Industrial Weighing Systems

9 Richmond St. Picton, ON Canada K0K 2T0

Ph: 613-786-0016 Cell: 613-921-0397 Fax: 613-476-5293

E-mail info@iwsystems.ca **Website:** www.iwsystems.ca

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LAB SCALE

ALD SERIES

USER MANUAL

ALD_07.06_UK

TABLE OF CONTENTS

1. INTRODUCTION

This manual contains installation, operation and maintenance instructions for the balance. Please read the manual completely before using the balance.

1.1 DESCRIPTION

These balances are precision weighing instruments that will provide you with years of service if properly cared for. The balances are available in capacities from 110 grams to 4100 grams.

1.2 FEATURES

- AC Adapter included
- Weighing, Parts Counting, Percent Weighing
- RS232 interface
- Integral security bracket
- Weighing with hanging load hook

1.3 SAFETY PRECAUTION

Please follow these safety precautions:

- Verify that the input voltage printed on the AC Adapter matches the local AC power supply.
- Use the balance only in dry locations.
- Do not operate the balance in hostile environments.
- Do not drop loads on the platform.
- Do not place the balance upside down, without first installing the cone cover.
- Service should be performed only by authorized personnel.

2. INSTALLATION

2.1 UNPACKING

Carefully remove your balance and each of its components from the package. Save the packaging to ensure safe storage and transport.

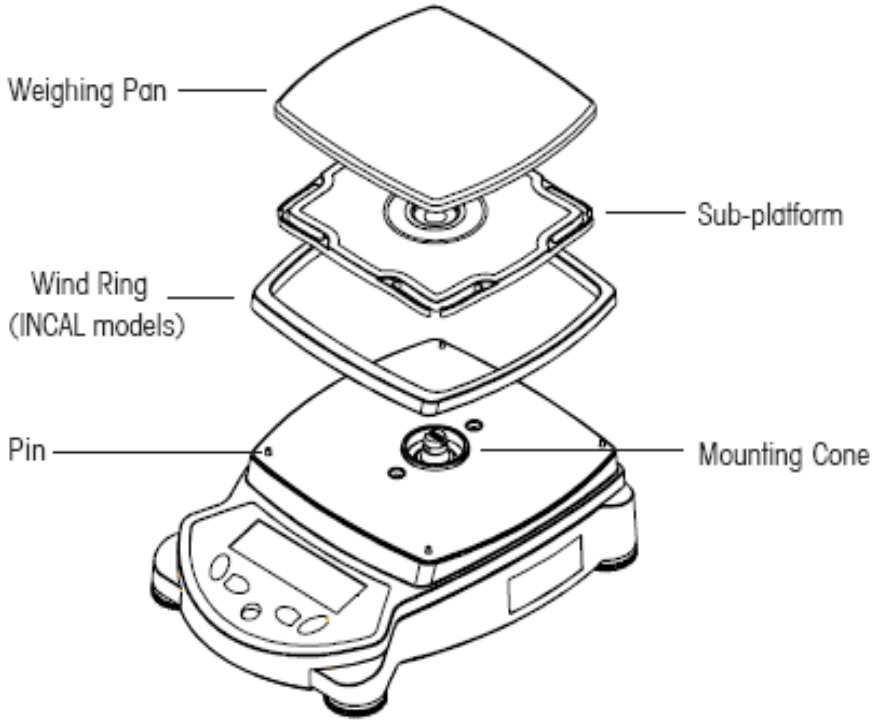
2.2 INSTALLING COMPONENTS

Use the illustrations and instructions below to identify and assemble your model with its components. All components must be installed before using the balance.

2.2.1 Assembly of models ALD2102, ALD4102

Note: Assembly instructions also apply to models with the suffix C.

1. Insert the Sub-plate on the Mounting Cone located in the center of the balance. Align the Sub-platform so that it is fully seated on the cone.
2. Place the Weighing Pan on the Sub-platform.
3. For applicable models, place the Wind Ring over the pins located on the perimeter of the balance.



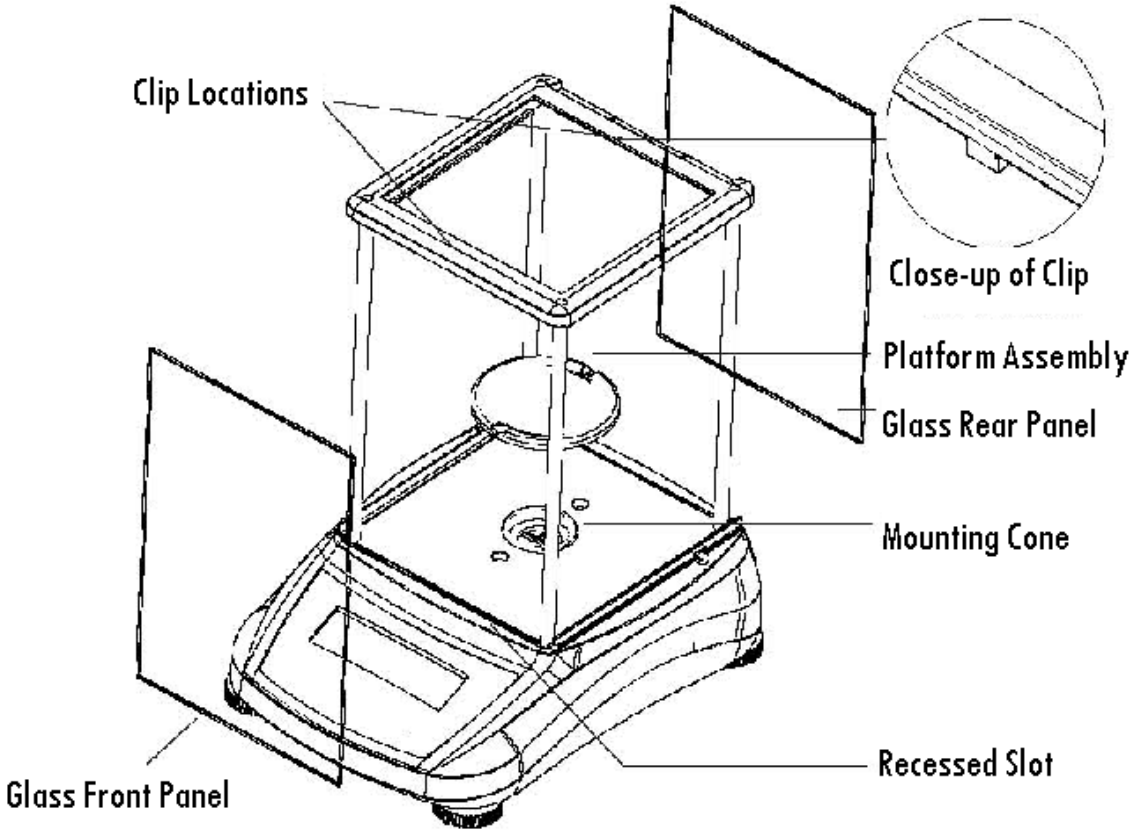
2.2.2 Assembly of models ALD114, ALD264, ALD213, ALD413, ALD513

1. Insert the Platform Assembly on the Mounting Cone in the center of the balance.

2. Carefully remove each of the five (5) glass Draft Shield sections from its packing. You will note that two (2) of these are plain, two (2) contain handles, and the other is set in a plastic frame. These sections or panels comprise the front and rear, side doors, and top (respectively) of the Draft Shield. The Draft Shield contains four (4) upright posts and two (2) cross-members which act as a framework for insertion of the panels.

3. Install the plain glass panels to form the front and rear of the Draft Shield.

- Select a plain glass panel and insert the bottom edge of the glass in the recessed slot in front of the balance, as shown.
- As you push the top edge of the glass panel toward the cross-member, reach inside the top of the framework and depress the small clip located under the cross-member.
- Press the glass panel into the framework until you feel the glass slip into place.
- Release the clip when the glass panel is fully inserted.
- Repeat these steps to install the other plain glass panel on the opposite side of the framework.

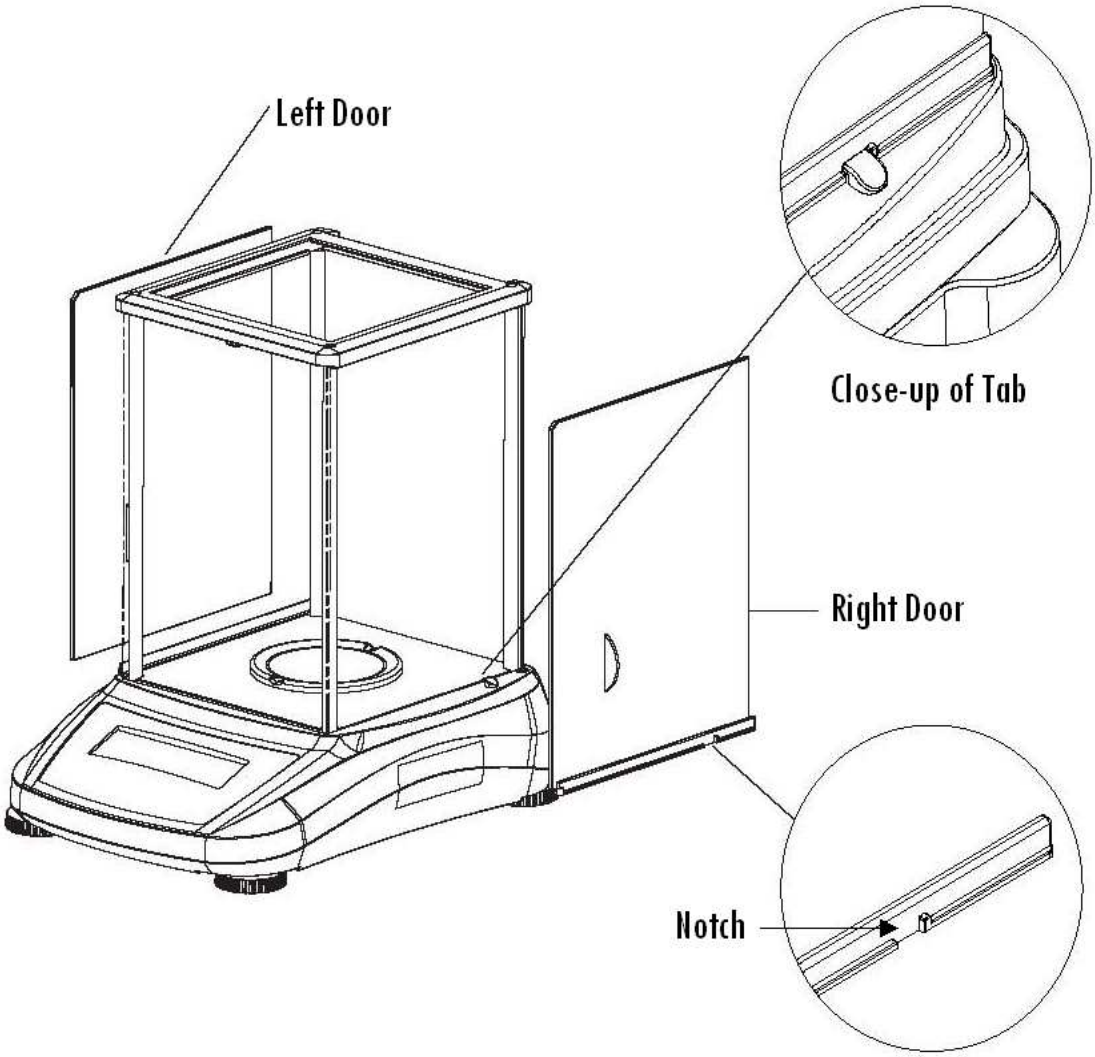


4. Install the glass doors in the sides of the Draft Shield framework.

Note: The glass doors must be inserted in the Draft Shield framework before inserting the top door; likewise, you must remove the top door before you remove the side doors.

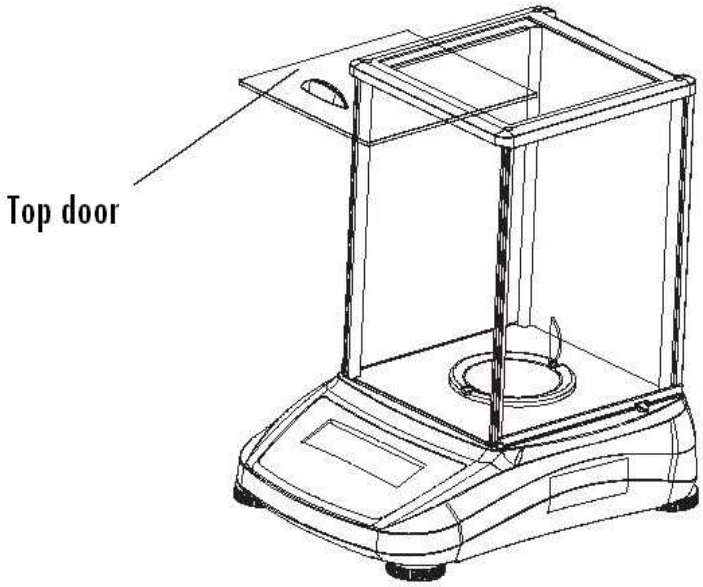
- Hold and position each door so that the handle is near the front of the balance and the small notch on the bottom edge of the door is lined up with the tab that protrudes from the side of the balance housing (shown below).
- Insert the top edge of the glass door into the recessed area under the top crossmember of the Draft Shield framework.
- Slide the notch on the bottom edge over the tab and slip the door in place.

5. The door may now be opened by sliding it toward the back of the balance.



6. Install the top door panel.

- Insert the top door in the Draft Shield by holding the door horizontally over the top of the Draft Shield framework, as shown.
- Position the back edge of the door so that it can be inserted in the opening.

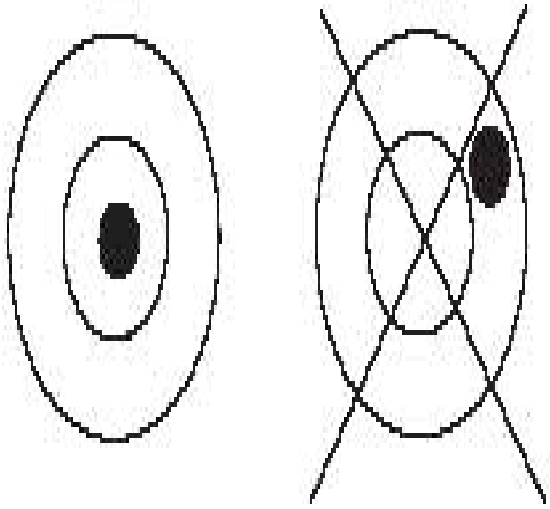


2.3 SELECTING THE LOCATION

Locate the balance on a firm, steady surface. Avoid locations with excessive air current, vibrations,heat sources, or rapid temperature changes.

2.4 LEVELING THE BALANCE

Before the balance is used, the feet should be adjusted so that the scale is level with the surface. This will enable accurate weighing. You will see a level bubble indicator in a small round window on the front of the balance. Level the balance by adjusting the leveling feet so the bubble is centered in the circle, as seen below.



Balance Level

2.5 CONNECTING POWER

2.5.1 AC Adapter

Connect the AC Adapter to the wall outlet. Connect the plug into the receptacle on the rear of the balance.

2.5.2 Turning Power On and Off

Press the **On/Zero** button to turn power on.

The balance performs a segment check.

The balance then displays the last selected application mode.

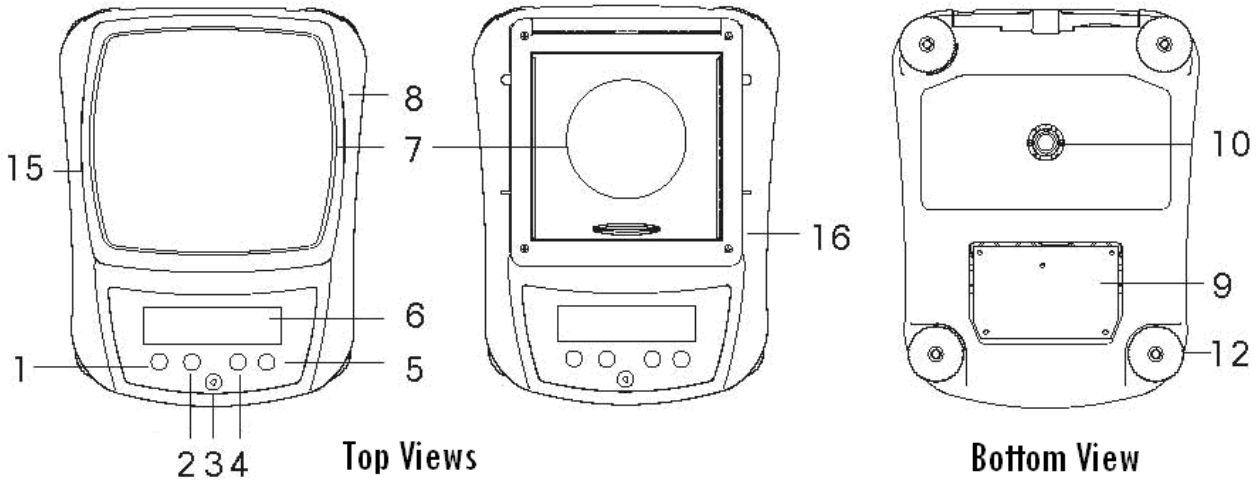
To turn power off, press and hold the **Off** button until OFF is displayed, then release the button.

2.6 INITIAL CALIBRATION

When the balance is first installed, and when it is moved to another location, it must be calibrated to ensure accurate weighing results. Have the appropriate calibration masses available before beginning calibration. Refer to Section 3.7 for masses and calibration procedure.

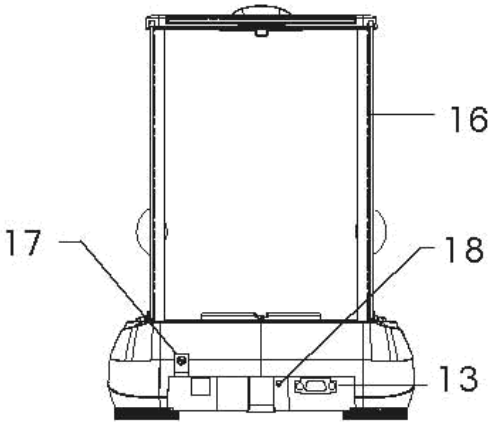
3. OPERATION

3.1 OVERVIEW OF CONTROLS AND DISPLAY FUNCTIONS



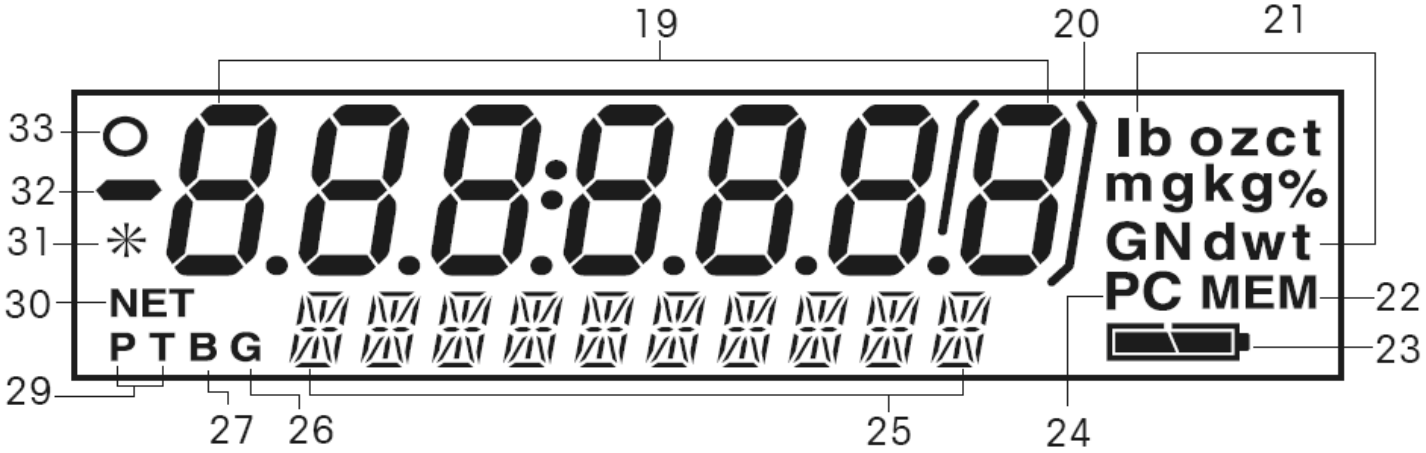
Top Views

Bottom View



Rear View

3.1.1 Models ALD114, ALD264, ALD213, ALD413, ALD513, ALD2102, ALD4102



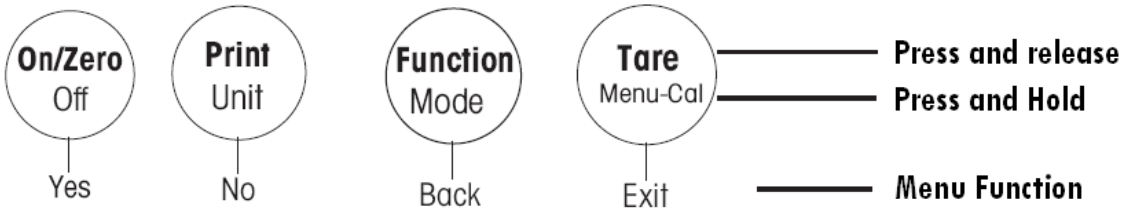
Top Views Bottom

al Display Window

No.	Description	No.	Description
1	ON / ZERO / OFF / yes Button	18	Lock Switch
2	PRINT / UNIT / no Button	19	Primary display
3	Level bubble	20	Brackets
4	Function Mode / Back Button	21	Units of Measurement
5	Tare Menu-Cal / Exit Button	22	Memory Indicator
6	Display	23	Battery Strength Indicator
7	Pan	24	Pieces Indicator
8	Type label on side of housing	25	Secondary Display
9	Data label	26	Gross Indicator
10	Weighing with hanging load Opening	27	Brutto Indicator
12	Leveling feet	29	Preset Tare Indicator
13	COM 1 - RS232 Connector	30	Net Indicator
15	Wind Ring	31	Stability Indicator
16	Draft Shield	32	Negative Indicator
17	Power Connector	33	Center of Zero Indicator

3.2 BUTTON CONTROL FUNCTIONS

Four multifunction buttons are used to to operate the balance and navigate the menus. The function of each button is shown below.



Primary Function	**On/Zero** • If balance is off, turns balance on. • If balance is on, sets zero.	**Print** • Sends current display value to the serial interface.	**Function** • Operation is dependent on the application mode.	**Tare** • Performs tare operation.
Secondary Function	**Off** • Turns balance off.	**Unit** • Change weighing unit.	**Mode** • Change application mode.	**Menu- Cal** • Enter the User menu. • Calibration is the first sub-menu.
Menu Function	**Yes** • Accepts the current (blinking) setting on the display.	**No** • Rejects the current setting (blinking) on the display. • Increments a value being entered.	**Back** • Reverts back to previous menu item. • Decrements a value being entered.	**Exit** • Immediately exits menu mode. • Aborts a calibration in progress.

3.3 USING THE BUTTON CONTROL FUNCTIONS

3.3.1 Setting the Balance to Zero

Remove the load from the pan and press the **Zero** button to set the display to zero.
When the weighing pan or platform is empty, the Center of Zero indicator turns on when the measurement is within ± 1/4 d of the zero setting.

3.3.2 Taring

Taring refers to the action of allowing for the weight of a container so that only the weight of objects held in the container (net weight) is displayed.

To Tare

Place the empty container on the pan and press the **Tare** button.
Add material to the container. The net weight of the material is displayed.
To clear the Tare value, remove the container from the pan and press the **Tare** button.

Auto Tare

Auto Tare automatically compensates for container weight so the balance displays net weight. Auto Tare must be set ON in the Setup sub-menu.
See Section 3.7.3 Setup Sub-menu.
The secondary display shows PLACE CONTAINER (blinking). The Tare value is automatically cleared when the container is removed from the pan.

Preset Tare

Use the xT command in the command table to enter a preset tare value through a computer.
To clear the Tare value, enter a value of 0.0. See Section 5.3.1.

3.3.3 Changing Units of Measure

The balance can be configured to measure in a variety of units. The ***Unit*** Sub-menu is used to enable or disable a specific unit.
To select a unit of measure:
Press and hold the **Unit** button, then release it when the desired unit is displayed.
Note: If the desired unit is not displayed, it must be turned on in the Unit menu (See Section 3.7.6).

3.3.4 Changing Application Modes

The balance can be configured to operate in various application modes. The ***Mode*** Submenu is used to enable or disable a specific application mode.
Press and hold the **Mode** button and release it when the desired mode is shown on the secondary display.
Note: If the desired mode is not displayed, it must be turned on in the Mode menu. See Section 3.7.5.

3.3.5 Printing Data

Press the **Print** button to send the displayed value to the COM port (See Section 3.10).
Note: The port must have Auto Print set to OFF.

3.4 MENU

3.4.1 Menu Structure

The balance menu structure is illustrated below.

CALIBRATE (3.7.1)
- Incal (Internal Calibration)
- Span
- Linearity
- CalTest (Calibration Test)
- Cal Adj (Calibration Adjust)
- End Cal

SETUP (3.7.3)
- Legal Trade
- Auto Tare
- Auto Off
- End Setup

READOUT (3.7.4)
- Auto Zero
- Filter
- Gross Ind.
- End Read

MODE (3.7.5)
- Weigh
- Count
- Percent
- End Mode

UNIT (3.7.6)
- mg
- g
- kg
- oz
- lb
- ct
- End Unit

PRINT-1 (3.7.7)
- Output : WhenStable,
  GLP Tare
- Auto Print
- Content : NumberOnly, Header,
  Gross, Net, Tare,
  Reference , Result, GLP
- Layout : Line Format,
  4LF
  Form Feed
- List
- End Print-1

RS232-1 (3.7.8)
- Baud
- Parity
- Handshake
- End RS232-1

GLP DATA (3.7.9)
- User ID
- Proj ID
- Time
- Date
- End GLP Data

GLP PRINT (3.7.10)
- Time
- Balance ID
- User ID
- Project ID
- Difference
- Name
- End GLP Prt

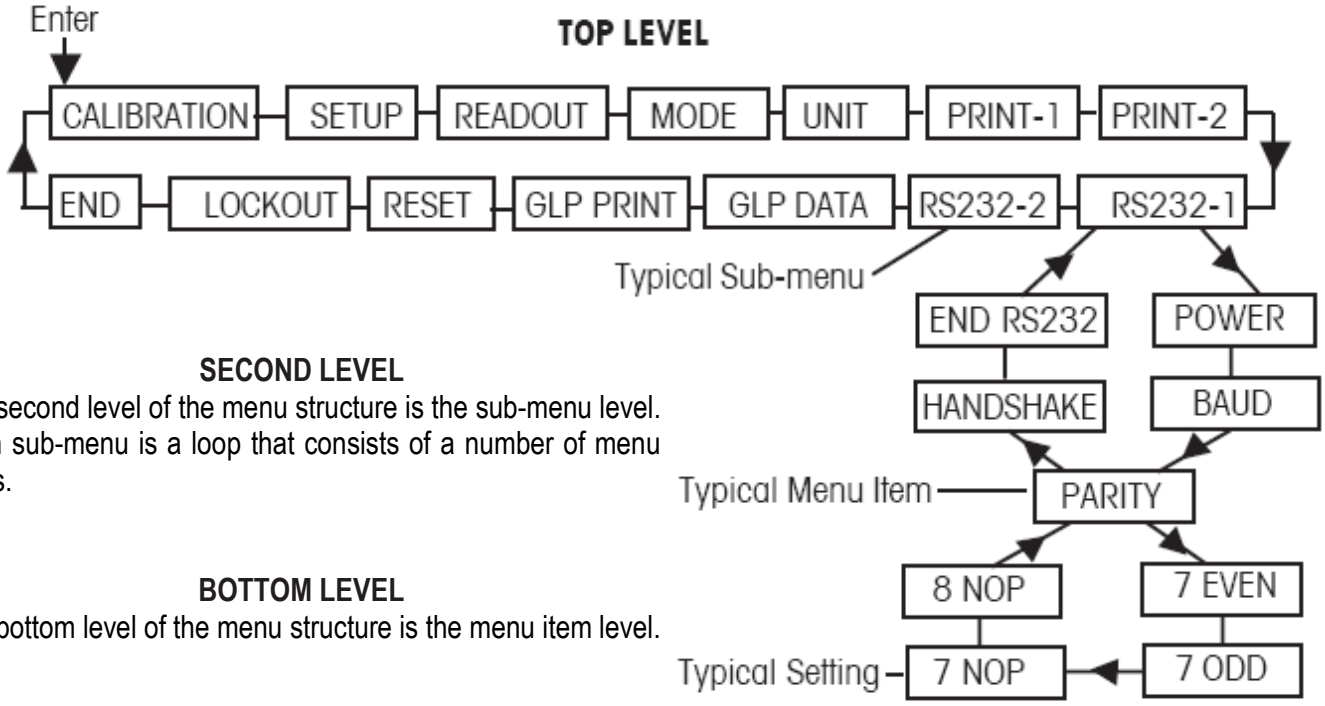
RESET (3.7.11)
- Setup
- Readout
- Mode
- Unit
- Print-1
- RS232-1
- GLP Data
- GLP Print
- Lockout
- Global
- End Reset

LOCKOUT (3.7.12)
- Calibrate
- Setup
- Readout
- Mode
- Unit
- Print-1
- RS232-1
- GLP Data
- GLP Print
- Reset
- Lock Set
- End Lockout

END (3.7.13)

3.4.2 Menu Navigation

The balance menu structure consists of three levels. The top level is the main menu which consists of a number of sub-menus.



SECOND LEVEL

The second level of the menu structure is the sub-menu level. Each sub-menu is a loop that consists of a number of menu items.

BOTTOM LEVEL

The bottom level of the menu structure is the menu item level.

3.4.3 Changing settings

To change a menu setting, perform the following steps:

ENTER THE MENU

Press and hold the **Menu** button until MENU appears on the primary display. Release the button and the first sub-menu appears on the secondary display (blinking).

Note: When the secondary display is blinking, press **Yes** to accept. Press **No** or **Back** for view another selection.

SELECT THE SUB-MENU

Press the **No** button to select the next sub-menu or the **Back** button to select the previous sub-menu in the loop. Press the **Yes** button to select the sub-menu that appears on the secondary display (blinking). The sub-menu name now appears on the primary display and the first menu item in the sub-menu now appears on the secondary display (blinking).

SELECT THE MENU ITEM

Press the **No** button to select the next setting or the **Back** button to select the previous setting in the loop. Press the **Yes** button to select and save the setting on the secondary display (blinking) as the new menu item setting.

EXIT THE MENU

Press the **Exit** button at any time to quickly exit the menu or select END sub-menu and press the **Yes** button.

3.5 APPLICATION MODES

The balance incorporates Weighing, Parts Counting and Percent Weighing application modes. The default setting has the weighing mode turned on and all other application modes turned off.

Note: Before using any application modes, they must be turned on in the Mode menu (See Section 3.3.4).

3.5.1 Weighing

Use this mode to determine the weight of items in the selected unit of measure. The balance is shipped with grams enabled. Before using other units of measure, these units must be turned on in the Unit menu (See Section 3.7.6).

Press and hold **Mode** until the display shows WEIGH, then release the button.
Press **Zero** to zero the balance.

Place objects to be weighed on the pan to display the weight.
The example displays a 200 gram weight.

3.5.2 Parts Counting

Use the Parts Counting Mode to count samples of uniform weight.

Press and hold **Mode** until Count is displayed, then release the button.

<u>Establish an Average Piece Weight (APW).</u>

Each time a new type of part is counted, the nominal weight of one piece (Average Piece Weight) must be established using a small quantity of pieces. This APW is stored until replaced by another APW.

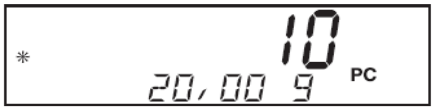
If an APW has already been established, Count is displayed with Clear APW? blinking.
Press **No** to use the previously saved APW. Otherwise, press **Yes** to establish a new APW.

(Clear APW? blinking)

The current weight (0.00) is shown on the primary display and the default sample size (PLACE 10) is shown on the secondary display.

To change the sample size, press and hold the **No** button to increment the sample size through the range of 1 to 100. Release the button when the desired sample size appears on the secondary display.

Place the specified number of parts on the pan.
Press the **Function** button to accept. The primary display will now indicate the number of parts. The weight is shown on the secondary display.



Pressing the **Function** button momentarily displays the APW on the secondary display. The example shows an APW of 2.000g.

Clearing the APW
Press and hold the **Mode** button until COUNT is shown on the secondary display.

APW Optimization
The only adjustment for Parts Counting is APW Optimization. APW Optimization is set On or Off in the Mode menu when Parts Counting is turned On. When APW Optimization is set On, the APW is automatically optimized. This results in more accurate parts counting. The factory default is On. When a new APW has been established, APW Optimization occurs when the number of pieces added to the pan are between one and three times the number already on the pan. The secondary display will momentarily indicate APW OPT.

3.5.3 Percent Weighing

Use the Percent Weighing Mode to measure the weight of a sample as a percentage of a pre-established reference weight. Refer to Section 3.3.4 to enable Percent Weighing.

Press and hold the **Mode** button. When PERCENT displays, release the button. The primary display shows PERCENT.
If a Reference Weight is stored in memory, the secondary display shows CLEAR REF? (blinking). Press **No** to use the stored reference weight and begin Percent Weighing.
Press **Yes** to clear the saved Reference Weight.

Establishing a Reference Weight
If no Reference Weight is stored, a Reference Weight must be established. The secondary display shows PUT SAMPLE. The current weight is shown on the primary display.

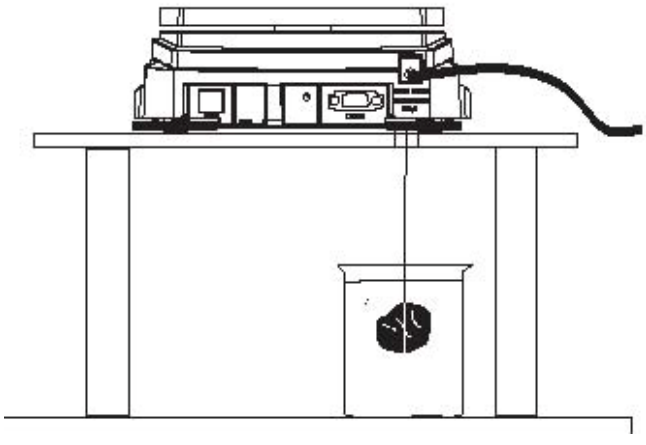
Place the sample on the pan and press the **Function** button. This example illustrates 50 grams as the reference weight.
Remove the reference weight and place the item to be compared on the pan. The balance indicates the actual percentage on the primary display. The secondary display indicates the weight in the selected measuring unit.
Pressing the **Function** button momentarily displays the reference weight on the secondary display.

Clearing the Reference Weight
Press and hold the **Mode** button until PERCENT is shown on the secondary display.

3.6 ADDITIONAL FEATURES

3.6.1 Weighing with hanging load (hook underneath)

The balance is equipped with a weighing with hanging load hook.



Note: Before turning the balance over, install the cone cover to prevent damage to the loadcell.

To use this feature, remove power from the balance and remove the protective cover for the weighing with hanging load opening.

The balance can be supported using lab jacks or any other convenient method. Make sure the balance is level and secure.
Use a string or wire to attach items to be weighed.

3.7 BALANCE SETTINGS

Refer to Section 3.4.2 to enter and navigate the menus.

3.7.1 Calibration

The balances offer a choice of five calibration methods: Internal Calibration (InCal), Span Calibration, Linearity Calibration, Calibration Test and Calibration Adjust.

- ***InCal*** - For models equipped with Internal calibration (InCal), calibration of the balance is accomplished by an internal mass.
- ***Span*** - Span calibration ensures that the balance reads correctly within specifications using two weight values: zero and a weight value between 25% and 100% of the balance's capacity.
- ***Linearity*** - Linearity calibration minimizes deviation between actual and displayed weights within the balance's weighing range. Three weight values are used: zero, a weight value at midpoint of the balance's weighing range, and a weight value at or near the balance's specified capacity.
- ***Cal Test*** - Calibration test allows the stored calibration data to be tested against the current mass being used for the test.
- ***Cal Adj*** - For models equipped with InCal, allows adjustment of the internal calibration.

Note: Calibration may be locked out to prevent unauthorized personnel from changing calibration. If calibration has been locked out, you can only execute InCal and Cal Test.
With balances for Legal for Trade you can only execute InCal and Cal Test.

Before beginning calibration, have masses available. Masses required for calibration are listed in the table in section 3.7.2. Default Span Calibration Points are shown in Bold print.

<u>Internal Calibration (InCal models)</u>

Models equipped with the internal calibration can be calibrated without using an external weight. With the balance on, press and hold the **Menu-Cal** button until MENU CALIBRATE is displayed, then release the button.

Press **Yes** to initiate the internal calibration process. When internal calibration is finished, the balance returns to the currently selected mode.

<u>Span Calibration</u>

With the balance on, press and hold the **Menu-Cal** button until MENU is displayed, then release the button. CALIBRATE (blinking) is displayed.

Note: If the balance has InCal, press the **No** button to advance to span calibration.

Press the **Yes** button to initiate span calibration.

First the zero reading is taken. Next the display shows the default span calibration weight value.

Press **No** to change to an alternate calibration weight. Press **Yes** when the desired calibration weight is displayed.

Place the specified calibration weight on the platform. After calibration, remove the weight from the platform.

To abort calibration at any time, press the **Exit** button.

Linearity Calibration

NOTICE:

Linearity Calibration is required only if the linearity error exceeds tolerance in specification table (section 5.2).

With the balance on, press and hed the **Menu-Cal** button until MENU CALIBRATE is displayed, then release the button.

Press the **Yes** button to enter calibration.

Note: Press the **No** button to advance to linearity calibration. CAL LINEARITY (blinking) is displayed.

Press the **Yes** button and follow the screen instructions. Use the weight values shown on the primary display.

First the zero reading is taken. Next the display shows the first calibration weight value.

PUT WEIGHT (blinking) is displayed. Place the specified calibration weight on the platform.

After a few seconds, place the second specified calibration weight on the platform. PUT WEIGHT (blinking) is displayed. After a few seconds, the calibration weight is displayed.

LINEAR DONE is momentarily displayed when calibration is completed.

After calibration, remove weight from platform. To leave the menu, press **Exit**.

To abort calibration at any time, press the **Exit** button.

Calibration Test (InCal models)

Calibration test allows a check of a known calibration mass against the last stored calibration information in the balance.

Press and hold the **Menu-Cal** button until MENU CALIBRATE is displayed.

Press **Yes** to enter calibration.
Press **No** until CAL TEST is displayed.

Press **Yes** and follow the screen instructions.

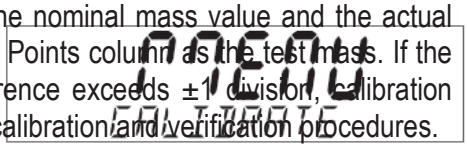
(Example)

Place the specified weight on the platform. After a short period, the display indicates the difference in weight from the last calibration, and then will display the calibration weight on the platform. After the test, remove the calibration weight from the platform. To leave the menu, press **Exit**.

Cal Adj - Aggiustamento della calibrazione (modelli InCal)

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 on the platform and note the difference (in divisions) between the nominal mass value and the actual reading. Refer to Section 3.7.2 and use the highest value from the Span Calibration Points column as the test mass. If the difference is within ±1 division, calibration adjustment is not required. If the difference exceeds ±1 division, calibration adjustment is recommended. Following a calibration adjustment, repeat the internal calibration and verification procedures.



To perform a calibration adjustment, press the **Menu-Cal** button and release it when MENU CALIBRATE is displayed.

Press **Yes** to enter the Calibration sub-menu.

Press **No** until CAL ADJ is displayed.

Press **Yes** to enter the CAL ADJ menu item and view the current setting. If the actual reading was less than the nominal mass value, a positive adjustment is required.

Press **No** until the setting matches the difference noted earlier in the procedure**.**

If the actual reading was greater than the nominal mass value, a negative adjustment is required.

Press **Back** until the setting matches the difference noted earlier in the procedure.

Press **Yes** to accept and store the setting.

3.7.2 Calibration Masses

Model	Linearity Calibration Points	Span Calibration Points (1)	Sample Weight Class OIML
ALD114	50g / 100g	50g , 100g	E2
ALD213	100g / 200g	100g, 200g	E2
ALD264	150g / 250g	200g, 250g	E2
ALD313	150g / 300g	150g, 200g, 250g, 300g	E2
ALD413	200g / 400g	200g, 300g, 400g	E2

ALD513	200g / 500g	200g, 300g,400g , 500g	E2
AV2102	1000g / 2000g	1000g, 2000g	E2
AV4102	2000g / 4000g	2000g, 3000g, 4000g	E2

3.7.3 Setup

SETUP	
Legal Trade	On/**Off**
Auto Tare	On/**Off**
Auto Off	**Off**, 1, 2, 5 min.
End Setup	

Legal Trade
When set On, the balance operates in compliance with Weights and Measures regulations.

Auto Tare
When set On, the balance will automatically tare the first item placed on the pan.

Auto Off
When set to 1, 2 or 5 minutes, the balance will turn off in the selected time interval if there has been no activity. Set to OFF for continuous operation.

End Setup
Press the **Yes** button, to advance to the Readout submenu. Press the **No** button to return to the LEGAL TRADE menu item.

3.7.4 Readout

READOUT	
Auto Zero	Off, **.5d**, 1d, 2d, 5d
Filter	Low, **Medium**, High
Gross Ind.	G, B, **Off**
End Read	

Auto Zero
Allows setting the balance auto zero level setting: .5, 1, 2 or 5 divisions.

Filter
Allows setting the balance filter level: Low, Medium, High. Compensates for vibration or excessive air currents.

Gross Ind.
Allows setting the gross indicator to G (gross), B (brutto) or Off.

End Read
Press the **Yes** button to advance to the Mode submenu. Press **No** to return to Auto Zero.

3.7.5 Mode

The Mode submenu is used to turn Application modes On or Off.

MODE		
Weigh	**On**/Off	
Count	On/**Off**	
	Apw Optimize	On/Off
Percent	On/**Off**	
End Mode		

Weigh
Use to set the Weighing Mode On or Off.

Count
Use to set the Counting Mode On or Off. If Count is set On, APW optimize can be set On or Off.

Percent
Allows setting the percent weighing mode On or Off.

End Mode
Press the **Yes** button to advance to the Unit submenu. Press **No** to return to Weigh.

3.7.6 Unit

The Unit submenu is used to turn measuring units On or Off. Available measuring units vary by model.

UNIT	
mg	On/Off*
g	On/Off
kg	On/Off
oz	On/Off
lb	On/Off
ct	On/Off
End Unit	

End Unit

Press the **Yes** button to advance to the Print-1 submenu. Press **No** to return to the first available unit.

3.7.7 Print-1

The Print-1 submenu is used to set printing parameters for an external printer or computer.

PRINT-1		
Output	When Stable	On/**Off**
	GLP Tare	On/**Off**
Auto Print	**Off**	
	Continuous	
	Interval	1 - 3600 seconds
	When Stable	Load , Load & Zero
Content	NumberOnly	On/**Off**
	Header	**On**/Off
	Gross	**On**/Off
	Net	**On**/Off
	Tare	**On**/Off
	Reference	**On**/Off
	Result	**On**/Off
	GLP	
Layout	Line Format	**Multi**, Single
	4LF	Yes/**No**
	Form Feed	Yes/**No**
List	Yes/**No**	
End Print-1		

Output

Set When Stable to On to print only stable values. Set When Stable to Off to print stable or unstable values. Set GLP Tare to On to print GLP data once after a tare operation. Set GLP Tare to Off to disable this feature.

Auto Print

When set to Continuous, the displayed value is printed continuously. When set to Interval, the displayed value is printed at the user specified time interval (1 to 3600 seconds). If set to When Stable, the balance will automatically print the displayed value when stability is achieved. An additional setting must be made to determine if only stable non-zero values will be printed (Load setting) or if stable zero and non-zero values will be printed (Load & Zero). When set to Off, the Auto print feature is disabled.

Content

All of these features can be set On or Off: Numeric data only, Header, Gross, Net, Tare, Reference, Result, GLP. (See sample printout 3.10)

Layout
Determines the format of data output to a printer or computer. If Line Format is set to Multi, a multi-line printout is generated. If it is set to Single, a single line printout is generated. If 4 LF is set to yes, 4 line feeds (ascii character 10) are appended to the printout. If Form feed is set to Yes, a form feed (ascii character 12) is appended to the printout. This is useful for printing to page printers.

List
When Yes is selected, a printout of balance settings is generated.

End Print-1
Press the **Yes** button to advance to the next menu, RS232-1. Pressing **No** returns to Output menu item.

3.7.8 RS232-1

The RS232-1 submenu is used to set communication parameters for an external printer or computer.

RS232-1	
Baud	600..**2400**...19200
Parity	7 Even, 7 Odd, **7 No Parity**, 8 No Parity.
Handshake	Off, **XONXOFF,** Hardware
End RS1	

Baud
Baud rates of 600, 1200, 2400, 4800, 9600 and 19,200 are available.

Parity
Parity settings of 7 even, 7 Odd, 7 No Parity and 8 No Parity are available.

Handshake
Settings of Off, XONXOFF and (for RS232-1 only) Hardware are available.

End RS1
Pressing the **Yes** button will advance to GLP Data submenu. Pressing **No** returns to the Baud menu item.

3.7.9 GLP Data

GLP DATA	
User ID	Set...
Proj ID	Set...
Time	Type-**12hr**, 24hr, Set..., Adj -60, +60
Date	Type **mdy**,...dym Set...
End GLP Data	

User ID
Used to enter a User ID up to 10 characters.

Project ID
Used to enter a Project ID up to 10 characters.

Entering a User ID or Project ID
Enter the user or Project ID one character at a time. The character to be entered is highlighted by a blinking cursor (underscore). Press the **No** button repeatedly to scroll through the list of available characters: (space), -, 0 through 9, A through Z. Press the **Yes** button to select the displayed character and move the cursor one position to the right. After the tenth character is entered, the ten character ID will blink. Press the **No** button to change the displayed ID or the Yes button to accept the ID and proceed to the next menu item.

Time

Type
Set the type to 12 hours or 24 hours.

Set
Set the current time using the format selected in the type menu item.

Adjust
Enter an adjustment value from -60 to + 60 seconds per day.

Date
Set the date type: M/D/Y, D/M/Y, Y/M/D, M/Y/D, Y/D/M, D/Y/M and the actual date.

End GLP Data
Press the **Yes** button to advance to the GLP Print submenu. Press the **No** button to return to User ID.

3.7.10 GLP Print

Select GLP items to be printed by setting them to On.

GLP PRINT	
Time	**On**/Off*
Balance ID	**On**/Off
User ID	**On**/Off
Project ID	**On**/Off
Difference	**On**/Off
Name	**On**/Off
End GLP Prt	

End GLP Print
Press the **Yes** button to advance to the reset submenu. Press the **No** button to return to Time.

3.7.11 Reset

RESET	
Setup	RESET?*
Readout	RESET?
Mode	RESET?
Unit	RESET?
Print-1	RESET?
RS232-1	RESET?
GLP Data	RESET?
GLP Print	RESET?
Lockout	RESET?
Global	RESET?
End Reset	

Setup
Select **Yes** to return all Setup menu items to their factory settings.

Readout
Select **Yes** to return all Readout menu items to their factory settings.

Mode
Select **Yes** to return all Mode menu items to their factory settings.

Unit
Select **Yes** to return all Unit menu items to their factory settings.

Print-1
Select **Yes** to return all Print-1 menu items to their factory settings.

RS232-1
Select **Yes** to return all RS232-1 menu items to their factory settings.

GLP Data
Select **Yes** to return all GLP Data menu items to their factory settings.

GLP Print
Select **Yes** to return all GLP Print menu items to their factory settings.

Lockout
Select **Yes** to return all Lockout menu items to their factory settings.

Global
Select **Yes** to return the menu items in all sub-menus to their factory settings.

End Reset
Press the **Yes** button to advance to the Lockout menu. Press the **No** button to return to Setup.

3.7.12 Lockout

Use this submenu to prevent unauthorized changes to menu settings. If a submenu is locked, its menu item settings can be viewed but not changed.

LOCKOUT	
Calibrate	On/**Off**
Setup	On/**Off**
Readout	On/**Off**
Mode	On/**Off**
Unit	On/**Off**
Print-1	On/**Off**
RS232-1	On/**Off**
GLP Data	On/**Off**
GLP Print	On/**Off**
Reset	On/**Off**
Lock Set	On/**Off**
End Lockout	

Cal
Set On to lock and hide the Calibration Menu.

Setup
Set On to lock the Setup Menu.

Readout
Set On to lock the Readout Menu.

Mode
Set On to lock the Mode Menu.

Unit
Set On to lock the Unit Menu.

Print-1
Set On to lock the Print-1 Menu.

RS232-1
Set On to lock the RS232-1 Menu.

GLP Data
Set On to lock the GLP Data Menu.

GLP Print
Set On to lock the GLP Print Menu.

Reset
Set On to lock the Reset Menu.

Lock Set
Set On to lock all submenu lock settings. When set Off, the lock settings for all menus are accessible. To turn Lock Set off, refer to section 3.9.

End Lockout
Press the **Yes** button to advance to the End menu. Press the **No** button to return to the Cal menu.

3.7.13 End
The End menu is used to exit the menus and return to previous application.

3.8 LEGAL FOR TRADE (LFT)
These specific models have been designed to comply with weights and measures regulations. When the LEGAL TRADE menu item setting is set to ON, the following conditions apply:

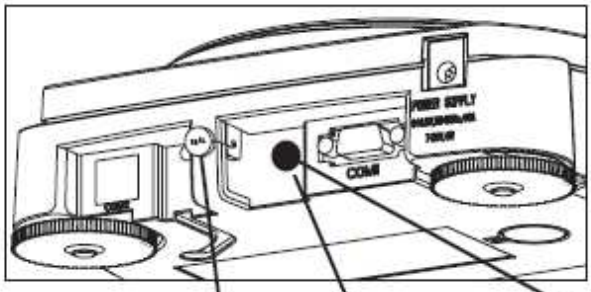
- The CALIBRATION menu is hidden.
- The LEGAL TRADE menu item is hidden.
- The AUTO ZERO menu item setting is set to 0.5d and locked.
- The OUTPUT WHEN STABLE menu item setting is set to ON and locked.
- The CONTINUOUS setting in the AUTO PRINT menu item is hidden.

3.9 SEALING ACCESS TO THE BALANCE SETTINGS
When used in conjunction with the Lockout menu, the balance may be sealed to prevent or detect unauthorized changes to the balance settings. For legal for trade applications, the balance must be sealed to prevent access to the metrological parameters.

To seal the balance, cover the Lock switch access hole at the rear of the balance. A paper seal, and a wire seal may be installed as shown.

To regain access to the locked balance settings, break the seal and press the recessed Lock switch momentarily during power up.

Sealing the Balance



3.10 PRINTING DATA
Printing data to an external computer or printer requires that the communication parameters in the RS232-1 submenu be set to match external device communication parameters.

```
04/01/03  12:30 PM
Bal ID 1234567
USER ID ABCDEFGHIJ
PROJ ID 1234567890
Name.....


0.0200kg G
0.0200kg T
0.0000kg NET

0.0200kg G
```

// If GLP SET> Time is ON
// If GLP SET> Balance ID is ON
// If GLP SET> User ID is ON
// If GLP SET> Proj ID is ON
// If GLP SET > Name is ON

// If a tare value is entered, these three items are printed if selected in the “Print-1” menu.
// Tare ON - G, B or [space] as determined in “Readout” submenu.
// Tare ON
// Net ON
// Otherwise, gross is printed if selected in the definition string.
// Gross ON - G, B or [space] as determined in Readout submenu.

4. MAINTENANCE

4.1 CALIBRATION

Periodically verify calibration by placing an accurate weight on the balance and if calibration is required, refer to section 3.7.1.

4.2 CLEANING

If cleaning is required, use a soft cloth dampened with water and a mild detergent. Do not allow liquids to enter the balance. Do not use harsh chemicals to clean the balance, as the finish may be damaged.

4.3 TROUBLESHOOTING

The following table lists common problems, possible causes and remedies.

Symptom	Possible Cause	Remedy
Balance will not turn on	• AC power not connected • Batteries discharged	• Connect AC adapter • Replace batteries
Balance does not display accurately	• Improper calibration • Unstable environment	• Perform calibration • Move balance to a suitable location
Cannot calibrate the balance	• Calibration menu locked • LFT parameter set to on • Unstable weight reading	• Turn Calibration menu lock off • Turn LFT off • Eliminate vibration
Cannot change Menu settings	• Submenu locked • LFT parameter set to on	• Unlock submenu • Turn LFT off
Error 7.0	• Unstable weight reading	• Eliminate vibration
Error 8.0	• Weight reading below Power On Zero limit.	• Put platform on balance
Error 8.1	• Weight reading exceeds Power On Zero limit.	• Clear platform
Error 8.3	• Weight reading exceeds overload limit	• Clear platform
Error 8.4	• Weight reading below underload limit	• Put platform on balance
Error 9.0	• Internal fault	• Return balance for service
Error 9.5	• Production calibration not present	• Return balance for service
Error 9.8	• User calibration data not present. (Required for LFT ON only)	• Calibrate balance
Error 53	• EEPROM Checksum error	• Cycle power on, off. If balance fails to operate, return for service.
LOW REF WT	• Average piece weight too small (Warning)	• See section 3.5.2
REF WT Err	• Reference weight too small • The weight on the pan is too small to define a valid reference weight	• Increase sample size
- - - - - -	• Busy (tare, zero, printing)	• Wait until completion

5. TECHNICAL DATA

Ambient conditions

The technical data are valid under the following ambient conditions:

- Ambient temperature: 10 °C to 30 °C
- Relative humidity: 15 % to 80 % at 31 °C non-condensing, decreasing linearly to 50 % at 40 °C
- Height above sea level: Up to 2000 m. Operability is assured at ambient temperatures between 5 and 40 °C

Power

- AC adapter
  Balance power input 6-14.5 VAC, 50/60Hz 4VA or 7-20VDC, 4W

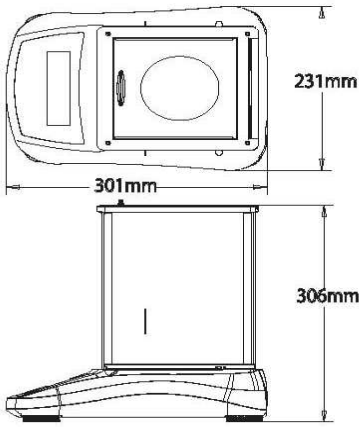
Materials

- Housing base: plastic (ABS/PC)
- Top Housing: plastic (ABS/PC)
- Platform: 18/10 stainless steel

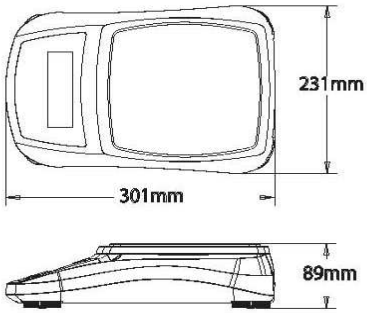
Protection

- Protected against dust and water
- Pollution degree: 2
- Installation category: Class II
- EMC: see declaration of conformity

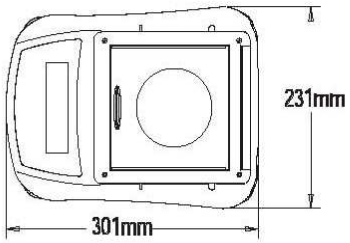
5.1 DRAWINGS

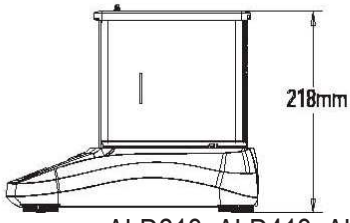


ALD114, ALD246



ALD2102,ALD4102





ALD213, ALD413, ALD513

Note: See table on next page for model designations and dimensions.

5.2 SPECIFICATIONS

Item Number	ALD114 ALD114C**	ALD264 ALD264 C**	ALD213 AV213C**	ALD413 AV413C**	ALD513 AV513C**	ALD2102 ALD 2102C**	ALD4102 ALD 4102C**
Capacity (g)	110	260	210	410	510	2100	4100
Readability (g)	0.0001		0.001			0.01	
Repeatability (Std deviation) (g)	0.0001		0.001			0.01	
Linearity (g)	± 0.0002	± 0.0003	± 0.002		± 0.003	± 0.02	
Weighing Units	Milligram, Gram, Kilogram, Ounce, Pound, Carat						
Application Modes	Weighing, Parts Counting, Percent Weighing						
Tare Range	To Capacity by Subtraction						
Stabilization Time (s)	3						
Draft Shield Height Over Platform	2		11.5				
Power Requirements	AC Adapter (Included)						
Calibration	Digital with External Weight						
Display Type	2-Line LCD w/Backlight						
Display Size (cm)	10 x 2.5						
Platform Size (cm)	9 dia.		12 dia.			16.8 x 18	
Dimensions W x H x D (cm)	22 x 30.5 x 30		22 x 19 x 30			22 x 8.5 x 30	
Net Weight (kg)	4.0		3.3			2.8	
Net Weight (with InCal) (kg)	4.4		3.7			3.2	

**Internal calibration option available (C) models

5.3 RS232 COMMUNICATION

The balance is equipped with an RS232 interface (COM1). Connecting the balance to a computer enables you to operate the balance from the computer, as well as receive data such as displayed weight.

5.3.1 Serial Commands

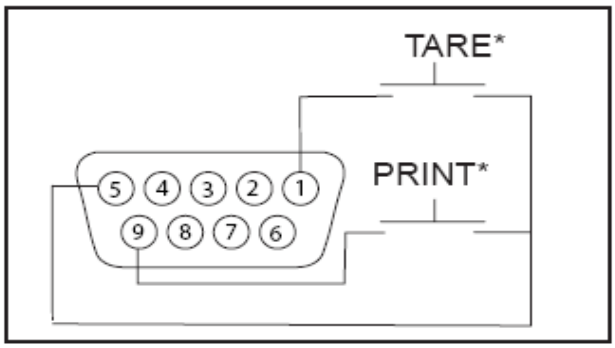
Commands listed in the following table will be acknowledged by the balance. The balance will return "ES" for invalid commands.

Command	Function
IP	Immediate Print of displayed weight (stable or unstable)
P	Print displayed weight (stable or unstable)
CP	Continuous Print. 0P ends Continuous Print
SP	Print displayed stable weight
SLP	Auto Print stable non-zero displayed weight
SLZP	Auto Print stable non-zero weight and stable zero reading
xP	Interval Print x = Print Interval (1-3600 seconds) 0P ends Interval Print
Z	Same as pressing Zero Key
T	Same as pressing Tare Key
xT	Establish a preset Tare value in grams. X= preset tare value in grams
PT	Prints Tare weight stored in memory
PM	Print current mode (weighing mode)
M	Scroll to the next enabled mode
PU	Print current weighing unit
U	Scroll to the next enabled unit
OFF	Turns balance OFF
ON	Turns balance ON
PSN	Print Serial Number
PV	Print Version: name, software revision
x#	Set % reference weight (x) in grams (Must have reference weight stored)
P#	Print PC reference weight.
x%	Set % reference weight (x) in grams (Must have reference weight stored)
P%	Print percent reference weight
PTIME	Print current time
PDATE	Print current date

5.3.2 RS232 Connections

RS232 Interface

On the rear of the balance, the 9-pin female subminiature “D” connector COM 1, is provided for interfacing to other devices. The pin connections are shown in the illustration below:



COM 1 Connector

COM1 Pin Connections
1 – Remote Tare
2 – TxD
3 – RxD
4 – DSR
5 – Ground
6 – DTR
7 – CTS
8 – RTS
9 – Remote Print

*External PRINT and/or TARE switches may be installed as shown in the diagram. Momentary contact switches must be used. To enable this feature, contact Technical Support.

DECLARATION OF CONFORMITY

This device conforms to the essential standards and norms relative to the applicable European regulations. The Declaration of conformity is available in the web site www.scalehouse.it.

WARRANTY

The TWO-YEAR warranty period begins on the day the instrument is delivered. It includes spare parts and labour for repairs at no charge if the INSTRUMENTS ARE RETURNED prepaid to the DEALER'S PLACE OF BUSINESS. Warranty covers all defects NOT attributable to the Customer (such as improper use) and NOT caused during transport.

If on site service is requested (or necessary), for any reason, where the instrument is used, the Customer will pay for all of the service technician's costs: travel time and expenses plus room and board (if any).

The customer pays for shipping costs (both ways), if the instrument is shipped to the DEALER or manufacturer for repair.

The WARRANTY is VOIDED if faults occur due to work done by unauthorised personnel or due to connections to equipment installed by others or incorrect connection to the power supply.

This warranty DOES NOT provide for any compensation for losses or damages, direct or indirect, incurred by the Customer due to complete or partial failure of instruments or systems sold, even during the warranty period.

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