BB200 Weighing Indicator

Programming and User's Manual

B and B Scales Inc.
P.O. Box 812
Santa Teresa, NM 88008
www.bbscales.com

The most current version of this publication and other product updates can be found on the product website:

www.bbscales.com/bb_200.html

Important Safety Information

	**WARNING**	Failure to follow warnings could result in serious injury or death. Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.

- Do not allow minors (children) or inexperienced persons to operate this unit.
- Do not operate without enclosure completely assembled.
- Do not place fingers into slots or possible pinch points.
- Do not use this product if any of the components are cracked.
- Do not make alterations or modifications to the unit.
- Do not remove or obscure warning labels.
- Do not submerge.
- Before opening the unit, ensure the power cord is disconnected from the power source.

	**WARNING**	Calibration, Inspection and Maintenance of this indicator should be performed by qualified staff only.

	**NOTICE**	This indicator can be placed in service as Legal for Trade in certain jurisdictions. Removing or Modifying Calibration Stickers, Opening the Indicator Housing, Junction Boxes, Cabling, or other parts of the scale may VOID your commercial certification.

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CHAPTER 1. INTRODUCTION

The BB-200 Family of Indicators is a group of general purpose weighing indicators that are designed for use in Agricultural and Industrial environments. Typical uses for this indicator include bench scales, floor scales, agricultural feeders, including cake feeders, auger or gravity fed box feeders, squeeze chute scales, single animal platform scales, calf table scales, and other agricultural applications.

Indicator Configurations

The indicator is available in four different configurations:

- Mild Steel, 110 volt A/C
- Stainless Steel Washdown, 110 volt A/C
- Mild Steel 110 volt A/C with rechargeable battery
- Stainless Steel Washdown, 110 volt A/C with rechargeable battery

Basic Features

All four available configurations share the following features:

- **Weighing Functions:** Zero, Tare, Accumulation, and Animal Weighing / Motion Filtering
- **Total / Accumulation:** Allows you to keep a running total of items weighed or counted.
- **Count:** Allows you to count items of a similar weight, for example, screws or nails.
- **Checkweighing:** The indicator can be programmed to support OVER / OK / UNDER warnings.
- **Print:** Can be printed to print Date, Time, Net, Tare and Gross.
- **kg/lb/g/oz conversion:** converts the shown weight between different units.
- **RS-232 Output for a printer or external display:** Used to connect to a printer or an external display (sold separately).

Optional Features

This indicator can be special ordered or upgraded to support Digital I/O functions with 4-20mA output.

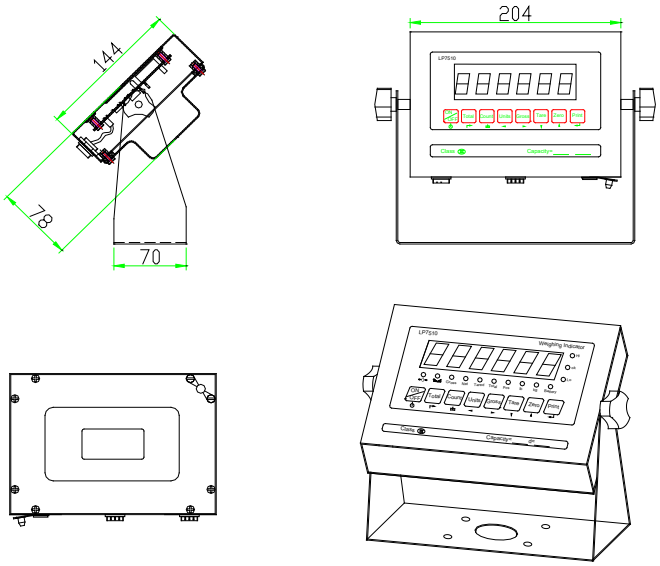
Technical Parameters

- Accuracy class (III)
- Maximum number of scale intervals n ≤ 10000
- Minimum input voltage per verification scale interval 1 μV /e
- Input signal voltage -5~20mV DC
- Excitation circuit 5 VDC, 4 wire connection, optional 6 wire connection
- Minimal load cell impedance 87 Ω, Maximum connection - 6 load cell of 350Ω
- AC power AC100~240V
- Battery life (if equipped) 6V4Ah lead battery or 7.4V4Ah Li battery 30h
- Operation temperature - 10 °C ~ + 40 °C
- Operation humidity ≤85%RH

Physical Characteristics

Images shown in millimeters.

Note: The housing below depicts the indicator configuration that includes a rechargeable battery. The versions of this indicator without a batter do not have an extruded back panel.



Battery Information

- To charge the battery, simply plug in the indicator with the included A/C Power Cord.
- Your battery will arrive partially charged from the factory. Prior to using the indicator for the first time, charge the battery for 10-12 hours to prevent damage and prolong the life of the battery.
- Battery life can be checked from the light on the right bottom of the display. When the voltage is getting low, the battery symbol will flicker, and the LCD display will show "LOBAT." On the LED display, the red light will flicker.
- Average Charge time: **10-12 hours.**
- Average Battery Life with normal use: **30 hours.**
- When fully charged, the light turns green on the LED display; the battery symbol shows full on LCD display.
- If the indicator is not used for an extended period, remove the battery to avoid leakage.
- If you use the indicator regularly, battery life may be extended by fully discharging the battery every month. To do this, simply leave the indicator on until the battery dies, then plug it in to recharge it.

CHAPTER 2. INSTALLATION

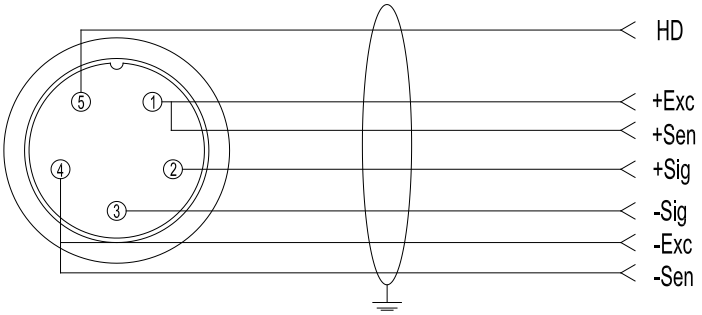
Power supply connection

The indicator is powered by the included A/C adapter or by the optional 6v battery. Simply plug the adapter directly into the "DC" port on the indicator housing. This action also charges the battery, if equipped.

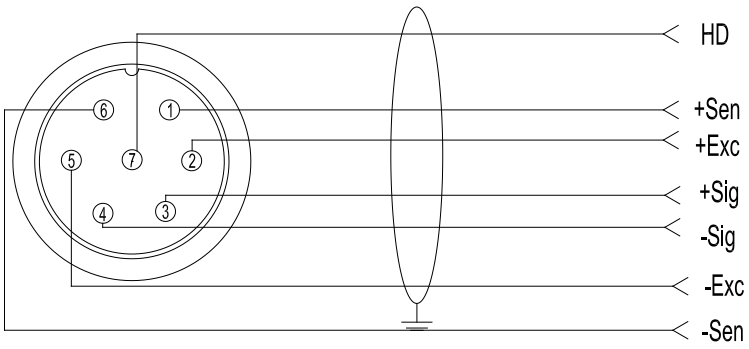
Connection of Load Cell(s) and Indicator

This indicator can power from one to six 350Ω load cells, with either a 4-wire or 6-wire configuration. There are two methods to connect the load cells to the indicator:

A. Quick disconnect, as below:



4 wire load cell connectors



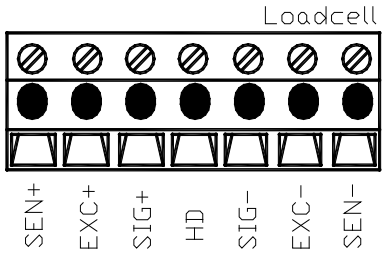
6 wire load cell connector

For most applications, the BB-200 Indicator comes with a five-pin male plug on the bottom of the indicator. This pigtail/plug is connected directly to the motherboard on the inside of the indicator. Having this plug allows you to disconnect the indicator from the rest of the scale, which is convenient should you need to charge the battery or protect the indicator from theft or weather. The typical exception to this is if you purchased a stainless steel washdown version of the indicator. In this case, Option B, below, is preferred, as it provides a better watertight connection.

B. Direct internal connection

The signal cable for load cell (or the junction box) is connected to the Load cell terminal strip on the motherboard. To make this connection,

1. Open Weighing indicator back cover
2. Insert the cable through one of the strain reliefs on the underside of the indicator
3. Run the cable to the load cell terminal strip, as shown below.
4. Connect the wires as indicated below and ensure that the screws are tightly secured.



For 4 wire load cell, connect EXC+ SIG+ SHD SIG- EXC-.

For 6 wire load cell, remove RJ4 and RJ7 above the terminal trip, then connect SEN+ EXC+ SIG+ SHD SIG- EXC- SEN-.

Important: Most vendors use a junction box with an internal summing card to combine the signals from all the attached load cells. However, different vendors use different plugs. Most cables that are used are simple four or five-pin microphone cables, however even these come in different sizes. B and B Scales, Inc. typically stocks four and five-pin microphone cables. See www.bbscales.com for more information about Home Run Cables and load cell cabling in general.

Communication Interface

RS-232/RS-485

The BB-200 supports an RS-232 connection on the motherboard however there is typically not an external port pre-wired when the indicator ships. You will notice in the packaging that was included with your indicator that there is a DB-9 RS-232 plug that can be wired to the motherboard and installed. DB9 Pin and 3 Pin are both supported.

DB9 definition

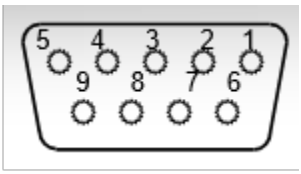


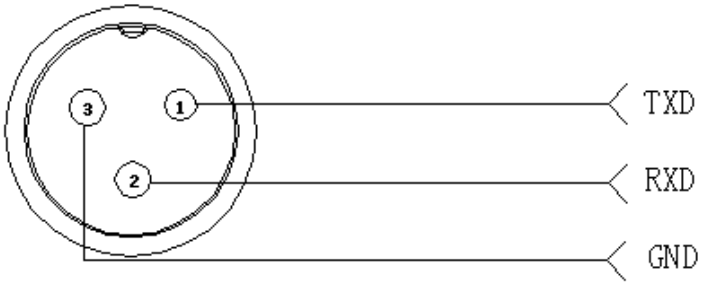
Table 1: DB9 Plug Pinout

DB9 joint	Definition	Function
2	TXD	Sending data
3	RXD	Receiving data

5	GND	Ground interface

Note: RS485 uses pin 2 and 5 for connection

3 Pin definition



Internal connection

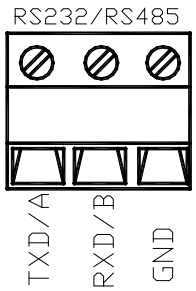


Table 2: RS-232 Pin Definitions

Pins	Definitions	Function
RS232	TXD	Sending data
	RXD	Receiving data
	GND	Ground
RS485	A	RS485 output "A" port
	B	RS485 output "B" port

4-20mA output (optional)

Technical parameters:

- Resolution: 1/1000
- Outside Load: 0-500Ω

Connection:

Outside connection: 4~20mA

analog input + port connected to "1" pin of DB9

analog input - port connect with "6" pin of DB9.

Testing :

Connect the 4~20mA to the analog input module, then read the value of 4~20mA at analog input channel of an external computer.

If you do not have ananalog input module, adjust a multimeter to the current stalls, series connection with the 4~20mA.

During Calibration

1. Press[◄┘] and [┌►] go to C32.
2. Show[out-4], the output current should be 4mA.
3. When you press [ ]show[out-5], Pres[ ]show[out-20], the output current should be 20mA.
4. Adjust the current as needed, for example, adjust to [out-20], Press [ ] or [ ] to adjust the current.

Digital I/O Function instructions:

4~20mA corresponds to Zero ~Max. capacity. After pressing " TARE", the weight will start from 4mA. Set C31=0, 0~20mA output mode; C31=1 4~20mA output mode.

If you need 0~5V output, Set C31=0, then connect 250Ω at the two ends of current output, that will get 5 voltage at resistance two ends.

Relay output function (optional)

The indicator can be equipped with up to four optional relays that can be used to control external equipment based on data gathered by the indicator. This can include controlling actions caused by weight, piece count, upper or lower weight limits, or other data points that the indicator can identify.

If equipped, these functions are controlled through the C33 menu, as described below.

Table 3: Relay Functions

	Function	Definition

C33＝0	No output	none
C33＝1	Weight comparison	Hi OK Low Zero
C33＝2	Stable weight comparison	Hi OK Low Zero
C33＝3	Set point output	Set point 1 Set point 2

Table 4: Checkweigh Port Settings

	Output port	**output condition**	**definition**
C33＝1 C33＝2	OUT1	weight>=C13	Hi (over)
	OUT2	C13> weight >=C14	OK (accept)
	OUT3	weight<C14	Low (under)
	OUT4	weight <20d	Zero

Table 5: Setpoint Port Settings

	Output port	**output condition**	**definition**
C33＝3	OUT1	weight >=C14	Set point 1
	OUT2	weight >=C13	Set point 2

For example, for a check weight application, connect the indicator with three lights; yellow, green, and red. The yellow light comes on when the scale is overloaded, the green light comes on if the seight is in the "OK" range, and the red light comes on if the weight is underweight.

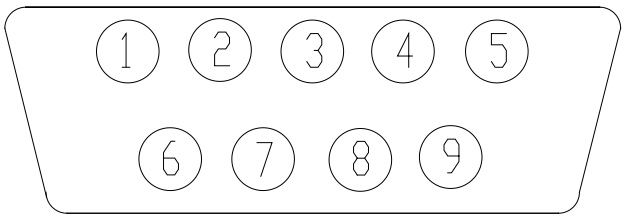
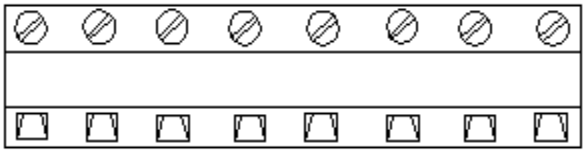


Table 6: DB9 Pin Settings

DB9 pin	**definition**	**port**
1 pin	1st output signal pin	Out1
6 pin	1st output signal pin	Out1
2 pin	2nd output signal pin	Out2
7pin	2nd output signal pin	Out2
3 pin	3rd output signal pin	Out3
8 pin	3rd output signal pin	Out3
4 pin	4th output signal pin	Out4
9 pin	4th output signal pin	Out4

Internal Pin Connections



CHAPTER 3. Basic Operation

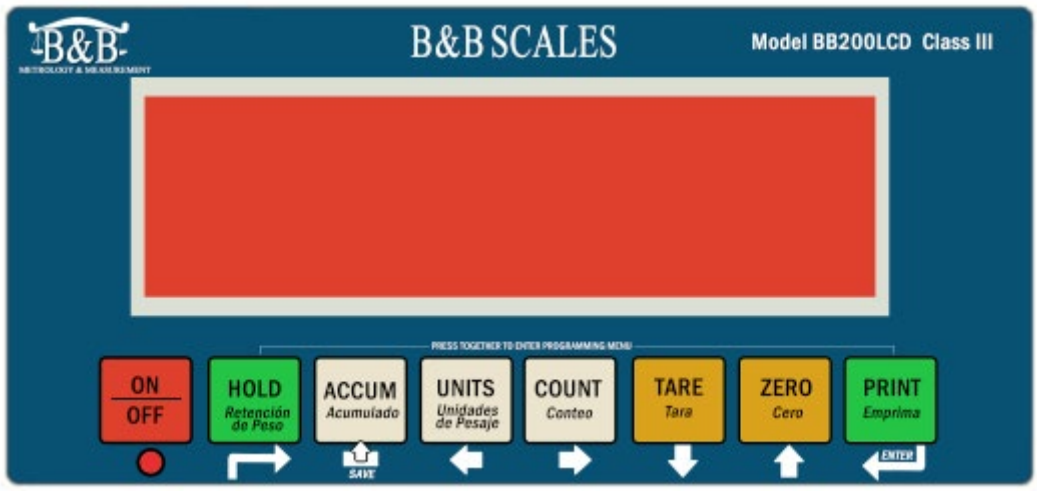
This chapter describes the basic operation of the indicator.

Keypad

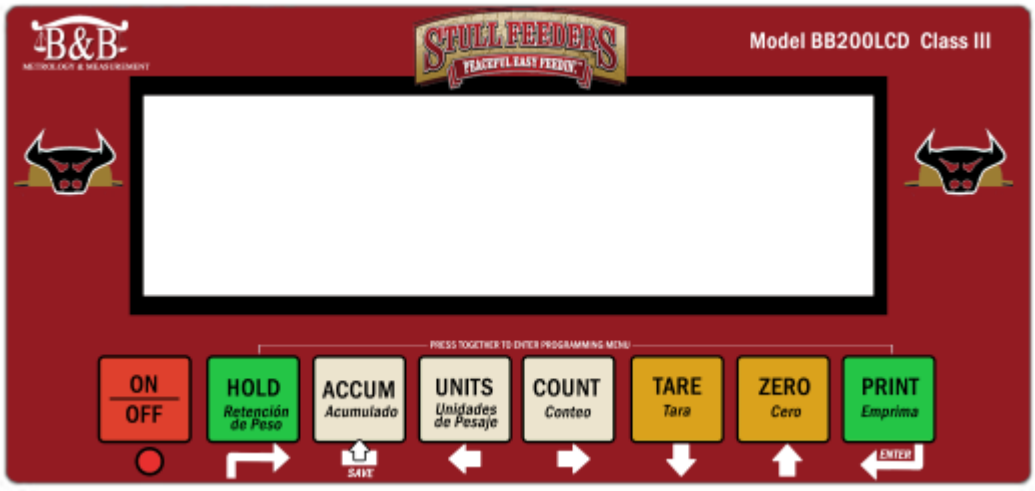
The indicator is available with either an Light Emitting Diode display panel (LED) or a Liquid Crystal Display display panel (LCD). Generally speaking, the LCD panel is better for outdoor use, as the characters are more visible. It can be difficult to read the LED display in direct sunlight, but the LED display is far preferable in low light situations, such as warehouses, barns, etc.

The LCD display is available in both B and B colors and with the Stull Feeders design. There is no functional difference between these two indicators.

LCD Version:



LCD Indicator Faceplate



Alternate LCD Indicator Faceplate produced for Stull Feeders
Note that the Stull Feeders Indicator is available in LCD only.

LED Version

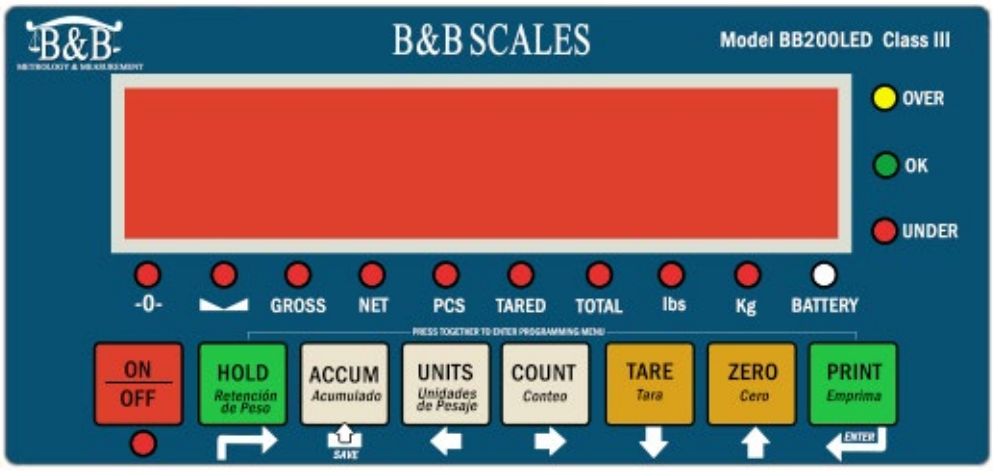
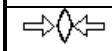


Table 7: LED Light Descriptions

Symbol	Meaning
	Weighing data
	Stable signal at ZERO pounds.
	weight is stable
Gross	Gross weight
Net	Net weight
Tared	Tare status
Total	Go to accumulation mode
Hold	Data hold
PCS	Show the counting status
lb	lb
kg	kg
.	Decimal
Hi	Over load
OK	accept
Lo	Under load

Key Functions

The table below describes the functions of the keys in standard operating mode, for both the LED and LCD versions of the indicator. In programming mode, the keys have different functions, which are described in PROGRAMMING and CALIBRATION PROCEDURES.

Table 8: Key Functions

Key	Key function
	Print
	Zeros the weight if the displayed weight is within the zero range
	1. In Gross Weight mode, get the tare weight and zeros the indicator. 2. In Net Weight Mode, clears the tare value and gets the Gross Weight.
	1. Displays the Piece Count when in Counting Mode. 2. Used with the PRINT Key to set up the scale for Counting mode. See description below.
	Coverts between Kg, Lbs, Oz and g.
	1. Shows the total accumulated weight in Accumulation mode. 2. works with the Print key to perform the accumulation function.
	Press 2 seconds to power on or power off
	Enter Hold Mode

Power on & off

Press  for 2 seconds to power on or power off the indicator. When the indicator starts up, it performs a Power On Self-Test (POST), during which it will light all of the lights, and test the screen functions, check for load cell connectivity, etc. After the POST, it will go to basic weighing mode.

Zero operation

Initial zero setting

By default, when you power on the indicator it will show zero, even if there is weight on the indicator. This is preferable if you have a squeeze chute, platform, floor scale, or other scale that has a heavy platform. In most cases, you really don't care about the actual weight of the scale itself. However, if you are weighing feed, grain, or another commodity that is routinely not removed from the scale when you shut it off, you can program the scale NOT to zero when it is first powered on. See Menu C-21 in CHAPTER 6 to change this setting.

Manual zero setting

Press the 

key when the scale is stable (and not negative) to zero the display. This is a good habit to get into every time you are preparing to weigh something.

Tare operation

Press the 

key to zero the weight of an empty container, then fill the container with a commodity to weigh it. If necessary, you can press and hold the 

for two seconds to manually enter the tare weight.

Accumulation operation

Enter Accumulation Mode

The 

key allows you to keep a running total of the commodities you are weighing. Follow the instructions below to use this function:

1. Zero the scale.
2. Place an item on the scale.
3. Press 

.. The display will show "n 001", then display the current weight.
4. Remove the load from the scale. The scale will return to zero.
5. Load the second weight. Press 

. The display will show "n 002"
6. Repeat for as many items as you have to weigh, up to 999 items.

mode, "Total" light on, display" n 001", and then display loaded weight; Unload the weight , back to zero, load the second weight again till stable. Press display"n002" then display the second loaded weight. Repeat it agin and again, maximum 999 times.

Check the Accumulation

Press 

and 

simultaneously to show the number of weighments and the total weight of the items weighed.

EXIT Accumulation Mode

Press and hold the 

key for two seconds to exit Accumulate Mode.

Print

Press the 

key to print.

Note: The scale must be stable and showing a positive number to print.

Hold

There are five different hold functions. You set up the Hold function in the C11 menu when you program the indicator. Press the 

key to activate the specific function that you have programmed. The available functions are:

Table 9: C11 (Hold Function) Menu Settings

C11 Menu Value	Function
0	Hold is disabled.
1	Peak Hold. The scale will lock on to the maximum weight attained. Imagine jumping on the scale.
2	Simple Hold. The scale will lock on to the weight on the scale.
3	Basic Animal Weighing. The scale will take a series of averages over six seconds, then display the average. (The scale takes hundreds of weights per second)
4	Manual Animal Hold. The scale will take a series of averages over a time period set in C39, then display the average. Press and hold the  key to activate. Press the key again to return to normal weighing mode.
5	Configurable Animal Weighing: Use C39 and C40 to set the parameters for animal weighing. C-39: Set the period of time that the animal is actively standing and moving around on the scale.

C11 Menu Value	Function
	C-40: Set the period of time between animals, when the scale is empty.

Important: Some versions of this indicator do not have advanced hold functions. Navigate to C-11. If you are not able to set a value of 0 to 5, your indicator is not equipped with advanced hold. The only way to fix this is to upgrade your motherboard. See www.bbscales.com for options.

COUNT

The counting feature allows you to count commodities that weigh the same; things like nuts, bolts, nails, beads, etc. To use the counting feature:

1. Turn on the scale in normal weighing mode.
2. Identify a known number of your commodity to use a sample, and place it on the scale.
3. Press the 

button. The display will read, "PCS 0."
4. Use the  and  keys (the Tare and Zero keys) to adjust the number of items in your sample. Press 

to confirm.
5. Load your commodity on the scale. The indicator will show the quantity of items in your batch. (this is the QUANTITY, *not* the WEIGHT).

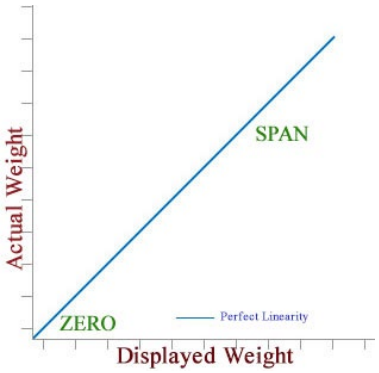
CHAPTER 4. PROGRAMMING and CALIBRATION

	**IMPORTANT**	This indicator can be commercially Legal for Trade in all 50 states and Canada. If your scale is certified as Legal for Trade, the following procedures must be performed by a technician who is licensed in your jurisdiction. **Failure to do so will void your calibration.**

	**WARNING**	If you remove or damage the wire seal and/or calibration sticker, your calibration is void.

Calibration Overview

Calibrating an indicator – almost any indicator – is an exercise in recording the signal the indicator is receiving from the load cell(s). You need at least two points. One of those points is "zero," and one of those points is a known weight placed at a point higher on the graph. This point is called the "Span."



The closer you can get to true linearity, the more accurate your scale will be. It is typically suggested that you calibrate a scale with at least 80% of the capacity of the scale. This is not always practical, since you would need 4000lbs of test weights to calibrate a 5000lb floor scale or livestock scale. Instead, it is good practice to use a test weight that is close to the weight of what you will actually be weighing.

Test Weights

Certified scale companies and regulatory agencies will typically use test weights that are certified and traceable to a government standard. If you are doing this yourself, you likely won't have these. Here are some acceptable alternatives for scales that *do not* need to be certified as Legal for Trade:

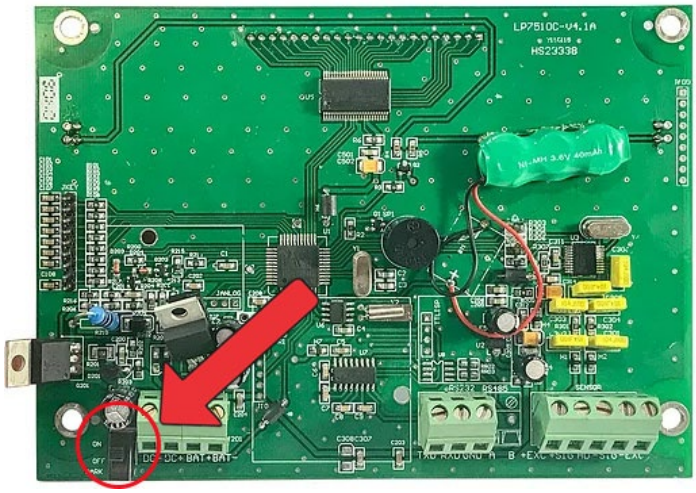
- Tractor Weights
- Unopened bags of feed, grain or mineral
- Anything made of steel that you know the weight of.

Do not use people or animals or anything that breathes or has a pulse.

Calibration Lock

The BB-200 indicators have a switch on the motherboard that prevents you from entering calibration mode, as shown in the image below. This is so that the housing of the indicator can be sealed, preventing unauthorized access to the calibration menus. Before you can calibrate the scale, you must disable the calibration lock.

TIP	By default, the BB-200 usually ships with the Calibration Lock UNLOCKED. There is usually no need to remove all the screws and open the back of the indicator to flip the switch. If you see "C1" when you enter programming mode (below), you're good to go. If you see "C9," you need to open the indicator and flip the switch.



Location of the Calibration Lock Switch

Entering Calibration Mode

Turn the indicator on and make sure it is connected to the scale. Ensure that the scale is reasonably level and clear of any debris.

Press HOLD (Retención de Peso) and PRINT (Emprima) simultaneously for two seconds, then release. The display will read "C01." If the display reads "C09," the Calibration Lock is engaged. See the previous section to unlock it.

C01 is the first of 49 menus, each of which has various different settings that you can adjust. C01 through C08 are the calibration menus.

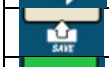
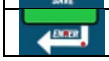
Navigating the Calibration and Programming Menus

The menus take the format of Cnn, where nn is the menu number. When you first navigate to a menu, the indicator displays the menu number only. Press the PRINT (Emprima) key to enter the menu and the current numeric value of that menu will be displayed. Use the arrow keys shown in the table below to change the menu values.

For example, when you first enter Calibration Mode, you will see [C01]. Press "Print" and you will see [C01 1]. Press "Print" again to advance to the next menu, [C02], etc.

When you are in Calibration Mode, use the keypad keys to navigate, as follows:

Table 10: Keypad Navigation

Key	Function
	Increase the value or move the cursor up
	Decrease the value or move the cursor down
	Move Left
	Move Right
	Save and Exit. This key is important – it SAVES the values you have just entered.
	Return / Enter

Calibration and Programming Menus

The table below describes the calibration functions. Put the indicator in Calibration Mode as above. When you see C01 on the display, follow the instructions below to calibrate the scale:

Menu Name	Description	Possible Values	Example / Notes
C01 Units Menu	Sets the unit that the indicator weighs in.	1 = kg 2=lbs 3=g 4=oz	This is the default value that the indicator will use. You can still switch between pounds and kilograms with the  key in normal weighing mode.
C02 Decimal Menu	Sets the number of zeros after the decimal point.	1,2,3,4	Use the arrow keys to set the number of decimals. For example, two decimals would read 0.00.
C03 Graduations	Sets the scale graduations	1,2,5,10,20,50	For example: Set to "1" to read to the nearest 1 pound.
C04 Scale Capacity	Sets the maximum capacity of the scale.	No Theoretical Maximum.	Default is 10,000. 5000 is suggested for most agricultural or industrial scales.
C05 Zero	Calibrates the scale at zero.	0 = No, do not calibrate. 1 = Yes,	If you are calibrating the scale, you MUST calibrate the ZERO value and the SPAN value together.

Menu Name	Description	Possible Values	Example / Notes
Calibration (make sure scale is empty)		proceed with zero calibration	So, to calibrate the scale at zero, simply empty the scale, change the 0 to 1 and press PRINT.
C06 Span Calibration (Place your Shadd	Calibrates the scale at the SPAN value, which you also define in this step. You must have known weights for this step.	0 = No, do not calibrate. 1 = Yes, proceed with SPAN calibration	If you are calibrating the scale, you MUST calibrate the ZERO value and the SPAN value together. So, to calibrate at SPAN: 1. change the value from 0 to 1 2. put your known weights on the scale 3. enter the amount of your known weights. 4. press PRINT.
When you have successfully calibrated the scale at C06, the indicator will display CALEND. **You MUST press the ACCUM Acumulado key to save the calibration information. If you do not press this key, you will have to start over.**			
C07 Factory Reset	Resets the indicator to factory default values.	0 = Do not reset 1= reset all values	Sometimes you just need to start over. Just be aware that this resets EVERYTHING.

Setting Up Scale Functions

The table below describes the various functions of the indicator, and how to change them. Examples are given where appropriate.

You do not need to recalibrate your scale to add or change the functions listed below. Simply enter calibration / programming mode by pressing HOLD Retención de Peso and PRINT Emprima simultaneously and use the arrow keys to navigate to the "C" menu that you need to change. When you have finished making changes, press the ACCUM Acumulado button to save your changes.

Table 11: Indicator Menus and Functions

Menu Name	Description	Possible Values	Example / Notes
C08 **Warning Tone**	The indicator sounds a warning tone during error conditions	0 = do not sound warning tone 1 = sound warning tone	
C09 **Automatic power off**	Automatically turn off the indicator after 10, 30 or 60 minutes of idle time.	0 = disable 10,30,60	
C10 **Backlight Power Setting**	Manages the display backlight	**LED Version:** 0= disable 3= turn off backlight if no change within 3 min. 5= turn off display if no change within 5 min. LCD Version: 0=disable backlight 1= enable backlight when weight changes or keyboard is pressed. 2 = constant backlight	
C11 **Hold Function** **(Animal Weighing)**	See Table 9: C11 (Hold Function) Menu Settings on Page 18	0= Disable hold function 1=Peak hold 2=Data Hold 3=Auto hold 4= Manual Animal Weighing 5=Auto Animal Weighing	These functions are described in *Table 9: C11 (Hold Function) Menu Settings on Page 18*

Menu Name	Description	Possible Values	Example / Notes
C12 **Unit Conversion**	kg/lb conversion	C12=0 stop kg/lb conversion C12=1 kg/lb conversion C12=2 kg/lb/oz conversion (LCD only) C12=3 kg/lb/lb:oz/oz conversion (LCD only) C12=4 kg/g conversion (LCD only)	
C13 **Upper limit C14**	Upper Alarm Limits for Checkweigh Applications	Must be set within the maximum capacity limit	
Lower Alarm Limit	Lower Alarm Limits for Checkweigh Applications	Must be set within the maximum capacity limit	
C15 **View Raw Digital Counts**	Displays the digital counts before they are converted to units of measure.	0 = no 1 = yes	Useful for troubleshooting signal problems
C16 **Date**	Set the Date	Year/Month/Day	
C17 **Time**	Set the Time	Hour/Minute/Second	

Menu Name	Description	Possible Values	Example / Notes
C18 **RS-232 Port Settings**	Controls how data is sent from the RS-232 Port.	0 = Disable RS-232 Port 1 = Continuous Data Transmit for a remote display 2 = Send data only when PRINT buttons is pressed (to connect to a printer) 3 = Command Mode so data can be requested by a PC 4 = Continuous Request Mode from a PC	
C19 **Baud Rate**	Sets the Baud Rate of the RS-232 Port	0 = 1200 1 = 2400 2 = 4800 3 = 9600	
C20 **Manual Zero Range**	Set the manual zero functions	Option: 0= disable manual zero 1=±1% max capacity 2=±2% max capacity	
C21 **Initial Zero Range**	Set the Initial Zero Range. This is the setting you would change if you are weighing grain and do not want the indicator to auto-zero when you turn it on.	0= disable initial zero 1=±1% max capacity 2=±2% max capacity 5=±5% max capacity 10=±10% max capacity	Set to "0" to have the indicator "remember" what was on the scale when it was turned off. Use the other settings to auto-zero when you're weighing cattle, for example, and they leave manure on the scale.

Menu Name	Description	Possible Values	Example / Notes
C22 **Automatic Zero Tracking Range**	This function defines a dynamic range that the indicator will interpret as ZERO. For example, this could be caused when ambient temperatures change in a laboratory environment.	0= disable zero tracking 0.5=±0.5d 1.0=±1.0d 2.0=±2.0d 3.0=±3.0d 4.0=±4.0d 5.0=±5.0d Notes: 1. d = division 2. The zero tracking range can not bigger than manual zero range.	
C23 **Automatic Zero Tracking Time**	Defines the period of time over which Automatic Zero Tracking is performed.	0= Disable zero tracking time 1= 1 second 2= 2 seconds 3= 3 seconds	
C24 **Overload Range**	Sets the tolerance, in divisions, before the indicator displays an Overload condition.	00= disable overload range 01d～99d Note: d =division	
C25 **Negative Display**	Defines how far negative the indicator can go before reaching an error condition	0=-20d 10=10% max. capacity 20=20% max. capacity 50=50% max. capacity 100=100% max. capacity	
C26 **Standstill Time**	Determines how fast the scale locks in on a weight.	0 = fast 1 = medium 3 = slow	Set this to slow if you are using Animal Hold or if you have a lot of filtering set

Menu Name	Description	Possible Values	Example / Notes
C27 **Standstill Range**	Sets the amount of change, in divisions, that the indicator allows before locking in on a weight.	1= 1d 2=2d 5=5d 10=10d D= division	
C28 **Dynamic Filtering**	This is a digital motion filter that allows the scale to tolerate motion or instability during the weighing process. Use this filter in conjunction with the Animal Hold features set at C11.	0= disable dynamic filter 1=1 digital filter strength 2=2 digital filter strength 3=3 digital filter strength 4=4 digital filter strength 5=5 digital filter strength 6=6 digital filter strength	
C29 **Noise Filter**	Filters out electrical interference	0=disable noise filter 1=1 digital filter strength 2=2 digital filter strength 3=3 digital filter strength	
C30 **Date Format**	Sets how the date is displayed.	C30=0 yy.mm.dd C30=1 mm.dd.yy C30=2 dd.mm.yy C30=3 yy.mm.dd	See **C16** to set the date. This function just formats it.
C31 **Analog Output Type**	Turns on or off the 20mA analog output functions, which are typically used to control downstream controllers	C31=0 0~20mA output C31=1 4~20mA output	
C32 **Calibrate 4-20mA Current**	See 4-20mA output (optional) on page 10		

Menu Name	Description	Possible Values	Example / Notes
C33 **Relay Output Setting**			
C34 **Communication Address Code**	Reserved	0 – 99	
C35 **Wireless Communication**	Reserved	0-99	
C36 **Gravity Setting for Calibration**	Adjust the calibration for the effects of gravity	9.7000 to 9.9999	
C37 **Gravity Setting for Location**	Adjust the settings for the effects of gravity set at calibration relative to the current location of the indicator	9.7000 to 9.9999	
C38 **Version No**	Reports the firmware version of the indicator		
C39 **Animal Hold Sample Time**	Sets the amount of time that averaging takes place during Manual and Automatic Animal Hold	0 – 9	
C40 **Animal Hold Delay Time**	Sets the delay between one animal exiting and another animal loading on the scale.	0 – 9	
C41 **Print Mode**	Sets the value that is printed	0 = auto (on screen) 1= gross mode 2 = tare mode See Print Formats on page 33 for more information.	

Menu Name	Description	Possible Values	Example / Notes
C 42 **Print Carriage Return**		0-9	
C43 **Space Print**		0-9	
C44 **Date Print**		0= Do Not Print Date 1= Print Date	
C45 **Time Print**		0= Do Not Print Time 1 = Print Time	
C46 **ID Number Print**		0 = Do Not Print ID 1 = Print ID	
C47 **Label Print Format**		0-99	
C48 **Second COM Baud Rate**		0=1200 1=2400 2=4800 3=9600	
C 49 **Automatic Print Valve**		0-999999	

CHAPTER 5. Output Formats

5. Output format

Remote Displays

Table 12: Continuous Output Format

Output continuous format																	
STX	SWA	SWB	SWC	X	X	X	X	X	X	X	X	X	X	X	X	CR	CKS
1	2			3						4						5	6

Table 13: Output State A

State A			
Bits0,1,2			
0	1	2	Decimal point position
1	0	0	XXXXXX0
0	1	0	XXXXXXX
1	1	0	XXXXX. X
0	0	1	XXXX. XX
1	0	1	XXX. XXX
Bits3,4			Division
0	1		X1
1	0		X2

Table 14: Output State B

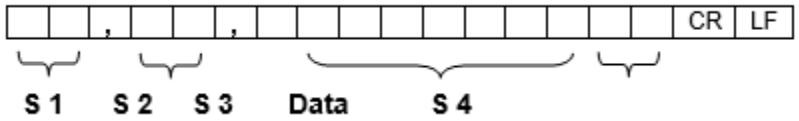
State B	
BitsS	function
Bits0	gross=0, net=1
Bits1	Symbol: positive =0,negative =1
Bits2	Overload(or under zero)=1

Bits3	dynamic=1
Bits4	unit：lb=0, kg=1
Bits5	Constant 1
Bits6	Constant 0

Table 15: Output State C

State C			
Bit2	Bit1	Bit0	unit
0	0	0	Kg or lb
0	0	1	g
0	1	0	t
Bit 3			printing=1
Bit 4			Extend display=1
Bit 5			Constant 1
Bit 6			Constant 0

Sending Data to/from a PC



S1: weight status, ST= standstill, US= not standstill, OL= overload

S2: weight mode, GS=gross mode, NT=net mode

S3: weight of positive and negative, "+" or " –"

S4: "kg" or "lb"

Data: weight value, including decimal point

CR: carriage return

LF: line feed

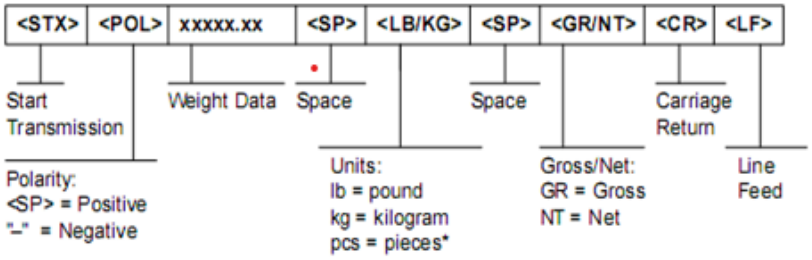
Serial Interface Reception Commands

RS232COM serial interface can receive simple ASCII commands as follows:

Table 16: Serial Interface Reception Commands

Command	NAME	Function
T	TARE	Save and clear tare
Z	ZERO	Zero gross weight
P	PRINT	Print the weight (See Below)
R	G.W/N.W	Read gross weight or net weight (See Below)
C	Kg/lb	Kg/lb conversion
G	G.W	Check gross weight at net weight mode
N	Inner code	Read C15 code (See Below)

R command data format



N command data format

STX SP SP SP XXXXXX SP IC SP IC CR LF

Print key data format

STX SP XXXXX.XX SP KG SP PT CR LF

Print Formats

Tare mode:

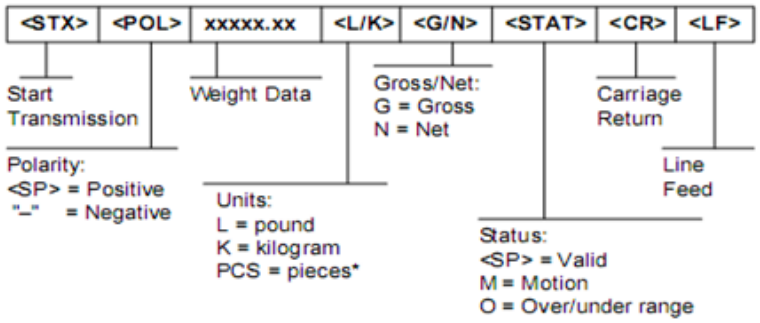
Date: XX.XX. XX
Time: XX : XXam
Net XX.X kg
Tare XX.X kg
Gross XXX.X kg

Gross mode:

Date: XX.XX. XX
Time: XX : XXam

Gross XXX.X kg

PC or Remote Display Continuous Sending Formats



Second COM protocol is Second display continuous sending format.

CHAPTER 6. Maintenance

Common Errors and Solutions

Table 17: Common Errors and Solutions

ERROR	REASON	SOLUTION
UUUUUU	1. Overload 2. Bad load cell connection or bad load cell.	1. Reduce the weight if overloaded. 2. Check each of the load cell cables to look for damage. You'll get this error if you have rodent damage or other cable issues.
nnnnnnn	1. Calibration Lost 2. Improper Connection 3. Bad load cell connection or bad load cell.	1. Recalibrate the scale 2. Check each of the load cell cables to look for damage. 3. Check junction box for loose wires
ERR1	Too much weight or improper weight during calibration	Make sure the amount of weight you set as your SPAN weight is really what you put on the scale.
ERR2	Not enough weight during calibration.	You must use at least 10% of the scale capacity to calibrate the scale. However, in reality, this is usually a load cell error because a load cell is damaged or is sending a corrupt signal.
ERR3	During calibration, the input signal is negative	Make sure you installed the load cells correctly. There is an arrow at the end of most load cells. This error should be pointing UP or you will receive a negative signal. Either flip the load cell over or swap the Green and White wires in the junction box.
ERR4	During calibration, the signal is unstable	This is a stability error, but this is usually a load cell error. Either a load cell is damaged or it is sending a corrupt signal.
ERR5	Internal Error.	Internal Error. Replace the motherboard.
ERR6	Exceed zero range. This is frequently a difficult error to troubleshoot because it is very ambiguous.	1. Recalibrate the scale. 2. Check all connections in the Junction Box 3. Check all the load cell cables and load cells

Daily Maintenance

1. Protect the indicator from direct sunlight
2. Ensure you have a good connection between the load cells and the indicator.
3. Do not operate the indicator near an electric field or a magnetic field.
4. Power off the indicator during thunderstorms or when lightning is present.
5. Power off the indicator before plugging and unplugging it.

Restoring the Indicator to Factory Defaults

To restore the indicator to the preset factory defaults, simply enter calibration / programming mode by pressing 

and 

simultaneously, then use the arrow keys to navigate to the "C07" menu.

Change C07 to 1. Press" 

" then press" 

" to exit. All parameters will be reset to default.

	**WARNING**	This procedure should only be done by a licensed scale technician or other professional staff.

Defalt Parameters

Parameter	Instruction	Default Value
C01	Calibration	1
C02	Decimal digits	0
C03	Resolution	1
C04	Max. capacity	10000
C05	Empty calibration	0
C06	Capacity calibration	0
C07	Restore default	0
C08	Warning tone	1
C09	Power-off automatically	0
C10	Power saving mode	0
C11	Hold function	0
C12	Prohibit kg/lb conversion	1
C13	Upper limit alarm	000000
C14	Under limit alarm	000000

Parameter	Instruction	Default Value
C15	Inner code	
C16	Date setting	
C17	Time setting	
C18	Serial interface data output	0
C19	Serial interface Baud rate	3（9600）
C20	Zero manually	10
C21	Initial zero	10
C22	Zero tracking range	0. 5
C23	Zero tracking time	1
C24	Overload range	9
C25	Negative range	10
C26	Standstill time	1
C27	Standstill range	2
C28	Dynamic filter	0
C29	Noisy filter	2
C30	Date format	1
C31	Analog signal options	1
C32	4~20mA testing	4
C33	Relay output setting	1
C34	Muti PC communication add.	0
C35	Wireless communication	6
C36	Calibration location gravity	9.7936
C37	Destination gravity	9.7936
C38	Version No. check	