PR Series

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1. INTRODUCTION

1.1 Description

The PR balance is a precision weighing instrument that will provide you with years of service if properly cared for.

PR balances are available in capacities from 62 grams to 6200 grams.

1.2 Features

Operation Controls: backlit display, with 3 weighing applications and many features.

1.3 Definition of Signal Warnings and Symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

WARNING	For a hazardous situation with medium risk, possibly resulting in injuries or death if not avoided.
CAUTION	For a hazardous situation with low risk, resulting in damage to the device or the property or in loss of data, or injuries if not avoided.
Attention	For important information about the product
Note	For useful information about the product

Warning Symbols


General Hazard


Electrical Shock Hazard


Alternating current


Direct current

1.4 Safety Precautions

CAUTION: Read all safety warnings before installing, making connections, or servicing this equipment. Failure to comply with these warnings could result in personal injury and/or property damage. Retain all instructions for future reference.

- Verify that the AC adapter's input voltage range and plug type are compatible with the local AC mains power supply.
- Make sure that the power cord does not pose a potential obstacle or tripping hazard.
- Do not position the balance such that it is difficult to reach the power connection.
- The balance is for indoor use only. Do not operate the equipment in hazardous or unstable environments.
- Operate the equipment only under ambient conditions specified in these instructions.
- Do not drop loads on the pan.
- Use the balance only in dry locations.
- Disconnect the equipment from the power supply when cleaning.
- Use only approved accessories and peripherals.
- Service should only be performed by authorized personnel.

2. INSTALLATION

2.1 Unpacking

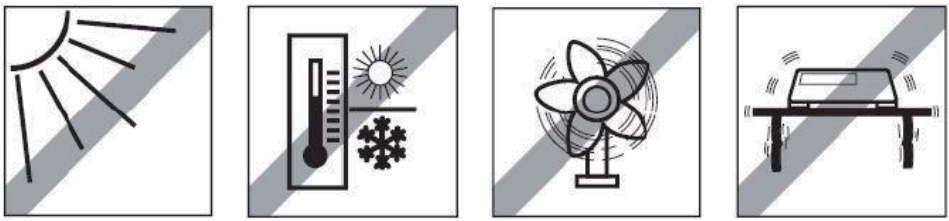
Carefully remove your PR balance and each of its components from the package. The included components vary depending on the balance model. Save the packaging to ensure safe storage and transport. Please read the manual completely before installing and using the PR balance to avoid incorrect operation.

Components included:

- Balance
- Power adapter + Attaching plug
- Stainless steel pan
- Pan support (for 0.1 g / 0.01 g model only)
- Warranty card

2.2 Select the Location

Avoid heat sources, rapid temperature changes, air current or excessive vibrations. Allow sufficient space.



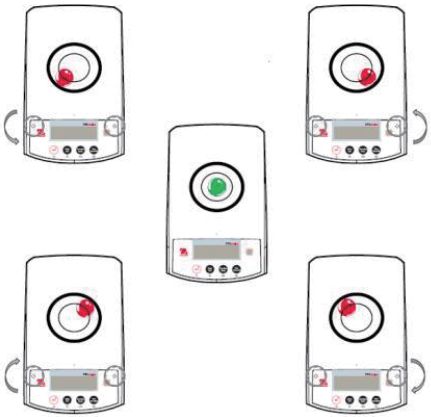
2.3 Leveling

Be sure the balance is level before it is used or after its location is changed.

The PR balance has a level bubble in a small round window beside the display.

To level the balance, adjust the 2 leveling feet until the bubble is centered in the circle.

Please refer to the right figure for leveling.



2.4 Connecting Power and Acclimatising the Balance

Connect the DC output connector to the power receptacle on the rear of the balance. Then connect the AC adapter plug to a suitable electrical outlet.

Acclimatising

It is suggested that the balance should not be used until it has been connected to power and acclimatised to the environment for a certain period of time. In the case of a balance with the precision above 0.1 mg, the acclimatisation time should be 1.5 hours; in the case of balance with the precision of 0.01 mg, the acclimatisation time should be more than 4 hours.

2.5 Connecting the Interface

The PR balance has a RS232 port.
Use the RS-232 port to connect either to a computer or a printer with a standard (straight-through) serial cable.

Interface connections on the rear of the balance

RS232

RS232：Used to connect to PC or Printer

Note: See the Printing section for Connecting, Configuring and Testing the Printer / Computer Interface.

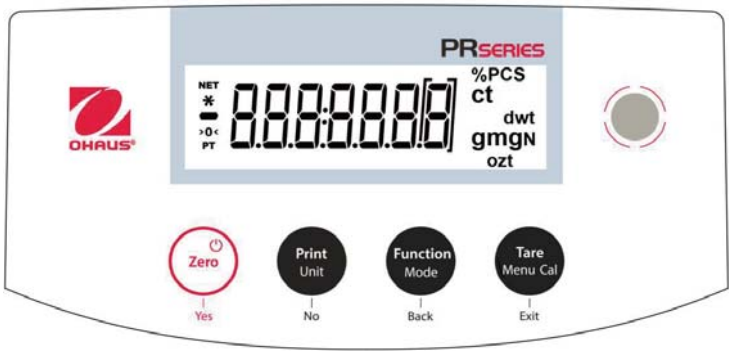
2.6 Initial Calibration

When the PR balance is first installed, or when it is moved to another location, it must be calibrated to ensure accurate weighing results. PR balances are classified into two categories, InCal models and ExCal models. InCal models have a built-in calibration mechanism which can calibrate the balance automatically and does not require the use of external calibration masses. If preferred, InCal models can also be manually calibrated with external masses. ExCal models are calibrated with external masses. Make sure to have the appropriate calibration masses available before beginning calibration.

3. OPERATION

3.1 Overview of Controls and Display

CONTROLS



CONTROL FUNCTIONS

Button	Zero / Yes	Print / Unit / No	Function / Mode / Back	Tare / Menu-Cal / Exit
Primary Function (Short Press)	**On / Zero** • If the balance is Off, turns on the balance. • If balance is On, sets zero.	**Print** • Sends the current displayed value to the serial interface.	**Function** • Operation is dependent on the application mode.	**Tare** • Performs tare operation.
Secondary Function (Press and Hold)	**Off** • Zeroing current value.	**Unit** • Changes weighing units.	**Mode** • Changes application mode.	**Menu-Cal** • Enters the main menu. Calibration is the first sub-menu. • Views the preset Tare value.
Menu Function (Short Press)	**Yes** • Accepts the current (blinking) setting on the display.	**No** • Rejects the current (blinking) setting on the display. • Increments a value being entered.	**Back** • Reverts back to previous menu item. • Decrements a value being entered.	**Exit** • Immediately exits the sub-menu. • Aborts a calibration in progress.

MAIN APPLICATION SCREEN

3.2 Principal Functions

Weighing: First press **Zero** to set the display to zero. Place an object on the pan. The display indicates the gross weight.

Taring: With no load on the pan, press **Zero** to set the display to zero. Place an empty container on the pan and press **Tare**. Add objects to the container and its net weight is displayed. After the container and the objects are removed, the load will be displayed as a negative number. Press **Tare** to clear.

Zero: Press **Zero** to zero the balance.

3.3 Overview of Parts and Features – Draft Shield Models

3.4 Overview of Parts and Features – Non-Draft Shield Models

4. APPLICATIONS

The PR balance can be operated in 3 application modes by long pressing the **Function / Mode** button.

4.1 Weighing

Note: Before using any application, be sure the balance has been leveled and calibrated.

Use this application to determine the weight of items in the selected unit of measure.

Weighing

1. Press **Tare** or **Zero** if necessary to begin. 2. Press and hold the **Function / Mode** button to select WEIGH (this application is the default).	
3. Place objects on the pan to display the weight. Once the reading is stable, the * will appear. 4. The resulting value is displayed in the active unit of measure.	

Item Settings

To view or adjust the current settings.

- **Weighing Units:** Change the displayed unit. See Section 5.4 for the detailed processes.
- **Filter Level:** Change Filtering level. See Section 5.3.1 for more information.
- **GLP Data:** See Section 5.7 for more information.
- **Print Settings:** Change printing settings. See Section 7 for more information.

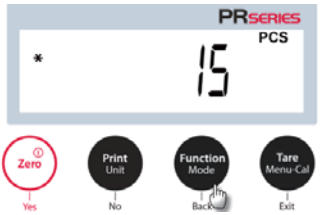
4.2 Parts Counting

Note: Before using any application, be sure the balance has been leveled and calibrated. The minimum piece weight should be no less than 0.1d.

Use this application to count samples of uniform weight.

Parts Counting

1. Press **Tare** or **Zero** if necessary to begin. 2. Press and hold the **Function / Mode** button until Count appears.	

3. After confirmation by pressing **Yes**, the message CLr.APW will appear on the screen.	
4. Press **Yes**, and the message Put 10 will display with the numeral 10 (default) flashing. The user can press **No** or **Back** to increase or decrease the value. For instance, to increase the value to 15, please press **No**. Then, Put and 15 will flash simultaneously.	
4. Place 15 samples on the pan. Press the **Function / Mode** button so that the weight of the 15 samples is used to establish the average piece weight (APW). The display will show 15 pieces.	
5. Remove the 15 samples from the pan and then place additional samples on the pan. The corresponding number of pieces will display on the screen.	
6. To view the total weight or the number of pieces of the objects, press the **Function / Mode** button.	

Item Settings

To view or adjust the current settings.

Sample size: The sample size ranges from 1 to 100. The default value is 10. **Note:** If the APW of the last parts counting operation needs to be kept, the user can press **No** when the display shows the message CLr.APWJ (clear the average piece weight. Place additional objects on the pan, and the corresponding number of pieces will display.	

APW Optimization: Improving counting accuracy by re-calculating the piece weight automatically as parts are added. APW Optimization occurs only when the number of pieces added to the pan is between one and three times the number already on the pan.	
Print Settings: Changing printing setup. See Section 7 for more information.	

4.3 Percent Weighing

Note: Before using any application, be sure the balance has been leveled and calibrated.

Use Percent Weighing to display the weight of a test object as a percentage of a pre-established reference sample.

Note: The minimum reference weight should be no less than 0.1d.

Percent Weighing

1. Press and hold the **Function / Mode** button until PErCEnt appears.	
2. After confirmation by pressing **Yes**, the message CLr.rEF (clear the reference) will appear on the screen.	

3. Press **Yes**, and PUt.rEF (put the reference weight) will display.	
4. Place the reference sample on the pan to display the weight. When the reading is stable, the * appears. 5. Press the **Function / Mode** button so that the weight of the reference sample is stored in memory. The display will show 100%.	
6. Remove the reference sample, and place the test object on the pan. The ratio of the test object to the reference sample weight is displayed as a percentage.	
7. To view the reference sample weight or the percentage of the test object weight to the reference sample weight, press the **Function / Mode** button.	
8. To establish a new reference sample weight, long press the **Function / Mode** button and repeat the steps described above.	

Item Settings

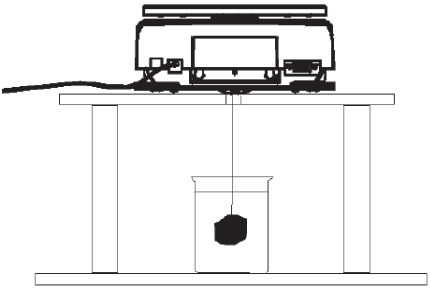
Note: If the reference weight of last Percent Weighing operation needs to be kept, press **No** when the message CLr.rEF (Clear reference) displays.	

Printing Setup:
Changing printing setup. See Section 7 for more information.

4.4 Additional Features

Weigh Below
Note: Ensure the balance has been leveled and calibrated.

The PR balance is equipped with a weigh below hook for weighing below the balance (as shown below).



Before turning the balance over, remove the pan and draft shield elements (if present) to prevent damage. Do not place the balance on the pan support cone or load cell pins.
To use this feature, remove power from the balance, then remove the protective cover for the weigh below opening.
Power on the balance, and then use a string or wire to attach items to be weighed.

Weigh below protective cover

Weigh below hook

5. MENU SETTINGS

5.1 Menu Navigation

Calibration	Setup	Unit	RS232	Print	GLP	Reset	Lock
InCal	Filter Level	Gram	Baud Rate	Stable Only	Header 1	Reset All	Calibration
Cal Adjust	AZT	Kilogram	Parity	Numeric Only	Header 2		Setup
Span Cal	Auto Tare	Milligram	Handshake	Single Header	Header 3		RS232
Linearity Cal	Graduations	Carat		Auto Print	Balance Name		Print
	Date Format	Pound		Header	User Name		GLP
	Date Setting	Ounce		Date and Time	Project Name		Reset
	Time Format	Ounce Troy		Balance ID			
	Time Setting	Penny Weight*		Balance Name			
	Brightness	Newton		User Name			
	Auto Dim	Grain		Project Name			
	LFT			Application Name			
				Result			
				Gross Weight			
				Net Weight			
				Tare Weight			
				Line Feed			

* Penny weight is not available for NTEP model.

5.1.1 Changing Settings

To change a menu setting, navigate to that setting using the following steps:

Enter the Menu
Long press the Menu button to enter the **Menu**.

Select the Sub-Menu
Press **No** to step between the sub-menus, and press **Yes** to enter the sub-menu.

Select the Menu Item
Press **No** to step through the Menu Items, and press **Yes** to enter the displayed Menu Item.

5.2 Calibration

PR balances offer a choice of three calibration methods: Internal Calibration (for InCal models only), Span calibration and Linearity Calibration.
Attention: Do not disturb the balance during any calibration.

5.2.1 Calibration Sub-menu (InCal models)

Note: ExCal models only have Span Calibration and Linearity Calibration.

5.2.2 Internal Calibration (not applicable to ExCal models)

Calibration is accomplished with the internal calibration mass. Internal Calibration can be performed at any time, provided the balance has warmed up to operating temperature and is level.
With the Balance turned On and no load on the pan, press the **Tare / Menu-Cal** button and select InCAL to initiate the internal calibration.
The screen shows the status, and then press any button to return to the current application after calibration.

5.2.3 Cal Adjust (not applicable to ExCal models)

Use this calibration method to fine tune the effect of the Internal Calibration.
Calibration Adjust may be used to adjust the result of the Internal Calibration by ±100 divisions.

Note: Before making a calibration adjustment, perform an Internal Calibration. To verify whether an adjustment is needed, place a test mass equal to the **span calibration value** on the pan and note the difference (in divisions) between the nominal mass value and the actual balance reading. If the difference is within +/- division, calibration adjustment is not required. If the difference exceeds +/-1 division, calibration adjustment is recommended.

Example:

Expected weight reading:	200.000g (Test mass value)
Actual weight reading:	200.014g
Difference in grams:	– 0.014g
Difference in divisions:	– 14 (InCal Adjust value)

To perform a Calibration Adjustment, select InCal Adjustment from the list of Calibration Menu; enter the value (positive or negative divisions) to match the difference noted earlier in the procedure.

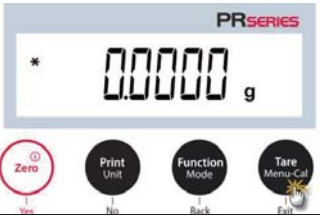
Recalibrate using Internal Calibration. After calibration, place the test mass on the pan and verify that the mass value now matches the displayed value. If not, repeat the procedure until Internal Calibration reading agrees with the test mass.

5.2.4 Span Calibration

Span calibration uses two calibration points, one at **zero load** and the other at **specified full load** (span). For detailed calibration mass information please refer to the specification tables in the "Span Calibration Points", SPECIFICATIONS, Section 9.

With the balance turned On and no load on the pan, Span Calibration can be performed. The best accuracy is achieved using the mass closest to the full span value.

Steps for span calibration

1. Press and hold the **Tare / Menu-Cal** button, and the Calibration Menu will display.	

2. Press **Yes** to enter the Calibration Menu.	
3. To change the calibration mode, press **No** until SPAN (span calibration) is displayed.	
4. The calibration mass value will be shown in the screen. After the display shows 200.0000 g, please place weight(s) of 200 g on the pan for calibration. To change to the calibration point of half full capacity (e.g. 100 g), press the **Function / Mode** button. After the screen shows "Place weights" and "100.000 g", place weight(s) of 100 g on the pan for calibration.	
5. Once the span calibration is completed successfully, CAL.donE will display. Press any button to return to the previous screen.	
6. Remove the weight, and the reading will be set to zero.	

5.2.5 Linearity Calibration

Linearity calibration uses three calibration points, one at zero load and the others at specified loads.
With no load on the balance, press Linearity Calibration to begin the process.
The balance captures the zero point, and then prompts for the next weight.
Continue to follow the instructions on the display until the calibration is completed.

Steps for linearity calibration

1. Press and hold the **Tare / Menu-Cal** button, and the Calibration Menu will display.	
2. Press **Yes** to enter the Calibration Menu.	
3. To change the calibration mode, press **No** until L inEAr (linearity calibration) is displayed.	
4. The calibration mass value will be shown in the display. After the display shows 100.0000 g, please place weight(s) of 100 g on the pan for calibration.	
5. Remove the weight of 100 g from the pan. After a while, 200.0000 g will be displayed on the screen. Please place weight(s) of 200 g on the pan.	
6. Once the linearity calibration is completed successfully, CAL.donE will display. Press any button to return to the previous screen.	
7. Remove the weight, and the reading will be set to zero.	

5.3 Balance Setup

Enter this sub-menu to customize the balance functionality.
Note: The factory default settings are shown below in **bold**.

5.3.1 Filter Level

Set the amount of signal filtering.		FiLtEr
Low = faster stabilization time with less stability. **Medium = normal stabilization time with normal stability.** High = slower stabilization time with more stability.		
LoW Low	MEd Medium	HIGH High

5.3.2 AZT (Auto Zero Tracking)

Set the automatic zero tracking functionality.		AZt Auto Zero Tracking
Off = disabled. **0.5d = display maintains zero up to a drift of 0.5 graduation per second.** 1d = display maintains zero up to a drift of 1 graduation per second. 3d = display maintains zero up to a drift of 3 graduations per second.		
0.5 d **0.5 d**	1 d 1 d	3 d 3 d

5.3.3 Auto Tare

Set the automatic tare. When Automatic Tare is set to On, the first object placed on the pan will be deemed as a container and tared automatically. **Off = disabled.** On = enabled.		
A.tArE Auto Tare	OFF **Off**	On On

5.3.4 Graduations

Set the displayed readability of the balance.

1 Division = standard readability.
10 Divisions = readability is increased by a factor of 10.

For example, if the standard readability is 0.01 g, selecting 10 Divisions will result in a reading of 0.1 g.

GrAd Graduation	1 d 1 Division	10 d **10 Division**

5.3.5 Date Format

Set the current date format. Date Format: YY/MM/DD **MM/DD/YY** DD/MM/YY	d.FormAt Date Format	mmdY **MM/DD/YYYY**
	dmmY DD/MM/YYYY	Ymmd YYYY/MM/DD

5.3.6 Date Setup

Set the current date in the desired date format. To set the current date, press **No** or **Back** to increase or decrease the value.	dAtE Date
For example, if the current date is 22nd June, 2017, MM/DD/YY：06.22.17 DD/MM/YY：22.06.17 YY/MM/DD：17.06.22	06.22.17

5.3.7 Time Format

Set the time format. Time Format: **24hr** 12hr		
t.FormAt Time Format	24 hr **24hr**	12 hr 12hr

5.3.8 Time Setup

Set the current time in the desired time format.	
To set the current time, press **No** or **Back** to increase or decrease the value.	

5.3.9 Brightness

Set the brightness of the display. **Medium** High Low	 Brightness	 **Medium**
	 High	 Low

5.3.10 Auto Dim

Set whether the balance automatically turns off the display backlight of the display.		
Off = disabled. 10 minutes = become dim if there is no motion for 10 minutes. 20 minutes = become dim if there is no motion for 30 minutes.		
 10 min	 20 min	 30 min

5.3.11 Approved Mode

Use this menu to set the Legal for Trade status. **OFF = standard operation.** ON = operation complies with Legal Metrology regulations.	LFt

Note: When Approved Mode is set to On, the menu settings are affected as follows:

Calibration Menu:
- For InCal models, only Internal Calibration is available. All other functions are hidden.
- For ExCal models, the entire Calibration menu is hidden.

Balance Setup Menu:
- Filter Level is locked at the current setting.
- Auto Zero Tracking is limited to 0.5 Division and Off. The selected setting is locked.
- Auto Tare is locked at current setting.
- Graduations are forced to 1 Division and the menu item is hidden.

Communication Menu (Communication->Print Settings->Print Output):
- Stable Weight Only is locked On.
- Numeric Value Only is locked Off.

Communication Menu (Communication->Print Settings->Auto Print):
- Auto print mode selections are limited to Off, On Stability, and Interval. Continuous is not available.

Lockout Menu:
- Menu is hidden

5.4 Weighing Units

Enter this sub-menu to activate the desired units of measure.

PR balances provide a choice of 10 units, which are all set On by default.
Note: Due to national laws, the balance may not include some of the units of measure listed below.

Unit	Display
Gram	g
Kilogram	kg
Milligram	mg
Carat	ct
Pound	lb
Ounce	oz
Ounce Troy	ozt
Penny weight	dwt
Newton	N
Grain	GN

Changing Weighing Units

1. Press and hold the **Print / Unit** button until the *Unit Menu* is displayed.	
2. The default unit is gram (g). To change the unit, press **No** to advance to the next unit.	
3. Press **Yes** to set the unit displayed to the weighing unit.	

5.5 RS232 Interface Setup

Enter this sub-menu to customize RS232 standard settings. Data may be output to either a printer or a PC.	rS232

5.5.1 Baud Rate

Set the baud rate (bits per second).	bAud
1200 = 1200 bps 2400 = 2400 bps 4800 = 4800 bps **9600 = 9600 bps** 19200 = 19200 bps 38400 = 38400 bps	

5.5.2 Transmission

Set the data bits, stop bit, and parity. **8-N-1 = 8 data bits, no parity, stop bit 1** 8-N-2 = 8 data bits, no parity, stop bit 2 7-E-1 = 7 data bits, even parity, stop bit 1 7-E-2 = 7 data bits, even parity, stop bit 2 7-N-1 = 7 data bits, no parity, stop bit 1 7-N-2 = 7 data bits, no parity, stop bit 2 7-O-1 = 7 data bits, odd parity, stop bit 1 7-O-2 = 7 data bits, odd parity, stop bit 2	
PAr itY Parity	8-n- 1 **8 data bits, stop bit 1**

5.5.3 Handshake

Set the flow control method. **NONE = no handshaking** XON-XOFF = XON/XOFF handshaking HARDWARE = hardware handshaking	
H.ShAkE Handshake	nONE **None**
ON-OFF Xon / Xoff	HArdwJ Hardware

5.6 Print Settings

Enter this sub-menu to customize data transfer settings.	Pr int

5.6.1 Stable Only

Off = values are printed immediately regardless of stability. On = values are printed only when the stability criteria are met.	StAbLE

5.6.2 Numeric Only

Off = All results selected are printed. On = Only numeric data values are printed.	

5.6.3 Single Header

Off = Headers will be printed for every print requirement. On = Headers will be printed once a day.	

5.6.4 Auto Print

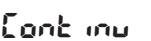
Enable or disable the functionality of auto print, and set the specific auto print mode.	

1. **Off = disabled**	

2. On Stability = printing occurs when the stability criteria are met.	

When On Stability is selected, set the conditions for printing. **Load = Prints when the displayed load is stable.**	
Load and Zero = Prints when the displayed load and zero reading is stable.	

3. Print Interval = printing occurs at the defined time interval. When Print Interval is selected, set the time interval using the numeric keypad. **Note:** Settings of 1 to 3600 seconds are available. Default is 0.	

4. Continuous = printing occurs continuously.	

5.6.5 Header

On = the header is printed. Off = the header is not printed.	HEAdEr

5.6.6 Date and Time

On = the date and the time are printed. Off = neither the date nor the time is printed.	dtMM

5.6.7 Balance ID

On = the balance ID is printed. Off = the balance ID is not printed.	bAL id

5.6.8 Balance Name

On = the balance name is printed. Off = the balance name is not printed.	bAL.nAMM

5.6.9 User Name

On = the user name is printed. Off = the user name is not printed.	USr.nAMM

5.6.10 Project Name

On = the project name is printed. Off = the project name is not printed.	PrJ.nAMM

5.6.11 Application Name

On = the application name is printed. Off = the application name is not printed.	APP.nAMM

5.6.12 Result

On = the weighing result is printed. Off = the weighing result is not printed.	rESuLt

5.6.13 Gross

On = the gross weight is printed. Off = the gross weight is not printed.	GroSS

5.6.14 Net

On = the net weight is printed. Off = the net weight is not printed.	nEt

5.6.15 Tare

On = the tare weight is printed. Off = the tare weight is not printed.	tArE

5.6.16 Line Feed

1 Line = move the paper up one line after printing. **4 Lines = move the paper up four lines after printing.**	FEEd
1 LinE 1 Line	4 LinES **4 Lines**

5.7 GLP

Enter this menu to set the Good Laboratory Practices (GLP).	GLP

5.7.1 Header

Enables the printing of GLP headings. There are up to 3 headings available. Alphanumeric settings up to 16 characters are available for each Header setting.	HEAdEr 1 Header 1
HEAdEr2 Header 2	HEAdEr3 Header 3

5.7.2 Balance Name

Set the balance name. Alphanumeric settings up to 16 characters are available for each Header setting.	bAL.nAME

5.7.3 User Name

Set the user name. Alphanumeric settings up to 16 characters are available for each Header setting.	

5.7.4 Project Name

Set the user name. Alphanumeric settings up to 16 characters are available for each Header setting. The default is blank.	

5.8 Factory Reset

Use this sub-menu to reset the all menu settings to their Factory default settings. Reset All = resets all menus to their factory default settings. **Exit** = return to application main screen without resetting any menus.	

5.9 Lockout

Use this sub-menu to lock / unlock certain menus. **Off = the menu is unlocked.** On = the menu is locked.	

6. LEGAL FOR TRADE（LFT）

When the balance is used in trade or a legally controlled application it must be set up, verified and sealed in accordance with local weights and measures regulations. It is the responsibility of the purchaser to ensure that **all pertinent legal requirements** are met.

6.1 Settings

Before verification and sealing, perform the following steps in order:

1. Verify that the menu settings meet the local weights and measures regulations.
2. Verify the units turned On meet the local weights and measures regulations.
3. Perform a calibration as explained in Section 5.2.
4. Set Approved Mode to On in the Balance Setup menu.
5. As shown in Figure 6-1, press the push button inside the hole.

Note: When Approved Mode is set to On, external calibration can't be performed.

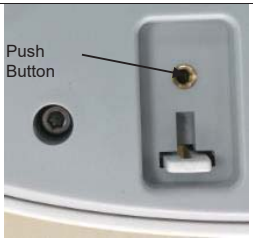
6.2 Verification

A weights and measures official or authorized service agent must perform the verification procedure.

6.3 Sealing

After the Balance has been verified, it must be sealed to prevent undetected access to the legally controlled settings. Before sealing the device, ensure the Approved Mode setting in the Balance Setup menu has been set to ON.

- If using a paper seal, place seals over the security switch and the bottom housing as shown.
- If using a wire seal, pass the sealing wire through the holes in the security screw and the bottom housing as shown.



Location of security switch

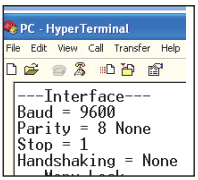
Paper Seal

Wire Seal

Figure 6-1. Sealing

7. PRINTING

7.1 Connecting, configuring and Testing the Printer / Computer Interface



Use the built-in RS-232 Port to connect either to a computer or a printer.
If connecting to a computer, use HyperTerminal or similar software like SPDC described below.
(Find HyperTerminal under **Accessories/Communications** in Windows XP.)

Connect to the computer with a standard (straight-through) serial cable.

Choose **New Connection**, "connect using" COM1 (or available COM port).

Select **Baud=9600**; **Parity=8 None**; **Stop=1**; **Handshaking=None**. Click **OK**.

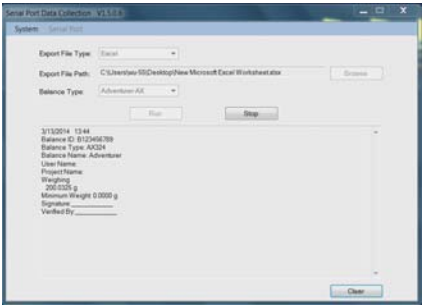
Choose Properties/Settings, then ASCII Setup. Check boxes as illustrated:
(**Send line ends…**; **Echo typed characters…**; **Wrap lines…**)

Use RS232 Interface Commands (Section 9.6.1) to control the balance from a PC.

SPDC Software

The Serial Port Data Collection / SPDC software is provided by Ohaus and can be used on operating systems that do not have the HyperTerminal software mentioned above. SPDC software can preliminarily collect and transfer the data to Microsoft files (such as Excel, Word, etc.).

Choose the export file type and export file path and then press Run as shown below.



System Requirements

- PC running Windows 98®, Windows 98SE®, Windows ME®, Windows 2000®, Windows XP®, Windows 7® or Windows 8® (32-bit).

Note: **The latest SPDC software support English and Chinese language and can be downloaded from the Ohaus' website. For more information, refer to the *SPDC Data Collection Instruction Manual.***

7.2 Output format

The Result Data, and G/N/T data, is output in the following format.

Field:	Label [1]	Space [2]	Weight [3]	Space[2]	Unit [4]	Space	Stability [5]	Space	G/N [6]	Space	Term. Characters [7]
Length:		1	11	1	5	1	≤ 1	≤ 1	≤ 3	0	≤ 8

Note:

1. The length of the label field is not fixed.
2. Each field is followed by a single delimiting space (ASCII 32).
3. The Weight field is 11 right justified characters. If the value is negative, the '–' character is located at the immediate left of the most significant digit.
4. The Unit field contains the unit of measure abbreviation up to 5 characters, right justified.
5. The Stability field contains the "?" character if the weight reading is not stable. The Stability field and the following Space field are omitted if the weight reading is stable.
6. The G/N field contains the net or gross indication. For net weights, the field contains "N". For gross weights, the field contains "G".
7. The Termination Characters field contains CRLF, Four CRLF or Form Feed (ASCII 12), depending on the LINE FEED menu setting.
8. When Numeric Only is set On, only the Weight Field is printed, left-aligned.

7.3 Printout Examples

Examples for each Application are shown with all items turned **ON** in the **Print** menu. The default values for **Header** lines 1-3 are also shown.

Basic Weighing

```
Header 1
Header 2
Header 3
07/19/2017    17:56:23
Balance ID: B234567890
Balance Name: PR4202/E
User Name:
Project Name:
Weigh
      0.10    g
Gross:          0.10    g G
Net:            0.10    g N
Tare:           0.00    g T



Signature: _____________
Verified By: _____________
```

Count Weighing

```
Header 1
Header 2
Header 3
07/19/2017    17:57:19
Balance ID: B234567890
Balance Name: PR4202/E
User Name:
Project Name:
Count
Quantity:       4999   PCS
Gross:         49.99    g G
Net:           49.99    g N
Tare:           0.00    g T
APW: 0.010 g
Sample Size: 10 PCS



Signature: _____________
Verified By: _____________
```

Percent Weighing

```
Header 1
Header 2
Header 3
07/19/2017    17:57:19
Balance ID: B234567890
Balance Name: PR223/E
User Name:
Project Name:
Percent
Percentage:    10.156    % N
Gross:         23.361    g G
Net:           10.156    g N
Tare:          13.205    g T
Reference weight: 100.000 g



Signature: _____________
Verified By: _____________
```

Internal Calibration

-OHAUS-
07/26/2017 05:16:53
Balance ID:
Balance Name: PR2202
User Name:
Project Name:
---Internal Calibration---
Calibration is done.
Difference weight: 0.00 g

Signature: _____
Verified By: _____

Span Calibration

-OHAUS-
07/26/2017 05:16:37
Balance ID:
Balance Name: PR2202
User Name:
Project Name:
---Span Calibration---
Calibration is done.
Reference weight: 2000.00 g
Actual weight: 2000.22 g
Difference weight: 0.22 g
Weight ID: _____

Signature: _____
Verified By: _____

Linearity Calibration

-OHAUS-
07/26/2017 05:16:11
Balance ID:
Balance Name: PR2202
User Name:
Project Name:
---Linear Calibration---
Calibration is done.

Signature: _____
Verified By: _____

8. MAINTENANCE

8.1 Calibration

Periodically verify calibration by placing an accurate weight on the balance and viewing the result. If calibration is required, refer to section 5.2 for instructions.

8.2 Cleaning

WARNING: Disconnect the balance from the power supply before cleaning.
Make sure that no liquid enters the interior of the balance.

Clean the Balance at regular intervals.

Housing surfaces may be cleaned with a lint-free cloth slightly dampened with water or a mild cleaning agent.

Glass surfaces may be cleaned with a commercial glass cleaner.

Attention: Do not use solvents, harsh chemicals, ammonia or abrasive cleaning agents.

8.3 Troubleshooting

TABLE 8-1 TROUBLESHOOTING

Symptom / Display	Possible Cause
Err 8.1	Over init zero range
Err 8.2	Under init zero range
Err 8.3	Over load
Err 8.4	Under load
Err 9.5	Loadcell is not ok
Err 53	EEPROM is not ok
No CAL	Production calibration failure
Idnr.Err	IDNR error
Error	Other error
--NO--	Tare out of range
--NO--	Zero out of range
Low.rEF	Low reference weight, only in counting mode.
t.Mout	Timeout
PUSH.LFt	For PR, need to push LFT button.

8.4 Service Information

If the troubleshooting section does not resolve your problem, contact an Authorized Ohaus Service Agent. Please visit our website www.ohaus.com to locate the Ohaus office nearest you.

9. TECHNICAL DATA

9.1 Specifications

Ambient conditions

- Indoor use only
- Altitude: Up to 2000 m
- Specified Temperature range: 10°C to 30°C
- Humidity: maximum relative humidity 80% for temperatures up to 30°C, decreasing linearly to 50% relative humidity at 40°C
- Operability is assured at ambient temperatures between 5°C and 40°C
- Mains supply voltage fluctuations: up to ±10% of the nominal voltage
- Installation category II
- Pollution degree: 2
- Supply voltage: 12V⎓0.5A

Materials

- Bottom Housing: Die-cast Aluminum, Painted + Plastic (HIPS)
- Top Housing: Plastic (HIPS)
- Weighing Platforms: Stainless steel
- Draft Shield: Glass, plastic (HIPS)
- Feet: Plastic (ABS)

Table 9-1 SPECIFICATIONS

InCal Model		**PR124**	**PR224**	**PR223**	**PR423**	**PR523**
ExCal Model	**PR64/E**	**PR124/E**	**PR224/E**	**PR223/E**	**PR423/E**	**PR523/E**
Capacity (g)	62	120	220	220	420	520
Readability d (g)	0.0001	0.0001	0.0001	0.001	0.001	0.001
Repeatability (STDEV) (g)	0.0001	0.0001	0.0001	0.001	0.001	0.001
Linearity (g)	0.0002	0.0002	0.0002	0.002	0.002	0.002
Stabilization Time Typical (s)	4	4	4	2	2	2
Sensitivity Temperature Drift (PPM/K)	±3	±3	±3	±8	±3	±3
Typical Minimum Weight USP (USP K=2,U=0.10%)	200 mg	200 mg	200 mg	2 g	2 g	2 g
Optimized Min-Weight (USP, u=0.10%, k=2) SRP ≤ 0.41d*	82 mg	82 mg	82 mg	0.82 g	0.82 g	0.82 g
Units	Milligram, Gram, Kilogram, Ounce, Pound, Carat, Penny weight, Ounce Troy, Newton, Grain					
Applications	Basic Weighing; Parts counting; Percent weighing					
Platform Size (diameter)	3.5 in / 9 cm	3.5 in / 9 cm	3.5 in / 9 cm	4.7 in / 12 cm	4.7 in / 12 cm	4.7 in / 12 cm
Span Calibration Points (g)	30, 60	50, 100	100, 200	100, 200	200, 400	250, 500
Linearity Calibration Points (g)	20, 40, 60	50, 75, 100	50, 100, 150, 200	50, 100, 150, 200	100, 200, 300, 400	200, 300, 400, 500
Tare Range	To capacity by subtraction					
Power Supply	Power input: 100-240 V ~ 200 mA 50-60Hz 12-18VA Power output: 12 VDC 0.5A					
Assembled Dimensions (W x D x H)	201 x 317 x 303 mm 7.9 x 12.5 x 11.9 inch					
Communication	RS232					
Operating Temperature Range	10°C to 30°C					
Storage Temperature Range	Humidity: maximum relative humidity 80 % for temperatures up to 30°C, decreasing linearly to 50% relative humidity at 40°C					
Storage Conditions	-10°C to 60°C, humidity 10% to 90%, without condensation					
Net Weight	10 lb / 4.5 kg	10 lb / 4.5 kg	10 lb / 4.5 kg	10 lb / 4.5 kg	10 lb / 4.5 kg	10 lb / 4.5 kg
Shipping Weight	15.4lb / 7 kg	15.4lb / 7 kg	15.4lb / 7 kg	15.4lb / 7 kg	15.4lb / 7 kg	15.4lb / 7 kg
Shipping Dimensions (W x D x H)	507 x 387 x 531 mm 20*15*21 inch					

*SRP refers to the standard deviation for n replicate weighings (n⩾10).

Table 9-2 SPECIFICATIONS (continued)

InCal Model	**PR1602**	**PR2202**	**PR4202**	**PR4201**	**PR6201**
ExCal Model	**PR1602/E**	**PR2202/E**	**PR4202/E**	**PR4201/E**	**PR6201/E**
Capacity (g)	1600	2200	4200	4200	6200
Readability d (g)	0.01	0.01	0.01	0.1	0.1
Repeatability (STDEV) (g)	0.01	0.01	0.01	0.1	0.1
Linearity (g)	0.02	0.02	0.02	0.2	0.2
Stabilization Time Typical (s)	1	1	1	1	1
Sensitivity Temperature Drift (PPM/K)	±6	±6	±3	±10	±10
Typical Minimum Weight USP (USP K=2,U=0.10%)	20 g	20 g	20 g	200 g	200 g
Optimized Min-Weight (USP, u=0.10%, k=2) SRP ≤ 0.41d*	8.2 g	8.2 g	8.2 g	82 g	82 g
Units	Milligram, Gram, Kilogram, Ounce, Pound, Carat, Pennyweight, Ounce Troy, Newton, Grain				
Applications	Basic Weighing; Parts counting; Percent weighing				
Platform Size (diameter)	7.1 in / 18 cm	7.1 in / 18 cm	7.1 in / 18 cm	7.1 in / 18 cm	7.1 in / 18 cm
Span Calibration Points (g)	750, 1500	1000, 2000	2000, 4000	2000, 4000	3000, 6000
Linearity Calibration Points (g)	500, 1000, 1500	500, 1000, 1500, 2000	1000, 2000, 3000, 4000	1000, 2000, 3000, 4000	2000, 4000, 6000
Tare Range	To capacity by subtraction				
Power Supply	Power input: 100-240 V ~ 200 mA 50-60Hz 12-18VA Power output: 12 VDC 0.5A				
Assembled Dimensions (W x D x H)	201 x 317 x 93 mm 7.9 x 12.5 x 3.7 inch				
Communication	RS232				
Operating Temperature Range	10°C to 30°C				
Storage Temperature Range	Humidity: maximum relative humidity 80 % for temperatures up to 30°C, decreasing linearly to 50% relative humidity at 40°C				
Storage Conditions	-10°C to 60°C, humidity 10% to 90%, without condensation				
Net Weight	7.7 lb / 3.5 kg				
Shipping Weight	11 lb / 5 kg				
Shipping Dimensions (W x D x H)	550 x 385 x 291 mm 22 x 15 x 12 inch				

*SRP refers to the standard deviation for n replicate weighings (n≥10).

Table 9-3 SPECIFICATIONS (continued)

InCal Model	**PR124N**	**PR224N**		**PR523N**
ExCal Model	**PR124N/E**	**PR224N/E**	**PR323N/E**	**PR523N/E**
Capacity (g)	120	220	320	520
Readability d (g)	0.0001	0.0001	0.001	0.001
Verification interval e(g)	0.001	0.001	0.01	0.01
Class	I	I	II	II
Repeatability (STDEV) (g)	0.0001	0.0001	0.001	0.001
Linearity (g)	0.0002	0.0002	0.002	0.002
Eccentric Load	Not exceeding the maximum permissible error for the one-third of the full capacity of the balance			
Stabilization Time Typical (s)	4	4	2	2
Sensitivity Temperature Drift (PPM/K)	±3	±3	±3	±3
Typical Minimum Weight USP (USP K=2,U=0.10%)	200mg	200mg	2g	2g
Optimized Min-Weight (USP, u=0.10%, k=2) SRP ≤ 0.41d*	82mg	82mg	0.82g	0.82g
Units	g, mg, ct, grain, oz, ozt			
Applications	Basic Weighing; Parts counting; Percent weighing			
Platform Size (diameter)	3.5 in / 9 cm	3.5 in / 9 cm	4.7 in / 12 cm	4.7 in / 12 cm
Span Calibration Points (g)	50, 100	100, 200	150,300	250, 500
Linearity Calibration Points (g)	50, 75, 100	50, 100, 150, 200	100, 200, 300	200, 300, 400, 500
Tare Range	To capacity by subtraction			
Power Supply	Power input: 100-240 V ~ 200 mA 50-60Hz 12-18VA Power output: 12 VDC 0.5A			
Assembled Dimensions (W x D x H)	201 x 317 x 303 mm 7.9 x 12.5 x 11.9 inch			
Communication	RS232			
Operating Temperature Range	10°C to 30°C			
Storage Temperature Range	Humidity: maximum relative humidity 80 % for temperatures up to 30°C, decreasing linearly to 50% relative humidity at 40°C			
Storage Conditions	-10°C to 60°C, humidity 10% to 90%, without condensation			
Net Weight	10 lb / 4.5 kg	10 lb / 4.5 kg	10 lb / 4.5 kg	10 lb / 4.5 kg
Shipping Weight	15.4lb / 7 kg	15.4lb / 7 kg	15.4lb / 7 kg	15.4lb / 7 kg
Shipping Dimensions (W x D x H)	507 x 387 x 531mm 20 x 15 x 21 inch			

*SRP refers to the standard deviation for n replicate weighings (n≥10).

Table 9-4 SPECIFICATIONS (continued)

ExCal Model	PR822N/E	PR2202N/E	PR4202N/E	PR5202N/E	PR2201N/E	PR4201N/E	PR6201N/E
Capacity (g)	820	2200	4200	5200	2200	4200	6200
Readability d (g)	0.1	0.01	0.01	0.01	0.1	0.1	1
Verification interval e(g)	0.1	0.1	0.1	0.1	1	1	1
Class	III	II	II	II	II	II	III
Repeatability (STDEV) (g)	0.1	0.01	0.01	0.01	0.1	0.1	1
Linearity (g)	0.02	0.02	0.02	0.02	0.2	0.2	0.2
Eccentric Load	Not exceeding the maximum permissible error for the one-third of the full capacity of the balance						
Stabilization Time Typical (s)	1	1	1	1	1	1	1
Sensitivity Temperature Drift (PPM/K)	±6	±6	±3	±3	±10	±10	±10
Typical Minimum Weight USP (USP K=2,U=0.10%)	20g	20g	20g	20g	200g	200g	200g
Optimized Min-Weight (USP, u=0.10%, k=2) SRP ≤ 0.41d*	8.2g	8.2g	8.2g	8.2g	82g	82g	82g
Units	g, kg, ct, grain, oz, ozt, lb						
Applications	Basic Weighing; Parts counting; Percent weighing						
Platform Size (diameter)	7.1 in / 18 cm						
Span Calibration Points (g)	400,800	1000, 2000	2000, 4000	2500, 5000	1000, 2000	2000, 4000	3000, 6000
Linearity Calibration Points (g)	200,400, 600,800	500, 1000, 1500, 2000	1000, 2000, 3000, 4000	2000, 3000, 4000, 5000	500, 1000, 1500, 2000	1000, 2000, 3000, 4000	2000, 4000, 6000
Tare Range	To capacity by subtraction						
Power Supply	Power input: 100-240 V ~ 200 mA 50-60Hz 12-18VA Power output: 12 VDC 0.5A						
Assembled Dimensions (W x D x H)	201 x 317 x 93 mm 7.9 x 12.5 x 3.7 inch						
Communication	RS232						
Operating Temperature Range	10°C-40°C	10°C to 30°C	10°C to 30°C	10°C to 30°C	10°C to 30°C	10°C to 30°C	10°C-40°C
Storage Temperature Range	Humidity: maximum relative humidity 80 % for temperatures up to 30°C, decreasing linearly to 50% relative humidity at 40°C						
Storage Conditions	-10°C to 60°C, humidity 10% to 90%, without condensation						
Net Weight	7.7 lb / 3.5 kg						
Shipping Weight	11 lb / 5 kg						
Shipping Dimensions (W x D x H)	550 x 385 x 291 mm 22 x 15 x 12 inch						

*SRP refers to the standard deviation for n replicate weighings (n≥10).

9.2 Drawings and Dimensions

Fully assembled dimensions

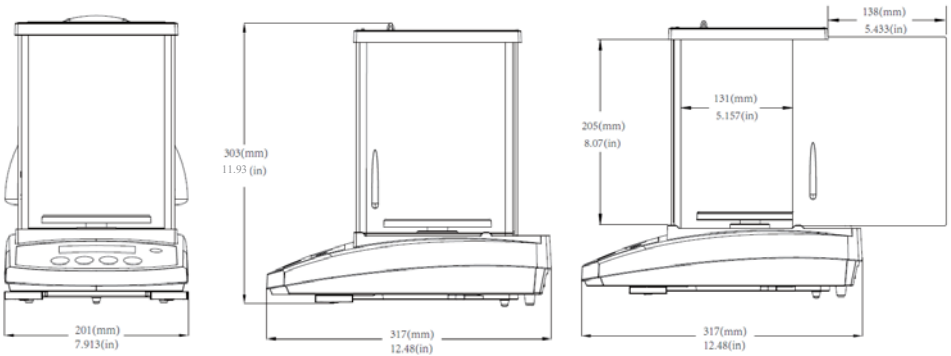


Figure 9-1 0.001 g / 0.0001 g model

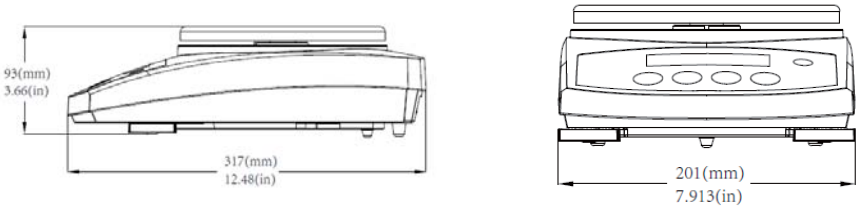


Figure 9-2 0.1 g / 0.01 g model

9.3 Accessories

DESCRIPTION	PART NUMBER
Auxiliary Display AD7-RS	30472064
Security Device	80850043
RS232 Cable（25 pin）	80500524
RS232 Cable（9 pin）	80500525
Dust Cover	30093334
In-use Cover	30372547
Printer SF40A	30064202 (EU); 30064203 (AM)
Power Adapter for Balance	46001724

9.4 Communication

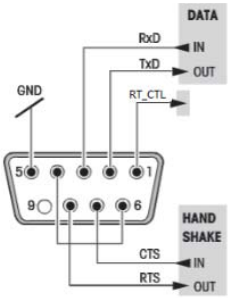
9.4.1 Interface Commands

Commands listed in the following table will be acknowledged by the balance.

Command	Function
IP	Immediate Print of displayed weight (stable or unstable).
P	Print displayed weight (stable or unstable).
CP	Continuous Print.
SP	Print on Stability.
SLP	Set Auto Print to On Stability, allow non-zero displayed weight be printed.
SLZP	Set Auto Print to On Stability, allow both stable non-zero weight and stable zero reading to be printed.
xP	Set Auto Print to Interval Print, x = print interval (1-3600 sec), 0P disable the interval Print
0P	0P disable interval print, continuous print or print on stability
H	Enter Print Header Lines, the format is: H x "header string". Where x = line number 1 to 3, “header string” can be up to 24 alphanumeric characters. If no string in the command, "H x" will read the stored header x.
Z	Same as pressing Zero Key.
T	Same as pressing Tare Key.
xT***	Establish a preset Tare value in displayed unit. x = preset tare value. Sending 0T clears tare (if allowed).
PT	Prints Tare weight stored in memory.
PM	Print current application mode (weighing mode).
xM	Set current application mode to x. x depends on applications 1 – Weigh 2 – Count 3 – Percent
M	Scroll to the next enabled mode.
PU	Print Current weighing unit: g, kg, lb, oz, etc.….
xU	Set balance to unit x: g, kg etc. 1 – g 2 – kg 3 – mg 4 – ct

Command	Function
	...
U	Scroll to the next enabled unit.
ON	Brings out of Standby
OFF	Goes to Standby.
C	Begin Span Calibration
IC	Begin Internal Calibration.
AC	Abort Calibration.
PSN	Print Serial Number.
PV	Print Version: print name, software revision and LFT On (if LFT is set On).
x#	Set Counting APW (x) in grams. (must have APW stored)
P#	Print Counting application APW.
x%	Set Percent application reference weight (x) in grams. (must have reference weight stored)
P%	Print Percent application reference weight.
PTIME	Print current time.
PDATE	Print current date.
xTIME	Set Time x format: hh:mm:ss
xDATE	Set Date x format: mm/dd/yyyy
xS	0 = print unstable data, 1 = print stable only
xRL	Enable or disable OK response to non-print commands: x=0 to disable, x=1 to enable.
xT	Pre-tare the container weight (x) in grams.

9.4.2 RS232 (DB9) Pin Connections

Diagram	Type	Description
	Interface type	Voltage interface conforming to EIA RS-232C/DIN 66020 (CCITT V24/V.28)
	Max. cable length	15 m
	Signal level	Output: +5 V ... +15 V (RL = 3 – 7kΩ) -5 V ... -15 V (RL = 3 - 7 kΩ) Input: +3 V ... +25 V -3 V ... -25 V
	Connector	Sub-D, 9-pole, female
	Operating mode	Full duplex
	Transmission mode	Bit-serial, asynchronous
	Transmission code	ASCII
	Baud rates	1200, 2400, 4800, 9600, 19200, 38400 (firmware selectable)
	Bits/parity	7-bit/even, 7-bit/odd, 7-bit/none, 8-bit/none (firmware selectable)
	Stop bits	Stop bit 1, 2
	Handshake	None, XON/XOFF, RTS/CTS (selectable)
	End-of-line	Not selectable

10. SOFTWARE UPDATES

Ohaus is continuously improving its balance software. To obtain the latest release, please contact your Authorized Ohaus Dealer or Ohaus Corporation.

11. COMPLIANCE

Compliance to the following standards is indicated by the corresponding mark on the product.

Mark	Standard
CE	This product complies with the EU Directives 2011/65/EU (RoHS), 2014/30/EU (EMC), 2014/35/EU (LVD) and 2014/31/EU (NAWI). The EU Declaration of Conformity is available online at www.ohaus.com/ce.
	EN 61326-1, AS/NZS 61010-1
C SP US MC173467	CAN/CSA-C22.2 No. 61010-1 UL Std. No. 61010-1

	This product complies with the EU Directive 2012/19/EU (WEEE). Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. For disposal instructions in Europe, refer to www.ohaus.com/weee.

Important notice for verified weighing instruments in the EU

When the instrument is used in trade or a legally controlled application it must be set up, verified and sealed in accordance with local weights and measures regulations. It is the responsibility of the purchaser to ensure that all pertinent legal requirements are met.

Weighing Instruments verified at the place of manufacture bear the following supplementary metrology marking on the descriptive plate.

CE M16 1259

Weighing Instruments to be verified in two stages have no supplementary metrology marking on the descriptive plate. The second stage of conformity assessment must be carried out by the applicable weights and measures authorities.

If national regulations limit the validity period of the verification, the user of the weighing instrument must strictly observe the re-verification period and inform the weights and measures authorities.

As verification requirements vary by jurisdiction, the purchaser should contact their local weights and measures office if they are not familiar with the requirements.

FCC Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Note

This Class A digital apparatus complies with Canadian ICES-003.

ISO 9001 Registration

In 1994, OHAUS Corporation, USA, was awarded a certificate of registration to ISO 9001 by Bureau Veritas Quality International (BVQI), confirming that the OHAUS quality management system is compliant with the ISO 9001 standard's requirements. On June 21, 2012, OHAUS Corporation, USA, was re-registered to the ISO 9001:2008 standard.

LIMITED WARRANTY

Ohaus products are warranted against defects in materials and workmanship from the date of delivery through the duration of the warranty period. During the warranty period Ohaus will repair, or, at its option, replace any component(s) that proves to be defective at no charge, provided that the product is returned, freight prepaid, to Ohaus.

This warranty does not apply if the product has been damaged by accident or misuse, exposed to radioactive or corrosive materials, has foreign material penetrating to the inside of the product, or as a result of service or modification by other than Ohaus. In lieu of a properly returned warranty registration card, the warranty period shall begin on the date of shipment to the authorized dealer. No other express or implied warranty is given by Ohaus Corporation. Ohaus Corporation shall not be liable for any consequential damages.

As warranty legislation differs from state to state and country to country, please contact Ohaus or your local Ohaus dealer for further details.