

ZK840Balance Application



User Instructions

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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



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.

Table 1.1 Cleaning DOs and DON'Ts



DO	DO NOT		
Wipe down the outside of standard products	Attempt to clean the inside of the machine		
with a clean cloth, moistened with water and a small amount of mild detergent	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:

- o 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.



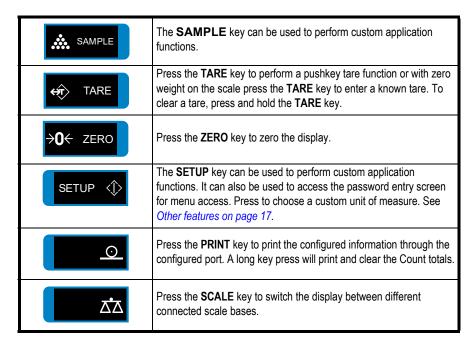
Figure 2.1 ZK840 front panel



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.



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.

→0←

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.



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.

Operating Instructions 3

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.

Use this key to toggle through a list of four active units of measure. **UNIT** key

> 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.

Printing 3.2

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.
- 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:

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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/cm³, as shown in the example below:



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:



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.

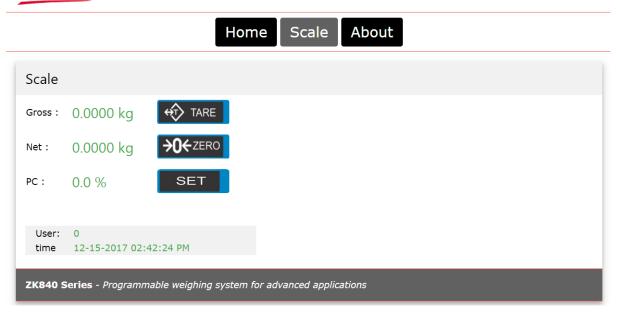
9. When you are finished, press the **Back** key to return to the main screen.

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.

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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:

- o 12HR Shows time in the 12 hour style
- o 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
- o 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:

Boot

Firm

App

Serial

Option

Enet

DLoad

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.

o **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.
- o *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

Print





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*.

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 ERRCount 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.

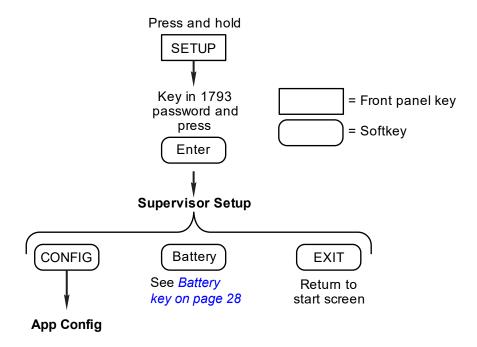


Figure 6.1 Supervisor menu

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

PF #5 - Broadcast to Remote display 1

G 0000001b

PF #7 - Broadcast to Remote display 2

000001b G

PF #9 - Density

Density
Weight in air: 0.000
Weight in water: 0.000
Water Temperature: 0
Water desity: 0.000
Density: 0.000

PF #15 - GLP

Model: 0.000
S/N: 0.000
ID: 0.000
Date: 0.000
Time: 0.000
Cal Target: 0.000
Zero Weight: 0.000
Target Weight: 0.000
User: 0.000

PF #16 - GLP Historic Report

GLP Historic Report

Model 0.000

S/N: 0.000

ID: 0.000

Date: 0.000

Time: 0.000

Cal Target: 0.000

Zero Weight: 0.000

Target Weight: 0.000

User: 0.000

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

105.000

Print formats

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