



Service Manual

UltegraTM Bench Scale SCB-R9000-14U USB Powered



Amendment Record

Ultegra™ Bench Scale SCB-R9000-14U USB Powered

Document 51221

Manufactured by **Fairbanks Scales Inc.**
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Created	09/2009	
Revision 1	09/2009	New Product Release
Revision 2	07/2013	Corrected part numbers, added logos for NTEP, MC, and RoHS.
Revision 3	09/2013	New feature added of adjustable gravity compensation and updated manual format.
Revision 4	04/2015	Removed AC adapter with the new USB to AC adapter.
Revision 5	06/2016	Updated calibration procedures
Revision 6	01/2019	Replaced old USB cord with new 90° Type B male end USB cord



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SECTION 1: GENERAL INFORMATION

1.1. INTRODUCTION:

The Ultegra™ Bench Scale is a USB powered unit with a capacity of 150 lbs and is constructed of ABS composite material. The scale may be placed on a desk, bench, or used with an 'Insert' adapter to countersink into a counter-top. Units may be ordered with a ball roller-deck surface.

1.2. DESCRIPTION:

This unit can be powered from any PC that is compliant with version USB 1.1 or later. This includes external hubs, either bus powered or self powered. The scale is identified by a PC as a human interface device (HID) and operates with Windows 2000, Windows XP or later. It also can be powered from a 5VDC AC adapter.

-  NTEP Approved
-  Measurement Canada Approved
-  RoHS Compliant

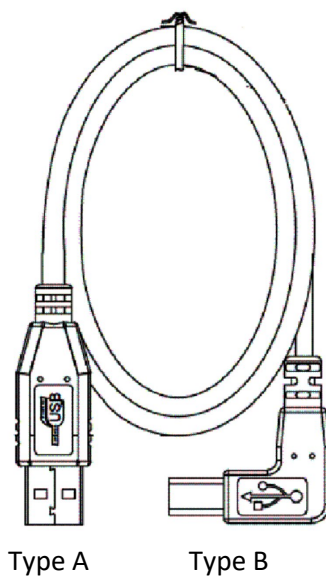
SECTION 2: SETUP

2.1. INSTALLING:

1. Remove the scale from the packing box and place on a flat surface where it will be used.
2. Using the level bubble, adjust one or two feet minimally to level the platform. Do NOT adjust all 4 feet.
3. For counter installation, install kit 21100 using the drawing. The suggested cut-out size is 15 ¼" x 15 ¼".

2.2. CONNECTIONS:

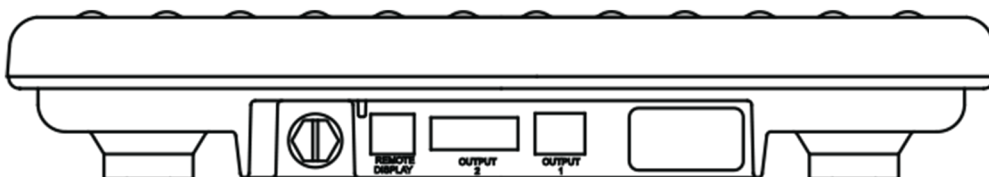
1. **USB** - The included six-foot USB cord has a 90 degree angle connector (type B) and a standard USB connector (type A). Plug the type B connector into the scale base marked **output 1**, and connect the other end (type A) into a USB port on your computer or USB hub.



2. **REMOTE DISPLAY** - To use a remote display, plug the remote display into the connector on the scale base where marked **remote display**. Mount the remote using 2 screws or use a velcro strip (not included). A stand PN 20301, can also be used.
3. **AC ADAPTER** - To use an AC adapter, plug the USB to AC power adapter into the

scale's USB cable. Check the AC receptacle for proper voltages prior to plugging in the adapter.

4. **Check with your freight provider** for compatible computer software.



2.3. COMPUTER CONNECTIONS:

1. **USB setup:** The USB port will only function with a computer utilizing Windows 2000, Windows XP, or higher operating system. When the scale-connected USB cable is interfaced to a computer's USB port or USB hub, the computer will prompt ***a device has been found*** and it will automatically install the driver.

SECTION 3: USING THE SCALE

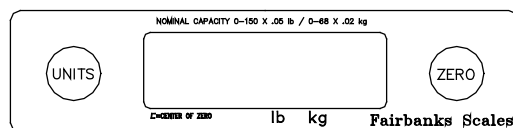
3.1. POWER-ON:

Because the scale uses special low-power circuitry, no warm-up time is required. Weight readings will be accurate as soon as the unit is powered on and set to zero.

When the unit is powered, the liquid crystal display (LCD) will show the software part number and the revision followed by either "0.00", or "-----". Dashes are displayed to indicate the scale is registering a weight upon startup. Press the [ZERO] key to set the display to "0.00" and start weighing.

3.2. KEYS:

The keys for operating the scale are located on the main display and on the remote display.



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1. Pressing the [ZERO] key resets the display to indicate zero (0).
 - a. The zero range is set at 2% or 3.00 lbs when set for Canadian use
 - b. The zero range is set at 100 % or 150 lbs when set for USA use
2. The [ZERO] key function will be inhibited if the instrument detects any of the following conditions:
 - a. Motion on the platform
 - b. An underload condition
 - c. An overload condition
 - d. Outside of programmed zero range
3. Pressing the [UNITS] key toggles the weighing units and the display 'indicators' between "lb" to "kg". Verify the units you want to use by noting the arrow 'indicator' on the display.

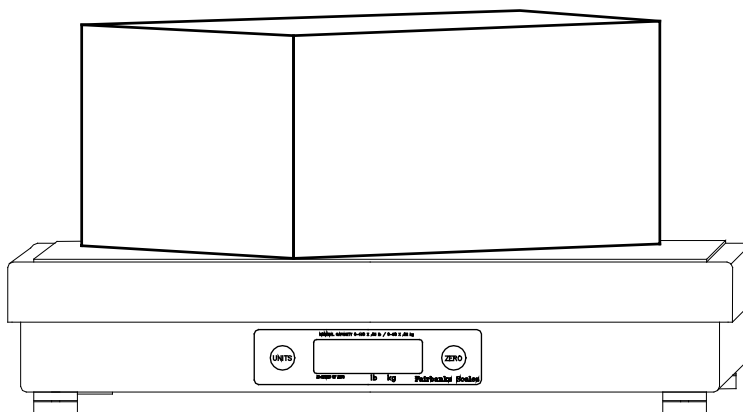
3.3. WEIGHING:

1. With the platform empty, press the [ZERO] key. The display will indicate zero



Note: The "C" to the left of the "0.00" indicates true center of zero.

2. Check that the correct units are indicated; press the [UNITS] key to change to "lb" or "kg".
3. Place the item to be weighed centered on the platform.
4. Read the Gross weight from the display.



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SECTION 4: CUSTOMER CARE

4.1. CLEANING:

Clean by wiping the scale assembly off with a damp cloth only. **Do not** use running water, harsh chemicals, or allow liquids to drip onto the scale/display.

4.2. OPERATOR INSTRUMENT PROMPTS:

Prompt	Description
HiCAP	Load 150 lbs/ 68 kg or greater - over capacity.
LoCAP	Scale is below normal Zero range - under capacity.
“-----”	Shown at startup. Indicates the scale is not within the center-of-zero range. Press the [ZERO] key to go to weigh mode.
“ ---- ”	Shown at startup. Motion is preventing the scale from entering weigh mode

4.3. TROUBLESHOOTING - In the event the scale does not function properly, check the following, see appendix for more information:

Problem	Possible Source / Remedy
No Display	Power OFF, plug disconnected, cord damage, faulty USB port or USB to AC adapter. IF you are using a remote display, check the main display first, if it's OK then check the cable plug connection on the remote. Unplug then plug in the power cord to reset the program.
Incorrect Weight	Check platform for binding or rubbing, reposition scale so all sides are clear. Ensure correct UNITS are displayed (lb or kg). For scales in counter inserts, make sure there is nothing jammed around edges Remove load, press the [ZERO] key to set the scale to “0.00”, then reweigh.
[ZERO] key will NOT reset zero	Motion on the platform, ensure that the platform is empty. Check platform for binding or rubbing, reposition scale so all sides are clear. For scales in counter inserts, make sure there is nothing jammed around edges. Unplug then plug in the power cord to reset the program



Problem	Possible Source / Remedy
Pushbuttons Will Not Operate	First unplug, then plug in the AC adapter to reset the power cord to reset the program. IF you are using a remote display, check the main display first, if it's OK then check the cable and plug connection on the remote
Display Locked or Inoperative	First unplug, then plug in the AC adapter to reset the program. IF you are using a remote display, check the main display first, if it's OK then check the cable and plug connection on the remote.
Display Indicates "HiCAP	Weight on the platform exceeds 150 lbs, remove load.
No USB Output	Check that both cable end connectors are securely fastened. Check the cable for damage. Check the Hub or USB port for problems.

SECTION 5: SPECIFICATIONS

5.1. TECHNICAL SPECIFICATIONS

1. **Capacities:** 150 lb/68 kg factory set
2. **Rounding:** Nearest division per NIST H-44
3. **Weight Display:** .27 inch LCD Display
4. **Power On Lockout:** Scale will display "-----", when power is turned on and weight is present. Press ZERO to establish zero reference.
5. **Display update rate:** 0.05 seconds.
6. **Overcapacity Warning:**
 - Displays "HiCAP" for overcapacity
7. **Motion Detection:** Satisfies H-44 requirements
8. **Power Failure Protection:** Zero reference, programming, and calibrations are retained if the instrument loses power
9. **Load Cell Excitation:** 3.3VDC
10. **USB Cable Length:** Type A/B, 6 feet in length
11. **Indicators:**
 - Lb or kg
12. **Dimensions:** Platform, Including Feet 14" x 14" x 2.5"
13. **Auto Zero Tracking:** Compensates for gradual buildup of material on platform, factory set at 0.5 divisions
14. **Power Requirements:** 5VDC, USB or USB to AC adapter
15. **Approvals:** NTEP CC# 98-198
MC# AM-5298
RoHS Compliant

5.2. ENVIRONMENT:

All equipment should be protected from direct sunlight.

- Relative Humidity 0% to 90% non-condensing.
- NOT suitable for water wash down.

5.3. ACCESSORIES:

1. **Remote Display 29595C** - (ACC-1520-1)
6.98"W x 3.48"H, 1.29"D, RJ45 cable and two
(2) function buttons.



2. **USB to AC Adapter 34232** - Input voltage range of 100 to 240 VAC, 50 to 60 Hz. Output, 5VDC, 1.2A. USB cable **NOT** included with adapter.



3. **Counter Insert Kit 21100** - Allows the unit to be placed at slightly above a counter-top for easier weighing. A remote display 29595 will be needed for display purposes.
4. **Remote Display Stand 20301** - A 18" high stand for mounting the Remote Display, ideal for counter-top applications.

SECTION 6: CALIBRATION PROCEDURES

6.1. ACCESS:

On the back of the platform, locate and remove the sealing screw that limits access to the setup switch.

6.2. KEYS IN PROGRAMMING / CALIBRATION MODE:

- Use the [UNITS] key to toggle between the choices
- Use the [ZERO] key to accept the displayed setting and advance to the next parameter

6.3. PROGRAMMING / CALIBRATION:

Access the program mode by pressing the Program/Cal button. Pressing the Program/Cal button during any stage of programming/calibration will cause the scale to return to weigh mode with the previous values. During calibration repeat a key press if the setup does not advance to the next step. This is due to motion on the platform. The values indicated in each step below are the default values from the factory. The actual values displayed at the start of each step will be determined by the previous configuration. The switch is located inside the right rear portion of the scale.

1. The display will show **GrU x**. This is the **Gr**avity **U**se Zone. Select the proper zone number for your location. Use the [UNITS] key to toggle to the selection. The choices are:

-8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

The breakdown of the zones are as follows:

Zone	Latitude (degrees)	Reference City
-8	68.659	Point Hope, AK
-7	64.929	Fairbanks, AK
-6	61.567	Anchorage, AK
-5	58.444	Fort Vermilion, Alberta

Zone	Latitude (degrees)	Reference City
-4	55.485	High Prairie, Alberta
-3	52.638	Coventry, England
-2	49.865	Winnipeg, Manitoba
-1	47.137	Tacoma, WA
0	44.427	St. Johnsbury, VT
1	41.711	Des Moines, IA
2	38.963	Kansas City, MO
3	36.156	Tulsa, OK
4	33.257	Tuscaloosa, AL
5	30.223	Austin, TX
6	26.992	Navojoa, Mexico
7	23.467	Mazatlan, Mexico
8	19.476	Mexico City
9	14.622	Guatemala City
10	7.326	Bucaramanga, Colombia

Press the **[ZERO]** key to accept the choice selected and advance to the next step.

If the only parameter being changed is the **Gravity Use Zone**, press the Program/Cal button at this time to return to the weigh mode.

- The display will show **AZt 0.5**. Use the **[UNITS]** key to toggle the selection, The choices are:

Of = Off

0.5 = 0.5 divisions

1 = 1 division

3 = 3 divisions

Press the **[ZERO]** key to accept the choice selected and advance to the next step.

3. The display will show **USA or CAN**. Use the [UNITS] key to toggle the selection, Press the [ZERO] key to accept the choice selected and advance to the next step.
4. The display will show **UNITS**. Use the [UNITS] key to toggle to the selection. The choices are:

lbs. only

kgs only

lbs/ kgs

An annunciator will be displayed over the units that are activated. Once the desired mode is selected, press the [ZERO] key to accept the choice selected and advance to the next step.

5. The display will show **GrC x**. This is the **Gr**avity **C**alibration Zone. Select the proper zone number for your location. Use the [UNITS] key to toggle to the selection. The choices available are:

-8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Press the [ZERO] key to accept the choice selected and advance to the next step. The scale **must be calibrated** if you proceed past this step.

The breakdown of the zones are as follows:

Zone	Latitude (degrees)	Reference City
-8	68.659	Point Hope, AK
-7	64.929	Fairbanks, AK
-6	61.567	Anchorage, AK
-5	58.444	Fort Vermilion, Alberta

Zone	Latitude (degrees)	Reference City
-4	55.485	High Prairie, Alberta
-3	52.638	Coventry, England
-2	49.865	Winnipeg, Manitoba
-1	47.137	Tacoma, WA
0	44.427	St. Johnsbury, VT
1	41.711	Des Moines, IA
2	38.963	Kansas City, MO
3	36.156	Tulsa, OK
4	33.257	Tuscaloosa, AL
5	30.223	Austin, TX
6	26.992	Navojoa, Mexico
7	23.467	Mazatlan, Mexico
8	19.476	Mexico City
9	14.622	Guatemala City
10	7.326	Bucaramanga, Colombia

Press the [ZERO] key to accept the choice selected and advance to the next step. The scale **must be calibrated** if you proceed past this step.

- The display will show **Flash Program**. Use the [UNITS] key to toggle the selection. Press the [ZERO] key to accept the choice selected and advance to the next step.

29811 (Ultegra) - **Default Setting***

30696 (Ultegra High Res)

30398 (Ultegra Max)

32624 (Ultegra Baggage Scale)

*Changing this setting will affect the USB output data protocol.

7. The display will show the counts **XXXXXX**. Verify no weight is on the platform. Press the **[ZERO]** key to zero the scale. Verify that the display shows 0 +/- 2 count. Press **[UNITS]** key to continue.
8. The display will show **C 200** and the **lb indicator** will be **ON**. This indicates the calibration weight selected is 200 lbs. To select a different calibration weight, press the **[UNITS]** key to toggle through the choices:

200 lb, 100 lb, 50 lb, or 50 kg.

Select the proper choice to indicate the amount of test weights being applied to the scale platform. Apply the test load. Press **[ZERO]** key to continue.

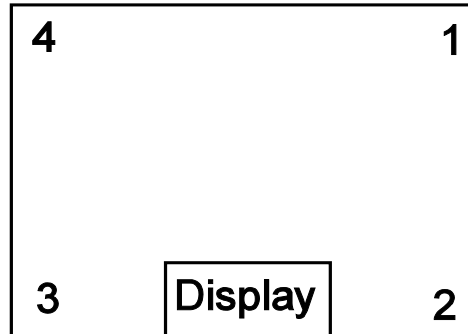
9. The display will flash either **Good** to indicate that the calibration was successful or **Error** indicating that the calibration was not successful and then go to the weigh mode.

If **Error** was shown on the display, conduct a good visual inspection to insure there are no binds or interference with the scale platform and repeat the calibration procedure. If the **Error** message is flashed on the display again, refer to the troubleshooting procedures in the appendix.

6.4. CORNER TEST:

1. With the scale unloaded, press the Program / Calibration switch and the **[UNITS]** switch at the same time. This will place the scale into a high resolution *test mode*.
2. The display will show three (3) digits after the decimal point.
3. Apply a third of capacity (50 lb) to each quadrant. Verify that the corners are within one (1) division each other. Please note the weight displayed is ten (10) times the graduated interval that is used in the *weigh mode*.
4. If the corners are within one (1) division of each other, return to the weigh mode by pressing the Program / Calibration switch and the **[UNIT]** switch at the same time.

5. If the corners are not within one (1) division of each other, conduct a good visual inspection to verify that there are no binds or interference with the platform and re test the scale. If the corners are still not within one (1) division of each other, identify the corner(s) with the error and replace the load cell in that corner.



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6.5. SEALING THE SCALE:

In commercial (legal-for-trade' applications), the scale must be sealed to keep the calibration and setup from being changed by unauthorized entry. This is accomplished using a sealing wire through the screw covering the calibration button.

With the screw plug in place, run the sealing wire through the hole in the screw plug and through the small hole in the base assembly adjacent to the cover. Run the wire back into the lead seal and use an approved crimper for securing seal. Remove or cut the excess wire.

SECTION 7: REPAIR AND PARTS REPLACEMENT

7.1. LOAD CELL REPLACEMENT

1. Disconnect power to the scale
2. Turn the unit upside down and remove all four feet from the scale platform
3. Use a 7/64" Allen wrench and remove the 4 socket head screws that are in the foot holes
4. Turn the base upright removing from the platform cover
5. Disconnect the (defective) load cell connector from the PC board
6. Remove the 2 screws holding cell in place
7. Install a new cell, torque screws to 7 INCH LBS ONLY!
8. Reinsert load cell cable into clip provided, re-insert connector into PC board
9. Invert and set the base into the cover, orient "FRONT" embossed on the cover with the scale display (it should still be 'upside down')
10. With the scale upside down, align the screw holes and re-insert all 4 screws torquing to 7 INCH LBS
11. Screw in all 4 feet, set upright and re-level
12. Calibrate the scale (Section 4)

Note: *Verify all cables within the scale are down flush and will not contact the platform.*

7.2. MAIN PCB BOARD REPLACEMENT

1. Disconnect power to the scale
2. Turn the unit upside down and remove all four feet from the scale platform
3. Use a 7/64" Allen wrench and remove the 4 socket head screws that are in the foot holes
4. Turn the base upright removing from the platform cover
5. Disconnect all connectors from the PCB board terminals
6. Remove the screws holding PCB board
7. Remove the PCB board.
8. Replace the PCB board using all screws to fasten, torque to 7 INCH LBS
9. Reconnect all cables
10. Invert and set the base into the cover, orient "FRONT" embossed on the cover with the scale display (it should still be 'upside down')

11. With the platform upside down, align the screw holes and re-insert all 4 screws torquing to 7 INCH LBS
12. Screw in all 4 feet, set upright and re-level
13. Calibrate the scale (Section 6)

Note: *Verify all cables within the scale are down flush and will not contact the platform.*

7.3. DISPLAY ASSEMBLY REPLACEMENT:

1. Disconnect power to the scale
2. Turn the unit upside down and remove all four feet from the scale platform
3. Use a 7/64" Allen wrench and remove the 4 socket head screws that are in the foot holes
4. Turn the base upright removing from the platform cover
5. Disconnect cable connector from the display assembly
6. Remove the display assembly from its mounting slot
7. Insert a new display assembly into the slot
8. Re-insert the two screws that hold the main display assembly torquing to 7 INCH LBS

Note: *Verify all cables within the scale are down flush and will not contact the platform.*

9. Reconnect the display cable
10. Invert and set the base into the cover, orient FRONT embossed on the cover with the scale display.
11. With the platform upside down, align the screw holes and re-insert all 4 screws torquing to 7 INCH LBS
12. Screw in all 4 feet, set upright and re-level
13. Check Calibration.

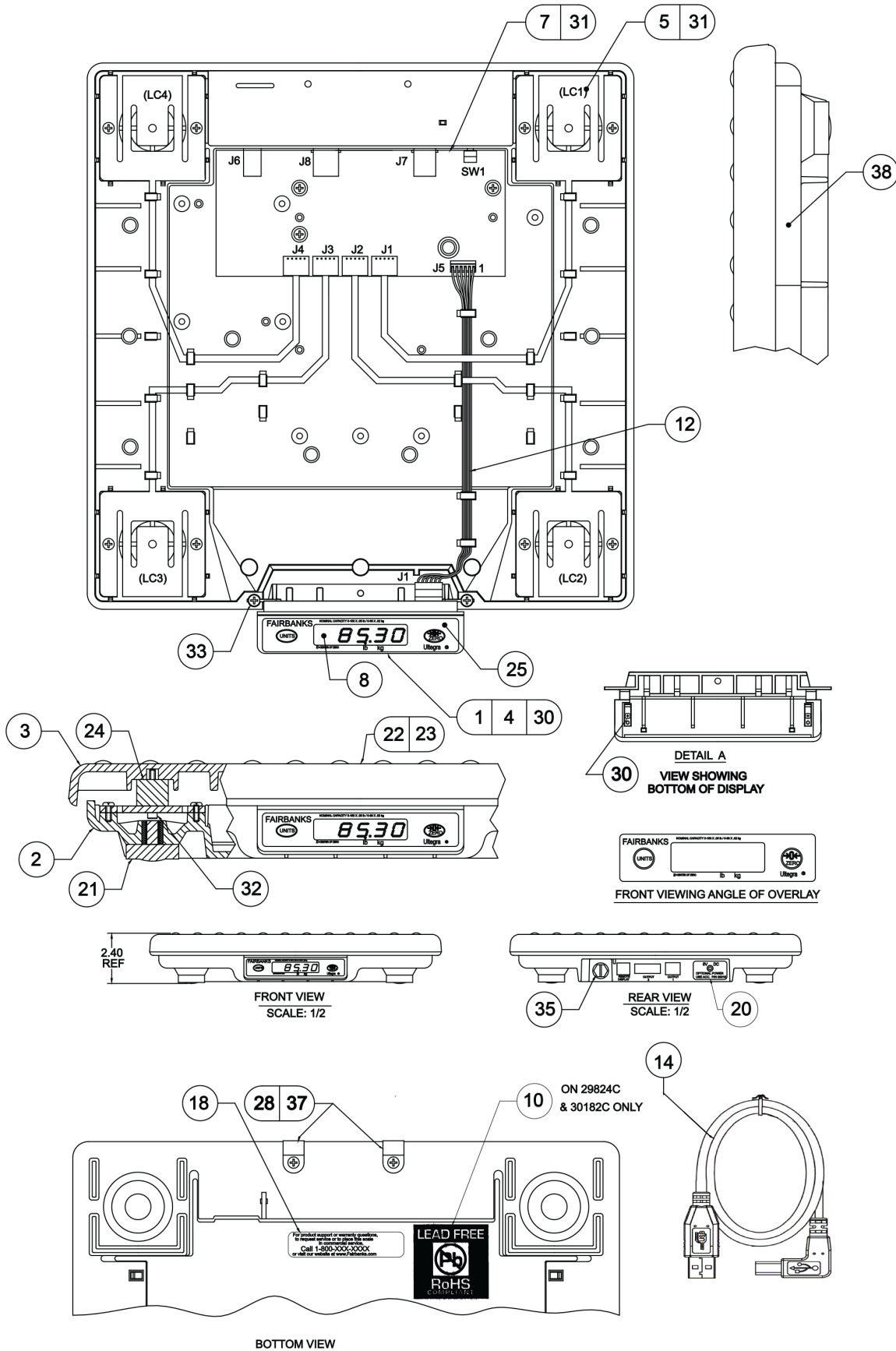
SECTION 8: PARTS

A. PARTS LIST:

Model SCB-R9000-14U USB Powered

<u>Item</u>	<u>Part No.</u>	<u>Qty</u>	<u>Description</u>
1	27654	1	Display, Front
2	26188	1	Molding, Base
3	26189	1	Molding Platform
4	27653	1	Display, Back
5	22267	4	Load Cell Wing Beam Matched 37.5 lb
7	29405C	1	PCB Assy, Weight & I/O
8	29481C	1	PCB Assy, Display
12	29826	1	Cable Assy, Display
*14	35025C	1	Cable Assy, USB
18	18886	1	Label
21	14233	4	Foot
22	11039	1	Bulls eye Level
23	15389	1	Loctite, Superbonder
24	15758	4	Mount, Load
25	29599	1	Overlay
28	11263	2	Clip, Cable 3/16"
30	18961	2	Screw, Tapping, FH, Phil, Type - 2 x.25
31	18281	11	Screw, Tapping, PH-Phil, Trilobular 6 x.38
32	10965	4	Screw Cap, Socket Hd - 6-32 x.31
33	18961	2	Screw, Tapping, PH-Phil, Trilobular 6x.44
35	26635	1	Plug, Sealing
36	12189	1	Seal, Wire Lead
37	21674	2	Screw, Tapping, PH-Phil, Trilobular 8 x.38
38	29825C	1	Nameplate

* P/N 35025C replaced P/N 29827C



APPENDIX I: USB OPERATION

A. OVERVIEW:

The Ultegra™ Bench Scale is a low power, full speed device. A low power USB device draws less than 100mA. A full speed device operates at 12Mbps/s. It uses default Windows drivers and is installed automatically upon first connection with a PC. The maximum USB cable length is 5 meters unless a self powered hub is used to extend the cable length.

When a PC goes into standby mode the scale is forced into a low power mode to comply with USB specifications. At this time the scale displays “SLEEP “, which remains until the PC resumes normal operation.

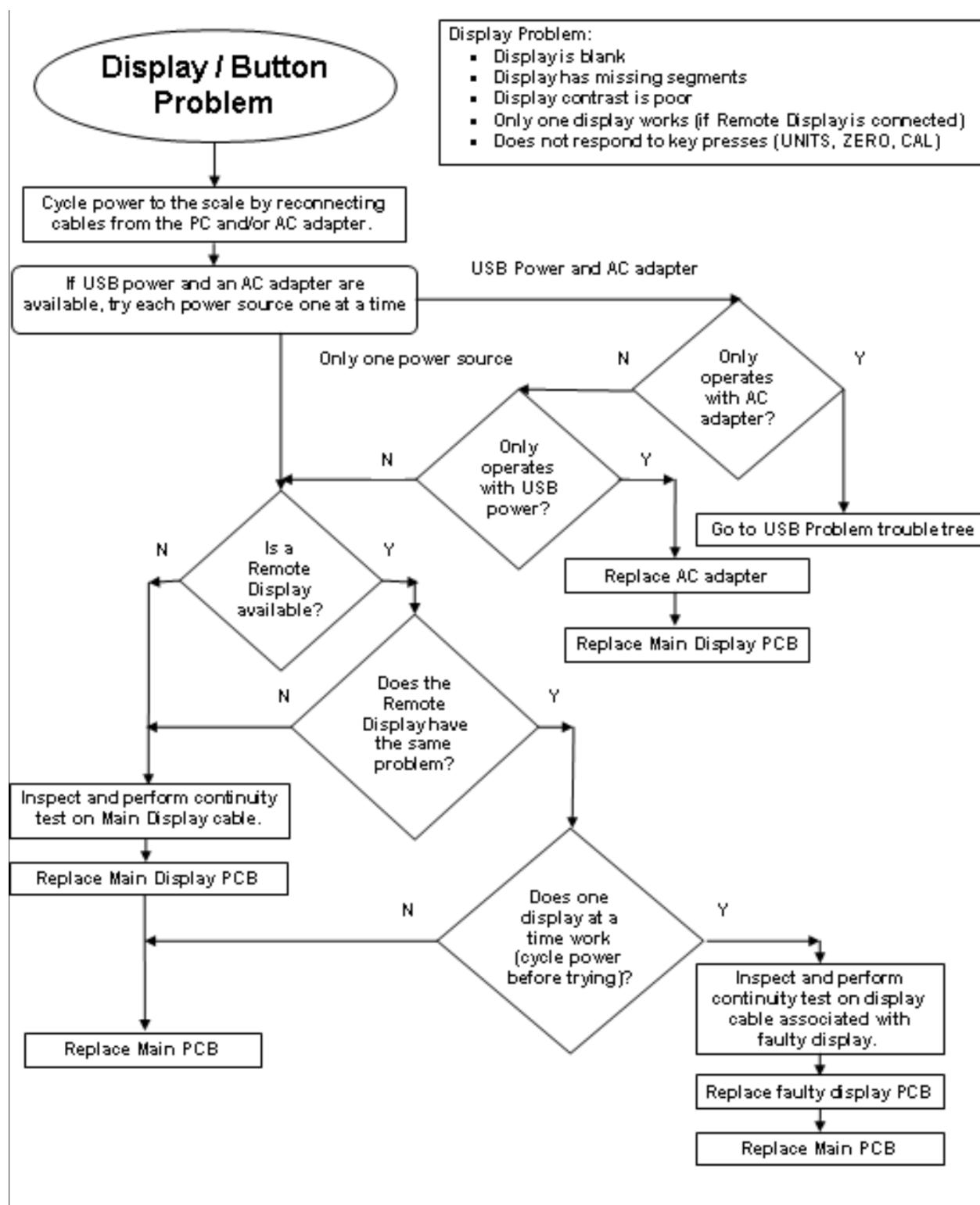
The device is displayed at the following location in Windows: Control Panel --> System --> Hardware --> Device Manager There are two items displayed for the unit, HID-compliant device and USB Human Interface Device.

The scale sends data to the PC using a Point of Sale (POS) format. A typical USB report includes scale status, units and weight.

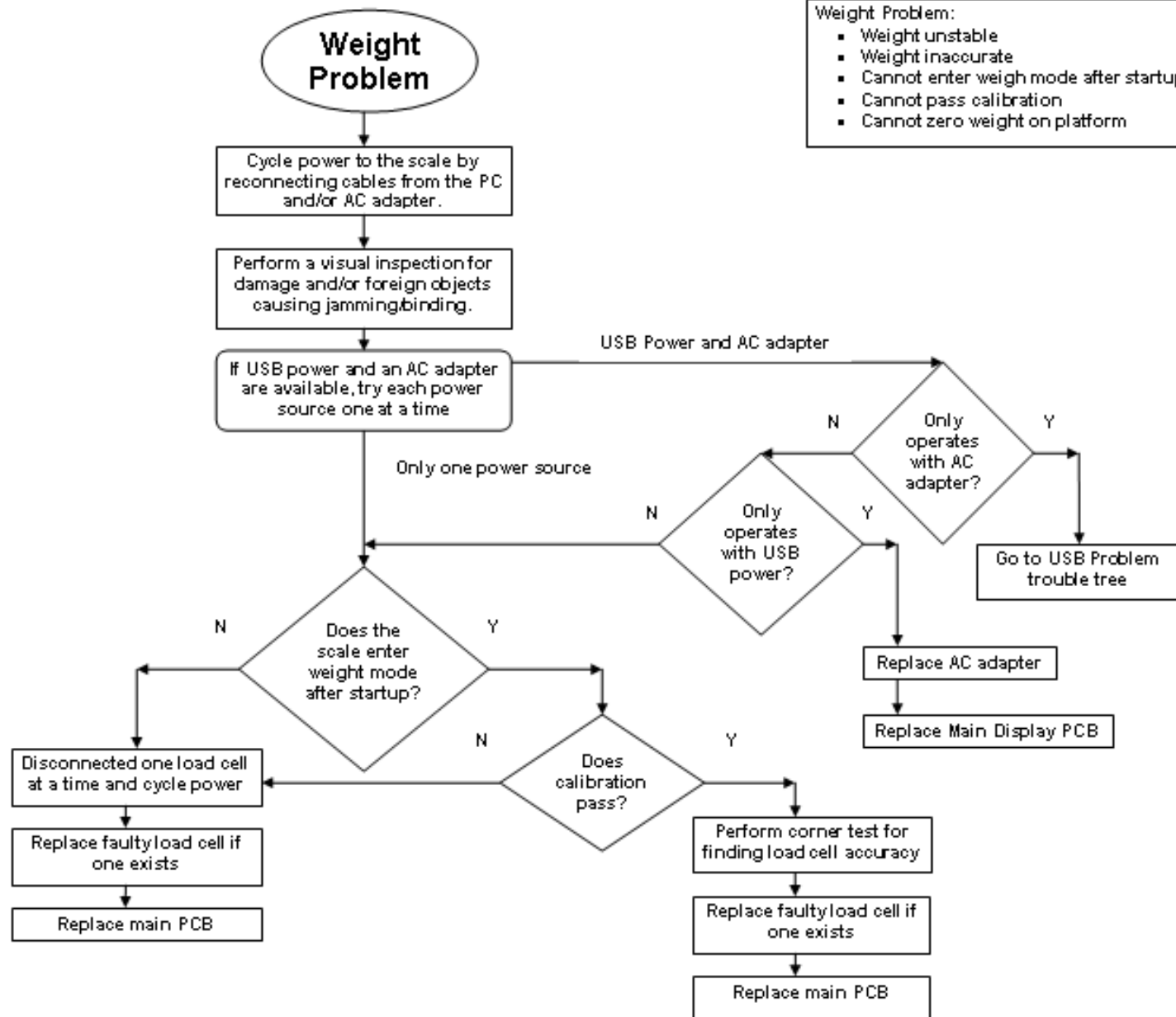
NOTE:

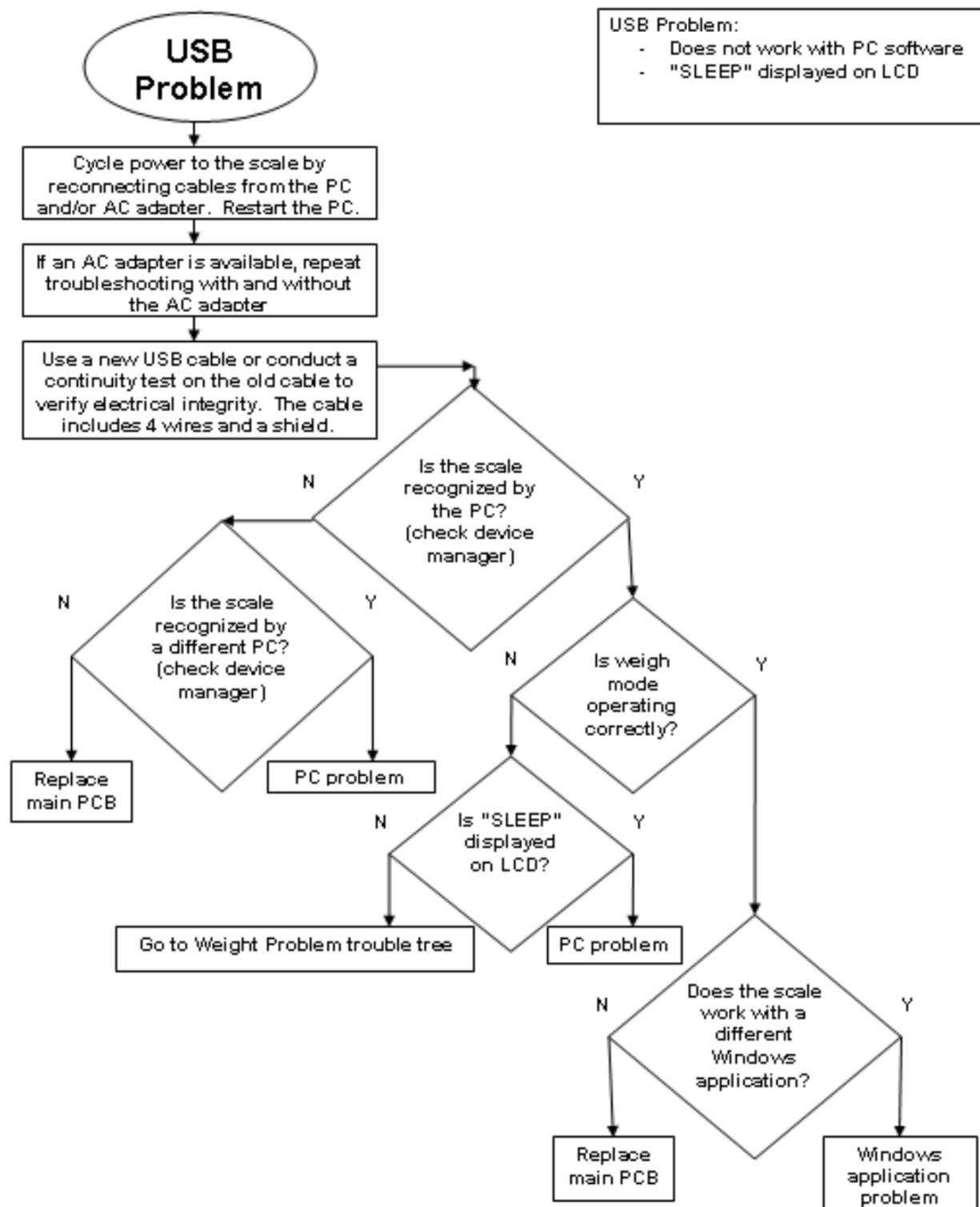
The Ultegra Series bench scales' USB output is compatible with UPS Worldship 2013 software, and all subsequent revisions.

APPENDIX II: TROUBLESHOOTING FLOW CHART



- Weight Problem:**
- Weight unstable
 - Weight inaccurate
 - Cannot enter weigh mode after startup
 - Cannot pass calibration
 - Cannot zero weight on platform





APPENDIX III: LOAD CELL WIRING

		Alternate Wiring*	
(-) EXC	Black	Green	Pin 1
(+) EXC	Green	Red	Pin 2
(+) SIG	White	Black	Pin 4
(-) SIG	Red	White	Pin 5

*Load cell alternate wiring effective on models manufactured after 01/15/2014.



Manufactured by Fairbanks Scales, Inc.

821 Locust

Kansas City, Missouri 64106

www.fairbanks.com

Ultegra™ Bench Scale

Service Manual

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