

# BenchPro Series

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*Version 1*

## Operation Manual



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# 1.0 Introduction

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The *BenchPro Series* family of digital bench scales is ideal for many diverse industries and markets around the world. As a general purpose scale, the *BenchPro* offers many benefits, including the ability to tare containers and battery operation. Because of these extra features not typically found in traditional shipping, point of sale and postal scales, the *BenchPro* may be used for additional applications including retail, restaurant and deli, manufacturing, inventory control and more.



Manuals can be viewed and downloaded from the Rice Lake Weighing Systems website at [www.ricelake.com](http://www.ricelake.com)

Warranty information can be found on the website at [www.ricelake.com/warranties](http://www.ricelake.com/warranties)

## 1.1 Safety

### 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.*

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### General Safety

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*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 may result in serious injury or death.*

*Ensure every individual operating or working with this unit has read and understands the following safety information.*

*Do not allow minors (children) or inexperienced persons to operate this scale.*

*Prior to cleaning, make sure the scale is disconnected from the power source.*

*Do not use this product if any of the components are loose or cracked.*

*Do not use in the presence of flammable materials.*

*Operating at voltages and frequencies other than specified could damage the equipment.*

*Do not use near water and avoid contact with excessive moisture.*

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

*Do not make alterations or modifications to the scale.*

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

## 1.2 Overview

### 1.2.1 Standard Features

- Die-cast aluminum base
- Stainless steel or dark plastic shroud (for dimensioning applications)
- 4 AA batteries with 80 hours of continuous use, AC power or USB powered operation
- 2.77" to 3.18" profile
- Local gravity compensation (non-approved)
- Optional post mount and secondary operator display

### 1.2.2 Options

The following options can be purchased for the *BenchPro* Model BP 1214-XXX series scales.

Part Number	Description
179184	Plastic weight platter
179183	Stainless steel weight platter
174784	Remote operator display with 6' cable
174783	Primary operator display pole mount bracket

Table 1-1. *BenchPro* Series Options

### 1.2.3 Display Mounting Options

Each model includes a mounting bracket. The bracket attaches to the base plate or can be mounted on the wall. The operator display attaches to the mounting bracket using two magnets which are included with each display.



**Note** Ensure the remote operator display is plugged into the RJ-45 connector prior to powering on the unit

#### Optional Post Mount Operator Display

An optional post mount bracket is required for use with the remote operator display. It can be attached to side or the back of the scale using the included mounting bolts. The mounting post has provisions to secure it to a table via mounting holes and nuts and bolts. The operator display attaches to the mounting bracket using two magnets which are included with each display.

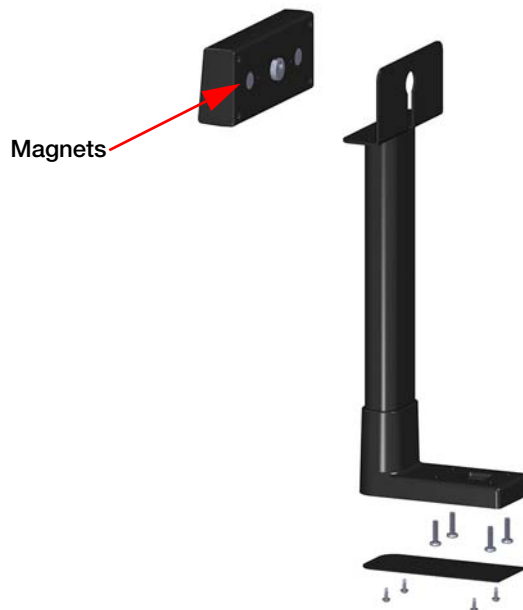


Figure 1-1. Operator Display with Optional Post Mount Assembly

## 1.3 Dimensions

For service replacement parts see [Section 6.3 on page 35](#).

### 1.3.1 Scale Mount Operator Display

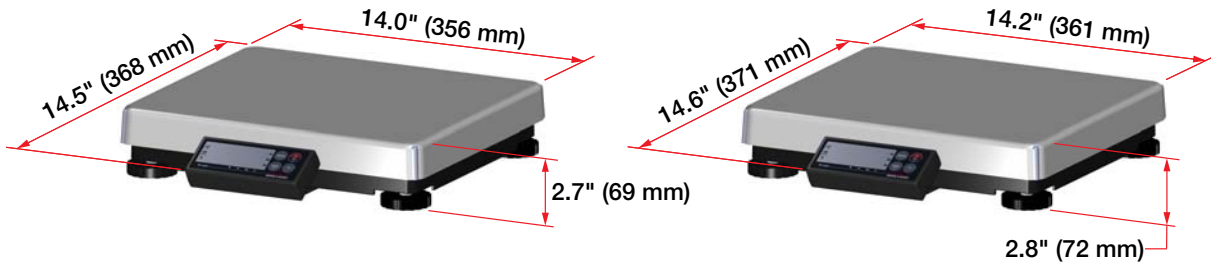


Figure 1-2. Dimensions - Scale Mount Operator Display

### 1.3.2 Optional Column Post Mount Operator Display

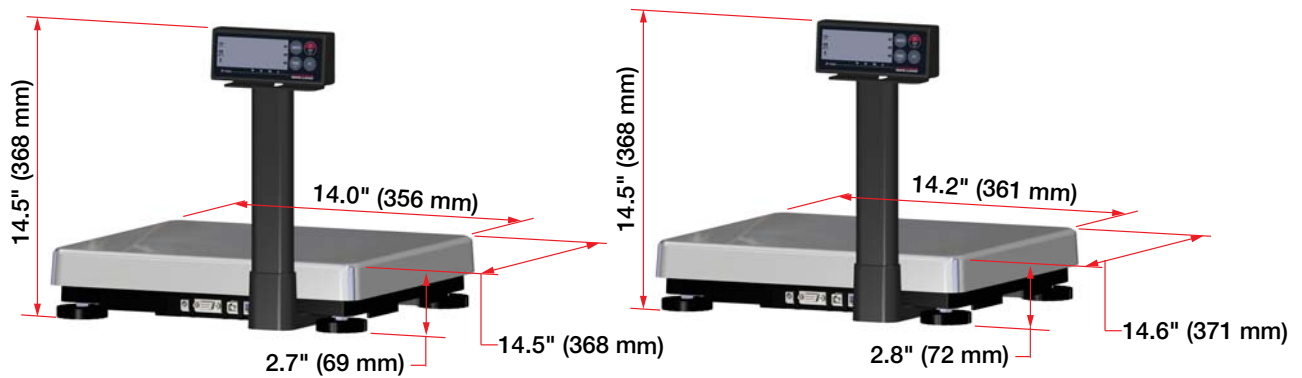


Figure 1-3. Dimensions - Column Mount Operator Display

### 1.3.3 Keys and Symbols



For reference only - Capacity marking changes with model.

Figure 1-4. BenchPro Series Operator Display



**Note** Additional capacity labels are provided with each unit. If using a scale in the applicable lb/oz mode or multi-range kg mode, install the correct label over the existing capacity markings. See [Figure 1-5 on page 5](#).

Key	Normal Operating Function	User and Configuration Mode Function
	Quick press to turn the unit on Perform a zero function Press and hold for three seconds to turn the unit off	N/A
	Toggle between configured weight units	Enter or accept the value selected
	Perform a tare function (if enabled)	Scroll left
	Quick press to enter the user menu and configure <i>A. OFF</i> , <i>bAH L</i> , <i>P-ot</i> , <i>bAUd</i> , <i>PAR</i> , <i>StoP</i> , <i>tARE</i> , <i>d iAG</i> and <i>dOnE</i> parameters of the scale. See <a href="#">Section 3.1 on page 9</a>	Scroll right

Table 1-2. Key Functions

LCD Annunciator	Description
→0←	Stable zero — indicates the scale is at a stable zero weight value
G/B	Gross/Brutto — indicates the scale is in gross mode.
N	Net — indicates a Tare condition and the net weight is displayed
W1, W2, W3	Weight range — indicates the weight range mode the scale is displaying
lb, lb:oz, oz, kg, g	Units of Measure — indicates the unit of measure the scale is displaying
power	Power LED — indicates scale is plugged into an AC outlet, batteries are charged, USB power is provided through the USB cable

Table 1-3. Annunciator Functions



## 1.4 Capacity by Model Type

Available models in the *BenchPro Series*. The model number can be found on the serial tag located on the bottom of the scale.

Part Number	Model Number	Description
174879	BP-1214-75S	12 X 14", 150 lb (75 kg) capacity with stainless steel weight platter
174880	BP-1214-75S	12 X 14", 150 lb (75 kg) capacity with plastic weight platter
174787	BP-1214-35P	12 X 14", 70 lb (35 kg) capacity with plastic weight platter
179732	BP-1214-15R	12 X 14", 30 lb (15 kg) capacity with stainless steel weight platter
179733	BP-1214-6R	12 X 14", 15 lb (6 kg) capacity with stainless steel weight platter

Table 1-4. BenchPro Series Models



**Note** Additional capacity labels are provided with each unit. If using a scale in the applicable lb/oz mode or multi-range kg mode, install the correct label over the existing capacity markings.

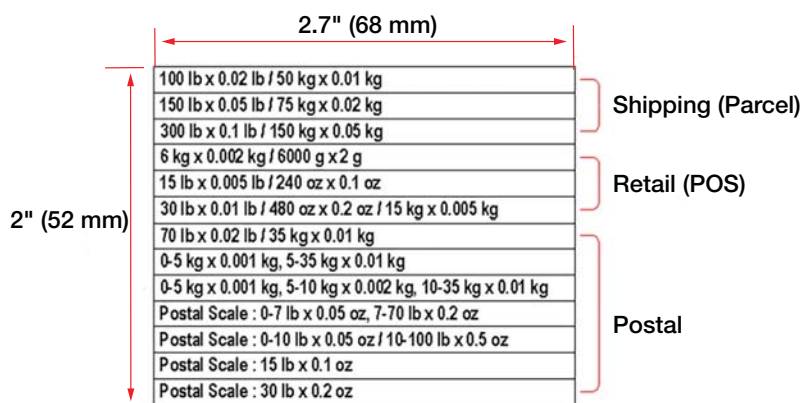


Figure 1-5. Capacity Labels

Model	Split (Range)	Units of Measure				
		lb	lb /oz	oz	kg	grams
BP 1214-75S	Off - Single	150 x 0.05	--	--	75 x 0.02	--
BP XXXX-50S	Off - Single	100 x 0.02	--	--	50 x 0.01	--
	2rng (multi range)	--	0 - 10 lb x 0.05oz 10-100 lb x 0.5oz	--	--	--
BP XXXX-150S	Off - Single	300 x 0.1	--	--	150 x 0.05	--

Table 1-5. Scales with Shipping Software

Model	Split (Range)	Units of Measure				
		lb	lb /oz	oz	kg	grams
BP 1214-35P	Off - Single	70 x 0.02	70 lb x 0.5 oz	--	35 x 0.01	--
	2rng	--	0-7 lb x 0.05 oz 7 - 70lb x 0.2 oz	--	0 - 5 x 0.001 kg 5 - 35 x 0.01kg	--
	3rng	--	--	--	0 - 5 x 0.001 kg 5 - 10 x 0.002 kg 10 - 35 x 0.01kg	--

Table 1-6. Scales with Postal Software

Model	Split (Range)	Units of Measure				
		lb	lb /oz	oz	kg	grams
BP 1214-6R	Off – Sngl	15 x 0.005	15 lb x 0.1 oz	240 x 0.1	6 x 0.002	6000 x 2
P 1214-15R	Off - Sngl	30 x 0.01	30 lb x 0.2 oz	480 x 0.2	15 x 0.005	--

Table 1-7. Scales with Retail Software

## 1.5 Operation


### 1.5.1 Initial Power Up

Upon initial power up, the scale briefly displays the following:

- *Sh iP/PoS/E/rEEA vL/* (type of firmware installed)
- Software type
- Version number of the software
- *PA55*



If the unit prompts *FAL*, power cycle the unit by unplugging the power adapter from the outlet or removing the batteries for 30 seconds. Replace the batteries or plug the adapter back in and turn the scale on.

### 1.5.2 Weigh Mode

1. Ensure the scale is at zero prior to placing an item on the scale.
2. If the scale is not at zero weight, press . The →0← annunciator displays to indicate the scale is stable zero.

### 1.5.3 Tare

The tare function must be enabled in the configuration menu for the tare key to be functional. The factory default setting is disabled.

1. Place an item or empty container on the scale. The weight value displays.
2. Press . The weight value displays as zero and the N annunciator displays to indicate the scale is displaying the net weight.
3. To return the scale to the gross mode, remove the item or container from the scale platform and press . The weight value is zero and the G/B annunciator indicates the scale has returned to the Gross/Brutto mode.

## 2.0 Setup

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### 2.1 Unpacking the Scale

Remove all contents from the packaging. Each carton contains the following:

- Scale with operator display attached
- In-line power supply
- US power cord
- USB cable
- RS-232 cable (not included with model BP1214-75S with plastic weight platter)
- Stainless steel, plastic weight platter or ball top weight platter (on selected models)

Inspect contents for damage. Contact Rice Lake Weighing Systems and the shipper immediately if any items are damaged.

### 2.2 Scale Setup

1. Remove the white protective cover from the stainless steel shroud.
2. Place the scale on a sturdy, level surface near a power outlet. Ensure the scale or weight platter are not touching any objects.
3. Level the scale by adjusting the leveling feet until the bubble level (under the weight platter) is within the circle.
4. Tighten the jam nut using a 12 mm or 1/2 " wrench once the scale is level.

### 2.3 Power

Power the *BenchPro Series* scale with one of the following:

- AC power supply
- Four AA alkaline batteries
- USB HID 2.0 Powered communications port (can be used as a stand alone device or interface to a 3rd party software program that recognizes devices following USB HID requirements). Loss of power to a USB device will turn off the scale

Once the scale is connected to a power source, the Power LED illuminates. Press  to power on the scale.

## 2.4 Connections

The available connections on the *BenchPro Series* model 1214-XXX are shown in [Figure 2-1](#). The USB connection may be used as an HID device or USB power supply. The scale is equipped with one standard bi-directional RS-232 port for connection to a PC or printer.



**Note** Do not use both the USB and RS-232 at the same time.

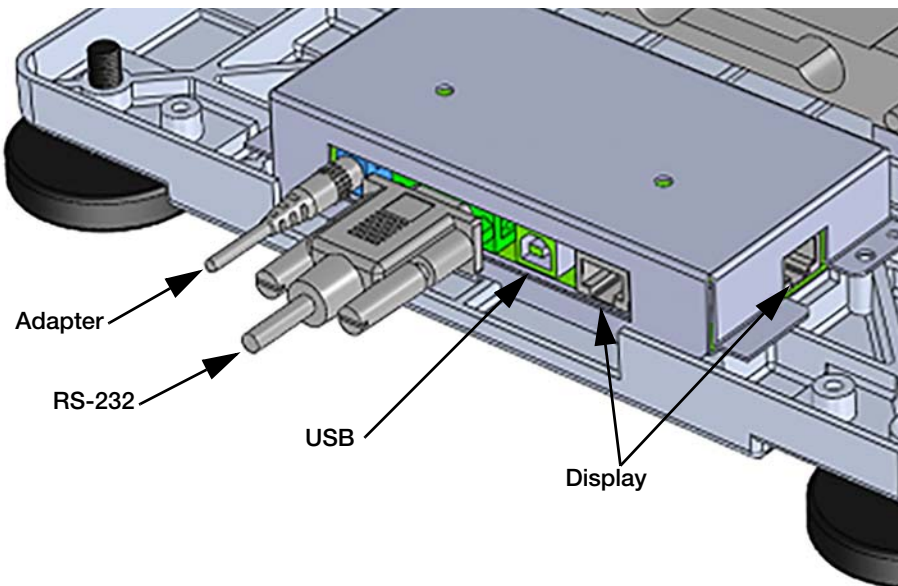


Figure 2-1. BenchPro Connections

## 2.5 Primary Operator Display Mounting Options

The primary operator display is included with each scale and comes connected to the die cast base housing. It comes with two magnets to hold the display in place during use. The operator display can be detached from the scale and mounted on a table or on a wall using the included 18" cable.



Figure 2-2. Operator Display Mounts



**Note** This picture is for reference only.

# 3.0 Configuration

## 3.1 User Settings

When navigating the user settings menu, press **F1** to scroll through the parameters and options. Press **UNITS** to select.

Parameter	Options	Definition
<i>RoFF</i>	30 sec, 1 min, 3 min, 5 min, No off	Auto Off Time Setting
<i>bRH L</i>	On, Auto, Off	Backlight Setting
<i>PrOt</i>	nci, 8213, ECr, EH-SCP, SMA	Protocol (model dependent)
<i>bRud</i>	1200,2400,4800,9600,19200,38400, 57600	Baud rate
<i>PAR</i>	7 even, 7 odd, 7 none, 8 none	Parity
<i>StoP</i>	1,2	Stop bits
<i>LRrE</i>	On, Off	Tare
<i>d iAG</i>	RAM, ROM, DIV-A, DIV-O	Diagnostics
<i>donE</i>	—	Done (exit)

Table 3-1. User Settings



**Note** After selecting all parameter settings, move to the *donE* parameter and press **UNITS** to confirm and save settings.

## 3.2 Service Menu

The service menu provides all configuration settings and access to perform calibrations.

To navigate the service setting menu, press **F1** to scroll through the parameters and settings; press **UNITS** to select.

Press **TARE** to return to the previous parameter.

To enter into the service menu:

1. Remove the scale platform.
2. Remove the sealing screws.

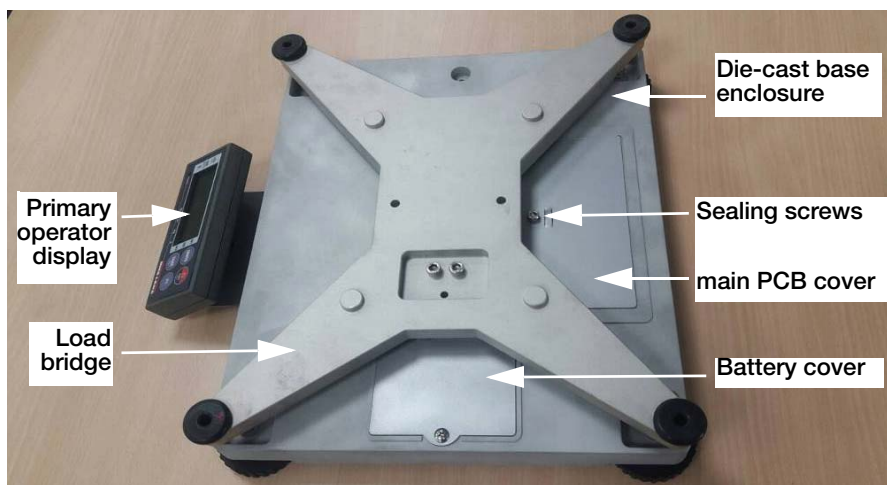


Figure 3-1. Remove Sealing Screws

3. Press **POWER** to power on the scale.

- Press the service setup switch once to enter the service setting mode.



- Set service parameters.
- Scroll to **dOnE** once all parameters have been set.
- Press **UNITS** to exit and save changes.

Parameter	Settings	Description
$\bar{z}Ero b$	<b>2%</b> 5% 10% 20%	Semi Automatic Zero Set — the amount of weight (% of scale capacity) that can be zeroed from the scale when the zero key is pressed
$PuZEro$	<b>10%</b> 20% 50%	Initial Power up Zero Setting — the amount of weight (% of scale capacity) that can be zeroed from the scale upon power up; use if adding a unique weight platter instead of the factory supplied platter
$Rz\bar{t}$	<b>0.25d</b> 0.5d 1d 2d, 3d	Automatic zero tracking — scale returns to zero weight using the selected multiplier based on the division or resolution of the displayed weight; in non-approved applications, use this feature to return the scale to zero weight if in a high vibration environment
$Filt$	Lo <b>Med</b> Hi	Filter — controls the weight display update rate; used if the weight displays is fluctuating in a high vibration environment Lo - faster update <b>Med</b> - default Hi - slower update
$E\bar{d}ModE$	On <b>Off</b>	Extended Mode — used for engineering testing; turn on this feature to increase the displayed resolution by one decimal place
$RoFF$	<b>Off 1</b> Off 3 Off 5 Off 30 OFF	Auto Shutdown (battery mode only) — select the amount of time of inactivity after which the scale automatically powers off <b>Off 1</b> — off after 1 minute of no use Off 3 — off after 3 minutes of no use Off 5 — off after 5 minutes of no use Off 30 — off after 30 seconds of no use Off — scale does not turn off
$bRH L$	On <b>Auto</b> Off	Backlight Shutdown — conserves battery life; select the amount of time of inactivity after which the backlight shuts off On - always on <b>Auto</b> - off after 5 seconds no activity Off - always off

Table 3-2. Service Settings

Parameter	Settings	Description
<i>PrOt</i>	<b>SMA</b> Nci 3835 8213 ECr r EH —	Protocol — determines the manufacturer output protocol or serial setting the scale is configured for; check 3rd party software to confirm correct selection, if the scale is connected to a PC via the <i>BenchPro</i> USB port, the USB HID protocol is automatically selected; USB HID settings are 1C19,0002 <b>SMA</b> — SMA Protocol (all models) Nci — 782X and 76XX family (all models) 3835 — NCI 3835 UPS worldship (models BP-XXXX-XXS only) 8213 — Toledo 8213 (models BP-XXXX-XXS only) ECr — Electronic Cash Register (models BP-XXS-XXR only) EH — Models BP-XXS-XXS only)
<i>bRud</i>	1200 2400 4800 <b>9600</b> 19200 38400 57600	Baud rate — match PC RS-232 setting to the setting of the scale; Check the PC Device Manager setting through the control panel in port settings
<i>PRr</i>	7 even 7 odd 7 none <b>8 none</b>	Data Bits and Parity — match PC RS-232 setting to the setting of the scale; Check the PC Device Manager setting through the control panel in port settings
<i>StoP</i>	<b>1</b> 2	Stop bits — match PC RS-232 setting to the setting of the scale; Check the PC Device Manager setting through the control panel in port settings
<i>tARE</i>	On <b>Off</b>	Enable or disable the tare button
<i>GRA</i>	No <b>Yes</b>	Gravity Compensation — see <a href="#">Section 3.4 on page 12</a> for detailed information No - deactivated, calibrate scale with known accurate calibration weights <b>Yes</b> - View original calibration gravity and modify local gravity settings
<i>SU</i>	<b>Off</b> On	Manufacturing mode only; do not use; not not adjust
<i>UNtS</i>	lb lb:oz oz kg g	Units of Measure — turn on and off units of measure; Applicable settings are dependant on the model of scale purchased; see <a href="#">Section 1.4 on page 5</a> for available selections; Most models have a minimum of two units of measure turned on. To avoid incorrect weight being displayed or transmitted to the PC, only have the applicable units of measure turned on.
<i>CRP</i>	150 kg	Capacity — defines the maximum capacity of the scale and determines the weight value to be used; <ul style="list-style-type: none"> <li>When selecting lb, the calibration weight used must be in lb</li> <li>When selecting kg, the calibration weight used must be in kilograms.</li> </ul> <b>NOTE: See <a href="#">Section 1.4 on page 5</a> for capacity selections on each model. Do not select capacities other than those indicated by the manufacturer,</b>
<i>SPLt</i>	<b>Off</b> 2rnG 3rnG 2intvl 3intvl	Configure the unit for multi-range or multi-interval on select models of the <i>BenchPro Series</i> <b>Off</b> - unit displays in single range 2rnG - displays weight in multi-range mode dual range 3rnG - displays weight in multi-range mode triple range 2intvl - displays weight in multi-interval mode dual range 3intvl, - displays weight in multi-interval mode triple range
<i>CRl</i>	--	Calibration — see <a href="#">Section 4.0 on page 14</a> for detailed information on calibration of the scale
<i>d,RS</i>	RAM ROM DIV-A DIV-O	Diagnostic menu — used to troubleshoot scale operation. See <a href="#">Section 6.1 on page 34</a> for more information on using the diagnostic menu. RAM - if an error occurs, contact RLWS for a new PCB ROM - If an error occurs, contact RLWS for a new PCB DIV-A - Display internal counts after auto zero tracking DIV-O - Display internal counts
<i>donE</i>	—	Done — exit the configuration menu, save settings and return to weigh mode

**Bold** indicates factory default setting.

Table 3-2. Service Settings (Continued)

### 3.3 Split Multi-Range and Multi-Interval

The split (*SPL*) menu option is used to configure the scale to display weight as a single range, multi-range or multi-interval.

**Single Range** — a scale having one weighing range.

**Multi-range** — a scale having two or more weighing ranges with different maximum capacities and different scale intervals for the same load receptor, each range extending from zero to its maximum capacity.

**Multi-interval** — a scale having one weighing range which is divided into partial weighing ranges each having different scale intervals; the weighing range is determined automatically according to the load applied, on both the increasing and decreasing load.

The default setting for the Model BP 1214-35P is **2rng**, however, the unit can be configured for single and **3rng**.

Model	Split (Range)	Units of Measure				
		lb	lb /oz	oz	kg	grams
BP 1214-35P	Off - Single	70 x 0.02	70 lb x 0.5 oz	--	35 x 0.01	--
	2rng	--	0-7 lb x 0.05 oz 7 - 70lb x 0.2 oz	--	0 - 5 x 0.001 kg 5 - 35 x 0.01kg	--
	3rng	--	--	--	0 - 5 x 0.001 kg 5 - 10 x 0.002 kg 10 - 35 x 0.01kg	--

Table 3-3. Model BP 1214-35P



**Note** *Italic Capacity and resolution in Table 3-3. are pending Legal for Trade approval.*

### 3.4 Gravity Mode Setting

Gravitational variations may affect the accuracy of the *BenchPro Series* scale upon initial installation. The scale includes a feature that allows for adjustment of the gravity setting to the location and reducing the need for initial calibration.

The *BenchPro Series* is a Legal for Trade device. Rice Lake Weighing Systems recommends contacting an authorized scale technician to perform a calibration using certified accurate weights. The Gravity Mode must be turned off when calibrating the scale with certified weights.

The factory default values are:






- Original Calibration Constant Setting: 9.7882 or 9.8056
- Local Calibration Constant Setting: 9.8056 (Rice Lake, Wisconsin)

To determine local gravity, use the Internet to identify local latitude and altitude. Type these values into a local gravity calculator to determine the local gravity constant. The *BenchPro Series* uses 4 values to the left of the decimal place and it may be necessary to round the values prior to input.

Use the following steps to modify the local gravity (**GRA**) constant setting.

1. Remove the weight platter.
2. Remove the main cover plate.
3. Locate and press the service setup switch.
4. Place the weight platter back onto the scale. The scale is now in calibration mode and **ZERO** is displayed.
5. Press **F1** until **GRA** is displayed.
6. Press **UNITS** to accept. **YES** is displayed.
7. Press **UNITS** to accept. The current gravity constant setting is displayed.
8. Press **UNITS** to accept. Local gravity is displayed **9.8056**.



9. Press  to increase the flashing digit.
10. Press  to accept the value entered and move to the next digit.
11. Repeat steps 9 and 10 until the local gravity value is complete.
12. Press . **GrAu** is displayed.
13. Press  until **donE** is displayed.
14. Press  to accept and save the setting. The scale returns to the weigh mode.

Below are links to websites used to determine local latitude and altitude. Please note these website address are provided for reference only and may change.

National Geophysical Data Center: [www.ngdc.noaa.gov](http://www.ngdc.noaa.gov)

Measurement Canada: [www.ic.gc.ca](http://www.ic.gc.ca)

Map Coordinates: [www.mapcoordinates.net/](http://www.mapcoordinates.net/)

Once local latitude and altitude have been determined, use the following link to calculate local gravity  
<http://www.sensorone.com/local-gravity-calculator/>



**Important**

*The gravity correction function has not been evaluated by an approvals agency, therefore it is up to the authorized scale dealer to ensure the device is accurate at the intended point of use.*

# 4.0 Calibration

## 4.1 Span Calibration

The *BenchPro Series* allows for calibration with weight values other than full capacity. [Table 4-1](#) displays the alternate calibration weights for each model.

Calibration should only be performed using certified tests weights and performed by the local scale distributor.







**Note** Turn off Gravity Compensation ([Section 3.4 on page 12](#)) prior to performing a calibration using certified weights. The default capacity (CAP) setting is in lb, if using kg calibration weights, change the CAP to the appropriate scale capacity of the scale model. The model number of the scale is located on the serial tag on the bottom of the scale.

Model	Scale Capacity	Alternate Calibration Weights	Scale Capacity	Alternate Calibration Weights
BP 1214-6R	15 LB	5, 10, 15LB	6 KG	2, 5, 6 KG
BP 1214-15R	30 LB	10, 20, 30 LB	15 KG	5, 10, 15 KG
BP 1214-35P	70 LB	20, 50 70 LB	35 KG	10, 20, 30 KG
	100 LB	30, 50, 100 LB	50 kg	10, 25, 50 KG
BP 1214-75S	150 LB	50, 100, 150 LB	75 kg	20, 50, 75 KG
	300 LB	100, 200, 300 LB	150 kg	50, 100, 150 KG

Table 4-1. Alternate Calibration Weights

1. To enter the calibration mode, remove the weight platter and the main pcb cover plate.
2. Locate and press the service setup switch.
3. Place the weight platter back onto the scale. **Zero** is displayed
4. Press **F1** until **GRA** is displayed.
5. Press **UNITS** to accept. **YES** or **NO** is displayed.
6. Press **F1** to scroll to **NO**
7. Press **UNITS** to accept. **GRA** is displayed.
8. Press **F1**. **CAP** is displayed.
9. Use [Table 4-1](#) to choose the appropriate scale capacity.
10. Press **F1** to scroll to chosen capacity.
11. Press **UNITS** to accept. **CAP** is displayed
12. Press **F1** until **CAL** is displayed.
13. Press **UNITS** to accept. **Zero** is displayed.
14. With no weight on the weight platter, press **UNITS** to accept. A six digit value displays. This is the internal counts of the load cell at zero weight.
15. Press **UNITS** to accept and perform a zero calibration. **Zero** is displayed.
16. Press **F1** once. **SPAN** is displayed.

17. Press  to accept. XXX lb or XXX kg displays.
18. Press  to scroll to the alternate calibrate weight value, if performing a calibration using certified weights. If not using certified weights, skip to [Step 19](#).
19. Press  to accept. 0 is displayed.
20. Place the calibration weight on the scale and wait for the value to stabilize.
21. Press  to accept. The calibration data is saved and the scale returns to the weigh mode.

The weight value displayed must match the value of the calibration weight used. If not, perform the calibration a second time and follow each step carefully. If *Error* displays, there is a calibration error. Ensure the correct calibration weight value was selected in comparison to the actual calibration weight used. See [Table 6-1 on page 34](#) for more information on troubleshooting.













## 4.2 Linear Calibration






### Important

*The linear calibration function should only be performed if instructed by Rice Lake Weighing Systems and an authorized scale technician.*

The *BenchPro Series* includes an optional linear calibration feature. This is an additional feature to perform after a span calibration has been completed at maximum capacity and linear calibration is performed with two lower calibration weight values.

1. To enter the calibration mode, remove weight platter and main cover plate.
2. Locate and press the service setup switch.
3. Place the weight platter back onto the scale. *Zero* is displayed.
4. Press  until *GRA* is displayed.
5. Press  to accept. *YES* or *n0* is displayed.
6. Press  to scroll to *n0*
7. Press  to accept. *GRA* is displayed.
8. Press . *CAP* is displayed.
9. Use [Table 4-1](#) to choose the appropriate scale capacity.
10. Press  to scroll to chosen capacity.
11. Press  to accept. *CAP* is displayed
12. Press  until *CAL* is displayed.
13. Press  to accept. *Zero* is displayed.
14. Press  twice. *CL in* is displayed.
15. With no weight on the weight platter, press  to accept. *Point 1* is displayed and then the first linear calibration weight value.
16. Press  to accept. 0 is displayed.
17. Place the weight on the weight platter and wait for the value to stabilize.

18. Press  to accept and perform Point1 calibration. **Point1** is displayed and then the second linear calibration weight value.
19. Remove the weight from the weight platter.
20. Press  to accept. **0** is displayed.
21. Place the weight on the weight platter, wait for the value to stabilize.
22. Press  to accept and perform Point2 calibration. The calibration data is saved and the scale returns to the weigh mode.

The weight value displayed must match the value of the calibration weight used. If not, perform the calibration a second time and follow each step carefully. If **Err 1** displays, there is a calibration error. Ensure the correct calibration weight value was selected in comparison to the actual calibration weight used. [See Table 6-1 on page 34](#) for more information on troubleshooting.

# 5.0 Communication

## 5.1 Scale to Computer Port Connections

The *BenchPro Series* scales can be connected to a computer using a compatible third party software program. In order for the scale to transmit the weight, identify the interface protocol included in the third party program and compare with the *BenchPro Series* Software Compatibility Chart (Section 5.5 on page 33). The most current version of the compatibility chart can be found at on the Rice Lake Weighing Systems website.

Computer COM Port	Scale Com Port
COM 1 – RS-232	9-pin DE type female connector
COM 2 – RS-232	9-pin DE type female connector
USB	Powered USB 2.0 COM port (USB HID compatible software only)
	9-pin DE type female connector RS-232/USB converter

Table 5-1. Communication Ports

## 5.2 I/O Specifications

The *BenchPro Series* includes both a straight pass through RS-232 cable and USB Cable. The functional pin out is as follows:

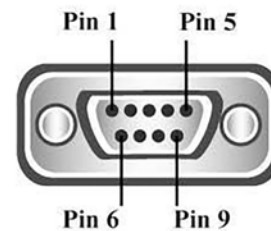
DE-9 Male Host		
Pin	Name	Direction
1	DCD IN	--
2	RXD	IN
3	TXD	OUT
4	DTR	OUT
5	GRND	--
6	DSR	IN
7	TRSR	OUT
8	CTS	IN
9	OUT	OUT

Computer

## RS232

Pin	Function
Pin 1	
Pin 2	TXD
Pin 3	RXD
Pin 4	
Pin 5	GND
Pin 6	
Pin 7	CTS
Pin 8	RTS
Pin 9	

RS232 Pinout (9 Pin)



Scale

Table 5-2. RS-232 Pinout



**Note** Modem control lines are not supported. The scale is DTE.

## 5.3 USB

The *BenchPro Series* conforms to the USB HID Point of Sale Usage Tables, March 5 2001, Version 1.02. Reference [www.usb.org](http://www.usb.org), HID Information at [www.usb.org/developers/hidpage](http://www.usb.org/developers/hidpage)

Make sure the computer software has a USB HID scale interface. After plugging into the USB port, turn the scale on. The following is displayed:

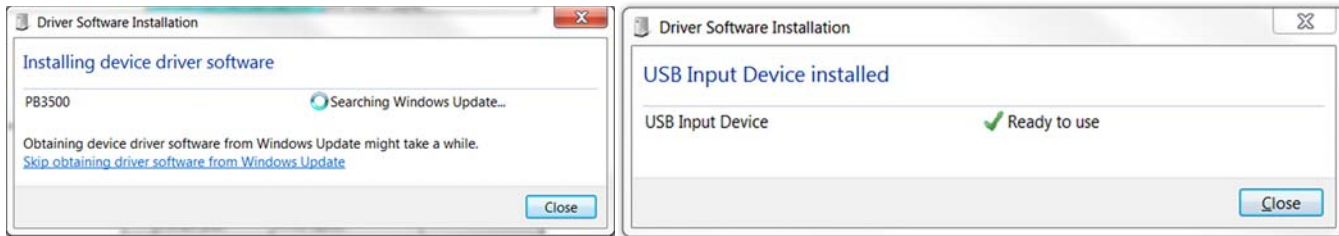


Table 5-3. USB Driver Install

When the driver is installed, using device manager, the *BenchPro Series* will be identified as a HID-compliant device.

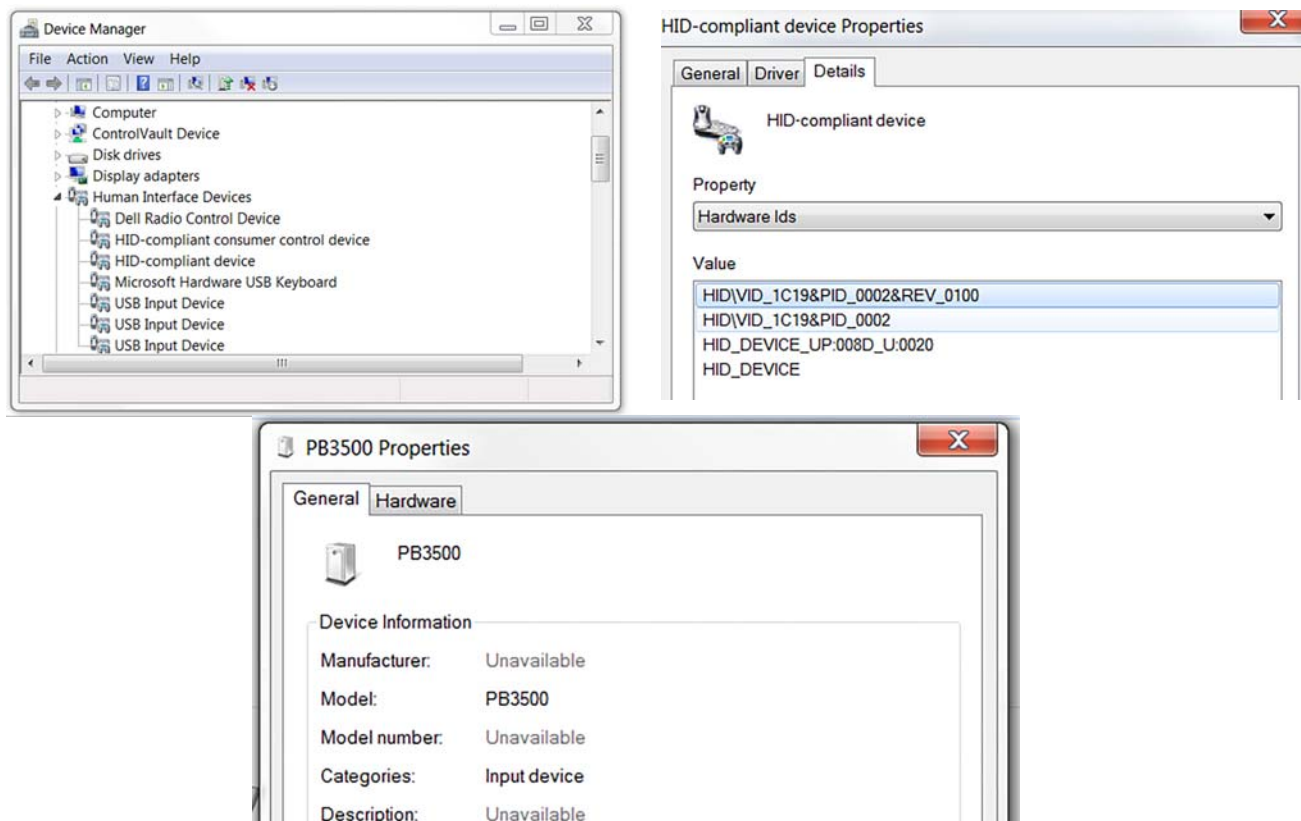


Figure 5-1. Device Properties

Once the windows driver has been found, the device is ready for use.

USB Specs:

- Vendor ID = 1C19
- Product ID = 0002

### Interface Protocols by Model

- BP-1214-75S = SMA, 3835, EH, 8213, nci, USB Hid
- BP-1214-35P = SMA, nci, USB Hid
- BP-1214-6R115RR = SMA, nci, USB Hid, Ecr

## 5.4 Interface Protocols

### 5.4.1 NCI General Serial Communications Protocol

NCI Protocol																			
Request displayed weight																			
Command	W<CR> (57h,0dh)																		
over capacity (invalid data)	<LF>	^	^	^	^	^	^	^	^	^	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>	
under capacity (-20d)	<LF>	_	_	_	_	_	_	_	_	_	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>	
zero point error (Initial Zero)	<LF>	-	-	-	-	-	-	-	-	-	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>	
in lb/oz/kg/g (normal data)	<LF>	<p>	<W>	.	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
in lb/oz/kg/g	<LF>	<p>	<sp>	<W>	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
in lb:oz	<LF>	<p>	<W>	l	b	<sp>	<W>	<W>	.	<W>	<W>	o	z	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>
in lb:oz	<LF>	<p>	<W>	<W>	l	b	<sp>	<W>	<W>	.	<W>	o	z	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>
in lb:oz	<LF>	<p>	<sp>	<W>	<W>	<W>	l	b	<sp>	<W>	<W>	o	z	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>

Request High-Resolution weight(10x)																				
Command	H<CR> (48h,0dh)																			
over capacity (invalid data)	<LF>	^	^	^	^	^	^	^	^	^	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
under capacity	<LF>	_	_	_	_	_	_	_	_	_	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
zero point error	<LF>	-	-	-	-	-	-	-	-	-	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>		
in lb/oz/kg/g (normal data)	<LF>	<p>	<W>	.	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>			
in lb:oz	<LF>	<p>	<W>	l	b	<sp>	<W>	<W>	.	<W>	<W>	o	z	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>	
in lb:oz	<LF>	<p>	<W>	<W>	l	b	<sp>	<W>	<W>	.	<W>	o	z	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>	
in lb:oz	<LF>	<p>	<W>	<W>	<W>	l	b	<sp>	<W>	<W>	.	<W>	o	z	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>
in lb:oz	<LF>	<p>	<sp>	<W>	<W>	<W>	l	b	<sp>	<W>	<W>	o	z	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>	

Request displayed Raw Count																	
Command: M<CR> (4dh,0dh)																	
Raw Count	<LF>	<M>	<M>	<M>	<M>	<M>	<M>	<M>	<M>	M	M	<CR>	<LF>	<H1>	<H2>	<CR>	<ETX>

Request current status					
Command: S<CR> (53h,0dh)					
Response	<LF>	<H1>	<H2>	<CR>	<ETX>

<b>Request scale to zero</b>	
<b>Command: Z&lt;CR&gt; (5ah,0dh)</b>	
simulate ZERO key	<LF> <H1> <H2> <CR> <ETX>

<b>Request scale to tare</b>	
<b>Command: T&lt;CR&gt; (54h,0dh)</b>	
simulate TARE key	<LF> <H1> <H2> <CR> <ETX>

<b>Change units of measure</b>	
<b>Command: U&lt;CR&gt; (55h,0dh)</b>	
simulate UNIT key (lb/kg)	<LF> <U> <U> <CR> <LF> <H1> <H2> <CR> <ETX>
simulate UNIT key (lb:oz)	<LF> l b : o z <CR> <LF> <H1> <H2> <CR> <ETX>

<b>Power off the scale</b>	
<b>Command: X&lt;CR&gt; (58h,0dh)</b>	
simulate OFF key	× × × × ×

<b>Unrecognized Command</b>	
<b>Command: others (xxh,0dh)</b>	
Response	<LF> ? <CR> <ETX>

Symbols Used	<LF>	line feed (0Ah)
	<CR>	carriage return (0Dh)
	<ETX>	end of text (03h)
	<sp>	space (20h)
	<p>	polarity "-" or " " (2Dh or 20h)
	<U><U>	measure units "lb", "oz", "kg", "g"
	<W><W><W><W><W>	weight data 5 ~ 6 Bytes
	<H1><H2>	current status
<M><M><M><M><M><M><M>	raw count 7 Bytes	



Bit	Byte 1(H1)	Byte 2(H2)
	0	0=stable
1=not stable		1=under capacity
1	0=not at zero point	0=not over capacity
	1=at zero point	1=over capacity
2	0=RAM ok	0=Flash ROM ok
	1=RAM error	1=Flash ROM error
3	0=eeprom ok	0=calibration ok
	1=eeprom error	1=calibration error
4	always 1	always 1
5	always 1	always 1
6	always 0	always 0
7	parity	parity

## 5.4.2 ECR Interface Protocol

### ECR Protocol

#### Request displayed weight

Command: W<CR> (57h,0dh)

over capacity (invalid data)	<LF>	^	^	^	^	^	^	^	^	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>		
under capacity (-20d)	<LF>	-	-	-	-	-	-	-	-	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>		
zero point error (Initial Zero)	<LF>	-	-	-	-	-	-	-	-	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>		
in lb/oz/kg/g (normal data)	<LF>	<p>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>			
in lb:oz	<LF>	<p>	<W>	l	b	<sp>	<W>	<W>	.	<W>	<W>	o	z	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>
in lb:oz	<LF>	<p>	<W>	<W>	l	b	<sp>	<W>	<W>	.	<W>	o	z	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>
in lb:oz	<LF>	<p>	<sp>	<W>	<W>	<W>	l	b	<sp>	<W>	<W>	o	z	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>

#### Request current status

Command: S<CR> (53h,0dh)

< status>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>
-----------	------	---	------	------	------	------	-------

<b>Request scale to zero</b>							
<b>Command: Z&lt;CR&gt; (5ah,0dh)</b>							
simulate ZERO key	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>

<b>Change units of measure</b>														
<b>Command: U&lt;CR&gt; (55h,0dh)</b>														
simulate UNIT key (lb/oz/kg)	<LF>	<U>	<U>	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>			
simulate UNIT key (lb:oz)	<LF>	l	b	:	o	z	<CR>	<LF>	S	<H1>	<H2>	<H3>	<CR>	<ETX>

<b>Request scale to tare and returns scale status</b>				
<b>Command: u&lt;CR&gt; (75h,0dh)</b>				
simulate TARE key (g)	<LF>	1	<CR>	<ETX>
simulate TARE key (kg)	<LF>	2	<CR>	<ETX>
simulate TARE key (oz)	<LF>	3	<CR>	<ETX>
simulate TARE key (lb)	<LF>	4	<CR>	<ETX>
simulate TARE key (lb:oz)	<LF>	5	<CR>	<ETX>

<b>Returns scale capabilities</b>									
<b>Command: A&lt;CR&gt; (41h,0dh)</b>									
<Response>	<LF>	v	w	x	y	z	<CR>	<ETX>	
current v='T'	v='T'-scale has a weight display								
	v='F'-scale does not have a weight display								
current w='F'	w='T'-scale has a text display								
	w='F'-scale does not have a text display								
current x='F'	x='T'-scale can calculate unit price								
	x='F'-scale cannot calculate unit price								
current y='F'	y='T'-scale allows setting tare value								
	y='F'-scale does not allow setting tare value								
current z='T'	z='T'-scale may be zeroed								
	z='F'-scale cannot be zeroed								

### Returns capacity of scale

**Command: m<CR> (6dh,0dh)**

capacity 15 lb	<LF>	1	5	1	b	<CR>	<ETX>	
capacity 30 lb	<LF>	3	0	1	b	<CR>	<ETX>	
capacity 70 lb	<LF>	7	0	1	b	<CR>	<ETX>	
capacity 100 lb	<LF>	1	0	0	1	b	<CR>	<ETX>
capacity 150 lb	<LF>	1	5	0	1	b	<CR>	<ETX>
capacity 300 lb	<LF>	3	0	0	1	b	<CR>	<ETX>
capacity 6 kg	<LF>	6	k	g		<CR>	<ETX>	
capacity 15 kg	<LF>	1	5	k	g	<CR>	<ETX>	
capacity 35 kg	<LF>	3	5	k	g	<CR>	<ETX>	
capacity 50 kg	<LF>	5	0	k	g	<CR>	<ETX>	
capacity 75 kg	<LF>	7	5	k	g	<CR>	<ETX>	
capacity 150 kg	<LF>	1	5	0	k	g	<CR>	<ETX>

### Unrecognized Command

**Command: others**

<status>	<LF>	?	<CR>	<ETX>
----------	------	---	------	-------

Symbols Used	<LF>	line feed (0Ah)
	<CR>	carriage return (0Dh)
	<ETX>	end of text (03h)
	<sp>	space (20h)
	<U><U>	measure units "lb", "oz", "kg", "g "
	<W><W><W><W><W>	weight data 5 Bytes
	<H1><H2><H3>	current status

Bit	Byte 1(H1)	Byte 2(H2)	Byte 3(H3)
	0	0=stable	0=not under capacity
1=not stable		1=under capacity	
1	0=not at zero point	0=not over capacity	
	1=at zero point	1=over capacity	
2	0=RAM ok	0=Flash ROM ok	0=gross weight
	1=RAM error	1=Flash ROM error	1=net weight
3	0=eeprom ok	0=calibration ok	0=initial zero ok
	1=eeprom error	1=calibration error	1=initial zero error
4	always 1	always 1	always 1
5	always 1	always 1	always 1
6	always 0	always 1	always 0
7	parity	parity	parity

### 5.4.3 8213 Interface Protocol

8213 Protocol										
Request displayed weight										
Command: W (57h)										
over capacity (invalid data)	<STX>	?	<S>	<CR>						
under capacity (-20d)	<STX>	?	<S>	<CR>						
under zero (Mulis)	<STX>	?	<S>	<CR>						
not stable	<STX>	?	<S>	<CR>						
in lb/oz/kg/g (normal data)	<STX>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<CR>
in lb/oz/kg/g	<STX>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>
in lb/oz/kg/g	<STX>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<CR>
in lb/oz/kg/g	<STX>	<W>	<W>	<W>	<W>	.	<W>	<U>	<U>	<CR>
in lb/oz/kg/g	<STX>	<sp>	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>
in lb:oz	<STX>	<W>	l	b	<W>	<W>	.	<W>	<W>	o z <CR>
in lb:oz	<STX>	<W>	<W>	l	b	<W>	<W>	.	<W>	o z <CR>
in lb:oz	<STX>	<sp>	<W>	<W>	<W>	l	b	<W>	<W>	o z <CR>

Request High-Resolution weight (10x)													
Command: H (48h)													
over capacity (invalid data)	<STX>	?	<S>	<CR>									
under capacity (-20d)	<STX>	?	<S>	<CR>									
under zero (Mulis)	<STX>	?	<S>	<CR>									
not stable	<STX>	?	<S>	<CR>									
in lb/oz/kg/g (normal data)	<STX>	<W>	.	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<W>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<W>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<W>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<W>	<W>	<W>	<W>	.	<W>	<U>	<U>	<CR>			
in lb:oz	<STX>	<W>	l	b	<W>	<W>	.	<W>	<W>	o	z	<CR>	
in lb:oz	<STX>	<W>	<W>	l	b	<W>	<W>	.	<W>	<W>	o	z	<CR>
in lb:oz	<STX>	<W>	<W>	<W>	l	b	<W>	<W>	.	<W>	o	z	<CR>
in lb:oz	<STX>	<sp>	<W>	<W>	<W>	<W>	l	b	<W>	<W>	o	z	<CR>

Request scale to zero				
Command: Z (5ah)				
simulate ZERO key	<STX>	?	<S>	<CR>

Scale is placed in echo mode			
Command: E (45h)			
echo mode enable	<STX>	E	<CR>

Scale is taken out of echo mode			
Command: F (46h)			
echo mode disable	<STX>	F	<CR>

Scale initiates a test of RAM and ROM			
Command: A (41h)			
RAM/ROM TEST	<STX>	?	<CR>

Scale confidence test result status			
Command: B (42h)			
Test result (Command A)	<STX>	<C>	<CR>

Bit Definition	Bit	Confidence <C>
	0	always 0
	1	always 0
	2	always 0
	3	0=RAM ok 1=RAM error
	4	0=Flash ROM ok 1=Flash ROM error
	5	always 0
	6	always 0
	7	parity

Unrecognized Command				
Command: others				
Respons	<STX> >	?	<S>	<CR>

Symbols Used	<STX>	start of test (02h)
	<CR>	carriage return (0Dh)
	<sp>	space (20h)
	<U><U>	measure units "lb", "oz", "kg", "g"
	<W><W><W><W><W>	weight data 5 ~ 6 Bytes

Bit Definition	Bit	Status <S>
	0	0=stable 1=no stable
	1	0=not over capacity 1=over capacity
	2	0=not under zero 1=under zero
	3	0=initial zero inside 1=initial zero outside
	4	0=not center of zero 1=center of zero
	5	always 1
	6	always 1
	7	parity

## 5.4.4 EH Interface Protocol

EH Protocol												
Request displayed weight												
Command: W (57h)												
over capacity (invalid data)	<STX>	?	<S>	<CR>								
under zero	<STX>	?	<S>	<CR>								
not stable	<STX>	?	<S>	<CR>								
in lb/oz/kg/g (normal data)	<STX>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<W>	<W>	<W>	<W>	.	<W>	<U>	<U>	<CR>		
in lb/oz/kg/g	<STX>	<sp>	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>		
in lb:oz	<STX>	<W>	l	b	<W>	<W>	.	<W>	<W>	o	z	<CR>
in lb:oz	<STX>	<W>	<W>	l	b	<W>	<W>	.	<W>	o	z	<CR>
in lb:oz	<STX>	<sp>	<W>	<W>	<W>	l	b	<W>	<W>	o	z	<CR>

Request current status				
Command: S (53h)				
Response	<STX>	?	<S>	<CR>

Request scale to zero				
Command: Z (5ah)				
simulate ZERO key	<STX>	?	<S>	<CR>

Request scale to tare				
Command: T (54h)				
simulate TARE key	<STX>	?	<S>	<CR>

Power off the scale				
Command: X (58h)				
simulate OFF key	x	x	x	x

Unrecognized Command				
Command: others				
Response	<STX>	?	<S>	<CR>

Symbols Used	<STX>	start of test (02h)
	<CR>	carriage return (0Dh)
	<sp>	space (20h)
	<U><U>	measure units "lb", "oz", "kg", "g"
	<W><W><W><W><W>	weight data 5 Bytes

Bit Definition	Bit	Status <S>
	0	0=stable 1=no stable
	1	0=not over capacity 1=over capacity
	2	0=not under zero 1=under zero
	3	0=initial zero inside 1=initial zero outside
	4	0=not center of zero 1=center of zero
	5	always 1
	6	always 1
	7	parity

## 5.4.5 SMA Interface Protocol

### SMA Protocol

Request displayed weight																				
Command: <LF>W<CR> (0Ah,57h,0dh)																				
in lb/oz/kg/g (normal data)	<LF>	<s>	<r>	<n>	<m>	<f>	<W>	<W>	<W>	<W>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<U>	<CR>
in lb/oz/kg/g	<LF>	<s>	<r>	<n>	<m>	<f>	<W>	<W>	<W>	<W>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<U>	<CR>
in lb/oz/kg/g	<LF>	<s>	<r>	<n>	<m>	<f>	<W>	<W>	<W>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<U>	<CR>	
in lb/oz/kg/g	<LF>	<s>	<r>	<n>	<m>	<f>	<W>	<W>	<W>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<U>	<CR>	
in lb:oz	<LF>	<s>	<r>	<n>	<m>	<f>	<W>	<W>	<W>	<W>	:	<W>	<W>	.	<W>	<W>	<U>	<U>	<U>	<CR>
in lb:oz	<LF>	<s>	<r>	<n>	<m>	<f>	<W>	<W>	<W>	<W>	:	<W>	<W>	.	<W>	<W>	<U>	<U>	<U>	<CR>
<s> = 'Z' or 'O' or 'U'	<LF>	<s>	<r>	<n>	<m>	<f>	-	-	-	-	-	-	-	-	-	-	<U>	<U>	<U>	<CR>





<b>Request scale to zero</b>	
<b>Command: &lt;LF&gt;Z&lt;CR&gt; (0Ah,5Ah,0dh)</b>	
simulate ZERO key	<LF> <s> <r> <n> <m> <f> <W> <W> <W> <W> <W> <W> . <W> <W> <W> <U> <U> <U> <CR>

<b>Request scale to tare</b>	
<b>Command: &lt;LF&gt;T&lt;CR&gt; (0Ah,54h,0dh)</b>	
simulate TARE key	<LF> <s> <r> <n> <m> <f> <W> <W> <W> <W> <W> <W> . <W> <W> <W> <U> <U> <U> <CR>

<b>Return tare weight</b>	
<b>Command: &lt;LF&gt;M&lt;CR&gt; (0Ah,4Dh,0dh)</b>	
Response	<LF> <s> <r> <n> <m> <f> <W> <W> <W> <W> <W> <W> . <W> <W> <W> <U> <U> <U> <CR>

<b>Clear scale tare weight</b>	
<b>Command: &lt;LF&gt;C&lt;CR&gt; (0Ah,43h,0dh)</b>	
Response	<LF> <s> <r> <n> <m> <f> <W> <W> <W> <W> <W> <W> . <W> <W> <W> <U> <U> <U> <CR>

<b>Change units of measure</b>	
<b>Command: &lt;LF&gt;U&lt;CR&gt; (0Ah,55h,0dh)</b>	
Response	<LF> <s> <r> <n> <m> <f> <W> <W> <W> <W> <W> <W> . <W> <W> <W> <U> <U> <U> <CR>

<b>Invoke scale diagnostics</b>	
<b>Command: &lt;LF&gt;D&lt;CR&gt; (0Ah,44h,0dh)</b>	
Response	<LF> <r> <e> <c> <m> <CR> >

<b>About scale first line</b>	
<b>Command: &lt;LF&gt;A&lt;CR&gt; (0Ah,42h,0dh)</b>	
level / revision	<LF> S M A ? <y> <y> <y> <y> <y> <y> ~ ~ ~ ~ ~ ~ ~ <y> <CR>

<b>About scale first line scroll</b>	
<b>Command: &lt;LF&gt;B&lt;CR&gt; (0Ah,42h,0dh)</b>	
Step1: Manufacturer	<LF> M F G ? <y> <y> <y> <y> <y> <y> ~ ~ ~ ~ ~ ~ ~ <y> <CR>
Step2: Product module	<LF> M O D ? <y> <y> <y> <y> <y> <y> ~ ~ ~ ~ ~ ~ ~ <y> <CR>
Step3: Software revision	<LF> R E V ? <y> <y> <y> <y> <y> <y> ~ ~ ~ ~ ~ ~ ~ <y> <CR>
Step4: Serial number	<LF> S N <sp> ? <y> <y> <y> <y> <y> <y> ~ ~ ~ ~ ~ ~ ~ <y> <CR>
Step5: End	<LF> E N D ? <CR> >

<b>Scale information</b>	
<b>Command: &lt;LF&gt;I&lt;CR&gt; (0Ah,49h,0dh)</b>	
level / revision	<LF> S M A ? <y> <y> <y> <y> <y> <y> ~ ~ ~ ~ ~ ~ ~ <y> <CR>

### Scale information scroll

**Command: <LF>N<CR> (0Ah,4Eh,0dh)**

Step1: Scale type	<LF>	T	Y	P	?	<y>	<y>	<y>	<y>	<y>	<y>	~	~	~	~	~	~	<y>	<CR>
Step2: Capacity(uuu:c.c:n:d)	<LF>	C	A	P	?	<y>	<y>	<y>	<y>	<y>	<y>	~	~	~	~	~	~	<y>	<CR>
Step3: Supported command	<LF>	C	M	D	?	<y>	<y>	<y>	<y>	<y>	<y>	~	~	~	~	~	~	<y>	<CR>
Step4: End	<LF>	E	N	D	?	<CR>	>												

### Repeat displayed weight continuously

**Command: <LF>R<CR> (0Ah,52h,0dh)**

Response	<LF>	<s>	<r>	<n>	<m>	<f>	<w>	<w>	<w>	<w>	<w>	<w>	.	<w>	<w>	<w>	<u>	<u>	<u>	<CR>
----------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	-----	-----	-----	-----	-----	-----	------

### Repeat High-resolution weight continuously

**Command: <LF>S<CR> (0Ah,53h,0dh)**

Response	<LF>	<s>	<r>	<n>	<m>	<f>	<w>	<w>	<w>	<w>	<w>	<w>	.	<w>	<w>	<w>	<u>	<u>	<u>	<CR>
----------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	-----	-----	-----	-----	-----	-----	------

Symbols Used	<LF>	line feed (0Ah)	
	<CR>	carriage return (0Dh)	
	<sp>	space (20h)	
	<s>	Z' Center of Zero	'O'
		Over Capacity	'U'
		Under Capacity	'E'
		Zero Error	'I'
		Initial-Zero Error	" "
		None of the above condition	
	<r>	range ('1','2','3') always "1" for single range	
	<n>	G' Gross normal weight	'T'
Tare weight		'N'	
Net normal weight		'g'	
gross weight in high-resolution		'n'	
net weight in high-resolution			
<m>	M' Scale in motion	'	
	Scale not in motion		
<f>	future		
<U><U><U>	measure units "lb ", "oz ", "1/o", "kg ", "g"		
<w><w><w><w><w> <w><w>	weight data fixed at 10 Bytes		
<y><y><y><y><y><y>	contain 25 characters maximum		

## 5.4.6 3835 Protocol

3835 Protocol																	
Request displayed weight																	
Command: W<CR> (57h,0dh)																	
over capacity (invalid data)	<LF>	^	^	^	^	^	^	^	^	<U>	<U>	<CR>	<H1>	<H2>	<ETX>		
under capacity (-20d)	<LF>	-	-	-	-	-	-	-	-	<U>	<U>	<CR>	<H1>	<H2>	<ETX>		
in lb/oz/kg/g (normal data)	<LF>	<p>	<W>	.	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<H1>	<H2>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	.	<W>	<W>	<W>	<U>	<U>	<CR>	<H1>	<H2>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<W>	<W>	<W>	.	<W>	<W>	<U>	<U>	<CR>	<H1>	<H2>	<ETX>			
in lb/oz/kg/g	<LF>	<p>	<sp>	<W>	<W>	<W>	<W>	<W>	<U>	<U>	<CR>	<H1>	<H2>	<ETX>			
in lb:oz	<LF>	<p>	<W>	l	b	<sp>	<W>	<W>	.	<W>	<W>	o	z	<CR>	<H1>	<H2>	<ETX>
in lb:oz	<LF>	<p>	<W>	<W>	l	b	<sp>	<W>	<W>	.	<W>	o	z	<CR>	<H1>	<H2>	<ETX>
in lb:oz	<LF>	<p>	<sp>	<W>	<W>	<W>	l	b	<sp>	<W>	<W>	o	z	<CR>	<H1>	<H2>	<ETX>
Initial Zero Error	<LF>	<H1>	<H2>	<CR>	<ETX>												

Request current status					
Command					
S<CR> (53h,0dh)					
Response	<LF>	<H1>	<H2>	<CR>	<ETX>

Request scale to zero	
Command: Z<CR> (5ah,0dh)	
Response	Scale is zeroed, no response from scale

Unrecognized Command			
Command: others			
Response	<LF>	?	<CR>

Symbols Used	<LF>	line feed (0Ah)
	<CR>	carriage return (0Dh)
	<ETX>	end of text (03h)
	<sp>	space (20h)
	<p>	polarity "-" or " " (2Dh or 20h)
	<U><U>	measure units "lb", "oz", "kg", "g"
	<W><W><W><W><W><W>	weight data 6 Bytes
<H1><H2>	current status	

Bit definition <H1 H2>	Bit	Byte 1(H1)	Byte 2(H2)
	0	0=stable	0=not under capacity
		1=not stable	1=under capacity
	1	0=not at zero point	0=not over capacity
		1=at zero point	1=over capacity
	2	0=RAM ok	0=Flash ROM ok
		1=RAM error	1=Flash ROM error
	3	0=eeprom ok	0=calibration ok
		1=eeprom error	1=calibration error
	4	always 1	always 1
5	always 1	always 1	
6	always 0	always 0	
7	parity	parity	

## 5.5 Bench Pro Series Software Compatibility

Verify the software products listed below continue to offer compatibility with scale manufacturer type or protocol identified prior to installing a software upgrade.

Company Name	Software	Protocol Settings	Notes
Rice Lake Weighing	iDimension Family	USB HID	1C19,0002
UPS	Worldship	3835	*4800, 7, E, 1
FedEx	Ship Manager	3835	**4800, 7, E, 1

Table 5-6. BenchPro Series Software Compatibility



**Note** \*UPS Worldship provides access only to COM ports 1-4 when using RS-232 to USB converter, Assign the USB COM port through device manager to reflect as COM port 1-4 in advanced settings.

\*\*FedEx Ship Manager allows users to customize the format of the scale. This feature is found in Utilities>Configure Scale>Scale Type = Custom. Query String = W; Response Format = xwwwwwwwttxxx.

# 6.0 Maintenance and Troubleshooting

Prior to calling customer support have the software type and software version number available. These are displayed briefly when powering on the scale.

## 6.1 Troubleshooting

Error Code	Description	Possible Cause	Corrective Action
<i>Err1</i>	Calibration error	Incorrect calibration weight value used; damaged load cell	Repeat calibration Replace load cell
<i>Err2</i>	Power up or initial zero error	Upon power up, weight or item on the plat form is greater than <i>PURE</i> setting	Remove weight and power cycle the scale
<i>Err3</i>	Semi-auto zero error	When pressing the zero button, the weight value displayed is greater than the % in Zero configuration	--
<i>Err4</i>	Configuration error	Invalid configuration settings	Check configuration settings
<i>Err5</i>	Overload error	Too much weigh applied	Perform calibration, check LC mV
<i>Err6</i>	Memory error	PCB is corrupt	Replace main PCB
<i>LoBAt</i>	Low battery	Battery power voltage is below 4.2 V	Replace batteries
<i>ErrAd</i>	A/D Conversion error	--	Calibrate, replace main PCB

Table 6-1. Error Codes

### Diagnostics Menu

The diagnostic menu (*d iAG*) is used to troubleshoot scale operation. Use *DIV-A* or *DIV-O* to test the functionality of the load cell.

1. From the diagnostics menu, press *DIVA* or *DIVO*. A value is displayed.
2. Add weight onto the scale to see if the counts increase.
3. Remove the weight to see if the value returns the value displayed in [Step 1](#).
4. Calibrate the scale before determining a load cell is bad.

## 6.2 Load Cell Wiring

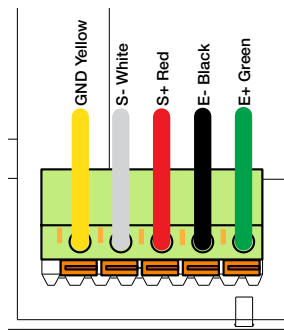


Figure 6-1. Load Cell Wiring

## 6.3 Replacement Parts

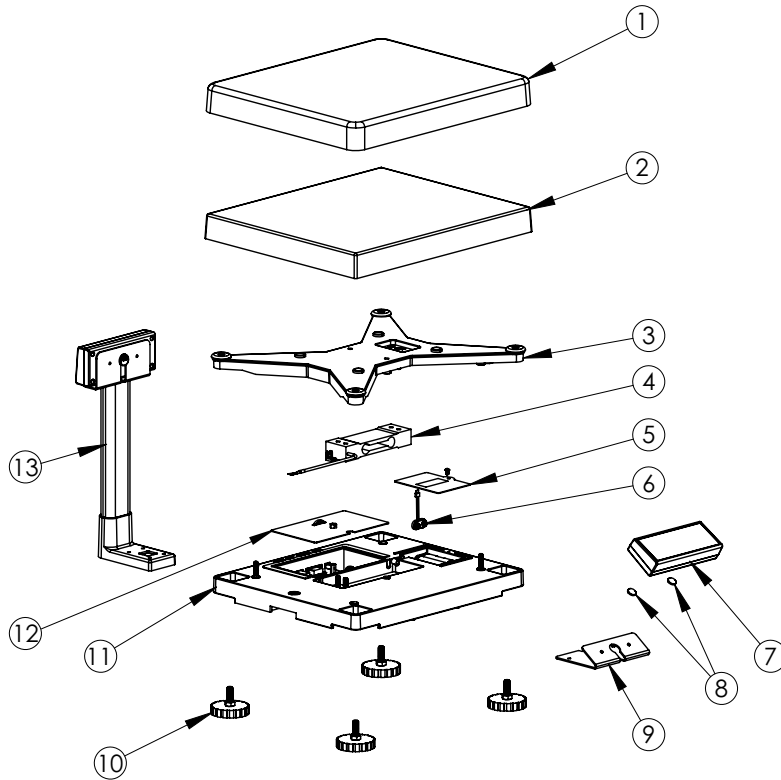


Figure 6-2. BenchPro Series Parts Illustration

Item No.	Part No.	Description
1	179184	Plastic platform
2	179183	Stainless steel platform
3	179186	Load bridge
4	50622	RL 1521A, 10 kg load cell — Model BP 1214-6R only*
	50624	RL 1521A, 20 kg load cell — Model BP 1214-15R only*
	179679	AL-2461B, 35 kg load cell — Model BP 1214-35P only*
	179680	AL-2461C, 75 kg load cell — Model BP 1214-75S only*
	179735	AL-2461C, 20 kg load cell — Model BP 1214-15R only*
	179736	AL-2461C, 10 kg load cell — Model BP 1214-6R only*
*Load cell torque: 120 kgf-cm		
5	179188	Battery housing cover
6	179190	AA Battery holder
7	179191	Primary operator display with 18' cable and capacity labels
	174784	Primary operator display with 6' cable and capacity labels
8	179192	Primary display magnet
9	179193	Primary operator display bracket
10	179185	Foot with nut
11	179187	Die Cast Base
12	179189	PCB housing cover
13	174783	Optional column post mount
NS	174785	Main PCB — Model BP 1214-75S only
	179648	Main PCB — Model BP 1214-35P only
	179651	Main PCB — Model BP 1214-6R/15R only
NS	174782	AC Power supply with cable
NS	174786	USB interface cable

Table 6-2. Parts List

# 7.0 Specifications

## Inline power supply

Input	100 V-240 V
Output	12 V/222 ma, VDC@ 1.0 amp CD min
Frequency	50/60 Hz ± 3 Hz, Standard
Approvals	UL, CE, EN, CUL

## Battery Power

Battery type	Four AA alkaline batteries, 6 V, with LowBat indication at 4.3 V (not included)
Approx life	Non-backlight and software controls for sleep mode—250 hours or 80 hours continuous use, power consumption at 23 mA  Backlight on and software control for sleep mode—80 hours or 50 hours continuous use, power consumption at 30 mA

## USB or AC Power

Approx life	Non-backlight power consumption at 68 mA  Backlight on power consumption at 75 mA
-------------	---

## Interface Protocols

NCI, ECR, 8213, EH, SMA, 3835

## Operator Display

Keypad	4 key touch key panel (Units, Power/Zero, Tare, F1) Minimum key press life of 5000,000 cycles
Display	ABS plastic housing, 6 digit backlight LCD display with 29 mm or 1" high digits. 6 annunciators (Zero, Gross/Brutto, Net, W1/W2/W3 multi-range or multi-interval weight ranges.
Display Dimensions	5.25" (133.4 mm) x 2.21" x (56.1 mm)
L x W x H	x 1.09" (27.76 mm)

Primary Operator display includes 18" cable  
Remote Operator Display includes 72" cable with RS-45 connection to base

## Units

kg, lb, oz, lb:oz, g

## Environmental

Operating Temperature	14°F to 104°F (-10°C to 40°C)
Humidity	15 to 85% (Non Condensing)

## Communication

RS-232  
USB HID

## Other:

USB HID:	1C19,0002
RS-232 Cable:	10' DB 9-pin male to female, straight pass through and null modem
USB Cable:	46" (116.84 mm) A/B type USB cable
Stainless Steel Platter:	18 gauge, approximate 1.2mm
Base:	Die-Cast aluminum base with black power coat
Load bridge:	Die cast aluminum, non painted
Leveling Feet:	Adjustable with lock nut, adjust the height of the scale from 2.77" H (70.5 mm) to 3.18" (80.76 mm) H
Sealing Means:	Calibration button is accessed on the main pcb with cover and provisions made for lead wire seal
Motherboard:	5000d A/D converter, microprocessor, dual display circuits with RJ-45 connections, Four AA Alkaline battery, 9-pin RS-232, USB HID Interface, IAP or Boot Load firmware download
Dynamic Response:	From time of weight applied to scale- time of stable weight display with applied weight of: 0 - 1000d, 1000 ms, maximum mean average 1000d +, 1500 ms, maximum mean average.
Internal Resolution:	500,000 internal count minimum
NSF Approval:	Pending
Overload Protection:	Corner and center overload protection will be provided on all models
Weight:	Scale: 11.4 lb (5.17 kg) Shipping Weight: 17 lb (8 kg)
Package Dimensions:	18.5" x 18.5" x 8" (47 cm x 47 cm x 21 cm)
Packaging:	Meets or exceeds NSTA and ISTA approvals
MTBF:	The MTBF of the equipment shall be greater than 50,000 hours (with 100% power-on).
Mean Time to Repair:	Shall not exceed 20 minutes
Cleaning:	Exterior surfaces are capable of withstanding mild soap and water wipe down with a wet cloth







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