

T401S

Weight Indicator



Service Manual

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Manual revision history

Current Issue	Date Created	Details of Changes
AA	January 2017	New manual

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.



CAUTION!

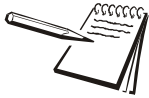
This is a Caution symbol.

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



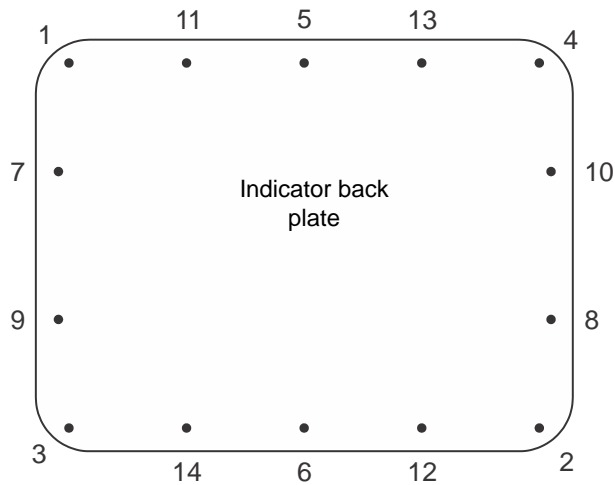
NO USER SERVICEABLE PARTS. REFER TO QUALIFIED SERVICE PERSONNEL FOR SERVICE.

1.2.1 Torque specifications

See all torque values in [Technical illustrations on page 144](#).



CAUTION: The acorn nuts holding the back plate of the stainless steel desktop indicator in place must each be tightened, in multiple passes, in the following pattern to a final torque of 6 in-lbs (approximately 0.68 N-m) 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.

Strain Relief Torque Specs	3/4" NPT Strain Relief	PG13.5 Strain Relief	PG11 Strain Relief	PG7 Strain Relief
Dome Nut	80-85 lb-in 9.0-9.6 N-m	17.7 lb-in 2.0 N-m	22.1 lb-in 2.5 N-m	8.9 lb-in 1.0 N-m
Lock Nut	75-80 lb-in 8.5-9.0 N-m	26.6 lb-in 3.0 N-m	33.2 lb-in 3.8 N-m	13.3 lb-in 1.5 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.*

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.

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.

2 Introduction

The T401S indicator, shown in [Figure 2.1](#), is easy to use for weighing. The indicator has two serial COM ports and an Ethernet port.

The indicator also have three logic level inputs with configurable functions and three setpoint outputs. See the Specification literature for a full list of specifications.

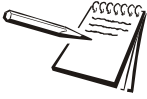


Figure 2.1 Front panel of the T401S indicator

The T401S can connect to printers, remote displays, computers and other peripheral devices.








2.1 Front panel

The front panel for the T401S 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.

	<p>Weigh mode - Press the TARE key to perform a tare function.</p> <p>Menu Navigation - Acts as an up arrow key for menu navigation.</p> <p>Numeric entry - Increments a value. Allows you to access the minus sign and comma if that is a valid option for the value being entered.</p>
	<p>Weigh mode - Press the SELECT key to toggle between Gross, Net, Tare and any other active display values.</p> <p>Menu Navigation - Press and hold to enter the setpoint editor. Acts as a down arrow key.</p> <p>Numeric entry - Decrements a value. Allows you to access the minus sign and comma if that is a valid option for the value being entered.</p>
	<p>Weigh mode - Press the PRINT key to send information to a peripheral device. Performs accumulator function, if enabled.</p> <p>Menu Navigation - Acts as a left arrow key.</p> <p>Numeric entry - Functions as a backspace.</p>
	<p>Weigh mode - Press the UNITS key to scroll through the active units of measure.</p> <p>Menu Navigation - Acts as a right arrow key.</p> <p>Numeric entry - Inserts a new digit and moves the cursor position to the right.</p>
	<p>Press the ZERO key to zero the display.</p> <p>Acts as an ENTER key to accept a displayed value or function.</p> <p>Also used to access the Quick Code entry for menu navigation.</p>
	<p>Press and hold the F1 key to view the password entry screen.</p> <p>Press to select application specific choices.</p> <p>Aborts a numeric entry and acts as an ESCAPE key for menu navigation.</p>
	<p>If DC powered, press the ON/OFF key to turn the indicator on. Press and hold for two seconds to turn the indicator off. P3 jumper on main PCB must be removed for ON/OFF key to function. If P3 jumper is in place, when power is applied to the indicator it will be on.</p>

2.2 Powering up the T401S

The indicator can be powered by AC or DC power. If AC powered, the indicator is always ON as long as power is received. If DC powered, the ON/OFF key functions as described in the section [Front panel on page 14](#).

For the stainless steel desktop T401S, power can be supplied by:

- AC power cord connected to a properly grounded outlet (100 VAC - 240 VAC, 50 or 60 Hz)
- Optional rechargeable battery pack
- DC power (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.



*You can view the active application name. From the flashing **0** display in the password entry screen. 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 15](#) 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.

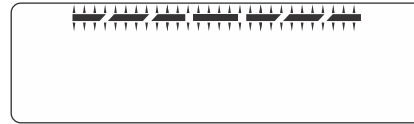
Press **F1** to escape and move up in the menu

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:

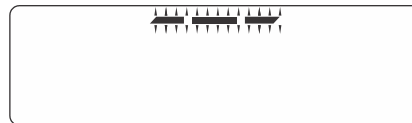
All segments flashing

This means you are in the menu structure but not in any of the following screens.



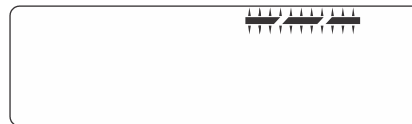
Center flashing / others off

This means you are in a numeric entry screen or the Quick Code prompt screen. See [Quick Code parameter entry on page 21](#). 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.



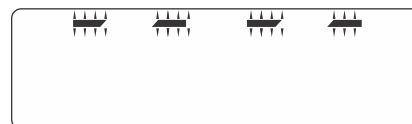
Left flashing / others off

This means you are in a data entry. See [String index/character data entry on page 18](#) for more information.



Every alternate segment flashing

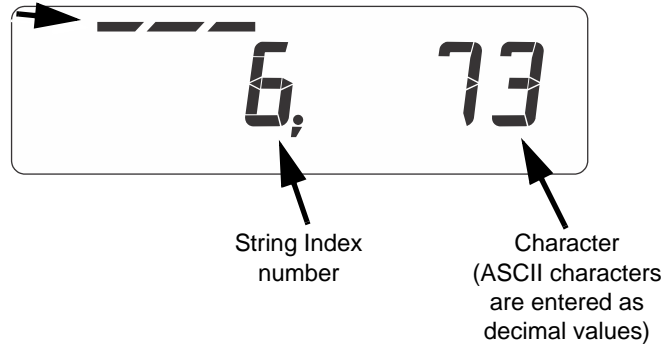
This means you are in octet entry for IP, Subnet or Gateway address.



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.



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	Does nothing	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	ESC/Abort
Long Key Press	Deletes current character	Append new character after this point Default character added is 32 (space)	Does nothing	Page Up (Decrements index by 10)	Page Down (Increments index by 10)	ESC/Abort

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	Does nothing	Delete the entire entry	Does nothing	Does nothing

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 16](#) 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.

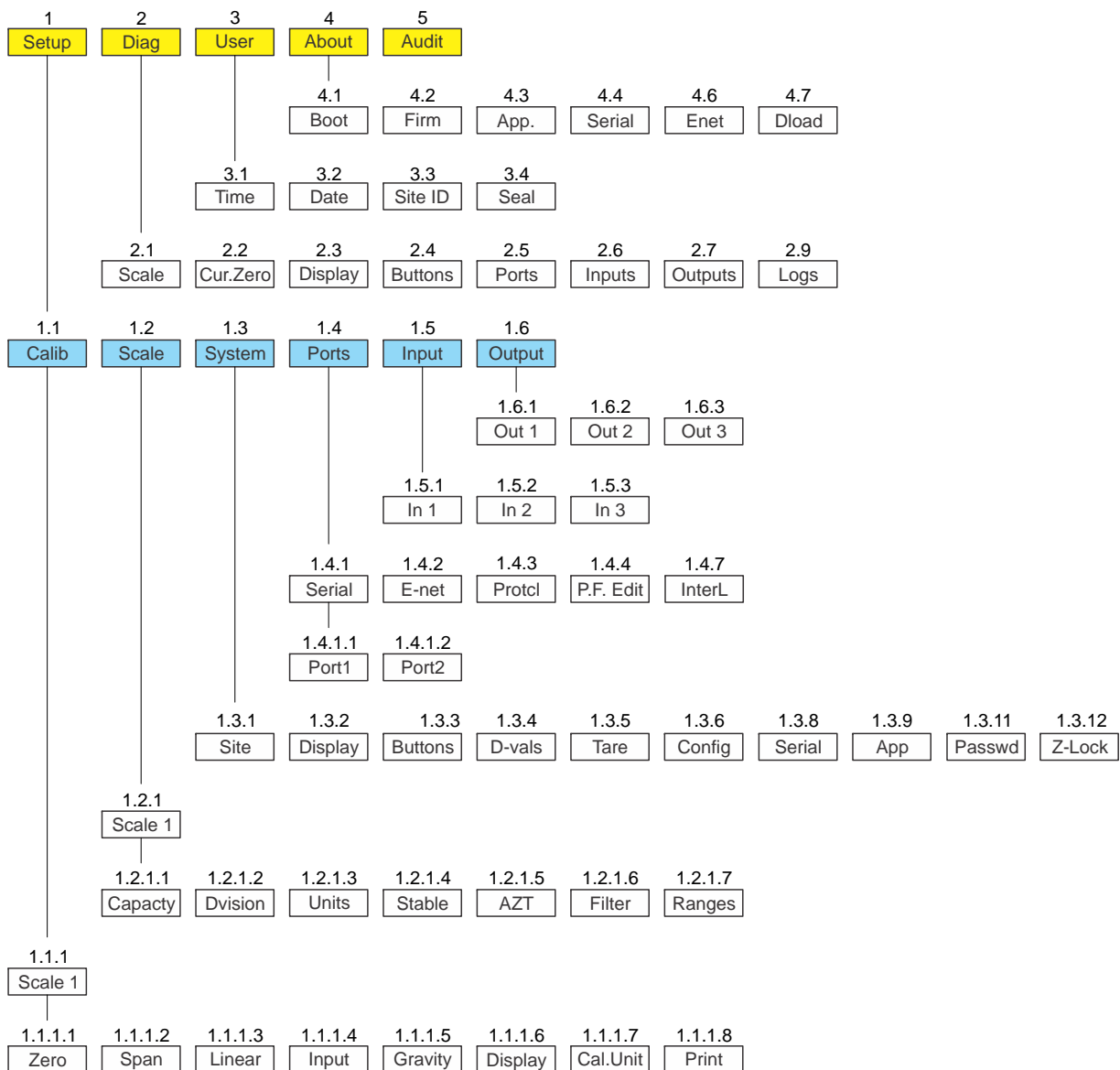


Figure 3.1 Quick Code table

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 1	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	1	3	3	3	3
Motion Div.	3	1	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](#).

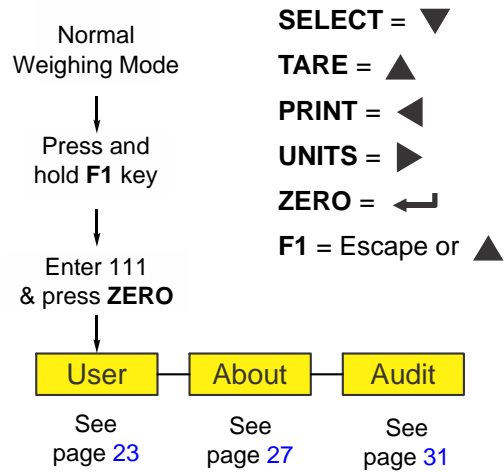


Figure 4.1 USER level (password 111) menus

4.1 User menu

The User menu is shown in [Figure 4.2](#).

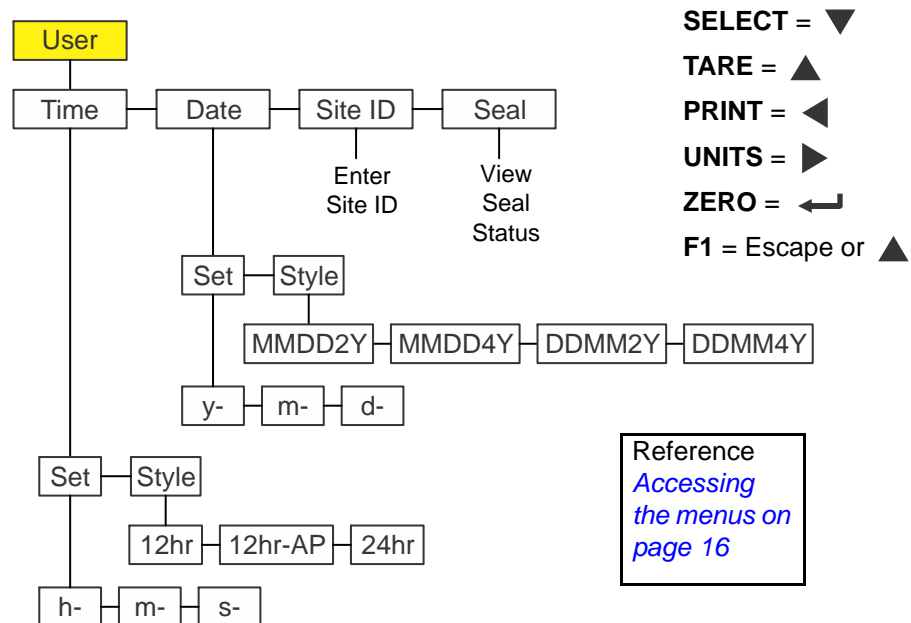


Figure 4.2 User menu

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



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 15](#) 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** ...
The current setting 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 15](#) 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** ...
The current setting 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. ASCII characters 32-126 can be used.

2. Press **SELECT** ...
A string entry screen is displayed.
3. Use the [String index/character data entry on page 18](#) to key in the site ID (seven characters) 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. See the note below.



*The seal switch jumper is located near the center of the main PCB. See [Main PCB jumpers, switch settings and status lights on page 146](#). If the jumper is installed, the indicator is sealed. This means the only the Diagnostic, User, About, Audit and Supervisor menus can be accessed. Other menus cannot be accessed - the display will flash **SEALed**.*

3. Press **F1** to return to the **SEAL** display.
4. To exit the menu, see [Exiting the menus on page 19](#).

4.2 About menu

The About menu is shown in [Figure 4.3](#).

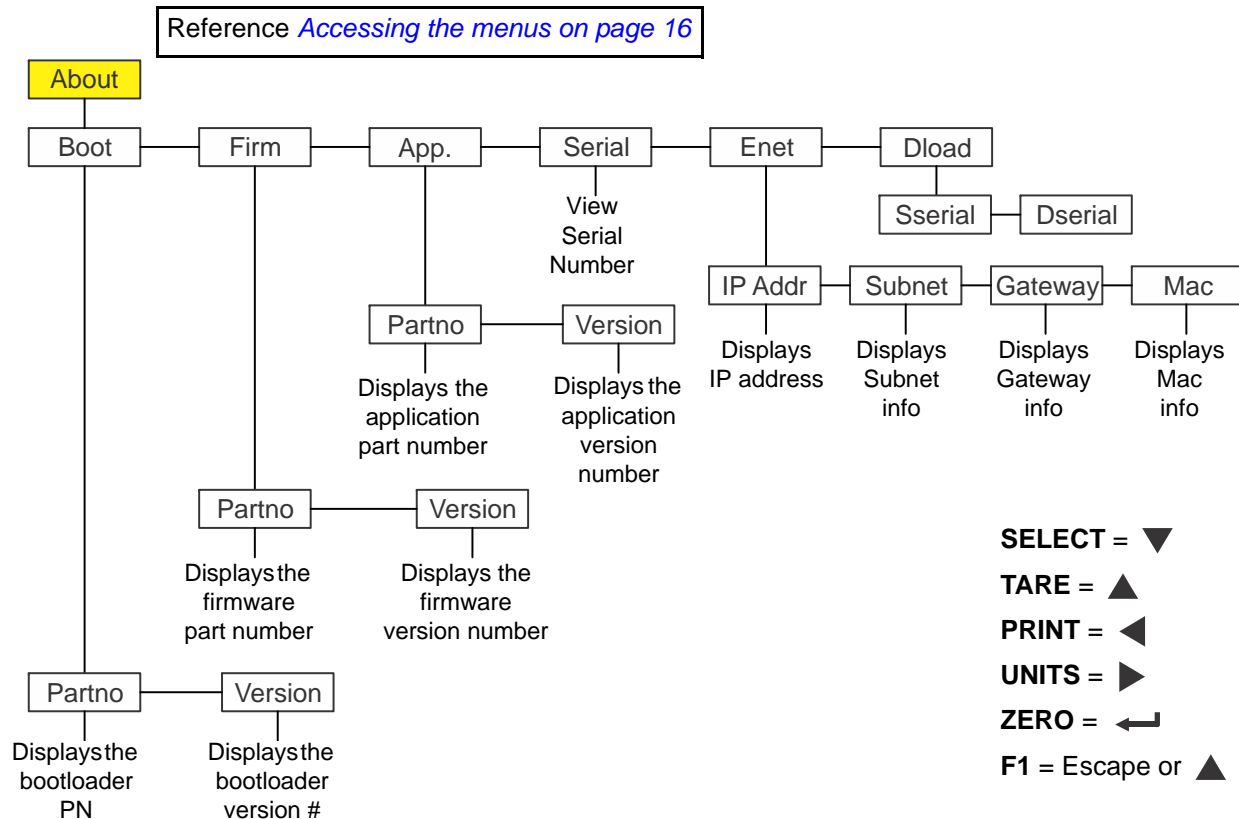


Figure 4.3 About menu

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 Enet

About ↓ Boot → Firmware → Application → Serial → Enet



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

- From **SERIAL**, press **UNITS** to move to the next item in this level ...
EnEt is displayed. Use this item to view the values for the IP, Subnet, Gateway and MAC addresses.

IP

Enet ↓ IP

- Press **SELECT** ...
iP Addr is displayed. Use this item to view the four part IP address.
- Press **SELECT** ...
1 xxx is displayed. This is first octet of the IP address
- Press **ZERO** ...
2 xxx is displayed. This is second octet of the IP address.
- Press **ZERO** ...
3 xxx is displayed. This is third octet of the IP address.
- Press **ZERO** ...
4 xxx is displayed. This is fourth octet of the IP address.
- Press **ZERO** ...
iP Addr is displayed.

Subnet, Gateway and MAC

Enet ↓ IP → Subnet & Gateway & MAC

- Press **UNITS** ...
Subnet is displayed.
- Repeat this sequence of key presses for the **Subnet**, **Gateway** and **MAC** addresses.
- When you are finished, press **TARE** to return to the **Enet** menu item.

4.2.5 Download

About ↓ Boot → Firmware → Application → Serial → 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 first portion of the serial number of the downloading application is displayed.

8. Press **ZERO** to show the next portion of the serial number.

9. Repeat step 8 until the entire serial number has been viewed.

10. Press **F1** ...

dSEriAL is displayed.

11. Press **TARE** twice ...

About is displayed.

12. To exit the menu, see [Exiting the menus on page 19](#).

4.3 Audit menu

The Audit menu is shown in [Figure 4.4](#).

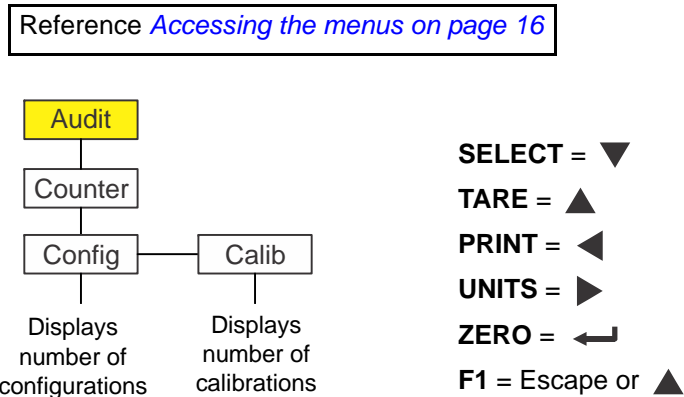


Figure 4.4 Audit menu

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.
9. To exit the menu, see [Exiting the menus on page 19](#).

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](#).

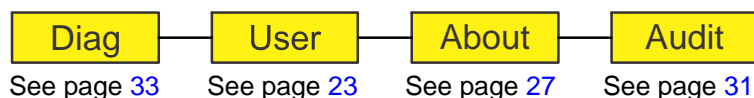


Figure 5.1 DIAGNOSTICS level (password 3570) menus

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, remote inputs and outputs test. 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](#).

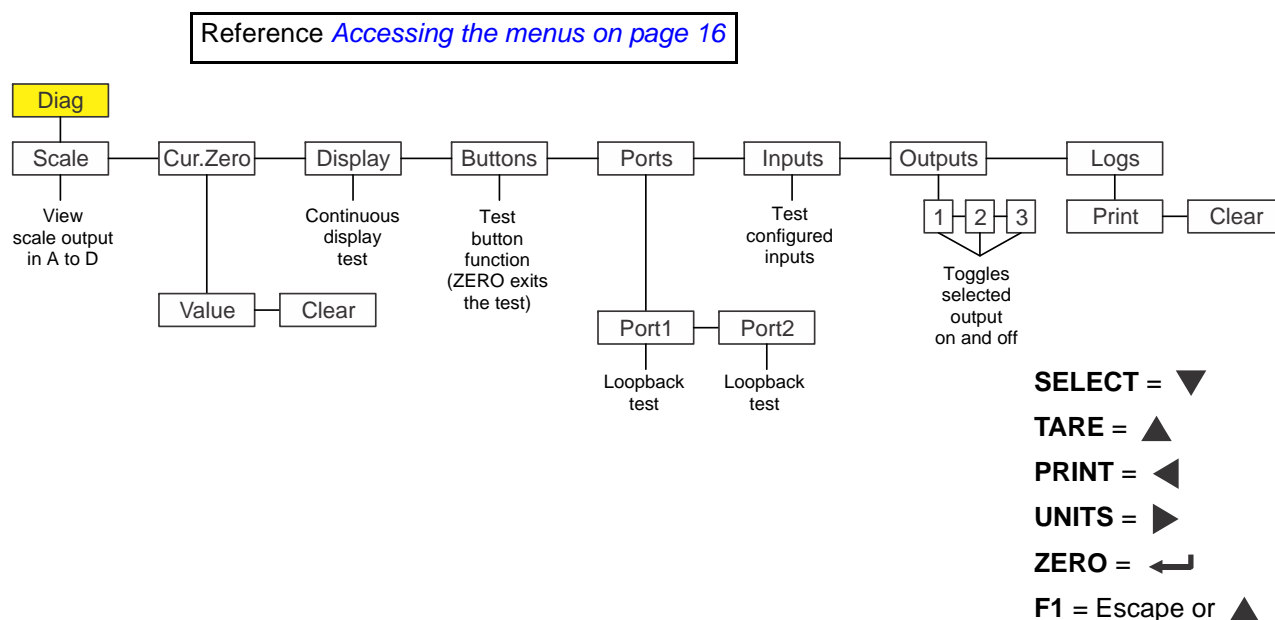


Figure 5.2 Diag menu



The \downarrow and \rightarrow symbols stand for direction moved in the menu. So **Diag** \downarrow **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 accidentally 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 147](#) for I/O configuration of the serial ports TB3.

The **PASS** or **FAiL** is displayed briefly then **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 then **Port 2** is displayed.

6. From the **Port 2** 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. The outputs will not activate if they are disabled under the Setup menu. See [Outputs on page 82](#).



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 Logs

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



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

1. With **outPutS** displayed, press **UNITS** to go to the next menu item ...
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** ...
Port 1 is displayed. You can change this to Port 2. See the next step.
4. Press the **UNITS** or **PRINT** key to toggle between the two choices. When your choice is displayed, press the **ZERO** key to accept the choice ...
Prntng is briefly displayed then **Print** is displayed.
5. Press **UNITS** ...
cLEAR is displayed. Use this to clear the log from memory. Go to step 6 to clear the log.
6. Press **SELECT** ...
The indicator shows **clr no**.
7. Press the **UNITS** or **PRINT** key to toggle between **clr no** and **clr YES**. When your choice is displayed, press the **ZERO** key to accept the choice ...
buSy is briefly displayed as the log is cleared from memory, then **donE** is briefly displayed
cLEAR is then displayed.
8. Press **TARE** ...
LogS is displayed.
9. This completes the Diag menu. To exit the menu, see [Exiting the menus on page 19](#).

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](#).



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](#).

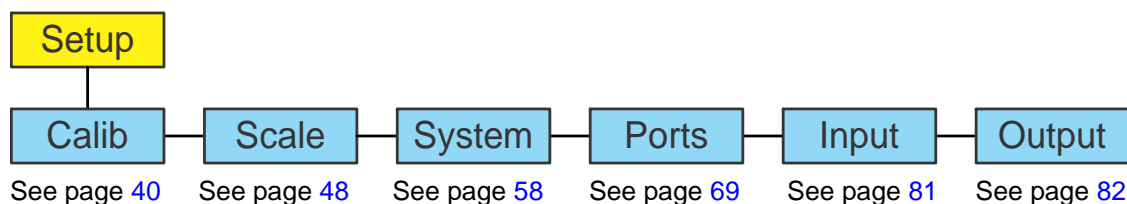


Figure 6.2 Setup menu (password 3088)

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.

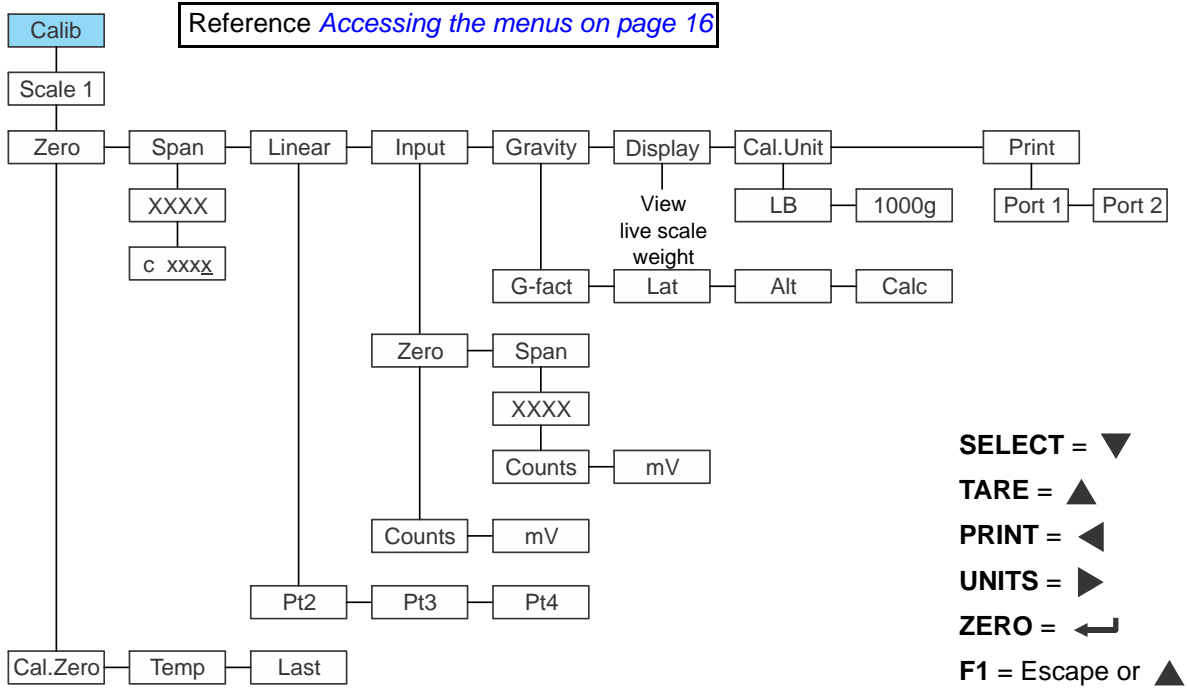


Figure 6.3 Calibration menu



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 set 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 may 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 \pm 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.

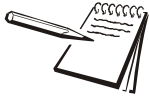
1. From **SPAn**, press **UNITS** ...
LinEAR is displayed. Linearity allows you to add up to three linearization points for the scale. The points are numbered 2, 3 and 4 because, internally, the zero reference point is point 1 and the span point is point 5.
2. With **LinEAR** displayed, press **SELECT** ...
Pt2 is displayed.
3. Press **SELECT** ...
A flashing **0** is displayed. This is the screen for entering the point 2 test weight.
4. Use the [Numeric entry procedure on page 15](#) 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.



Linearity points are cleared if a new span calibration is performed.

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 T401S indicator.

Current settings for zero and span values can be obtained from a printed calibration report. See [Print calibration report on page 47](#).

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 ...**

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.

8. With **countS** or **mV** displayed, press **SELECT** to access the value entry screen.

A flashing value is displayed representing the span weight.

9. Press **ZERO** to accept this or key in the span weight and press **ZERO** to accept it ...

Another flashing value is displayed representing the count value or the mV/V value.

10. Press **ZERO** to accept it or key in the count or MV/V value and press **ZERO** to accept it ...

countS or **mV** is displayed.

11. Press **TARE** ...

SPAn is displayed.

12. 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 15](#) 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 ...**
LAf 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 ...
LAf is displayed.

Altitude

Gravity ↓ G-Fact → Lat → Alt

9. Press **UNITS ...**
ALf 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 ...
ALf 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 **SELECT** 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** or **Port 2**. 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 115](#) 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 19](#).

6.3 Scale



CAUTION: Be sure you 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.

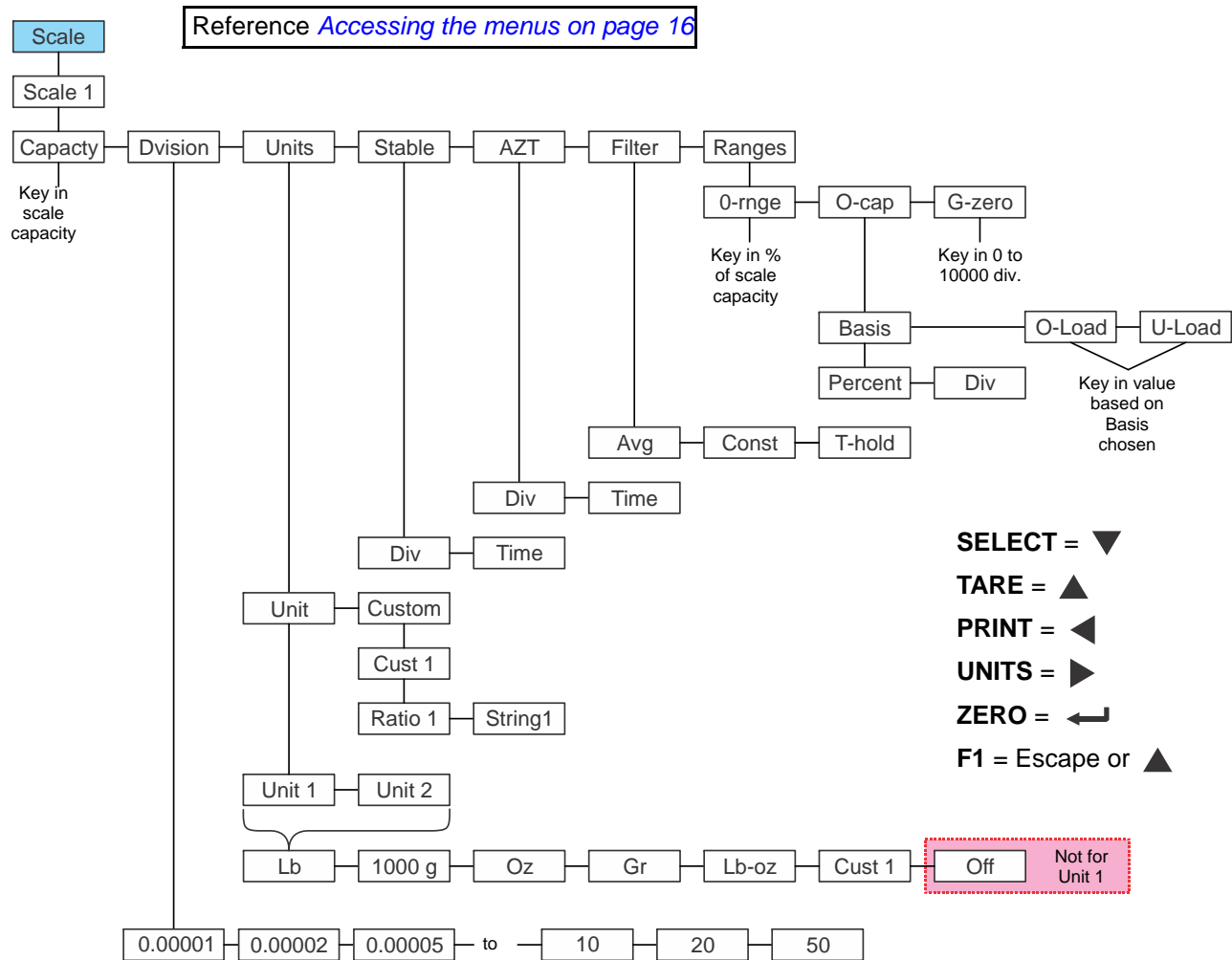


Figure 6.4 Scale menu

Access the Scale menu. See [Accessing the menus on page 16](#).

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 ↓ Capacity



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 in the calibration unit of measure.

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 ↓ Capacity → Division

1. From **cAPActY** press **UNITS ...**

dViSion is displayed. This stands for the division size of the calibration unit of measure.

2. Press **SELECT ...**

The current division size is displayed.

3. Press **PRINT** or **UNITS** to scroll through the division size choices. Choices are **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** and **50**. 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 ↓ Capacity → Division → 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 two units for viewing. They are listed as: **unit 1** and **unit 2**. You can assign any of the following units of measure to either of these units: **lb**, **1000g**, **oz**, **gr**, **lb-oz**, **cuSt 1** 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. Skip to step 9 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.
- 3c. Press **SELECT** ...
rAtio 1 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 15](#) 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 ...
String1 is displayed.

- 3g. Press **SELECT** ...

A string entry screen is displayed. Refer to [String index/character data entry on page 18](#) 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 ...

String1 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 two 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 two units of measure ...

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

6.3.5 Stable

Scale ↓ Scale 1 ↓ Capacity → Division → 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 (0-100 are acceptable values. 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. (0-10 are acceptable values)
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 ↓ Capacity → 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. (Acceptable range for **diV** is 0-100. Acceptable range for **timE** is 0-10)

The **diV** value defines a \pm range around zero. When scale weight is not at the center of zero but inside this range for the time value entered, $\frac{1}{2}$ 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 ↓ Capacity → Division → 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.

Min/Max values for these three filter settings are:

AVG = 1-512

Const = 0-10

t-hold = 0-1,000,000

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. Acceptable values are 1through 512.
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.

- Press **ZERO** to accept this value or scroll through the list (0-10) with the **PRINT** or **UNITS** key and press **ZERO** to accept the displayed choice ...

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.

- Press **UNITS** ...

t-hoLd is displayed.

- Press **SELECT** ...

The current value is displayed. 0 is the default value. When **0** is the threshold value, filtering is always on. Possible values are 0 - 1 million.

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

t-hoLd is displayed.

- Press **TARE** ...

FiLtEr is displayed.

- Press **UNITS** to move to the next item ...

rAngES is displayed

6.3.8 Ranges

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

Zero Range

Ranges ↓ 0-Rnge

- 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. Acceptable values are 0 through 100. Your region may have specific regulations.

- Press **SELECT** ...

A value entry screen is displayed.

- Use the [Numeric entry procedure on page 15](#) 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. Acceptable values are 0 through 105% or 0 through 100 divisions.
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. Acceptable values are 0 through 105% or 0 through 250 divisions.
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, Accumulate, 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.

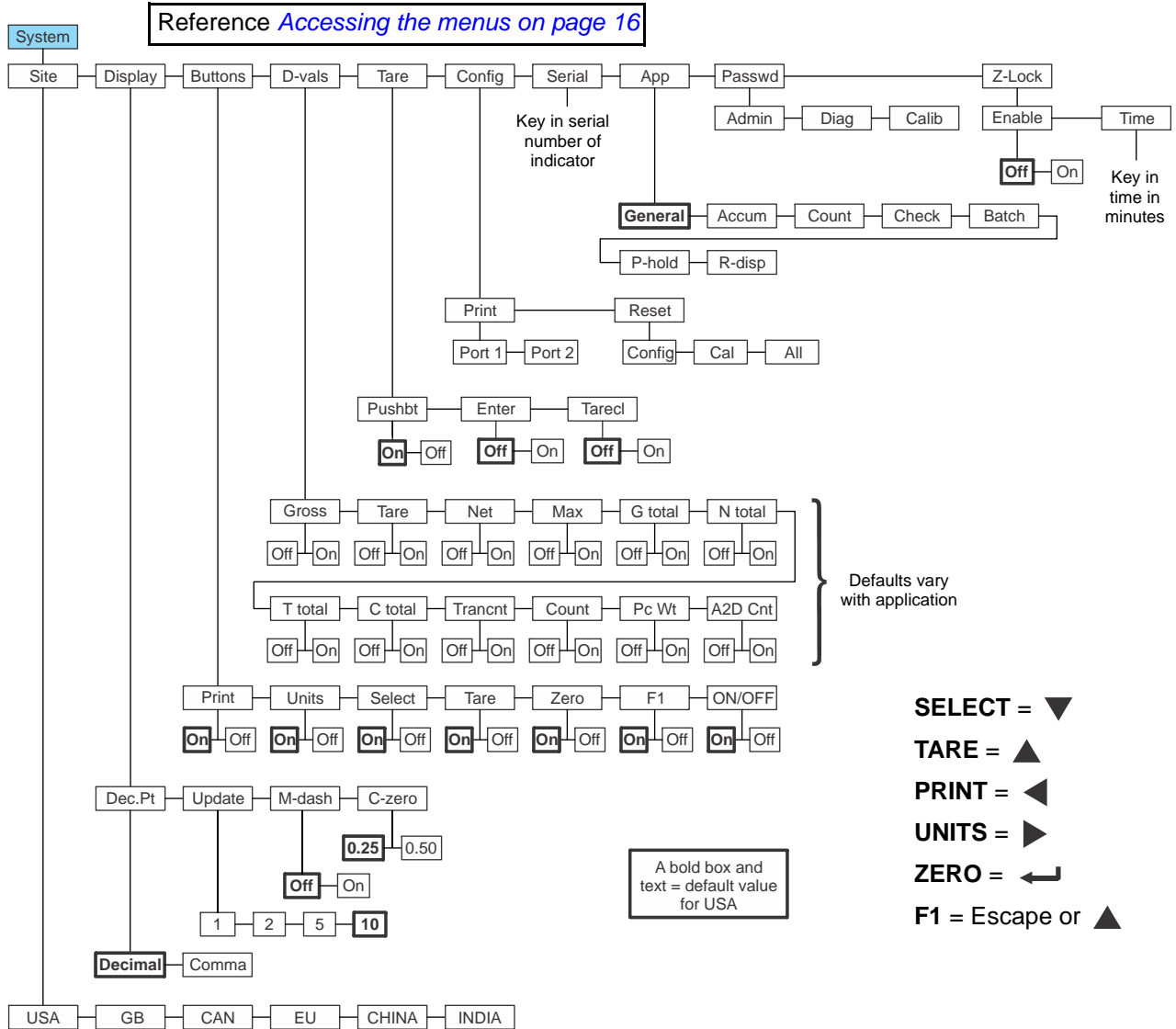


Figure 6.5 System menu



Items in bold boxes and text are default values for the USA. Other sites will have different defaults for the following:
Calibration Unit, Capacity, Division, Unit 1, Zero range, Over/Under basis, Decimal point separator, Time style, Date style

Access the System menu. See [Accessing the menus on page 16](#).

or

With **ScALE** displayed from the previous section, 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. See [Default Values on page 22](#).



CAUTION: Be sure you 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** or **10**.



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 58. When finished press **TARE ...**
buttonS is displayed.

6.4.4 Display values

System ↓ Site → Display → Buttons → D-Vals

- 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:

Display Values			
1	Gross	8	Tare Total
2	Tare	9	Count Total
3	Net	10	Transaction Count
5	Maximum	11	Count
6	Gross Total	12	PCWT
7	Net Total	13	A2D Counts



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, Transaction Count

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

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.

- Press **SELECT** ...

The display value is displayed.

- Press **SELECT** ...

on or **off** is displayed.

- 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.

Keyboard entry tare

Tare ↓ Pushbt → Enter

5. Press **UNITS ...**
EntEr is displayed. This stands for keypad entry tare. Enable this and you can key in a tare value and press **TARE** to activate it during normal weighing mode.
6. Press **SELECT ...**
on or **oFF** is displayed. **oFF** is the default value for keyboard entry tare.
7. Press **PRINT** or **UNITS** to toggle to the other choice and press **ZERO** to accept the displayed choice.
EntEr is displayed.

Auto tare clear

Tare ↓ Pushbt → Tarecl

8. Press **UNITS** ...

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

on or **oFF** is displayed. **oFF** is the default value.
10. Press **PRINT** or **UNITS** to toggle to the other choice and press **ZERO** to accept the displayed choice.

tArEcl is displayed.
11. 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 \(page 115\)](#)
3. Press **SELECT** ...

Port 1 is displayed. The other choice is **Port 2**.
4. Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice.

Prnting is briefly displayed as the information is sent, then **Print** is displayed.

Reset

Config ↓ Print → Reset

5. 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.
6. Press **PRINT** or **UNITS** to scroll through the choices and press **ZERO** to accept the displayed choice.
 bUSY is briefly displayed as the selected memory item is reset to factory defaults and then **rESEt** is displayed.
7. Press **TARE** ...
 conFig is displayed.

6.4.7 Serial

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

1. From **conFig**, press **UNITS** ...
 SEriAL is displayed. Use this to enter the serial number of the indicator.
2. Press **SELECT** ...
 1_ is displayed. This is the first value entry screen.
3. Key in the first four digits of the 9 digit serial number of the indicator and press **ZERO**.
 2_ is displayed. This is the second value entry screen.
4. Key in the last five digits of the serial number and press **ZERO** to accept it.
 SEriAL is displayed.



The serial number is located on the label attached to the indicator.

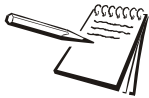
6.4.8 Application

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



Refer to the User manual for configuration settings and operation instructions for the selected application. The R-Disp application enables the T401S 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 76](#) 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.

6.4.9 Password

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Serial → App → 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 **APP**, 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 15](#) 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.

6.4.10 Z-Lock

System ↓ Site → Display → Buttons → D-Vals → Tare → Config → Serial → App → 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](#).

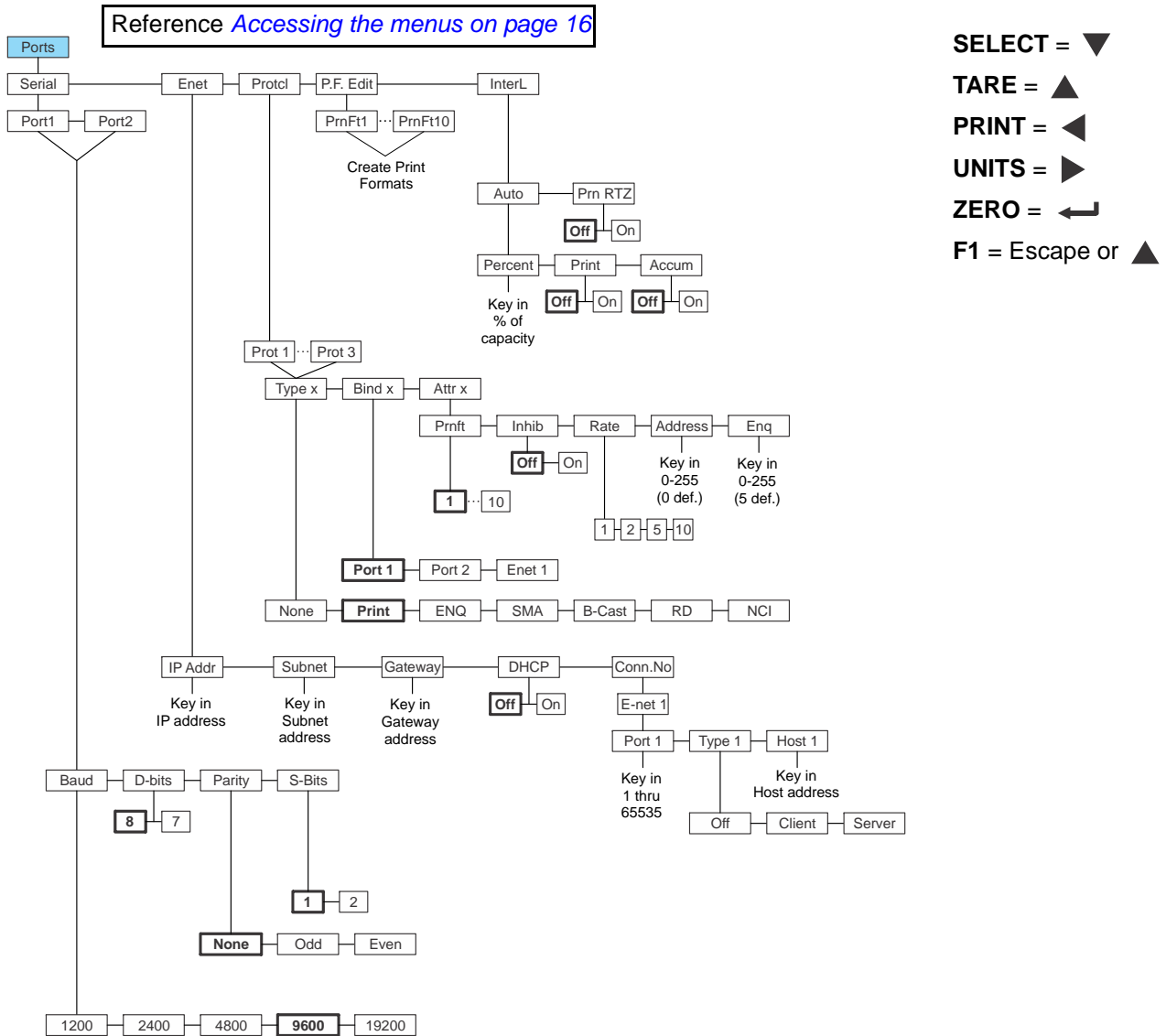


Figure 6.6 Ports menu



Items in bold boxes and text are default values for the USA. Other sites will have different defaults for the following:

Calibration Unit, Capacity, Division, Unit 1, Zero range, Over/Under basis, Decimal point separator, Time style, Date style

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 **1200, 2400, 4800, 9600** and **19200**. **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.

Databits

Serial ↓ Port ↓ Baud → Databits

6. With **bAud** displayed, press **UNITS ...**
d-bitS is displayed. This stands for databits.
7. Press **SELECT ...**
The current databits setting is displayed (**8** or **7**).
8. Press **PRINT** or **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice ...
d-bitS is displayed.

Parity

Serial ↓ Port ↓ Baud → Databits → 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.

- 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 → Databits → Parity → S-Bits

- Press **UNITS** ...

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

- Press **SELECT** ...

The current setting is displayed.

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

S-bitS is displayed.

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

SEriAL is displayed.

6.5.2 Ethernet

Ports ↓ Serial → E-nEt

- 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, 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.

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

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

- Press **SELECT** ...

The first octet value entry screen is displayed.

4. Use the [Numeric entry procedure on page 15](#) 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 **off**.
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



The connection settings are ONLY used for Raw Socket client or server communications. Do not use these settings with Modbus TCP/IP communications.

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 an Ethernet port.

24. Press **SELECT** ...

E-nEt 1 is displayed.

25. Press **SELECT** ...

Port 1 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.

For a client type connection, the port setting is the remote port that the indicator will attempt to connect to. For a server type connection, the port setting is the local port number of the port that the indicator will listen on.

26. Press **SELECT** ...

A value entry screen is displayed.

27. Use the [Numeric entry procedure on page 15](#) and key in a port number and press **ZERO** ...

Port 1 is displayed.

28. Press **UNITS** ...

tyPE 1 is displayed. Use this to set the type of connection; **oFF**, **cLiEnt** or **SErVEr**.



*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 1 is displayed.
30. Press **UNITS** ...
hoSt 1 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 1 is displayed.
36. Press **TARE** to return to **E-nEt 1**.
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 three communication protocols. These protocols define the information sent to and from specific types of communication equipment.

For Protocol x, x can equal 1 to 3.

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

Type x - (x = 1 to 3, depending on the Protocol selection) In this item you choose the method to send and receive data: Print, Enquire, SMA, Broadcast, RD, NCI and none.



The T401SSP (Signal Processor) offers two Ethernet interface choices: Modbus TCP or SMA over Raw Socket (Type = SMA).

For Modbus TCP only the IP addresses are required.

*The T401S only offers SMA over Raw Socket (Type = **SMA**).*

Bind x - (x = 1 to 3, depending on the Protocol selection) In this item you choose the physical connection, or hardware, for the communication for Protocol x: Port 1, Port 2 or Ethernet 1.

Attr x- (x = 1 to 3, depending on the Protocol selection) 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 three 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 112](#).
- SMA** Choose this to send and receive data when using the SMA (Scale Manufacturers Association) protocol. See [SMA Protocol Level 1 and 2 on page 105](#). 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 and displays. See [ENQ & B-Cast commands on page 112](#).
- 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. Additional settings are detailed in the User manual. Contact your local B-TEK representative for information on setting up the indicator as a Primary or Secondary indicator.

See [R-Disp commands on page 113](#).

- nci** Choose this to use the NCI communication protocol. See [NCI commands on page 112](#).

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** and **E-nEt 1**.

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** or **10**Hz. **2** Hz is the default.

AddrESS The address attribute affects the SMA protocol. Key in a value of 0 to use the SMA protocol with no address character. Keying in a value of 1 to 255 will add an address character to the protocol. The address character must be sent immediately after the starting <LF> for the indicator to respond. The response will also include the address character immediately following the <LF>.

Enq Key in the enquire character used to request a print function to occur from the communications port. Choices are **0** to **255**. **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 116](#) for the procedures to edit or create print formats.

6.5.5 Interlock

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

1. With *P.F.Edit* displayed, press **UNITS** to continue to the next menu parameter ...

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

Autoprnt

Interl ↓ Auto

2. Press **SELECT** ...

Auto is displayed. This is the autoprnt 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 15](#) and key in the percent of scale capacity above which the indicator will do an autoprnt function. Press **ZERO** to accept ...

PErcEnt is displayed.



The displayed weight must drop below the Gross Zero Band setting to re-arm the Autoprnt operation

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

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

Print is displayed. Use this to enable or disable autoprnting. Choices are **on** or **off**. If enabled and a percentage is set in the other parameter, autoprnting will occur. If disabled, autoprnting 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.

6.6 Inputs

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

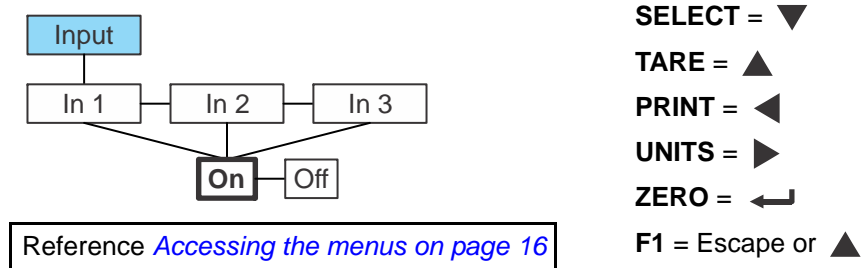


Figure 6.7 Inputs menu

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.

Inputs 1, 2, & 3 are defaulted (ON) enabled and are configured for PBzero, PBtare, and Print respectively.

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.

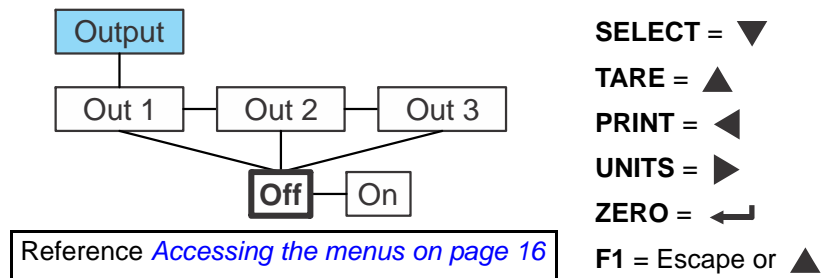


Figure 6.8 Outputs menu



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 weight value on the scale that will activate the output is defined in the Supervisor menu. Refer to the User manual for instructions.

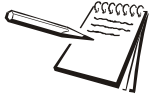
This completes the service menus for the T401S indicator. See [Exiting the menus on page 19](#) to save the setup and return to normal weigh mode.

7 Supervisor menu

This menu allows a supervisor to change those functions of an application that are configurable. Access the supervisor menu using the password 1793. Refer to [Accessing the menus on page 16](#) for instructions.



Wherever there is an option to print information in the any of the supervisor's menus, the information will print out of Port 1 or Port 2, whichever is configured.



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 navigation key chart shown with the menus.

The Supervisor menu changes based on the active application. Go to the appropriate section.

- [General Weighing application supervisor menu on page 84](#)
- [Accumulator application supervisor menu on page 89](#)
- [Counting application supervisor menu on page 92](#)
- [Checkweighing application supervisor menu on page 95](#)
- [Batching application supervisor menu on page 98](#)
- [Peak Hold application supervisor menu on page 101](#)
- [Remote Display application supervisor menu on page 103](#)



Use the [Numeric entry procedure on page 15](#) when you need to enter values.

7.1 General Weighing application supervisor menu

Figure 7.1 shows the Supervisor menu when you are in the General Weighing application.

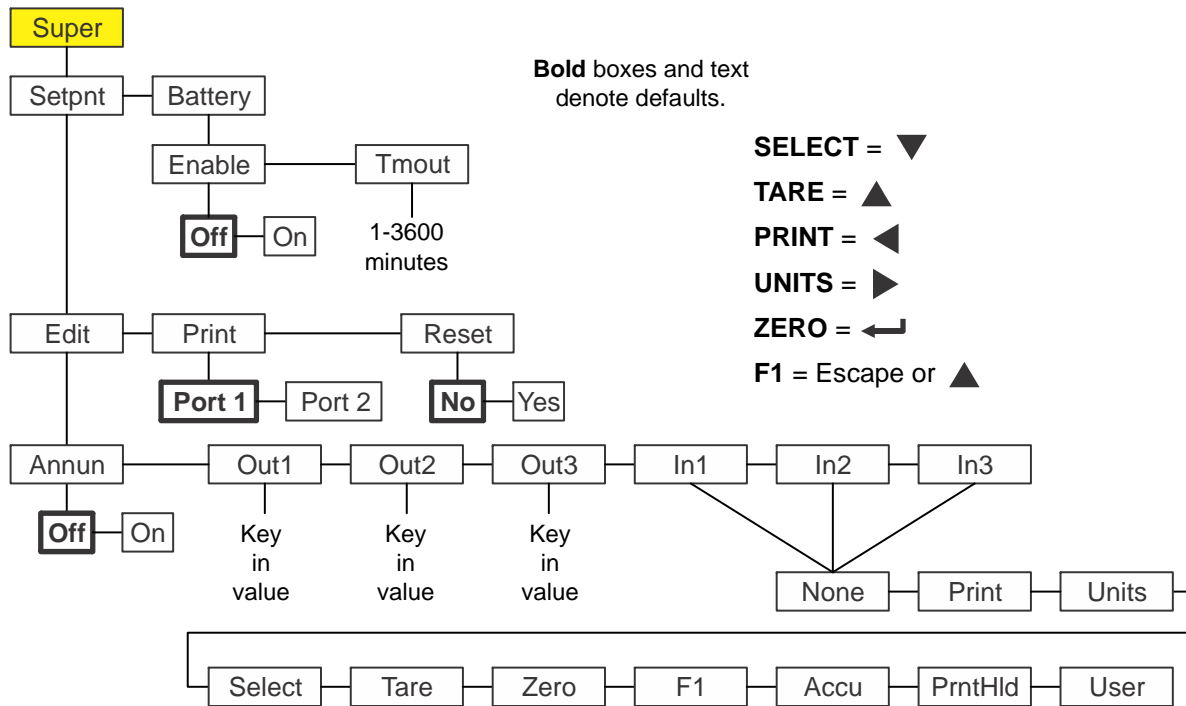


Figure 7.1 Supervisor menu for the General Weighing application



The Setpoint menu is the same for all the applications so will only be explained once here. Exceptions are noted in the text.

Follow these steps to set the items in the Supervisor menu.



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

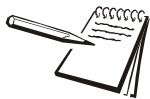
Inputs 1, 2, & 3 are defaulted (ON) enabled and are configured for PBzero, PBtare, and Print respectively.

7.1.1 Setpoint

Super↓ Setpoint



The ↓ and → symbols used in this section stand for direction moved in the menu. So Super ↓ Setpoint, shown above, illustrates that you move down from **SuPEr** to **SEtPnt**. This will help you keep track of where you are in the menu structure.



A setpoint value can be entered up to scale capacity.

Turn off or disable any setpoints you are not using. See the Service manual for information on disabling or turning off setpoints.

1. With the General Weighing application active, access the Supervisor menu. Refer to [Accessing the menus on page 16](#) for instructions. From **SuPEr**, press **SELECT ...**

SEtPnt is displayed. Use this to:

- set the function of the setpoint annunciators
- enter up to three setpoint values
- select inputs for up to three inputs
- print the setpoint settings
- reset all setpoint settings to factory defaults.

Annunciators

Setpoint ↓ Edit ↓ Annun

2. From **SEtPnt**, press **SELECT ...**

Edit is displayed.

3. Press **SELECT ...**

Annun is displayed. (**Annun** is not included in the Batch application Supervisor menu. Skip steps 3 through 5).

This stands for annunciators, referring to the *SP1*, *SP2* and *SP3* setpoint annunciators. By default (**oFF**) these annunciators are ON when the displayed weight is below the setpoint value or OFF above the setpoint value. If you select **on**, the annunciators work in the opposite fashion-- OFF when below, ON when above.

4. Press **SELECT ...**

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

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

Annun is displayed.

Outputs

Setpoint ↓ Edit ↓ Annun → Out

6. Press **UNITS** ...
out1 is displayed. This is the weight value for setpoint 1.
7. Press **SELECT** ...
The current value is displayed with a flashing right digit.
8. Press **ZERO** to accept the displayed value or key in a new value and press **ZERO** to accept ...
out1 is displayed.
9. Press **UNITS** ...
out2 is displayed.
10. Repeat steps 7 through 9 for **out2** and **out3**. Press **UNITS** when finished ...
in1 is displayed. This stands for input 1. Use this to assign a function to input 1 when an external switch is tripped. Default choice is **none**. The choices are listed in [Figure 7.1](#).



Inputs and Outputs must be enabled ON in a separate password protected menu. Some input choices will not apply in the application that is active.



*The remote input can be used to perform an accumulated print total function. Use the **PrintHoLd** function to simulate a “press and hold” of the **PRINT** key. If you are using a momentary switch, press and release. If you are using a toggle switch, switch it ON then OFF to reset the function for the next time.*

Inputs

Setpoint ↓ Edit ↓ Annun → Out → In

11. From **in1**, press **SELECT** ...
The current choice is displayed.
12. Press **UNITS** to scroll through the choices and when your choice is displayed, press **ZERO** to accept ...
in1 is displayed.
13. Press **UNITS** ...
in2 is displayed.
14. Repeat steps through 13 for **in2** and **in3**. Press **TARE** when finished ...
Edit is displayed.

Print

Setpoint ↓ Edit → Print

15. Press **UNITS** ...

Print is displayed. Use this to print the settings under **SEtPnt**.

16. Press **SELECT** ...

Port 1 is displayed.

17. Press **F1** to abort the print process or press **UNITS** to scroll to the desired port and press **ZERO** to print the information ...

Print is displayed after either action.

Reset

Setpoint ↓ Edit → Print → Reset

18. Press **UNITS** ...

rESEt is displayed. Use this to reset the settings under **Edit** to factory defaults.

19. Press **SELECT** ...

no is displayed.

20. Press **ZERO** to abort the reset or press **UNITS** ...

YES is displayed.

21. Press **ZERO** to reset the settings to factory defaults ...

rESEt is displayed.

22. Press **TARE** ...

SEtPnt is displayed.

7.1.2 Battery

Super ↓ Setpoint → Battery



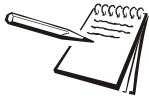
The battery status and timeout features are for the internal battery option and do not function with other battery sources.

1. Press **UNITS** ...

bAttErY is displayed. Use this to enable the battery and to set a timeout length (in minutes). If this time expires with no scale or keypad activity the indicator will automatically shut off.

Enable

Battery ↓ Enable



Only enable the battery and set the **tMout** value if using the internal T401S battery option. The shut off timer will not work with other external battery sources.

2. Press **SELECT** ...

EnAbLE is displayed. Choices are **oFF** and **on**. Choose **oFF** to disable battery usage. Choose **on** to enable battery usage.

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

EnAbLE is displayed.

Timeout

Battery ↓ Enable → Timeout

4. Press **UNITS** ...

tMout is displayed. This stands for timeout. Use this to set the length of time before inactivity of the scale and keypad cause battery power to be shutoff. Values between 1 and 3600 minutes are valid.

5. Press **SELECT** ...

A numeric entry screen appears.

6. Key in a value, in minutes and press **ZERO** to accept ...

tMout is displayed.

7. This completes the Supervisor menu for General Weighing. Repeatedly press **TARE** until the indicator returns to normal weighing mode.



The changes are saved automatically and the indicator reboots.

The current weight value is displayed.

7.2 Accumulator application supervisor menu

Figure 7.2 shows the Supervisor menu when you are in the Accumulator application:

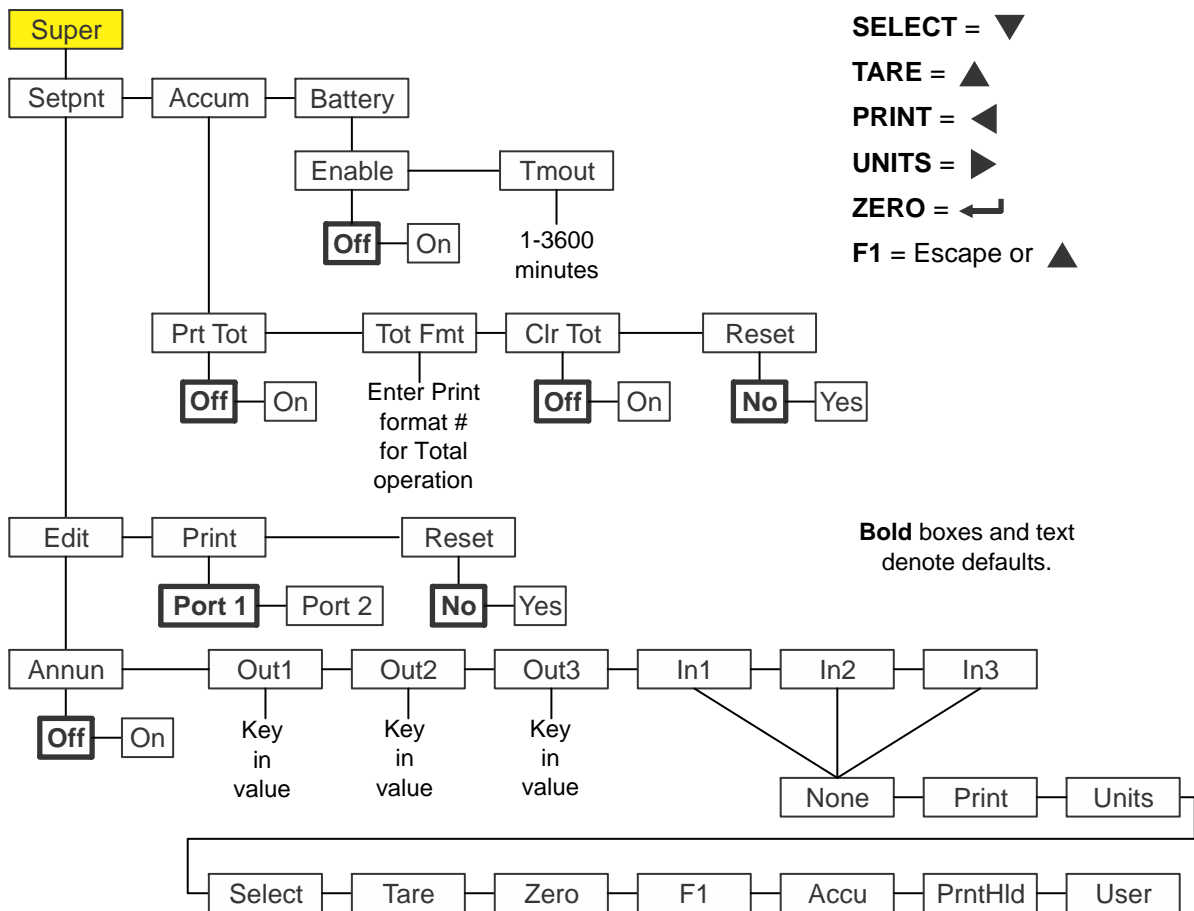


Figure 7.2 Supervisor menu for the Accumulator application

Follow these steps to set the items in the Supervisor menu.



The **Setpnt** and **bAttErY** submenus in Figure 7.2 are the same as described in [General Weighing application supervisor menu on page 84](#). Go there for information on those submenus. The unique submenus to this application are described below.

7.2.1 Accumulator

Super ↓ Setpoint → Accum

1. With the Accumulator application active, access the Supervisor menu using password 1793. Refer to [Accessing the menus on page 16](#) for instructions. From **SuPEr**, press **SELECT** ...

SEtPnt is displayed.

2. Press **UNITS** ...

AccuM is displayed. Use this to set the items relating to accumulation. Under **AccuM** you can do the following:

- Enable/Disable the ability to print the accumulated total (**Prt tot**).
- Key in a print format number for printing the total accumulated weight information (**tot Fmt**).
- Enable/Disable the ability to clear the total accumulation information when the total is printed (**clr tot**).
- Reset the accumulator memory channel value to 0 (**rESEt**).

The following steps describe the procedure to set these items.

Print total

Accum ↓ Print Total

3. From **AccuM**, press **SELECT** ...

Prt tot is displayed. This stands for print total.

4. Press **SELECT** ...

oFF is displayed.

5. Press **ZERO** to keep the print total function disabled or press **UNITS** to toggle to **on** and press **ZERO** to enable printing of the accumulated total ...

Prt tot is displayed.

If enabled, during normal operation the user can press and hold **PRINT** for three seconds and the selected total print format (see step 8) will be sent out any port that is set up to printed. The display will flash **Prn-tot**.

Total format

Accum ↓ Print Total → Total Format

6. Press **UNITS** ...

tot Fmt is displayed. This stands for the total print format.

7. Press **SELECT** ...

The current print format number is displayed with a flashing right-most digit. (Default is format 8)

8. Press **ZERO** to accept the existing setting or key in a new format number and press **ZERO** ...

tot Fmt is displayed.

Clear total

Accum ↓ Print Total → Total Format → Clear Total

9. Press **UNITS** ...

cLr tot is displayed. This stands for clear total. Choose **on** to enable clearing the accumulated total when printed. Choose **off** to disable this function.

If enabled, the total is cleared if the user presses and holds the **PRINT** key for three seconds. The message **cLr-tot** will flash. The total is printed prior to clearing if this was enabled in step 5 above.

10. Press **SELECT** ...

The current setting is displayed.

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

cLr tot is displayed.

Reset

Accum ↓ Print Total → Total Format → Clear Total → Reset

12. Press **UNITS** ...

rESet is displayed. Use this to reset the all the items under **AccuM** to the factory defaults.

13. Press **SELECT** ...

no is displayed.

14. Press **ZERO** to abort the reset or press **UNITS** ...

YES is displayed.

15. Press **ZERO** to reset the settings to factory defaults ...

rESet is displayed.

16. Press **TARE** ...

AccuM is displayed.

17. Press **UNITS** ...

bAttErY is displayed. The battery menu is identical in all the applications. Refer to step 1 on page 87 for information on setting up the battery.

18. This completes the Supervisor menu for the Accumulation application. Repeatedly press **TARE** until the indicator returns to normal weighing mode.

The current weight value is displayed.

7.3 Counting application supervisor menu

Figure 7.3 shows the Supervisor menu when you are in the Counting application:

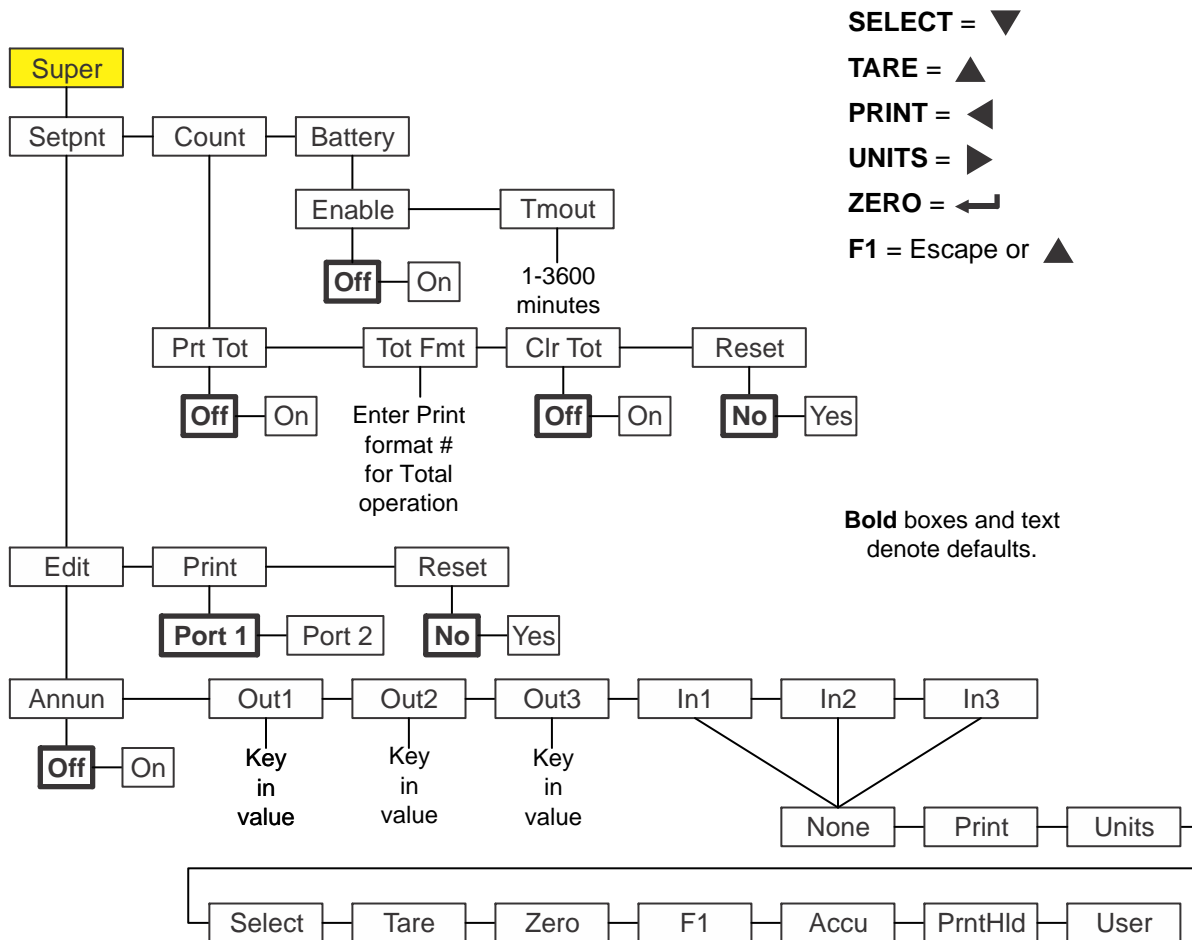


Figure 7.3 Supervisor menu for the Count application

Follow these steps to set the items in the Supervisor menu.



The **Setpnt** and **bAttErY** submenus in Figure 7.3 are the same as described in [General Weighing application supervisor menu on page 84](#). Go there for information on those submenus. The unique submenus to this application are described below.

The **cnt Acc** submenu is the same described in the **Accum** submenu in the [Accumulator application. Refer to step 3 on page 90](#).

7.3.1 Count

Super ↓ Setpoint → Count

1. With the Count application active, access the Supervisor menu using password 1793. Refer to [Accessing the menus on page 16](#) for instructions. From **SUPER**, press **SELECT** ...

SEtPnt is displayed.

2. Press **UNITS** ...

count is displayed. Use this to set the items relating to counting:

- Enable/Disable the ability to print the accumulated total (**Prt tot**).
- Key in a print format number for printing the total accumulated information (**tot Fmt**).
- Enable/Disable the ability to clear the total accumulation information when the total is printed (**clr tot**).
- Reset the accumulator memory channel value to 0 (**rESEt**).

The following steps describe the procedure to set these items.

Print total

Count ↓ Print Total

3. From **count**, press **SELECT** ...

Prt tot is displayed. This stands for print total.

4. Press **SELECT** ...

oFF is displayed.

5. Press **ZERO** to keep the print total function disabled or press **UNITS** to toggle to **on** and press **ZERO** to enable printing of the accumulated total ...

Prt tot is displayed.

If enabled, during normal operation the user can press and hold **PRINT** for three seconds and the selected total print format (see step 8 below) will be sent out any port that is set up to print. The display will flash **Prn-tot**.

Total format

Count ↓ Print Total → Total Format

6. Press **UNITS** ...

tot Fmt is displayed. This stands for the total print format.

7. Press **SELECT** ...

The current print format number is displayed with a flashing right-most digit. (Default is format 8)

8. Press **ZERO** to accept the existing setting or key in a new format number and press **ZERO** ...

tot Fmt is displayed.

Clear total

Count ↓ Print Total → Total Format → Clear Total

9. Press **UNITS** ...

cLr tot is displayed. This stands for clear total. Choose **on** to enable clearing the accumulated total when printed. Choose **off** to disable this function.

If enabled, the total is cleared if the user presses and holds the **PRINT** key for three seconds. The message **cLr-tot** will flash. The total is printed prior to clearing if this was enabled in step 5 above.

10. Press **SELECT** ...

The current setting is displayed.

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

cLr tot is displayed.

Reset

Accum ↓ Print Total → Total Format → Clear Total → Reset

12. Press **UNITS** ...

rESet is displayed. Use this to reset all the items under **count** to the factory defaults.

13. Press **SELECT** ...

no is displayed.

14. Press **ZERO** to abort the reset or press **UNITS** ...

YES is displayed.

15. Press **ZERO** to reset the settings to factory defaults ...

rESet is displayed.

16. Press **TARE** ...

count is displayed.

17. Press **UNITS** ...

bAttErY is displayed. The battery menu is identical in all the applications. Refer to step 1 on page 87 for information on setting up the battery.

18. This completes the Supervisor menu for the Accumulation application. Repeatedly press **TARE** until the indicator returns to normal weighing mode.

The current weight value is displayed.

7.4 Checkweighing application supervisor menu

Figure 7.4 shows the Supervisor menu when you are in the Checkweighing application:

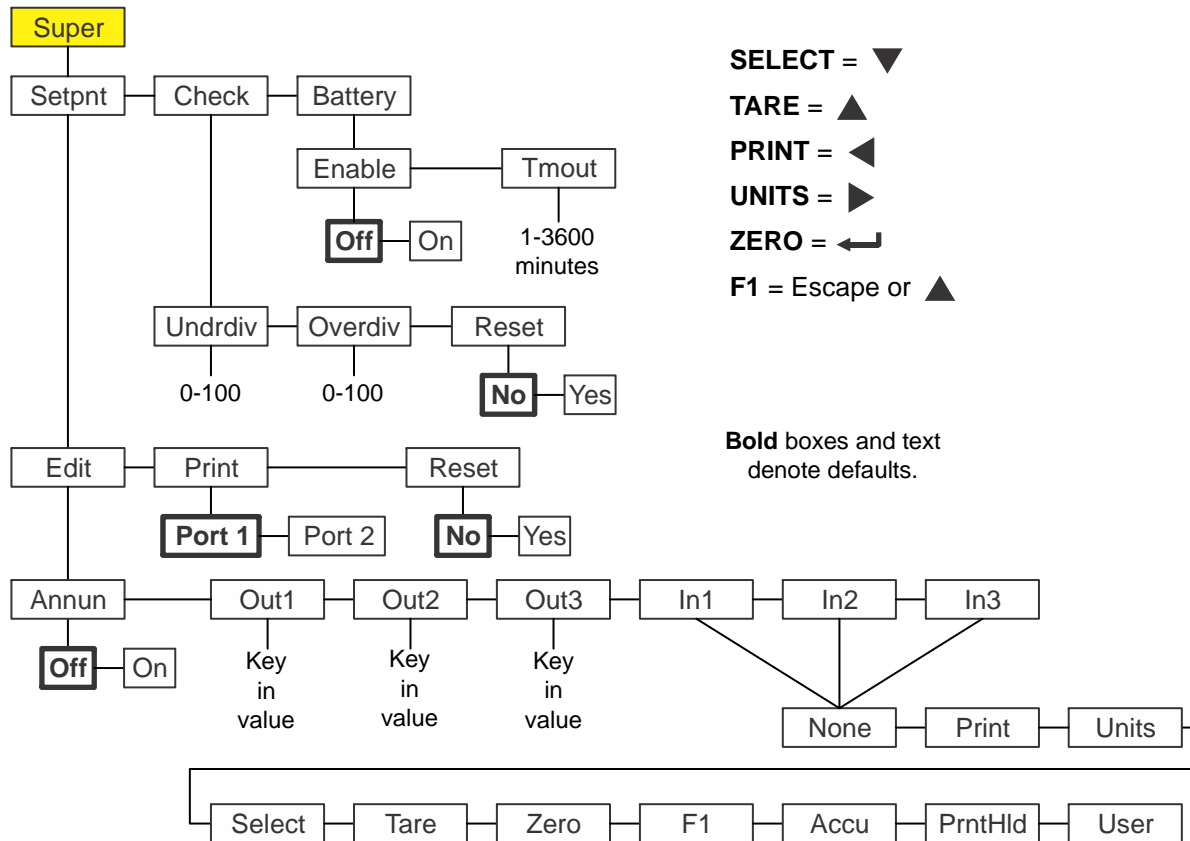


Figure 7.4 Supervisor menu for the Checkweighing application

Follow these steps to set the items in the Supervisor menu.



The **SEtPnt** and **bAttErY** submenus in Figure 7.4 are the same as described in [General Weighing application supervisor menu on page 84](#). Go there for information on those submenus. The unique submenus to this application are described below.

7.4.1 Check

Super ↓ Setpoint → Check

1. With the Checkweighing application active, access the Supervisor menu using password 1793. Refer to [Accessing the menus on page 16](#) for instructions. From **SuPEr**, press **SELECT** ...

SEtPnt is displayed.

2. Press **UNITS** ...

chEck is displayed. This stands for checkweigher. Use this to set the items relating to checkweighing:

- Set under divisions for acceptable target weight (**undrdiv**)

- Set over divisions for acceptable target weight (**oVERdiV**)
- Reset the target values to zero.(**rESEt**)



The checkweigher uses the Latch method for outputs. This means that the weight has to stabilize before the annunciator and output for the appropriate condition (Under, Accept or Over) are activated.

In latch mode, once activated the annunciator and output will remain unchanged until the item is removed and the gross weight returns to inside the gross zero band.

Under divisions

Check ↓ Under divisions



If you are keying in the upper/lower limit as the method for setting a target weight, the **undrdiv** and **oVERdiV** parameters do not affect the checkweighing process. They only work for setting the acceptable range in the target weight method. See Weighing a target object in the User manual.

3. Press **SELECT** ...

undrdiv is displayed. Use this to set the number of divisions (0-100) below the target weight that is still within the accept window.

4. Press **SELECT** ...

The current value is shown with a flashing right-most digit.

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

undrdiv is displayed.

Over divisions

Check ↓ Under divisions → Over divisions

6. Press **UNITS** ...

oVERdiV is displayed. Use this to set the number of divisions (0-100) above the target weight that is still within the accept window.

7. Press **SELECT** ...

The current value is shown with a flashing right-most digit.

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

oVERdiV is displayed.

Reset

Check ↓ Under divisions → Over divisions → Reset

9. Press **UNITS** ...
rESEt is displayed. Use this to reset the all the checkweigher variables to the factory defaults.
10. Press **SELECT** ...
no is displayed.
11. Press **ZERO** to abort the reset or press **UNITS** ...
YES is displayed.
12. Press **ZERO** to reset the settings to factory defaults ...
rESEt is displayed.
13. Press **TARE** ...
chEcK is displayed.
14. Press **UNITS** ...
bAttErY is displayed. The battery menu is identical in all the applications. Refer to step 1 on page 87 for information on setting up the battery.
15. This completes the Supervisor menu for the Checkweighing application. Repeatedly press **TARE** until the indicator returns to normal weighing mode.
The current weight value is displayed.

7.5 Batching application supervisor menu

Figure 7.5 shows the Supervisor menu when you are in the Batching application:

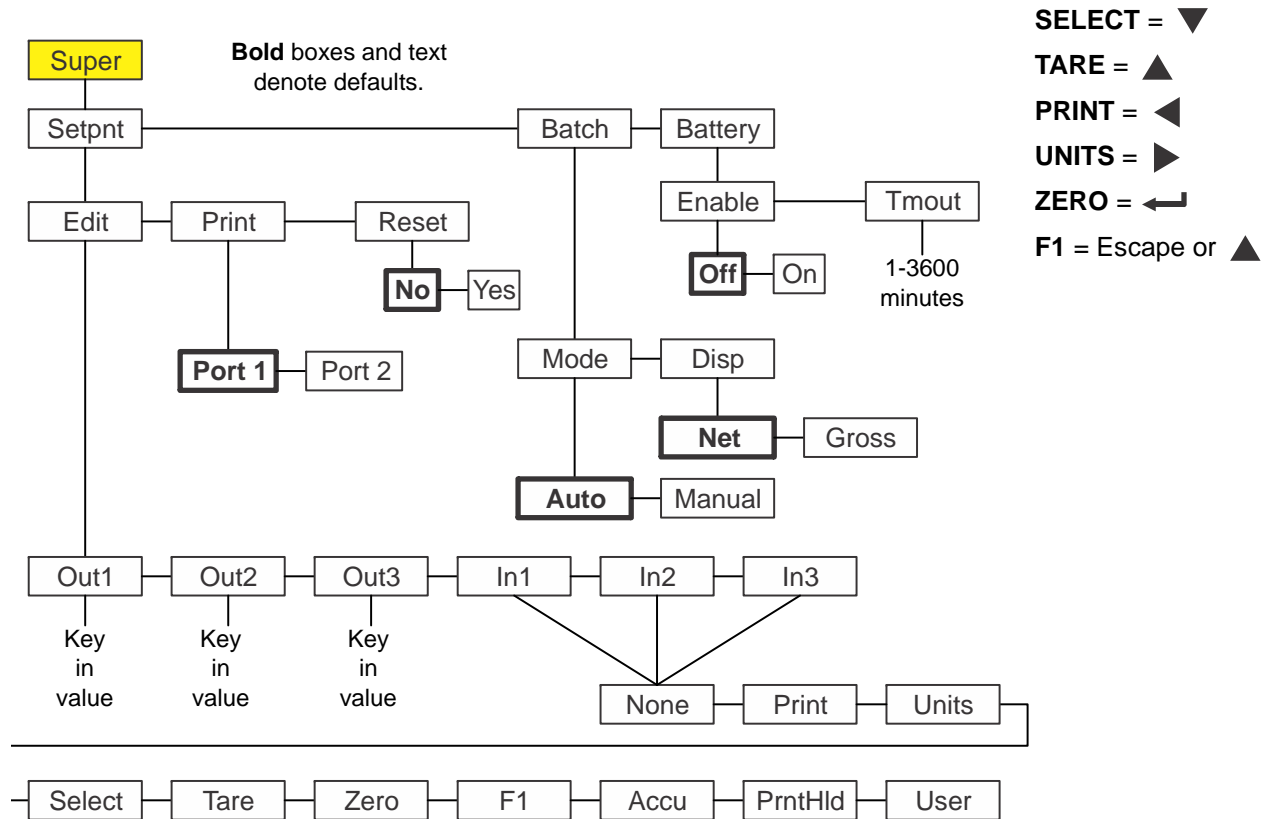


Figure 7.5 Supervisor menu for the Batching application

Follow these steps to set the items in the Supervisor menu.



The **Setpnt** and **bAttErY** submenus in Figure 7.5 are the same as described in [General Weighing application supervisor menu on page 84](#). Go there for information on those submenus. The unique submenus to this application are described below.

7.5.1 Batch

Super ↓ Setpoint → Batch

1. With the Batching application active, access the Supervisor menu using password 1793. Refer to [Accessing the menus on page 16](#) for instructions. From **SUPER**, press **SELECT** ...

SEtPnt is displayed.

2. Press **UNITS** ...

bAtch is displayed. Use this to set the items relating to batching:

- Select auto or manual operation. (**ModE**)
- Set gross or net display mode. (**diSP**)

See [Notes on batching on page 100](#) for information about settings for batching.

Mode

Batch ↓ Mode

3. Press **SELECT** ...

ModE is displayed. Mode has two choices: **Auto** or **MAnuAL**. There is a detailed description for each type in the section titled *Batching application* in the User Manual.

4. Press **SELECT** ...

The current setting is displayed.

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

ModE is displayed.

Display

Batch ↓ Mode → Display

6. Press **UNITS** ...

diSP is displayed. Display has two choices: **NEt** or **GroSS**. Each is explained below:

NEt Choose Net to base batching on net weights.

GroSS Choose Gross to base batching on gross weights.

7. Press **SELECT** ...

The current setting is displayed.

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

diSP is displayed.

7.5.2 Notes on batching

If **MODE** is set to **AUTO**, the batch process will continue until the final ingredient is completed. Between each ingredient there will be a slight delay to allow for motion and final weight.

If **MODE** is set to **MANUAL**, this requires that you press **F1** between each ingredient to complete the fill cycle.

If **DISP** is set to **NET**, an autotare will occur prior to each ingredient and the Out 1, 2 and 3 fill weights will be based on Net weight.

If **DISP** is set to **GROSS**, no autotare will occur and the Out 1, 2 and 3 fill weights would be based on the Gross weight of the accumulated ingredients. If Ingredient 1 amount is 10, Ingredient 2 amount is 20 and ingredient 3 amount is 30 then you would enter Out 1 = 10, Out 2 = 30 (10 + 20) and Out 3 = 60 (10 + 20 + 30). Output setpoints are based on the actual displayed Gross weight so if inaccurate amounts of ingredient are experienced during the batch then it may affect the amount of each subsequent ingredient that is added.

7.6 Peak Hold application supervisor menu

Figure 7.6 shows the Supervisor menu when you are in the Peak Hold application:

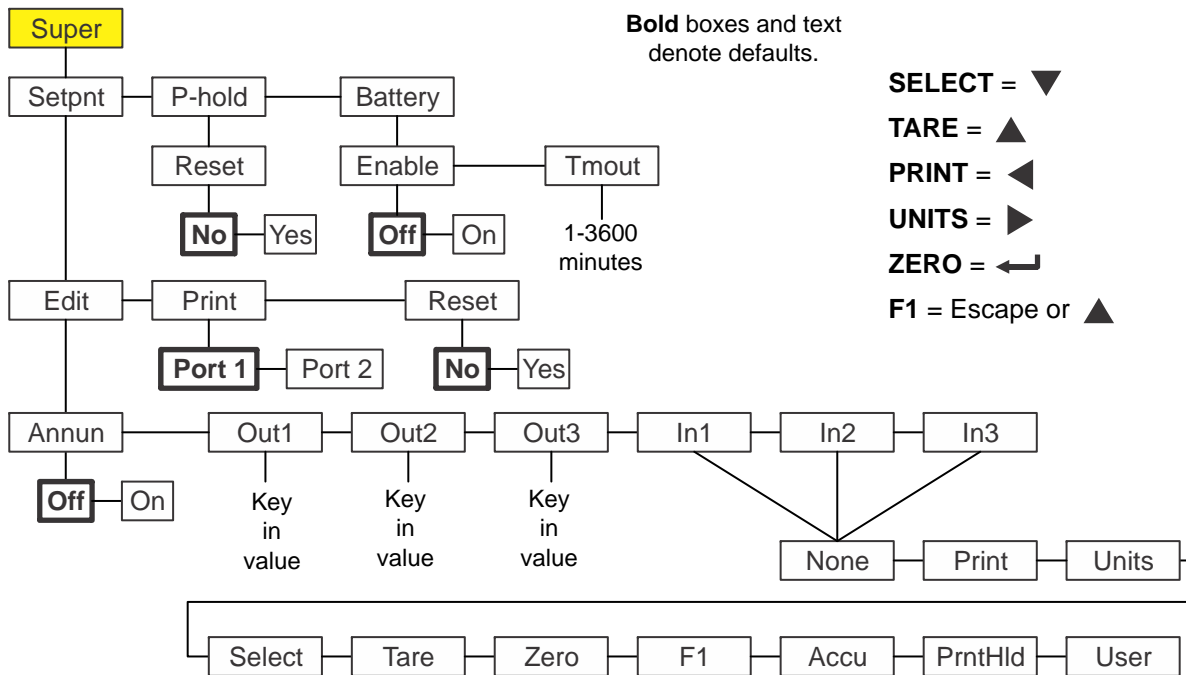


Figure 7.6 Supervisor menu for the Peak Hold application



The **Setpnt** and **bAttErY** submenus in Figure 7.6 are the same as described in [General Weighing application supervisor menu on page 84](#). Go there for information on those submenus. The unique submenus to this application are described below.

7.6.1 Peak hold

Super ↓ Setpoint → P-hold

1. With the Peak Hold application active, access the Supervisor menu using password 1793. Refer to [Accessing the menus on page 16](#) for instructions. From **SuPEr**, press **SELECT** ...

SEtPnt is displayed.

2. Press **UNITS** ...

P-hoLd is displayed. Use this to reset the max peak value. If the **F1** key is disabled, which is the normal key to reset peak value, the supervisor needs an alternate method to reset these values.

Reset

P-hold ↓ Reset

3. Press **SELECT** ...
rESEt is displayed.
4. Press **SELECT** ...
no is displayed.
5. Press **UNITS** to toggle between the **no** and **YES** choices. Press **ZERO** to accept...

If you chose **YES**, the max peak value is reset to the current gross weight and **rESEt** is displayed.
6. Press **TARE** repeatedly to exit and save changes.

7.7 Remote Display application supervisor menu

To configure the indicator for remote display operation you must choose the mode of operation in the supervisor menu and configure the port. Configuring the port is done through a password protected menu. Contact your supervisor or your local B-TEK representative for more information.

Figure 7.7 shows the Supervisor menu when you are in the Remote Display application:

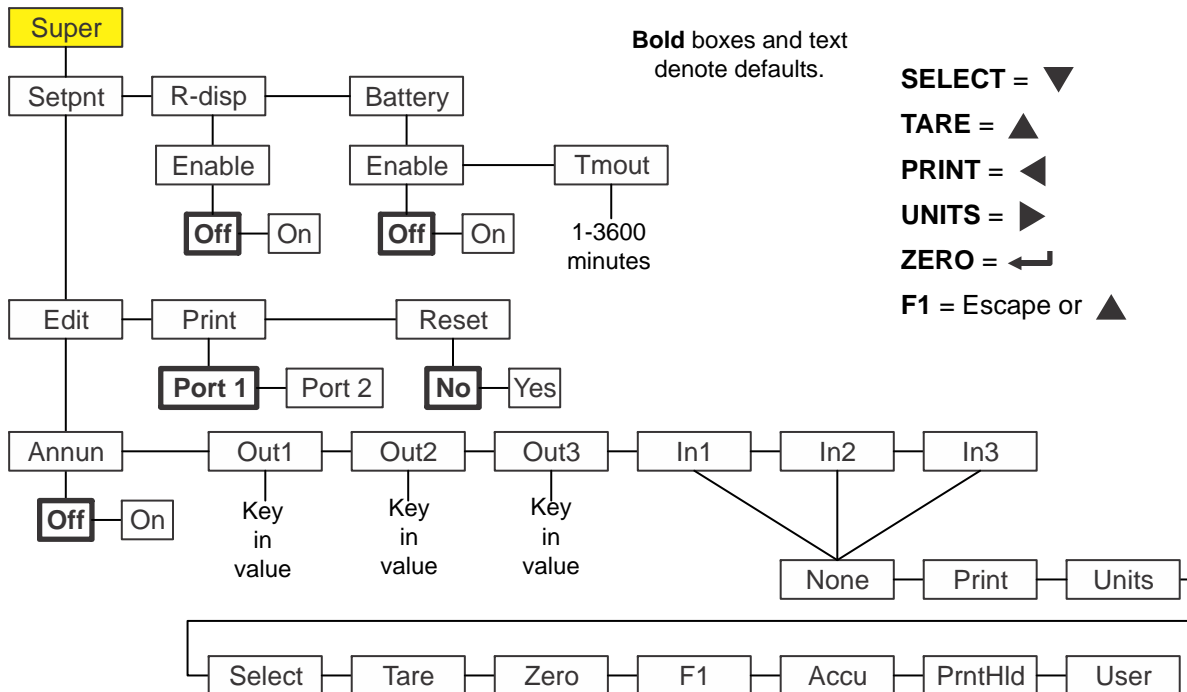
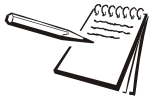


Figure 7.7 Supervisor menu for the Remote Display application



The **Setpnt** and **bAttErY** submenus in Figure 7.7 are the same as described in [General Weighing application supervisor menu on page 84](#). Go there for information on those submenus. The unique submenu to this application is described below.

- With **r-diSP** displayed press **SELECT** ...
EnAbLE is displayed. Use this to enable or disable the remote display function. Choices are **OFF** (disable) or **on** (enable).
- Press **SELECT** ...
The current setting is displayed.
- Press **UNITS** to toggle between the choices and press **ZERO** to accept the displayed choice ...
EnAbLE is displayed.
- Press **TARE** ...
r-diSP is displayed.

Supervisor menu

Settings in two password protected menus must be made to configure the indicator for remote display operation. Contact your local B-TEK representative for information on setting up the indicator as a Primary or Secondary indicator.

8 Communication port protocols

8.1 SMA Protocol Level 1 and 2



There can only be one active SMA/NCI protocol at a time in this indicator.

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.

8.1.1 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.
    
```

8.1.2 Unrecognized Command Response

```
<LF>?<CR>
```

8.1.3 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, 4th and 5th responses. Once the 5th 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>:<yyyy><CR>
```

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

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

3rd response: <xxx> = "MOD"
<yyyy> = model name

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

5th response: <xxx> = "SN"
<yyyy> = indicator serial number

8.1.4 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>:<yyyy><CR>

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

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

3rd response: <xxx> = "CAP"
<yyyy> = uu:ccc:n:d where
uu = 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"
<yyyy> = uu:ccc:n:d where
uu = 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"
<yyyy> = "PTMCU" list of supported SMA commands.
Level 1 commands are not included in the list.

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

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

8.2 Extended SMA Commands

8.2.1 Level 2 commands



*SMA Level 2 command/response protocol allows use of only the Network Tokens shown below as denoted by **. Some of the values represented by tokens 1 to 999 are available using SMA level 1 commands. See page 105 for level 1 SMA 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.

No response.



XZ and XS commands, below, only work if the indicator is unsealed.

<LF>XZ<CR>

This will initiate a Cal Zero command. The scale responds with a standard scale response message, with one additional custom status response added. If the "Set Zero" operation fails then the scale responds with the <s> field = "0"

<LF>XS<www><CR>

This will initiate a Cal Span command where <www> is the weight used to calibrate with. The scale responds with a standard scale response message, with one additional custom status response added. If the "Set Span" operation fails then the scale responds with the <s> field = "s"

<LF>XC<CR>

This will initiate a Get Audit Counters command. The scale responds with
 <LF>Calib:123456:Config:9876:<CR>
 The numbers can be variable length as they are delimited by colons

**** <LF>XVG1004<CR>**

This will return the value of setpoint 1. The scale responds with <LF>xvg1004:XXX<CR> where XXX is the value of the setpoint.

- ** <LF>XVG1005<CR>** This will return the value of setpoint 2. The scale responds with <LF>xvg1005:XXX<CR> where XXX is the value of the setpoint.
- ** <LF>XVG1006<CR>** This will return the value of setpoint 3. The scale responds with <LF>xvg1006:XXX<CR> where XXX is the value of the setpoint.
- ** <LF>XVS1004:XXX<CR>** This will set the value of setpoint 1. The scale responds with <LF>xvs1004:XXX<CR> where XXX is the value of the setpoint.
- ** <LF>XVS1005:XXX<CR>** This will set the value of setpoint 2. The scale responds with <LF>xvs1005:XXX<CR> where XXX is the value of the setpoint.
- ** <LF>XVS1006:XXX<CR>** This will set the value of setpoint 3. The scale responds with <LF>xvs1006:XXX<CR> where XXX is the value of the setpoint.

<LF>nXUGI1<CR>

Returns the division size in this form:
<LF>nXUGi1,x<CR>, where 'x' is the ASCII value that corresponds to the division size in the table below.

<LF>nXUSI1,x<CR>

Sets the division size, where 'x' is the ASCII value in the table below which corresponds to the division size.

After setting the division, the system automatically reboots to save the change.

Returns <LF>nXUGi1,x<CR>, where 'x' is the ASCII value in the table below which corresponds to the division size.

If the value of "x" is not within this range the command will return <LF>n?<CR> and will not change the calibration division size.

Value of x	Division
3	0.00001
4	0.00002
5	0.00005
6	0.0001
7	0.0002
8	0.0005
9	0.001
:	0.002
;	0.005
<	0.01
=	0.02
>	0.05
?	0.1
@	0.2

Value of x	Division
A	0.5
B	1
C	2
D	5
E	10
F	20
G	50

<LF>XUGW14<CR>

This will get the unfiltered weight. Indicator returns:
<LF>XUGw14xxx.xxx,uuu<CR>

"xxx.xxx" is unfiltered (raw counts converted), hi-resolution net weight value.

"uuu" is current unit of measure, e.g. "lb ", "kg ".

<LF>XUGW15<CR>

This command will get the mv/V. Indicator returns:
<LF>XUGw15x.xxx,mvv<CR>

"x.xxx" is current mV value being converted to counts by the ADC.

<LF>XUGF<CR>

This will get the filter values. Indicator returns:
<LF>XUGfxx,yy,zzz.zzz<CR>

"xx" is configured average filter value. (1 to 80)

"yy" is configured const filter value. (0 to 10)

"zzz.zzz" is configured threshold filter value. (0 to capacity)

<LF>XUSFxx,yy,zzz.zzz<CR>

This will set the filter values.

"xx" is desired average filter value. (1 to 80)

"yy" is desired const filter value. (0 to 10)

"zzz.zzz" is desired threshold filter value. (0 to capacity)

The indicator will return:

<LF>XUGfxx,yy,zzz.zzz<CR>

"xx" is the updated average filter value. (1 to 80)

"yy" is the updated const filter value. (0 to 10)

"zzz.zzz" is the updated threshold filter value. (0 to capacity)

After response, the configuration counter value is incremented, updated configuration is saved, then a restart is triggered.

<LF> XGxxxx.xx,u,y.yyyy <CR> This will set the calibration span.

"xxx.xxx" is desired span weight
"y.yyyy" (optional, for mV only) is the mV reading at the span weight.

"u" is 1, 2, or 3.

1 = span weight is in lb.

2 = span weight is in kg.

3 = span value is for mV.

Neither argument is allowed to be 0.0 (default returned by string conversion if error occurs).

If the command does not parse into meaningful values, "<LF>?<CR>" is returned and nothing is saved.

After calibration completes, the calibration counter value is incremented and updated calibration is saved.

8.3 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.

8.4 NCI commands

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 the unit of measure 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>

8.5 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 Unit 1
k	kg	Change to Unit 2

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.

8.6 ModbusTCP mapping



The T401SSP (Signal Processor) offers two Ethernet interface choices: Modbus TCP or SMA over Raw Socket (Type = SMA).

For Modbus TCP only the IP addresses are required.

The T401S only offers SMA over Raw Socket (Type = **SMA**).

The T401S signal processor uses a set ModbusTCP mapping which cannot be changed. That mapping is shown on the following page.

8.6.1 Output mapping

Tag Name	Address
Gross	001
Tare	003
Net	005
Motion	007
CenerZero	009
OverUnder Flag	011
HeartBeat	013
ConfigCounter	015
CalibCounter	017
HiResGross	019
calZeroDone	021
calSpanDone	023
PbZero Done	025
PbTareDone	027

8.6.2 Input mapping

Tag Name	Address
PbZero	125
PbTare	127
KeypadTare	129
calZero	131
calSpan	133
calWeight	135

8.6.3 Data Format

These settings are fixed in the T401S Signal Processor:

Trade (Word Swap)	OFF (WORD1,WORD2)
Endian	LITTLE (Least Significant Byte, Most Significant Byte)
Data Type	SINT32 (32 Bits Signed Value / -2,147,483,647 to 2,147,483,647)

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 = 10.00000000
UNIT SERIAL NUMBER	Value = 20120111

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 129](#) 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 129](#) for a list of the optional parameter tables.

The 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 Functions for String Indexing						
Action	TARE	SELECT	ZERO	PRINT	UNITS	F1
Momentary Key Press	Does nothing	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	ESC/Abort
Long Key Press	Deletes current character	Inserts new character before this point Default character added is 32 (space)	Does nothing	Page Up (Increments index by 10)	Page Down (Decrements index by 10)	ESC/Abort

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

Table 2: Key Functions for Character Editing						
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	Does nothing	Delete the entire entry	Does nothing	Does nothing

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 138](#) 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

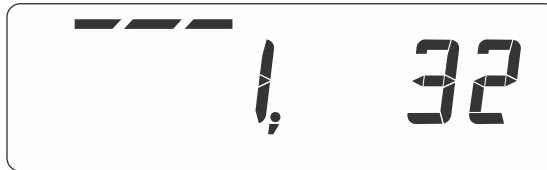
To center the company name on a printed ticket, you must add spaces in front of the company name. This will add to the total count of characters to insert.

10.2.1 Inserting characters

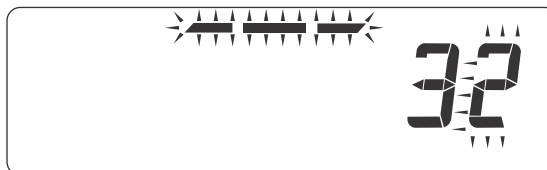
1. To insert characters into a print string, press and hold the **SELECT** key. After you hold the **SELECT** key for about 3 seconds the Index number will start to automatically increment by 1 about every second as Spaces (dec 32) are inserted into the print string. You will still see the current string 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 ...



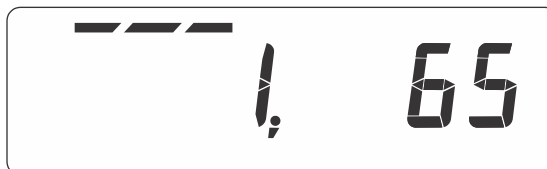
2. To start the entry of the company name press the **PRINT** key to scroll backwards until string index number 1 is again displayed, as shown below.



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 15](#) 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.

- 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

- Press **TARE** or **F1** until **SAVE NO** is displayed. Then press **UNITS** and **SAVEYES** is displayed. Press **ZERO** to save.
- 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 138](#) 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																		

- From **P.F.Edit** press **SELECT ...**
PrnFt1 is displayed.
- 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), repeatedly press the **UNITS** key until the display shows ...



You need to delete all characters from index position 15 to 28 to remove the entire Tare weight line. A long press of the **TARE** key deletes the character displayed and then shifts the remaining characters to this index position. So, repeatedly long press the **TARE** key until the display shows ...



This is the start of the Net weight characters (T.NWT token...see current index position 29).

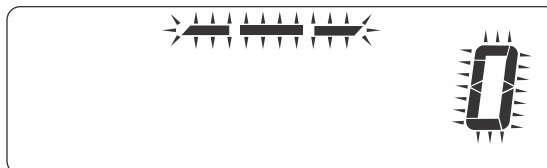
4. Remember to press the **ZERO** key when finished with the edit process to accept these changes and return to **PrnFt1** display.
5. Press **TARE** or **F1** until **SAVE no** is displayed. Press **UNITS** and **SAVEYES** is displayed. Press **ZERO** to save.
6. After the indicator reboots press the **PRINT** key to test the results.



*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 [Application variable token table \(Print Tokens\) 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 \(Print Tokens\) on page 135](#) for available variables that can be selected to print
- t** - (Token) See [Firmware tokens on page 129](#) 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.

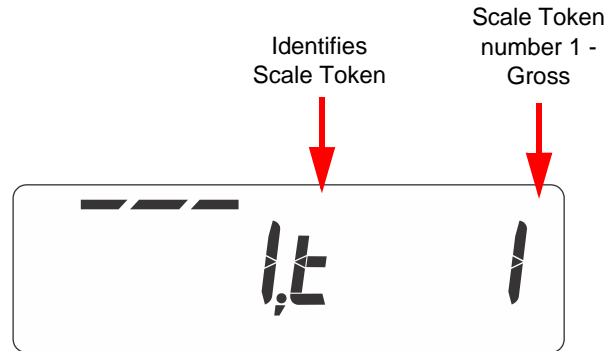
Token entry example

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.

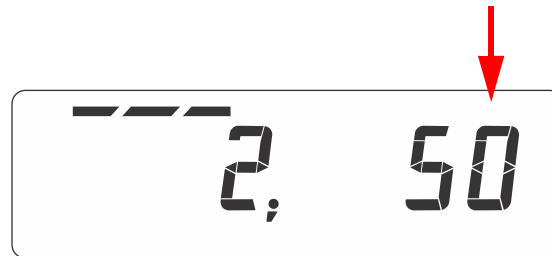


The value **1** in the above screen will be whatever index value you started from.

More scale token examples



This ASCII number identifies the type of scale token. In this case it identifies the token as the word **Gross**



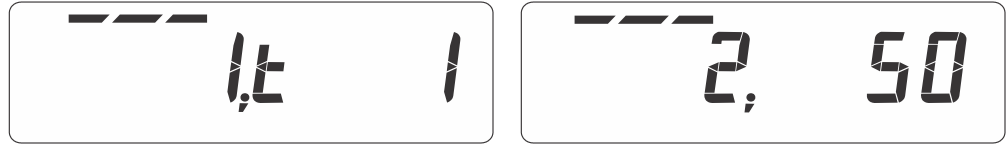
Above is a typical example of using a scale token. Upon creating the token, **t1** for Gross weight, the indicator automatically appends an additional number in the next character location. The value of the number in this next location identifies what function of the token is being used.

Decimal 1 = 49 is the actual Gross weight value.

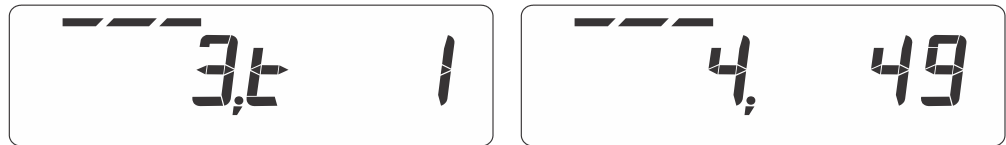
Decimal 2 = 50 is the token name, "Gross", applied to that token

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.

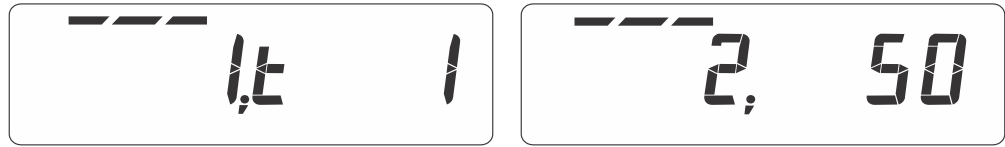


Characters 5 to 8 will remove the decimal point from the weight transmitted using an attribute parameter. You may need to refer to the [Application variable token table \(Print Tokens\)](#)

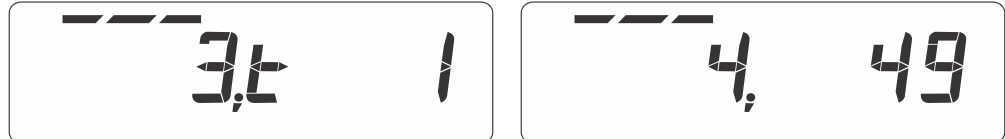
- [= t501** indicates the start of an optional parameter
- 68 = D** for decimal point parameter
- 50 = 2** for hide decimal point
-] = t502** indicates the end of the optional parameter

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 [Application variable token table \(Print Tokens\) 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 129](#).

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 Application Notes

This chapter contains general information about varying topics that can assist or educate users who are new to the T40XS systems.

11.1 I/O interfaces

I/O interfacing to the indicator must be tested before the indicator is sealed. Before you attempt to connect external devices to the indicator, you must fully understand what these interfaces are expected to do, as follows:

- Is it possible?
- Are they electrically compatible with our I/O, voltage, current, and so on?
- Are there any drawings available?
- Details of internal connections on B-TEK equipment.

Consult an electrician during the connection and testing process.

11.1.1 Inputs

Here are the things you need to do:

- Identified the terminal numbers in the indicator (for example: TB1, TB2, etc.)
- Determine if the inputs are mechanical or digital logic inputs. See note below.



Mechanical (remote switch) inputs receive their voltage from the identified indicator terminal.

Digital logic inputs change state based on a secondary or remote interface (such as a PLC or HMI, human-machine interface).

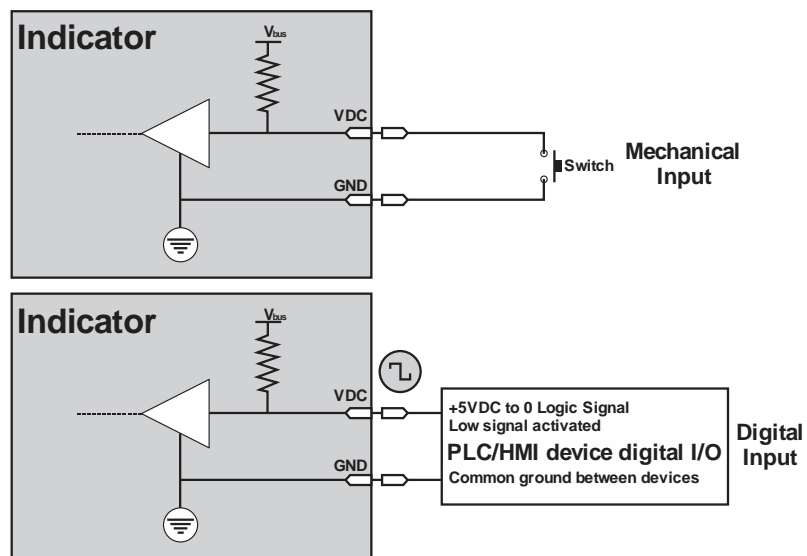


Figure 11.1 Typical input wiring

11.2 Outputs

There are a variety of interfaces for output control:

Relay	Electro-mechanical switching device capable of switching multiple voltages or currents
Opto module	Solid state switching device capable of switching multiple voltages or currents
Transistor	Low voltage/low current switching device, typically not more than 5VDC or 100mA

You must determine, from the customer, the voltage and current that will be switched.

Be sure the indicator capabilities match the customer need.

Below is an example of output wiring.

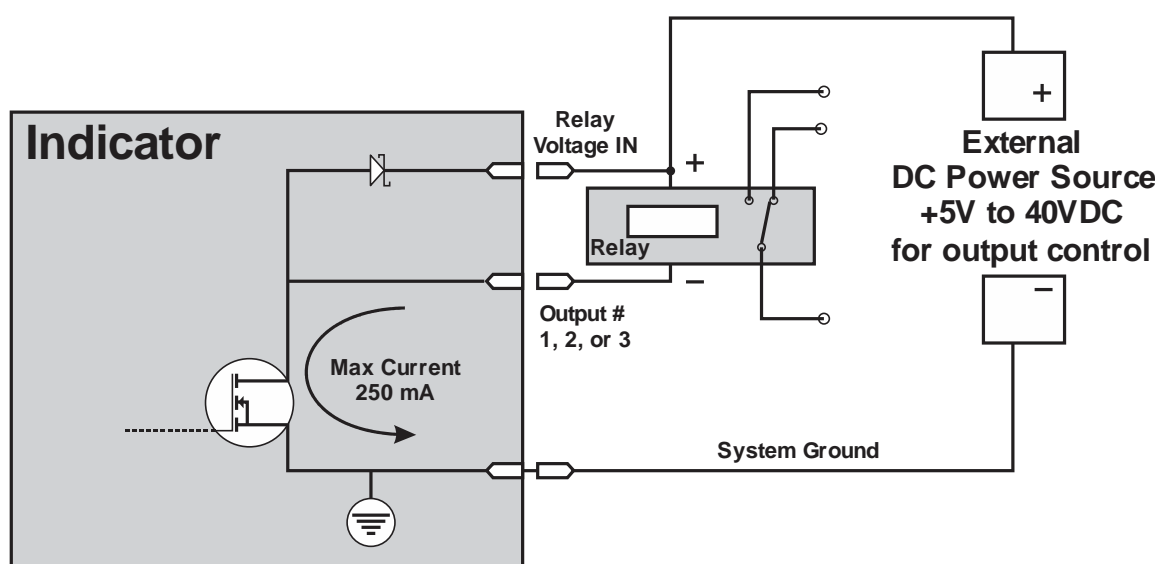


Figure 11.2 Transistor output driving an external relay



Relay Power IN signal provides protection for the transistor circuit against power supply spikes.

11.2.1 Relays

There are many types of relays. Match the customer need to the relay types available.

11.2.2 Opto module

Opto modules are available in a variety of types. Make sure that the opto in the machine is compatible with the customer's voltage. There are AC optos, DC optos and optos with reed relay contacts. As well as optos of various voltage ratings, they may be polarity dependant.

11.2.3 Transistor outputs

You must be cautious when you work with transistor outputs as they usually behave in either common emitter or common collector arrangements.

Transistor outputs usually switch low voltages and they are limited in voltage and current so you must not exceed their values. There may be a diode for back EMF protection (CR8 in the circuit shown in [Figure 11.2](#)) available. It is also possible that the 0 volts line is not isolated. Transistor outputs would have difficulty operating in a circuit where they are expected to switch positive voltages.

11.3 Diagnostics

After you have wired up the I/O use the indicator's diagnostics to confirm that the operation of the I/O is correct.



WARNING: AFTER YOU HAVE FINISHED THE WIRING, THERE MAY BE HIGH VOLTAGES PRESENT IN THE INDICATOR FROM CUSTOMER'S EQUIPMENT. TREAT IT WITH CAUTION



WARNING: MAKE SURE THAT DURING TESTING STAGES THE I/O CANNOT DISCHARGE ANY PRODUCT, OR CAUSE ANY ACCIDENTS.



WARNING: WHATEVER TYPE OF OUTPUTS YOU ARE WORKING WITH, ALWAYS TRY AND INSTALL A SYSTEM THAT IS FAILSAFE. THIS MEANS THAT IF THE INDICATOR IS SWITCHED OFF, FOR ANY REASON, THE STATE OF THE OUTPUTS WILL BE IN A POSITION TO PREVENT ANY UNWANTED MOTION.

12 Print tokens, parameters and default print formats

12.1 Firmware tokens

Token	Token	Description of Value	Name Value	Data Type	Parameter Name	Optional Parameter	Available Values
T.x		T.x.1	T.x.2	T.x.3			
1	GWT	Gross Weight	Gross	WEIGHT	Show sign	p	1 = Show minus (default) 2 = Show plus 3 = Show both 4 = Hide both
2	SAT	Semi Automatic Tare Weight	Tare		Width	W	1 - 127 Characters Default is Configuration Dependent
3	NWT	Net Weight	Net		Precision	P	0 - 127 Characters Default is Configuration Dependent
10	PGW	Peak Gross Weight	Peak Max		Leading Zero	Z	0 = None (default) 1 = Leading Zeros 2 = Leading Spaces 3 = Show All 4 = Hide All
11	PNW	Peak Net Weight	Peak Min		Multiplier	m	0 = None or *1 (default) 1 = Multiply *10 2 = Multiply *100 3 = Multiply *1000
13	PCE	Piece Weight	Piece Weight		Decimal Point	D	1 = Show decimal (default) 2 = Hide Decimal
14	HAO	Hub Analog Output	HubAnalogOut		Justification	J	1 = Right (default) 2 = Left
16	ACT	Active Displayed Value	Spelled Active Value		Unit of Measure	u	1 = Current displayed Unit of measure (default) 2 = Calibration Unit 3 = Rounded Current Unit 4 = Rounded Calibration Unit
19	PMAX	Peak Maximum Weight	Peak Max		Rounded Unit of Measure	r	5 = lb 6 = kg 7 = oz 8 = g 9 = lb-oz 10 = Custom Unit 1 11 = Custom Unit 2 12 = Custom Unit 3 13 = Custom Unit 4
20	PMIN	Peak Minimum Weight	Peak Min		Binary Output	B	1 = Truncate to 1-Byte Integer 2 = Truncate to 2-Byte Integer 3 = Truncate to 4-Byte Integer 4 = 4-Byte Floating Point
35	GWTHR	High Resolution Gross Weight	GrossHiRes		Binary Conversion	c	1 = As Binary (High Byte First) 2 = As Comma Separated Decimal in ASCII Format (High Byte First) 3 = As HEX in ASCII Format (High Byte First)
36	NWTHR	High Resolution Net Weight	NetHiRes		Polarity Character	v	Just a "+" or "-" character.
37	INMOWT	Active Displayed In-Motion Weight Value	In-Motion Weight				
104	GAT	Accumulated Gross Weight Total	Gross Total				
105	TAT	Accumulated Tare Weight Total	Tare Total				
106	NAT	Accumulated Net Weight Total	Net Total				

Token	Token	Description of Value	Name Value	Data Type	Parameter Name	Optional Parameter	Available Values
T.x		T.x.1	T.x.2	T.x.3			
200	TIM	Time	Time	TIME	Time Format	F	0 = As Configured (default) 1 = HH:MM:SS (12hr) 2 = HH:MM AM/PM 3 = HH:MM:SS (24hr)
					Seconds Format	S	0 = As Configured (default) 1 = Hide Seconds 2 = Seconds Since Midnight 3 = Both 1 and 2
					Width	W	1 - 127 Characters Default is Configuration Dependent
					Time Separator	s	1 = None 2 = Comma (,) 3 = Period or Decimal Point (.) 4 = Backslash (\) 5 = Space () 6 = Forward Slash (/) 7 = Colon (:) 8 = Dash (-)
201	DAT	Date	Date	DATE	Format	F	0 = As Configured (default) 1 = MM-DD-YY 2 = MM-DD-YYYY 3 = DD-MM-YY 4 = DD-MM-YYYY 5 = YY-MM-DD 6 = YYYY-MM-DD 7 = DD-YY-MM 8 = DD-YYYY-MM 9 = YY-DD-MM 10 = YYYY-DD-MM 11 = WW-YY 12 = WW-YYYY 13 = YY-WW 14 = YYYY-WW
					Show Day of Week	d	d = day of the week spelled out (MON, TUES, etc.)
					Day of the year	j	j = number of days since beginning of the year
					Spelled Date	S	S = month spelled out (MAY, JUNE, etc.)
					Width	W	1 - 127 Characters Default is Configuration Dependent
Separator	s	1 = None 2 = Comma (,) 3 = Period or Decimal Point (.) 4 = Backslash (\) 5 = Space () 6 = Forward Slash (/) 7 = Colon (:) 8 = Dash (-) (default)					

Token	Token	Description of Value	Name Value	Data Type	Parameter Name	Optional Parameter	Available Values				
T.x		T.x.1	T.x.2	T.x.3							
4	MOTN	Motion	Motion	INTEGER			1 = Show - (default) 2 = Show + 3 = Show All 4 = Hide All				
6	OVER	Overload	Overload								
7	UNDER	Underload	Underload								
8	CZ	Center of Zero	Center of Zero								
12	CNT	Count	Count								
38	INMOTM	InMotion Time	InMotion Time								
107	CAT	Accumulated Count Value Total	Count Total								
250	OUT1	Output 1 State: 0 = Not Active, 1 = Active	OUT1								
251	OUT2	Output 2 State: 0 = Not Active, 1 = Active	OUT2								
252	OUT3	Output 3 State: 0 = Not Active, 1 = Active	OUT3								
300	RTN	Transaction Count	Transaction Count								
301	CON	Consecutive Number	Consecutive Number								
304	B2H	Binary to Hexadecimal	Bin2Hex								
305	B2A	Binary to ASCII	Bin2Asc								
313	DIS	Status Byte See Additional token tables on page 134	Status								
314	UTID	Unique ID (Archive menu)	DSD Consec.								
302	CKSM	Checksum	Checksum						Mode Applies to token 302 only	M	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

Token	Token	Description of Value	Name Value	Data Type	Parameter Name	Optional Parameter	Available Values	
T.x		T.x.1	T.x.2	T.x.3				
9	UNIT	Unit of Measure Type	Unit	STRING	Unit of Measure Applies to token 9 only	U	1 = Current (default) 2 = Calibration 3 = lb 4 = kg 5 = oz 6 = g 7 = lb-oz 8 = Custom Unit 1 9 = Custom Unit 2 10 = Custom Unit 3 11 = Custom Unit 4	
5	WST	Motion = M Stable or no motion = S	sMotion					
15	WSTAT	Weight Status See Additional token tables on page 134	Weight Status					
17	TSAT	Returns type of Tare used See Additional token tables on page 134	Tare Type					
28	HEX	Prints HEX value of a ASCII Decimal Value	Hexadecimal			Applies to token 28 only.	non-optional parameter [hXX]	0 through 255
29	NCIBYTE1	Returns NCI Status Byte 1 only See Additional token tables on page 134	NCI Status Byte 1					
30	NCIBYTE2	Returns NCI Status Byte 2 only See Additional token tables on page 134	NCI Status Byte 2					
31	NCIBYTE3	Returns NCI Status Byte 3 only See Additional token tables on page 134	NCI Status Byte 3					
32	NCIBYTE12	Returns NCI Status Bytes 1 & 2 only See Additional token tables on page 134	NCI Status Bytes 12					
33	NCIBYTE23	Returns NCI Status Bytes 2 & 3 only See Additional token tables on page 134	NCI Status Bytes 23					
34	NCIBYTE123	Returns NCI Status Bytes 1, 2 & 3 See Additional token tables on page 134	NCI Status Bytes 123					
309	SITE	Site ID	Site ID					
310	SN	Serial Number	Serial Number			Justification	J	1 = Right (default) 2 = Left
311	LK	Condec Units = L or K	Condec Units					
312	STAT	Condec Status = " " (space = stable) "M" = motion "O" = out of range	Condec Status			Width	W	1 - 127 Characters
323	S127	WI-127 Status Byte	127 Status					STATUS CODES These are the most common characters you will see on a terminal: "0" = Valid weight "1" = Motion "2" = Range error (Over/Underload) "4" = A-D error "8" = Low voltage Combinations of these errors can also occur. (e.g., "3" = Range error (2) plus Motion (1))
324	NAME	Indicator Scale Name	Scale Name					
325	LOC	Indicator Scale Location	Scale Location					32 characters max entered in Ztools under SYSTEM TAB

Token	Token	Description of Value	Name Value	Data Type	Parameter Name	Optional Parameter	Available Values
T.x		T.x.1	T.x.2	T.x.3			
21	SMOTSTR	Sets values for Motion TRUE / FALSE	sSPCMot	STRING (cont.)	Applies to tokens 21-27 only		Using these tokens requires use of the required parameter [tXXfYY] where XX and YY represent the ASCII hex character (1-255) to be sent for a true or false condition respectively. The XX or YY must be entered as individual decimal values. Example: To send a "1" for true or "0" for false condition the parameter would be entered as [116 52 57 102 52 56] in the Print Format Editor.
22	SCZSTR	Sets values for Center of Zero TRUE / FALSE	sSPCCZ				
23	SOLDSTR	Sets values for Overload TRUE / FALSE	sSPCOld				
24	SULDSTR	Sets values for Underload TRUE / FALSE	sSPCUld				
25	SGPOL	Sets values for Gross Polarity	sSPCGPol				
26	SNPOL	Sets values for Net Polarity	sSPCNPol				
27	SAPOL	Sets values for Active Value Polarity	sSPCAPol				
500	NULL	Null	NULL	Undefined			
501	SOP	Start Optional Parameters	SOP		[
502	EOP	End Optional Parameters	EOP]		
600	TEXT	Print Data is Text	Data Type Text		"<ESC>txt"		
601	PCL	Print Data is Printer Control Language	Data Type PCL		"<ESC>PCL"		
602	EPPOS	Print Data is Epson Point of Sale	Data Type Epson Pos		"<ESC>EPS"		
603	ZEBRA	Print Data is Zebra Language	Data Type Zebra		"<ESC>ZEB"		
604	RAW	Print Data is RAW	Data Type RAW		"<ESC>raw"		
650	BOLD	Print Format Bold	Format Bold		"<ESC><ESC>B"		
651	ITAL	Print Format Italic	Format Italic		"<ESC><ESC>I"		
652	UNDR	Print Format Underline	Format Underline		"<ESC><ESC>U"		
653	LAND	Print Format Landscape	Format Landscape		"<ESC><ESC>L"		
654	FF	Print Format Form feed	Format Form Feed		"<ESC><ESC>F"		
655	WRAP	Print Format Line Wrap	Format Line Wrap		"<ESC><ESC>W"		

12.1.1 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: 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"

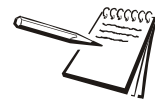
NCI Status Byte Table

Bit	Byte 1	Byte 2	Byte 3
1	1 = Scale in motion 0 = Stable	1 = Underloaded 0 = Not Underloaded	00 = Low Range 01 = Undefined 10 = Undefined 11 = High Range
2	1 = Scale at Zero 0 =Not at Zero	1 = Overloaded 0 = Not Overloaded	
3	1 = RAM error 0 = RAM OK	1 = ROM error 0 = ROM OK	1 = Net Weight 0 = Gross Weight
4	Always 0	1 = Faulty Calibration 0 = Calibration OK	1 = Initial Zero Error 0 = Initial Zero OK
5	Always 1	Always 1	Always 1
6	Always 1	Always 1	Always 1
7	Always 0	1 = Byte follows 0 = Last Byte	1 = Byte follows 0 = Last Byte
8	Parity	Parity	Parity

12.2 Application variable token table (Print Tokens)

If the Application Variable is unavailable for the selected application, the value will be 0 and the name will be "invalid".

App Token	Variable Value Description	Name Value	Data Type	Standard Applications						
				General	Accumulate	Counting	Checkweigher	Batching	Peak Hold	Remote Display
A.x	A.x.1	A.x.2	A.x.3							
1	ID as entered into the ID Key field	ID	Integer	X	X	X	X	X	X	X
2	Stored Tare Weight Channel	Tare Channel	Integer	X	X	X	X	X	X	X
3	Accumulator Channel	Accum Channel	Integer		X					
4	Output 1 Configured Value	Output #1 Value	Float	X	X	X	X	X	X	X
5	Output 2 Configured Value	Output #2 Value	Float	X	X	X	X	X	X	X
6	Output 3 Configured Value	Output #3 Value	Float	X	X	X	X	X	X	X
7	Preact Value #1	Preact1	Float					X		
	Output #1 Low Value	Output #1 Low Value	Float	X	X	X	X		X	X
8	Preact Value #2	Preact2	Float					X		
	Output #2 Low Value	Output #2 Low Value	Float	X	X	X	X		X	X
9	Preact Value #3	Preact3	Float					X		
	Output #3 Low Value	Output #3 Low Value	Float	X	X	X	X		X	X
10	Output #1 Actual Value	Actual1	Float					X		
	Output #1 High Value	Output #1 High Value	Float	X	X	X	X		X	X
11	Output #2 Actual Value	Actual2	Float					X		
	Output #2 High Value	Output #2 High Value	Float	X	X	X	X		X	X
12	Output #3 Actual Value	Actual3	Float					X		
	Output #3 High Value	Output #3 High Value	Float	X	X	X	X		X	X
13	Input #1 State	<i>Configured</i> Input x Action (None, Print Key, Units Key, Select Key, Tare Key, Zero Key, *Sample Key, F1 Key, *Target Key, *Start Key, *Stop Key, *ID Key, *Setup Key, *Under Key, *Over Key, *Accum Key, *Base Key, *Print Hold Key, *User Defined) <i>An (*) signifies indicator specific keys</i>	Integer	X	X	X	X	X	X	X
14	Input #2 State		Integer	X	X	X	X	X	X	X
15	Input #2 State		Integer	X	X	X	X	X	X	X



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.

12.3 ASCII characters

Code #	Cont. Char.	Print Char.	Hex	Code #	Cont. Char.	Print Char.	Hex	Code #	Cont. Char.	Print Char.	Hex	Code #	Cont. Char.	Print Char.	Hex	Code #	Cont. Char.	Print Char.	Hex				
0	NUL		00	045	-	-	2D	090	Z	Z	5A	0128	NA	Ç	80	0173	NA	ı	ad	0218	NA	ƒ	da
01	SOH	☺	01	046	.	.	2E	091	[	[	5B	0129	NA	ü	81	0174	NA	«	ae	0219	NA	█	db
02	STX	☹	02	047	/	/	2F	092	\	\	5C	0130	NA	é	82	0175	NA	»	af	0220	NA	■	dc
03	ETX	♥	03	048	0	0	30	093	]	]	5D	0131	NA	â	83	0176	NA	☒	b0	0221	NA	▩	dd
04	EOT	♦	04	049	1	1	31	094	^	^	5E	0132	NA	ä	84	0177	NA	☒	b1	0222	NA	▩	de
05	ENG	♣	05	050	2	2	32	095	_	_	5F	0133	NA	à	85	0178	NA	☒	b2	0223	NA	■	df
06	ACK	♠	06	051	3	3	33	096	`	`	60	0134	NA	á	86	0179	NA	|	b3	0224	NA	α	e0
07	BEL		07	052	4	4	34	097	a	a	61	0135	NA	ç	87	0180	NA	†	b4	0225	NA	β	e1
08	BS		08	053	5	5	35	098	b	b	62	0136	NA	ê	88	0181	NA	‡	b5	0226	NA	Γ	e2
09	HT		09	054	6	6	36	099	c	c	63	0137	NA	è	89	0182	NA	‡	b6	0227	NA	π	e3
010	LF	LF	0A	055	7	7	37	0100	d	d	64	0138	NA	è	8a	0183	NA	¶	b7	0228	NA	Σ	e4
011	VT	♁	0B	056	8	8	38	0101	e	e	65	0139	NA	ï	8b	0184	NA	¶	b8	0229	NA	σ	e5
012	FF	FF	0C	057	9	9	39	0102	f	f	66	0140	NA	î	8c	0185	NA	¶	b9	0230	NA	μ	e6
013	CR	CR	0D	058	:	:	3A	0103	g	g	67	0141	NA	ì	8d	0186	NA	¶	ba	0231	NA	τ	e7
014	S0	🎵	0E	059	;	;	3B	0104	h	h	68	0142	NA	Ë	8e	0187	NA	¶	bb	0232	NA	φ	e8
015	S1	⚙	0F	060	<	<	3C	0105	i	i	69	0143	NA	Ä	8f	0188	NA	¶	bc	0233	NA	θ	e9
016	DLE	4	10	061	=	=	3D	0106	j	j	6A	0144	NA	É	90	0189	NA	¶	bd	0234	NA	Ω	ea
017	DC1	3	11	062	>	>	3E	0107	k	k	6B	0145	NA	æ	91	0190	NA	¶	be	0235	NA	ø	eb
018	DC2	ø	12	063	?	?	3F	0108	l	l	6C	0146	NA	⌘	92	0191	NA	¶	bf	0236	NA	∞	ec
019	DC3	∅	13	064	@	@	40	0109	m	m	6D	0147	NA	ô	93	0192	NA	¶	c0	0237	NA	∅	ed
020	DC4	β	14	065	A	A	41	0110	n	n	6E	0148	NA	ö	94	0193	NA	¶	c1	0238	NA	ε	ee
021	NAK	§	15	066	B	B	42	0111	o	o	6F	0149	NA	ò	95	0194	NA	¶	c2	0239	NA	∩	ef
022	SYN		16	067	C	C	43	0112	p	p	70	0150	NA	û	96	0195	NA	¶	c3	0240	NA	≡	f0
023	ETB	—	17	068	D	D	44	0113	q	q	71	0151	NA	ù	97	0196	NA	—	c4	0241	NA	±	f1
024	CAN	↑	18	069	E	E	45	0114	r	r	72	0152	NA	ÿ	98	0197	NA	+	c5	0242	NA	≥	f2
025	EM	↓	19	070	F	F	46	0115	s	s	73	0153	NA	ÿ	99	0198	NA	†	c6	0243	NA	≤	f3
026	SUB	→	1A	071	G	G	47	0116	t	t	74	0154	NA	ÿ	9a	0199	NA	¶	c7	0244	NA	|	f4
027	ESC	←	1B	072	H	H	48	0117	u	u	75	0155	NA	ç	9b	0200	NA	¶	c8	0245	NA	|	f5
028	FS	—	1C	073	I	I	49	0118	v	v	76	0156	NA	£	9c	0201	NA	¶	c9	0246	NA	÷	f6
029	GS	—	1D	074	J	J	4A	0119	w	w	77	0157	NA	¥	9d	0202	NA	¶	ca	0247	NA	≈	f7
030	RS	5	1E	075	K	K	4B	0120	x	x	78	0158	NA	⌘	9e	0203	NA	¶	cb	0248	NA	°	f8
031	US	ó	1F	076	L	L	4C	0121	y	y	79	0159	NA	f	9f	0204	NA	¶	cc	0249	NA	•	f9
032	SP		20	077	M	M	4D	0122	z	z	7A	0160	NA	⌘	a0	0205	NA	=	cd	0250	NA	·	fa
033	!	!	21	078	N	N	4E	0123	{	{	7B	0161	NA	í	a1	0206	NA	¶	ce	0251	NA	√	fb
034	"	"	22	079	O	O	4F	0124	|	|	7C	0162	NA	ó	a2	0207	NA	¶	cf	0252	NA	∞	fc
035	#	#	23	080	P	P	50	0125	}	}	7D	0163	NA	ú	a3	0208	NA	¶	d0	0253	NA	²	fd
036	\$	\$	24	081	Q	Q	51	0126	~	~	7E	0164	NA	ñ	a4	0209	NA	¶	d1	0254	NA	■	fe
037	%	%	25	082	R	R	52	0127	DEL	□	7F	0165	NA	Ñ	a5	0210	NA	¶	d2	0255	NA		ff
038	&	&	26	083	S	S	53					0166	NA	ª	a6	0211	NA	¶	d3				
039	'	'	27	084	T	T	54					0167	NA	º	a7	0212	NA	¶	d4				
040	(	(	28	085	U	U	55					0168	NA	¿	a8	0213	NA	¶	d5				
041	)	)	29	086	V	V	56					0169	NA	ƒ	a9	0214	NA	¶	d6				
042	*	*	2A	087	W	W	57					0170	NA	ƒ	aa	0215	NA	¶	d7				
043	+	+	2B	088	X	X	58					0171	NA	½	ab	0216	NA	¶	d8				
044	,	,	2C	089	Y	Y	59					0172	NA	¼	ac	0217	NA	¶	d9				

12.4 Control codes

ASCII	Control Code Description	Control
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	Vertical 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

12.5 Default print formats

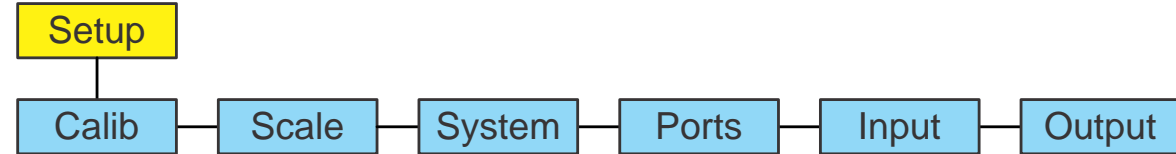
Num	Description	Tokenized Format	Example	Print Format Editor Position																					
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	General Weighing	{T.GWT.2[W6]} {T.GWT.1} {T.UNIT.1}#CR#LF{T.SAT.2[W6]} {T.SAT.1} {T.UNIT.1}#CR#LF{T.NWT.2[W6]} {T.NWT.1} {T.UNIT.1}#CR#LF	<pre> Gross 272.04 lb Tare 95.88 lb Net 176.16 lb </pre>	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	{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	<pre> Transaction Count: 10 Gross 272.04 lb Tare 95.88 lb Net 176.16 lb </pre>	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	{T.CNT.2} {T.CNT.1}#CR#LF	<pre> Count 176 </pre>	T.CNT	2		T.CNT	1	#CR	#LF															
				t12	50	32	t12	49	13	10															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
4	Checkweigh Format	{T.NWT.2} {T.NWT.1} {T.UNIT.1}#CR#LF	<pre> Net 176.16 lb </pre>	T.NWT	2		T.NWT	1		T.UNIT	1	#CR	#LF												
				t3	50	32	t3	49	32	t9	49	13	10												
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
5	Batch Format	{T.ACT.2[W1]} {T.ACT.1} {T.UNIT.1}#CR#LF	<pre> G 272.04 lb </pre>	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								
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
6	Peak Format	{T.PGW.2} {T.PGW.1} {T.UNIT.1}#CR#LF	<pre> Peak Max 1000.02 lb </pre>	T.PGW	2		T.PGW	1		T.UNIT	1	#CR	#LF												
				t10	50	32	t10	49	32	t9	49	13	10												
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		

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		
7	RD Format	{T.ACT.1}{T.UNIT.1} {T.ACT.2[W1]}#CR#LF	~~~~~ 272.04 lb G ~~~~~	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	{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	~~~~~ Transaction Count: 10 Gross Total 0.00 lb Tare Total 0.00 lb Net Total 0.00 lb ~~~~~	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	Count Accum.	{T.RTN.2}; {T.TN.1}#CR#LF {T.CAT.2} {T.CAT.1}#CR#LF	~~~~~ Transaction Count: 10 Count Total 176 ~~~~~	RTN	2	:	<SP>	RTN	1	<CR>	<LF>	CAT	2	<SP>	<SP>	CAT	1	<CR>	<LF>						
				t300	50	58	32	t300	49	13	10	t107	50	32	32	t107	49	13	10						
10	Blank		~~~~~ ~~~~~																						

13 Complete menu structures

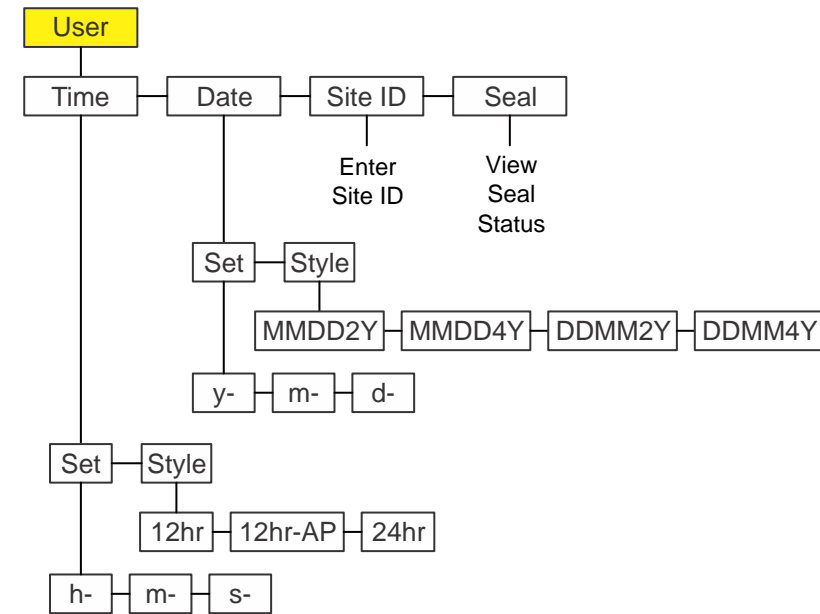


Setup top level menu



User Menu

See [User menu on page 23](#)

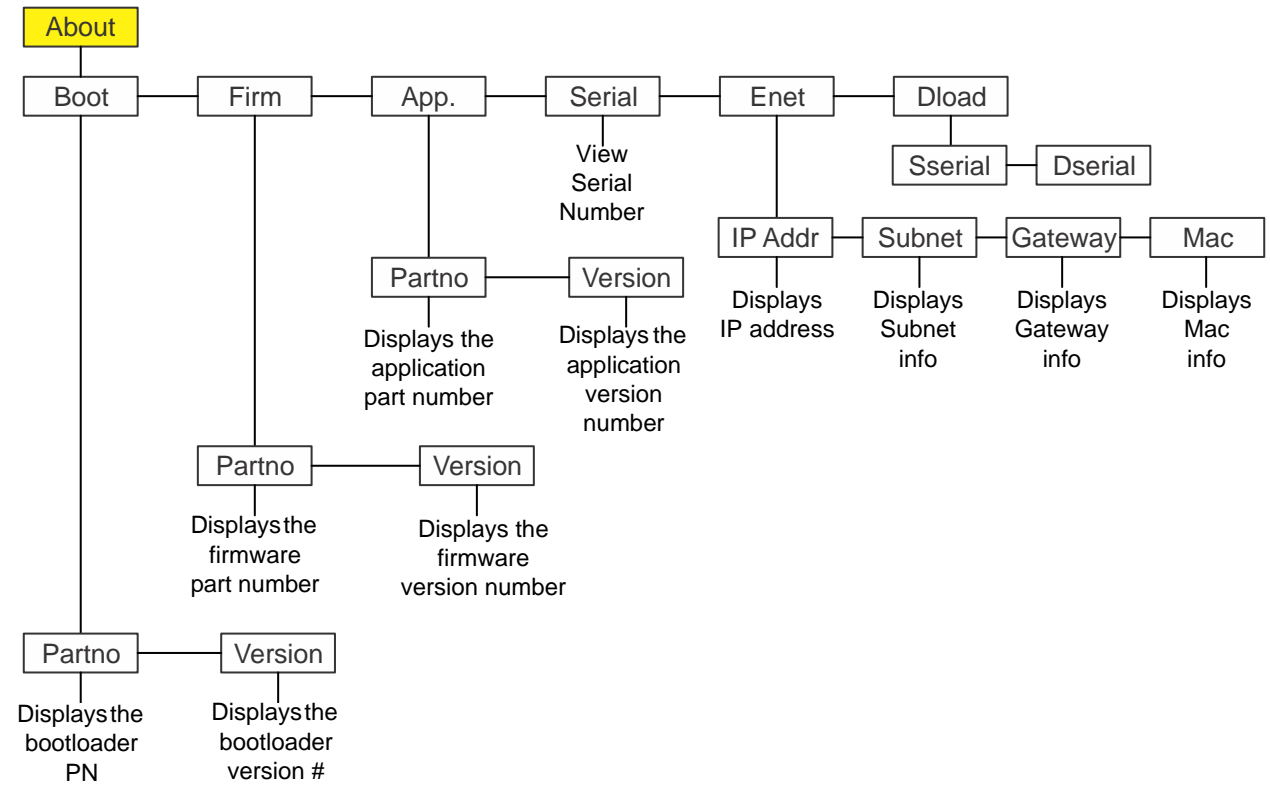


Menu Navigation Keys:

- 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

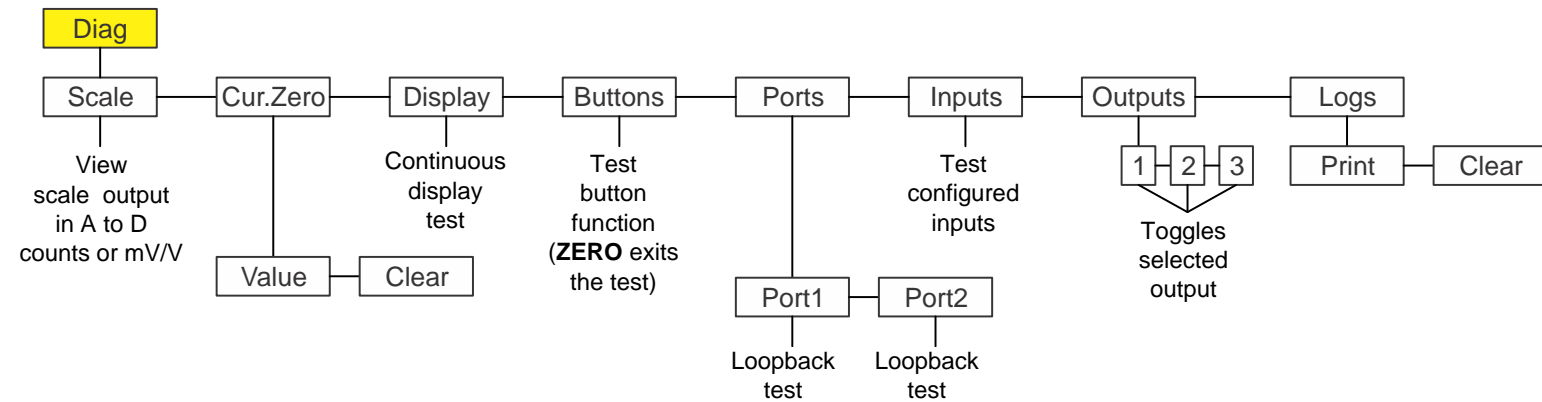
About Menu

See [About menu on page 27](#)



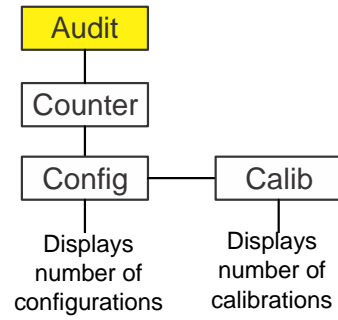
Diagnostics Menu

See [Diag menu on page 33](#)



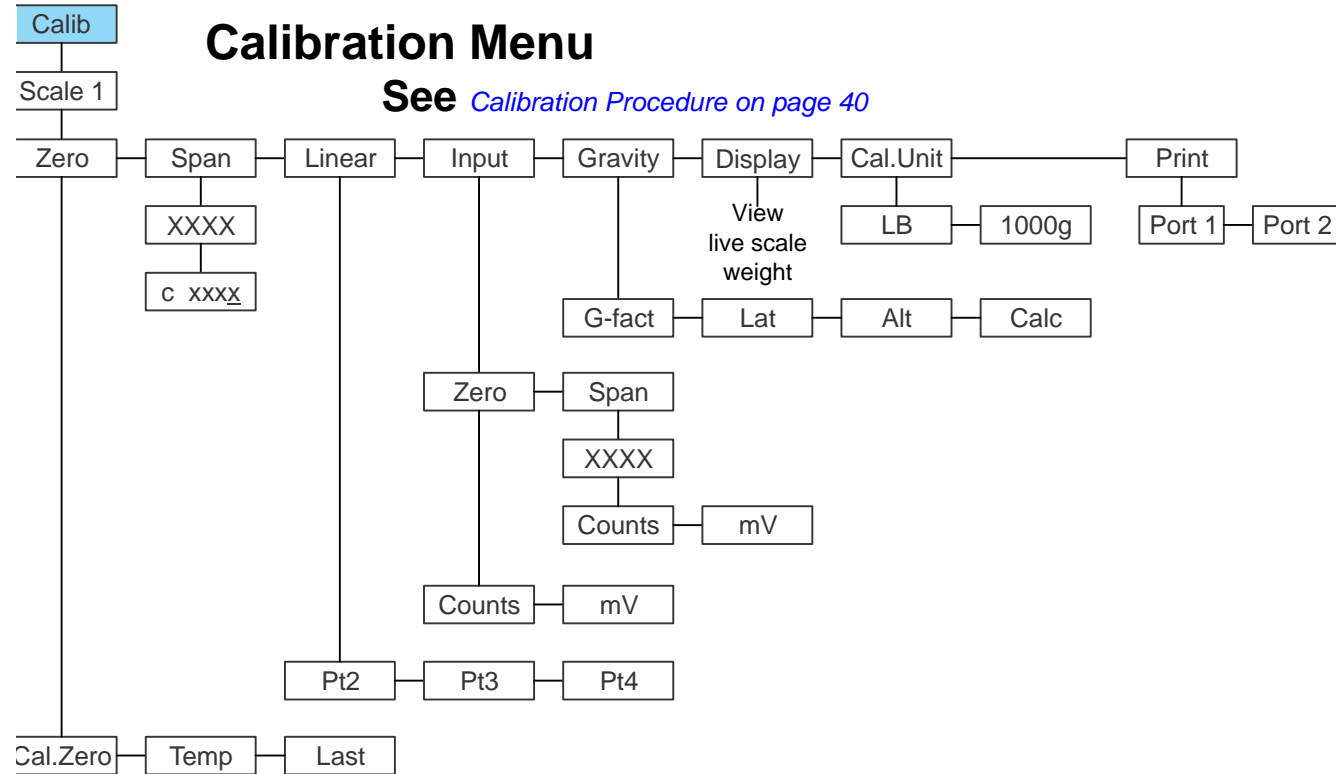
Audit Menu

See [Audit menu on page 31](#)



Calibration Menu

See [Calibration Procedure on page 40](#)

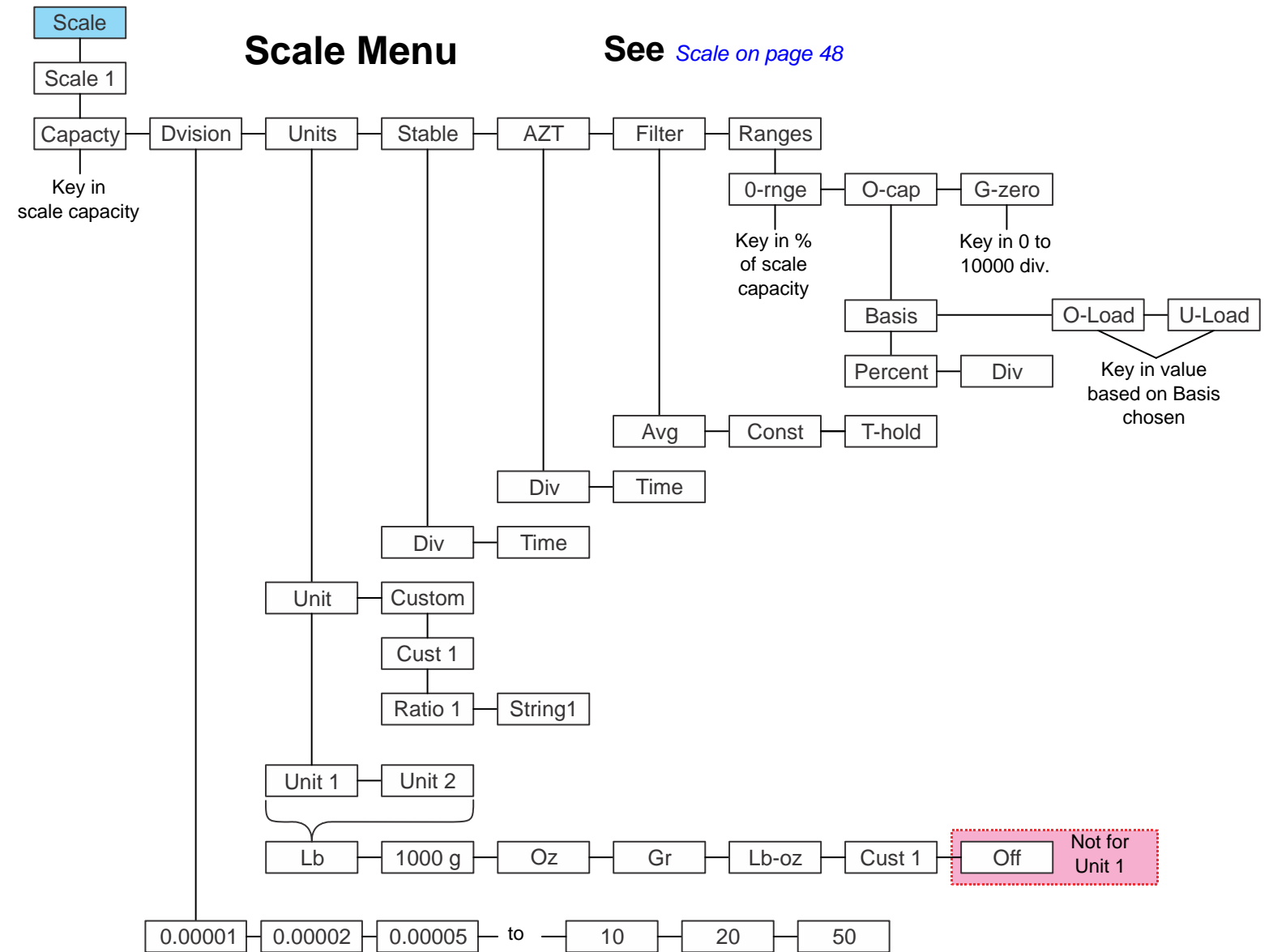


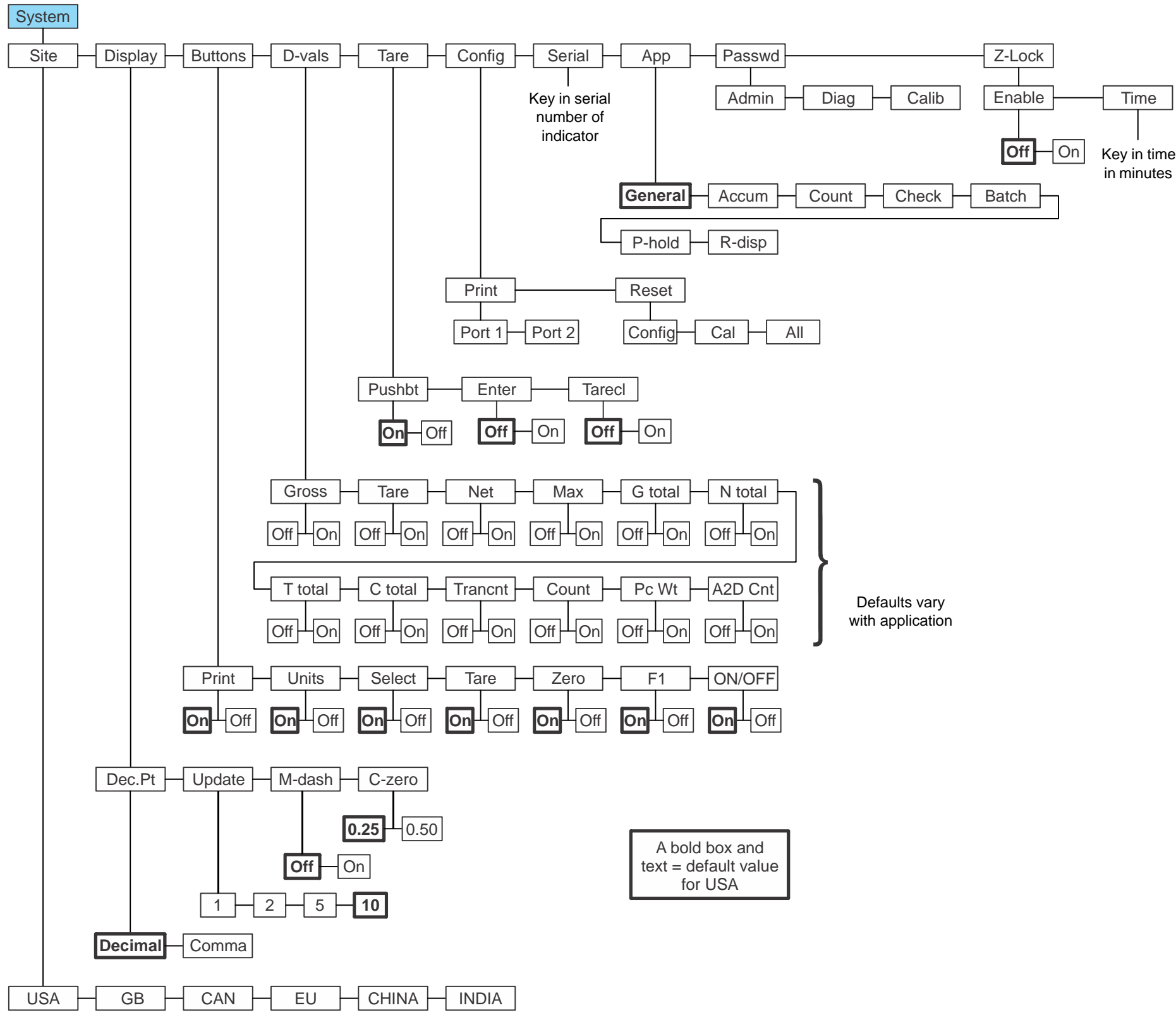
Menu Navigation Keys:

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

See [Scale on page 48](#)



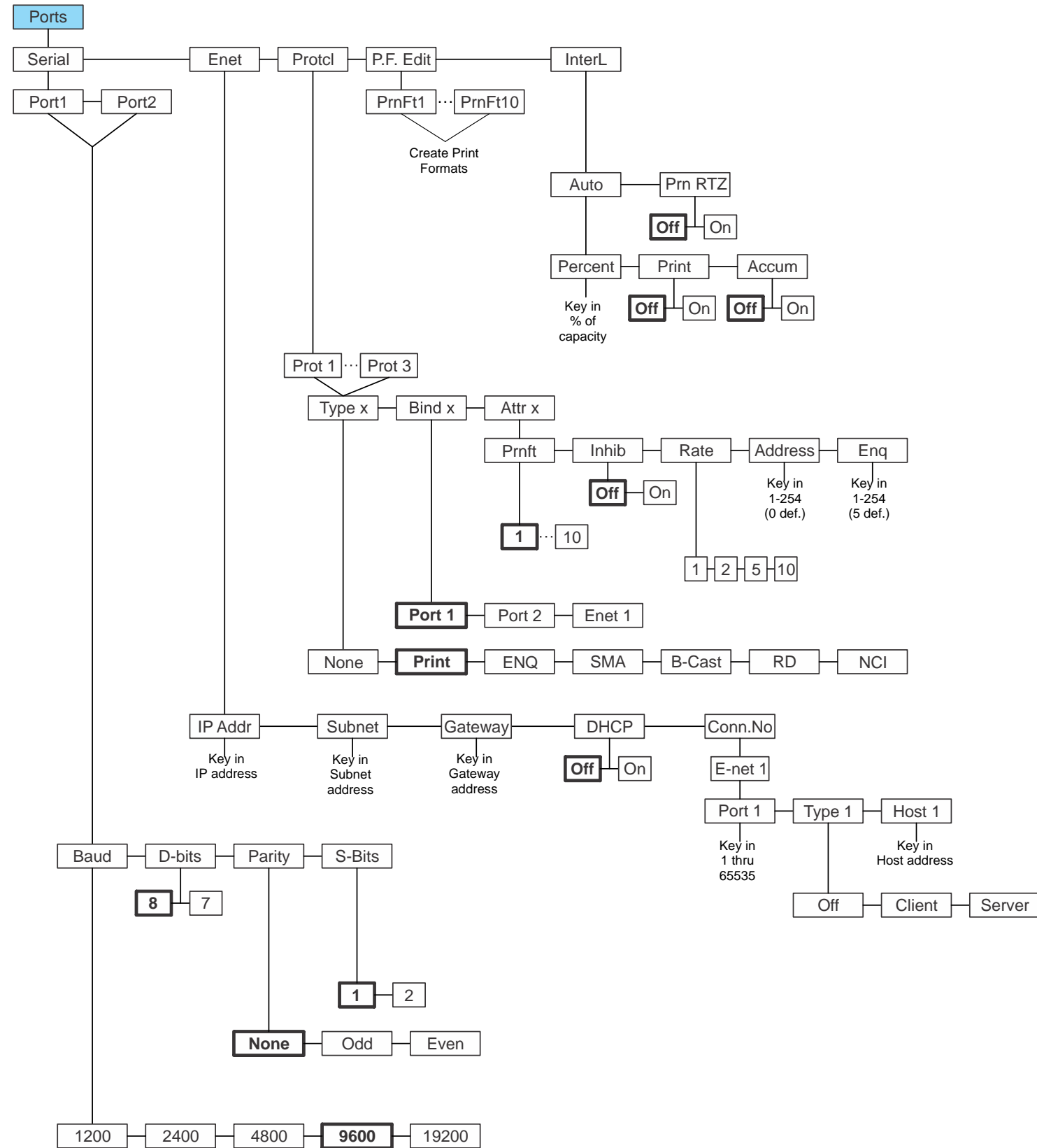


System Menu

See [System on page 58](#)

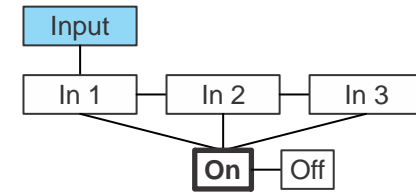
Ports Menu

See [Ports on page 69](#)



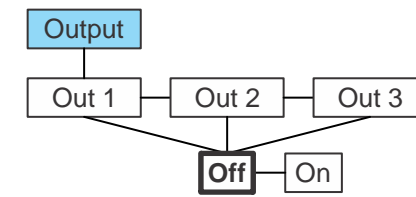
Input Menu

See [Inputs on page 81](#)



Output Menu

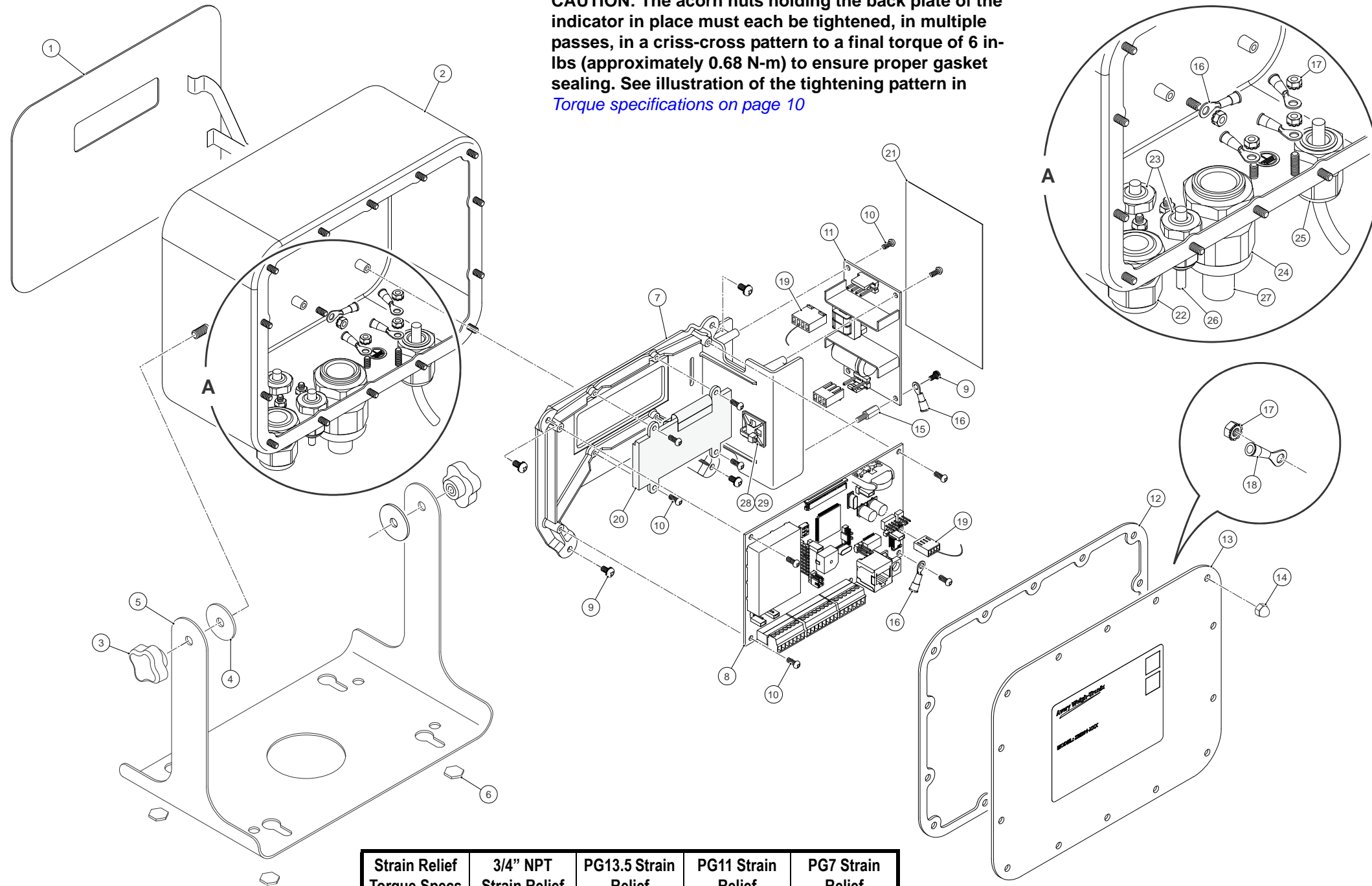
See [Outputs on page 82](#)



14 Technical illustrations

14.1 Stainless steel enclosure assembly

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 6 in-lbs (approximately 0.68 N-m) to ensure proper gasket sealing. See illustration of the tightening pattern in [Torque specifications on page 10](#)



Strain Relief Torque Specs	3/4" NPT Strain Relief	PG13.5 Strain Relief	PG11 Strain Relief	PG7 Strain Relief
Dome Nut	80-85 lb-in 9.0-9.6 N-m	17.7 lb-in 2.0 N-m	22.1 lb-in 2.5 N-m	8.9 lb-in 1.0 N-m
Lock Nut	75-80 lb-in 8.5-9.0 N-m	26.6 lb-in 3.0 N-m	33.2 lb-in 3.8 N-m	13.3 lb-in 1.5 N-m

Item	Description	Qty
1	OVERLAY, KEYPAD, T401S	1
2	ENCLOSURE, WELDMNT-T401S	1
3	KNOB, 4 LOBE-M6	2
4	PAD,NEOPRENE-1"DIA	2
5	STAND, ENCLOSURE T401S	1
6	LO-SKID FOOT 7/16"HEX,1/16"THK W/9672	4
7	BRACKET,ADAPTER PCB T401S-SD2	1
8	PCB ASSY, MAIN	1
9	SCREW,MACH PH M3X0.5 6MML SST	5
10	SCREW, 3x8mm PLASTECH SELFTAP	12
11	PSU,SWITCHING,24VDC 20W	1
12	GASKET, UNIVERSAL	1
13	PLATE, BACK- WLDMNT T401S-SD2	1
14	NUT, ACORN-M4,LOWER-CHAMFER	14
15	STANDOFF,HEX M3X0.5X10mm M/F	1
16	WIRE GND PWR SPLY / CHAS	1
17	NUT,M4 W/EXT LOCK WASHER SST	7
18	WIRE, GROUND	1
19	CABLE ASSY, POWER SUPPLY	1
20	DISPLAY LCD POS IMAGE TN 0.5"	1
21	PAPER, INSULATING W/ADHESIVE	1
22	NUT,LOCK STR RELIEF PG13.5 THR O-RING PG 13.5 BUNA-N STRAIN RELIEF,PWR CORD .24-.47	1 1 1
23	NUT,LOCK STR RELIEF PG7 THR'D PG7 'O' RING SEAL:HUMMEL OR-07 STRAIN RELIEF,PWR CORD .11-.26 PLUG, STRAIN RELIEF PG 7	2 2 2 2
24	NUT,LOCK STR RELIEF 3/4" NPT O-RING 3/4" NPT BUNA-N STRAIN RELIEF,PWR CORD .39-.62 PLUG, STRAIN RELIEF 3/4" NPT	1 1 1 1
25	POWER CORD KIT	1
26	CORD,BLACK NEOPRENE - .25" DIA	1
27	CORD,BLACK NEOPRENE - .625" DIA	1
28	TIE,CABLE	1
29	CABLE CLAMP	1

FASTENER TORQUE VALUES	
FASTENERS	TORQUE lb-in (N-m)
ITEM 9 (M3 SEM SCREWS)	3.5 (0.4)
ITEM 14 (M4 ACORN NUTS)	10 (1.13)
ITEM 10 (M3 SELF TAP)	3.5 (0.40)
ITEM 17 (M4 NUT)	10 (1.13)

AWT15-501417
ZM201_205 indicator series.cdr

14.2 Kits for the indicator

Battery Option Kit, AWT05-507349

Description	Qty.
BATTERY PACK RECHRG 9.6V	1
KIT, BATT OPT T401S NO BATTERY	1

T401S Battery Option (no battery), AWT05-506255

Description	Qty.
PCB ASSY T401S CHARGING OPTION	1
CABLE ASSY,CHARGER TO MAIN PCB	1
MAN,T401S BATTERY PACK,INSTALL	1
SCREW, 3x8mm PLASTECH SELFTAP	4
NUT,M3 W/EXT LOCK WASHER SST	4
SCREW,MACH PH M3X0.5 6MML SST	4
BRACKET ASSY, BATTERY T401S	1

Spare Battery, AWT05-506249

Description	Qty.
BATTERY PACK RECHRG 9.6V	1

Hardware Kit, AWT05-507910

Item # (from previous page)	Description	Qty.
9	SCREW,MACH PH M3X0.5 6MML SST	25
10	SCREW, 3x8mm PLASTECH SELFTAP	60
15	STANDOFF,HEX M3X0.5X10mm M/F	5
17	NUT,M4 W/EXT LOCK WASHER SST	35
28	TIE,CABLE	5
29	CABLE CLAMP	5

Gasket Kit, AWT05-800247

Item #	Description	Qty.
12	GASKET, UNIVERSAL	5

Sealing Kit for T401S w/SST case, AWT15-501444

Description	Qty.
LABEL,SEAL,AWTX 20MM SQR	2
NUT, DOME-MODIFIED M4 SST	2
MANUAL, SEALING INST SHEET	1

Knobs and Pads Kit, AWT05-507911

Item # (from previous page)	Description	Qty.
3	KNOB, 4 LOBE-M6	10
4	PAD,NEOPRENE-1"DIA	10

Acorn Nut Kit, AWT05-506054

Item # (from previous page)	Description	Qty.
14	NUT, ACORN-M4	100

Connectors Kit, AWT05-506301

DESC	Qty
TERMINAL BLOCK,PLUG 2 PIN	1
TERMINAL BLOCK, 7 POS PLUG PHOENIX ONLY	1
TERMINAL BLOCK 6 POS PLUG 3.8	1
TERMINAL BLOCK 8 POS PLUG 3.5	1

T401S SST - Enclosure kit, AWT05-509141

Item number (previous page)	Description	Qty.
1 & 2	ENCLOSURE, WELDMNT WITH OVERLAY KEYPAD (MODEL T401S-SD2) ATTACHED	1

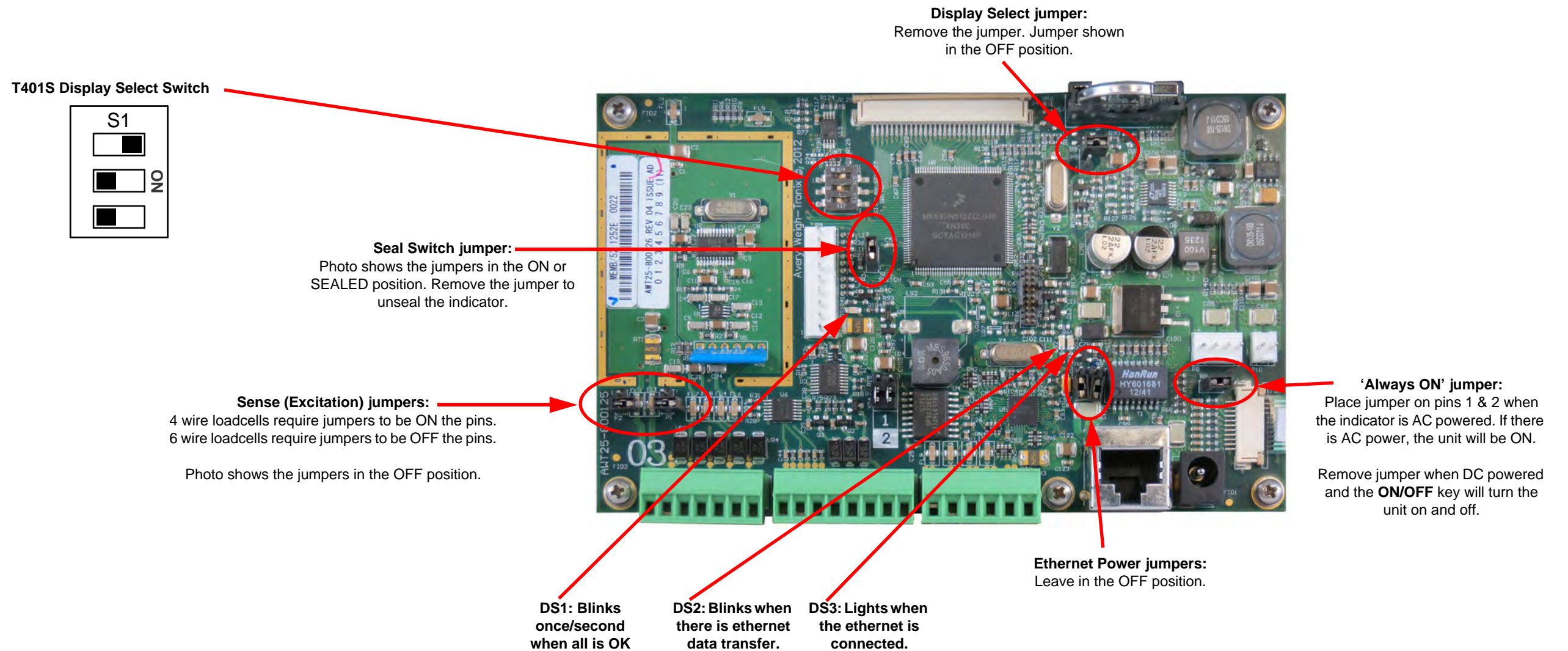
T401S SST - Misc. Parts

Item number (previous page)	Description	P/N
5	STAND, ENCLOSURE T401S	AWT20-505480
7	BRACKET,ADAPTER PCB T401S-SD2	AWT20-507637
8	PCB ASSY, MAIN SERIES	AWT25-800126
11	PSU,SWITCHING,24VDC 20W	AWT25-800143
13	PLATE, BACK- W/LDMNT T401S-SD2	AWT20-507651
16	WIRE GND PWR SPLY / CHAS	AWT25-501464
18	WIRE, GROUND	AWT25-501072
19	CABLE ASSY, POWER SUPPLY	AWT25-501063
20	DISPLAY LCD POS IMAGE TN 0.5"	AWT25-501330
25	POWER CORD KIT	AWT25-501064

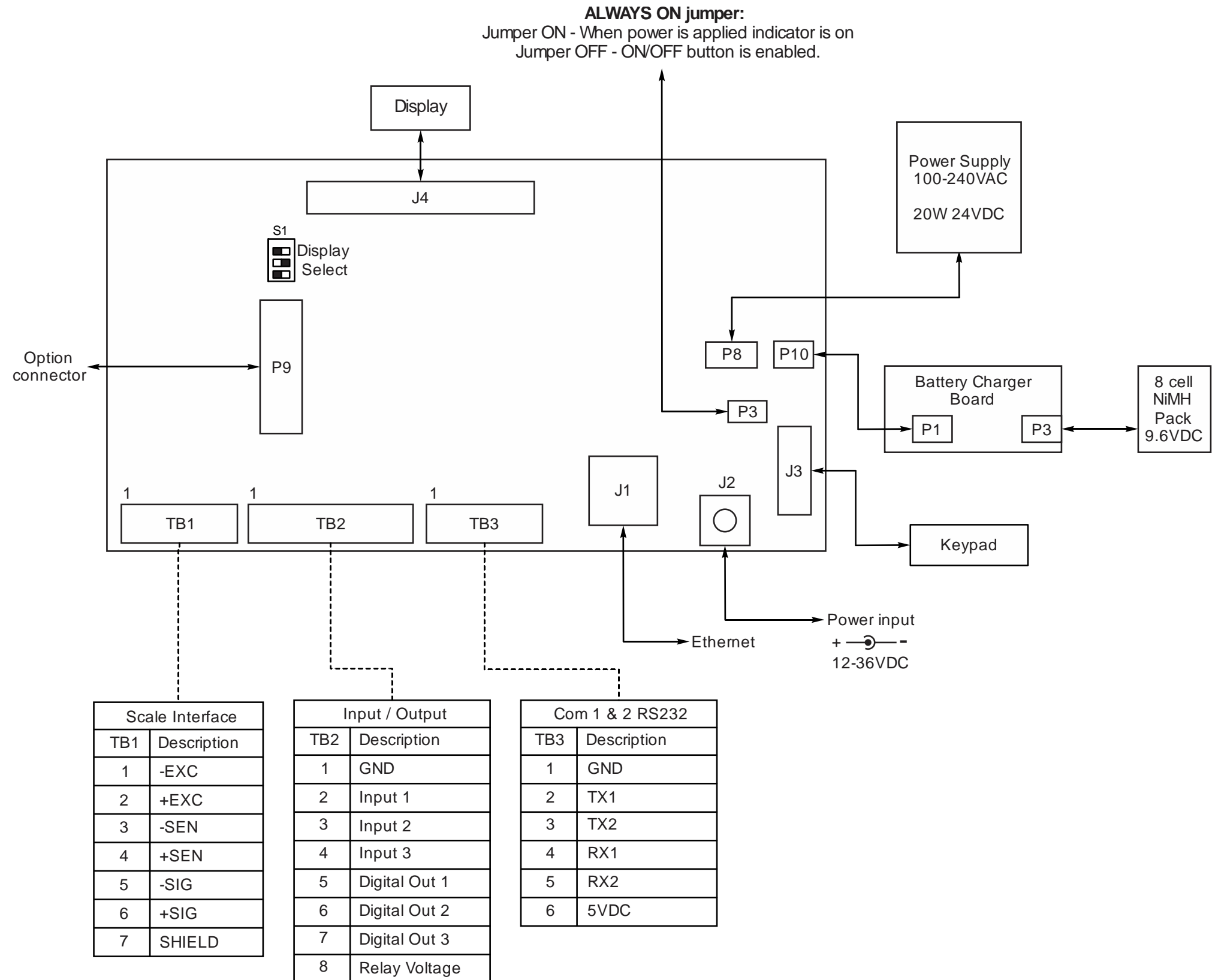
Strain Reliefs Kit - AWT05-507912

Item number (previous page)	Description	Qty.
22	NUT,LOCK STR RELIEF PG13.5 THR	5
	O-RING PG 13.5 BUNA-N	5
	STRAIN RELIEF,PWR CORD .24-.47	5
23	NUT,LOCK STR RELIEF PG7 THR'D	10
	PG7 'O' RING SEAL:HUMMEL OR-07	10
	STRAIN RELIEF,PWR CORD .11-.26	10
	PLUG, STRAIN RELIEF PG 7	10
24	NUT,LOCK STR RELIEF 3/4" NPT	5
	O-RING 3/4" NPT BUNA-N	5
	STRAIN RELIEF,PWR CORD .39-.62	5
	PLUG, STRAIN RELIEF 3/4" NPT	5
26	CORD,BLACK NEOPRENE - .25" DIA	5
27	CORD,BLACK NEOPRENE - .625" DIA	5

14.3 Main PCB jumpers, switch settings and status lights



14.4 System block diagram

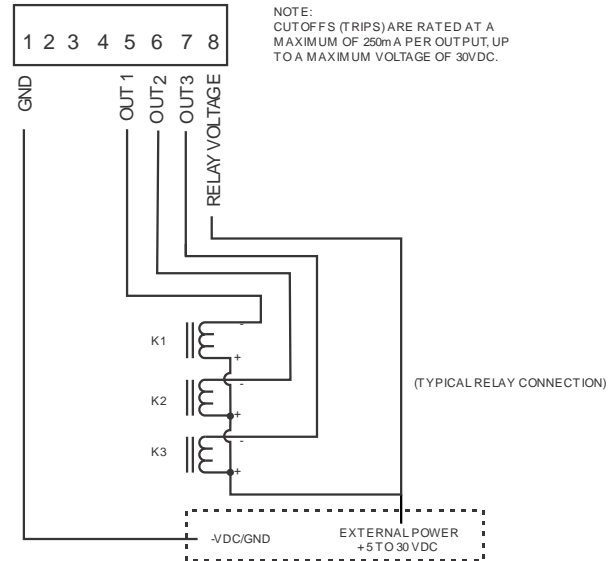


14.5 Mainboard connections

USING EXTERNAL DC VOLTAGE TO OPERATE RELAYS

(TB2)-Indicator

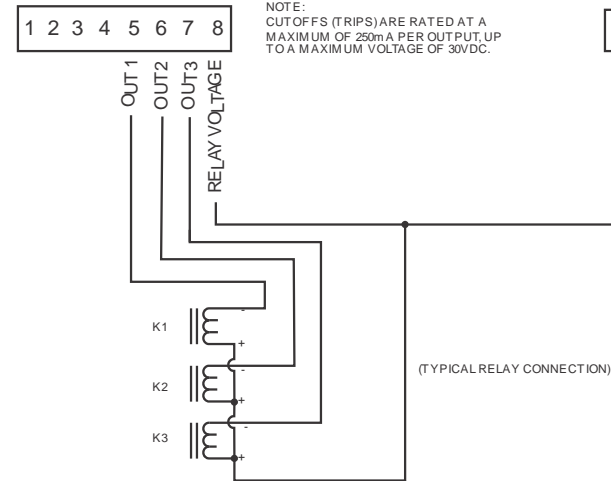
CUTOFFS (TRIPS) CONNECTOR



USING INTERNAL +5VDC VOLTAGE TO OPERATE RELAYS

(TB2)-Indicator

CUTOFFS (TRIPS) CONNECTOR



(TB3)-Indicator

COM 1 & 2 RS232 (SERIAL)



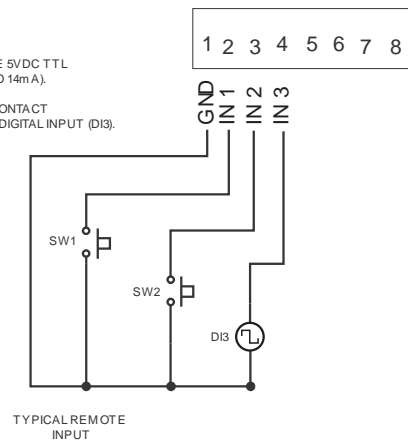
WARNING: EXCEEDING ANY OF THE CURRENT LIMITS OR VOLTAGE MAXIMUMS WILL DAMAGE THE INDICATOR.

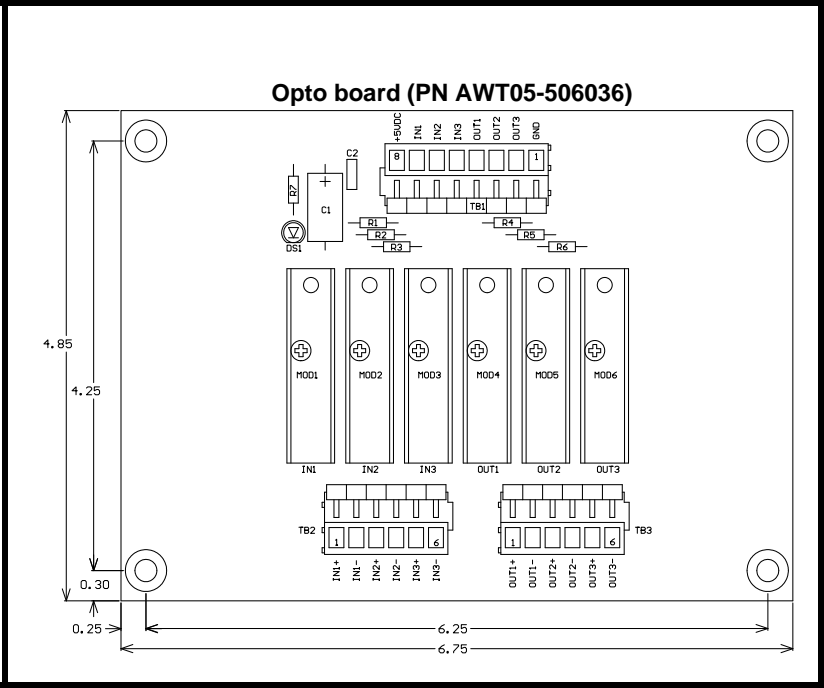
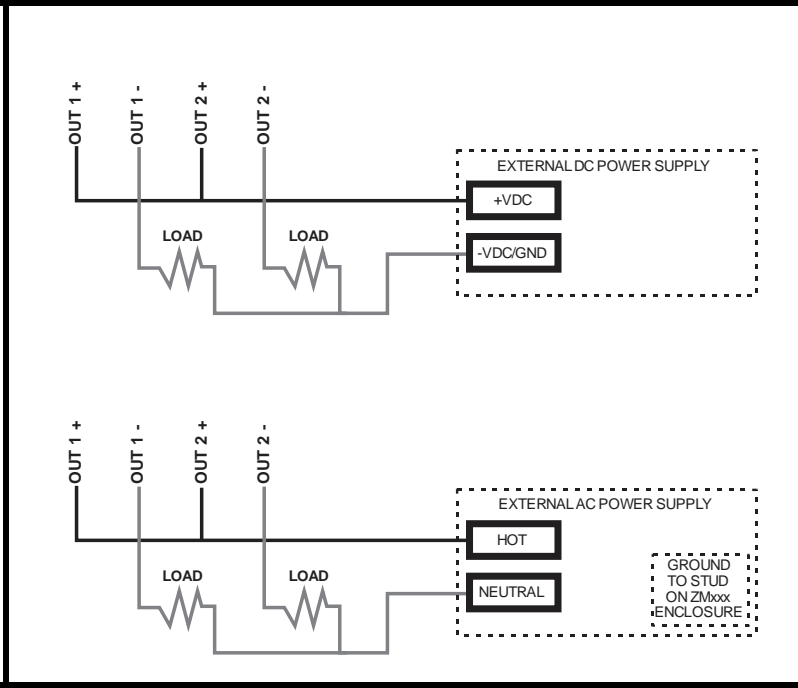
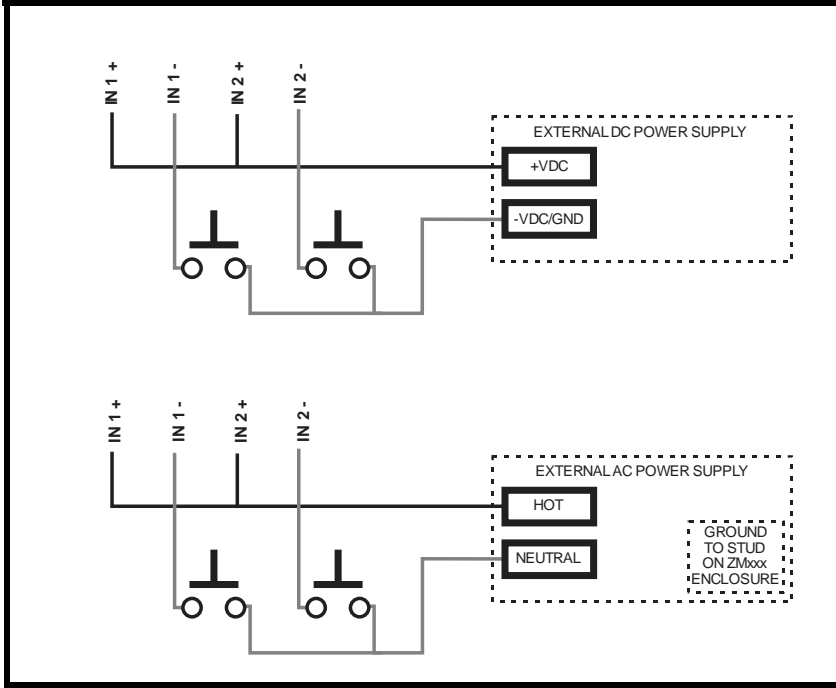
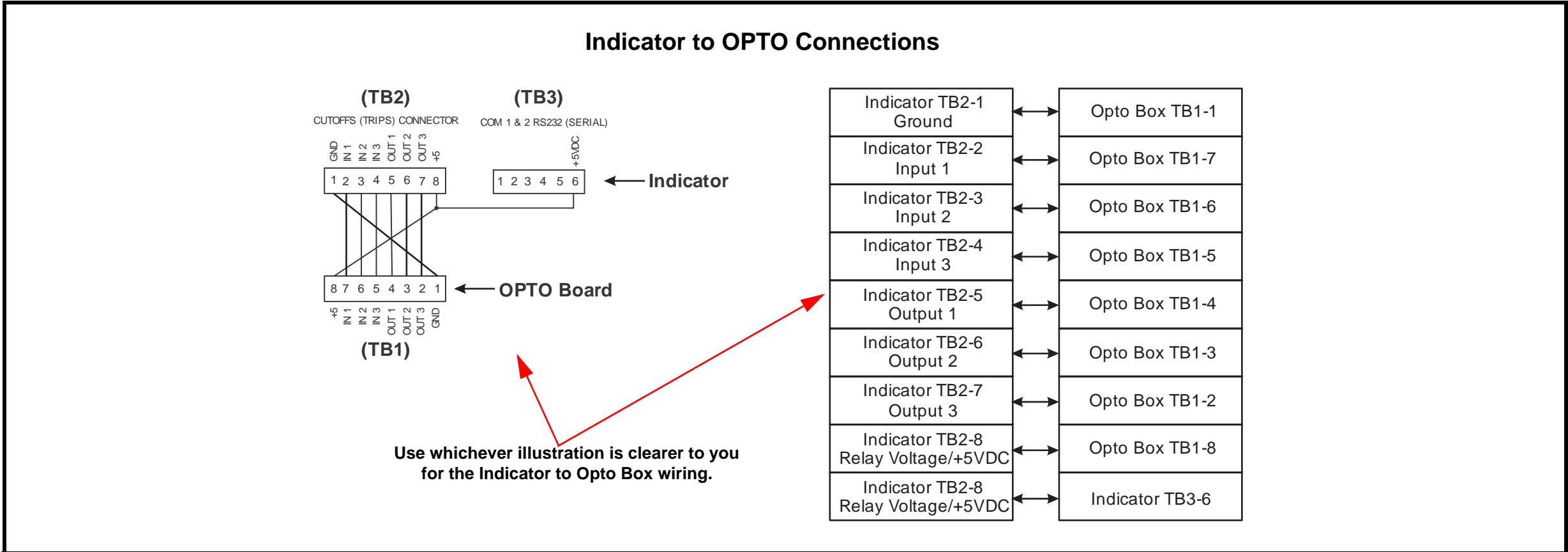
(TB2)

EXTERNAL INPUTS CONNECTOR

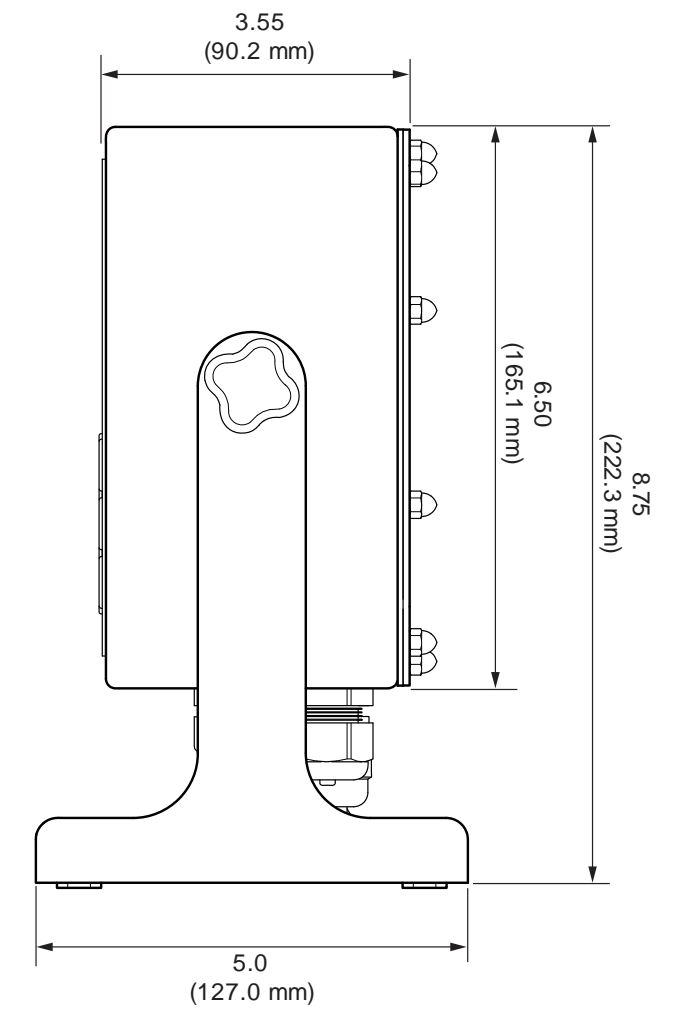
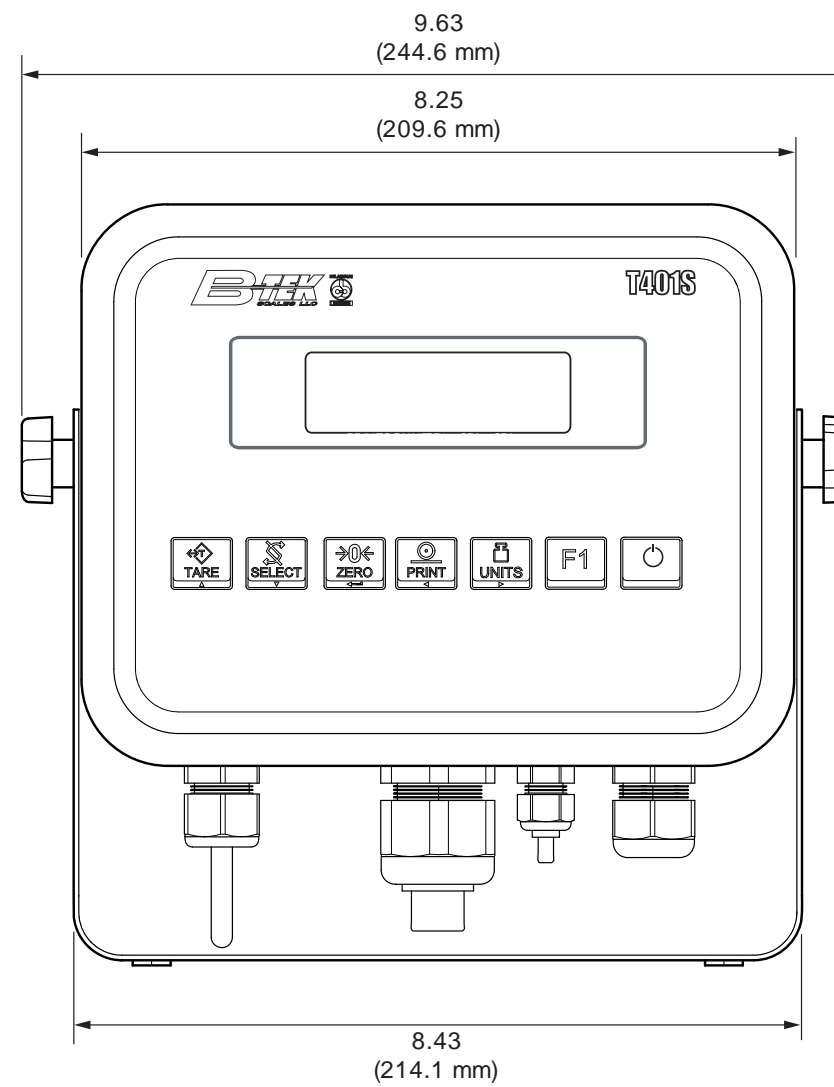
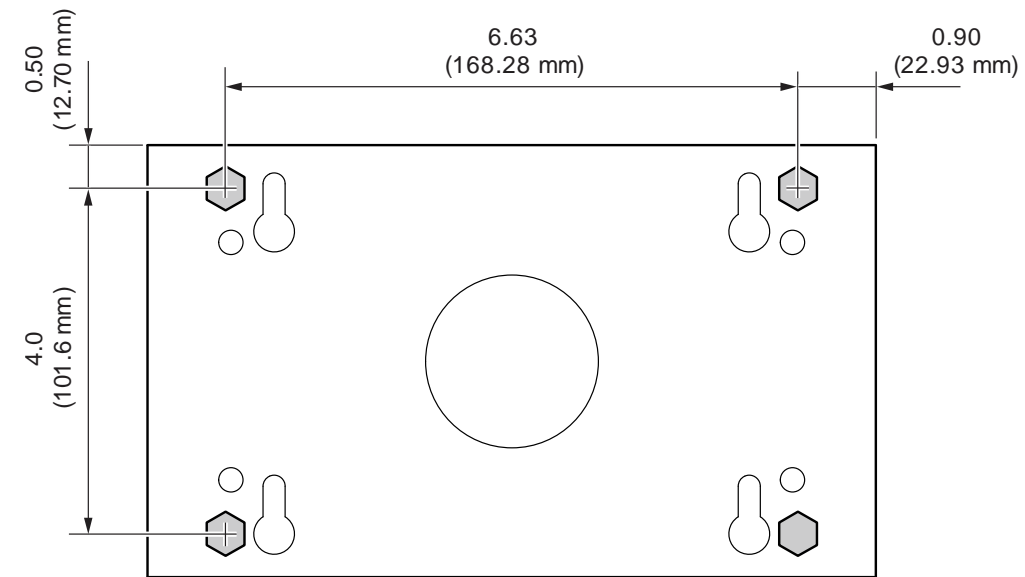
NOTE:
EXTERNAL INPUT CONNECTIONS ARE 5VDC TTL LOGIC LEVEL (INTERNALLY LIMITED TO 14mA).

INPUTS WORK WITH EITHER A DRY CONTACT SWITCH (SW1, SW2) OR A 0 TO +5VDC DIGITAL INPUT (DI3).

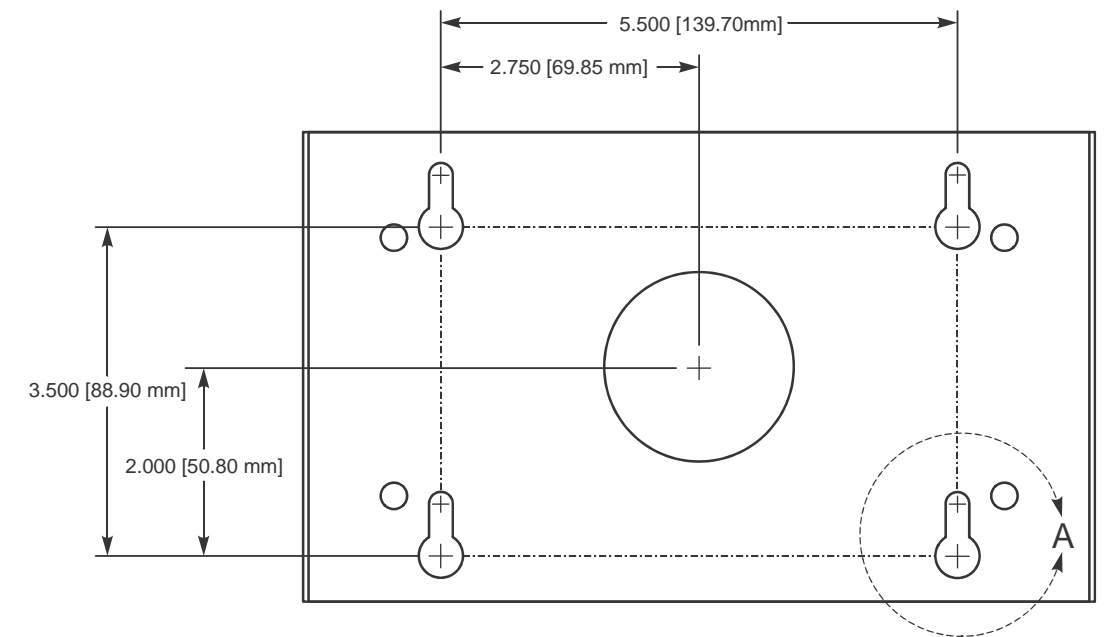
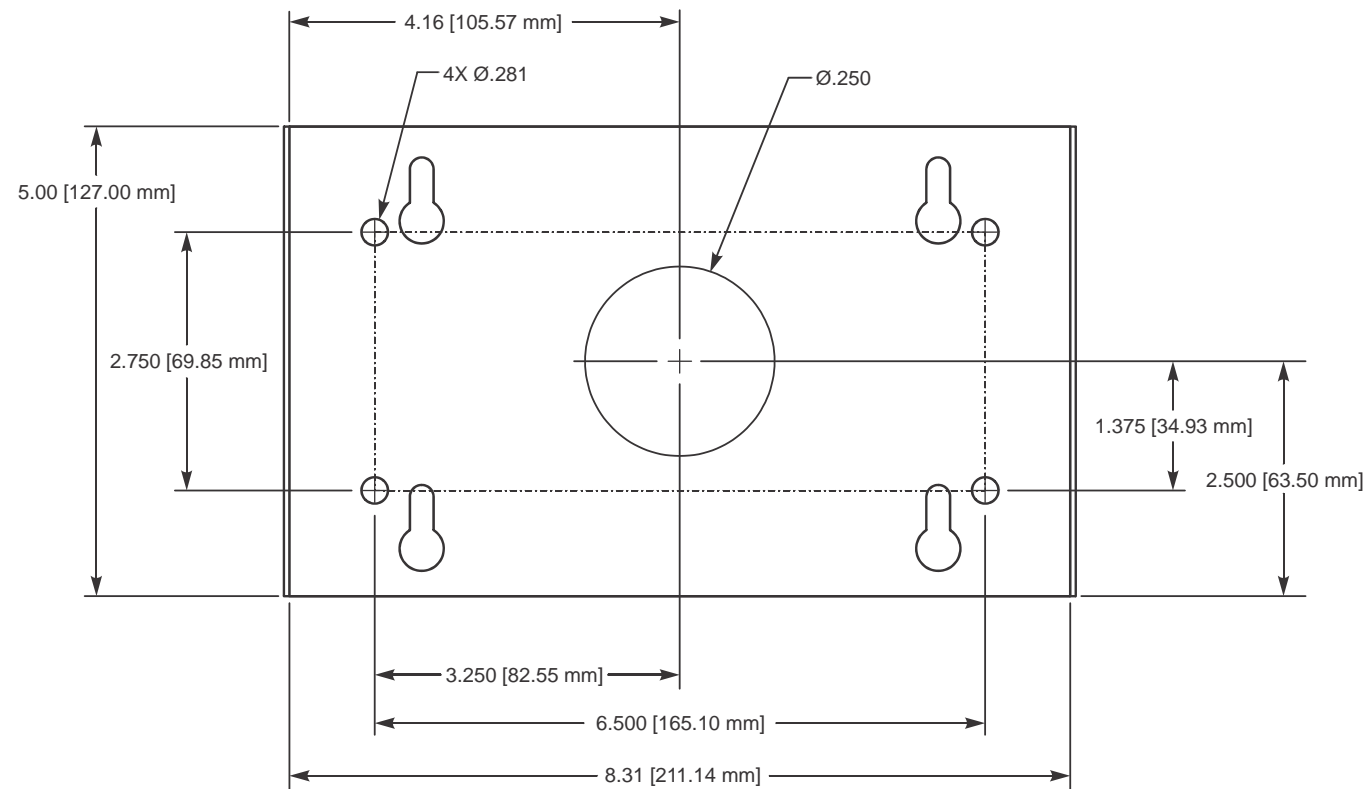




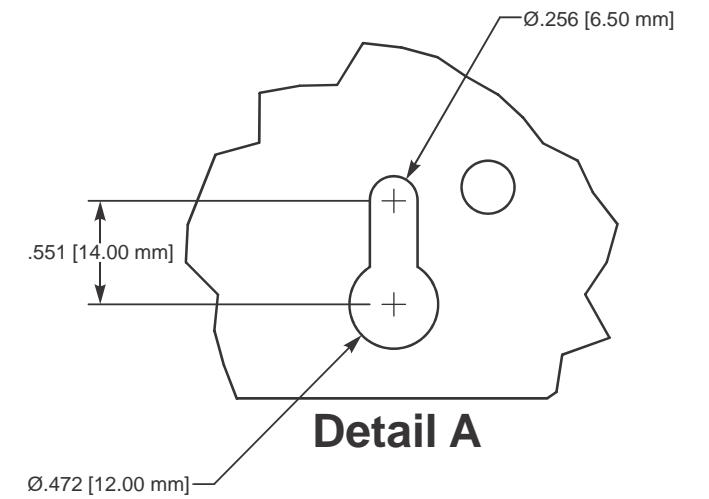
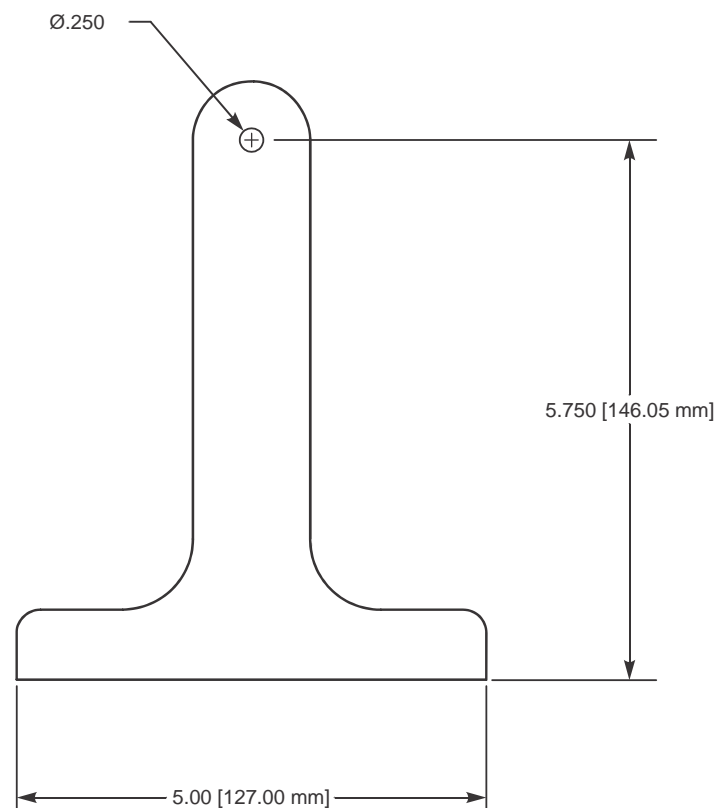
14.7 Outline dimensions



14.8 Stand dimensions - SST indicator



Keyhole Detail



Detail A

14.9 Keypad overlay replacement procedure

Problems that arise due to the keypad being changed are not warrantable, such as keys not functioning correctly.

14.9.1 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.

14.9.2 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.

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