

# 820i<sup>®</sup>

Programmable HMI Indicator/Controller  
Version 1.08

## Technical Manual



**REVOLUTION**  
SCALE SOFTWARE

**RICE LAKE**<sup>®</sup>  
WEIGHING SYSTEMS

December 7, 2022

PN 93018 Rev D

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## Revision History

This section tracks and describes manual revisions for awareness of major updates.

| Revision | Date             | Description                                                                          |
|----------|------------------|--------------------------------------------------------------------------------------|
| D        | December 7, 2022 | Revision history established; added UL and Revolution updates; firmware version 1.08 |
|          |                  |                                                                                      |
|          |                  |                                                                                      |

Table i. Revision Letter History



Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at [www.ricelake.com/training](http://www.ricelake.com/training) or obtained by calling 715-234-9171 and asking for the training department.

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# 1.0 Introduction

This manual is intended for use by service technicians responsible for installing and servicing *Revolution*® digital weight indicators. This manual applies to Version 1.08 of the 820i indicator software.

Configuration and calibration of the indicator can be accomplished using the *Revolution*® configuration utility, serial commands, or the indicator front panel keys. See [Section 3.1 on page 24](#) for information about configuration methods.



Manuals and additional resources are available from Rice Lake Weighing Systems at [www.ricelake.com/manuals](http://www.ricelake.com/manuals)

Warranty information can be found at [www.ricelake.com/warranties](http://www.ricelake.com/warranties)

The **Operator Card** included with this manual provides basic operating instructions for users of the 820i. Please leave the **Operator Card** with the indicator when installation and configuration are complete.

## 1.1 Safety

### Safety Definitions:



**DANGER:** Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.



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



**CAUTION:** Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.



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

### General Safety



**Do not operate or work on this equipment unless this manual has been read and all instructions are understood. 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.**



#### WARNING

**Failure to heed could result in serious injury or death.**

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

**Do not allow minors (children) or inexperienced persons to operate this unit.**

**Do not use for purposes other than weight taking.**

**Do not place fingers into slots or possible pinch points.**

**Do not use this product if any of the components are cracked.**

**Do not exceed the rated specification of the unit.**

**Do not make alterations or modifications to the unit.**

**Do not remove or obscure warning labels.**

**Do not submerge.**

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

**Socket-outlet shall be installed near the equipment and shall be easily accessible.**

**Fuses shall only be replaced by service personnel.**

## 1.2 FCC Compliance

### United States

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

### Canada

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

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

## 1.3 Overview

The 820i is a programmable, multi-channel digital weight indicator/controller. The configuration can be performed using the front panel, with an attached PS/2<sup>®</sup>1-type keyboard, or using the *Revolution* utility.

Custom event-driven programs can be written with the *iRite-IDE*<sup>®</sup> language. These programs are compiled with an *iRite-IDE* compiler utility, which can only be downloaded into the indicator. The Rice Lake Weighing Systems Web Update utility can be used to download 820i firmware upgrades to a PC from the Rice Lake Weighing Systems web site; *Revolution* provides functions for installing the new software into the 820i.

### Onboard Features

Features of the basic 820i include:

- Support for two A/D or serial scale inputs, or total of all scales.
- Eight digital I/O channels on main board, each configurable as either input or output.
- Two serial ports on main board support duplex RS-232 up to 115200 bps. Port 2 supports RS-232 with hardware handshaking; Port 4 supports RS-232, 20mA output, and 2-wire RS-485 communications.
- Available in 115 VAC and 230 VAC North American and European versions.
- Configurable print formats can be defined for up to 1000 characters each. These formats are used to print gross or net weights, truck in/out weights, setpoint weights, accumulator weights, alert messages, and header information. Additional print formats can be created using twenty auxiliary print formats.
- Six truck modes to store and recall weights for gross, tare, and net printing. The truck register contains fields for ID number, weight, and the transaction time and date. Weights can be stored permanently or erased at the end of the transaction.
- The setpoint engine supports 31 configurable setpoint kinds. Setpoints can be arranged in a sequential batch routine of up to 100 steps. If setpoints are configured as free running setpoints, they can be tied to program control. This allows for simultaneous batching operations to be written with the *iRite-IDE* language.

The 820i is NTEP-certified for Classes III and III L at 10,000 divisions. See [Section 12.0 on page 115](#) for more information about additional certifications and approvals.

---

1. PS/2<sup>®</sup> is a registered trademark of IBM Corporation.

## Option Cards

The CPU board provides one slot for installing other option cards. Available option cards include:

- Analog output card (dual or single) for 0–10 VDC or 0–20 mA tracking of gross or net weight values.
- Dual-channel serial expansion card provides one additional RS-485 port or two ports for either RS-232 or 20mA communications at up to 19200 bps.
- 24-channel digital I/O expansion card.
- 1MB memory expansion card for expanded database capability.
- Pulse input card for use with pulse count and pulse rate setpoints.
- Dual-channel analog input card supports 0–10 VDC, 0–20 mA, ambient temperature, and four types of thermocouple.
- Bus interface cards for Ethernet, EtherNet/IP<sup>TM1</sup>, DeviceNet<sup>TM2</sup>, Allen-Bradley Remote I/O<sup>3</sup>, and Profibus<sup>®</sup> DP networks<sup>4</sup>.

Part numbers of available option cards are listed in [Section 1.7 on page 12](#).

## Front Panel

The 820i front panel, shown in [Figure 1-1](#), consists of a 28-button keypad with a large backlit LCD display. The keys are grouped as five configurable softkeys, five primary scale function keys, four navigation keys, and numeric entry keys.

Weight information is displayed with a graphical scale in two font sizes. Status areas on the display are used for operator prompts and entering data.

LCD display contrast and backlighting can be adjusted using the **Display** button on the front panel.

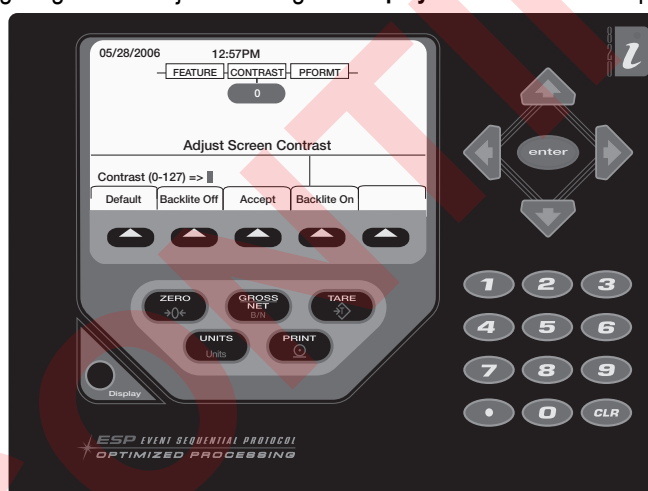


Figure 1-1. 820i Front Panel

## Enclosures

The 820i is available in universal (tilt-stand) and panel mount enclosures. Stainless steel enclosures are rated for NEMA Type 4X/IP66. This manual provides assembly drawings and replacement parts lists for the universal model; supplemental documentation provides information specific to the panel mount model ([Section 1.7 on page 12](#)).

1. EtherNet/IP<sup>TM</sup> is a trademark of ControlNet International, Ltd., under license by the Open DeviceNet Vendor Association.
2. DeviceNet<sup>TM</sup> is a trademark of the Open DeviceNet Vendor Association.
3. Allen-Bradley<sup>®</sup>, PLC<sup>®</sup>, and SLC<sup>TM</sup> are trademarks of Allen-Bradley Company, Inc., a Rockwell International company.
4. Profibus<sup>®</sup> is a registered trademark of Profibus International.

## 1.4 Operating Modes

The 820i has two modes of operation.

### Normal mode

Normal mode is the weighing mode of the indicator. The indicator displays gross, net, or tare weights as required, using the secondary display to indicate scale status and the type of weight value displayed. Once configuration is complete and a legal seal is affixed to the large fillister-head screw on the indicator enclosure, this is the only mode in which the 820i can operate.

### 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 large fillister head screw from the enclosure. Insert a screwdriver or a similar tool into the access hole and press the setup switch once. The indicator display changes to show scale configuration menus.

## 1.5 Indicator Operations

Basic 820i operations are summarized in the following sections.

### Toggle Gross/Net Mode

Press the **GROSS/NET** key to switch the display mode from gross to net, or from net to gross. 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.

Gross mode is indicated by the word **Gross** (or **Brutto** in OIML mode); net mode is indicated by the word **Net**.

To display audit trail information, press and hold the **Gross/Net** mode key for three seconds. Weighing functions continue while audit trail information is displayed. Press the **Gross/Net** or **CLR** key to exit the audit trail display.

### Toggle Units

Press the **UNITS** key to switch between primary, secondary, and tertiary units.

### Zero Scale

1. In gross mode, remove all weight from the scale and wait for the standstill annunciator (▲▲).
2. Press the **ZERO** key. The center of zero (→0←) annunciator lights to indicate the scale is zeroed.

### Acquire Tare

1. Place container on scale and wait for the standstill annunciator (▲▲).
2. Press the **TARE** key to acquire the tare weight of the container.
3. Display shifts to net weight and shows the word **Net** on the display.

### Remove Stored Tare Value

1. Remove all weight from the scale and wait for the standstill annunciator (▲▲).
2. Press the **TARE** key (or, in OIML mode, the **ZERO** key). Display shifts to gross weight and shows the word **Gross**.

### Print Ticket

1. Wait for the standstill annunciator (▲▲).
2. Press the **PRINT** key to send data to the serial port.

### Accumulator Functions

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, or serial command. The scale must return to zero (net zero if a tare is in the system) before the next accumulation.

The **Display Accum** softkey can be configured to display the current accumulator value. Printing while the accumulator is displayed, or when the setpoint PSHACCUM function is active, uses the ACCFMT print format (see [Section 6.0 on page 60](#)).

Press the **CLEAR** key twice to clear the accumulator.

## 1.6 Softkey Operations

Softkeys can be defined to provide additional operator functions for specific applications. Softkey assignments are listed on the tabs shown at the bottom of the LCD display; softkey functions are activated by pressing the arrow keys below the softkey tabs (Table 1-1).

The particular set of softkeys shown on the display is determined by the indicator configuration and program.

| Softkey       | Description                                                                                                                                                                                |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time/Date     | Displays current time and date; allows time and date change.                                                                                                                               |
| Display Tare  | Displays tare value for the current scale                                                                                                                                                  |
| Display Accum | Displays accumulator value, if enabled, for the current scale.                                                                                                                             |
| Display ROC   | Displays rate-of-change value, if enabled, for the current scale.                                                                                                                          |
| Setpoint      | Displays a menu of configured setpoints; allows display and change of some setpoint parameters.                                                                                            |
| Batch Start   | Starts a configured batch.                                                                                                                                                                 |
| Batch Stop    | Stops a running batch and turns off all associated digital outputs. Requires a batch start to resume processing.                                                                           |
| Batch Pause   | Pauses a running batch. (Same as stop, but digital outputs, if on, are not turned off.)                                                                                                    |
| Batch Reset   | Stops a batch and resets it to the first batch step.                                                                                                                                       |
| Weigh In      | Allows truck ID entry; generates weigh-in ticket for truck weighing applications.                                                                                                          |
| Weigh Out     | Allows truck ID entry; generates weigh-out ticket for truck weighing applications.                                                                                                         |
| Truck Regs    | Displays truck register; allows deletion of individual or all entries. Truck register can be printed by pressing the <b>PRINT</b> key while the truck register is displayed.               |
| Unit ID       | Allows display or change of Unit ID.                                                                                                                                                       |
| Select Scale  | For multi-scale applications, provides a prompt to enter the scale number to be displayed.                                                                                                 |
| Diagnostics   | Provides access to diagnostic displays for attached <i>iQUBE</i> junction boxes.                                                                                                           |
| Alibi         | Allows previous print transactions to be recalled and reprinted.                                                                                                                           |
| <b>F1–F10</b> | User-programmable keys; defined by application.                                                                                                                                            |
| More...       | For applications with more than five defined softkeys, the More... key is automatically assigned to the fifth softkey position. Press <b>More...</b> to toggle between groups of softkeys. |

Table 1-1. Configurable Softkeys

## 1.7 System Configurations and Options

Table 1-2 lists the 820i system models and part numbers. All models include CPU board with one option card slot. Each model comes equipped with a single- or dual-channel A/D.

| System Model                                                                     | Model PNs          |                  |
|----------------------------------------------------------------------------------|--------------------|------------------|
|                                                                                  | Single-Channel A/D | Dual-Channel A/D |
| Universal (tilt stand) model, 115 VAC                                            | 91995              | 93011            |
| Universal (tilt stand) model, 230 VAC, North American, NEMA Type 15-5 power cord | 91996              | 93012            |
| Universal (tilt stand) model, 230 VAC, European, CEE 7/7 power cord              | 91997              | 93013            |
| Panel mount model, 115/230 VAC (power cord sold separately)                      | 93424              | 93425            |

Table 1-2. Part Numbers for 820i Models

### Option Cards

Table 1-3 lists the available 820i option cards. Most of the listed option cards are be installed in the expansion card slot, J6. USB, Ethernet, and fiber-optic interface cards are installed in connector J1.

| Option Card                               | PN     |
|-------------------------------------------|--------|
| Analog output card - Single               | 67602  |
| Analog output card - Dual                 | 103138 |
| Dual serial port expansion card           | 67604  |
| 24-channel digital I/O expansion card     | 67601  |
| 1MB NV RAM memory expansion card          | 67600  |
| Pulse input card                          | 67603  |
| Ethernet communications card              | 71986  |
| EtherNet/IP communications card           | 87803  |
| DeviceNet interface card                  | 68541  |
| Allen-Bradley Remote I/O interface card   | 68539  |
| Profibus DP interface card                | 68540  |
| Analog input card with thermocouple input | 87697  |
| USB interface card                        | 93245  |
| Ethernet interface card                   | 77142  |
| Fiber-optic interface card                | 77143  |
| ControlNet interface card                 | 103136 |

Table 1-3. Part Numbers for 820i Option Cards

### Relay Options

8-, 16-, and 24-channel relay racks are available for all 820i systems. Relays require an external enclosure for the relays. Consult factory for details.

### DC Power Supplies

Two DC power supplies are available for mobile 820i applications:

PN 97474, 9–36 VDC supply

PN 99480, 10–60 VDC supply

### Outdoor Display

An optional display, PN 100758, is available for applications requiring use of the 820i in bright, sunlit environments. Consult factory for details.

## 1.8 Summary of Changes

Changes to recent editions of this manual are listed below:

### Version 1.05

- Added **TOKENS** parameters to the **SERIAL** menu (see [Section 3.2.2 on page 36](#)).

### Version 1.04

- Added new EDP command SF#*n*. See Section 9.1.5 for more information.
- Added <AN> print token for alibi numbering. See Section 6.1 on page 52 for more information.
- Added front panel token selections for streaming. See Figure 3-9 for more information.
- Changed default **PFORMAT** port setting to the new **NONE** selection. See Figure 3-15 on page 40 for setting.

### Version 1.02

- Support for local/remote indicator configurations provides function equivalent to a legal-for-trade remote display with keypad for truck scale and similar applications. See [Section 10.4 on page 101](#) for more information.
- The description for setting rate of change (ROC) parameters has been changed. See [Table 3-3 on page 31](#) for details.
- New values have been added to the **STREAM** parameter on the **SERIAL** menu to allow streaming of keypad events to another indicator (4KEYS, KEYPAD) and, for the local/remote function, to send the complete display image (DISPLAY). See [Section 3.2.2 on page 36](#) for more information.
- New **IMAGE** parameter on the **FEATURE** menu allows inversion of the display image (blue-on-white or white-on-blue) for support of the outdoor display option. See [Section 3.2.3 on page 41](#) for more information.
- Display and printing of audit trail information is described in [Section 10.10 on page 110](#).

## 2.0 Installation

This section describes procedures for connecting load cell, digital I/O, and serial communications cables to the 820i indicator. Assembly drawings and replacement parts lists for the universal model are included for the service technician. See [Section 10.11 on page 111](#) for dimension drawings.



**CAUTION:** Use a wrist strap for grounding and to 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 820i. 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 820i to ensure all components are included and undamaged. The shipping carton should contain the indicator, this manual, and a parts kit. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

See [Section 2.9 on page 21](#) for parts kit contents.

### 2.2 Enclosure Disassembly

The indicator enclosure must be opened to install option cards and to connect cables for installed option cards.



**WARNING:** The 820i has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

1. Ensure power to the indicator is disconnected.
2. Place the indicator face-down on an anti static work mat.
3. Remove the screws that hold the backplate to the enclosure body.
4. Lift the backplate away from the enclosure and set it aside.

## 2.3 Cable Connections

The universal model of the 820i provides six cord grips for cabling into the indicator: one for the power cord, five to accommodate other cabling. Install plugs in all unused cord grips to prevent moisture from entering the enclosure.

### 2.3.1 Cable Specifications

| Cord Grip          | Diameter Range                |
|--------------------|-------------------------------|
| PG9 (PN 15626)     | 0.138 - 0.315 in (3.5 - 8 mm) |
| 1/2 NPT (PN 15628) | 0.197-0.472 in (5-12 mm)      |

Table 2-1. Cord Grip Specifications



**NOTE:** Cord grips torqued to 22 in-lb around cables and 33 in-lb to enclosure.

### 2.3.2 Cable Grounding

Except for the power cord, all cables routed through the cord grips should be grounded against the indicator enclosure. To ground shielded cables:

1. Use the lockwashers, clamps, and kep nuts provided in the parts kit to secure grounding clamps to the enclosure studs near the cord grips. Install clamps only for cord grips that will be used. Do not tighten nuts.
2. Route cables through cord grips and clamps to determine cable length required to reach cable connectors.
3. Mark cables to remove insulation and shield.
  - **Foil shielded cables** – strip insulation and foil from cable 1/2 inch (13 mm) past the grounding clamp (see [Figure 2-1](#)). Fold the foil shield back onto the cable where it passes through the clamp. Ensure silver (conductive) side of foil is outward to contact with the grounding clamp.
  - **Braided shielded cables** – strip cable insulation and shield to just past the clamp. Strip another 1/2 inch (15 mm) of insulation to expose the shield where it passes through the clamp (see [Figure 2-1](#)).
  - **Load cell cables** – cut the shield wire just past the grounding clamp. Shield wire function is provided by contact between the cable shield and the grounding clamp.

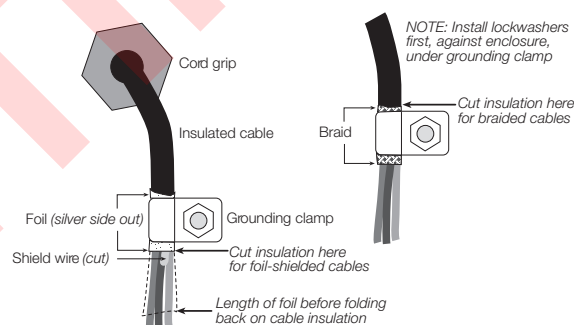


Figure 2-1. Grounding Cables

4. Route stripped cables through cord grips and clamps. Ensure shields contact clamps as shown in [Figure 2-1](#).
5. Tighten grounding clamp nuts.
6. Finish installation using cable ties to secure cables inside of indicator enclosure.

### 2.3.3 Load Cells

To attach cable from a load cell or junction box to the 820i:

1. Route the cable through the cord grip and ground the shield wire as described in [Section 2.3.2 on page 15](#).
2. Remove load cell connector J7 or J8 from CPU board.
3. Wire the load cell cable from the load cell or junction box to the connector as shown in [Table 2-2](#).
  - For 6-wire load cell cable (with sense wires), remove jumpers JP1 and JP2 before reinstalling connector J7.
  - For 4-wire installation, leave jumpers JP1 and JP2 on.
  - For 6-wire load cell connections on dual-channel A/D cards, remove jumpers JP3 and JP4 for connections to J8.

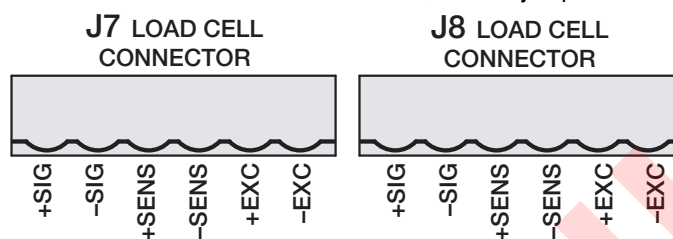


Figure 2-2. Load Cell Connectors

4. When connections are complete, reinstall load cell connector on the CPU board header and use two cable ties to secure the load cell cable to the inside of the enclosure.

| J7 or J8<br>Connector Pin                                                                                                                                                          | Function |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1                                                                                                                                                                                  | +SIG     |
| 2                                                                                                                                                                                  | -SIG     |
| 3                                                                                                                                                                                  | +SENSE   |
| 4                                                                                                                                                                                  | -SENSE   |
| 5                                                                                                                                                                                  | +EXC     |
| 6                                                                                                                                                                                  | -EXC     |
| •For 6-wire load cell connections to connector J7, remove jumpers JP1 and JP2.<br>•For 6-wire load cell connections to connector J8 (dual A/D boards), remove jumpers JP3 and JP4. |          |

Table 2-2. Load Cell Connector Pin Assignments

### 2.3.4 Serial Communications

Communications ports on the 820i CPU board support PS/2-type remote keyboard, full duplex RS-232, 20 mA output, or RS-485 communications at up to 115200 bps. Optional communications cards support USB, Ethernet, and fiber-optic connections to the 820i.

To attach serial communications cables:

1. Route the cable through the cord grip and ground the shield wire as described in [Section 2.3.2 on page 15](#).
2. Remove the serial connector from the CPU board
3. Wire cable to the connector.
4. Plug the connector into the header on the board.
5. Use cable ties to secure serial cables to the inside of the enclosure.

Table 2-3 shows the pin assignments for Ports 1, 2, and 4. Port 1 supports remote keyboard attachment of PS/2-type personal computer keyboards (see [Section 10.9 on page 109](#) for information about the PS/2 keyboard interface.)

| Connector | Pin | Signal     | Port |
|-----------|-----|------------|------|
| J9        | 1   | CLK        | 1    |
|           | 2   | +5V        |      |
|           | 3   | GND        |      |
|           | 4   | DATA       |      |
| J10       | 1   | GND        | 2    |
|           | 2   | RS-232 RxD |      |
|           | 3   | RS-232 TxD |      |
|           | 4   | RS-232 RTS |      |
|           | 5   | RS-232 CTS |      |
|           | 6   | GND        |      |
| J11       | 1   | GND        | 4    |
|           | 2   | N/C        |      |
|           | 3   | N/C        |      |
|           | 4   | RS-485 A   |      |
|           | 5   | RS-485 B   |      |
|           | 6   | +20mA OUT  |      |
|           | 7   | -20mA OUT  |      |
|           | 8   | GND        |      |
|           | 9   | RS-232 RxD |      |
|           | 10  | RS-232 TxD |      |

Table 2-3. Serial Port Pin Assignments

Serial ports are configured using the **SERIAL** menu. See [Section 3.2.2 on page 36](#) for configuration information.

An optional dual-channel serial communications expansion card, PN 67604, is available. The serial expansion card provides two additional serial ports, assigned as port numbers 7 and 8. One port on the serial expansion card supports four-wire RS-485 communications. Both ports on the expansion card can support RS-232 or 20mA connections.

Port 3 uses connector J1 to support USB, Ethernet, and fiber-optic interface cards.



**NOTE:** Installation of option cards in connector J1 requires removal of the J1/J10 port selection jumper (see [Figure 2-3 on page 19](#)). Removing the jumper disables RS-232 communications through connector J10. For the USB interface card only, connections for simultaneous RS-232 (configured as Port 3) and USB communications (Port 2) are provided on the USB interface card.

See the communications interface card installation instructions for more information.

### 2.3.5 Digital I/O

Digital inputs can be set to provide many indicator functions, including all keypad functions. Digital inputs are active low (0 VDC), inactive high (5 VDC).

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 24 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.

Table 2-4 shows the pin assignments for connector J5.

| J5 Pin | J5 Signal |
|--------|-----------|
| 1      | +5 VDC    |
| 2      | GND       |
| 3      | DIO 1     |
| 4      | DIO 2     |
| 5      | DIO 3     |
| 6      | DIO 4     |
| 7      | DIO 5     |
| 8      | DIO 6     |
| 9      | DIO 7     |
| 10     | DIO 8     |

Table 2-4. J5 Pin Assignments (Digital I/O)

Digital inputs and outputs are configured using the DIG I/O menu. See Section 3.2.7 on page 48 for configuration information. An optional 24-channel digital I/O expansion card, PN 67601, is available for applications requiring more digital I/O channels.



**NOTE:** Digital I/O points can be configured to count active pulse inputs by setting them to PROGIN (DIGIN menu) and using the iRite-IDE DigInSsBb Activate handler with a timer to turn the handler on and off. However, the fastest pulse rate that can be counted using a digital input is 10Hz (10 pulses per second). More demanding applications can use the pulse input option card (PN 67603) to count pulses in the 4–4000Hz range.

## 2.4 Installing Option Cards



**NOTE:** Each option card is shipped with installation instructions specific to that card.



**CAUTION:** Option cards are not hot-pluggable. Disconnect power to the 820i before installing option cards.

#### General installation of options cards:

1. Disconnect power to the indicator.
2. Remove backplate as described in Section 2.2 on page 14.
3. Carefully align the large option card connector with connector J6 on the CPU board (see Figure 2-3 on page 19) or J1.
4. Press down to seat the option card in the CPU board connector.
5. Use the screws provided in the option kit to secure the option card to the threaded standoffs on the CPU board (see Figure 2-3 on page 19).
6. Make connections to the option card as required.
7. Use cable ties to secure loose cables inside the enclosure.
8. Reassemble the enclosure as described in Section 2.6 on page 20.

The 820i automatically recognizes all installed option cards when the unit is powered on. No hardware-specific configuration is required to identify the newly-installed card to the system.

## J6 EXPANSION CARD SLOT

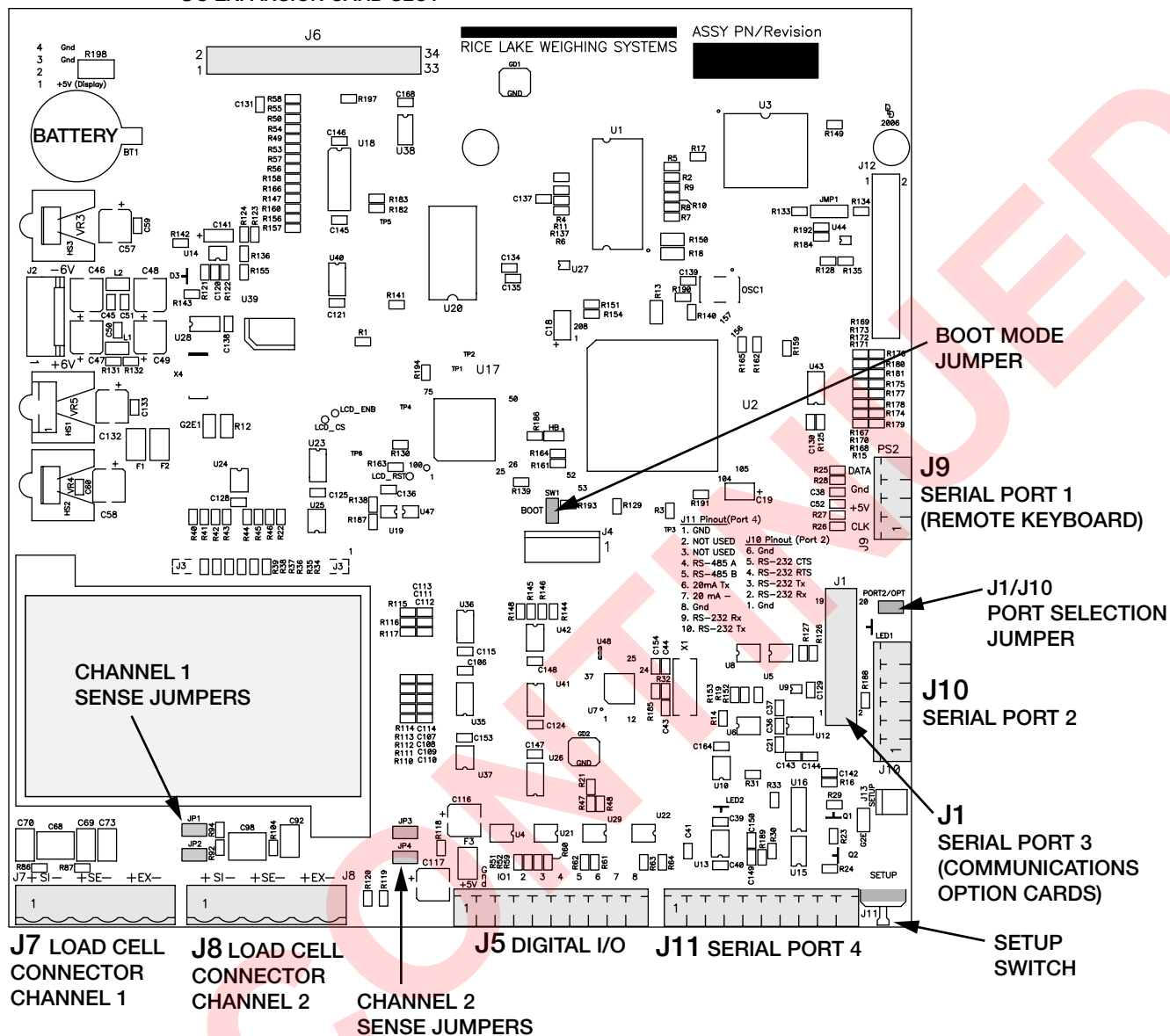


Figure 2-3. 820i CPU Board

## 2.5 Slot Assignments

Table 2-5 lists the slot numbers, CPU board connectors, and configuration assignments made for both onboard and expansion card functions in the 820i. See Figure 2-3 on page 19 for connector locations.

| Slot Number | Connector                       | Function                            | Configured As        |
|-------------|---------------------------------|-------------------------------------|----------------------|
| 0           | Connector J5                    | Onboard digital I/O                 | Slot 0, bits 1–8     |
|             | Connectors J9, J1, J10, J11     | Onboard serial communications       | Ports 1–4            |
| 1           | Connectors J7, J8               | Onboard single- or dual-channel A/D | Channel 1, Channel 2 |
| 2           | Connector J6 (option card slot) | Dual-channel serial expansion card  | Ports 7–8            |
|             |                                 | Digital I/O expansion card          | Slot 2, bits 1–24    |
|             |                                 | Analog input card                   | Slot 2, channels 1–2 |
|             |                                 | Analog output card                  | Analog 2             |
|             |                                 | Pulse input card                    | Pulse 2              |
|             |                                 | Memory expansion card               | Memory 2             |
|             |                                 | Bus communications cards            | Bus Option 2         |

Table 2-5. 820i Slot Assignments

## 2.6 Enclosure Reassembly

Once cabling is complete, position the backplate over the enclosure and reinstall the backplate screws. Use the torque pattern shown in Figure 2-4 to prevent distorting the backplate gasket. Torque screws to 15 in-lb (1.7 N-m).

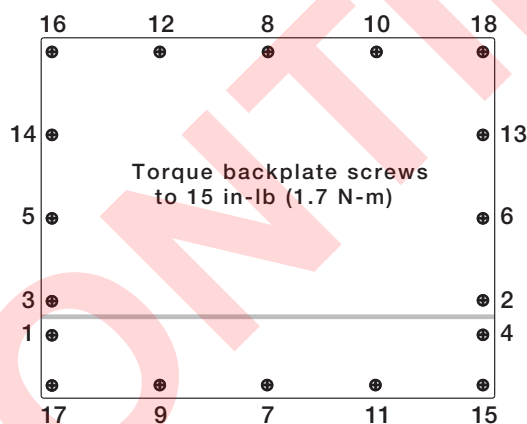


Figure 2-4. 820i Enclosure Backplate



**IMPORTANT:** Torqued screws may become less tight as the gasket is compressed during torque pattern, therefore a second torque is required using the same pattern and torque value.

## 2.7 CPU Board Removal

Removing the 820i CPU board:

1. Disconnect power to the indicator.
2. Remove backplate as described in Section 2.2 on page 14.
3. Unplug connectors for power to the board, serial communications, digital I/O, and any installed option cards.
4. Remove any installed option cards.
5. Remove the five Phillips head screws and two key nuts from the CPU board.
6. Gently lift up the CPU board, then disconnect bottom-side connectors for power to display, ribbon cable, and keypad connector.
7. Remove CPU board from the enclosure. If necessary, cut cable ties to shift cables out of the way.

To replace the CPU board, reverse the above procedure. Be sure to reinstall cable ties to secure all cables inside the indicator enclosure.

## 2.8 Battery Replacement

The lithium battery on the CPU board maintains the real-time clock and protects data stored in the system RAM when the indicator is not connected to AC power. Data protected includes time and date, truck and tare memory, onboard database information, and setpoint configuration.

Use *Revolution* to store a copy of the indicator configuration on a PC before attempting battery replacement. If data is lost, the indicator configuration can be restored from the PC.

A low battery warning on the LCD display will display when battery needs to be replaced.

Battery voltage on the CPU board and on installed memory option cards should be checked periodically. If battery voltage is to 2.2 VDC or less, replace the battery. Life expectancy of the battery is ten years.

### Replacement Procedure

**Replace the battery while in weigh mode and AC power applied.** Use care not to bend the battery retaining spring.

If the battery must be replaced with power removed, immediately after restoring power:

1. Place indicator in setup mode.
2. Navigate to the **Version** menu and press the **Reset Config** softkey. If connected using *Revolution*, configuration can be reset by using monitor mode to enter the **RESETCONFIGURATION** command followed by the **RS** command.

See [Figure 2-3 on page 19](#) for CPU board battery location and orientation (positive side up).



**CAUTION:** Risk of explosion if battery is replaced with incorrect type. Dispose of batteries per manufacturer instruction.

## 2.9 Parts Kit Contents

[Table 2-6](#) lists the parts kit contents for the universal model of the 820i.

| Part No. | Description                                                                   | Qty |
|----------|-------------------------------------------------------------------------------|-----|
| 14626    | Kep nuts, 8-32NC                                                              | 3   |
| 14862    | Machine screws, 8-32NC x 3/8                                                  | 12  |
| 75062    | Sealing washers                                                               | 14  |
| 15133    | Lock washers, No. 8, Type A                                                   | 5   |
| 30623    | Machine screws, 8-32NC x 7/16                                                 | 2   |
| 15631    | Cable ties                                                                    | 8   |
| 15665    | Reducing gland for 1/2 NPT cord grip                                          | 1   |
| 15887    | 6-position screw terminal for load cell connection (1–single A/D, 2–dual A/D) |     |
| 19538    | Cord grip plugs                                                               | 4   |
| 94422    | Capacity label                                                                | 1   |
| 53075    | Cable shield ground clamps                                                    | 5   |
| 76514    | 6-position screw terminal for J10                                             | 1   |
| 76513    | 4-position screw terminal for J9                                              | 1   |
| 71344    | 10-position screw terminals for J5 and J11                                    | 2   |
| 42149    | Rubber feet for tilt stand                                                    | 4   |
| 103988   | Nylon washers for tilt stand                                                  | 2   |
| 103610   | Knobs for tilt stand                                                          | 2   |
| 77925    | Indicator/HMI Software Tool Kit CD                                            | 1   |

Table 2-6. Parts Kit Contents (PN 94139)

## 2.10 Universal Replacement Parts



**NOTE:** For replacement parts information for the panel mount enclosures, see the 820i Panel Mount Installation Instructions, PN 95304.

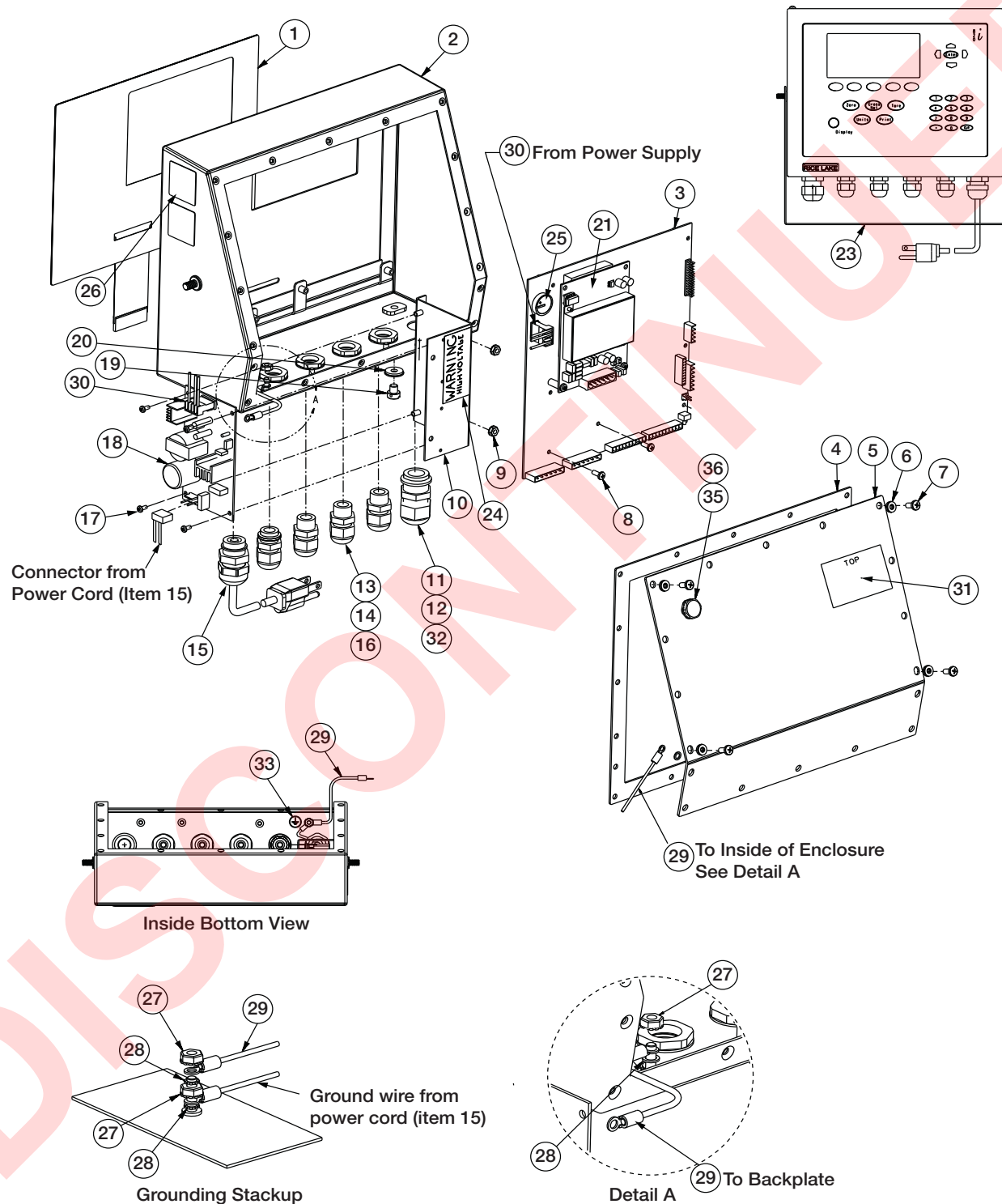


Figure 2-5. 820i Universal Model Replacement Parts

| Item No. | Part No. | Description                                                   | Qty |
|----------|----------|---------------------------------------------------------------|-----|
| 1        | 93247    | Switch panel membrane                                         | 1   |
| 2        | 93618    | Enclosure, universal                                          | 1   |
| 3        | 102331   | CPU board with single-channel A/D                             | 1   |
|          | 102333   | CPU board with dual-channel A/D                               | 1   |
| 4        | 67532    | Backplate gasket, universal                                   | 1   |
| 5        | 68424    | Enclosure backplate, universal                                | 1   |
| 6        | 75062    | Sealing washers*                                              | 4   |
| 7        | 14862    | Machine screws, 8-32NC x 3/8*                                 | 4   |
| 8        | 14839    | Machine screws, 6-32NC x 1/4                                  | 3   |
| 9        | 58248    | Lock nuts, 6-32NC, nylon                                      | 2   |
| 10       | 94392    | Power supply bracket                                          | 1   |
| 11       | 15628    | Cord grip, 1/2 NPT                                            | 1   |
| 12       | 15630    | Lock nut for 1/2 NPT cord grip                                | 1   |
| 13       | 15626    | Cord grips, PG9                                               | 4   |
| 14       | 15627    | Lock nuts, PCN9                                               | 4   |
| 15       | 85202    | Power cord assembly, 115 VAC and 230 VAC North American units | 1   |
|          | 85203    | Power cord assembly, 230 VAC European units                   | 1   |
| 16       | 30375    | Nylon seal rings for PG9 cord grips                           | 4   |
| 17       | 14822    | Machine screws, 4-40NC x 1/4                                  | 4   |
| 18       | 67613    | Power supply, $\pm 6$ VDC, 25W                                | 1   |
| 19       | 42640    | Setup switch access screw, 1/4 x 28NF x 1/4                   | 1   |
| 20       | 44676    | Sealing washer for setup switch access screw                  | 1   |
| 23       | 67531    | Tilt stand                                                    | 1   |
| 24       | 16861    | High voltage warning label                                    | 1   |
| 25       | 69291    | 3V Lithium coin battery                                       | 1   |
| 26       | 53308    | Model/serial number label                                     | 1   |
| 27       | 14626    | Kep nuts, 8-32NC*                                             | 3   |
| 28       | 15134    | Lock washers, No. 8, Type A                                   | 3   |
| 29       | 45043    | Ground wire, 4 in w/ No. 8 eye connector                      | 1   |
| 30       | 67796    | Power supply cable assembly, to CPU board                     | 1   |
| 31       | 53307    | Label                                                         | 1   |
| 32       | 30376    | Nylon seal ring for 1/2 NPT cord grip                         | 1   |
| 33       | 16892    | Ground/Earth label                                            | 1   |
| 35       | 88733    | Vent, breather sealed                                         | 1   |
| 36       | 88734    | Nut, breather vent                                            | 1   |
| —        | 93246    | Display board assembly                                        | 1   |

\* Additional parts included in parts kit.

Table 2-7. 820i Universal Model Replacement Parts List

## 3.0 Configuration

To configure the 820i indicator, the indicator must be placed in setup mode. The setup switch is accessed by removing the large fillister head screw on the bottom of the enclosure. Switch position is changed by inserting a screwdriver into the access hole and pressing the switch.

When the indicator is placed in setup mode, a series of menus is shown across the top of the display, along with the words **Scale Configuration**. The SCALES menu is highlighted as the first used to configure the indicator. Detailed descriptions of these menus are provided in [Section 3.2 on page 26](#).

When configuration is complete, press the **Exit** or **Save and Exit** softkey to exit setup mode, then replace the setup switch access screw.

- The **Exit** softkey exits setup mode without saving parameter changes to NV RAM. Changes made to the configuration remain in the system until indicator power is cycled.
- **Save and Exit** writes all parameter changes to NV RAM before returning to normal mode.

### 3.1 Configuration Methods

The 820i 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 an indicator serial port. Configuration using the menus is described in [Section 3.1.3 on page 25](#).

Configuration using the serial port can be accomplished using either the serial command set described in [Section 9.0 on page 86](#) or the *Revolution*® configuration utility.



**NOTE:** Some configuration parameters, such as those used to configure the 820i display, cannot be accessed through the configuration menus. *Revolution* provides the most complete and efficient configuration interface for the 820i.

#### 3.1.1 Revolution Configuration

The *Revolution* configuration utility provides the preferred method for configuring the 820i 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.

*Revolution* supports both uploading and downloading of indicator configuration data. This capability allows configuration data to be retrieved from one indicator, edited, then downloaded to another indicator with an identical hardware configuration.

To use *Revolution*, do the following:

1. Install *Revolution* on an IBM-compatible personal computer. See [Section 5.0 on page 56](#) for detailed hardware and software requirements.
2. With both indicator and PC powered off, connect the PC serial port to the RS-232 pins on the indicator serial port or to the optional USB communications card.
3. Power up the PC and the indicator. Use the setup switch to place the indicator in setup mode.
4. Start the *Revolution* program.

*Revolution* provides online help for each of its configuration displays. Parameter descriptions provided in this manual for front panel configuration can also be used when configuring the indicator using *Revolution*: The interface is different, but the parameters set are the same.

See [Section 5.0 on page 56](#) for more information about using *Revolution* to configure the 820i.

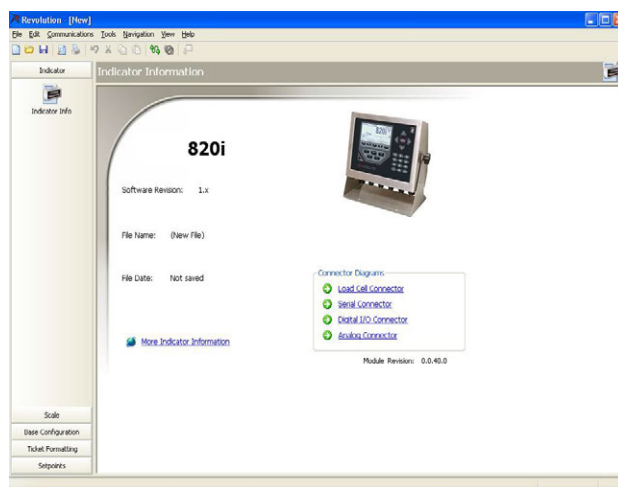


Figure 3-1. Revolution Display

### 3.1.2 Serial Command Configuration

The serial command set can be used to configure the 820i indicator using either a personal computer, terminal, or remote keyboard. Like *Revolution*, serial command configuration sends commands to the indicator serial port; unlike *Revolution*, serial commands can be sent using any external device capable of sending ASCII characters over a serial connection.

Serial commands duplicate the functions available using the indicator front panel and provide some functions not otherwise available. Serial commands can be used to simulate pressing front panel keys, to configure the indicator, or to dump lists of parameter settings. See [Section 9.0 on page 86](#) for more information about using the serial command set.

### 3.1.3 Front Panel Configuration

Use the CONFIG submenu under the SCALES menu to configure A/D scales. For example, in an indicator with a single-channel A/D card installed in Slot 1, the Scale Configuration display will show the A/D listed (**Slot 1 Channel 1**) under the **AVAILABLE A/D's** column. Use the **left** navigation key to select the A/D, then press the center softkey, **Add**. The A/D is then moved to the Associated A/D's column. If no other A/D's are listed in the **AVAILABLE A/D's** column, the center softkey changes to **Done**, as shown in [Figure 3-2](#). Press **Done** to exit the Scale Configuration display.

See [Section 10.3 on page 101](#) for information about configuring serial scales.

|                 |                                         |                                          |           |
|-----------------|-----------------------------------------|------------------------------------------|-----------|
| 05/24/2006      |                                         | 02:22PM                                  |           |
| — SCALE 2       |                                         | CONFIG                                   | SCALE 1 — |
| AVAILABLE A/D's | SCALES<br>Scale 1<br>Scale 2<br>Scale 3 | ASSOCIATED A/D's<br><br>Slot 1 Channel 1 |           |
|                 |                                         |                                          |           |
|                 | Change Type                             | Done                                     |           |

Figure 3-2. Scale Configuration Display

### 3.1.4 Multi-Range and Multi-Interval Scales

The 820i supports multi-range and multi-interval scales of either two or three ranges or intervals.

**Multi-range scales** provide two or three ranges, each extending from zero to the maximum capacity specified for the range, that can specify different scale intervals (graduations). The scale interval changes as the applied weight increases but does not reset to lower range intervals until the scale returns to zero.

**Multi-interval scales** divide the scale into two or three partial weighing ranges, each with different scale intervals. The scale interval changes with both increasing and decreasing loads applied.

To configure a multi-range or multi-interval scale, use the SPLIT parameter to select 2RNG or 3RNG (for multi-range scales), or 2INTVL or 3INTVL (for multi-interval scales). Selecting a SPLIT value other than OFF allows specification of decimal point, display divisions, and maximum capacity for each range or interval.

The SPLIT parameter is used to enable multi-range or multi-interval. The SPLIT parameter is in the SCALES menu, see [Figure 3-4 on page 27](#), and Table 3-2. After setting the SPLIT parameter, the **Format** menu selection will change as shown in [Figure 3-6 on page 33](#), and Table 3-4.

If using streaming with multi-range or multi-interval, the stream must be set to Custom in *Revolution*. The Tokens for Secondary and Tertiary Units must be set to L or K to match the Primary, refer to the Serial Menu, Tokens Parameter, in [Section 3.2.2 on page 36](#). They can be set using *Revolution* or through the front panel.

In multi-range, each range has its own capacity and display division, extending from zero. The scale display division will increase at the entered range capacities, either two or three ranges. Once the range has increased to the next level, the display division will remain in new range until the scale returns to zero. The tare value can be taken in any range.

For example,

Range 1 is 0 - 3000 x 1 lb.

Range 2 is 0 - 10,000 x 5 lb.

In multi-interval, the scale has one capacity, which is segmented into weighing intervals, either two or three intervals, each with different display division sizes. As the weight value exceeds an interval or set interval, the display division will increase, as the weight falls below an interval or set interval, the display division will decrease. The tare can only be taken in the first interval.

For example,

Range 1 is 0-30 x 0.01 lb.

Range 2 is 30 - 60 x 0.02 lbs.

### 3.1.5 Total Scale Configuration

The output of A/D scales, serial scales, or *iQUBE* systems can be configured to function as a total scale. Once configured and calibrated, the total scale can be used as a source for other system functions, including streaming, setpoints, print formatting, and analog output.

To set up a total scale from the indicator front panel, use the scale configuration display (see [Figure 3-2 on page 25](#)) to select the A/D scales or *iQUBE* systems to configure as a total scale. (Use the **Change Type** softkey to show available A/D scales or *iQUBE* systems; use the right navigation key to select the total scale sources.) In *Revolution*, assign the total scale to an unused position then select source scales from the existing A/D scales or *iQUBE* systems.

The FORMAT configuration of the total scale (see [Figure 3-5 on page 30](#)) should match that of the source scales. However, the value specified for the total scale GRADS parameter should be specified as the sum of the GRADS values for the source scales. For example: if SCALE 1 is set to GRADS=10000, SCALE 2 to GRADS=5000, SCALE 3 (the total scale) should be set to 15000 grads.

The total scale will show an overrange indication if the maximum capacity of any source scale is exceeded, and show dashes if any source scale reads a negative value. Source scales will respond to Tare and Zero operations performed on the total scale.



**NOTE:** Total scale function is not supported for multi-range or multi-interval scales at this time.

## 3.2 Menu Structures and Parameter Descriptions

The 820i 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.

| Menu    |                  | Menu Function                                                                                                                                                               |
|---------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCALES  | Configuration    | Configure and calibrate scales.                                                                                                                                             |
| SERIAL  | Serial           | Configure communications ports.                                                                                                                                             |
| FEATURE | Feature          | Set date and time formats, truck mode, passwords, keyboard locks, regulatory mode, and initial consecutive number value, define softkeys and setpoint prompts.              |
| DISPLAY | Display Features | Adjust display contrast and set backlighting on or off.<br>Set number of scale widgets shown (1 or 2).                                                                      |
| PFORMT  | Print Format     | Set print format used for header, gross, net, truck in/out, setpoint, and auxiliary ticket formats. See <a href="#">Section 6.0 on page 60</a> for more information.        |
| SETPTS  | Setpoints        | Configure setpoints and batching mode.                                                                                                                                      |
| DIG I/O | Digital I/O      | Assign digital input/output functions.                                                                                                                                      |
| ALGOUT  | Analog Output    | Configure analog output module. Used only if analog output option is installed.                                                                                             |
| VERSION | Version          | Display installed software version number. The <b>Reset Config</b> softkey on the Version menu can be used to restore all configuration parameters to their default values. |

Table 3-1. 820i Menu Summary

The following sections provide graphic representations of the 820i menu structures and tables describing the menu parameters. Default values are shown in **bold** type; numeric ranges and string values are shown in *italic* type. Parameters shown surrounded by a dotted-line box only appear under the special circumstances explained under each box.



Figure 3-3. Configuration Menu Flow

### 3.2.1 SCALES Menu

The SCALES menu is shown in Figure 3-4. The FORMAT submenu is shown in Figure 3-5 on page 30; the CALIBR submenu is shown in Figure 3-7 on page 35. Parameters shown in each diagram are described in the table following that diagram.

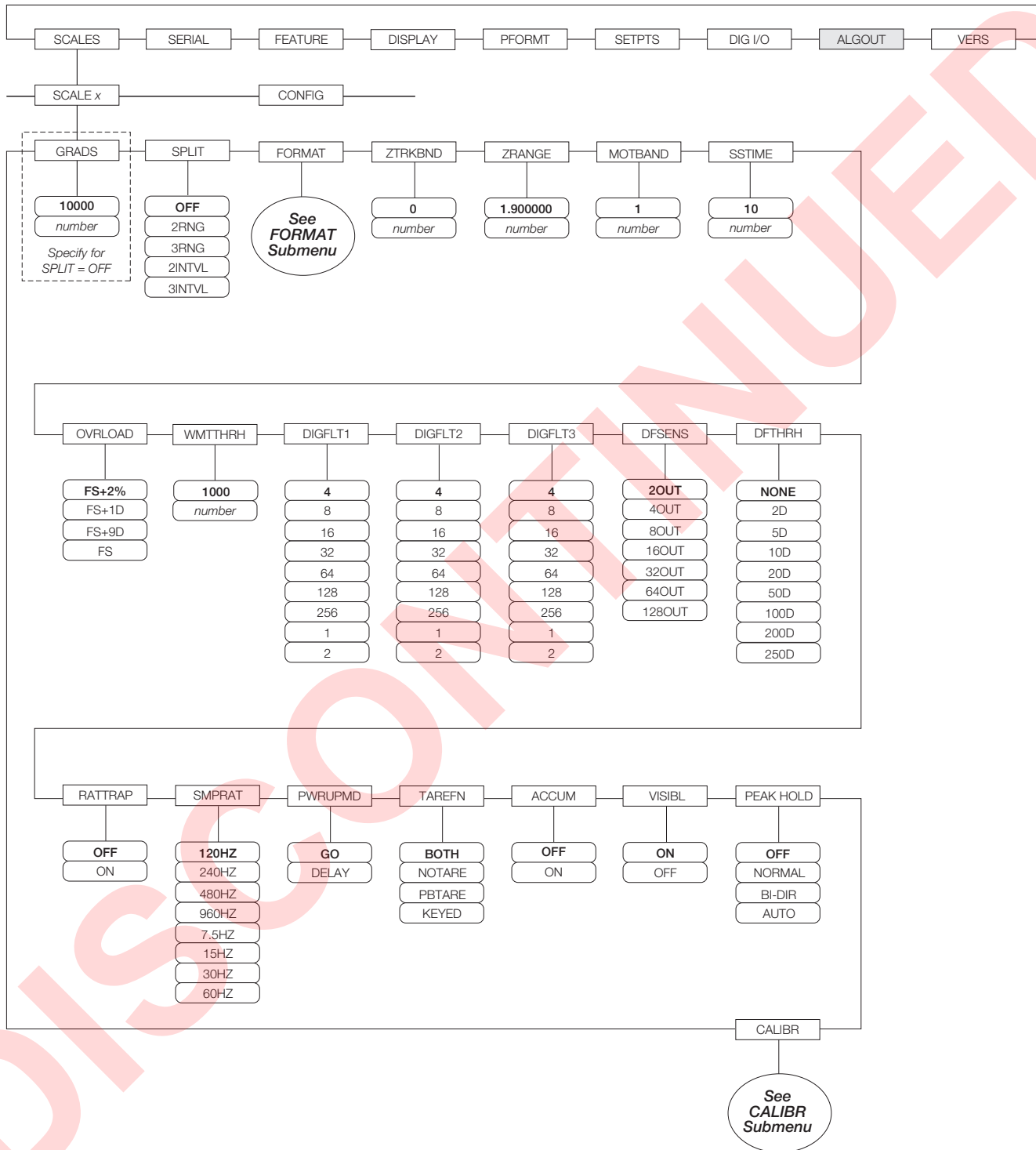


Figure 3-4. SCALES Menu

| Parameter                     | Choices                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 2 submenus              |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SCALEX                        |                                                  | Allows configuration and calibration of each scale                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CONFIG                        |                                                  | Lists available and associated A/Ds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Level 3 submenus              |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| GRADS                         | 10000<br>1-9999999                               | Specifies the number of full scale graduations if SPLIT=OFF. (For multi-range and multi-interval scales (SPLIT ≠ OFF), the GRADS value is derived from the capacity and display divisions specified for the range or interval.) The value entered must be in the range 1-9999999 and should be consistent with legal requirements and environmental limits on system resolution.<br>To calculate GRADS, use the formula: $GRADS = Capacity / Display Divisions$ .<br>Display divisions are specified under the FORMAT submenu.                                                                              |
| SPLIT                         | OFF<br>2RNG<br>3RNG<br>2INTVL<br>3INTVL          | Specifies whether the scale is full-range (OFF), multi-range (2RNG, 3RNG), or multi-interval (2INTVL, 3INTVL). For multi-range and multi-interval scales, see the submenu shown in <a href="#">Figure 3-6 on page 33</a> and parameter descriptions in <a href="#">Figure 3-4 on page 34</a> .                                                                                                                                                                                                                                                                                                              |
| FORMAT                        | PRIMAR<br>SECNDR<br>TERTIA<br>ROC                | For standard scales (SPLIT=OFF), see Level 4 submenu descriptions in Table 3-3.<br>For multi-range and multi-interval scales, see Table 3-4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ZTRKBND                       | 0<br>number                                      | Automatically zeroes the scale when within the range specified, as long as the input is within the ZRANGE and scale is at standstill. Specify the zero tracking band in ± display divisions. Maximum legal value varies depending on local regulations.<br><b>NOTE: For scales using linear calibration, do not set the zero tracking band to a value greater than that specified for the first linearization point.</b>                                                                                                                                                                                    |
| ZRANGE                        | 1.900000<br>number                               | Selects the range within which the scale can be zeroed. The 1.900000 default value is ± 1.9% around the calibrated zero point, for a total range of 3.8%. Indicator must be at standstill to zero the scale. Use the default value for legal-for-trade applications.                                                                                                                                                                                                                                                                                                                                        |
| MOTBAND                       | 1<br>number                                      | Sets the level, in display divisions, at which scale motion is detected. If motion is not detected for 1 second or more, the standstill symbol lights. Some operations, including print, tare, and zero, require the scale to be at standstill. Maximum legal value varies depending on local regulations.<br>If this parameter is set to 0 the standstill annunciator does not light; operations normally requiring standstill (zero, tare, print) are performed regardless of scale motion. If 0 is selected, ZTRKBND must also be set to 0.                                                              |
| SSTIME                        | 10<br>number                                     | Specifies the length of time the scale must be out of motion, in 0.1-second intervals, before the scale is considered to be at standstill. Values greater than 10 are not recommended.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| OVRLOAD                       | FS+2%<br>FS+1D<br>FS+9D<br>FS                    | Determines the point at which the display blanks and an out-of-range error message is displayed. Maximum legal value varies depending on local regulations.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| WMTTHR                        | 1000<br>number                                   | Specifies the minimum number of grads required for a weightment to be added to the recorded number of weightments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| DIGFLT1<br>DIGFLT2<br>DIGFLT3 | 4<br>8<br>16<br>32<br>64<br>128<br>256<br>1<br>2 | Selects the digital filtering rate used to reduce the effects of mechanical vibration from the immediate area of the scale. Choices indicate the number of A/D conversions per update that are averaged to obtain the displayed reading. A higher number gives a more accurate display by minimizing the effect of a few noisy readings, but slows down the settling rate of the indicator.<br><b>NOTE: When configuring non-A/D scales, set the DIGFLT<sub>x</sub> parameters to 1 to disable filtering.</b><br>See <a href="#">Section 10.7 on page 105</a> for more information about digital filtering. |

Table 3-2. SCALES Menu Parameters

| Parameter | Choices                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DFSENS    | 20OUT<br>40OUT<br>80OUT<br>160OUT<br>320OUT<br>640OUT<br>1280OUT  | Digital filter cutout sensitivity. Specifies the number of consecutive readings that must fall outside the filter threshold (DFTHRH parameter) before digital filtering is suspended.<br>See <a href="#">Section 10.7 on page 105</a> for more information about digital filtering.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DFTHRH    | NONE<br>2D<br>5D<br>10D<br>20D<br>50D<br>100D<br>200D<br>250D     | Digital filter cutout threshold. Specifies the filter threshold, in display divisions. When a specified number of consecutive scale readings (DFSENS parameter) fall outside of this threshold, digital filtering is suspended. If NONE is selected, the filter is always enabled.<br>See <a href="#">Section 10.7 on page 105</a> for more information about digital filtering.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| RATTRAP   | OFF<br>ON                                                         | Enables RATTLETRAP® digital filtering. RATTLETRAP is most effective at filtering repeating vibrations caused by mechanical noise from nearby machines but may increase settling times over standard digital filter selections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SMPRAT    | 120HZ<br>240HZ<br>480HZ<br>960HZ<br>7.5HZ<br>15HZ<br>30HZ<br>60HZ | Sample rate. Selects measurement rate, in samples per second, of the analog-to-digital converter. Lower sample rate values provide greater signal noise immunity: the default 120 Hz value may be too fast to provide the desired stability in some static weighing applications.<br><br><b>NOTE: The maximum total sample rate for all configured A/D channels—the sum of the sample rates for all scales—is 1200 Hz.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| PWRUPMD   | GO<br>DELAY                                                       | Power up mode. In GO mode, the indicator goes into operation immediately after a brief power up display test. In DELAY mode, the indicator performs a power up display test, then enters a 30-second warm up period. If no motion is detected during the warm up period, the indicator becomes operational when the warm up period ends; if motion is detected, the delay timer is reset and the warm up period repeated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| TAREFN    | BOTH<br>NOTARE<br>PBTARE<br>KEYED                                 | Enables or disables push-button and keyed tares. Possible values are:<br>BOTH: Both push-button and keyed tares are enabled<br>NOTARE: No tare allowed (gross mode only)<br>PBTARE: Push-button tares enabled<br>KEYED: Keyed tare enabled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ACCUM     | OFF<br>ON                                                         | Accumulator. Specifies whether the scale accumulator is enabled. If enabled, accumulation occurs whenever a print operation is performed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| VISIBL    | ON<br>OFF                                                         | Scale visibility. Specifies whether scale data is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| PEAK HOLD | OFF<br>NORMAL<br>BI-DIR<br>AUTO                                   | Peak hold. Used to determine, display, and print the greatest net weight read during a weighing cycle. The weighing cycle ends when a print command is executed (AUTO setting) or when the peak weight is cleared by pressing <b>ZERO</b> or <b>PRINT</b> . Press <b>GROSS/NET</b> to display gross weight data when using the peak hold function.<br>OFFPeak hold function is off.<br>NORMALPositive peak, manual reset. Greatest net weight is held in memory until the weight is removed from the scale and either the <b>ZERO</b> or <b>PRINT</b> key is pressed.<br>BI-DIRBi-directional peak, manual reset. Same as NORMAL, but peak value can be either positive or negative, determined by absolute value.<br>AUTOPositive peak, auto print, auto reset. Automatic print occurs when scale load is $0 \pm 10$ display divisions and at standstill. Following the print command, the peak value is cleared and reset automatically. |
| CALIBR    | WZERO<br>WVAL<br>WSPAN<br>WLIN<br>REZERO                          | See Level 4 submenu descriptions in <a href="#">Table 3-5 on page 35</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Table 3-2. SCALES Menu Parameters (Continued)

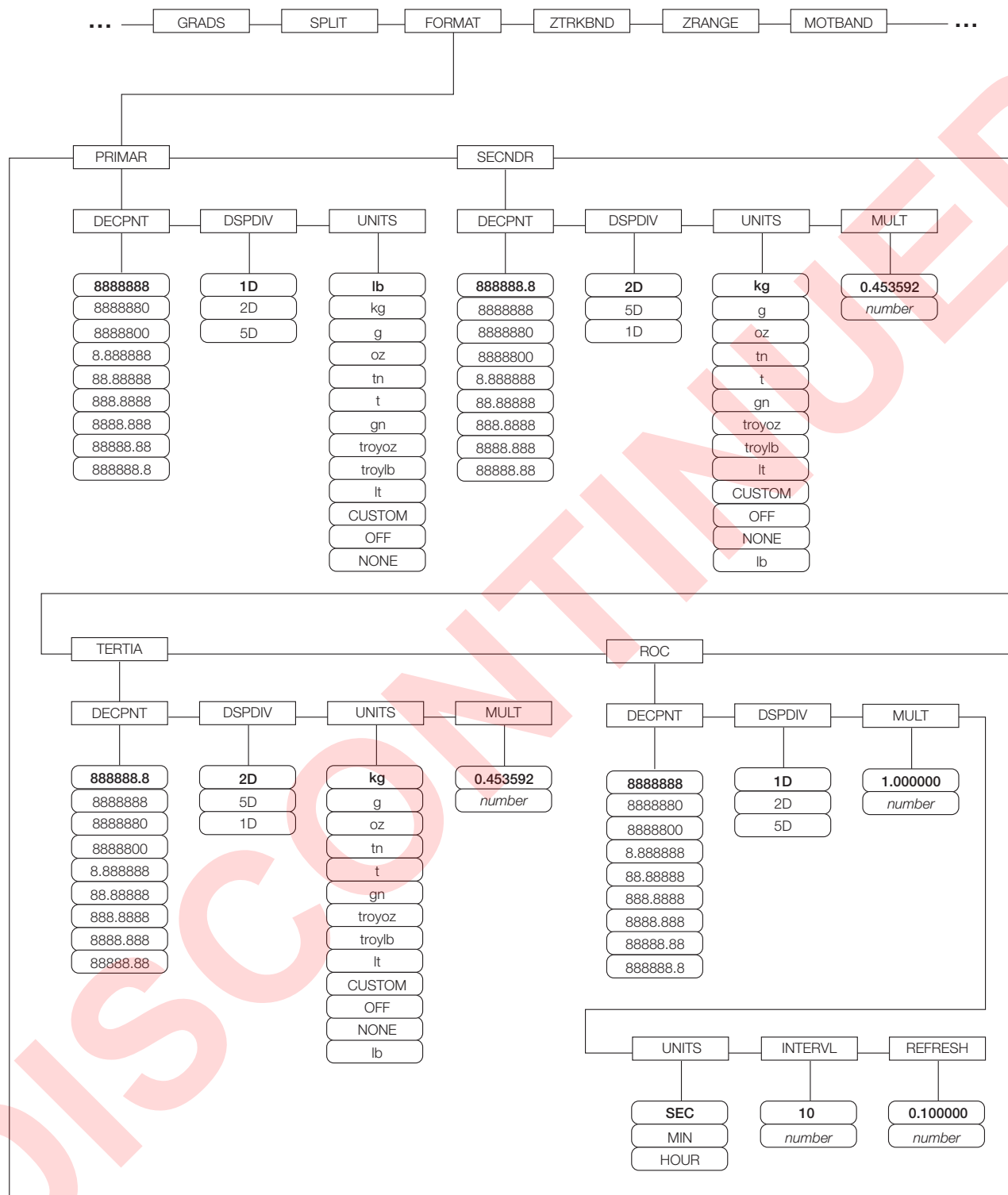


Figure 3-5. SCALES Menu, FORMAT Submenu, SPLIT = OFF

| Parameter                         | Choices                                                                                               | Description                                                                                                                                                                                                |
|-----------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 4, FORMAT submenu           |                                                                                                       |                                                                                                                                                                                                            |
| PRIMAR                            | DECPNT<br>DSPDIV<br>UNITS                                                                             | Specifies the decimal position, display divisions, and units used for the primary units. See Level 5 submenu parameter descriptions.                                                                       |
| SECNDR                            | DECPNT<br>DSPDIV<br>UNITS<br>MULT                                                                     | Specifies the decimal position, display divisions, units, and conversion multiplier used for the secondary units. See Level 5 submenu parameter descriptions.                                              |
| TERTIA                            | DECPNT<br>DSPDIV<br>UNITS<br>MULT                                                                     | Specifies the decimal position, display divisions, units, and conversion multiplier used for the tertiary units. See Level 5 submenu parameter descriptions.                                               |
| ROC                               | DECPNT<br>DSPDIV<br>MULT<br>TIME<br>INTERVL<br>REFRESH                                                | Specifies the decimal position, display divisions, conversion multiplier, time units, update interval, and refresh interval used for the rate of change units. See Level 5 submenu parameter descriptions. |
| Level 5 submenus                  |                                                                                                       |                                                                                                                                                                                                            |
| Primary Units (PRIMAR) Parameters |                                                                                                       |                                                                                                                                                                                                            |
| DECPNT                            | 8888888<br>8888880<br>8888800<br>8.888888<br>88.88888<br>888.8888<br>8888.888<br>88888.88<br>888888.8 | Decimal point location. Specifies the location of the decimal point or dummy zeroes in the primary unit display. Value should be consistent with local legal requirements.                                 |
| DSPDIV                            | 1D<br>2D<br>5D                                                                                        | Display divisions. Selects the minimum division size for the primary units displayed weight.                                                                                                               |
| UNITS                             | lb<br>kg<br>g<br>oz<br>tn<br>t<br>gn<br>troyoz<br>troylb<br>lt<br>CUSTOM<br>NONE<br>OFF               | Specifies primary units for displayed and printed weight. Values are: lb=pound; kg=kilogram; g=gram; oz=ounce; tn=short ton; t=metric ton; gn=grain; troyoz=troy ounce; troylb=troy pound; lt=long ton.    |

Table 3-3. SCALES Menu, FORMAT Submenu Parameters, SPLIT = OFF

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Choices                                                                                               | Description                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Secondary Units (SECNDR) and Tertiary Units (TERTIA) Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                        |
| DECPNT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 888888.8<br>8888888<br>8888880<br>8888800<br>8.888888<br>88.88888<br>888.8888<br>8888.888<br>88888.88 | Decimal point location. Determines the location of the decimal point or dummy zeros in the secondary or tertiary units display.                                                                                                                                                                                                                                                        |
| DSPDIV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2D<br>5D<br>1D                                                                                        | Display divisions. Selects the value of minimum division size of the displayed weight for secondary or tertiary units display.                                                                                                                                                                                                                                                         |
| UNITS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | kg<br>g<br>oz<br>tn<br>t<br>gn<br>troyoz<br>troylb<br>lt<br>CUSTOM<br>OFF<br>NONE<br>lb               | Specifies secondary or tertiary units for displayed and printed weight. Values are: lb=pound; kg=kilogram; g=gram; oz=ounce; tn=short ton; t=metric ton; gn=grain; troyoz=troy ounce; troylb=troy pound; lt=long ton.                                                                                                                                                                  |
| MULT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.453592<br>0.000001–<br>9999999                                                                      | Multiplier. Specifies the conversion factor by which the primary units are multiplied by to obtain the secondary or tertiary units. The default is 0.453592, which is the conversion factor for changing pounds to kilograms. See <a href="#">Section 10.8 on page 107</a> for a list of multipliers.<br>To shift between primary, secondary, and tertiary units, press the UNITS key. |
| Rate of Change (ROC) Units Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>For applications using the ROC function, the primary scale should be configured with a finer resolution than the rate of change (ROC) units to prevent a stepwise appearance in the ROC display. The ROC display step size (weight increment between displayed values) can be roughly calculated as follows:</p> <p><b>(updates_per_ROC_UNIT) * (PRIMARY_resolution / ROC_resolution)</b></p> <p>For example, with INTERVL=30; REFRESH=0.1; UNITS=MIN; PRIMARY resolution at 0.1 LB and ROC resolution at 1.0 (LB/MIN):</p> <p>-INTERVL * REFRESH = 30 * 0.1 = 3.0 seconds per update (ROC data is flushed every 3.0 seconds)</p> <p>-With UNITS = MIN, there are 20 ROC data updates per ROC time unit: 60 seconds / 3.0 seconds per update</p> <p>-The resolution ratio of PRIMARY to ROC units is 0.1 (0.1 / 1.0)</p> <p>-This configuration provides a step size in the ROC display of 2 LB (2 LB increments between displayed values):</p> <p><math>20 * 0.1 = 2</math></p> <p><b>NOTE: Setting both PRIMARY and ROC display resolutions to 1 LB would have resulted in a step size of 20 LB.</b></p> |                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                        |
| DECPNT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8888888<br>8888880<br>8888800<br>8.888888<br>88.88888<br>888.8888<br>8888.888<br>88888.88<br>888888.8 | Decimal point location. Determines the location of the decimal point or dummy zeros in the display.                                                                                                                                                                                                                                                                                    |
| DSPDIV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1D<br>2D<br>5D                                                                                        | Display divisions. Selects the minimum division size for the ROC units displayed weight.                                                                                                                                                                                                                                                                                               |

Table 3-3. SCALES Menu, FORMAT Submenu Parameters, SPLIT = OFF (Continued)

| Parameter | Choices                     | Description                                                                                                                                                                                                                                         |
|-----------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MULT      | 1.0<br>0.000001–<br>9999999 | Multiplier. Specifies the conversion factor by which the primary units are multiplied by to obtain the displayed rate of change units.<br>See <a href="#">Section 10.8 on page 107</a> for information about conversion factors.                    |
| UNITS     | SEC<br>MIN<br>HOUR          | Rate-of-change units.                                                                                                                                                                                                                               |
| INTERVL   | 10<br>1–100                 | Update interval. Specifies the number of refreshes over which the rate-of-change is calculated.<br>For example, with REFRESH set to 0.1 second and INTERVL at 60, each weight value takes 6 seconds ( $0.1 * 60$ ) to be flushed from the ROC data. |
| REFRESH   | 0.1<br>0.1–60               | Refresh interval. Specifies the number of seconds between rate-of-change samples.                                                                                                                                                                   |

Table 3-3. SCALES Menu, FORMAT Submenu Parameters, SPLIT = OFF (Continued)

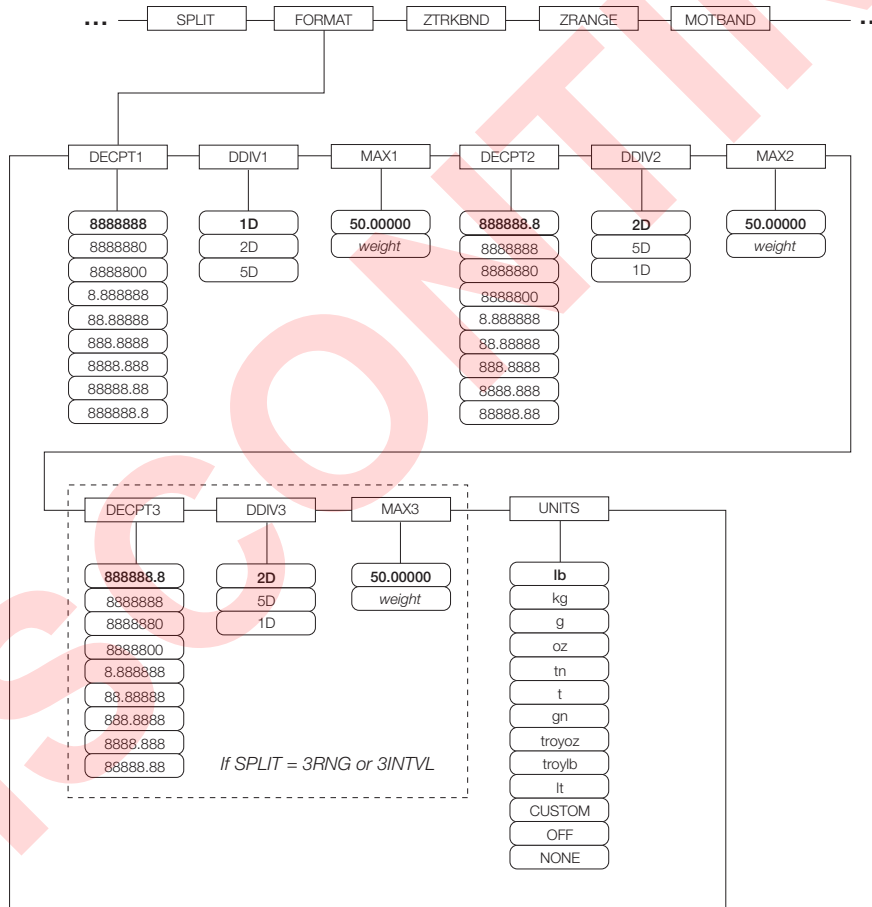


Figure 3-6. FORMAT Submenu, SPLIT ≠ OFF (Multi-range and Multi-interval Scales)

| Parameter               | Choices                                                                                                      | Description                                                                                                                                                                                                                          |
|-------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 4, FORMAT submenu |                                                                                                              |                                                                                                                                                                                                                                      |
| DECPT1                  | <b>8888888</b><br>8888880<br>8888800<br>8.888888<br>88.88888<br>888.8888<br>8888.888<br>88888.88<br>888888.8 | Decimal point location for first range or interval. Specifies the location of the decimal point or dummy zeroes in the primary unit display. Value should be consistent with local legal requirements.                               |
| DDIV1                   | <b>1D</b><br>2D<br>5D                                                                                        | Display divisions for first range or interval. Selects the minimum division size for the primary units displayed weight.                                                                                                             |
| MAX1                    | <b>50.00000</b><br><b>weight</b>                                                                             | Maximum weight for first range or interval.                                                                                                                                                                                          |
| DECPT2                  | <b>888888.8</b><br>8888888<br>8888880<br>8888800<br>8.888888<br>88.88888<br>888.8888<br>8888.888<br>88888.88 | Decimal point location for second range or interval. Specifies the location of the decimal point or dummy zeroes in the primary unit display. Value should be consistent with local legal requirements.                              |
| DDIV2                   | <b>2D</b><br>5D<br>1D                                                                                        | Display divisions for second range or interval. Selects the minimum division size for the primary units displayed weight.                                                                                                            |
| MAX2                    | <b>50.00000</b><br><b>weight</b>                                                                             | Maximum weight for second range or interval.                                                                                                                                                                                         |
| DECPT3                  | <b>888888.8</b><br>8888888<br>8888880<br>8888800<br>8.888888<br>88.88888<br>888.8888<br>8888.888<br>88888.88 | Decimal point location for third range or interval (SPLIT = 3RNG or 3INTVL only). Specifies the location of the decimal point or dummy zeroes in the primary unit display. Value should be consistent with local legal requirements. |
| DDIV3                   | <b>2D</b><br>5D<br>1D                                                                                        | Display divisions for third range or interval (SPLIT = 3RNG or 3INTVL only). Selects the minimum division size for the primary units displayed weight.                                                                               |
| MAX3                    | <b>50.00000</b><br><b>weight</b>                                                                             | Maximum weight for third range or interval (SPLIT = 3RNG or 3INTVL only).                                                                                                                                                            |

Table 3-4. SCALES Menu, FORMAT Submenu Parameters, SPLIT ≠ OFF

| Parameter | Choices                                                                                 | Description                                                                                                                                                                                             |
|-----------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNITS     | lb<br>kg<br>g<br>oz<br>tn<br>t<br>gn<br>troyoz<br>troylb<br>lt<br>CUSTOM<br>NONE<br>OFF | Specifies primary units for displayed and printed weight. Values are: lb=pound; kg=kilogram; g=gram; oz=ounce; tn=short ton; t=metric ton; gn=grain; troyoz=troy ounce; troylb=troy pound; lt=long ton. |

Table 3-4. SCALES Menu, FORMAT Submenu Parameters, SPLIT ≠ OFF (Continued)

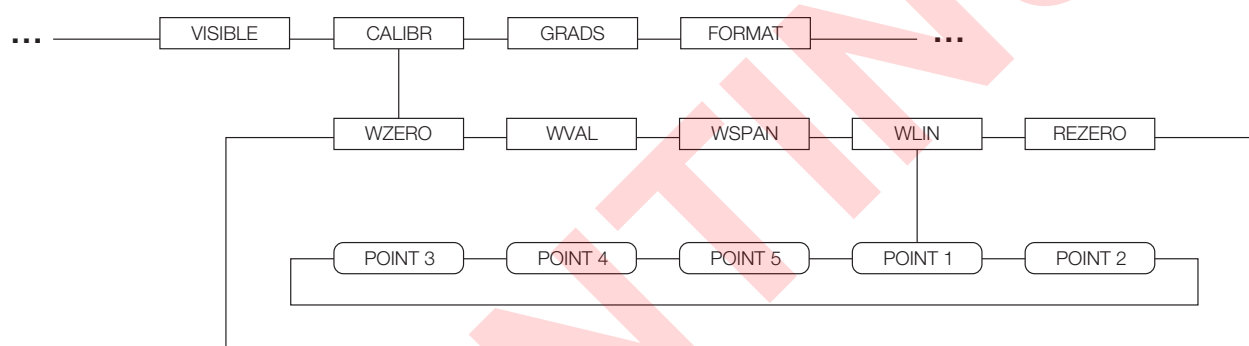


Figure 3-7. SCALES Menu, CALIBR Submenu

See the *iQUBE* Installation Manual, PN 77224, for information about configuring *iQUBE* scales.

| Parameter               | Choices              | Description                                                                                                                                                                                                                                      |
|-------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 4, CALIBR submenu |                      |                                                                                                                                                                                                                                                  |
| WZERO                   | —                    | Press ENTER to display and edit the zero calibration A/D count or millivolts value.                                                                                                                                                              |
| WVAL                    | —                    | Press ENTER to display and edit the test weight value.                                                                                                                                                                                           |
| WSPAN                   | —                    | Press ENTER to display and edit the span calibration A/D count or millivolts value.                                                                                                                                                              |
| WLIN                    | POINT 1 —<br>POINT 5 | Press ENTER to display and edit test weight and calibration values for up to five linearization points. Perform linear calibration only after WZERO and WSPAN have been set.                                                                     |
| REZERO                  | —                    | Press ENTER to remove an offset value from the zero and span calibrations.<br><br>NOTE: Use this parameter only after WZERO and WSPAN have been set. See <a href="#">Section 4.2 on page 53</a> for more information about using this parameter. |

Table 3-5. SCALES Menu, CALIBR Submenu Parameters

### 3.2.2 SERIAL Menu

See [Section 10.5 on page 102](#) for information about 820i serial data formats.

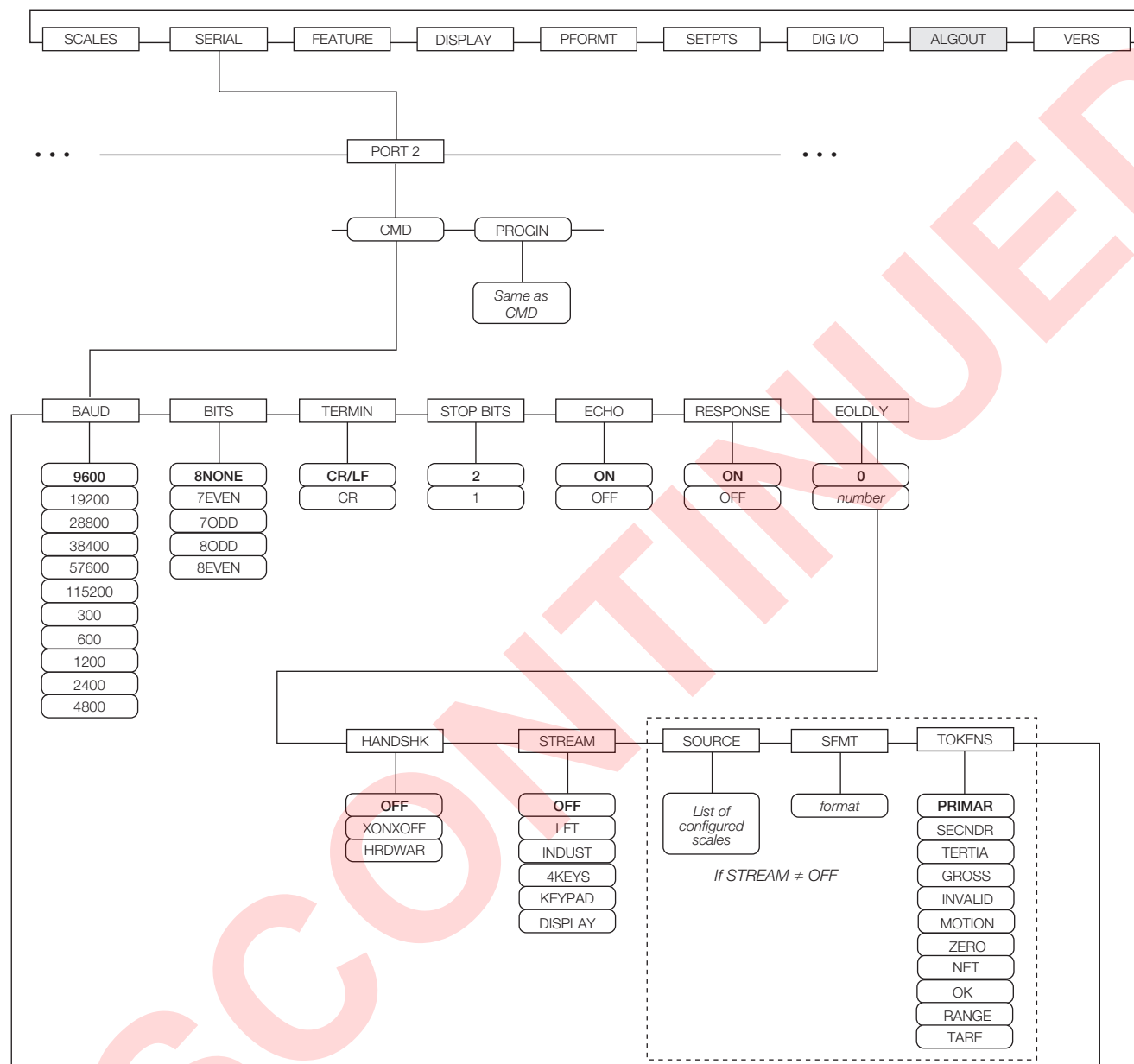


Figure 3-8. SERIAL Menu, Port 2

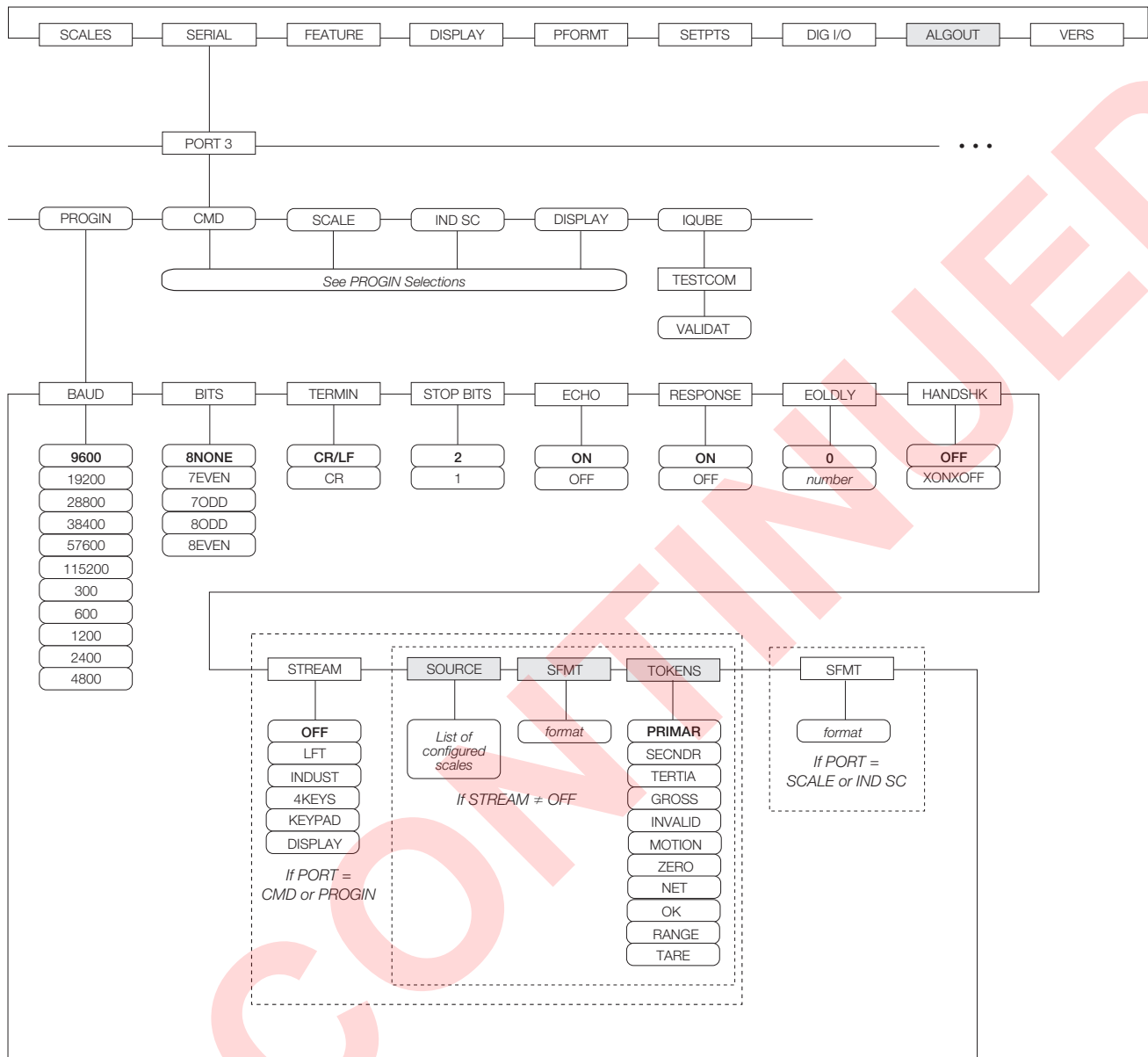


Figure 3-9. SERIAL Menu, Port 3

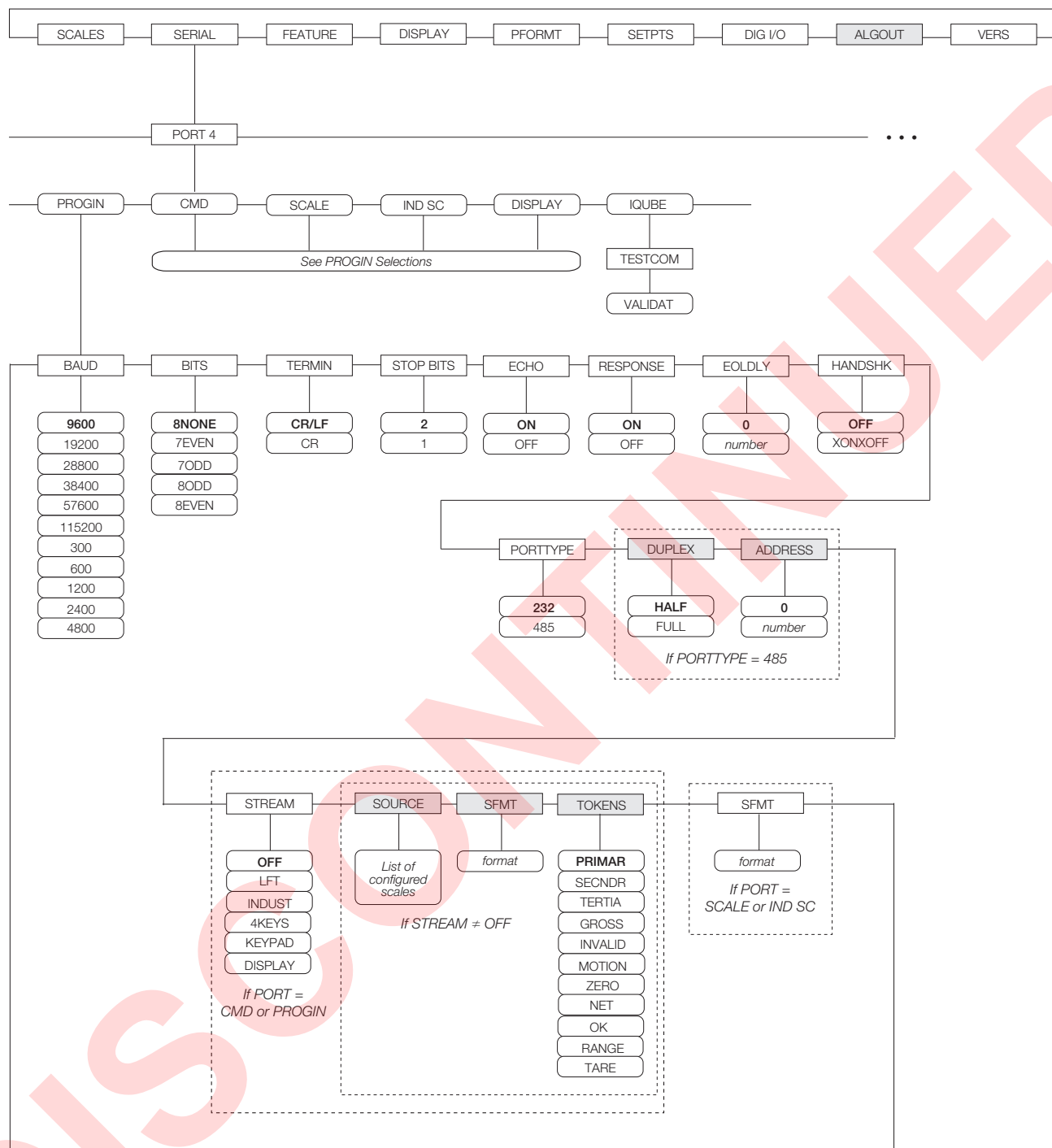


Figure 3-10. SERIAL Menu, Port 4 and Expansion Ports

| Parameter                            | Choices                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 2 submenus                     |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| PORT 1<br>PORT 2<br>PORT 3<br>PORT 4 | CMD<br>PROGIN<br>KEYBD<br>SCALE<br>IND SC<br>DISPLAY<br>IQUBE                            | <p>Specifies the type of data received by the port:<br/>           KEYBD:Remote keyboard input<br/>           CMD:Remote command input<br/>           PROGIN:Programmable input<br/>           SCALE:Legal-for-trade serial scale input<br/>           IND SC:Industrial (non-legal-for-trade) scale input<br/>           DISPLAY:Display data input for remote units in local/remote configurations<br/>           IQUBE:iQUBE serial scale input</p> <p>KEYBD is available only on Port 1; SCALE, IND SC, and IQUBE are available only on Ports 3 and 4 and higher (expansion ports).</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>* The keyboard interface is not hot-pluggable. Power-off the 820i before attaching keyboard cable to the Port 1 connector.</li> <li>* Port 3 is used only for the USB interface card</li> <li>* For iQUBE configuration, set the port type to <b>IQUBE</b> then configure using <b>Revolution</b></li> <li>* Print format outputs default to Port 4; if using Port 4 for iQUBE or other scale connections, reassign needed print formats to another port before configuring.</li> </ul> |
| Level 3 Submenus                     |                                                                                          | Port 1–Port 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| BAUD                                 | 9600<br>19200<br>28800<br>38400<br>57600<br>115200<br>300<br>600<br>1200<br>2400<br>4800 | <p>Baud rate. Selects the transmission speed for the port.</p> <p><b>NOTE: The maximum baud rate for ports on serial expansion cards (port number greater than 4) is 19200.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| BITS                                 | 8NONE<br>7EVEN<br>7ODD<br>8ODD<br>8EVEN                                                  | Selects number of data bits and parity of data transmitted or received by the port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| STOP BITS                            | 2<br>1                                                                                   | Selects number of stop bits transmitted or received by the port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| ECHO                                 | ON<br>OFF                                                                                | Specifies whether characters received by the port are echoed back to the sending unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| RESPONSE                             | ON<br>OFF                                                                                | Specifies whether the port transmits replies to serial commands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| TERMIN                               | CR/LF<br>CR                                                                              | Termination character. Selects termination character for data sent from the port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| EOLDLY                               | 0<br>0–255                                                                               | End-of-line delay. Sets the delay period, in 0.01-second intervals, from when a formatted line is terminated to the beginning of the next formatted serial output. Value specified must be in the range 0-255, in tenths of a second (10 = 1 second).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| HANDSHK                              | OFF<br>XONOFF<br>HRDWAR                                                                  | Specifies whether XON/XOFF flow control characters or hardware handshaking is used. Hardware handshaking is available only on Port 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Table 3-6. Serial Menu Parameters

| Parameter        | Choices                                                                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PORTTYPE         | 232<br>485                                                                                     | Specifies whether Port 4 is used for RS-232 or RS-485 communications. If 485 is selected, additional prompts are shown to specify half- or full-duplex operation and RS-485 address.<br><b>NOTE: RS-485 communications can be specified for Ports 4 and 7.</b>                                                                                                                                                                                                                                                                       |
| DUPLEX           | HALF<br>FULL                                                                                   | Specifies whether the RS-485 communications is half- or full-duplex.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ADDRESS          | 0<br>0–255                                                                                     | Specifies the decimal indicator address for RS-485 connections. RS-232 communications is disabled if an address other than zero is specified for this parameter. RS-485 addresses must be in the range 01–255.                                                                                                                                                                                                                                                                                                                       |
| STREAM           | OFF<br>LFT<br>INDUST<br>4KEYS<br>KEYPAD<br>DISPLAY                                             | Specifies what data, if any, is streamed from the port.<br>4KEYS and KEYPAD stream keypad events to a receiving indicator. KEYPAD transmits all keypad events; 4KEYS transmits keypresses of the <b>ZERO</b> , <b>GROSS/NET</b> , <b>TARE</b> , and <b>UNITS</b> keys only.<br>DISPLAY streams the complete display image to the receiving indicator in local/remote indicator configurations. See <a href="#">Section 10.4 on page 101</a> for more information.<br><b>NOTE: Streaming is not supported for RS-485 connections.</b> |
| SOURCE           | source_scale                                                                                   | If STREAM is set to a value other than OFF, SOURCE specifies the source scale for data streamed from the port.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| SFMT             | format                                                                                         | Specifies the stream format used for the streamed data (SCALE or IND SC scale types). The default format is the Consolidated Controls format (see <a href="#">Section 10.6 on page 104</a> ). See <a href="#">Section 10.5 on page 102</a> for information about custom stream formatting.                                                                                                                                                                                                                                           |
| TOKENS           | PRIMAR<br>SECNDR<br>TERTIA<br>GROSS<br>INVALID<br>MOTION<br>ZERO<br>NET<br>OK<br>RANGE<br>TARE | If STREAM is set to OFF, the TOKENS parameter can be used to replace tokens used in the data stream from the indicator front panel. See <a href="#">Section 10.5 on page 102</a> for more information about custom stream formatting.                                                                                                                                                                                                                                                                                                |
| TESTCOM          | —                                                                                              | iQUBE communications tests.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Level 4 Submenus |                                                                                                | iQUBE only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| VALIDAT          | —                                                                                              | Use <b>Upload</b> softkey to retrieve serial numbers of attached iQUBE units.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Table 3-6. Serial Menu Parameters (Continued)

### 3.2.3 FEATURE Menu

The FEATURE menu is used to set miscellaneous system attributes, including time and date, truck mode, softkey definitions, and parameters relating to the regulatory environment. See [Table 3-7 on page 41](#) for parameter descriptions.

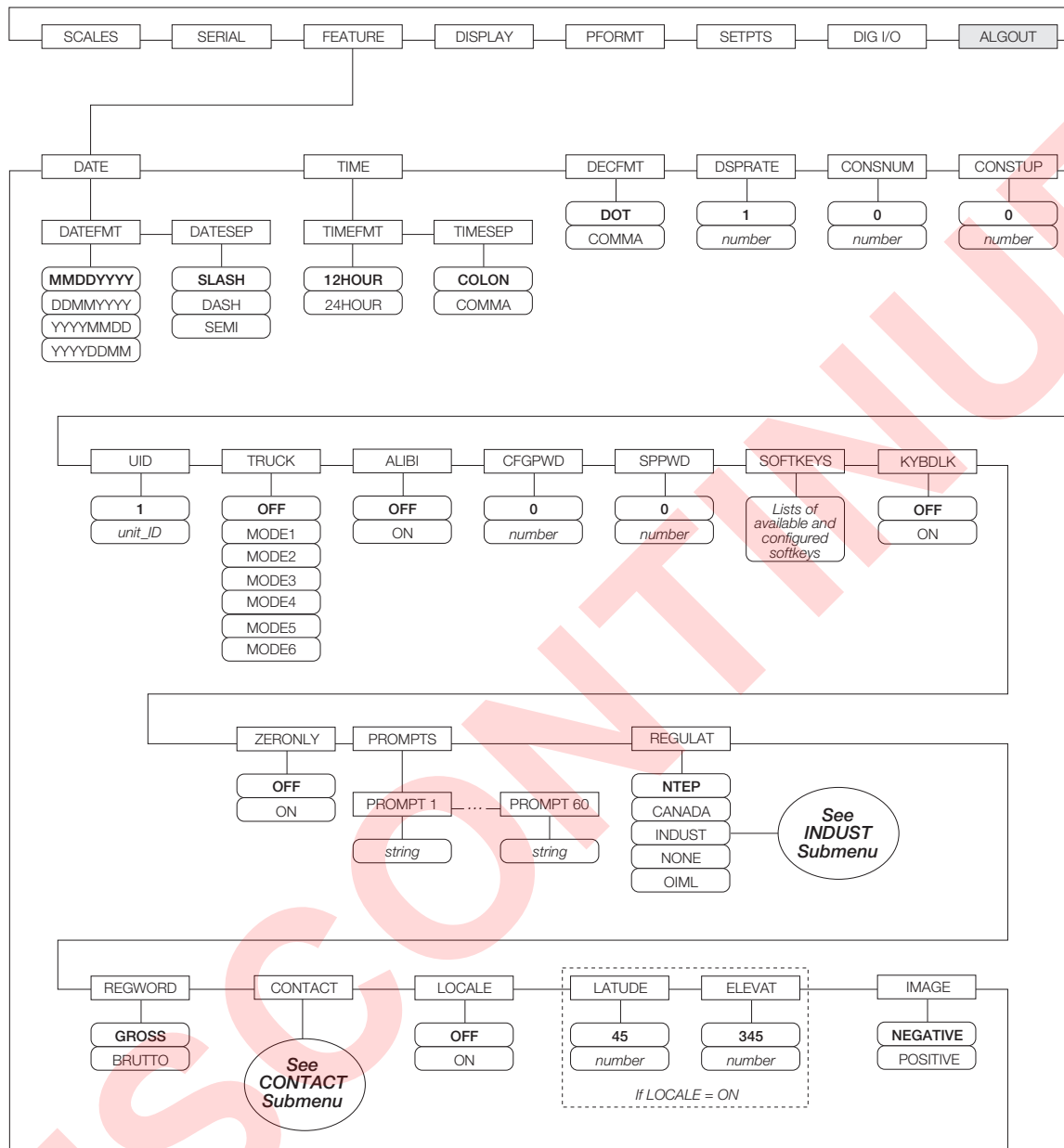


Figure 3-11. FEATURE Menu

| Parameter        | Choices            | Description                                                                                                                                                                                                                                                                      |
|------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 2 submenus |                    |                                                                                                                                                                                                                                                                                  |
| DATE             | DATEfmt<br>DATESEP | Allows selection of date format and date separator character. See Level 3 submenu parameter descriptions. Use the <b>TIME/DATE</b> softkey or the SD serial command to set the date. See <a href="#">Section 9.0 on page 86</a> for information about using the serial commands. |

Table 3-7. FEATURE Menu Parameters

| Parameter | Choices                                                                                                                                                                                                                                                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TIME      | TIMEFMT<br>TIMESEP                                                                                                                                                                                                                                     | Allows selection of time format and separator character. See Level 3 submenu parameter descriptions. Use the <b>TIME/DATE</b> softkey or the ST serial command to set the time. See <a href="#">Section 9.0 on page 86</a> for information about using the serial commands.                                                                                                                                                                                                                                                                                                                             |
| DECfmt    | <b>DOT</b><br>COMMA                                                                                                                                                                                                                                    | Specifies whether decimal numbers are displayed using a period (DOT) or comma as the decimal symbol.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DSPrate   | <b>1</b><br>1–80                                                                                                                                                                                                                                       | Display update rate. Specifies the display update rate, in the number of 100-millisecond intervals between updates. The default value, 1, provides about 10 updates per second. The maximum value updates the display every 8 seconds.L                                                                                                                                                                                                                                                                                                                                                                 |
| CONSNUM   | <b>0</b><br>0–9999999                                                                                                                                                                                                                                  | Consecutive numbering. Allows sequential numbering for print operations. The consecutive number value is incremented following each print operation that includes <CN> in the ticket format. When the consecutive number is reset, it is reset to the value specified on the CONSTUP parameter.                                                                                                                                                                                                                                                                                                         |
| CONSTUP   | <b>0</b><br>0–9999999                                                                                                                                                                                                                                  | Specifies the consecutive number start-up value used when the consecutive number is reset by sending the KCLRCN serial command or a CLRCN digital input. Value specified must be in the range 0–9 999 999.                                                                                                                                                                                                                                                                                                                                                                                              |
| UID       | <b>1</b><br>unit-ID                                                                                                                                                                                                                                    | Specifies the unit identification number. Value specified can be any alphanumeric value, up to eight characters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| TRUCK     | <b>OFF</b><br>MODE1<br>MODE2<br>MODE3<br>MODE4<br>MODE5<br>MODE6                                                                                                                                                                                       | Specifies the truck mode used. If selected, the indicator switches from normal mode to the selected truck mode. See <a href="#">Section 7.0 on page 66</a> for more information about using the truck modes.<br>MODE1: Auto clear ID, keyed tares, value swapping<br>MODE2: Auto clear ID, no keyed tares, value swapping<br>MODE3: Stored ID, keyed tares, value swapping<br>MODE4: Stored ID, no keyed tares, value swapping<br>MODE5: Stored ID, keyed tares, no value swapping<br>MODE6: Stored ID, no keyed tares, no value swapping                                                               |
| ALIBI     | <b>OFF</b><br>ON                                                                                                                                                                                                                                       | Specifies whether data storage is used by the alibi feature to allow reprinting any transaction. Use the SOFTKEYS parameter to enable a softkey for recalling alibi print transactions.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| CFGPWD    | <b>0</b><br>0–9999999<br><br>reset=999999                                                                                                                                                                                                              | Configuration password. Specify a non-zero value to restrict access to all configuration menus.<br><br><b>NOTE: If a configuration password is specified, be sure to record the password and keep it in a safe place. If the configuration password is lost or unavailable, the indicator must be cleared (reset configuration and calibration parameters) to continue use.</b><br><br>To clear the indicator, press the setup switch, then enter 999999 (six nines) at the configuration password prompt. The unit performs a RESETCONFIGURATION then returns to the setup mode configuration display. |
| SPPWD     | <b>0</b><br>0–9999999                                                                                                                                                                                                                                  | Setpoint password. Specify a non-zero value to restrict access to the setpoint menu. The SPPWD is also shared by, and can be used to protect, the truck register. If a non-zero setpoint password is specified, the password must be entered before deleting any entries from the truck register.                                                                                                                                                                                                                                                                                                       |
| SOFTKEYS  | <blank><br>Time/Date<br>Display Tare<br>Display Accum<br>Display ROC<br>Setpoint<br>Batch Start<br>Batch Stop<br>Batch Pause<br>Batch Reset<br>Weigh In<br>Weigh Out<br>Truck Regs<br>Unit ID<br>Select Scale<br>Diagnostics<br>Alibi<br><b>F1–F10</b> | Use the <b>Add</b> and <b>Remove</b> softkeys to select softkeys to be displayed in weighing mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

Table 3-7. FEATURE Menu Parameters (Continued)

| Parameter        | Choices                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KYBDLK           | OFF<br>ON                                    | Keyboard lock. Specify ON to disable the keypad in normal mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ZERONLY          | OFF<br>ON                                    | Zero key only. Specify ON to disable all front panel keys except ZERO in normal mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PROMPTS          | PROMPT1–<br>PROMPT60                         | Specify prompts for use in setpoint names. Prompts are referenced by the NAME parameter under the SETPTS submenus; prompts can be shown on the display during setpoint execution.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| REGULAT          | NTEP<br>CANADA<br>INDUST<br>NONE<br>OIML     | Regulatory mode. Specifies the regulatory agency having jurisdiction over the scale site. OIML, NTEP, and CANADA modes allow a tare to be acquired at any weight greater than zero. NONE allows tares to be acquired at any weight value. OIML, NTEP, and CANADA modes allow a tare to be cleared only if the gross weight is at no load. NONE allows tares to be cleared at any weight value. NTEP and OIML modes allow a new tare to be acquired even if a tare is already present. In CANADA mode, the previous tare must be cleared before a new tare can be acquired. NONE, NTEP and CANADA modes allow the scale to be zeroed in either gross or net mode as long as the current weight is within the specified ZRANGE. In OIML mode, the scale must be in gross mode before it can be zeroed; pressing the ZERO key in net mode clears the tare. INDUST provides a set of subparameters to allow customization of tare, clear, and print functions in non-legal-for-trade scale installations. See Level 4 parameter descriptions in Table 3-9. The value specified for this parameter affects the function of the front panel TARE and ZERO keys. See <a href="#">Section 10.2 on page 100</a> for a complete description of TARE and ZERO key functions for each of the regulatory modes. |
| REGWORD          | GROSS<br>BRUTTO                              | Sets the term displayed when weighing in gross mode. Selecting BRUTTO replaces the <b>Gross</b> annunciator with <b>Brutto</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CONTACT          | —                                            | Allows specification of contact information for use in <i>iQUBE</i> alert messages. See Level 3 submenu descriptions in Table 3-8.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| LOCALE           | OFF<br>ON                                    | Locale. Set this parameter ON to enable the LATUDE and ELEVAT parameters. Specifying latitude and elevation of the scale site provides compensation for gravitational effects. Attached scales must be recalibrated after changing this parameter from OFF to ON.<br><br><b>NOTE: Gravitational compensation settings do not affect iQUBE scales.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| LATUDE           | 45<br>0–90                                   | Latitude. Specify the latitude of the scale site in degrees. This parameter is shown only if LOCALE=ON.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ELEVAT           | 345<br>±0–9999                               | Elevation. Specify the elevation of the scale site in meters. Valid values are –9999 through 9999. This parameter is shown only if LOCALE=ON.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| IMAGE            | NEGATIVE<br>POSITIVE                         | Specifies whether the indicator display is presented as blue-on-white or white-on-blue. The default value, NEGATIVE, shows the standard blue-on-white image when using the stock LCD display; the optional outdoor display shows white-on-blue. When using the outdoor display, set this value to POSITIVE to show the standard, blue-on-white display image, then use the CONTRAST parameter on the DISPLAY menu to adjust for optimal viewing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Level 3 submenus |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DATEFMT          | MMDDYYYY<br>DDMMYYYY<br>YYYYMMDD<br>YYYYDDMM | Specifies the format used to display or print the date.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| DATESEP          | SLASH<br>DASH<br>SEMI                        | Specifies the date separator character.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| TIMEFMT          | 12HOUR<br>24HOUR                             | Specifies the format used to display or print the time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| TIMESEP          | COLON<br>COMMA                               | Specifies the time separator character.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

Table 3-7. FEATURE Menu Parameters (Continued)

## FEATURE Menu, CONTACT Submenu

The CONTACT submenu allows entry of contact information for a contact company or scale dealer. Contact information can be displayed by pressing the **Contacts** softkey on the Version menu in setup mode or the **Diagnostics** softkey when in weigh mode. Contact information may be used in print formats (see [Section 6.0](#)).

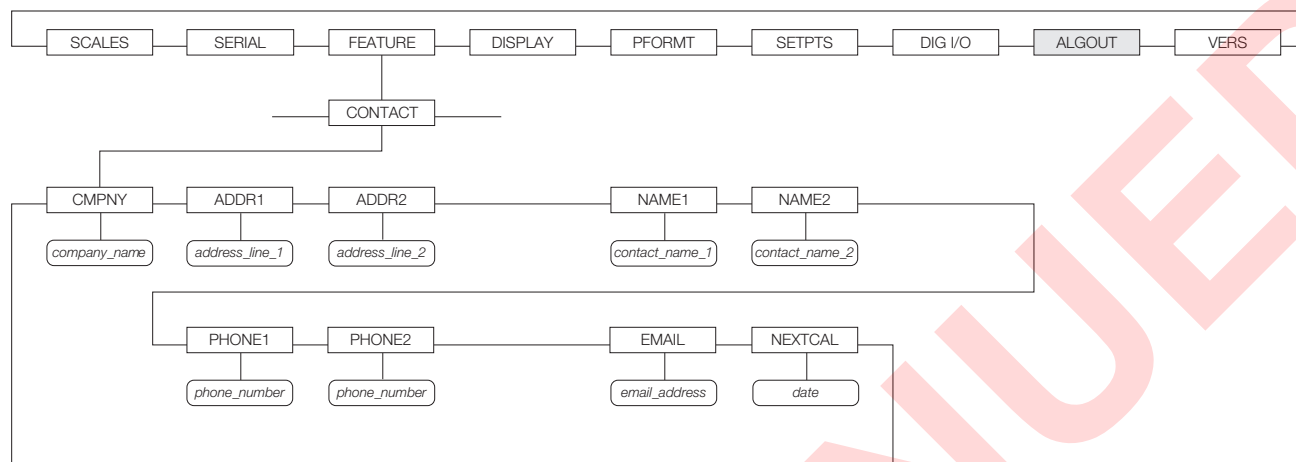


Figure 3-12. CONTACT Submenu

| Parameter                | Choices              | Description                                                                                                                                                                                                                                                                                                             |
|--------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 3, CONTACT submenu |                      |                                                                                                                                                                                                                                                                                                                         |
| CMPNY                    | company_name         | Enter the name of the contact company or dealer.                                                                                                                                                                                                                                                                        |
| ADDR1–ADDR2              | <b>address</b>       | Enter up to three lines of address information for the contact company.                                                                                                                                                                                                                                                 |
| NAME1–NAME2              | <b>contact_name</b>  | Enter names of up to three contact persons.                                                                                                                                                                                                                                                                             |
| PHONE1–PHONE2            | <b>phone_number</b>  | Enter phone numbers for each of the contact persons specified for the NAME <sub>x</sub> parameter.                                                                                                                                                                                                                      |
| EMAIL                    | <b>email_address</b> | Enter the e-mail address of the contact company or dealer.<br>If the <i>iQUBE</i> alert support is used to send automated alert e-mail messages, enter the e-mail address to which the alert messages will be sent. See the <i>iQUBE Installation Manual</i> , PN 77224 for more information about <i>iQUBE</i> alerts. |
| NEXTCAL*                 | <b>date</b>          | Enter the next scheduled calibration date using the month/day/year format on the DATEFMT parameter. Separator characters are not required.                                                                                                                                                                              |

Table 3-8. CONTACT Submenu Parameters

*\*If value is not changed, date will reflect 6 months out from last calibration.*

## FEATURE Menu, REGULAT/INDUST Submenu

The INDUST setting of the REGULAT parameter allows customization of several tare, clear, and print functions for use in **non-legal-for-trade** scale installations. See [Section 10.2 on page 100](#) for more information about regulatory mode functions.

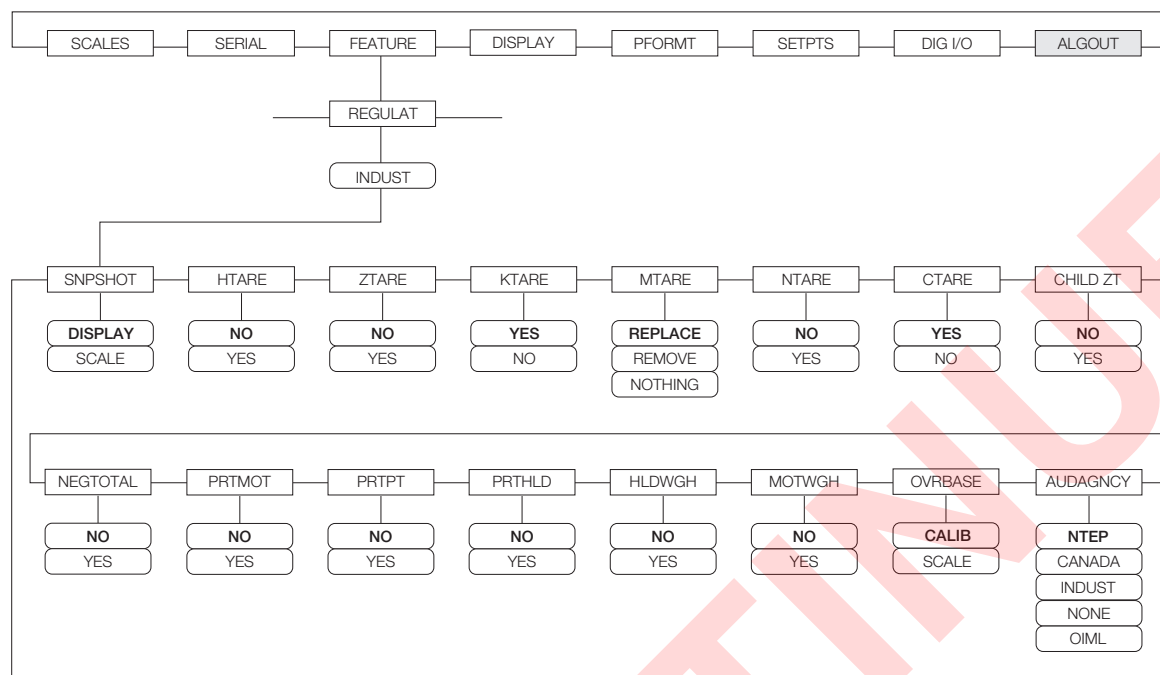


Figure 3-13. REGULAT / INDUST Submenu

| Parameter                         | Choices                                  | Description                                                                                                      |
|-----------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Level 4, REGULAT / INDUST submenu |                                          |                                                                                                                  |
| SNPSHOT                           | DISPLAY, SCALE                           | Display or Scale weight source.                                                                                  |
| HTARE                             | NO, YES                                  | Allow tare in display hold                                                                                       |
| ZTARE                             | NO, YES                                  | Remove tare on ZERO                                                                                              |
| KTARE                             | YES, NO                                  | Always allow keyed tare                                                                                          |
| MTARE                             | REPLACE<br>REMOVE<br>NOTHING             | Multiple tare action                                                                                             |
| NTARE                             | NO, YES                                  | Allow negative or zero tare                                                                                      |
| CTARE                             | YES, NO                                  | Allow CLEAR key to clear tare/accumulator                                                                        |
| CHILD ZT                          | NO, YES                                  | Clear child scales individually                                                                                  |
| NEGTOTAL                          | NO, YES                                  | Allow total scale to display negative value                                                                      |
| PRTMOT                            | NO, YES                                  | Allow print while in motion                                                                                      |
| PRTPT                             | NO, YES                                  | Add PT to keyed tare print                                                                                       |
| PRTHLD                            | NO, YES                                  | Print during display hold                                                                                        |
| HLDWGH                            | NO, YES                                  | Allow truck weighment during display hold                                                                        |
| MOTWGH                            | NO, YES                                  | Allow truck weighment in motion                                                                                  |
| OVRBASE                           | CALIB<br>SCALE                           | Sets an industrial scale to function like an OIML or NTEP scale (see <a href="#">Section 10.2 on page 100</a> ). |
| AUDAGNCY                          | NTEP<br>CANADA<br>INDUST<br>NONE<br>OIML | Audit trail display agency format.                                                                               |

Table 3-9. REGULAT / INDUST Submenu Parameters

### 3.2.4 DISPLAY Menu

The DISPLAY menu provides the same function as the **Display** front panel key while in setup mode. Screen contrast can be set to values 0–127; softkeys allow the screen backlight to be turned on or off. The DISPLAY menu also allows the number of screen widgets to be set (1 or 2) to allow simultaneous viewing of two scales.

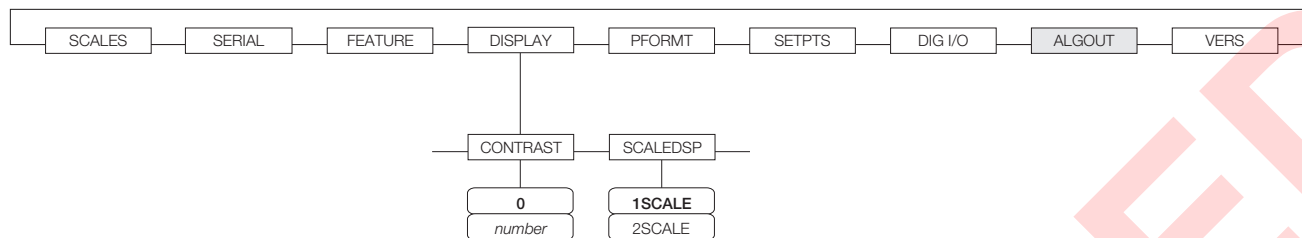


Figure 3-14. DISPLAY Menu

### 3.2.5 PFORMT Menu

See [Section 6.0 on page 60](#) for information about custom print formatting.

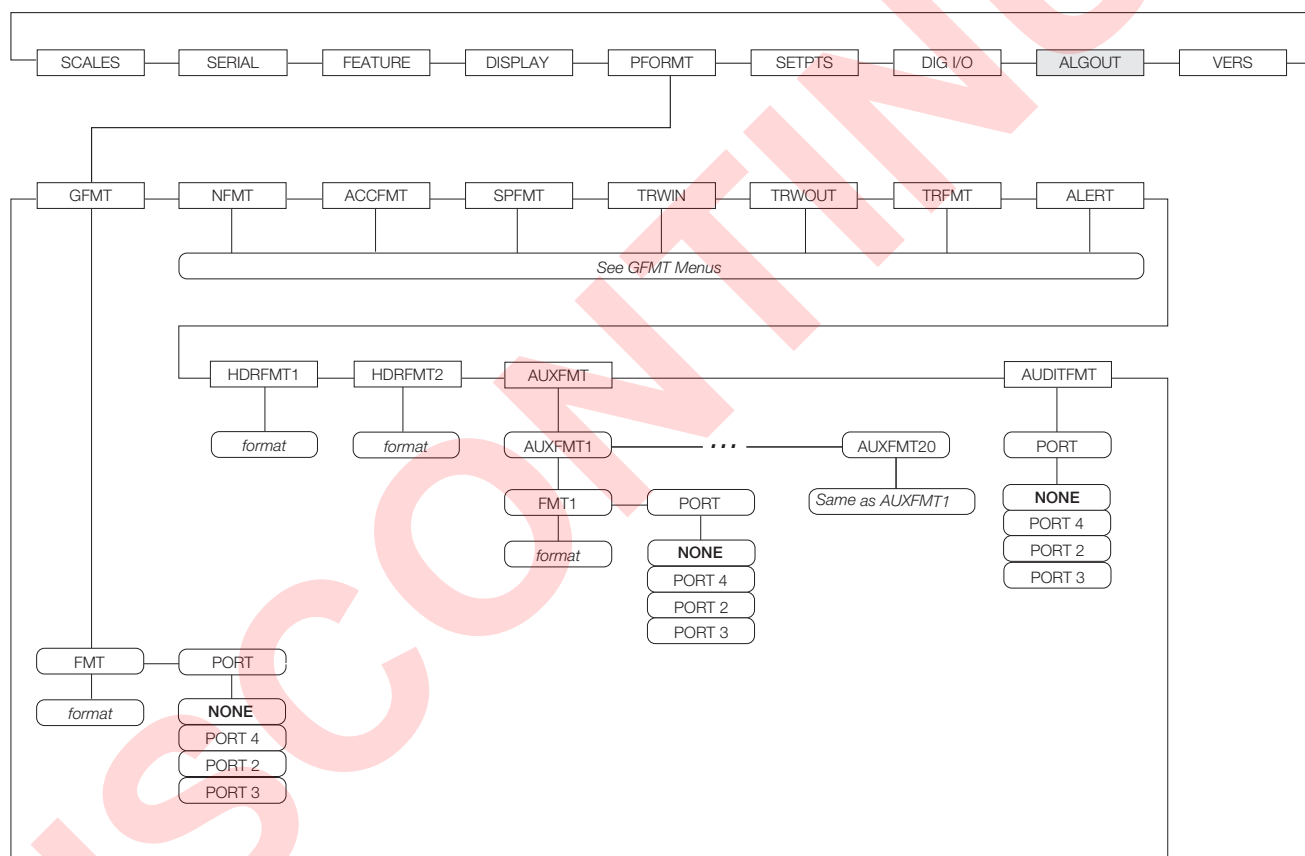


Figure 3-15. PFORMT Menu

### 3.2.6 SETPTS Menu

See [Section 8.0 on page 68](#) for more information about configuring and using setpoints. Submenus for the various setpoint kinds (shown as **Go to X** in [Figure 3-16](#)) are described in Figures 8-2 through 8-9, beginning on page 72.

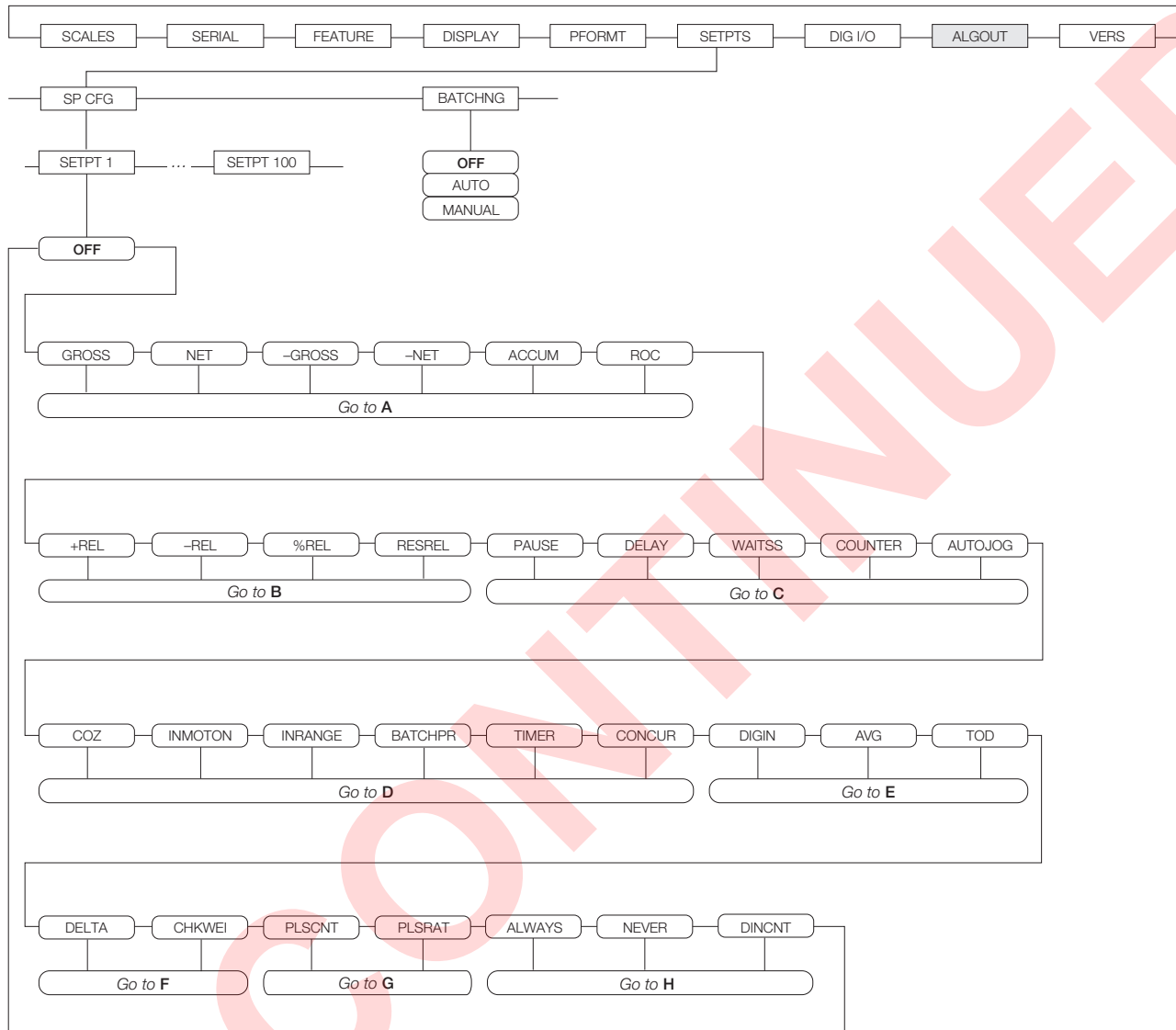


Figure 3-16. SETPTS Menu

### 3.2.7 DIG I/O Menu

The DIG I/O menu shown in [Figure 3-17](#) is used to assign functions to digital inputs and outputs. SLOT 0 represents the eight I/O bits available on the CPU board (connector J5). The additional slot, with 24 I/O bits, is shown only if the digital I/O expansion card is installed.

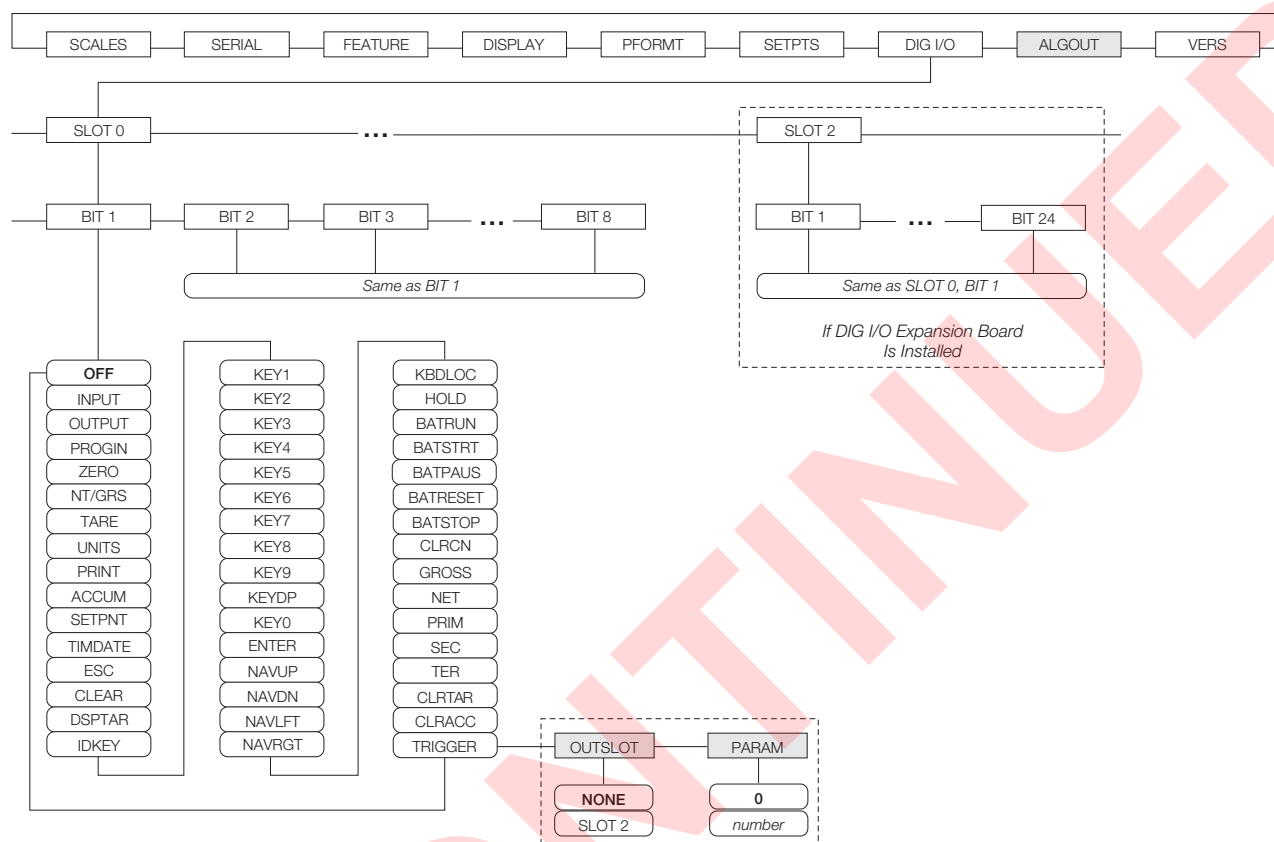


Figure 3-17. DIG I/O Menu

| Parameter        | Choices   | Description                                                                                                                                                         |
|------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 2 submenus |           |                                                                                                                                                                     |
| SLOTx            | BIT y     | Lists available digital I/O slots.                                                                                                                                  |
| Level 3 submenus |           |                                                                                                                                                                     |
| BIT y            | OFF       | Indicates that the bit is not configured.                                                                                                                           |
|                  | INPUT     | Assigns the bit as a digital input used for DIGIN setpoints.                                                                                                        |
|                  | OUTPUT    | Assigns the bit as a digital output for setpoint or program use.                                                                                                    |
|                  | PROGIN    | Assigns the bit as a digital input used to generate a program event.                                                                                                |
|                  | ZERO      | Provide the same functions as the five major front panel keys.                                                                                                      |
|                  | NT/GRS    | Provide the same functions as the five major front panel keys.                                                                                                      |
|                  | TARE      | Provide the same functions as the five major front panel keys.                                                                                                      |
|                  | UNITS     | Provide the same functions as the five major front panel keys.                                                                                                      |
|                  | PRINT     | Provide the same functions as the five major front panel keys.                                                                                                      |
|                  | ACCUM     | ACCUM adds the current scale weight to the accumulator, if the scale accumulator is enabled.                                                                        |
|                  | SETPNT    | Provide the same functions as the Setpoint and Time/Date softkeys. L                                                                                                |
|                  | TIMDATE   | Provide the same functions as the Setpoint and Time/Date softkeys. L                                                                                                |
|                  | ESC       | Provides a function equivalent to the Cancel softkey.                                                                                                               |
|                  | CLEAR     | Simulates pressing the front panel CLR key.                                                                                                                         |
|                  | DSPTAR    | Displays the current tare; equivalent to pressing the Display Tare softkey.                                                                                         |
|                  | IDKEY     | Displays a prompt to enter a new unit ID; equivalent to pressing the Unit ID softkey.                                                                               |
|                  | KEY0—KEY9 | Simulate pressing keys on the numeric keypad.                                                                                                                       |
|                  | KEYDP     | Simulate pressing keys on the numeric keypad.                                                                                                                       |
|                  | ENTER     | Simulates pressing the front panel ENTER key.                                                                                                                       |
|                  | NAVUP     | Simulate pressing the navigation keys.                                                                                                                              |
|                  | NAVDN     | Simulate pressing the navigation keys.                                                                                                                              |
|                  | NAVLFT    | Simulate pressing the navigation keys.                                                                                                                              |
|                  | NAVRGT    | Simulate pressing the navigation keys.                                                                                                                              |
|                  | KBDLOC    | Locks the keyboard (indicator front panel) when held low.                                                                                                           |
|                  | HOLD      | Holds the current display. Releasing this input clears the running average filter.                                                                                  |
|                  | BATRUN    | Allows a batch routine to be started and run. With BATRUN active (low), the BATSTRT input starts the batch; if BATRUN is inactive (high), BATSTRT resets the batch. |
|                  | BATSTRT   | Starts or resets a batch routine, depending on the state of the BATRUN input.                                                                                       |
|                  | BATPAUS   | Pauses a batch routine when held low.                                                                                                                               |
|                  | BATRESET  | Stops the batch sequence and resets to the first batch step.                                                                                                        |
|                  | BATSTOP   | Stops the batch routine.                                                                                                                                            |
|                  | CLRCN     | Resets the consecutive number to the value specified on the CONSTUP parameter (FEATURE menu).                                                                       |
|                  | GROSS     | Select gross or net weight display, and primary, secondary, or tertiary units display modes.                                                                        |
|                  | NET       | Select gross or net weight display, and primary, secondary, or tertiary units display modes.                                                                        |
|                  | PRIM      | Select gross or net weight display, and primary, secondary, or tertiary units display modes.                                                                        |
|                  | SEC       | Select gross or net weight display, and primary, secondary, or tertiary units display modes.                                                                        |
|                  | TER       | Select gross or net weight display, and primary, secondary, or tertiary units display modes.                                                                        |
|                  | CLRTAR    | Clears the current tare for the active scale.                                                                                                                       |
|                  | CLRACC    | Clears the active accumulator.                                                                                                                                      |
|                  | TRIGGER   | Used for custom applications only.                                                                                                                                  |

Table 3-10. DIG I/O Menu Parameters

| Parameter        | Choices               | Description                                                                         |
|------------------|-----------------------|-------------------------------------------------------------------------------------|
| Level 4 submenus |                       | TRIGGER subparameters                                                               |
| OUTSLOT          | <b>NONE</b><br>SLOT 2 | Specifies the card slot receiving the trigger output.                               |
| PARAM            | <b>0</b><br>number    | Specifies the value passed as a parameter to the option card in the specified slot. |

Table 3-10. DIG I/O Menu Parameters (Continued)

### 3.2.8 Analog Output Menu

The ALGOUT menu is shown only if the analog output option is installed. If the analog output option is installed, configure all other indicator functions and calibrate the indicator itself before configuring the analog output. See the Analog Output Card Installation Instructions, PN 69089, for more information.

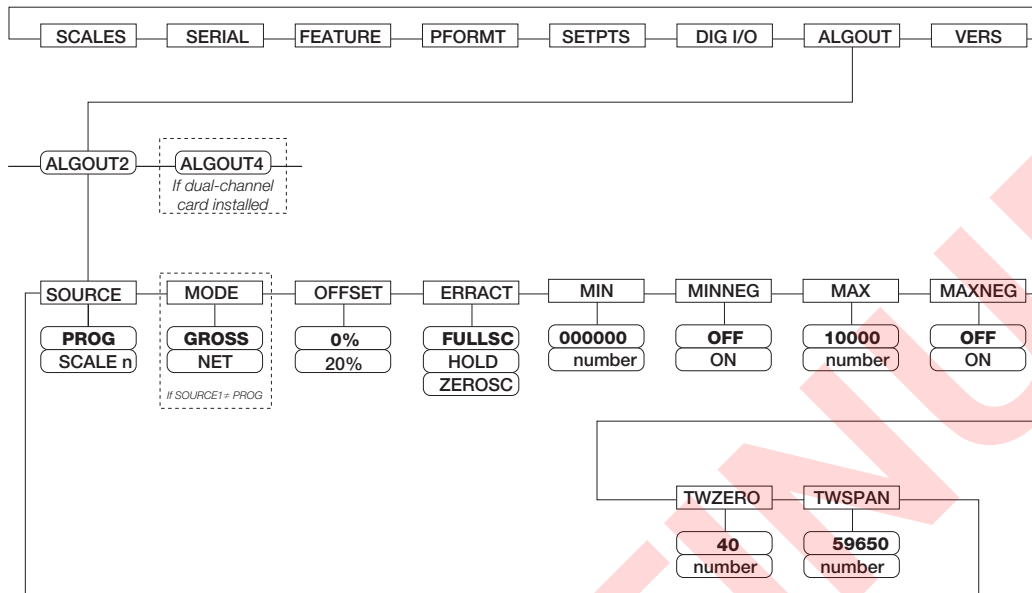


Figure 3-18. Analog Output Menu

| Parameter        | Choices                  | Description                                                                                                                                                                                                                           |
|------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 2 submenus |                          |                                                                                                                                                                                                                                       |
| SOURCE1          | PROG<br>SCALEn           | Specifies the scale tracked by the analog output. PROG indicates that the analog output is under program control.                                                                                                                     |
| MODE1            | GROSS<br>NET             | Specifies the weight data, gross or net, tracked by the analog output.                                                                                                                                                                |
| OFFSET           | 0%<br>20%                | Zero offset. Select 0% for 0–10 V or 0–20 mA output; select 20% for 4–20 mA output. This parameter must be set before calibrating the analog output.                                                                                  |
| ERRACT           | FULLSC<br>HOLD<br>ZEROSC | <b>Error action.</b> Specifies how the analog output responds to system error conditions.<br>Possible values are:<br>FULLSC: Set to full value (10 V or 20 mA)<br>HOLD: Hold current value<br>ZEROSC: Set to zero value (0 V or 4 mA) |
| MIN              | 000000<br>0–9999999      | Specifies the minimum weight value tracked by the analog output. Specify a value in the range 0–9999999.                                                                                                                              |
| MINNEG           | OFF<br>ON                | Specify ON if the minimum weight (MIN parameter) is a negative value.                                                                                                                                                                 |
| MAX              | 10000<br>0–9999999       | Specifies the maximum weight value tracked by the analog output. Specify a value in the range 0–9999999                                                                                                                               |
| MAXNEG           | OFF<br>ON                | Specify ON if the maximum weight (MAX parameter) is a negative value.                                                                                                                                                                 |
| TWZERO           | 40<br>0–65535            | Tweak zero. Enter tweak value to adjust the analog output zero calibration. Use a multimeter to monitor the analog output value.                                                                                                      |
| TWSPAN           | 59650<br>0–65535         | Tweak span. Enter tweak value to adjust the analog output span calibration. Use a multimeter to monitor the analog output value.                                                                                                      |

Table 3-11. Analog Output Menu Parameters

### 3.3 Version Menu

The VERS menu can be used to check the installed software version or, by using the **Reset Config** softkey, to restore all configuration parameters to their factory default values. There are no parameters associated with the Version menu: when selected, the indicator displays the installed software version number.

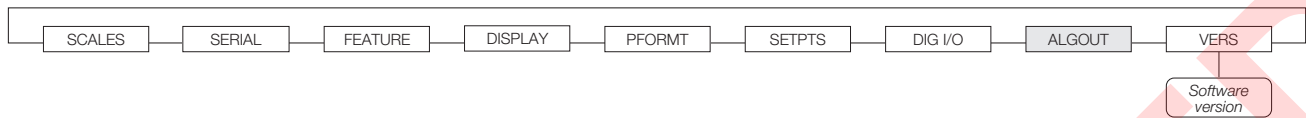


Figure 3-19. Version Menu

If an *iQUBE* scale is configured, a **Diagnostics** softkey provides access to *iQUBE* diagnostic information.

## 4.0 Calibration

The 820i can be calibrated using the front panel, serial commands, or *Revolution®*. Each method consists of the following steps:

- Zero calibration
- Entering the test weight value
- Span calibration
- Optional five-point linearization
- Optional rezero calibration for test weights using hooks or chains

The following sections describe the calibration procedure for each of the calibration methods. See the *iQUBE Installation Manual*, PN 77224, for information about configuring *iQUBE*-attached scales.

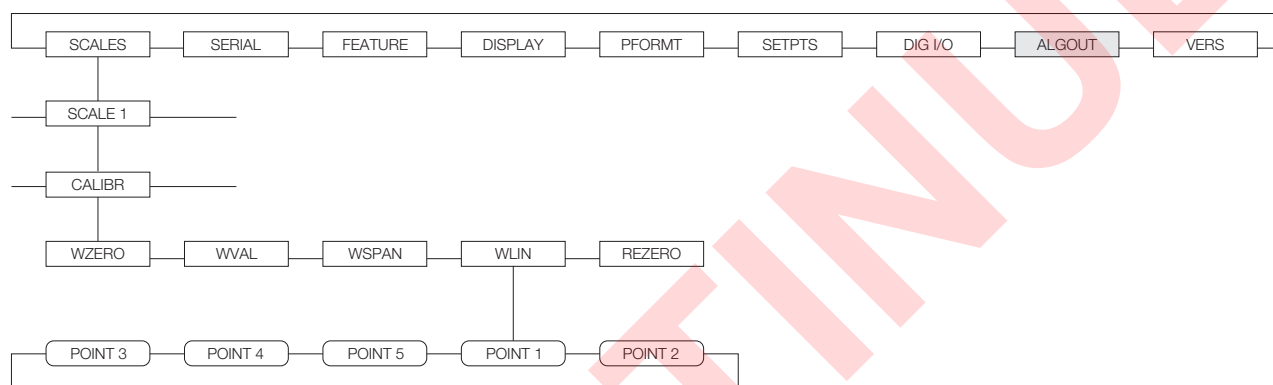


Figure 4-1. Calibration (CALIBR) Submenu

### 4.1 Gravity Compensation

Gravity compensation for latitude and elevation is available for the 820i. To calibrate with gravity compensation, the LOCALE parameter under the FEATURE menu must be set ON, and the LATUDE (latitude) and ELEVAT (elevation, in meters) parameters set before calibrating the indicator (see [Figure 3-11 on page 41](#)).

If the indicator is later installed at a different location, gravity compensation can be applied to a pre-calibrated indicator by adjusting the LATUDE and ELEVAT parameters.

### 4.2 Front Panel Calibration

The CALIBR submenu (under the SCALES menu, see [Figure 4-2](#)) is used to calibrate the 820i.

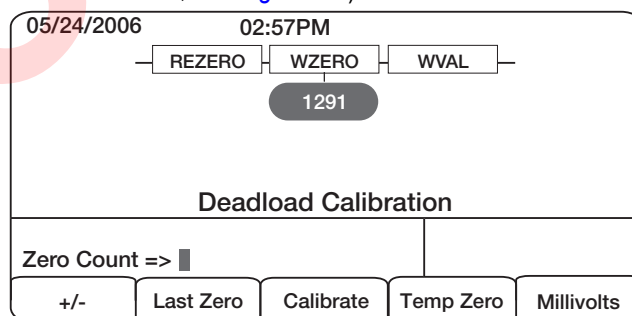


Figure 4-2. WZERO Calibration Display

The zero, span, and linear calibration point displays provide a set of softkeys used specifically for calibration procedures:

**+/-**—Toggles to allow entry of negative or positive values

#### Last Zero

Recalls the last established zero value to allow calibration without removing tests weights or product from scale.

## Calibrate

Performs calibration for the selected point

## Temp Zero

Temporarily zeroes the displayed weight of a non-empty scale. After span calibration, the difference between the temp zero and the previously calibrated zero value is used as an offset.

## Millivolts (or Counts)

Toggles between display of captured A/D counts and captured millivolts values; allows entry of calibration values in mV or counts

To calibrate the indicator using the front panel, do the following:

1. Place the indicator in setup mode (display reads **Scale Configuration**) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. With the **SCALES** menu highlighted, press the **down** key, then select the scale to be calibrated. Press **down** again (**GRADS** parameter highlighted), then press **left** to highlight the **CALIBR** submenu (see Figure 4-1 on page 53). Press **down** to go to zero calibration (**WZERO**). See Figure 4-2 on page 53.
3. Ensure scale is empty, then press **down** again to show the current **WZERO** value, then press the **Calibrate** softkey to calibrate zero. When complete, the new A/D count for the zero calibration is displayed. Press **enter** to save the zero calibration value and go to the next prompt (**WVAL**).
4. With **WVAL** displayed, press **down** to show the stored calibration weight value. Use the numeric keypad to enter the actual value of the calibration test weights, then press **enter** to save the value and go to span calibration (**WSPAN**).
5. Place test weights on scale. Press **down** again to show the current **WSPAN** value, then press the **Calibrate** softkey to calibrate span. When complete, the new A/D count for the span calibration is displayed. Press **enter** again to save the span calibration value and go to the next prompt (**WLIN**).
6. Five-point linearization (using the **WLIN** parameter) provides increased scale accuracy by calibrating the indicator at up to five additional points between the zero and span calibrations.

Linearization is optional: if you choose not to perform linearization, skip the **WLIN** parameter; if linearization values have previously been entered, these values are reset to zero during calibration. To perform linearization, follow the procedure below:

With **WLIN** displayed, Press **down** to go to the first linearization point (**POINT 1**). Press **down** again to show the weight value prompt (**WGT 1**), then **down** once more to show the weight value. Place test weights on the scale, then use the numeric keypad to enter the actual test weight value. Press **enter** to save the value and move to the calibration (**CAL 1**) prompt. Press **down** to show the current calibration value, then press the **Calibrate** softkey to calibrate the linearization point. When complete, the A/D count for the linear calibration is displayed. Press **enter** again to save the calibration value and go to the next prompt (**POINT 2**).

Repeat for up to five linearization points. To exit the linearization parameters, press the **up** key to return to **WLIN**.

7. The optional rezero function is used to remove a calibration offset when hooks or chains are used to hang the test weights.



**NOTE:** The rezero function cannot be used with five-point linear calibration.

- If no other apparatus was used to hang the test weights during calibration, remove the test weights and press **up** to return to the **CALIBR** submenu.
  - If hooks or chains were used during calibration, remove these and the test weights from the scale. With all weight removed, go to the **REZERO** parameter, then press **down** to show the current zero value. Press the **Calibrate** softkey to adjust the zero and span calibration values. Press **enter** or **up** to return to the **CALIBR** submenu.
8. Press **up** to return to the **SCALES** menu, or press the **Save and Exit** softkey to exit setup mode.

### 4.3 Serial Command Calibration

To calibrate the indicator using serial commands, the indicator serial port must be connected to a terminal or personal computer. See [Section 2.3.4 on page 16](#) for serial port pin assignments; see [Section 9.0 on page 86](#) for more information about using serial commands.

Once the indicator is connected to the sending device, do the following:

1. Place the indicator in setup mode (display reads **CONFIG**) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. Send the SC.WZERO#*n* serial command (where *n* is the number of the scale) to calibrate zero.
3. Place test weights on the scale and use the SC.WVAL command to enter the test weight value in the following format:

SC.WVAL#*n*=*vvvvv*<CR>

4. Send the SC.WSPAN#*n* serial command to calibrate span.
5. Up to five linearization points can be calibrated between the zero and span calibration values. Use the following commands to set and calibrate a single linearization point:

SC.WLIN#*n*.V1=*vvvvv*<CR>

SC.WLIN#*n*.C1<CR>

The SC.WLIN#*n*.V1 command sets the test weight value (*vvvvv*) for linearization point 1. The SC.WLIN#*n*.C1 command calibrates the point. Repeat using the SC.WLIN#*n*.V*x* and SC.WLIN#*n*.C*x* commands as required for additional linearization points.

6. To remove an offset value, clear all weight from the scale, including hooks or chains used to hang test weights, then send the SC.REZERO#*n* serial command.
7. Send the KSAVE serial command to save the calibration changes; send KEXIT to exit setup mode.

### 4.4 Revolution Calibration

The *Revolution* Calibration Wizard provides step-by-step scale calibration. See [Section 5.0 on page 56](#) for a general overview of the *Revolution* utility. With the 820i connected to the PC:

1. Place the indicator into configuration mode.
2. Select **New** from the File menu.
3. The **Select Indicator** dialog box appears. Select 820i and click **OK**.
4. Select **Connect** from the Communications menu.
5. Select **Scale** from the left-side menu and then select the scale icon.
6. Select **Calibration Wizard** from the Tools menu. The **Calibration Wizard** window appears.
7. Select *Standard Calibration* (zero and span) or *Standard with Multi-Point Linearization* and click **Next** to continue.
8. Enter the test weight used to calibrate the scale. If chains or hooks are used to hold the weights, check the box below the test weight value entry. This adds a rezero step to the calibration sequence.
9. Remove all weights from the scale. If chains or hooks are used, place them on the scale. Press the **Calibrate Zero** button to perform the zero calibration. A message box appears when the process is complete.
10. Apply the test weights to the scale. Press the **Calibrate Span** button to perform the span calibration. A message box appears when the process is complete.
11. If the option for chains or hooks was selected in step 8, the Rezero display is shown. Remove all weights from the scale, including chains or hooks. Press the **Re-Zero** button to calibrate the zero offset.
12. If performing a multi-point linear calibration, up to five other calibration weight values can be entered on the display. The weights must be in ascending order and must not include zero or the span weight. Enter the weight values and click the **Go** button to calibrate each point.
13. Review the new calibration values then click **Finish** to close the Calibration Wizard. To restore the current calibration values, click **Cancel**.

## 5.0 Using Revolution®

The *Revolution* utility provides a suite of functions used to support configuration, calibration, customization, and backup of the 820i software. Hardware and software configuration, stream and ticket formatting, setpoint configuration, database management, and *iRite-IDE* program editing are all supported by *Revolution*.

Calibration values, scale, setpoint, and display configuration, database tables, and user programs, can be both saved and restored to the 820i using *Revolution*. (See [Section 4.4 on page 55](#) for *Revolution* calibration procedures.)

Other supporting applications provided with *Revolution* include:

- The *iRite-IDE* Editor provides a basic editor and a compiler for writing *iRite-IDE* applications.
- The Rice Lake Web Update utility uses the Internet connection to check for and download updates to the *Revolution* and 820i software.
- The iLaunch utility can be installed to display a set of icons used for convenient startup of *Revolution* and its supporting applications, including the Help system.

### Hardware and Software Requirements

Minimum system requirements: 166 MHz, x86-compatible, with 32MB RAM (64MB for NT4/2000/XP), 40MB disk space.  
Recommended system: 233 MHz, x86-compatible or greater, with 64MB RAM, 40 MB disk space.

*Revolution* runs on most Windows® operating systems, including Windows 98, Windows 98 SE, Windows ME, Windows NT 4.0 (SP4 or greater), Windows 2000, Windows XP (Home or Professional), and Windows Vista™.

Internet Explorer® (IE) 4.0 or greater is required to use the *Revolution* help system. Explorer is included on the *Revolution* installation CD or is available from Microsoft Corporation.

### 5.1 Installing and Starting the Program

*Revolution* is installed using a standard Windows installation procedure. *Revolution* applications and support files are installed in a directory named RevIII; icons for the *Revolution* application, the *Revolution* Editor, Uninstall and the Rice Lake Web Update utility are placed in the Windows Start menu.

### 5.2 Configuring Scales

To configure the 820i using *Revolution*, start the program, then select New from the File menu. The Select Indicator display, shown in [Figure 5-1](#), prompts you to select the indicator type. To open a new configuration file, select the icon for the 820i and click OK.

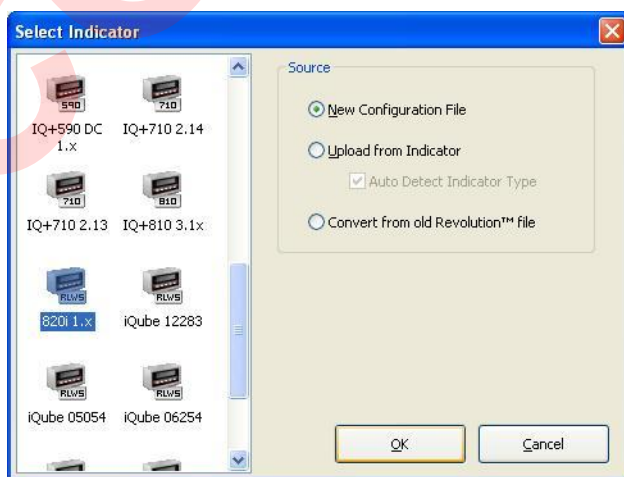


Figure 5-1. Revolution Select Indicator Display

Next, the Indicator Information display for the 820i is shown. To begin configuring the indicator, click on the Scales tab (bottom left of display), then on the Scales icon (see [Figure 5-2](#)).

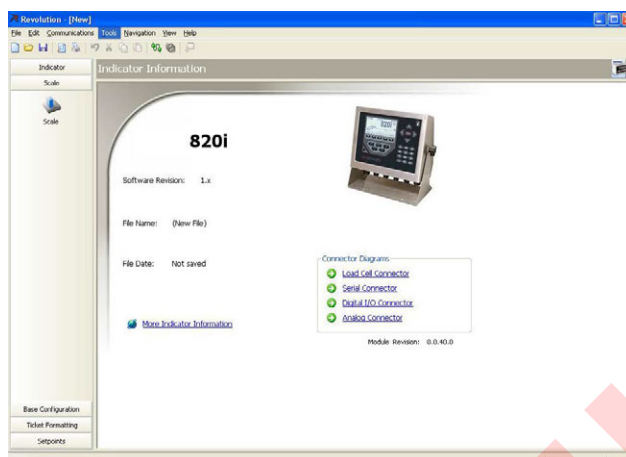


Figure 5-2. Revolution Indicator Information Display

Next, a blank Scale display is shown, with scale entries listed for Scale #1, Scale #2, and Scale #3. Double-click on one of the listed scales, then select the type of scale being configured in the Scale Configuration pop-window (see [Figure 5-3](#)). For A/D scales, select **Load Cell A/D Channel** as the Source Type, then click the arrow button to move the A/D from the Source list to the Selected list. Click **OK** to return to the Scales display.

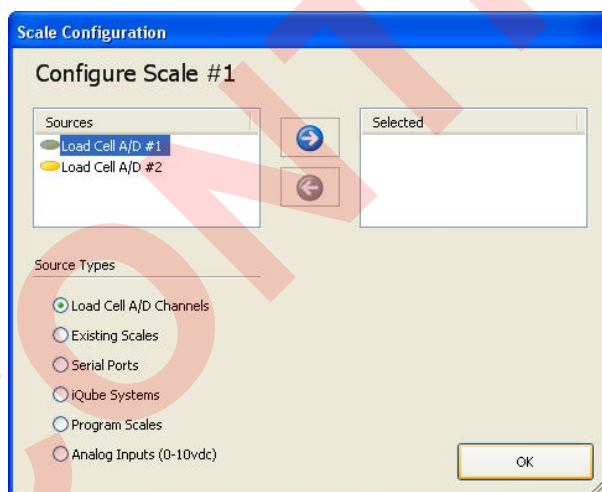


Figure 5-3. Revolution Scale Configuration Display

Once the scale type is established, the default values are supplied for the Scale display fields and the Scale Wizard button is enabled (see Figure 5-4).

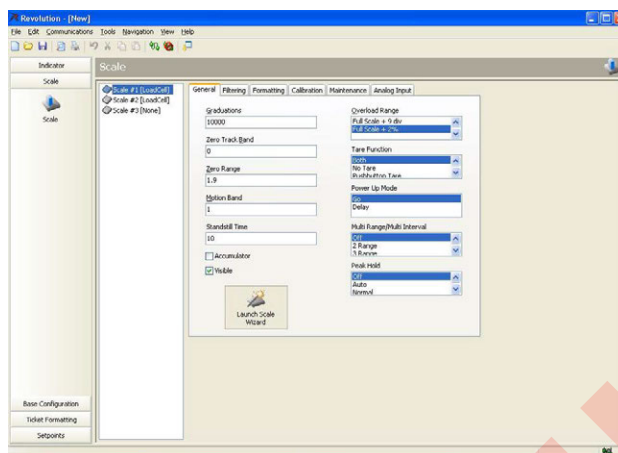


Figure 5-4. Revolution Scales Display

Continue configuring the scale using the other tabs shown on the *Revolution* displays, or you can use the Scale Wizard (shown as a button on the Scales menu; also available under the Tools menu) to create a basic configuration based on your application type.

## 5.3 Connecting to the Indicator

Connect the PC serial port to port 2 of the 820i, then click on the **Connect** icon in the toolbar. Revolution attempts to establish communications to the indicator. If communications settings need to be adjusted, select **Options...** from the Tools menu.

### 5.3.1 Downloading to the Indicator

The **Send Configuration to Device** function in the Revolution Communications menu allows a Revolution configuration file (with or without scale calibration data), ticket formats, setpoint data, or an *iRite-IDE* program file to be sent/downloaded to a connected indicator in *Setup* mode.

The **Send Section to Device** function in the Revolution Communications menu allows the download only the currently displayed object, such as a scale configuration.

Because less data is transferred using **Send Section to Device**, it is typically faster than a full configuration download, but there is an increased possibility that the download may fail due to dependencies on other objects. If the download fails, try performing a complete download using the **Send Configuration to Device** function.

### 5.3.2 Uploading Configuration to Revolution

The **Get Configuration from Device** function in the Revolution Communications menu allows the existing configuration of a connected indicator to be saved to a file on the PC. Once saved, the configuration file provides a backup that can be quickly restored to the indicator if needed. Alternatively, the file can be edited within Revolution and sent back to the indicator.



**NOTE:** The indicator must be in setup mode before uploading or downloading data.

## 5.4 Installing Software Upgrades

New releases of the 820i system software can be downloaded and installed using an internet connection and the Rice Lake Web Update application. To use the Web Update application, install iRev from the Tool Kit CD.



**NOTE:** Before upgrading to a new version of 820i system software, ensure that a copy of the current indicator configuration has been saved using Revolution. Reloading the system software requires a RESETCONFIGURATION function and resets all configuration and calibration values to their factory defaults.

Click on the **Check for Updates** button in the Rice Lake Web Update application to check if a new version of the 820i software is available. To download a new software version, select the new software version and click on **Get Selection**. Once the new software is downloaded to the PC, do the following:

1. Disconnect power to the 820i.
2. Open the indicator enclosure and place a jumper across the SW1 boot mode pins (see [Figure 2-3 on page 19](#)).
3. Connect the PC serial port to port 2 of the 820i.
4. Power up the 820i. The indicator will stall at the diagnostic monitor.
5. Click on the **Update Indicator** button to download the new software. When the download begins, the following messages are shown:

**Loading...**

**System Diagnostic Monitor v1.0**

\$

?

\$

?

**\$KNIX**

**\$SYSLOAD**

6. When the download is complete, the indicator display shows the following messages:

**\$DONE**

**\$BOOT**

**Loading...**

7. The indicator resets and goes to weigh mode.
8. Disconnect power to the indicator. Remove the jumper from across the SW1 boot mode pins and place it on a single pin.
9. Power up the indicator and reload *Revolution* and *iRite-IDE* files as necessary.

## 6.0 Print Formatting

The 820i provides print formats that determine the format of the printed output when the **PRINT** key is pressed, a KPRINT serial command is received, or when setpoint push-print or truck weigh-in or weigh-out operations are performed. Supported print formats are: GFMT, NFMT, ACCFMT, SPFMT, TRWIN, TRWOUT, ALERT, AUXFMT1—AUXFMT20, and AUDITFMT. Additionally, two header formats, HDRFMT1 and HDRFMT2, can be inserted into any of the other ticket formats using the <H1> and <H2>-formatting commands. The particular ticket format used for a given print operation depends on the indicator configuration (see Table 6-2) and the particular operation performed.

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

### 6.1 Print Formatting Commands

Table 6-1 lists commands you can use to format the 820i 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Supported Ticket Formats                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| General Weight Data Commands                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    |
| <G>                                                                                                                                                                                                                                                          | Gross weight, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                                       | GFMT, NFMT, TRWIN, TRWOUT, ACCFMT, AUXFMTxx, ALERT |
| <G#n>                                                                                                                                                                                                                                                        | Gross weight, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                    |
| <N>                                                                                                                                                                                                                                                          | Net weight, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |
| <N#n>                                                                                                                                                                                                                                                        | Net weight, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                    |
| <T>                                                                                                                                                                                                                                                          | Tare weight, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                    |
| <T#n>                                                                                                                                                                                                                                                        | Tare weight, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                    |
| <S>                                                                                                                                                                                                                                                          | Current scale number                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                    |
|                                                                                                                                                                           | <b>NOTE: Gross, net, tare, accumulator, truck, and setpoint weights can be printed in any configured weight units by adding the following modifiers to the gross, net, and tare 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 for Scale #3 in secondary units, use the following command: &lt;N#3/S&gt;</b> |                                                    |
| <b>Formatted weight strings contain a 10-digit weight field (including sign and decimal point, with leading zeroes suppressed), followed by a space and a two-digit units identifier. Total field length with units identifier is 12 (or 13) characters.</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    |
| Accumulator Commands                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    |
| <A>                                                                                                                                                                                                                                                          | Accumulated weight, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                                 | GFMT, NFMT, ACCFMT, AUX-FMTxx                      |
| <A#n>                                                                                                                                                                                                                                                        | Accumulated weight, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                    |
| <AA>                                                                                                                                                                                                                                                         | Average accumulation, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                    |
| <AA#n>                                                                                                                                                                                                                                                       | Average accumulation, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                    |
| <AC>                                                                                                                                                                                                                                                         | Number of accumulations, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                    |
| <AC#n>                                                                                                                                                                                                                                                       | Number of accumulations, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                    |
| <AT>                                                                                                                                                                                                                                                         | Time of last accumulation, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |
| <AT#n>                                                                                                                                                                                                                                                       | Time of last accumulation, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |
| <AD>                                                                                                                                                                                                                                                         | Date of last accumulation, current scale                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |
| <AD#n>                                                                                                                                                                                                                                                       | Date of last accumulation, scale <b>n</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |
| <AN#n>                                                                                                                                                                                                                                                       | Number of alibi print token                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                    |
| Truck Mode Commands                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    |
| <TID>                                                                                                                                                                                                                                                        | Truck ID number                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TRWIN, TRWOUT                                      |
| <TR1>                                                                                                                                                                                                                                                        | Gross weight for current ticket in displayed units                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                    |
| <TR2>                                                                                                                                                                                                                                                        | Tare weight for current ticket in displayed units                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                    |
| <TR3>                                                                                                                                                                                                                                                        | Net weight for current ticket in displayed units                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                    |

Table 6-1. Print Format Commands

| Command                                                                                                                                                                                                     | Description                                                                                                                             | Supported Ticket Formats |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>NOTE: TR1, TR2, and TR3 truck ticket weight data includes keywords INBOUND, KEYED, RECALLED, as necessary.</b>                                                                                           |                                                                                                                                         |                          |
| Setpoint Commands                                                                                                                                                                                           |                                                                                                                                         |                          |
| <SCV>                                                                                                                                                                                                       | Setpoint captured value                                                                                                                 | SPFMT                    |
| <SN>                                                                                                                                                                                                        | Setpoint number                                                                                                                         |                          |
| <SNA>                                                                                                                                                                                                       | Setpoint name                                                                                                                           |                          |
| <SPM>                                                                                                                                                                                                       | Setpoint mode (gross or net label)                                                                                                      |                          |
| <SPV>                                                                                                                                                                                                       | Setpoint preact value                                                                                                                   |                          |
| <STV>                                                                                                                                                                                                       | Setpoint target value                                                                                                                   |                          |
| Auditing Commands                                                                                                                                                                                           |                                                                                                                                         |                          |
| <CD>                                                                                                                                                                                                        | Last calibration date                                                                                                                   | All                      |
| <NOC>                                                                                                                                                                                                       | Number of calibrations                                                                                                                  |                          |
| <NOW>                                                                                                                                                                                                       | Number of weighments since last calibration                                                                                             |                          |
| <b>NOTE: Last calibration date (&lt;CD&gt;) and number of calibrations (&lt;NOC&gt;) are updated whenever WZERO, WVAL, WSPAN, or REZERO are changed.</b>                                                    |                                                                                                                                         |                          |
| <b>Number of weighments (&lt;NOW&gt; command) is incremented whenever the scale weight exceeds 10% of scale capacity. Scale must return to gross or net zero before the value can be incremented again.</b> |                                                                                                                                         |                          |
| Formatting and General-Purpose Commands                                                                                                                                                                     |                                                                                                                                         |                          |
| <nnn>                                                                                                                                                                                                       | ASCII character (nnn = decimal value of ASCII character). Used for inserting control characters (STX, for example) in the print stream. | All                      |
| <TI>                                                                                                                                                                                                        | Time                                                                                                                                    |                          |
| <DA>                                                                                                                                                                                                        | Date                                                                                                                                    |                          |
| <TD>                                                                                                                                                                                                        | Time and date                                                                                                                           |                          |
| <UID>                                                                                                                                                                                                       | Unit ID number (up to 8 alphanumeric characters)                                                                                        |                          |
| <CN>                                                                                                                                                                                                        | Consecutive number (up to 7 digits)                                                                                                     |                          |
| <H1>                                                                                                                                                                                                        | Insert header format 1 (HDRFMT1); see <a href="#">Table 6-2 on page 62</a>                                                              |                          |
| <H2>                                                                                                                                                                                                        | Insert header format 2 (HDRFMT2); see <a href="#">Table 6-2 on page 62</a>                                                              |                          |
| <CR>                                                                                                                                                                                                        | Carriage return character                                                                                                               |                          |
| <LF>                                                                                                                                                                                                        | Line feed character                                                                                                                     |                          |
| <NLnn>                                                                                                                                                                                                      | New line (nn = number of termination (<CR/LF> or <CR>) characters)*                                                                     |                          |
| <SPnn>                                                                                                                                                                                                      | Space (nn = number of spaces)*                                                                                                          |                          |
| <SU>                                                                                                                                                                                                        | Toggle weight data format (formatted/unformatted)                                                                                       |                          |
| <USnn>                                                                                                                                                                                                      | Insert user print text string (from user program, SetPrintText API)                                                                     |                          |
| <b>NOTE: If nn is not specified, 1 is assumed. Value must be in the range 1–99.</b>                                                                                                                         |                                                                                                                                         |                          |
| User Program-dependent Commands                                                                                                                                                                             |                                                                                                                                         |                          |
| <USnn>                                                                                                                                                                                                      | Insert user print text string (from user program, SetPrintText API)                                                                     | All                      |
| <EV>                                                                                                                                                                                                        | Invoke user program print handler <b>X</b> (PrintFmt <b>X</b> )                                                                         | AUXFMT <b>X</b>          |

Table 6-1. Print Format Commands (Continued)

| Command                                                                                       | Description                                              | Supported Ticket Formats |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------|
| Alert Format Commands                                                                         |                                                          |                          |
| <COMP>                                                                                        | Company name (up to 30 characters)                       | All                      |
| <COAR1><br><COAR2>                                                                            | Contact company address, lines 1–3 (up to 30 characters) |                          |
| <CONM1><br><CONM2>                                                                            | Contact names (up to 20 characters)                      |                          |
| <COPH1><br><COPH2>                                                                            | Contact phone numbers (up to 20 characters)              |                          |
| <COML>                                                                                        | Contact e-mail address (up to 30 characters)             |                          |
| <ERR>                                                                                         | Alert error message (system-generated)                   | ALERT                    |
| See the <i>iQUBE Installation Manual</i> , PN 77224, for more information about using alerts. |                                                          |                          |

Table 6-1. Print Format Commands (Continued)

## 6.2 Default Print Formats

Table 6-2 shows the default print formats for the 820i and lists the conditions under which each print format is used. The HDRFMT1 and HDRFMT2 formats are used to specify header information that can be used by the other ticket formats. The contents of the HDRFMTx format can be inserted into any other ticket format using the <H1> and <H2> formatting commands.

| Format                                                                                                                               | Default Format String                                                                                       | Used When                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GFMT                                                                                                                                 | GROSS<G><NL2><TD><NL>                                                                                       | Normal mode, no tare in system                                                                                                                                                      |
| NFMT                                                                                                                                 | GROSS<G><NL>TARE<SP><T><NL>NET<SP2><N><br><NL2><TD><NL>                                                     | Normal mode, tare in system                                                                                                                                                         |
| ACCFMT                                                                                                                               | ACCUM<A><NL><DA><TI><NL>                                                                                    | Accumulator enabled and displayed, or setpoint print operation with PSHACCM=ON                                                                                                      |
| SPFMT                                                                                                                                | <SCV><SP><SPM><NL>                                                                                          | Setpoint print operation with PSHPRNT=ON                                                                                                                                            |
| TRWIN                                                                                                                                | <NL>ID<SP><TID><NL2>GROSS<TR1><br><NL2><DA><SP><TI><NL>                                                     | Press the <b>Weigh In</b> softkey, enter truck ID number, and press <b>enter</b> .                                                                                                  |
| TRWOUT                                                                                                                               | <NL6>ID<SP><TID><NL2>GROSS<TR1><NL>TARE<SP><br>><br><TR2><NL>NET<SP2><TR3><NL2><DA><SP><TI><NL><br>>        | Press the <b>Weigh Out</b> softkey, enter truck ID number, and press <b>enter</b> .                                                                                                 |
| TRFMT                                                                                                                                | REG ID: <TID>: <TR2> SCALE<S> <TD><NL>                                                                      | Truck register currently displayed                                                                                                                                                  |
| ALERT                                                                                                                                | <COMP><NL><COAR1><NL><COAR2><NL><br><CONM1><NL><COPH1><NL><br><CONM2><NL><COPH2><NL><br><COML><NL><ERR><NL> | Alert message is sent to specified port when error indication is generated by an attached <i>iQUBE</i> . See the <i>iQUBE Installation Manual</i> , PN 77224, for more information. |
| HDRFMT1<br>HDRFMT2                                                                                                                   | COMPANY NAME<NL>STREET ADDRESS<NL><br>CITY, ST ZIP<NL2>                                                     | Must be inserted into other print format                                                                                                                                            |
| AUXFMTxx                                                                                                                             | GROSS<G><NL2><TD><NL>                                                                                       | Formats AUX1FMT—AUX20FMT                                                                                                                                                            |
| AUDITFMT                                                                                                                             | Fixed format; cannot be edited                                                                              | Press <b>PRINT</b> when audit trail is displayed, or in response to a DUMPAUDIT serial command.                                                                                     |
| <b>NOTE:</b> In OIML and CANADA modes, the letters <b>PT</b> (preset tare) are automatically inserted after the printed tare weight. |                                                                                                             |                                                                                                                                                                                     |

Table 6-2. Default Print Formats

## 6.3 Customizing Print Formats

The following sections describe procedures for customizing print formats using the *Revolution* configuration utility, serial commands, or the front panel (PFORMT menu). See [Section 10.5 on page 102](#) for information about custom stream formatting.

### 6.3.1 Using Revolution

The *Revolution* configuration utility provides a ticket formatting grid with a tool bar. The grid allows you to construct the ticket format without using the formatting commands (<NL> and <SP>) required by the front panel or serial command methods. Using *Revolution*, you can type text directly into the grid, then select weight value fields from the tool bar and place them where you want them to appear on the printed ticket.

Figure 6-1 shows an example of the *Revolution* print formatting display.

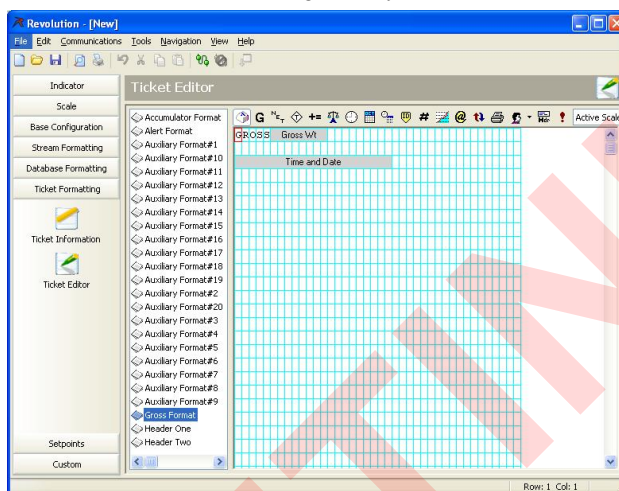


Figure 6-1. Revolution Print Formatting Display

### 6.3.2 Using the Front Panel

If you have no access to equipment for communication through a serial port or are working at a site where such equipment cannot be used, you can use the PFORMT menu (see Figure 6-2) to customize the print formats.

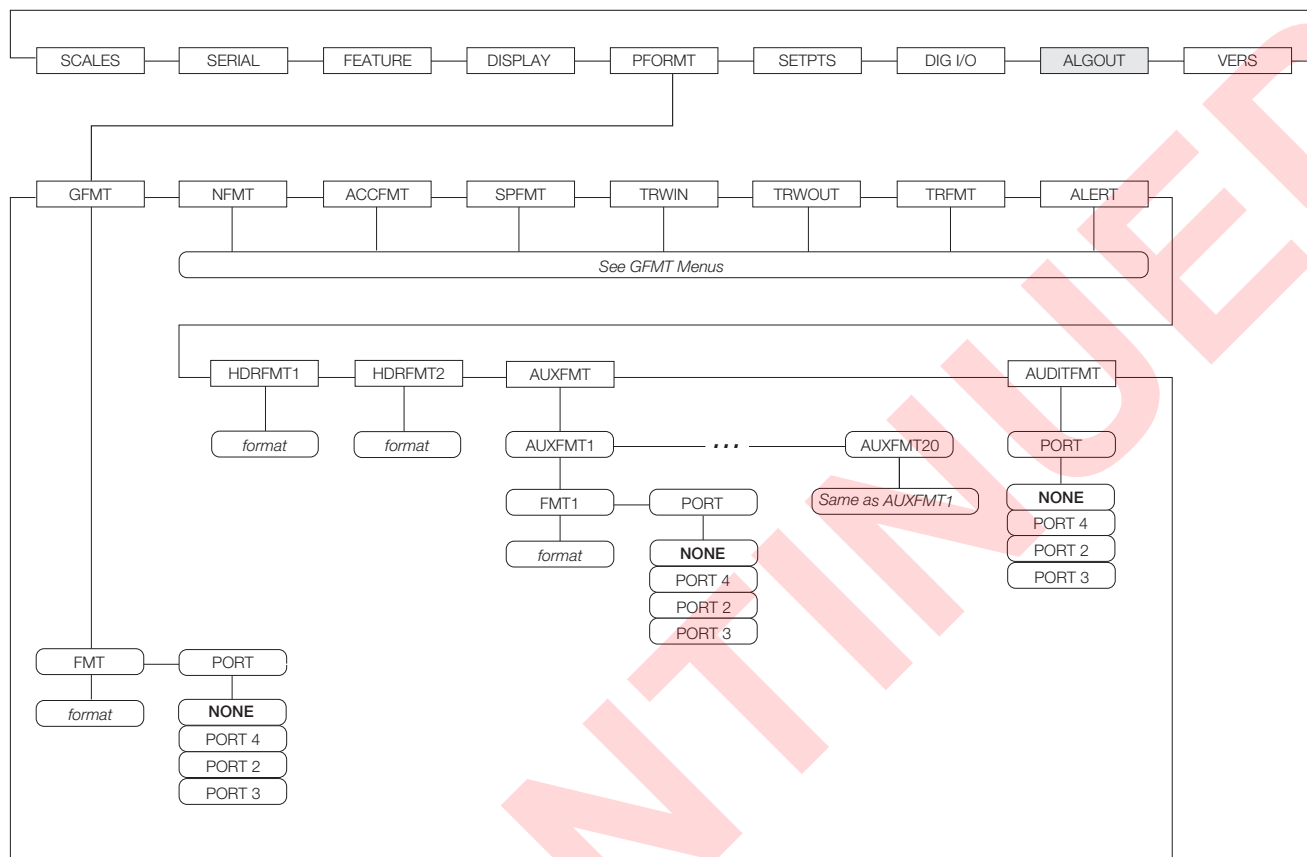


Figure 6-2. PFORMT Menu

Each print format can be edited from the front panel using a character selection like that shown in Figure 6-3. Use the navigation keys (**up**, **down**, **left**, **right**) to move around and between the format command line and the character selection list.

|                                                                                                    |      |         |      |
|----------------------------------------------------------------------------------------------------|------|---------|------|
| 05/24/2006                                                                                         |      | 03:13PM |      |
| —                                                                                                  | PORT | FMT     | PORT |
| ABCDEFGHIJKLMNOPQRSTUVWXYZ<br>abcdefghijklmnopqrstuvwxyz<br>\$p!#\$%&?@()<>+-*%=/\".,,:;'^_ '~[]{} |      |         |      |
| GFmt =>  ROSS<G><NL2><TD>                                                                          |      |         |      |
| Default                                                                                            | Home | Cancel  | End  |
| Restore                                                                                            |      |         |      |

Figure 6-3. Print Formatting Character Selection Display

- To add a character: position the cursor in the format where you want to add the character. Use the **up** key to return to the character selection list, use the navigation keys to highlight the character to add, then press **enter**. The new character is added to the left of the current cursor location in the format string.
- To add a blank space to a string, position the cursor to the right of where the space is to be inserted in the format string, highlight the **\$P** character in the selection list, and press **enter**.
- To delete a character, position the cursor to the right of the character to be deleted from the format string, then press the **CLR** key.

- To add a special character, insert the < and > delimiter characters from the selection list. Use the numeric keypad to insert the decimal ASCII value (1–255) of the character between the delimiters. For example, insert <2> to add the STX character to the print format.

To save the edited format string, position the cursor in the format string and press enter. Softkeys shown on the character selection display provide additional functions:

**Default** Restores the string to its default value.

**Home** Positions cursor at the beginning of the format string.

**Cancel** Exits without saving changes to the format string.

**End** Positions cursor at the end of the format string.

**Restore** Restores the string to its previously saved value.

A **Print Test** softkey is shown under the **FMT** parameter after exiting the character selection display. If a printer is attached, this key can be used to verify the edited string format before exiting setup mode.



**NOTE:** The Print Test softkey is not available for the HDRFMTx formats. These formats can be output only when inserted into one of the printable ticket formats by using the <H1> or <H2> print format commands.

### 6.3.3 Using Serial Commands

With a personal computer, terminal, or remote keyboard attached to one of the 820i serial ports, you can use the serial command set described in Table 6-1 to customize the print format strings.

To view the current setting of a format string, type the name of the print format and press the **enter** key. For example, to check the current configuration of the GFMT format, type GFMT.FMT and press **enter**. The indicator responds by sending the current configuration for the gross format:

```
GFMT.FMT=<G> GROSS<NL>
```

To change the format, use the GFMT.FMT or NFMT.FMT serial command followed by an equals sign (=) and the modified print format string. For example, to add the name and address of a company to the gross format, you could send the following serial command:

```
GFMT.FMT=MOE'S DUMP<NL>2356 EAST HIGHWAY ROAD<NL>SMALLTOWN<NL2><G> GROSS<NL>
```

A ticket printed using this format might look like the following:

```
MOE'S DUMP
2356 EAST HIGHWAY ROAD
SMALLTOWN
```

```
1345 LB GROSS
```

The ticket above could also be formatted by specifying the company address information in the HDRFMT1 ticket format, then substituting the <H1> command for the address in the GFMT ticket format:

```
HDRFMT1=MOE'S DUMP<NL>2356 EAST HIGHWAY ROAD<NL>SMALLTOWN<NL2>
GFMT.FMT=<H1><G> GROSS<NL>
```

## 7.0 Truck Modes

The truck in/out modes are used to handle multiple truck ID numbers and weights. Truck IDs can be up to 16 alphanumeric characters in length.

Six truck modes combine stored ID, keyed tare, and value swapping features in various ways:

| Mode  | Stored IDs | Keyed Tares | Value Swapping |
|-------|------------|-------------|----------------|
| MODE1 | NO         | YES         | YES            |
| MODE2 | NO         | NO          | YES            |
| MODE3 | YES        | YES         | YES            |
| MODE4 | YES        | NO          | YES            |
| MODE5 | YES        | YES         | NO             |
| MODE6 | YES        | NO          | NO             |
| OFF   |            |             |                |

Truck Mode Features

**Stored IDs** let you keep a database of truck IDs and weigh-in weights in the indicator's memory. The indicator can automatically store up to 1000 truck IDs and tares; or it can clear the information after printing a weigh-out ticket. For example, if the same truck seldom crosses the scale, it may not be practical to save its ID number and weigh-in weight. However, if that same truck crosses the scale many times each day, it's more convenient to store the information in the indicator memory and recall it when needed. Stored IDs and weights are available in modes 3, 4, 5, and 6.

**Keyed tares** allow you to manually enter the tare weight using the numeric keypad and the **TARE** key. Keyed tares are available in modes 1, 3, and 5. To use keyed tares, an incoming truck must be empty at weigh-in, full at weigh-out.



**NOTE:** Some local regulations require the tare weight to be read from the scale. If so, don't use the keyed tares feature.

**Value swapping** ensures that the lowest of two weight values associated with a particular ID number is used as the tare weight. For example, if a truck crosses the scale fully loaded at weigh-in, then unloads and crosses the scale empty at weigh-out, the indicator automatically assigns the lesser (empty truck) weight as the tare. Value swapping is available in modes 1, 2, 3, and 4.

### 7.1 Using the Truck Modes

To select a truck in/out mode, press the setup switch to enter setup mode. Use the navigation keys to go to the **FEATURE** menu, then to the **TRUCK** submenu to select the mode.

Next, go **right** to the **SOFTKEYS** submenu and configure the **Weigh In**, **Weigh Out**, and **Truck Regs** softkeys. These keys are required when using the truck modes.

Figure 7-1. 820i Display, showing Truck Mode Softkeys

## 7.2 Using the Truck Regs Display

The Truck Regs display is shown by pressing the Truck Regs softkey in weighing mode. The display contains an alphabetical list of stored truck IDs, weigh-in weights (in primary units), and the time and date of the weigh-in transaction (see [Figure 7-2](#)).

Softkeys shown at the bottom of the Truck Regs display are described below.

**Page Up** Shows previous page of the truck register.

**Page Down** Shows next page of the truck register.

**Cancel** Exits to weighing mode.

**Delete** Deletes the highlighted truck ID from the truck register.

**Delete All** Deletes all truck IDs from the truck register.

The truck register can be printed to an attached printer by pressing the **PRINT** key while the Truck Regs display is shown. The printed register uses the TRFMT print format (see [Section 6.2 on page 62](#)).



**NOTE:** If a non-zero setpoint password is configured (SPPWD parameter on the FEATURE menu), you must enter the password before any truck register entries can be deleted.

|                                                                                                                |   |          |                       |
|----------------------------------------------------------------------------------------------------------------|---|----------|-----------------------|
| 05/25/2006                                                                                                     |   | 08:04PM  |                       |
| ACME 152                                                                                                       | : | 45260 lb | 03:20PM<br>05/17/2006 |
| BRF 1454                                                                                                       | : | 32500 lb | 05:18PM<br>05/18/2006 |
| BRF 1468                                                                                                       | : | 32500 lb | 05:29PM<br>05/18/2006 |
| GREEN 12                                                                                                       | : | 45260 lb | 08:06AM<br>05/18/2006 |
| GREEN 66                                                                                                       | : | 44220 lb | 10:24AM<br>05/18/2006 |
| <div> <div>Page Up</div> <div>Page Down</div> <div>Cancel</div> <div>Delete</div> <div>Delete All</div> </div> |   |          |                       |

Figure 7-2. Truck Register Display

## 7.3 Weigh-In Procedure

In modes 1 and 2, the indicator erases truck ID numbers and tare weights from memory after the transaction. In modes 3–6, the truck ID and weigh-in weight values are saved after the weigh-out ticket has been processed.

The general weigh-in procedure is as follows:

1. The empty truck moves onto the scale for weigh-in.
2. Press the **Weigh In** softkey.
3. A prompt is shown to enter the truck ID (up to eight alphanumeric characters). Enter the ID, then press the **enter** key.
4. Indicator generates the weigh-in ticket:  
ID 304812  
GROSS 15000. LB INBOUND  
01/14/2002 10:24 AM
5. Truck leaves the scale.

## 7.4 Weigh-Out Procedure

The general weigh-out procedure is as follows:

1. The loaded truck moves onto the scale for weigh-out.
2. If truck ID is known, press the **Weigh Out** softkey, enter the ID, and press the **Enter** key.  
If ID is not known, press the **Truck Regs** softkey to view list of stored IDs (see [Figure 7-2](#)). Scroll to the correct truck ID, note the ID number, then press the **Cancel** softkey to return to the weight display. From the weight display, press **Weigh Out**, key in the ID, then press the **Enter** key.
3. Indicator generates the weigh-out ticket. In modes 1 and 2, the ID is deleted once the weigh-out ticket is processed.

## 7.5 Single-Transaction Tare Weights and IDs

One-time transactions are supported in all modes that can be configured to use stored IDs (modes 3–6). This function allows one-time weighing of trucks without adding the truck ID and weigh-in weight to the permanent truck register.

To use this function, press the **Weigh In** or **Weigh Out** softkey, then enter a truck ID containing a decimal point. IDs entered with a decimal point as part of the ID are erased from the truck register when the transaction is complete.

## 8.0 Setpoints

The 820i indicator provides 100 configurable setpoints for control of both indicator and external equipment functions. Setpoints can be configured to perform actions or functions based on specified parameter conditions. Parameters associated with various setpoint kinds can, for example, be configured to perform functions (print, tare, accumulate), to change the state of a digital output controlling indicator or external equipment functions, or to make conditional decisions.



**NOTE:** Weight-based setpoints are tripped by values specified in primary units only.

### 8.1 Batch and Continuous Setpoints

820i setpoints can be either continuous or batch setpoints.

**Continuous setpoints** are free-running: the indicator constantly monitors the condition of free-running setpoints at each A/D update. The specified setpoint action or function is performed when the designated setpoint parameter conditions are met. A digital output or function assigned to a free-running setpoint continuously changes state, becoming active or inactive, as defined by the setpoint parameters.

**Batch setpoints** are active one at a time, in an ordered sequence. The 820i can use setpoints to control up to 100 separate batch processing steps.

A digital output associated with a batch setpoint is active until the setpoint condition is met, then latched for the remainder of the batch sequence.

To use batch setpoints, you must activate the BATCHNG parameter on the SETPTS menu. This parameter defines whether a batch sequence is automatic or manual. AUTO sequences repeat continuously, while MANUAL sequences require a BATSTRT signal. The BATSTRT signal can be initiated by a digital input, serial command, **Batch Start** softkey, or the StartBatch function in an *iRite-IDE* program.

For setpoint kinds that can be used as either continuous or batch setpoints, the BATCH parameter must also be set ON. (Setpoint kinds that can only be used as batch setpoints do not require the BATCH parameter.) If the setpoint is defined but the BATCH parameter is off, the setpoint operates as a continuous setpoint, even during batch sequences.



**NOTE:** In applications that contain both batch setpoint routines and continuous setpoints, continuous setpoints should be kept separate from the batch sequence. This is especially true when using CONCUR or TIMER setpoints to perform actions or functions based on the batch sequence. CONCUR and TIMER setpoints should not be included in the referenced START and END setpoint sequence.

| Kind   | Description                                                                                                                                                                                                                               | Batch | Continuous |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| OFF    | Setpoint turned off/ignored.                                                                                                                                                                                                              |       |            |
| GROSS  | Gross setpoint. Performs functions based on the gross weight. The target weight entered is considered a positive gross weight.                                                                                                            | X     | X          |
| NET    | Net setpoint. Performs functions based on the net weight. The target weight entered is considered a positive net weight value.                                                                                                            | X     | X          |
| -GROSS | Negative gross weight. Performs functions based on the gross weight. The target weight entered is considered a negative gross weight.                                                                                                     | X     | X          |
| -NET   | Negative net weight. Performs functions based on the net weight. The target weight entered is considered a negative net weight value.                                                                                                     | X     | X          |
| ACCUM  | Accumulate setpoint. Compares the value of the setpoint to the source scale accumulator. The accumulator setpoint is satisfied when the value of the source scale accumulator meets the value and conditions of the accumulator setpoint. | X     | X          |
| ROC    | Rate-of-change setpoint. Performs functions based on the rate-of-change (ROC) value.                                                                                                                                                      | X     | X          |
| +REL   | Positive relative setpoint. Performs functions based on a specified value above a referenced setpoint, using the same weight mode as the referenced setpoint.                                                                             | X     | X          |
| -REL   | Negative relative setpoint. Performs functions based on a specified value below a referenced setpoint, using the same weight mode as the referenced setpoint.                                                                             | X     | X          |

Table 8-1. Setpoint Kinds

| Kind    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Batch | Continuous |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| %REL    | Percent relative setpoint. Performs functions based on a specified percentage of the target value of a referenced setpoint, using the same weight mode as the referenced setpoint. The actual target value of the %REL setpoint is calculated as a percentage of the target value of the referenced setpoint.                                                                                                                                                                                                                                                                                                                                                                                                     | X     | X          |
| RESREL  | Relative to a result setpoint. Performs functions based on a specified percentage of the captured value of a referenced setpoint, using the same weight mode as the referenced setpoint. The actual target value of the RESREL setpoint is calculated as a percentage of the captured value of the referenced setpoint, rather than the target value.                                                                                                                                                                                                                                                                                                                                                             | X     | X          |
| PAUSE   | Pauses the batch sequence indefinitely. A BATSTRT signal must be initiated to continue the batch process.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | X     |            |
| DELAY   | Delays the batch sequence for a specified time. The length of the delay (in tenths of a second) is specified on the VALUE parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | X     |            |
| WAITSS  | Wait for standstill. Suspends the batch sequence until the scale is at standstill.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | X     |            |
| COUNTER | Specifies the number of consecutive batch sequences to perform. Counter setpoints should be placed at the beginning of a batch routine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | X     |            |
| AUTOJOG | Automatically checks the previous weight-based setpoint to verify the setpoint weight value is satisfied in a standstill condition. If the previous setpoint is not satisfied when at standstill, the AUTOJOG setpoint activates the digital output of the previous weight-based setpoint for a period of time, specified on the VALUE parameter. The autojog process repeats until the previous weight-based setpoint is satisfied when the scale is at standstill.<br><br><b>NOTE: The AUTOJOG digital output is typically used to signify that an autojog operation is being performed. AUTOJOG should not be assigned to the same digital output as the related weight-based setpoint.</b>                    | X     |            |
| COZ     | Center of zero. Monitors for a gross zero condition. The digital output associated with this setpoint kind is activated when the referenced scale is a center of zero. No value is required for this setpoint.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       | X          |
| INMOTON | In motion. Monitors for an in-motion condition. The digital output associated with this setpoint is activated when the scale is not at standstill. No value is required for this setpoint.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       | X          |
| INRANGE | In range. Monitors for an in-range condition. The digital output associated with this setpoint is activated when the scale is within capacity range. No value is required for this setpoint.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       | X          |
| BATCHPR | Batch processing signal. The digital output associated with this setpoint is activated whenever a batch sequence is in progress. No value is required for this setpoint.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       | X          |
| TIMER   | Tracks the progress of a batch sequence based on a timer.<br>The timer value, specified in tenths of a second on the VALUE parameter, determines the length of time allowed between start and end setpoints. The indicator START and END parameters are used to specify the start and end setpoints. If the END setpoint is not reached before the timer expires, the digital output associated with this setpoint is activated.                                                                                                                                                                                                                                                                                  |       | X          |
| CONCUR  | Allows a digital output to remain active over a specified portion of the batch sequence. Two types of concur setpoints can be configured:<br><b>Type 1 (VALUE=0) :</b> The digital output associated with this setpoint becomes active when the START setpoint becomes the current batch step and remains active until the END setpoint becomes the current batch step.<br><b>Type 2 (VALUE &gt; 0) :</b> If a non-zero value is specified for the VALUE parameter, that value represents the timer, in tenths of a second, for this setpoint. The digital output associated with this setpoint becomes active when the START setpoint becomes the current batch step and remains active until the timer expires. |       | X          |
| DIGIN   | Digital input setpoint. Requires a specific group of digital inputs to be in low (0 VDC) state to satisfy the setpoint. The digital output associated with this setpoint is held in a low (0 VDC) state until the inputs selected for the digital input mask are all in a low state.                                                                                                                                                                                                                                                                                                                                                                                                                              | X     | X          |
| AVG     | Average setpoint. Performs functions based on the calculated average weight over a specified number of A/D samples.<br><br><b>NOTE: This setpoint is based on the raw A/D weight value, rather than the rounded value shown on the indicator display. For example, if the display shows 50.0 but the actual raw A/D value is 49.99, the setpoint will not be satisfied.</b>                                                                                                                                                                                                                                                                                                                                       | X     |            |

Table 8-1. Setpoint Kinds (Continued)

| Kind   | Description                                                                                                                                                                                                                 | Batch | Continuous |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| TOD    | Time of day setpoint. Performs functions when the internal clock time of the indicator matches the specified setpoint time.                                                                                                 | X     | X          |
| DELTA  | Delta weight setpoint. Satisfied when the change in weight on the scale is equal to or exceeds the absolute value specified for the setpoint.                                                                               | X     |            |
| CHKWEI | Checkweigher setpoint. Allows specification of over- and under-weight values. Up to three digital outputs can be configured to represent overweight, underweight, and accept conditions.                                    |       | X          |
| PLSCNT | Pulse counter setpoint. Performs functions based on pulse counts received by a pulse input card.                                                                                                                            | X     | X          |
| PLSRAT | Pulse rate setpoint. Performs functions based on the pulse rate received by a pulse input card.                                                                                                                             |       | X          |
| ALWAYS | Always setpoint. This setpoint is always satisfied. It is typically used to provide an endpoint for true/false branching batch routines.                                                                                    | X     |            |
| NEVER  | Never setpoint. This setpoint is never satisfied. It is used to branch to a designated setpoint in true/false branching batch routines in which the batch will not continue through the normal sequence of batch setpoints. | X     |            |
| DINCNT | Digital input count setpoint. Counts pulses received at the specified digital input.                                                                                                                                        | X     | X          |

Table 8-1. Setpoint Kinds (Continued)

## 8.2 Setpoint Menu Parameters

Figure 8-1 shows the general structure of the SETPTS menu. Submenus (indicated by Go to X in Figure 8-1) for various groups of setpoint kinds are shown on the following pages (Figures 8-3 through 8-9); parameter descriptions for the submenus are provided in Table 8-2 on page 80.

See Table 8-1 on page 68 for descriptions of each of the setpoint kinds.

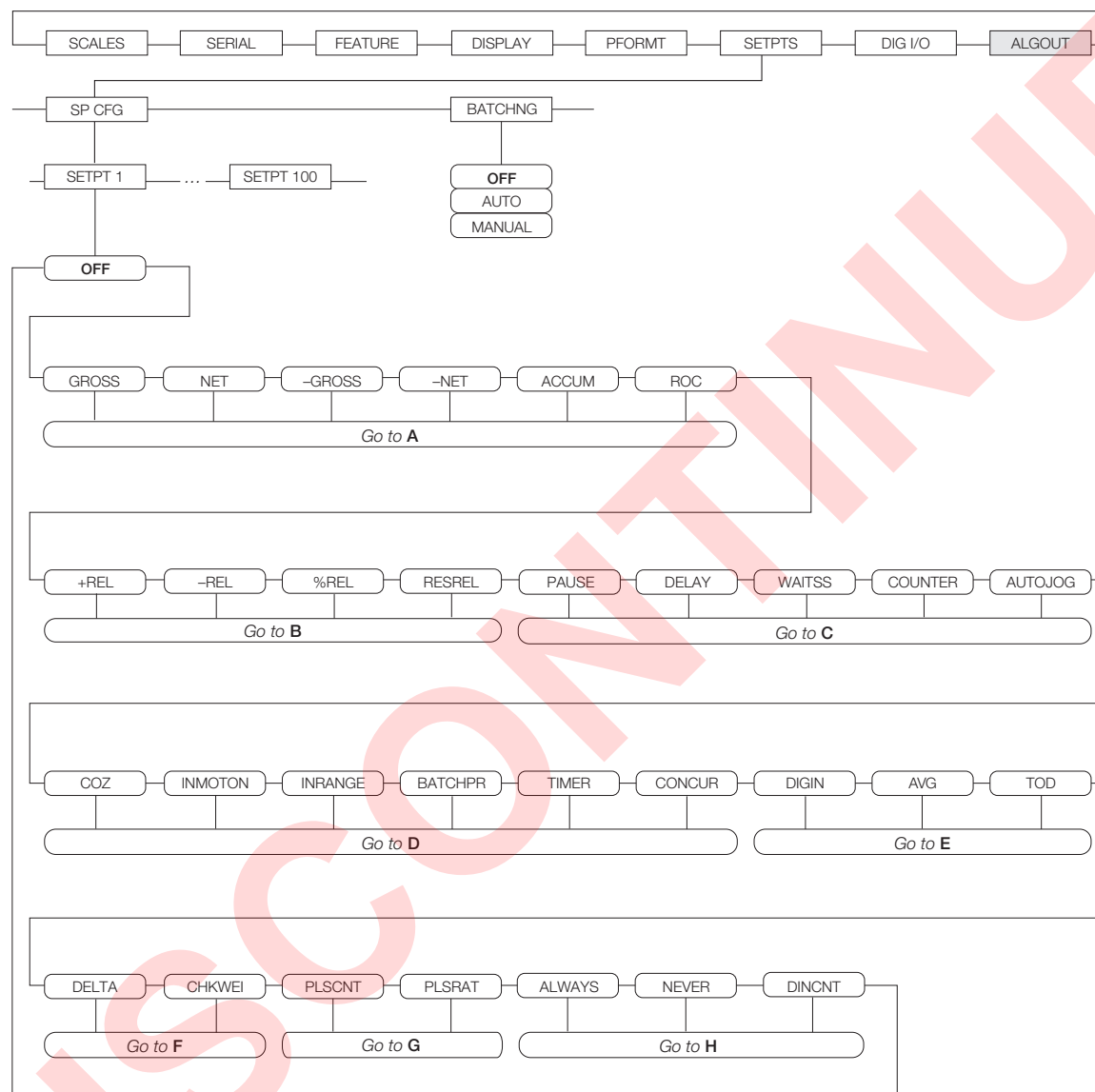


Figure 8-1. SETPTS Menu

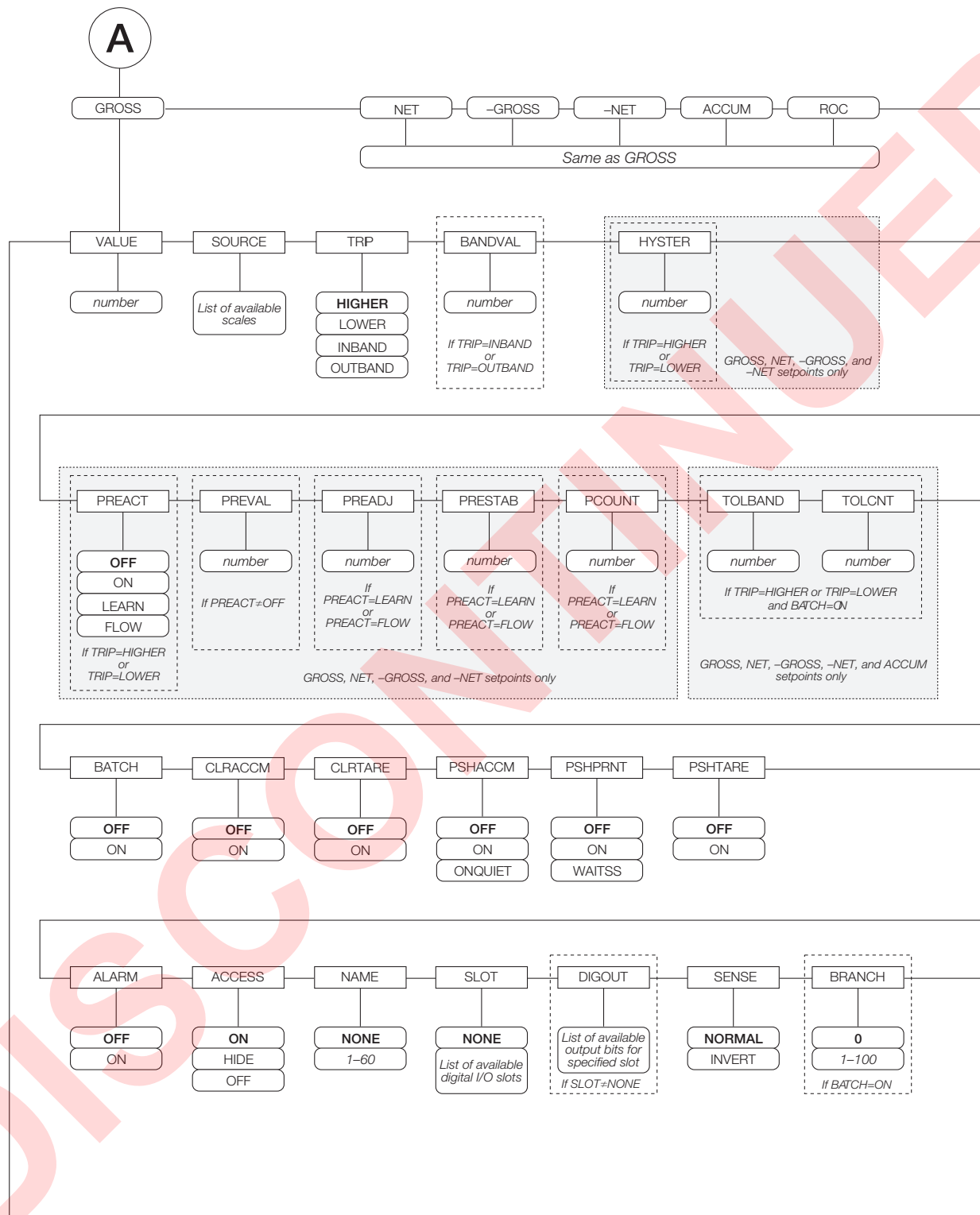


Figure 8-2. GROSS, NET, -GROSS, -NET, ACCUM, and ROC Setpoint Parameters

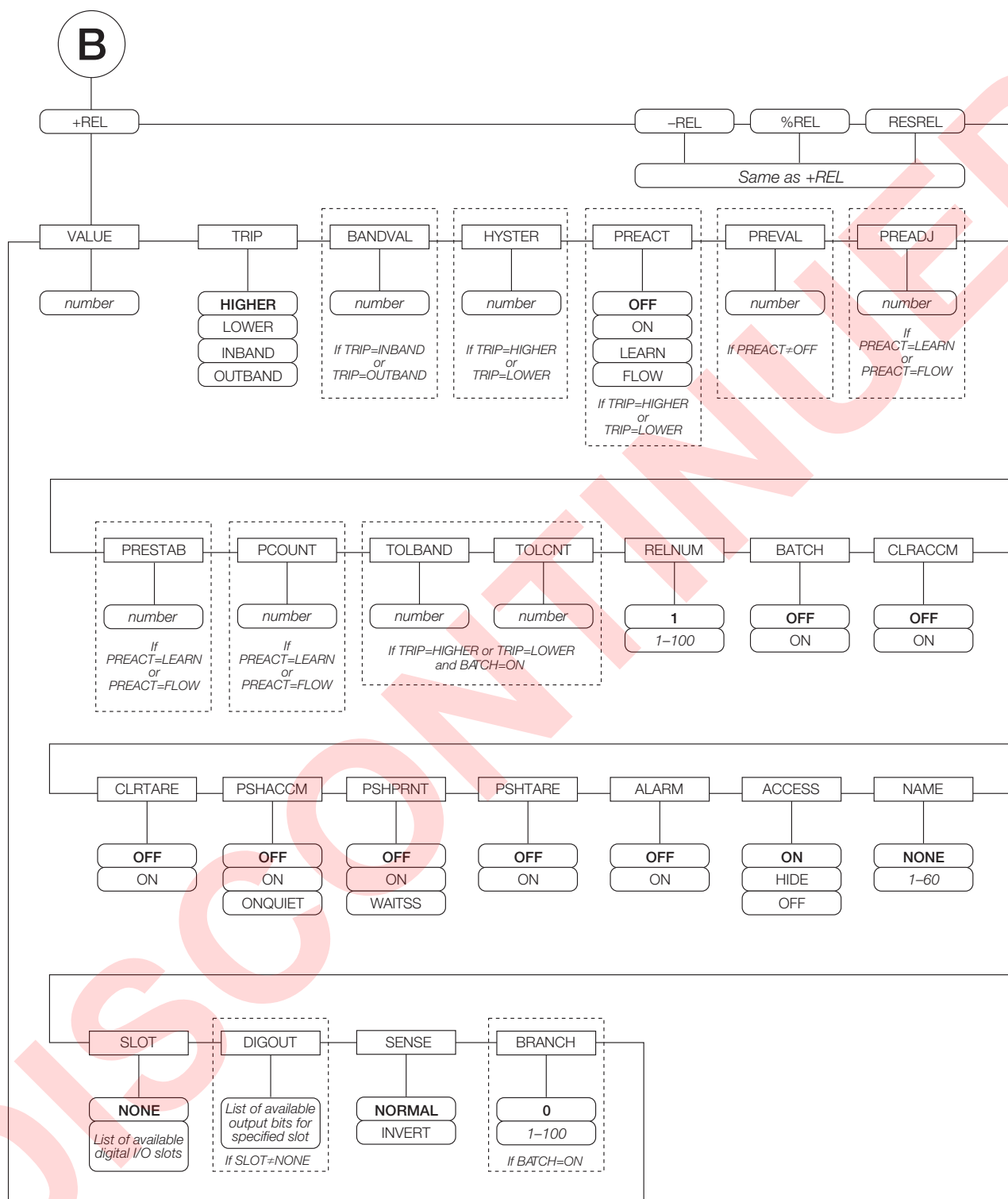


Figure 8-3. +REL, -REL, %RELS and RESREL Setpoint Parameters

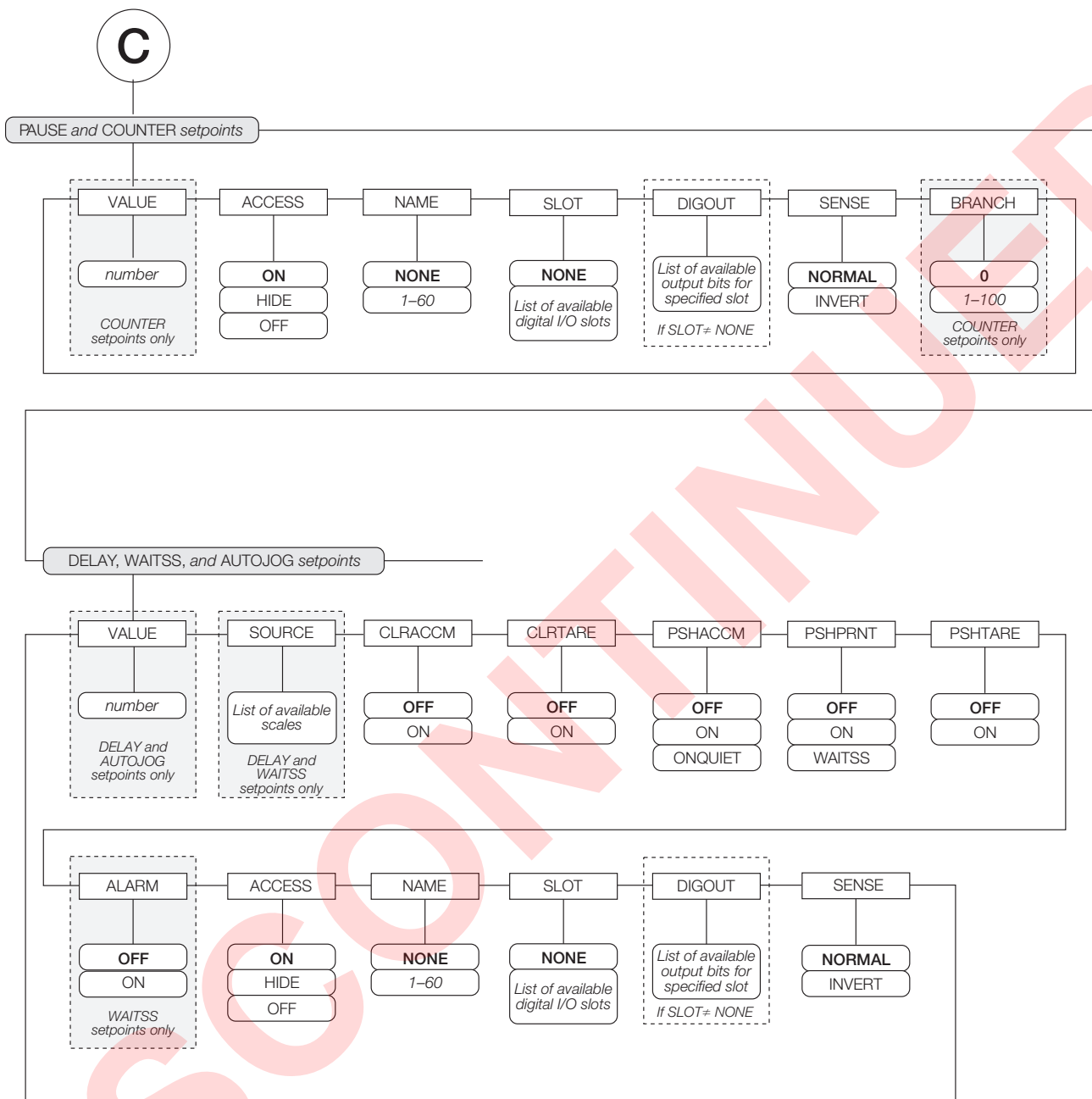


Figure 8-4. PAUSE, COUNTER, DELAY, WAITSS, and AUTOJOG Setpoint Parameters

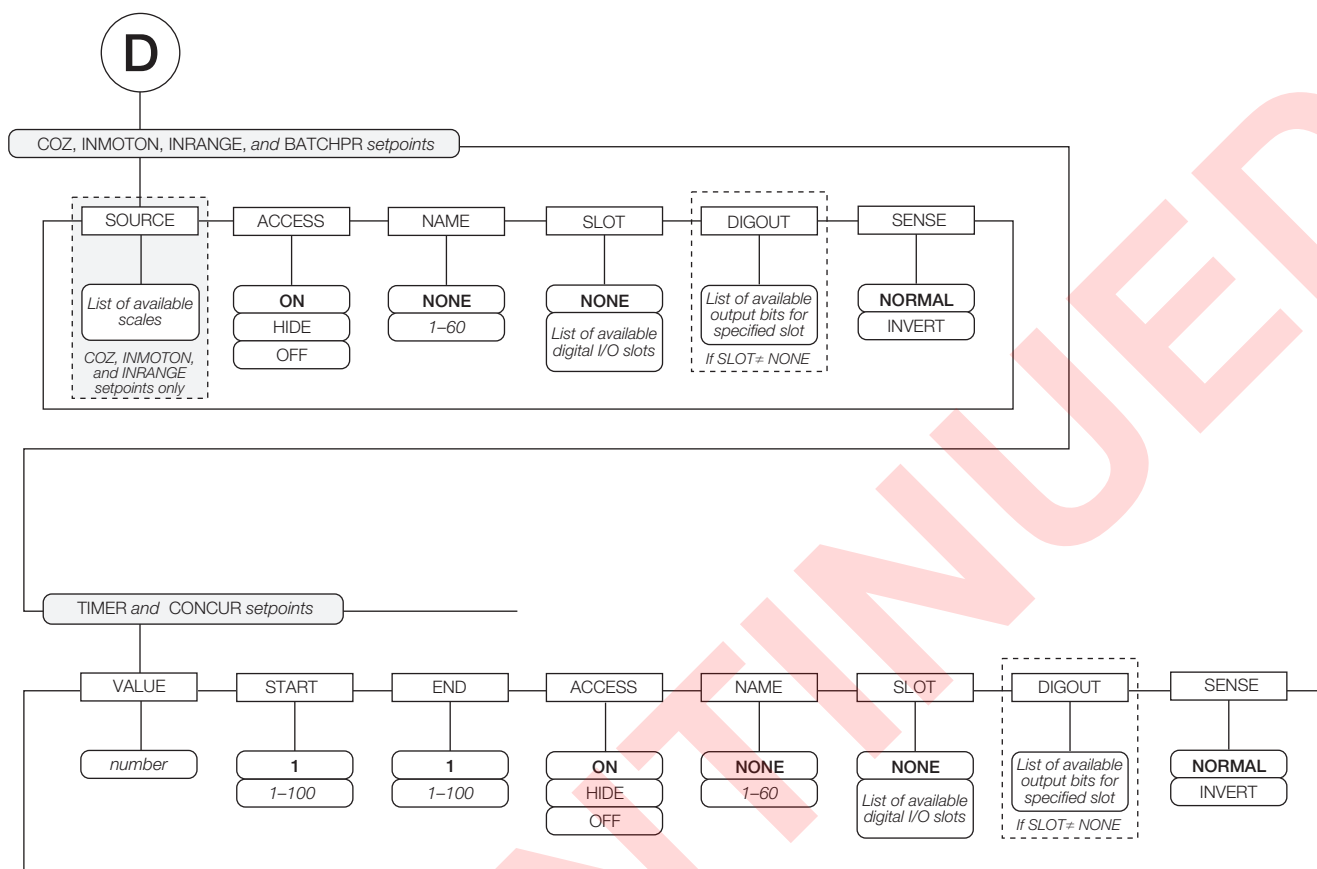


Figure 8-5. COZ, INMOTON, INRANGE, and BATCHPR Setpoint Parameters

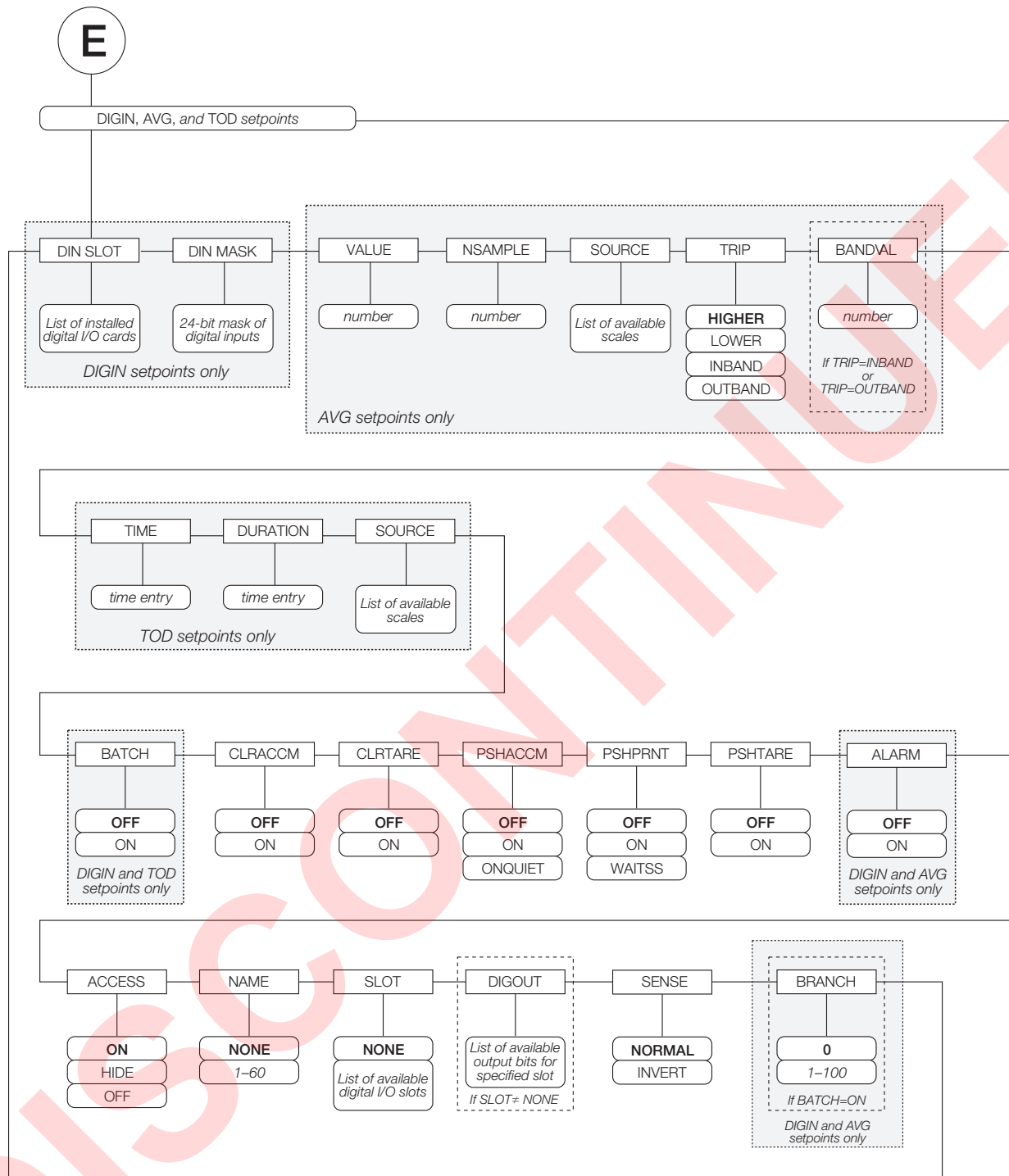


Figure 8-6. DIGIN, AVG, and TOD Setpoint Parameters

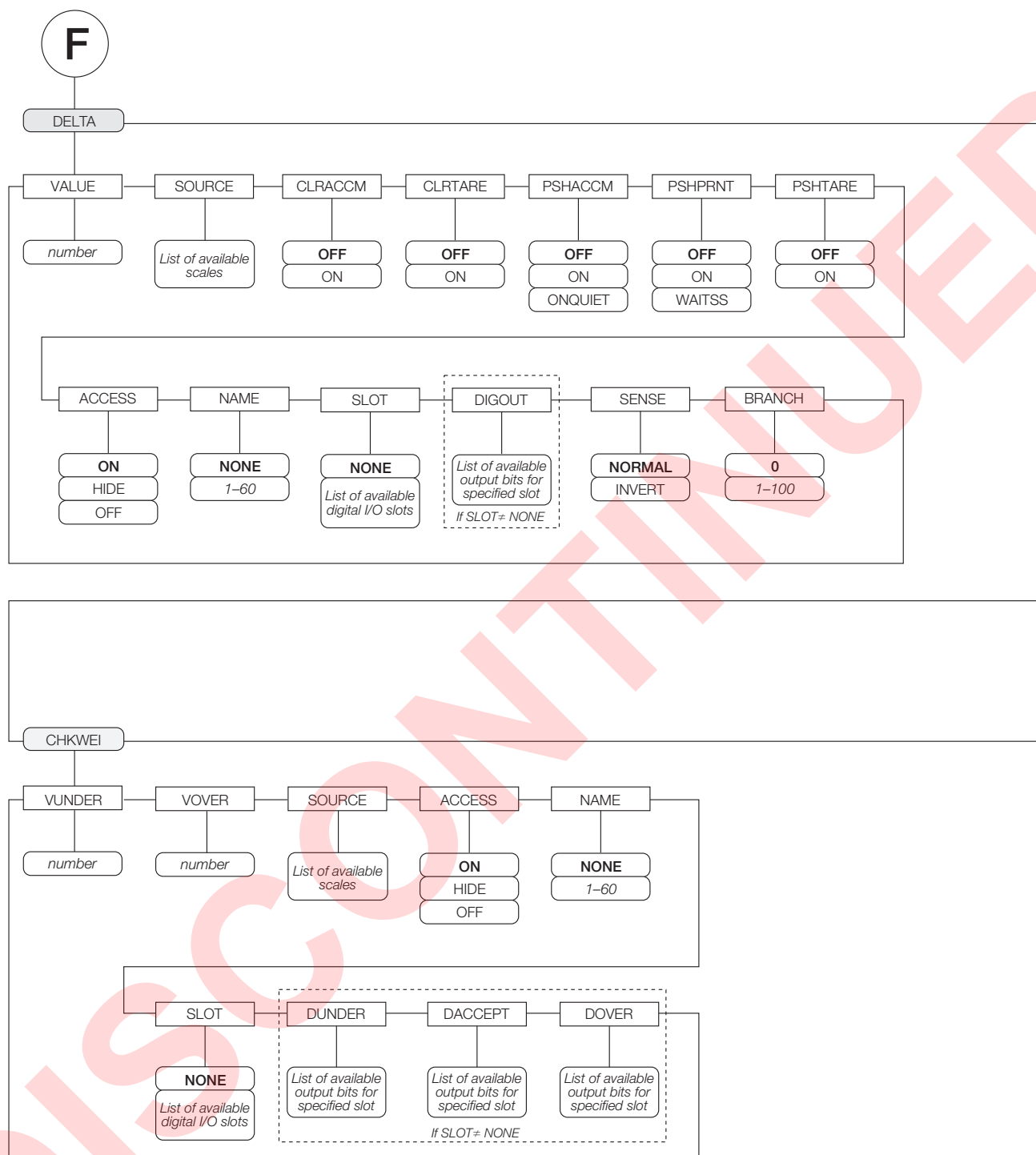


Figure 8-7. DELTA and CHKWEI Setpoint Parameters

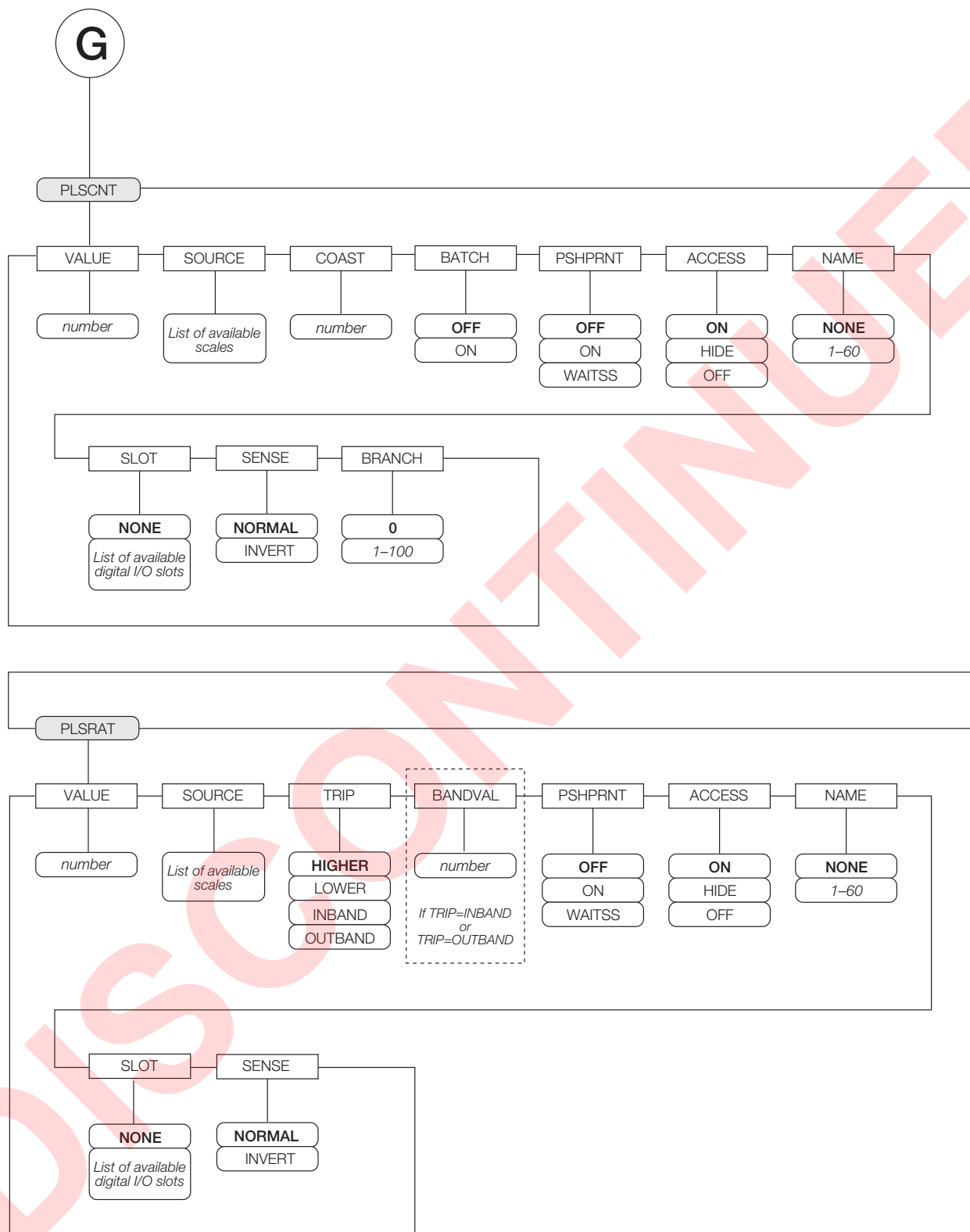


Figure 8-8. PLSCNT and PLSRAT Setpoint Parameters

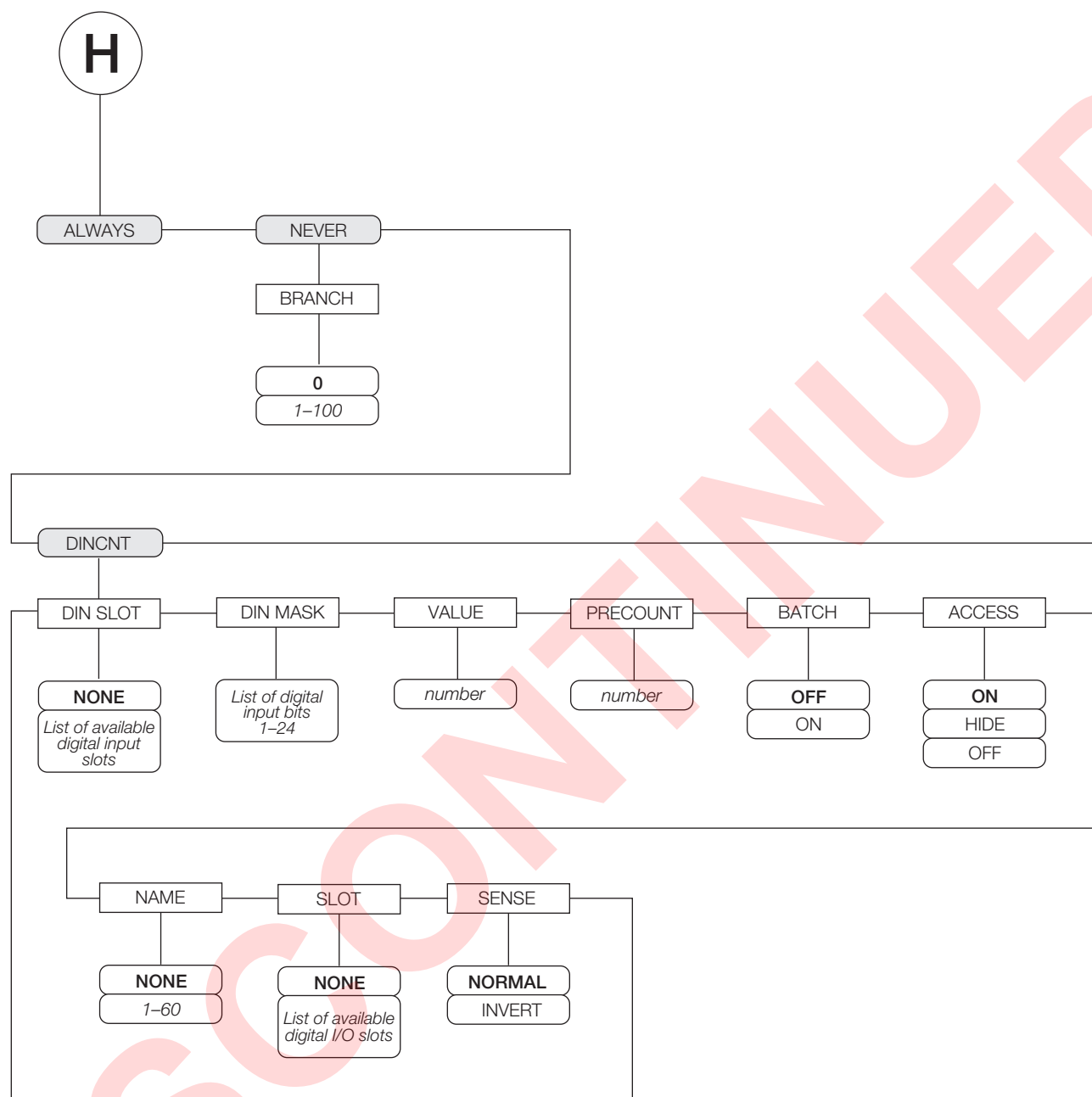


Figure 8-9. ALWAYS, NEVER, and DINCNT Setpoint Parameters

| Parameter                                                                                            | Choices               | Description                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 2 submenus                                                                                     |                       |                                                                                                                                                                                                                                                                                                                  |
| SETPT 1–<br>SETPT 100 (see<br>Table 8-1 on page 68<br>for more information<br>about setpoint kinds.) | OFF                   |                                                                                                                                                                                                                                                                                                                  |
|                                                                                                      | GROSS                 | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | NET                   | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | –GROSS                | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | –NET                  | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | ACCUM                 | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | ROC                   | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | +REL                  | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | –REL                  | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | %REL                  | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | RESREL                | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | PAUSE                 | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | DELAY                 | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | WAITSS                | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | COUNTER               | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | AUTOJOG               | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | COZ                   | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | INMOTON               | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | INRANGE               | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | BATCHPR               | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | TIMER                 | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | CONCUR                | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | DGIN                  | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | AVG                   | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | TOD                   | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
|                                                                                                      | DELTA                 | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | CHKWEI                | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | PLSCNT                | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | PLSRAT                | Can only be used as continuous setpoints.                                                                                                                                                                                                                                                                        |
|                                                                                                      | ALWAYS                | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | NEVER                 | Can only be used in batch sequences.                                                                                                                                                                                                                                                                             |
|                                                                                                      | DINCNT                | Can be used as either batch or continuous setpoints.                                                                                                                                                                                                                                                             |
| BATCHNG                                                                                              | OFF<br>AUTO<br>MANUAL | Batching enable. Set to AUTO or MANUAL to allow a batch sequence to run. MANUAL requires a BATSTRT digital input, BATSTART serial command, <b>Batch Start</b> softkey, or the StartBatch function in an iRite-IDE program before the batch sequence can run. AUTO allows batch sequences to repeat continuously. |

Table 8-2. Setpoint Menu Parameters

| Parameter        | Choices                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 4 submenus |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| VALUE            | number                               | Setpoint value.<br>•For weight-based setpoints: Specifies the target weight value, 0–9999999.<br>•For time-based setpoints: Specifies, in 0.1-second intervals, a time value in the range 0–65535.<br>•For COUNTER setpoints: Specifies the number of consecutive batches to be run, 0–65535.<br>•For PLSCNT setpoints, specifies a number of pulses, 0–9999999, received by a pulse input card.<br>•For PLSRAT setpoints, specifies a pulse rate in Hz, 0–65535, received by a pulse input card.                                                                                                                                                                                                                                                                                                                                                                                                      |
| TRIP             | HIGHER<br>LOWER<br>INBAND<br>OUTBAND | Specifies whether the setpoint is satisfied when the weight is higher or lower than the setpoint value, within a band established around the value, or outside of that band.<br><br>In a batch sequence with TRIP=HIGHER, the associated digital output is active until the setpoint value is reached or exceeded; with TRIP=LOWER, the output is active until the weight goes below the setpoint value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| BANDVAL          | 0.500000<br>0–9999999                | For setpoints with TRIP=INBAND or OUTBAND, specifies a weight equal to half the band width. The band established around the setpoint value is $VALUE \pm BANDVAL$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| HYSTER           | 0<br>0–9999999                       | Specifies a band around the setpoint value that must be exceeded before the setpoint, once off, can trip on again.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PREACT           | OFF<br>ON<br>LEARN<br>FLOW           | Allows the digital output associated with a setpoint to shut off before the setpoint is satisfied to allow for material in suspension.<br>The ON value adjusts the setpoint trip value up or down (depending on the TRIP parameter setting) from the setpoint value using a fixed value specified on the PREVAL parameter.<br>The LEARN value can be used to automatically adjust the preact value after each batch. LEARN compares the actual weight at standstill to the target setpoint value, then adjusts the preact PREVAL by the PREADJ value times the difference after each batch.<br>FLOW preact provides dynamic compensation for material flow rate in determining when to shut off the digital output. Rather than waiting for the specified weight to be reached, FLOW preact uses the change in weight over time to anticipate when the TRIP minus PREACT weight value will be reached. |
| PREVAL           | 0<br>0–9999999                       | Specifies the preact value for setpoints with PREACT set to ON, LEARN, or FLOW. Depending on the TRIP setting specified for the setpoint, the setpoint trip value is adjusted up or down by the PREVAL value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| PREADJ           | 0.500000<br>0–9999999                | Preact adjustment factor. For setpoints with PREACT set to LEARN, specifies a decimal representation of the percentage of error correction applied (0.5 = 50%, 1.0 = 100%) each time a PREACT adjustment is made.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| PRESTAB          | 0<br>0–65535                         | Preact stabilization time-out. For setpoints with PREACT set to LEARN, specifies the time, in 0.1-second intervals, to wait for standstill before adjusting the PREACT value. Setting this parameter to a value greater than zero disables the learn process if standstill is not achieved in the specified interval.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| PCOUNT           | 1<br>0–65535                         | Preact learn interval. For setpoints with PREACT set to LEARN, specifies the number of batches after which the preact value is recalculated. The default value, 1, recalculates the preact value after every batch cycle.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| TOLBAND          | 0<br>0–9999999                       | Tolerance band. For setpoints with TRIP set to HIGHER or LOWER, specifies a tolerance band around the target weight. If the captured weight is not within the specified tolerance band, the preact learn function is not applied and the batch is paused (based on the value of the TOLCNT parameter, below) until restarted or reset.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| TOLCNT           | 1<br>0–65535                         | Tolerance count. For setpoints with TRIP set to HIGHER or LOWER, specifies the number of consecutive batch cycles in which the tolerance band (TOLBAND parameter) must be exceeded before the batch process is paused. When the specified value is met, the batch is paused and an error message is displayed. The batch must be restarted or reset to clear the error message. The special value of zero means that the batch is never paused for an out-of-tolerance condition.                                                                                                                                                                                                                                                                                                                                                                                                                      |

Table 8-2. Setpoint Menu Parameters (Continued)

| Parameter                                                                                                                                                                                                                                                                   | Choices              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RELNUM                                                                                                                                                                                                                                                                      | 1<br>1–100           | For relative setpoints, specifies the number of the relative setpoint. The target weight for this setpoint is determined as follows: <ul style="list-style-type: none"> <li>• For +REL setpoints, the value of the relative setpoint plus the value (VALUE parameter) of the +REL setpoint</li> <li>• For –REL setpoints, the value of the relative setpoint minus the value of the –REL setpoint</li> <li>• For %REL setpoints, the percentage (specified on the VALUE parameter of the %REL setpoint) of the target value of the relative setpoint</li> <li>• For RESREL setpoints, the percentage (specified on the VALUE parameter of the RESREL setpoint) of the <b>captured</b> value of the relative setpoint</li> </ul> |
| BATCH                                                                                                                                                                                                                                                                       | OFF<br>ON            | Specifies whether the setpoint is used as a batch (ON) or continuous (OFF) setpoint.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| CLRACCM                                                                                                                                                                                                                                                                     | OFF<br>ON            | Specify ON to clear the accumulator when the setpoint is satisfied                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| CLRTARE                                                                                                                                                                                                                                                                     | OFF<br>ON            | Specify ON to clear the tare when the setpoint is satisfied                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PSHACCM                                                                                                                                                                                                                                                                     | OFF<br>ON<br>ONQUIET | Specify ON to update the accumulator and perform a print operation when the setpoint is satisfied. Specify ONQUIET to update the accumulator without printing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| PSHPRNT                                                                                                                                                                                                                                                                     | OFF<br>ON<br>WAITSS  | Specify ON to perform a print operation when the setpoint is satisfied; specify WAITSS to wait for standstill after setpoint is satisfied before printing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| PSHTARE                                                                                                                                                                                                                                                                     | OFF<br>ON            | Specify ON to perform an acquire tare operation when the setpoint is satisfied.<br><br><b>NOTE: PSHTARE acquires the tare regardless of the value specified for the REGULAT parameter on the FEATURE menu.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>NOTE: If two or more of the CLRxxxx and PSHxxxx parameters are set on, the actions specified by those parameters are performed in the following order when the setpoint is satisfied: 1) clear accumulator; 2) clear tare; 3) accumulate; 4) print; 5) acquire tare.</b> |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ALARM                                                                                                                                                                                                                                                                       | OFF<br>ON            | Specify ON to display the word <b>ALARM</b> on the primary display while the setpoint is active (batch setpoints) or while the setpoint is not tripped (continuous setpoints).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| START                                                                                                                                                                                                                                                                       | 1<br>1–100           | Specifies the starting setpoint number. <b>Do not</b> specify the number of the TIMER or CONCUR setpoint itself. The TIMER or CONCUR setpoint begins when the starting setpoint begins.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| END                                                                                                                                                                                                                                                                         | 1<br>1–100           | Specifies the ending setpoint number. <b>Do not</b> specify the number of the TIMER or CONCUR setpoint itself. The TIMER or CONCUR setpoint stops when the ending setpoint begins.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ACCESS                                                                                                                                                                                                                                                                      | ON<br>HIDE<br>OFF    | Specifies the access allowed to setpoint parameters shown by pressing the <b>Setpoint</b> softkey in normal mode.<br>ON: Values can be displayed and changed<br>HIDE: Values cannot be displayed or changed<br>OFF: Values can be displayed but not changed                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| NAME                                                                                                                                                                                                                                                                        | NONE, 1–60           | Specify the number of an assigned prompt. Up to 60 prompt names can be specified on the PROMPTS submenu of the FEATURE menu.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| SLOT                                                                                                                                                                                                                                                                        | NONE<br>slot_number  | Lists all available digital I/O slots. This parameter specifies the slot number of the digital I/O card referenced by the DIGOUT parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| DIGOUT                                                                                                                                                                                                                                                                      | bit_number           | Lists all digital output bits available for the specified SLOT. This parameter is used to specify the digital output bit associated with this setpoint. Use the DIG I/O menu to assign bit function to OUTPUT. For continuous setpoints, the digital output becomes active (low) when the condition is met; for batch setpoints, the digital output is active <b>until</b> the setpoint condition is met.                                                                                                                                                                                                                                                                                                                       |
| BRANCH                                                                                                                                                                                                                                                                      | 0<br>1–100           | Specifies the setpoint number to which the batch sequence is to branch if the current setpoint is not satisfied upon initial evaluation.<br>The special value zero indicates that no branch is taken.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| TIME                                                                                                                                                                                                                                                                        | time                 | For TOD setpoints, specifies the time at which the setpoint becomes active. The format used to enter the time (12-hour or 24-hour) is based on the value specified for the TIMEFMT parameter on the FEATURE menu.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Table 8-2. Setpoint Menu Parameters (Continued)

| Parameter | Choices             | Description                                                                                                                                                                                                                                                                                                                       |
|-----------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DURATION  | hh:mm:ss            | For TOD setpoints, specifies the length of time that the digital output associated with this setpoint changes state. The value is entered in hours, minutes, and seconds ( <b>hh:mm:ss</b> ). All other operations associated with this setpoint (print, tare, or accumulate) are performed at the end of the specified duration. |
| NSAMPLE   | 1–65535             | For AVG setpoints, specify the number of A/D samples used to calculate the average weight.                                                                                                                                                                                                                                        |
| SOURCE    | source_scale        | Specify the scale number used as the source for the setpoint.                                                                                                                                                                                                                                                                     |
| DIN SLOT  | NONE<br>slot_number | For DIGIN and DINCNT setpoints, specify the slot number from which digital inputs will be read.                                                                                                                                                                                                                                   |
| DIN MASK  | digital_input_mask  | For DIGIN and DINCNT setpoints, specify the bits used as inputs to the setpoint. Use the <b>Select</b> soft-key to select bits.                                                                                                                                                                                                   |
| VUNDER    | 0–9999999           | For CHKWEI setpoints, specifies the lower weight limit.                                                                                                                                                                                                                                                                           |
| VOVER     | 0–9999999           | For CHKWEI setpoints, specifies the upper weight limit.                                                                                                                                                                                                                                                                           |
| DUNDER    | digital_output      | For CHKWEI setpoints, specifies the bit number of digital output activated when the scale weight is less than the VUNDER value specified.                                                                                                                                                                                         |
| DACCEPT   | digital_output      | For CHKWEI setpoints, specifies the bit number of digital output activated when the scale weight between the VUNDER and VOVER values specified.                                                                                                                                                                                   |
| DOVER     | digital_output      | For CHKWEI setpoints, specifies the bit number of digital output activated when the scale weight is greater than the VOVER value specified.                                                                                                                                                                                       |
| COAST     | 0–65535             | For PLS CNT setpoints, specifies the time delay (in 0.1-second intervals) inserted between reaching the setpoint target value and capture of the actual pulse count.                                                                                                                                                              |
| SENSE     | NORMAL<br>INVERT    | Specifies whether the value of the digital output associated with this setpoint is inverted when the setpoint is satisfied.                                                                                                                                                                                                       |

Table 8-2. Setpoint Menu Parameters (Continued)

### 8.3 Batch Operations

Softkeys can be configured to allow operator control of batch operations from the 820i front panel (see Figure 8-10), Softkeys can be configured using *Revolution*, serial commands, or the FEATURE menu (see Section 3.2.3 on page 41).

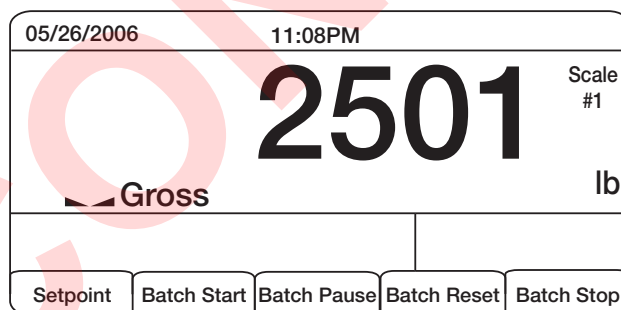


Figure 8-10. Batching Softkeys

#### Setpoint

Display or change assigned setpoints.

#### Batch Start

Starts batch process.

#### Batch Pause

Pauses an active batch and turns off all digital outputs except those associated with concurrent and timer setpoints. Processing is suspended until **Batch Start** is pressed again. Pressing **Batch Start** resumes the batch and re-energizes all digital outputs turned off by the **Batch Pause**.

#### Batch Reset

Stops and resets an active batch to the beginning of the process.

#### Batch Stop

Stops an active batch and turns off all associated digital outputs.



**WARNING:** To prevent personal injury and equipment damage, software-based interrupts must always be supplemented by emergency stop switches and other safety devices necessary for the application.

## Batching Switch

The batching switch option, PN 19369, comes as a complete unit in an FRP enclosure, with legend plate, locking stop switch (mushroom button), and a run/start/abort 3-way switch.

Both switches are wired into the indicator's digital I/O terminal strip as shown in Figure 8-12. Each switch uses a separate digital input.

Once cables and switches have been connected to the indicator, use the setup switch to place the indicator in setup mode. Use the DIG I/O menu (see Section 3.2.7 on page 48) to configure digital input and output functions.

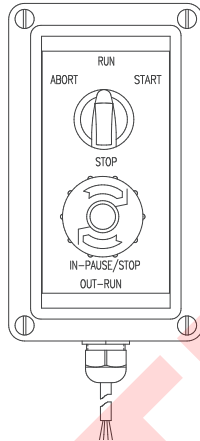


Figure 8-11. Batching Switch

When configuration is complete, exit setup mode. Initialize the batch by turning the 3-way switch to **ABORT**, then unlock the STOP button (the STOP button must be in the OUT position to allow the batch process to run). The batching switch is now ready to use.



**WARNING:** If no digital input is assigned to **BATRUN**, batching proceeds as if **BATRUN** were always on: the batch will start when the 3-way switch is turned to **RUN**, but the **STOP** mushroom button will not function.

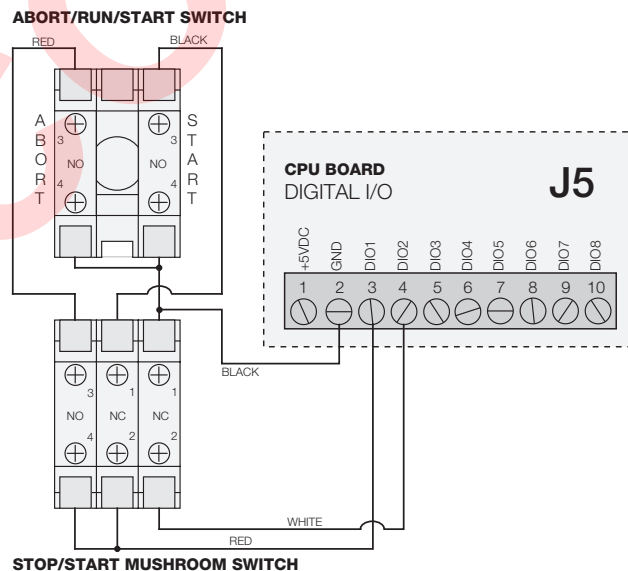


Figure 8-12. Batching Switch Wiring Diagram Example

To begin a batch process, turn the 3-way switch to **START** momentarily. If the STOP button is pushed during the batch process, the process halts and the button locks in the IN position.

The **START** switch is ignored while the STOP button is locked in the IN position. The STOP button must be turned counterclockwise to unlock it, then released into the OUT position to enable the 3-way switch.

To restart an interrupted batch from the step where it left off, do the following:

1. Unlock STOP button (OUT position)
2. Turn 3-way switch to **START**

To restart an interrupted batch from the first batch step, do the following:

1. Turn 3-way switch to **ABORT**
2. Unlock STOP button (OUT position)
3. Turn 3-way switch to **START**



**NOTE:** Use this procedure (or the **BATRESET** serial command) to initialize the new batch routine following any change to the setpoint configuration.

## 9.0 Serial Commands

The 820i indicator can be controlled by a personal computer or remote keyboard connected to an indicator serial port. Control is provided by a set of serial commands that can simulate front panel key press functions, display and change setup parameters, and perform reporting functions. The serial commands provide the capability to print configuration data or to save that data to an attached personal computer. This section describes the serial command set and procedures for saving and transferring data using the serial ports.

### 9.1 The Serial Command Set

The serial command set can be divided into five groups: key press commands, reporting commands, the RESETCONFIGURATION special function command, parameter setting commands, and transmit weight data commands.

When the indicator processes a serial command, it responds with the message **OK**. The **OK** response verifies that the command was received and has been executed. If the command is unrecognized or cannot be executed, the indicator responds with **??**.

The following sections list the commands and command syntax used for each of these groups.

#### 9.1.1 Key Press Commands

Key press serial commands (see Table 9-1) simulate pressing the keys on the front panel of the indicator. These commands can be used in both setup and normal (weighing) mode. Several of the commands serve as “pseudo” keys, providing functions that are not represented by a key on the front panel.

For example, to enter a 15-pound tare weight using serial commands:

1. Type K1 and press **ENTER** (or **RETURN**).
2. Type K5 and press **ENTER**.
3. Type KTARE and press **ENTER**.

| Command    | Function                                                                                        |
|------------|-------------------------------------------------------------------------------------------------|
| KBASE      | Select current scale (Example: KBASE, K2, KENTER to select Scale #2)                            |
| KZERO      | In normal mode, press the ZERO key                                                              |
| KGROSSNET  | In normal mode, press the GROSS/NET key                                                         |
| KGROSS     | Go to gross mode (pseudo key)                                                                   |
| KNET       | Go to net mode (pseudo key)                                                                     |
| KTARE      | Press the TARE key                                                                              |
| KUNITS     | In weighing mode, press the UNITS key                                                           |
| KPRIM      | Go to primary units (pseudo key)                                                                |
| KSEC       | Go to secondary units (pseudo key)                                                              |
| KTER       | Go to tertiary units (pseudo key)                                                               |
| KPRINT     | In normal mode, press the PRINT key                                                             |
| KDISPACCUM | Press the ACCUM key                                                                             |
| KDISPTARE  | Display tare (pseudo key)                                                                       |
| KCLR       | Press the CLEAR key                                                                             |
| KCLRCN     | Reset consecutive number (pseudo key)                                                           |
| KCLRTAR    | Clear tare from system (pseudo key)                                                             |
| KLEFT      | In setup mode, move left in the menu                                                            |
| KRIGHT     | In setup mode, move right in the menu                                                           |
| KUP        | In setup mode, move up in the menu; in normal mode, scroll up to previous configured scale.     |
| KDOWN      | In setup mode, move down in the menu; in normal mode, scroll down to the next configured scale. |
| KEXIT      | In setup mode, exits to normal mode                                                             |
| KSAVE      | In setup mode, saves the current configuration                                                  |
| KCLRNV     | In setup mode, clears non-volatile RAM                                                          |

Table 9-1. Serial Key Press Commands

| Command            | Function                                                                                      |
|--------------------|-----------------------------------------------------------------------------------------------|
| K0–K9              | Press number 0 (zero) through 9                                                               |
| KDOT               | Press the decimal point (.)                                                                   |
| KENTER             | Press the ENTER key                                                                           |
| KSOFT $\mathbf{x}$ | Press softkey $\mathbf{x}$                                                                    |
| KLOCK              | Lock specified front panel key. For example, to lock the ZERO key, enter KLOCK=KZERO.         |
| KUNLOCK            | Unlock specified front panel key. For example, to unlock the PRINT key, enter KUNLOCK=KPRINT. |
| KID                | Display Unit ID entry screen                                                                  |
| KTREG              | Display truck register                                                                        |
| KWIN               | Process truck weigh-in transaction Example: KWIN, K2, K3, KENTER to select ID #23)            |
| KWOUT              | Process truck weigh-out transaction                                                           |
| KDEL               | While truck register is displayed, delete truck register                                      |
| KSETPOINT          | Display setpoint configuration (pseudo key)                                                   |
| KDATE              | Display date (pseudo key)                                                                     |
| KTIME              | Display time (pseudo key)                                                                     |
| KTIMEDATE          | Display time and date (pseudo key)                                                            |

Table 9-1. Serial Key Press Commands (Continued)

### 9.1.2 Reporting Commands

Reporting commands send specific information to the serial port. The commands listed in Table 9-2 can be used in either setup mode and normal mode.

| Command   | Function                                                                                                                                                          |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DUMPALL   | List all parameter values                                                                                                                                         |
| DUMPAUDIT | List audit trail information                                                                                                                                      |
| SPDUMP    | Print setpoint configuration                                                                                                                                      |
| VERSION   | Write 820i software version                                                                                                                                       |
| HARDWARE  | Lists installed option cards. See <a href="#">Section 10.1.2 on page 97</a> for more information about using the HARDWARE command.                                |
| XE        | Returns a 10-digit code representing any error conditions currently shown on the front panel. See <a href="#">Section 10.1.4 on page 99</a> for more information. |

Table 9-2. Reporting Commands

### 9.1.3 Clear and Reset Commands

The following commands can be used to clear and reset the 820i:

**PCLR:** Program clear. Erases the loaded user program (setup mode only).

**RS:** Reset system. Resets the indicator without resetting the configuration.

**RESETCONFIGURATION:** Restores all configuration parameters to their default values (setup mode only). The **RESETCONFIGURATION** function can also be initiated by pressing the **Reset Config** softkey under the VERSION menu. Use the **up** key to select **Clear entire indicator configuration**, then press **ENTER** to reset the indicator.



**NOTE:** All load cell calibration settings are lost when the **RESETCONFIGURATION** command is run.

### 9.1.4 Parameter Setting Commands

Parameter setting commands allow you to display or change the current value for a particular configuration parameter (Tables 9-3 through 9-11).

Current configuration parameter settings can be displayed in either setup mode or normal mode using the following syntax:  
**command<ENTER>**

Most parameter values can be changed in setup mode only; setpoint parameters listed in [Table 9-6 on page 92](#) can be changed when in normal weighing mode.

Use the following command syntax when changing parameter values: **command=value<ENTER>**, where **value** is either a number or a parameter value. Use no spaces before or after the equal (=) sign. If you type an incorrect command, the display reads **??**.

For example, to set the motion band parameter on Scale #1 to 5 divisions, type the following:

SC.MOTBAND#1=5<ENTER>

For parameters with selectable values, enter the command and equal sign followed by a question mark:

**command=?<ENTER>** to see a list of those values. The indicator must be in setup mode to use this function.



**NOTE:** Some parameters are valid only if other parameters or parameter values are specified. See the configuration menus in [Section 3.2 on page 26](#) for information about parameter dependencies. Restrictions for front-panel configuration also apply to serial command configuration.

| Command                                         | Description                              | Values                                                                                |
|-------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------|
| SC.GRADS#n                                      | Graduations                              | 1-9999999                                                                             |
| SC.SPLIT#n                                      | Multi-range or multi-interval scale type | OFF, 2RNG, 3RNG, 2INTVL, 3INTVL                                                       |
| SC.ZTRKBND#n                                    | Zero track band                          | 0, 0-100                                                                              |
| SC.ZRANGE#n                                     | Zero range                               | 1.900000, 0-100                                                                       |
| SC.MOTBAND#n                                    | Motion band                              | 1, 0-100                                                                              |
| SC.SSTIME#n                                     | Standstill time                          | 1-65535                                                                               |
| SC.OVRLOAD#n                                    | Overload                                 | FS+2%, FS+1D, FS+9D, FS                                                               |
| SC.WMTTHR#n                                     | Weighment threshold                      | grads                                                                                 |
| SC.NUMWEIGH#n                                   | Number of weighments                     | —                                                                                     |
| SC.MAX_WEIGHT#n                                 | Maximum weight                           | —                                                                                     |
| SC.DIGFLTR1#n<br>SC.DIGFLTR2#n<br>SC.DIGFLTR3#n | Digital filtering                        | 1, 2, 4, 8, 16, 32, 64, 128, 256                                                      |
| SC.DFSENS#n                                     | Digital filter cutout sensitivity        | 2OUT, 4OUT, 8OUT, 16OUT, 32OUT, 64OUT, 128OUT                                         |
| SC.DFTHR#n                                      | Digital filter cutout threshold          | NONE, 2D, 5D, 10D, 20D, 50D, 100D, 200D, 250D                                         |
| SC.RATLTRAP#n                                   | Rattletrap filtering                     | OFF, ON                                                                               |
| SC.SMPRAT#n                                     | Sample rate                              | 30HZ, 60HZ, 120HZ, 240HZ, 480HZ, 960HZ                                                |
| SC.PWRUPMD#n                                    | Power up mode                            | GO, DELAY                                                                             |
| SC.TAREFN#n                                     | Tare function                            | BOTH, NOTARE, PBTARE, KEYED                                                           |
| SC.PRI.DPCNT#n                                  | Primary units decimal position           | 8.888888, 88.88888, 888.8888, 8888.888, 88888.88, 888888.8, 8888888, 8888880, 8888800 |
| SC.PRI.DSPDIV#n                                 | Primary units display divisions          | 1D, 2D, 5D                                                                            |
| SC.PRI.UNITS#n                                  | Primary units                            | lb, kg, g, oz, tn, t, gn, troyoz, troylb, lt, CUSTOM, NONE, OFF                       |
| SC.PRI.CUNITS#n                                 | Primary custom units                     | Specify units if SC.PRI.UNITS=CUSTOM                                                  |
| SC.SEC.DPCNT#n                                  | Secondary units decimal position         | 8.888888, 88.88888, 888.8888, 8888.888, 88888.88, 888888.8, 8888888, 8888880, 8888800 |
| SC.SEC.DSPDIV#n                                 | Secondary units display divisions        | 1D, 2D, 5D                                                                            |

Table 9-3. SCALES Serial Commands

| Command                       | Description                                         | Values                                                                                |
|-------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------------------|
| SC.SEC.UNITS#n                | Secondary units                                     | lb, kg, g, oz, tn, t, gn, troyoz, troylb, lt, CUSTOM, NONE, OFF                       |
| SC.SEC.CUNITS#n               | Secondary custom units                              | Specify units if SC.SEC.UNITS=CUSTOM                                                  |
| SC.SEC.MULT#n                 | Secondary units multiplier                          | 0.00000–9999999                                                                       |
| SC.TER.UNITS#n                | Tertiary units                                      | lb, kg, g, oz, tn, t, gn, troyoz, troylb, lt, CUSTOM, NONE, OFF                       |
| SC.TER.CUNITS#n               | Tertiary custom units                               | Specify units if SC.TER.UNITS=CUSTOM                                                  |
| SC.TER.DPCNT#n                | Tertiary units decimal position                     | 8.888888, 88.88888, 888.8888, 8888.888, 88888.88, 888888.8, 8888888, 8888880, 8888800 |
| SC.TER.DSPDIV#n               | Tertiary units display divisions                    | 1D, 2D, 5D                                                                            |
| SC.TER.MULT#n                 | Tertiary units multiplier                           | 0.000001–9999999                                                                      |
| SC.ROC.DPCNT#n                | Tertiary units decimal position                     | 8.888888, 88.88888, 888.8888, 8888.888, 88888.88, 888888.8, 8888888, 8888880, 8888800 |
| SC.ROC.DSPDIV#n               | Rate-of-change units display divisions              | 1D, 2D, 5D                                                                            |
| SC.ROC.MULT#n                 | Rate-of-change units multiplier                     | 0.000001–9999999                                                                      |
| SC.ROC.UNITS#n                | Rate-of-change units                                | SEC, MIN, HOUR                                                                        |
| SC.ROC.INTERVL#n              | Rate-of-change interval                             | 1–100                                                                                 |
| SC.ROC.REFRESH#n              | Rate-of-change refresh interval                     | 0.1–60                                                                                |
| SC.RANGE1.MAX#n               | Weight maximum for first range or interval          | weight                                                                                |
| SC.RANGE2.MAX#n               | Weight maximum for second range or interval         | weight                                                                                |
| SC.RANGE3.MAX#n               | Weight maximum for third range or interval          | weight                                                                                |
| SC.ACCUM#n                    | Accumulator enable                                  | ON, OFF                                                                               |
| SC.VISIBLE#n                  | Scale visibility                                    | ON, OFF                                                                               |
| SC.PEAKHOLD#n                 | Peak hold                                           | OFF, NORMAL, BI-DIR, AUTO                                                             |
| SC.WZERO#n                    | Zero calibration                                    | —                                                                                     |
| SC.WVAL#n                     | Test weight value                                   | test_weight_value                                                                     |
| SC.WSPAN#n                    | Span calibration                                    | —                                                                                     |
| SC.WLIN.F1#n–<br>SC.WLIN.F5#n | Actual raw count value for linearization points 1–5 | 0–16777215                                                                            |
| SC.WLIN.V1#n–<br>SC.WLIN.V5#n | Test weight value for linearization points 1–5      | 0.000001–9999999                                                                      |
| SC.WLIN.C1#n–<br>SC.WLIN.C5#n | Calibrate linearization points 1–5                  | —                                                                                     |
| SC.LC.CD#n                    | Deadload coefficient                                | —                                                                                     |
| SC.LC.CW#n                    | Span coefficient                                    | —                                                                                     |
| SC.LC.CZ#n                    | Temporary zero                                      | —                                                                                     |
| SC.REZERO#n                   | Rezero                                              | —                                                                                     |

For commands ending with “#n”, n is the scale number.

Table 9-3. SCALES Serial Commands (Continued)

| Command                                                   | Description                  | Values                                                                                                                                                                  |
|-----------------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EDP.PORT                                                  | Active serial port           | Returns number of port being used for serial command input                                                                                                              |
| EDP.INPUT#p                                               | Port serial input function   | CMD, KEYBD, SCALE, IND SC, DISPLAY, IQUBE<br>See the iQUBE Installation Manual, PN 77224, for more information about configuring iQUBE serial scales.                   |
| EDP.BAUD#p                                                | Port baud rate               | 300, 600, 1200, 2400, 4800, 9600, 19200, 28800, 38400, 57600, 115200                                                                                                    |
| EDP.BITS#p                                                | Port data bits/parity        | 8NONE, 7EVEN, 7ODD, 8ODD, 8EVEN                                                                                                                                         |
| EDP.TERMIN#p                                              | Port termination character   | CR/LF, CR                                                                                                                                                               |
| EDP.STOPBITS#p                                            | Port stop bits               | 2, 1                                                                                                                                                                    |
| EDP.ECHO#p                                                | Port echo                    | ON, OFF                                                                                                                                                                 |
| EDP.RESPONSE#p                                            | Port response                | ON, OFF                                                                                                                                                                 |
| EDP.EOLDLY#p                                              | Port end-of-line delay       | 0–255 (0.1-second intervals)                                                                                                                                            |
| EDP.HANDSHK#p                                             | Port handshaking             | OFF, XONXOFF, HRDWAR                                                                                                                                                    |
| EDP.PORTTYPE#p                                            | Port type                    | 232, 485                                                                                                                                                                |
| EDP.DUPLEX#p                                              | Port RS-485 duplex           | HALF, FULL                                                                                                                                                              |
| EDP.ADDRESS#p                                             | Port RS-485 address          | 0, 1–255                                                                                                                                                                |
| EDP.STREAM#p                                              | Port streaming               | OFF, LFT, INDUST, 4KEYS, KEYPAD, DISPLAY                                                                                                                                |
| EDP.SOURCE#p                                              | Port source scale for output | scale_number                                                                                                                                                            |
| EDP.SFMT#p                                                | Port custom stream format    | 0-50 characters                                                                                                                                                         |
| STR.POS#p                                                 | Custom stream identifiers    | Specify replacement text for token<br><br>Example: STR.PRI#1=L<br><br>See <a href="#">Section 10.5 on page 102</a> for more information about custom stream formatting. |
| STR.NEG#p                                                 |                              |                                                                                                                                                                         |
| STR.PRI#p                                                 |                              |                                                                                                                                                                         |
| STR.SEC#p                                                 |                              |                                                                                                                                                                         |
| STR.TER#p                                                 |                              |                                                                                                                                                                         |
| STR.GROSS#p                                               |                              |                                                                                                                                                                         |
| STR.NET#p                                                 |                              |                                                                                                                                                                         |
| STR.TARE#p                                                |                              |                                                                                                                                                                         |
| STR.MOTION#p                                              |                              |                                                                                                                                                                         |
| STR.RANGE#p                                               |                              |                                                                                                                                                                         |
| STR.OK#p                                                  |                              |                                                                                                                                                                         |
| STR.INVALID#p                                             |                              |                                                                                                                                                                         |
| For commands including “#p”, p is the serial port number. |                              |                                                                                                                                                                         |

Table 9-4. SERIAL Port Serial Commands

| Command                          | Description                                 | Values                                                                                                                                                                          |
|----------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SD                               | Set date                                    | <b>MMDDYY, DDDMMYY, YYMMDD, or YYDDMM.</b> Enter six-digit date using the year-month-day order specified for the DATEFMT parameter, using only the last two digits of the year. |
| ST                               | Set time                                    | <b>hhmm</b> (enter using 24-hour format)                                                                                                                                        |
| DATEFMT                          | Date format                                 | <b>MMDDYYYY, DDDMMYYYY, YYYYMMDD, YYYYDDMM</b>                                                                                                                                  |
| DATESEP                          | Date separator                              | <b>SLASH, DASH, SEMI</b>                                                                                                                                                        |
| TIMEFMT                          | Time format                                 | <b>12HOUR, 24HOUR</b>                                                                                                                                                           |
| TIMESEP                          | Time separator                              | <b>COLON, COMMA</b>                                                                                                                                                             |
| DECfmt                           | Decimal format                              | <b>DOT, COMMA</b>                                                                                                                                                               |
| DSPrATE                          | Display rate                                | <b>1–80,</b> in 100-ms intervals                                                                                                                                                |
| CONSNUM                          | Consecutive numbering                       | <b>0–9999999</b>                                                                                                                                                                |
| CONSTUP                          | Consecutive number start-up value           | <b>0–9999999</b>                                                                                                                                                                |
| UID                              | Unit identifier                             | <b>aaaaaaaa</b> (up to 8 alphanumeric characters)                                                                                                                               |
| TRUCK                            | Truck in/out mode                           | <b>OFF, MODE1, MODE2, MODE3, MODE4, MODE5, MODE6</b>                                                                                                                            |
| ALIBI                            | Alibi data storage enable                   | <b>OFF, ON</b>                                                                                                                                                                  |
| CFGPWD                           | Configuration password                      | <b>0, 1–9999999</b>                                                                                                                                                             |
| SPPWD                            | Setpoint password                           | <b>0, 1–9999999</b>                                                                                                                                                             |
| SK#1–SK#10                       | Softkey assignment                          | Blank, TimeDate, DspTar, DspAcc, DspROC, SetPt, BatStrt, BatStop, Bat-Pause, BatRst, WeighIn, WeighOut, TrkReg, UID, Diagnostics, Alibi, SclSel, <b>SKUD1–SKUD10</b>            |
| SKT#1–SKT#10                     | User-defined softkey text                   | —                                                                                                                                                                               |
| KYBDLK                           | Keyboard lock (disable keypad)              | <b>OFF, ON</b>                                                                                                                                                                  |
| ZERONLY                          | Disable all keys except ZERO                | <b>OFF, ON</b>                                                                                                                                                                  |
| PROMPT#1–<br>PROMPT#60           | Prompts/setpoint names                      | —                                                                                                                                                                               |
| REGULAT                          | Regulatory compliance                       | <b>NONE, OIML, NTEP, CANADA, INDUST</b>                                                                                                                                         |
| REG.SNPSHOT                      | Display or Scale weight source              | <b>DISPLAY, SCALE</b>                                                                                                                                                           |
| REG.HTARE                        | Allow tare in display hold                  | <b>NO, YES</b>                                                                                                                                                                  |
| REG.ZTARE                        | Remove tare on ZERO                         | <b>NO, YES</b>                                                                                                                                                                  |
| REG.KTARE                        | Always allow keyed tare                     | <b>NO, YES</b>                                                                                                                                                                  |
| REG.MTARE                        | Multiple tare action                        | <b>REPLACE, REMOVE, NOTHING</b>                                                                                                                                                 |
| REG.NTARE                        | Allow negative tare                         | <b>NO, YES</b>                                                                                                                                                                  |
| REG.CTARE                        | Allow clear keyed tare                      | <b>NO, YES</b>                                                                                                                                                                  |
| REG.CHILDZT                      | Clear child scales individually             | <b>NO, YES</b>                                                                                                                                                                  |
| REG.NEGTOTAL                     | Allow total scale to display negative value | <b>NO, YES</b>                                                                                                                                                                  |
| REG.PRTMOT                       | Allow print while in motion                 | <b>NO, YES</b>                                                                                                                                                                  |
| REG.PRINTPT                      | Add PT to keyed tare print                  | <b>NO, YES</b>                                                                                                                                                                  |
| REG.PRTHLD                       | Print during display hold                   | <b>NO, YES</b>                                                                                                                                                                  |
| REG.HLDWGH                       | Allow weighment during display hold         | <b>NO, YES</b>                                                                                                                                                                  |
| REG.MOTWGH                       | Allow weighment in motion                   | <b>NO, YES</b>                                                                                                                                                                  |
| REGWORD                          | Regulatory word                             | <b>GROSS, BRUTTO</b>                                                                                                                                                            |
| CONTACT.COMPANY                  | Contact company name                        | <b>company_name</b> (up to 30 characters)                                                                                                                                       |
| CONTACT.ADDR1<br>CONTACT.ADDR2   | Contact company address                     | <b>company_address</b> (up to 30 characters for each line)                                                                                                                      |
| CONTACT.NAME1<br>CONTACT.NAME2   | Contact names                               | <b>contact_names</b> (up to 20 characters each)                                                                                                                                 |
| CONTACT.PHONE1<br>CONTACT.PHONE2 | Contact phone numbers                       | <b>contact_phone_numbers</b> (up to 20 characters each)                                                                                                                         |
| CONTACT.EMAIL                    | Contact e-mail address                      | <b>contact_e-mail_address</b> (up to 30 characters)                                                                                                                             |

Table 9-5. FEATURE Serial Commands

| Command  | Description              | Values                                      |
|----------|--------------------------|---------------------------------------------|
| NEXTCAL  | Next calibration date    | <b>calibration_date</b>                     |
| GRAVADJ  | Gravitational adjustment | OFF, ON                                     |
| LAT.LOC  | Latitude                 | <b>0–90</b> (to nearest degree of latitude) |
| ELEV.LOC | Elevation                | <b>±0–9999</b> (in meters)                  |
| IMAGE    | Display image            | NEGATIVE, POSITIVE                          |

Table 9-5. FEATURE Serial Commands (Continued)

| Command               | Description                  | Values                                                                                                                                                                                                                            |
|-----------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SP.KIND# <b>n</b>     | Setpoint kind                | OFF, GROSS, NET, –GROSS, –NET, ACCUM, ROC, +REL, –REL, %REL, RES-REL, PAUSE, DELAY, WAITSS, COUNTER, AUTOJOG, COZ, INMOTON, INRANGE, BATCHPR, TIMER, CONCUR, DIGIN, AVG, TOD, DELTA, CHWEI, PLSCNT, PLSRAT, ALWAYS, NEVER, DINCNT |
| SP.VALUE# <b>n</b>    | Setpoint value               | <b>number</b>                                                                                                                                                                                                                     |
| SP.SOURCE# <b>n</b>   | Source scale                 | SCALE1, SCALE2, SCALE3                                                                                                                                                                                                            |
| SP.COAST# <b>n</b>    | Pulse counter coast          | <b>number</b>                                                                                                                                                                                                                     |
| SP.TRIP# <b>n</b>     | Trip                         | HIGHER, LOWER, INBAND, OUTBAND                                                                                                                                                                                                    |
| SP.BANDVAL# <b>n</b>  | Band value                   | <b>number</b>                                                                                                                                                                                                                     |
| SP.HYSTER# <b>n</b>   | Hysteresis                   | <b>number</b>                                                                                                                                                                                                                     |
| SP.PREACT# <b>n</b>   | Preact type                  | OFF, ON, LEARN, FLOW                                                                                                                                                                                                              |
| SP.PREVAL# <b>n</b>   | Preact value                 | <b>number</b>                                                                                                                                                                                                                     |
| SP.PREADJ# <b>n</b>   | Preact adjustment percentage | <b>number</b>                                                                                                                                                                                                                     |
| SP.PRESTAB# <b>n</b>  | Preact learn stability       | <b>number</b>                                                                                                                                                                                                                     |
| SP.PCOUNT# <b>n</b>   | Preact learn interval        | <b>number</b>                                                                                                                                                                                                                     |
| SP.TOLBAND# <b>n</b>  | Target tolerance             | <b>number</b>                                                                                                                                                                                                                     |
| SP.TOLCNT# <b>n</b>   | Tolerance count              | <b>number</b>                                                                                                                                                                                                                     |
| SP.BATCH# <b>n</b>    | Batch step enable            | OFF, ON                                                                                                                                                                                                                           |
| SP.CLRACCM# <b>n</b>  | Clear accumulator enable     | OFF, ON                                                                                                                                                                                                                           |
| SP.CLRTARE# <b>n</b>  | Clear tare enable            | OFF, ON                                                                                                                                                                                                                           |
| SP.PSHACCM# <b>n</b>  | Push accumulate              | OFF, ON, ONQUIET                                                                                                                                                                                                                  |
| SP.PSHPRINT# <b>n</b> | Push print                   | OFF, ON, WAITSS                                                                                                                                                                                                                   |
| SP.PSHTARE# <b>n</b>  | Push tare                    | OFF, ON                                                                                                                                                                                                                           |
| SP.ALARM# <b>n</b>    | Alarm enable                 | OFF, ON                                                                                                                                                                                                                           |
| SP.NAME# <b>n</b>     | Setpoint name number         | NONE, <b>1–60</b>                                                                                                                                                                                                                 |
| SP.ACCESS# <b>n</b>   | Setpoint access              | OFF, ON, HIDE                                                                                                                                                                                                                     |
| SP.DSLOT# <b>n</b>    | Digital output slot          | NONE, SLOT <b>x</b>                                                                                                                                                                                                               |
| SP.DIGOUT# <b>n</b>   | Digital output               | BIT <b>x</b>                                                                                                                                                                                                                      |
| SP.SENSE# <b>n</b>    | Digital output sense         | NORMAL, INVERT                                                                                                                                                                                                                    |
| SP.BRANCH# <b>n</b>   | Branch destination           | <b>0, 1–100</b>                                                                                                                                                                                                                   |
| SP.RELNUM# <b>n</b>   | Relative setpoint number     | <b>1–100</b>                                                                                                                                                                                                                      |
| SP.START# <b>n</b>    | Starting setpoint            | <b>1–100</b>                                                                                                                                                                                                                      |
| SP.END# <b>n</b>      | Ending setpoint              | <b>1–100</b>                                                                                                                                                                                                                      |
| SP.DISLOT# <b>n</b>   | Digital input slot           | NONE, SLOT <b>x</b>                                                                                                                                                                                                               |
| SP.MASK# <b>n</b>     | Digital input mask           | <b>number</b>                                                                                                                                                                                                                     |

Table 9-6. SETPNTS Serial Commands

| Command               | Description               | Values            |
|-----------------------|---------------------------|-------------------|
| SP.NSAMPLE# <b>n</b>  | Number of samples         | <b>number</b>     |
| SP.TIME# <b>n</b>     | Trip time                 | hhmm              |
| SP.DURATION# <b>n</b> | Trip duration             | hhmmss            |
| SP.VUNDER# <b>n</b>   | Underrange value          | number            |
| SP.VOVER# <b>n</b>    | Overrange value           | number            |
| SP.DUNDER# <b>n</b>   | Underrange digital output | BIT <b>x</b>      |
| SP.DACCEPT# <b>n</b>  | Accept digital output     | BIT <b>x</b>      |
| SP.DOVER# <b>n</b>    | Overrange digital output  | BIT <b>x</b>      |
| BATCHNG               | Batching mode             | OFF, AUTO, MANUAL |
| SP.ENABLE# <b>n</b>   | Setpoint enable           | ON, OFF           |

For setpoint commands ending with “#**n**”, **n** is the setpoint number.

Table 9-6. SETPNTS Serial Commands (Continued)

| Command                                         | Description                         | Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GFMT.FMT<br>GFMT.PORT                           | Gross demand print format string    | <p>For .PORT commands, specify the port number as PORT<b>xx</b> (no leading zero). For example: GFMT.PORT=PORT3.</p> <p>For AUXFMT.FMT commands, specify the auxiliary format number (1—20) as AUX-FMT<b>xx</b> (no leading zero). For example: AUX8FMT=GROSS&lt;G&gt;&lt;NL2&gt;...</p> <p>See <a href="#">Section 6.0 on page 60</a> for information about demand print format strings.</p> <p>See the <i>iQUBE Installation Manual</i>, PN 77224, for more information about alert formats.</p> |
| NFMT.FMT<br>NFMT.PORT                           | Net demand print format string      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ACC.FMT<br>ACC.PORT                             | Accumulator print format string     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| SPFMT.FMT<br>SPFMT.PORT                         | Setpoint print format string        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TRWIN.FMT<br>TRWIN.PORT                         | Truck weigh-in print format string  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TRWOUT.FMT<br>TRWOUT.PORT                       | Truck weigh-out print format string |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TR.FMT<br>TR.PORT                               | Truck register print format string  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ALERT.FMT<br>ALERT.PORT                         | Alert format string                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| HDRFMT1<br>HDRFMT2                              | Ticket header format strings        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| AUXFMT <b>xx</b> .FMT<br>AUXFMT <b>xx</b> .PORT | Auxiliary ticket format             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| AUD.PORT                                        | Audit trail port                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| WDGT#1= <b>n, f, d, s</b>                       | Widget display                      | <p>Sets scale display characteristics, where: <b>n</b> = widget number; <b>f</b> = font; <b>d</b> = number of scale displays; <b>s</b> = screen number.</p> <p>The 820i supports the following widget display configurations:</p> <p>WDGT#1=1,3,1,1Single scale display, larger font</p> <p>WDGT#1=1,2,2,1Dual scale display, smaller font</p>                                                                                                                                                     |

Table 9-7. PFORMT Serial Commands

| Command                                                                                          | Description                                                         | Values                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DON. <b>b#s</b>                                                                                  | Set digital output on (active) at bit <b>b</b> , slot <b>s</b> .    | —                                                                                                                                                                                                                                                                                       |
| DOFF. <b>b#s</b>                                                                                 | Set digital output off (inactive) at bit <b>b</b> , slot <b>s</b> . | —                                                                                                                                                                                                                                                                                       |
| DIO. <b>b#s</b>                                                                                  | Digital input function                                              | OFF, INPUT, OUTPUT, PROGIN, ZERO, NT/GRS, TARE, UNITS, PRINT, ACCUM, SETPNT, TIMDATE, ESC, CLEAR, DSPTAR, IDKEY, KEY0–KEY9, KEYDP, ENTER, NAVUP, NAVDN, NAVLFT, NAVRG, KBDLOC, HOLD, BATRUN, BATSTRT, BATPAUS, BATRESET, BATSTOP, CLRCN, GROSS, NET, PRIM, SEC, CLRTAR, CLRACC, TRIGGER |
| DIO.TRIG_SLOT. <b>b#s</b>                                                                        | Trigger output slot                                                 | NONE, SLOT3                                                                                                                                                                                                                                                                             |
| DIO.TRIG_PARAM. <b>b#s</b>                                                                       | Trigger output parameter                                            | value                                                                                                                                                                                                                                                                                   |
| Digital inputs and outputs are specified by bit number ( <b>b</b> ) and slot number ( <b>s</b> ) |                                                                     |                                                                                                                                                                                                                                                                                         |

Table 9-8. DIG I/O Serial Commands

| Command                                                              | Description           | Values               |
|----------------------------------------------------------------------|-----------------------|----------------------|
| ALG.ALIAS# <b>s</b>                                                  | Analog output alias   | name                 |
| ALG.SOURCE# <b>s</b>                                                 | Analog output source  | PROG, SCALE          |
| ALG.MODE# <b>s</b>                                                   | Mode                  | GROSS, NET           |
| ALG.OFFSET# <b>s</b>                                                 | Zero offset           | 0%, 20%              |
| ALG.ERRACT# <b>s</b>                                                 | Error action          | FULLSC, HOLD, ZEROSC |
| ALG.MIN# <b>s</b>                                                    | Minimum value tracked | 0–9999999            |
| ALG.MAX# <b>s</b>                                                    | Maximum value tracked | 0–9999999            |
| ALG.ZERO# <b>s</b>                                                   | Zero calibration      | 0–65535              |
| ALG.SPAN# <b>s</b>                                                   | Span calibration      | 0–65535              |
| For commands ending with “# <b>s</b> ”, <b>s</b> is the slot number. |                       |                      |

Table 9-9. ALGOUT Serial Commands (Valid Only If Analog Output Card Is Installed)

| Command                                                              | Description                         | Values |
|----------------------------------------------------------------------|-------------------------------------|--------|
| XP# <b>s</b>                                                         | Extract probe temperature           | —      |
| XPP# <b>s</b>                                                        | Extract probe primary temperature   |        |
| XPS# <b>s</b>                                                        | Extract probe secondary temperature |        |
| XPT# <b>s</b>                                                        | Extract probe tertiary temperature  |        |
| XI# <b>s</b>                                                         | Extract 0–20 mA value               |        |
| XV# <b>s</b>                                                         | Extract 0–10 V value                |        |
| For commands ending with “# <b>s</b> ”, <b>s</b> is the slot number. |                                     |        |

Table 9-10. Analog Input Serial Commands (Valid Only If Analog Input Card Is Installed)

### 9.1.5 Normal Mode Commands

The normal mode print commands (see Table 9-11) transmit data to the serial port on demand in either setup or normal mode.

| Command  | Description                                   | Values                                                                                                                                                                                                                                      |
|----------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CONSNUM  | Set consecutive number                        | 0–9 999 999                                                                                                                                                                                                                                 |
| UID      | Set unit ID                                   | nnnnnnn                                                                                                                                                                                                                                     |
| SD       | Set date                                      | MMDDYY, DDDMMYY, YYMMDD, or YYDDMM . Enter six-digit date using the year-month-day order specified for the DATEFMT parameter, using only the last two digits of the year.                                                                   |
| ST       | Set time                                      | hhmm (enter using 24-hour format)                                                                                                                                                                                                           |
| CONTRAST | Set display contrast                          | 0–127                                                                                                                                                                                                                                       |
| BACKLITE | Set display backlighting                      | ON, OFF                                                                                                                                                                                                                                     |
| SX#n     | Start serial port streaming                   | OK or ??                                                                                                                                                                                                                                    |
| EX#n     | Stop serial port streaming                    | The port streaming parameter (EDP.STREAM#p) for the streaming port must be set to LFT or INDUST before using these commands.<br>An EX command sent while in setup mode does not take effect until the indicator is returned to normal mode. |
| SF#n     | Transmit single frame of stream               | Sends a single frame from scale <i>n</i> to the streaming port                                                                                                                                                                              |
| RS       | Reset system                                  | Soft reset. Used to reset the indicator without resetting the configuration to the factory defaults.                                                                                                                                        |
| XA#n     | Transmit accumulator value in displayed units | nnnnnn UU                                                                                                                                                                                                                                   |
| XAP#n    | Transmit accumulator value in primary units   |                                                                                                                                                                                                                                             |
| XAS#n    | Transmit accumulator value in secondary units |                                                                                                                                                                                                                                             |
| XAT#n    | Transmit accumulator value in tertiary units  |                                                                                                                                                                                                                                             |
| XG#n     | Transmit gross weight in displayed units      | nnnnnn UU                                                                                                                                                                                                                                   |
| XGP#n    | Transmit gross weight in primary units        |                                                                                                                                                                                                                                             |
| XGS#n    | Transmit gross weight in secondary units      |                                                                                                                                                                                                                                             |
| XGT#n    | Transmit gross weight in tertiary units       |                                                                                                                                                                                                                                             |
| XN#n     | Transmit net weight in displayed units        | nnnnnn UU                                                                                                                                                                                                                                   |
| XNP#n    | Transmit net weight in primary units          |                                                                                                                                                                                                                                             |
| XNS#n    | Transmit net weight in secondary units        |                                                                                                                                                                                                                                             |
| XNT#n    | Transmit net weight in tertiary units         |                                                                                                                                                                                                                                             |
| XT#n     | Transmit tare weight in displayed units       | nnnnnn UU                                                                                                                                                                                                                                   |
| XTP#n    | Transmit tare weight in primary units         |                                                                                                                                                                                                                                             |
| XTS#n    | Transmit tare weight in secondary units       |                                                                                                                                                                                                                                             |
| XTT#n    | Transmit tare weight in tertiary units        |                                                                                                                                                                                                                                             |
| XE       | Query system error conditions                 | nnnnn<br>See <a href="#">Section 10.1.4 on page 99</a> for detailed information about the XE command response format.                                                                                                                       |

Table 9-11. Normal Mode Serial Commands

### 9.1.6 Batching Control Commands

The commands listed in Table 9-12 provide batching control through the serial port

| Command  | Description | Values                                                                                                                                                                                                                                                                                                                                              |
|----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BATSTART | Batch start | If the BATRUN digital input is active (low) or not assigned, the BATSTART command can be used to start the batch program.                                                                                                                                                                                                                           |
| BATSTOP  | Batch stop  | Stops the batch program and turns off all associated digital outputs.                                                                                                                                                                                                                                                                               |
| BATPAUSE | Batch pause | Stops the batch program at the current step. All digital outputs set on by the current step (except for those set by concur setpoints) are set off. The BATSTRT DIGIN, BATSTART serial command, <b>Batch Start</b> softkey, or the StartBatch function in an <i>iRite-IDE</i> program can be used to restart the batch program at the current step. |
| BATRESET | Batch reset | Stops the program and resets the batch program to the first batch step. Run the BATRESET command after making changes to the batch configuration.                                                                                                                                                                                                   |

Table 9-12. Batching Control Commands

## 10.0 Appendix

### 10.1 Troubleshooting

Table 10-1 lists general troubleshooting tips for various hardware and software error conditions. See the following pages for additional information about specific diagnostic tools.

| Symptom                                                                                                                    | Cause/Remedy                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Indicator does not power up                                                                                                | Possible blown fuse or bad power supply. Check all voltages on CPU board. Power supply should output both +6V and –6V levels to the CPU board (see <a href="#">Figure 2-3 on page 19</a> ). If power supply appears bad, check the small glass fuse (2.5A, 5x20mm) on the power supply board. |
| Front panel power indicator blinking (  ) | Power supply overloaded. Check for shorts in A/D card regulators or in the DC-to-DC converter of any installed analog output or pulse input cards.                                                                                                                                            |
| "Blue screen"                                                                                                              | Press front panel <b>Display</b> key, press <b>down</b> key, enter <b>100</b> using the numeric keypad, then press <b>Enter</b> . Possible corrupt core software; reset or reload software.                                                                                                   |
| Hangs in "888" display                                                                                                     | Corrupt core software. Reset or reload software.                                                                                                                                                                                                                                              |
| <b>Tare and truck data pointers are corrupt, Tare storage is corrupt</b> error messages at startup                         | Possible dead battery. Perform configuration reset then check for low battery warning on display. If battery is low, replace battery, perform another configuration reset, then reload files.                                                                                                 |
| <b>Divide by zero</b> error message at startup                                                                             | User program error. See <a href="#">Section 10.1.3 on page 98</a>                                                                                                                                                                                                                             |
| <b>ERROR</b> message in weight display                                                                                     | Excitation voltage too low or off.                                                                                                                                                                                                                                                            |
| Dashes in weight display                                                                                                   | Overrange or underrange scale condition. Check scale. For out-of-range conditions in total scale display, check all scale inputs for positive weight values.                                                                                                                                  |
| Display reads <b>0.000000</b>                                                                                              | Scale not updating. Check for bad option card hanging the bus.                                                                                                                                                                                                                                |
| Cannot enter setup mode                                                                                                    | Possible bad switch. Test switch; replace interface board if necessary.                                                                                                                                                                                                                       |
| Serial port not responding                                                                                                 | Possible configuration error. For command input, ensure port INPUT parameter is set to CMD.                                                                                                                                                                                                   |
| A/D scale out of range                                                                                                     | Check source scale for proper mechanical operation. Check load cell and cable connection. Possible bad load cell: check indicator operation with load cell simulator.                                                                                                                         |
| Locked — Scale in use                                                                                                      | Scale is assigned as an input to a total scale or is the source for a serial scale, analog output, or setpoint. If not correct, deconfigure this scale assignment and reconfigure as required.                                                                                                |
| Serial scale out of range                                                                                                  | Check source scale for proper mechanical operation. Check cable connection. Possible format mismatch between serial scale and 820i: Check SFMT specification under SERIAL menu.                                                                                                               |
| Option <b>X</b> Error                                                                                                      | Field bus card (Profibus, DeviceNet, or Remote I/O) in slot <b>x</b> failed to initialize.                                                                                                                                                                                                    |
| Option card failure                                                                                                        | Possible defective card or slot.                                                                                                                                                                                                                                                              |
| Option card hardware diagnostic error                                                                                      | Required option card not found. See <a href="#">Section 10.1.1 on page 97</a> .                                                                                                                                                                                                               |

Table 10-1. Basic Troubleshooting



**NOTE:** Always save copies of the indicator configuration, calibration, Revolution® and iRite-IDE files on a local PC so that these are available when a software reload or upgrade is required.

### 10.1.1 Option Card Diagnostic Errors

Option cards are detected by the 820i at power-up. If the current indicator configuration requires an option card but that card is not detected at power-up, an error similar to the following is displayed:

HARDWARE CRITICAL TO PROPER OPERATION  
WITH CURRENT CONFIGURATION  
CANNOT BE FOUND  
INSTALL HARDWARE OR RECONFIGURE

To recover from this error you can do the following:

- If the option is required, ensure that the card is properly seated in its slot and cycle the power. If the card is still not recognized, replace the card.
- Enter setup mode and reconfigure to eliminate the requirement for the option.
- Go to the VERSION menu and use the **Reset Config** softkey (or RESETCONFIGURATION command) to perform a configuration reset. Configuration reset returns all configuration values to their factory defaults.

See [Section 10.1.2](#) below, for information about using the HARDWARE serial command to verify that installed cards are recognized.

### 10.1.2 Using the HARDWARE Command

The HARDWARE serial command can be issued to verify that all installed cards are recognized by the system. The HARDWARE command returns a string of card type codes. The first digit represents the single- or dual-A/D of the 820i; the second digit represents the card, if any, installed in the expansion slot:

HARDWARE=3,4

Table 10-2 lists the card codes returned by the HARDWARE command.

| Code                                                                                                                                                                                                             | Card Type                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 0                                                                                                                                                                                                                | No card installed                     |
| 1                                                                                                                                                                                                                | Dual-Channel Serial Expansion Card    |
| 2                                                                                                                                                                                                                | Dual-Channel A/D Card                 |
| 3                                                                                                                                                                                                                | Single-Channel A/D Card               |
| 4                                                                                                                                                                                                                | Analog Output Card                    |
| 5                                                                                                                                                                                                                | 24-Channel Digital I/O Expansion Card |
| 6                                                                                                                                                                                                                | Pulse Input Card                      |
| 7                                                                                                                                                                                                                | 1 MB Memory Expansion Card            |
| 9                                                                                                                                                                                                                | DeviceNet Card                        |
| 10                                                                                                                                                                                                               | Profibus Card                         |
| 11                                                                                                                                                                                                               | EtherNet/IP Card                      |
| 12                                                                                                                                                                                                               | Remote I/O Card                       |
| 14                                                                                                                                                                                                               | Custom Card                           |
| 15                                                                                                                                                                                                               | Analog Input Card                     |
| <b>NOTE: Code 11 is returned only by the EtherNet/IP card. The standard 10M/100Mbps Ethernet card does not return a card type code. The standard Ethernet card returns a value of 0 on the HARDWARE command.</b> |                                       |

Table 10-2. HARDWARE Command Option Card Codes

If an installed card is not recognized (HARDWARE command returns a code of 0 for that slot), ensure that the card is seated properly. Reinstall the card, if necessary, then cycle the indicator power to read the configuration again.

### 10.1.3 User Program Diagnostic Errors

Faulty user programs can cause critical errors that are detected by the 820i at power-up. The following error message is caused by a user program attempting to divide by zero:

A CRITICAL USER PROGRAM ERROR  
HAS BEEN DETECTED  
DIVIDE BY ZERO  
SYSTEM RESET IS REQUIRED

To recover from this error you can do the following:

- Cycle the indicator power to reset the user program.
- Correct the *iRite-IDE* program to eliminate the divide by zero operation. Recompile the program, then download the corrected program to the indicator.

If technical assistance is required, contact Rice Lake Weighing Systems technical support.

#### Diagnostic Boot Procedure

If a user program causes an error in the start-up handler, press and hold the setup switch while cycling power to the 820i to place the indicator in setup mode. Use *Revolution* monitor mode to send the PCLR command erase clear the user program.

If the error is still not cleared, perform the following diagnostic boot procedure.

1. Disconnect power to the 820i.
2. Connect the serial port of a PC with *Revolution* installed to port 2 of the 820i.
3. Open the indicator enclosure and place a jumper across the boot mode pins (see [Figure 2-3 on page 19](#)).
4. Power up the 820i. The indicator will stall at the diagnostic monitor.
5. Start *Revolution* and enter monitor mode, then type `BOOT`.
6. Use the indicator setup switch to enter setup mode.
7. Remove the jumper from SW1.
8. From monitor mode, enter the `RESETCONFIGURATION` command.

Determine the cause of the startup handler error, make program corrections, then reload the corrected user program and test.

### 10.1.4 Using the XE Serial Command

The XE serial command can be used to remotely query the 820i for the error conditions shown on the front panel. The XE command returns a decimal number representing any existing error conditions. For multi-scale applications, the value returned by the XE command represents all error conditions, if any, present on all configured scales.

If more than one error condition exists, the number returned is the sum of the values representing the error conditions (see Table 10-3). For example, if both a tare error (TAREERR, 65536) and a truck database checksum error (ETRUCKERR, 8192) have occurred, the XE command returns the value 73728, representing the sum of those two error conditions.

| Error Code    | Value   | Description                   |
|---------------|---------|-------------------------------|
| VIRGERR       | 1       | Virgin error                  |
| PARMCHKERR    | 2       | Configuration checksum error  |
| LOADCHKERR    | 4       | Calibration checksum error    |
| PRINTCHKERR   | 8       | Print format checksum error   |
| ENVNVRAMERR   | 16      | General NVRAM error           |
| ENVCRC1ERR    | 32      | Setpoint NVRAM data error     |
| ENVCRC2ERR    | 64      |                               |
| ENVCRC3ERR    | 128     |                               |
| ENVCRC4ERR    | 256     |                               |
| ENVCRC5ERR    | 512     |                               |
| ENVCRC6ERR    | 1024    |                               |
| ENVCRC7ERR    | 2056    |                               |
| ENVCRC8ERR    | 4096    |                               |
| ETRUCKERR     | 8192    | Truck database checksum error |
| GRAVERR       | 16384   | Gravity calibration error     |
| ADPHYSICALERR | 32768   | A/D physical error            |
| TAREERR       | 65536   | Tare checksum error           |
| STRINGERR     | 262144  | String program error          |
| POWER_FAIL    | 524288  | Power failure                 |
| RTCERR        | 1048576 | Real time clock error         |

Table 10-3. Error Codes Returned on XE Command

## 10.2 Regulatory Mode Functions

The function of the front panel **TARE** and **ZERO** keys depends on the value specified for the **REGULAT** parameter on the **FEATURE** menu. Table 10-4 describes the function of these keys for the **NTEP**, **CANADA**, **OIML**, and **NONE** regulatory modes. **TARE** and **ZERO** key functions are configurable when the **REGULAT** mode is set to **INDUST** (see Table 10-5).

| REGULAT<br>Parameter Value | Weight on Scale  | Tare in System | Front Panel Key Function |                                                                                             |
|----------------------------|------------------|----------------|--------------------------|---------------------------------------------------------------------------------------------|
|                            |                  |                | TARE                     | ZERO                                                                                        |
| NTEP                       | zero or negative | no             | no action                | ZERO                                                                                        |
|                            |                  | yes            | CLEAR TARE               |                                                                                             |
|                            | positive         | no             | TARE                     |                                                                                             |
|                            |                  | yes            | TARE                     |                                                                                             |
| CANADA                     | zero or negative | no             | no action                | ZERO                                                                                        |
|                            |                  | yes            | CLEAR TARE               |                                                                                             |
|                            | positive         | no             | TARE                     |                                                                                             |
|                            |                  | yes            | no action                |                                                                                             |
| OIML                       | zero or negative | no             | no action                | ZERO                                                                                        |
|                            |                  | yes            | CLEAR TARE               | ZERO and CLEAR TARE                                                                         |
|                            | positive         | no             | TARE                     | ZERO                                                                                        |
|                            |                  | yes            | TARE                     | ZERO and CLEAR TARE if weight is within ZRANGE.<br>No action if weight is outside of ZRANGE |
| NONE                       | zero or negative | no             | TARE                     | ZERO                                                                                        |
|                            |                  | yes            | CLEAR TARE               |                                                                                             |
|                            | positive         | no             | TARE                     |                                                                                             |
|                            |                  | yes            | CLEAR TARE               |                                                                                             |

Table 10-4. TARE and ZERO Key Functions for REGULAT Parameter Settings

Table 10-5 lists the subparameters available when configuring a scale using **INDUST** mode. The table includes the default values of the **INDUST** subparameters and the effective (not configurable) values used by the **NTEP**, **CANADA**, **OIML**, and **NONE** regulatory modes.

| REGULAT / INDUST Parameter |                                             | REGULAT Mode |         |         |         |        |
|----------------------------|---------------------------------------------|--------------|---------|---------|---------|--------|
| Parameter Name             | Text Prompt                                 | INDUST       | NTEP    | CANADA  | OIML    | NONE   |
| SNPSHOT                    | Display or Scale weight source              | DISPLAY      | DISPLAY | DISPLAY | DISPLAY | SCALE  |
| HTARE                      | Allow tare in display hold                  | NO           | NO      | NO      | NO      | YES    |
| ZTARE                      | Remove tare on ZERO                         | NO           | NO      | NO      | YES     | NO     |
| KTARE                      | Always allow keyed tare                     | YES          | YES     | NO      | YES     | YES    |
| MTARE                      | Multiple tare action                        | REPLACE      | REPLACE | NOTHING | REPLACE | REMOVE |
| NTARE                      | Allow negative tare                         | NO           | NO      | NO      | NO      | YES    |
| CTARE                      | Allow CLEAR key to clear tare/accumulator   | YES          | YES     | NO      | NO      | YES    |
| CHILDZT                    | Clear child scales individually             | NO           | NO      | NO      | NO      | NO     |
| NEGTOTAL                   | Allow total scale to display negative value | NO           | NO      | NO      | NO      | NO     |
| PRTMOT                     | Allow print while in motion                 | NO           | NO      | NO      | NO      | YES    |
| PRTPT                      | Add PT to keyed tare print                  | NO           | NO      | YES     | YES     | NO     |
| PRTHLD                     | Print during display hold                   | NO           | NO      | NO      | NO      | YES    |
| HLDWGH                     | Allow weigh during display hold             | NO           | NO      | NO      | NO      | YES    |
| MOTWGH                     | Allow weighment in motion                   | NO           | NO      | NO      | NO      | NO     |

Table 10-5. REGULAT / INDUST Mode Parameters, Comparison with Effective Values of Other Modes

## 10.3 Serial Scale Interface

Serial ports 3, 4 and any expansion ports can be configured for serial scale input. The serial scale function allows other scale indicators to send gross, net, or tare weight data to the 820i. Once a serial port has been configured to accept scale data, the data format can be customized to match the data stream sent by that indicator.

To configure a serial scale, do the following:

1. Under the SERIAL menu, set the INPUT parameter for the selected port to SCALE (legal-for-trade serial scale) or INDUST (industrial serial scale).
2. Return to the SCALES menu. Under CONFIG, drop down and select the serial port. If the serial scale is not shown, press the **Change Type** softkey to select available serial scales, then use the navigational keys to select the serial scale. Press **Add** to move the scale to the righthand column, then press **Done**.
3. Under the SERIAL menu, return to the selected port and set the format under the SFMT parameter to match the format sent by the serial scale.

The default serial scale format is:

<2><P><W7.><U><M><S><CR><LF>

where:

|       |                                                 |
|-------|-------------------------------------------------|
| <2>   | STX character                                   |
| <P>   | Polarity                                        |
| <W7.> | Seven characters of net data with decimal point |
| <M>   | Mode                                            |
| <U>   | Units                                           |
| <S>   | Status                                          |
| <CR>  | Carriage return                                 |
| <LF>  | Line feed                                       |



**NOTE:** Industrial serial scales (INDUST) do not require the <M>, <U>, and <S> identifiers. However, the units and number of decimal places must be specified. Units can be selected from the FORMAT menu; decimal places should be indicated on the w-spec identifier. For example, a seven-digit weight requiring two decimal places should be specified as <W7.2> rather than <W7.>.

See [Section 10.5 on page 102](#) for more information about stream formatting and format identifiers.

## 10.4 Local/Remote Operation

For truck scale and similar applications, local/remote support provides function equivalent to that of a legal-for-trade remote display with keypad. Scale data from the local indicator is also displayed at the remote unit, and keypad input from the remote allows transactions to be initiated from either the local or remote unit.

To configure for local/remote operation, first set up the local scale (including softkey assignments, truck mode, and database information, as required). Use the SERIAL menu, serial commands, or *Revolution* to set the Local Unit serial parameters shown in Table 10-6. Configure the remote indicator using the serial parameters listed for the Remote Unit.

| Serial Configuration Parameter                                      | Parameter Value                                      |             |
|---------------------------------------------------------------------|------------------------------------------------------|-------------|
|                                                                     | Local Unit                                           | Remote Unit |
| EDP.INPUT#p                                                         | CMD                                                  | DISPLAY     |
| EDP.STREAM#p                                                        | DISPLAY                                              | KEYPAD      |
| EDP.BAUD#p                                                          | 115200 preferred; local and remote values must match |             |
| EDP.ECHO#p                                                          | OFF                                                  | OFF         |
| EDP.RESPONSE#p                                                      | ON                                                   | ON          |
| In the listed serial commands, p represents the serial port number. |                                                      |             |

Table 10-6. Local/Remote Configuration Parameters

## 10.5 Custom Stream Formatting

Each port can be independently configured to stream a default frame format or can be customized to stream a user-defined format. Custom formatting is very similar to the standard print formatting described in [Section 6.0 on page 60](#).

Table 10-7 lists the format identifiers used to configure a custom stream format.

| Format Identifier | Defined By                                                                               | Description                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <P[G   N   T]>    | STR.POS# <b>n</b><br>STR.NEG# <b>n</b>                                                   | Polarity. Specifies positive or negative polarity for the current or specified (Gross/Net/Tare) weight on the source scale. Possible values are SPACE, NONE, + (for STR.POS# <b>n</b> ), or – (for STR.NEG# <b>n</b> ) |
| <U[P   S   T]>    | STR.PRI# <b>n</b><br>STR.SEC# <b>n</b><br>STR.TER# <b>n</b>                              | Units. Specifies primary, secondary, or tertiary units for the current or specified weight on the source scale.                                                                                                        |
| <M[G   N   T]>    | STR.GROSS# <b>n</b><br>STR.NET# <b>n</b><br>STR.TARE# <b>n</b>                           | Mode. Specifies gross, net, or tare weight for the current or specified weight on the source scale.                                                                                                                    |
| <S>               | STR.MOTION# <b>n</b><br>STR.RANGE# <b>n</b><br>STR.OK# <b>n</b><br>STR.INVALID# <b>n</b> | Status for the source scale. Default values and meanings for each status:<br>STR.MOTION# <b>n</b> MIn motion<br>STR.RANGE# <b>n</b> OOut of range<br>STR.OK# <b>n</b> <space>OK<br>STR.INVALID# <b>n</b> IInvalid      |
| <B [-]n,...>      | See descriptions below                                                                   | Bit fields. Comma-separated sequence of bit field specifiers. Must be exactly 8 bits. Minus sign ([–]) inverts the bit.                                                                                                |
| B0                | —                                                                                        | Always 0                                                                                                                                                                                                               |
| B1                | —                                                                                        | Always 1                                                                                                                                                                                                               |
| B2                | Configuration                                                                            | =1 if even parity                                                                                                                                                                                                      |
| B3                | Dynamic                                                                                  | =1 if MODE=NET                                                                                                                                                                                                         |
| B4                | Dynamic                                                                                  | =1 if COZ                                                                                                                                                                                                              |
| B5                | Dynamic                                                                                  | =1 if standstill                                                                                                                                                                                                       |
| B6                | Dynamic                                                                                  | =1 if gross negative                                                                                                                                                                                                   |
| B7                | Dynamic                                                                                  | =1 if out of range                                                                                                                                                                                                     |
| B8                | Dynamic                                                                                  | =1 if secondary/tertiary                                                                                                                                                                                               |
| B9                | Dynamic                                                                                  | =1 if tare in system                                                                                                                                                                                                   |
| B10               | Dynamic                                                                                  | =1 if tare is keyed                                                                                                                                                                                                    |
| B11               | Dynamic                                                                                  | =00 if MODE=GROSS<br>=01 if MODE=NET<br>=10 if MODE=TARE<br>=11 ( <b>not used</b> )                                                                                                                                    |
| B12               | Dynamic                                                                                  | =00 if UNITS=PRIMARY<br>=01 if UNITS=SECONDARY<br>=10 if UNITS=TERTIARY<br>=11 ( <b>not used</b> )                                                                                                                     |
| B13               | Configuration                                                                            | =00 ( <b>not used</b> )<br>=01 if current DSPDIV=1<br>=10 if current DSPDIV=2<br>=11 if current DSPDIV=5                                                                                                               |
| B14               | Configuration                                                                            | =00 ( <b>not used</b> )<br>=01 if primary DSPDIV=1<br>=10 if primary DSPDIV=2<br>=11 if primary DSPDIV=5                                                                                                               |

Table 10-7. Custom Stream Format Identifiers

| Format Identifier               | Defined By    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B15                             | Configuration | =00 ( <b>not used</b> )<br>=01 if secondary DSPDIV=1<br>=10 if secondary DSPDIV=2<br>=11 if secondary DSPDIV=5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| B16                             | Configuration | =00 ( <b>not used</b> )<br>=01 if tertiary DSPDIV=1<br>=10 if tertiary DSPDIV=2<br>=11 if tertiary DSPDIV=5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| B17                             | Configuration | =000 if current DECPNT=8888800<br>=001 if current DECPNT=8888880<br>=010 if current DECPNT=8888888<br>=011 if current DECPNT=888888.8<br>=100 if current DECPNT=88888.88<br>=101 if current DECPNT=8888.888<br>=110 if current DECPNT=888.8888<br>=111 if current DECPNT=88.88888                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| B18                             | Configuration | =000 if primary DECPNT=8888800<br>=001 if primary DECPNT=8888880<br>=010 if primary DECPNT=8888888<br>=011 if primary DECPNT=888888.8<br>=100 if primary DECPNT=88888.88<br>=101 if primary DECPNT=8888.888<br>=110 if primary DECPNT=888.8888<br>=111 if primary DECPNT=88.88888                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| B19                             | Configuration | =000 if secondary DECPNT=8888800<br>=001 if secondary DECPNT=8888880<br>=010 if secondary DECPNT=8888888<br>=011 if secondary DECPNT=888888.8<br>=100 if secondary DECPNT=88888.88<br>=101 if secondary DECPNT=8888.888<br>=110 if secondary DECPNT=888.8888<br>=111 if secondary DECPNT=88.88888                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| B20                             | Configuration | =000 if tertiary DECPNT=8888800<br>=001 if tertiary DECPNT=8888880<br>=010 if tertiary DECPNT=8888888<br>=011 if tertiary DECPNT=888888.8<br>=100 if tertiary DECPNT=88888.88<br>=101 if tertiary DECPNT=8888.888<br>=110 if tertiary DECPNT=888.8888<br>=111 if tertiary DECPNT=88.88888                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <wspec [-] [0] digit[.][digit]> | Scale weight  | Weight for the source scale. <b>wspec</b> is defined as follows:<br><b>wspec</b> Indicates whether the weight is the current displayed weight (W, w), gross (G, g), net (N, n), or tare (T, t) weight. Upper-case letters specify right-justified weights; lower-case are left-justified.<br>Optional /P, /S, or /T suffixes can be added before the ending delimiter (>) to specify weight display in primary (/P), secondary (/S), or tertiary (/T) units.<br>[-]Enter a minus sign (-) to include sign for negative values.<br>[0]Enter a zero (0) to display leading zeroes.<br><b>digit[.][digit]</b><br>The first digit indicates the field width in characters. Decimal point only indicates floating decimal; decimal point with following digit indicates fixed decimal with <b>n</b> digits to the right of the decimal. Two consecutive decimals send the decimal point even if it falls at the end of the transmitted weight field. |
| <CR>                            | —             | Carriage return                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <LF>                            | —             | Line feed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Table 10-7. Custom Stream Format Identifiers

## 10.6 Data Formats

### Continuous Output Serial Data Format

If continuous transmission is configured for a serial port (STREAM parameter set to LFT or INDUST on the SERIAL menu), the 820i sends data using the Consolidated Controls serial data format shown in [Figure 10-1](#):

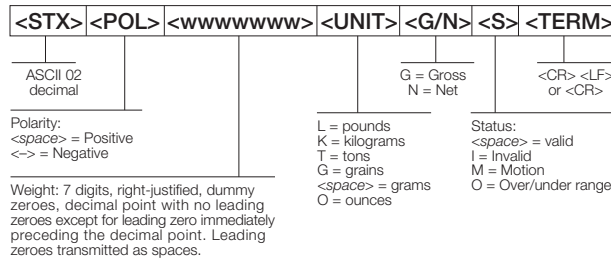


Figure 10-1. Continuous Output Serial Data Format

### Demand Output Serial Data Format

When demand mode is configured for the serial port (STREAM parameter set to OFF), the 820i uses a data string formatted for a basic ticket printout. The particular ticket format printed depends on the indicator configuration.

You can customize the ticket to work with a wide variety of printers, scoreboard displays, and other remote equipment. See [Section 6.0 on page 60](#) for more information on custom print formats.

### RS-485 Data Formats

Two-wire RS-485 communications is available on port 4 of the CPU board; four-wire RS-485 communications is supported on the "A" ports of any installed serial expansion cards.

The 820i has a built-in RS-485 software protocol which is enabled when you assign a non-zero address to the indicator. Valid RS-485 addresses must be in the range 1–255; the address is specified on the ADDRESS parameter on the SERIAL menu.

All remote commands are initiated using the data format shown in [Figure 10-2](#):

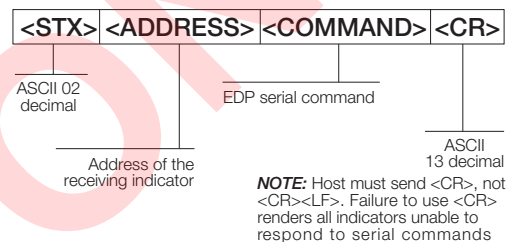


Figure 10-2. RS-485 Send Data Format

If the initiating device address matches the port address of an 820i on the RS-485 network, that indicator responds. For example, with demand outputs, or in response to a KPRINT command, the responding indicator uses the format shown in [Figure 10-3](#):

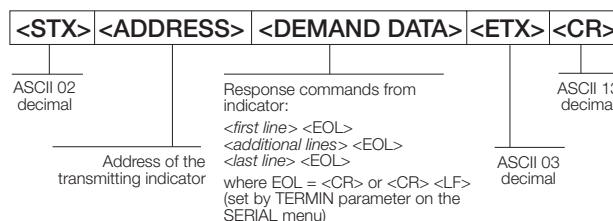


Figure 10-3. RS-485 Respond Data Format

Example: To send the KPRINT command from an ASCII terminal to an indicator at address 65 (decimal) on the RS-485 network, use the format shown in [Figure 10-2](#).

- The keyboard equivalent for the start-of-text (STX) character is CONTROL-B.

- The indicator address (65) is represented by an upper case “A”.
- The carriage return (CR) character is generated by pressing the **ENTER** key.

Therefore, to send the KPRINT command to the indicator at address 65, enter the following at the terminal: CONTROL-B, A, K, P, R, I, N, T, **ENTER**.

The indicator responds with the format shown in [Figure 10-3 on page 104](#):

```
<STX> ASCALE #1<EOL>
GROSS 1699 LB<EOL>
08/20/1998 10:05 AM<EOL>
<ETX> <CR>
```

If continuous transmission is configured for the serial port, the 820i sends data using the data format shown in [Figure 10-4](#):

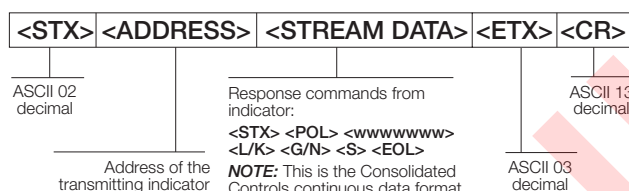


Figure 10-4. RS-485 Continuous Data Format

## 10.7 Digital Filtering

Standard digital filtering uses mathematical averaging to eliminate the variant digital readings that the A/D converter sends periodically because of external vibration. Digital filtering does not affect the indicator measurement rate, but does affect the settling time. The selections from 1 to 256 reflect the number of readings averaged per update period. When a reading is encountered that is outside a predetermined band, the averaging is overridden, and the display jumps directly to the new value.

### DIGFLT<sub>x</sub> Parameters

The first three digital filtering parameters, DIGFLT1, DIGFLT2, and DIGFLT3, are configurable filter stages that control the effect of a single A/D reading on the displayed weight. The value assigned to each parameter sets the number of readings received from the preceding filter stage before averaging.

A rolling average is passed to successive filters for an overall filtering effect that is effectively a weighted average of the product of the values assigned to the filter stages ( $DIGFLT1 \times DIGFLT2 \times DIGFLT3$ ) within a time frame corresponding to the sum of the values ( $DIGFLT1 + DIGFLT2 + DIGFLT3$ ).

Setting the filters to 1 effectively disables digital filtering.

### RATTLETRAP® Filtering

RATTLETRAP digital filtering (RATTRAP parameter set ON) uses a vibration-dampening algorithm to provide a combination of the best features of analog and digital filtering. The RATTLETRAP algorithm evaluates the frequency of a repeating vibration then derives a composite displayed weight equal to the actual weight on the scale less the vibration-induced flaws. It is particularly effective for eliminating vibration effects or mechanical interference from nearby machinery. Using RATTLETRAP filtering can eliminate much more mechanical vibration than standard digital filtering, but will usually increase settling time over standard digital filtering.

### DFSENS and DFTHR Parameters

The digital filter can be used by itself to eliminate vibration effects, but heavy filtering also increases settling time. The DFSENS (digital filter sensitivity) and DFTHR (digital filter threshold) parameters can be used to temporarily override filter averaging and improve settling time:

- DFSENS specifies the number of consecutive scale readings that must fall outside the filter threshold (DFTHR) before digital filtering is suspended.
- DFTHR sets a threshold value, in display divisions. When a specified number of consecutive scale readings (DFSENS) fall outside of this threshold, digital filtering is suspended. Set DFTHR to NONE to turn off the filter override.

## Setting the Digital Filter Parameters

Fine-tuning the digital filter parameters greatly improves indicator performance in heavy-vibration environments. Use the following procedure to determine vibration effects on the scale and optimize the digital filtering configuration.

1. In setup mode, set the digital filter parameters (DIGFLT1–DIGFLT3) to 1. Set DFTHR to NONE. Return indicator to normal mode.
2. Remove all weight from the scale, then watch the indicator display to determine the magnitude of vibration effects on the scale. Record the weight below which all but a few readings fall. This value is used to calculate the DFTHR parameter value in Step 4.

For example, if a heavy-capacity scale (10000 x 5 lb) produces vibration-related readings of up to 50 lb, with occasional spikes to 75 lb, record 50 lb as the threshold weight value.

3. Place the indicator in setup mode and set the DIGFLT<sub>x</sub> parameters to eliminate the vibration effects on the scale. (Leave DFTHR set to NONE.) Find the lowest effective value for the DIGFLT<sub>x</sub> parameters.
4. Calculate the DFTHR parameter value by converting the weight value recorded in Step 2 to display divisions:

$$\text{threshold\_weight\_value} / \text{display\_divisions}$$

In the example in Step 2, with a threshold weight value of 50 lb and a display divisions value of 5 lb: **50 / 5 = 10**. DFTHR should be set to 10D for this example.

5. Finally, set the DFSENS parameter high enough to ignore transient peaks. Longer transients (typically caused by lower vibration frequencies) will cause more consecutive out-of-band readings, so DFSENS should be set higher to counter low frequency transients.

Reconfigure as necessary to find the lowest effective value for the DFSENS parameter.

## 10.8 Conversion Factors for Secondary Units

The 820i has the capability to mathematically convert a weight into many different types of units and instantly display those results with a press of the **UNITS** key.

Secondary and tertiary units can be specified on the FORMAT menu using the SECNDR and TERTIA parameters, or by using serial commands.

- To configure secondary or tertiary units using the front panel menus, use the Table 10-8 to find the conversion multiplier for the MULT parameter. For example, if the primary unit is pounds and the secondary unit is short tons, set the MULT parameter to 0.000500.
- To configure secondary or tertiary units using serial commands, use the Table 10-8 to find the conversion multiplier for the SC.SEC.MULT or SC.TER.MULT command. For example, if the primary unit is pounds and the secondary unit is short tons, send the serial command SC.SEC.MULT= 0.0005<CR> to set the multiplier for the secondary units.



**NOTE:** Ensure that the secondary decimal point position is set appropriately for the scale capacity in the secondary units. If the converted value requires more digits than are available, the indicator displays an overflow message (OVERFL).

For example, if the primary units are short tons, secondary units are pounds, and the secondary decimal point is set to 8888.888, the indicator will overflow if 5 tons or more are applied to the scale. With 5 tons applied, and a conversion factor of 2000, the secondary units display needs five digits to the left of the decimal point to display the 10000 lb secondary units value.

| Primary Unit | x Multiplier | Secondary/<br>Tertiary Unit |
|--------------|--------------|-----------------------------|
| grains       | 0.064799     | grams                       |
|              | 0.002286     | ounces                      |
|              | 0.000143     | pounds                      |
|              | 0.000065     | kilograms                   |
|              | 0.002083     | troy ounces                 |
|              | 0.000174     | troy pounds                 |
| ounces       | 437.500      | grains                      |
|              | 28.3495      | grams                       |
|              | 0.06250      | pounds                      |
|              | 0.02835      | kilograms                   |
|              | 0.911458     | troy ounces                 |
|              | 0.075955     | troy pounds                 |
| pounds       | 7000.00      | grains                      |
|              | 453.592      | grams                       |
|              | 16.0000      | ounces                      |
|              | 0.453592     | kilograms                   |
|              | 14.58333     | troy ounces                 |
|              | 1.215278     | troy pounds                 |
|              | 0.000500     | short tons                  |
|              | 0.000446     | long tons                   |
| grams        | 0.000453     | metric tons                 |
|              | 15.4324      | grains                      |
|              | 0.035274     | ounces                      |
|              | 0.002205     | pounds                      |
|              | 0.001000     | kilograms                   |
|              | 0.032151     | troy ounces                 |
|              | 0.002679     | troy pounds                 |

Table 10-8. Conversion Factors

| Primary Unit | x Multiplier | Secondary/<br>Tertiary Unit |
|--------------|--------------|-----------------------------|
| kilograms    | 15432.4      | grains                      |
|              | 35.2740      | ounces                      |
|              | 1000.00      | grams                       |
|              | 2.20462      | pounds                      |
|              | 32.15075     | troy ounces                 |
|              | 2.679229     | troy pounds                 |
|              | 0.001102     | short tons                  |
|              | 0.000984     | long tons                   |
|              | 0.001000     | metric tons                 |
| short tons   | 2000.00      | pounds                      |
|              | 907.185      | kilograms                   |
|              | 0.892857     | long tons                   |
|              | 0.907185     | metric tons                 |
| metric tons  | 2204.62      | pounds                      |
|              | 1000.00      | kilograms                   |
|              | 1.10231      | short tons                  |
|              | 0.984207     | long tons                   |
| long tons    | 2240.00      | pounds                      |
|              | 1016.05      | kilograms                   |
|              | 1.12000      | short tons                  |
|              | 1.01605      | metric tons                 |
| troy ounces  | 480          | grains                      |
|              | 31.10348     | grams                       |
|              | 0.031103     | kilograms                   |
|              | 1.09714      | ounces                      |
|              | 0.068571     | pounds                      |
|              | 0.083333     | troy pounds                 |
| troy pounds  | 5760         | grains                      |
|              | 373.2417     | grams                       |
|              | 0.373242     | kilograms                   |
|              | 13.16571     | ounces                      |
|              | 0.822857     | pounds                      |
|              | 12           | troy ounces                 |

Table 10-8. Conversion Factors (Continued)

## 10.9 PS/2 Keyboard Interface

Serial port 1 (connector J9) on the 820i CPU board provides a PS/2-type keyboard interface (Scan Code Set 1 only) for use with a remote keyboard. Table 10-9 shows the pin assignments for a PS/2 keyboard cable.

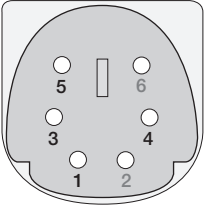
| Pin | Signal     | Male Connector                                                                     |
|-----|------------|------------------------------------------------------------------------------------|
| 1   | DATA       |  |
| 2   | (reserved) |                                                                                    |
| 3   | GND        |                                                                                    |
| 4   | +5V        |                                                                                    |
| 5   | CLOCK      |                                                                                    |
| 6   | (reserved) |                                                                                    |

Table 10-9. PS/2 Keyboard Connector Pin Assignments

Table 10-10 summarizes the 820i-specific functions provided by the keyboard interface; most other alphanumeric and navigational keys provide functions equivalent to those typical for PC operation. Menu parameters and serial commands that affect indicator keypad operation (including the KBDLCK, ZERONLY, and KLOCK serial commands) also affect the remote keyboard.



**NOTE:** The keyboard interface is not hot-pluggable. Disconnect power to the 820i before connecting the keyboard cable to the Port 1 connector.

| Key          | Function                                          |
|--------------|---------------------------------------------------|
| F1           | Softkey 1                                         |
| F2           | Softkey 2                                         |
| F3           | Softkey 3                                         |
| F4           | Softkey 4                                         |
| F5           | Softkey 5                                         |
| F6 (Alt+Z)   | ZERO key                                          |
| F7 (Alt+G)   | GROSS/NET key                                     |
| F8 (Alt+T)   | TARE key                                          |
| F9 (Alt+U)   | UNITS key                                         |
| F10 (Alt+P)  | PRINT key                                         |
| F11          | Not used                                          |
| F12          |                                                   |
| Print Screen | Same as PRINT key, in both normal and setup modes |

Table 10-10. PS/2 Keyboard Functions

## 10.10 Audit Trail Support

Audit trail support provides tracking information for configuration and calibration events. A separate calibration counter is provided for each scale; a single configuration counter tracks all configuration changes.

To prevent potential misuse, unsaved configuration or calibration changes (those followed by an **Exit**, rather than **Save and Exit**) are counted as change events; restoration of the previous saved configuration or calibration is also counted.

### 10.10.1 Displaying Audit Trail Information

To display audit trail information, press and hold the **Gross/Net** key for several seconds. Various audit trail information screens can then be accessed by pressing the front panel number keys (**1–5** and **0**). The exact format of each screen depends on the regulatory agency specified for the REGULAT (FEATURE menu) parameter.

The initial screen shown when entering the audit trail display (or whenever the **1** key is pressed while showing audit trail information) shows the legally relevant (LR) version number (software version for the code that provides audit trail information), a calibration count and, if REGULAT=NTEP, a configuration count.

Press **2** to show the configuration count display. This display shows the number of times the system has been configured, the date and time of the last configuration event, and the before and after information for the most recent change of the system date and time.

Press the **Down** key to show the number of weighments, number of configuration events, number of calibrations, and the date and time of the most recent calibration for the first configured scale. Continue pressing the **Down** key to cycle through the information for all configured scales.

Press **3** to show the number and the most recent date and time of power-on events, power-on configuration changes, and user program loads. (Power-on configuration changes are those that restore a previous configuration after reconfiguring or recalibrating then pressing **Exit**, rather than **Save and Exit**.)

Use the **Down** key to show the number of power-on calibration events for all configured scales.

Press **4** to show the number of times the OEM version number has been changed, and the date and time of the most recent change.

Press **5** to show the number of times the configuration has been reset, the date and time of the most recent reset, and the indicator EIN number.

Press **0** to show the indicator and LR software versions.

When done, press the **Gross/Net** key to exit the audit trail displays.

### 10.10.2 Printing Audit Trail Information

Audit trail information can be printed by pressing the **PRINT** key while displaying the audit trail or by sending the DUMPAUDIT serial command. Audit trail information is sent to the port specified on the AUD.PORT serial command or by the AUDFMT parameter (PFORMT menu).



**NOTE:** Printed audit trail information contains data for all scales, whether configured or not, that can be supported by the indicator. Displayed audit trail information shows data only for currently configured scales.

## 10.11 Dimension Drawings

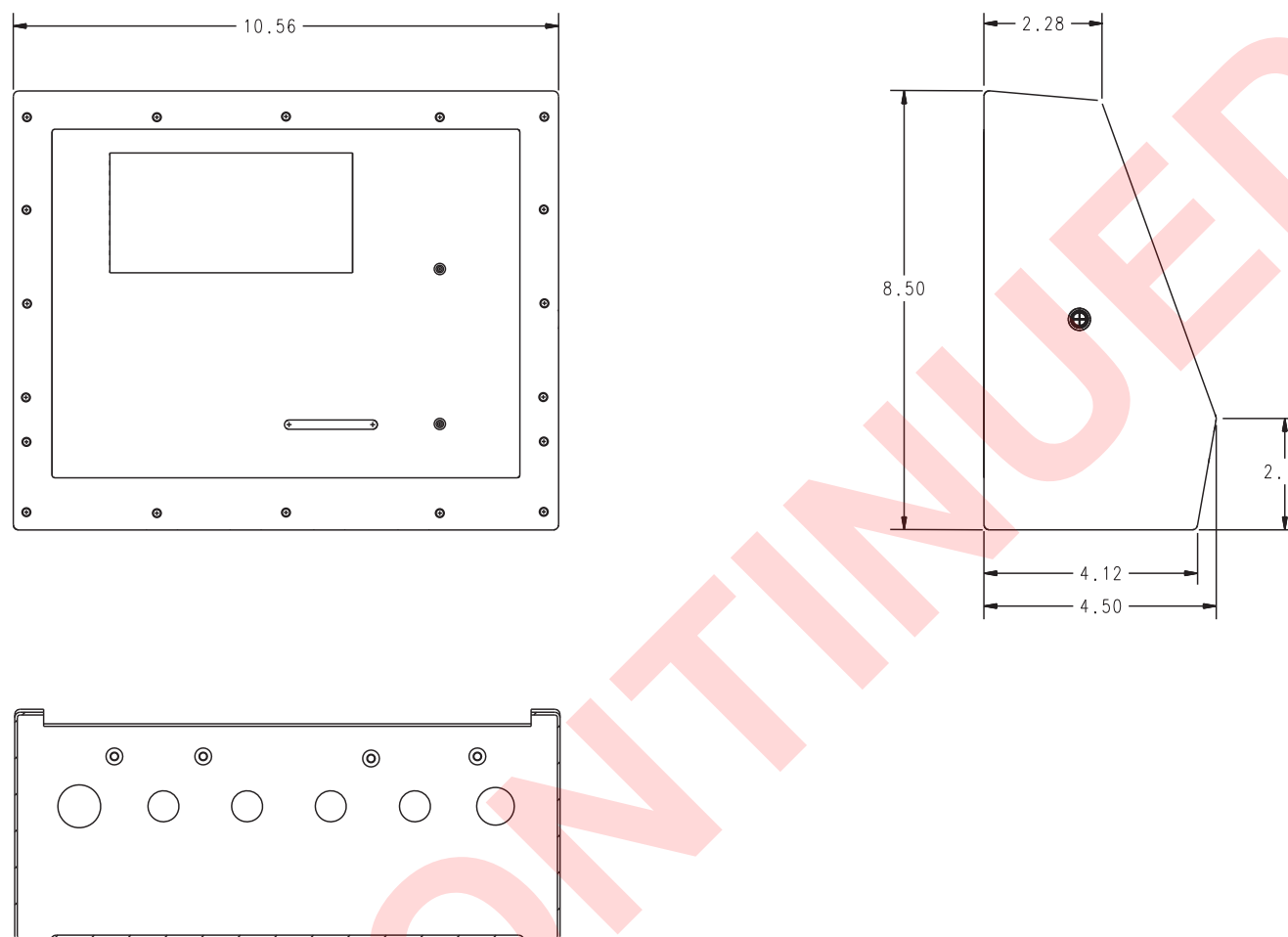


Figure 10-5. Universal Model Dimensions

## 10.12 Printed Information

### System Manuals

- 820i Installation Manual, PN 93018

### Enclosures

- 820i Panel Mount Installation Instructions, PN 95304

### Option Cards (820i/920i)

- Analog Output Card Installation Instructions, PN 69089
- 24-Channel Digital I/O Expansion Card Installation Instructions, PN 69087
- Dual-Channel Serial Expansion Card Installation Instructions, PN 69088
- Pulse Input Card Installation Instructions, PN 69086
- Memory Expansion Card Installation Instructions, PN 69085
- Analog Input Card with Thermocouple Input Installation Instructions, PN 88110

### Communications Options (520/820i/920i)

- DeviceNet™ Interface Installation and Programming Manual, PN 69949
- Profibus® DP Interface Installation and Programming Manual, PN 69948
- Allen-Bradley® Remote I/O Interface Installation and Programming Manual, PN 69950
- Ethernet Communications Card Installation Instructions, PN 72117
- EtherNet/IP Communications Card Installation Instructions, PN 88537
- USB Interface Card Installation Instructions, PN 95490

### iQUBE Digital Diagnostic Junction Box

- iQUBE Installation Manual, PN 77224

### White Papers

- Using Ferrite Cores to Suppress Electromagnetic Interference - For Digital Weight Indicators, PN 117085

## 11.0 Compliance



**EU DECLARATION OF CONFORMITY**  
*EU-KONFORMITÄTSERKLÄRUNG  
 DÉCLARATION UE DE CONFORMITÉ*

Rice Lake Weighing Systems  
 230 West Coleman Street  
 Rice Lake, Wisconsin 54868  
 United States of America



**Type/Typ/Type:** 820i and 920i series

English We declare under our sole responsibility that the products to which this declaration refers to, is in conformity with the following standard(s) or other regulations document(s).

Deutsch Wir erklären unter unserer alleinigen Verantwortung, dass die Produkte auf die sich diese Erklärung bezieht, den folgenden Normen und Regulierungsbestimmungen entsprechen.

Francais Nous déclarons sous notre responsabilité que les produits auxquels se rapporte la présente déclaration, sont conformes à la/aux norme/s suivante ou au/aux document/s normatif/s suivant/s.

| EU Directive    | Certificates | Standards Used / Notified Body Involvement                                   |
|-----------------|--------------|------------------------------------------------------------------------------|
| 2014/30/EU EMC  | -            | EN 61326-1:2013, EN 55011:2009+A1:2010, EN 61000-6-1:1995, EN 61000-6-2:2007 |
| 2014/35/EU LVD  | -            | IEC 60950-1 ed.2                                                             |
| 2011/65/EU RoHS | -            | EN 50581:2012                                                                |

Signature: 

Type Name: Richard Shipman

Title: Quality Manager

Place: Rice Lake, WI USA

Date: May 3, 2019

**UK DECLARATION  
OF CONFORMITY**

Rice Lake Weighing Systems  
230 West Coleman Street  
Rice Lake, Wisconsin 54868  
United States of America

**RICE LAKE**  
WEIGHING SYSTEMS

**Type:** 820i and 920i series

English We declare under our sole responsibility that the products to which this declaration refers to, is in conformity with the following standard(s) or other regulations document(s).

| UK Regulations        | Certificates | Standards Used / Approved Body Involvement                                   |
|-----------------------|--------------|------------------------------------------------------------------------------|
| 2016/1101 Low Voltage | -            | IEC 60950-1 ed.2                                                             |
| 2016/1091 EMC         | -            | EN 61326-1:2013, EN 55011:2009+A1:2010, EN 61000-6-1:1995, EN 61000-6-2:2007 |
| 2012/3032 RoHS        | -            | EN 50581:2012                                                                |

Signature: Brandi Harder

Place: Rice Lake, WI USA

Name: Brandi Harder

Date: December 30, 2021

Title: Quality Manager

## 12.0 Specifications

### Power

|                   |                  |
|-------------------|------------------|
| Line Voltages     | 115 or 230 VAC   |
| Frequency         | 50 or 60 Hz      |
| Power Consumption | 25 watts maximum |

### A/D Specifications

|                            |                                                                                              |
|----------------------------|----------------------------------------------------------------------------------------------|
| Excitation Voltage         | 10 ± 0.5 VDC,<br>16 x 350Ω or 32 x 700Ω load cells per A/D card                              |
| Sense Amplifier            | Differential amplifier with<br>4- and 6-wire sensing                                         |
| Analog Signal Input Range  | –6 mV to +40 mV                                                                              |
| Analog Signal Sensitivity  | 0.3 μV/grad minimum @ 7.5 Hz<br>1.0 μV/grad typical @ 120 Hz<br>4.0 μV/grad typical @ 960 Hz |
| A/D Sample Rate            | 7.5–960 Hz, software selectable                                                              |
| Input Impedance            | >35 MΩ typical                                                                               |
| Internal Resolution        | 8 000 000 counts                                                                             |
| Wt Display Resolution      | 9,999,999                                                                                    |
| Input Sensitivity          | 10 nV per internal count                                                                     |
| System Linearity           | ±0.01% of full scale                                                                         |
| Zero Stability             | ±150 nV/°C, maximum                                                                          |
| Span Stability             | ± 3.5 ppm/°C, maximum                                                                        |
| Input Voltage Differential | ±800 mV referenced to earth ground                                                           |
| Input Overload             | Load cell signal lines ±10 V continuous, ESD protected                                       |
| RFI/EMI Protection         | Communications, signal, excitation, and sense lines protected                                |

### Digital Specifications

|                |                                                                               |
|----------------|-------------------------------------------------------------------------------|
| Microcomputer  | Motorola ColdFire® MCF5307 main processor @ 90 MHz                            |
| Digital I/O    | 8 I/O channels on CPU board; optional 24-channel I/O expansion card available |
| Digital Filter | Software selectable: 1–256, enhanced Rattletrap® hybrid digital filtering     |

### Serial Communications

|              |                                                                                                    |
|--------------|----------------------------------------------------------------------------------------------------|
| Serial Ports | Ports on CPU board support up to 115200 bps; optional dual-channel serial expansion card available |
| Port 2       | Full duplex RS-232 with CTS/RTS                                                                    |
| Port 4       | Full duplex RS-232; 2-wire RS-485, 20mA                                                            |

### Operator Interface

|          |                                                                               |
|----------|-------------------------------------------------------------------------------|
| Display  | 320x156 pixel VGA LCD display module with adjustable contrast, 75Hz scan rate |
| Keyboard | 28-key membrane panel, PS/2 port for external keyboard connection             |

### Environmental

|                       |                                                                         |
|-----------------------|-------------------------------------------------------------------------|
| Operating Temperature | Legal–10 to +40°C (14 to 104°F)<br>Industrial–10 to +40°C (14 to 104°F) |
| Storage Temperature   | –10 to +70°C (14 to 158°F)                                              |
| Humidity              | 0–95% relative humidity                                                 |

### Enclosure

|                                          |                                                        |
|------------------------------------------|--------------------------------------------------------|
| Enclosure Dimensions                     |                                                        |
| Universal enclosure (without tilt stand) | 10.56 in x 8.5 in x 4.5 in<br>268 mm x 216 mm x 114 mm |
| Panel mount enclosure                    | 11.6 in x 9.2 in x 5.2 in<br>294 mm x 231 mm x 127 mm  |
| Weight                                   |                                                        |
| Universal enclosure                      | 9.5 lb (4.3 Kg)                                        |
| Panel mount enclosure                    | 8.5 lb (3.9 Kg)                                        |
| Rating/Material                          | NEMA Type 4X/IP66, stainless steel                     |

### Certifications and Approvals



#### NTEP

CoC Number 01-088A6  
Accuracy Class III/III<sub>n</sub>  $n_{max}$ : 10 000



#### Measurement Canada

Approval AM-5426  
Accuracy Class III  $n_{max}$ : 10 000



#### UL

Universal model  
File Number: E151461



#### Panel mount model

File Number: E151461, Vol 2



#### OIML

GB-1140  $n_{max}$ : 6 000  
GB-1135  $n_{max}$ : 10 000



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