zero)
<cr> or W	<stx><weight><sp> <uu><sp><cr><lf>	<stx> (☻) = ASCII 02h, Start of Text <weight> = 6 character field with decimal point <sp> ( ) = ASCII 20h, Space <uu> = 2 character field “lb” or “kg” <cr> (♪) = ASCII 0dh, Carriage Return <lf> (◙) = ASCII 0ah, Linefeed
U		Scale scrolls through available weight units
H	<height><sp><hh><sp>GR <sp><cr><lf>	Current Height value in inches or centimeters <height> = 6 character field with decimal point <sp> ( ) = ASCII 20h, Space <hh> = 2 characters Height Unit “in” or “cm” <cr> (♪) = ASCII 0dh, Carriage Return <lf> (◙) = ASCII 0ah, Linefeed
R or r		Scale performs a Reweigh operation

Doran F1 protocol (F1) (9600, 8N1)		
Command (RXD) Computer to Scale	**Scale Output Responds (TXD)** Scale to Computer	**Description**
Z or z		Zero the scale (if in motion, scale will wait until stable, then zero)
<cr> or W	<stx><pol><weight>#<uu>#GR S#<height>#<hh>#<bmi>#BMI <cr><lf>	<stx> (☻) = ASCII 02h, Start of Text <pol> = 1 character “-“ =negative, “ “=ASCII 20h <weight> = 6 character field with decimal point <uu> = 2 character field “lb” or “kg” <height> = 5 character field with decimal point <hh> = 2 characters Height Unit “in” or “cm” <bmi> = BMI value 4 character field with decimal point <cr> (♪) = ASCII 0dh, Carriage Return <lf> (◙) = ASCII 0ah, Linefeed
U		Scale scrolls through available weight units.
R or r		Scale performs a Reweigh operation (same as pressing the Reweigh button)

Doran Fd protocol (Fd) (2400, 8N1)		
Command (RXD) Computer to Scale	**Scale Output Responds (TXD)** Scale to Computer	**Description**
Z or z		Zero the scale (if in motion, scale will wait until stable, then zero)
<cr> or W	--:--,--/--/--,<bmi>,<height>, <gross><uu><sp>G <cr><lf>	<bmi> = BMI value 4 character field with decimal point <height> = 6 character field with decimal point and cm (metric) OR 7 character field with decimal point and ‘ after foot reading and “ after inch reading (SAE) <gross> = gross weight 6 character field with decimal point <uu> = 2 character field “lb” or “kg” <sp> ( ) = ASCII 20h, Space <cr> (♪) = ASCII 0dh, Carriage Return <lf> (◙) = ASCII 0ah, Linefeed
U		Scale scrolls through available weight units.
R or r		Scale performs a Reweigh operation (same as pressing the Reweigh button)

Doran FH protocol (FH) (Continuously transmits at 3.75 per second – 2400 8N2)		
Command (RXD) Computer to Scale	**Scale Output Responds (TXD)** Scale to Computer	**Description**
Z or z		Zero the scale (if in motion, scale will wait until stable, then zero)
<cr> or W	<stx><status><0xD7><0xE4> <weight><cr>	<stx> (☻) = ASCII 02h, Start of Text <status>0x80 = positive lb weight, 0x82 = positive kg weight <weight> = 6 character field with decimal point <cr> (♪) = ASCII 0dh, Carriage Return Current Display Weight. Active, Stable Hold, or Average Hold.
U		Scale scrolls through available weight units.
R or r		Scale performs a Reweigh operation (same as pressing the Reweigh button)

Welch Allyn Spot protocol (ш) (2400, 7E1)		
Command (RXD) Computer to Scale	**Scale Output Responds (TXD)** Scale to Computer	**Description**
DR<cr><lf>	<mot><sp><sp> <weight><uu><cr><lf>	<mot> “SD”=stable, “S_” = motion <sp> ( ) = ASCII 20h, Space <weight> = 6 character field with decimal point <uu> = 2 character field “lb” or “kg” <cr> (♪) = ASCII 0dh, Carriage Return <lf> (◙) = ASCII 0ah, Linefeed

IQ Vitals protocol (ш) Fairbanks TeleWeigh (9600, 7O2)		
Command (RXD) Computer to Scale	**Scale Output Responds (TXD)** Scale to Computer	**Description**
Z or z		Zero the scale (if in motion, scale will wait until stable, then zero)
<cr> or W	<weight><sp><uu><sp> <mot><sp><sp><cr><lf> <eot>	<weight> = 6 character field with decimal point <sp> ( ) = ASCII 20h, Space <uu> = 2 character field “lb” or “kg” <mot> = 2 character field “GR” = stable, “gr” = motion <cr> (♪) = ASCII 0dh, Carriage Return <lf> (◙) = ASCII 0ah, Linefeed <eot> (♦) = ASCII 04h, End of Transmit
U		Scale scrolls through available weight units.
H	<height><sp><hh><sp>GR<sp> <sp><cr><lf>	Current height value in inches “in”.
R or r		Scale performs a Reweigh operation

Section 7. Specifications

Scale Platform Dimensions	20.5” L x 22.5” W x 2” H
Scale Dimensions	25” L x 29” W x 46” H
Wheels	Permanently sealed and lubricated Wheel Material EVA
Power	AC Adapter (UL, ULc and CE approved) Two year battery life with 10 second Automatic Shutoff Timer setting
Displayed Units	lb, kg
Capacity	1000 x 0.1 lb 454 x 0.05 kg
Construction	Aluminum Base and Column Aluminum and Plastic Housing
Options	RS-232 Communications USB Communications International AC Adapter

Section 8. Troubleshooting

General Problem Resolution

Problem	What to Do or Check
Weight reading will not repeat or scale does not return to zero when weight is removed.	If on carpet, verify the bottom of the platter is not touching the carpet. Person or object other than that being weighed is touching the scale. Verify that there is nothing caught in the platform or interfering with the feet.
Scale overloads before scale capacity is reached.	Verify scale calibration is correct. If problem persists, recalibrate the scale.
Scale will not come to zero when the ZERO button is pressed.	Make sure that the scale is stabilizing (Motion annunciator is off). After pressing the ZERO button, the scale should zero as soon as it becomes stable.
Weight readings are not correct.	Verify the scale calibration with an accurate test weight. If the readings are not correct, recalibrate. Be sure the platform is on a flat surface and all four feet are touching the floor.
Scale drifts off zero.	Check for air currents and/or vibration around the scale.
Scale shuts itself off or will not turn on.	Press the ZERO button to turn on the indicator. Check that new batteries are installed properly in the battery tray. If using an AC adapter, confirm that it is firmly plugged into a functioning wall outlet. Verify the connector at the rear of the indicator is properly installed.

Doran Scales, Inc.
883 Enterprise Court
St. Charles, IL 60174

www.doranscales.com

tech@doranscales.com