BC

Counting Scale
User's Guide

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Mettler Toledo is recognized around the world for manufacturing and marketing high quality scales and weighing systems. With roots tracing back to 1901, the company takes pride in its long established record of employing innovation, technology, and a close working relationship with its customers to meet the diverse needs of the global marketplace. Mettler Toledo's worldwide headquarters are in Greifensee, Switzerland. Corporate offices for the North American Marketing Organization are in Worthington, Ohio, USA.

Declaration of conformity
Konformitätserklärung
Déclaration de conformité
Declaración de Conformidad
Verklaring de overeenstemming
Dichiarazione di conformitá

We/Wir/Nous/WIJ/Noi: **Mettler-Toledo, Inc.**
1150 Dearborn Drive
Worthington, Ohio 43085
USA

declare under our sole responsibility that the product,
erklären, in alleiniger Verantwortung, daß dieses Produkt,
déclarons sous notre seule responsabilité que le produit,
declaramos, bajo nuestra sola responsabilidad, que el producto,
verklaren onder onze verantwoordelijkheid, dat het product,
dichiariamo sotto nostra unica responsabilitá, che il prodotto,

Type: Mentor (Parts Counting Scale)

Models: SCxx and BCxx **(where xx defines the capacity of the Scale from 5 to 60 kg)**

to which this declaration relates is in conformity with the following standard(s) or other normative document(s).
auf das sich diese Erklärung bezieht, mitder/den folgenden Norm(en) oder Richtlinie(n) übereinstimmt.
Auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou au(x) document(s) normatif(s).
Al que se refiere esta declaración es conforme a la(s) norma(s) u otro(s) documento(s) normativo(s).
Waarnaar deze verklaring verwijst, aan de volende norm(en) of richtlijn(en) beantwoordt.
A cui si riferiBCe questa dichiarazione è conforme alla/e sequente/i norma/e o documento/i normativo/i.

CE Conformity / CE-Konformität / Conformité CE
90/384/EU Nonautomatic Balances and Scales / Nichteselbsttätige Waagen / Balances à Functionnement non automatique
EN45501:1992 Adopted European Standard / Norme Européenne Adoptée / Angenommene EuropäiBChe Norm
89/336/EU EMC Directive / EMU-Richtlinie / Directive concernant la CEM
EN55022, A 01.04.87 Emissions / Funkstörungen
EN50081-1 Immunity
73/23/EU Low Voltage / Niederspannung / basse tension
EN61010 el. Safety / el. Sicherheit / sécurité el.

Other Directives and Standards / Andere Richtlinien und Normen / Autres documents
corresponding to local requirements / entsprechend lokalen Anforderungen / correspondant aux exigences locales

UL	1950	el. Safety / el. Sicherheit / sécurité el. (if UL mark is applied)
CSA	C22.2 No. 950-M89	el. Safety / el. Sicherheit / sécurité el. (if cUL mark is applied)
FCC	Part 15, class A	Emissions / Funkstörungen (if FCC mark is applied)

Darrell Flocken, Manager - Weights & Measures
Office of Weights and Measures
Worthington, Ohio USA
January, 1995
September, 1996 (revised to include NAWI and LV Directives compliance.) according to EN45014

Introduction

This manual is provided solely as a guide to the operation of the METTLER TOLEDO BC counting scale. Programming, service and maintenance information is presented in the BC Counting Scale Technical Manual (PN B147516 00A).

SOFTWARE VERSION

This manual properly describes the operation and functionality of the METTLER TOLEDO BC counting scale containing software part number F144258, version 2.0. The software version and part number are displayed during the power-up sequence of the scale.

FCC NOTICE

This equipment has been tested and found to comply with the limits of the United States of America FCC rules for a Class A digital device, pursuant to Part 15 of the FCC Rules and the Radio Interference Regulations of the Canadian Department of Communications. 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.

METTLER TOLEDO RESERVES THE RIGHT TO MAKE REFINEMENTS OR CHANGES WITHOUT NOTICE.

PRECAUTIONS

READ this manual BEFORE operating or this equipment.

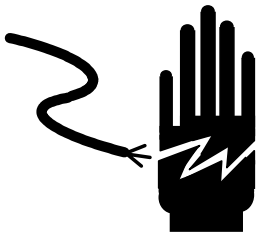
FOLLOW these instructions carefully.

SAVE this manual for future reference.

DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

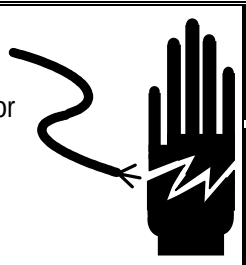
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.



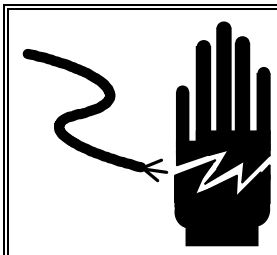
WARNING!

DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING. TO DISCONNECT POWER, FIRST TURN THE POWER SWITCH TO OFF. THEN REMOVE THE POWER CORD FROM THE OUTLET.



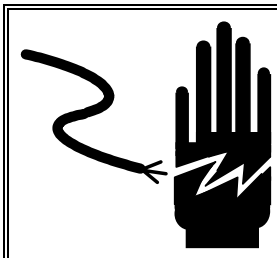
WARNING!

PERMIT ONLY QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY INJURY.



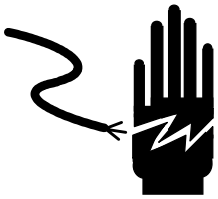
WARNING!

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY. DO NOT REMOVE THE GROUND PRONG.



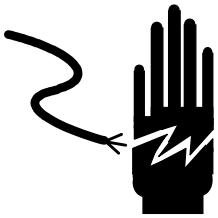
WARNING!

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, OR CLEANING. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



WARNING!

DO NOT OPERATE THE BC COUNTING SCALE IN WET OR HAZARDOUS ENVIRONMENTS. DOING SO MAY RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



CAUTION!

USE ONLY THE AC POWER SUPPLY PROVIDED WITH YOUR SCALE (24V @ 250mA) AND ENSURE THAT THE VOLTAGE VALUE PRINTED ON IT MATCHES THE LOCAL LINE VOLTAGE. IF THE OPTIONAL BATTERY IS USED WITH THE BC COUNTING SCALE, A LARGER POWER SUPPLY (24V @1A) MUST BE USED. DO NOT USE THE STANDARD POWER SUPPLY WHEN THE BATTERY OPTION IS INSTALLED.

CAUTION!

USE ONLY OPTIONAL EQUIPMENT AND PERIPHERALS SUPPLIED BY METTLER TOLEDO WITH THE BC SCALE. THESE ITEMS HAVE BEEN DESIGNED AND TESTED SPECIFICALLY FOR USE WITH THE BC SCALE.

CAUTION!

THE BC SCALE HAS A RUGGED CONSTRUCTION, BUT IT IS STILL A PRECISION INSTRUMENT. HANDLE IT WITH APPROPRIATE CARE TO ENSURE THAT IT PROVIDES YEARS OF TROUBLE-FREE OPERATION.

CAUTION!

DO NOT OPEN THE BC SCALE COVERS OR DISPLAY. THEY DO NOT CONTAIN ANY PARTS WHICH CAN BE MAINTAINED, REPAIRED OR REPLACED BY THE USER. FAILURE TO OBSERVE THIS WILL VOID THE WARRANTY ON THE BC COUNTING SCALE.

CONTENTS

1 Introduction

The BC counting scale is an easy-to-use, high performance industrial counting scale that accurately and dependably counts parts of all shapes and sizes. Designed for use in normal industrial environments, it features an easy-to-learn counting system and a simple keypad that make it ideal for simple applications.

This manual provides detailed information for operating the BC counting scale. Please read it thoroughly and familiarize yourself with all safety requirements. All service procedures must be performed only by authorized personnel.

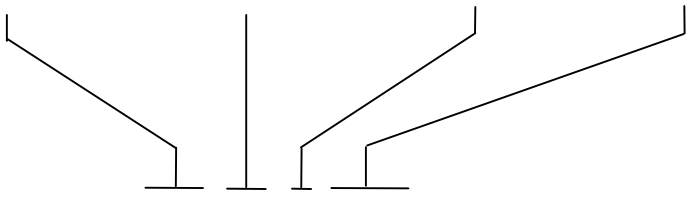
If you discover a problem with this documentation, please complete the **Publication Evaluation Form** found in the back. For information not found in this manual, please contact your authorized Mettler Toledo representative. Space is provided on the inside back cover of this manual for the name and number of the local Mettler Toledo representative.

Model Identification

The BC counting scale is available in four different capacities and is configured for the market in which it will be used at the time of ordering. Refer to the following chart to confirm the model number of the BC scale with which you are working. The example below shows a BC 15kg capacity scale with the battery option for the USA market.

Model Number Configuration

Scale Type	Capacity	Battery Option	Market
BC	05 - 10 lb / 5 kg 15 - 37.5 lb / 15 kg 30 - 60 lb / 30 kg 60 - 120 lb / 60 kg	Blank - None B - Battery	000 to 999 Market Code per Mettler Toledo Specifications



BC 15 B 000

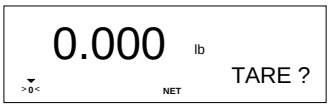
Using These Instructions

The instructions in this manual provide various types of help to facilitate your search for desired information.

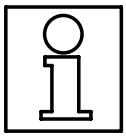
- Work steps are marked by a **"•"** symbol while descriptive information is preceded by a **"--"**.
- Key designations are in bold uppercase such as **TARE** or **SAMPLE**.

[ADDING]

- Certain display messages are shown within brackets.



- This shows the current condition of the BC counting scale display.



- This symbol indicates additional information and instructions for handling the BC counting scale that contribute to proper and economical use.

- This symbol indicates safety and hazard instructions. All personnel must comply with these instructions to avoid injury to the user(s), damage to the scale and other tangible assets, and malfunctions.


- These symbols indicate electrical safety and hazard instructions and/or warnings. All personnel must comply with these instructions to avoid injury to the user(s), damage to the scale and other tangible assets, and malfunctions.

Safety Considerations

Please read ALL instructions and review the safety precautions and warnings listed in the front of this manual. Even if you are familiar with METTLER TOLEDO scales and balances, you must read the operating instructions carefully and abide by all safety precautions. Should you have any problems with the BC scale, please contact your local authorized METTLER TOLEDO representative for assistance.

2 Installation

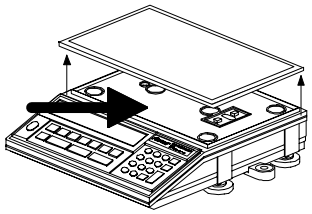
Setup for Previous BC Scale Users

If you are familiar with the BC counting scale, just complete these six steps to prepare the scale for operation. All other users should refer to **Setup for New Users** following this section.

1

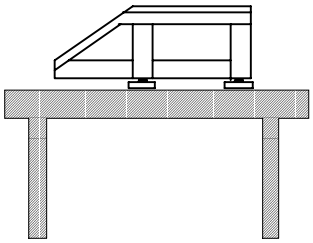
- Unpack (if you have not already done so).

2



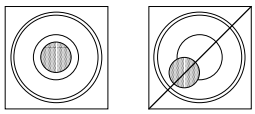
- Unlock. (Model BC05 Only)

3



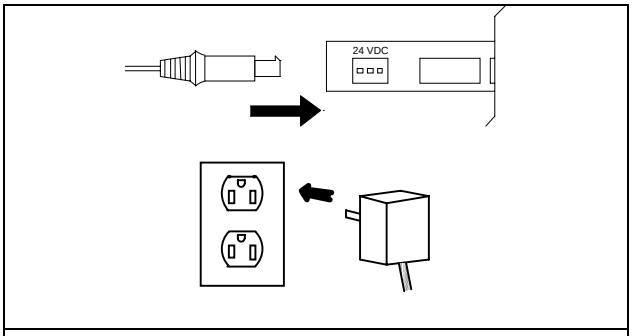
- Set into position.

4



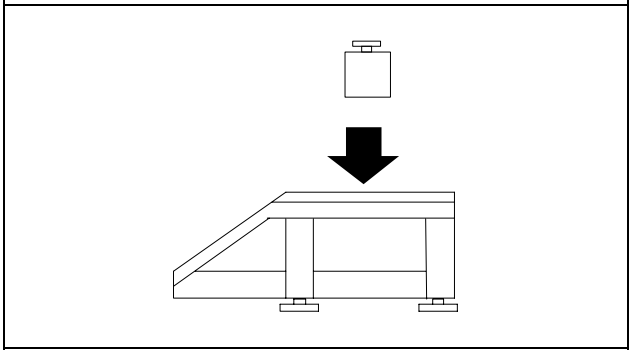
- Level.

5



- Connect power supply.

6



- Count.

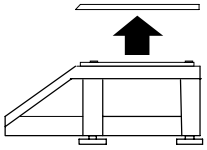
Setup for New Users

Unpacking the BC Scale

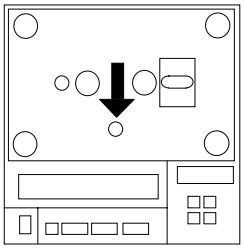
- Pull the scale out of the box and remove the protective cushioning, if you have not already done so. Note: The BC05 and BC15 have packing material under the platter that must be removed.
- Check that all components are present. You should have:
  - BC counting scale
  - Keyboard/display unit (BC30 and BC60 only)
  - Scale platter
  - AC power supply
  - User's Guide
  - Technical Manual
  - Operator's Quick Reference Card
  - Allen wrench (BC05 only)
  - Factory-installed battery option (If ordered)
- Store the packaging for future use as it provides the best possible protection for the transporting the scale.
- Notify your METTLER TOLEDO representative immediately if you discover any damage or missing parts. Do not operate the scale if you find external damage.

Unlocking the BC05

The model BC05 is shipped from the factory with a lock-down screw to secure and protect the sensitive load cell. **No other capacities require this extra protection**. You must entirely remove this lock-down screw before using the scale.



- Lift the platter from the top of the BC05 scale.



- Locate the lock-down screw near the front of the scale. Use the allen wrench provided to remove the screw. Remove it entirely. Do not just loosen it. Turn it counterclockwise to remove.

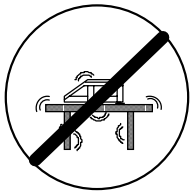
- Retain the screw for future use in case you wish to transport the BC counting scale in its original packing material.

Selecting or Changing the Location

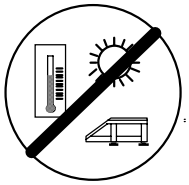
The BC counting scale is a precision instrument and performs best when placed in an optimum location.

- Never operate the BC counting scale in a hazardous (explosive) environment.

- Never use the BC counting scale in wet areas.



- Provide a firm, vibration-free, horizontal foundation capable of supporting the weight of a fully loaded scale.



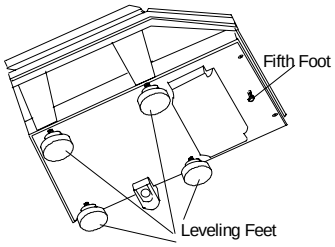
- The BC counting scale can operate and be stored in a temperature range of 50° F to 104° F (10 to 40° C). Avoid sudden temperature changes. They can affect accuracy.

- Avoid excessive drafts (from fans or other sources)

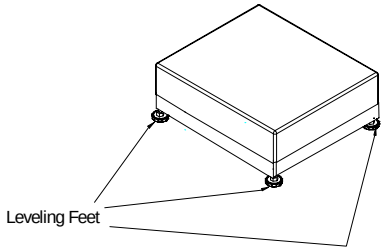
Note: If your BC counting scale is certified (legal for trade) and is moved far from the original location, please contact the local METTLER TOLEDO representative at the new destination to have the scale recalibrated.

Leveling the BC Scale

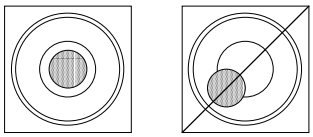
Weighing instruments work best when they are installed in a level position. To compensate for any minor unevenness at its location, the scale can be leveled as follows:



- On the BC05 and BC15, turn the four leveling feet on the bottom of the weighing platform until the scale is horizontal then adjust the fifth foot on the front to just touch the mounting surface.



- On the BC30 and BC60, turn the leveling feet on the bottom of the weighing platform until the scale is horizontal.



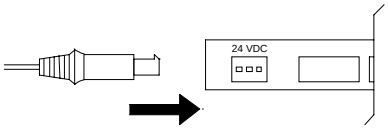
- The air bubble must be in the center of the level as shown here.

- Re-level the scale after every location change.

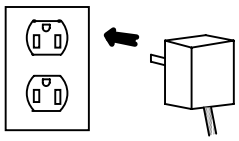
Applying Power

An AC adapter designed for your local line voltage is enclosed with your scale. There is also a battery option that allows portable operation of the BC counting scale. If the battery option is installed, the more powerful (1.0 A) AC supply is required for recharging the battery through the scale. If the battery option was installed at the factory, the larger supply is automatically included with the BC counting scale. If the battery option has been added, the larger power supply must be ordered separately.

- Make sure the voltage printed on the AC adapter matches the local line voltage. **If it does not, do not connect the AC adapter to the power outlet.** Contact your local METTLER TOLEDO representative immediately!

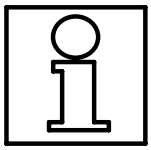


- Connect the AC adapter to the back of the BC counting scale with the ridge of the connector at the top.

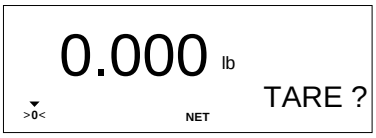


- Connect the AC adapter to your power outlet.

- Ensure that liquids never contact the AC adapter. Route the cable so that it does not become cut or damaged in the work area.
- Take care to route the AC power cable so that it does not touch the weighing platter or interfere with normal operation of the scale.



- When power is applied, the scale performs a self-test in which all display segments light up briefly and internal verifications are made. Information specific to the scale such as the software part number and revision level, is also displayed.



- When the power up sequence is complete, the BC counting scale is ready to use.

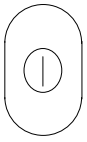
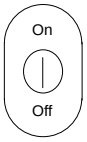
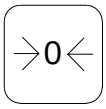
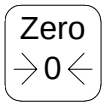
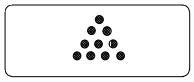
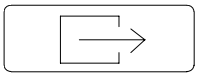
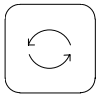
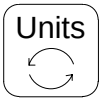
3 Operating the BC Counting Scale

This section describes common counting keyboard sequences you will need to know to operate the BC counting scale properly.

There are two versions of the BC counting scale keyboard. One contains international symbols. The other also includes English descriptions. The instructions in this manual are based on the English version keyboard. However, both sets of keys are shown with the descriptions that follow to assist you in cross referencing the two keyboards.

If you are interested in switching to an English version or international version keyboard, contact your authorized Mettler Toledo representative.

Keyboard Descriptions

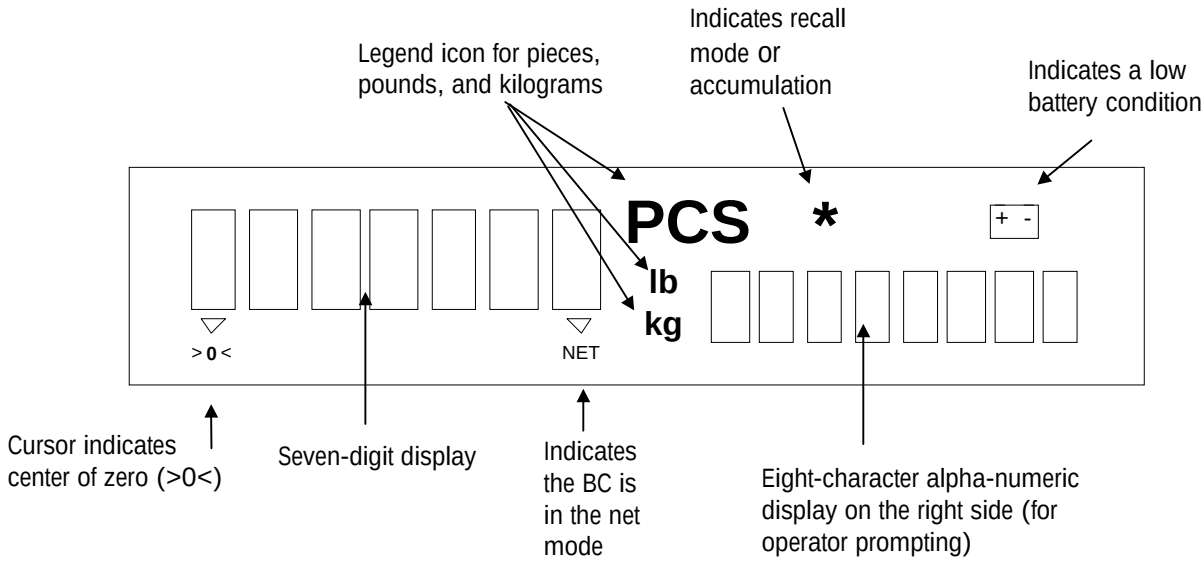
International Version	English Version	Description
		The **ON/OFF** key turns the scale on and off (sleep mode).
		The **ZERO** key zeroes the scale.
		The **TARE** key subtracts tare values and changes the BC counting scale from gross mode (no tare) to net mode.
		The **SAMPLE** key enters sample quantities.
		The **PRINT** key sends data to a printer.
		The **UNITS** key switches the scale from primary weight units to the alternate weight unit.
		The **RECALL** key recalls various data to the display.

The **ACCUM+** key adds data to the accumulators.

The **CLEAR** key clears data from the display and exits the count mode.

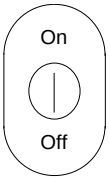
Display

You should also become familiar with the BC counting scale's liquid crystal display. The various areas of the display and their functions are noted below.

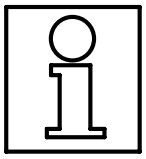


Switching On and Off

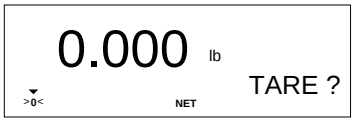
When power is applied to the BC counting scale, it powers up, captures the zero point, and is ready to weigh. To turn the scale off without unplugging the power cord, just press the **ON/OFF** key at the far left of the keyboard.



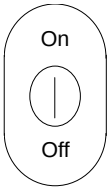
When the BC counting scale is turned off with the **ON/OFF** key, the display shows [SLEEP], and the scale is “off." To turn the scale on, press **ON/OFF** again. The BC counting scale powers up, captures zero, and is ready to operate.



During power up, the BC counting scale performs a self-test in which all display segments light up briefly and internal verifications are made. Information specific to the scale is shown, such as the software part number and revision level.

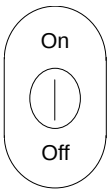


When the power up sequence is complete, the BC counting scale is ready to use.



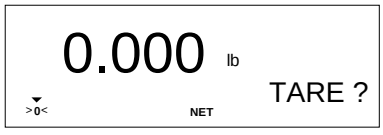
With the display on, pressing the **ON/OFF** key will turn the scale off.

The display will show [SLEEP].



Pressing the **ON/OFF** key again will turn the scale on again.

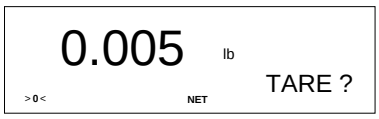
The right display will show [WAKING], while the BC counting scale exits the sleep mode.



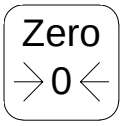
The BC counting scale then returns to normal operation.

Zeroing the Scale

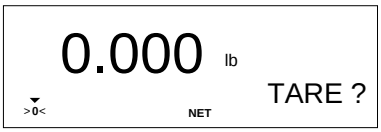
During the “warm-up” period and occasionally during normal use of the BC counting scale, you may notice the scale does not display zero when it is empty in the gross mode. In the count mode, the zero cursor may not illuminate when the scale is empty. When this occurs, you may re-zero the scale by pressing the **ZERO** key. This returns the scale display to gross zero and provides a new, accurate zero reference for counting.



The BC counting scale displays a weight value other than zero with no weight on the platter at gross zero.



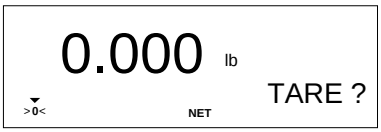
Pressing the **ZERO** key will return the BC counting scale to a zero reading.



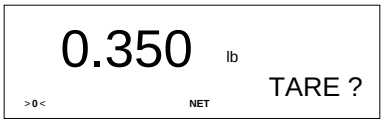
After zero has been set, the BC counting scale is ready to use. Note the cursor above the center of zero legend indicating the scale is at gross zero.

Taring the Scale

When counting parts, you may be placing parts into a box or other container when they are added to the scale. You do not want to include the weight of this container in the total count calculation since it would create an error. Pressing **TARE** with the empty container on the scale will automatically subtract the weight of the carton on the scale and allow you to begin at net zero. The cursor above the 'NET' legend on the display will illuminate, indicating the scale is in the net mode.



The BC counting scale displays gross zero weight before a tare container is placed on the scale.



The display then shows the weight of the container placed on the scale and prompts for a tare to be taken.

Pressing the **TARE** key with the empty container on the scale will initiate a tare action.

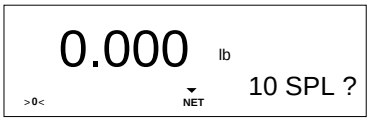
With the BC counting scale displaying zero weight in the net mode, a tare has been taken successfully. Additional pieces placed on the platter will display the net weight of the parts. Note the cursor above the 'NET' legend on the display indicating net weight mode.

Sampling Pieces for Counting Mode

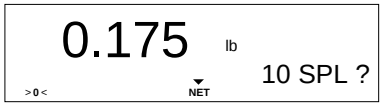
To count with the BC counting scale, it is necessary to sample a small quantity of parts so the scale can determine how much each piece weighs. The BC counting scale then uses this average piece weight (APW) to determine how many pieces are on the platter. To initiate a count, you place the specified number of sample pieces on the scale when prompted and press **SAMPLE**.

TIP: The purpose of the sampling step in piece counting is to determine a correct average piece weight (APW) of the parts. Ideally, if every piece weighed exactly the same, only one piece would be necessary to

calculate an accurate APW. In the normal counting environment however, the APW of each piece varies. Generally, the larger the variance in the individual piece weights, the larger a sample size will be required. Refer to the section titled **Variable Sample Counting** for additional information on selecting different sample sizes.

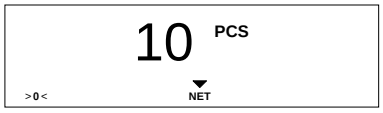


The BC counting scale displays net zero weight (with empty tare container on the scale) before a sample quantity is placed on the scale.



As the sample pieces are placed on the scale, the display shows the total weight with the container as it prompts for a sample to be taken.

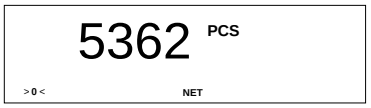
Pressing the **SAMPLE** key with the sample pieces on the scale will initiate an APW calculation.



The BC scale will now display the sample count. Additional parts placed on the platter will display the new total count of the parts. (PCS = pieces)

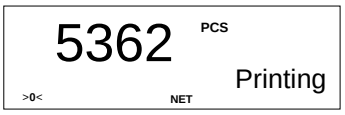
Printing the Results

When a transaction is complete, you may send the results to a printer or other device attached to the serial port of the BC counting scale. Pressing the **PRINT** key initiates the data transmission.



The BC counting scale displays the results of a counting sequence.

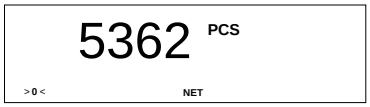
Press the **PRINT** key to initiate a data transmission.



The BC counting scale displays the message [Printing] on the right side of the display then returns to the normal count display when finished.

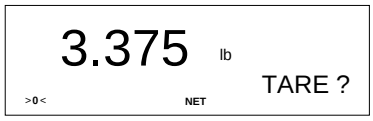
Clearing Out of Counting Mode

After a count is taken, the pieces on the scale may be removed. The scale remains in the count mode, ready for the next empty tare container (same weight as previous one) and pieces to be added. You do not need to sample for each count. When you do change pieces or switch to a different tare container, you must exit the count mode and begin the counting process again. To exit from the count mode, press **CLEAR**.



The BC counting scale displays count from current transaction.

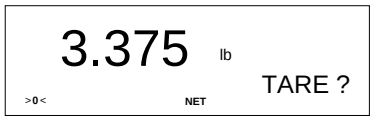
Pressing the **CLEAR** key will initiate the exit process.



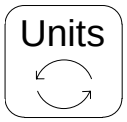
After exiting piece count mode, the BC scale will return to the gross weight mode. Any weight placed on the weighing surface (platter) will appear on the display. The BC scale is ready for another counting sequence.

Switching Weighing Units

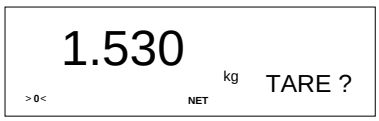
The BC counting scale can switch between two weight units from the keyboard. It arrives programmed for pounds with kilograms switching. Unit switching is permitted in the weight and count modes. When switching units in the count mode, the display will change from pieces to the newly selected weight unit. Pressing **CLEAR** will return the display to piece count. This feature allows you to count parts or weigh in two different weight units.



The BC counting scale displays a gross weight value in the pounds mode.



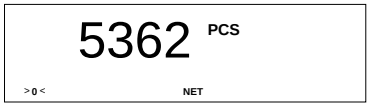
Pressing the **UNITS** key will switch the BC counting scale from the current weight unit to the other weight unit.



After pressing **UNITS**, the BC counting scale displays the equivalent weight value in the alternate unit and the unit symbol is illuminated. Units available are pounds (lb), kilograms (kg) and grams (g).

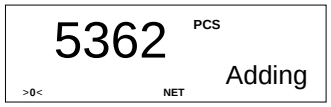
Accumulating Weight and Count

The BC counting scale has three data accumulators available for tracking totals of gross weight, net weight, and piece count. To initiate an accumulation, press **ACCUM+**. If the scale is in the weighing mode, only weight fields will be accumulated. If the BC counting scale is displaying count, all fields will be accumulated.



BC counting scale displays the results of a counting sequence.

Pressing the **ACCUM+** key will initiate the accumulation of data.



The BC counting scale will display the message [Adding] on the right side of the display then return to the normal count display when finished.

Recalling Weight and Count Information

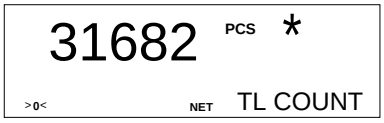
The BC scale uses different types of data throughout the counting process that can be recalled any time during the weighing or counting process: Percent Accuracy, Total Piece Count, Total Net Weight, Total Gross Weight, Gross Weight, Net Weight, Count, Sample Quantity, APW, and Tare Weight. Pressing **RECALL** will display each item in sequence.

The BC counting scale displays the results of a counting sequence.

Pressing the **RECALL** key will retrieve data from memory.

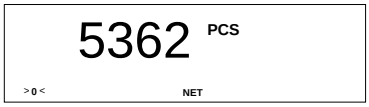
The first field recalled will be percent accuracy. The left side of the display will show “ACCurCy” and the right side will show the value of the percent accuracy if enabled (if not enabled, it will be blank). Note the asterisk on the display indicating that you are in the recall mode.

Pressing **RECALL** again will retrieve the next data field from memory. Each time the **RECALL** key is pressed, the next field in sequence will be recalled.



The second field recalled will be the accumulated piece count. The right side of the display will show [TL COUNT] and the left side will show the total of the accumulated pieces.

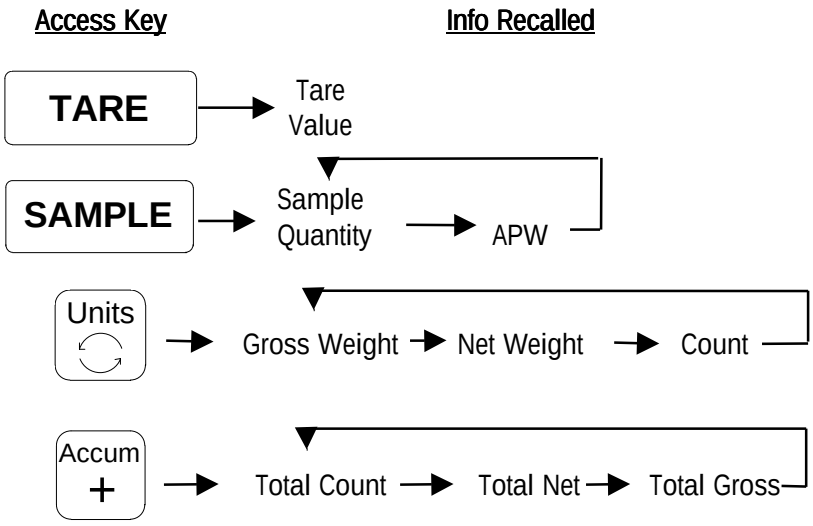
Pressing **CLEAR** at any time will exit the recall mode.



The BC counting scale returns to its original mode.

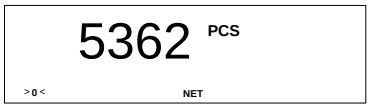
Quick Access to Recall Data

There are several fields or “groups” of data fields which can be recalled directly without proceeding through the complete recall sequence. Repeatedly pressing the specific “group” key after pressing **RECALL** will continue to recall the associated data fields in a loop so all fields can be viewed. The fields and “groups” which have direct access are defined below.



To recall any of these fields or “groups,” press the **RECALL** key then the access key shown in the chart above. The display will show the field in the first column on the display. For keys which contain data in either the second or third recall column, repeated pressing of the access key will toggle the display through each of these fields.

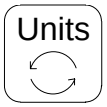
The following example shows how to quickly recall the gross weight:



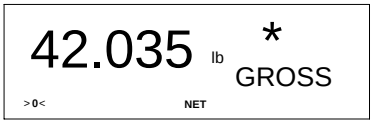
The BC counting scale displays the results of a counting sequence.

Pressing the **RECALL** key will retrieve data from memory.

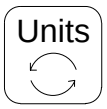
The first field recalled will be percent accuracy. The left side of the display will show [ACCurCy] and the right side will show the value of the calculated percent accuracy. Note the asterisk on the display indicating that you are in the recall mode.



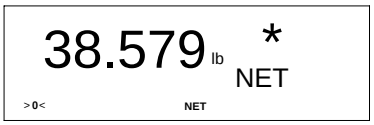
Pressing the **UNITS** key will retrieve the gross weight data field from memory.



The gross weight will be recalled.



Press the **UNITS** key again.



Each time the **UNITS** key is pressed, the next field in sequence will be recalled - net weight then count.

After recalling the required fields, press **CLEAR** to exit the recall mode.

The BC counting scale returns to its original mode, which in this case is showing the piece count.

NOTES

4

Counting and Sampling Modes

During the initial setup of the BC counting scale, different modes of operation may be selected. Although you may not have reason to use these modes and functions, you should understand how they affect the operation of your scale. During installation, your METTLER TOLEDO representative will configure the BC scale to suit your exact needs.

To change the BC counting scale's mode of operation, settings are modified in the Master Mode. These procedures are fully described in the BC Counting Scale Technical Manual. To modify the setup, contact your local METTLER TOLEDO representative for assistance.

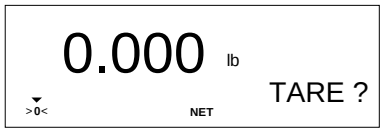
Dependent Mode of Operation

There are two modes of operation available in the BC counting scale: **dependent** and **independent**.

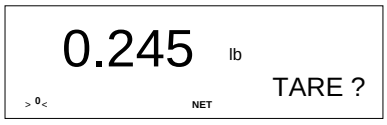
The **dependent** mode provides a prompting display for a pre-selected sequence of operation. The display will prompt the operator through a complete counting sequence using the eight-character alphanumeric display. The operator follows the prompts and responds to the display. In dependent mode, there is only one sequence of operation: [Tare ?] is followed by [10 Spl ?]. The operator is asked to initiate a tare and then to place a quantity of sample pieces on the scale.

When these steps are completed, the BC scale indicates the total piece count of additional pieces placed on the platter.

Example - Dependent Mode

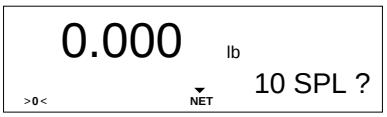


The BC counting scale will prompt for a tare weight to be added.

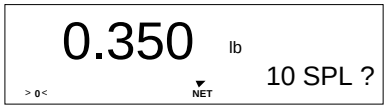


Place the empty container that will be used to hold the pieces to be counted on the platter. If a tare container will not be used, proceed to the next step.

Press the **TARE** key to acknowledge entry of the tare value.

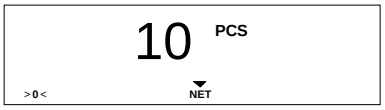


The BC counting scale will now prompt for a pre-selected sample quantity of pieces to be added to the scale.

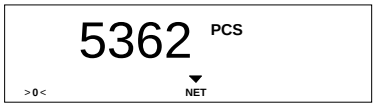


Place the correct quantity of sample pieces (10) on the scale .

Press the **SAMPLE** key to acknowledge the placement of sample pieces on the weighing surface.



The BC counting scale display will now display the sample quantity as the current count.



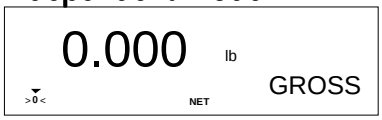
Additional pieces placed on the platter will be shown on the display. The count sequence is complete.

Independent Mode of Operation

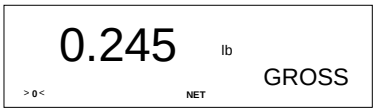
independent mode allows an operator to choose which data is entered and in what order and, in some cases, can reduce the keystrokes required for a count transaction. **NOTE: Independent** mode is for use by experienced operators.

In the previous example, the operator had to press **TARE** to proceed to the next prompt even though no tare container was used. In **independent** mode, the operator simply presses **SAMPLE** after placing the sample pieces on the scale. The scale then calculates the piece count. The disadvantage is that the scale does not prompt the operator for the next step. The following example shows a complete tare and sample sequence that an operator can follow. Remember, the tare sequence can be skipped if no tare container is used. The **Independent** mode must be enabled in the Master Mode.

Example - Independent Mode



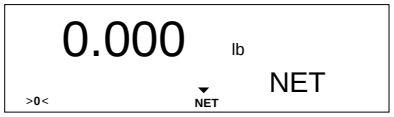
The BC scale indicates that it is in the gross weight mode ready to begin.



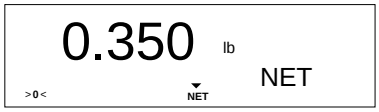
Place the empty container on the platter. If a tare container will not be used, this step and the next two steps may be skipped.

TARE

Press the **TARE** key to acknowledge entry of the tare value even if no tare container is used.



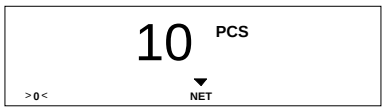
The BC counting scale will now indicate zero weight in the net mode and is ready for the next step. If no tare container was used, the BC counting scale will remain in the gross mode and the net cursor will not be lit.



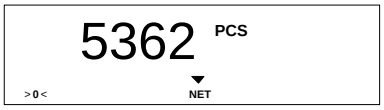
Place the correct quantity of sample pieces (10) on the scale. The operator must either know the correct sample quantity or may view it by pressing the **SAMPLE** key before placing the sample pieces on the platter. Note: Net cursor will not be on if there was no tare container.

SAMPLE

Press the **SAMPLE** key to acknowledge the placement of sample pieces.



The BC counting scale display will now display the sample quantity as the current count.



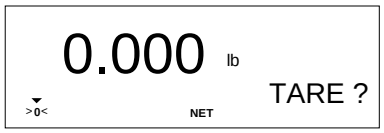
Additional pieces placed on the platter will be shown on the display. The count sequence is complete.

Count-In Sample Method

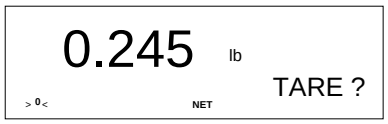
There are many methods an operator can use to obtain a piece count. Both examples used so far utilize the **count-in sample method**. The pieces to be sampled were added to the scale and not removed.

The **count-in method** may be used in either dependent or independent mode. The BC counting scale can change between the count-in and count-out methods (described in the next section) with no change to the Master Mode programming. The only change is the procedure the operator follows.

Example - Dependent Mode Using Count-In Method

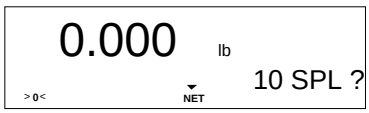


The BC counting scale will prompt for a tare weight to be added.

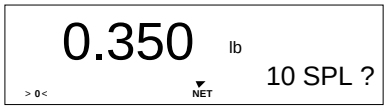


Place the empty container on the platter. If a tare container will not be used, proceed to the next step.

Press the **TARE** key to enter the tare value.

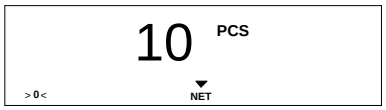


The scale will now prompt for a pre-selected sample quantity of pieces to be added to the scale.

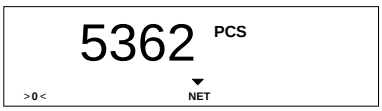


Place the correct quantity of sample pieces (10) on the scale .

Press the **SAMPLE** key to acknowledge the placement of sample pieces.



The display will now show the count of the sample quantity.



Additional pieces placed on the platter will be shown on the display. The count sequence is complete.

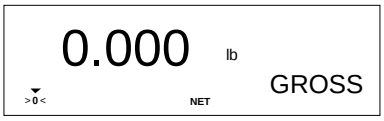
Count-Out Sample Method

The **count-out sample method** is useful for counting pieces removed from a container on the scale platter. For example, suppose you want to take a full bin of parts from the stock shelf and pack up three boxes of 500 pieces each. You could use the “count-in” mode by placing an empty box on the scale, sampling the correct quantity in the box, then placing pieces on the scale until "500" was displayed.

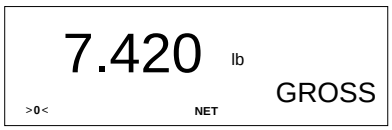
An alternative method would be to place the full bin of parts on the scale, tare it, remove the correct sample quantity from the container, and press **SAMPLE**. Additional pieces could now be removed and placed in the smaller box until the display shows [-500 pcs]. The operator could then press **TARE** again and remove the next lot of 500 pieces.

The count-out method may be used in the dependent or independent mode. The BC counting scale can alternate between count-in and count-out methods with no change to Master Mode programming. The only change is the procedure that the operator follows. The count sign (positive or negative) is selectable for count-in and count-out methods in the Master Mode.

Example - Independent Mode Using Count-Out Method

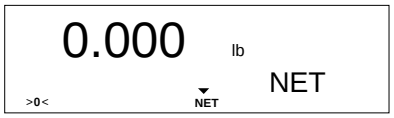


The BC counting scale indicates that it is in the gross weight mode ready to begin.

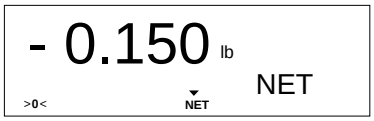


Place the full container of the parts to be counted on the platter.

Press the **TARE** key to capture the gross weight as the tare value.

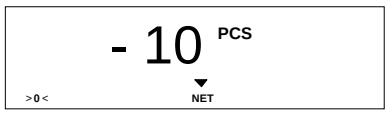


The scale now indicates a zero weight in the net mode and is ready for the next step.

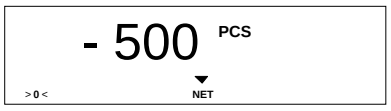


Remove the correct quantity of sample pieces (10) from the scale. The operator must either know the correct sample quantity or may scroll through the possible choices by pressing the **SAMPLE** key before removing the sample pieces from the platter.

Press the **SAMPLE** key to confirm the removal of the sample pieces.

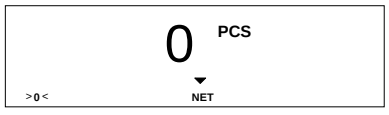


The BC counting scale now displays the count of the sample quantity as a negative number indicating pieces have been removed.



Additional pieces removed from the platter will be shown on the display. The count sequence is complete. Additional piece quantities can be removed and counted by pressing the **TARE** key between each sequence.

Additional piece quantities can be removed and counted by pressing the **TARE** key between each sequence.



The display is set to 0 pieces and provides a new beginning point for the next count sequence.

Variable Sample Quantity

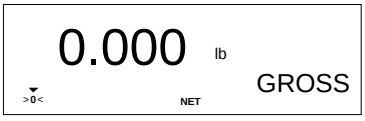
During initial set up, a default sample quantity was selected in the Master Mode. This is the quantity displayed first when sampling. The original

default value is 10 pieces. When a different weight piece is counted, it may be necessary to sample a different quantity to determine an accurate APW. For instance, more sample parts would be required when counting lighter weight pieces; fewer parts if the individual pieces are heavier.

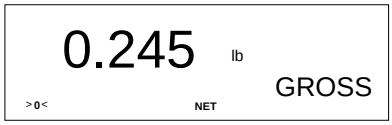
You can select from a preset list of quantities to be used when sampling if **variable sample** is enabled in the Master Mode. Select the desired quantity by pressing **SAMPLE** several times before placing sample pieces on the platter. Then place the sample pieces on the scale and press **SAMPLE** again. You can change to any sample quantity (5, 10, 20, 50, or 100). Generally, the larger the variance in individual piece weights, the larger the sample quantity must be.

Variable sample is the factory default. However, if variable sample is off in the Master Mode, the operator cannot change the sample quantity and must always use the same number of sample pieces. The variable sample feature may be used in either the dependent or independent mode of operation, and when using count-in or count-out methods.

Example - Independent Mode Using Variable Sample

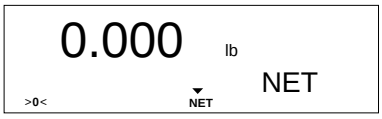


The display indicates that it is in the gross weight mode ready to begin.



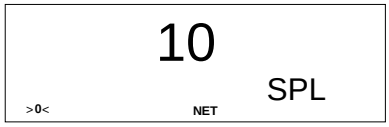
Place an empty container on the platter. If a tare container will not be used, this step and the next two steps may be skipped.

Press the **TARE** key to enter the tare value.



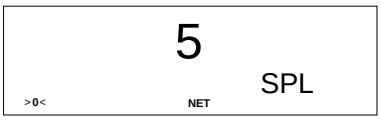
The scale will now indicate zero weight in the net mode and is ready for the next step.

With the scale showing zero net weight , press the **SAMPLE** key to view the current sample quantity.

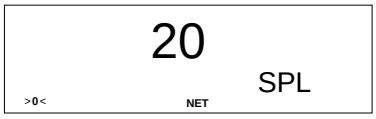


The default sample quantity is shown on the display. This is the sample quantity that would be used to calculate the APW for a count sequence.

With the default sample quantity displayed , press the **SAMPLE** key to view the next sample quantity in the list.



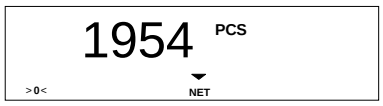
The display will show the second sample quantity of 5. The choices for variable sample always begin with 5 then proceed through the other values (10, 20, 50, and 100) each time the **SAMPLE** key is pressed.



When the desired sample quantity is displayed, place the correct number of sample pieces on the scale.

Press **SAMPLE** to acknowledge the placement of the sample pieces.

The BC counting scale will now display the count of the sample quantity indicating the number of pieces on the platter.



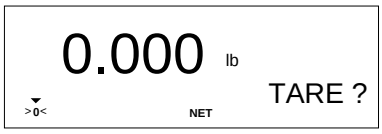
Additional pieces added will be shown on the display. The count sequence is complete.

Fixed Sample Quantity

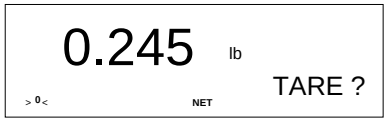
For applications in which you do not want the operator to be able to change the sample size, you can use the **fixed sample mode**. In this mode, no other sample quantity may be used other than the default sample size. You can view the sample size but cannot change the value.

Fixed sample is useful if all of the items you are counting have approximately the same APW and can be counted accurately using the same sample quantity. The fixed sample feature may be used in either the dependent or independent mode of operation and when using the count-in or count-out sample methods. Fixed sample must be enabled in Master Mode.

Example - Dependent Mode Using Fixed Sample



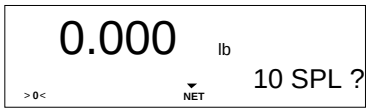
The BC counting scale will prompt for a tare weight to be added.



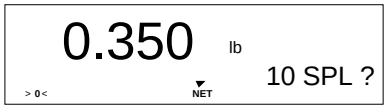
Place the empty container on the platter. If a tare container will not be used, proceed to the next step.

Press the **TARE** key to confirm entry of the tare value.

TARE



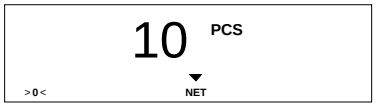
The scale will now prompt for a pre-selected sample quantity of pieces to be added to the scale.



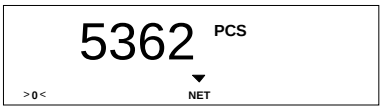
Place the correct quantity of sample pieces (10) on the scale .

Press the **SAMPLE** key to acknowledge the placement of sample pieces.

SAMPLE



The BC counting scale now displays the count of the sample quantity.



Additional pieces placed on the platter will be shown on the display. The count sequence is complete.

5 Special Operations and Functions

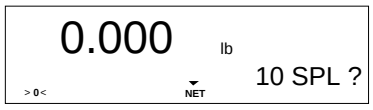
The BC counting scale has several operations and functions that can be used to expand its capabilities. Some are not enabled in the default settings and can only be modified in the Master Mode of programming. Accessing Master Mode is discussed in the BC Counting Scale Technical Manual. To modify the setup, please contact your local METTLER TOLEDO representative for assistance or to obtain a service manual.

Percent Accuracy Display

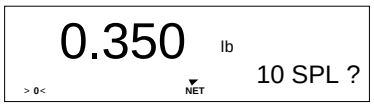
The BC scale can be programmed to display the percent of accuracy during a sample sequence. When **percent accuracy display** is enabled, the percent accuracy value is shown on the lower right display. This value indicates the relative accuracy of the APW calculation resulting from the sample size used. In theory, the more sample weight used, the more accurately the scale can determine the APW since the ratio of error that the scale can introduce into the calculation is reduced. This calculation does not take into account any variance in the individual piece weight of the item being counted. It simply indicates the potential error that could be added to the piece count related to the scale's counting process.

If automatic or manual APW enhancement is enabled (discussed later in this chapter), the percent accuracy will be updated every time a new sample enhancement is initiated. The percent accuracy will be calculated to a maximum value of 99.99%. The following sequence is possible by enabling the percent accuracy calculation in the Master Mode as discussed in the BC Counting Scale Technical Manual.

Example - Percent Accuracy Display

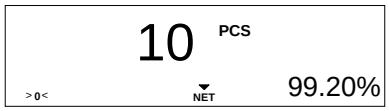


This example shows the BC counting scale in the dependent mode prompting for the addition of 10 sample pieces.



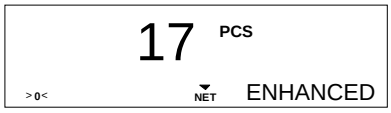
Place the correct number of sample pieces (10) on the scale.

Press the **SAMPLE** key to acknowledge the placement of sample pieces.

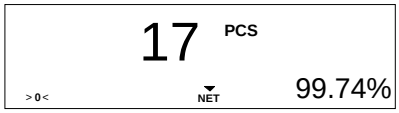


The piece count will be shown and the percent accuracy calculation will be shown on the right display.

As additional pieces are added, they will be shown on the display.



If automatic APW enhancement is enabled, adding these additional pieces will automatically update with the 'ENHANCED' display. If manual APW enhancement is enabled, the **SAMPLE** key must be pressed.



Then the new percent accuracy display will be shown.

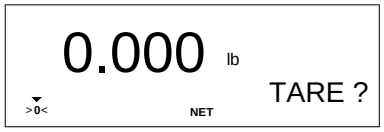
Automatic Clear Tare and/or APW Feature

Some BC counting scale data fields can be programmed to automatically clear after a transaction is complete. **Tare and APW are common fields chosen for automatic clearing**. When the same piece is counted repeatedly but packed in different size boxes, time can be saved by automatically clearing the tare value after each count and retaining the APW. If the same box was used to package many different parts, you may want to retain the tare value to save time but clear the APW each time.

For **auto clear tare** and **auto clear APW** to function, the weight on the scale must exceed three increments above net zero and the count mode must have been accessed. When the weight on the scale settles to no motion within these parameters then returns to within three divisions of gross zero, tare will automatically clear. Both features may be combined so that tare and APW are cleared after each transaction.

These sequences are possible by enabling the auto clear features in the Master Mode. Master Mode programming is discussed in the BC Counting Scale Technical Manual.

Example - Auto Clear Tare in the Dependent Mode

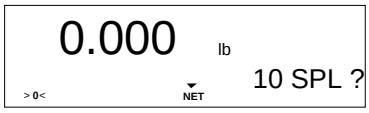


The BC counting scale begins by prompting for a tare weight to be added.

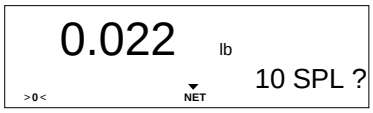
Place an empty container on the platter.

TARE

Press the **TARE** key to enter the tare value.



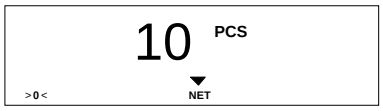
The BC counting scale now prompts for a pre-selected sample quantity of pieces to be added.



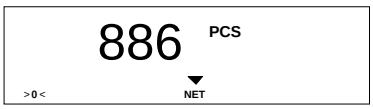
Place the sample pieces on the scale.

SAMPLE

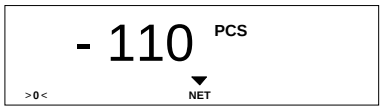
Press the **SAMPLE** key.



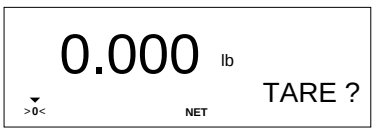
The BC counting scale indicates the piece count.



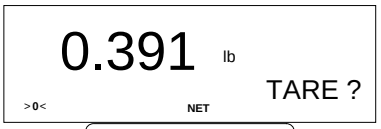
As additional pieces are added, the new count is shown in the count display. When the transaction is complete, remove all the weight from the scale platter.



The BC counting scale indicates a negative piece count equal to the tare value for a brief moment.



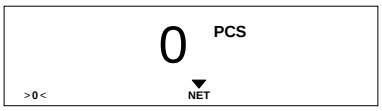
Then the tare is automatically cleared and the display prompts for a new tare to be taken. The APW is retained for the next transaction.



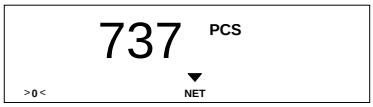
Place the next empty tare container on the scale.

TARE

Press the **TARE** key to enter the tare weight of the new container.

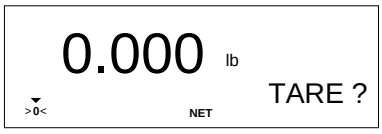


The scale enters the count mode immediately since the APW was retained from the previous transaction.



As additional parts are added, the count will be shown.

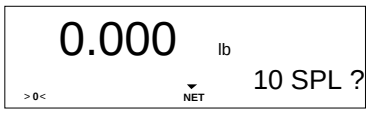
Example - Auto Clear APW in the Dependent Mode



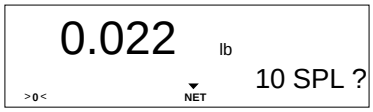
The BC counting scale begins with a tare weight prompt.

Place the empty container on the platter.

Press the **TARE** key to acknowledge entry of the tare value.

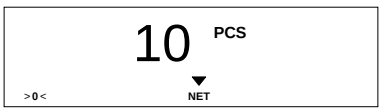


The BC counting scale will now prompt for a pre-selected sample quantity of pieces to be added.

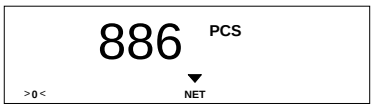


Add the sample pieces to the scale.

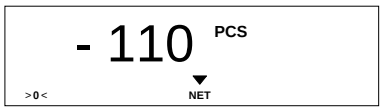
Press the **SAMPLE** key.



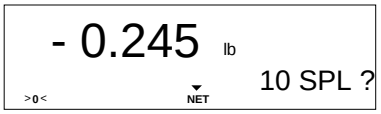
The BC counting scale indicates the piece count.



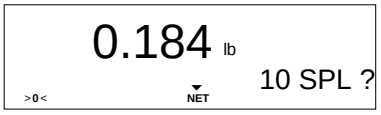
As additional pieces are added, the new count is shown in the count display. When the transaction is complete, remove all the weight from the scale platter.



The BC counting scale indicates a negative piece count equal to the tare value for a brief moment.

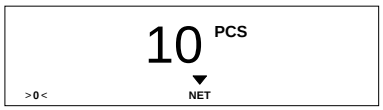


Then the APW is automatically cleared and the display prompts for a new sample to be taken. The tare is retained for the next transaction.

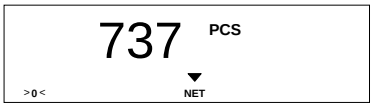


Place an empty container AND the correct sample number of new pieces on the scale platter.

Press the **SAMPLE** key to enter the sample quantity of the new part.



The scale is in the count mode ready for additional pieces to be placed on the scale.



When the parts are added, the count will be shown.

Average Piece Weight Enhancement

APW Enhancement improves the accuracy of an APW. APW enhancement is based on the fact that an inaccurate APW, while not able to accurately count large numbers of parts, will reliably count a small number. This allows a determination of APW based on a larger weight. Given enough enhancements, the APW becomes very accurate.

In Master Mode, the BC counting scale can be programmed to permit the operator to continuously update the average piece weight based on larger and larger samples. A minimum sample weight is required before initially calculating an APW. As additional pieces are placed on the scale, a new APW can be calculated based on the new total sample weight and count.

APW Enhancement is useful when the initial computed value of APW does not have the accuracy needed to count large numbers of small pieces. To compensate, the APW can be enhanced constantly up to 4% of the scale capacity. To ensure a minimum APW initial accuracy, a sample weight of at least two display increments must be used. There is a selection in Master Mode which increases the minimum sample to 0.02%, 0.05%, or 0.1% of capacity.

When using APW Enhancement, you must not add more pieces to the scale than have already been counted. If this maximum is exceeded, a

warning [- Too Many] will be displayed for approximately two seconds then will automatically clear. The operator can remove parts until [Enhanced] is displayed.

If the operator ignores the [-Too Many] warning display and adds more pieces (or removes more in count-out sample mode), or prints, no further APW enhancement will be done for the current transaction. If the proper procedure is followed, the scale will continue to enhance the APW until 4% of the scale capacity is reached. Once the counting weight reaches 4%, APW Enhancement is discontinued.

There are two modes selectable in the Master Mode for APW Enhancement: manual and automatic. If manual APW Enhancement mode is selected, the **SAMPLE** key must be pressed to initiate an enhancement cycle. If the automatic APW Enhancement mode is selected, each time the scale sees a motion/no-motion sequence, an APW enhancement is initiated.

No operator input is required in automatic mode. The enhancement is automatically done each sample sequence up to 4% of capacity or until the [Too Many] display is ignored by the operator. This can slow down the sampling process if enhancement is not needed for all the parts being counted. The manual enhancement mode allows the operator to choose when an APW should be enhanced. If none is required for a particular part, the operator does not press **SAMPLE**. If the next part requires enhancement, the operator simply presses **SAMPLE** after adding additional pieces.

Remember that enhancement occurs on a motion/no-motion sequence with the following conditions satisfied:

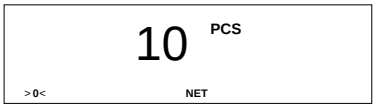
a) A minimum sample weight of two display increments (or other value selected as minimum sample in the Master Mode) has been used initially.

b) Pieces must be added. The weight must have increased (or decreased in the count-out sample mode) at least one display increment since last APW calculation.

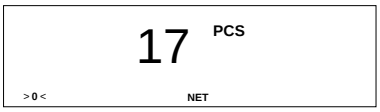
c) The pieces added (or removed) must not exceed the amount which can be counted accurately with the current APW. A display of [- Too Many] results when this amount is exceeded.

Note: If a manageable sample size of an item does not reach the minimum sample weight of two display increments, the APW for this item should be accurately determined on a smaller, more sensitive scale and then entered via the serial port of the BC counting scale using a remote terminal.

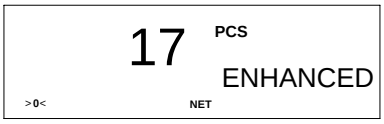
Example - Automatic APW Enhancement Procedure



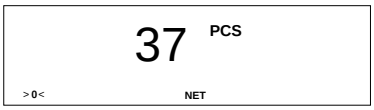
This example shows the BC counting scale in the piece count mode immediately after sampling 10 pieces



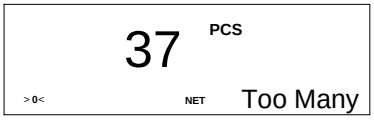
Add 7 additional pieces to the platter.



After the BC counting scale settles to no motion, an APW enhancement will occur and a new APW will be calculated.

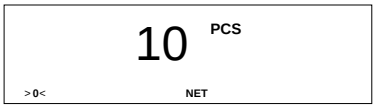


Add 20 more pieces to the platter. The piece count will be shown.



Since you cannot add more pieces for enhancement than have already been counted (17), the BC counting scale will indicate an error. Either remove pieces (to continue enhancement) or continue to add pieces and APW enhancement will be discontinued.

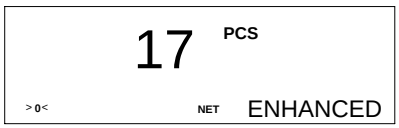
Example - Manual APW Enhancement Procedure



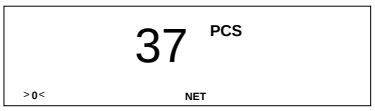
This example shows the BC counting scale in the piece count mode immediately after sampling 10 pieces

Add 7 additional pieces to the platter.

After the BC counting scale settles to no motion, press the **SAMPLE** key.

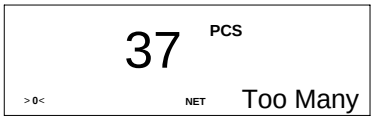


An APW enhancement will occur and a new APW will be calculated. This procedure can be repeated up to 4% of the scale capacity.



Add 20 more pieces to the platter. The new piece count will be shown.

After the BC counting scale settles to no motion, press the **SAMPLE** key.



Since you cannot add more pieces for enhancement than have already been counted, the BC counting scale will indicate an error. Remove pieces (to continue enhancement) or add pieces and APW enhancement will be discontinued.

Accumulation

Accumulation is used for tracking the totals of several weighing or counting sequences. The BC counting scale offers accumulators for gross weight, net weight, and piece count. You may use one, any combination of the three, or all of them. Accumulation is accomplished by pressing the **ACCUM+** key when the BC counting scale is in the count or weight mode. If you are not in the count mode, a piece count cannot be accumulated but gross and net weight can be. Each accumulator can store values up to seven digits in length, allowing you to accumulate up to 9,999,999 pieces.

When the **ACCUM+** key is pressed, the following values are stored:

Gross - current gross weight on the scale is added to the totals.

Net - the absolute value of the net weight is added to the totals.

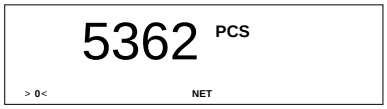
Pieces - the absolute value of the piece count is added to the totals.

For protection against duplicate accumulation, the weight on the scale must return to within +/- 3 increments of gross or net zero to be able to accumulate again. If the weight does not return to within this “window” and a second accumulation is attempted, the BC counting scale will replace the previous accumulation with the current values. The display will show [Replaced] in this situation.

You cannot accumulate when the weight on the scale is within the reset “window" (within +/- 3 increments of gross or net zero). If an accumulation is attempted, a display of [No ADD] will be shown. This display also will be shown in other circumstances where accumulation is not possible.

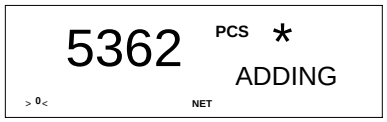
Accumulators may be recalled for viewing or may be added to the data output to a printer or other serial device for documentation purposes. They can be cleared automatically or manually.

Example - Accumulation Procedure

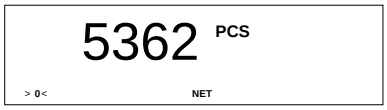


This shows the BC counting scale in the piece count mode when the transaction is complete and the operator is ready to accumulate.

Press the **ACCUM+** key and the BC counting scale will add the selected fields to its accumulators.



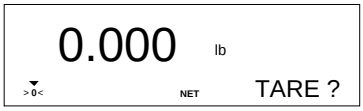
After the **ACCUM +** key is pressed, the display will show [Adding] on the right side of the display. The * symbol above the [Adding] display will also illuminate to indicate an accumulation is taking place.



When accumulation is complete, the display will return to showing only the piece count again.

The accumulator values can be recalled to the display using the **RECALL** key. Multiple depressions of the **ACCUM+** key will recall the totals for net weight, gross weight and count.

Example - Viewing the Totals

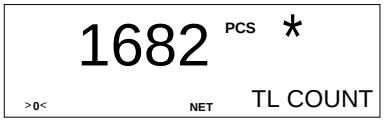


The BC counting scale can recall the accumulated totals for viewing from almost any display mode. The home position is shown here.

Press the **RECALL** key to begin the accumulator viewing process.

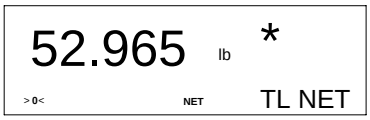
The first recall field (percent accuracy) will be recalled on the display for viewing.

Press the **ACCUM+** key to directly access the accumulator values.



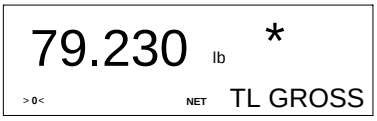
The total piece count accumulator will be shown first.

Press the **ACCUM+** key to directly access the next accumulator value.



The total net weight accumulator will be shown.

Pressing the **ACCUM+** key again will display the final accumulator value - total gross weight.



You can continue to scroll through the accumulators by pressing the **ACCUM+** key as many times as needed.

After all desired accumulators have been viewed, pressing the **CLEAR** key will exit the recall sequence. The **CLEAR** key can be pressed at any time during recall to return to the normal display mode.

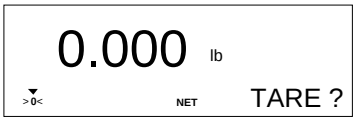
After exiting the recall sequence, the BC counting scale will return to its previous display condition as shown.

Clearing the Totals

The **accumulator totals may be cleared** from the BC counting scale keyboard. During the recall sequence, when the desired accumulator is displayed, press the **ZERO** key twice to clear the totals value.

During Master Mode programming, automatic clearing of the totals can be enabled. All three accumulators will be cleared when the **CLEAR** key is pressed at the end of a count cycle. The display will show [CLR ACCM] during the clearing process. This would typically be used when accumulating one part for several transactions, then wanting to print the total values and clear out the tare and APW, and begin counting a different part. The automatic clearing eliminates the operator steps of clearing each total individually. The totals will also be cleared if the scale goes into the sleep mode when auto clear is enabled.

Example - Manually Clearing the Totals

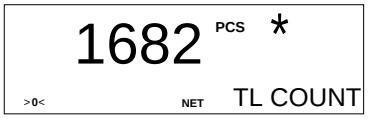


The BC counting scale can recall the accumulated totals for viewing from almost any display mode. The home display position is shown here.

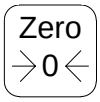
Press the **RECALL** key to begin the accumulator viewing process.

The first recall field (percent accuracy) will be recalled on the display for viewing.

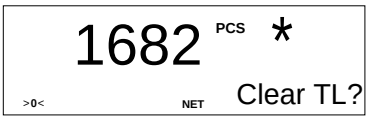
Press the **ACCUM+** key to directly access the accumulator values.



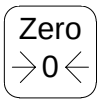
The total piece count accumulator will be shown first.



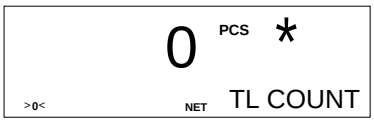
Press **ZERO** to clear the piece count accumulator value. If you do not want to clear the piece count accumulator, press **ACCUM+** to skip to the net weight accumulator. Any accumulator may be cleared using this method.



The BC counting scale will ask you to verify that you wish to clear the accumulator by asking [Clear TL?].



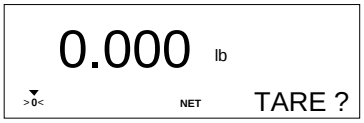
Press the **ZERO** key again to confirm and the accumulator value will be reset to zero. If you do not wish to clear the total, press **CLEAR** to exit the recall sequence.



The piece count accumulator will reset to zero as shown.

Pressing the **ACCUM+** key again will take you to the next accumulator which you may either clear or skip.

After all desired accumulators have been viewed and/or cleared, pressing the **CLEAR** key will exit the recall sequence.



After exiting the recall sequence, the scale will return to its previous display condition as shown.

Printing the Results

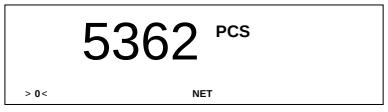
The BC counting scale includes a standard serial I/O port that may be used to transmit data to a printer. This provides the ability to print labels, tickets or record individual transactions on a strip printer. All parameters for serial communication are programmed in the Master Mode as described in the BC Counting Scale Technical Manual.

To send information to the printer, when the sequence is complete, press **PRINT**. If the weight on the scale is more than 20 increments above gross zero and there is no motion on the scale, a data output will occur. If there is motion, the BC counting scale will wait until motion ceases then transmit the data. If the weight on the scale is less than 20 increments above gross zero, an error of [No Print] is displayed for approximately 2 seconds. More weight must be added to complete a print cycle.

The BC counting scale can perform an autoprint without operator control. In count mode when the weight settles to a no-motion condition greater than 3 increments, the scale will automatically transmit data. After transmission, the weight must return to within +/- 3 increments of gross or net zero before another auto print cycle is possible. If autoprint is enabled, the **PRINT** key on the BC counting scale keypad is still operational.

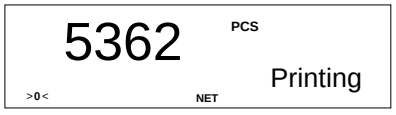
To print several times without returning the scale to zero between prints, use the repeat print feature in the Master Mode. The default setting for this step is enabled so you can print multiple times. If only one print is permitted per transaction, repeat print must be disabled. This provides tighter control for documentation purposes.

Example - Printing

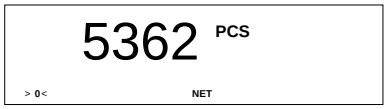


This example shows the BC counting scale in the piece count mode when the transaction is complete and the operator is ready to print.

Press the **PRINT** key and the scale will transmit data from the serial port to a printer or other device.



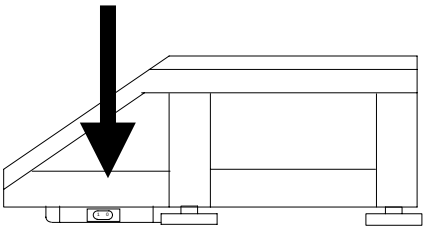
While the data is being transmitted, the right display will show [Printing].



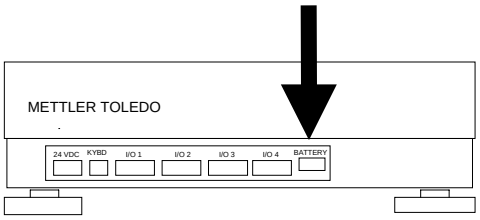
When printing is complete, the display will return to showing only the piece count again.

Battery Operation

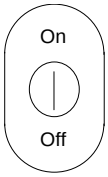
An optional internal NiCad battery pack allows the BC counting scale to operate in areas where it would be difficult to attach AC power, such as when used with a portable cart. When this option is installed, you do not need to plug the scale into AC power. To operate from battery power, you must have the battery switch on the scale turned on (1=On; 0=Off). Refer to the following figures for the location of the switch.



Battery Switch BC05 and BC15



Battery Switch BC30 and BC60



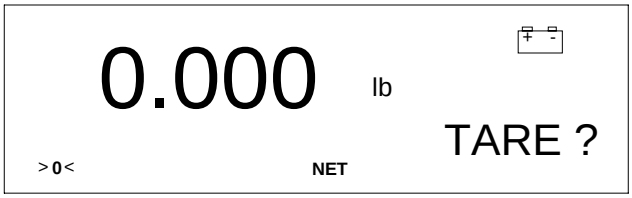
Front Panel ON/OFF Key

When the scale is not plugged into an AC power source and the battery switch is "on," power from the battery is operating the scale. All the standard features of the BC counting scale may still be used. The BC counting scale will operate continuously for approximately 6.5 hours from a fully charged battery.

To conserve battery power, a sleep mode is available (set in Master Mode) which allows the scale to “sleep” during periods of inactivity. Extended operation time will depend on how often the scale accesses the sleep mode. In normal use, up to 30% additional operating time may be obtained. The sleep mode can also be accessed directly by pressing the front panel keypad **ON/OFF** key.

When the battery can no longer operate the scale, a warning symbol will flash on the display for approximately 2 minutes before the BC counting scale turns off. The display will show [PowEr Failure]. The battery must be recharged before the scale can be used again. Turn the battery switch “off,” and plug the scale into an AC outlet to recharge.

If the battery is low when the scale is turned on, the display will show [SLEEP], and the BC counting scale will not operate. The battery symbol will be blinking. To operate the scale, connect it to an AC power source and wait until the battery symbol shuts off (approximately 2 minutes). Then press the **ON/OFF** key to turn the scale on.



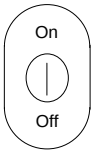
Flashing Low Battery Symbol

NOTE: Do not use the standard size 250mA power supply (P/N 14083200A, 14806900A or 14912100A) to recharge the battery. You must use the larger 1.0 Amp power supply (P/N 14605500A or A14664800A). Failure to do so could result in permanent damage to either the power supply or the scale. Use only the 1.0 Amp power supply to recharge the battery.

To recharge the battery, attach the larger power supply (P/N 14605500A or A14664800A) to the rear of the scale and an AC power source. The average recharge time for a fully discharged battery is approximately14 hours. It is recommended that a battery-equipped BC counting scale be plugged into an AC power source to recharge the battery whenever possible to ensure maximum operating time when battery power is used. The internal charger will not overcharge the battery.

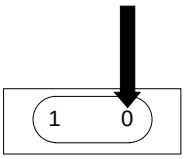
If using a spare battery, you must replace the discharged internal battery with a fully charged battery. Remove the battery cover plate from the bottom of the BC counting scale, unplug the discharged battery, and plug in the fully charged one. Reinstall the cover plate. The BC counting scale is ready to use. The discharged battery can be recharged using the external battery charger.

Battery Replacement Procedure

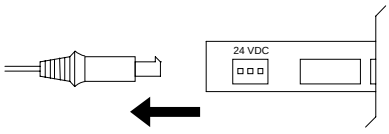


- Press the **ON/OFF** key on the front panel to put the BC counting scale into the sleep mode.

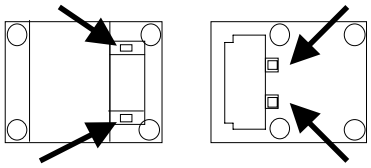
- The BC counting scale should now show [SLEEP] on the display.



- Turn the battery switch to the “off” position. The switch for the small BC counting scale is under the scale on the right side and the larger BC counting scale is on the rear panel.

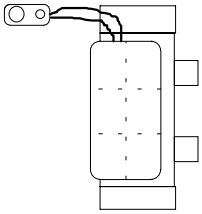


- Disconnect the AC power plug from the rear of the BC counting scale.



Large Chassis Small Chassis

- Place the BC counting scale onto its side and remove the battery cover by turning the two plastic retainers 90°. There is a bracket with screws holding the battery pack in place beneath the battery cover.



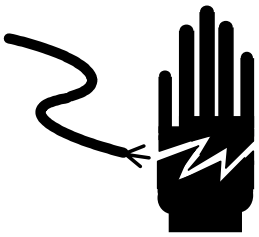
- Carefully remove the battery pack from the scale and unplug the batteries from the main harness.

- Connect the new battery pack and repeat the steps above in reverse order.

NOTES

6 Additional Information

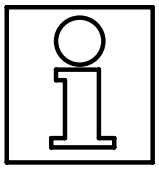
Caring for Your Scale



WARNING!

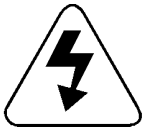
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, OR CLEANING. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

The BC counting scale requires minimal maintenance. It is recommended that you clean it regularly to preserve its value and enhance its dependability.



- Wipe the exterior surfaces of the scale with a damp cloth and a mild commercial household cleaner.

- POTENTIAL SHOCK HAZARD!

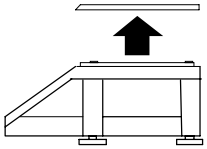


- Do not spray the cleaner directly onto the scale. Apply the cleaner to the cleaning cloth then wipe the scale.

- Never clean the scale under running water.

- Always remove corrosive materials immediately.

- Never use acids, bases or similar types of solvents for cleaning.



- Lift the platter of the BC counting scale and remove any dirt or other objects which may have collected between the cover and platter. Do not attempt any cleaning below the covers. Damage to the scale may result.

Display Messages and Error Messages

Occasionally, you may see errors or messages displayed due to an incorrect key sequence, not meeting certain requirements for a feature, or a failure of the scale. The following chart lists some of these displays and action items that may eliminate the errors or explain the messages. If an error persists, contact your local representative for further assistance.

DISPLAY MESSAGE	DESCRIPTION	ACTION
Adding	Indicates that the ACCUM+ key was pressed and the current scale values are being accumulated.	No action required.
Replaced	Indicates that the ACCUM+ key was replaced and the current scale values are replacing the previously stored values in the accumulators.	No action required. If a second accumulation was desired, make sure the scale returns to zero between accumulations.
Too Many	Too many pieces were added to the platter during an APW enhancement process.	Remove some pieces from the scale platter until the error does not reoccur. After an enhancement occurs, more pieces may be added.
• - - - - - • OutOfRng	Scale turned on with weight on the scale exceeding the programmed power up zero capture range.	Remove extra weight on the scale. A larger power up zero capture range may be required in Master Mode. Shipping screw may be in SC05.
• - - - - - • OutOfRng	Scale turned on with weight on the scale below the programmed power up zero capture range.	Add weight to the scale. Platter may be off. Larger power up zero capture range may be required in Master Mode.
• - - - - - • Over Cap	Weight on the scale has exceeded the calibrated capacity.	Remove weight from the platter until the error disappears and weight is shown.
• - - - - - • UnderCap	Weight on the scale is below zero more than 5 increments.	Press ZERO key. If zero cannot be captured, service may be required.
- - - - - - -	Tare interlock is enabled and there is motion on the scale.	The message automatically clears when weight on the scale becomes stable. Disable tare interlock in Master Mode to show weight values during motion.
CLEAr Illegal	A sequence of operation is taken out of order.	Press CLEAR, then reenter the operation in the correct sequence.

CLEAr Too High	The count data to be displayed is greater than 9,999,999 pieces.	Remove some pieces, press CLEAR key.
Error BadEntry	Data type is not correct or invalid data was entered. Possibly an incorrect key sequence.	Enter an integer for the sample size (no decimal) or enter a number for the weight (no alpha). Follow the correct key sequence.
Error FullAccm	The accumulator is full.	Clear accumulators by recalling the accumulator to be cleared using the RECALL key. When the desired accumulator is displayed, press ZERO key twice.
Error InRecall	The function being attempted, cannot be completed while the BC counting scale is in the recall mode.	Error will automatically clear in 2 seconds. Press CLEAR to exit Information mode, then retry the function.
Error No Add	An addition (ACCUM+) was tried without meeting the accumulation requirements or ACCUM+ was pressed out of sequence.	Make sure weight is more than 3 increments from gross and net zero before accumulating
Error No Chain	Multiple tares attempted while chain tare disabled in Master Mode.	Enable chain tare in Master Mode or clear out of a count transaction and begin a new transaction from the beginning.
Error No Print	A print sequence attempted with gross weight below 20 increments or repeat print is disabled.	Add additional weight then retry the print or enable repeat print in the Master Mode.
Error NoRemote	The remote second scale not configured or installed properly.	This is not a user function. Please call Mettler Toledo for assistance.
Error NoSwitch	Switching units while alternate weight unit disabled.	Do not switch units or enable an alternate weight unit in Master Mode.
Error No Tare	Occurs if tare is disabled and a pushbutton tare is attempted.	Do not attempt a tare or enable the tare feature in Master Mode.
Error No Var	A variable sample entry was attempted while only fixed sample size is enabled in Master Mode.	Use only the selected fixed sample quantity or enable the variable sample selection in Master Mode.
Error Spl Low	Total weight of sample is not 2 display increments or has not met the minimum sample % selected in the Master Mode.	Error will automatically clear after 2 seconds. Add additional sample pieces and resample.

PouuEr Failure	Low battery condition. Further use of the scale is not permitted.	Battery must be recharged. Turn battery switch off and plug scale into AC outlet. Display shows [SLEEP] and battery symbol blinks. After the symbol stops blinking, press On/Off key to turn scale on.
SLEEP	Shows that the scale is "off" and is "sleeping". This extends battery life. At powerup, this may indicate a low battery condition.	To turn the scale on, press the On/Off front panel key. The BC counting scale should complete a powerup cycle. If a low battery condition exists, turn the battery switch off and plug the scale into an AC power source. After a few minutes, press On/Off to turn the scale on.
SLEEP Waking	Indicates the scale is powering up from the sleep mode after the On/Off key was pressed.	Display will automatically clear after approximately 5 seconds.

Specifications

The BC counting scale is available in the capacities and configurations shown here.

Weighing Capacity	Configuration
10 lb (5 kg)	Combined keyboard/display and weighing platform assembly
37.5 lb (15 kg)	Combined keyboard/display, and weighing platform assembly
60 lb (30 kg)	Separate keyboard/display with a 3-foot coiled cable that extends to12 feet and connects it to the platform
120 lb (60 kg)	Separate keyboard/display with a 3-foot coiled cable that extends to12 feet and connects it to the platform

Product Weights

Model	Net Weight	Shipping Weight
BC05, BC15	11.3 lb / 5 kg	15.4 lb / 6.8 kg
BC30, BC60	22.3 lb / 10 kg	30 lb / 13.6 kg

Dimensions

BC05 and BC15 Scales: 12.2” (310mm) wide by 14.8” (375mm) deep by 5.3” (135mm) high.

Platter size: 12” (305mm) wide by 8.3” (210mm) deep.

BC30 and BC60 Scales: 13.8” (350mm) wide by 11.8” (300mm) deep by 5.3” (135mm) high.

Platter size: 13.8” (350mm) wide by 11.8” (300mm) deep.

Temperature

Operating temperature range: 50°F to 104°F (10 to 40°C).
Storage temperature range: -4°F to 158°F (-20 to 70°C).

BC Scale Capacities

The following are the standard builds for the BC scale. Other builds are possible by recalibrating in the Service Mode as described in the BC Counting Scale Technical Manual (part number B14751600A).

Model	Pounds Mode	Kilogram Mode	Display Divisions
BC05	10 x 0.001 lb	5 x 0.0005 kg	10,000
BC15	37.5 x 0.005 lb	15 x 0.002 kg	7,500
BC30	60 x 0.01 lb	30 x 0.005 kg	6,000
BC60	120 x 0.02 lb	60 x 0.01 kg	6,000

Standard Features

All BC scales have the following standard features:

- Compact and rugged, industrial construction.
- Convenient keypad and large, easy to read display. (See Chapter 3 for illustration.)
- Eight-character, alpha-numeric display for operator prompting. (See Chapter 3 for illustration.)
- Stainless steel platter to ensure long life.
- Bi-directional RS-232 serial port.
- Expandability through use of optional battery.
- UltraRes® load cell with 1 part in 1 million counting resolution.
- Ability to switch between weighing units (lb/kg, lb/g, kg/g)
- Beeper to indicate key activation or error condition.
- Accumulators for gross and net weights and count.
- Various counting modes to adapt to your counting sequences.

Optional Equipment

The following optional equipment may be factory-installed or ordered as a separate kit for installation at a later time. Detailed instructions are included with each kit for installation by qualified personnel. Please contact your local METTLER TOLEDO representative.

NiCad Battery Option (0919-0045 and 0919-0049)

Two battery options - one for the smaller and one for the larger BC counting scale, allow the BC counting scale to operate when not connected to an AC power outlet. Both use a "pack" of NiCad batteries, which allows multiple recharging, and are attached to the bottom of the scale. The battery pack provides 7.2 volts of power to operate the BC counting scale (without a remote second scale) up to 6.5 hours without recharging. To recharge the pack, plug the BC counting scale into an AC power source for approximately 14 hours.

Extra NiCad Battery (0919-0046)

This kit consists of the NiCad battery only. It can be installed to operate the BC counting scale while the original battery is being recharged externally.

Heavy Duty 1.0 Amp Power Supply (0919-0047)

The power supply is required when any electrical option is used with the BC counting scale. It supplies additional power to operate a remote scale or to recharge a battery via the scale. This power supply is designed for 120/240VAC with U.S. line cord.

External Battery Charger (0919-0051)

This 120VAC charging device recharges a NiCad battery pack external to the scale while a fresh battery pack is installed for longer operating time.

Heavy Duty 1.0 Amp Power Supply (0919-0052)

This power supply is required when any electrical option is used with the BC scale. It supplies additional power to operate a remote scale or to recharge a battery via the scale. This power supply is designed for 120/240VAC input with U.K. line.

Heavy Duty 1.0 Amp Power Supply (0919-0053)

This power supply is required when any electrical option is used with the BC scale. It supplies additional power to operate a remote scale or to recharge a battery via the scale. This power supply is designed for 120/240VAC input with European line cord.

Heavy Duty 1.0 Amp Power Supply (0919-0054)

This power supply is required when any electrical option is used with the BC scale. It supplies additional power to operate a remote scale or to recharge a battery via the scale. This power supply is designed for 120/240VAC input with Australian line cord.

Keyboard/Display Stand (0992-0001)

This metal stand supports the keyboard/display of the BC30 or BC60 to make it easier to view and use in certain situations. The stand may be used alone or with the attachment bracket below (0992-0002).

Stand Attachment Bracket (0992-0002)

The bracket attaches the keyboard/display stand (described above but not included) to the base of the BC30 and BC60 scale to make each an integral system that can be easily moved.

Sealing Kit (0992-0003)

The sealing kit contains all required hardware to prevent unauthorized access to the scale weighing parameters. This is only required when “sealing” the BC counting scale for approved applications. Hardware for both large and small models is included.

Software Upgrade Kit (0992-0004).

This kit contains new firmware for the BC to upgrade an older unit to the latest functionality. THIS KIT REQUIRES INSTALLATION BY A TRAINED SERVICE TECHNICIAN.

RS-232 Interface Cable (0900-0255)

This 20-foot (6 m) long cable provides bi-directional RS-232 interface between the BC counting scale and a serial device such as a printer that utilizes a 25 pin female serial connector.

RS-232 Interface Cable (0900-0278)

This 15-foot (5 m) long cable provides bi-directional RS-232 interface between the BC counting scale and a serial device such as a computer that utilizes a 9 pin male serial connector.

RS-232 Interface Cable (0900-0279)

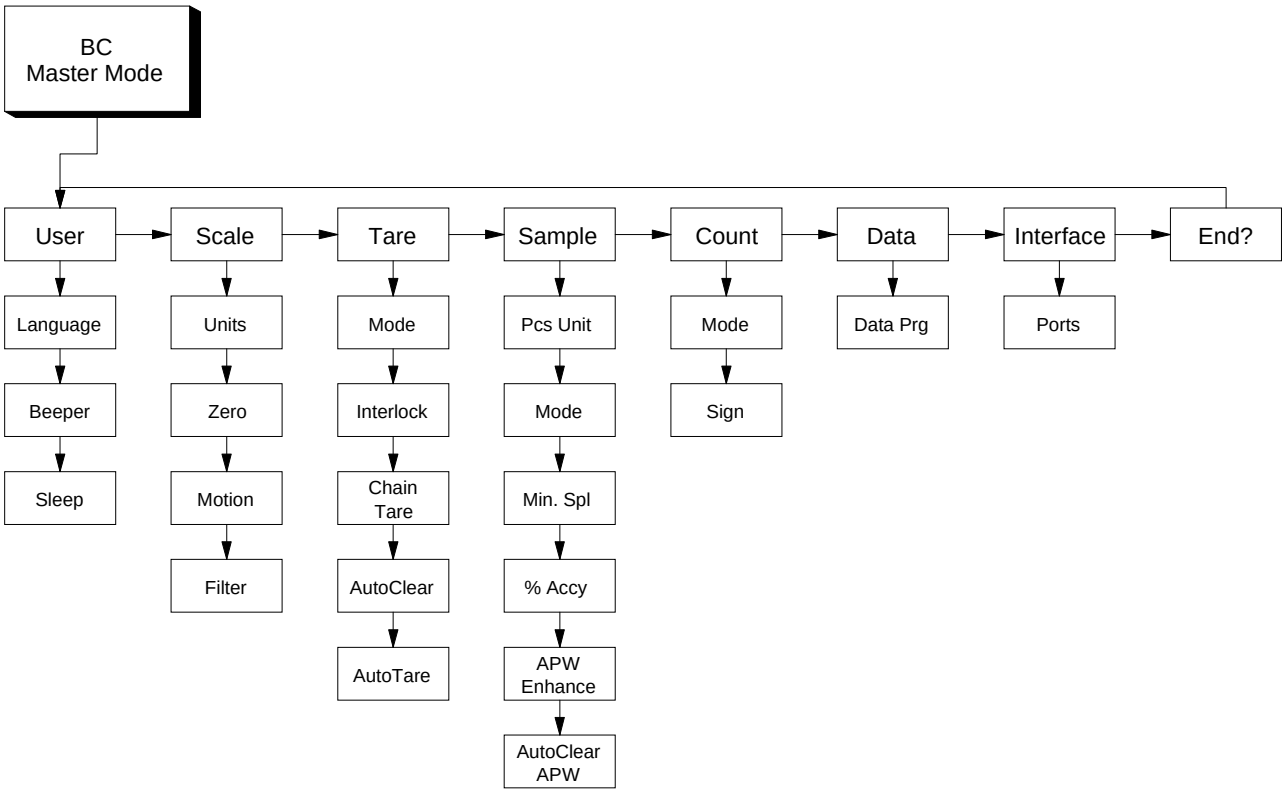
This 15-foot (5 m) long cable provides bi-directional RS-232 interface between the BC counting scale and a serial device such as a computer that utilizes a 25 pin male serial connector.

Roller Ball Top Platter (0906-0161)

This platter contains 14 roller balls and is designed to allow the operator to easily move containers onto the base of the BC30 or BC60 scales.

Master Mode

The following is an overview of the parameters that may be selected during the programming of the BC counting scale in the Master Mode. Information on accessing the Master Mode is found in the BC Counting Scale Technical Manual. If you wish to modify any of the programming selections in the Master Mode, please contact your local Mettle Toledo representative for assistance or to obtain a service manual.


BC
Master Mode
User
Scale
Tare
Sample
Count
Data
Interface
End?
Language
Beeper
Sleep
Units
Zero
Motion
Filter
Mode
Interlock
Chain
Tare
AutoClear
AutoTare
Pcs Unit
Mode
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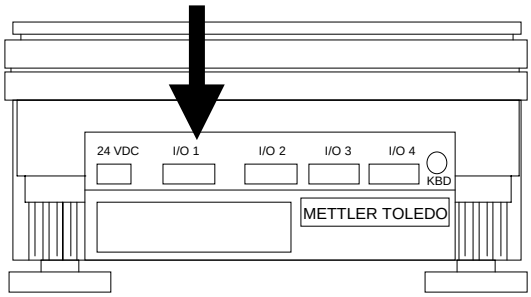
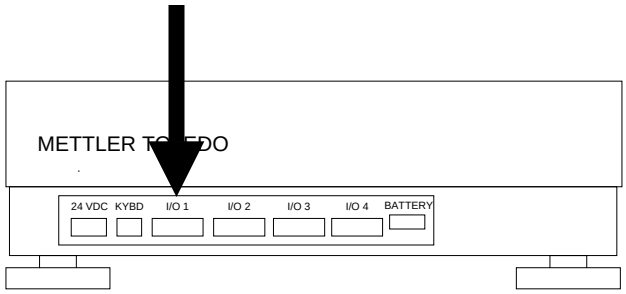
APW
Enhance
AutoClear
APW
Mode
Sign
Data Prg
Ports

Connecting a Printer

Every BC scale contains an installed RS-232 serial port. The connection to the serial port is via a female 9 pin connector on the back panel of the scale labeled I/O 1.



BC05, BC15



BC30, BC60

Mettler Toledo provides several cables to connect various devices to the serial port of the BC counting scale. These cables are described in the beginning of this chapter under *Optional Equipment*.

The pin designations for I/O 1 on the rear panel of the BC counting scale are configured as follows:

Note: Do not use pin locations other than 2,3 or 5. Other pins are used for testing at the factory and may cause damage if mis-connected.

Pin Number	Signal	Definition
2	RxD	Receive RS-232 data
3	TxD	Transmit RS-232 data
5	Signal Ground	Ground Connection

For more information about serial connections, contact your local Mettler Toledo representative for assistance or to obtain a technical manual.

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Publication Name: BC Counting Scale User's Guide

Publication Part Number: A15031400A Publication Date: 5/98

PROBLEM(S) TYPE:	DESCRIBE PROBLEM(S):	*INTERNAL USE ONLY*
☐ Technical Accuracy	☐ Text ☐ Illustration	
☐ Completeness What information is missing?	☐ Procedure/step ☐ Illustration ☐ Definition ☐ Example ☐ Guideline ☐ Feature ☐ Explanation ☐ Other (please explain below)	☐ *Info. in manual* ☐ *Info. not in manual*
☐ Clarity What is not clear?		
☐ Sequence What is not in the right order?		
☐ Other Comments Use another sheet for additional comments.		

Your Name: _____ Location: _____

Phone Number: ( ) _____

Please note the name, address, phone number and fax number of the local METTLER TOLEDO representative below for future reference.

Representative's Name: _____

Local Address: _____

_____

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