Avery Weigh-Tronix

ZP2XX Family

Bench Scales

User Instructions

AWT35-100129
Issue AC

Manual revision history

Current Issue	Date Created	Details of Changes
AA	January 2023	New manual
AB	September 2023	General updates suggested by Fabio Polesel.
AC	December 2023	Added information about installing a Keyboard Wedge.

Table of Contents

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. This applies to hard keys and on-screen or soft keys.

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

1.1.2 Special messages

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

ELECTRICAL WARNING!
THIS IS AN ELECTRICAL WARNING SYMBOL.
ELECTRICAL WARNINGS MEAN THAT FAILURE TO FOLLOW SPECIFIC PRACTICES OR PROCEDURES MAY RESULT IN ELECTROCUTION, ARC BURNS, EXPLOSIONS OR OTHER HAZARDS THAT MAY CAUSE INJURY OR DEATH.

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

DANGER: RISK OF ELECTRICAL SHOCK. NO USER SERVICEABLE PARTS. REFER TO QUALIFIED SERVICE PERSONNEL FOR SERVICE.

CAUTION: Installation, configuration, and servicing are only to be done by qualified service personnel as authorized by Avery Weigh-Tronix.

1.3 Electrical installation

CAUTION: The power cable must be connected to an earth-grounded electrical outlet. The electrical supply must have a circuit breaker with an appropriate rating to protect from over-current conditions.

For your protection, all electrical (110V or 230V) equipment used out of doors or in wet or damp conditions should be supplied from a correctly fused power source and protected by an approved ground fault protection device (RCD, GFCI etc.)

IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

1.3.1 Pluggable equipment

Pluggable equipment must be installed near an easily accessible socket outlet.

1.3.2 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.

1.4 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 turn off the machine and isolate from the power supply before starting any routine maintenance to avoid the possibility of electric shock.

Make sure that it is placed securely on a flat and level surface.

1.5 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

1.6 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.

1.7 FCC and EMC declarations of compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2 Specifications

Description

The ZP2XX models are digital electronic parcel bench scales specifically designed for shipping applications and are Legal-for-Trade. The scales have built-in intelligence that enables them to be easily interfaced with a computer or other data-processing device.

Capacity/Resolution

Model	Platter Size	Capacity (lb)	Capacity (kg)	n(max)	emin
ZP212		200 x 0.05 lb	100 x 0.02 kg	4000d	
	12" x 14"	150 x 0.05 lb	75 x 0.02 kg	3000d	0.02 lb (0.01kg)
		100 x 0.02 lb	50 x 0.01 kg	2000d	
ZP218					
	18" x 18"	150 x 0.05 lb	75 x 0.02 kg	3000d	0.02lb (0.01kg)
		100 x 0.02 lb	50 x 0.01 kg	2000d	
ZP224	24" x 24"	250 x 0.05 lb	100 x 0.02 kg	5000d	0.05 lb (0.02kg)

Agency Certificates of Conformance

If unit is to be used as a commercial device, all local reporting and registration requirements must be followed.

Model ZP212

United States: NTEP #22-053
Canada: Measurement Canada AM-6205
For use as a Class III device from -10°C through +40°C

Model ZP218

United States: NTEP #22-053
Canada: Measurement Canada AM-6205
For use as a Class III device from -10°C through +40°C

Models ZP224

United States: NTEP #22-053
Canada: Measurement Canada AM-6205
For use as a Class III device from -10°C through +40°C

Power Supply

UL/CSA/CE approved wall-mount adapter.
Input:100~240V 50/60hz, 0.4A max
Output: 12V/1A DC OUTPUT 12W

Frequency

50/60 Hz Standard

Power Requirements

0.1 amp maximum

Operating Temperature

14ºF to 104ºF (-10ºC to 40ºC)
10% to 95% RH (non-condensing)

Construction

Model ZP2XX: Painted mild steel base with stainless steel weigh platter. Overload protection: Fixed center and corner stops.

Display

1" high, six-digit LCD. Internal display standard
Key panel with **UNITS**, **TARE**, and **ZERO** keys.
Optional remote display with 7 ft. cable.

Scale Leveling

Level bubble located under weigh platter. For the portable ZP212, level bubble is located on the handle. Adjustable locking feet in each corner to level the scale.

Zero Window

Initial automatic zero setting is 10% of maximum capacity—active at power up. Manual zero setting range is 2% of maximum capacity—active using the **ZERO** key.

Under Capacity Limits

Under capacity indication will be given **-uL-** on the center of the display whenever the scale exceeds -20%.

Over Capacity Limits

The over capacity indication (**-oL-**) will populate in the center of the display whenever an item's weight exceeds the unit's rated capacity. The scale will use the Initial zero value for reference for over capacity determination.

Sealing

Access to the Service Switch is located under the platter on the display housing. The switch is under the access plate that can be secured with a lead wire or a pressure sensitive security seal. The remote display has no metrological features that require use of a security seal.

Internal Counts

The scale has 2,000,000 internal counts.

Dynamic Response

The time from when weight is applied to the scale until a stable weight display is displayed:

0–1000d 1.0 second
1000d+ 1.2 seconds
maximum mean average

Communications

Factory default settings of the RS232 port: 9600 baud, 7 data bits, even parity, 1 stop bit.

RS232 bidirectional, 9600 by default and configurable at 19,200. Transmits weight and scale status whenever ASCII “W” <CR> is sent by a remote device.

USB VCP (Virtual Com Port)

USB HID Keyboard Wedge

Only one of these three interface devices (RS232, USB VCP or USB HID) can be used from the scale at a time.

3 Initial Setup

3.1 Unpacking the Scale

1. Remove contents of the shipping container.
2. Inspect the scale for evidence of shipping damage. Immediately report any damage to the shipper.
3. Remove shipping stops.
4. Locate the power supply and other spare parts under the weight platter.

3.2 Installing the Scale

1. Mount the scale on a stable, level surface that is free from air currents and vibration. Be sure the scale platter does not touch any adjacent surfaces.
2. To install the scale surface flush with a counter top, use the following dimensions to guide construction:

Model ZP212		
	Scale Dimensions	Min. Cut-Out Dimensions
D	12.5 in. (31.7 cm)	13.25 in. (33.7 cm)
W	14 in. (35.6 cm)	14.75 in. (37.5 cm)
H	4.1 in. (10.4 cm)*	

*Adjustable to 4.6 in. (11.7 cm)

Model ZP218		
	Scale Dimensions	Min. Cut-Out Dimensions
D	18 in. (45.7 cm)	18.75 in. (47.6 cm)
W	18 in. (45.7 cm)	18.75 in. (47.6 cm)
H	5.1 in. (12.9 cm)*	

*Adjustable to 5.6 in. (14.2 cm)

Model ZP224		
	Scale Dimensions	Min. Cut-Out Dimensions
D	24 in. (61 cm)	24.75 in. (62.9 cm)
W	24 in. (61 cm)	24.75 in. (62.9 cm)
H	5.1 in. (12.9 cm)*	

*Adjustable to 5.6 in. (14.2 cm)

3. Loosen the collars or jam nuts on the leveling feet. Level the scale by using the level bubble under the scale platter as a guide. Be sure all four feet are in firm contact with the counter, then tighten all collars and jam nuts.

4. Make sure all power cords, remote display cables, etc., are not touching the live weighing surface.

5. Plug the unit into an appropriate voltage outlet that is properly grounded.

6. Press the power button to turn on the scale.

4 Operation

4.1 Power Up Test Sequence

When the scale is first powered on, it will perform a test sequence. During this sequence, the display will show the following:

- The model number and the software revision level.
- A numeric counting test for all segments of the display.

4.2 Operation Controls

Normal Weighing Mode - The **UNITS** key will change the units of measure between lb and kg.

Menu Modes - The **UNITS** key will act as an escape key and return to the previous menu or normal weighing mode.

Normal Weighing Mode - Enters a pushbutton tare to change the system into Net mode. After removing the Tare weight, press the **TARE** key again to return to Gross Weight.

Menu Modes - Acts as a next or scroll button to the next selection. When a flashing digit appears, the Tare key is used to increase the value.

Normal Weighing Mode - Press and hold the **UNITS** key for 3 seconds, until the display says “oFF”, to put the scale in standby mode (the display is turned off).

Quickly press to zero the scale.

Menu Modes - Acts as an Enter or Accept button and moves the blinking values to the next value that requires modification.

4.3 Scale Display

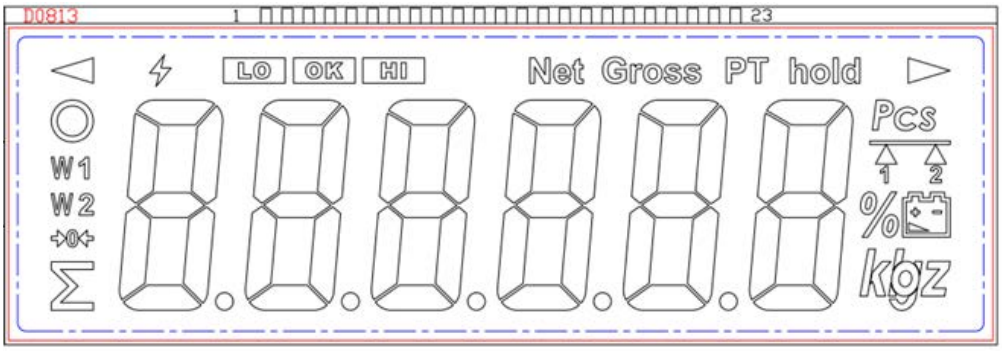


Figure 4.1

 - Indicates the weight is stable within 1 division

 - Indicates the scale is at stable zero

Gross - appears when the scale is in normal weighing mode (Gross mode), and a pushbutton Tare has not been enabled.

Net - Appears when a Tare is in effect and the scale is in Net weighing mode.

lb or kg Indicates the active unit of measure in weighing mode.

 - Always on, indicates the battery operation unit is fully charged in normal weighing mode.

- Flashing, indicates battery operation unit is charging.

- Not visible, after the unit has been fully charged, this icon will disappear.

 - Indicates battery voltage level is getting low, plug in AC power adapter to charge.

4.4 Connections

Figure 4.2 shows the connections found on the rear of the unit with their definition of use. The ZP2XX Series is intended to only use 1 interface connector (USB B, USB mini or 9 Pin RS-232) to transmit data to the computer or host device.

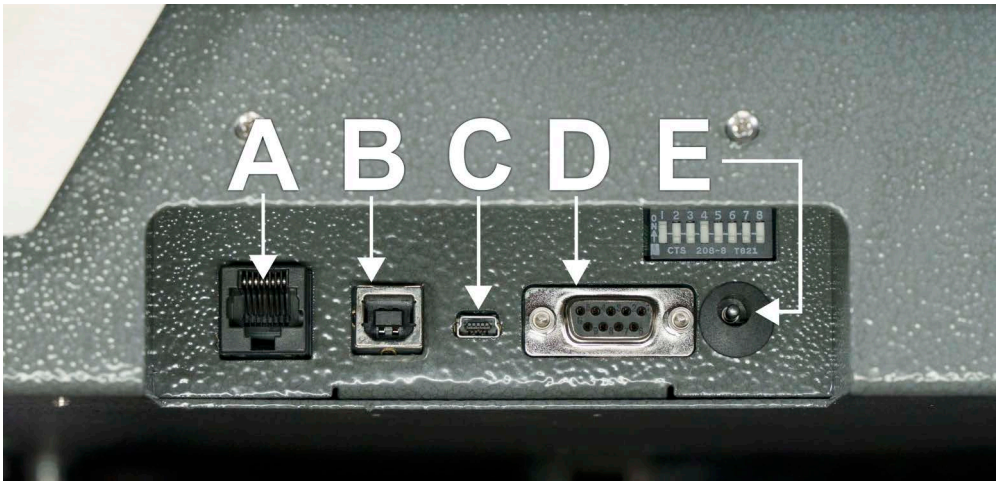


Figure 4.2 Rear Connections

Connector	Description
A	RJ 45 Connector - for customer remote display
B	USB Type B - for use with USB VCP (Virtual COM port). Provides power to the scale. The connected PC requires installation of the USB VCP driver.
C	USB Mini - for use with USB HID keyboard wedge mode. Provides power to the scale.
D	9 Pin RS-232 Connector - for use with RS-232 cables and RS-232/USB converters.
E	AC power adapter connection (+12VDC).

4.5 Performing a Normal Weighment

When first powered on, if the scale is outside the ± 10% zero window, center dashes are displayed, ***- - - -***

If necessary, reapply power to reset the initial zero setting. Refer to *Error Codes and Troubleshooting on page 41* *if the problem persists.*

If everything is OK, the display will show zero weight and the scale is ready for use.

1. With the scale powered on, make sure the scale platter is empty and the display is at zero. If it is not, press the **ZERO** key …

   0.00 is displayed.

2. Place an item to be weighed on the scale platter …

   The scale will display the gross weight.

3. Remove the item from the scale platter.

Figure 4.3 ZP2XX display

4.5.1 Operation - Performing a Pushbutton Tare or Net Weighing

1. With the scale powered on, make sure the scale platter is empty and the display is at zero. If it is not, press the **ZERO** key …

   0.00 is displayed.

2. Place the item to be tared on the scale platter and press the **TARE** key …

   The display reads ***0.00*** and indicates “Net”.

3. Add more weight/items to the scale …

   The net weight value is displayed.

4. To return to Gross weighing mode:

   Remove all items from the scale, including the tared item. A negative weight value is displayed.

   Press the **TARE** key to return to Gross weighing mode.

4.6 Setting Your Scale to Communicate With Your Software

This section describes how you setup the scale to communicate with your WMS, ERP or shipping software program.

4.6.1 Communications Port, Interface Protocol, Baud Rate Configuration

To configure the communication ports for use with software programs, the ZP2XX Series is designed with a unique and rugged DIP switch method to set up the communications protocol quickly without having to enter into the service menu. The communications board is separate from the scale configuration and calibration menus.

The DIP switch **(Figure 4.4)** is located at the rear of the scale. Use a pen or small screw driver to change the switch settings on or off.

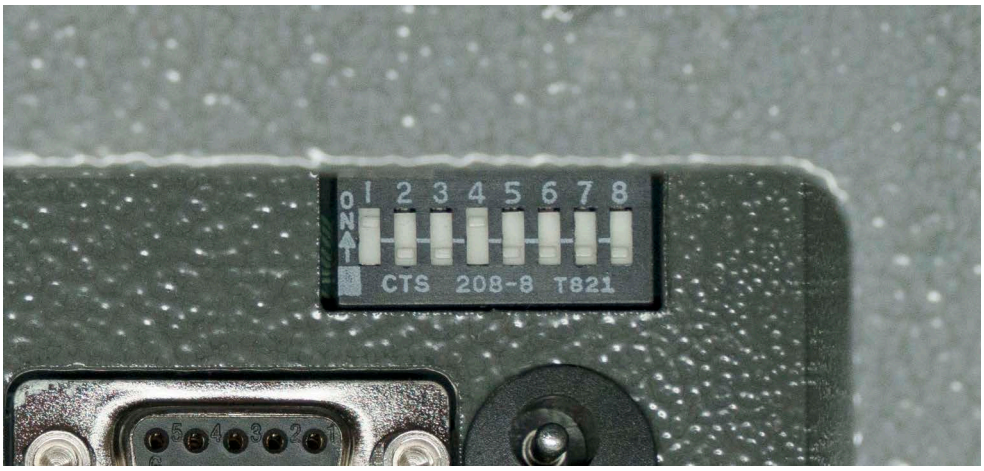


Figure 4.4 DIP Switch

4.6.2 Data Bits and Stop Bits Settings

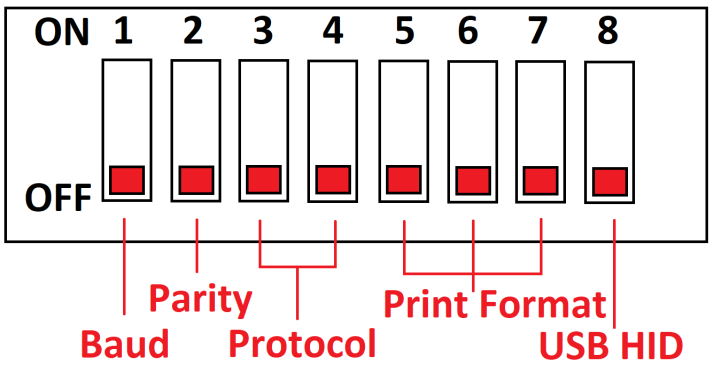
For RS-232 and USB VCP communication ports, the following are unable to be configured:

Data Bits: 7 bits

Stop Bits: 1 bit

Please check your computer COM port device manager setting to make sure they are set for 7 data bits and 1 stop bit.

4.6.3 DIP Switch Default Settings Definition



Pin #	Definition	Switch Position
1	Baud Rate	OFF = 9600 ON = 19200
2	Parity	OFF = Even *(Always required for use with SMA and NCI protocols)* ON = None
Interface Protocol Settings		
3 & 4	Protocol	**Pin 3** / **Pin 4** NCI: OFF / OFF SMA: OFF / ON Auto1: ON / OFF Auto2: OFF / ON
Auto Print 1 and 2 Format Output Configuration		
5	Leading Line Feed <LF>	OFF = Line feed **ENABLED** at beginning of data stream ON = Line feed **DISABLED** at beginning of data stream
6	Units of Measure Included	OFF = Units of measure **INCLUDED** in data stream ON = Units of measure **REMOVED** from data stream
7	Trailing Line Feed <LF> (end of data string)	OFF = Trailing line feed **ENABLED** at end of data stream ON = Trailing line feed **DISABLED** at end of data stream Note: Use of the above is dependent on what format the data needs to be sent in, typically used in conjunction when USB HID Keyboard Wedge mode is enabled or replacing a ZP2XX Series bench scale with Auto Print used to interface to a computer.
8	USB Keyboard Wedge Mode	OFF = USB HID Keyboard Wedge Mode **ENABLED** ON = USB HID Keyboard Wedge Mode **DISABLED** (for USB mini COM port only)

AFTER CONFIGURING A DIP SWITCH, MAKE SURE YOU POWER CYCLE THE UNIT FROM EITHER THE USB CABLE OR POWER ADAPTER CONNECTION. USING THE POWER KEY ON THE KEYBOARD WILL HAVE NO EFFECT. THE INTERFACE PCB REQUIRES A POWER CYCLE.

5 Configuration

5.1 User Function Menu - Approved Mode

The User Function (UF-1 thru UF-9) menu allows the scale to be configured for your specific application needs for legal and non-legal for trade applications. The items you can configure are as follows in the legal for trade mode:

User Function	Description
UF-1 (System Values)	Displays the load cell counts to help troubleshoot the load cell functionality. (Example: Model ZP212 will display 216481 (+/-100) at zero weight). "bAt X.XX" - Indicates the input voltage being supplied from the battery power source. (Example: USB Type B connection is 7.56, AC power is 6.66, Battery operation is 6.30).
UF-3 (Standby Mode)	Fur use in battery operation mode, the display will shutoff in "xx" minutes. The interface board will remain powered on. Available values are: **AoFF00 -** Disabled (factory default) AoFF 01 – AoFF 99 – 1 to 99 minutes

User Function	Description
UF-4 (Backlight Settings)	Adjust the operation of the backlight display. For battery operation it is recommended to use “Lit oFF”. Available values are: **Lit A** – Automatic Mode, without activity the backlight display will automatically turn off after 30 seconds of no use. When weight is applied to the scale, the backlight display will turn on (factory default) Lit on – Backlight always on Lit OFF – Backlight always off
UF-5 (Hold) – FOR FUTURE USE	Non Legal for trade use only. **Hold 0** – Hold function off Hold 1 – Hold function enabled PCt XXX– Set the percentage between 001 and 100 % tiMe - 1,2,4,8,16,32,64
UF-7 (Filtering)	**Non Legal for trade use configuration only.** ADC update speed can be adjusted in non legal for trade applications, to improve the speed in which a stable weight is available in conjunction with outside influences, such as vibration. Since the default is Speed 1 (12.5 Hz) for high vibration areas select Speed 2 at 6.25Hz. **Speed 1** –12.5Hhz (Stable weight available between approx. 1-2 seconds) Speed 2 –25 Hz (Stable weight available in approx. 1 second) Speed 3 – 6.25 Hz (Stable weight available in approx. 2+ seconds)
UF-8 (AZT)	**Non Legal for trade use configuration only.** AZT or Auto Zero Tracking automatically zero the scale if it does not return. The zero tracking value is based on the resolution or division size of the scale multiplied by the AZT setting. For example: 200 x 0.05 scale capacity, 0.05 * 0.5 AZT = 0.025 lb, the scale will return to zero automatically if it recognizes 0.025 lb internally. **2P 0.5 =** 0.5 division 2P 1 = 1 division 2P 2 = 2 division 2P 3 = 3 division 2P 4 = 4 division 2P 5 = 5 division 2P 0 = Off
UF-9 (Gravity Mode)	Displays the gravitational value of the location of manufacture and calibration. **9.79450** is the default. (See Menu Tree for adjusting Gravity setting.)

***Bold** indicates factory default.*

5.2 User Function Menu (NON-LEGAL FOR TRADE)

When the Service Switch is configured in the OPEN position the following non-legal for trade menus are available (see next page):

5.2.1 User Function Menu Tree

Press and hold the **ZERO** and **TARE** button simultaniously to enter into User Function Menu
Use the **TARE** key to scroll between menus
Use the **ZERO** key to act as accept or enter into menu to modify the selection
Select the units key at any time to return to the previous menu or exit the menu
Flashing digits - **TARE** key used to increase numeric values
ZERO key to accept value and move to next selection
Press the **UNITS** key at any time to return to menu selection or return to normal weighing mode

Selections are visible but cannot be viewed or changed in NTEP mode

UF - 1 System Values → **TARE** → **UF-3** Standby Mode → **TARE** → **UF-4** Backlight Settings → **TARE** → **UF-5** Weight Hold → **TARE** → **UF-7** Filter → **TARE** → **UF-8** AZT Auto Zero Tracking → **TARE** → **UF-9** Gravity Mode

ZERO
"XXXXXX" Load cell counts
ZERO
"bAtX.XX" battery voltage

ZERO
"AoFF 00" 0 indicates flashing digit
"AoFF 00" Increase the value using the **TARE** key
"AoFF 00" Use the **ZERO** key to accept the value, move to next value

Valid values are 1-99 minutes. 00 indicates Off.
The display will shutdown within XX minutes to save battery life.

ZERO
TARE
Lit A auto
Lit on always on
Lit oFF off

Use the **TARE** key to scroll between selections

ZERO
For future use

ZERO
TARE
Speed 1 12.5 Hz
Speed 2 25 Hz
Speed 3 6.25 Hz

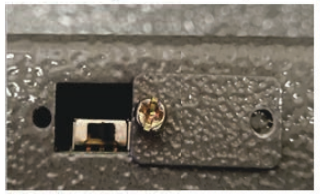
Use the **TARE** key to scroll between selections

ZERO
TARE
2P 0.5 0.5 d
2P 1 1 d
2P 2 2 d
2P 3 3 d
2P 4 4 d
2P 5 5 d
2P 0 Off

ZERO
Displays the gravitational value of factory calibration

Move the service switch into the open position to modify gravity value to your location

Service Switch, location under wt. platter



Closed Open

Move the switch from the closed to open position to access the service menu.

"9. 79450" **9** indicates flashing digit
"9. 79450" Increase the value using the **TARE** key
"9. 79450" Use the **ZERO** key to accept the value, move to next value

Valid values are between 9.78031 and 9.83217.

Use a search to identify your latitude and elevation, then a on-line local gravity calculator.

5.3 Service Menu Access

The ZP2XX Series provides access to the service menus through the Service Switch. Remove the weight platter of the unit, the Service Switch is located under the metal tab on the display housing and secured with two screws.

Figure 5.1

Remove one of the screws to gain access to the Service Switch. Slide the switch to the right to enter into the Service Menu Mode.

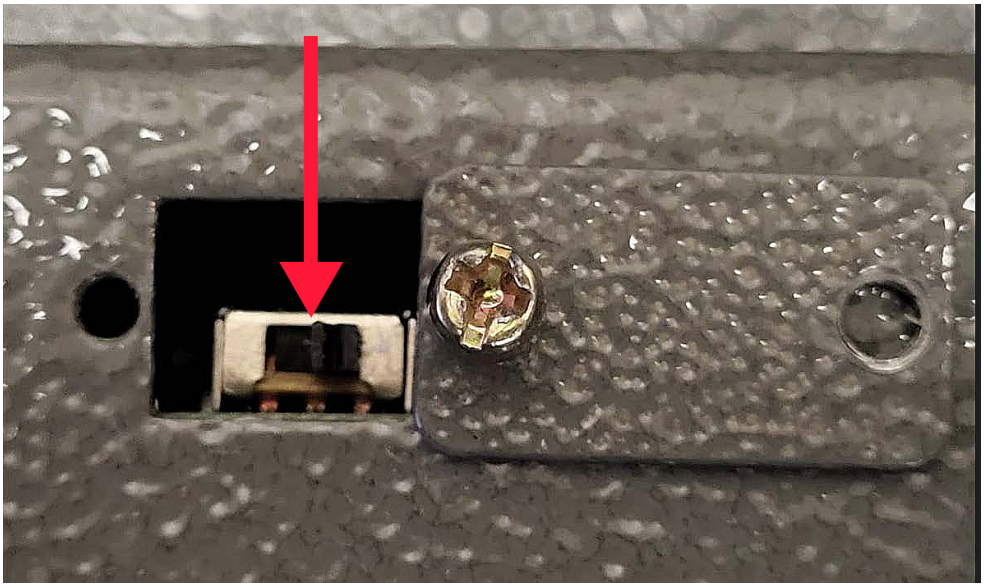


Figure 5.2

5.4 Accessing the Service Menu Mode

1. Turn the scale off.
2. Move the Service Switch to the Open position, toward the right side of the base, when facing the scale display.
3. Turn the scale on using the keyboard.
4. While the unit is performing the display test, press and hold the **TARE** key anytime until the display shows 0629 (software version is subject to change). Release the **TARE** key.

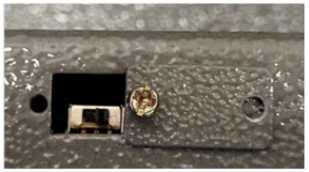
   LF1 is displayed

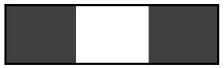
Value	Description	Available setting and/or use
LF-1	Calibration	Perform a Zero and Span Weight Calibration using setting configured in the **LF-2** Scale menu. It is always recommended to have a qualified scale technician use certified weights to perform calibration for legal for trade applications.
LF-2	Scale Menu	Displays Internal A/D values of load cell Code Number menu structure to configure scale parameters: kg – on or off lb – on of on Calibration weight used lb or kg Displayed Weight: Maximum scale weight capacity Decimal position of displayed division (resolution) Displayed division size (resolution) 1,2,5
LF-3	Linear Calibration	Perform a 3-point linear calibration. Linear calibration weights should be as close as possible to 1/3, 2/3, and then equal to full weight capacity when used for best performance. Linear calibration is typically performed when the scale is used in non- legal for trade capacity and resolutions configured.
LF-4	Filtering	ADC update speed can be adjusted in non legal for trade applications, to improve the speed in which a stable weight is available in conjunction with outside influences, such as vibration. Since the default is Speed 1 (12.5 Hz) for high vibration areas select Speed 2 at 6.25Hz **Speed 1** –12.5Hhz (Stable weight available between approx. 1-2 seconds) Speed 2 –25 Hz (Stable weight available in approx. 1 second) Speed 3 – 6.25 Hz (Stable weight available in approx. 2+ seconds)

Value	Description	Available setting and/or use
LF-5	AZT (Auto Zero Tracking)	AZT or Auto Zero Tracking automatically zero the scale if it does not return. The zero tracking value is based on the resolution or division size of the scale multiplied by the AZT setting. For example: 200 x 0.05 scale capacity, 0.05 * 0.5 AZT = 0.025 lb, the scale will return to zero automatically if it recognizes 0.025 lb internally. **2P 0.5** = 0.5 division 2P 1 = 1 division 2P 2 = 2 division 2P 3 = 3 division 2P 4 = 4 division 2P 5 = 5 division 2P 0 = Off
LF-6	Legal for trade mode	All ZP2XX Series scales are shipped from the factory with legal for trade settings and features available for use. **ntEP –** For use under US NTEP (COC: 22-053) and Measurements Canada (AM-6025) nonE – for use in non legal for trade applications. Allows access to modifying filtering, AZT and capacities/resolutions choices for non-legal for trade applications
LF-7	Gravity Mode	Displays the gravitational value of the location of manufacture and calibration. **9.79450** is the default.
LF-8	Initial Zero	Initial Power on Zero - Reset of the initial calibrated zero every time the scale is turned on. **Set2 n –** Off Set2 y – On
LF-9	High Resolution Mode	For testing purposes only, when turned on with the displayed resolution will increase x 10. **d 10 n** – Off , standard weighing mode d 10 y – On, standard weighing mode x 10. For example; a ZP212 at 200 x 0.05 lb, when turned on the display will show 200 x 0.005 lb.

5.4.1 Service Menu Tree

Service Switch, location under wt. platter





Move the switch from the closed to open position to access the service menu.

Press and hold the **UNITS** key upon powering up the unit during the display countdown.

When the display shows "0629" release the **UNITS** key to enter into the Service Mode

Use the **TARE** key to scroll between menus

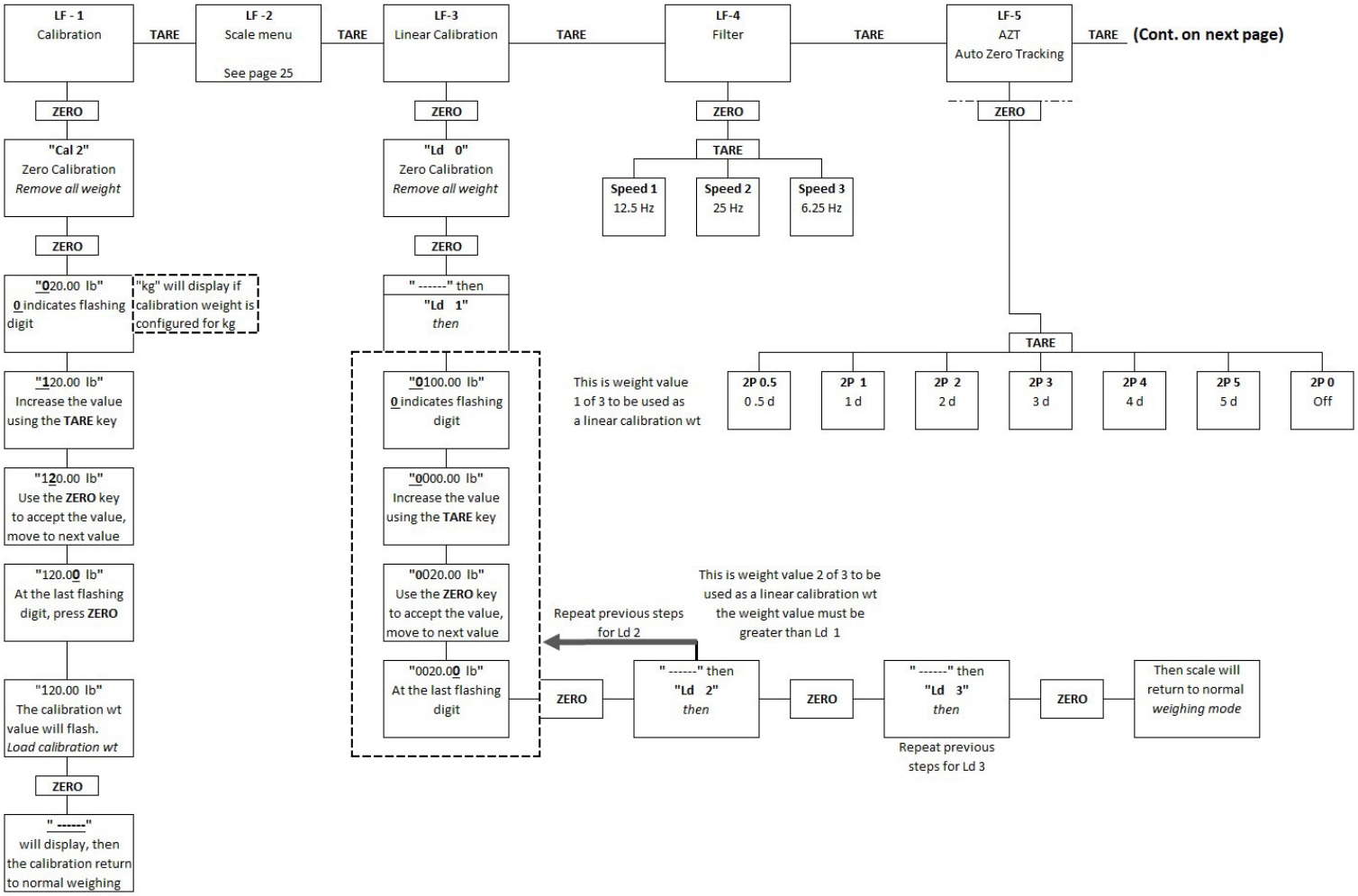
Use the **ZERO** key to act as accept or enter into menu to modify the selection

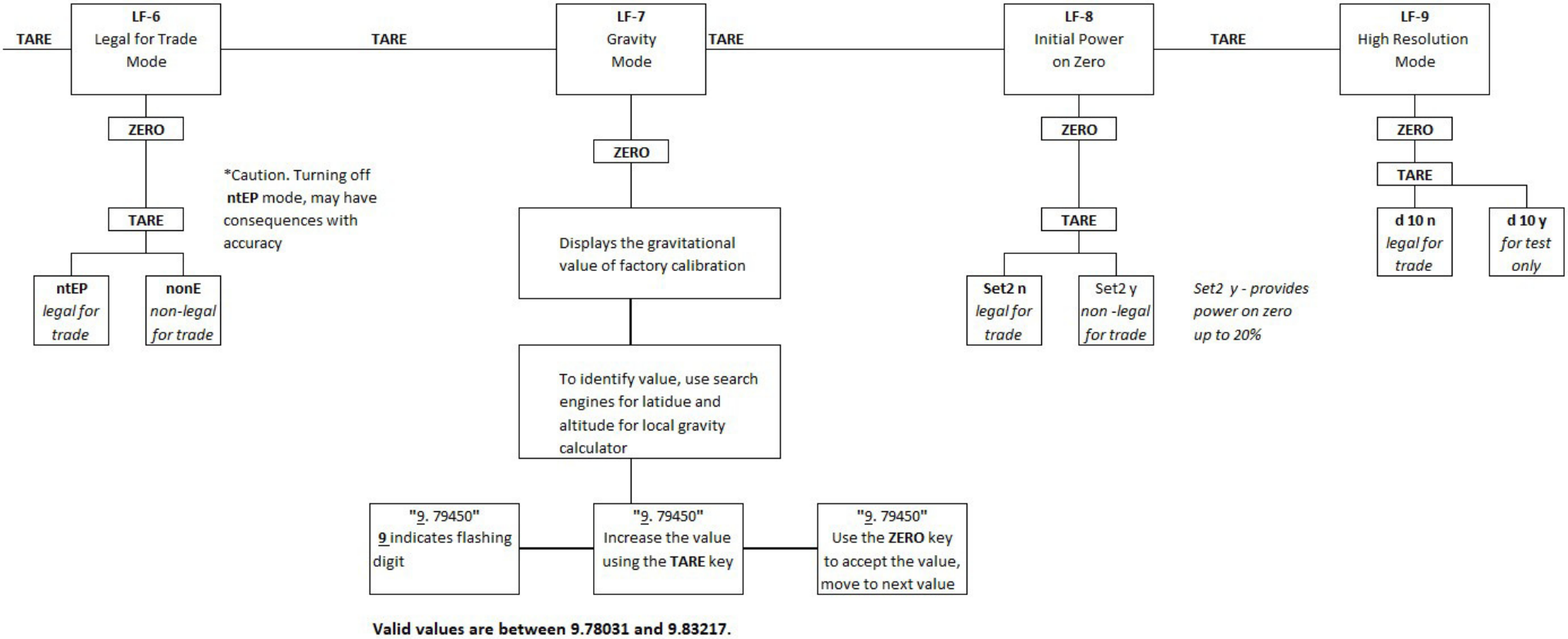
Select the units key at any time to return to the previous menu or exit the menu

Flashing digits - **TARE** key used to increase numeric values

ZERO key to accept value and move to next selection

Press the **UNITS** key at any time to return to menu selection or return to normal weighing mode





Valid values are between 9.78031 and 9.83217.

5.5 Scale Menu

The scale menu is used to configure the maximum capacity and division size (resolution), Calibration Weight (primary units of measure) and units key configuration.

The Units key and calibration unit of measure are configured by factory default with the following code: 110002 – Units key enabled for lb and kg, calibrated in lb.

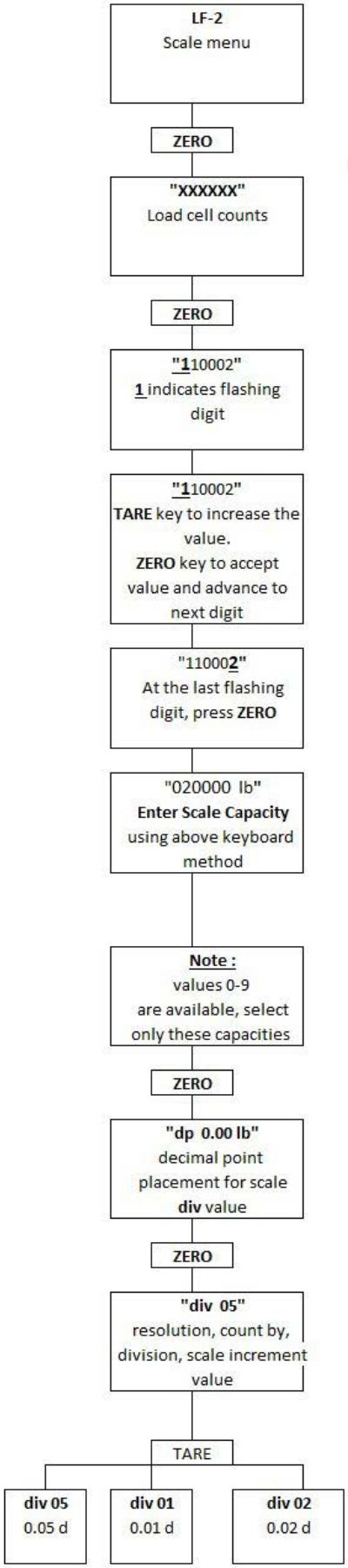
		Available Values					
Value	Positions	#	Definition	#	Definition	#	Definition
1	A	0	kg unit selection - OFF	1	kg unit selection - ON		
1	B	0	lb unit selection - OFF	1			
0	C	0	Future Use				
0	D	0	Future Use				
0	E	0	Single range	1	Multi interval - future use only	2	Multi range - for future use
2	F	1	Calibration weight is kg	2	Calibration weight is lb		

Examples:

Scale displaying weight in lb, calibrated with lb and units key inactive: 010002

Scale displaying weight in kg, calibrated with kg and units key inactive: 100001

5.5.1 Scale Menu Tree



Use the **TARE** key to scroll between menus
Use the **ZERO** key to act as accept or enter into menu to modify the selection
Select the units key at any time to return to the previous menu or exit the menu
Flashing digits - **TARE** key used to increase numeric values
ZERO key to accept value and move to next selection

Press the **UNITS** key at any time to return to menu selection or return to normal weighing mode.

Code map default:

Value	1	1	0	0	0	2
Position	A	B	C	D	E	F

Each position configures the following:

Position	Definition	Value
A	kg Unit of measure key ON	1
	kg Unit of measure key disabled	0
B	lb Unit of measure key ON	1
	lb Unit of measure key disabled	0
C	For future use , always	0
D	For future use , always	0
E	For future use , always	0
F	Calibration Weight is kg	1
	Calibration Weight is lb	2

See section 5.5.2 for more examples:

Scale Capacity Valid Values are:

Model	Scale Capacity	Value	Scale Capacity	Value
ZP212	200 lb	020000	100 kg	010000
	150 lb	015000	75 kg	007500
	100 lb	010000	50kg	005000

Model	Scale Capacity	Value	Scale Capacity	Value
ZP218	150 lb	015000	75 kg	007500
	100 lb	010000	50kg	005000

Model	Scale Capacity	Value	Scale Capacity	Value
ZP224	250 lb	025000	100 kg	010000

The decimal point value of 0.00 lb or 0.00 kg should only be used.
Other values; 0.000, 0.0000, 0.000000, 0, 0.2 are selectable and not used for this product.

Scale Valid Values are:

Model	Scale Capacity	Value	Scale Capacity	Value
ZP212	200 x 0.05 lb	div 05	100 x 0.02 kg	div 02
	150 x 0.05 lb	div 05	75 x 0.02 kg	div 02
	100 x 0.02 lb	div 02	50 x 0.01 kg	div 01

Model	Scale Capacity	Value	Scale Capacity	Value
ZP218	150 x 0.05 lb	div 05	75 x 0.02 kg	div 02
	100 x 0.02 lb	div 02	50 x 0.01 kg	div 01

Model	Scale Capacity	Value	Scale Capacity	Value
ZP224	250 0.05 lb	div 05	100 x 0.02 kg	div 02

5.5.2 Capacity and Size Configuration Examples

Model ZP212						
	Factory Default	**Legal for Trade Configuration with Calibration to:**				
	200 x 0.05 lb	100 x 0.02 kg	150 x 0.05 lb	75 x 0.02 kg	100 x 0.02 lb	50 x 0.01 kg
Calibration Wt	lb	kg	lb	kg	lb	kg
Max Capacity	020000	010000	015000	007500	010000	005000
Decimal Point	dp 0.00	dp 0.00	dp 0.00	dp 0.00	dp 0.00	dp 0.00
Count by Value (Division)	div 05	div 02	div 05	div 02	div 02	div 01

Model ZP218				
	Factory Default	**Legal for Trade Configuration with Calibration to:**		
	150 x 0.05 lb	75 x 0.02 kg	100 x 0.02 lb	50 x 0.01 kg
Calibration Wt	lb	kg	lb	kg
Max Capacity	015000	007500	010000	005000
Decimal Point	dp 0.00	dp 0.00	dp 0.00	dp 0.00
Count by Value (Division)	div 05	div 02	div 02	div 01

Model ZP224		
	Factory Default	
	250 x 0.05 lb	100 x 0.02 kg
Calibration Wt	lb	kg
Max Capacity	025000	010000
Decimal Point	dp 0.00	dp 0.00
Count by Value (Division)	div 05	div 02

5.6 Standard Calibration (Span)

Since this is a legal for trade scale, it is recommended by the manufacturer to calibrate the scale using legal for trade weights, when placing into service, at full capacity.

Standard Calibration allows you to perform calibration using the recommended full weight capacity or less.

See the table below for alternate span weights:

Model	Max Capacity	Alternate Calibration Weights (lb)	Alternate Calibration Weights (kg)
ZP212	200 x 0.05 lb / 100 x 0.02 kg	20, 50, 100, 200	20, 40, 50, 100
	150 x 0.05 lb / 75 x 0.02 kg	20, 50, 100, 150	20, 40, 50, 75
	100 x 0.02 lb / 50 x 0.01 kg	20, 50, 100	20, 40, 50
ZP218	150 x 0.05 lb / 75 x 0.02 kg	20, 50, 100, 150	20, 40, 50, 75
	100 x 0.02 lb / 50 x 0.01 kg	20, 50, 100	20, 40, 50
ZP224	250 x 0.05 lb / 100 x 0.02 kg	20, 100, 150, 250	20, 40, 50, 100

5.7 Scale Calibration for LEGAL FOR TRADE MODE

If you have configured the scale in the LF-6 service mode for NTEP, the scale can be calibrated using the following instructions:

1. Press the **TARE** key, then **UNITS** key simultaneously to enter into the calibration mode.

   LF-1 is displayed

2. Press the **ZERO key.**

   CAL 2 is displayed. The displayed will indicate lb or kg, the units of measure of the calibration weight as configured in **LF 2** Scale menu.

3. Make sure the weighing platter is clear from any weight.

4. Press the **ZERO** key to Accept.

   "- - - - - " is briefly displayed indicating the scale is performing zero calibration. "**0**020.00" the minimum calibration weight value is displayed. The first digit will flash "**0"** indicating you can change the value

   Press the **TARE** key to increase the value or/then:

   Press the **ZERO** key to accept and move to the next value

5. Once accepting the last digit, press the **ZERO** key.

   20.00 (calibration weight value entered) will display and flash

6. Place your calibration weight on the scale, press the **ZERO** key.

   "- - - - - " is briefly displayed indicating the scale is performing calibration

   The scale will then return to normal weighing mode

5.8 LF 3 - Linear Calibration

Linear calibration is used when span calibration does not provide linear weight reading from 0.00 weight to maximum capacity. Linear calibration should be performed by an authorized scale technician using the maximum capacity weights and two lower calibration weight values.

1. Press the **TARE** key, then **UNITS** key simultaneously to enter into the service menu mode.

   LF-1 is displayed

2. Press the **ZERO** key two times.

   LF-3 is displayed

3. Make sure the weighing platter is clear from any weight.

4. Press the **ZERO** key to Accept.

   Ld 0 is displayed

5. Press the **ZERO** key.

   "- - - - - " is briefly displayed indicating the scale is performing zero calibration.

   Ld 1 is displayed then **"0**100.00" or the maximum calibration weight value is displayed.

   The first digit will flash "**0"** indicating you can change the value

   Press the **TARE** key to increase the value

   Press the **ZERO** key to accept and move to the next value

   Enter the 1st calibration weight value using the steps above.

6. Once accepting the last digit, press the **ZERO** key.

   XX.XX (linear calibration wt value entered) will display and flash

7. Place your calibration weight on the scale, press the **ZERO** key.

   "- - - - - " is briefly displayed indicating the scale is performing calibration

   Ld 2 is displayed

8. **Repeat steps 4 and 5, making sure the calibration weight value has increased.**

   Ld 3 is displayed

9. **Repeat steps 4 and 5, making sure the calibration weight value is maximum capacity.**

10. Press the **ZERO** key.

    The scale will then return to normal weighing mode.

5.9 NON-LEGAL FOR TRADE MODE Password

If you have configured the scale in the LF-6 service mode for none, this allows you access to the service menu and other user menu functions without moving the service switch into the open position.

When entering the service mode:

P **0**000 is displayed. Asking to enter a password. (**0** indicates the value is blinking)

1. Press the **ZERO** key twice until...

   *P 00**0**0* is displayed.

2. Press the **TARE** key to change the value to 2.

3. Press the **ZERO** key twice.

   LF 1 is displayed. Continue through the service menu.

5.10 Scale Calibration in NON-LEGAL FOR TRADE MODE

If you have configure the scale in the LF-6 service mode for none, the scale can be calibrate using the following instructions:

1. Press the **TARE** and **UNITS** key simultaneously to enter into the calibration mode.

   ECF-1 is displayed

2. Press the **ZERO key.**

   CAL 2 is displayed. The display will indicate lb or kg, the units of measure of the calibration weight as configured in **LF 2** Scale menu.

3. Make sure the weighing platter is clear from any weight.

4. Press the **ZERO** key to Accept.

   "- - - - - " is briefly displayed indicating the scale is performing zero calibration.

   *"**0**020.00"* the minimum calibration weight value is displayed. The first digit will flash "**0"** indicating you can change the value

   Press the **TARE** key to increase the value or/then...

   Press the **ZERO** key to accept and move to the next value

5. Once accepting the last digit, press the **ZERO** key.

   20.00 (calibration weight value entered) will display and flash

6. Place your calibration weight on the scale, then press the **ZERO** key

   "- - - - - " is briefly displayed indicating the scale is performing calibration

   The scale will then return to normal weighing mode.

5.11 Gravity Mode

Gravitational variations may affect the accuracy of your scale during initial installation. The gravitational value is set to the origin of manufacture. These differences can cause a given mass (weight) to indicate a slightly different weight at the location of use compared to the site of calibration.

Modification of the gravity value can be performed in the User Menu, when the service switch is set to the open mode, from the front keypad.

The factory default is 9.79450. Use a search engine to identify your latitude and elevation. Then, use a local gravity calculator to determine your value.

For example: Fairmont, MN has a latitude of 43.652222 and elevation of 1,178 feet. The local gravity is 9.80387.

6 Communication

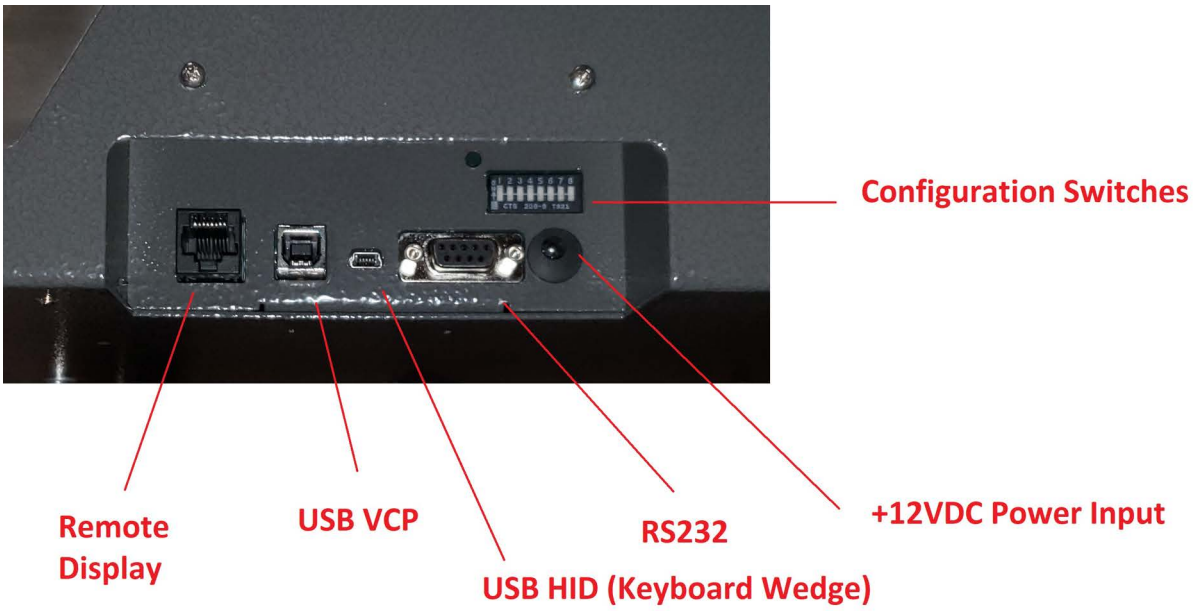
6.1 Communication Ports

The ZP2XX family of scales are designed to communicate with only one of the following communication ports:

1 serial RS232, 1 USB VCP or 1 USB HID.

Only one of these interface devices can be used from the scale at a time.

Driver required when connected to a PC. Download driver from the password protected portion of www.averyweigh-tronix.com.



RS232

There is one 9-pin DE type female connector accessible at the rear of the unit. The functional pinout of this connector is compatible with a standard PC with a pass through cable.

Scale baud and parity needs to be set to the default setting 96E (baud 9600, Parity: even) as shown in *Baud Rate and Parity Options on page 19*.

USB VCP

Allows the base to connect directly to PC using the USB port connection.

PC USB port still needs to be setup to match scale baud rate communications.

Scale baud and parity needs to be set to the default setting 96E (baud 9600, Parity: even) as shown in *Baud Rate and Parity Options on page 19*.

Driver required when connected to a PC. Download driver from the password protected portion of www.averyweigh-tronix.com.

USB HID

Used primarily with Auto Print Protocols, to push the data into the existing software programs with no programing required. Eliminates manual keyboard entry when the selection within the software programming is on the weight entry field.

6.2 Interface Cable Specifications

DE-9 Female Scale			DE-9 Male Host		
Pin	**Name**	**Direction**	**Pin**	**Name**	**Direction**
1.	NC	-	1.	DCD	IN
2.	TXD	OUT	2.	RXD	IN
3.	RXD	IN	3.	TXD	OUT
4.	NC	-	4.	DTR	OUT
5.	SG	-	5.	GRD	-
6.	NC	-	6.	DSR	IN
7.	CTS	IN	7.	RTS	OUT
8.	RTS	OUT	8.	CTS	IN
9.	NC	-	9.	RI	IN

6.3 NCI Serial Communications Protocol

SYMBOL KEY:

<ETX> End of text character (Ø3 hex)

<LF> Line feed character (ØA hex)

<CR> Carriage return character (ØD hex)

<SP> Space (2Ø hex)

x Character from display including minus sign.

hh Two status bytes

uu Unit of measure (lb, kg, oz, g, etc. using ANSI standard abbreviations)

6.3.1 Standard Commands

W<CR>
Scale Response

<LF>xxxx.xxuu<CR>
<LF>hh<CR><ETX>
Results
Returns decimal weight with units plus scale status.

S<CR>
Scale Response
<LF>hh<CR><ETX>
Results
Returns to scale status.

Z<CR>
Scale Response
<LF>hh<CR><ETX>
Results
Scale is zeroed, returns status.

H<CR>
Scale Response
<LF>xxxx.xxxuu<CR>
<LF>hh<CR><ETX>
Results
Returns decimal wt in 10x with units plus scale status.

T<CR>
Scale Response
<LF>hh<CR><ETX>
Results
Tare is performed, and scale status is returned.

All other commands
Scale Response
<LF>?<CR><ETX>
Results
Unrecognized command

Contact Customer Service for protocol details or visit our website at www.averyweigh-tronix.com.

6.4 AutoPrint Modes

AUTO-1:

Weight is automatically transmitted after weight is removed from the scale platform. The last “stable” weight prior to removing the item will be “sent,” as soon as the displayed weight returns to within five display divisions (i.e. 5d). This option is normally used in applications where items are added to a box already placed on the scale, but where only one weight data transaction is to occur. See note below.

To avoid potential erroneous weight values from being transmitted, create enough instantaneous motion on the platform to avoid a recapture of a stable weight that might occur if the item were removed slowly.

AUTO-2:

Weight is automatically transmitted when the item is placed on the scale and the weight stabilizes. This option is normally used in an application where the item placed on the scale is sealed and ready for the shipment weight to be registered. The minimum stable weight required to trigger an auto SEND is set at five display divisions (i.e. 5d).

AutoPrint Output Formats Pin Configuration (Keyboard Wedge Mode)								
					DIP Switch Setting			
Formated Output Data String					Pin 5	Pin 6	Pin 7	Pin 8
<LF>	www.ww	uu	<CR>	<LF>	OFF	OFF	OFF	ON
<LF>	www.ww	uu	<CR>		OFF	OFF	ON	ON
<LF>	www.ww		<CR>	<LF>	OFF	ON	OFF	ON
<LF>	www.ww		<CR>		OFF	ON	ON	ON
	www.ww	uu	<CR>	<LF>	ON	OFF	OFF	ON
	www.ww	uu	<CR>		ON	OFF	ON	ON
	www.ww		<CR>	<LF>	ON	ON	OFF	ON
	www.ww		<CR>		ON	ON	ON	ON

Make sure Pins 3 and 4 are configured for Auto1 or Auto 2.

7 Error Codes and Troubleshooting

The error codes are defined as follows:

"Err N" - Unstable internal count

"-OL-" - Overload; when the weight is heavier than the 105% full capacity

"-UL-" - Underload; when the weight is lower than the 20% negative full capacity

"Err-T" - Error when performing a Tare function from the keyboard

7.1 Troubleshooting

Perform the following steps in the order presented until the described problem is corrected. If the problem cannot be corrected, contact your Avery Weigh-Tronix service provider.

No Power (Display is Blank)

1. Check that the primary side of the cord is plugged into the AC outlet, and the secondary side is properly connected to the power jack on the back of the scale.
2. Press the "On" key.
3. Replace the power supply, AWT15-100083.
4. Replace the main PCB/display board, AWT15-100085.
5. If the PCB/display board is replaced, the scale must be recalibrated.

Missing or extra segments on display

1. Replace the main PCB/display board, AWT15-100085.
2. If the PCB/display board is replaced, the scale must be recalibrated.

Scale will not return to zero, or incorrect weight is displayed

1. Press the **ZERO** key.
2. Check for interference of weighing platform.
3. Power off, remove all items from the platter, and then power on the scale.
4. Recalibrate the scale.
5. Replace the load cell.
6. Replace the main board.
7. If either are replaced, the scale must be recalibrated.

Display shows -UL-

(Indicates that the scale is below zero or under capacity.)

1. Verify that weigh platter is on the scale.
2. Press the **ZERO** key.
3. Power off, remove any items from the platter, and then power on the scale.
4. Recalibrate the scale.
5. Replace the load cell.
6. If the load cell is replaced, the scale must be recalibrated.

Display shows center OL dashes

(Indicates that the scale above 105% capacity.)

1. Verify that weigh platter is on the scale.
2. Press the **ZERO** key.
3. Power off, remove any items from the platter, and then power on the scale.
4. Recalibrate the scale.
5. Replace the load cell.
6. If the load cell is replaced, the scale must be recalibrated.

Installing a USB Keyboard Wedge

The USB keyboard wedge will not work upon initial installation. The keyboard wedge needs another power source, usually a computer, to work initially.

1. Plug the keyboard wedge's USB Type B cable into a computer to provide power. Test the keyboard for proper function, then disconnect the cable.
2. Connect the AC power to provide the new power source and test the keyboard for proper function.

8 Spare parts

MODEL	PART NUMBER	DESCRIPTION
ZP212/ZP218	AWT15-100087	Load Cell HBM 1-SP4MC3MR/100kg-1
ZP224	AWT15-100088	Load Cell HBM 1-SP4MC3MR/150kg-1
ZP Series	AWT15-100089	Main PCB/Display Kit
ZP Series	AWT15-100085	Interface Communications PCB
ZP Series	AWT15-100083	AC Power Adapter Kit
ZP212	AWT15-100075	Battery 6V/3.2AH Kit Including Bracket/Screws
ZP212	AWT15-100084	Handle Kit Including Bolts
ZP212	AWT15-100076	Stainless Steel Weight Platter, 12 x 14
ZP218	AWT15-100077	Stainless Steel Weight Platter, 18 x 18
ZP224	AWT15-100078	Stainless Steel Weight Platter, 24 x 24
ZP212	AWT15-100079	Ball Top Weight Platter, 12 x 14
ZP218	AWT15-100080	Ball Top Weight Platter, 18 x 18
ZP224	AWT15-100081	Ball Top Weight Platter, 24 x 24

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