# S.K.R.

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**BN-V9 Series counting balance instruction manual**

Version:v1.0

# *Introduction*

This manual is divided into five major sections. Section One, "Understanding Your Balance", explains the features and specifications, the various keys, displays, and messages you will encounter while using your balance. Section Two, "Installing Your Balance", explains where to put your balance, how to level it and install the pan, and how to get start. Section Three, "Using Your Balance", provides the detailed instructions necessary to perform various operations. Section Four, "Setup" explains how to setup your balance when you first use it, include setting the print function, baud rate, backlight, checking limits, restoring the factory default setups and enabling units of measure. Following Section Five are appendices which include RS232 information, accessory information, troubleshooting, and a warranty.

Typographical conventions used in this manual include the following:

1. BOLD UPPER CASE CHARACTERS indicate specific keys on the balance keyboard.
2. "Quotation marks" enclose messages seen on the balance display.

## *Understanding Your Balance*

### *1. BN-V9 series balance specification*

| Model | BN-V9-210 | BN-V9-410 | BN-V9-500 |
|---|---|---|---|
| Max. Cap.-Div. | 210g/0.001g 7.40753oz/0.00005oz | 410g/0.001g 14.4623oz/0.00005oz | 500g/0.001g 17.6370oz/0.00005oz |
| Pan size | Φ120mm/4.724inch | | |
| Model no. | BN-V9-2100 | BN-V9-4100 | BN-V9-5000 |
| Max. Cap.-Div. | 2100g/0.01g 74.0753oz/0.0005oz | 4100g/0.01g 144.623oz/0.0005oz | 5000g/0.01g 176.369oz/0.0005oz |
| Pan size | Φ160/6.299inch | | |

## 2. Features of BN-V9 Series Electronic Balance

∗ High Accuracy
∗ Standard RS232 Communication Port
∗ Multiple Weighing Units
∗ Automatic Calibration
∗ Large LCD Display
∗ Piece Counting & Percentage Weighing
∗ Durable Metal Structure
∗ Over-Weighing Protection

## 3. Keyboard Function

| No. | Keyboard | Function |
|---|---|---|
| 1 | →0←T （**Tare**） | Assigns the pan and whatever is currently being weighed a value of zero. |

| 2 | (Power) | To turn the display off, To turn the display on press this key again. |
|---|---|---|
| 3 | **Cal.** | Calibrate balance with weights |
| 4 | (Unit) | Converts weighing units (for example, change from grams to Carat, Ounce etc.,). |
| 5 | **% (Percentage)** | Instructs the balance to display percent weight |
| 6 | **Count** | Piece counting |
| 7 | **Menu** | Instructs the balance to enter the MENU system |
| 8 | PRINT (Print) | Sends to a printer or other peripheral device the information on the display. |

## 4. LCD Indicator

| No. | Display | Indication |
|---|---|---|
| 1 | **OK** | Reading shown is stable. |
| 2 | **g** | Reading shown is given in grams. |
| 3 | **OZ** | Reading shown is given in ounces. |
| 4 | **Ct** | Reading shown is given in carats. |
| 5 | **dwt** | Reading shown is given in pennyweight |
| 6 | **%** | Reading shown is given in as a percent weight. |
| 7 | **PCS** | Reading shown is given in as a counting. |
| 8 | **lb** | Reading shown is given in pound. |

## 5. Display Messages

| No. | Display | Indication |
|---|---|---|
| 1 | ------ | Wait, reading is in process |

| 2 | **UNABLE** | The balance is unable to perform your requested operation. Press the TARE key to quit |
|---|------------|---------------------------------------------------------------------------------------|
| 3 | **HHHHHH** | Over Load |
| 4 | **LLLLLL** | The pan is not properly seated or has been removed. |

# *Section 2*

## *Using Your Balance*

### *1. Basic Weighing*
To weigh a sample on your balance, use the following procedure:

1.1 Warm up the balance at least 15 minutes before using.

1.2 Clear away anything on the weighing pan.

1.3 Press the **TARE** key to zero the display.

1.4 Press the **UNIT** key if you want to convert to other weighing unit. Continue pressing the key until the unit you wish to use is displayed.

1.5 Place the object to be weighed on the pan.

1.6 Wait for the "ok" indicator, and then read the weight from the display.


### *2. Weighing with a Container*
To weigh objects or liquids without including the weight of the container, use the following procedure:

2.1 Place the empty container on the pan.

2.2 Press the **TARE** key, the balance will display "------"and return to zero.

2.3 Wait for the "ok" indicator, place or pour objects or liquids into the container.

2.4 Wait for the "ok" indicator, the net weight will be displayed.


### *3. Counter Mode*
To count a number of like objects on the balance, use the following procedure:

3.1 Press the TARE key to zero the display. If you need use a container, place the container on the balance, then press the **TARE** key.

3.2 Press the **COUNT** key, each time the key is pressed requested sample size will increase(i.e.,10,25,50,100,500 PCS)

3.3 Place the requested number of pieces on the pan or in the container, press the **UNITS** key. LCD display the unit "PCS".

3.4 Fill the container to the desired number of pieces.

3.5 Wait for the "ok" indicator, the number will be displayed.

**Note:**

※ Pressing the **UNITS** key can convert from Counter Mode to Weighing Mode. Press the **UNIT** key can convert to different units. (i.e., "PCS", "g", "Oz", "Ct", "lb", "dwt")

## *4. Percent Deviation*

To calculate the amount by which a weight varies from a reference, follow this procedure:

4.1.1  Press **TARE** key to zero the display.

4.1.2  Place the reference weight on the pan.

4.1.3  Press the **%** key. After acquiring a stable reading, the display will read "100.000",or "100.00" depending on the amount of weight applied and the % LCD will be lit.

4.1.4  Remove the reference weight, the display will read "0.000" or "0.00".

4.1.5  Place the weight to be measured on the pan.

4.1.6  Wait for the "ok" LCD to light, read the display, the display indicates percent deviation from the reference.

4.1.7  Press the **UNITS** key to return to basic weighing.

To weigh objects or liquids without including the weight of the container, use the following procedure:

4.2.1  Place the empty container on the pan. and press **TARE** key to zero the display.

4.2.2  Place or pour objects or liquids into the container.

4.2.3 Press the **%** key. After acquiring a stable reading, the display will read "100.000",or "100.00"

4.2.4 Remove the filled container and place a same empty container on the pan, the display will read "0.000" or "0.00"

4.2.5 Place or pour objects or liquids into the container and wait for the "ok" LCD to light, read the display, the display indicates percent deviation from the reference.

4.2.6 Press the **UNITS** key to return to basic weighing.

## 5. Check Weighing Limits

If you want to judge objects are in the range of your specific requirement, just need setup the limits of the objects.

5.1 Setup the objects' limits and start check weighing mode.(refer to setup section)

5.2 Press **TARE** key.

5.3 Place the objects to be measured on the pan.

5.4 After acquiring a stable reading, the display will indicates "LOW" or "HIGH" or "OK".

5.5 "OK" means the objects weight is in the range of your specific requirement. "LOW" means the objects weight is lower than your specific requirement. "HIGH" means the objects weight is higher than your specific requirement.

## 6. Print Out Information

Your balance is designed to print out the displayed weight when connected to an optional serial printer. To print using the thermal receipt/label printer, follow the instructions below:

6.1 Connect the printer to the balance's RS232 connector using the cable provided.

6.2 Connect the printer's AC adaptor to the proper electrical outlet.

6.3 Perform the necessary weighing procedures on the balance. (refer to setup section)

6.4 Press the **PRINT** key to print relative data.

### 7. Interface with Computer

Your balance has a RS232 serial port and is designed to interface with computer equipment. If your balance is connected to a computer, follow the instructions in appendix.

## Section 3

## User Setups

Your balance has a setup mode that can be used by the operator to optimize the balance's performance. To enter the menu presses the **MENU** key. To view the current menu options, press the **TARE** key repeatedly. To select the displayed option, press the **COUNT** Key. To quit setup mode press the **TARE** key, LCD will display "ESC" and press the **COUNT** Key.

### 1. Setting the Print Function

The **PRINT** key can be setup to send readings to a printer or computer under different parameters via the RS232 port. The selectable print function is: stable print which will only print once a stable reading is attained. Instant print which will print immediately after the print key is pressed (note: the reading may not be stable) and interval print which may be programmed to print at predetermined time intervals. The number of line feeds also is set for label printing.

**Note:**
※ The print function is separate from the line feed setup, i.e., set the print function first then re-enter the print MENU to program the number of line feeds. To set the print key function, use the following procedure:

Press the **MENU** key, the display will read "PRINT". Note: to escape anytime during this procedure, press the TARE key until "ESC" is displayed,

and then presses the **COUNT** Key.

Press the **COUNT** Key to enter the print menu. The display will read "STABLE" for stable print.

To view the predetermined print intervals (in seconds) press the **TARE** key repeatedly. When the desired time interval is displayed, press the **COUNT** Key. (Select zero for continuous printing.)The balance will then return to the normal weighing mode. Pressing the **PRINT** key will print the displayed weight after each selected time interval (e.g., 90 seconds). To interrupt the interval printing presses the **PRINT** key again. To reactivate, press the **PRINT** key.

Note: print intervals can vary up to ±0.2 seconds depending on weight variations.

1.4 Press the **COUNT** Key, the balance return to weighing mode.

1.5 To view the preset number of line feeds available (0~18) press the **TARE** key repeatedly. When the desired number of line feeds is displayed, press the **COUNT** Key. The balance will then return to the normal weighing mode.

## 2. Setting the Baud Rate

The balance is capable of interfacing with a wide variety of computer devices. To set the baud rate (the rate at which the scale communications with a computer or printer) and parity, use the following procedure:

2.1 Press the **MENU** key, enter the menu setup mode.

2.2 Press the **TARE** key, the display will read "baud".

**Note:**

※ To escape anytime during this procedure, press the **TARE** key until "ESC" is display and presses the **COUNT** Key.

2.3 Press the **COUNT** Key to enter the baud rate menu. The display will read 300.

2.4 To view the other baud rates press the **TARE** key repeatedly. When the desired baud rate is displayed, press the **COUNT** Key to select it. The

display will then read "parity".

2.5 Press the **COUNT** Key to enter the party menu. The display will read "NONE" for no parity. To view the parity menu press the **TARE** key.

2.6 When the desired parity (none, odd, even) is displayed, press the **COUNT** Key. The balance will then return to the normal weighing mode.

## 3. Enabling Units of Measure

The default boot unit is ounce

The units function can be programmed to turn certain weighing units on or off. To enable or disable certain units of measure, perform the following procedure.

3.1 Press the **MENU** key, the display will read "PRINT"

3.2 Press the **TARE** key twice, to display the "UNITS" for the units menu.

**Note:**

※ To escape anytime during this procedure, press the **TARE** key until "ESC" is display and presses the **COUNT** Key.

3.3 Press the **COUNT** Key. The first selection display is "g yes" which represents grams enabled. To enable grams press the **COUNT** Key. To disable grams, press the **TARE** key to display "g no", and then press the **COUNT** Key.

**Note:**

※to enable or disable any unit of measure, the procedure outlined above must be completed for each unit. If you make a change and escape before finishing the complete procedure (which ends with dwt) the change will not take effect.

3.4 These yes/no selections are also displayed for ounces (oz), carats (ct)，pounds(lb) and dwt.

3.5 The default boot unit is ounce。

## 4. Restoring the Factory Default Setups

The many features in this section allow the user to customize the balance to suit a particular application. However, in doing this it is possible to inadvertently set up the balance in such a way that it does not operate as expected.

Perform the following steps:

4.1 press the **MENU** key, the display will read "PRINT"

4.2 Press the **TARE** key repeatedly until the display reads "initia" for factory defaults.

4.3 Press the **COUNT** Key to restore the original factory defaults. The balance will display "BUSY" and then return to the normal weighing mode.

**Note:**

※ Restore the factory defaults will return your balance to the entire factory spans and temperature calibration settings. You must recalibrate (span) your balance after restoring the factory defaults. If you are experiencing a temperature included offset, you should also run the temperature compensation procedure.

## 5. Backlight Setups

The backlight function can be programmed to turn off after a certain interval seconds when there is no any operation. To enable or disable backlight, perform the following procedure.

5.1 press the **MENU** key, the display will read "PRINT"

5.2 Press the **TARE** key repeatedly until the display reads "blight".

5.3 Press the **COUNT** Key, the display will be read "1 nin" (after 1 minute will be off when there is no any operation).

5.4 Repeatedly press the **TARE** key until you select the desired time ,(1,2,3,5,10,30,60)   and then press the **COUNT** key. The balance will return to normal weighing mode.

## 6. Checking Setups

The check weighing function can be programmed to turn certain weighing limits on or off. If you want to judge objects are in the range of your specific requirement, just need setup the limits of the objects. To enable or disable certain limits of measure, perform the following procedure

6.1 Press the **MENU** key.

6.2 Press the **TARE** key repeatedly until the display reads "INSPCT"

6.3 Press the **COUNT** key , the display will be read "SET HI".(high limit weight)

6.4 Press the **COUNT** Key, the display will be read "0" which is initial in factory.

6.5 Press the **COUNT** Key, the display will be read "set dp", repeatedly press the **TARE** key until you select the desired point location.

6.6 And then press the **COUNT** Key, the display will read "0". Press the **COUNT** key to increase the display and press the **TARE** key to decrease the display.

6.7 Press the **MENU** key, the targeted weight high limits will flash. When you need to modify the display readings, press the **TARE** key for modifies the targeted number. When you reach the correct readings press the **COUNT** key and the display will say "SET HI".

6.8 Press the **TARE** key to select the "SET LO" (setup the low limits). Same as above.

6.9 To enter checking weighing mode, press the **TARE** key until the display read "ENABLE", then press the **COUNT** key; If you would return to normal weighing mode, repeatedly press the **TARE** key until the display read "DISABL", then press the **COUNT** key, the balance will return to normal weighing mode.

6.10  If you would view the weighing limits, perform the follow procedure:

6.10.1  Press the **MENU** key, the display will read "print", and press the **TARE** key repeatedly until the display reads "INSPCT"

6.10.2  Press the **COUNT** Key, the display reads "SET HI".

6.10.3  Press the **COUNT** Key, the display reads the high limit weigh.

6.10.4  Press the **TARE** key, the display reads "SET HI".

6.10.5  Press the **TARE** key, the display reads "SET LO". Then press the **COUNT** Key, the display will reads the low limit weighing.

**Note:**

※ To escape anytime during this procedure, press the **TARE** key until "ESC" is display and press the **COUNT** Key.

※ If you would clear the setups, repeatedly press the **TARE** key when you enter the check weighing mode until the display reads "clear", and then press the **COUNT** Key. All of you set the data will be cleared.

※ After setup the weighing limits, the balance will quit from checking weighing mode automatically. If you want to return to checking weighing mode, should

take step 6.7 and 6.9.

※ If you finish the high limit and low limits setups, all of the data will be stored in memory.

# *Appendix*

## *1. Communication with a Computer*

The balance keyboard functions can be accessed via the RS232 interface. The following commands are available:

U: = unit key                    T: =TARE key                    C: =cal. key

P: = print key                    %: = % key                    #: = immediate print

Receiving data using the immediate print symbol

When a balance is connected to a computer, it is suggested that immediate print (#) be used. In response to this command the balance will transmit whatever number or message appears on the balance display. The string format output is shown below:

A   B   C   D   E   F   G   H   I   J   K   L   M

The first six digits represent the number field. A sign (±) always precedes the number and a decimal point is always transmitted. Numbers less than six digits long are preceded by spaces.(messages, when transmitted, are sent in the number field.)

Note: the position of the decimal point will depend on the readability and units the balance is displaying. The sign will be adjacent to the leading digit.

"H" and "I" are spaces.

"J" is the unit character. It describes the units of the number being transmitted. Your balance will transmit G for grams, O for ounces, C for carats.

"K" is stable character. This character corresponds to the "ok" indicator on the display. A (space) means the reading is not stable. "S" means the reading is stable.

The immediate print output is always transmitted with a carriage return and line feed. If the balance is set to a specific number of line feeds, these will be

transmitted with a carriage return.

## *2. The RS232 Interface Hardware*

Although NAPCO balance can communicate with almost any RS232 device, the build-in interface does not include the complete protocol. Only the transmit and receive lines of the standard interface are used. This should not present any interfacing problems in most applications.

The data format is      1 start bit

                         8 data bits include parity

                         1 stop bit

Connect a high quality, shielded cable with a DB9S (D-subminiature 9 pin female connector) using the following printout:

| 1 2 3 4 5 | pin | description |
|---|---|---|
| ○ ○ ○ ○ ○ | 2 | TXD- scale transmits data |
| ○ ○ ○ ○ | 3 | RXD-scale receives data |
| 6 7 8 9 | 5 | RRD- signal ground |

**<u>Note:</u>**

※ "handshake" signals, such as "clear to send" (CTS) are not used. The peripheral must have a minimum buffer (15 characters)

※ Computers which require handshaking need a connection between two pins on the computer's connector named DTR and DSR (data terminal ready and data set ready). CTS may also need to jumpier to RTS at your computer interface (clear to send and request to send).the maximum recommended cable length is 15 meters(39.370inch). The load impedance of the device connected should be between 3000 and 7000 ohms with no more than 2500 pf shunt capacitance.

## *3. Routine Maintenance*

**Daily maintenance**

1.  Remove the weighing pan and thoroughly clean (top, bottom and edges) to remove any dirty which may have accumulated.

2. Note: do not use water, paint thinner or mild solvent is recommended.
3. After cleaning, avoid dropping anything into the balance.

**Monthly maintenance**

1. Calibration the balance with weight
   1.1 Warm up the balance at least 30 minutes after power the balance.
   1.2 Press the **TARE** key to zero the display.
   1.3 Press the **Cal** key, the display read the capacity; press the **TARE** key, the display read half capacity.
   1.4 Place the half capacity standard weight on the pan, press the **Cal** key, the display read "ACAL" and then half capacity is displayed.
   1.5 Press the **Cal** key, the display read the capacity; place the capacity standard weight on the pan, and press the **Cal** key, the display read "ACAL", then capacity is displayed.

2. For safety reasons, check that the AC mains cable has not visible signs of damage.

**Troubleshooting**

| No. | Display | Indication |
|-----|---------|------------|
| 1 | ------ | Long display indicates unstable internal reading |
| 2 | **UNABLE** | The balance is unable to perform your requested operation. Press the TARE key and select another operation. |
| 3 | **HHHHHH** | Over Load, remove the weight on the pan |
| 4 | **LLLLLL** | The pan is not properly seated or has been removed. |
| 5 | **NOCAL** | The checking weighing mode cannot be entered, refer to checking setups. |