

880 Performance Series

Panel Mount Controller/Indicator
Version 1.0

Operator's Manual



RICE LAKE[®]
WEIGHING SYSTEMS

To be the best by every measure[®]

152240

Contents

About This Manual	1
1.0 Introduction.....	1
1.1 Safety	2
1.2 Operating Modes	3
1.3 Front Panel Display	3
1.4 Indicator Operations	6
1.4.1 Toggle Gross/Net Mode	6
1.4.2 Toggle Units	6
1.4.3 Zero Scale	6
1.4.4 Acquire Tare	6
1.4.5 Remove Stored Tare Value	6
1.4.6 Preset Tare (Keyed Tare)	7
1.4.7 Print Ticket	7
1.4.8 Front Panel Setup	7
1.4.9 Displaying Audit Trail Information	8
1.4.10 Setpoints	8
1.4.11 Set Time and Date	10
1.4.12 Display Accumulator	10
1.4.13 Clear the Accumulator	11
1.4.14 Display Tare	11
2.0 Installation.....	12
2.1 Unpacking and Assembly	12
2.2 Panel Mount Installation	12
2.2.1 Mounting the Controller Assembly Remotely	14
2.3 Cable Connections	15
2.3.1 Load Cells	15
2.3.2 Power Connections	15
2.3.3 Serial Communications	16
2.3.4 USB Device Communications – Port 2 (USBCOM)	16
2.3.5 USB Host Device	16
2.3.6 Ethernet Communications	16
2.4 CPU Board	17
2.5 Audit Trail and the Audit Jumper	17
2.5.1 Digital I/O	18
2.6 Option Cards	18
2.7 Battery Replacement	18

3.0	Configuration	19
3.1	Configuration Methods	19
3.1.1	Revolution® Configuration	19
3.1.2	EDP Command Configuration	20
3.1.3	Front Panel Configuration	20
3.1.4	Alphanumeric Entry Procedure	22
3.2	Menu Structures and Parameter Descriptions	22
3.2.1	Audit Menu	22
3.2.2	Setup Menu	23
3.2.3	Scale Menu	23
3.2.4	Feature Menu	26
3.2.5	Ports Menu	28
3.2.6	Print Format Menu	30
3.2.7	Setpoint Menu	30
3.2.8	Digital Input/Output Menu	33
3.2.9	Analog Output Menu	33
3.2.10	Version Menu	33
4.0	Print Formatting	34
4.1	Print Formatting Commands	34
4.2	Default Ticket Formats	36
4.3	Stream Serial Data Format	36
5.0	Specifications	37
880	Limited Warranty.....	39

About This Manual

This manual is intended for use the operator of the 880 digital weight indicators and applies to indicators using Version 1.0 of the 880 software.

The *Technical/Service* manual (PN 158387) that is referred to throughout this manual and is available online.



Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems website at www.ricelake.com.

Please leave this manual with the indicator when installation and configuration are complete.

1.0 Introduction

The 880 is a single-channel digital weight indicator housed in a panel mount enclosure. The front panel bezel can be sealed to a NEMA 4X/IP65 rating. The front panel consists of a 6-button keypad; a large, seven-digit, 14-segment, vacuum fluorescent display; two-character dot-matrix annunciator field; and 16-character dot-matrix prompt field. Features include:

- Drives up to 8 350 Ω or 16 700 Ω load cells
- Supports four and six wire load cell connections
- Four configurable digital inputs or outputs
- Full duplex RS-232 or half duplex RS-485 communications at up to 115200 bps
- Ethernet TCP/IP interface for 10-Base T network communications
- USB interface for host (type A connection) or device
- Hardware slot for one option card
- Optional DeviceNet™ interface for communications network with Allen-Bradley® controllers¹
- Optional Ethernet/IP interface for Allen-Bradley PLC and other Ethernet/IP master devices³
- Optional Profibus® DP interface for network communications²
- Optional Modbus
- Optional analog output module provides 0–10 VDC or 4–20 mA tracking of gross or net weight values
- Optional four channel relay module, dry connect 3A @ 115VAC, 5A @ 30VDC
- Available in 115 VAC and 230 VAC versions

1. DeviceNet™ is a trademark of the Open DeviceNet Vendor Association.

2. Profibus® is a registered trademark of Profibus International.

3. EtherNet/IP™ is a trademark of Open DeviceNet Vendor Association.

1.1 Safety

Safety Symbol Definitions



Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death, and includes hazards that are exposed when guards are removed.



Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.



Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

Safety Precautions



Do not operate or work on this equipment unless you have read and understand the instructions and warnings in this manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals. Proper care is your responsibility.



Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.

General Safety



Failure to heed may result in serious injury or death.

DO NOT allow minors (children) or inexperienced persons to operate this unit.

DO NOT operate without all shields and guards in place.

DO NOT step on the unit.

DO NOT jump on the scale.

DO NOT use for purposes other than weight taking.

DO NOT place fingers into slots or possible pinch points.

DO NOT use any load-bearing component that is worn beyond 5% of the original dimension.

DO NOT use this product if any of the components are cracked.

DO NOT exceed the rated load limit of the unit.

DO NOT make alterations or modifications to the unit.

DO NOT remove or obscure warning labels.

DO NOT use near water.

Before opening the unit, ensure the power cord is disconnected from the outlet.

Keep hands, feet and loose clothing away from moving parts.

1.2 Operating Modes

The 880 has three modes of operation:

Normal mode

Normal mode is the weighing mode of the indicator. The indicator displays gross or net weights as required, and annunciators to indicate scale status and the type of weight value displayed.

Setup mode

Most of the procedures described in this manual require the indicator to be in setup mode, including configuration and calibration.

To enter setup mode, remove the fillister head screw from the enclosure backplate. Insert a screwdriver or a similar tool into the access hole and press the setup switch once. The indicator display changes to show the word **CONFIG**.

The 880 also has an Audit Trail that can track changes to configuration and calibration, allowing the setup switch to be bypassed with Jumper J5 on the CPU board.

User Setup Mode

User setup mode (accessed by pressing the MENU key) is used

- View the audit trail
- Set the time and date
- Access the accumulator
- Change setpoint values

See Section 1.4.8 for more information about entering user setup mode.

1.3 Front Panel Display

Figure 1-1 shows the 880 front panel keys and the key functions assigned in normal mode.

The numeric display consists of six large, 14-segment LED digits. If a negative number is displayed the first LED is used to display “-”, reducing the number of available digits to five.

The symbols on the keys in Figure 1-1 (representing up, down, enter, left, right) describe the key functions assigned in setup mode. The keys are used to navigate through menus, select digits within numeric values, and increment/decrement values. See Section 3.1.3 for information about using the front panel keys in setup mode.

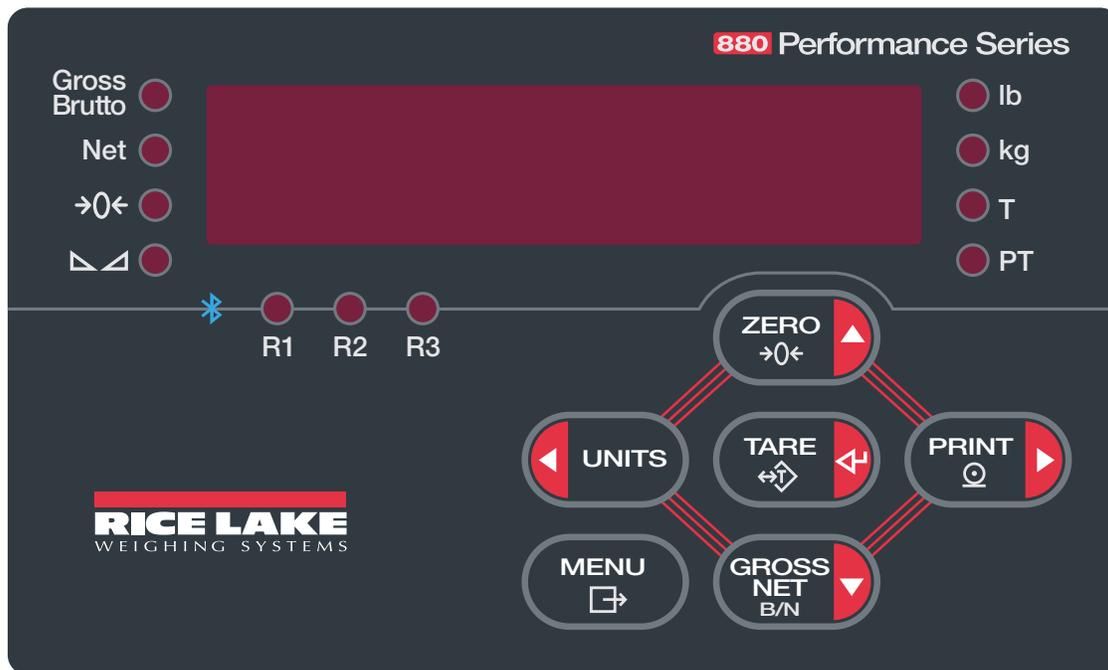


Figure 1-1. 880 Front Panel Display

Key	Function
	Sets the current gross weight to zero. Also used to navigate to different menu levels or used to increment a number when editing a value.
	Sends “on-demand” print format out the serial port, provided the conditions for standstill are met. PRINT may be displayed while the unit prints. Also used to navigate to different menus or to toggle to another digit when editing a value.
	Toggles between gross and net. If a tare value has been entered or acquired, the net value is the gross weight minus the tare. Gross mode is shown by the Gross/Brutto annunciator; net mode is shown by the Net annunciator. Also used to navigate to different menu levels or to decrement a number when editing a value.
	The MENU key is used to access the setup menu. Also acts as the cancel key when editing parameter values.
	Switches the weight display to an alternate unit, defined in the Format menu, see Technical/Service manual for more information. Units Available: lb, kg, oz, metric ton, ton, gram. Also used to navigate to different menus or to toggle to another digit when editing a value.
	Performs one of several predetermined Tare functions dependent on the mode of operation selected in the TAREFN parameter. Also acts as enter for numeric or parameter entry.

Table 1-1. Key Functions

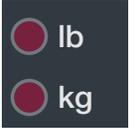
Key	Function
	<p>Gross/Brutto LED Gross weight mode (or Brutto in OIML mode)</p> <p>Net LED Net weight mode.</p> <p>→0← Center of Zero LED Indicates that the current gross weight reading is within +/- 0.25 display divisions of the acquired zero, or is within the center of zero band. A display division is the resolution of the displayed weight value, or the smallest incremental increase or decrease that can be displayed or printed.</p> <p>▲ Standstill LED Scale is at standstill or within the specified motion band. Some operations, including Zero, Tare and Printing, can only be done when the standstill LED is on.</p>
	<p>lb/kg LED Displays which unit of measure is being used. The lb and kg annunciators indicate the units associated with the displayed value. If the displayed value is pounds, lb will be lit. If the displayed value is kilograms, kg will be lit.</p>
	<p>primary/secondary LED If the other units value is neither lb or kg, then lb will be lit for the units assigned as primary, and kg will be lit for the units assigned as secondary.</p>
	<p>lb/tn,t,oz,g,none LED Alternate units that can be displayed include short tons (tn), metric tons (t), ounces (oz), grams (g), or NONE (no units). If the displayed units is one of these alternate units, and the other unit value is lb, then lb will be lit.</p>
	<p>tn,t,oz,g,none /kg LED Alternate units that can be displayed include short tons (tn), metric tons (t), ounces (oz), grams (g), or NONE (no units). If the displayed units is one of these alternate units, and the other unit value is kg, then kg will be lit.</p>
	<p>T LED Indicates that a tare has been acquired and stored by the system.</p> <p>PT LED Indicates that a preset tare weight has been keyed in or entered via the EDP serial port.</p>
	<p> Bluetooth Bluetooth communications enabled</p> <p>R1, R2 and R3 Range settings for multi interval or multi range</p>

Table 1-2. Annunciator Functions

1.4 Indicator Operations

Basic 880 operations are summarized below:

1.4.1 Toggle Gross/Net Mode

1. Press  to toggle the display mode between gross and net.



Note *Net mode is only available if a tare value has been entered or acquired, the net value is the gross weight minus the tare. If no tare has been entered or acquired, the display remains in gross mode.*

A lit LED next to the Gross (Brutto in OIML) or Net on the display indicates the current mode.

1.4.2 Toggle Units

1. Press  to switch between primary and secondary units. The current units LED will be lit.

1.4.3 Zero Scale

1. In gross mode, remove all weight from the scale and wait for the  LED to light.
2. Press . The  LED lights to indicate the scale is zeroed.

1.4.4 Acquire Tare

1. Place container on scale and wait for the  LED to light.
2. Press  to acquire the tare weight of the container. Net weight is displayed and the  LED lights to show the tare value was entered.

1.4.5 Remove Stored Tare Value

1. Remove all weight from the scale and wait for the  LED to light.
2. The display should read zero and the  LED should be lit, zero the scale if needed.
3. Press  (or, in OIML mode, the **ZERO** key). Display shifts to gross weight and the Gross LED is lit.



Note *If keyed tare is allowed, press  to open the keyed tare prompt.*

To clear the tare press  again.

1.4.6 Preset Tare (Keyed Tare)



Note Tare mode must be set to keyed or both for the preset tare command to function.

1. With the scale empty and display showing zero weight, press .
2. Display will show (000000); the focused digit will flash.
3. To edit the value:
 - Press ◀ or ▶ to select the digit.
 - Press ▲ or ▼ to increment or decrement the value.
 - Press  to move to the decimal point entry.
 - Press ◀ or ▶ to adjust the decimal point placement.
 - Press  when the value is correct.
4. The display will change to the Net mode and the PT LED lights to show the preset tare was entered.



Note Entering a keyed tare of zero will remove the stored tare value.

1.4.7 Print Ticket

1. Wait for the (▲▲) LED to light.
2. Press  to send data to a communications port.

1.4.8 Front Panel Setup

1. Press  to enter user setup mode. Use user setup to:
 - View audit trail information
 - Enter setup mode if audit trail is enabled
 - View or set time and date
 - View or clear the accumulator
 - Change setpoint values and enable/disable setpoints
 - View the current tare value

1.4.9 Displaying Audit Trail Information

The Audit Trail Configuration and Calibration counters can be viewed through the User Menu.

1. Press , AUDIT is displayed.
2. Press ∇ to display the Legally Relevant Firmware version.
3. Press \triangleright to display CALIB.
4. Press ∇ to view the Calibration Counter.
5. Press  to return to CALIB.
6. Press \triangleright to display CFG.
7. Press ∇ to view the Configuration Counter.
8. Press  to return to CFG.
9. Press  to return to the weigh mode.

1.4.10 Setpoints

Setpoints must be enabled in the setup mode to be accessible in the user setup mode.

To enter the setup mode:

1. Remove the large fillister head screw from the back of the enclosure.
2. Insert a nonconductive tool into the access hole and press the setup switch. Indicator display changes to show *SCALE*.
3. Press \triangleleft or \triangleright until *SETPTS* is displayed.
4. Press ∇ , *SP CFG* is displayed.
5. Press ∇ , press \triangle or ∇ to desired setpoint number.
6. Press ∇ to enter setpoint settings.
7. Select the type by pressing \triangleleft or \triangleright to desired setting, then press ∇ to set the value. For complete list of options see Section 3.2.11.
8. When all settings have been made, press  to return to weighing mode.



Note *Setpoints are now accessible from the front panel menu.*

Display or Edit Setpoint Value

1. Press . *AUDIT* is displayed.
2. Press \triangleleft or \triangleright until *SETPTS* is displayed.
3. Press ∇ and the first available setpoint number is displayed.

4. Press ◀ or ▶ to toggle through each setpoint that is operator accessible.
5. Press ▾, VALUE is displayed.
6. Press ▾ again to display or edit the value. To edit the value:
 - Press ▲ or ▼ to increment or decrement the value of the flashing digit.
 - Press ◀ or ▶ to select the digit to edit.
 - Press  to move to the decimal point entry.
 - Press ◀ or ▶ to adjust the decimal point placement.
7. Press  to accept the displayed value.
8. Repeat the above steps to set *PREACT*, if enabled
9. When all settings have been made, press  to return to weighing mode.



Note *Setpoint Value and Preact Value may be accessible from the front panel in weigh mode.*

Some indicator configurations may not allow setpoint values to be changed through the front panel or may require a password to display or change the setpoint value.

Turn Setpoint On or Off

To turn a setpoint off at the front panel:

1. Press . *AUDIT* is displayed.
2. Press ◀ or ▶ until *SETPTS* is displayed.
3. Press ▾ and the first available setpoint number is displayed.
4. Press ◀ or ▶ to toggle through each setpoint that is operator accessible.
5. Press ▾, then press ◀ or ▶ to **ENABLE/DISABLE**.
6. Press ▾, then press ◀ or ▶ to turn setpoint **ON/OFF**.
7. Press  to accept the setting.
8. Press  to return to weighing mode.



Note *Some indicator configurations may not allow setpoints to be turned off through the front panel or may require a password to turn the setpoint on and off.*

1.4.11 Set Time and Date

1. Press , *AUDIT* is displayed.
2. Press ◀ or ▶ until *TSD* is displayed.
3. Press ▾, *TIME* is displayed.
4. Press ▾, to enter time.
5. To edit the value (24 hour format):
 - Press ◀ or ▶ to select the digit.
 - Press ▲ or ▼ to increment or decrement the value.
6. Press  when the value is correct. *DATE* is displayed.
7. Press ▾, to enter time.
8. To edit the value in specified format (*MMDDYY*, *DDMMYY*, or *YYMMDD*):
 - Press ◀ or ▶ to select the digit.
 - Press ▲ or ▼ to increment or decrement the value.
9. Press  when the value is correct. *TIME* is displayed.
10. Press  to return to weighing mode.

1.4.12 Display Accumulator

The accumulator must be enabled before use in either normal mode or setpoint operations. Once enabled, weight (net weight if a tare is in the system) is accumulated whenever a print operation is performed using the **PRINT** key, digital input, setpoint *PSHACC* operation or serial command. The scale must return to below the threshold value (except for the setpoint *PSHACC* operation) before the next accumulation.

1. Press  to enter the user setup mode, *AUDIT* is displayed.
2. Press ◀ or ▶ until *ACCUM* is displayed.



Note *ACCUM* is only displayed if the accumulator is enabled.

3. Press ▾, *VIEW* is displayed.
4. Press ▾ to view the current accumulator value.
5. While the accumulator value is displayed, press  to print the value.



Note The format of the print output can be configured using accumulator print format. See Section 7.0.

1.4.13 Clear the Accumulator

1. Press  to enter the user setup mode, *AUDIT* is displayed.
2. Press ◀ or ▶ until *ACCUM* is displayed.
3. Press ▼, then press ◀ or ▶ until *CLP 3* is displayed.
4. Press  to clear the accumulator, *CLEAR* will display briefly and display returns to *CLP 3*.
5. Press  to return to the weigh mode.



Note *The PRINT key only performs one accumulation. Weight must return to zero below the configured threshold value before another accumulation is allowed.*

Threshold is configured in the setup menu, see Section 3.2.3.

1.4.14 Display Tare

When a stored Tare value is displayed, the Gross and Net LEDs will be off and the →0← will be lit. To display a stored tare:

1. Press .
2. Press ▶ to *TARE* and press ▼ to view the current tare value.
3. Press  twice to return to weighing mode.

If there is no tare in the system, the value displayed will be zero and the Gross and Net LED will be turned off.

See Section 9.12 for more information pertaining to the regulatory mode of operation.

2.0 Installation

This section describes procedures for connecting load cells, digital I/O, and serial communications cables to the 880 indicator. Instructions for replacement of the CPU board are included, along with assembly drawings and parts lists for the service technician.



- Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when working inside the indicator enclosure.
- This unit uses double pole/neutral fusing which could create an electric shock hazard. Procedures requiring work inside the indicator must be performed by qualified service personnel only.
- The supply cord serves as the power disconnect for the 880. The power outlet supplying the indicator must be installed near the unit and be easily accessible.

2.1 Unpacking and Assembly

Immediately after unpacking, visually inspect the 880 to ensure all components are included and undamaged. The shipping carton should contain the controller, display, Operator's manual, CD and parts kit. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

2.2 Panel Mount Installation



Note The controller can be mounted to the display DIN rail or mounted remotely up to 250 ft away from display.

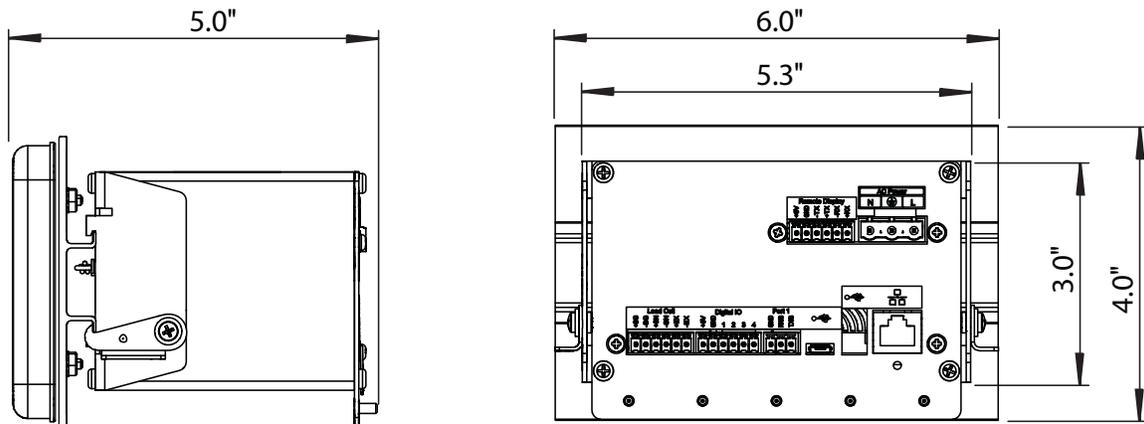


Figure 2-1. 880 Panel Mount Dimensions

Use the Din Rail mount plate as a template (see Figure 2-2) to drill the mounting holes in the panel for the stainless steel panel mount enclosure.

See Figure 2-1 for enclosure dimensions.

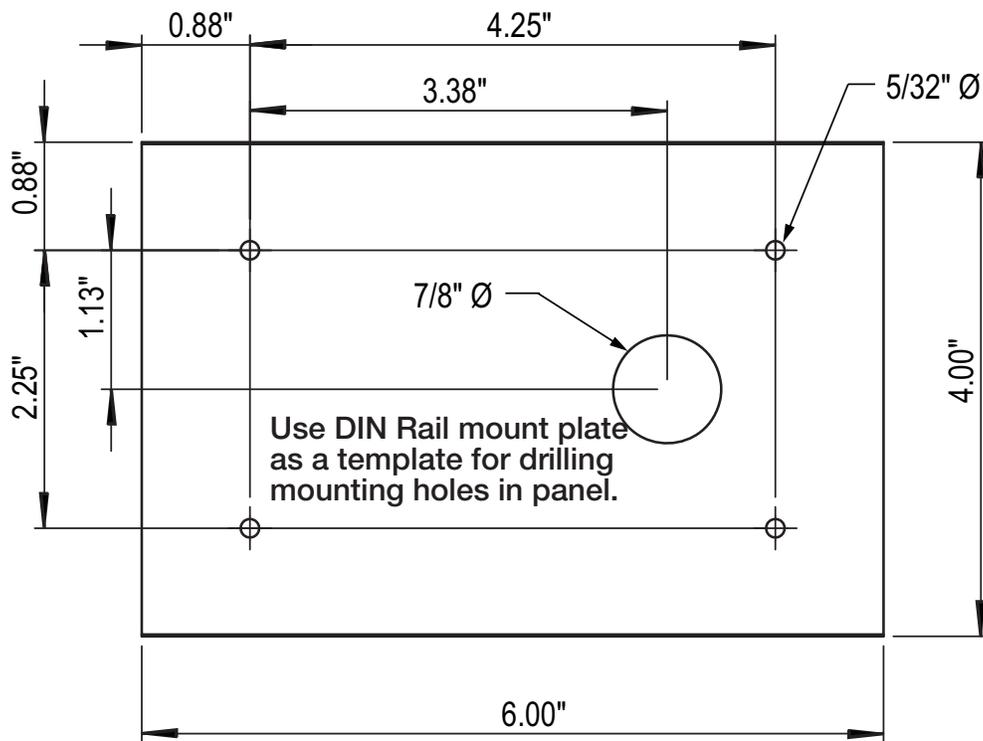


Figure 2-2. Pattern for Cutting Holes

1. Install the gasket on the display assembly. It must be seated correctly on display before mounting to ensure tight seal.
2. Align the display assembly to the front and the DIN rail mounting plate to the back of the panel with the holes cut in step 1.
3. Secure the display and mounting plate to the panel using the four 6-32 Kep nuts (PN 14621) provided.

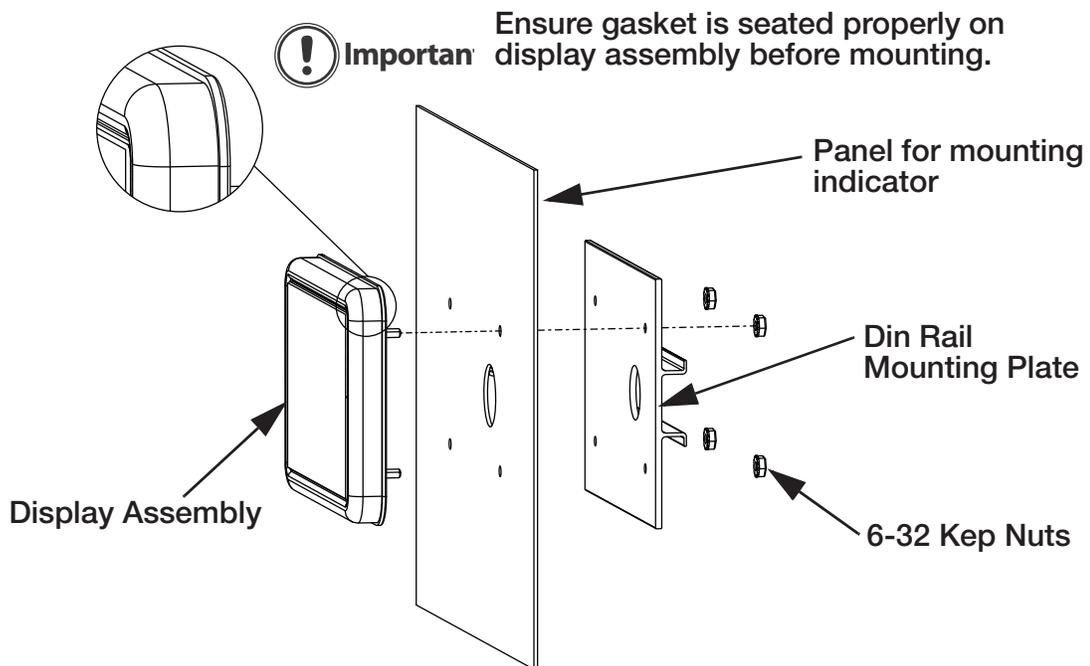


Figure 2-3. Mounting Display Assembly

4. Connect the cable assembly to the controller assembly.
5. Place the controller assembly on the DIN rail as shown in Figure 2-4.
6. Secure to DIN rail by rotating the left and right hooks up connecting with the bottom rail.

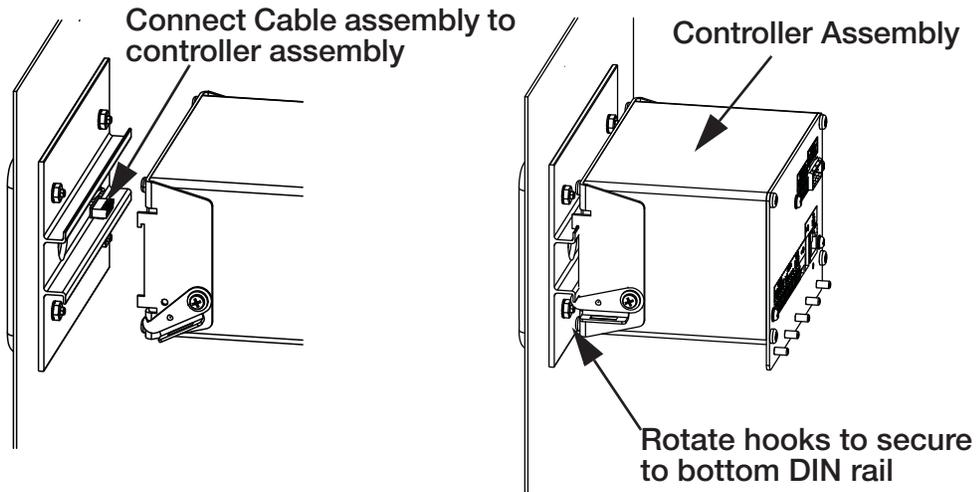


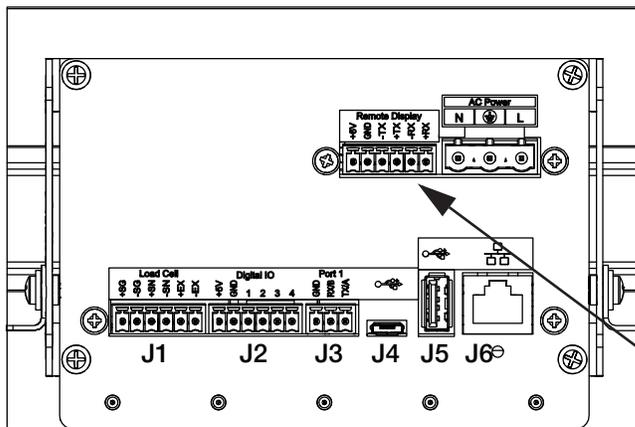
Figure 2-4. Install Controller Assembly

2.2.1 Mounting the Controller Assembly Remotely

To mount the controller assembly remotely a 6 pin connector (PN 153885) is required. See Figure 2-5 for terminal location and pin assignments.



Note Controller Assembly can be mounted remotely on a standard 35 mm DIN rail up to 250 ft from display.



Pin	Function
1	+6V
2	GND
3	-TX
4	+TX
5	-RX
6	+RX

When mounting the display remotely from the controller assembly, connect to this terminal.

Figure 2-5. Mount Controller Assembly Remotely

2.3 Cable Connections

The 880 has three external connectors, a terminal connector for the power cord, and a cutout for installed options. Enclosure disassembly is not required to make connections to load cells, communications, digital inputs, and digital outputs. These connectors are all externally mounted on the back of the controller.

2.3.1 Load Cells

To attach cable from a load cell or junction box, route the cable to the external J1 connector. Wire the load cell cable from the load cell or junction box to connector J1 as shown in Table 2-1. If using 6-wire load cell cable (with sense wires), open the unit and remove jumpers JP5 and JP6.



Note For 4-wire installation, leave jumpers JP5 and JP6 on (see Figure 2-7).
Shield wire will attach to ground clamp on backplate.

Connector	Pin	Function
J1	1	+SIG
	2	-SIG
	3	+SENSE
	4	-SENSE
	5	+EXC
	6	-EXC

For 6-wire load cell connections, remove jumpers JP5 and JP6.

Table 2-1. J1 Pin Assignments

2.3.2 Power Connections

Power connections to the 880 Panel Mount are shown below.

- Part number 152334 is used to connect AC power to the power supply board.
- Part number 15888 is used to connect DC power to the power supply board.

Attach the wires per the diagram shown below.

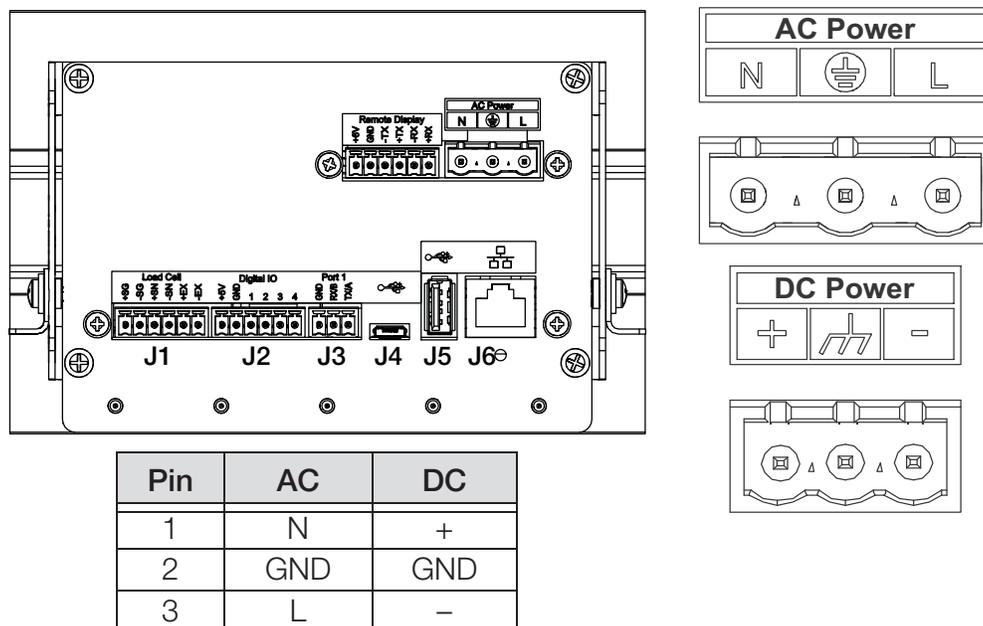


Figure 2-6. AC/DC Power Cord Connection Location

2.3.3 Serial Communications

Connector J3 provides connections for the RS-232 or the two-wire RS-485. Table 2-2 shows the pin assignments.

Pin	RS-232	RS-485
1	GND	GND
2	RX	B
3	TX	A

Table 2-2. Serial Communications to Connector J7 Pin Assignments



Note For RS-232, all four switches on SW3 (see Figure 2-7) must be in the OFF position.

For RS-485, all four switches on SW3 must be in the ON position.

2.3.4 USB Device Communications – Port 2 (USBCOM)

The USB Device Port is intended to be connected only to a PC. It will appear as a Virtual Comm Port and be assigned a “COMx” (J4 micro USB connector, see Figure 2-6) designation. Applications will communicate through the port like a standard RS-232 communications port. See Technical/Service Manual for more details.

2.3.5 USB Host Device

Not available at time of publication.

2.3.6 Ethernet Communications

The 880 supports Ethernet TCP/IP 10Base-T/100Base-TX communications using a standard RJ45 connector (J6 – see Figure 2-6). Through the network, software applications are able to communicate with the 880 using the EDP command set. See Technical/Service Manual for more details.

2.4 CPU Board

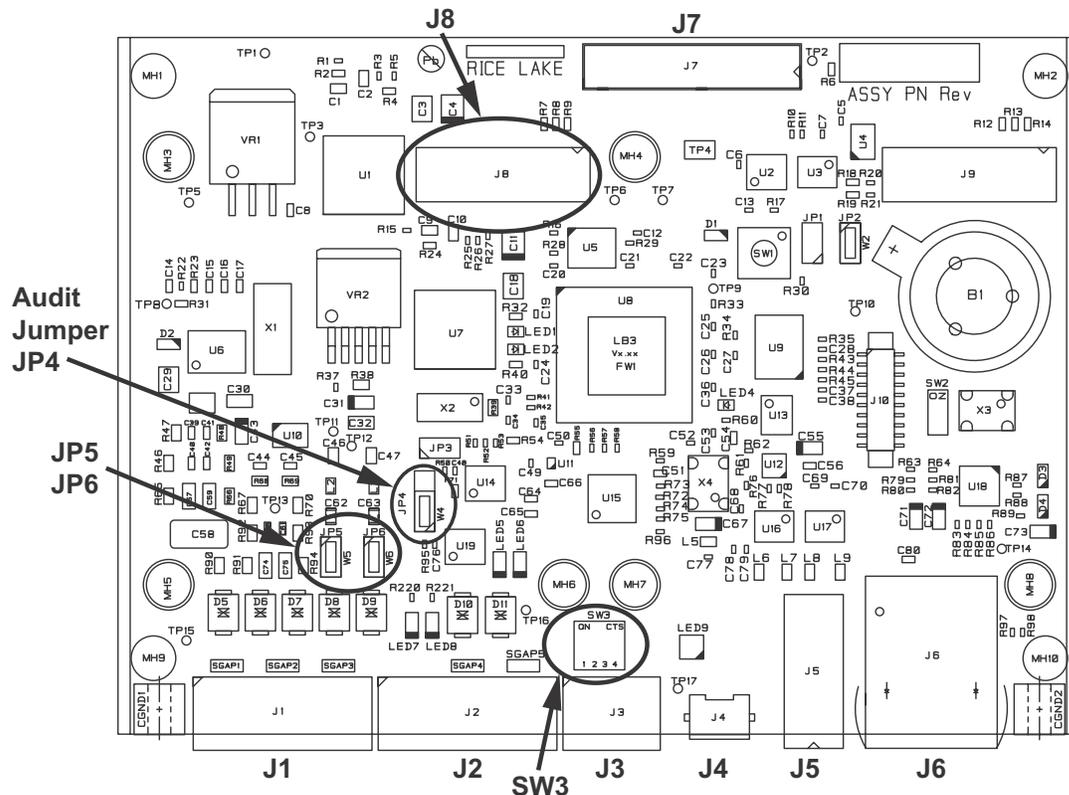


Figure 2-7. 880 CPU Board

Connectors

- Load cell (J1)
- DIO (J2)
- Comm 1 (J3)
- USB Micro Device (J4)
- USB Host (J5)
- Ethernet TCP/IP (J6)
- Opt Header (J8)
- Power Board (J7)

The Comm 1 port supports RS-232 or RS-485 communications; selectable with switch SW3. The port is configured using the COM menu under Ports. See Section 3.2.5.

2.5 Audit Trail and the Audit Jumper

The 880 includes an audit trail feature that keeps track of the number and the last date of calibrations and Legal-for-Trade configuration changes. It is possible to setup the 880 to allow entry to the configuration and calibration menus using only the front panel MENU key.

On the top of the CPU board is a 3-pin Jumper (JP4 - see Figure 2-7) that enables or disables this feature.

- To use the audit trail and allow the use of the MENU key to enter the configuration and calibration mode, place the jumper in the ON position.
- To prevent the use of the MENU key to enter the configuration and calibration mode, instead requiring use of the externally sealable configuration switch located inside the enclosure (see Figure 3-1), place the Jumper in the OFF position.

The audit trail counters will operate in either position of the audit jumper.

2.5.1 Digital I/O

Digital inputs can be set to provide many indicator functions, including all keypad functions. Digital inputs are active (on) with low voltage (0 VDC), inactive (off) at 5 VDC. Use the DIG IN menu to configure the digital inputs.

Digital outputs are typically used to control relays that drive other equipment. Outputs are designed to sink, rather than source, switching current. Each output is a normally open collector circuit, capable of sinking 250 mA when active. Digital outputs are wired to switch relays when the digital output is active (low, 0 VDC) with reference to a 5 VDC supply.

Use the SETPTS menu (see Figure 3-16 on page 30) to configure digital outputs.

Table 2-3 shows the pin assignments for connector J2.

Connector	Pin	Signal
J2	1	+5VDC, 500mA max
	2	GND
	3	DIO1
	4	DIO2
	5	DIO3
	6	DIO4

Table 2-3. J6 Pin Assignments (Digital I/O)

2.6 Option Cards

Connector J8 is reserved for option cards. Table 2-4 lists the options available for the 880 Indicator. Each kit includes instructions for installing and setting up the option.

Option	Addendum Part Number
Analog Output Card	131601
Relay Board	131602
EtherNet/IP	156554
DeviceNet	156558
Profibus DP	156556
Modbus TCP	156557
ProfiNet	156555

Table 2-4. Available Option Cards

2.7 Battery Replacement

When battery voltage gets low, the indicator display shows *low bat*. Replace the battery when this warning is displayed. The battery should last about seven years.

Use the Revolution[®] configuration utility or EDP commands (see Section 6.1 on page 64) to store a copy of the indicator configuration on a PC before attempting battery replacement. If any data is lost, the indicator configuration can be restored from the PC.



Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of unused batteries according to the manufacturer's instructions. The battery should be considered bad and discarded at 2.9V.

3.0 Configuration

To configure the 880 indicator, the indicator must be placed in setup mode. The setup switch is accessed through a small hole on the enclosure backplate, insert a nonconductive tool into the access hole and press the configuration switch. Indicator display changes to show **CONFIG**.



Important

Use caution when inserting the nonconductive tool into the backplate, press the tool in about 3/4 inch, using the board as a guide, until the switch is engaged. Do not use excessive force, the switch may be damaged.



Note

If audit trail is enabled, press  to access setup mode. Press ◀ or ▶ until **SETUP** is displayed, then press ▼ to **SCALE**.

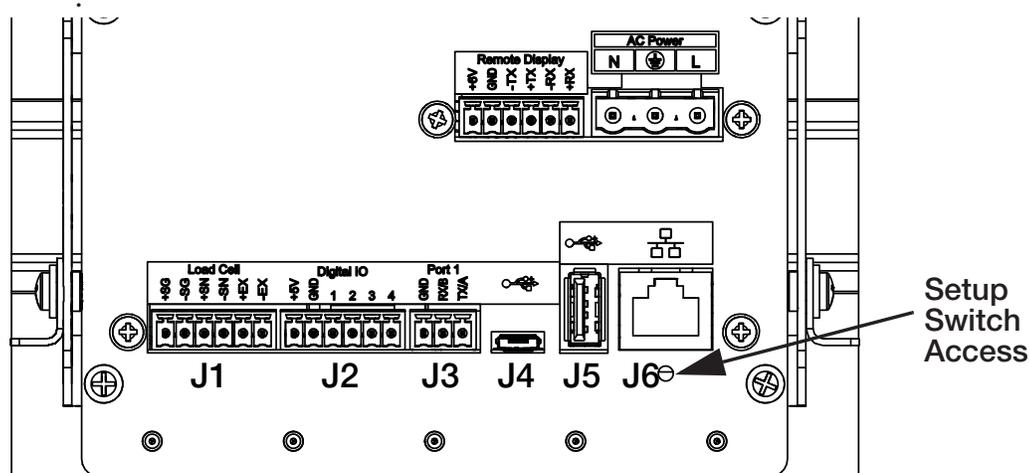


Figure 3-1. Back View – Setup Switch Access

When the indicator is placed in setup mode, the word **CONFIG** is shown on the display. The CONFIG menu is the first of ten top-level menus used for configuring the indicator. Detailed descriptions of these menus are given in Section 3.2. When configuration is complete, return to the CONFIG menu and press the Δ (**ZERO**) key to exit setup mode.

When configuration is complete, press  to return to the weigh mode.

3.1 Configuration Methods

The 880 indicator can be configured by using the front panel keys to navigate through a series of configuration menus or by sending commands or configuration data to the EDP port. Configuration using the menus is described in Section 3.1.3.

Configuration using the EDP port can be accomplished using either the EDP command set described in the Technical Service manual or Version 3.0 or later of the Revolution[®] configuration utility.

3.1.1 Revolution[®] Configuration

The Revolution configuration utility provides the preferred method for configuring the 880 indicator. Revolution runs on a personal computer to set configuration parameters for the indicator. When Revolution configuration is complete, configuration data is downloaded to the indicator.



Note See Section 5.0 of the Technical/Service manual (PN 158387) for more information on Revolution.

3.1.2 EDP Command Configuration

The EDP command set can be used to configure the 880 indicator using either a personal computer or terminal. Like Revolution, EDP command configuration sends commands to the indicator EDP port; unlike Revolution, EDP commands can be sent using any external device capable of sending ASCII characters over a serial connection.

EDP commands duplicate the functions available using the indicator front panel and provide some functions not otherwise available. EDP commands can be used to simulate pressing front panel keys, to configure the indicator, or to dump lists of parameter settings. See the Technical Service manual for more information about using the EDP command set.

3.1.3 Front Panel Configuration

The 880 indicator can be configured using a series of menus accessed through the indicator front panel when the indicator is in setup mode. Table 3-1 summarizes the functions of each of the main menus.

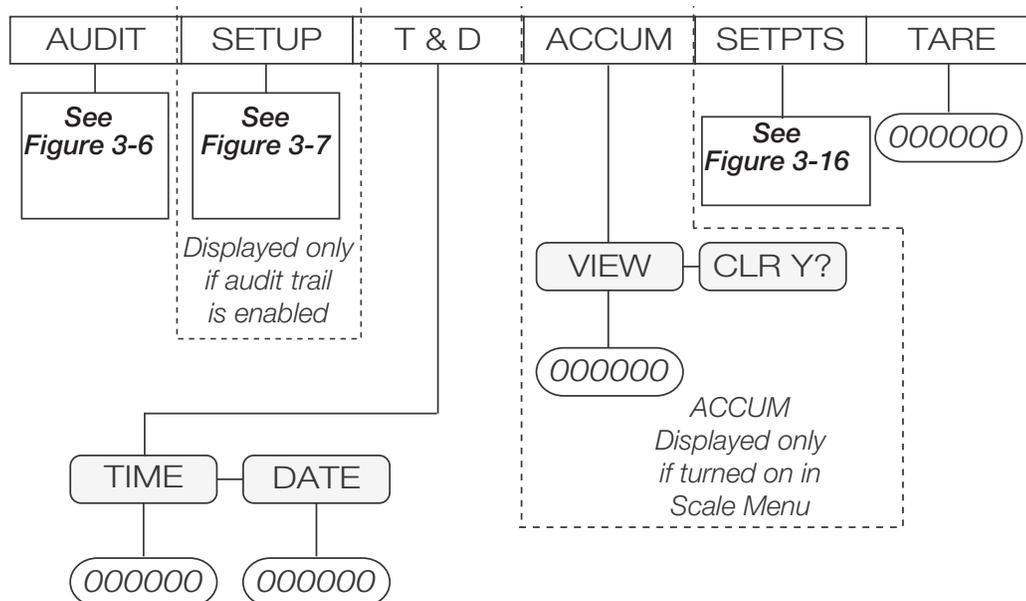


Figure 3-2. 880 Menu Layout

Menu		Menu Function
AUDIT	Audit Trail	Displays the legally relevant (LR) firmware version, configuration count and calibration count.
SETUP	Setup	
T&D	Time and Date	View and change time and date.
ACCUM	Accumulator	Displays the current accumulator value.
SETPTS	Setpoints	Configure setpoints.
TARE	Tare	Tare function. Enables or disables push-button and keyed tare

Table 3-1. 880 Menu Summary

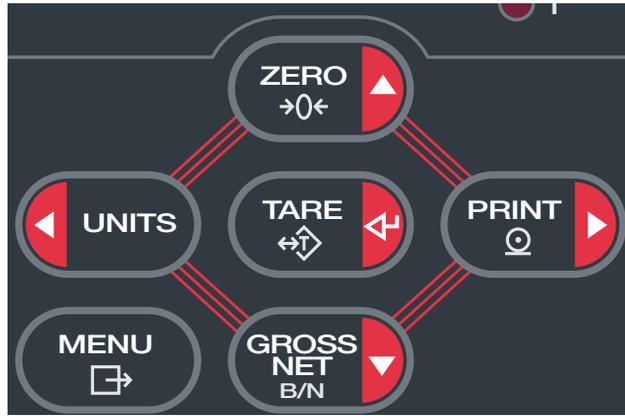
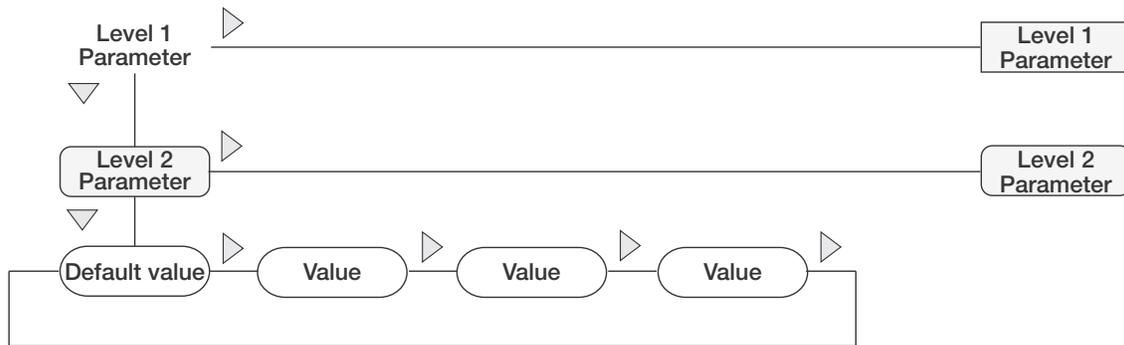


Figure 3-3. Five-Key Keypad Functions in Setup Mode

Four front panel keys are used as directional keys to navigate through the menus in setup mode (see Figure 3-3). The **UNITS** (\triangleleft) and **PRINT** (\triangleright) keys scroll left and right (horizontally) on the same menu level; **ZERO** (\triangle) and **GROSS/NET** (∇) move up and down (vertically) to different menu levels. The **TARE** key (\triangleleft) serves as an Enter key (\triangleleft) for selecting parameter values within the menus.



When moving through values below the first menu level, press \triangle to return to the level above.

Figure 3-4. Setup Mode Menu Navigation

To select a parameter, press \triangleleft or \triangleright to scroll left or right until the desired menu group appears on the display, then press ∇ to move down to the submenu or parameter you want. When moving through the menu parameters, the default or previously selected value appears first on the display.

To change a parameter value, scroll left or right to view the values for that parameter. When the desired value appears on the display, press \triangleleft to select the value and move back up one level. To edit numerical values, use the navigation keys to select the digit and to increment or decrement the value.

0 0 0 0 0 0

When editing numeric values, press \triangleleft or \triangleright to change the selected digit. Press \triangle or ∇ to increment or decrement the value of the selected digit. After the number desired is displayed, press ENTER. The decimal point will begin flashing if a decimal value is allowed. To move the decimal, use \triangleleft or \triangleright to move the decimal position. Press ENTER when done.

Figure 3-5. Editing Procedure for Numeric Values

3.1.4 Alphanumeric Entry Procedure

Because of its limited keypad, the 880 will use the following scheme for alphanumeric entry.

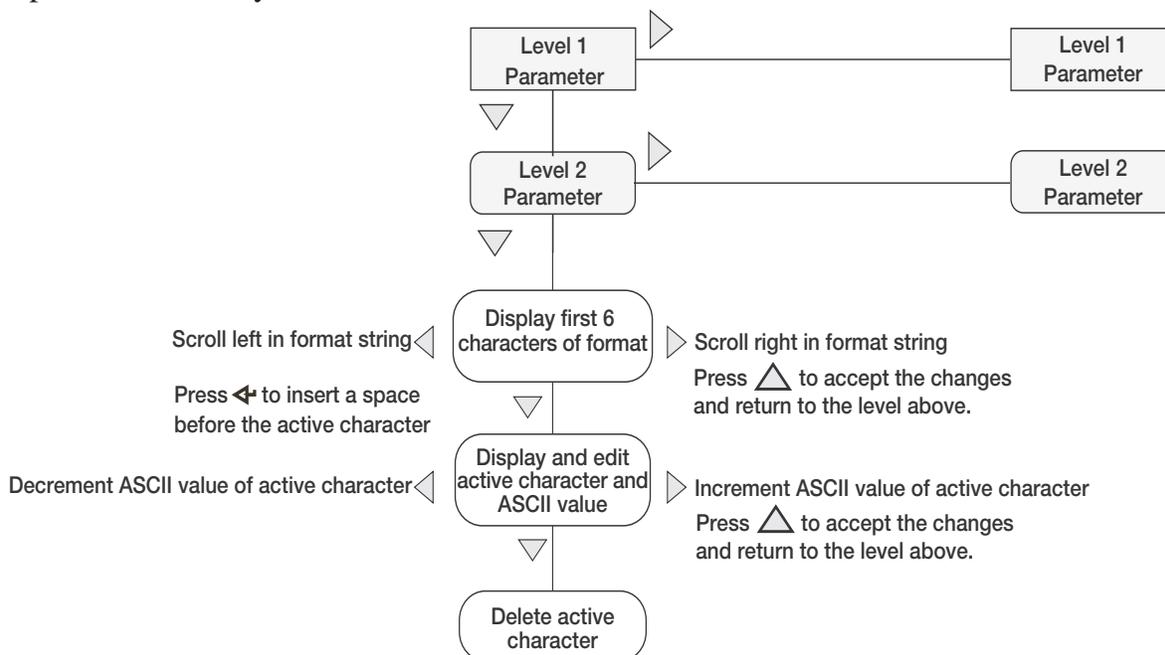


Table 3-2. Editing Procedure for Numeric Values

3.2 Menu Structures and Parameter Descriptions

The following sections provide graphic representations of the 880 menu structures. In the actual menu structure, the settings you choose under each parameter are arranged horizontally. To save page space, menu choices are shown in vertical columns. The factory default setting appears at the top of each column and is bolded. Parameters shown surrounded by a dotted-line box only appear under the special circumstances explained under each box.

Most menu diagrams are accompanied by one or more tables that describe all parameters and parameter values associated with that menu option. Default parameter values are shown in bold type.

3.2.1 Audit Menu

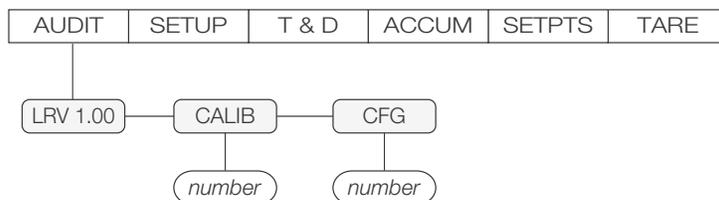


Figure 3-6. Audit Menu Structure

AUDIT Menu		
Parameter	Choices	Description
LRV	---	Legally relevant firmware version
CALIB	000000	Displays total calibration events.
CFG	000000	Displays total configuration events.

Table 3-3. Audit Menu Parameters

3.2.2 Setup Menu

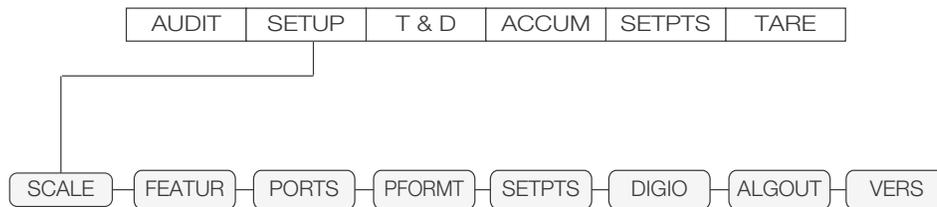


Figure 3-7. Setup Menu Structure

3.2.3 Scale Menu

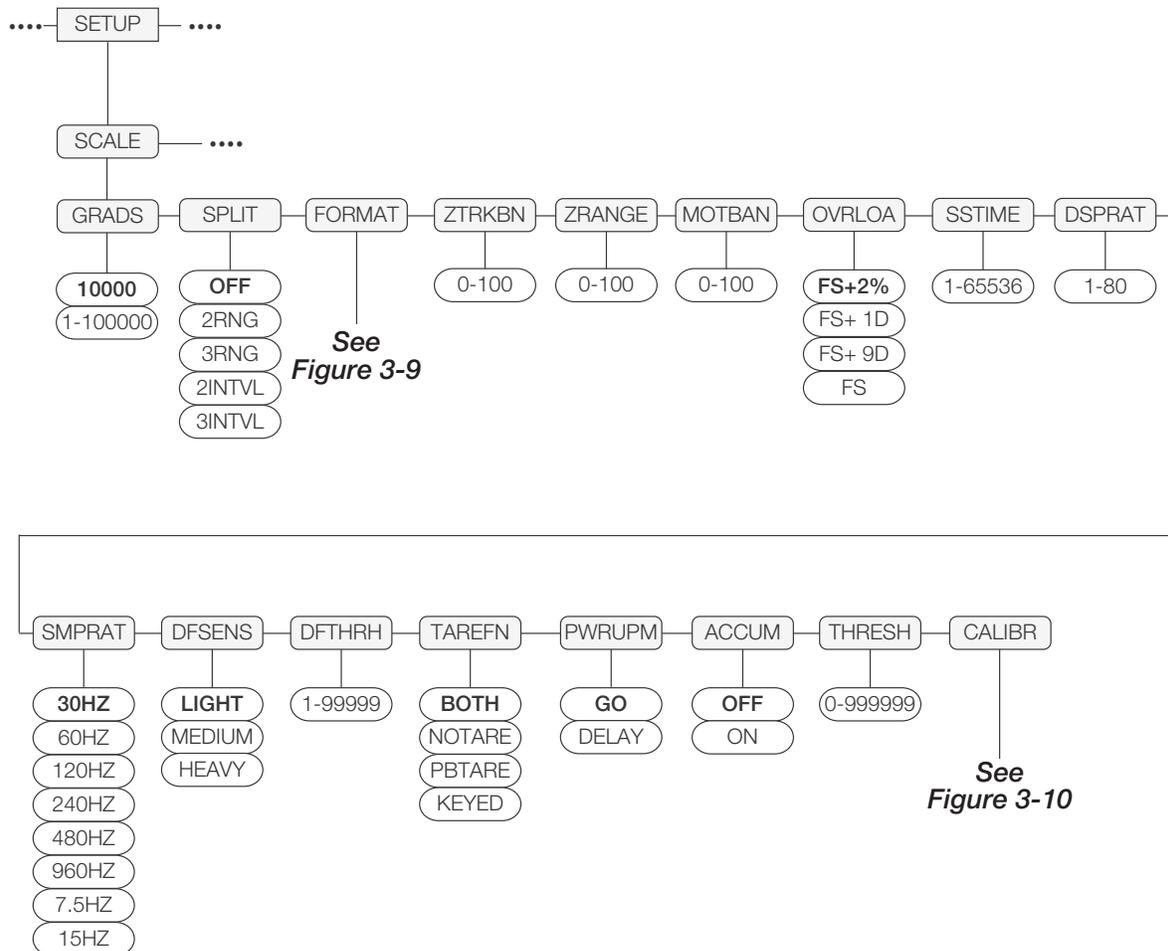
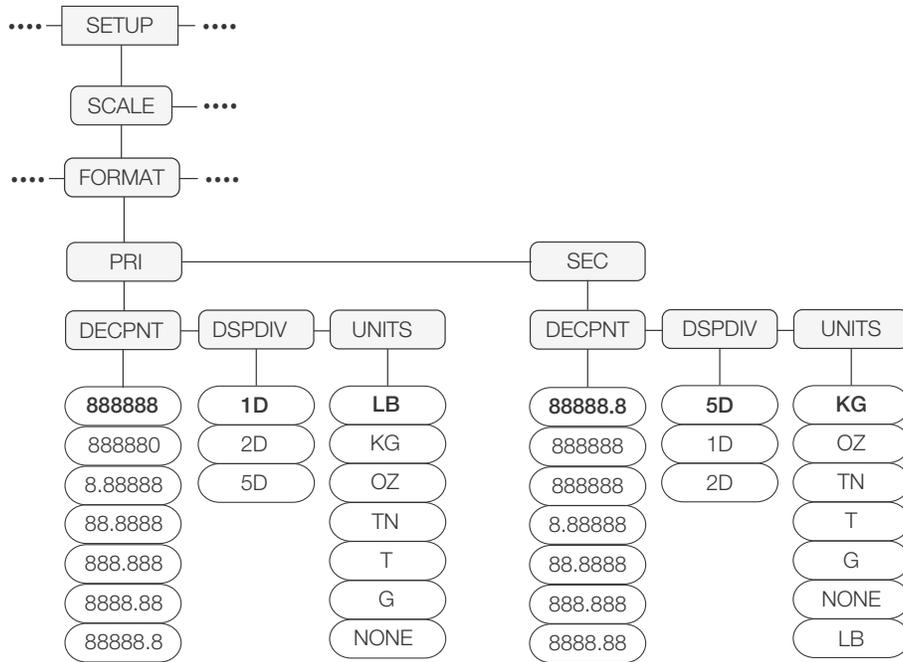
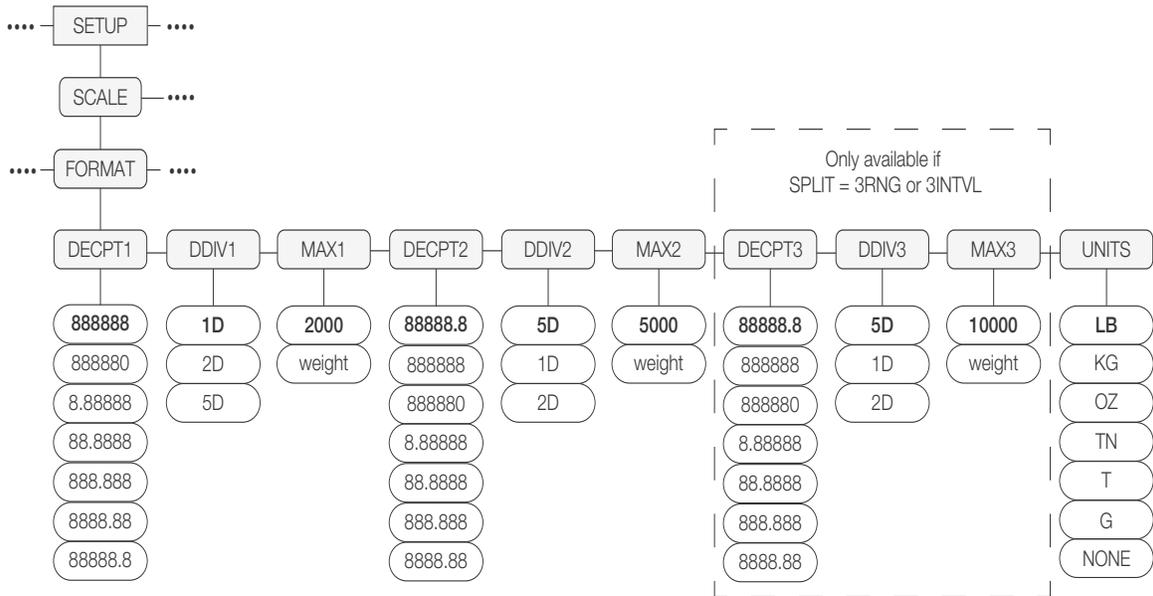


Figure 3-8. Scale Menu Structure

Format Menu



If SPLIT = OFF



If SPLIT = 2RNG, 3RNG, 2INTVL, or 3INTVL

Figure 3-9. Format Menu Structure

Calibration Menu

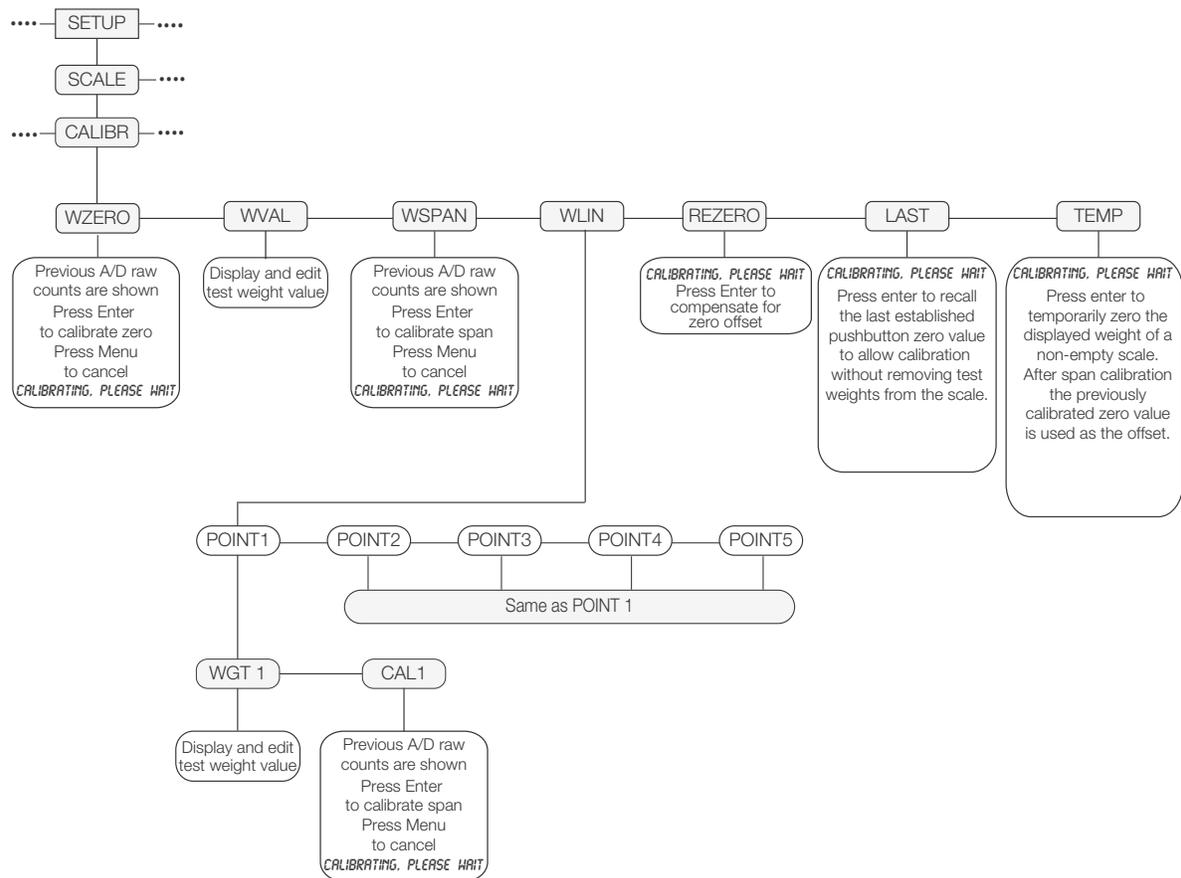


Figure 3-10. Calibration Menu Structure

3.2.4 Feature Menu

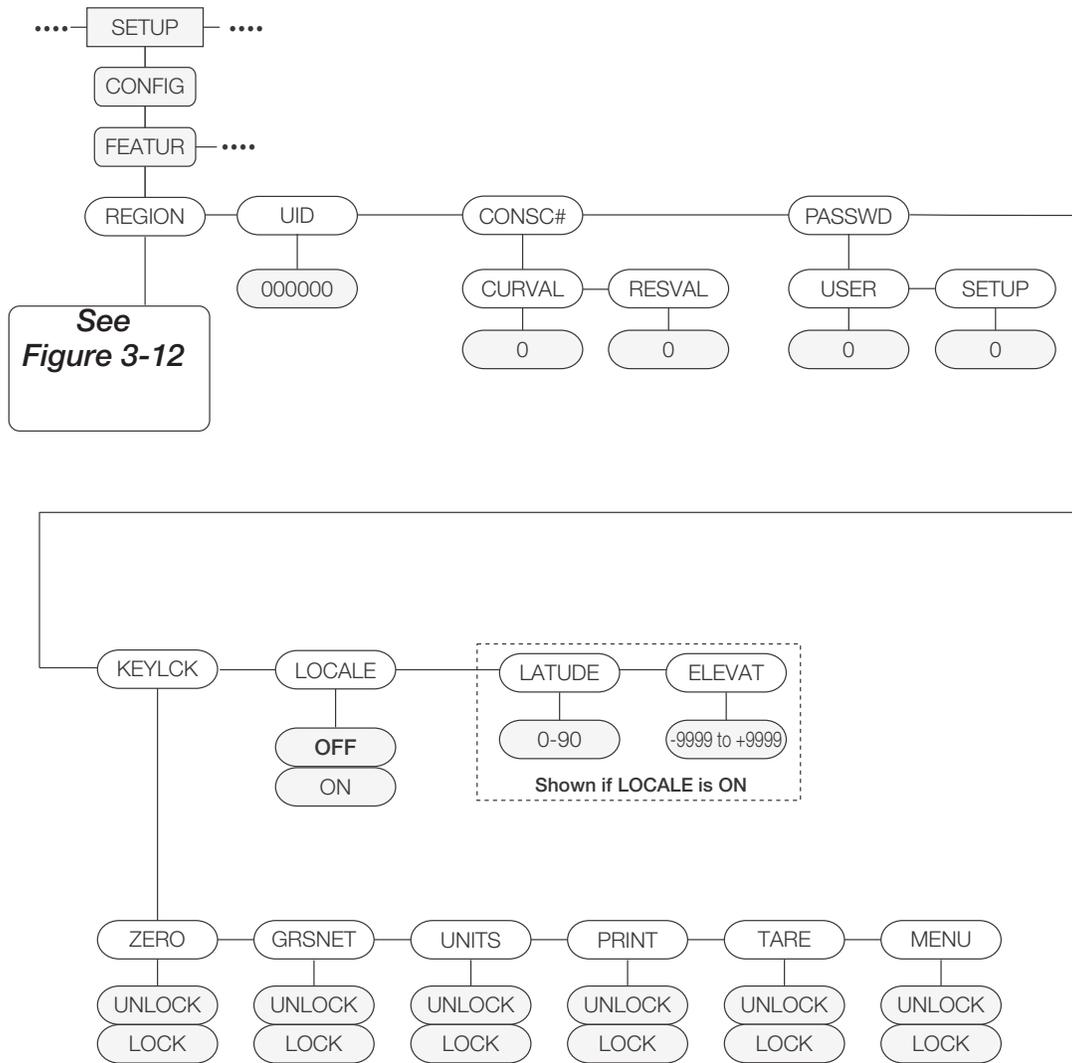


Figure 3-11. Feature Menu Structure

Region Menu

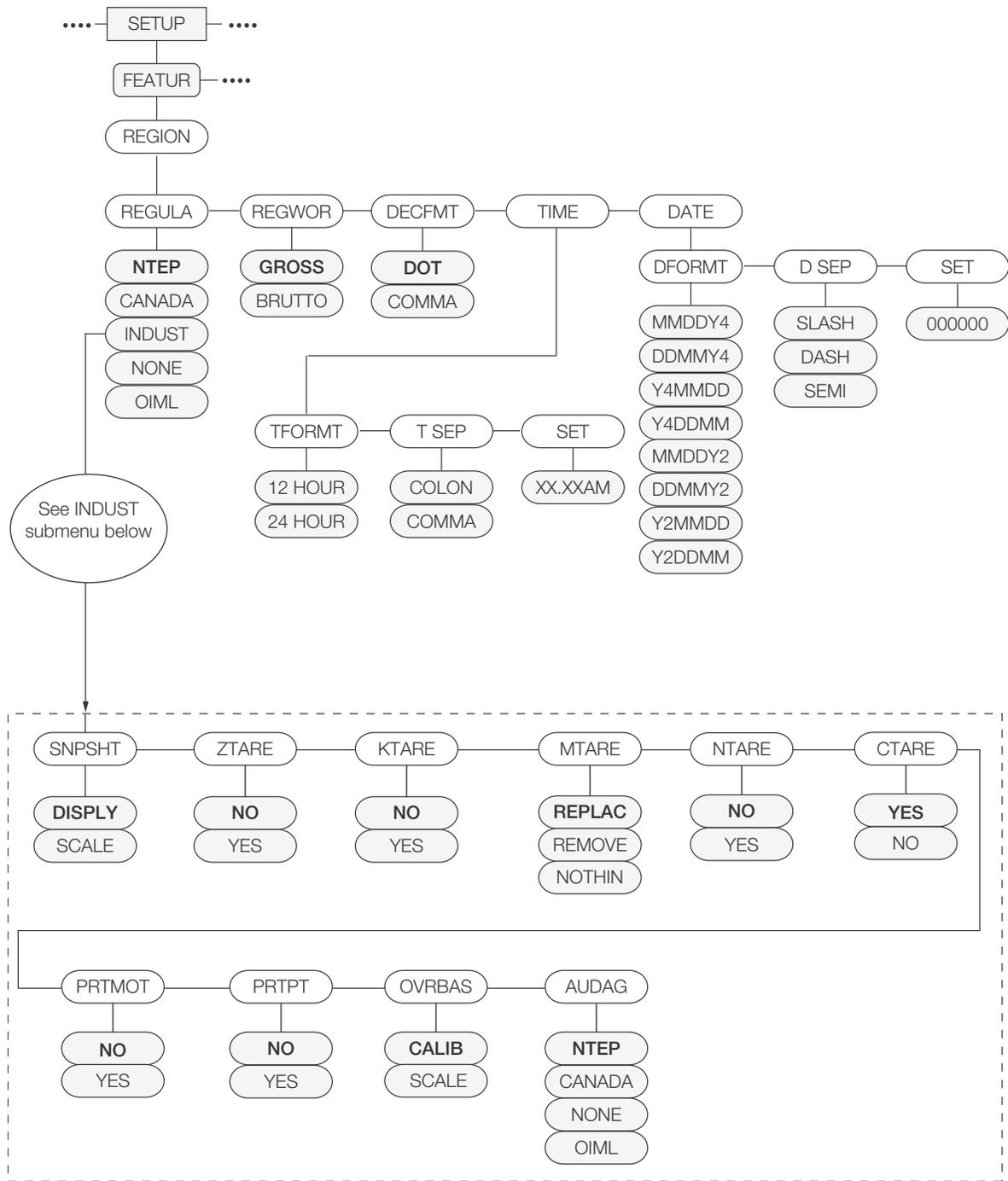


Figure 3-12. Region Menu Structure

3.2.5 Ports Menu

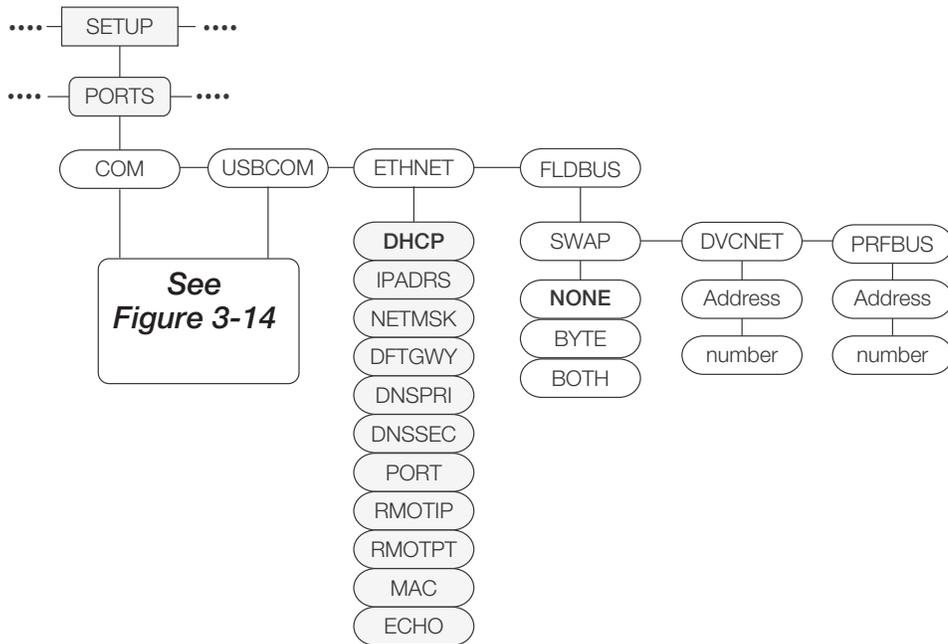


Figure 3-13. Ports Menu Structure

Com and USBCOM Menu

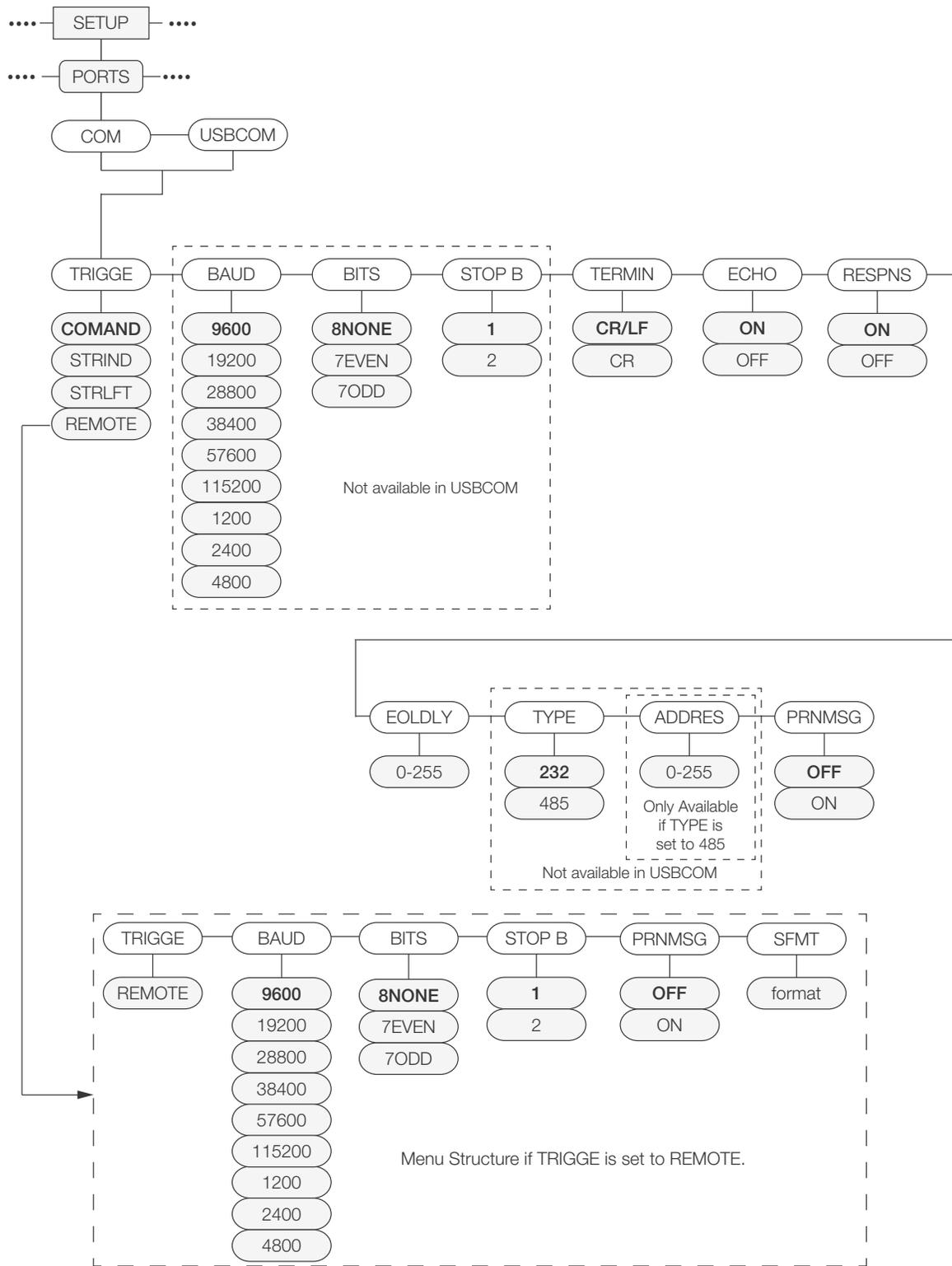


Figure 3-14. Com Menu Structure

3.2.6 Print Format Menu

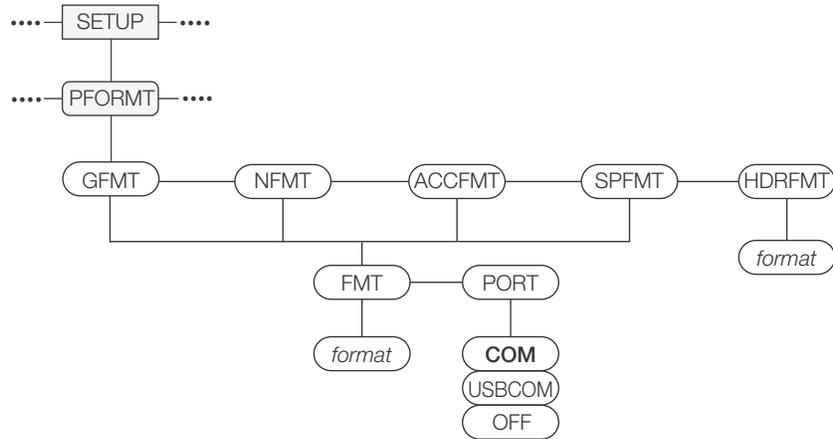


Figure 3-15. Print Format Menu Structure

3.2.7 Setpoint Menu

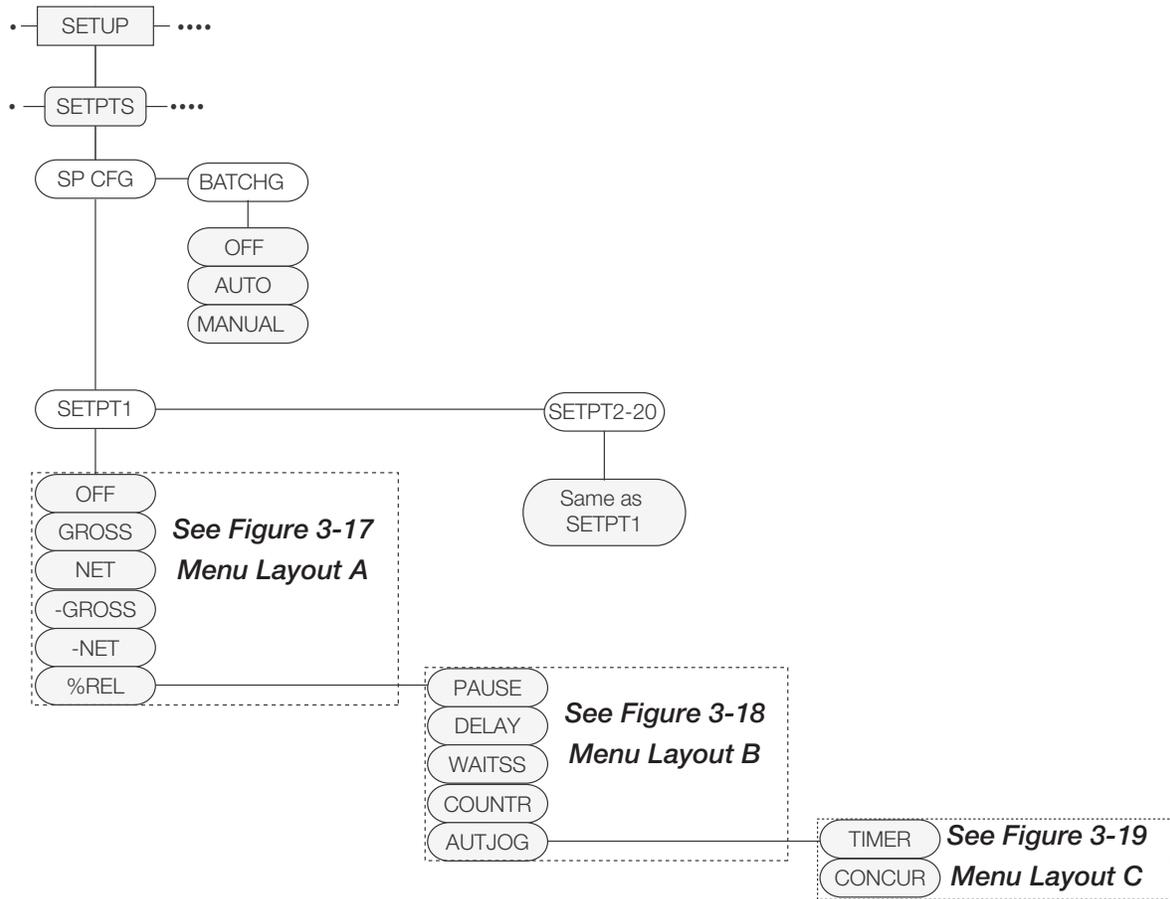


Figure 3-16. Setpoint Menu Structure

Setpoint Menu – Layout A

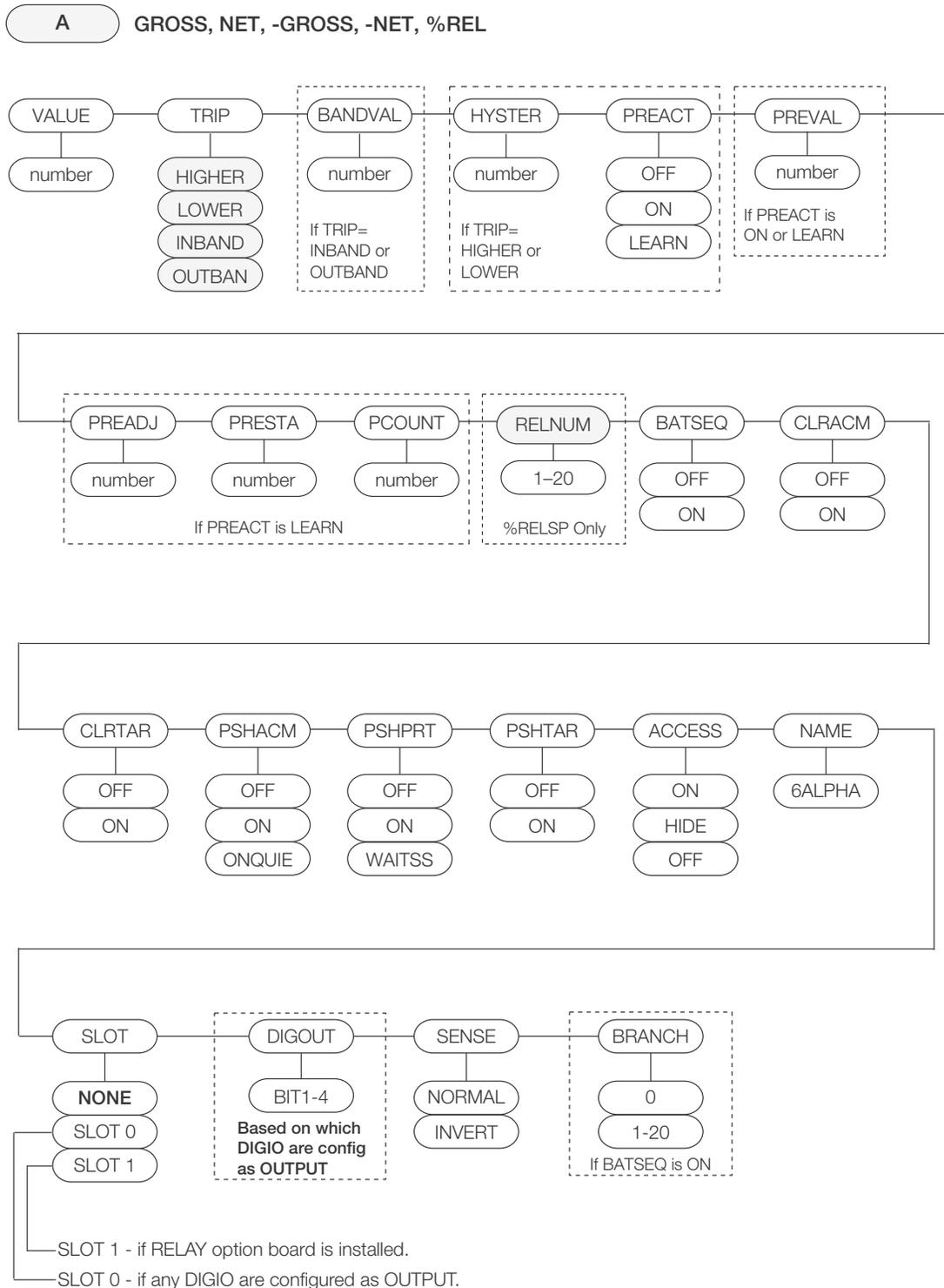


Figure 3-17. Setpoint Menu Structure – Layout A

Setpoint Menu – Layout B

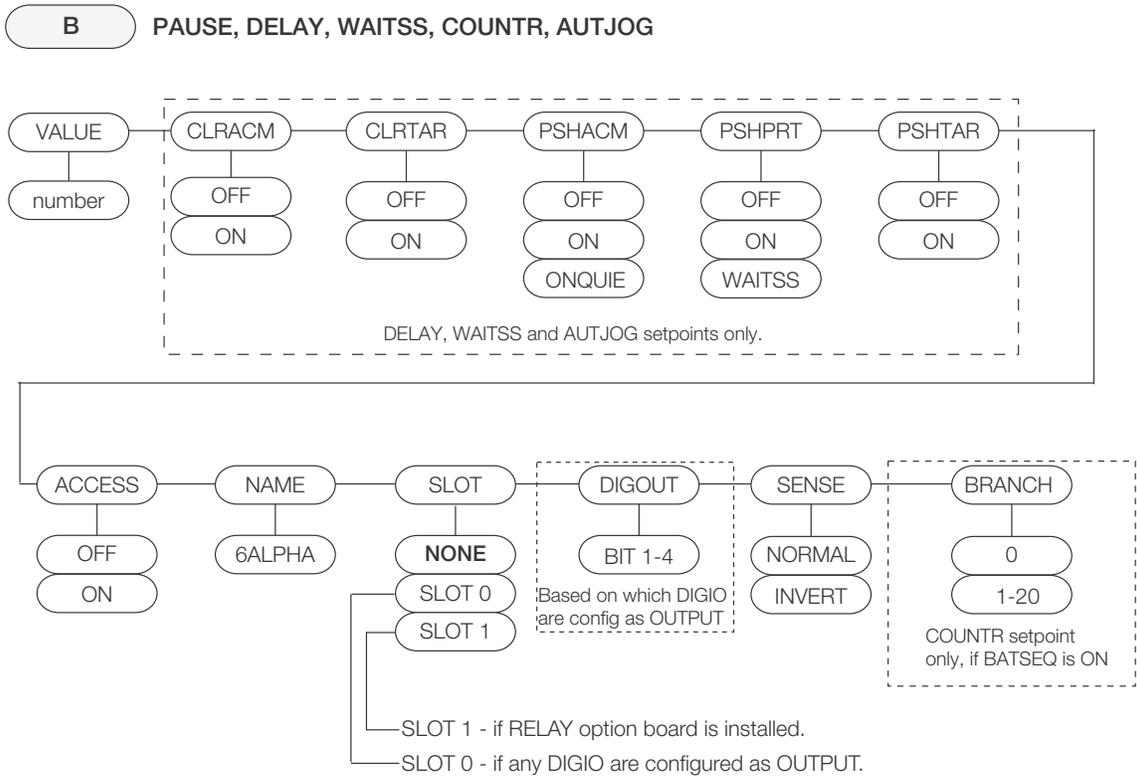


Figure 3-18. Setpoint Menu Structure – Layout B

Setpoint Menu – Layout C

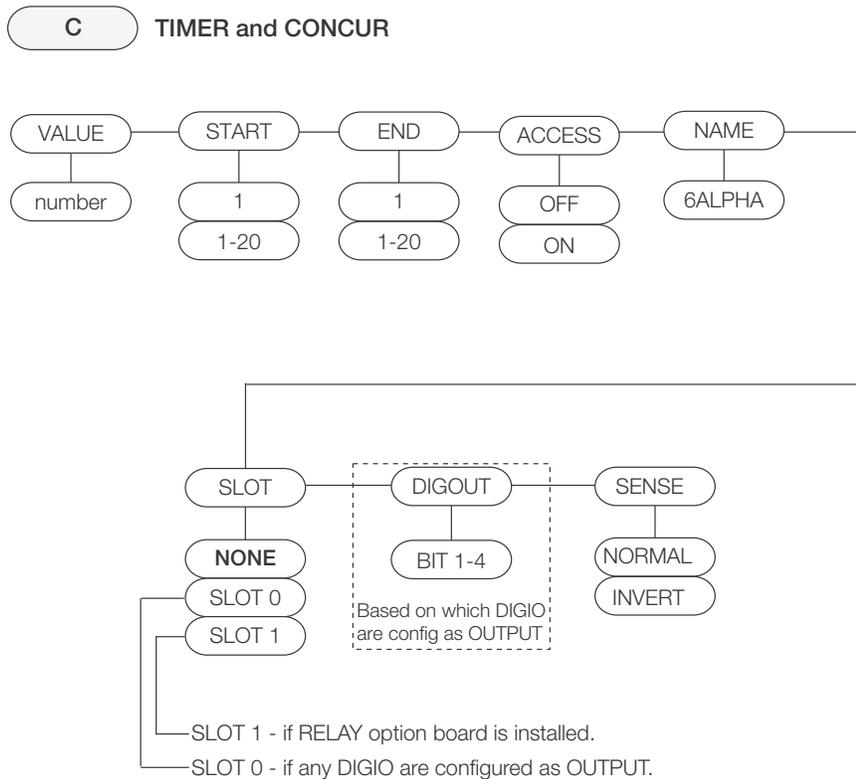


Figure 3-19. Setpoint Menu Structure – Layout C

3.2.8 Digital Input/Output Menu

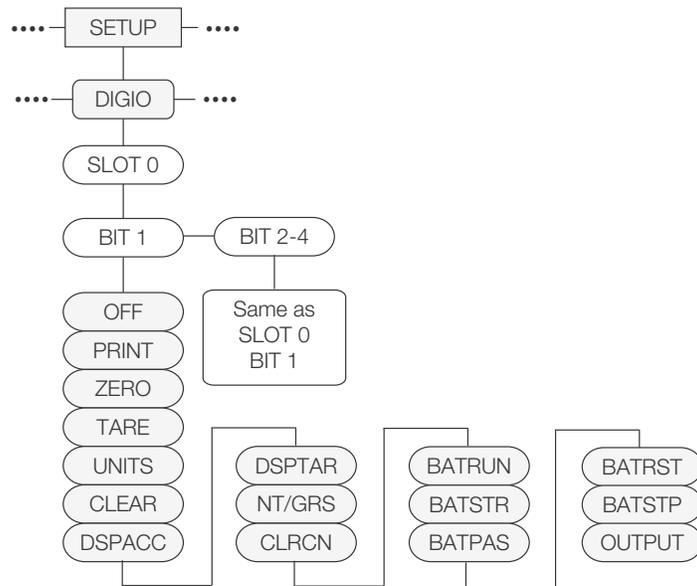


Figure 3-20. Digital Input/Output Menu Structure

3.2.9 Analog Output Menu

The ALGOUT menu is used only if the analog output option is installed. If the analog output option is installed, configure all other indicator functions and calibrate the indicator before configuring the analog output. See Technical/Service Manual for analog output calibration procedures.

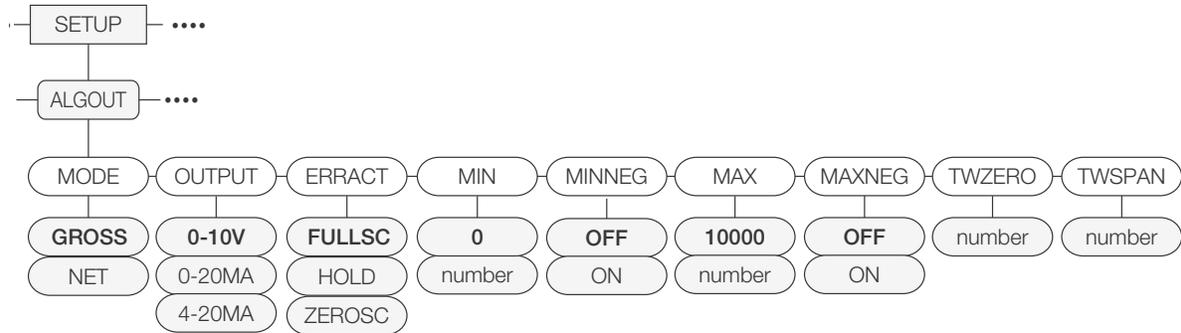


Figure 3-21. Analog Output Menu Structure

3.2.10 Version Menu

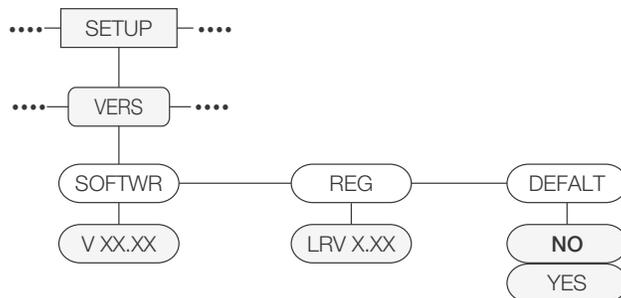


Figure 3-22. Version Menu Structure

4.0 Print Formatting

The 880 provides five print formats. Formats **GFMT** and **NFMT** will be printed in a ticket format based on the current mode of operation when the **PRINT** key is pressed (see Table 4-2 on page 36). **HDRFMT** can be inserted into any other ticket format using the <H1> formatting command. **SPFMT** is printed if **PSHPRT** is set to **ON** or **WAITSS** in the setpoint configuration. The **ACCFMT** is printed if the accumulator is embedded and the print key is pressed while viewing the accumulator value, or if a setpoint **PSHACM** is set to **ON**. If **PSHACM** is set to **ONQUIE**, it will accumulate, but not print.

Each print format can be customized to include up to 300 characters of information (1000 for **HDRFMT**), such as company name and address, on print tickets. You can use the indicator front panel (**PFORMT** menu), EDP commands, or the Revolution[®] configuration utility to customize the print formats.

4.1 Print Formatting Commands

Table 4-1 lists commands you can use to format the 880 print formats. Commands included in the format strings must be enclosed between < and > delimiters. Any characters outside of the delimiters are printed as text on the ticket. Text characters can include any ASCII character that can be printed by the output device.

Command	Description	Ticket Format	
		GFMT/ NFMT/ ACCFMT	SPFMT
<G>	Gross weight in displayed units (See notes 1 and 2 below)	√	√
<N>	Net weight in displayed units (See notes 1 and 2)	√	√
<T>	Tare weight in displayed units (See notes 1 and 2)	√	√
<A>	Accumulated weight in displayed units	√	√
<AC>	Number of accumulator event (5-digit counter)	√	√
<AT>	Time of last accumulator event	√	√
<AD>	Date of last accumulator event	√	√
<SCV>	Setpoint captured value		√
<STV>	Setpoint target value		√
<SPM>	Setpoint mode (gross or net label)		√
<SNA>	Setpoint name		√
<SN>	Setpoint number		√
<SPV>	Setpoint preact value		√

Table 4-1. Print Format Commands

Command	Description	Ticket Format	
		GFMT/ NFMT/ ACCFMT	SPFMT
<TI>	Time	√	√
<DA>	Date	√	√
<TD>	Time and date	√	√
<UID>	Unit ID number (See note 3)	√	√
<CN>	Consecutive number (See note 3)	√	√
<H1>	Ticket header (HDRFMT)	√	√
<NL nn >	New line (nn = number of termination (<CR/LF> or <CR>) characters) (See note 4)	√	√
<SP nn >	Space (nn = number of spaces) (See note 4)	√	√
<SU>	Toggle weight data format (formatted/unformatted) (See note 5)	√	√
<AN>	Alibi Ticket Number	√	√
<CR>	Carriage return character	√	√
<LF>	Line feed character	√	√



Note

1. Gross, net, and tare weights are 8 digits in length, including sign and decimal point, followed by a space and a one- to five-digit units identifier. Total field length with units identifier is 10-14 characters. Depending on what units are configured, the units identifier will be lb, kg, oz, tn, t, or g.
2. Gross, net, tare, and accumulator weights can be printed in any configured weight units by adding the following modifiers to the gross, net, tare, and accumulator weight commands: /P (primary units), /D (displayed units), /S (secondary units), /T (tertiary units). If not specified, the current displayed units (/D) is assumed. Example: To format a ticket to show net weight in secondary units, use the following command: <N/S>.
3. Unit ID and consecutive number (CN) fields are 1–6 characters in length, as required.
4. If nn is not specified, 1 is assumed. Value must be in the range 1–99.
5. After receiving an SU command, the indicator sends unformatted data until the next SU command is received. Unformatted data omits decimal points, leading and trailing characters.

Table 4-1. Print Format Commands (Continued)

4.2 Default Ticket Formats

Table 4-2 shows the default print formats for the 880 and lists the conditions under which each print format is used. The **HDRFMT** format is used to specify header information that can be used by the other ticket formats. The contents of the **HDRFMT** format can be inserted into any other ticket format using the <H1> formatting command.

Format	Default Format String	Used When
GFMT FMT	GROSS<G><NL2><TD><NL>	Normal mode, no tare in system
GFMT PORT	Defines the communication port that the format will be sent to.	
NFMT FMT	GROSS<G><NL>TARE<SP><T><NL> NET<SP2><N><NL2><TD><NL>	Normal mode, tare in system
NFMT PORT	Defines the communication port that the format will be sent to.	
ACCFMT FMT	ACCUM<A><NL><DA> <TI><NL>	Accumulator enabled and displayed, or setpoint print operation with PSHACCM=ON
ACCFMT PORT	Defines the communication port that the format will be sent to.	
SPFMT FMT	<SCV><SP><SPM><NL>	Setpoint push print operation (PSHPRNT=ON or WAITSS)
SPFMT PORT	Defines the communication port that the format will be sent to.	
 Note	<p>In OIML and CANADA modes, the letters PT (preset tare) are automatically inserted after the printed tare weight.</p> <p>If the COM port is set to TYPE = RS485, the port will not perform a demand print. See Technical/Service manual for more information.</p>	

Table 4-2. Default Print Formats

4.3 Stream Serial Data Format

If stream data transmission is configured for the COM and/or USBCOM port (STRLFT or STRIND), by default the 880 sends data using the Consolidated Controls serial data format shown in Figure 4-1.

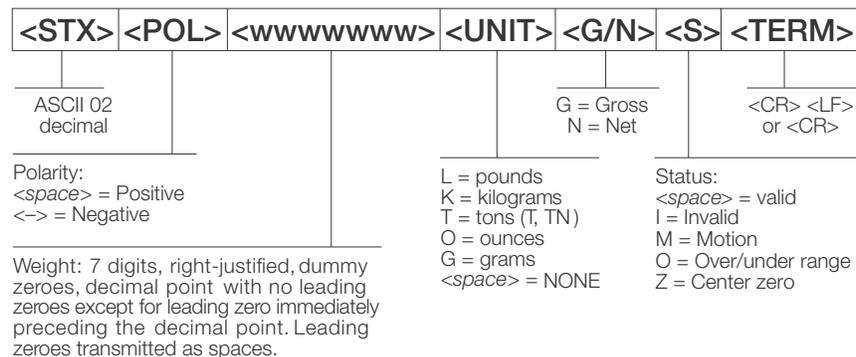


Figure 4-1. Stream Serial Data Format

 **Note** *Format can be changed, see Technical/Service Manual.*
The character values can be changes for the stream format tokens, see Table 6-9 on page 68.
If the COM port is set to TYPE = RS485, the port will not stream data, and cannot be used in a local/remote application.

5.0 Specifications

Power

Line Voltages	Input Voltage – 100-240VAC, 9-36VDC Input Frequency – 47-63Hz
Power Consumption	AC: 15 watts DC: 20 watts

Analog Specifications

Full Scale Input Signal	-45 mV to +45 mV
Excitation Voltage	10 VDC \pm , 8 x 350 Ω or 16 x 700 Ω load cells
Sense Amplifier	Differential amplifier with 4- and 6-wire sensing
Analog Signal Input Range	-45 mV to 45mV
Analog Signal Sensitivity:	0.3 μ V/graduation minimum @ 7.5 Hz 1.0 μ V/graduation typical @ 120 Hz 4.0 μ V/graduation typical @ 960 Hz
A/D Sample Rate:	7.5 – 960Hz, software selectable
Input Impedance	200 M Ω , typical
Noise (Usable Minimum LSB)	0.3 μ V p-p
Internal Resolution	8 000 000 counts @ 23 usable bits, approximate
Display Resolution	100 000 dd
Input Sensitivity	10 nV per internal count
System Linearity	\pm 0.01% of full scale
Temperature	
Zero	\pm 150 nV/ $^{\circ}$ C, maximum
Span	\pm 3.5 ppm/ $^{\circ}$ C, maximum
Calibration Method	Software, constants stored in EEPROM
Common Mode	Voltage \pm 0.8V in unbalanced condition
Common Mode	Rejection 120 dB minimum @ 50 or 60 Hz
Input Overload	\pm 12 V continuous, static discharge protected
EMI/RFI Protection	Signal, excitation, and sense lines protected by capacitor bypass and filtering elements
Optional Analog Output	Fully isolated, voltage or current output Voltage output: 0 –10 VDC Load resistance: 1k Ω minimum Current output: 4–20 mA External loop resistance: 500 Ω maximum

Digital I/O

Four I/O Onboard
Primary keys, pseudo functions, batching functions

Serial Communications

RS-232 Full Duplex

RS-485	Half Duplex
USB	USB Type A Connector 2.0 USB Micro A/B Connector 2.0
EtherNet	EtherNet TCP/IP

Operator Interface

Display	LED, Six 0.56 inch (14 mm), 14 Segment with Decimal or Comma
Keyboard	6-key membrane panel

Environmental

Operating Temperature	14°F to 104°F (–10 to +40°C) (legal-for-trade applications); 14°F to 122°F (–10 to +50°C) (industrial applications)
Storage Temperature	–25 to +70°C
Humidity	0–95% relative humidity

Enclosure

Enclosure Dimensions	6.0 in x 4.0 in x 4.95 in (152 mm x 102 mm x 126 mm)
Weight	2.5 lb (1.2 kg)
Rating/Material	Display Bezel NEMA 4X, IP69K

Certifications and Approvals



NTEP
CoC Number: 13-080
Accuracy Class III/IIIL n_{max} : 10 000

Measurement Canada
Approval: Pending
Accuracy Class III/IIHD n_{max} : 10 000

UL



File Number: E151461



File Number: Pending



880 Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, *Protecting Your Components From Static Damage in Shipment*, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

These warranties exclude all other warranties, expressed or implied, including without limitation warranties of merchantability or fitness for a particular purpose. Neither RLWS nor distributor will, in any event, be liable for incidental or consequential damages.

RLWS and buyer agree that RLWS's sole and exclusive liability hereunder is limited to repair or replacement of such goods. In accepting this warranty, the buyer waives any and all other claims to warranty.

Should the seller be other than RLWS, the buyer agrees to look only to the seller for warranty claims.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

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