



## Compact Bench Piececounter for Internal Use C 100

# Use and Maintenance Manual

## **DECLARATION OF CONFORMITY**

# **SOCIETA' COOPERATIVA BILANCIAI**

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We declare that the product described in this manual complies with the following CE requirements

- 90/384 CEE and subsequent modifications: Standard EN 45501
- 2004/108/CE : Standard EN 61000-6

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## **1 GENERAL**

C100 series offer a range of multi task fast and accurate piececounters which can be connected to an external platform (remote scale) for operations with heavier articles.

These piececounters are able to store detailed information about the most frequently selected products (PLU).

The unit of measurement Pounds, Kilograms or both can be activated.

All come with a stainless steel pan.

The keyboard is waterproof, the keys are covered by a coloured membrane, on each key its function is marked and the liquid crystal displays are large. LCDs are backlighted.

All the instruments come with zero tracking function, acoustic alarm for the preset counting or checkweigher mode, known tares and a function allowing the storage of countings that can be recalled as totalization.

The scales come with RS-232 two-way interface to communicate to PCs or printers.

## **2 INSTALLATION**

### **2.1 PLACING THE SCALE (WHERE)**

- Scales shall not be placed where their accuracy can be reduced.
- Avoid extreme temperatures. Do not put them in the direct sunlight or close to air conditioning fans.
- The surface or the floor shall be stiff and stable, without vibrations.
- Avoid unstable current. Do not use them close to high electrical absorption machines such as equipment for welding or powerful motors.
- Do not place them close to machines causing vibrations.
- Avoid very moisty areas which can generate condensation. Avoid the direct contact with water. Do not sprinkle or dip them into water.
- Avoid airflows such as fans or airstreams.

- Keep the scales clean. Do not pile material on the scales not in use.

## 2.2 PLACING THE SCALE (HOW)

### 2.2.1 PLACING THE LOCAL SCALE

- C100 series come with a stainless steel platform in a separate packaging.
- Place the platform in the holes on the upper cover.
- Do not press too much in order not to damage the load cell inside.
- Level the scale adjusting the feet until the bubble is in the middle of the lever and the scale leans on the four feet.
- Plug the power cable in the input on the right of the base. Connect the power pack to the network. The switch is on the right of the scale base.

After switching the terminal on a code is displayed along with the instrument capacity in kg, on the “Weight” display and the software version on the “Unit Weight” display.

The terminal then carries out a self check before “0” is displayed in the three displays if the scale has been zeroed.

### 2.2.2 PLACING THE REMOTE SCALE

- C100 series can be connected to a scale equipped with load cells through the appropriate port “load cell”, on the left of the scale case. Make sure the remote platform is suitable, for the C100 terminal has been calibrated with a specific platform. Using another platform would cause the instrument to measure the weight in a wrong way, which would lead to a wrong piece counting.
- Place the platform of the remote scale where it is to be used. Level, adjusting the four feet. Make sure the four feet properly support the scale.
- Press the **Local/Rem** key and check the weighing performance.

### 3 KEYS

**0-9, .**

Keys used to manually enter a preset tare and a sample unit weight. Their secondary function allows to enter alphanumeric characters for the descriptions of the PLUs and so on.

**CE**

Deletes a unit weight or a wrong entry. Deletes the stored values as well if the total is displayed.

**M+**

Adds the current count to the totaled data. Recalls the memory too if pressed when the scale is empty. 99 values can be added or up to the max amount to be displayed. Prints the displayed values too.

**Smpl** or 


Is displayed to enter the article quantity used for the unit average weight.

**PLU**

To store and recall the sample information.

**U. Wt./Units** or 


To manually enter the weight of a sample. Changes the unit of measurement too if other ones are enabled.

**PST** or 


To determine the upper limit of the counted number of articles. In case such limit is exceeded, an acoustic alarm activates. Their secondary function adjusts backlighting.

**Local/Rem** or 

This key is to select the local or remote scale.

**Tare** or 

Captures a tare, storing the current weight as tare value, subtracting the tare value from the total weight and displaying the result as net weight.

**Zero** or 

Defines zero for all the subsequent weighing operations setting the display to zero.

## 4 DISPLAYS

### 4.1 "Weight" DISPLAY

It is a six digit display to show the weight on the scale.

The arrow on the symbols points out the following:

Battery almost flat,



Net weight, "Net"

Stable weight, "Stable"

Zero, "Zero"

Unit of measurement, "Lb" or "Kg"

### 4.2 "Unit Weight" DISPLAY

- Displays a sample unit weight. This value can be manually entered or processed by the scale. The unit of measurement can be in grams, on all the scales, if the selected unit of measurement of the weight is kilogram, or in pounds.
- If the scale deems the quantity of samples is not enough for an accurate counting, an arrow above "Smpl" appears.
- If the unit weight is not enough for an accurate counting, an arrow appears above "U.Wt".
- In both cases the scale does not stop its operation and the indicators warn about a potential problem.
- If a value has been stored, an arrow above "M+" appears.

### 4.3 "Count" DISPLAY

- Displays the number of articles on the scale or the value of the accrued count. See OPERATION section.
- An arrow above the following symbols points out that:  
The Checkweigher mode is active during the count, "Ck Pcs"

The Checkweigher mode is active during the weighing operation, "Ck Wt"

The Checkweigher mode is active, the result exceeds the Upper Limit, "High"

The Checkweigher mode is active, the result is between the Upper Limit and the Lower Limit, "OK"

The Checkweigher mode is active, the result is below the Lower Limit, "Low"

- Under the "Count" display a LED signals the battery status. The built in battery recharges when the scale is plugged in the power network. If said LED is green the battery is fully charged, if it is red the battery is being charged.

## 5 OPERATION

- The basic functions are the same for both scales - local and remote. Although the number of divisions could be lower in the remote scale because of the total capacity of the load cells.
- Both scales can count pieces on the basis of a current unit weight. The most accurate way to get it is to determine the sample on the local scale which should be more sensitive. So the scale can be switched to remote where big quantity can be counted.
- Each scale has its own tare value which can be entered through the keyboard or placing a weight on the platform and pressing the **Tare** key. The tare value of each scale is stored even in case of switch between local and remote scale.
- Both scales can be used to determine a unit weight.
- When the scale switches from local to remote, a clear visualization is displayed notifying the change and the scales process the count on the basis of the tares and on the unit weight currently in use on the selected scale. The message for the switch is: "chAngE" "LocAL" and "chAngE" "remotE".



- The switch from local scale to remote scale is allowed any time pressing the **Local/Rem** key, against the scale switch it is possible to have a weight indication different from zero, even of + or – 50 divisions, set the scale to zero with the appropriate key.

Note: As for the most used articles, the counting is made simpler by the use of PLU codes. Up to 100 PLUs can be stored and recalled. See paragraph 5.4 about details concerning PLUs. Place the article on the pan and digit, on the keyboard, “PLUxx” (where xx is the PLU code bound to an article). The scale displays Total Weight, Unit Weight and the Count on the article in the respective windows.

### 5.1 ZEROING THE SCALE AND CAPTURING A TARE

When the gross weight is within  $\pm 2\%$  with respect to zero, upon power on for both scales a new zero is set. If the gross weight exceeds  $\pm 2\%$  the tare function is enabled.

#### 5.1.1 ZEROING

- Any time it is possible to press the **Zero** key to define the zero for all the subsequent weighing operations or countings. After displaying the weight, the scale displays “Zero”.
- The scale comes with a function of automatic zero tracking which compensates slight drifts or little material on the platform.

It can be necessary to press the **Zero** key to set the scale to zero in case little weights are displayed when the scale is empty.

#### 5.1.2 CAPTURING A TARE

Select the local or remote scale pressing the **Local/Rem** key.

Preset tare values can be used in the local and remote scales. A new scale value can be entered in two ways: using the weight on the platform, using a value entered by the user.

First way to capture a tare value:

- Set the scale to zero pressing the **Zero** key, if necessary. The arrow is displayed above "Zero" whenever the scale is perfectly zeroed.
- Put a container on the platform in order to have the weight displayed.
- Press the **Tare** key. The displayed weight is stored as tare value and zero is displayed. An arrow above "Net" appears. Adding pieces, the net weight only is displayed. The scale can process another tare value if a second product has to be added. Again, only the weight added after the tare capture keeps being displayed.
- If the container is removed, the display value is negative. If the tare is captured pressing the **Tare** key and then removing the container, this value is the container weight more all the removed pieces. An arrow above the writing "Zero" appears when the platform returns to the condition it was when **Zero** has last been pressed.

Second way to capture a tare value:

- Capturing a tare value through the keyboard. It is useful if all the containers have the same weight or if the container is full and the net weight is needed knowing the container weight.
- Remove all the weights from the platform, press the **Zero** key to set the display to zero.
- Enter the tare value included decimals through the keyboard, press **Tare** to store the tare value.
- Place the container on the platform.
- The weight of the container is displayed minus the tare. When the

full container is placed on the platform, the tare value is subtracted from the gross weight displaying only the net weight.

- If the entered value is smaller than the scale division, the value is rounded to the closest one. If, for example, the tare value is 103g and is entered in a 60Kg scale with division 5g, -105g is displayed.
- The tare value in each scale is stored even in case the active scale changes.

### 5.1.3 CAPTURING A TARE IN THE REMOTE SCALE

Select the remote scale pressing the **Local/Rem** key and follow the tare capturing procedure described in the previous sections.

## 5.2 TOTALIZATION

The **M+** key saves the results of a weighing operation in the archives, whether the local or remote scale is used for the weighing operation.

### 5.2.1 Accruing function

- The displayed values (weight and count) can be added to the totalized values pressing the **M+** key.

The "Weight" display shows the total weight, the "Count" display shows the total of the totalized counts and the "Unit Weight" display shows the number of times that the articles have been saved in the memory. Such values are displayed for 2 seconds.

- The scale shall return to zero or to a negative value before another sample can be stored.
- More products can be added pressing **M+** again. 99 items can be entered or to the "Weight" display capacity.
- To see the total stored value, press **M+** when the scale is at zero. The total is displayed for 2 seconds.

- To clear the memory, press **M+** to recall the stored total, then press **CE** to delete all the values stored.

### 5.3 PIECECOUNTER MODE

The basic piececounter function is the same for both scales. It is necessary to know the average weight of the objects to be counted. Such value can be found weighing a known quantity of pieces in order to make the scale process the average unit weight or manually entering it from the keyboard.

Both scales can be used for the calculation of the average unit weight or for the manual entry which can be used for the count on both scales.

It is possible to increase the average unit weight accuracy any time during the counting process entering the displayed count and pressing the **Smpl** key. Make sure that the displayed quantity matches the quantity on the scale before pressing the key. The unit weight can be modified on the basis of a bigger quantity of samples improving the count accuracy of big quantities.

#### 5.3.1 Weighing a Sample to Calculate the Unit Weight

Put a known number of pieces on the scale and enter their quantity to determine the average weight of the articles to be counted.

The scale divides the total weight by the number of samples and

displays the average unit weight.

- Set the scale to zero pressing **Zero** if necessary. In case a container is used, put it on the scale and accrue the tare following the procedure above described.
- Put a known quantity of pieces on the scale. As the "Weight" display is stable, enter the quantity of piece using the numeric keys, then press **Smpl**. The "Count" display shows the unit number and the processed average weight is shown by the "Unit Weight" display.
- Adding pieces on the scale, weight and count increase.
- If the scale is not stable, the calculation cannot be accomplished.
- If the weight is lower than zero, the "Count" display shows a negative count.

### 5.3.2 Entering a Known Unit Weight

- If the unit weight is known, it can be entered through the keyboard.
- Enter the unit weight value by means of numeric keys, then press **U. Wt.** while the display flashes. If no operation is carried out within few seconds, the "Unit Weight" display returns to the previous value, otherwise it shows the new entered value.
- The sample is then stored in the scale and the net weight is displayed together with the quantity processed on the basis of the unit weight. When the scale is in kilograms, the unit weight is displayed in grams. When the scale is in pounds, the unit weight is displayed in pounds.
- After the processing or entry of the unit weight, the scale can be used as piececounter. It can be given a tare to process the net weight as described in previous sections.
- After capturing the tare, adding more pieces, the "Count" display shows the number of processed articles using weight and unit weight.
- It is possible to increase the unit weight accuracy during the

counting manually entering the sample quantity and pressing **Smpl**. Make sure that the display quantity matches the one on the scale before pressing the key. The more the weighed samples, the more accurate the unit weight.

### 5.3.3 Automatic Update of the Unit Weight

- The scale automatically updates the unit weight when, after the capture, a lower number of samples compared with the one used for the first average weight capture is loaded on the scale. Each update is acoustically signalled. Users are suggested to check the quantity correctness after the automatic update of the weight.

- Press **U.Wt** to lock the unit weight avoiding the Auto-update.

- This function disables as soon as the number of added pieces exceeds the count used as sample.

### 5.3.4 Preset Counting or Checkweigher Mode

The Checkweigher (or Preset Counting) procedure activates an alarm whenever the net weight (or the number of pieces) on the scale matches or exceeds a stored number. The value to be stored is entered through the keyboard.

#### SETTING LIMITS

It is possible to set an upper and lower limit for the counting and weighing functions (using the net weight). Pressing **Pst**, the user can select counting or weighing and set the limits.

For example:

ACTION	DISPLAYED MESSAGES
Press <b>Pst</b>	"PST " " nEt " " " if in weighing mode
Press <b>U.Wt/Units</b>	"PST " " cnt " " " shift from weighing to counting
Press <b>Tare</b>	"Hi cnt" "0.3 234" " " " The upper limit of the current count is displayed, press <b>CE</b> to delete and change if necessary.
Press <b>Tare</b>	"lo cnt" "0.0234" " " " The lower limit of the current count is displayed, press <b>CE</b> to delete and change if necessary.
Press <b>Tare</b>	Returns to weighing with set limits.

- It is possible to delete one or both limits. Deleting both limits disables the function as well.
- If the Checkweigher mode has been selected, the first display shows “Hi net” and “Lo net”.

#### 5.4 PLU

PLU codes are to store information about the most used articles. Digiting a PLU code, its Tare, Description and Unit Weight are recalled.

The scale can store Tare, Description and Unit weight Values to 100 PLU codes.

The Tare value is needed for the calculation of the Net Weight in case a container is used. Descriptions are used for the data transfer via RS-232 for the display or printing and the Unit Weight for the counting of pieces.

Such data shall be entered in a particular PLU before the beginning of the weighing process in order to be recalled during the weighing operation. Data can be stored and manually recalled or transferred via RS-232.

##### 5.4.1 PLU MANUAL STORAGE

ACTIONS	DISPLAYED MESSAGES			NOTES
	Weight	Unit weight	Count	
Press <b>Zero</b> if requested.	“00000”	“ 0”	“ 0”	The scale is zeroed.

Note: Enter or capture the tare in case a container is being used (see paragraph 5.1.2 in this User Manual). In case a Tare value is needed, the scale is in NET mode.

Enter or capture the Unit Weight following the procedure described in 5.3.1 and 5.3.2 in this User Manual.

Tare and Average Unit Weight can be captured or manually set by the user.

The following table is an example of the compilation of the “PLU 27” with Description “M4 Nut” and Unit Weight “0.015”.

ACTIONS	DISPLAYED MESSAGES			NOTES
	Weight	Unit Weight	Count	
Press <b>PLU</b>	“PLU ”	“ - - “	“ “	-
Press <b>2, 7</b>	“PLU ”	“ 27”	“ “	-
Press <b>Pst</b>	“PLU 27”	“x x x x x x”	“x x x ”	The current description is displayed with the first character flashing, it can be changed from the numeric keyboard.
Pressing <b>CE</b> while the first character flashes, all the descriptions are deleted	“PLU 27 ”	“ “	“ “	-
Complete the Description.	“PLU 27 ”	“M 4 Nut“	“Bras s “	12 characters all in all shared by between the two displays (UNIT WEIGHT and COUNT).

Note: Use the **.** key to return to the previous character or the **M+** key to move on to the following one.

A flashing character can be modified, to enter a space keep **0** pressed for a short while.

The tare value is stored in a PLU if the scale is in the NET mode. In case the weight of the container is lower than manual preset zero, 2% of the capacity, the scale zeroes and no tare value is stored. To avoid this, use a bigger container.

#### 5.4.1.1 CANCELLATION OF A PLU FROM PRINTING

Store a PLU when the scale is completely set to zero and a space as description. This PLU shall be used to delete the printing when switching from operation with PLU to operation without PLU.



### 5.4.2 MANUAL INSERTION OF DESCRIPTIONS

A description can be made up of max 12 characters which are numbers, symbols or letters.

During the insertion procedure, the numeric keyboard works like the one of a cellular phone. Shortly pressing a key selects the digit, keeping pressed scrolls the characters.

Table of digits and matching characters:

1	- / \
2	A B C
3	D E F
4	G H I
5	J K L
6	M N O
7	P Q R S
8	T U V
9	W X Y Z
0	_ [ ] Where _ is a Space (Not an Hyphen)

The 7 segment display sometimes limits the display of some letters.

All characters are saved as text, so the RS-232 interface output is correct.

### 5.4.3 MANUAL PLU RECALL

- To recall the PLU values, the user shall first select the local or remote scale as the stored tare value belongs to the selected scale.
- Pressing **PLU**, enter the PLU code (00 – 99) and press **PLU** again to recall its data.
- The recall result is displayed for 1 second, then the scale returns to the weighing mode.

ACTIONS	DISPLAYED MESSAGES		
Press <b>PLU</b>	"PLU "	" - "	" "
Press <b>2, 7</b>	"PLU "	" 27"	" "
Press <b>PLU</b>	"PLU 27 "	"M4 Nut"	"Brass "
After 1 second, the scale returns to the normal weighing with the Tare and Unit Weight previously entered.	" x x x x"	" x x x x "	" x x"

For instance:

Keeping the **PLU** key pressed after the numeric insertion, the description is displayed as long as the key is kept pressed.

- In this example the "PLU 27 " "M 4 Nut" "Brass " is displayed for 1 second, if there were no data stored, "PLU 27" " " " " would be displayed.
- If the tare value is out of the range of the selected scale (for example if the local scale has been selected while the tare value applicable to the remote scale exceeds the local scale capacity) the "Weight" display shows tare weight zero.
- If the stored tare value does not match with the division of the selected scale (for example, storing -1.446 in a scale with d=0.05) it is necessary to round the tare weight (for example, in this case, -1.45 would be used as tare value).
- If a PLU code with no information is recalled, the scale goes on working without Tare and Unit Weight variations.

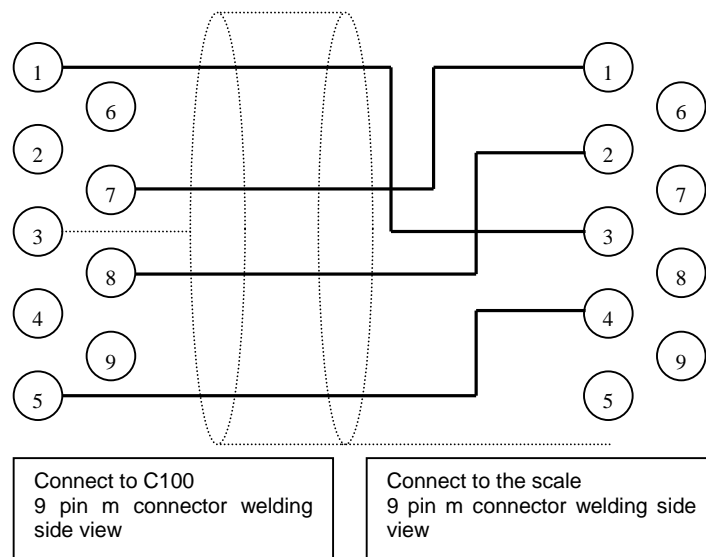
## 6 BATTERY OPERATION

- The scale can be battery operated. The battery has an approximately 70 hour life span if only the base unit is used. In case a second platform is connected, the battery life span is shorter.
- When the battery needs to be recharged, the arrow on the low battery symbol under the "Weight" display is on. The battery must be recharged as soon as the arrow above the symbol appears. The scale operates for about 10 more hours, then it automatically switches off in order to protect the battery.
- To recharge the battery plug it in the power network. It is not necessary for the scale to be on.
- The battery needs 12 hours to fully recharge
- Just under the "Count" display, a LED informs about the battery status. When the scale is connected to the power network, the built in battery is recharging. If the LED is green, the battery is charged. If it is red, the battery is nearly flat.

Note: We recommend to charge the battery before using the scale for the first time.

## 7 CONNECTION OF THE REMOTE SCALE

The C100 terminal can be connected to a remote scale to the “load cell” connector. Below the scheme of a cable to interface directly to the Bilanciai scales with 9 pin connector and the table with the function of every single wire. As for the remote scale connection and calibration, please contact your dealer.



Terminal side Pin	Function	Scale side Pin
1	EX +	3
5	EX -	4
7	Signal -	1
8	Signal +	2
3	shield	Conn. body

## 8 CONNECTION OF THE SERIAL INTERFACE

The C100 terminal comes with a RS 232 serial interface and cyclically transfers data with ASCII coding with the following serialization:

baude 4800  
bits 8  
stop 1  
parity NO

The connector has the following pin path:

pin 2 RX  
pin 3 TX  
pin 5 GND

Below an example of string:

ST,GS, 0.0000kg  
U.W. 0g  
PCS 0pcs

where:

ST = Stable weight (US in case of unstable weight)

GS = Gross Weight (NT in case of net weight)

U.W. = Average Unit Weight

PCS = Number of pieces







# WorldWEIGH



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