Avery Weigh-Tronix

ZK840

Balance Application

User Instructions

AWT35-501770
Issue AA

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1 General information and warnings

1.1 About this manual

This manual is divided into chapters by the chapter number and the large text at the top of a page. Subsections are labeled as shown by the 1.1 and 1.1.1 headings. The names of the chapter and the next subsection level appear at the top of alternating pages of the manual to remind you of where you are in the manual. The manual name and page numbers appear at the bottom of the pages.

1.1.1 Text conventions

Key names are shown in **bold** and reflect the case of the key being described. If a key has a dual function it may be referred to by its alternate function.

Displayed messages appear in ***bold italic*** type and reflect the case of the displayed message.

Annunciator names appear as *italic* text and reflect the case of the annunciator.

1.1.2 Special messages

Examples of special messages you will see in this manual are defined below. The signal words have specific meanings to alert you to additional information or the relative level of hazard.

CAUTION!
This is a Caution symbol.
Cautions give information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

NOTE: This is a Note symbol. Notes give additional and important information, hints and tips that help you to use your product.

1.2 Installation

NO USER SERVICEABLE PARTS. REFER TO QUALIFIED SERVICE PERSONNEL FOR SERVICE.

1.2.1 Safe handling of equipment with batteries

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

ATTENTION: Il y a danger d'explosion s'il y a remplacement incorrect de la batterie, remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

1.2.2 Wet conditions

Under wet conditions, the plug must be connected to the final branch circuit via an appropriate socket / receptacle designed for washdown use.

Installations within the USA should use a cover that meets NEMA 3R specifications as required by the National Electrical Code under section 410-57. This allows the unit to be plugged in with a rain tight cover fitted over the plug.

Installations within Europe must use a socket which provides a minimum of IP56 protection to the plug / cable assembly. Care must be taken to make sure that the degree of protection provided by the socket is suitable for the environment.

1.3 Routine maintenance

IMPORTANT: This equipment must be routinely checked for proper operation and calibration.
Application and usage will determine the frequency of calibration required for safe operation.

Always isolate the indicator from the power supply before starting any routine maintenance to avoid the possibility of electric shock.

1.4 Cleaning the machine

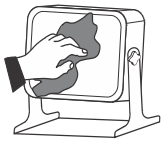


Table 1.1 Cleaning DOs and DON'Ts

DO	DO NOT
Wipe down the outside of standard products with a clean cloth, moistened with water and a small amount of mild detergent	Attempt to clean the inside of the machine
	Use harsh abrasives, solvents, scouring cleaners or alkaline cleaning solutions
Spray the cloth when using a proprietary cleaning fluid	Spray any liquid directly on to the display windows

1.5 Training

Do not attempt to operate or complete any procedure on a machine unless you have received the appropriate training or read the instruction books.

To avoid the risk of RSI (Repetitive Strain Injury), place the machine on a surface which is ergonomically satisfactory to the user. Take frequent breaks during prolonged usage.

1.6 Sharp objects

Do not use sharp objects such as screwdrivers or long fingernails to operate the keys.

2 Introduction

The ZK840 is a fully programmable indicator which, when attached to a BSQ digital scale base, creates a highly accurate counting and weighing system. With custom programming the indicator and its touch-screen graphic display can perform many other functions. This manual applies to the Balance application. See *Operating Instructions on page 13* for information about this application.

The indicator, shown in Figure 2.1, requires 100 VAC - 240 VAC, 50 or 60 Hz or 9-36VDC. The indicator has two full duplex RS232 ports, two USB host ports, Ethernet port, one Micro SD slot, three logic level inputs with configurable functions, three setpoint outputs and an expansion card slot for 1 of 2 option cards:

- 802 Wireless card
- 5V Analog scale card

Other options available are a stack light kit for visual confirmation of outputs, two columns for mounting the indicator above the BSQ base, battery packs and scanners. The ZK840 allows five bases to be used (one local BSQ base, two remote BSQ bases and two analog platforms). Other base combinations are available.

See the Specification literature for a full list of specifications.

For information on the BSQ bases please refer to the manuals for the BSQ line.

Figure 2.1 shows the front panel of the ZK840 indicator. The front panel consists of the keys and the graphic display.

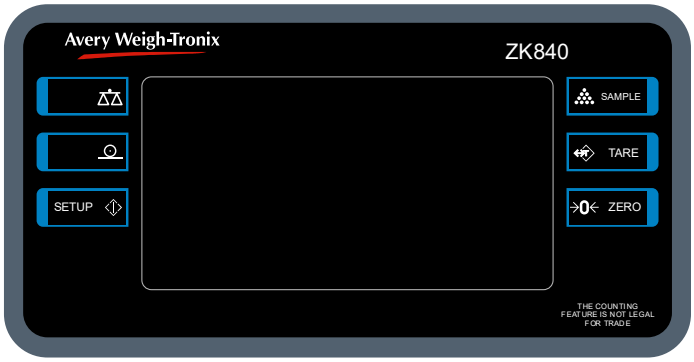


Figure 2.1 ZK840 front panel

Never press a key with anything but your finger. Damage to the overlay may result if sharp or rough objects are used.

2.1 Front panel keys

The keys and their functions are listed below.

	The **SAMPLE** key can be used to perform custom application functions.
	Press the **TARE** key to perform a pushkey tare function or with zero weight on the scale press the **TARE** key to enter a known tare. To clear a tare, press and hold the **TARE** key.
	Press the **ZERO** key to zero the display.
	The **SETUP** key can be used to perform custom application functions. It can also be used to access the password entry screen for menu access. Press to choose a custom unit of measure. See *Other features on page 17*.
	Press the **PRINT** key to print the configured information through the configured port. A long key press will print and clear the Count totals.
	Press the **SCALE** key to switch the display between different connected scale bases.

2.2 Annunciators

On screen you will see various annunciators. Below are the annunciators and what they mean.

 Motion - This appears when the indicator senses scale motion.

 Center of Zero - This appears when the scale is in the zero window.

SCL#1 Scale - If multiple scales are attached and active, this annunciator shows which scale's information is being displayed.

W1 Weight Range 1 - For multi-range operation, this shows which weight range the weight is in. May also be **W2** or **W3**.

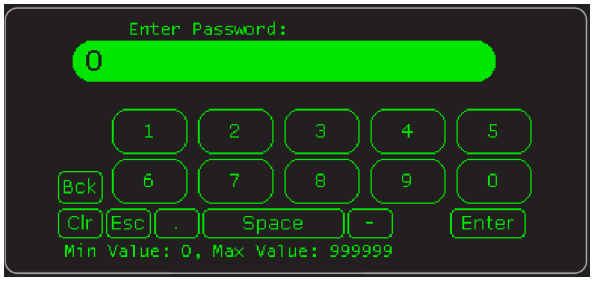
PT Appears when a Preset Tare is active.

2.3 Powering up a ZK840 indicator

The indicator is always active as long as power is received. Power must be 100-240 VAC with a frequency of 50 or 60 Hz, or 9-36 VDC.

2.4 Menu access and navigation

The menus used to configure the ZK840 are accessed with passwords. Press and hold the **SETUP** key to access the password entry screen, shown below.

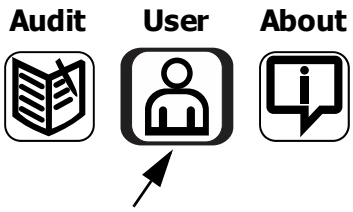


Note that the display shown above and throughout the manual is not proportional to the actual screen. It is shortened vertically to save space on the page when practical.

In general, a menu is made up of a group of top level items, sub levels under each of those and lists of items to view or configure. There are variations on this theme. Sometimes there may be no sub level or there maybe two sub levels before you get to a list of items to set.

You will see on-screen lists with instructions on how to choose and set an item in each menu list. On-screen prompts guide you as you move through the menus.

When icons are on screen the bold box around an icon means it is the highlighted icon. See the example below.



Highlighted icon

When a text list appears on screen the highlighted item is shown by a green bar over the text. See the example below.

Press the up or down arrow to move the highlight and then press the Enter key to accept the choice. Press **Esc** to return to the previous screen without making a change.

The main menu is made up of the User, About and Audit menus. See Chapter 4 for complete information.

2.4.1 Escaping or exiting from a menu

In any menu you will have either **UP** or **ESC** keys listed on-screen.

If **ESC** is listed use it until it disappears then use the **UP** key until you are asked if you want to save any changes or not. Highlight your choice and press **ENTER** to accept.

The indicator will reboot and return to the startup screen.

2.5 Adjusting screen contrast

To adjust the screen contrast press and hold the middle key on the left side of the ZK840 and repeatedly press the **SAMPLE** key to increase contrast or the **TARE** key to decrease the contrast. You may need to press the key many times until the change is visible.

2.6 Touch screen calibration

If you need to calibrate the touchscreen, press and hold the top key on the left side of the ZK840 on powerup and the touch calibration screen appears. Follow the prompts to calibrate the screen.

3 Operating Instructions

3.1 Power up

The indicator can be powered by one of the battery options on the BSQ scale or by AC power supply. If the battery option is used, there is a power key on the rear of the scale. Press and hold the key until the screen lights up. If AC power is used, when the power is on, the indicator is on.

When the indicator is powered up, you will see a start screen similar to the one below.

With the Balance application active the screen shows the user name and time and date in the top line. Below that is the current weight. Below that are softkeys used in this application.

Touch the *User* area of the screen and a keyboard pops up so that you can enter your desired user name. Press **Enter** to accept. The user name will remain active until changed or deleted.

Below are short descriptions of three softkeys' functions.

UNIT key — Use this key to toggle through a list of four active units of measure. The fourth is a custom unit you can pick from a list that appears when you press the **SETUP** key. You can choose from 15 custom units.

HI-RES key — Use this key to temporarily display an increase in the resolution by a factor of 10. The display will revert to its former resolution after five seconds.

GLP key — Use this key to use the Good Lab Practices. This allows you to record how accurate the scale is by recording the weight at zero and the weight with a known test load. The results can be printed and are stored for future reference.

SELECT key — Use this key to scroll through the active display values. By default they are: ***Gross***, ***Net***, ***Tare*** and ***Percent***.

3.2 Printing

Press the **PRINT** key when there is no scale motion. What is printed is typically controlled by the custom program.

3.3 Balance application

The Balance application has 3 modes: Balance, Percentage Recipe and Density. These modes are configurable using the supervisor menu. See the *Supervisor menu on page 26*.

3.3.1 Balance mode plus percentage weighing

Balance mode is a general weighing mode. You can zero, tare, cycle units and print. The significant difference from your normal weighing mode is percentage weighing. Percentage weighing is for showing a percentage gain or loss of the weight of an object. For example, you could see the amount of evaporation from a container of liquid, etc. Follow these steps for percentage weighing:

1. Be sure the scale is at zero and then press the **SELECT** softkey repeatedly until the ***Prcnt*** annunciator appears on the right side of the screen
2. Place the item to be weighed on the scale and press the **SAMPLE** key …

   0 will be displayed on the screen.
3. Any weight gained or lost from this item will show as a percentage (a positive or negative number).

For this example a 100kg gross weight is placed on the scale. If it loses 10kg from evaporation, the scale will show -10 percent.

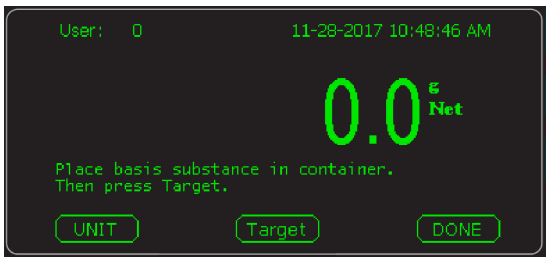
3.3.2 Percentage recipe mode

This mode allows for manual filling of containers using a percentage of the main or majority ingredient. The lesser items added are calculated as a percent of this main ingredient. For example, if you want to mix colored paint, you start with a gallon of your base color - white. All pigments added to make your final color can be added as a percentage of this gallon's weight. First set the weight of the main ingredient as the target weight and then weigh each successive ingredient as a percentage of this target weight. Follow these steps:

The startup screen for this mode is shown below:

1. Place an empty container on the scale and press the **START** key …

   The weight of the container is tared and the following screen is displayed:



2. Fill the container with the main ingredient and press the **Target** key …

   The application switches into percentage mode and shows the percentage weight.

3. Add the next ingredient until the percentage reaches the desired level.

4. Repeat this process using the **NEXT** key. Every time new material is added to the main ingredient, a counter is incremented. When finished, press the **DONE** key.

3.3.3 Density mode

This application allows the density of material to be calculated. The application works by weighing the material on the scale and then weighing the material suspended in water, typically using an underbody hook.

The startup screen for this mode is shown below:

1. Press the **SETUP** key …

   You are asked to enter the temperature of the water.

2. Enter the water temperature in Celsius and press the **Enter** key …

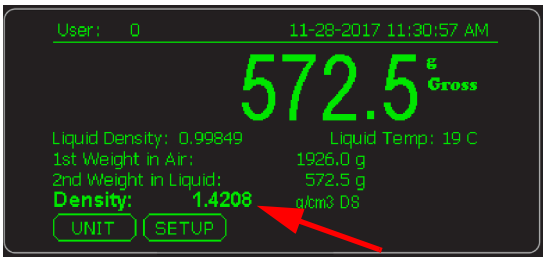
   The main screen appears again showing the temperature you entered. Also the ***1st Weight in Air:*** line is flashing to prompt for the next step.

3. Apply weight to the scale and press the **Accept** key …

   The next line flashes, prompting you to take the second weight while the object is submerged in the water.

4. Place the item in the water and press the **Accept** key …

   The density of the object is calculated and displayed as g/cm^3, as shown in the example below:



3.3.4 Other features

Custom unit of measure

In all modes the 4th weighing unit can be temporarily set by pressing the **SETUP** key while viewing the 4th unit. A list of alternate units of measure are displayed. The optional units are: gram, kilogram, milligram, carat, newton, pounds, ounces, troy ounces, grains, pennyweight, Mommes, Taels (Hong Kong), Taels (Singapore), Taels (Taiwan), dram, Tica (Asia).

Highlight the desired unit and press the **Enter** ↵ key.

Good Lab Practices (GLP)

In all modes a Good Lab Practices (GLP) feature can be enabled in the supervisor menu. When enabled all applications show a **GLP** softkey, as shown below:

Use the GLP function at the beginning of a shift or on another regular interval to record how accurate the scale is by recording the weight at zero and the weight with a known test load. The results can be printed and are stored for future reference. The information saved is the operator name, the time/date, and the recorded weights at zero and at the test weight you've chosen.

Follow these steps:

1. Press **GLP** …

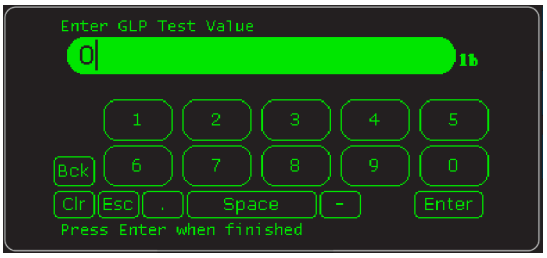
   The following screen is displayed:

2. Press the **Setup** key …

   The following screen is displayed:

3. Key in the user name and press **Enter** …

   The following screen is displayed:



4. Key in the weight of your test weight and press **Enter** …

   The following screen is displayed:

   The top line flashes prompting you to remove all weight.

5. Press the **Accept** key to capture this zero point …

   The following screen is displayed:

   This screen shows the captured weight for the zero point (***0.000***) and flashes the amount of weight to place on the scale.

6. Place the 20 lb weight on the scale and press **Accept** …

   The following screen is displayed:

7. Press the **Record** key to save the test data …

   The following screen is displayed:

8. Press the **Report** key to view the record of tests that exist.
   Press the **Print** key to print the report.
   Press the **Export** key to export the report as a CSV format file through FTP or USB.

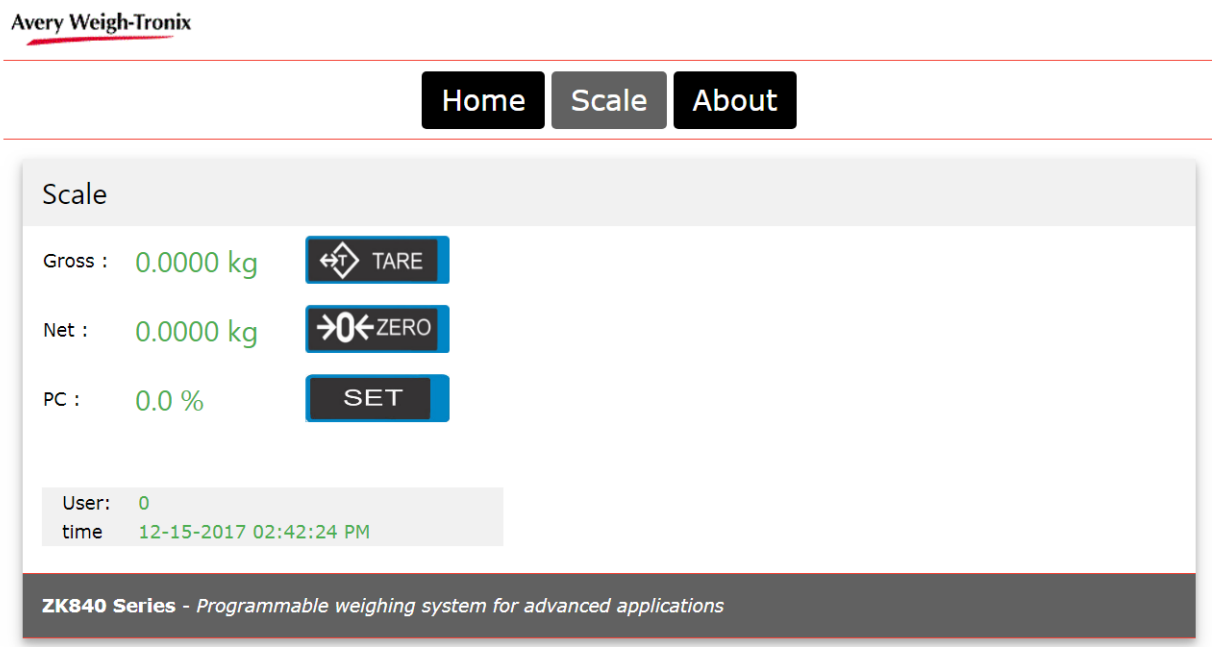
*If you export a file, a **Filter** key appears that lets you search for a file by date.*

9. When you are finished, press the **Back** key to return to the main screen.

Web access

The ZK840 can be accessed from a web browser. This allows you to access basic functions of the scale, such as zero, print, and tare.

You must have the scale connected to the internet and when you enter the IP address of your scale in the browser address bar, the following screen will appear allowing access to the scale.



4 Menus

The ZK840 three user accessible menus:

- **User** menu - Use to set Time, Date, Site ID, check Seal status and check Archive information.
- **About** menu - Use to see information on the software, firmware, application, serial number, options, ethernet and downloads
- **Audit** menu - Use this to check and/or print the calibration and configuration counters.

The password for these menus is 111. Follow these steps to access and use these menus.

1. Press and hold the **SETUP** key until …

   the password entry screen appears.

2. Key in 111 and press the **ENTER** key …

   This screen is displayed:

   The bold box around the center image means that is the highlighted menu item.

3. Use the **Left** and **Right** keys to highlight the menu you want to enter and press the **ENTER** key. Below are the explanations for these menus.

4.1 User menu

When the User menu is selected, these choices appear:

Use the **Left** and **Right** keys to highlight the menu item you want to access and press the **ENTER** key.

Time **Set** - Use the numeric keys to enter the correct time in the style chosen below.
Style - Choose the style of time display from these choices:

- 12HR - Shows time in the 12 hour style
- 12HR-AP - Shows time in the 12 hour style with AM/PM
- 24HR - Shows time in the 24 hour style

No matter which style you pick, time must always be entered in the 24 hour style. The display of the time will follow the style you pick.

Date **Set** - Use the numeric keys to enter the correct date in the style chosen below.
Style - Choose the style of date display from these choices:

- MMDD2Y
- MMDD4Y
- DDMM2Y
- DDMM4Y

The date format is how the date is stored internally. Printed dates will appear as programmed in the selected print format.

Site ID Use the alphanumeric keys to enter a Site ID, up to six characters.

Seal Shows the status of the physical seal jumper inside the indicator: ***SEAL*** or ***NO SEAL***. If the unit is sealed, no changes can be made to the configuration of the indicator.

Archive This item appears only if so configured in the ADMIN password protected menu. This stands for electronic archive. In other regions it is known as an alibi memory or tally roll. These will be transmitted via configured communications ports. These reports can be used to confirm a weighment if it is ever in dispute. Only records that are qualified as a LEGAL record, per site motion criteria, are considered as entries to this log.

The indicator has memory capacity to store approximately 5,000 transactions.

The Archive report uses a rolling memory configuration (FIFO) so the oldest transaction will be written over first when all the memory slots are filled.

You can exit the menu by following the instructions in *Escaping or exiting from a menu on page 12*.

4.2 About menu

If you access the About menu you will see this menu:

Definitions:
Bootloader *Software that makes the electronics run.*

Firmware *Embedded system software that creates core functions of the product.*

App *Specific software that controls the behaviour for a given installation.*

Use the **Left** and **Right** keys to highlight the menu item you want to access and press the **ENTER** key.

Boot ***PartNo*** - See the bootloader part number.
Version - See the version of the bootloader.

Firm ***PartNo*** - See the firmware part number.
Version - See the version of the firmware.

App ***PartNo*** - See the application part number.
Version - See the version of the application.

Serial See the serial number of the indicator.

Option ***Bus 1*** - Choose the Bus of the option card. Only one Bus available on the ZK840.
Card 1 or 2 - Choose the Card you want to view.

- ***Type*** - View the type of card.
- ***Version*** - View the firmware version of the card.

Enet This stands for Ethernet. Use this to view the network addresses:

IP Addr - See the IP address.
Subnet - See the Subnet address.
Gateway - See the Gateway address.
MAC - See the MAC address.

DLoad This stands for download. Use this to view the following:

sSerial - View the license number that created the configuration file.
dSerial - View the license number that downloaded the configuration file.
dName - View the company name for the license shown for downloading.

This is used for security and licensing purposes.

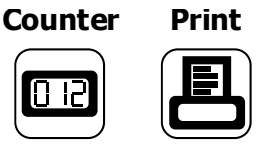
BSQ ***Scale X*** - Choose the scale.

- ***SW Part*** - View the firmware part number of the cell that is connected.
- ***Version*** - View the firmware version of the cell that is connected.
- ***Cur. Ser*** - View the serial number of the cell that is connected.
- ***Cal. Ser*** - View the serial number of the cell that WAS connected at the time of calibration.

You can exit the menu by following the instructions in *Escaping or exiting from a menu on page 12*.

4.3 Audit menu

If you access the Audit menu you will see this menu:



Counter ***Config*** - See the number of configurations the indicator has undergone.
Calib - See the number of calibrations the indicator has undergone.

Print Use this to select which port to print the audit report through. The audit report will contain both Config and Calib information. Choices are:

- ***Port 1*** Under ***Port 1*** choose to print to a column or ticket printer.
- ***Port 2*** Under ***Port 2*** choose to print to a column or ticket printer.
- ***USB*** Printing to USB requires that a USB flash drive is connected to the indicator host USB. Printing to USB will create a folder on the flash drive and a comma separated file with the data.

You can exit the menu by following the instructions in *Escaping or exiting from a menu on page 12*.

5 Error messages

In order to complete the weighing process, a number of conditions must be met. The following messages may appear which may prevent completion of the weighing sequence.

5.1 Printing errors

Timeout	Something interfered with the printing process. Check connections and retry.
Print Error	Something interfered with the printing process. Check connections and retry.
Print Aborted	Something interfered with the printing process. Check connections and retry.
Print Failed	Something interfered with the printing process. Check connections and retry.

5.2 ‘Copying to or from USB’ errors

Failed to Copy File	Something interfered with the copy process. Check USB device.
Can’t Close database	Software error. Restart indicator.
File Not Found	File doesn’t exist. Create the database.

5.3 BSQ errors

BSQ Error	Communications error
BSQ XCAL	BSQ Calibration Mismatch Error - cell that is connected to the scale is not the cell that was calibrated. X = scale number.

5.4 Accumulation errors

FAILED RTZ ERR	Scale must return to zero between accumulations.
NO COUNT ERR	Count is not a positive number when you try to accumulate. Count must be a positive value to accumulate.

6 Supervisor menu

The supervisor menu, shown in Figure 6.1 allows access to the items related to the indicator's function and the Balance application that you can set or enable/disable. Follow the steps below to access the menu items described.

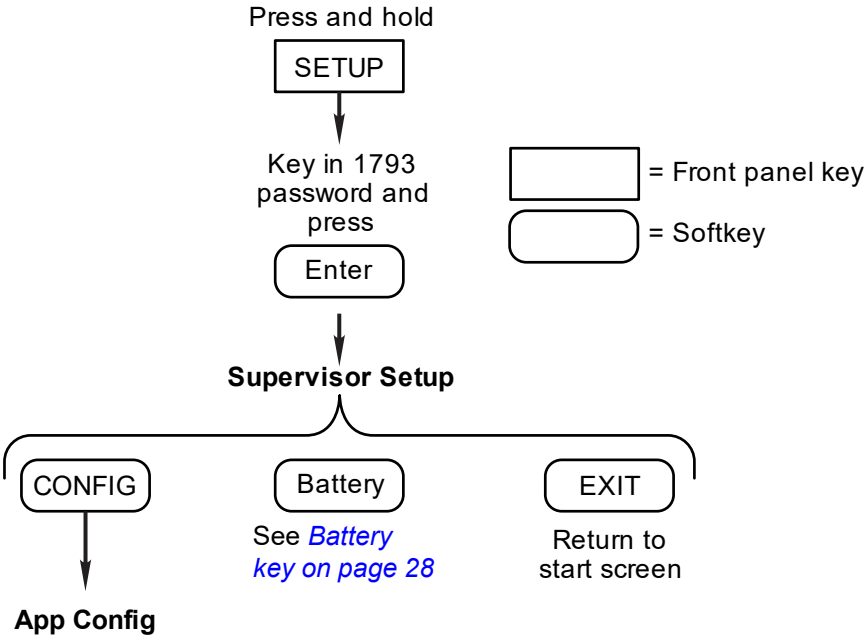


Figure 6.1 Supervisor menu

Press and hold the **SETUP** key until the password entry screen appears. Key in the Supervisor password, 1793, and press the **Enter** key. The screen in Figure 6.2 appears.

Figure 6.2 Supervisor menu, Setup screen

CONFIG Press this to set the application parameters. See *CONFIG key on page 27*.

Battery Press this to monitor battery activity or to set a shut down timer.*Battery key on page 28*.

6.1 CONFIG key

The screen in Figure 6.3 appears when you press the **CONFIG** key.

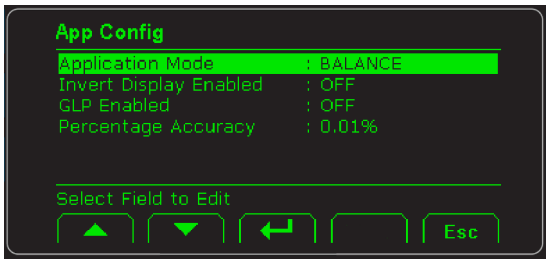
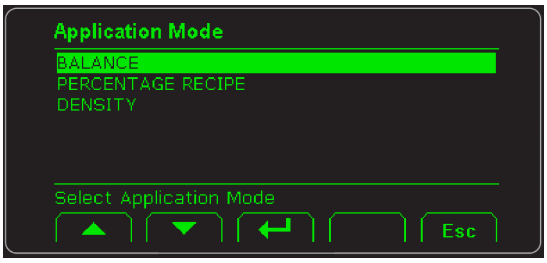


Figure 6.3 App Configuration screen

6.1.1 Application Mode

Highlight ***Application Mode*** and press the **Enter** ↵ key.



Choose from three application modes:

BALANCE Select this mode for precision weighing and percentage weighing. See *Balance mode plus percentage weighing on page 14*.

PERCENTAGE RECIPE Select this mode for creating recipes using percentage. See *Percentage recipe mode on page 14*.

DENSITY Select this mode to calculate material densities. See *Density mode on page 15*.

6.1.2 Invert Display Enabled

Turn this ***ON*** or ***OFF*** to invert the color scheme of the indicator display. The default scheme is green on a black background. If you choose to turn screen invert ***ON***, the screen will change to black text and graphics on a green background.

6.1.3 GLP

Choose to turn Good Lab Practices (GLP) function ***ON*** or ***OFF***. When enabled all applications show a soft key **GPL**. Press it to record how accurate the scale is by recording the weight at zero and the weight with a known test load. The results can be printed and are stored for future reference.

6.1.4 Percentage Accuracy

Choose from 4 displayed percentages: ***1%***, ***0.1%***, ***0.01%***, ***0.001%***.

6.2 Battery key

Press this to choose the following:

Battery type	Choices are ***NONE***, ***BSQ*** and ***OTHER***.
Shutdown Timer	Key in the number of minutes of inactivity which will cause theindicator to shutdown.

7 Print formats

Below are examples of the print formats available by default. Any number of new formats can be created for special applications. See the Service Manual.

PF #1 - Gross, Tare, Net w/Units

```
Gross  0.479 lb
 Tare  0.453 lb
  Net  0.026 lb
```

PF #2 - Preset Tare Header

```
List of Preset Tares
_____________________
Tare Name:  Tare Value:
```

PF #3 - Preset Tare Footer

```
_____________________
Tare List Complete
```

PF #4 - Preset Tare Body

```
xxxxxxx      xxxxxxx
```

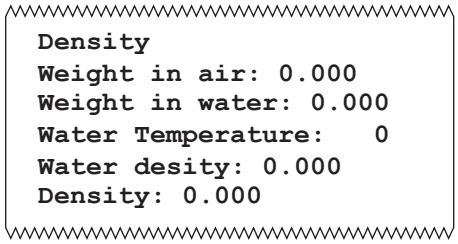
PF #5 - Broadcast to Remote display 1

```
G 00000001b
```

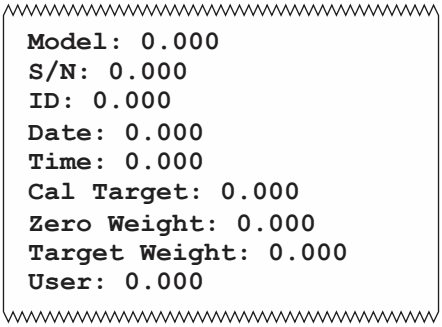
PF #7 - Broadcast to Remote display 2

```
 00001b G
```

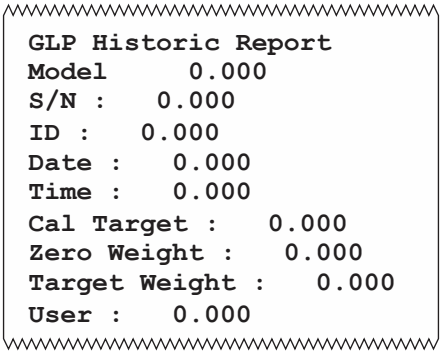
PF #9 - Density



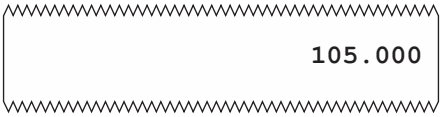
PF #15 - GLP



PF #16 - GLP Historic Report



PF #32 - High Resolution Gross weight (Analog output)



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