Avery Weigh-Tronix

ZM301
Weight Indicator

Service Manual

original instructions

Table of Contents

Manual revision history

Current Issue	Date Created	Details of Changes
AA	April 2012	New manual
AB	April 2012	Added SMA 2 info to chapter 7. Fixed a note in Endian section of chapter 6. Added token 603 to token table in chapter 11.
AC	May 2012	Added section 13.16 in chapter 13.
AD	October 2012	Enhancements and references to firmware 1.0.1.0
AE	December 2012	Added AC Relay module to chapter 8 and a kit for internal connectors to chapter 13.
AF	July 2013	Fixed missing item in print format #9 in section 11.6. Added items to stainless steel enclosure kit in section 13.2.
AG	September 2013	Added an index. Fixed some information in section 7.7 and clarified the DIP switch drawing in the system block diagram in Chapter 13. Fixed an error in Table 1 of 10.1, added sections 10.2.1 and 10.2.2, small additions and corrections to chapter 11, added cable clip to illustrations in chapter 13. Updated the logo.
AH	September 2013	Updated coypyright, added 'CONFIDENTIAL' and 'original instructions to front page.
AJ	November 2013	Added statement to 802.11g module description saying that it provides a wireless 'ethernet' connection, for clarity of function.
AK	January 2014	Corrected PN of the keypad overlay on page 156.
AL	March 2014	Various small corrections.

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 using the 1.1 and 1.1.1 convention. 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 dual functions, the function is shown first followed by the key name in parentheses and in bold, such as in these examples: **F1**, **SELECT**, **PRINT**, etc.

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.

DANGER!
THIS IS A DANGER SYMBOL.
DANGER MEANS THAT FAILURE TO FOLLOW SPECIFIC PRACTICES OR PROCEDURES WILL CAUSE INJURY OR DEATH.

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.

WARNING!
This is a Warning symbol.
Warnings mean that failure to follow specific practices and procedures may have major consequences such as 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

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

1.2.1   Torque specifications

CAUTION: The acorn nuts holding the back plate of the indicator in place must each be tightened, in multiple passes, in the following pattern to a final torque of 0.68 N-m (approximately 6 in-lbs) to ensure proper gasket sealing.
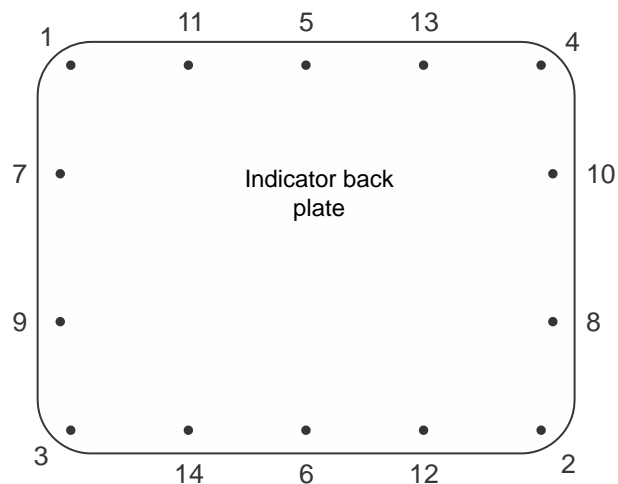
There are four sizes of strain reliefs exiting the indicator: PG11, PG7, PG13.5 and NPT 3/4". The torque specifications for the locknuts which hold the strain reliefs to the indicator housing and the specs for the dome nuts which seal the cable that passes through the strain relief are shown in the table below.

	3/4″ NPT Strain Relief	PG13.5 Strain Relief	PG11 Strain Relief	PG7 Strain Relief
Dome Nut	66.4 lb-in 7.5 N-m	33.2 lb-in 3.75 N-m	33.2 lb-in 3.75 N-m	22.1 lb-in 2.5 N-m
Lock Nut	44.2 lb-in 5 N-m	22.1 lb-in 2.5 N-m	22.1 lb-in 2.5 N-m	14.4 lb-in 1.62 N-m

1.2.2   Proper grounding of cables

On the stainless steel desktop models, cable shield wires should be grounded directly to the studs provided at the bottom of the enclosure, close to the strain relief entry point, with wire lengths at a minimum. On the aluminum and panel mount models the shield wires should be connected to the SHLD connection on the corresponding terminal block connectors.

1.2.3 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.

1.2.4 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 turn off the machine and isolate 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
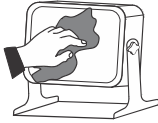
DO	DO NOT
Wipe down the outside of standard products with a clean cloth, moistened with water and a small amount of mild detergent	Attempt to clean the inside of the machine
	Use harsh abrasives, solvents, scouring cleaners or alkaline cleaning solutions
Spray the cloth when using a proprietary cleaning 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 to operate the keys.

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.

Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique edicté par le ministère des Communications du Canada.

European Countries

WARNING: This is a Class A product. In a domestic environment, this product may cause radio interference in which the user may be required to take adequate measures.

2   Introduction

This manual covers the installation, connections, configuration and servicing of the ZM301 indicator, shown in Figure 2.1. The ZM301 comes in three housing types: stainless steel, aluminum desktop and stainless steel panel mount. The indicator has a USB port, 2 serial COM ports and an Ethernet port. Analog Output, Current Loop/RS485/RS422, USB Device and Wireless 802.11g internal module cards are available options.

The indicator also has three logic level inputs with configurable functions and three set point outputs. See the Specification literature for a full list of specifications.
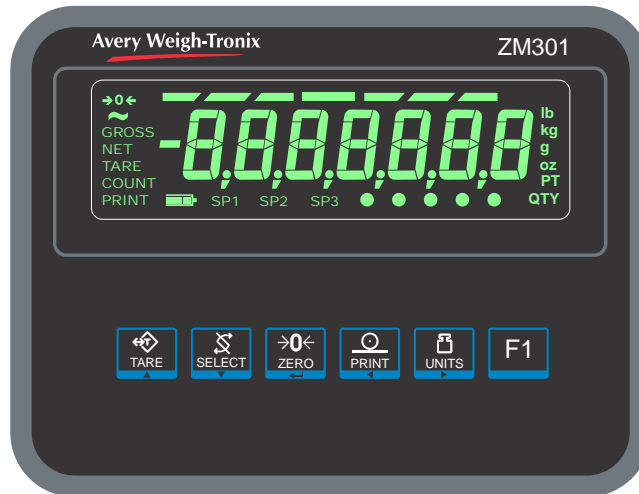
Figure 2.1 Front panel of the ZM301 indicator

The ZM301 can connect to USB flash drives, printers, remote displays, computers and other peripheral devices.

2.1   Front panel

The front panel for the ZM301 is shown in Figure 2.1 and consists of the keys and the display.

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

The functions of each key on the front panel are listed below.

TARE	**Weigh mode** - Press the **TARE** key to perform a tare function or prompts for a keyboard tare, if enabled. **Menu Navigation** - Acts as an up arrow key for menu navigation. **Numeric entry** - Increments a value. Allows you to access minus and comma signs.
SELECT	**Weigh mode** - Press the **SELECT** key to toggle between Gross, Net, Tare and any other active display values. **Menu Navigation** - Press and hold to enter the setpoint editor. Acts as a down arrow key. **Numeric entry** - Decrements a value. Allows you to access minus and comma signs.
PRINT	**Weigh mode** - Press the **PRINT** to send information to a peripheral device. Performs accumulator function, if enabled. **Menu Navigation** - Acts as a left arrow key. **Numeric entry** - Functions as a backspace.
UNITS	**Weigh mode** - Press the **UNITS** key to scroll through the active units of measure. **Menu Navigation** - Acts as a right arrow key. **Numeric entry** - Moves the cursor position to the right.
ZERO	Press the **ZERO** key to zero the display. Acts as an **ENTER** key to accept a displayed value or function. Also used to access the Quick Code entry for menu navigation.
F1	Press and hold **F1** to view the password entry screen. Press to select application specific choices. Aborts a numeric entry and acts as an ESCAPE key for menu navigation.

2.2   Powering up the ZM301

The indicator is always active as long as power is received. Power can be supplied by:

● AC power cord connected to a properly grounded outlet (100 VAC - 240 VAC, 50 or 60 Hz)
● Optional external battery pack with 4 D cells (12 hr operation with one loadcell. 11 hr with four loadcells). See *D-cell Battery pack option (AWT05-505852) on page 169* for more information.
● AC to DC power converter. (12 to 36 VDC)

2.3   Numeric entry procedure

The keys in Figure 2.2 have alternate functions in numeric entry screens.

⬭⬭⬭	These segments flash in numeric entry mode
TARE / ▲ -	Press to increment the flashing number
SELECT / ▼ -	Press to decrement the flashing number
PRINT / ◀ -	Press to backspace cursor in a number
UNITS / ▶ -	Press to advance cursor in a number
ZERO / ↵ -	Press to accept a value
F1 / ESC -	Press to escape an entry screen

Figure 2.2 Key function during numeric entry

In numeric entry screens, the center segments shown in Figure 2.2 flash. Use the keys, as described in Figure 2.2, to enter a value on the display. Following is an example:

Example: To key in the number 507:

Repeatedly press the **TARE(↑)** or **SELECT(↓)** key until *5* appears on the display.

Press the **UNITS(→)** key once to move cursor one space to the right.

Repeatedly press the **TARE(↑)** or **SELECT(↓)** key until *0* appears on the display.

Press the **UNITS(→)** key once to move cursor one space to the right.

Repeatedly press the **TARE(↑)** or **SELECT(↓)** key until *7* appears on the display.

Press the **ZERO** key to enter or accept the value.

Press the **PRINT(←)** key to move the entry function one digit to the left. This effectively deletes the current value in that position and allows you to enter a new value in that position.

2.4   Accessing the menus

Follow these steps to access the various menus in the indicator.

1.   With the indicator powered up and in normal operating mode, press and hold the **F1** key …

> *Pass* is briefly displayed, then a flashing *0*, prompting you to enter the password.

When the 0 is flashing, press F1 and the application name is briefly displayed, then the indicator returns to normal operating mode.

2.   Use the *Numeric entry procedure on page 16* to key in the password for the menu you want to access and press the **ZERO** key to accept it …

> The first item in the top level of the menu you accessed is displayed.

3.   Use the navigation keys, shown below, to navigate through the menu structure. The symbols appear on the bottom of the keys.

Menu Navigation Keys:

Press **SELECT**/ ▼ to move down in a menu

Press **TARE**/ ▲ to move up in a menu, except at the bottom item in a menu, then use **ZERO**/ ⏎ or **F1**

Press **PRINT**/ ◀ to move left in a menu

Press **UNITS**/ ▶ to move right in a menu

Press **ZERO**/ ⏎ to accept a value or choice and move up in the menu.

Press **F1** to escape and move up in the menu

2.5   Menu annunciators

The menu structure is made up of menu items, parameters, value entry screens and lists from which you choose one item. To help you know where you are in the menu, the bar graph at the top of the display is on while the indicator is in the menus and will change appearance according to the following rules:

All segments flashing

This means you are in the menu structure but not in any of the following screens.
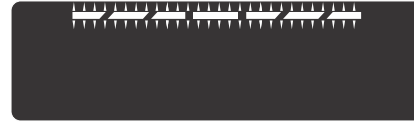
Center flashing / others off

This means you are in a numeric entry screen or the Quick Code prompt screen. See *Quick Code parameter entry on page 22.* Enter a number and press **ZERO** to accept.

Right flashing / others off

This means you are in a list. Scroll through the choices with the **PRINT** and **UNITS** keys and press **ZERO** to accept.

Left flashing / others off

This means you are in a data entry. See *String index/character data entry on page 19* for more information.

Every alternate segment flashing

This means you are in octet entry for IP, Subnet or Gateway address.

2.6   String index/character data entry

Below are guidelines to create or edit text and scale information for print formats. This is a sample of a string entry display.

When these segments are flashing, you are in the string index select mode. In this mode you select the index character you want to edit or add/delete a character.

String Index number

Character (ASCII characters are entered as decimal values)

Left-flashing bar graph segments indicate you are in the String Index select mode. Use the Table 1 key legend to:

● move to the index number you want to edit
● add a new index number
● delete an existing index number.

	Table 1: Key Action When In The String Index Select Mode					
Action	TARE	SELECT	ZERO	PRINT	UNITS	F1
Momentary Key Press	Deletes current character	Selects the index character for editing using the key actions in Table 2	EXIT	Moves left one position in the index	Moves right one position in the index	Escape Edit mode and Abort all changes
Long Key Press	Deletes current character	Inserts new character before this point. Default character added is 32 (space)	EXIT	Page Up (Decrements index by 10)	Page Down (Increments index by 10)	Deletes characters while held

After you select the index number, use the Table 2 key actions to edit the character for that index number.

	Table 2: Key Action When In The Character Edit Mode					
Action	TARE	SELECT	ZERO	PRINT	UNITS	F1
Single Key Press	Increments the flashing digit by 1	Decrements the flashing digit by 1	Enter	Delete flashing digit	Add Digit	ESC/Abort
Long Key Press	Move flashing digit left	Move flashing digit right	Enter	Delete the entire entry	Does nothing	ESC/Abort

2.7 Exiting the menus

1.   If you are at the bottom item in a menu use **ZERO** to accept a choice or value and move up a level, or use **F1** to escape and move up one level without accepting the choice or value. From that point, press the **TARE** key repeatedly until …

     SAVE no is displayed. This means "Do not save changes. "

2.   Use the **PRINT** or **UNITS** key to scroll through the choices: ***SAVE no***, ***SAVEYES*** and ***CAnCEL***. Press **ZERO** to accept the displayed choice.

     If you choose ***SAVE no*** or ***SAVEYES*** the indicator exits the menu and returns to normal weighing mode.

     OR

If you choose ***CAnCEL***, the indicator remains in the menu.

3   Introduction to the menus

Menus, accessed through passwords, are available in the indicator to customize and configure the indicator for your purposes. The menu levels and their passwords are shown below:

Password	Menu Level	Accessed Menus
111	USER	User, About, Audit
3570	DIAGNOSTICS	Diag, User, About, Audit
3088	ADMIN	Setup, Diag, User, About, Audit
2580	CALIBRATE	Calib
1793	SUPER	Application specific items. See User manual.

The CALIBRATE menu level accesses the calibration procedure only. You can also access the calibration menu through the Setup menu using the ADMIN password.

Some menus appear in more than one menu level. As you can see in the table above, the 111 password gives you access to three menus; User, About and Audit. The 3570 password gives you access to those three plus the Diagnostics menu. The 3088 password gives you access to those four plus the Setup menu.

This allows the supervisor to control access to some or all of the menus based on the passwords shared. The menus are the same no matter which menu level you access them from.

The menus are always explained in a sequential manner to cover all information in a logical fashion. You will probably never access all the menu items in this manner. You can navigate to the area of the menu that needs to be changed by using the menu maps and key navigation legends which are inserted as a reminder with most menus.

See *Accessing the menus on page 17* for instructions on how to enter a password to get to the menus. Key functions in the menus are shown below.

Menu Navigation Keys:

Press **SELECT**/ ▼ to move down in a menu

Press **TARE**/ ▲ to move up in a menu, except at the bottom item in a menu, then use **ZERO**/ ↵ or **F1**

Press **PRINT**/ ◀ to move left in a menu

Press **UNITS**/ ▶ to move right in a menu

Press **ZERO**/ ↵ to accept a value or choice and move up in the menu.

Press **F1** to escape and move up in the menu

3.1 Quick Code parameter entry

The Quick Code parameter entry lets you quickly jump to sections of the menu. Here's how it works:

1. Access the 3088 ADMIN menu. Press and hold the **ZERO** key for one second. When you release the key …

    P-   0 is displayed and the three center bargraph segments flash.

2. Refer to the Quick Code table in Figure 3.1, find the parameter you want to access, key in that number and press **ZERO** …

    The screen will show the associated menu item.

3. Use the normal procedures to set the menu item and to save the changes you make.
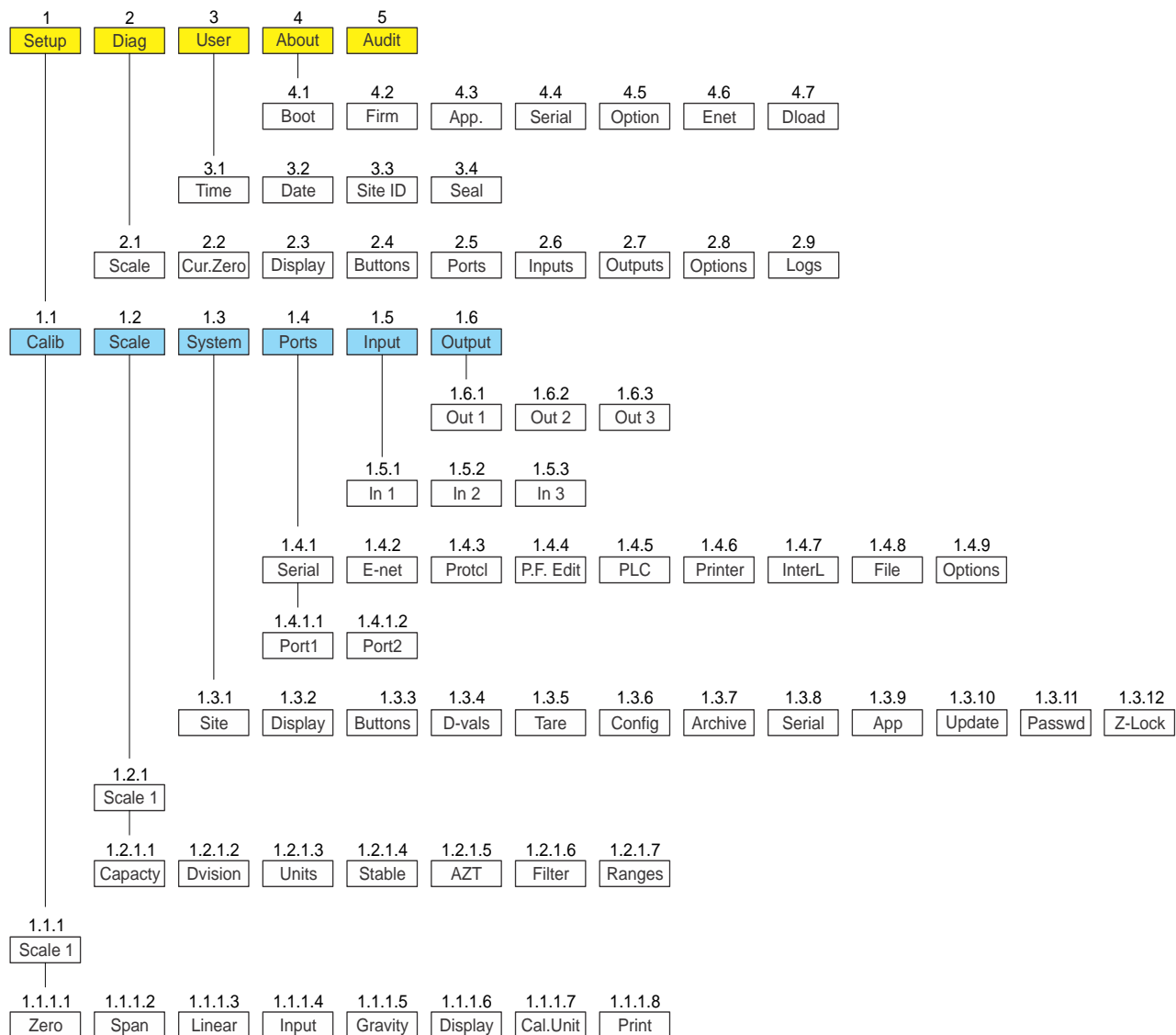
Figure 3.1 Quick Code table

3.2 Default Values

Each area of the world has different requirements for indicator configuration. The table below shows all the default values listed for all the different sites covered by the indicator.

	USA	GB	CAN	EU	CHINA	INDIA
Capacity	5000	2500	2500	2500	2500	2500
Division	1	0.5	0.5	0.5	0.5	0.5
Unit of measure	lb	kg	kg	kg	kg	kg
Unit of measure 2	kg	off	off	off	off	off
Cal unit	lb	kg	kg	kg	kg	kg
Cal wt	5000	2500	2500	2500	2500	2500
Zero Range	100	2	2	2	2	2
Over Basis	Percent	Division	Percent	Division	Division	Division
Separator	decimal	decimal	decimal	comma	decimal	decimal
Date Format	MM-DD-YY	DD-MM-YY	DD-MM-YY	DD-MM-YY	DD-MM-YY	DD-MM-YY
Time Format	12 Hr	24	24	24	24	24
Average	10	10	10	10	10	10
Filter Constant	1	1	1	1	1	1
Filter Threshold	100	50	50	50	50	50
Under Cap. Div.	250	20	250	250	250	250
AZT Div.	3	.25	3	3	3	3
Motion Div.	3	.25	3	3	3	3
App	General	General	General	General	General	General

4 User level menus

The USER level (password 111) contains the User, About, and Audit menus arranged as shown in Figure 4.1.

Figure 4.1 USER level (password 111) menus

4.1 User menu

The User menu is shown in Figure 4.2.

Figure 4.2 User menu

Use this menu to set the time, date, site ID, and to see the physical seal status. Each is explained below:

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*The ↓ and → symbols stand for direction moved in the menu. So **User ↓ Time** illustrates that you move down from **User** to **Time**. This will help you keep track of where you are in the menu structure.*

4.1.1   Time

User ↓ Time

1.   Access the User menu and press **SELECT** …

        tiME is displayed. Use this to set the time and clock style.

Set time

Time ↓ Set

2.   Press **SELECT** …

        SEt is displayed.

3.   Press **SELECT** …

        h-   x is displayed, with the *x* flashing. This is a numeric entry screen for the hour value.

4.   Use the *Numeric entry procedure on page 16* to key in the hour of the day using military (24 hr) time and press *ZERO* …

        The choice is made and *M-   x* is displayed, with the *x* flashing. This is a numeric entry screen for the minute value.

5.   Key in the minute value and press *ZERO* …

        The choice is made and *S-   x* is displayed, with the *x* flashing. This is a numeric entry screen for the second value.

6.   Key in the seconds value and press *ZERO* …

        The choice is made and *SEt* is displayed.

Style

Time ↓ Set → Style

7.   Press **UNITS** …

        StYLE is displayed. Use this to set the style of clock for printouts. Choices are *12hr*, *12hr-AP* (AM/PM) and *24hr* (military time).

8.   Press **SELECT** …

        12hr is displayed.

9. Press **PRINT** or **UNITS** to scroll through the choices. Press **ZERO** when your choice is displayed …

    The choice is made and *StYLE* is displayed.

10. Press **TARE** …

    tiME is displayed.

4.1.2 Date

User ↓ Time → Date

1. Press **UNITS** to move to the next menu item …

    dAtE is displayed.

Set date

Date ↓ Set

2. Press **SELECT** …

    SEt is displayed.

3. Press **SELECT** …

    y-　x is displayed, with the *x* flashing. This is a numeric entry screen for the year value.

4. Use the *Numeric entry procedure on page 16* to key in the year and press *ZERO* …

    The choice is made and *M-　x* is displayed, with the *x* flashing. This is a numeric entry screen for the month.

5. Key in the month value and press *ZERO* …

    The choice is made and *d-　x* is displayed, with the *x* flashing. This is a numeric entry screen for the day value.

6. Key in the day value and press *ZERO* …

    The choice is made and *SEt* is displayed.

Style

Date ↓ Set → Style

7. Press **UNITS** to move to the next menu item …

    StYLE is displayed. Use this to set the style of date for printouts. Choices are *MMDD2Y*, *MMDD4Y*, *DDMM2Y* and *DDMM4Y*.

8. Press **SELECT** …

    MMDD2Y is displayed.

9. Press **PRINT** or **UNITS** to scroll through the choices. Press **ZERO** when your choice is displayed …

    The choice is made and *StYLE* is displayed.

10.   Press **TARE** …

dAtE is displayed.

4.1.3   Site ID

User ↓ Time → Date → Site ID

1.   From *dAtE*, press **UNITS** to move to the next menu item …

SitE id is displayed. Use this item to enter a site ID number or indicator location reference number (up to six characters).

The Site ID can be used in transmitted or printed information.

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2.   Press **SELECT** …

A string entry screen is displayed. Refer to *String index/character data entry on page 19*

3.   Use the *Numeric entry procedure on page 16* to key in the site ID number and press **ZERO** to accept …

SitE id is displayed.

4.1.4   Seal

User ↓ Time → Date → Site ID → Seal

1.   From *SitE id*, press **UNITS** …

SEAL is displayed.

2.   Press **SELECT** …

no SEAL or *SEALEd* is displayed. This is the status of the physical seal jumper inside the indicator. If the unit is sealed, no changes can be made to the configuration of the indicator.

The seal jumper, P9, is located near the top left corner of the main PCB. If the jumper is installed, the indicator is sealed. This means the ADMIN and CALIB menus cannot be accessed and the display will flash **SEALEd***. Only Time and Date can be changed when the indicator is sealed.*

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3.   Press **F1** to return to the *SEAL* display.

4.   To exit the menu, see *Exiting the menus on page 20*.

4.2   About menu

The About menu is shown in Figure 4.3.
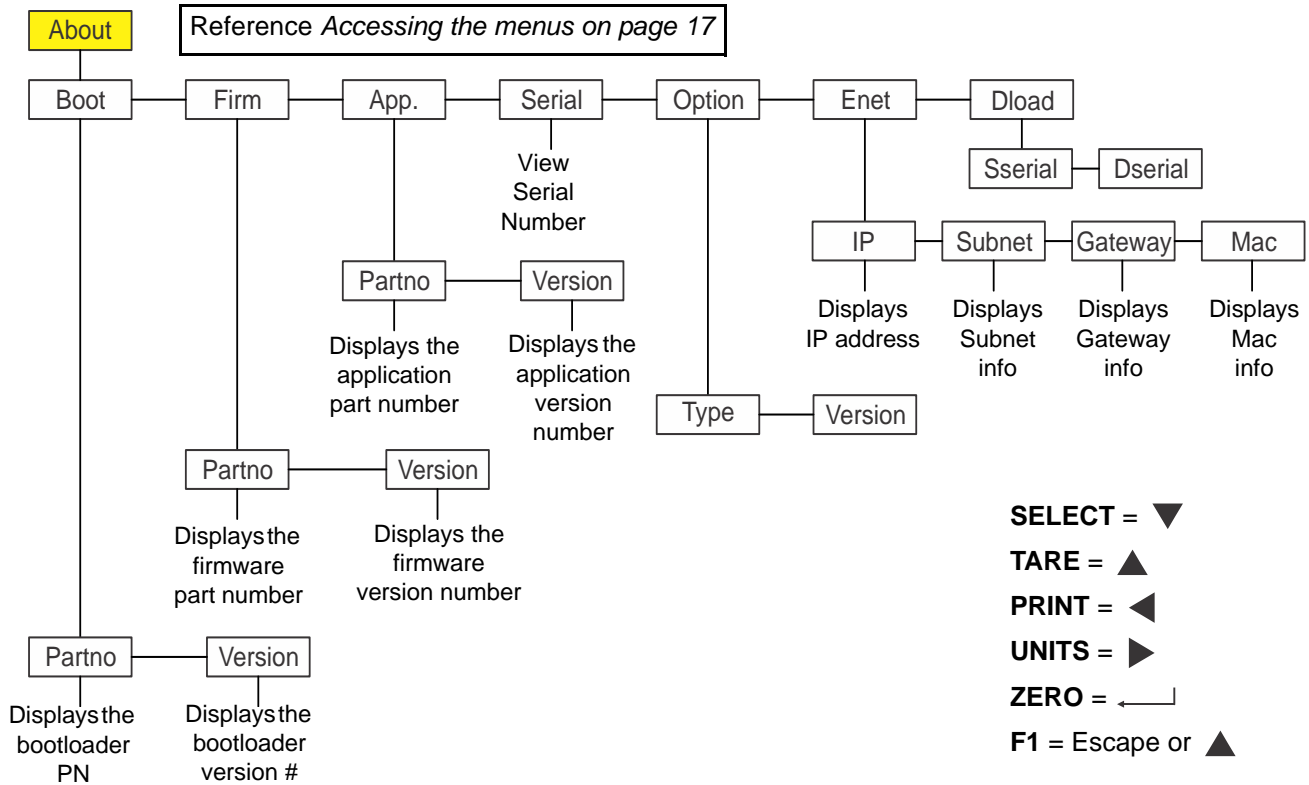
Figure 4.3   About menu

Use this menu to display information about the various items shown in Figure 4.3. Each is explained below:

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

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

App   *Specific software to create specific behavior for a given installation. For example: counting, accumulation, peak, etc.*

4.2.1   Bootloader

About ↓ Boot

1.   Access the About menu and press **SELECT** …

boot is displayed.

2.   Press **SELECT** …

PArtno is displayed

3.   Press **SELECT** …

> The first part of the bootloader part number is displayed.

4.   Press **UNITS** or **PRINT** to toggle the display between the first and second parts of the part number.

5.   Press **ZERO** to return to the *PArtno* item.

6.   Press **UNITS** …

> *VErSion* is displayed.

7.   Press **SELECT** …

> The version number of the bootloader is displayed.

8.   Press **ZERO** to return to the *VErSion* item.

9.   Press **TARE** to return to the *boot* item.

4.2.2   Firmware and Application

About ↓ Boot → Firmware and → Application

1.   From *boot*, press **UNITS** to move to the next item …

> *FirM* is displayed. This stands for firmware.

2.   Repeat the same pattern of key presses in steps 2 through 9 above to view the part number and version for the *FirM* (firmware) and *APP* (application) menu items.

4.2.3   Serial

About ↓ Boot → Firmware → Application → Serial

1.   With *APP* displayed, press **UNITS** to move to the next item in this level …

> *SEriAL* is displayed.

The Serial Number should match the serial number that is printed on the indicator ID tag and is also included in the printed calibration report.

2.   Press **SELECT** …

> The first part of the indicator's serial number is displayed.

3.   Press **UNITS** or **PRINT** to toggle the display between the first and second parts of the serial number.

4.   Press **ZERO** to return to the *SEriAL* display.

4.2.4   Option

About ↓ Boot → Firmware → Application → Serial → Option

1. From *SEriAL*, press **UNITS** to move to the next item in this level …

    oPtion is displayed. Use this to view the version and type of installed option card.

2. Press **SELECT** …

    VErSion is displayed.

3. Press **SELECT** to see the version of the installed option card …

    The version is displayed. If there is no installed option card, *cAnt* is displayed.

4. Press **ZERO** …

    VErSion is displayed.

5. Press **UNITS** to move to the next item …

    tYPE is displayed.

6. Press **SELECT** to see the type of the installed option card …

    The type of card is displayed. If there is no installed option card, *cAnt* is displayed.

7. Press **ZERO** …

    tYPE is displayed.

8. Press **TARE** …

    oPtion is displayed.

4.2.5   Enet

About ↓ Boot → Firmware → Application → Serial → Option → Enet

If the indicator is connected to an ethernet network, the values displayed will be the current assigned addresses.

1. From *oPtion*, press **UNITS** to move to the next menu item …

    EnEt is displayed. Use this item to view the values for the IP, Subnet, Gateway and MAC addresses.

IP

Enet ↓ IP

2. Press **SELECT** …

    iP is displayed. Use this item to view the four part IP address.

3.   Press **SELECT** …

1   xxx is displayed. This is first octet of the IP address

4.   Press **ZERO** …

2   xxx is displayed. This is second octet of the IP address.

5.   Press **ZERO** …

3   xxx is displayed. This is third octet of the IP address.

6.   Press **ZERO** …

4   xxx is displayed. This is fourth octet of the IP address.

7.   Press **ZERO** …

iP is displayed.

MAC

Enet ↓ IP → Subnet & Gateway & MAC

8.   Press **UNITS** …

Subnet is displayed.

9.   Repeat this sequence of key presses for the *Subnet*, *Gateway* and *MAC* addresses.

10. When you are finished, press **TARE** to return to the *Enet* menu item.

4.2.6   Download

About ↓ Boot → Firmware → Application → Serial → Option → Enet → Dload

1.   Press **UNITS** …

dLoAd is displayed. This stands for download. Under *SSEriAL* you can view the serial number of the software application that created the configuration file. Under *dSEriAL* you can view the serial number of the software application that downloaded the configuration file. This is used for security and licensing purposes.

If the license number of your Configuration Software application does not match either the SSerial or DSerial numbers you will be unable to upload the existing configuration file from the indicator. Contact AWTX Technical Support for assistance.

Sserial

Dload ↓ Sserial

2.   Press **SELECT** …

SSEriAL is displayed.

3. Press **SELECT** …

   The 1st half of the serial number of the creating application of the configuration file is displayed.

4. Press **ZERO** to show the 2nd half.

5. Press **F1** …

   SSEriAL is displayed.

Dserial

Dload ↓ Sserial → Dserial

6. Press **UNITS** …

   dSEriAL is displayed.

7. Press **SELECT** …

   The 1st half of the serial number of the downloading application of the configuration file was downloaded to, is displayed.

8. Press **ZERO** to show the 2nd half.

9. Press **F1** …

   dSEriAL is displayed.

10. Press **TARE** twice …

    About is displayed.

11. To exit the menu, see *Exiting the menus on page 20*.

4.3   Audit menu

The Audit menu is shown in Figure 4.4.
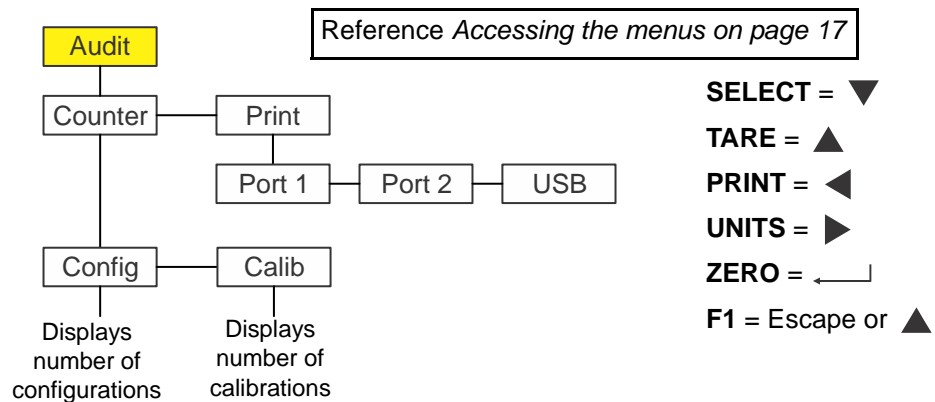
Figure 4.4 Audit menu

Use this menu to display audit counters for configuration and calibration and to print the information. Each is explained below:

4.3.1   Counter

Audit ↓ Counter

1.   Access the Audit menu and press **SELECT** …

countEr is displayed. This has two counters that tell you how many times the indicator has been configured and calibrated.

Config

Counter ↓ Config

2.   Press **SELECT** …

conFig is displayed.

3.   Press **SELECT** again …

A number appears showing how many times the indicator has been configured.

4.   Press **ZERO** …

conFig is displayed.

Calibration

Counter ↓ Config → Calib

5.   Press **UNITS** to move to the next item in this level …

cALib is displayed.

6.   Press **SELECT** …

A number appears showing how many times the indicator has been calibrated.

7.   Press **ZERO** …

cALib is displayed.

8.   Press **TARE** …

countEr is displayed.

4.3.2   Print

Audit ↓ Counter → Print

1.   Press **UNITS** …

Print is displayed.

Port 1/Port 2/USB

Print ↓ Port 1 → Port 2 → USB

2.   Press **SELECT** …

> **Port1** is displayed. This is the first of three choices: **Port 1**, **Port 2** or **uSb**. Use these to select which port to print the audit report through.

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.

3.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** when your choice is displayed …

> **Print** is displayed.

4.   To exit the menu, see *Exiting the menus on page 20*.

5   Diagnostics level menus

The DIAGNOSTICS level (password 3570) is the same as the USER level except it adds the Diag menu. The DIAGNOSTICS level is shown in Figure 5.1.

Diag	User	About	Audit
See page 35	See page 24	See page 28	See page 32
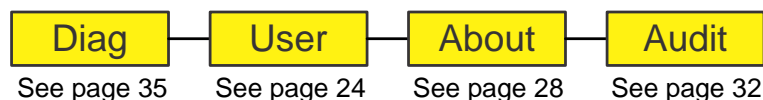
Figure 5.1 DIAGNOSTICS level (password 3570) menus

5.1   Diag menu

Use the Diag menu to check or verify the performance of the indicator. The diagnostic tests available include: Scale A to D to view output from the connected scale base or load device, the current zero offset from calibration zero, a display segment test, a front panel keypad or button test, serial Com ports and USB host port test, remote inputs and outputs test, and an option card test if installed. You can print an error log report that provides information on previous error conditions such as overloads or underloads. The Diag menu is shown in Figure 5.2.

Reference *Accessing the menus on page 17*
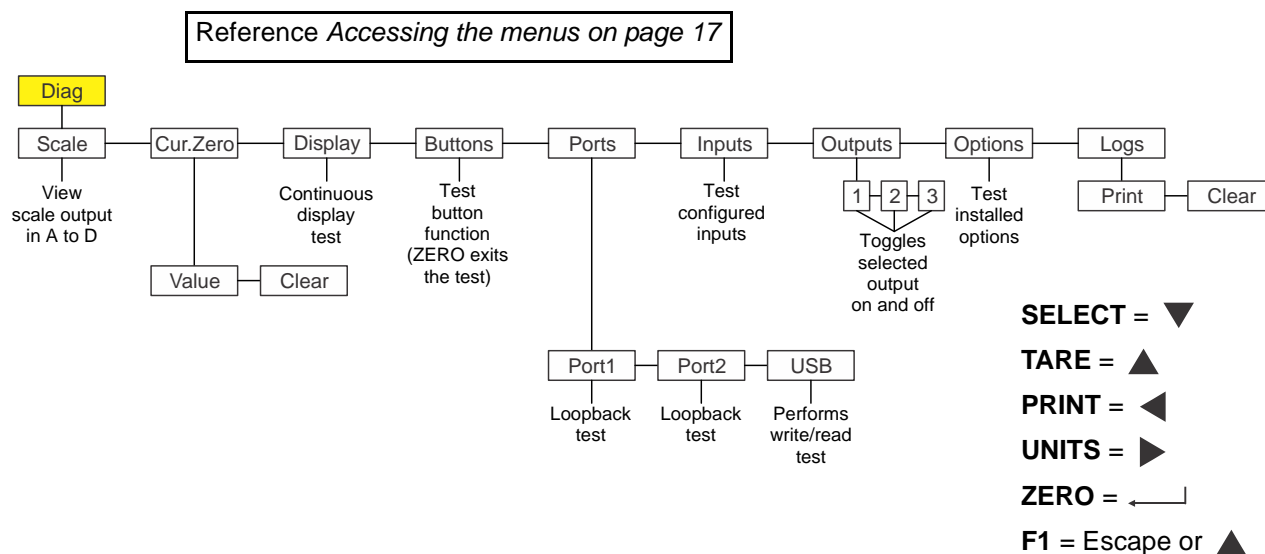
Figure 5.2 Diag menu

*The ↓ and → symbols stand for direction moved in the menu. So **Diag** ↓ **Scale** illustrates that you move down from **Diag** to **Scale**. This will help you keep track of where you are in the menu structure.*

Each of the items in the Diag menu is explained below:

5.1.1 Scale

Diag ↓ Scale

1. Access the Diag menu item and press **SELECT** …

    ScALE is displayed.

2. Press **SELECT** again …

    A number appears representing the A to D counts. The value is only for diagnostic purposes. The value should increase as weight on the scale increases and decrease as weight decreases.

3. Press **SELECT** to toggle to a mV/V display …

    The mV/V value is displayed. This is an approximate value for the mV/V value output by the loadcell.

4. Press **ZERO** …

    ScALE is displayed.

5.1.2 Current Zero

Diag ↓ Scale → Current Zero

1. With ***ScALE*** displayed, press **UNITS** …

    cur.ZEro is displayed. This stands for current zero. The two items under current zero allow you to view the pushbutton zero offset (which includes any weight subtracted by the Auto-Zero Tracking mechanism (AZT) from the calibration zero and to reset the zero back to calibration zero.

2. Press **SELECT** …

    VALuE is displayed.

3. Press **SELECT** to view the zero offset …

    The value of the offset is shown.

4. Press **ZERO** to escape …

    VALuE is displayed.

5. Press **UNITS** …

    cLEAr is displayed. This lets you clear the zero offset to return the indicator to calibration zero.

*This can restore the original calibration zero point if the **ZERO** key is accidently pressed when a tank or vessel contains product that cannot be emptied.*

6. Press **SELECT** …

    no is displayed. Choose ***no*** or ***YES*** to clear the offset or not.

7. Press **UNITS** to toggle between the two choices and press **ZERO** when your choice is displayed …

    If you choose *YES*, the offset is cleared and *cLEAr* is displayed. If you choose *no*, the offset is not cleared and *cLEAr* is displayed.

8. Press **TARE** …

    cur.ZEro is displayed.

5.1.3   Display

Diag ↓ Scale → Current Zero → Display

1. With *cur.ZEro* displayed, press **UNITS** …

    diSPLAy is displayed.

2. Press **SELECT** …

    The segments of the display light up in progression and continue until you press any key.

    After you press any key, *diSPLAy* is displayed.

5.1.4   Buttons

Diag ↓ Scale → Current Zero → Display → Buttons

1. With *diSPLAy* displayed, press **UNITS** …

    buttonS is displayed.

2. Press **SELECT** …

    tESting is briefly displayed followed by dashes.

3. Press any key to test if it is functioning and its name or value will be displayed. Press **ZERO** to escape the test.

    ZERO is briefly displayed then *buttonS*.

5.1.5   Ports

Diag ↓ Scale → Current Zero → Display → Buttons → Ports

1. With *buttonS* displayed, press **UNITS** …

    PortS is displayed.

2. Press **SELECT** …

    Port 1 is displayed. Use this to do a loopback test on port 1.

3.   Press **SELECT** to test this port …

> *tESting* is briefly displayed and then *PASS* or *FAiL*, depending on if the send and receive lines are jumpered (pass) or not (fail). Add a jumper or wire between the transmit output and receive input. On an external 9 pin connector the transmit line is pin 2 and the receive line is pin 3.

It is recommended that you insert the jumper (a paper clip works) into the external cable connector to validate the wiring and not just the internal ports. See System block diagram on page 161 for I/O configuration of the serial ports TB3.

> The *PASS* or *FAiL* is displayed briefly and *Port 1* is displayed.

4.   Press **UNITS** to advance to the next item …

> *Port 2* is displayed. Use this to do a loopback test on port 2.

5.   Press **SELECT** to test this port …

> *tESting* is briefly displayed and then *PASS* or *FAiL*, depending on if the transmit and receive lines are jumpered (pass) or not (fail).

> The *PASS* or *FAiL* is displayed briefly and *Port 2* is displayed.

6.   Press **UNITS** to advance to the next item …

> *uSb* is displayed. Use this to test a connected USB flash drive.

7.   Press **SELECT** to test …

> *oPEn* is briefly displayed, then *WritE* is briefly displayed, then *rEAd* is briefly displayed, then *PASS* or *FAiL*, depending on if the USB device is working correctly or not. The *PASS* or *FAiL* is displayed briefly and *uSb* is displayed.

> If no USB device is plugged in when you begin the test, *oPEn* is briefly displayed, then *no uSb* is briefly displayed, then *uSb*.

8.   From the *uSb* display, press **TARE** …

> *PortS* is displayed.

5.1.6   Inputs

Diag ↓ Scale → Current Zero → Display → Buttons → Ports → Inputs

The input test is used to verify if external switches wired to the input ports on TB2 are functioning properly.

1.   With *PortS* displayed, press **UNITS** …

> *inPutS* is displayed.

2.   Press **SELECT** …

> *in 000* is displayed, if no inputs are jumpered.

3.   To test input 1, jumper pins 1 and 2 of the I/O connector on the indicator …

  The first digit becomes *1* until the jumper is removed.

4.   To test input 2, jumper pins 1 and 3 of the I/O connector on the indicator …

  The second digit becomes *2* until the jumper is removed.

5.   To test input 3, jumper pins 1 and 4 of the I/O connector on the indicator ….

  The third digit becomes *3* until the jumper is removed.

6.   Press **ZERO** …

  inPutS is displayed.

5.1.7   Outputs

Diag ↓ Scale → Current Zero → Display → Buttons → Ports → Inputs → Outputs

The output test is used to verify if external relays or lights (etc.) connected to TB2 are properly wired and functioning properly.

CAUTION: Be sure to take proper precautions to ensure material controlled by the scale outputs will not create a hazardous condition during an output test.

1.   With *inPutS* displayed, press **UNITS** …

  outPutS is displayed.

2.   Press **SELECT** …

  outPut1 is displayed.

3.   Press **SELECT** …

  o.1-oFF is displayed.

4.   Press **PRINT** or **UNITS** to toggle the output *on* (**o.1-on**) and repeat to turn it **oFF**.

  Output 1 will be toggled on and off as you press the keys. This is shown by the annunciator (*SP1)* on the display turning on and off.

5.   Press **ZERO** or **F1** to stop the test …

  outPut1 is displayed.

6.   Press **UNITS** to go to the next output. Repeat the steps to test output 2 and 3.

7.   When finished, press **TARE** …

  outPutS is displayed.

5.1.8   Options

Diag ↓ Scale → Current Zero → Display → Buttons → Ports → Inputs → Outputs → Options

1.   With **outPutS** displayed, press **UNITS** to go to the next menu item …

   oPtionS is displayed. Use this to test the various installed option cards.

2.   Press **SELECT** …

   The name of the installed option card is displayed.

3.   Press **F1** to return to **oPtionS**.

5.1.9   Logs

Diag ↓ Scale → Current Zero → Display → Buttons → Ports → Inputs → Outputs → Options → Logs

The logs report will print any error conditions that may have occurred such as overloads and underloads

1.   With **oPtionS** displayed, press **UNITS** …

   LogS is displayed. These are logs of various functions. You can print or clear them from memory.

2.   Press **SELECT** …

   Print is displayed.

3.   Press **SELECT** to print the log …

   buSy is briefly displayed as the log is sent to the configured peripheral device and then the display returns to **Print**.

4.   Press **UNITS** …

   cLEAr is displayed. Use this to clear the log from memory. Go to step 5 to clear the log.

5.   Press **SELECT** to clear the log …

   buSy is briefly displayed as the log is cleared from memory, then **donE** is briefly displayed

   cLEAr is then displayed.

6.   Press **TARE** …

   LogS is displayed.

7.   This completes the Diag menu. To exit the menu, see *Exiting the menus on page 20*.

6   ADMIN level menus

The ADMIN level (password 3088) is the same as the DIAG level except it adds the Setup menu. The ADMIN level is shown in Figure 6.1.

Setup	Diag	User	About	Audit
See page 41	See page 35	See page 24	See page 28	See page 32
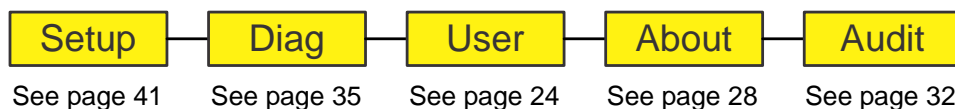
Figure 6.1 ADMIN level

6.1   Setup menu

In the Setup menu there are various submenus available to configure specific sections of the scale operation. The top level items in the Setup menu are shown in Figure 6.2.

Setup

Calib	Scale	System	Ports	Input	Output
See page 42	See page 50	See page 60	See page 72	See page 96	See page 97
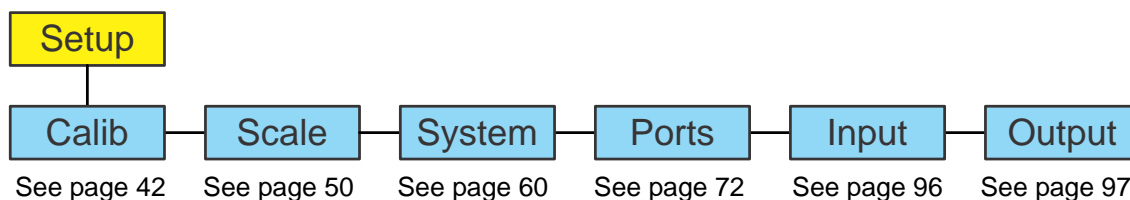
Figure 6.2 Setup menu (password 3088)

Each of the items in the Setup menu are explained in the following sections.

6.2 Calibration Procedure

Use the Calib menu to perform Zero and Span calibration, add Linearity correction points, manually input calibration parameters for Zero and Span, manually input Gravitational correction values, view the live weight, set the calibration unit of measure and print out a calibration report. Follow the menu in Figure 6.3 and the steps that follow.
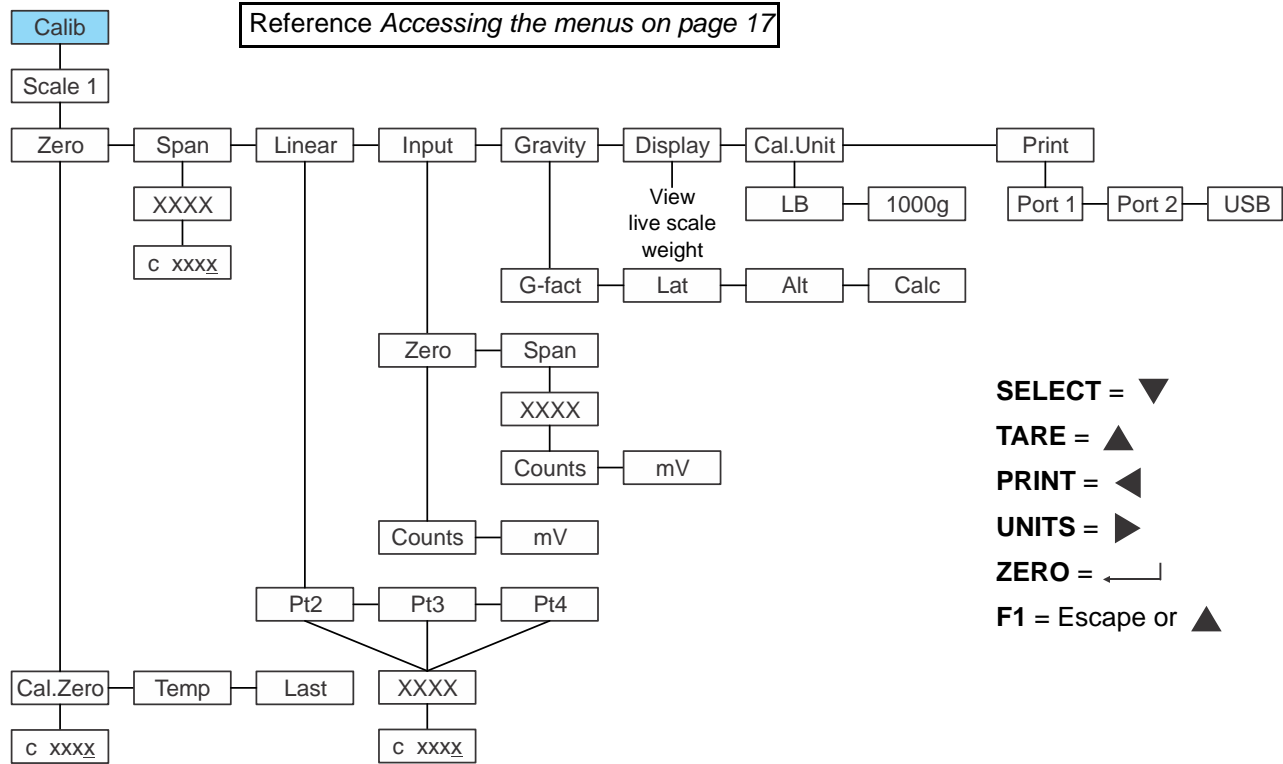
Figure 6.3 Calibrate menu

*The ↓ and → symbols stand for direction moved in the menu. So **Calib ↓ Scale 1** illustrates that you move down from **Calib** to **Scale 1**. This will help you keep track of where you are in the menu structure.*

The calibration procedure can be accessed directly following this procedure:

6.2.1   Accessing calibration

Calib ↓ Scale 1

1.   Press and hold **F1** …

   Pass is briefly displayed, then a flashing **0**, prompting you to enter the password.

2.   Key in the password, 2580, and press **ZERO** to accept it …

   cALib is displayed.

3.   Press **SELECT** …

   ScALE 1 is displayed. There is only one scale available to calibrate so continue to the next step.

6.2.2   Zero Procedure

Calib ↓ Scale 1 ↓ Zero

1.   From **ScALE 1** press **SELECT** …

   ZEro is displayed.

2.   Press **SELECT** again …

   cAL.ZEro is displayed. Use this to record the zero point.

3.   To perform a normal calibration, from the **cAL.Zero** display, press **SELECT** …

   c xxxx is displayed. The **c** denotes the fact you are in the calibration procedure. The numeric value is the current weight value seen by the indicator.

4.   Remove all weight from the scale and press **ZERO** …

   buSy is briefly displayed and then **c   0** is displayed, if the zero procedure was successful. If not successful, repeat steps 3 and 4.

5.   Press **ZERO** …

   cAL.ZEro is displayed.

On the initial zero calibration of the indicator to a new scale, the zero cal counts by appear unstable. Continue to the span calibration and when completed the condition should correct itself.

6.2.3   Span Procedure

Calib ↓ Scale 1 ↓ Zero → Span

1.   From **cAL.ZEro** display, press **TARE** …

   Zero is displayed.

2.   Press **UNITS** …

   SPAn is displayed.

3.   Press **SELECT** to span the scale …

> *XXXX* is displayed with a flashing right digit.

4.   Press **ZERO** to accept the displayed span weight or key in your span weight (not to exceed the configured capacity) and press ***ZERO*** …

> *c xxx* is displayed. This is the current weight on the scale. The *c* is a reminder that you are in the calibration procedure.

5.   Place the span weight on the scale and press **ZERO** …

> *buSy* is briefly displayed and then *c   XXXX* is displayed, which should be the same as the span weight you keyed in. The span procedure is complete.

6.   Press **ZERO** …

> *SPAn* is displayed.

To save calibration or any changes you make in the menus, when you are finished making the changes, press **TARE** *or* **F1** *repeatedly until the display shows* **SAVE no**. *Press* **UNITS** *and* **SAVE YES** *is displayed. Press* **ZERO** *to accept this. All changes will be saved and the indicator will return to normal weighing mode.*

6.2.4   Alternate zero procedures

Last Zero and Temporary Zero

As you can see in the Calibrate menu there are two other items under ***Zero***; ***Last*** and ***Temp***.

Last   Use ***Last*** zero if certified test weights placed on the scale display a slightly inaccurate value. Be sure that the scale is at zero before the test weights are added and enter the calibration procedure and select ***Last*** zero. The last acquired zero value will be assigned as the new Cal Zero value. Continue to the SPAN procedure without removing the test weights. Key in the value of the test weights on the scale and complete the SPAN procedure. The test weights will now read accurately.

Temp.   Use ***Temp.*** zero when the product weight on the scale, such as in a tank or vessel, appears to be inaccurate but cannot be removed to establish a no-load condition. Enter the calibration procedure and select ***Temp.*** zero. The current weight on the scale will be temporarily assigned as the Cal Zero value. Continue to the SPAN procedure, key in the value of the test weights and place them on the scale and complete the SPAN procedure. The original Cal Zero is restored after exiting the span procedure and the current product weight will now be correctly represented. Due to factors that created the original inaccuracy, it may be necessary to re-zero the scale when the tank or vessel is empty.

1.   With ***Last*** or ***Temp*** zero displayed, press **SELECT** …

> *buSY* and *donE* are briefly displayed, followed by *Last* or *Temp* depending on which procedure you are performing.

2.   Press **TARE** …

> ***ZEro*** is displayed.

3.   Press **UNITS** …

> ***SPAn*** is displayed.

4.   Continue the regular span procedure.

6.2.5   Linearity Procedure

Calib ↓ Scale 1 ↓ Zero → Span → Linear

Perform the linearity procedure only if test weights applied to the scale between the zero and span calibration points are showing slight inaccuracies, such as ± a few divisions. If large inaccuracies are recorded, this indicates a possible mechanical problem or possible loadcell failure which linearity calibration may not be able to correct.

1.   From ***SPAn***, press **UNITS** …

> ***LinEAr*** is displayed. Linearity allows you to add up to three linearization points for the scale. The points are numbered 2, 3 and 4 because, internally, the zero reference point is point 1 and the span point is point 5.

2.   With ***LinEAr*** displayed, press **SELECT** …

> ***Pt2*** is displayed.

3.   Press **ZERO** …

> A flashing ***0*** is displayed. This is the screen for entering the point 2 test weight.

4.   Use the *Numeric entry procedure on page 16* and key in a value for the weight and press **ZERO** …

> ***c xxx*** is displayed. This is the live weight on the scale.

5.   Place the test weight, equal to the value keyed in during step 4 above, on the scale and press **ZERO** …

> ***buSy*** is briefly displayed and then ***c xxx*** is displayed again.

6.   Press **ZERO** …

> ***Pt2*** is displayed. This completes the setting of linearization point 2.

7.   Repeat steps 3 through 6 for points 3 and 4, if necessary.

8.   Press **TARE** …

> ***LinEAr*** is displayed.

6.2.6   Input Calibration Procedure

Calib ↓ Scale 1 ↓ Zero → Span → Linear → Input
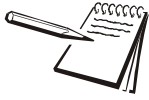
Input calibration is useful to restore an indicator back to previous calibration settings if inadvertently changed or to clone a replacement ZM300 series indicator.

Current settings for zero and span values can be obtained from a printed calibration report. See Print calibration report on page 49.

1.   From *LinEAr* press **UNITS** …

> *inPut* is displayed. This menu item allows you to enter calibration data recorded from an earlier calibration procedure using the keypad.

Zero

Input ↓ Zero

2.   Press **SELECT** …

> *ZEro* is displayed. This is for entering a value for zero in either ADC counts or mv/V.

3.   Press **SELECT** …

> *countS* is displayed. Use this to enter a zero point using ADC counts or press **UNITS** to toggle to *mV* if you want to set the zero point using mV/V.

4.   With *countS* or *mV* displayed, press **ZERO** to access the value entry screen.

5.   Key in the count value or the mV/V (millivolts per volt) value you want for the zero point and press **ZERO** to accept it …

> *ZEro* is displayed.

Span

Input ↓ Zero → Span

6.   Press **UNITS** …

> *SPAn* is displayed.

The INPUT > SPAN value is the differential value of the actual Calibration Zero and Span count (or mv/v) values.

7.   Press **SELECT** …

> A flashing value is displayed representing the span weight.

8.   Press **ZERO** to accept this or key in the span weight that corresponds with the span ADC or mV/V value and press **ZERO** to accept it …

> *countS* is displayed. Use this to enter a span using ADC counts or press **UNITS** to scroll to *mV* if you want to set the span using mV/V.

9.   With *countS* or *mV* displayed, press **ZERO** to access the value entry screen.

10.   Key in the count value or the mV/V value you want for the span and press **ZERO** to accept it …

> *SPAn* is displayed.

11.   Press **TARE** …

> *inPut* is displayed.

6.2.7   Gravity Factor Procedure

Calib ↓ Scale 1 ↓ Zero → Span → Linear → Input → Gravity

1.   From *inPut* press **UNITS** …

> *grAvitY* is displayed. Use this item to key in a gravity constant value. If the scale has been calibrated at a different location that has a significantly different gravitational factor than the installation site, and it is not possible to re-calibrate with known test weights, the scale can be adjusted using this gravity factor.

Gravity factor

Gravity ↓ G-Fact

2.   To set the gravity factor, press **SELECT** …

> *g-FACt* is displayed.

3.   If you know the local gravitation factor (allowable range is 9.70000 to 9.90000) and want to key it in, proceed to step 4.
OR
If you do not know the local gravitation factor but can determine the approximate latitude and altitude of the installation site, then the indicator can calculate the gravity factor from these two values. Skip to step .

4.   Press **SELECT** …

> The current setting for the gravity factor is displayed.

5.   Use the *Numeric entry procedure on page 16* and key in the new gravitation factor and press **ZERO** …

> The value is accepted and the display returns to *g-FACt*. Proceed to step 14.

Latitude

Gravity ↓ G-Fact → Lat

6.   From the *g-FACt* display, press **UNITS** …

> *LAt* is displayed. This stands for latitude.

7.   Press **SELECT** …

> A value entry screen appears.

8.   Key in the latitude for the installation site. The valid range is 0 to 90. A positive value works for north or south of the equator. Press **ZERO** to accept it …

> *LAt* is displayed.

Altitude

Gravity ↓ G-Fact → Lat → Alt

9.   Press **UNITS** …

> *ALt* is displayed. This stands for altitude.

10.   Press **SELECT** …

> A value entry screen appears.

11.   Key in the altitude for the installation site. The valid range is 0 to 30,000 ft. (10000 m). Press **ZERO** to accept it …

> *ALt* is displayed.

Calculate gravity factor

Gravity ↓ G-Fact → Lat → Alt → Calc

12.   After you have entered the latitude and altitude values, press **UNITS** …

> *CALC* is displayed. This stands for calculate.

13.   Press **SELECT** …

> *buSY* is displayed while the indicator calculates the gravity factor and loads this value as the gravity factor. *CALC* is then displayed. Be sure to save the changes when you exit the menu and test the accuracy with a know weight.

(!)   ***CAUTION: Verify with local agencies if adjusting the gravity factor is accepted in your area. It may be required that calibration be done with certified weights.***

---

14.   Press **TARE** …

> *grAvitY* is displayed.

6.2.8   Display

Calib ↓ Scale 1 ↓ Zero → Span → Linear → Input → Gravity → Display

1.   From *grAvitY* press **UNITS** …

diSPLAY is displayed. Use this item to view live scale weight while in the calibration menu.

2.   Press **ZERO** to view the live weight …

The live weight value is displayed.
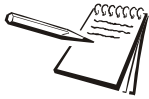
*Use the **ZERO** key to zero the indicator so you can add test weights to validate the accuracy of the scale.*

3.   Press **F1** …

diSPLAY is displayed.

6.2.9   Calibration Unit

Calib ↓ Scale 1 ↓ Zero → Span → Linear → Input → Gravity → Display → Cal.Unit

1.   From *diSPLAY* press **UNITS** …

CAL.unit is displayed. This stands for calibration unit. This is the unit of measure of the weights used during calibration.

2.   Press **SELECT** …

Lb or *1000g* is displayed.

3.   Use **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice.

CAL.unit is displayed.

6.2.10   Print calibration report

Calib ↓ Scale 1 ↓ Zero → Span → Linear → Input → Gravity → Display → Cal.Unit → Print

1.   From *CAL.unit* press **UNITS** …

Print is displayed. Use this print function to print a calibration report through *Port 1*, *Port 2* or to *USB*. This information can be used in the future to restore calibration.

2.   Press **SELECT** …

Port 1 is displayed.

3.   Use **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice.

The calibration report will be printed to a peripheral device through the chosen port. See *Calibration report on page 121* to view an example of the printed report.

4. Press **TARE** twice to return to the *cALib* item.

5. This completes the Calib menu. To exit the menu, see *Exiting the menus on page 20*.

6.3   Scale

> **(!)**
>
> *CAUTION: Be sure to follow all local weights and measures regulations.*
>
> *Some parameters may be set automatically by your choice of SitE in the System menu item.*

Use the Scale menu to configure the scale operating parameters such as capacity and division size, available units of measure, motion and auto zero tracking values, filtering parameters, range of operation for zeroing the scale, over and underload conditions and the return to gross zero region or band. Refer to the menu in Figure 6.3 and the steps that follow.
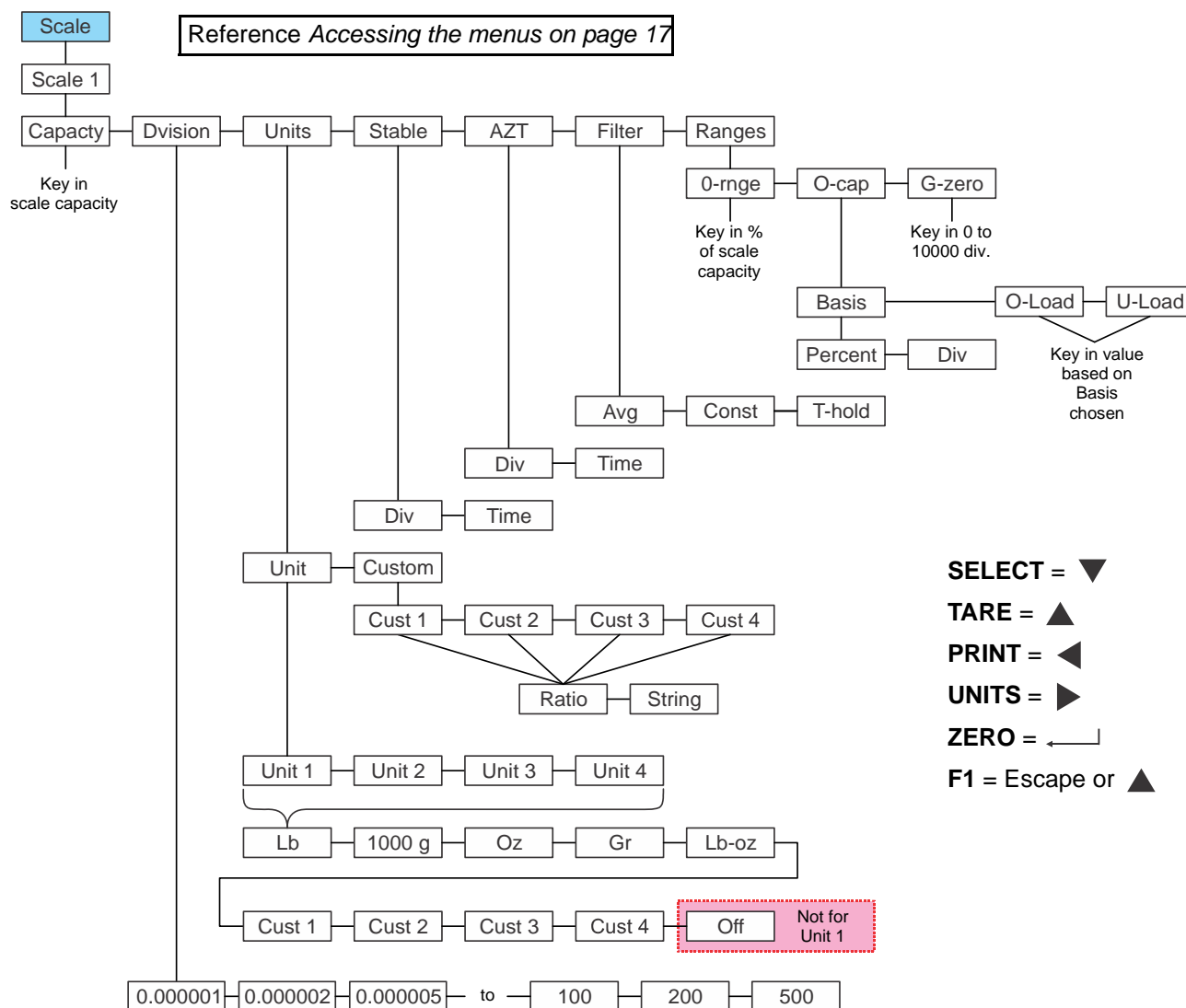
Figure 6.4   Scale menu

Access the Scale menu. See *Accessing the menus on page 17.*

6.3.1   Accessing scale configuration

Scale ↓ Scale 1

With *Scale* displayed, press **SELECT** …

ScALE 1 is displayed. There is only one scale available so continue to *Capacity.*

6.3.2   Capacity

Scale ↓ Scale 1 ↓ Capacty

The capacity that you enter should never exceed the rated capacity of the scale that is connected.

1.   From *ScALE 1* press **SELECT** …

A value is shown on the screen with the right digit flashing. This is the current setting for the capacity of the scale.

2.   Press **ZERO** to accept this or key in a new value and press **ZERO** …

cAPActY is displayed.

6.3.3   Division

Scale ↓ Scale 1 ↓ Capacty → Dvision

1.   From *cAPActY* press **UNITS** …

dViSion is displayed. This stands for division size.

2.   Press **SELECT** …

The current division size is displayed.

3.   Press **PRINT** or **UNITS** to scroll through the division size choices. Choices are *0.000001*, *0.000002*, *0.000005*, *0.00001*, *0.00002*, *0.00005*, *0.0001*, *0.0002*, *0.0005*, *0.001*, *0.002*, 0.*005*, *0.01*, *0.02*, *0.05*, *0.1*, *0.2*, *0.5*, *1*, *2*, *5*, *10*, *20*, *50*, *100*, *200* and *500*. The default value is *1*. Press **ZERO** to accept the displayed choice.

dViSion is displayed.

Division sizes for other units of measure are automatically calculated by the indicator.

6.3.4   Units

Scale ↓ Scale 1 ↓ Capacty → Dvision → Units

1.   From *dViSion* press **UNITS** …

   unitS is displayed.

Unit

Units ↓ Unit

2.   Press **SELECT** …

   unit is displayed. From this item you can choose which units of measure are available when the user presses the **UNITS** key during normal weighing. You can have up to four units for viewing. They are listed as: *unit 1*, *unit 2*, *unit 3* and *unit 4*. You can assign any of the following units of measure to any of these: *lb*, *1000g*, *oz*, *gr*, *lb-oz*, *cuSt 1*, *cuSt 2*, *cuSt 3*, *cuSt 4* or *oFF*.

   cuSt stands for custom unit. To use a custom unit you must first create them by entering a ratio and a string to define it. See the section below on creating a custom unit before continuing with the rest of the unit menu item. You can ignore all the 10x steps if you do not want to create a custom unit of measure.

Custom unit creation

Units ↓ Unit → Custom (refer to Figure 6.4)

3a.   With *unit* displayed, press **UNITS** …

   cuStom is displayed.

3b.   Press **SELECT** …

   cuSt 1 is displayed. Press the **UNITS** key to scroll through the other three custom units. The process to set up a custom unit is the same for all four but it will be explained just once below.

3c.   With the custom unit you want to create displayed, press **SELECT** …

   rAtio is displayed. The ratio is the number you divide into the calibration unit of measure to create the custom unit. Example: Ratio would equal 2000 if you wanted to convert pounds to tons.

3d.   Press **ZERO** …

   The data entry screen appears.

3e.   Use the *Numeric entry procedure on page 16* and key in the value for the ratio of your custom unit and press **ZERO** …

   The value is saved and *rAtio* is displayed.

3f.   Press **PRINT** or **UNITS** to scroll to the other menu item …

   String is displayed.

3g.   Press **SELECT** …

A string entry screen is displayed. Refer to *String index/character data entry on page 19* for instructions on how to enter a string label for the custom unit of measure. This is only used when data is transmitted out one of the communication ports.

3h.   When you are finished, press **ZERO** to accept the changes …

String is displayed.

4.   Press **TARE** twice to return to ***cuStom***.

4a.   Press **PRINT** or **UNITS** to scroll to the other menu item …

unit is displayed.

5.   Press **SELECT** and continue with the following steps to choose up to four units of measure.

unit x displayed.

6.   Press **SELECT** …

The current unit of measure is displayed.

7.   Press **PRINT** or **UNITS** to scroll through the choices. Press **ZERO** to accept the displayed choice …

unit x is displayed again.

8.   Press **PRINT** or **UNITS** to scroll to the other menu items and repeat the procedure up to four units of measure …

9.   Repeatedly press **TARE** (or **F1**) until ***unitS*** is displayed.

6.3.5   Stable

Scale ↓ Scale 1 ↓ Capacty → Dvision → Units → Stable

1.   From ***unitS*** press **UNITS** to scroll to the next menu item …

StAbLE is displayed. Use this parameter to set the stability window for the scale. Set a division window and a time window which will be used to determine when the stability icon will be displayed. If weight does not change more than the division window size within the time window, the icon will be visible indicating a stable condition. Set both ***diV*** and ***timE*** to ***0*** to disable stability.

*The **StAbLE** time value is used during normal operation as the length of time the indicator will continue to check for a 'motion stable' condition after the **ZERO**, **TARE** or **PRINT** button is pressed. If the intended operation cannot be completed before the timeout, **cAnt** is displayed and the key request is ignored.*

Divisions

Stable ↓ Div

2.   Press **SELECT** …

> *diV* is displayed. This stands for the division size of the motion window.

3.   Press **SELECT** …

> A value entry screen is displayed.

4.   Key in a value for the motion window (3 divisions is default) and press **ZERO** to accept …

> *diV* is displayed.

Time

Stable ↓ Div → Time

5.   Press **UNITS** to scroll to the next menu item …

> *timE* is displayed. This is the time window, in seconds, for stability.

6.   Press **SELECT** …

> A value entry screen is displayed.

7.   Key in a value for the time window (1 second is default) and press **ZERO** to accept …

> *timE* is displayed.

8.   Press **TARE** …

> *StAbLE* is displayed.

6.3.6   AZT

Scale ↓ Scale 1 ↓ Capacty → Dvision → Units → Stable → AZT

From *StAbLE* press **UNITS** to scroll to the next menu item …

> *AZt* is displayed. Automatic Zero Tracking has the same parameters (*diV* and *timE*) as **StAbLE** in step 1. Set them the same way you did for **StAbLE**. 3 divisions and 1 second are default values for these parameters. Set *diV* to *0* to disable AZT.
>
> The *diV* value defines a ± range around zero. When scale weight is not at the center of zero but inside this range for the time value entered, ½ of the weight will be subtracted. This process is repeated until weight is inside the center of zero region.

In certain applications, such as when batching product that starts falling slowly onto the scale, it may require disabling AZT or changing the default values to reduce the effect.

6.3.7 Filter

Scale ↓ Scale 1 ↓ Capacty → Dvision → Units → Stable → AZT → Filter

1.   From **AZt** press **UNITS** to scroll to the next menu item …

   FiLtEr is displayed. Use this to filter out vibrations affecting the scale. Under this item you have three parameters to set: **AVg** (average), **conSt** (constant) and **t-hoLd** (threshold).

   Instructions on setting these items start in step 2. To find the best settings for your filter needs, follow the steps 1a to 1g.

Default settings are:
AVG = 10
Const = 1
t-hold = 100 (factory default based on 5000 lb capacity)

These values will provide the best weight response for the majority of scale installations. In adverse conditions, where wind, vibration or other conditions are affecting the stability of the weight displayed, refer to the following instructions to improve the performance of the indicator.

If you are using Ztools to configure your scale it will attempt to calculate filtering based upon your capacity and division size used.

1a.   Determine the amount of positive and negative force exerted by the vibration on the scale.

   To do this: Set **t-hoLd** to 0.0, **conSt** to 0, and **AVg** to 1.0. Return to weigh mode and, with a typical item on the scale, observe the weight swings. Record the difference between the highest and lowest displayed weight values. Add 30 to 50% to this value. This is a good starting value for the **t-hoLd** setting. Do not set your indicator to this value until told to in step 1g.

1b.   Setting **AVg** to higher values increases the filtering effect.

   To do this: Set **t-hoLd** to 0.0, **conSt** to 0, and **AVg** to 10. Check the stability of the scale by exiting to normal weigh mode, remove all weight from the scale and/or press **ZERO** and observe the Center of Zero annunciator. If it is on all the time your scale is stable. If the Center of Zero light blinks, more filtering is required. Go to step 1c.

1c.   Repeat step 1b but increase **AVg** by 10.

   Keep repeating steps 1b and 1c until the scale is stable or you've tried an Average value up to 80. If the scale is still not stable go to step 1d.

1d.   Setting the **conSt** to higher values increases the filtering effect.

   To do this: Set **t-hoLd** to 0.0, **conSt** to 1, and **AVg** to 80. Check the stability of the scale by exiting to normal weight mode and observe the Center of Zero annunciator. If it is on all the time your scale is stable. If the Center of Zero light blinks, more filtering is required. Go to step 1e.

1e.   Repeat step 1d but increase the ***conSt*** by 1. Keep repeating steps 1d and 1e until the scale is stable or you've tried the entire range of Constant (10). If the scale is still not stable, decrease your display update rate and start over at step 1a using the new, slower display rate.

1f.   After the ***conSt*** value is established you may wish to lower the ***AVg*** value to improve display response time.

1g.   After a final value for ***t-hoLd***, ***conSt*** and ***AVg*** has been set, enter the ***t-hoLd*** value established in step 1a. If this value is too small your scale will act as if the filtering is off or not working.

Increase the ***t-hoLd*** value until your scale stabilizes.

If the Threshold value is too high, your scale will react slowly to weight changes.

When filtering is properly adjusted the scale will be stable at zero and will rapidly display a stable test weight value.

Follow the steps below to set these three items.

Average

Filter ↓ Avg

2.   With ***FiLtEr*** is displayed, press **SELECT** …

AVG is displayed.

3.   Press **SELECT** …

The current value is displayed. 20 is the default value.

4.   Press **ZERO** to accept this value or key in a new one and press **ZERO** …

AVG is displayed.

Constant

Filter ↓ Avg → Const

5.   Press **UNITS** …

conSt is displayed.

6.   Press **SELECT** …

The current value is displayed. 0 is the default value.

7.   Press **ZERO** to accept this value or key in a new one (1-10) and press **ZERO** …

conSt is displayed.

Threshold

Filter ↓ Avg → Const → T-hold

If a weight added to the scale exceeds the threshold value, it temporarily disables the filtering and allows the display to quickly indicate the actual weight applied before the filtering is re-activated.

8.   Press **UNITS** …

>   *t-hoLd* is displayed.

9.   Press **SELECT** …

>   The current value is displayed. 0 is the default value. When *0* is the threshold value, filtering is always on.

10.   Press **ZERO** to accept this value or key in a new one and press **ZERO** …

>   *t-hoLd* is displayed.

11.   Press **TARE** …

>   *FiLtEr* is displayed.

12.   Press UNITS to move to the next item …

>   *rAngES* is displayed

6.3.8   Ranges

Scale ↓ Scale 1 ↓ Capacty → Dvision → Units → Stable → AZT → Filter → Ranges

Zero Range

Ranges ↓ 0-Rnge

1.   From *rAngES* press **SELECT** …

>   *0-rngE* is displayed. Use this to set the percentage of capacity which can be zeroed off the scale by pressing the **ZERO** key.

2.   Press **SELECT** …

>   A value entry screen is displayed.

3.   Use the *Numeric entry procedure on page 16* and key in a percent of scale capacity and press **ZERO** to accept …

>   *0-rngE* is displayed.

Over capacity

Ranges ↓ 0-Rnge → O-cap

4.   Press **UNITS** to scroll to the next menu item …

>   *o-cAP* is displayed. This stands for over capacity. Use this to configure the over/under capacity function of the scale.

5.   With *o-cAP* displayed, press **SELECT** …

> *bASis* is displayed. Use this to choose what the over and under capacity function is based on.

6.   Press *SELECT* …

> The current setting, *PErcEnt* or *diV*, is displayed. Choose to base over/under capacity on a percent (*PErcEnt*) or to a number of divisions (*diV*).

7.   Use **PRINT** and **UNITS** to toggle between the choices and press **ZERO** to accept the choice …

> *bASis* is displayed.

8.   Press **UNITS** …

> *o-LoAd* is displayed. This stands for overload. Once you've picked the basis for an over capacity condition, use this item to set the value that triggers the overload condition.

9.   Press *SELECT* …

> The current setting is displayed.

10.   Key in the percent or division value and press **ZERO** to accept …

> *o-LoAd* is displayed.

11.   Press **UNITS** …

> *u-LoAd* is displayed. This stands for underload. Use this item to set the value that triggers the underload condition.

12.   Press *SELECT* …

> The current setting is displayed.

13.   Key in the percent or division value and press **ZERO** to accept …

> *u-LoAd* is displayed.

14.   Press **TARE** …

> *o-cAP* is displayed.

Gross zero band

Ranges ↓ 0-Rnge → O-cap → G-zero

15.   Press **UNITS** to scroll to the next menu item …

> *g-ZEro* is displayed. Use this to configure the gross zero band. This is a parameter used to perform the tare clear function and set the Return to Zero range for Autoprint, Acccumulate, Checkweighing, Counting and Batch functions. You can enter a value between 0 and 10000 divisions.

16.   With *g-ZEro* displayed, press **SELECT** …

> A value entry screen is displayed.

17.   Key in a value between 0 and 10000 divisions and press **ZERO** to accept …

> *g-ZEro* is displayed. This completes the Scale menu.

18.   Press **TARE** twice …

        ScALE is displayed.

This completes the Scale menu. Go to the next section for the next menu item,
SYStEm.

6.4   System

Use the System menu to configure system parameters such as loading defaults for the country of operation, setting available display modes and tare functions, selection of the scale application mode, and several other functions that will be described. Refer to Figure 6.5 as you setup the items of the System menu.
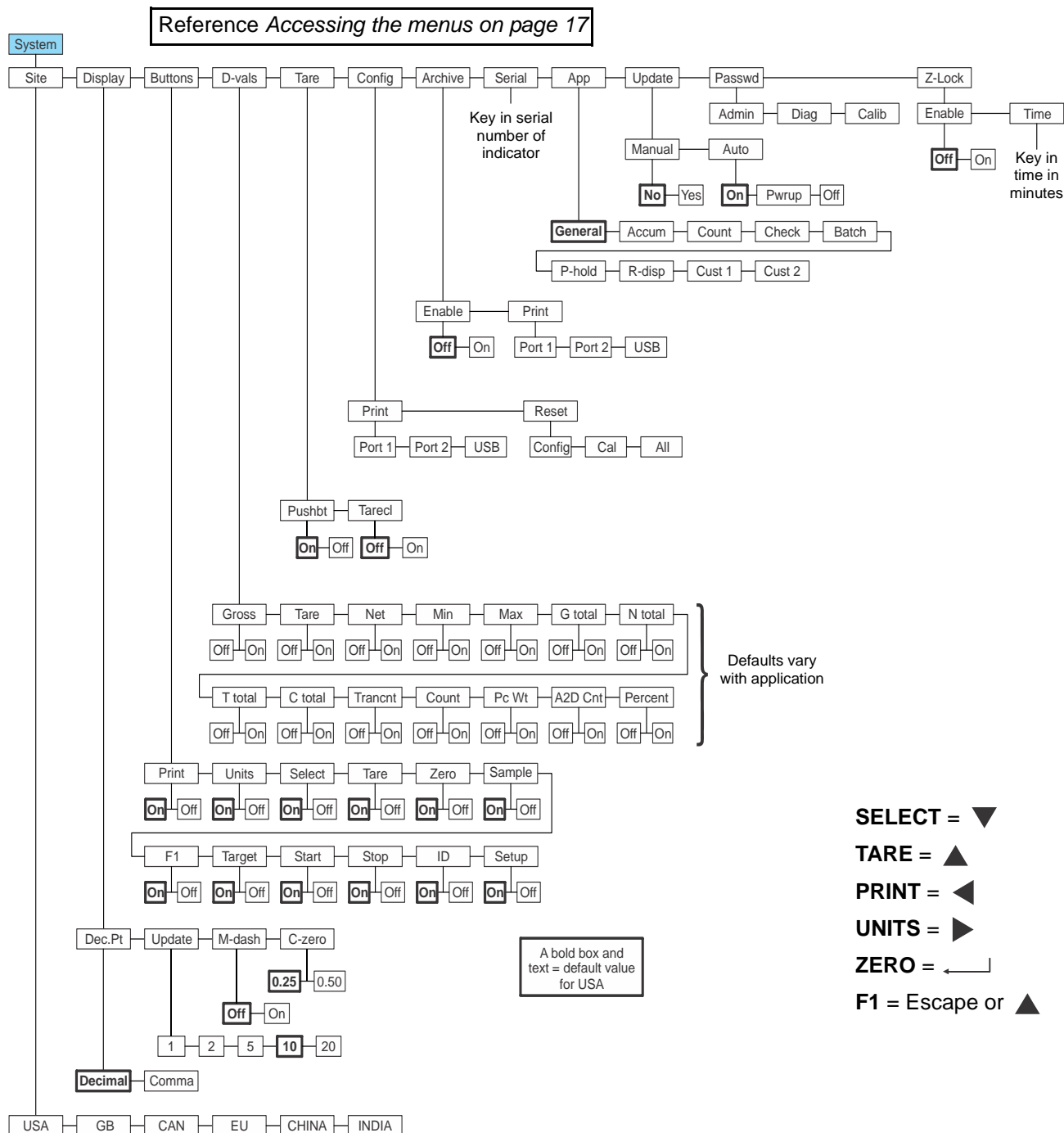
Figure 6.5 System menu

Items in bold boxes and text are default values.

With ***ScALE*** displayed, press **UNITS** …

> ***SYStEm*** is displayed. This is the next item in the Setup menu.

6.4.1   Site

System ↓ Site

1. Press **SELECT** …

   > ***SitE*** is displayed. Choose your area of operation of the indicator. Choices are: ***uSA***, ***gb***, ***cAn***, ***Eu***, ***chinA*** and ***indiA***. This sets the defaults needed for your area when the indicator is reset. See *Default Values on page 23*.

CAUTION: Be sure to follow all local weights and measures regulations.

2. Press **SELECT** …

   > The current site is displayed.

3. Press **PRINT** or **UNITS** to scroll to the other choices and press **ZERO** to accept the displayed choice.

   > ***bUSY*** is briefly displayed, then ***SitE***.

6.4.2   Display

System ↓ Site → Display

1. From ***SitE***, press **UNITS** …

   > ***diSPLAy*** is displayed.

Decimal Point

Display ↓ Dec.Pt

2. From ***diSPLAy***, press **SELECT** …

   > ***dEc.Pt*** is displayed. This configures whether a decimal point or comma is used to separate whole and fractional numbers.

3. Press **SELECT** …

   > The current choice is displayed, ***dEcimAL*** or ***comma***.

4.   Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice.

> *dEc.Pt* is displayed.

Update

Display ↓ Dec.Pt → Update

5.   From *dEc.Pt*, press **UNITS** …

> *uPdAte* is displayed. This configures the number of display refreshes per second. Choices are *1*, *2*, *5*, *10* and *20*.

> *Lowering the update rate can sometimes improve stability of the display in noisy environments, e.g. vibration or wind.*

6.   Press **SELECT** …

> The current choice is displayed.

7.   Press **PRINT** or **UNITS** to scroll to the other choices and press **ZERO** to accept the displayed choice.

> *uPdAte* is displayed.

Motion Dashes

Display ↓ Dec.Pt → Update → M-dash

8.   From *uPdAte*, press **UNITS** …

> *m-dASh* is displayed. If enabled, the display will show dashes during motion.

9.   Press **SELECT** …

> The current choice (*oFF* or *on*) is displayed.

10.   Press **PRINT** or **UNITS** to scroll to the other choice and press **ZERO** to accept the displayed choice.

> *m-dASh* is displayed.

Center of Zero

Display ↓ Dec.Pt → Update → M-dash → C-zero

11.   From *m-dASh*, press **UNITS** …

> *c-ZEro* is displayed. Choose the center-of-zero window size to be *0.25* or *0.50* division. If the weight is within this window, the zero annunciator on the display will be lit.

12.   Press **SELECT** …

> The current choice is displayed.

13. Press **PRINT** or **UNITS** to scroll to the other choice and press **ZERO** to accept the displayed choice.

>   *c-ZEro* is displayed. This is the last item in the Display menu.

14. Press **TARE** …

>   *diSPLAy* is displayed.

6.4.3 Buttons

System ↓ Site → Display → Buttons

1. From *diSPLAy*, press **UNITS** …

>   *buttonS* is displayed. Use this item to configure each button (key) *on* or *oFF*. This allows you to limit the front panel function to suit your situation. Follow the same procedure for each key to turn it on or off. *on* is the default value for all the buttons.

2. Press **SELECT** …

>   The key name is displayed.

3. Press **SELECT** …

>   *on* or *oFF* is displayed.

4. Press **PRINT** or **UNITS** to scroll to the other choice and press **ZERO** to accept the displayed choice.

>   The key name is displayed.

5. Press **UNITS** …

>   The next key name is displayed.

6. Repeat steps 3 through 5 for all the keys you want to change. Refer to the list of buttons in the menu found in Figure 6.5 on page 60. When finished press **TARE** …

>   *buttonS* is displayed.

6.4.4   Display values

System ↓ Site → Display → Buttons → D-Vals

1.   From ***buttonS***, press **UNITS** …

> ***d-VALS*** is displayed. This stands for the displayable active values. In normal weighing mode, press **SELECT** to scroll through all enabled values. Follow the same procedure for each active value to turn it on or off. Defaults vary with the application that is active.

> Below is the complete list of display values:

<table>
<tr><th colspan="4">Display Values</th></tr>
<tr><td>1</td><td>Gross</td><td>8</td><td>Tare Total</td></tr>
<tr><td>2</td><td>Tare</td><td>9</td><td>Count Total</td></tr>
<tr><td>3</td><td>Net</td><td>10</td><td>Transaction Count</td></tr>
<tr><td>4</td><td>Minimum</td><td>11</td><td>Count</td></tr>
<tr><td>5</td><td>Maximum</td><td>12</td><td>PCWT</td></tr>
<tr><td>6</td><td>Gross Total</td><td>13</td><td>A2D Counts</td></tr>
<tr><td>7</td><td>Net Total</td><td>14</td><td>Percent (Net/Tare)</td></tr>
</table>

*For **General Weighing**, the following display values will be active by default: Gross, Tare, Net*

*For **Accumulator**, the following display values will be active by default: Gross, Tare, Net, Gross Total, Net Total, Tare Total, Transaction Count*

*For **Parts Counting**, the following display values will be active by default: Gross, Tare, Net, Count, Pieceweight*

*For **Checkweighing**, the following display values will be active by default: Gross, Tare, Net*

*For **Batching**, the following display values will be active by default: Gross, Tare, Net*

*For **Peak Weighing**, the following display values will be active by default: Gross, Max, Min*

*For **Remote Display**, no display values will be active. The display will mimic the master display or show **no dAtA** if there is no communication.*

2.   Press **SELECT** …

> The display value is displayed.

3.   Press **SELECT** …

> ***on*** or ***oFF*** is displayed.

4.   Press **PRINT** or **UNITS** to scroll to the other choice and press **ZERO** to accept the displayed choice.

> The display value is displayed.

5.   Press **UNITS** …

> The next display value is displayed.

6.   Repeat steps 3 through 5 for all the display values you want to change. When finished press **TARE** …

> **d-VALS** is displayed.

6.4.5   Tare

System ↓ Site → Display → Buttons → D-Vals → Tare

1.   From **d-VALS**, press **UNITS** …

> **tArE** is displayed. Use this item to set the type of tare entry and the tare autoclear functions.

Pushbutton tare

Tare ↓ Pushbt

2.   Press **SELECT** …

> **PuShbt** is displayed. This stands for pushbutton tare. Enable this to use the **TARE** key to tare weight from the scale.

3.   Press **SELECT** …

> **on** or **oFF** is displayed. **on** is the default value for pushbutton tare.

4.   Press **PRINT** or **UNITS** to toggle to the other choice and press **ZERO** to accept the displayed choice.

> **PuShbt** is displayed.

Auto tare clear

Tare ↓ Pushbt → Tarecl

5.   Press **UNITS** …

> **tArEcl** is displayed. This stands for automatic tare clear. Enable this to automatically clear a tare after a weighment when the weight stabilizes inside the gross zero band.

6.   Press **SELECT** …

> **on** or **oFF** is displayed. **oFF** is the default value.

7.   Press **PRINT** or **UNITS** to toggle to the other choice and press **ZERO** to accept the displayed choice.

> **tArEcl** is displayed.

8.   Press **TARE** …

> **tArE** is displayed.

6.4.6   Config

System ↓ Site → Display → Buttons → D-Vals → Tare → Config

    1.   From *tArE*, press **UNITS** …

        conFig is displayed. Use this to print out the configuration data through one of the ports or reset the configuration, calibration or database to factory defaults. Follow these steps:

Print

Config ↓ Print

    2.   From *conFig* press **SELECT** …

        Print is displayed. Use this to print the indicator configuration information. You pick the port to use for printing in the following steps. See a sample in Chapter 9 - *Printed reports (page 121)*

    3.   Press **SELECT** …

        Port 1 is displayed. The other choices are *Port 2* and *uSb* (text file).

If USB is selected, a USB flash drive must be installed to create the text file of the indicator configuration.

    4.   Press **PRINT** or **UNITS** to scroll to the other choices and press **ZERO** to accept the displayed choice.

        no is displayed. Choose *no* to abort the print function or choose *YES* to print the configuration file.

    5.   Press **PRINT** or **UNITS** to toggle between the *no* and *YES* choices. Press **ZERO** when your choice is displayed.

        If you chose *YES*, the configuration list is printed through the chosen port and then *Print* is displayed. If you chose *no*, the print action is aborted and *Print* is displayed.

Reset

Config ↓ Print → Reset

    6.   With *Print* displayed press the **UNITS** key …

        rESEt is displayed. Under this item you can choose to reset the *conFig* (configuration) and *cAL* (calibration) memory or choose *ALL* to reset both of them at once.

    7.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice.

        The chosen selected memory item is reset to factory defaults and then *rESEt* is displayed.

8.   Press **TARE** …

   conFig is displayed.

6.4.7   Archive

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Archive

1.   From *conFig*, press **UNITS** …

   ArchiVE is displayed. 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.

Enable

Archive ↓ Enable

2.   Press **SELECT** …

   EnAbLE is displayed.

3.   Press **SELECT** …

   oFF or *on* is displayed. Choose *on* to enable a PC query.

4.   Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice.

   EnAbLE is displayed. If enabled, a print item appears in the menu to the right of *EnAbLE*. Continue to step for instructions to print the archive or skip to step 8 to move to the next menu item.

Print

Archive ↓ Enable → Print

5.   Press **UNITS** …

   Print is displayed. You can choose to print the archive from Port 1, 2 or to USB. (USB device must be installed)

6.   Press **SELECT** …

   Port 1 is displayed.

7.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice.

   Print is displayed.

8. Press **TARE** …

   ArchiVE is displayed.

6.4.8 Serial

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Archive → Serial

1. From ***ArchiVE***, press **UNITS** …

   SEriAL is displayed. Use this to record the serial number of the indicator.

2. Press **SELECT** …

   A value entry screen is displayed.

3. Key in the first four digits of the 9 digit serial number of the indicator and press **ZERO**, then key in the last five digits of the serial number and press **ZERO** to accept it. The serial number is located on the label attached to the indicator.

   SEriAL is displayed.

6.4.9 Application

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Archive → Serial → App

1. From ***SEriAL***, press **UNITS** …

   APP is displayed. Use this item to enable an application. Choose from this list:

gEnErAL -	General weighing
AccUM -	Accumulator
count -	Part counting
chEck -	Checkweighing
bAtch -	Batching
P-hoLd -	Peak Minimum and Maximum
r-diSP -	Remote Display mode
cUSt 1 -	Custom application provided by the AWTX specials group
cUSt 2 -	Custom application provided by the AWTX specials group

Refer to the User manual for configuration settings and operation instructions for the selected application. The R-Disp application enables the ZM indicator to operate as a remote display when connected to a properly configured primary indicator. In addition to the settings described in the User manual refer to details in section Protocol on page 80 to complete the setup for remote display operation.

2. Press **SELECT** …

   The current application is displayed.

3. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice.

   APP is displayed. When you exit the menu and save your changes, the indicator will boot up in the new application.

6.4.10 Update

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Archive → Serial → App → Update

1.   From *APP*, press **UNITS** …

> *uPdAtE* is displayed. This menu will allow you to set the conditions for the indicator to accept software updates from a remote site. If connected to the internet, the indicator can accept a software update file via FTP. The software update can be installed manually or automatically when the file is received or on the next powerup.

Manual

Update ↓ Manual

2.   Press **SELECT** …

> *MAnuAL* is displayed. Choices under this are *no* and *YES*. Choose *YES* to start the update process. Choose *no* to not do an update. *no* is the default.

Manual update selection only applies when AUTO update is disabled and only if a file has been sent via FTP to the indicator and is waiting to update.

3.   Press **SELECT** …

> The current choice is displayed.

4.   Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice.

> If you choose *no*, no update occurs and *MAnuAL* is displayed. If you choose *YES*, the indicator will update and reboot.

Auto

Update ↓ Manual → Auto

5.   From *MAnuAL*, press **UNITS** …

> *Auto* is displayed. Choices under this are *on*, *PwruP* and *oFF*. Choose *on* (the default setting) and the indicator will update anytime it receives an update via FTP. Choose *PwruP* to have the indicator auto-update on powerup if an update is available. Choose *oFF* to turn auto-update off.

6.   Press **SELECT** …

> The current choice is displayed.

7. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice.

    Auto is displayed.

*If **Auto** = **oFF**, the only way to update the indicator is to use the **MAnuAL** update and select **YES**.*

8. Press TARE …

    uPdAtE is displayed.

6.4.11 Password

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Archive → Serial → App → Update → Passwd

If the ADMIN password is changed, be sure to keep a record of it available for service personnel or they may not be able to perform required maintenance when necessary.

1. From ***uPdAtE***, press **UNITS** …

    PASSWd is displayed. Use this to change the password for the Admin, Diag and Calib menus.

2. Press **SELECT** …

    AdMin is displayed.

3. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice.

    The current password for the chosen menu is displayed.

4. Use the *Numeric entry procedure on page 16* and key in a new password and press **ZERO** to accept it or press **F1** to escape without changing the password.

    The menu name is displayed.

5. Press **TARE** …

    PASSWd is displayed.

6.4.12   Z-Lock

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Archive → Serial → App → Update → Passwd → Z-Lock

1. From *PASSWd*, press **UNITS** …

    Z-LocK is displayed. This stands for zero lock.

    Use this to enable and configure the zero lock feature during an automated weighing process. When enabled, if the scale does not achieve a stable, gross zero condition some time within X minutes (the time you configure), then the indicator locks up and displays a message in three, one second displays: *Z-LocK PrESS ZEro*. The operator must press **ZERO** to unlock the indicator.

2. From *Z-LocK* press **SELECT** …

    EnAbLE is displayed.

3. Press **SELECT** …

    The current setting is displayed: *oFF* or *on*. *oFF* is the default.

4. Press **UNITS** to toggle between the choices and press **ZERO** when your choice is displayed.

    EnAbLE is displayed.

5. Press **UNITS** …

    timE is displayed. Use this to set the time value, in minutes, for this function. 60 minutes is the default

6. Press **SELECT** …

    The current value is displayed.

7. Press **ZERO** to accept the current value or key in a new value and press **ZERO** to accept …

    timE is displayed.

8. Press **TARE** twice …

    SYStEM is displayed.

This completes the System menu. Continue to the next section of the manual to continue with the next menu item, *PortS*.

6.5 Ports

Use the Ports menu to configure the scale communication ports and protocols for connection to external devices. Detailed descriptions are provided in each section below. Refer to Figure 6.6.

Reference *Accessing the menus on page 17*
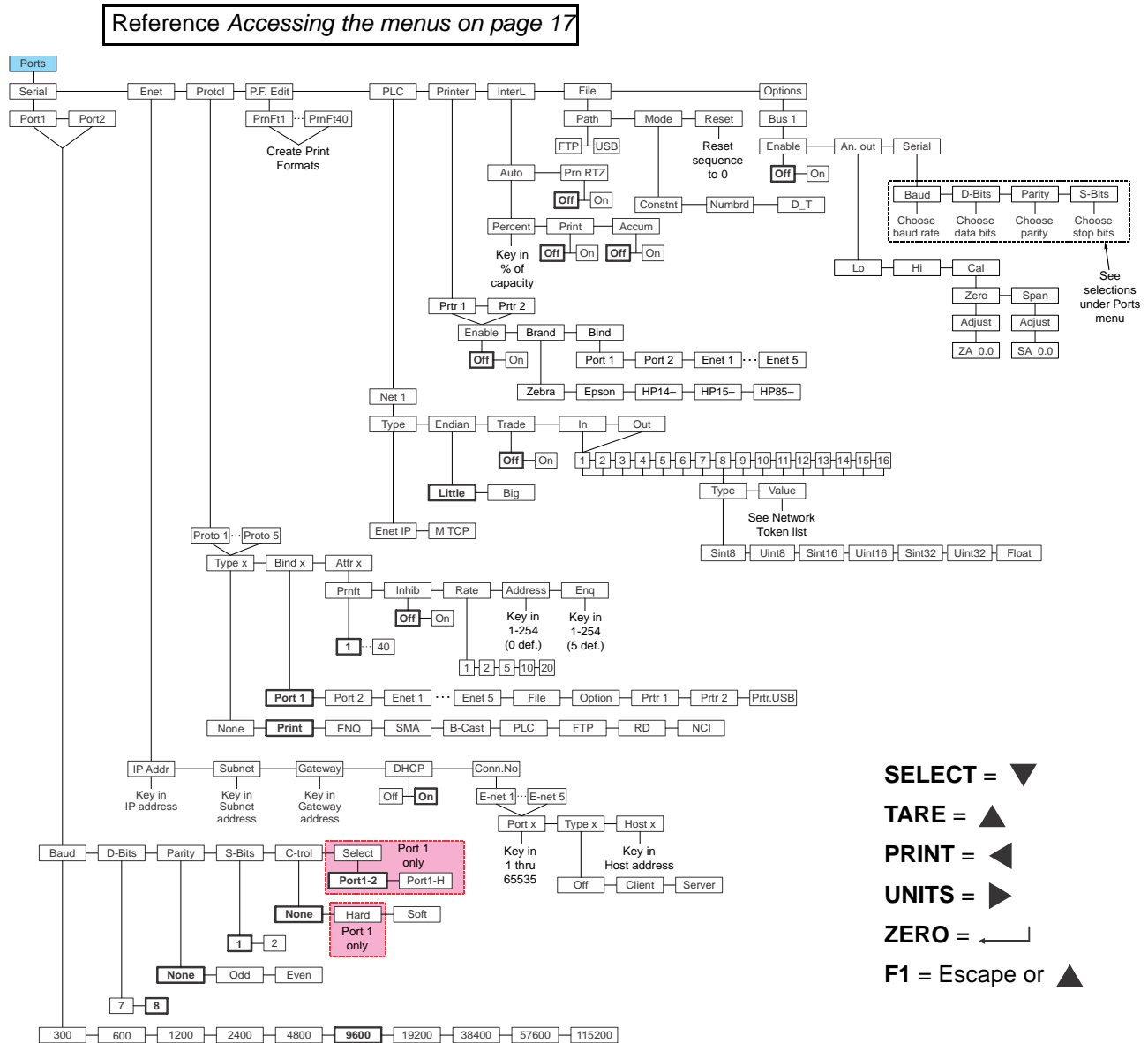
Figure 6.6 Ports menu

Items in bold boxes and text are default values.

With **SYStEM**, displayed, press **UNITS** …

> **PortS** is displayed.

6.5.1   Serial

Ports ↓ Serial

1.   With *PortS* displayed, press **SELECT** …

SErIAL is displayed.

2.   Press **SELECT** …

Port 1 is displayed. Port 1 and Port 2 have the same parameters so they'll only be explained once below. To set up Port 2, press **UNITS** to scroll to *Port 2*.

Baud

Serial ↓ Port ↓ Baud

3.   With *Port 1* or *Port 2* displayed, press **SELECT** …

bAud is displayed. Use this to set the baud rate for the port. Choices are *300*, *600*, *1200*, *2400*, *4800*, *9600*, *19200*, *38400*, *57600* and *115200*. *9600* is the default value.

4.   Press **SELECT** …

The current baud setting is displayed.

5.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

bAud is displayed.

Data Bits

Serial ↓ Port ↓ Baud → D-Bits

6.   Press **UNITS** …

d-bitS is displayed. Use this to set the data bits value for the port. Choices are *7* or *8* and *8* is the default.

7.   Press **SELECT** …

The current setting is displayed.

8.   Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed value …

d-bitS is displayed.

Parity

Serial ↓ Port ↓ Baud → D-Bits→ Parity

9.   Press **UNITS** …

PArity is displayed. Use this to set the parity for the port. Choices are *None*, *Odd* or *Even*.

10. Press **SELECT** …

> The current setting is displayed.

11. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

> *PArity* is displayed.

Stop Bits

Serial ↓ Port ↓ Baud → D-Bits→ Parity→ S-Bits

12. Press **UNITS** …

> *S-bitS* is displayed. Use this to set the stop bits for the port. Choices are *1* or *2*.

13. Press **SELECT** …

> The current setting is displayed.

14. Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed value …

> *S-bitS* is displayed.

Flow control

Serial ↓ Port ↓ Baud → D-Bits→ Parity→ S-Bits→ C-trol

15. Press **UNITS** …

> *c-trol* is displayed. Use this to set the flow control for the port. Choices for Port 1 are *nonE*, *hArd* or *SoFt*. Choices for Port 2 are *nonE* or *SoFt*. Default is *nonE* for both ports.
>
> *hArd* Stands for hardware flow control. If wired, a device can stop the indicator and restart it for transmitting. Example is the CTS signal on a PC serial port or print busy output on a Line or Lister printer.
>
> *SoFt* Stands for software handshaking. This allows a device to start and stop the indicator transmit by sending Xon or Xoff characters.
>
> Port 1 has both *hArd* and *SoFt*. Port 2 does not have hardware handshaking.

Hardware flow control on Port 1 is only available if Port1-H is selected and Jumper P5 is in position 1.

See the photo in section ZM Jumper and Switch settings on page 162.

16. Press **SELECT** …

> The current setting is displayed.

17. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

> *c-trol* is displayed.

Port select

Serial ↓ Port ↓ Baud → D-Bits→ Parity→ S-Bits→ C-trol→ Select

18. Press **UNITS** …

> *SELEct* is displayed. Use this to select Port 1 and Port 2 (*Port1-2*) or just Port 1 with full hardware flow control capability (*Port1-h*).

19. Press **SELECT** …

> The current setting is displayed.

20. Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed value …

> *SELEct* is displayed.

21. This completes the selections for Port 1 and 2. Repeatedly press **TARE** until …

> *SEriAL* is displayed.

6.5.2   Ethernet

Ports ↓ Serial → E-nEt

1. From *SEriAL* display, press **UNITS** …

> *E-nEt* is displayed. Use these menu items to setup the ethernet port.

IP Address

E-nEt ↓ IP Addr

The IP address is the unique address for a device which is part of an Ethernet network. IPv4 is supported by this indicator. The address is a numeric entry in four parts or octets (###. ###. ###. ###).

> *If DHCP setting is **on** (default) the indicated IP address will not apply and will not be available to a static configured network. A DHCP server will issue the network addresses.*

2. From *E-nEt* display, press **SELECT** …

> *iP Addr* is displayed. Use this to key in the static IP address of the indicator.

3. Press **SELECT** …

> The first octet value entry screen is displayed.

4.　Use the *Numeric entry procedure on page 16* and key in the first octet of the IP address and press **ZERO** …

　　The second octet value entry screen is displayed.

5.　Key in the second octet of the IP address and press **ZERO** …

　　The third octet value entry screen is displayed.

Typically devices within a network share the same address for the first three octets (network address) and each device will have a unique setting or value for the fourth octet (device address).

6.　Key in the third octet of the IP address and press **ZERO** …

　　The fourth octet value entry screen is displayed.

7.　Key in the fourth octet of the IP address and press **ZERO** …

　　iP Addr is displayed.

Subnet address

E-nEt ↓ IP Addr → Subnet

The Subnet Mask address is used to divide a network into smaller subnets. The address is a numeric entry in four parts or octets (###. ###. ###. ###).

Typically the subnet mask address is set to 255,255,255,0 which means the first three octets in the device network are the same and only the fourth octet of the IP address is unique for each device.

8.　From *iP Addr* display, press **UNITS** …

　　SubnEt is displayed. Use this to key in the static subnet mask address of the indicator.

9.　Press **SELECT** …

　　The first octet value entry screen is displayed.

10.　Key in the first octet of the subnet address and press **ZERO** …

　　The second octet value entry screen is displayed.

11.　Key in the second octet of the subnet address and press **ZERO** …

　　The third octet value entry screen is displayed.

12.　Key in the third octet of the subnet address and press **ZERO** …

　　The fourth octet value entry screen is displayed.

13.　Key in the fourth octet of the subnet address and press **ZERO** …

　　SubnEt is displayed.

Gateway address

E-nEt ↓ IP Addr → Subnet → Gateway

The Gateway address allows one network a gateway to another network. The address is a numeric entry in four parts or octets (###. ###. ###. ###).

In most simple networks a gateway address is not used and is set to 0,0,0,0. If the indicator is part of a network that uses an access point to another network, then a gateway address may be required. (Consult the site IT specialist)

14.   From *SubnEt* display, press **UNITS** …

> *gAtEWAy* is displayed. Use this to key in the static gateway address of the indicator.

15.   Press **SELECT** …

> The first octet value entry screen is displayed.

16.   Key in the first octet of the gateway address and press **ZERO** …

> The second octet value entry screen is displayed.

17.   Key in the second octet of the gateway address and press **ZERO** …

> The third octet value entry screen is displayed.

18.   Key in the third octet of the gateway address and press **ZERO** …

> The fourth octet value entry screen is displayed.

19.   Key in the fourth octet of the gateway address and press **ZERO** …

> *gAtEWAy* is displayed

DHCP

E-nEt ↓ IP Addr → Subnet → Gateway → DHCP

*If DHCP is enabled **on**, the above settings for the IP, Subnet and Gateway are set by the network server. In applications where the indicator ethernet port is connected directly to a PC, laptop, printer or other non-DHCP device, you must set DHCP to **OFF**.*

20.   From *gAtEWAy* display, press **UNITS** …

> *dhcP* is displayed. Use this to enable or disable DHCP capability. This allows a DHCP server to automatically set the indicator IP, subnet and gateway addresses. Choices are **on** (enabled) or **oFF** (disabled). Default is **on**.

21.   Press **SELECT** …

> The current setting is displayed.

22. Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed value …

> *dhcP* is displayed.

Connection number

E-nEt ↓ IP Addr → Subnet → Gateway → DHCP → Conn.No

23. From *dhcP* display, press **UNITS** …

> *con.no* is displayed. This stands for connection number. This lets you set the *Port*, *tyPE* and *hoSt* for each of 5 (*E-nEt 1* through *E-nEt 5*) Ethernet ports. This allows multiple (up to five) devices to access or control information to/from the indicator. (Referred to as *E-nEt 1* through *E-nEt 5* in Protocol menu)

24. Press **SELECT** …

> *E-nEt 1* is displayed. This is the first connection number. The process for setting the port, type and host is the same for each connection so the process will be explained just once below.

25. Press **SELECT** …

> *Port x* is displayed. You can key any port number from 1 to 65535.

Some port numbers are reserved. Contact your IT department for the correct port number to use.

26. Press **SELECT** …

> A value entry screen is displayed.

27. Use the *Numeric entry procedure on page 16* and key in a port number and press **ZERO** …

> *Port x* is displayed.

28. Press **UNITS** …

> *tyPE x* is displayed. Use this to set the type of connection; *oFF*, *cLiEnt* or *SErVEr*.

*If the Ethernet port connection is to a PLC, the **tyPE** setting must be set to **oFF**.*

*If **tyPE** is set to **oFF**, it disables the selected port from communication to a server or client on the network.*

*The **cLiEnt** selection is typically used when the indicator(s) is connected to a print server or a shared printer on the network.*

*Host IP Address is only used if the **tyPE** setting is **cLiEnt** for this port connection.*

29.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

      tyPE x is displayed.

30.   Press **UNITS** …

      hoSt x is displayed. Use this to enter the host IP address

31.   Press **SELECT** …

      The first value entry screen is displayed.

32.   Key in the first octet of the host IP address and press **ZERO** …

      The second value entry screen is displayed.

33.   Key in the second octet of the host IP address and press **ZERO** …

      The third value entry screen is displayed.

34.   Key in the third octet of the host IP address and press **ZERO** …

      The fourth value entry screen is displayed.

35.   Key in the fourth octet of the host IP address and press **ZERO** …

      hoSt x is displayed.

36.   Press **TARE** to return to *E-nEt x*. If another connection is required, press the **UNITS** key to scroll to the next *E-nEt x* and repeat the above steps.

37.   Repeatedly press **TARE** until …

      E-nEt is displayed. This completes the ethernet portion of the Ports menu.

6.5.3   Protocol

Ports ↓ Serial → E-nEt → ProtcL

1.   With ***E-nEt*** display, press **UNITS** …

ProtcL is displayed. Use this to configure up to 5 communication protocols. These protocols define the information sent to and from specific types of communication equipment.

Each protocol you will set the type, the binding and the attributes.

Type x -   In this item you choose the method to send and receive data for Protocol x, where x = 1 to 5: Print, Enquire, SMA, Broadcast, PLC, FTP, RD, NCI and none.

Bind x -   In this item you choose the physical connection, or hardware, for the communication for Protocol x: Port 1, Port 2, Ethernet 1 through Ethernet 5, File, Option Card, Printer 1, Printer 2, or Printer-USB. Some Bindings will not apply for certain Type selections.

***Attr x*-**   In this item you choose the print format and other properties that are required for the Type and Binding selected for Protocol x. Some attributes will not apply for certain Types or Binding combinations.

Which Attributes and Bindings apply to the selected Type will be described in the detailed descriptions below.

2.   Press **SELECT** …

Prot 1 is displayed. There are 5 protocols available by scrolling through the list with the **UNITS** key. Each has the same choices so the process will be explained just once below.

Type x

Protcl ↓ Prot x → Type x

3.   From **Prot x**, press **SELECT** …

> **tyPE x** is displayed. This is to set the method of communication for **Prot x**. The choices are:

> **nonE**   Choose this to disable the selected protocol.

> **Print**   Choose this when you want to press the **PRINT** key or when using Autoprint to send the data through the selected binding (Port) using the associated attributes.

> **Enq**,   Choose this to send data when the indicator receives the configured enquire code from an external device. The information will be sent through the selected binding using the associated attributes. See *ENQ & B-Cast commands on page 102*.

> **SMA**   Choose this to send and receive data when using the SMA (Scale Manufacturers Association) protocol. See *SMA Protocol Level 1 on page 98*. The information will be sent through the bound port using attributes that are pre-defined by the SMA protocol.

> **b-cASt**   Choose this to send data continuously through the selected binding using the associated attributes. Typical use is for remote scoreboards, displays and the Analog output option if installed. See *ENQ & B-Cast commands on page 102*.

> **PLC**   Choose this to send and receive data to/from a PLC network. A binding of Enet x (1 thru 5) is required. The attributes are established using the PLC menu described later in this manual.

> **FtP**   Choose this to send data via FTP. A binding of Enet x (1 thru 5) is required. The Rate attribute determines the time (in minutes) between attempted FTP updates. A second Protocol is required to complete the FTP setup. This additional protocol requires a Type x = PRINT, Bind x = File and Attributes x will need a Print Format. Also, set File Path = FTP and define the File Mode (File naming convention) in the File menu described later in this manual.

> **rd**   Choose this to use the indicator as a remote display. When set as a remote display, the indicator will only function as a remote display for the connected primary indicator which is connected to the weighing platform.

RD (remote display) requires selection of a port for Binding to the primary display. Choices include Port 1, Port 2 or E-Net 1 thru 5. Additional settings are detailed in the User manual. Contact your local Avery Weigh-Tronix representative for information on setting up the indicator as a Primary or Secondary indicator.

See *R-Disp commands on page 103*.

> ***nci*** Choose this to use the NCI communication protocol. See *NCI commands on page 103*.

4. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

> ***tyPE x*** is displayed.

Bind x

Protcl ↓ Prot x → Type x → Bind x

5. Press **UNITS** …

> ***bind x*** is displayed. This is the hardware the protocol is bound to. The ***x*** is a reminder of which protocol you are in. The choices are ***Port 1***, ***Port 2***, ***E-nEt 1 - E-nEt 5***, ***FiLe***, ***oPtion***, ***Prtr 1***, ***Prtr 2*** and ***Prtr.uSb***.

6. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

> ***bind x*** is displayed.

Attribute x

Protcl ↓ Prot x → Type x → Bind x → Attr x

7. Press **UNITS** …

> ***Attr x*** is displayed. Use this to set the properties for protocol x. The ***x*** is a reminder of which protocol you are in. The choices are ***PrnFt***, ***inhib***, ***rate***, ***AddrESS***, and ***Enq***.
>
> > ***PrnFt***, Choose a print format from the documented list. Key in the format number. Print format ***1*** is the default.
> >
> > ***inhib*** This is motion inhibit. Choose ***on*** to enable or ***oFF*** to disable. If enabled, data transmission or file creation will be inhibited until there is no motion on the scale or until the process times out. ***oFF*** is the default.
> >
> > ***rAtE*** This is the transmit rate associated with broadcast type. Choices are ***1***, ***2***, ***5***, ***10*** or ***20*** Hz. ***5*** Hz is the default.
> >
> > ***AddrESS*** Key in the node address if using an RS-485 option in a multidrop network. Choices are ***1*** to ***254***.
> >
> > ***Enq*** Key in the enquire character used to request a print function to occur from the communications port. Choices are ***1*** to ***254***. ***5*** is the default value (ASCII ENQ character).

8. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

> ***Attr x*** is displayed.

9. Press **TARE** …

> ***Prot x*** is displayed.

10.   Repeat this process (steps 2 - 9) for each protocol you want to configure.
       When finished press **TARE** repeatedly until …

               Protcl is displayed. This completes the settings in the Protocol menu.

6.5.4   P.F.Edit

Ports ↓ Serial → E-net → Protcl → P.F.Edit

From ***Protcl***, press **UNITS** …

               P.F.Edit is displayed. This stands for print format editor. Please refer to
               the section *Print formatting on page 123* for the procedures to edit or
               create print formats.

6.5.5   PLC

Ports ↓ Serial → E-net → Protcl → P.F.Edit → PLC

*If connecting to a PLC, the E-NET configuration menu does not require any special
configuration and the Client/Server selection for **tYPE** setting must be set to **oFF**.*

1.   With ***P.F.Edit*** displayed, press **UNITS** …

               PLc is displayed. Use this to setup a programmable logic controller
               connected to the indicator.

Net 1

PLC ↓ Net 1

2.   Press **SELECT** …

               nEt 1 is displayed. There is only 1 network so continue to the next step.

Type

PLC ↓ Net 1 → Type

3.   Press **SELECT** …

               tYPE is displayed. In this item you can choose; ***EnEt iP*** or ***M tcP***.
               Choose ***EnEt iP*** to enable Ethernet IP. Choose ***M tcP*** to enable
               Modbus-TCP.

4.   Press **SELECT** to see the first choice, then press **PRINT** or **UNITS** to toggle
       between the choices and press **ZERO** to accept the displayed choice …

               tYPE is displayed.

Endian

PLC ↓ Net 1 → Type → Endian

5.   Press **UNITS** …

> *EndiAn* is displayed. Choices for this item are *big* or *LittLE*. Default is *LittLE*.

ENDIAN:
Big = Most Significant Byte, Least Significant Byte
Little = Least Significant Byte, Most Significant Byte

6.   Press **SELECT** to see the first choice, then press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

> *EndiAn* is displayed.

Trade

PLC ↓ Net 1 → Type → Endian → Trade

7.   Press **UNITS** …

> *trAdE* is displayed. This stands for word swap or trade configuration. Choices for this item are *on* or *oFF*. Default is *oFF*.

TRADE: On = WORD2,WORD1
Off = WORD1,WORD2

8.   Press **SELECT** to see the first choice, then press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed value …

> *trAdE* is displayed.

The PLC configuration determines the appropriate indicator settings for Endian and Trade.

In

PLC ↓ Net 1 → Type → Endian → Trade → In

9.   Press **UNITS** …

> *in* is displayed. This stands for inbound data configuration. You will first select one of the 16 memory registers available for inbound data. Then you will select the data type and then the network token you want assigned to that memory register.

10.   Press **SELECT** …

> *in 1* is displayed. This is the first of 16 inbound data configuration memory registers.

11.   Press **PRINT** or **UNITS** to scroll through the choices and press **SELECT** …

> *tyPE* is displayed. Below is a table showing the choices for the Type, a description and a range of values for that data type.

Type	Description	Range of Value
SINT8 - 1 byte	Signed Character	-127 to 127
UINT8 - 1 byte	Unsigned Character	0 to 255
SINT16 - 2 bytes	Signed Integer	-32767 to 32767
UINT16 - 2 bytes	Unsigned Integer	0 to 65535
SINT32 - 4 bytes	Signed Long	-2,147,483,647 to 2,147,483,647
UINT32 - 4 bytes	Unsigned Long	0 to 4,294,967,295
Float - 4 bytes	Floating Point	1.0×10^{-37} to 1.0×10^{37}
Double - 8 bytes	Double precision floating point	1.0×10^{-1023} to 1.0×10^{1023}

12.   Press **SELECT** …

> *Sint* is displayed. This is the first choice in the list shown in the left column of the table above.

13.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice …

> *tyPE* is displayed.

The Type and order of the Values selected must coincide with the configuration of the PLC register setup. Consult with the site IT specialist.

14.   Press **UNITS** …

> *VALuE* is displayed. This stands for the network token value to be assigned to the inbound data memory register.

15.   Press **SELECT** …

> The value entry screen is displayed.

16.   Key in the value for the network token you want from the table above and press **ZERO** to accept the displayed choice …

> *VALuE* is displayed.

17.   Press **TARE** …

> *in 1* is displayed.

18.   Repeat the process from step 11 to 17 for any other inbound memory registers you want to configure. Press **TARE** to return to the *in* menu item …

> *in* is displayed.

Out

PLC ↓ Net 1 → Type → Endian → Trade → In → Out

19.   Press **UNITS** …

> *out* is displayed. This stands for outbound data configuration. This menu
> item is exactly like the *in* menu item except it is for outbound data.
> Follow the same process to set up the 16 memory registers.

20.   Press **TARE** repeatedly until *PLc* is displayed.

6.5.6   Printer

Ports ↓ Serial → E-nEt → ProtcL → P.F.Edit → PLC → Printer

> *The PrintEr menu is used when the indicator is interfaced with one of the printers
> listed in the brAnd submenu. This is necessary to ensure all the appropriate control
> codes are added to the selected print format.*
>
> *If either PRTR1 or PRTR2 selections are enabled then the port that is Binded may
> occasionally send out a set of random characters to test for a connected printer. Be
> sure to disable these settings if the indicator is not connected to one of the printer
> brands listed.*

1.   With *PLc* displayed, press **UNITS** to continue to the next menu parameter …

> *PrintEr* is displayed.

2.   Press **SELECT** …

> *Prtr 1* is displayed. You can choose to set up this printer or *Prtr 2*. The
> setup procedure is the same. Follow these steps for both:

Enable

Printer ↓ Prtr 1 ↓ Enable

3.   Press **SELECT** …

> *EnAbLE* is displayed. Choice under this item are *oFF* (default) or *on*.

4.   Press **SELECT** …

> The current setting is displayed.

5.   Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to
      accept the displayed choice …

> *EnAbLE* is displayed.

Brand

Printer ↓ Prtr 1 ↓ Enable → Brand

6.   Press **UNITS** …

> ***brAnd*** is displayed. Choices under this item are the five printer models supported by this indicator: ***ZEbrA***, ***EPSnPoS***, ***hP 14--***, ***hp15--*** and ***hp85--***.

7.   Press **SELECT** …

> The current model is displayed.

8.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice …

> ***brAnd*** is displayed.

Bind

Printer ↓ Prtr 1 ↓ Enable → Brand → Bind

9.   Press **UNITS** …

> ***bind*** is displayed. Choices under this item are: ***Port 1***, ***Port 2*** and ***EnEt 1*** through ***EnEt 5***. Choose which port the printer output is attached to.

10.   Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice …

> ***bind*** is displayed.

11.   Press **TARE** twice …

> ***PrintEr*** is displayed. This completes the settings in the ***PrintEr*** menu.

6.5.7   Interlock

Ports ↓ Serial → E-nEt → ProtcL → P.F.Edit → PLC → Printer → Interl

1.   With ***PrintEr*** displayed, press **UNITS** to continue to the next menu parameter …

> ***intErL*** is displayed. This stands for Interlock. Under this item you can setup autoprint and print-return-to-zero parameters which are interlocked with weight values.

Autoprint

Interl ↓ Auto

2.   Press **SELECT** …

> ***Auto*** is displayed. This is the autoprint parameter. Under this parameter you can key in a scale capacity percentage (0.0-100.0), above which the indicator will perform a print function. You can also enable or disable this function.

3.   Press **SELECT** …

> ***PErcEnt*** is displayed.

4.　　Press **SELECT** …

　　　　The numeric entry screen is displayed.

5.　　Use the *Numeric entry procedure on page 16* and key in the percent of scale capacity above which the indicator will do an autoprint function. Press **ZERO** to accept …

　　　　PErcEnt is displayed.

The displayed weight must drop below the Autoprint percentage to re-arm the Autoprint operation

Type = Print must be selected in the Protocol menu for Autoprint to function.

6.　　Press **UNITS** to continue to the next menu parameter …

　　　　Print is displayed. Use this to enable or disable autoprinting. Choices are ***on*** or ***oFF***. If enabled and a percentage is set in the other parameter, autoprinting will occur. If disabled, autoprinting will not occur even if a percentage is entered.

7.　　Press **SELECT** …

　　　　The current setting is displayed.

8.　　Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice …

　　　　Print is displayed.

9.　　Press **UNITS** to continue to the next menu parameter …

　　　　AccUm is displayed. Use this to enable or disable auto-accumulation. Choices are ***on*** or ***oFF***. If enabled and a percentage is set in the other parameter, auto-accumulation will occur. If disabled, auto-accumulation will not occur even if a percentage is entered.

10.　　Press **SELECT** …

　　　　The current setting is displayed.

11.　　Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice …

　　　　AccUm is displayed.

12.　　Press **TARE** …

　　　　Auto is displayed.

Print - Return to Zero

Interl ↓ Auto → Prn Rtz

13.   Press **UNITS** to continue to the next menu parameter …

> ***Prn rtZ*** is displayed. Choices for this item or ***oFF*** or ***on***. This stands for
> Print - Return to Zero. If set to ***on***, the weight on the scale must fall into
> the gross zero band before the next weighment can be printed. ***oFF*** is
> the default value.

14.   Press **SELECT** …

> The current setting is displayed.

15.   Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to
accept the displayed choice …

> ***Prn rtZ*** is displayed.

16.   Press **TARE** …

> ***intErL*** is displayed.

6.5.8   File

Ports ↓ Serial → E-nEt → ProtcL → P.F.Edit → PLC → Printer → Interl → File

1.   Press **UNITS** to continue to the next menu parameter …

> ***FiLE*** is displayed. Use this item to configure how and where files are
> saved.

Path

File ↓ Path

2.   Press **SELECT** …

> ***PAth*** is displayed. Use this item to choose where the file is saved,
> internally for transfer by ***FtP*** using an Ethernet port or to a connected
> ***USb*** flash drive.

3.   Press **SELECT** …

> The current setting is displayed.

4. Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice …

>   *PAth* is displayed.

When the FILE > PATH is set for USB, a USB flash drive can be installed into the USB Host port and transactions will be transferred to the flash drive as they occur. If the flash drive is not installed, transactions will be saved onto the Flash memory in the indicator.

*The size of the print format will determine the number that can be stored but with a typical print format the indicator should be capable of storing several thousand transactions. The saved transactions will transfer immediately when the USB flash drive is re-installed. The message **CoPYing** will display as each stored file is transferred to the flash drive. If using the d_t file mode this could take a few seconds to transfer each file. Do not remove the flash drive until the message **donE** is finally displayed. Stored transactions will then be cleared after the transfer.*

Mode

File ↓ Path → Mode

5. Press **UNITS** to continue to the next menu parameter …

>   *ModE* is displayed. Use this item to configure the file convention;

conStAnt	This will create a single file that will be appended to as new information is saved.
nuMbrd	This will create new file appended with a sequential number for each transaction.
d_t	This will create a new file and the file name will be appended with the date and time (including seconds) for each transaction.

Filename Examples:
<MODEL>_<SERIAL>XXXXXX.txt
where <MODEL> is the model number, <Serial> is the serial number, XXXXXX is either nothing, the sequential number, or the time and date.

Sequential number increments from 000001 – 999999 …. when RESET starts at 000001

Date = YYYY_MM_DD__HH_MM_SS
with double underscore between DD and HH

Examples:
Constant: ZM301_120450001.txt
Numbered: ZM301_120450001_000001.txt
D_T: ZM301_120450001_2012_01_31__10_31_23.txt

If transactions are being store on the indicator Flash memory, only a single Constant or Numbered file will be created. If using the Date & Time file naming convention then individual files will be created.

6.   Press **SELECT** …

> The current setting is displayed.

7.   Press **PRINT** or **UNITS** to scroll through the three choices and press **ZERO** to accept the displayed choice …

> ***ModE*** is displayed.

Reset

File ↓ Path → Mode → Reset

8.   Press **UNITS** to continue to the next menu parameter …

> ***rESEt*** is displayed. Reset will clear all stored transactions and also reset the numbered file sequence to 000001.

9.   Press **SELECT** …

> Any stored transaction will be cleared and the numbered sequence is restarted at 000001. ***rESEt*** is displayed.

10.   Press **TARE** …

> ***FiLE*** is displayed.

6.5.9   Options

Ports ↓ Serial → E-nEt → ProtcL → P.F.Edit → PLC → Printer → Interl → File > Options

1.   With ***FiLE*** displayed, press **UNITS** to continue to the next menu parameter …

> ***oPtionS*** is displayed. Use this parameter to enable any of the available option cards, to configure the Analog output card or setup the serial port settings for the Current Loop/RS485/RS422 communication card.

Bus 1

Options ↓ Bus 1

2.   Press **SELECT** …

> ***buS 1*** is displayed. There is only 1 bus available on this indicator so continue to the next step.

Enable

Options ↓ Bus 1 ↓ Enable

3.   Press **SELECT** …

> ***EnAbLE*** is displayed. Use this to enable the installed option card. The cards available for the indicator are:
>
> ● Analog output card
> ● 802.11 wireless card (see note below)
> ● Serial RS-485/20mA card

● USB-D(evice) card.

Choices are *oFF* (default) or *on*. *oFF* will disable the installed card and *on* will enable it.

4. Press **SELECT** …

> The current setting is displayed.

5. Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice …

> *EnAbLE* is displayed.
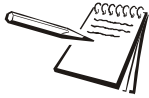
The Analog Output, Serial RS485/20ma and USB-D options require a Prot X > Bind X setting of OPTION along with the desired Type X and Attr X > PrnFt settings.

The 802.11 wireless option requires the same settings as an Ethernet port. Refer to the Ethernet menu for details. Wireless communication will also require a Prot X >Bind X setting of E-Net X based on the Ethernet menu setup along with the desired Type X and Attr X > PrnFt settings.

The use of the Ztools configuration software tool is also necessary to configure the security and SSID settings.

An.out

Options ↓ Bus 1 ↓ Enable → An.out

The Protocol and Print Format menus are used to configure the analog output. Typical settings would be:
Prot X
  Type X = B-cast
  Bind X = Option
  Attr X Prnft = 32 for displayed value output, Rate = 20 for maximum update speed of the analog output signal

Refer to Option module pin assignments, jumpers and switches (continued) on page 164 for jumper configuration settings on the analog option.

6. Press **UNITS** to continue to the next menu parameter …

> *An.out* is displayed. This stands for the Analog output option card. This card allows you to output voltage or current to an external device that increases in direct proportion to the value on the indicator display. Use this menu item to configure the analog output option.

7. Press **SELECT** …

> *Lo* is displayed. Use this to set the display value which is equal to the lowest analog output.

8. Press **SELECT** …

> Current value is displayed.

9.   Key in a value (negative values can be entered) and press **ZERO** …

Lo is displayed.

10.   Press **UNITS** …

hi is displayed. This is the display value at which the analog output will be at maximum. The value entered can be between 0 and the maximum number of the displayed value.

CAUTION: The output will run to the minimum value when a fault occurs and when you enter the Setup menus, so plan accordingly!

11.   Press **SELECT** …

Current value is displayed.

12.   Use the *Numeric entry procedure on page 16* and key in a value and press **ZERO** …

hi is displayed.

13.   Press **UNITS** …

cAL is displayed. Use this to calibrate the analog output.

Always perform the ZERO adjustment prior to the SPAN adjustment procedure.

14.   Press **SELECT** …

ZEro is displayed. Use this to set the analog output zero point.

15.   Press **SELECT** …

AdJuSt is displayed and then *ZA x.x*. The value, **x.x**, is only a reference number used for calibrating the zero output and not representative of the actual voltage or current output to the external device. The value shown is the offset adjustment for Zero. The allowable adjustment setting is from -50.0 to 50.0 and provides sufficient range for any necessary Zero offset compensation.

When setting the ZERO adjustment it is recommended that you approach from the positive side of zero.

Example: On a 4 - 20ma adjustment, make the necessary adjustments until you are just slightly above 4.00ma and then only press the SELECT key until the external device finally reads 4.00ma and then do not press SELECT again as this may cause non-linear readings at intermediate weight values.

16. To adjust the zero output up or down by small increments, press **TARE** or **SELECT**, respectively. To adjust the zero output up or down by large increments, press **PRINT** or **UNITS**, respectively. When you are done, press **ZERO**.

> *ZEro* is displayed.

17. Press **UNITS** …

> *SPAn* is displayed. Use this to set the analog output span point.

18. Press **SELECT** …

> *AdJuSt* is displayed and then *SA xx.x*. The value, *x.x*, is only a reference number used for calibrating the span output and not representative of the actual voltage or current output to the external device. The value shown is the offset adjustment for span. The allowable adjustment setting is from 50.0 to 150.0 and provides sufficient range for any necessary span offset compensation.

When setting the SPAN adjustment it is recommended that you approach from the low side of the span value.

*Example: On a 4 - 20ma adjustment, make the necessary adjustments until you are just slightly below 20.00ma and then only press the **TARE** key until the external device finally reads 20.00ma and then do not press **TARE** again as this may cause non-linear readings at intermediate weight values.*

19. Repeat the procedure in step 16 to adjust the span.

20. Press **TARE** …

> *An.out* is briefly displayed as the span point is set then *ZEro* is displayed.

21. Press **UNITS** …

> *SPAn* is displayed. Use this to set the analog output span point.

22. Repeatedly press **TARE** until …

> *An.out* is displayed.

Serial

Options ↓ Bus 1 ↓ Enable → An.out → Serial

23. From *An.out*, press **UNITS** to advance to the next menu item …

> *SEriAL* is displayed. Use this item to configure communication protocol for those options cards that require it.

24. Press **SELECT** …

> *bAud* is displayed. Use this to set the baud rate.

25. Press **SELECT** …

> The current baud rate is displayed.

26.   Press **UNITS** or **PRINT** to scroll through the choices. Press **SELECT** when your choice is displayed …

    bAud is displayed.

27.   Press **UNITS** …

    d-bits is displayed. Use this to set the data bits.

28.   Press **SELECT** …

    The current data bit value is displayed.

29.   Press **UNITS** to toggle between the choices: *7* or *8*. Press **SELECT** when your choice is displayed …

    d-bits is displayed.

30.   Press **UNITS** …

    PAritY is displayed. Use this to set the parity.

31.   Press **SELECT** …

    The current data bit value is displayed.

32.   Press **UNITS** or **PRINT** to scroll through the choices: ***nonE***, ***odd*** or ***EVEn***. Press **SELECT** when your choice is displayed …

    PAritY is displayed.

33.   Press **UNITS** …

    S-bitS is displayed. Use this to set the stop bits.

34.   Press **SELECT** …

    The current stop bit value is displayed.

35.   Press **UNITS** to toggle between the choices: *1* or *2*. Press **SELECT** when your choice is displayed …

    S-bitS is displayed.

36.   Press **TARE** repeatedly until …

    PortS is displayed.

This completes the Ports menu. Continue to the next section for the next item in the Setup menu.

6.6 Inputs

There are three inputs in the indicator. Use this menu to enable or disable each input. Figure 6.7 shows the Inputs menu.

SELECT = ▼
TARE = ▲
PRINT = ◄
UNITS = ►
ZERO = ↵
F1 = Escape or ▲
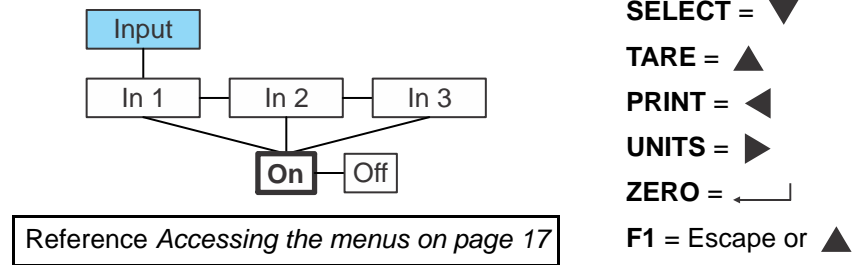
Figure 6.7 Inputs menu

1.   With *PortS* displayed, press **UNITS** …

   inPut is displayed.

2.   Press **SELECT** …

   in 1 is displayed.

3.   Press **SELECT** …

   The current setting is displayed: *oFF* or *on* (default).

4.   Press **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice …

   in 1 is displayed.

5.   Press **UNITS** …

   in 2 is displayed.

6.   Repeat the process for enabling or disabling input 2 and input 3.

7.   When finished press **TARE** until …

   inPut is displayed.

8.   Press **UNITS** …

   outPut is displayed.

The function of an input that is ON is defined in the Supervisor menu. Refer to the User manual for instructions.

6.7 Outputs

There are three outputs in the indicator. Use this menu to enable or disable each output. Figure 6.8 shows the Outputs menu.

SELECT = ▼
TARE = ▲
PRINT = ◄
UNITS = ►
ZERO = ↵
F1 = Escape or ▲
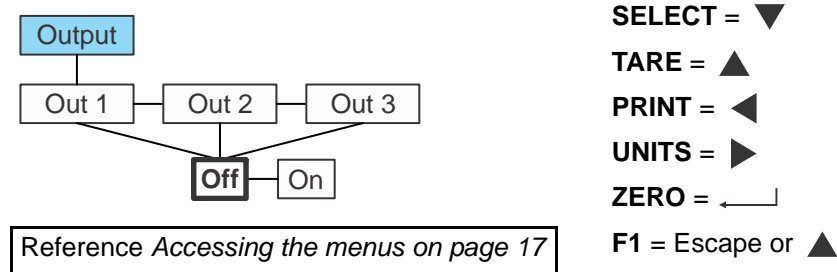
Figure 6.8 Outputs menu

Outputs are defaulted OFF. This disables the physical output and also the SPx annunciators on the display. If connecting external relays, lights or other control devices to the TB2 terminal in the indicator you must enable these ON.

1.   With *outPut* displayed, press **SELECT** …

    out 1 is displayed.

2.   Press **SELECT** …

    out 1 is displayed.

3.   Press **SELECT** …

    The current setting is displayed: *oFF* or *on* (default).

4.   Press **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice …

    out 1 is displayed.

5.   Press **UNITS** …

    out 2 is displayed.

6.   Repeat the process for enabling or disabling output 2 and output 3.

7.   When finished press **TARE** until …

    outPut is displayed.

The function of an output that is ON is defined in the Supervisor menu. Refer to the User manual for instructions.

This completes the service menus for the ZM301 indicator. See *Exiting the menus on page 20* to save the setup and return to normal weigh mode.

7 Communication port protocols

7.1 SMA Protocol Level 1

Sent	Action	Response
<LF>W<CR>	Weight of the current scale is return.	Standard response (displayed weight)
<LF>P<CR>	Indicator attempts to capture a stable weight on the current scale.	Standard response (displayed weight). W eight is returned as center dashes < ------ > if a stable weight cannot be
<LF>Z<CR>	Indicator attempts to zero the current scale.	Standard response (displayed weight)
<LF>T<CR>	Indicator attempts to tare the current scale.	Standard response (displayed weight)
<LF>T<xxxxxx.xxx><CR>	The indicator attempts to set the current scale's tare weight to the value that was sent.	Standard response (displayed weight)
<LF>M<CR>	The indicator returns the current scale's Tare weight.	Standard response (tare weight)
<LF>C<CR>	The indicator sets the current scale's Tare weight to zero.	Standard response (gross weight)
<LF>U<CR>	The indicator will cycle the unit of measure on the current scale	Standard response (displayed weight)
<LF>U<uuu><CR>	The indicator will set the unit of measure to <uuu> on the current scale.	Standard response (displayed weight)
<LF>D<CR>	The indicator will return a diagnostic message.	<LF><r><e><c><m><CR> <r> = 'R' (RAM error) or ' ' (space) (RAM ok) <e> = 'E' (EEPROM
<LF>A<CR>	The indicator will respond with the first line of the About data.	See "About Command Response" (below)
<LF>B<CR>	The indicator will respond with the rest of the About data.	See "About Command Response" (below)
<LF>I<CR>	The indicator will respond with the first line of the scale Information data. (for the current scale)	See "Scale Information Command Response" (below)
<LF>N<CR>	The indicator will respond with the rest of the scale Information data. (for the current scale)	See "Scale Information Command Response" (below)
<ESC>	The indicator will reboot itself	None

SMA protocol is maintained by an external organization. For definitive and current details on this protocol go to www.scalemanufacturers.org.

7.1.1 Standard Scale Response Message

<LF><s><r><n><m><f><xxxxxx.xxx><uuu><CR>

<LF>	Line feed	Start of the response message.
<s>	Scale Status	'Z' Center of Zero
		'O' Over Capacity
		'U' Under Capacity
		'E' Zero Error
		'T' Tare Error
		<space> None of the above conditions.

<r>   range   Multi-interval range. Always '1' if multi-interval is disabled.

<n>	gross/net status	'G' = Gross weight
		'T' = Tare weight
		'N' = Net weight
<m>	Motion status	'M' = scale is in motion
		<space> = scale is stable
<f>	Future use	<space> = always a space.

7.1.2 Unrecognized Command Response

<LF>?<CR>

7.1.3 About Command Response

The 'A' and 'B' commands are used together to get all of the scale about data. The 'A' command will always return the 1st response below. The 'B' command must be sent multiple times to get the 2nd, 3rd, and 4th responses. Once the 4th response is received, the next 'B' command will return an Unrecognized Command Response. At this point you would have to send another 'A' command to get the 1st response again.

<LF><xxx>:<yyyyy><CR>

1st response: <xxx> = "SMA"
                 <yyyyy> = compliance level/revision

2nd response: <xxx> = "MFG"
                 <yyyyy> = manufacturer

3rd response: <xxx> = "MOD"
                 <yyyyy> = software part number

4th response: <xxx> = "REV"
                 <yyyyy> = software revision

7.1.4 Scale Information Command Response

The 'I' and 'N' commands are used together to get all of the scale information data. The 'I' command will always return the 1st response below. The 'N' command must be sent multiple times to get the 2nd, 3rd, 4th, 5th, and 6th responses. Once the 6th response is received, the next 'N' command will return an Unrecognized Command Response. At this point you would have to send another 'I' command to get the 1st response again.

<LF><xxx>:<yyyyy><CR>

1st response: <xxx> = "SMA"
                <yyyyy> = compliance level/revision

2nd response: <xxx> = "TYP"
                <yyy> = 'S'

3rd response: <xxx> = "CAP"
                <yyyyy> = uuu:ccc:n:d where
                        uuu = unit of measure
                        ccc = capacity of the range lower range (capacity of the scale is multi-interval is disabled)
                        n = least significant count-by digit for this range
                        d = decimal point position for this range
                        '0' = none
                        '1' = xxxx.x
                        '2' = xxx.xx
                        etc.

4th response: <xxx> = "CAP"
                <yyyyy> = uuu:ccc:n:d where
                        uuu = unit of measure
                        ccc = capacity of the range upper range (4th response will not be sent if multi-interval is disabled)
                        n = least significant count-by digit for this range
                        d = decimal point position for this range
                        '0' = none
                        '1' = xxxx.x
                        '2' = xxx.xx
                        etc.

5th response: <xxx> = "CMD"
                <yyyyy> = "PTMCU" list of supported SMA commands.
                Level 1 commands are not included in the list.

6th response: <xxx> = "END"
                <yyyyy> = nothing

7th & more -
responses: Subsequent N commands will return a '?' response. Unrecognized Command Response

7.2   SMA Level 2

7.2.1   Level 2 commands

SMA Level 2 command/response protocol allows use of the same Network Tokens shown in Network Tokens on page 107. Tokens from 1001 and above are supported. Many of the other values represented by tokens 1 to 999 are available using SMA level 1 commands.

<LF>XA<CR>   This will initiate an Accumulate command. If the indicator is in ACCUM or COUNT app it will perform an Accumulation transaction if all required conditions are met.

The command will also perform the same function as pressing the **PRINT** key on the front panel. Response will be to any communication ports that are binded to a Type = Print. The port that initiated the command will also receive an <LF>xa<CR> response.

<LF>XB<CR>   This will initiate a PRINT command. The command will also perform the same function as pressing the **PRINT** key on the front panel. Response will be to any communication ports that are binded to a Type = Print. The port that initiated the command will also receive an <LF>xb<CR> response.

<LF>XVS<n>:<value><CR>   The indicator will set the <value> of the variable specified by the Network token. A valid XVS command will receive a response of <LF>xvs<CR>. To verify an XVS command was successful requires sending the XVG command to confirm the value of the variable.

To set Out 1 value to 10.5 lb, send
<LF>XVS1004:10.5<CR>

To tell the indicator to use Tare register 2, send
<LF>XVS1002:2<CR>

<LF>XVG<n><CR>   The indicator will get or return the value of the variable specified by the network token. A valid response is in the form of <value><CR>.

To get the Out 1 value, send
<LF>XVG1004<CR>
10.500000 will be returned. Integer type variables will return integer values.

The XVS and XVG commands use lb for the unit of measure.

If multiple indicators are connected on a RS485 multi-drop network, each will have a unique address. The network device can use SMA protocol to communicate to individual indicators by adding the indicator address <addr> following the initial <LF> character to any of the SMA level 1 or 2 commands. As an example the standard weight command would be <LF><addr>W<CR>. The response will also include the indicator address value following the initial <LF><addr>... See Standard Scale Response Message on page 99 for details.

7.3 ENQ & B-Cast commands

A	ACCUM command	"If ACCUM APP is active this command will generate an accumulation transaction, but it does not perform the print function"
P	PRINT command	"Performs same function as pressing the **PRINT** key. All Ports that are binded with PRINT type will transmit the assigned print format"
S	SELECT command	Performs same function as pressing the **SELECT** key
T	TARE command	Performs same function as pressing the **TARE** key
U	UNITS command	Performs same function as pressing the **UNITS** key
Z	ZERO command	Performs same function as pressing the **ZERO** key
F	F1 command	Performs same function as pressing the **F1** key

Upper or lower case characters will perform the same function.

7.4   NCI commands
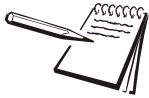
Refer to AWTX Control Document SCP-01 for complete details on NCI command protocol.

W <Cr>	Weight request	Returns decimal weight, units and status
S <Cr>	Status request	Returns status.
Z <Cr>	Zero request	Scale is Zeroed and returns scale status
H <Cr>	High Resolution Weight request	"Returns decimal wt in 10x or x100 resolution with units and status. For x100 resolution set the associated PROT > ATTR > ENQ menu value to 100. For all other values the H command will return x10 resolution"
U <Cr>	Units request	Changes unit of measure and then returns decimal weight in the new units with status.
M <Cr>	Metrology Raw Counts request	Returns normalized raw counts and scale status.
T <Cr>	Tare request	Scale is Tared and returns scale status.
all else	Unrecognized command	Returns <Cr> ? <Lf>

7.5   R-Disp commands

Incoming commands from the Master indicator that control the Remote display annunciators		
G	Gross	Change to Gross weight mode
N	Net	Change to Net weight mode
T	Tare	Change to Tare weight mode
l	lb	Change to lb
k	kg	Change to kg
0	oz	Change to oz
g	grams	Change to grams

Outgoing key press commands from the Remote display that control the Master indicator operation.	
T	TARE
S	SELECT
Z	ZERO
P	PRINT
U	UNITS
F	F1

Key press commands are supported by COM Port 1 and 2 only.

7.6   PLC Configuration information
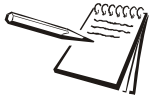
If connecting to a PLC there are required configuration settings in the SETUP > PORTS menu.

In the PROTCL menu set TYPE x = PLC and BIND x = Enet x

In E-NET menu you must configure the proper network IP address settings in IP ADDR, set DHCP = OFF (PLC's are not DHCP reliant), and CONN > E-NET x > TYPE x = OFF (PLC's do not use Client/Server topology)

In PLC menu configure the settings as required for the connected PLC network.

At the PLC select the size that matches the number of bytes for each item configured in the indicators data type setting. If possible use the same data type for all data.

DATA TYPE TABLE		
Typical PLC Terminology	Indicator Terminology	Data TYPE Size
CHAR / SBYTE	SINT8	8 Bits (Signed Value / -127 to 127)
BYTE / UBYTE	UNIT8	8 Bits (Unsigned Value / 0-255)
SHORT / SINT	SINT16	16 Bits (Signed Value /-32767 to 32767)
WORD / UINT	UNIT16	16 Bits (Unsigned Value / 0 to 65535)
LONG / SDINT	SINT32	32 Bits (Signed Value / -2,147,483,647 to 2,147,483,647)
DWORD / UDINT	UNIT32	32 Bits (Unsigned Value / 0 to 4,294,967,295)
REAL	FLOAT	32 Bits (Signed Decimal Value / 1.0E-37 to 1.0E37

7.6.1   ModBus/TCP

Starting Register Locations for PLC Configuration

Input Read Only	30001 (Mirrored at the Read/Write Locations)
Input Read/Write	40001
Output Read/Write	41025

2 Byte Example	
Indicator Data Type (out)	ModBus Register
SINT16	41025
SINT16	41026

4 Byte Example	
Indicator Data Type (out)	ModBus Register
SINT32	41025
SINT32	41027
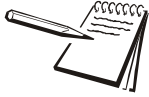
Note each register holds 2-bytes or 1-word. If a 4-byte or 2-word data type is used 2-registers are required for each item. This makes the starting register number for each item skip a register number between items.

7.6.2 Ethernet/IP Implicit Messaging:

AWTX Assembly Instance and Size

	Assembly Instance	Size
Input	100	Refer to the number of items configured for Out Configuration at the indicator
Output	112	Refer to the number of items configured for In Configuration at the indicator
Configuration	128	0

INPUT/OPUTPUT SIZE: Is the number of elements (items) configured in the indicator for the data IN and OUT not the number of bytes.

7.6.3 Ethernet/IP Explicit Messaging:

AWTX Indicator Input Point Object (PLC Data Out)
CLASS: 64 hex
ATTRIBUTE: 3 hex

PLC Instance	Supported services for this attribute (hex value)	Data Type	Indicator Input (In) Configuration Data
Data Element Location 1= First Element 2=Second Element	0E (Get Attribute Single)	Based on network configuration in indicator. See DATA TYPE TABLE	1-16 (Bound to the instance x)

AWTX Indicator Output Point Object (PLC Data in)
CLASS: 65 hex
ATTRIBUTE: 3 hex

PLC Instance	Supported services for this attribute (hex value)	Data Type	Indicator Output (Out) Configuration Data
Data Element Location 1= First Element 2=Second Element	10 (Set Attribute Single)	Based on network configuration in indicator. See DATA TYPE TABLE	1-16 (Bound to the instance x)

7.7   Network Tokens

Token	Name of Value	Inbound to net1	Outbound from net 1	Description of Value
0	**Disabled**	X	X	No data in or out
1	**Gross**		X	Output GROSS weight to the network.
2	**Tare**	X	X	Input/Output the current active "TARE" weight value to/from the network in the current unit of measure.
3	**Net**		X	Output NET weight to the network.
4	**Motion / Weight Steady**		X	Output to the network to determine the stability of the scale. **0** = MOTION / not stable **1** = NO-MOTION / stable
6	**Overload**		X	Output to network to determine if the scale has an OVERLOAD condition. **0** = Not OVERLOAD **1** = OVERLOAD
7	**Underload**		X	Output to network to determine if the scale has an UNDERLOAD condition. **0** = Not UNDERLOAD **1** = UNDERLOAD
8	**Center of Zero / zero balance**		X	Output to the network to determine if the scale is at Center of Zero / zero balance. **0** = NOT Center of Zero / zero balance **1** = Center of Zero / zero balance
9	**Active Units of Measure**	X	X	If the value in the register is: **0** = LB **1** = KG **2** = OZ **3** = Grams **4** = LB's / OZ's **5** = Custom # 1 **6** = Custom # 2 **7** = Custom # 3 **8** = Custom # 4
10	**Peak** PEAK HOLD application		X	Output maximum gross weight to the network.
11	**Peak Min** PEAK HOLD application		X	Output minimum gross weight to the network.
12	**Count** COUNT application		X	Output the quantity of parts "COUNT" to the network.
13	**PCWT** COUNT application	X	X	Input/Output the average piece weight "PCWT" to/from the network.
14	Hub Analog Output/ R-DISP application (350IS mode)		X	Output 35xIS Hub analog output value to the network
104	**Gross Total** ACCUMULATE and COUNT application	X	X	Input/Output the accumulated weight "GROSS_TOTAL" to/ from the network.

Token	Name of Value	Inbound to net1	Outbound from net 1	Description of Value
105	**Tare Total** ACCUMULATE and COUNT application		X	Input/Output the accumulated weight "TARE_TOTAL" to/from the network.
106	**Net Total** ACCUMULATE and COUNT application	X	X	Input/Output the accumulated weight "NET_TOTAL" to/from the network.
107	**Count Total** COUNT application	X	X	Input/Output the quantity of parts "COUNT_TOTAL" to/from the network.
257	**Watch Dog Counter**		X	Output the value of the WATCHDOG counter to the network. Enables the operator to verify scale is functioning.
300	**Transaction Counter** ACCUMULATE and COUNT application	X	X	Accumulated number of transactions that were processed.
310	**Serial Number**		X	Output the indicator serial number, unique ID, to the network.
313	**Indicator Healthy Status**		X	Output of 2 bytes to the network indicating any faults in the indicator. When no errors, the value output to the network is 0xFFFF. Byte#1: Bit # 0 = Any Fault Bit # 1 = ADC Error Bit # 2 = N/A Bit # 3 = N/A Bit # 4 = N/A Bit # 5 = Overload Bit # 6 = Underload Bit # 7 = N/A Byte # 2: Bit # 0 – bit # 7 is not used at this time.
700	**Input 1-3** State **ON** is active **OFF** is not active		X	If the value in the register is: **0** = input #1, #2, and #3 **OFF** **1** = input #1 **ON** **2** = input #2 **ON** **3** = input #1 and #2 **ON** **4** = input #3 **ON** **5** = input #1 and #3 **ON** **6** = input #2 and #3 **ON** **7** = input #1, #2. and #3 **ON**
800	**Output 1-3** State **ON** is active **OFF** is not active		X	If the value in the register is: **0** = set point #1, #2, and #3 **OFF** **1** = set point #1 **ON** **2** = set point #2 **ON** **3** = set point #1 and #2 **ON** **4** = set point #3 **ON** **5** = set point #1 and #3 **ON** **6** = set point #2 and #3 **ON** **7** = set point #1, #2. and #3 **ON**

Token	Name of Value	Inbound to net1	Outbound from net 1	Description of Value
For Tokens 900 through 904, the following information is relevant: When a host is controlling setpoints, events, print formats, or basic scale functions like zero, tare…, certain rules MUST, be followed for proper functionality. The following commands will change their value or perform a given function, if the register that is mapped from the host changes at any time. For example, to zero the scale, simply XOR the register mapped for remote zero with a "1". This will toggle the register every time the XOR is executed, thus telling the indicator to zero the scale. The commands are as follows: Remote PB_Zero Remote PB_Tare Remote Print Remote Accumulation Remote Units				
900	**Remote PB_Zero**	X		Allows the network to perform a PB_ZERO operation. PB_ZERO operation dependant upon indicator configuration.
901	**Remote PB_Tare**	X		Allows the network to perform a PB_TARE operation. PB_TARE operation dependant upon indicator configuration.
902	**Remote Print**	X		Allows the network to perform a PRINT operation. PRINT operation dependant upon indicator configuration.
903	**Remote Accumulate** ACCUMULATE and COUNT application	X		Allows the network to perform a ACCUM operation. ACCUM operation dependant upon indicator configuration.
904	**Remote Units**	X		Allows the network to perform a UNITS KEY operation. UNITS operation dependant upon indicator configuration.
1001	**ID**	X	X	Input/Output ID value to/from network
1002	**Tare Channels** (1 to 10)	X	X	Input/Output the "Active Tare Channel 1-10" value to/from network
1003	**Accumulator Channels** (1 to 10) ACCUMULATE application	X	X	Input/Output the "Active Accumulator Channel 1-10" value to/from network
1004	Out # 1	X	X	Output "Out 1" weight value to/from network in the current unit of measure.
1005	Out # 2	X	X	Output "Out 2" weight value to/from network in the current unit of measure.
1006	Out # 3	X	X	Output "Out 3" weight value to/from network in the current unit of measure.
1007	Preact # 1 BATCHING application	X	X	Output "Preact 1" weight value to/from network in the current unit of measure.
1008	Preact # 2 BATCHING application	X	X	Output "Preact 2" weight value to/from network in the current unit of measure.
1009	Preact # 3 BATCHING application	X	X	Output "Preact 3" weight value to/from network in the current unit of measure.
1010	Out #1 actual BATCHING application		X	Output "Out 1 actual" weight value from network in the current unit of measure.

Token	Name of Value	Inbound to net1	Outbound from net 1	Description of Value
1011	Out #2 actual BATCHING application		X	Output "Out 2 actual" weight value from network in the current unit of measure.
1012	Out #3 actual BATCHING application		X	Output "Out 3 actual" weight value from network in the current unit of measure.
1013	Remote Input # 1 BATCHING application	X		Send/set "1" to initiate function defined by Input 1
1014	Remote Input # 2 BATCHING application	X		Send/set "1" to initiate function defined by Input 2
1015	Remote Input # 3 BATCHING application	X		Send/set "1" to initiate function defined by Input 3

8   Option modules

The ZM301 has five option modules available. This chapter covers the description and installation of these modules:

- *Analog output module on page 111*
- *Current Loop/RS485/RS422 module on page 113*
- *USB Device option module on page 115*
- *802.11g Wireless communication module on page 117*
- *AC relay module on page 119*

The 802.11 wireless communications option can only be configured through the use of the Ztools computer software package. This is due to the complexity of the security and SSID settings required.

On all the option modules, S1 switch settings must all be OFF to operate.

8.1   Analog output module

Figure 8.1 shows the analog output module. This provides analog output in proportion to the weight on the scale. See *Options on page 91* for information on configuring the indicator and this module.

S1 switch settings must all be OFF to operate.

The analog output module uses a 16 bit A/D with resolution capabilities of 65,536 divisions.

Analog Output Chart							
Types of Output	Jumper						
	P2	P3	P5	P6	P7	P8	*Load Resistance
4 to 20MA	1-2	2-3	1	1	1	1	500 Ohm Max.
0 to 20MA	2-3	1-2	1	1	1	1	
0 to 24MA	1-2	1-2	1	1	1	1	
0 to 5V	2-3	2-3	1-2	1	1	1	800 Ohm Min.
0 to 10V	2-3	2-3	1	1-2	1	1	
±-5V	2-3	2-3	1	1	1-2	1	
±-10V	2-3	2-3	1	1	1	1-2	

*Load Resistance = Cable resistance plus resistance of input unit.

P2 & P3

P5-P8

Figure 8.1 Analog output option module

> ⓘ *CAUTION: The output will run to the minimum value when a fault occurs and when you enter the Setup menus, so plan accordingly!*

Figure 8.2 shows the option module in place on the main board of the indicator. All the option modules connect to the main board at terminal J4. Screws, at the four locations noted by the arrows, hold the board in place.
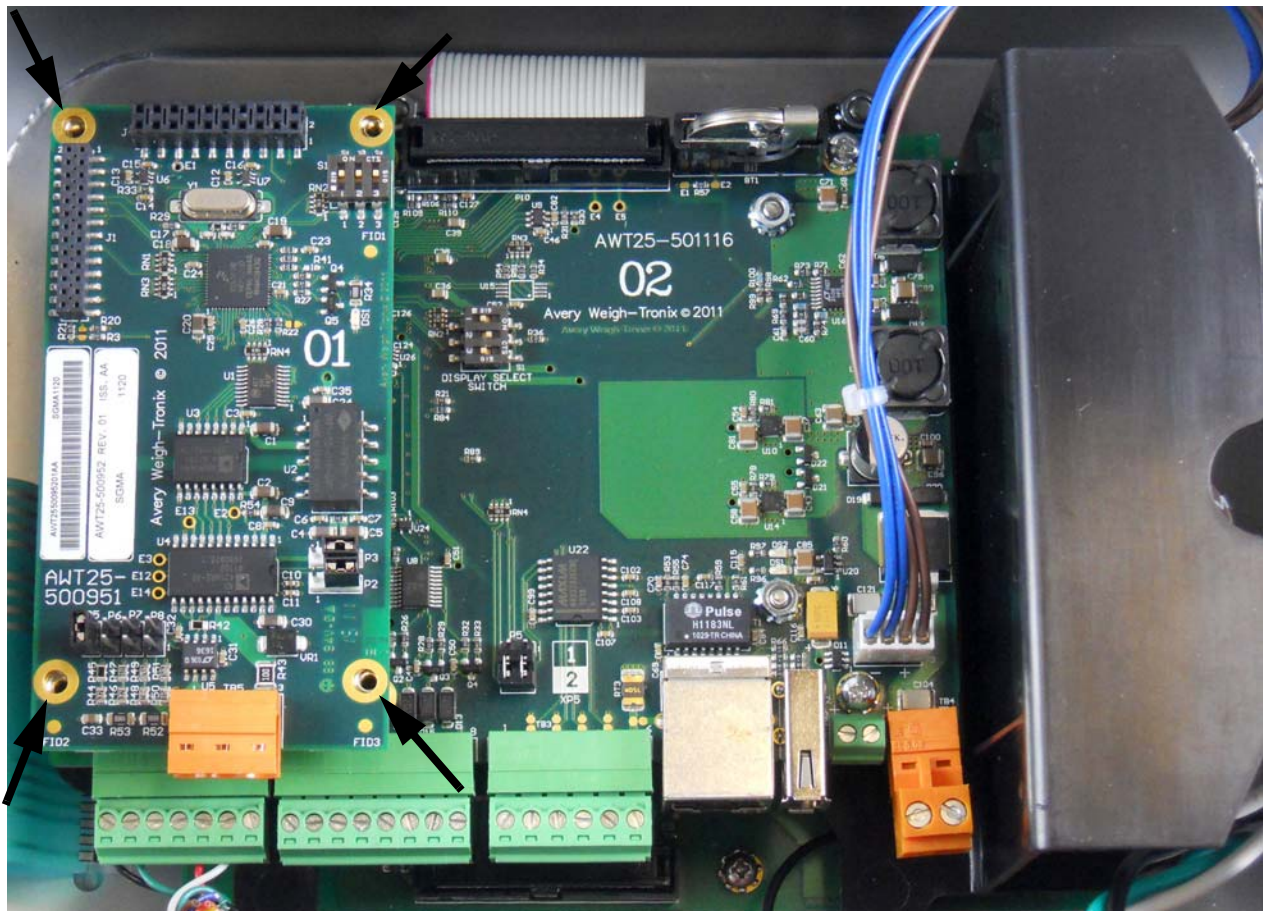
Figure 8.2 Analog output option module on main board

8.2   Current Loop/RS485/RS422 module

Figure 8.3 shows the Current Loop/RS485/RS422 option module. This provides Current Loop/RS485/RS422 communication to and from connected devices. See *Options on page 91* for information on configuring the indicator and this module.

S1 switch settings must all be OFF to operate.

TB1	
Pin	**Function**
1	GND (isolated)
2	XMTA
3	XMTB
4	RCVA
5	RCVB
6	NC
7	20ma TX Out
8	20ma TX Return
9	20ma RCV Input
10	20ma RCV Return

P2 - Jumper On = RCV Sinking
P2 - Jumper Off = RCV Sourcing

P1 - Jumper On = Terminated
P1 - Jumper Off = Unterminated
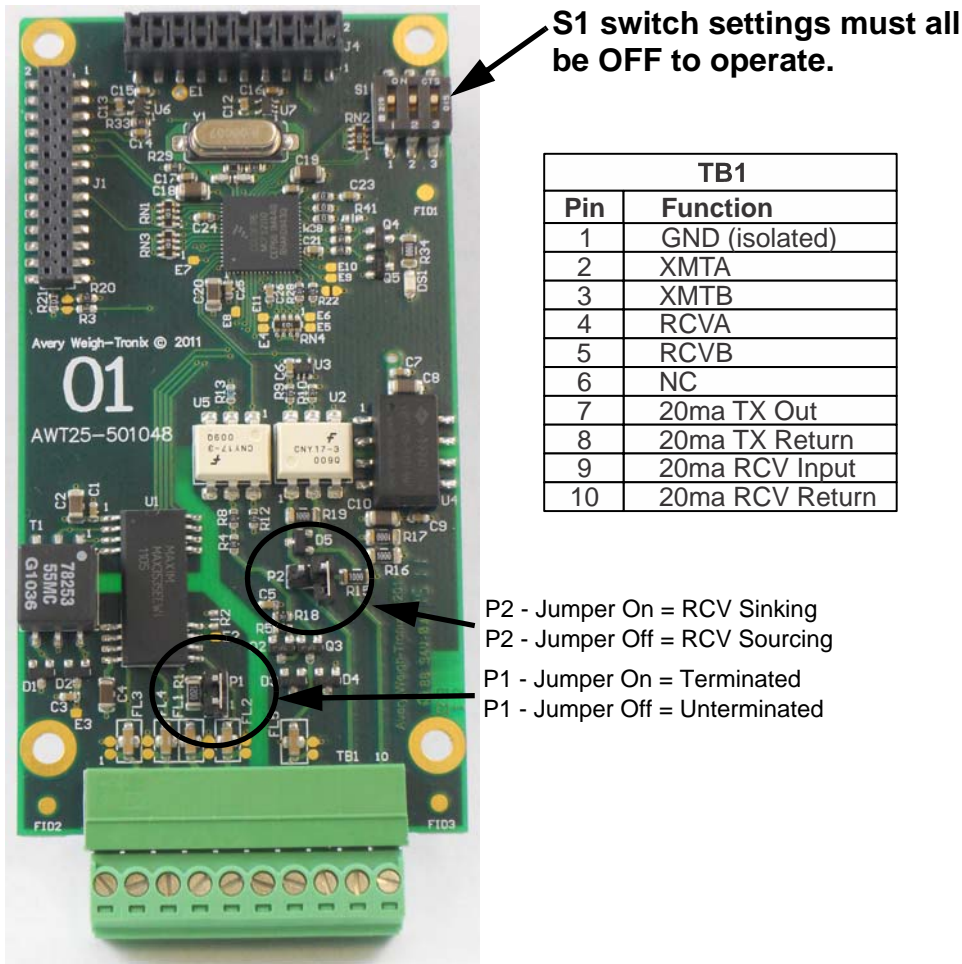
Figure 8.3 Current Loop/RS485/RS422 module

Figure 8.4 shows the option module in place on the main board of the indicator. All the option modules connect to the main board at terminal J4. Screws, at the four locations noted by the arrows, hold the board in place.
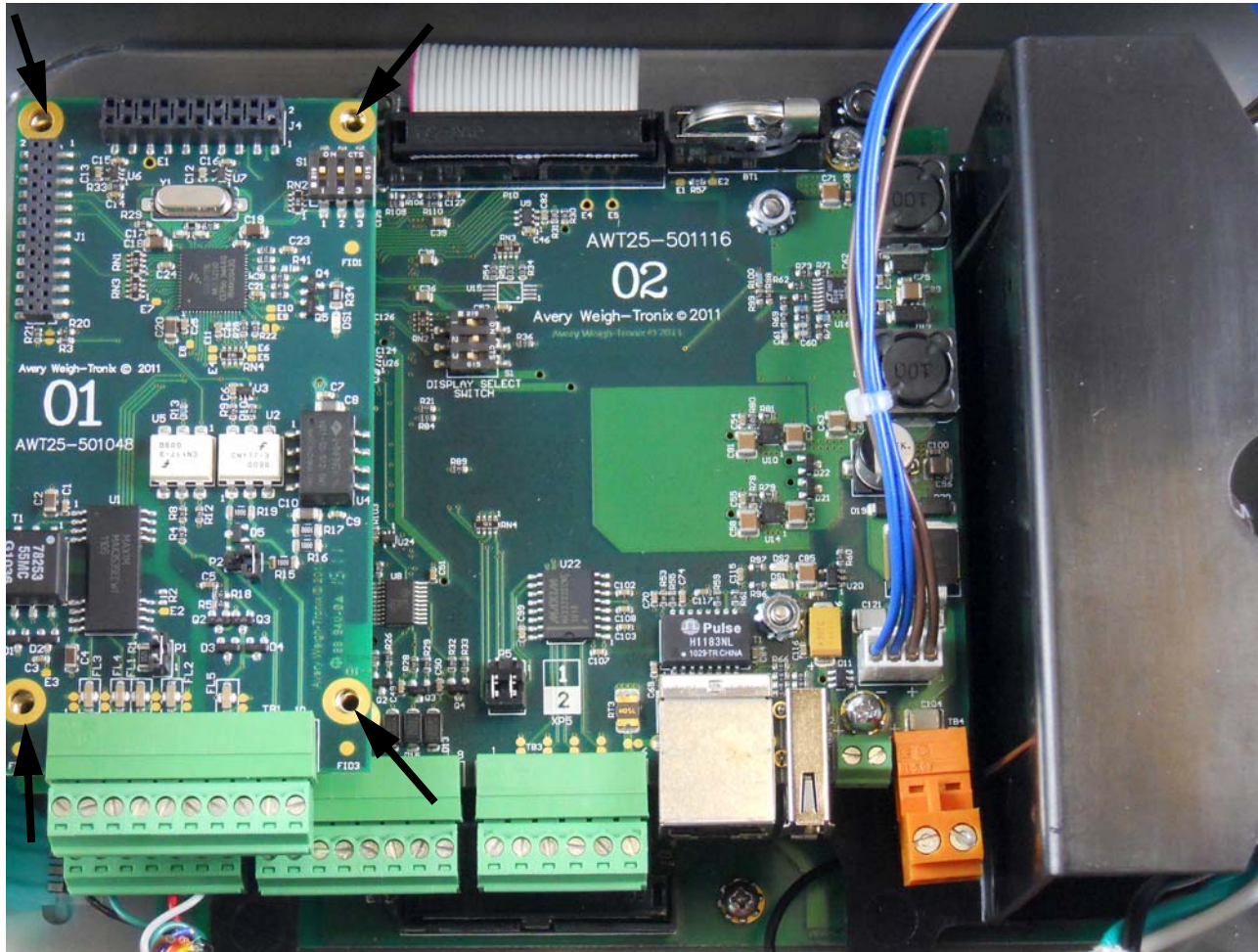
Figure 8.4 Current Loop/RS485/RS422 option module on main board

8.3   USB Device option module

Figure 8.5 shows the USB Device option module. This provides connection for a USB client device.

S1 switch settings must all be OFF to operate.
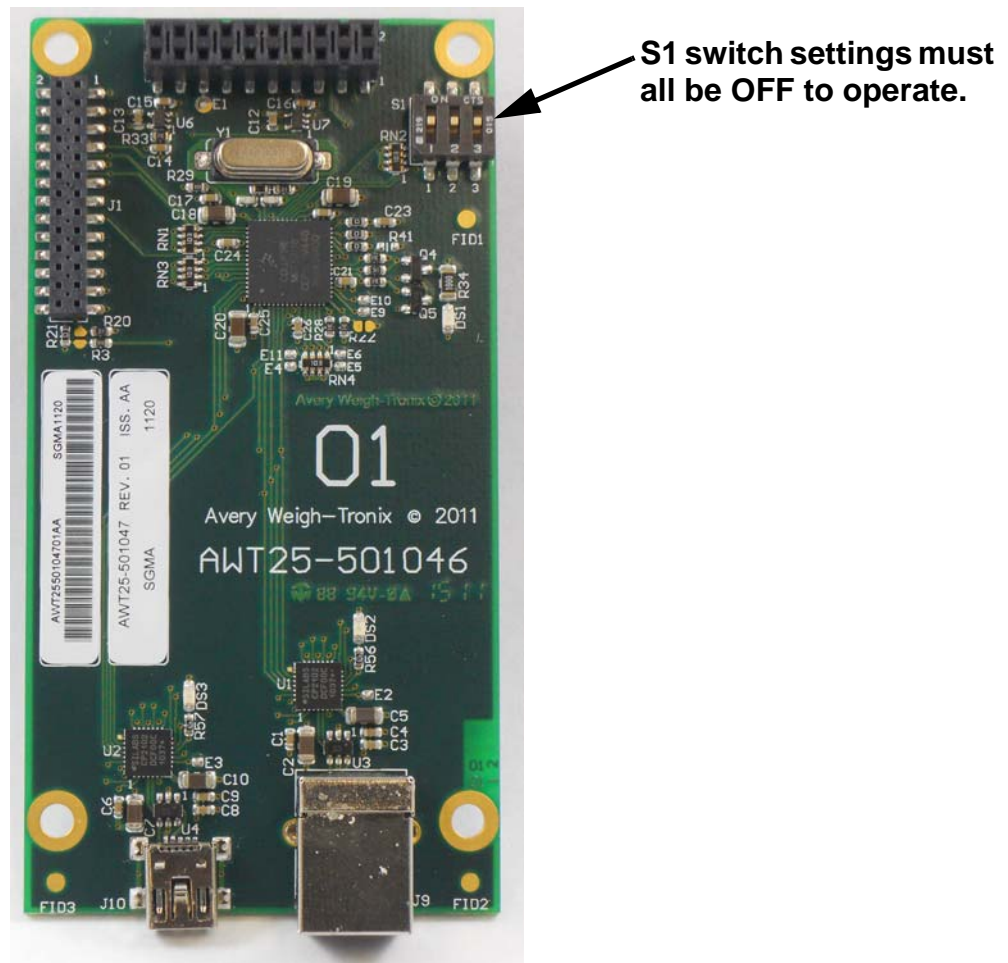
Figure 8.5 USB Device option module

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

Figure 8.6 shows the option module in place on the main board of the indicator. All the option modules connect to the main board at terminal J4. Screws, at the four locations noted by the arrows, hold the board in place.
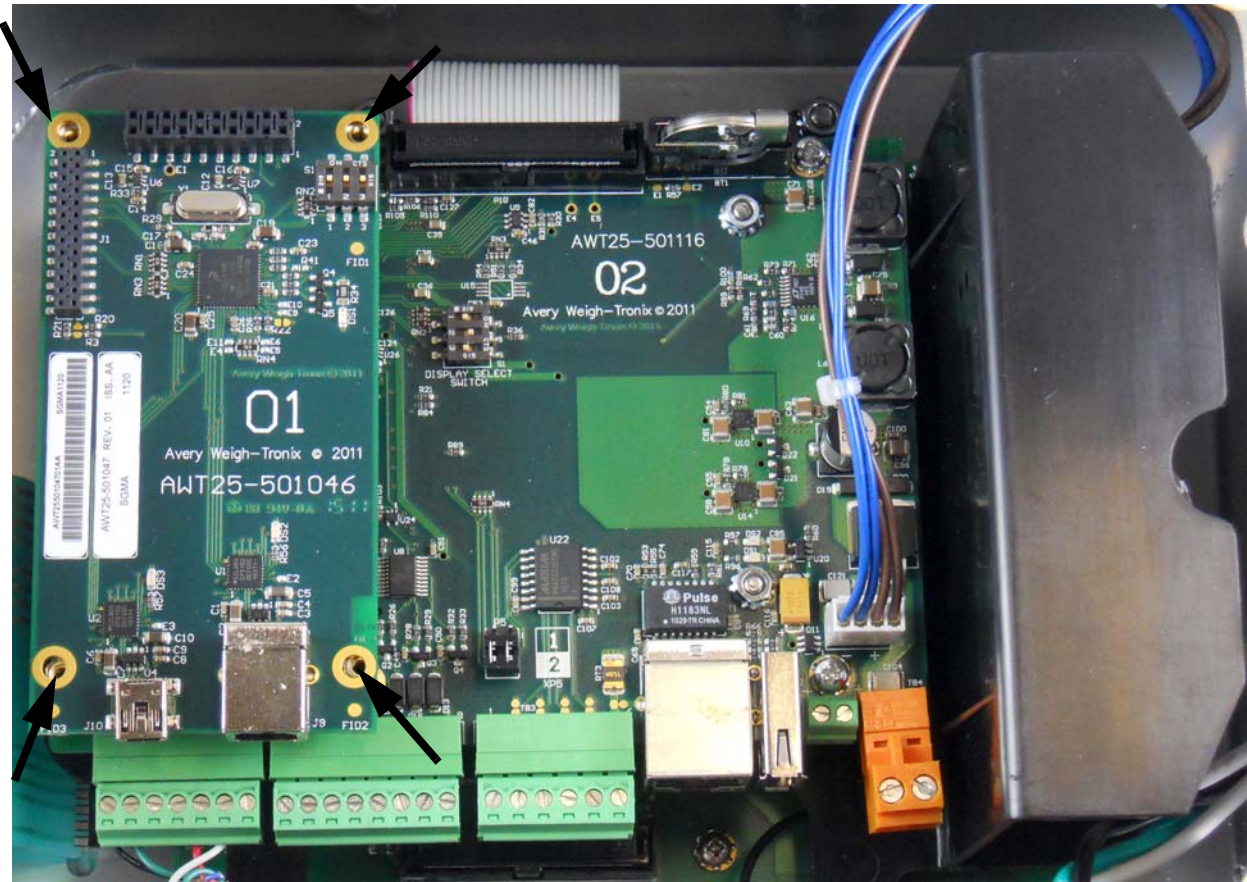
Figure 8.6 USB Device option module on main board

8.4   802.11g Wireless communication module

Figure 8.7 shows the 802.11g wireless communication option module. This provides wireless ethernet connectivity via the 802.11g protocol.

Configuration of the 802.11g wireless interface can only be offered through the use of the Ztools computer software package configuration tool for the Z-series of indicators.

With the limitations of seven segment displays and the complexity of WEP, SSID securities the configuration of this feature is not provided through the front panel of the indicator.

S1 switch settings must all be OFF to operate.

Figure 8.7 802.11g wireless communication option module

Figure 8.8 802.11g wireless communication antenna and connection point

Figure 8.9 shows the option module in place on the main board of the indicator. All the option modules connect to the main board at terminal J4. Screws, at the four locations noted by the arrows, hold the board in place.
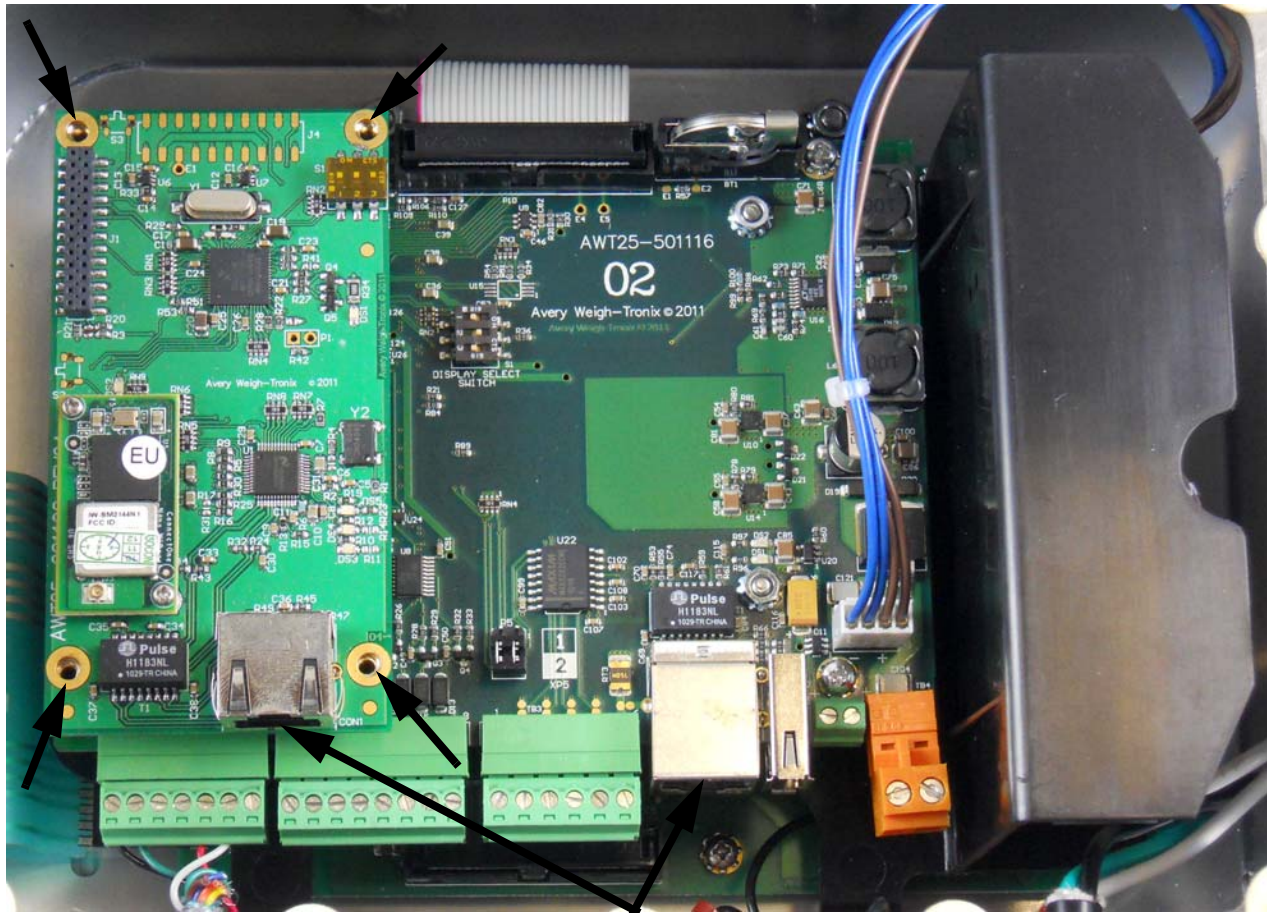
Install included RJ45 cable between these two connectors.

Figure 8.9 802.11g wireless communication option module on main board

The cable included with the module kit is to connect the RJ45 connector on the module card to the RJ45 connector on the main PC board. See Figure 8.9.

8.5   AC relay module

The AC relay converts three logic level outputs into AC solid state relays internal to the indicator. The AC relay module is shown in Figure 8.10.
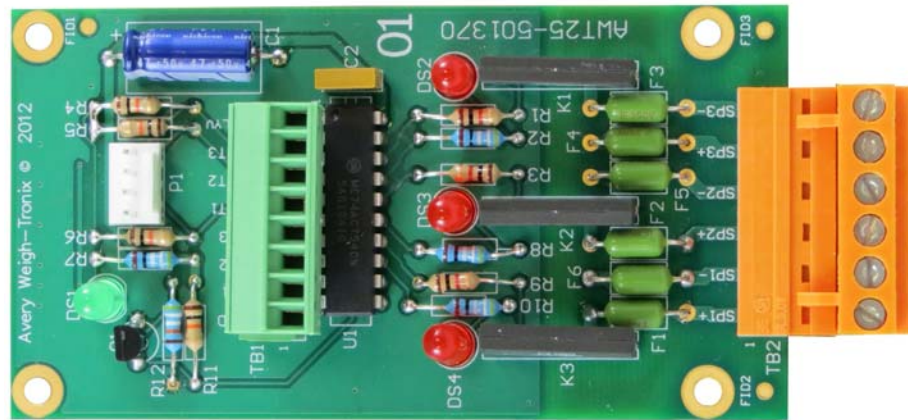
Figure 8.10 AC relay option module

8.5.1   Accessing the main PC board

Stainless steel case

1.   Remove the acorn nuts on the back panel of the indicator.

2.   Carefully remove the back. Be aware of the ground wire attached to the back plate.

WARNING: Risk of Electrical Shock. Insure power is removed from the indicator before installing the option card.

This option card is capable of switching up to 1Amp Max. per channel at 20-120VAC.

Please refer to the appropriate National Electrical Code regulations with regards to the switched AC mains voltage wiring sizes and insulation requirements.

8.5.2 Installing the option module

1.   Plug the option module into terminal J4 on the main board. See Figure 8.11.
     Use the included standoffs and screws to fasten the module to the main board
     at the four locations noted by the arrows.
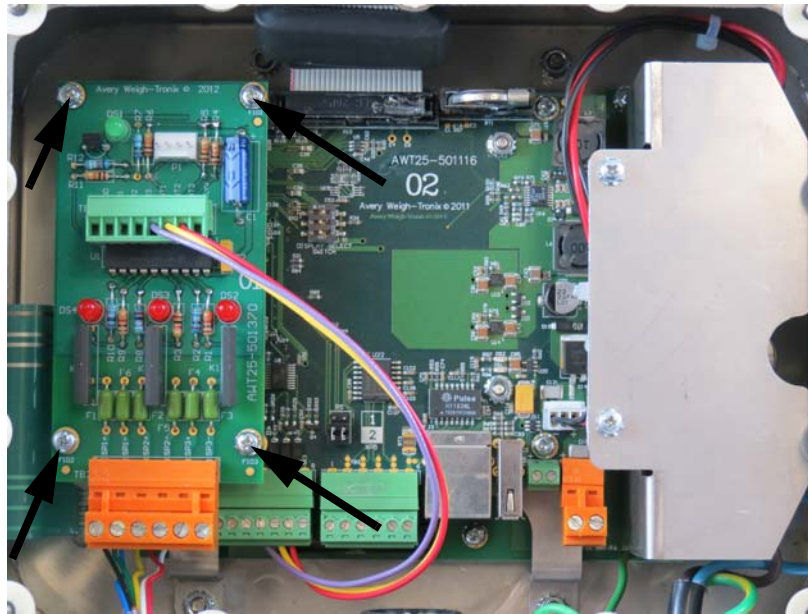
Figure 8.11 AC Relay option module on main board

2.   Attach 22AWG min. wires between the:

     Option card TB1 pin 5 (OUT1) and the Main Board TB2 pin 5 (OUT1) : SP1

     Option card TB1 pin 6 (OUT2) and the Main Board TB2 pin 6 (OUT2) : SP2

     Option card TB1 pin 7 (OUT3) and the Main Board TB2 pin 7 (OUT3) : SP3

     These wires are shown in place in Figure 8.11.

8.5.3 Option Setup

See the *Setpoints* section of the Service manual for your indicator for information on
configuring the indicator and this module.

9   Printed reports

Below are examples of a Configuration report, a Calibration report and an Audit report.

9.1   Configuration report

Below is a partial sample printout of a configuration report.

Parameter	Value	Data Type
SCALE_1_STABILITY_DIV	3	DOUBLE
SCALE_1_STABILITY_TIME	1	DOUBLE
SCALE_1_AZT_DIV	3	DOUBLE
SCALE_1_AZT_TIME	1	DOUBLE
SCALE_1_ZERO_RANGE	100	DOUBLE
SCALE_1_OVER_CAP_BASIS	0	ENUM
SCALE_1_OVER_CAP_DIV	9	INTEGER
SCALE_1_OVER_CAP_PER	105	DOUBLE
SCALE_1_UNDER_CAP_DIV	250	INTEGER
SCALE_1_UNDER_CAP_PER	20	DOUBLE
SCALE_1_CZERO	0.25	DOUBLE
SCALE_1_GZERO_BAND	10	INTEGER
DISPLAY_SEPARATOR	0	ENUM
DISPLAY_UPDATE_RATE	10	INTEGER
SITE_ID	SiteId	STRING
CALIBRATION_PASSWORD	2580	INTEGER
COM1_BAUD_RATE	9600	INTEGER
COM1_DATA_BITS	8	INTEGER
COM1_PARITY	0	ENUM
COM1_STOP_BITS	0	ENUM
COM1_CONTROL	0	ENUM

etc.

9.2   Calibration report

```
                      CALIBRATION REPORT


                 Parameter        Value
        SCALE_1_ZERO_COUNTS Value =      255037
   SCALE_1_LIN_FACTOR_1_WT Value = 0.00000000
  SCALE_1_LIN_FACTOR_1_CNT Value =           0
   SCALE_1_LIN_FACTOR_2_WT Value = 0.00000000
  SCALE_1_LIN_FACTOR_2_CNT Value =           0
   SCALE_1_LIN_FACTOR_3_WT Value = 0.00000000
  SCALE_1_LIN_FACTOR_3_CNT Value =           0
        SCALE_1_SPAN_FACTOR Value = 0.00000909
            SCALE_1_GRAVITY Value =      9.8043
            SCALE_1_ZERO_MV Value = 0.38003510
            SCALE_1_SPAN_MV Value = 1.63769878
           SCALE_1_ALTITUDE Value = 0.00000000
           SCALE_1_LATITUDE Value = 0.00000000
        SCALE_1_SPAN_COUNTS Value =     1099040
         SCALE_1_CAL_WEIGHT Value = 10.0000000
         UNIT SERIAL NUMBER Value =    20120111
```

9.3   Audit report

```
                      AUDIT LOG REPORT
           Parameter      old value   new value   Time
       PROTOCOL_1_TYPE            0           1   2012-03-20 10:12:30
         SCALE_1_UNIT3            2           4   2012-03-20 10:08:17
       PROTOCOL_1_TYPE            1           0   2012-03-20 10:00:27
    PROTOCOL_2_FORMAT_1           1          40   2012-03-20 09:14:45
         SCALE_1_UNIT4            0           5   2012-03-20 09:10:35
         SCALE_1_UNIT3            0           2   2012-03-20 09:10:30
         SCALE_1_UNIT2            0           2   2012-03-20 09:10:27
    SCALE_1_SPAN_FACTOR   0.00003265  0.00003707   2012-03-20 09:09:43
    SCALE_1_ZERO_COUNTS       394685     -651448   2012-03-20 09:09:27
       PROTOCOL_2_BIND            0           0   2012-03-20 09:09:14
       PROTOCOL_2_TYPE            0           3   2012-03-20 09:09:12
```

10 Print formatting

10.1   Print Format Editor

The Print Format Editor creates custom print formats by letting you insert ASCII characters, scale tokens and variables into a print string. See *Print tokens, parameters and default print formats on page 133* for the ASCII characters, scale tokens and variables that can be used.

When you use scale tokens or variables, you must append a function number to the token or variable. The function number used depends on whether you want to print the Value, Name or Data Type of the token. The most common function usage is to print the token Value but in certain situations you may want to print the token Name. The token Data Type is reserved for special application usage.

You can also append optional parameters to a token or variable to modify the default behavior. For example, the optional parameters allow you to change the printed format such as the number of digits or characters, or use leading zeros instead of spaces, etc. The token that is selected will determine what optional parameters are available. See *Print tokens, parameters and default print formats on page 133* for a list of the optional parameter tables.

The ZM series indicator also supports the UTF-8 Unicode character set which is used for numerical HTML Coding values and to support many foreign language character sets.

● Following are tables showing the key functions in the string indexing and character editing modes. Use them for reference.

	Table 1: Key Action When In The String Index Select Mode					
Action	TARE	SELECT	ZERO	PRINT	UNITS	F1
Momentary Key Press	Deletes current character	Selects the index character for editing using the key actions in Table 2	EXIT	Moves left one position in the index	Moves right one position in the index	Escape Edit mode and Abort all changes
Long Key Press	Deletes current character	Inserts new character before this point. Default character added is 32 (space)	EXIT	Page Up (Decrements index by 10)	Page Down (Increments index by 10)	Deletes characters while held

After you select the index number, use the Table 2 key actions to edit the character for that index number.

	Table 2: Key Action When In The Character Edit Mode					
Action	TARE	SELECT	ZERO	PRINT	UNITS	F1
Single Key Press	Increments the flashing digit by 1	Decrements the flashing digit by 1	Enter	Delete flashing digit	Add Digit	ESC/Abort
Long Key Press	Move flashing digit left	Move flashing digit right	Enter	Delete the entire entry	Does nothing	ESC/Abort

10.2   Editing an existing print string

Here is an example of how to edit an existing print string.

1.   In the Admin menu, under *Setup*>*Ports* you will find *P.F.Edit*. With *P.F.Edit* displayed, press **SELECT** …

> *PrnFt 1* is displayed. This is Print Format 1.

2.   Press **UNITS** or **PRINT** to scroll until the display shows the print format number you want to edit.

> In this example let's use format 1 (standard gross, tare and net printout) and add a company name as the header or first line of the printout. Refer to *Default print formats on page 141* to view the default settings for print format number 1

3.   So from *PRNFT1* press **SELECT** …

> The first character in the print format will be displayed:

> Since we want to add a header to the beginning of the printout we will want to insert in front of string index number 1. If you wanted to add characters or tokens in a different area of the printout then you would scroll using the **UNITS** key until the string index number you want to insert in front of is displayed.

> For this example let's add the company name *ABC Company*. Start by adding up the number of characters in the company name including any spaces. Then add to this number the carriage return and line feed if necessary. For this example that would be 13 characters. (example of adding up the 13 characters)

A	B	C	Sp	C	o	m	p	a	n	y	Cr	Lf	⬅ **Text, etc. to insert**
1	2	3	4	5	6	7	8	9	10	11	12	13	⬅ Number of characters to insert
65	*66*	*67*	*32*	*67*	*111*	*109*	*112*	*97*	*110*	*121*	*13*	*10*	⬅ *Decimal value to enter*

> To center the company name on a printed ticket, you must add spaces in front of the company name. This will add to the total count of characters to insert.

10.2.1   Inserting characters

1. To insert characters into a print string, press and hold the **SELECT** key. After you hold the **SELECT** key for about 3 seconds the Index number will start to automatically increment by 1 about every second as Spaces (dec 32) are inserted into the print string. You will still see the current string character on the right side of the display but the string index number will increment as spaces are inserted in front of this character. So for this example, press and hold **SELECT** until the display shown below appears, then release the **SELECT** key …

2. To start the entry of the company name press the **PRINT** key to scroll backwards until string index number 1 is again displayed, as shown below.

3. Press **SELECT** and the display will show the center bar segments flashing as well as the right digit. This shows you are in the editing mode.

4. Using the *Numeric entry procedure on page 16* enter 65, the decimal value for *A* and press **ZERO**

5. Press **UNITS** to advance to the next string index number and press **SELECT** …

    X,   32 is displayed, where *X* is the next string index number

6. Enter the decimal value for the next letter in the company name and press **ZERO**.

7. Repeat steps 5 and 6 until the last character is entered. In this example that would be *13,   10* for the line feed.

8. Press the **ZERO** to accept the new characters into the print string.

Do not forget step 8 or the changes will not be entered into the print string

9. Press **TARE** or **F1** until *SAVE NO* is displayed. Then press **UNITS** and *SAVEYES* is displayed. Press **ZERO** to save.

10. After the indicator reboots press the PRINT key to test the results.

10.2.2 Deleting characters

In this example let's use format 1 (Gross, Tare and Net printout) and delete the Tare weight so that only the Gross and Net weight are printed. Refer to *Default print formats on page 143* to view the current default settings for print format number 1.

```
Gross  272.04 lb
 Tare   95.88 lb
  Net  176.16 lb
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.GWT	2	[	W	6	]		T.GWT	1		T.UNIT	1	#CR	#LF	T.SAT	2	[	W	6	]
t1	50	t501	87	54	t502	32	t1	49	32	t9	49	13	10	t2	50	t501	87	54	t502

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	T.SAT	1		T.UNIT	1	#CR	#LF	T.NWT	2	[	W	6	]		T.NWT	1		T.UNIT	1
32	t2	49	32	t9	49	13	10	t3	50	t501	87	54	t502	32	t3	49	32	t9	49

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
#CR	#LF																		
13	10																		

1. From *P.F.Edit* press **SELECT** …

   PrnFt1 is displayed.

2. Press **SELECT** …

   The first character in the print format will be displayed:

3.   To move the string index position to the start of the Tare weight characters (T.SAT token), press the **UNITS** key until the display shows …

4.   You need to delete all characters from index position 15 through 28 to remove the entire Tare weight line. The **TARE** key deletes the displayed character and then shifts the remaining characters to this index position. Repeatedly press the **TARE** key until the display shows …

5.   This is the start of the Net weight characters (T.NWT token, see current index position 29).

6.   Press the **ZERO** key when finished with the edit process to accept these changes and return to *PrnFt1* display.

7.   Press **TARE** or **F1** until …

        SAVE no is displayed.

8.   Press UNITS …

        SAVEYES is displayed.

9.   Press **ZERO** to save.

After the indicator reboots press the **PRINT** key to test the results. The following should be printed:

```
Gross  272.04 lb
  Net  176.16 lb
```

*At any time during a string edit you can press **F1** to abort the print format editor without affecting the existing print string. This allows for an ESCAPE if you think you may have made an error during the editing process.*

10.3   Inserting tokens, etc.

To insert tokens, application variables or optional parameters to add to an existing token there are special characters available to use during character editing. When you are at the string index position where you wish to insert a token or variable, press and hold **SELECT** to insert a space (32). Then press **PRINT** to return to the index position and press **SELECT**. With the *32* displayed, press the **PRINT** key to set the value to 0. This will be displayed:
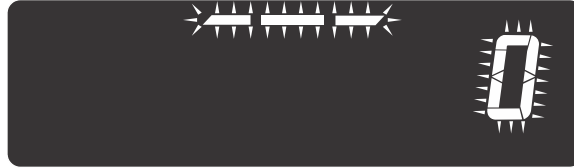
Now press the **SELECT** key to scroll through the following special characters …

] - (Closing bracket)	End an optional parameter. Added automatically when a Start parameter opening bracket [is inserted. See the *Parameter table on page 135*
[- (Opening bracket)	Start an optional parameter. When [is selected a] is automatically added to the string for your benefit.
A - (Application variable)	See *Application variable token table on page 138* for available variables that can be selected to print
t - (Token)	See *System variable token table on page 133* for available print tokens that can be selected to print.

When a token t (or APP variable A) is selected, a decimal 49 is automatically added to indicate printing of the value. If you want to print the name of the token (or APP variable) then change (edit) the 49 to a 50.

Token entry example

If the token for Time is to be inserted, press the **SELECT** key until a *t* is flashing, then enter 200 (decimal value for Time) and press **ZERO**. This will insert the Time into the print string at the selected location. Add appropriate spacing in front or after as needed for proper alignment in the printed data.

*The value **1** in the above screen will be whatever index value you started from.*

More scale token examples

Identifies
Scale Token

Scale Token
number 1 -
Gross
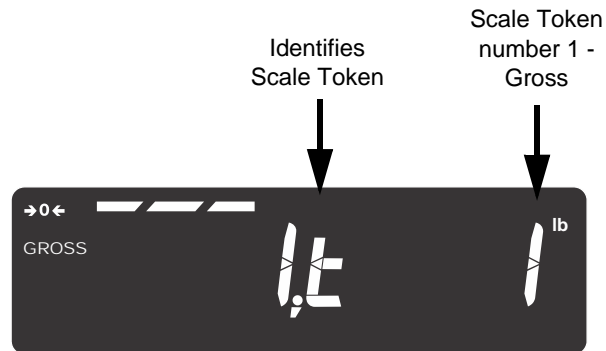
This ASCII number identifies the type of scale
token. In this case it identifies the token as the word
Gross

Above is a typical example of using a scale token. Upon creating the token, ***t1*** for Gross
weight, the indicator automatically appends an additional number in the next character
location. The value of the number in this next location identifies what function of the
token is being used.

Decimal 1 = 49 is the actual Gross weight value.

Decimal 2 = 50 is the token name, "Gross", applied to that token

10.4   Other scale tokens

In addition to the above, you can examine the tokens available and do much more with the data. For example suppose the Customer's PC can't cope with decimal point in the weight value from the scale. We can add optional parameters after the Gross weight token to remove the decimal point. This print format character sequence would look like this …

The above token and function will output the text "Gross"

The above token and function will output the Gross weight value.

Characters 5 to 8 will remove the decimal point from the weight transmitted using an attribute parameter. You may need to refer to the *Parameter table on page 135* for more detail on necessary character values.

[= t501	indicates the start of an optional parameter
68 = D	for decimal point parameter
50 = 2	for hide decimal point
] = t502	indicates the end of the optional parameter

10.5   Transmitting leading zeroes

A Customer may wish to have the data transmitted with leading zeros and not spaces. The print format sequence would look like this …

The above token and function will output the text "Gross"

The above token and function will output the Gross weight value.
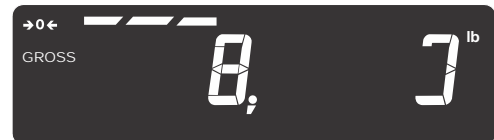
Characters 5 to 8 will add the leading zeros to the weight transmitted using an optional parameter. You may need to refer to *Parameter table on page 135* for more detail on necessary character values.

[= t501   indicates the start of an optional parameter

90 = Z   for leading zero parameters

49 = 1   for use leading zeros

] = t502   indicates the end of the optional parameter

For more examples of editing formats consult *Print tokens, parameters and default print formats on page 133*.

10.6   Print format errors

Error	Description
0	No error - print string OK
1	Print format number out of range
2	Parser error - no memory
3	A or T token character not found
4	Token Delimiter is missing.
5	Print token invalid range
6	Application variable invalid range
7	Aspect data invalid, codepoint is NOT 1, 2 or 3
8	Invalid UTF8 string
9	Left parameter bracket not found
10	Right parameter bracket not found
11	Dot separator not found
12	Token tag string is invalid
13	UTF8 codepoint to large
14	Token to large
15	Error within optional parameter

11 Print tokens, parameters and default print formats

11.1 System variable token table

Token #	Token name	Token Description	Function "1" (dec 49)	Function "2" (dec 50)	Parameter Table
decimal			Value	Name	
1	GWT	Gross Weight	value	"Gross "	WEIGHT
2	SAT	Tare Weight	value	"Tare "	WEIGHT
3	NWT	Net Weight	value	"Net "	WEIGHT
4	MOTN	Motion	"0" stable, "1" motion	"Motion"	INTEGER
5	WST	MotionString	"S" stable, "M" motion	"sMotion"	STRING
6	OVER	Overload	"0" no overload, "1" overload	"Overload"	INTEGER
7	UNDER	Underload	"0" no underload, "1" underload	"Underload"	INTEGER
8	CZ	Center Zero	"0" no center zero, "1" center zero	"Center of Zero"	INTEGER
9	UNIT	Unit	"lb" (or active unit)	"Units"	UNIT
10	PGW	Peak Max weight	value	"Peak Max"	WEIGHT
11	PGW	Peak Min weight	value	"Peak Min"	WEIGHT
12	CNT	Count	value	"Count"	INTEGER
13	PCE	Piece Weight	value	"Piece Weight"	WEIGHT
14	HAO	Hub Analog Output	value	"Hub Analog Out"	WEIGHT
15	WSTAT	Weight Status	"O", "U", "M", "S", "E": see WSTAT table in *Additional token tables on page 134*	"Weight Status"	WSTAT
16	ACT	Active Display Value	value	active display name	WEIGHT
17	TSAT	Tare Type	"NT", "T", "PT" : see TARE table in *Additional token tables on page 134*	"Tare Type"	TSAT
104	GAT	Accumulated Gross Weight Total	value	"Gross Total"	WEIGHT
105	TAT	Accumulated Tare Weight Total	value	"Tare Total"	WEIGHT
106	NAT	Accumulated Net Weight Total	value	"Net Total"	WEIGHT
107	CAT	Accumulated Count Value Total	value	"Count Total"	INTEGER
200	TIM	Time	value	"Time"	TIME
201	DAT	Date	value	"Date"	DATE
250	OUT1	Output 1		"OUT1"	
251	OUT2	Output 2		"OUT2"	
252	OUT3	Output 3		"OUT3"	
300	RTN	Transaction Count	value	"Transaction Count"	INTEGER
302	CKSM	Checksum	see Checksum table	"Checksum"	CHECKSUM
309	SITE	Site ID	value	"Site ID"	STRING
310	SN	Serial Number	value	"Serial Number"	STRING
311	LK	Condec Units	"L" or "K"		
312	STAT	Condec Status	" " (space) stable, "M" motion, "O" out of range		

Token #	Token name	Token Description	Function "1" (dec 49)	Function "2" (dec 50)	Parameter Table
313	DIS	AWTX Status Bytes	see DIS table in *Additional token tables on page 134*	"Status"	DIS
314	UTID	Unique Transaction ID	value	UTID	
500	NULL	Null	null char (dec 0)		
501	SOP	Start Optional Parameters	[		
502	EOP	End Optional Parameters	]		
603		Printer Wrapper Disabled			
650	BOLD	Format Bold	Esc Esc B		
651	ITAL	Format Italic	Esc Esc I		
652	UNDR	Format Underline	Esc Esc U		
653	LAND	Format Landscape	Esc Esc L		
654	FF	Format Formfeed	Esc Esc F		
655	WRAP	Format Line Wrap	Esc Esc W		

11.1.1 Additional token tables

WSTAT token table	
"O"	Overload
"U"	Underload
"M"	Motion
"S"	Stable
"E"	Cal error

TSAT token table	
"NT"	no tare active
"T"	pushbutton tare active
"PT"	preset or enter tare active

The WSTAT and TSAT token default length is 6 characters.

DIS token table: AWTX Status Byte format			
	Byte 1	Byte 2	Byte 3
Bit 0	1 = Under or OverLoad	1 = Center Zero	0
Bit 1	0	1=Gross	1
Bit 2	1=kg	1=Net	1=Overload
Bit 3	1=lb	0	1=Motion
Bit 4	1	1	1
Bit 5	1	1	1
Bit 6	0	0	0
Bit 7	0	0	0

Example: Stable and valid gross weight in lb unit of measure would return "822"

11.2 Parameter table

Parameter Table	Parameter Description	Parameter character	Default Value	Alternate Values	Comments
WEIGHT	Width	W (87)	7	1 - 9 characters	sets minimum width
	Precision	P (80)	0 = normal precision	0 - 8 characters	sets number of digits right of decimal
	Leading Zero	Z (90)	0 = Leading Spaces	1 = Leading Zeros	
	Sign	p (112)	1 = Show -	2 = Show + 3 = Show All 4 = Hide All	
	Multiplier	m (109)	0 = None	1 = *10, 2 = *100, 3 = *1000, 4 = *10000, 5 = *100000	
	Decimal Point	D (68)	1 = Show	2 = Hide	
	Justification	J (74)	1 = Right	2 = Left	
	Round	r(114)	1 = Current	2 = Calibration unit 3 = Rounded current unit 4 = Rounded calibration unit 5 = Unit 1 6 = Unit 2 7 = Unit 3 8 = Unit 4	use metrology compatible rounding of division size for selected unit
	Unit of Measure	u (117)	1 = Current	2 = Calibration unit 3 = Rounded current unit 4 = Rounded calibration unit 5 = Unit 1 6 = Unit 2 7 = Unit 3 8 = Unit 4	allows printing in alternate units
	Reset	R (82)		Accumulators and Counters only	clear or reset value after printing
UNIT	Unit of Measure	U (85)	1 = Current	2 = Default calibration unit 3 = Unit 1 4 = Unit 2 5 = Unit 3 6 = Unit 4	
	Justification	J (74)	1 = Right	2 = Left	

Parameter Table	Parameter Description	Parameter character	Default Value	Alternate Values	Comments
TIME	Format	F (70)	0 = As Configured	1 = HH:MM:SS (12hr) 2 = HH:MM AM/PM 3 = HH:MM:SS (24hr)	
	Seperator	s (115)	7 = Colon (:)	1 = None 2 = Comma (,) 3 = Period or Decimal Point (.) 4 = Backslash (\) 5 = Space ( ) 6 = Forward Slash (/) 7 = Colon (:) 8 = Dash (-)	
	Seconds	S (83)	0 = As Configured	1 = Do not show seconds 2 = Show both seconds and seconds since midnight 3 = Show seconds since midnight 4 = Do not show time, only show seconds since Jan 01, 1970	The S parameter must follow the F parameter if both are used
DATE	Format	F (70)	0 = As Configured	1 = MM-DD-YY 2 = MM-DD-YYYY 3 = DD-MM-YY 4 = DD-MM-YYYY	
	Seperator	s (115)	8 = Dash (-)	1 = None 2 = Comma (,) 3 = Period or Decimal Point (.) 4 = Backslash (\) 5 = Space ( ) 6 = Forward Slash (/) 7 = Colon (:) 8 = Dash (-)	
UNIT	Unit of Measure	U (85)	1 = Current	2 = Default calibration unit 3 = Unit 1 4 = Unit 2 5 = Unit 3 6 = Unit 4	allows printing of alternate unit name (used in conjunction with "u" parameter in weight table
	Justification	J (74)	1 = Right	2 = Left	
INTEGER	Justification	J (74)	1 = Right	2 = Left	
	Leading Zero	Z (90)	0 = Leading Spaces	1 = Leading Zeros	
	Multiplier	m (109)	0 = None	1 = *10, 2 = *100, 3 = *1000, 4 = *10000, 5 = *100000	
	Reset	R (82)		Accumulators and Counters only	
STRING	Justification	J (74)	1 = Right	2 = Left	

Parameter Table	Parameter Description	Parameter character	Default Value	Alternate Values	Comments
CHECKSUM	Mode	M (77)	0 = None	1 = Stop 2 = Transmit LSB First 3 = Transmit MSB First 4 = Send CRC 7-Bit 50 = Start CCITT 51 = Start SDLC / HDLC 52 = Start CRC 16 (0000) 53 = Start CRC 12 54 = Start IRCC 16 55 = Start IRCC 8 56 = Start Xmodem 57 = Start Sum 16 58 = Start Sum 8 59 = Start CRC 16 (FFFF) 60 = Start Inverse IRCC 8 61 = Start Sum 16 (W/O Twos) 62 = BCC	Place necessary Checksum type Start parameter in front of first character to calculate checksum Place the Stop checksum after the last character to calculate checksum Place the Send checksum after the Stop checksum

If the Application Variable is unavailable for the selected application, the value will be 0 and the name will be "invalid".

App Variable	Description	"Function ""1" (dec 49)	"Function ""2" (dec 50)	
1	ID	ID	ID	INTEGER
2	Tare Channel	value	"Tare Channel"	INTEGER
3	Accumulator Channel	Accum Channel Number	"Accum Channel"	INTEGER
4	Output 1	value		FLOAT
5	Output 2	value		FLOAT
6	Output 3	value		FLOAT
7	Preact 1	value	"Preact1"	FLOAT
8	Preact 2	value	"Preact2"	FLOAT
9	Preact 3	value	"Preact3"	FLOAT
10	Output 1 Actual	value	"Actual1"	FLOAT
11	Output 2 Actual	value	"Actual2"	FLOAT
12	Output 3 Actual	value	"Actual3"	FLOAT
13	Remote Input 1		Remote Switch Input 1 Name	INTEGER
14	Remote Input 2		Remote Switch Input 2 Name	INTEGER
15	Remote Input 3		Remote Switch Input 3 Name	INTEGER
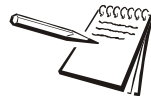
When application variables are used in a print format they typically only get updated by a Print command. If using ENQ or B-Cast protocols use the P (Print) command to get active values for application variables.

11.4 ASCII characters

Code #	Cont. Char.	Print Char.	Hex
0	NUL		00
01	SOH	☺	01
02	STX	☻	02
03	ETX	♥	03
04	EOT	♦	04
05	ENG	♣	05
06	ACK	♠	06
07	BEL		07
08	BS		08
09	HT		09
010	LF	LF	0A
011	VT	♂	0B
012	FF	FF	0C
013	CR	CR	0D
014	S0	♪	0E
015	S1	☼	0F
016	DLE	◄	10
017	DC1	3	11
018	DC2	ø	12
019	DC3	Ø	13
020	DC4	ß	14
021	NAK	§	15
022	SYN		16
023	ETB	—	17
024	CAN	↑	18
025	EM	↓	19
026	SUB	→	1A
027	ESC	←	1B
028	FS	—	1C
029	GS	—	1D
030	RS	5	1E
031	US	6	1F
032	SP		20
033	!	!	21
034	"	"	22
035	#	#	23
036	$	$	24
037	%	%	25
038	&	&	26
039	'	'	27
040	(	(	28
041	)	)	29
042	*	*	2A
043	+	+	2B
044	,	,	2C

Code #	Cont. Char.	Print Char.	Hex
045	-	-	2D
046	.	.	2E
047	/	/	2F
048	0	0	30
049	1	1	31
050	2	2	32
051	3	3	33
052	4	4	34
053	5	5	35
054	6	6	36
055	7	7	37
056	8	8	38
057	9	9	39
058	:	:	3A
059	;	;	3B
060	<	<	3C
061	=	=	3D
062	>	>	3E
063	?	?	3F
064	@	@	40
065	A	A	41
066	B	B	42
067	C	C	43
068	D	D	44
069	E	E	45
070	F	F	46
071	G	G	47
072	H	H	48
073	I	I	49
074	J	J	4A
075	K	K	4B
076	L	L	4C
077	M	M	4D
078	N	N	4E
079	O	O	4F
080	P	P	50
081	Q	Q	51
082	R	R	52
083	S	S	53
084	T	T	54
085	U	U	55
086	V	V	56
087	W	W	57
088	X	X	58
089	Y	Y	59

Code #	Cont. Char.	Print Char.	Hex
090	Z	Z	5A
091	[	[	5B
092	\	\	5C
093	]	]	5D
094	^	^	5E
095	_	_	5F
096	`	`	60
097	a	a	61
098	b	b	62
099	c	c	63
0100	d	d	64
0101	e	e	65
0102	f	f	66
0103	g	g	67
0104	h	h	68
0105	i	i	69
0106	j	j	6A
0107	k	k	6B
0108	l	l	6C
0109	m	m	6D
0110	n	n	6E
0111	o	o	6F
0112	p	p	70
0113	q	q	71
0114	r	r	72
0115	s	s	73
0116	t	t	74
0117	u	u	75
0118	v	v	76
0119	w	w	77
0120	x	x	78
0121	y	y	79
0122	z	z	7A
0123	{	{	7B
0124					7C
0125	}	}	7D
0126	~	~	7E
0127	DEL	□	7F

Code #	Cont. Char.	Print Char.
0128	NA	Ç
0129	NA	ü
0130	NA	é
0131	NA	â
0132	NA	ä
0133	NA	à
0134	NA	å
0135	NA	ç
0136	NA	ê
0137	NA	ë
0138	NA	è
0139	NA	ï
0140	NA	î
0141	NA	ì
0142	NA	Ä
0143	NA	Å
0144	NA	É
0145	NA	æ
0146	NA	Æ
0147	NA	ô
0148	NA	ö
0149	NA	ò
0150	NA	û
0151	NA	ù
0152	NA	ÿ
0153	NA	Ö
0154	NA	Ü
0155	NA	¢
0156	NA	£
0157	NA	¥
0158	NA	₧
0159	NA	ƒ
0160	NA	á
0161	NA	í
0162	NA	ó
0163	NA	ú
0164	NA	ñ
0165	NA	Ñ
0166	NA	ª
0167	NA	º
0168	NA	¿
0169	NA	⌐
0170	NA	¬
0171	NA	½
0172	NA	¼

Code #	Cont. Char.	Print Char.
0173	NA	¡
0174	NA	«
0175	NA	»
0176	NA	░
0177	NA	▒
0178	NA	▓
0179	NA	│
0180	NA	┤
0181	NA	╡
0182	NA	╢
0183	NA	╖
0184	NA	╕
0185	NA	╣
0186	NA	║
0187	NA	╗
0188	NA	╝
0189	NA	╜
0190	NA	╛
0191	NA	┐
0192	NA	└
0193	NA	┴
0194	NA	┬
0195	NA	├
0196	NA	─
0197	NA	┼
0198	NA	╞
0199	NA	╟
0200	NA	╚
0201	NA	╔
0202	NA	╩
0203	NA	╦
0204	NA	╠
0205	NA	═
0206	NA	╬
0207	NA	╧
0208	NA	╨
0209	NA	╤
0210	NA	╥
0211	NA	╙
0212	NA	╘
0213	NA	╒
0214	NA	╓
0215	NA	╫
0216	NA	╪
0217	NA	┘

Code #	Cont. Char.	Print Char.
0218	NA	┌
0219	NA	█
0220	NA	▄
0221	NA	▌
0222	NA	▐
0223	NA	▀
0224	NA	α
0225	NA	ß
0226	NA	Γ
0227	NA	π
0228	NA	Σ
0229	NA	σ
0230	NA	µ
0231	NA	τ
0232	NA	Φ
0233	NA	Θ
0234	NA	Ω
0235	NA	δ
0236	NA	∞
0237	NA	ø
0238	NA	ε
0239	NA	∩
0240	NA	≡
0241	NA	±
0242	NA	≥
0243	NA	≤
0244	NA	⌠
0245	NA	⌡
0246	NA	÷
0247	NA	≈
0248	NA	°
0249	NA	•
0250	NA	·
0251	NA	√
0252	NA	ⁿ
0253	NA	²
0254	NA	■
0255	NA	

Decimal	Control Code Description	Control Code Name
1	Start of Heading	SOH
2	Start of Text	STX
3	End of Text	ETX
4	End of Transmission	EOT
5	Enquiry	ENQ
6	Acknowledge	ACK
7	Bell	BEL
8	Backspace	BS
9	Horizontal Tab	TAB
10	Line Feed (New Line)	LF
11	Veriticle Tab	VT
12	Form Feed (New Page)	FF
13	Carriage Return	CR
14	Shift Out	SO
15	Shift In	SI
16	Data Link Escape	DLE
17	Device Control 1	DC1
18	Device Control 2	DC2
19	Device Control 3	DC3
20	Device Control 4	DC4
21	Negative Acknowledge	NAK
22	Synchronous Idle	SYN
23	End of Block	ETB
24	Cancel	CAN
25	End of Medium	EM
26	Substitute	SUB
27	Escape	ESC
28	File Separator	FS
29	Group Separator	GS
30	Record Separator	RS
31	Unit Separator	US

Num	Description	Tokenized Format	Example	Print Format Editor Position

1 — General Weighing

Tokenized Format: {T.GWT.2[W6]} {T.GWT.1} {T.UNIT.1}#CR#LF{T.SAT.2[W6]} {T.SAT.1} {T.UNIT.1}#CR#LF{T.NWT.2[W6]} {T.NWT.1} {T.UNIT.1}#CR#LF

Example:
```
Gross  272.04 lb
Tare    95.88 lb
Net    176.16 lb
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.GWT	2	[	W	6	]		T.GWT	1		T.UNIT	1	#CR	#LF	T.SAT	2	[	W	6	]
t1	50	t501	87	54	t502	32	t1	49	32	t9	49	13	10	t2	50	t501	87	54	t502
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	T.SAT	1		T.UNIT	1	#CR	#LF	T.NWT	2	[	W	6	]		T.NWT	1		T.UNIT	1
32	t2	49	32	t9	49	13	10	t3	50	t501	87	54	t502	32	t3	49	32	t9	49
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
#CR	#LF																		
13	10																		

2 — Accumulate Format

Tokenized Format: {T.RTN.2}: {T.RTN.1}#CR#LF{T.GWT.2[W6]} {T.GWT.1} {T.UNIT.1}#CR#LF{T.SAT.2[W6]} {T.SAT.1} {T.UNIT.1}#CR#LF{T.NWT.2[W6]} {T.NWT.1} {T.UNIT.1}#CR#LF

Example:
```
Transaction Count:   10
Gross  272.04 lb
 Tare   95.88 lb
 Net   176.16 lb
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.RTN	2	:		T.RTN	1	#CR	#LF	T.GWT	2	[	W	6	]		T.GWT	1		T.UNIT	1
t300	50	58	32	t300	49	13	10	t1	50	t501	87	54	t502	32	t1	49	32	t9	49
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
#CR	#LF	T.SAT	2	[	W	6	]		T.SAT	1		T.UNIT	1	#CR	#LF	T.NWT	2	[	W
13	10	t2	50	t501	87	54	t502	32	t2	49	32	t9	49	13	10	t3	50	t501	87
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
6	]		T.NWT	1		T.UNIT	1	#CR	#LF										
54	t502	32	t3	49	32	t9	49	13	10										

3 — Count Format

Tokenized Format: {T.CNT.2} {T.CNT.1}#CR#LF

Example:
```
Count    176
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.CNT	2		T.CNT	1	#CR	#LF													
t12	50	32	t12	49	13	10													

4 — Checkweigh Format

Tokenized Format: {T.NWT.2} {T.NWT.1} {T.UNIT.1}#CR#LF

Example:
```
Net  176.16 lb
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.NWT	2		T.NWT	1		T.UNIT	1	#CR	#LF										
t3	50	32	t3	49	32	t9	49	13	10										

5 — Batch Format

Tokenized Format: {T.ACT.2[W1]} {T.ACT.1} {T.UNIT.1}#CR#LF

Example:
```
G  272.04 lb
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.ACT	2	[	W	1	]		T.ACT	1		T.UNIT	1	#CR	#LF						
t16	50	t501	87	49	t502	32	t16	49	32	t9	49	13	10						

6 — Peak Format

Tokenized Format: {T.PGW.2} {T.PGW.1} {T.UNIT.1}#CR#LF

Example:
```
Peak Gross  1000.02 lb
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.PGW	2		T.PGW	1		T.UNIT	1	#CR	#LF										
t10	50	32	t10	49	32	t9	49	13	10										

7 — RD Format

Tokenized Format: {T.ACT.1} {T.UNIT.1} {T.ACT.2[W1]}#CR#LF

Example: `272.04 lb G`

Print Format Editor Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	T.ACT	1		T.UNIT	1		T.ACT	2	[	W	1	]	#CR	#LF						
	t16	49	32	t9	49	32	t16	50	t501	87	49	t502	13	10						

8 — Accum Total Format

Tokenized Format: {T.RTN.2}: {T.RTN.1}#CR#LF{T.GAT.2} {T.GAT.1} {T.UNIT.1}#CR#LF {T.TAT.2} {T.TAT.1} {T.UNIT.1}#CR#LF {T.NAT.2} {T.NAT.1} {T.UNIT.1}#CR#LF

Example:
```
Transaction Count:    10
Gross Total      0.00 lb
 Tare Total      0.00 lb
  Net Total      0.00 lb
```

Print Format Editor Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	T.RTN	2	:		T.RTN	1	#CR	#LF	T.GAT	2		T.GAT	1		T.UNIT	1	#CR	#LF	T.TAT	2
	t300	50	58	32	t300	49	13	10	t104	50	32	t104	49	32	t9	49	13	10	t105	50

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		T.TAT	1		T.UNIT	1	#CR	#LF	T.NAT	2		T.NAT	1		T.UNIT	1	#CR	#LF		
	32	t105	49	32	t9	49	13	10	t106	50	32	t106	49	32	t9	49	13	10		

9 — CONDEC Clone Format

Tokenized Format: #STX{T.GWT.1[W8]}{T.LK.1}{T.ACT.2[W1]}{T.STAT.1}#CR#LF

Example: `@272.04LG`

Print Format Editor Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	#STX	T.GWT	1	[	W	8	]	T.LK	1	T.ACT	2	[	W	1	]	T.STAT	1	#CR	#LF	
	2	t1	49	t501	87	56	t502	t311	49	t16	50	t501	87	49	t502	t312	49	13	10	

10 — Displayed Weight with Register (Does not apply with model ZM301)

Tokenized Format: {A.2.1[W1]} {T.ACT.2[W1]} {T.ACT.1} {T.UNIT.1}#CR#LF

Example: `1 G  272.04 lb`

Print Format Editor Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	A.2	1	[	W	1	]		T.ACT	2	[	W	1	]		T.ACT	1		T.UNIT	1	#CR
	a2	49	t501	87	49	t502	32	t16	50	t501	87	49	t502	32	t16	49	32	t9	49	13

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	#LF																			
	10																			

11 — Displayed Weight with Status Byte

Tokenized Format: {T.ACT.2[W1]} {T.ACT.1} {T.UNIT.1} {T.DIS.1[W3]}#CR#LF

Example: `G  272.04 lb 830`

Print Format Editor Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	T.ACT	2	[	W	1	]		T.ACT	1		T.UNIT	1		T.DIS	1	[	W	3	]	#CR
	t16	50	t501	87	49	t502	32	t16	49	32	t9	49	32	t313	49	t501	87	51	t502	13

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	#LF																			
	10																			

12 — Displayed Weight with Status

Tokenized Format: {T.ACT.2[W1]} {T.ACT.1} {T.UNIT.1} {T.WSTAT.1[W1]}#CR#LF

Example: `G  272.04 lb O`

Print Format Editor Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	T.ACT	2	[	W	1	]		T.ACT	1		T.UNIT	1		T.WSTAT	1	[	W	1	]	#CR
	t16	50	t501	87	49	t502	32	t16	49	32	t9	49	32	t15	49	t501	87	49	t502	13

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	#LF																			
	10																			

Num 13 — Basic Weight Ticket with Site ID, Time and Date

Tokenized Format: {T.TIM.1}#TAB{T.DAT.1}#CR#LF{A.1.2[W6]} {A.1.1[W6]}#CR#LF{T.GWT.2[W6]} {T.GWT.1} {T.UNIT.1}#CR#LF{T.SAT.2[W6]} {T.SAT.1} {T.UNIT.1}#CR#LF{T.NWT.2[W6]} {T.NWT.1} {T.UNIT.1}#CR#LF

Example:
```
03:15:43 02-08-2016
   ID  8262
Gross  272.04 lb
Tare   95.88 lb
Net  176.16 lb
```

Print Format Editor Position:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.TIM	1	#TAB	T.DAT	1	#CR	#LF	A.1	2	[	W	6	]		A.1	1	[	W	6	]
t200	49	9	t201	49	13	10	a1	50	t501	87	54	t502	32	a1	49	t501	87	54	t502

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
#CR	#LF	T.GWT	2	[	W	6	]		T.GWT	1		T.UNIT	1	#CR	#LF	T.SAT	2	[	W
13	10	t1	50	t501	87	54	t502	32	t1	49	32	t9	49	13	10	t2	50	t501	87

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
6	]		T.SAT	1		T.UNIT	1	#CR	#LF	T.NWT	2	[	W	6	]			T.NWT	1
54	t502	32	t2	49	32	t9	49	13	10	t3	50	t501	87	54	t502	32	t3	49	32

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
T.UNIT	1	#CR	#LF																
t9	49	13	10																

Num 14 — Basic Weight Ticket with Time and Date and Register (Does not apply with model ZM301)

Tokenized Format: {T.TIM.1} {T.DAT.1}#CR#LF {T.GWT.2[W1]} {T.GWT.1} {T.UNIT.1}#CR#LF{A.2.1[W1]} {T.SAT.2[W1]} {T.SAT.1} {T.UNIT.1}#CR#LF {T.NWT.2[W1]} {T.NWT.1} {T.UNIT.1}#CR#LF

Example:
```
03:15:43 02-08-2016
 G  272.04 lb
1 T   95.88 lb
 N  176.16 lb
```

Print Format Editor Position:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.TIM	1		T.DAT	1	#CR	#LF			T.GWT	2	[	W	1	]		T.GWT	1		T.UNIT
t200	49	32	t201	49	13	10	32	32	t1	50	t501	87	49	t502	32	t1	49	32	t9

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	#CR	#LF	A.2	1	[	W	1	]		T.SAT	2	[	W	1	]			T.SAT	1
49	13	10	a2	49	t501	87	49	t502	32	t2	50	t501	87	49	t502	32	t2	49	32

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
T.UNIT	1	#CR	#LF			T.NWT	2	[	W	1	]		T.NWT	1		T.UNIT	1	#CR	#LF
t9	49	13	10	32	32	t3	50	t501	87	49	t502	32	t3	49	32	t9	49	13	10

Num 15 — Accumulated Gross

Tokenized Format: {T.GAT.2} {T.GAT.1} {T.UNIT.1}#CR#LF

Example:
```
Gross Total   0.00 lb
```

Print Format Editor Position:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.GAT	2		T.GAT	1		T.UNIT	1	#CR	#LF										
t104	50	32	t104	49	32	t9	49	13	10										

Num 16 — Accumulated Net

Tokenized Format: {T.NAT.2} {T.NAT.1} {T.UNIT.1}#CR#LF

Example:
```
Net Total    0.00
```

Print Format Editor Position:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.NAT	2		T.NAT	1		T.UNIT	1	#CR	#LF										
t106	50	32	t106	49	32	t9	49	13	10										

Num 17 — Basic Accum Ticket

Tokenized Format: {T.GAT.2} {T.GAT.1} {T.UNIT.1}#CR#LF {T.TAT.2} {T.TAT.1} {T.UNIT.1}#CR#LF {T.NAT.2} {T.NAT.1} {T.UNIT.1}#CR#LF

Example:
```
Gross Total   0.00 lb
Tare Total   0.00 lb
Net Total   0.00 lb
```

Print Format Editor Position:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.GAT	2		T.GAT	1		T.UNIT	1	#CR	#LF	T.TAT	2		T.TAT	1		T.UNIT	1	#CR	#LF
t104	50	32	t104	49	32	t9	49	13	10	t105	50	32	t105	49	32	t9	49	13	10

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
T.NAT	2		T.NAT	1		T.UNIT	1	#CR	#LF										
t106	50	32	t106	49	32	t9	49	13	10										

Num	Description	Tokenized Format	Example
18	Peak Ticket with Register	{A.2.1[W1]} {T.PNW.2} {T.PNW.1} {T.UNIT.1}#CR#LF	Peak Min -1.00 lb

Print Format Editor Position (Num 18)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
T.PNW	2		T.PNW	1		T.UNIT	1	#CR	#LF										
t11	50	32	11	49	32	t9	49	13	10										

Num	Description	Tokenized Format	Example
19	2.5 in. X 4.0 in. Barcode Ticket with Site ID, Time and Date	OD#CR#LFN#CR#LFq464#CR#LFQ812,20+0#CR#LFS2#CR#LFD8#CR#LFZT#CR#LFA55,650,3,4,1,1,N,"{T.TIM.1}{T.DAT.1}"#CR#LFB100,690,3,3,2,4,40,B,"ID{A.1.1}"#CR#LFB180,690,3,3,2,4,40,B,"G {T.GWT.1}{T.UNIT.1}"#CR#LFB265,690,3,3,2,4,40,B,"T {T.SAT.1}{T.UNIT.1}"#CR#LFB370,690,3,3,2,4,40,B,"N {T.NWT.1}{T.UNIT.1}"#CR#LFP1#CR#LF#FF	02:23 12-08-16 ID 10 G 2242 lb T 0 lb N 2242 lb

Print Format Editor Position (Num 19)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O	D	#CR	#LF	N	#CR	#LF	q	4	6	4	#CR	#LF	Q	8	1	2	,	2	0
79	68	13	10	78	13	10	113	52	54	52	13	10	81	56	49	50	44	50	48

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
+	0	#CR	#LF	S	2	#CR	#LF	D	8	#CR	#LF	Z	T	#CR	#LF	A	5	5	,
43	48	13	10	83	50	13	10	68	56	13	10	90	84	13	10	65	53	53	44

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
6	5	0	,	3	,	4	,	1	,	1	,	N	,	"	T.TIM	1	[	F	2
54	53	48	44	51	44	52	44	49	44	49	44	78	44	34	t200	49	t501	70	50

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
]		T.DAT	1	[	F	2	]	"	#CR	#LF	B	1	0	0	,	6	9	0	,
t502	32	t201	49	t501	70	50	t502	34	13	10	66	49	48	48	44	54	57	48	44

81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
3	,	3	,	2	,	4	,	4	0	,	B	,	"	I	D		A.1	1	"
51	44	51	44	50	44	52	44	52	48	44	66	44	34	73	68	32	a1	49	34

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
#CR	#LF	B	1	8	0	,	6	9	0	,	3	,	3	,	2	,	4	,	4
13	10	66	49	56	48	44	54	57	48	44	51	44	51	44	50	44	52	44	52

121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
0	,	B	,	"	G		T.GWT	1		T.UNIT	1	"	#CR	#LF	B	2	6	5	,
48	44	66	44	34	71	32	t1	49	32	t9	49	34	13	10	66	50	54	53	44

141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
6	9	0	,	3	,	3	,	2	,	4	,	4	0	,	B	,	"	T	
54	57	48	44	51	44	51	44	50	44	52	44	52	48	44	66	44	34	84	32

161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
T.SAT	1		T.UNIT	1	"	#CR	#LF	B	3	7	0	,	6	9	0	,	3	,	3
t2	49	32	t9	49	34	13	10	66	51	55	48	44	54	57	48	44	51	44	51

181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
,	2	,	4	,	4	0	,	B	,	"	N		T.NWT	1		T.UNIT	1	"	#CR
44	50	44	52	44	52	48	44	66	44	34	78	32	t3	49	32	t9	49	34	13

201	202	203	204	205	206
#LF	P	1	#CR	#LF	#FF
10	80	49	13	10	12

Num	Description	Tokenized Format	Example

20	1.25 x 1.00 Thermal Label Ticket with Time and Date	#CR#LF OD#CR#LF N#CR#LF q248#CR#LF Q173,24+0#CR#LF S2#CR#LF D8#CR#LF ZT#CR#LF A18,8,0,3,1,1,N,"{T.TIM.1[F2]}"#CR#LF A134,8,0,3,1,1,N,"{T.DAT.1[F2]}"#CR#LF A30,47,0,4,1,1,N,"G {T.GWT.1} {T.UNIT.1}"#CR#LF A30,81,0,4,1,1,N,"T {T.SAT.1} {T.UNIT.1}"#CR#LF A30,116,0,4,1,1,N,"N {T.NWT.1} {T.UNIT.1}"#CR#LF P1#CR#LF #FF	`02:23   12-8-16`
			
			`G      2242 lb`
			
			`T         0 lb`
			
			`N      2242 lb`

Print Format Editor Position

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
#CR	#LF	O	D	#CR	#LF	N	#CR	#LF	q	2	4	8	#CR	#LF	Q	1	7	3	,
13	10	79	68	13	10	78	13	10	113	50	52	56	13	10	81	49	55	51	44

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
2	4	+	0	#CR	#LF	S	2	#CR	#LF	D	8	#CR	#LF	Z	T	#CR	#LF	A	1
50	52	43	48	13	10	83	50	13	10	68	56	13	10	90	84	13	10	65	49

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
8	,	8	,	0	,	3	,	1	,	1	,	N	,	"	T.TIM	1	[	F	2
56	44	56	44	48	44	51	44	49	44	49	44	78	44	34	t200	49	t501	70	50

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
]	"	#CR	#LF	A	1	3	4	,	8	,	0	,	3	,	1	,	1	,	N
t502	34	13	10	65	49	51	52	44	56	44	48	44	51	44	49	44	49	44	78

81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
,	"	T.DAT	1	[	F	2	]	"	#CR	#LF	A	3	0	,	4	7	,	0	,
44	34	t201	49	t501	70	50	t502	34	13	10	65	51	48	44	52	55	44	48	44

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
4	,	1	,	1	,	N	,	"	G		T.GWT	1		T.UNIT	1	"	#CR	#LF	A
52	44	49	44	49	44	78	44	34	71	32	t1	49	32	t9	49	34	13	10	65

121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
3	0	,	8	1	,	0	,	4	,	1	,	1	,	N	,	"	T		T.SAT
51	48	44	56	49	44	48	44	52	44	49	44	49	44	78	44	34	84	32	t2

141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
1		T.UNIT	1	"	#CR	#LF	A	3	0	,	1	1	6	,	0	,	4	,	1
49	32	t9	49	34	13	10	65	51	48	44	49	49	54	44	48	44	52	44	49

161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
,	1	,	N	,	"	N		T.NWT	1		T.UNIT	1	"	#CR	#LF	P	1	#CR	#LF
44	49	44	78	44	34	78	32	t3	49	32	t9	49	34	13	10	80	49	13	10

181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
#FF																			
12																			

Num	Description	Tokenized Format	Example	Print Format Editor Position

Print Format Editor Position

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
#CR	#LF	O	D	#CR	#LF	N	#CR	#LF	q	4	6	4	#CR	#LF	Q	8	1	2	,
13	10	79	68	13	10	78	13	10	113	52	54	52	13	10	81	56	49	50	44

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
2	4	+	0	#CR	#LF	S	2	#CR	#LF	D	8	#CR	#LF	Z	T	#CR	#LF	A	4
50	52	43	48	13	10	83	50	13	10	68	56	13	10	90	84	13	10	65	52

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
0	,	1	2	0	,	0	,	1	,	2	,	2	,	N	,	"	T.TIM	1	[
48	44	49	50	48	44	48	44	49	44	50	44	50	44	78	44	34	t200	49	t501

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
F	2	]		T.DAT	1	[	F	2	]	"	#CR	#LF	A	6	0	,	2	2	5
70	50	t502	32	t201	49	t501	70	50	t502	34	13	10	65	54	48	44	50	50	53

81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
,	0	,	1	,	3	,	4	,	N	,	"	I	D		A.1	1	"	#CR	#LF
44	48	44	49	44	51	44	52	44	78	44	34	73	68	32	a1	49	34	13	10

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
A	3	0	,	3	6	0	,	0	,	1	,	3	,	5	,	N	,	"	G
65	51	48	44	51	54	48	44	48	44	49	44	51	44	53	44	78	44	34	71

121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
	T.GWT	1		T.UNIT	1	"	#CR	#LF	A	3	0	,	4	9	0	,	0	,	1
32	t1	49	32	t9	49	34	13	10	65	51	48	44	52	57	48	44	48	44	49

141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
,	3	,	5	,	N	,	"	T		T.SAT	1		T.UNIT	1	"	#CR	#LF	A	3
44	51	44	53	44	78	44	34	84	32	t2	49	32	t9	49	34	13	10	65	51

161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
0	,	6	2	0	,	0	,	1	,	3	,	5	,	N	,	"	N		T.NWT
48	44	54	50	48	44	48	44	49	44	51	44	53	44	78	44	34	78	32	t3

181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
1		T.UNIT	1	"	#CR	#LF	P	1	#CR	#LF	#FF								
49	32	t9	49	34	13	10	80	49	13	10	12								

Num: 21

Description: 2.50 x 4.00 Thermal Label Ticket with ID, Time and Date

Tokenized Format:
#CR#LFOD#CR#LFN#CR#LFq464#CR#LFQ812,24+0#CR#LFS2#CR#LFD8#CR#LFZT#CR#LFA40,120,0,1,2,2,N,"{T.TIM.1}{T.DAT.1}"#CR#LFA60,225,0,1,3,4,N,"ID {A.1.1}"#CR#LFA30,360,0,1,3,5,N,"G {T.GWT.1}{T.UNIT.1}"#CR#LFA30,490,0,1,3,5,N,"T {T.SAT.1}{T.UNIT.1}"#CR#LFA30,620,0,1,3,5,N,"N {T.NWT.1}{T.UNIT.1}"#CR#LFP1#CR#LF#FF

Example:
```
 02:23   12-8-16

 ID          10

 G     2242 lb

 T        0 lb

 N     2242 lb
```

Num 22

Description: 4.00 x 6.00 Thermal Label Ticket with ID, Time and Date

Tokenized Format:
#CR#LFOD#CR#LFN#CR#LFq816#CR#LFQ1218,20+0#CR#LFS2#CR#LFD8#CR#LFZT#CR#LFA190,135,0,2,2,2,N,"{T.TIM.1}{T.DAT.1}"#CR#LFA190,275,0,2,3,3,N,"ID {A.1.1}"#CR#LFA90,545,0,2,4,4,N,"G {T.GWT.1} {T.UNIT.1}"#CR#LFA90,685,0,2,4,4,N,"T {T.SAT.1} {T.UNIT.1}"#CR#LFA90,825,0,2,4,4,N,"N {T.NWT.1} {T.UNIT.1}"#CR#LFP1#CR#LF#FF

Example:
```
 02:23    12-8-16


 ID           10


 G     2242 lb


 T        0 lb


 N     2242 lb
```

Print Format Editor Position:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
#CR	#LF	O	D	#CR	#LF	N	#CR	#LF	q	8	1	6	#CR	#LF	Q	1	2	1	8
13	10	79	68	13	10	78	13	10	113	56	49	54	13	10	81	49	50	49	56

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
,	2	0	+	0	#CR	#LF	S	2	#CR	#LF	D	8	#CR	#LF	Z	T	#CR	#LF	A
44	50	48	43	48	13	10	83	50	13	10	68	56	13	10	90	84	13	10	65

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1	9	0	,	1	3	5	,	0	,	2	,	3	,	3	,	N	,	"	T.TIM
49	57	48	44	49	51	53	44	48	44	50	44	51	44	51	44	78	44	34	t200

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1	[	F	2	]		T.DAT	1	[	F	2	]	"	#CR	#LF	A	1	9	0	,
49	t501	70	50	t502	32	t201	49	t501	70	50	t502	34	13	10	65	49	57	48	44

81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
2	7	5	,	0	,	2	,	3	,	3	,	N	,	"	I	D		A.1	1
50	55	53	44	48	44	50	44	51	44	51	44	78	44	34	73	68	32	a1	49

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
"	#CR	#LF	A	9	0	,	5	4	5	,	0	,	2	,	4	,	4	,	N
34	13	10	65	57	48	44	53	52	53	44	48	44	50	44	52	44	52	44	78

121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
,	"	G		T.GWT	1		T.UNIT	1	"	#CR	#LF	A	9	0	,	6	8	5	,
44	34	71	32	t1	49	32	t9	49	34	13	10	65	57	48	44	54	56	53	44

141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
0	,	2	,	4	,	4	,	N	,	"	T		T.SAT	1		T.UNIT	1	"	#CR
48	44	50	44	52	44	52	44	78	44	34	84	32	t2	49	32	t9	49	34	13

161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
#LF	A	9	0	,	8	2	5	,	0	,	2	,	4	,	4	,	N	,	"
10	65	57	48	44	56	50	53	44	48	44	50	44	52	44	52	44	78	44	34

181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
N		T.NWT	1		T.UNIT	1	"	#CR	#LF	P	1	#CR	#LF	#FF					
78	32	t3	49	32	t9	49	34	13	10	80	49	13	10	12					

Num 26

Description: Brecknell RD-65 (Setup RD for Data Format #3)

Tokenized Format:
{T.ACT.2[W1]} {T.ACT.1[W6]} {T.UNIT.1[W2]} #CR#LF

Example:
```
G  272.04 lb
```

Print Format Editor Position:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	T.ACT	2	[	W	1	]		T.ACT	1	[	W	6	]		T.UNIT	[	W	2	]
32	t16	50	t501	87	49	t502	32	t16	49	t501	87	54	t502	32	t9	t501	87	50	t502

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
#CR	#LF																		
13	10																		

Num	Description	Tokenized Format	Example	Print Format Editor Position																			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
31	Accumulated Count Total	{T.CAT.2} {T.CAT.1}#CR#LF	Count Total 45	T.CAT	2		T.CAT	1	#CR	#LF													
				t107	50	32	t107	49	13	10													
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
32	Analog Output	{T.ACT.1}	6.005	T.ACT	1																		
				t16	49																		

12 Complete menu structures

Setup — Diag — User — About — Audit

Setup top level menu

Setup

Calib — Scale — System — Ports — Input — Output
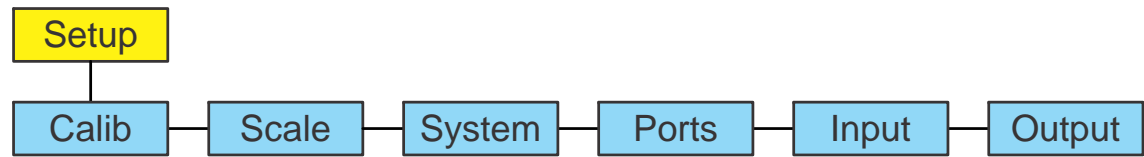
User Menu

See *User menu on page 24*
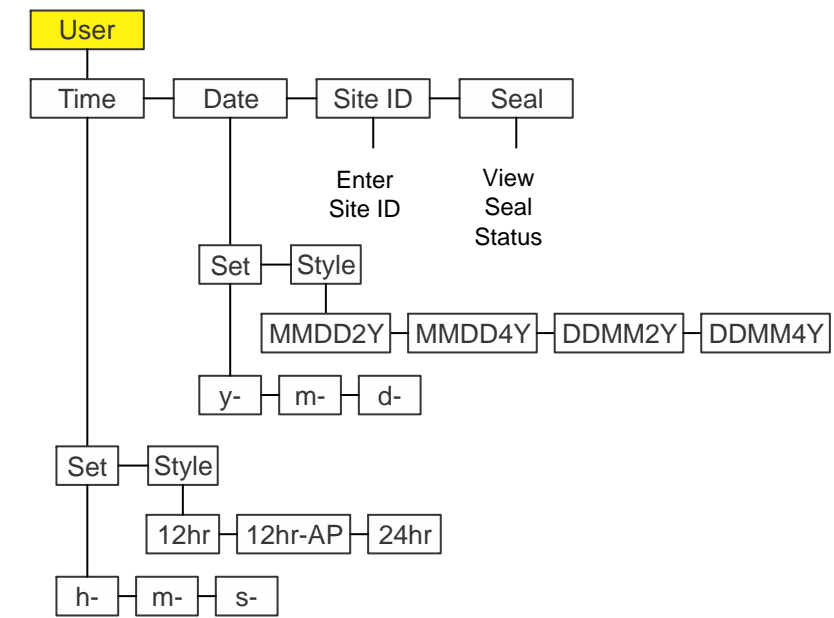
User

Time — Date — Site ID — Seal

Site ID: Enter Site ID
Seal: View Seal Status

Date:
Set — Style
Style: MMDD2Y — MMDD4Y — DDMM2Y — DDMM4Y
Set: y- — m- — d-

Time:
Set — Style
Style: 12hr — 12hr-AP — 24hr
Set: h- — m- — s-

Menu Navigation Keys:

Press **SELECT**/ ▼ to move down in a menu

Press **TARE**/ ▲ to move up in a menu, except at the bottom item in a menu, then use **ZERO**/ ⏎ or **F1**

Press **PRINT**/ ◀ to move left in a menu

Press **UNITS**/ ▶ to move right in a menu

Press **ZERO**/ ⏎ to accept a value or choice and move up in the menu.

Press **F1** to escape and move up in the menu

About Menu

See *About menu on page 28*

About

Boot — Firm — App. — Serial — Option — Enet — Dload

Serial: View Serial Number

Dload — Sserial — Dserial

Enet:
IP — Subnet — Gateway — Mac
IP: Displays IP address
Subnet: Displays Subnet info
Gateway: Displays Gateway info
Mac: Displays Mac info

App.:
Partno — Version
Partno: Displays the application part number
Version: Displays the application version number

Option:
Type — Version

Firm:
Partno — Version
Partno: Displays the firmware part number
Version: Displays the firmware version number

Boot:
Partno — Version
Partno: Displays the bootloader PN
Version: Displays the bootloader version #

Diagnostics Menu

See *Diag menu on page 35*

Diag

Scale — Cur.Zero — Display — Buttons — Ports — Inputs — Outputs — Options — Logs

Scale: View scale output in A to D counts or mV/V

Cur.Zero:
Value — Clear

Display: Continuous display test

Buttons: Test button function (**ZERO** exits the test)

Ports:
Port1 — Port2 — USB
Port1: Loopback test
Port2: Loopback test
USB: Performs write/read test

Inputs: Test configured inputs

Outputs:
1 — 2 — 3
Toggles selected output

Options: Test installed options

Logs:
Print — Clear

Audit Menu

Audit
Counter — Print
Port 1 — Port 2 — USB
Config — Calib
Displays number of configurations
Displays number of calibrations

Calibration Menu

Calib
Scale 1

Zero — Span — Linear — Input — Gravity — Display — Cal.Unit — Print
XXXX
c xxxx

LB — 1000g
Port 1 — Port 2 — USB

View live scale weight

G-fact — Alt — Calc

Zero — Span
XXXX
Counts — mV

Counts — mV

Pt2 — Pt3 — Pt4
XXXX
c xxxx

Cal.Zero — Temp — Last
c xxxx

Menu Navigation Keys:

Press **SELECT**/ ▼ to move down in a menu

Press **TARE**/ ▲ to move up in a menu, except at the bottom item in a menu, then use **ZERO**/ ↵ or **F1**

Press **PRINT**/ ◀ to move left in a menu

Press **UNITS**/ ▶ to move right in a menu

Press **ZERO**/ ↵ to accept a value or choice and move up in the menu.

Press **F1** to escape and move up in the menu

Scale Menu

Scale
Scale 1
Capacty — Dvision — Units — Stable — AZT — Filter — Ranges

Key in scale capacity

0-rnge — O-cap — G-zero

Key in % of scale capacity

Key in 0 to 10000 div.

Basis — O-Load — U-Load

Percent — Div

Key in value based on Basis chosen

Avg — Const — T-hold

Div — Time

Div — Time

Unit — Custom

Cust 1 — Cust 2 — Cust 3 — Cust 4

Ratio — String

Unit 1 — Unit 2 — Unit 3 — Unit 4

Lb — 1000 g — Oz — Gr — Lb-oz

Cust 1 — Cust 2 — Cust 3 — Cust 4 — Off

Not for Unit 1

0.000001 — 0.000002 — 0.000005 — to — 100 — 200 — 500

System Menu

See *System on page 60*

System

| Site | Display | Buttons | D-vals | Tare | Config | Archive | Serial | App | Update | Passwd | | Z-Lock |

Serial — Key in serial number of indicator

Passwd → Admin — Diag — Calib

Z-Lock → Enable — Time

Enable → **Off** — On — Key in time in minutes

Update → Manual — Auto

Manual → **No** — Yes

Auto → **On** — Pwrup — Off

App → **General** — Accum — Count — Check — Batch
→ P-hold — R-disp — Cust 1 — Cust 2

Archive → Enable — Print

Enable → **Off** — On

Print → Port 1 — Port 2 — USB

Config → Print — Reset

Print → Port 1 — Port 2 — USB

Reset → Config — Cal — All

Tare → Pushbt — Tarecl

Pushbt → **On** — Off

Tarecl → **Off** — On

D-vals:

| Gross | Tare | Net | Min | Max | G total | N total |
| Off — On | Off — On | Off — On | Off — On | Off — On | Off — On | Off — On |

| T total | C total | Trancnt | Count | Pc Wt | A2D Cnt | Percent |
| Off — On | Off — On | Off — On | Off — On | Off — On | Off — On | Off — On |

Defaults vary with application

Buttons:

| Print | Units | Select | Tare | Zero | Sample |
| **On** — Off | **On** — Off | **On** — Off | **On** — Off | **On** — Off | **On** — Off |

| F1 | Target | Start | Stop | ID | Setup |
| **On** — Off | **On** — Off | **On** — Off | **On** — Off | **On** — Off | **On** — Off |

Display → Dec.Pt — Update — M-dash — C-zero

C-zero → **0.25** — 0.50

M-dash → **Off** — On

Update → 1 — 2 — 5 — **10** — 20

Dec.Pt → **Decimal** — Comma

A bold box and text = default value for USA

Site → USA — GB — CAN — EU — CHINA — INDIA

Ports Menu

See *Ports on page 72*

Ports

Serial — Enet — Protcl — P.F. Edit — PLC — Printer — InterL — File — Options

Port1 — Port2

PrnFt1 ··· PrnFt40

Create Print Formats

Path — Mode — Reset

FTP — USB

Reset sequence to 0

Auto — Prn RTZ

Off — On

Percent — Print — Accum

Key in % of capacity

Off — On   **Off** — On

Constnt — Numbrd — D_T

Bus 1

Enable — An. out — Serial

Off — On

Baud — D-Bits — Parity — S-Bits

Choose baud rate | Choose data bits | Choose parity | Choose stop bits

See selections under Ports menu

Lo — Hi — Cal

Zero — Span

Adjust — Adjust

ZA 0.0 — SA 0.0

Prtr 1 — Prtr 2

Enable — Brand — Bind

Off — On

Port 1 — Port 2 — Enet 1 ··· Enet 5

Zebra — Epson — HP14– — HP15– — HP85–

Net 1

Type — Endian — Trade — In — Out

Off — On

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Little — Big

Type — Value

See Network Token list

Sint8 — Uint8 — Sint16 — Uint16 — Sint32 — Uint32 — Float

Enet IP — M TCP

Proto 1 ··· Proto 5

Type x — Bind x — Attr x

Prnft — Inhib — Rate — Address — Enq

Off — On

Key in 1-254 (0 def.)   Key in 1-254 (5 def.)

1 ··· 40

1 2 5 10 20

Port 1 — Port 2 — Enet 1 ··· Enet 5 — File — Option — Prtr 1 — Prtr 2 — Prtr.USB

None — **Print** — ENQ — SMA — B-Cast — PLC — FTP — RD — NCI

IP Addr — Subnet — Gateway — DHCP — Conn.No

Key in IP address | Key in Subnet address | Key in Gateway address

Off — **On**

E-net 1 ··· E-net 5

Port x — Type x — Host x

Key in 1 thru 65535   Key in Host address

Off — Client — Server

Baud — D-Bits — Parity — S-Bits — C-trol — Select

Port 1 only

Port1-2 — Port1-H

None — Hard — Soft

Port 1 only

1 — 2

None — Odd — Even

7 — **8**

300 — 600 — 1200 — 2400 — 4800 — **9600** — 19200 — 38400 — 57600 — 115200

Input Menu

See *Inputs on page 96*

Input

In 1 — In 2 — In 3

On — Off

Output Menu

See *Outputs on page 97*

Output

Out 1 — Out 2 — Out 3

Off — On
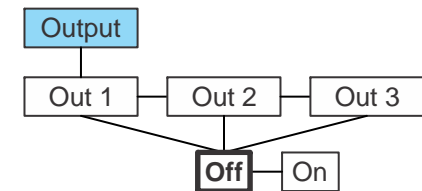
13 Technical illustrations

13.1 Stainless steel enclosure assembly
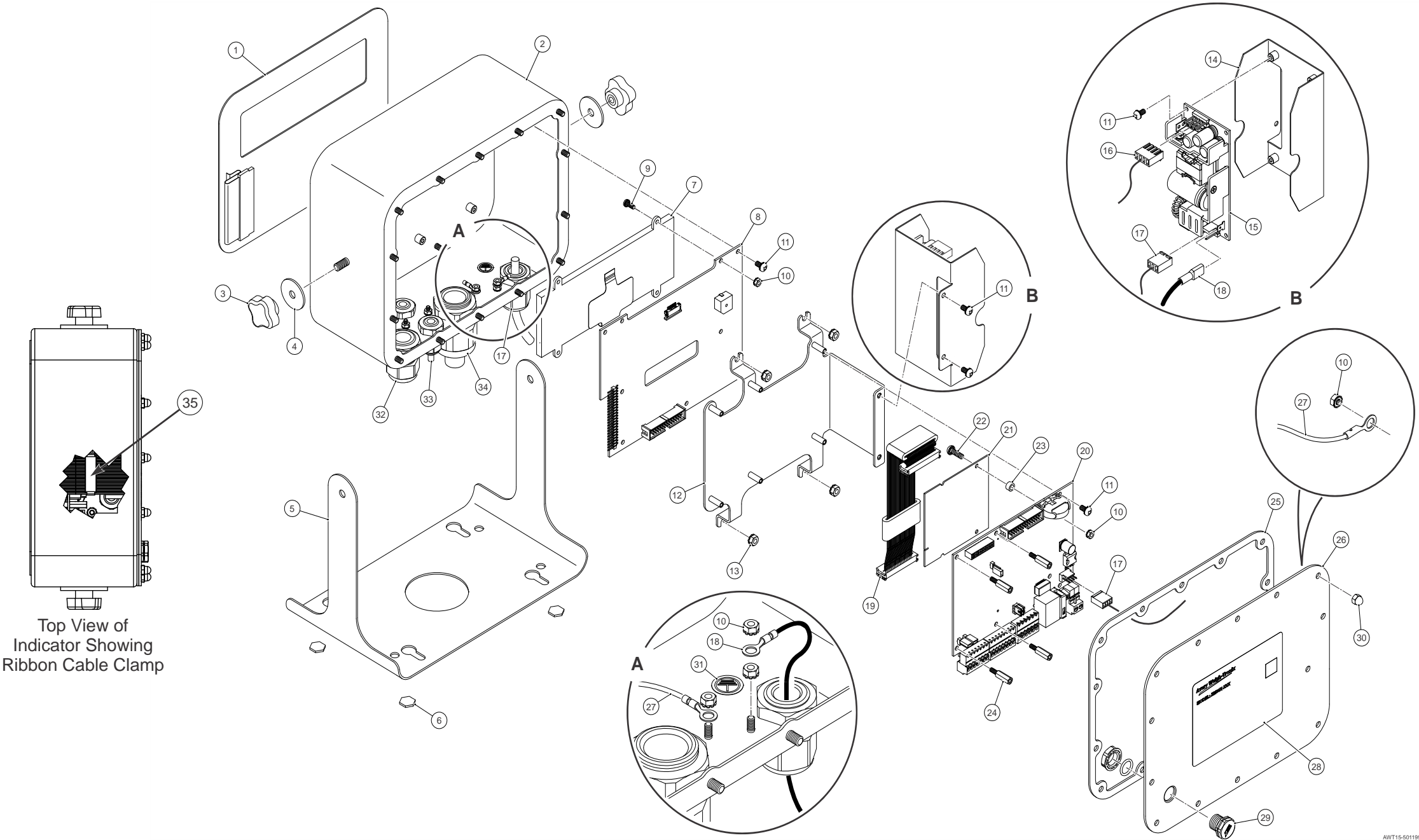
Top View of Indicator Showing Ribbon Cable Clamp

AWT15-501199

ITEM	DESCRIPTION	QTY
1	OVERLAY, KEYPAD, ZM301	1
2	ENCLOSURE, WELDMENT-ZM301	1
3	KNOB, 4 LOBE-M6	2
4	PAD,NEOPRENE-1"DIA	2
5	STAND, ENCLOSURE ZM301	1
6	LO-SKID FOOT 7/16"HEX,1/16"THK W/9672	4
7	DISPLAY LCD NEG IMAGE IBN SEG	1
8	PCB ASSY DSPL/KYPD INTFC ZM3XX	1
9	SCREW/WASHER ASSY M3.0X0.5X8MM	4
10	NUT,M3 W/EXT LOCK WASHER	12
11	SCREW, M3 x.5 6mm LG SEMS PHILIPS PAN HEAD	13
12	BRACKET, PC BOARD ZM301	1
13	NUT,M4 W/EXT LOCK WASHER	4
14	SHIELD, POWER SUPPLY-ZM301	1
15	POWER SPLY 100-240VAC 65W 24V	1
16	CABLE ASSY, ZMXXX POWER SUPPLY	1
17	POWER CORD KIT, ZMXXX USA	1
18	WIRE GND ZM PWR SUPPLY TO CHAS	1
19	CABLE ASSY MAIN/DSPL INTFC ZM	1
20	PCB ASSY, MAIN ZMXX	1
21	PCB ASSY, CARD ENGINE MCF54450	1
22	SCREW, M3x10mm LONG	2
23	SPACER,RD-3.2MMID X 3.0MM LG	2
24	STANDOFF,HEX M3X0.5X14mm M/F	4
25	GASKET, UNIVERSAL ZM301	1
26	PANEL, BACK ENCLOSURE	1
27	WIRE, GROUND ZMXXX SERIES	1
28	LABEL,WHT POLY TAMPER 4X3	1
29	VENT,MEMBRANE GREY W/NUT	1
30	NUT, ACORN-M4	14
31	LABEL,GROUND (YELLOW)	1
32	NUT,LOCK STR RELIEF PG13.5 THR	1
	O-RING PG 13.5 BUNA-N	1
	STRAIN RELIEF,PWR CORD .24-.47	1
33	NUT,LOCK STR RELIEF PG7 THR'D	2
	PG7 'O' RING SEAL:HUMMEL OR-07	2
	STRAIN RELIEF,PWR CORD .11-.26	2
	PLUG, STRAIN RELIEF PG 7	2
34	NUT,LOCK STR RELIEF 3/4" NPT	1
	O-RING 3/4" NPT BUNA-N	1
	STRAIN RELIEF,PWR CORD .39-.62	1
	PLUG, STRAIN RELIEF 3/4" NPT	1
35	CABLE CLAMP, ALUMINUM FLAT	1
Extras not shown	SPACER, FOAM	1
	TAPE, TRANSPARENT 12.7mm WIDE	60mm
	SELF ZIP BAG; 110X160	1
	ADHESIVE SEALANT	4 mL

Strain Relief Torque Specs	3/4" NPT Strain Relief	PG13.5 Strain Relief	PG11 Strain Relief	PG7 Strain Relief
Dome Nut	66.4 lb-in 7.5 N-m	33.2 lb-in 3.75 N-m	33.2 lb-in 3.75 N-m	22.1 lb-in 2.5 N-m
Lock Nut	44.2 lb-in 5 N-m	22.1 lb-in 2.5 N-m	22.1 lb-in 2.5 N-m	14.4 lb-in 1.62 N-m

CAUTION: The acorn nuts holding the back plate of the indicator in place must each be tightened, in multiple passes, in a criss-cross pattern to a final torque of 0.68 N-m (approximately 6 in-lbs) to ensure proper gasket sealing. See illustration of the tightening pattern in *Torque specifications on page 11*

AWT05-506055 - Universal Hardware Kit (Parts appear in one or more ZM301 body styles)	
Description	Qty.
LOSKID7/16"HEX,1/16"THK W/9672	10
SPACER,RD-3.2MMID X 3.0MM LG	10
SCREW, FHD MACH M3X.5X5MM LG	20
NUT,M3 W/EXT LOCK WASHER	30
SCREW/WASHER ASSY M3.0X0.5X8MM	20
SCREW, M3 x.5 6mm LG SEMS PHILIPS PAN HEAD	65
SCREW, M3x10mm LONG	10
STANDOFF,HEX M3X0.5X14mm M/F	20
SPACER, FOAM	5
AC4 NYL.BLK ARROW CLIP	2
SCREW,MACH P/HD M4X12MM SST	4
STANDOFF,HEX M3X0.5X14mm M/F	4

AWT05-506052 - SS Hardware kit		
Item # (page 153)	Description	Qty.
3	KNOB, 4 LOBE-M6	10
4	PAD,NEOPRENE-1"DIA	10
13	NUT,M4 W/EXT LOCK WASHER	55
29	VENT,MEMBRANE GREY W/NUT	5
	CABLE CLAMP	5
	WASHER,RUBBER,BLUE	10
	TIE,CABLE	5

Common Parts			
Item # (page 153)	PN	Description	Qty.
	AWT25-501095	CABLE ASSY, POWER ALLOY ZMXXX	1
19	AWT25-501168	CABLE ASSY MAIN/DSPL INTFC ZM	1
	AWT25-501234	Spacer, Card Engine ZM Series	1
21	AWT25-500934	PCB ASSY, CARD ENGINE MCF54450	1
8	AWT25-500949	PCB ASSY DSPL/KYPD INTFC ZM3XX	1
7	AWT25-501025	DISPLAY LCD POS IMAGE TN SEG	1
7	AWT25-501026	DISPLAY LCD NEG IMAGE IBN SEG	1
1	AWT25-501042	OVERLAY, KEYPAD, ZM301	1
20	AWT25-501117	PCB ASSY, MAIN ZMXX	1

AWT05-506054 - Kit, M4 ACORN NUT	
NUT, ACORN-M4	100

AWT05-506301 - Kit Service Connectors for ZM Indicator		
PN	DESC	QTY
18009-0011	TERMINAL BLOCK,PLUG 2 PIN	1
AWT25-500782	TERMINAL BLOCK, 7 POS PLUG PHOENIX ONLY	1
AWT25-500945	TERMINAL BLOCK 6 POS PLUG 3.8	1
AWT25-500946	TERMINAL BLOCK 8 POS PLUG 3.5	1

Stainless steel enclosure parts			
Item # (page 153)	PN	Description	Qty.
5	AWT20-505480	STAND, ENCLOSURE ZM301	1
12	AWT20-505669	BRACKET, PC BOARD ZM301	1
14	AWT20-505670	SHIELD, POWER SUPPLY-ZM301	1
15	AWT25-501098	POWER SPLY 100-240VAC 65W 24V	1
16	AWT25-501063	CABLE ASSY, ZMXXX POWER SUPPLY	1
17	AWT25-501064	POWER CORD KIT, ZMXXX NA	1
18	AWT25-501162	WIRE GND ZM PWR SUPPLY TO CHAS	1
25	AWT20-505668	GASKET, UNIVERSAL ZM301	1
26	AWT20-505912	PANEL, BACK ENCLOSURE	1
27	AWT25-501072	WIRE, GROUND ZMXXX SERIES	1

KIT AWT05-506050 - Stainless Steel Enclosure Subassembly		
Item # (page 153)	Description	Qty.
2	ENCLOSURE, WELDMENT-ZM301	1
	ZM301 KEYPAD (PN AWT25-501042 can be ordered alone)	1
25	GASKET	1
	ADHESIVE SEALANT	4 mL

AWT05-506053 - Strain Relief Kit for Stanless steel enclosure		
Item # (page 153)	Description	Qty.
32	O-RING PG 13.5 BUNA-N	5
34	O-RING 3/4" NPT BUNA-N	5
33	PG7 'O' RING SEAL:HUMMEL OR-07	10
33	STRAIN RELIEF,PWR CORD .11-.26	10
32	STRAIN RELIEF,PWR CORD .24-.47	5
33	NUT,LOCK STR RELIEF PG7 THR'D	10
32	NUT,LOCK STR RELIEF PG13.5 THR	5
34	STRAIN RELIEF,PWR CORD .39-.62	5
	CORD,BLACK NEOPRENE - .25" DIA	5
	CORD,BLACK NEOPRENE - .62" DIA	5

13.3 Diecast aluminum enclosure parts and assembly
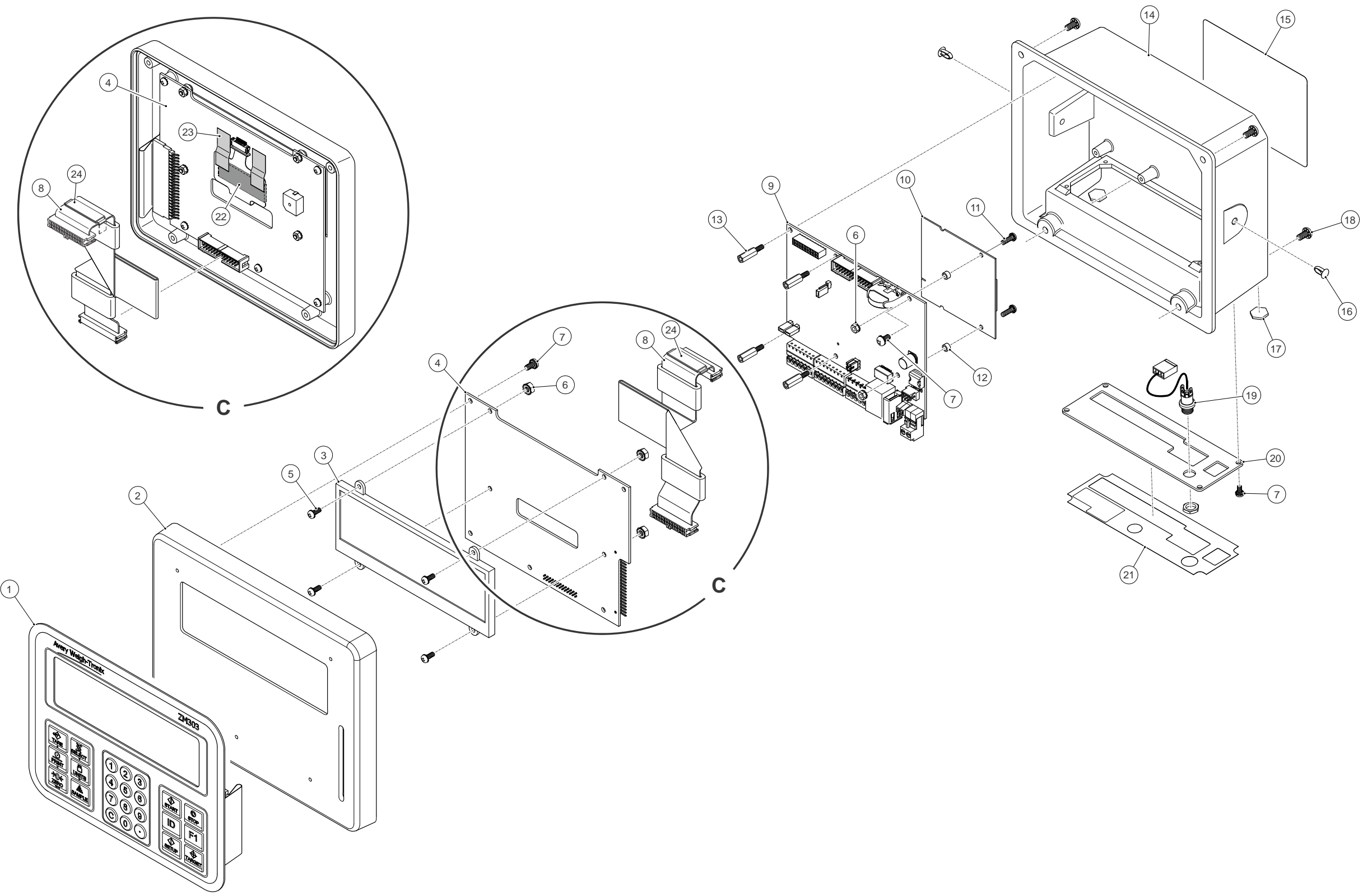
ITEM	DESCRIPTION	QTY
1	OVERLAY, KEYPAD, ZM301	1
2	COVER,ENC DESKTOP CAST ALUM	1
3	DISPLAY LCD NEG IMAGE IBN SEG	1
4	PCB ASSY DSPL/KYPD INTFC ZM3XX	1
5	SCREW/WASHER ASSY M3.0X0.5X8MM	4
6	NUT,M3 W/EXT LOCK WASHER	6
7	SCREW, M3 x.5 6mm LG SEMS PHILIPS PAN HEAD	11
8	CABLE ASSY MAIN/DSPL INTFC ZM	1
9	PCB ASSY, MAIN ZMXX	1
10	PCB ASSY, CARD ENGINE MCF54450	1
11	SCREW, M3x10mm LONG	2
12	SPACER,RD-3.2MMID X 3.0MM LG	2
13	STANDOFF,HEX M3X0.5X14mm M/F	4
14	ENCLOSURE, DESKTOP CAST ALUM	1
15	LABEL,WHT POLY TAMPER 4X3	1
16	AC4 NYL.BLK ARROW CLIP	2
17	LOSKID7/16"HEX,1/16"THK W/9672	2
18	SCREW,MACH P/HD M4X8MM SST	4
19	CABLE ASSY, POWER ALLOY ZMXXX	1
20	PLATE,COVER PCB DESKTOP MNT	1
21	DECAL ZM3XX REAR PLATE DESKTOP	1
22	SPACER, FOAM	1
23	TAPE, TRANSPARENT 12.7mm WIDE	60mm
24	CABLE CLAMP, ALUM., FLAT	1

AWT15-501296

Parts for Diecast Aluminum Enclosure			
Item # (page 155)	PN	Description	Qty.
1 2	Kit AWT05-506045	KEYPAD OVERLAY (AWT25-501042 can be ordered separately) COVER,ENC DESKTOP CAST ALUM	1 1
14	AWT20-505813	ENCLOSURE, DESKTOP CAST ALUM	1
20	AWT20-506643	PLATE,COVER PCB DESKTOP MNT	1
21	AWT20-506657	DECAL ZM3XX REAR PLATE DESKTOP	1

	Common Parts		
Item # (page 155)	PN	Description	Qty.
19	AWT25-501095	CABLE ASSY, POWER ALLOY ZMXXX	1
8	AWT25-501168	CABLE ASSY MAIN/DSPL INTFC ZM	1
	AWT25-501234	Spacer, Card Engine ZM Series	1
10	AWT25-500934	PCB ASSY, CARD ENGINE MCF54450	1
4	AWT25-500949	PCB ASSY DSPL/KYPD INTFC ZM3XX	1
3	AWT25-501025	DISPLAY LCD POS IMAGE TN SEG	1
3	AWT25-501026	DISPLAY LCD NEG IMAGE IBN SEG	1
1	AWT25-501041	OVERLAY, KEYPAD, ZM301	1
9	AWT25-501117	PCB ASSY, MAIN ZMXX	1

AWT05-506055 - Universal Hardware Kit	
Description	Qty.
LOSKID7/16"HEX,1/16"THK W/9672	10
SPACER,RD-3.2MMID X 3.0MM LG	10
SCREW, FHD MACH M3X.5X5MM LG	20
NUT,M3 W/EXT LOCK WASHER	30
SCREW/WASHER ASSY M3.0X0.5X8MM	20
SCREW, M3 x.5 6mm LG SEMS PHILIPS PAN HEAD	65
SCREW, M3x10mm LONG	10
STANDOFF,HEX M3X0.5X14mm M/F	20
SPACER, FOAM	5
AC4 NYL.BLK ARROW CLIP	2
SCREW,MACH P/HD M4X12MM SST	4
STANDOFF,HEX M3X0.5X14mm M/F	4

13.5 Panel mount enclosure parts and assembly

AWT15-501225
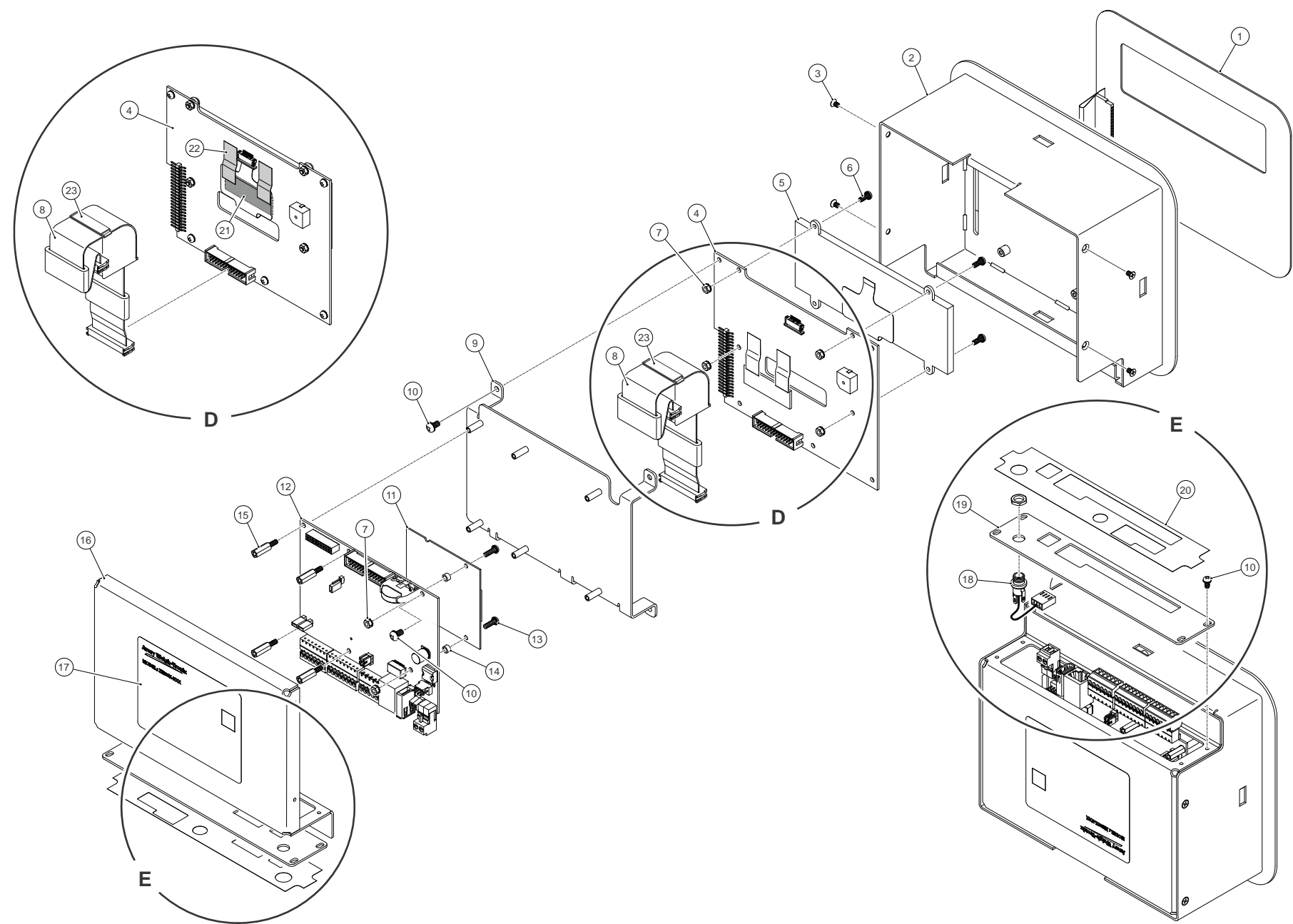
ITEM	DESCRIPTION	QTY
1	OVERLAY, KEYPAD, ZM301	1
2	BACKER PLATE/COVER WELDMENT	1
3	SCREW, FHD MACH M3X.5X5MM LG	4
4	PCB ASSY DSPL/KYPD INTFC ZM3XX	1
5	DISPLAY LCD NEG IMAGE IBN SEG	1
6	SCREW/WASHER ASSY M3.0X0.5X8MM	4
7	NUT,M3 W/EXT LOCK WASHER	6
8	CABLE ASSY MAIN/DSPL INTFC ZM	1
9	BRACKET, PCB PM W/STDOFF	1
10	SCREW, M3 x.5 6mm LG SEMS PHILIPS PAN HEAD	11
11	PCB ASSY, CARD ENGINE MCF54450	1
12	PCB ASSY, MAIN ZMXX	1
13	SCREW, M3x10mm LONG	2
14	SPACER,RD-3.2MMID X 3.0MM LG	2
15	STANDOFF,HEX M3X0.5X14mm M/F	4
16	COVER , REAR, PANEL MOUNT	1
17	LABEL,WHT POLY TAMPER 4X3	1
18	CABLE ASSY, POWER ALLOY ZMXXX	1
19	PLATE, COVER PCB-PANEL MOUNT	1
20	DECAL ZM3XX REAR PLATE PNL MTG	1
21	SPACER, FOAM	1
22	TAPE, TRANSPARENT 12.7mm WIDE	60 mm
23	CABLE CLAMP, ALUMINUM, FLAT	1

AWT05-506055 - Universal Hardware Kit	
Description	Qty.
LOSKID7/16"HEX,1/16"THK W/9672	10
SPACER,RD-3.2MMID X 3.0MM LG	10
SCREW, FHD MACH M3X.5X5MM LG	20
NUT,M3 W/EXT LOCK WASHER	30
SCREW/WASHER ASSY M3.0X0.5X8MM	20
SCREW, M3 x.5 6mm LG SEMS PHILIPS PAN HEAD	65
SCREW, M3x10mm LONG	10
STANDOFF,HEX M3X0.5X14mm M/F	20
SPACER, FOAM	5
AC4 NYL.BLK ARROW CLIP	2
SCREW,MACH P/HD M4X12MM SST	4
STANDOFF,HEX M3X0.5X14mm M/F	4

Parts for Panel Mount Encloursure			
Item # (from page 157)	PN	Description	Qty.
16	AWT20-506125	COVER , REAR, PANEL MOUNT	1
9	AWT20-506423	BRACKET, PCB PM W/STDOFF	1
19	AWT20-506743	PLATE, COVER PCB-PANEL MOUNT	1
20	AWT20-506655	DECAL ZM3XX REAR PLATE PNL MTG	1

Kit AWT05-506047 - Enclosure Subassembly, PANEL MOUNT ZM301		
Item #	Description	Qty.
1	KEYPAD OVERLAY (AWT25-501042 can be ordered separately)	1
2	BACKER PLATE/COVER WELDMENT	1

Common Parts		
AWT25-501095	CABLE ASSY, POWER ALLOY ZMXXX	1
AWT25-501168	CABLE ASSY MAIN/DSPL INTFC ZM	1
AWT25-501234	Spacer, Card Engin ZM Series	1
AWT25-500934	PCB ASSY, CARD ENGINE MCF54450	1
AWT25-500949	PCB ASSY DSPL/KYPD INTFC ZM3XX	1
AWT25-501025	DISPLAY LCD POS IMAGE TN SEG	1
AWT25-501026	DISPLAY LCD NEG IMAGE IBN SEG	1
AWT25-501041	OVERLAY, KEYPAD, ZM301	1
AWT25-501117	PCB ASSY, MAIN ZMXX	1

13.7 Stand dimensions for SST indicator
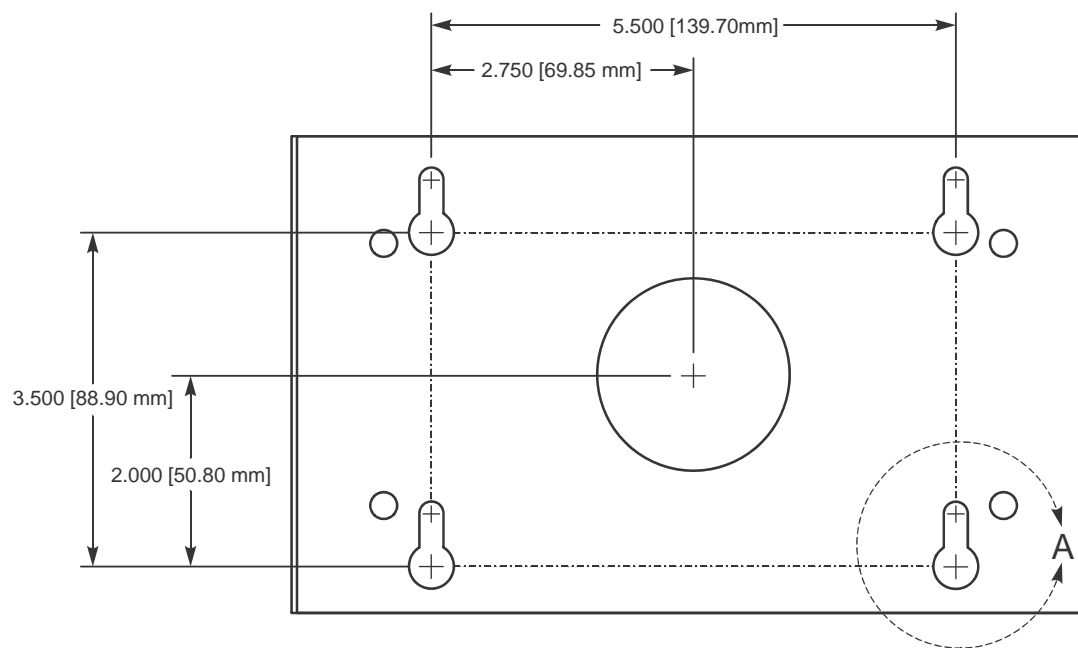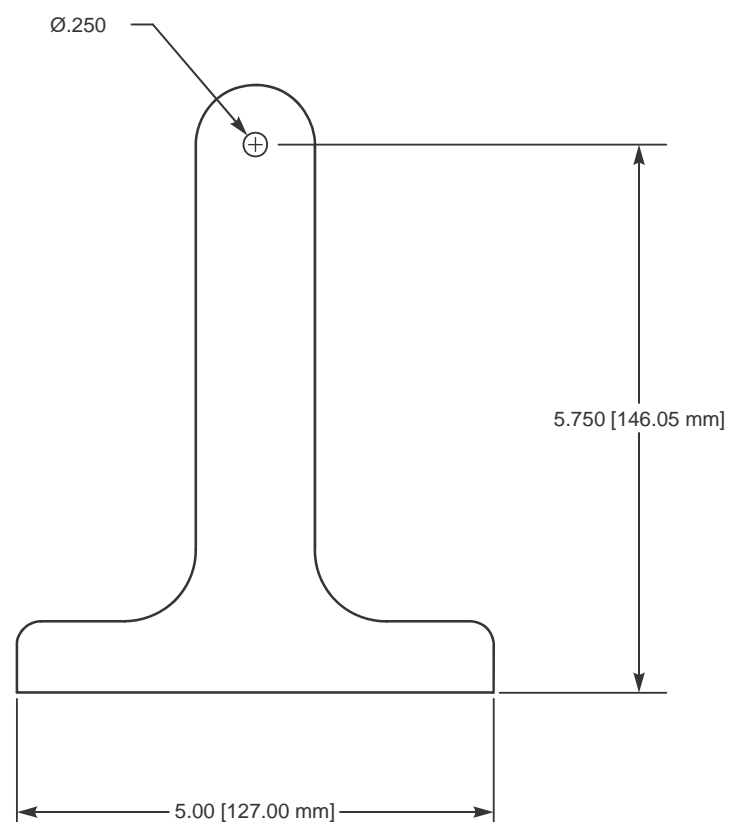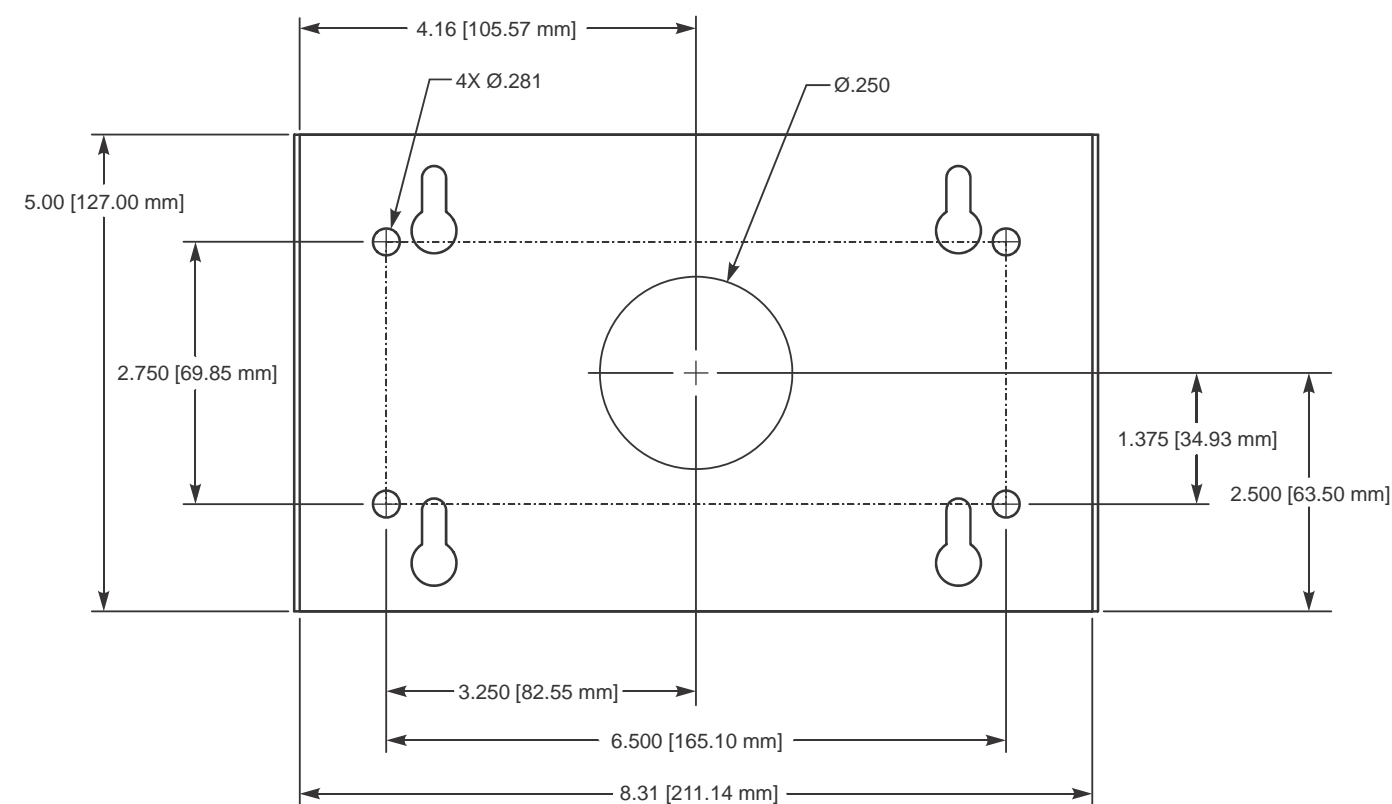
4.16 [105.57 mm]

4X Ø.281

Ø.250

5.00 [127.00 mm]

2.750 [69.85 mm]

1.375 [34.93 mm]

2.500 [63.50 mm]

3.250 [82.55 mm]

6.500 [165.10 mm]

8.31 [211.14 mm]

5.500 [139.70mm]

2.750 [69.85 mm]

3.500 [88.90 mm]

2.000 [50.80 mm]

Keyhole Detail

A

Ø.250

5.750 [146.05 mm]

5.00 [127.00 mm]

Ø.256 [6.50 mm]

.551 [14.00 mm]

Detail A

Ø.472 [12.00 mm]
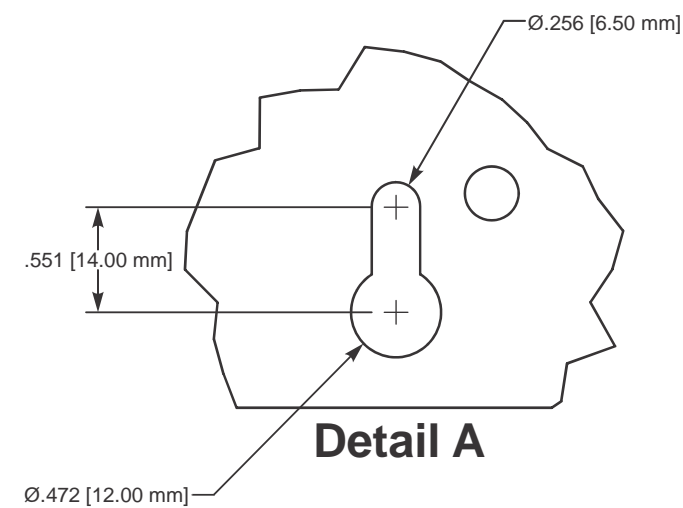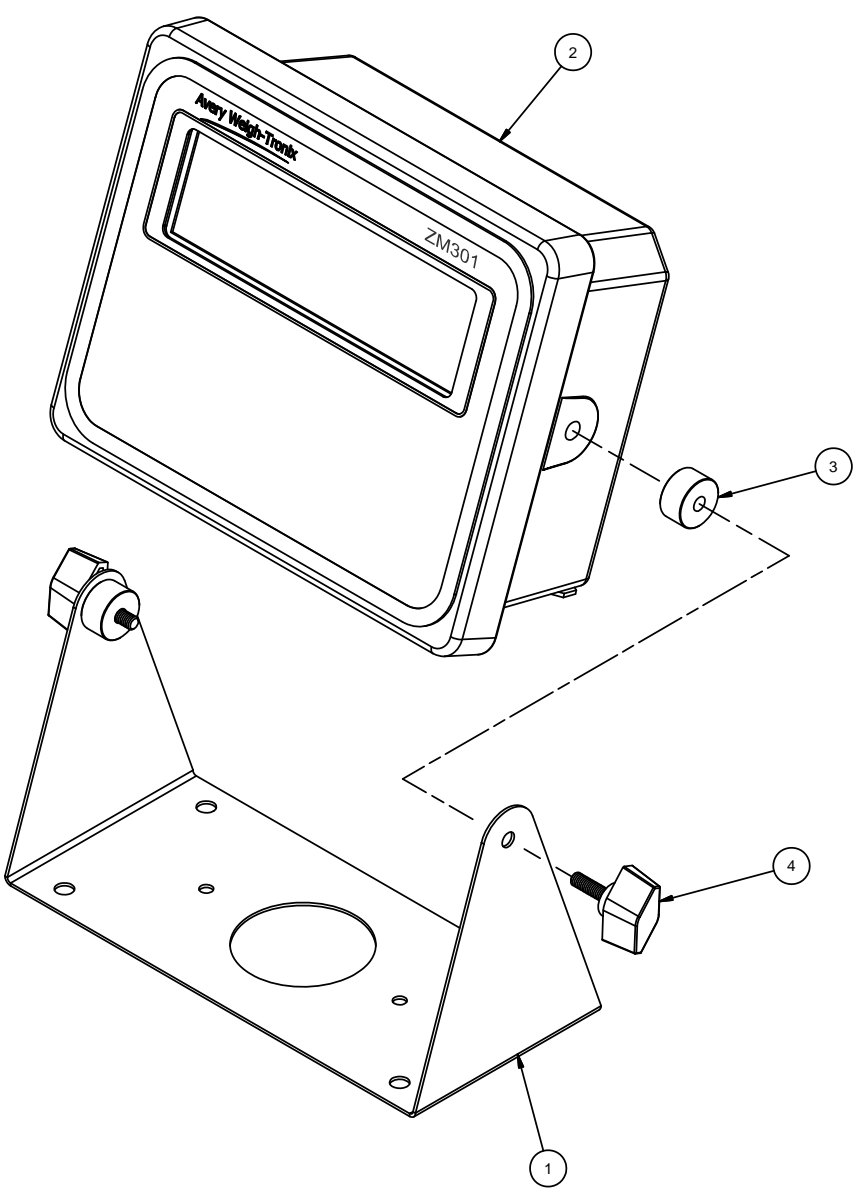
Item	Description
1	SWIVEL BRACKET
2	ALUMINUM ENCLOSURE ASSY
3	SPACER
4	KNOB
5	LO-SKID FOOT

13.9 System block diagram

Display

J1

ZM3XX Series
Display / Keypad PCB

Keypad — P1

P10

P4
Option Module

P10

Display Select
ZM301
S1
NO

ZX3XX Series
Main PCB/ Card Engine Kit

J4

Power Supply
100-240 VAC
65W 24VDC

P3

TB1 TB2 TB3 J3 J2 TB5 TB4

USB
Ethernet

Power Input			
TB5	TB4	P3	Description
		1	
1	1	2	9-36 VDC
		3	
2	2	4	GND

Scale Interface	
TB1	Description
1	-EXC
2	+EXC
3	-SEN
4	+SEN
5	-SIG
6	+SIG
7	SHIELD

Input / Output	
TB2	Description
1	GND
2	Input 1
3	Input 2
4	Input 3
5	Digital Out 1
6	Digital Out 2
7	Digital Out 3
8	Relay Voltage

Com 1 & 2 RS232	
TB3	Description
1	GND
2	TX1
3	RTS / TX2
4	RX1
5	CTS / RX2
6	5VDC

ZM301 Main PC board

Display Select Switch

See the settings for these switches in the *System block diagram on page 161*.

Flow control jumper

Jumper shown in position 2 (default) for 2 comm ports.

Position 1 = Hardware flow control for port 1.

Sense (Excitation) jumpers shown in the jumpered position.

4 wire loadcells require jumper.
6 wire loadcells do not require jumper.

13.11 ZM Remote Inputs and Outputs, Opto-22 Module

USING EXTERNAL DC VOLTAGE TO OPERATE RELAYS

(TB2)

CUTOFFS (TRIPS) CONNECTOR

1 2 3 4 5 6 7 8

NOTE:
CUTOFFS (TRIPS) ARE RATED AT A MAXIMUM OF 250mA PER OUTPUT, UP TO A MAXIMUM VOLTAGE OF 30VDC.

GND
OUT 1
OUT 2
OUT 3
RELAY VOLTAGE

K1
K2
K3

(TYPICAL RELAY CONNECTION)

-VDC/GND   EXTERNAL POWER +5 TO 30 VDC
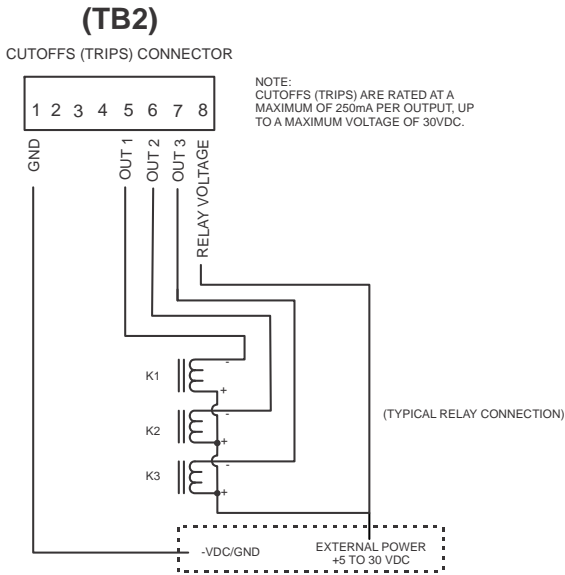
USING INTERNAL +5VDC VOLTAGE TO OPERATE RELAYS

(TB2)

CUTOFFS (TRIPS) CONNECTOR

1 2 3 4 5 6 7 8

NOTE:
CUTOFFS (TRIPS) ARE RATED AT A MAXIMUM OF 250mA PER OUTPUT, UP TO A MAXIMUM VOLTAGE OF 30VDC.

OUT 1
OUT 2
OUT 3
RELAY VOLTAGE

(TB3)

COM 1 & 2 RS232 (SERIAL)

1 2 3 4 5 6

+5VDC

MAXIMUM CURRENT DRAW OF THE +5VDC IS 500mA

K1
K2
K3

(TYPICAL RELAY CONNECTION)
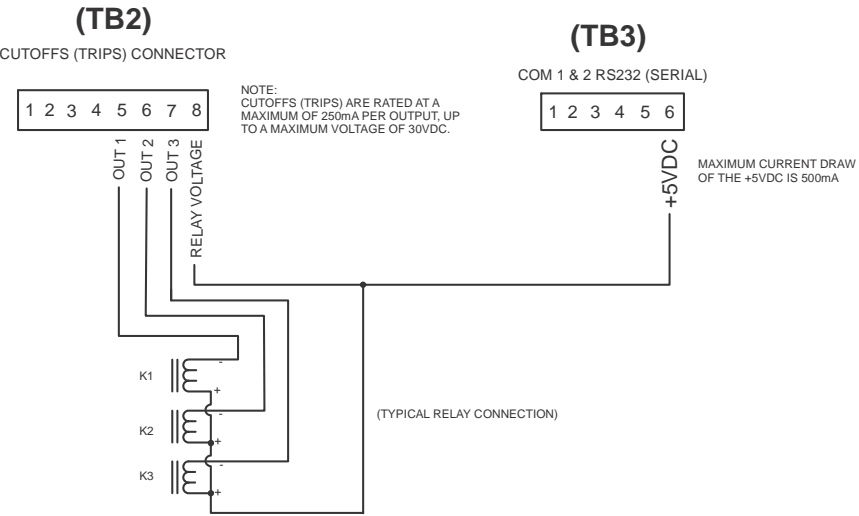
USING INTERNAL +24VDC VOLTAGE TO OPERATE RELAYS

(TB2)

CUTOFFS (TRIPS) CONNECTOR

1 2 3 4 5 6 7 8

NOTE:
CUTOFFS (TRIPS) ARE RATED AT A MAXIMUM OF 250mA PER OUTPUT, UP TO A MAXIMUM VOLTAGE OF 30VDC.

OUT 1
OUT 2
OUT 3
RELAY VOLTAGE

(TB5)

BATTERY POWER CONNECTOR

1 2

+24VDC

MAXIMUM CURRENT DRAW OF THE +24VDC IS 1 AMP

K1
K2
K3

(TYPICAL RELAY CONNECTION)
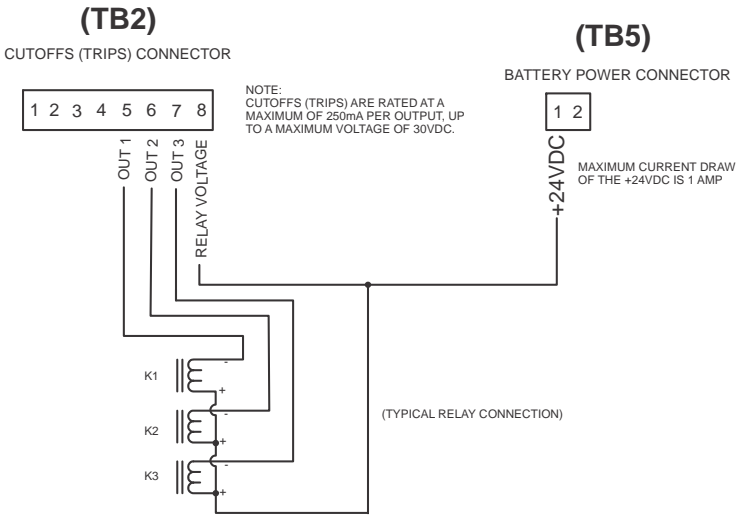
WARNING: EXCEEDING ANY OF THE CURRENT LIMITS OR VOLTAGE MAXIMUMS WILL DAMAGE THE INDICATOR.

(TB1)

EXTERNAL INPUTS CONNECTOR

1 2 3 4 5 6 7 8

NOTE:
EXTERNAL INPUT CONNECTIONS ARE 5VDC TTL LOGIC LEVEL (INTERNALLY LIMITED TO 14mA).

INPUTS WORK WITH EITHER A DRY CONTACT SWITCH (SW1, SW2) OR A 0 TO +5VDC DIGITAL INPUT (DI3).

GND
IN 1
IN 2
IN 3

SW1
SW2
DI3

TYPICAL REMOTE INPUT
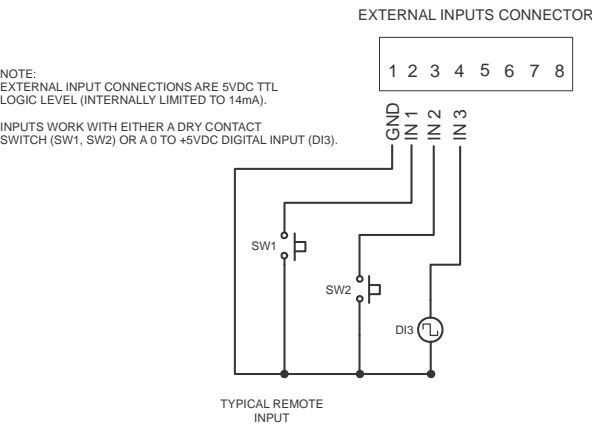
ZM Opto board
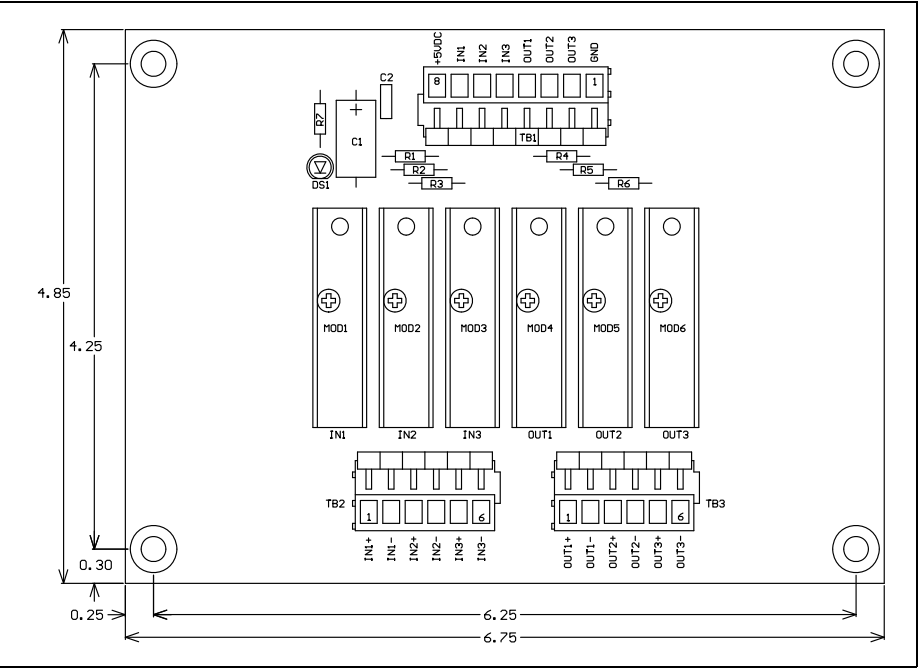
Analog Output module
(PN AWT05-505632)
Jumpers

P5 - P8
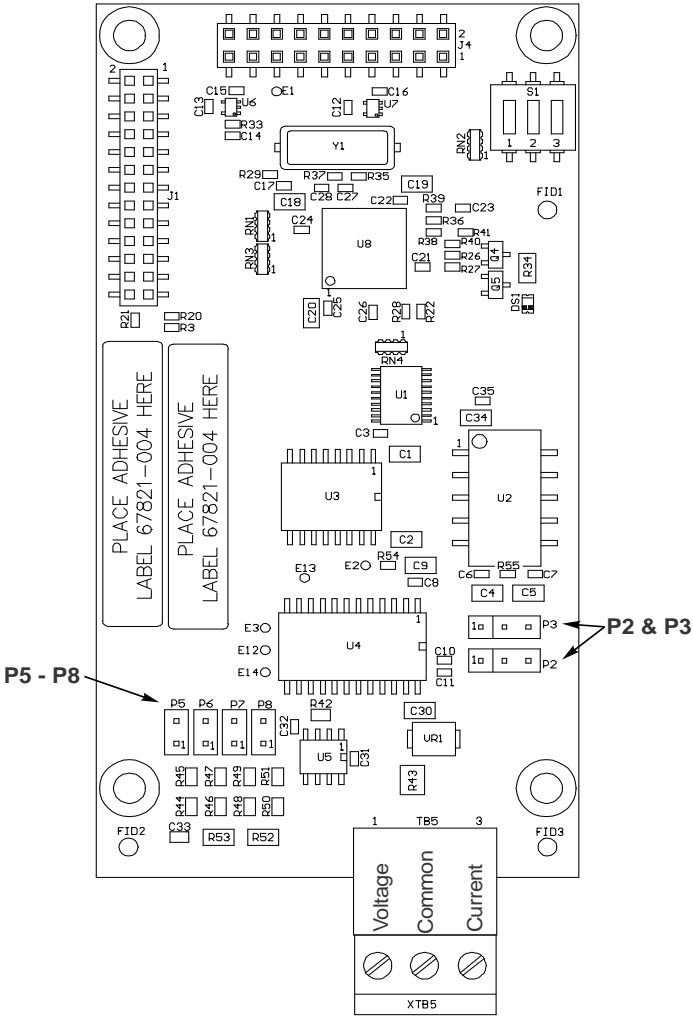
P2 & P3

Analog Output Chart							
Types of Output	Jumper						*Load Resistance
	P2	P3	P5	P6	P7	P8	
4 to 20MA	1-2	2-3	1	1	1	1	500 Ohm Max.
0 to 20MA	2-3	1-2	1	1	1	1	
0 to 24MA	1-2	1-2	1	1	1	1	
0 to 5V	2-3	2-3	1-2	1	1	1	800 Ohm Min.
0 to 10V	2-3	2-3	1	1-2	1	1	
±-5V	2-3	2-3	1	1	1-2	1	
±-10V	2-3	2-3	1	1	1	1-2	

*Load Resistance = Cable resistance plus resistance of input unit.

RS485 / Current Loop Module
(PN AWT05-505634)
Jumpers

P2 - Jumper On = RCV Sinking
P2 - Jumper Off = RCV Sourcing

P1 - Jumper On = Terminated
P1 - Jumper Off = Unterminated
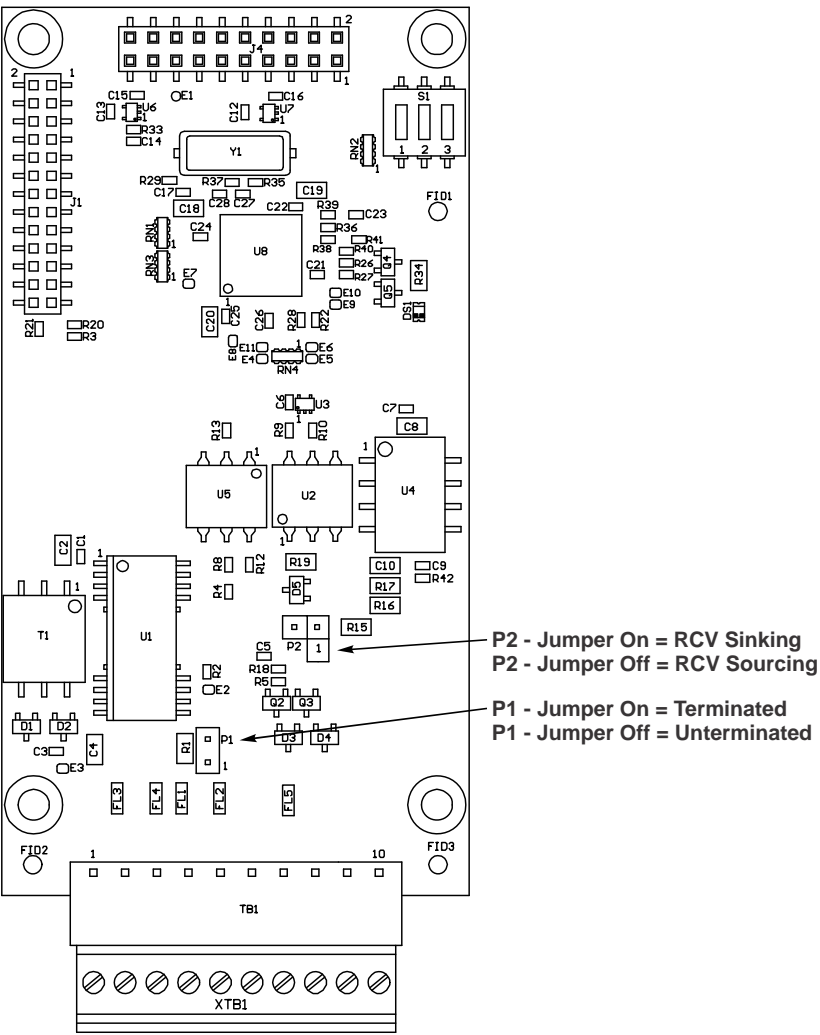
Component Side

TB1	
Pin	Function
1	GND (isolated)
2	XMTA
3	XMTB
4	RCVA
5	RCVB
6	NC
7	20ma TX Out
8	20ma TX Return
9	20ma RCV Input
10	20ma RCV Return

USB Device Module
(PN AWT05-505633)

Component Side
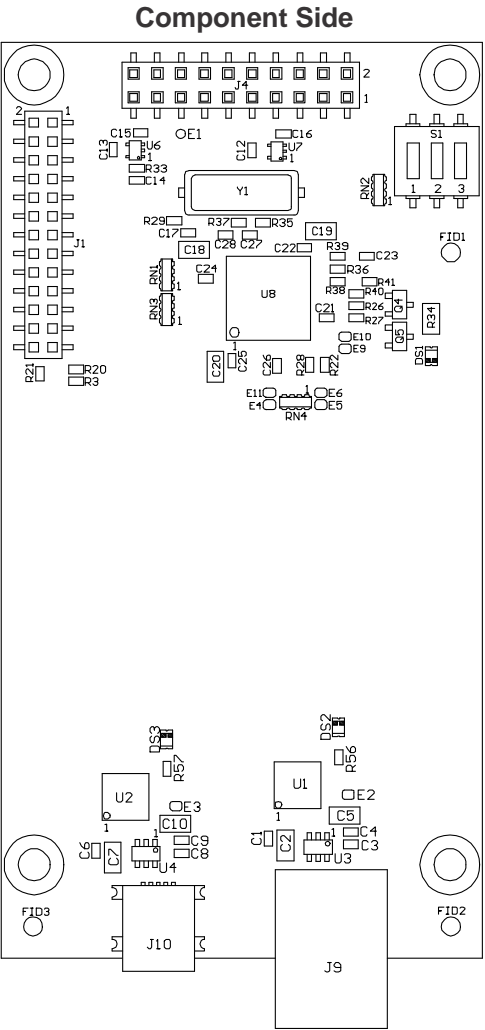
Wireless 802.11g Module
(PN AWT05-505849)

Component Side
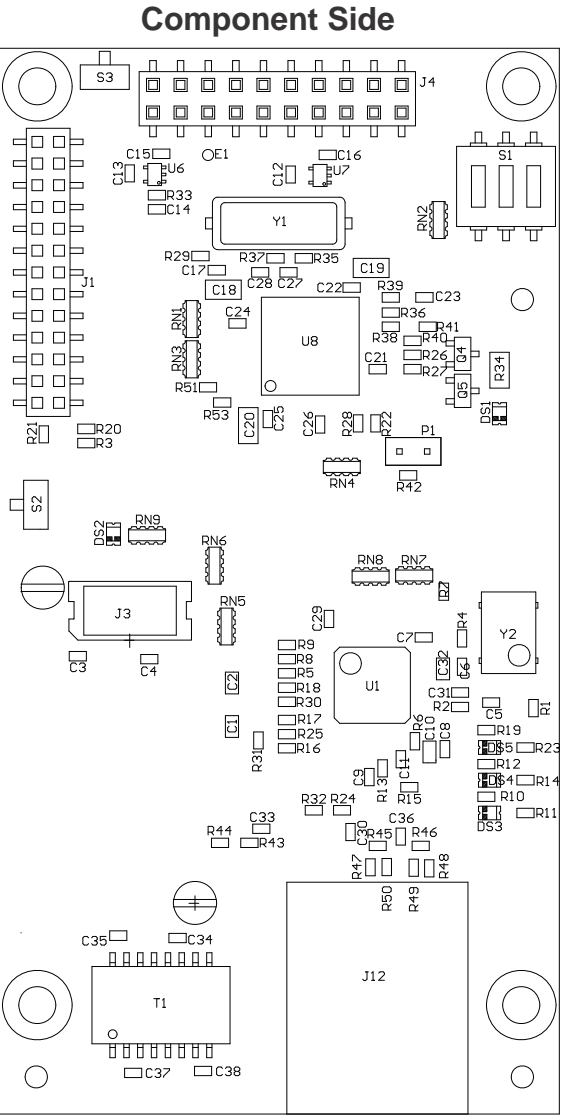
13.13 Outline dimensions (stainless steel)
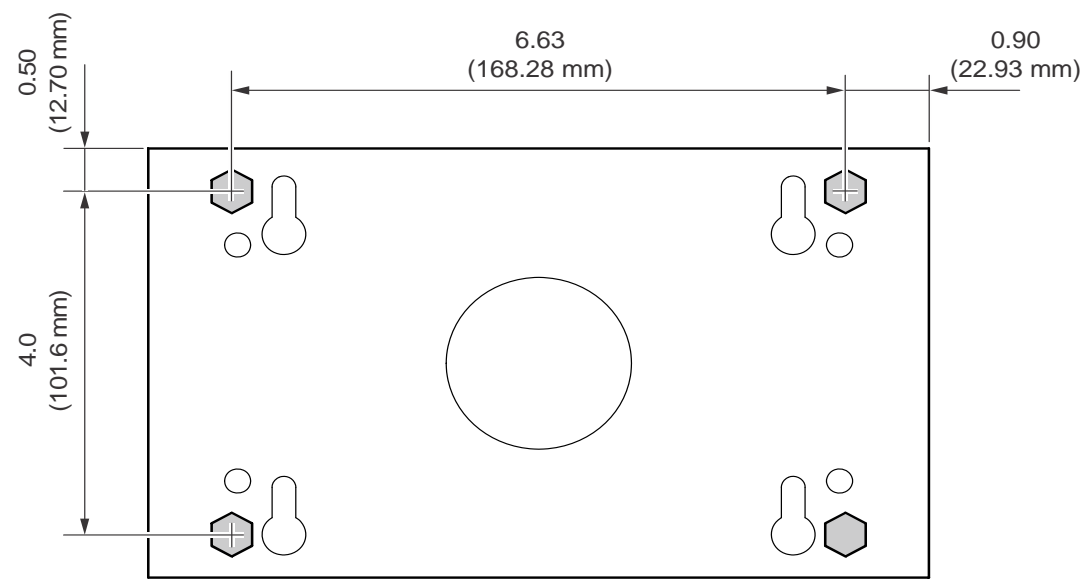
ZM301 Stainless Steel

0.50
(12.70 mm)

6.63
(168.28 mm)

0.90
(22.93 mm)

4.0
(101.6 mm)

9.63
(244.6 mm)

8.25
(209.6 mm)

3.55
(90.2 mm)

Avery Weigh-Tronix   ZM301

TARE   SELECT   ZERO   PRINT   UNITS   F1

6.50
(165.1 mm)

8.75
(222.3 mm)

8.43
(214.1 mm)

5.0
(127.0 mm)

8.69
(220.7 mm)

3.49
(88.1 mm)

6.94
(176.3 mm)

5.94
(150.9 mm)

Avery Weigh-Tronix   ZM301

TARE   SELECT   ZERO   PRINT   UNITS   F1

ZM301 Panel Mount

7.69
(195.3 mm)
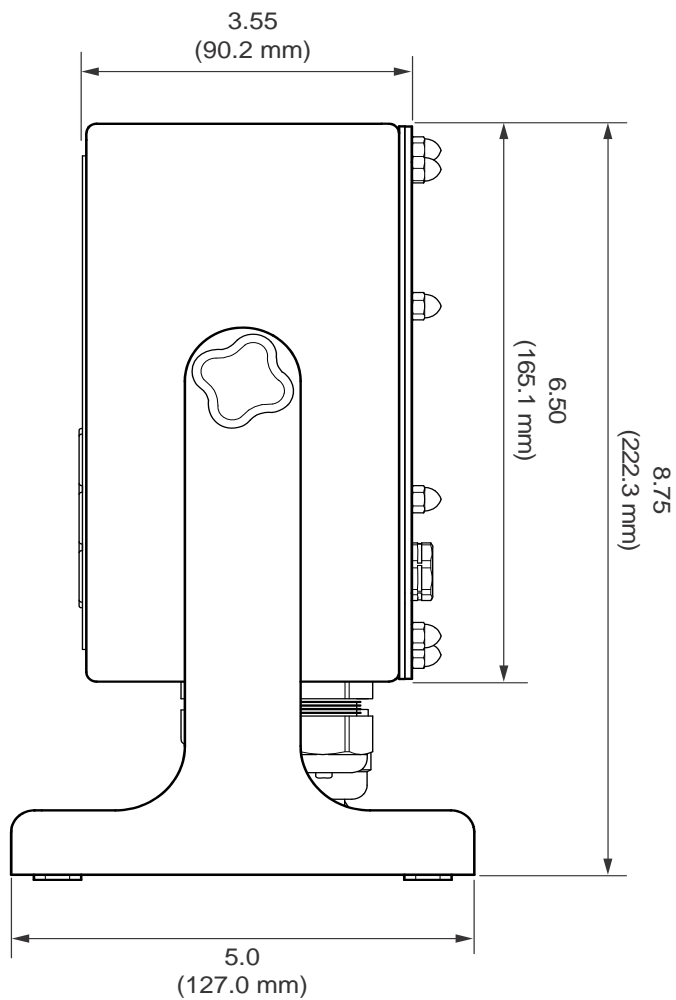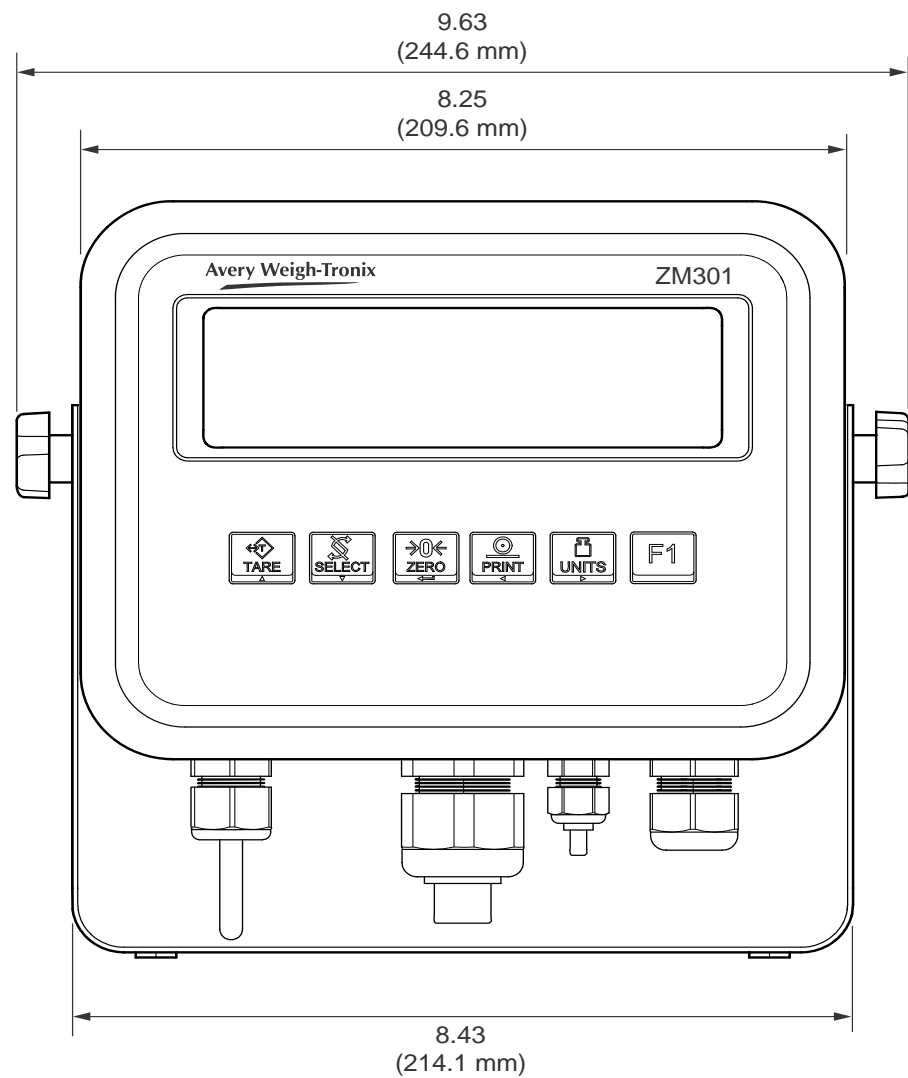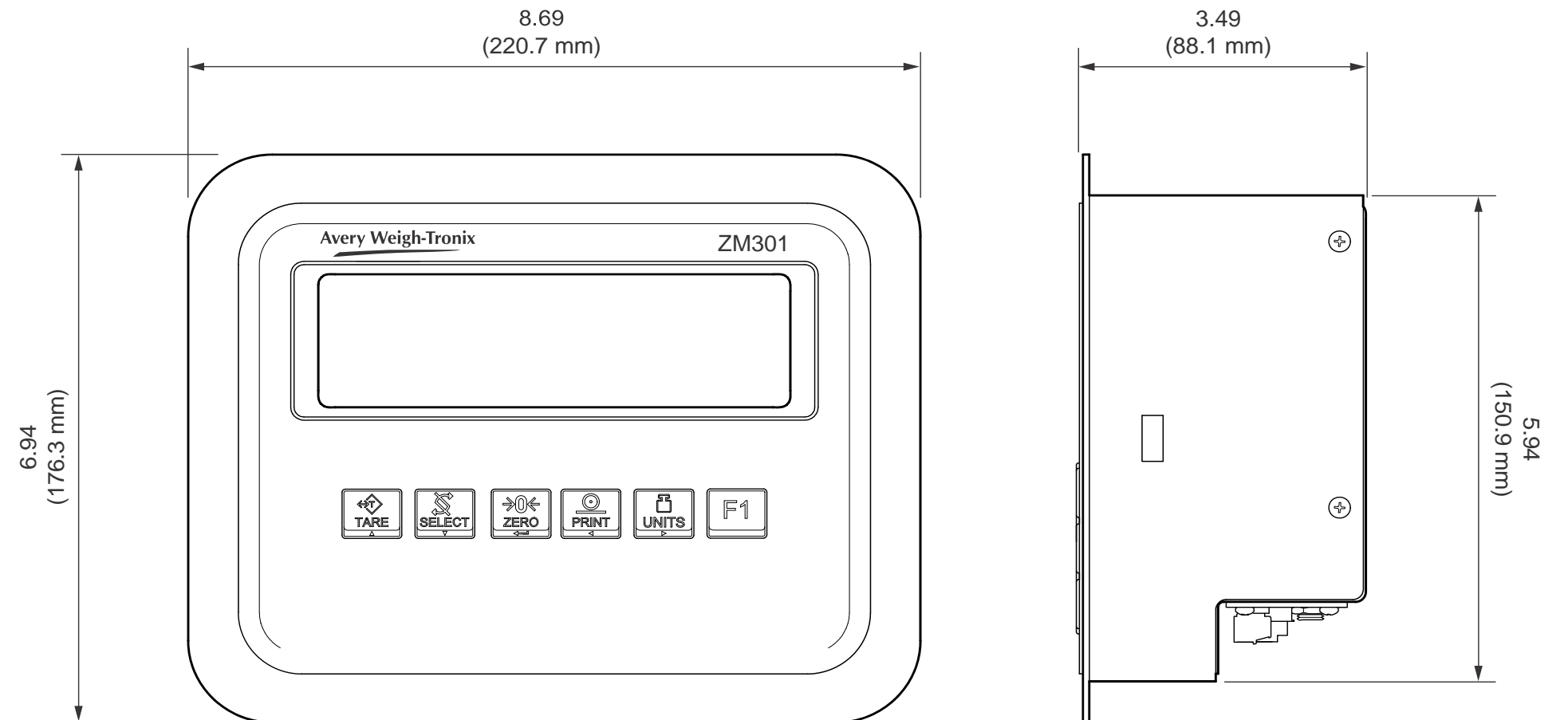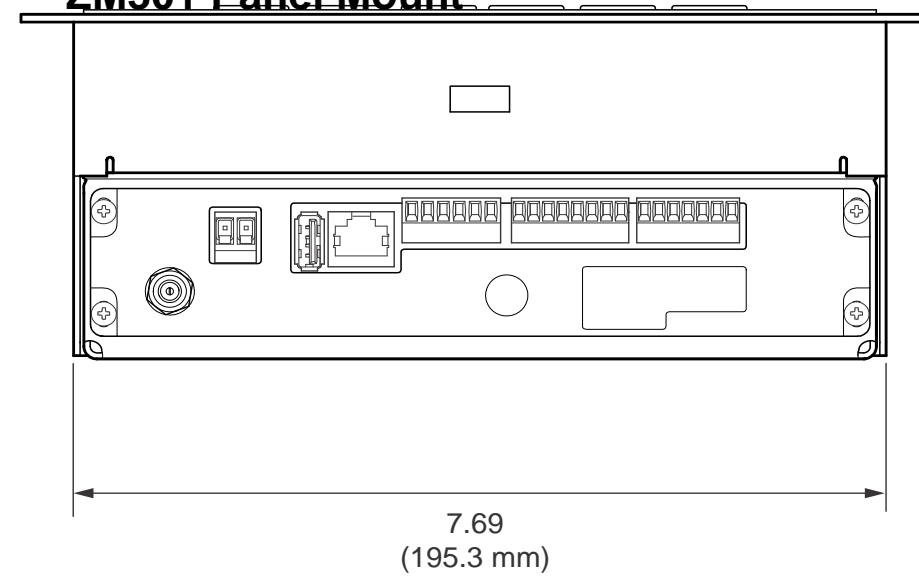
13.15 Panel mount assembly

7.75
(196.850 mm)

6.00
(152.400 mm)

EXISTING ENCLOSURE DOOR

CUTOUT DIMENSIONS

INSIDE VIEW ASSEMBLY

ZM SERIES PANEL MOUNT ENCLOSURE

TENSION PLATE

TENSION BLOCK
TORQUE VALUE FOR
THE TENSION BLOCKS
4-5 IN/LBS

**EXPLODED INSIDE VIEW
ASSEMBLY**

PANEL MOUNT GASKET

**EXPLODED OUTSIDE VIEW
ASSEMBLY**

8.00
(203.2 mm)

3.75
(82.6 mm)

6.31
(160.3 mm)

Avery Weigh-Tronix

ZM301

TARE   SELECT   ZERO   PRINT   UNITS   F1
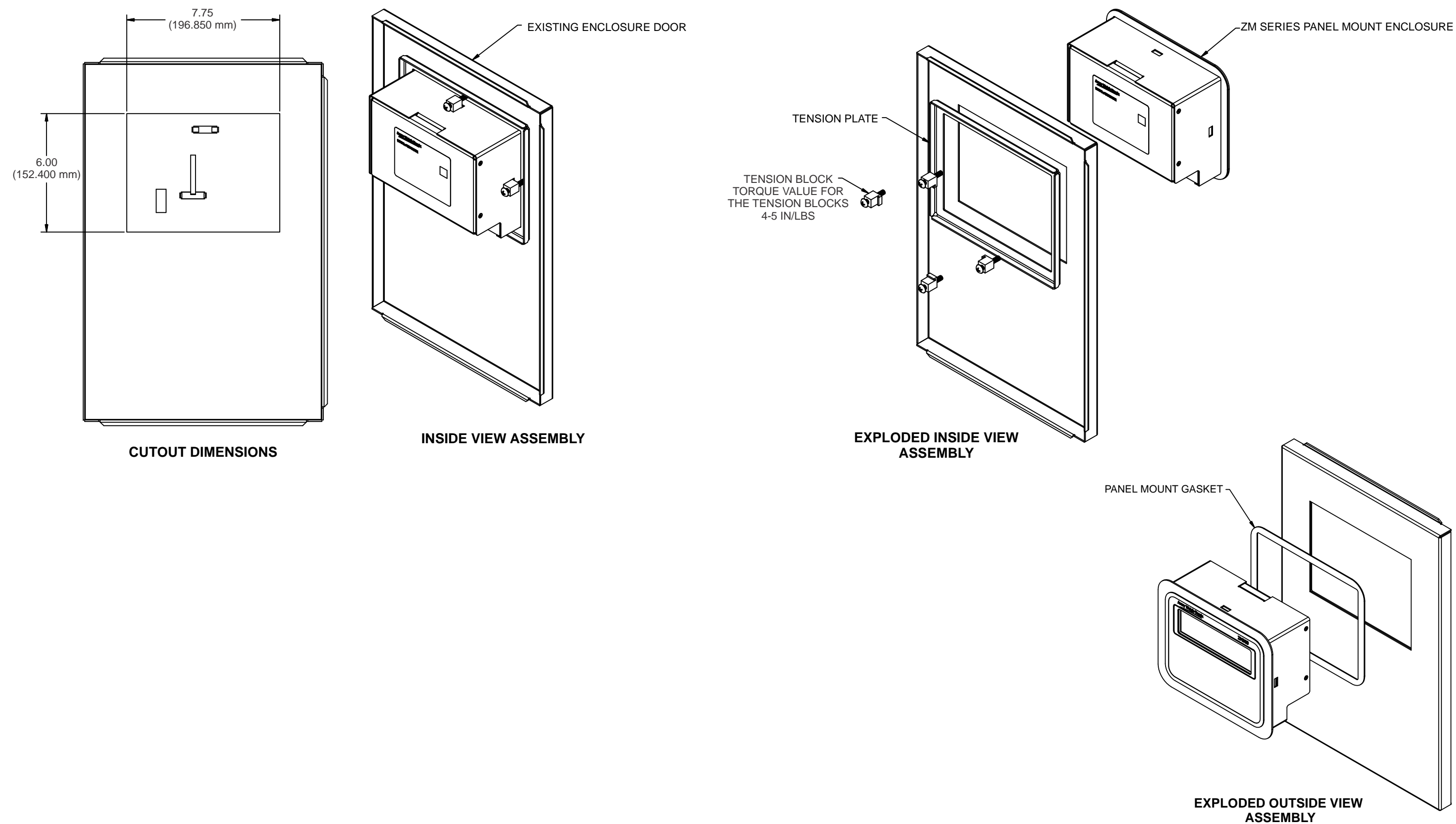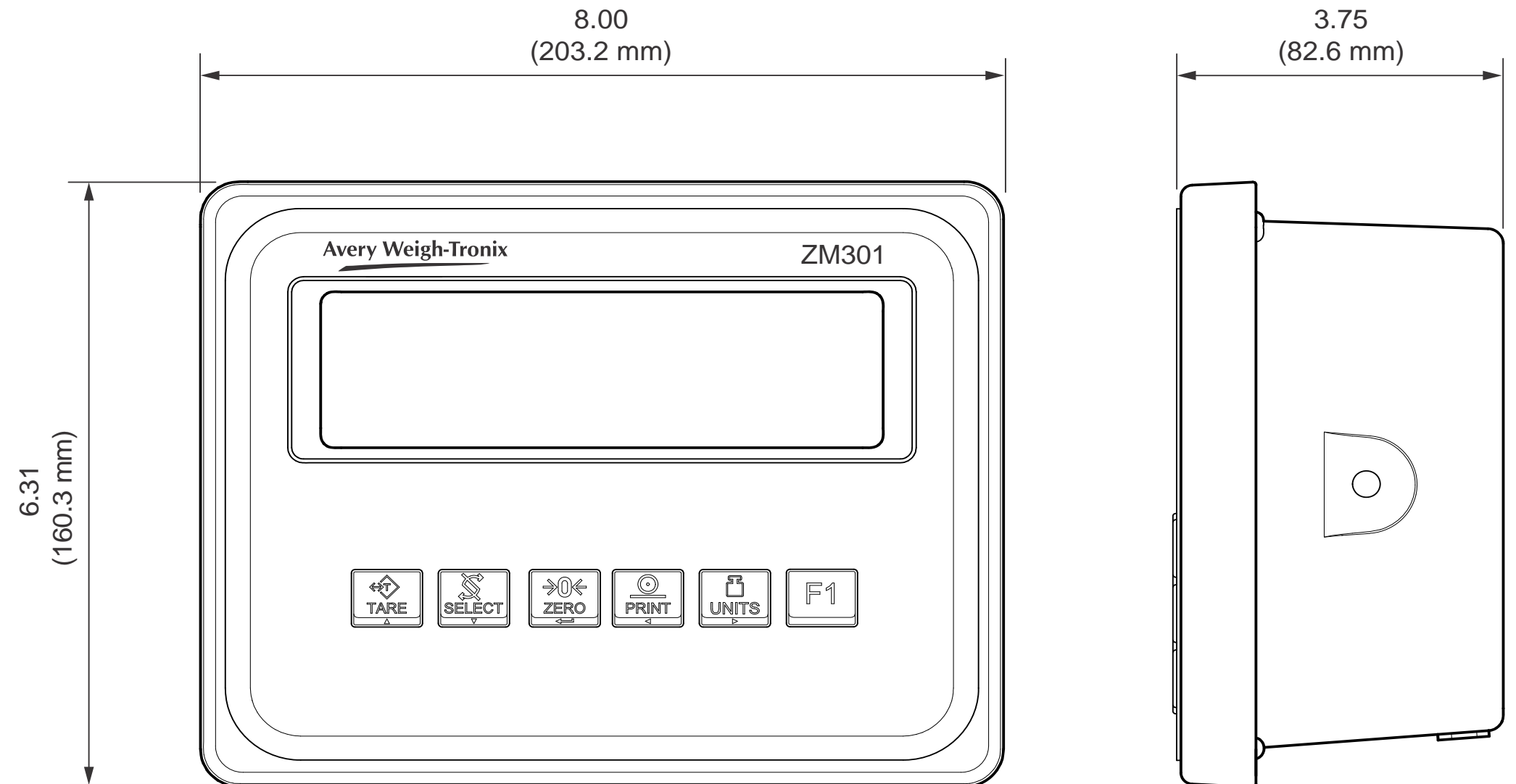
ZM301 Aluminum case

13.17 D-cell Battery pack option (AWT05-505852)

Dimensions:
9 in (22.86 cm) L
5.25 in (13.33 cm) W
2.75 in (6.98 cm) H

Mounting holes for
indicator base.

ZM-BAT

RATED OUTPUT: 9-12VDC 2.0Ah

On/Off button

Open

Close

Turn knobs counter clockwise to remove the door.
Clockwise to secure door in place.

Pass cable through an available gland, attach the
wires to the orange connector as described below:
Battery Connections:
White wire to + side of TB4
Black wire to - side of TB4.

If you use an external battery for power and wish to take advantage of the
auto off function, follow the suggested circuit illustration below.

ZM
Power

0.20A

+ RLY

ZM - Output #3
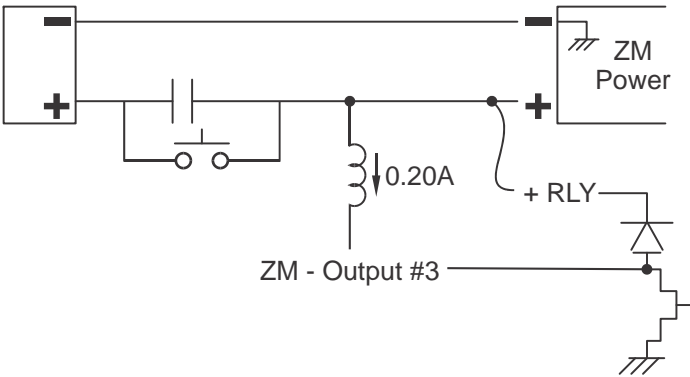
Problems that arise due to the keypad being changed are not warrantable, such as keys not functioning correctly or water ingress through the front panel.

The IP69K rating cannot be guaranteed when changing the keypad overlay. If you are in an environment that requires the IP69K rating, it is advised that you order the keypad/enclosure assembly instead of changing out the keypad.

13.18.1   To change the keypad you will need these tools:

- A razor blade
- A container big enough to place the indicator case in
- Rubbing alcohol.
- A large wooden dowel or wooden kitchen rolling pin.

13.18.2   Process to remove and replace the keypad overlay

1.   Open the enclosure and remove all electronic P.C. boards, including the display board.

2.   Use the razor blade to remove the old overlay and remove as much of the glue as possible.

3.   Place some rubbing alcohol in the container, enough to be able to submerge the front of the enclosure where the keypad was. No more than ½ an inch should be needed.

4.   Place the enclosure face down in the rubbing alcohol and soak it for 30 minutes.

5.   Use the razor blade to remove all remaining glue.

6.   Let the enclosure dry for at least 5 minutes.

7.   Place new keypad on the enclosure; ensure that the keypad is aligned correctly.

8.   Use rolling pin on the overlay to ensure good contact between the enclosure and the keypad overlay.

ZM301 Keypad/Enclosure Assembly

- AWT05-506050   SST Enclosure
- AWT05-506045   Die Cast Enclosure
- AWT05-506047   Panel Mount enclosure

Index

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