920i®

Programmable Indicator/Controller
Version 5

Operation Manual

USB

iRev™

Disponible en Español
Visite **ricelake.com/spanish** para ver todos los materiales RLWS disponibles en Español

RICE LAKE®
WEIGHING SYSTEMS

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Contents

1.0 Introduction

This manual applies to Version 5+ of the *920i* software, which is compatible with both the serial interface and USB hardware versions of the indicator.

Note ***See the 920i technical manual (PN 67887) for section references not found in this manual.***

Manuals are available for viewing and/or downloading from the Rice Lake Weighing Systems website at www.ricelake.com/manuals

Warranty information can be found on the website at www.ricelake.com/warranties

1.1 Safety

Safety Signal 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 operate if the enclosure is not completely assembled.

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 enclosure, ensure the power cord is disconnected from the power source.

2.0 Operation

2.1 Front Panel

Weight information is displayed with a graphical scale in six font sizes up to 1.2". Up to four scale widgets can be displayed in Legal for Trade, multiple-scale applications. Display contrast can be adjusted with the LCD contrast potentiometer or ***CONTRAST*** parameter. The display can be graphically configured using *iRev* software.

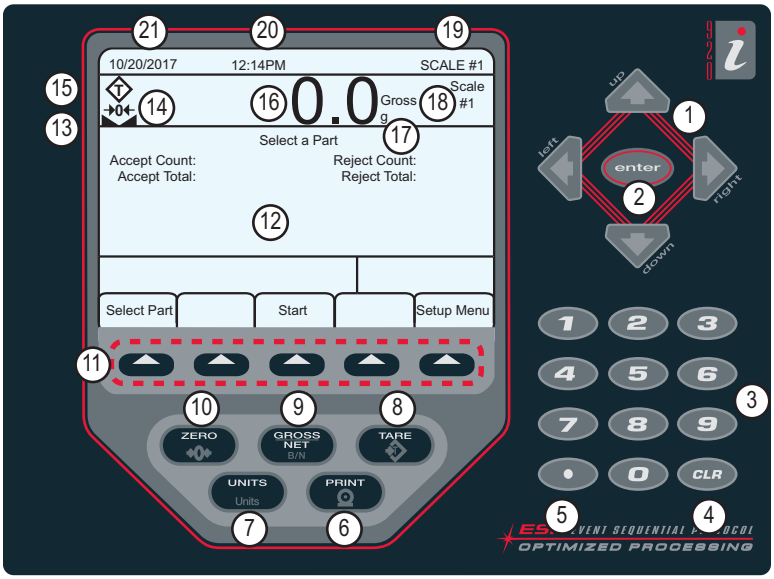

Figure 2-1. 920i Front Panel

Item No.	Description
1	Navigation Keys – used to enter values; scroll through menus
2	Enter – save entries from the numeric keypad
3	Numeric Entry – used for entering numbers or keyed tares
4	Clear – backspace when entering numbers/letters
5	Decimal – Inserts a decimal point as needed
6	Print – sends an on-demand print format out a communications port, provided the conditions for standstill are met
7	Units – switches the weight display to an alternate unit
8	Tare – performs a predetermined tare function as set in the ***TAREFN*** parameter; set in the Scale menu
9	Gross/Net – toggles the weight display between gross and net mode; if a tare value has been entered or acquired, the net value is the gross weight minus the tare
10	Zero – sets the current gross weight to zero
11	Softkeys – keys that can be configured to provide additional operator functions
12	Display – status areas on the display are used for operator prompts and entering data; the remainder of the display can be graphically configured for representation of a specific application
13	Standstill Symbol – scale is at standstill or within the specified motion band
14	Center of Zero Symbol – indicates that the current gross weight reading is within +/- 0.25 display divisions of the acquired zero
15	Tare Symbol – indicates that a tare has been acquired and stored in the system • T = pushbutton tare; see Section 2.3.4 on page 3 • PT = keyed tare, see Section 2.3.5 on page 3
16	Weight Display – current weight displays
17	Units Indicator – current unit of display
18	Gross/Net Indicator – indicates whether the weight value is in Net or Gross mode
19	Scale in use – indicates the scale that is currently being read by indicator
20	Time – displays current time
21	Date – displays current date

Table 2-1. Key and Icon Descriptions

2.2 Operating Modes

The 920i has two modes of operation.

Weigh Mode

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. Weigh mode is the only mode in which the 920i can operate (without breaking the seal) once configuration is complete and a legal seal has been affixed the indicator.

Configuration Mode

Many of the procedures described in this manual require the indicator to be in configuration mode, including calibration. See Section 4.0 on page 20.

2.3 Indicator Operations

Basic 920i operations are summarized in this section.

2.3.1 Gross/Net Mode

If a tare value has been entered or acquired, the net value is equal to gross minus the tare value.

Press GROSS NET B/N to toggle between ***Gross*** (***Brutto***) and ***Net*** modes. If there is no tare, the display remains in gross mode.

Annunciators at the end of the weight indicates the current mode.

2.3.2 Units

Press UNITS Units to toggle between primary, secondary and tertiary units.

2.3.3 Zero Scale

1. In gross mode, remove all weight from the scale and wait for ◣ ◢ to display.
2. Press ZERO. →0← displays, indicating the scale is zeroed.

2.3.4 Acquire Tare

1. Place a container on the scale and wait for ◣ ◢ to display.
2. Press TARE to acquire a tare weight of the container. ***0*** displays with ***Net***.

2.3.5 Keyed Tare (Preset Tare)

1. Enter a value from the numeric keypad.
2. Press TARE. ***Net*** displays indicating the keyed tare weight is in the system.

2.3.6 Remove Stored Tare Value

1. Remove all weight from the scale and wait for ◣ ◢ to display.
2. Press TARE (in OIML mode, press ZERO). ***0*** displays with ***Gross***.

2.3.7 Print Ticket

With ◣ ◢ displayed, press PRINT to send data to the serial port.

To print tickets using auxiliary formats, press the number key for the format and press **Print**.

Example:

*To print using **AUXFMT2**, press **2** on the numerical keypad, then* PRINT.

2.4 Accumulator Functions

The accumulator must be enabled to use in weigh mode or setpoint operations.

Weight (net if a tare is entered) is accumulated when a print operation is performed by pressing PRINT, or entering a digital input or a serial command. The scale must return to zero (net zero if a tare is entered) 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 enabled, uses the ***ACCFMT*** print format.

Press CLR twice to clear the accumulator.

2.5 Softkey Operations

Softkeys are defined to provide additional operator functions for specific applications. Softkey assignments are listed on the tabs shown at the bottom of the LCD display and are activated by pressing the arrow keys below the tabs.

The displayed softkeys are determined by the indicator configuration and program. Use the ***FEATURE*** menu to enable softkeys.

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 **Print** 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 *iQUBE2* junction boxes
Alibi	Allows previous print transactions to be recalled and reprinted
Contrast	Adjusts the screen contrast
Test	Future functionality
Stop	Sends AuxFmt1 out its configured port to prompt a red light on a LaserLight
Go	Sends AuxFmt2 out its configured port to prompt a green light on a LaserLight
Off	Sends AuxFmt3 out its configured port to turn a LaserLight red/green light off
Screen	Allows multiple display screens without a user program
F1–F10	User-programmable keys; defined by application
USB	Allows the changing of USB devices (and that device's corresponding function) while in Weigh mode
More…	For applications with more than five defined softkeys, the More… softkey is automatically assigned to the fifth position. Press **More…** to toggle between groups of softkeys

Table 2-2. Configurable Softkeys

2.6 USB Functions

With the USB interface card installed, the 920i supports a connection to a host PC and the following devices:

- one flash drive
- two printers
- and/or one keyboard

Connecting more than one device requires a USB hub.

Note ***Version 5 Rev L boards (or higher) are required for USB functionality.***

USB Device	Functions Supported
Host PC	Data transfer of configuration files, database files and iRite programs*
Flash Drive	Download boot monitor and core to the indicator, data transfer of configuration files, database files and iRite programs**
Printer(s)	If using more than one printer, the lowest numbered USB port on the hub will determine Printer #1
Keyboard	Inputs text and numeric characters
* Download of boot monitor and core from a PC to the indicator is not supported. ** Transfer of iRite files from 920i to flash drive is not supported.	

Table 2-3. USB devices and functions

To select the target USB device to be used, see Section 4.0 on page 20.

2.7 Contrast Adjustment

To adjust the contrast, use the ***CONTRAST*** parameter in the Features menu. Front panel adjustment can be made by assigning a softkey. This is available for CPU Board Rev H-N, PN 109549, and CPU board PN 180902.

Note ***When Port 2 has the Serial Interface option, there is also a potentiometer for contrast adjustment on the interface card.***

2.8 Hardware and Firmware Compatibility

- CPU board (PN 67612) revision A-G was the initial release and covered versions 1 and 2
  Revision E-G had an increase in memory to support version 3
- CPU board (PN 109549) Rev H-N, supported iQube^2 and USB, and requires a minimum core of 3.14.00
- CPU board (PN 180902) Rev B of higher, an LED backlight, replaces the CCFL (Fluorescent) backlight

Important Information Regarding the 920i CPU Board

Beginning with Revision H, the CPU board supports only firmware 3.14 or higher. This does not affect any pre-existing user programs, contact Rice Lake Weighing Systems for any performance issues.

CPU Board Revision	Recommended Boot Monitor	Minimum Core	Maximum Core	Minimum USB Version
Part Number 67612				
A-D	1.00	1.00	2.08	N/A
E	1.10	1.00	4.00	N/A
F-G	1.12	1.00	5.XX*	N/A
Part Number 109549				
H	1.13	3.14	5.XX*	N/A
L-N**	2.03	3.14	5.XX*	1.01
Part Number 180902				
B**	2.03	3.14	5.XX*	1.01
* Refer to current release version ** Supports USB Interface				

Table 2-4. Hardware and Software Compatibility

3.0 Installation

This section describes procedures for connecting load cells, digital I/O and serial communications cables to the 920i. Replacement parts lists for the universal model are included for the service technician. See the 920i technical manual (PN 67887) for dimension drawings of the all models.

CAUTION ***Failure to heed could result in injury and or product damage.***

- ***This unit can 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 920i. The power outlet supplying the indicator must be installed near the unit and be easily accessible.***
- ***Use a wrist strap as a ground to protect components from electrostatic discharge (ESD) when working inside the indicator enclosure.***

3.1 Unpacking

Immediately after unpacking, visually inspect the 920i to ensure all components are included and undamaged. The shipping carton contains the indicator and a parts kit. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

3.2 Enclosure

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

WARNING ***The 920i has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power supply.***

3.2.1 Remove Back Plate

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 from the enclosure and set it aside.

3.2.2 Install Back Plate

1. Position the back plate over the enclosure.
2. Secure with the back plate screws.
3. Torque screws to 15 in-lb (1.7 N-m), using pattern shown in Figure 3-1, to prevent distorting the back plate gasket.

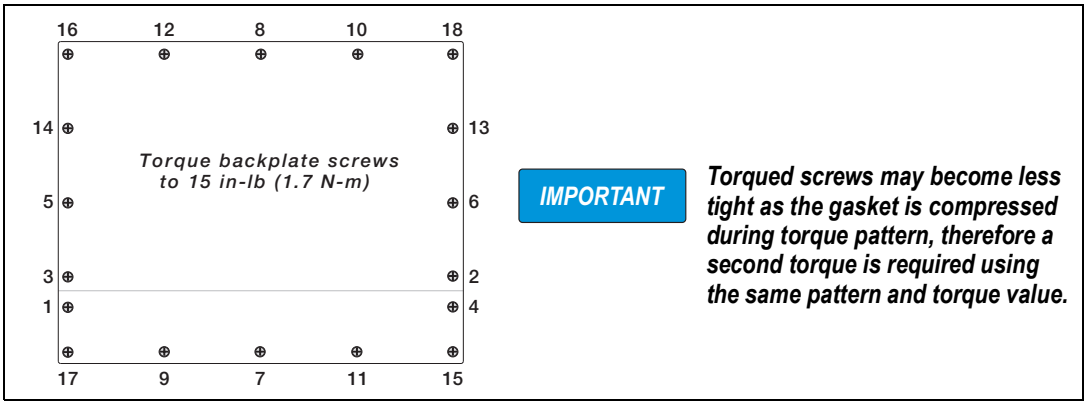

Figure 3-1. 920i Enclosure Backplate

3.3 Cable Connections

The parts kits includes cord grip plugs to prevent moisture from entering the enclosure.

Use the cable grounding instructions below for wiring into the indicator.

Install plugs in all unused cord grips to prevent moisture from entering the enclosure.

3.3.1 Sealed USB Connectors – Optional

For wash down environments, optional sealed USB receptacles are available for use with an optional backplate (PN 119891). For optimal cable routing, it is recommended for the Type-A connector to be on the left and the Type-B connector to be on the right side.

Part No.	Description
126476	Receptacle, USB Panel Mount Sealed Circular USB Type-A, with 50 cm pigtail and Type-A end (Approx. 19.68 inches.)
124703	Receptacle, USB Panel Mount Sealed Circular USB Type-A, with 50 cm pigtail and Type-B end
124704	Receptacle, USB Panel Mount Sealed Circular USB Type-B, with 50 cm pigtail and Type-B End
125998	Receptacle, USB Panel Mount Sealed Circular USB Type-A, with 28cm Cable to 5 Pin Connector
125999	Receptacle, USB Panel Mount Sealed Circular USB Type-B, with 28cm Cable to 5 Pin Connector
124689	Dust Cap, USB Flash Drive; for use with above Receptacles
124694	Cover; for use with above Receptacles

Table 3-1. Sealed USB Connectors

To install the sealed watertight USB receptacles:

1. The hole in the backplate is notched. Align the receptacle with the notches, ensuring the key on the housing is inserted in the notch.

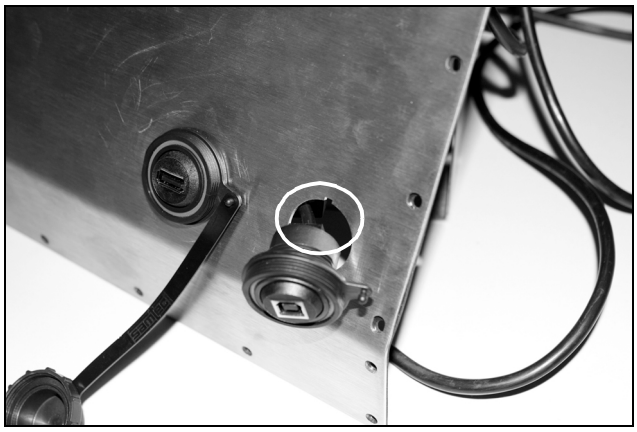

Figure 3-2. Sealed USB Receptacles on Backplate

2. Fasten the receptacle so it is flush with the backplate.
3. Connect the interface cables to the headers on the USB card.
4. Re-install the backplate, see Figure 3-1 on page 6.

Note

Sealed cables are available to make a watertight connection.
The same type of receptacle and cables are available for Ethernet connections.

3.3.2 Load Cells

To attach the cable from a load cell or junction box to an installed A/D card, route the cable through the cord grip and ground the shield wire.

Remove connector J1 from the A/D card. The connector plugs into a header on the A/D card. Wire the load cell cable from the load cell or junction box to connector J1 as shown in Table 3-2.

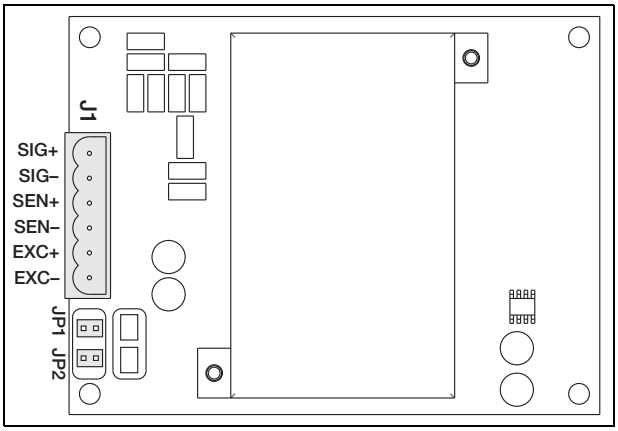

Figure 3-3. Single-Channel A/D Card

A/D Card Connector Pin	Function
1	+SIG
2	–SIG
3	+SENSE
4	–SENSE
5	+EXC
6	–EXC

Table 3-2. A/D Card Pin Assignments

If using 6-wire load cell cable (with sense wires), remove jumpers JP1 and JP2 before reinstalling connector J1. For 4-wire installation, leave jumpers JP1 and JP2 on.

If using 6-wire load cell connections on dual-channel A/D cards, remove jumpers JP3 and JP4 for connections to J2.

When connections are complete, reinstall load cell connector on the A/D card and use two cable ties to secure the load cell cable to the inside of the enclosure.

3.3.3 Serial Communications

The four communications ports on the 920i CPU board support full duplex RS-232, 20 mA output or RS-485 communications at up to 115200 bps.

To attach serial communications cables:

1. Route the cable through the cord grip.
2. Ground the shield wire as described in Section 3.3.2 on page 8.
3. Remove the serial connector from the CPU board and wire to the connector.
4. Once cables are attached, plug the connector into the header on the board.
5. Use cable ties to secure serial cables to the inside of the enclosure.

Table 3-3 indicates the pin assignments for Ports 1, 3, and 4. Port 2 provides DIN-8 and DB-9 connectors for remote keyboard attachment of PS/2-type personal computer keyboards. The DB-9 connector pin assignments for Port 2 are shown in Table 3-4. See Section 3.3.5 on page 10 for information about the PS/2 keyboard interface.

Connector	Pin	Signal	Port
J11	1	GND	1
	2	RS-232 RxD	
	3	RS-232 TxD	
J9	1	GND / –20mA OUT	3
	2	RS-232 RxD	
	3	RS-232 TxD	
	4	+20mA OUT	
J10	1	GND / –20mA OUT	4
	2	RS-232 RxD	
	3	RS-232 TxD	
	4	+20mA OUT	
	5	RS-485 A	
	6	RS-485 B	

Table 3-3. Serial Port Pin Assignments

Serial ports are configured using the SERIAL menu. See Section 4.7 on page 30 for configuration information.

An optional dual-channel serial communications expansion card, PN 67604, is available. Each serial expansion card provides two additional serial ports, including one port that supports RS-485 communications. Both ports on the expansion card can support RS-232 or 20mA connections.

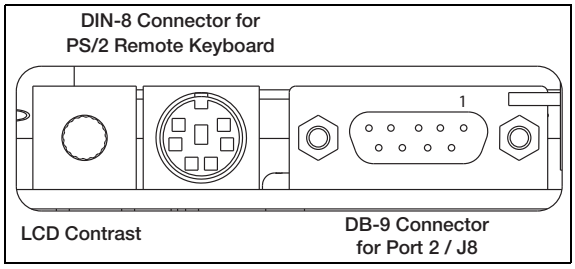

Figure 3-4. Serial Interface Board Connections

DB-9 Pin	Signal
2	TxD
3	RxD
5	GND
7	CTS
8	RTS

Table 3-4. DB-9 Connector Pin Assignments

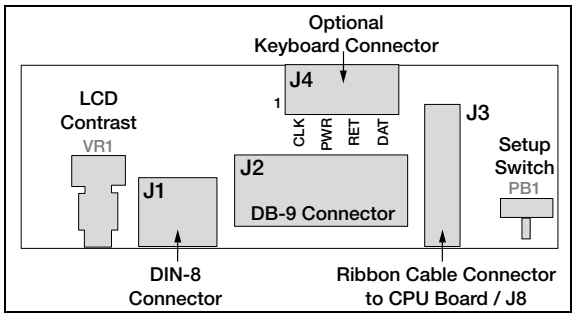

Figure 3-5. Interface Board, Top View

J4 Pin	Color	Signal
1	Brown	Clock
2	Clear	+5v
3	Yellow	GND
4	Red	Data

Table 3-5. J4 Pin Assignments (Optional Keyboard Connector)

3.3.4 USB Communications (Port 2)

The USB interface provides Type-A and Type-B connectors.

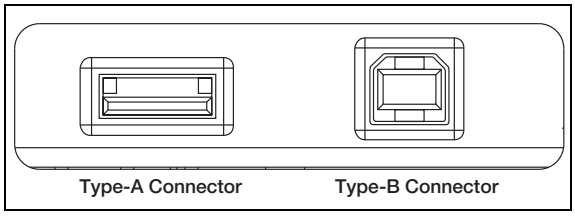

Figure 3-6. USB Interface Board Connections

Compatible devices using a Type-A connector include a flash drive, keyboard, USB hub and label and ticket printers. The host PC uses a Type-B connector.

3.3.5 Keyboard Interface

Serial Interface

Serial port 2 on the 920i CPU board provides a PS/2-type keyboard interface for use with a remote keyboard. To use the keyboard interface, set the INPUT parameter for Port 2 (under the SERIAL menu) to ***KEYBD***.

Table 3-6 on page 11 summarizes the 920i 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 920i before plugging the keyboard cable into the Port 2 connector.

The 920i supports keyboard scan codes 1, 2, and 3.

USB Interface

The 920i USB interface board provides a type-A connection for a USB keyboard interface. To use the keyboard interface, set the DEVICE parameter for Port 2 (under the SERIAL menu) to ***KEYBOARD***.

Table 3-6 summarizes the 920i 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.

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 3-6. PS/2 Keyboard Functions

3.3.6 Digital I/O

Digital inputs can be set to provide several indicator functions, including keypad. 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.

J2 Pin	J2 Signal
1	+5 VDC
2	GND
3	DIO 1
4	DIO 2
5	DIO 3
6	DIO 4
7	DIO 5
8	DIO 6

Table 3-7. J2 Pin Assignments (Digital I/O)

Digital inputs and outputs are configured using the ***DIG I/O*** menu. See Section 4.11 on page 44 for configuration information.

An optional 24-channel digital I/O expansion card, PN 67601, is available for applications requiring more digital I/O channels.

Digital I/O points can be configured to count active pulse inputs by setting them to ***PROGIN*** and using the iRite ***DigInSsBbActivate*** handler. 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.

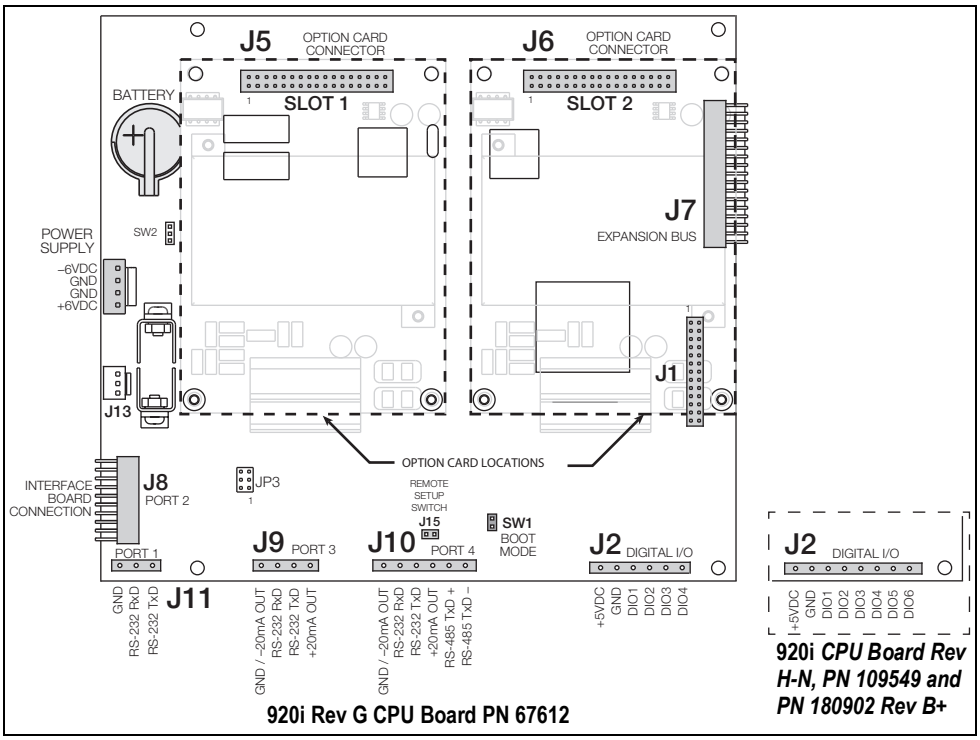

Figure 3-7. 920i CPU Board

3.4 Ground Cables/Wires

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

1. Install the grounding clamps on an enclosure stud near the cord grip being used.
2. Secure the ground clamp with hardware included in the hardware kit. Do not tighten the screws at this time.
3. Route the cables through the cord grips and the grounding clamps to determine the cable lengths required to reach the cable connectors.
4. Mark the cables to remove insulation and shield. See Section 3.4.1.
5. Route stripped cables through the cord grips and grounding clamps.
6. Ensure the shields contact the grounding clamps and tighten the ground clamp screws.

3.4.1 Stripping Cables

Foil Insulated Cable

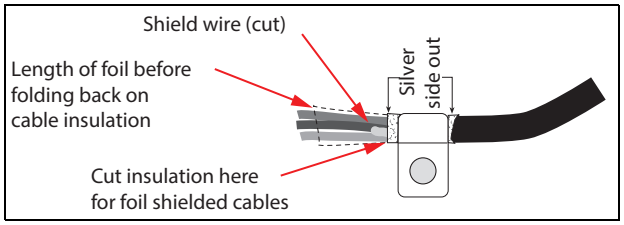

Figure 3-8. Foil Insulated Cable

1. Strip the insulation and foil from the cable 1/2" (15 mm) past the grounding clamp.
2. Fold the foil shield back on the cable where the cable passes through the clamp.
3. Ensure the silver (conductive) side of the foil is turned outward for contact with the grounding clamp.

Braided Shielding

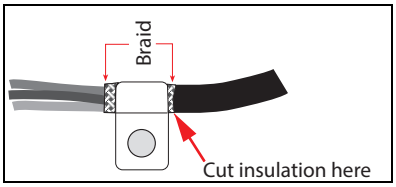

Figure 3-9. Braided Insulated Cable

1. Strip the insulation and braided shield from a point just past the grounding clamp.
2. Strip another 1/2" (15 mm) of the insulation to expose the braid where the cable passes through the clamp.

Load Cell Cable

Cut the shield wire just past the grounding clamp. Shield wire function is provided by contact between the cable shield and the grounding clamp.

3.5 Installing Option Cards

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

CAUTION ***Option cards are not hot-pluggable. Disconnect power to the 920i before installing option cards.***

The general procedure for all option cards is as follows:

1. Disconnect power to the indicator.
2. Remove backplate as described in Section 3.2.1 on page 6.
3. Carefully align the option card connector with connector J5 or J6 on the CPU board.
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 other end of the option card to the threaded standoffs on the CPU board.
6. Make connections to the option card as required.
7. Use cable ties to secure loose cables inside the enclosure.
8. When installation is complete, reassemble the enclosure as described in Section 3.2.2 on page 6.

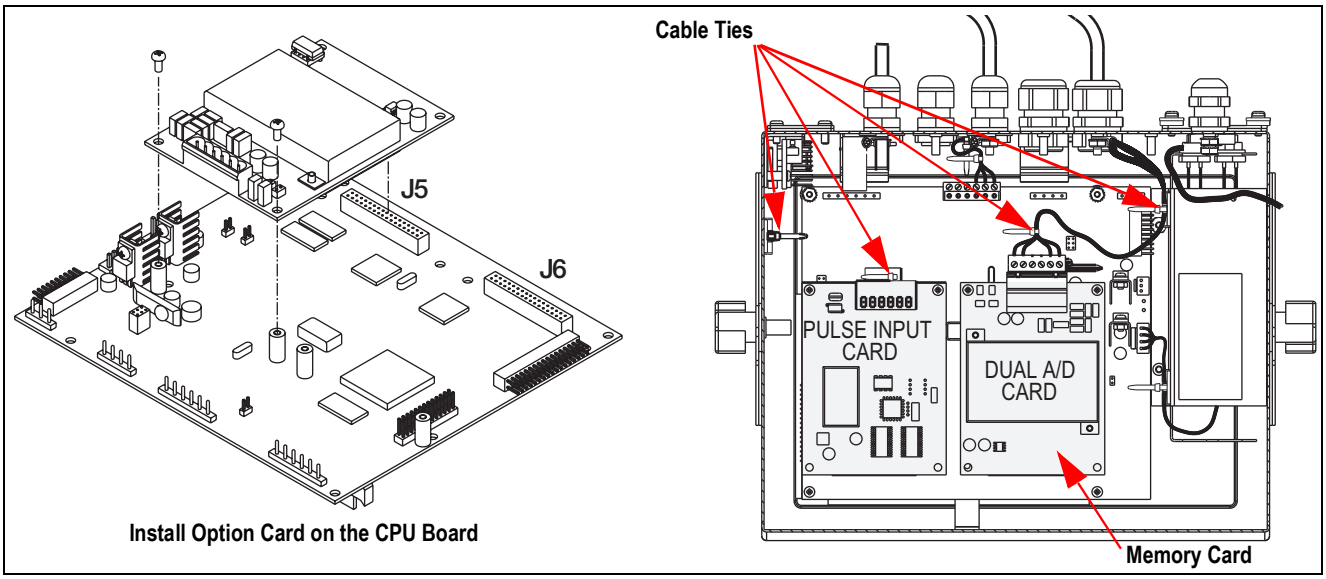

Figure 3-10. Install Option Card

The 920i 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.

3.6 Expansion Board Configurations

Two- and six-card expansion boards allow up to fourteen option cards to be attached to the 920i. Figure 3-11 illustrates the slot numbers assigned for various combinations of two- and six-card expansion boards. A single six-card expansion board is assigned slots 3–8.

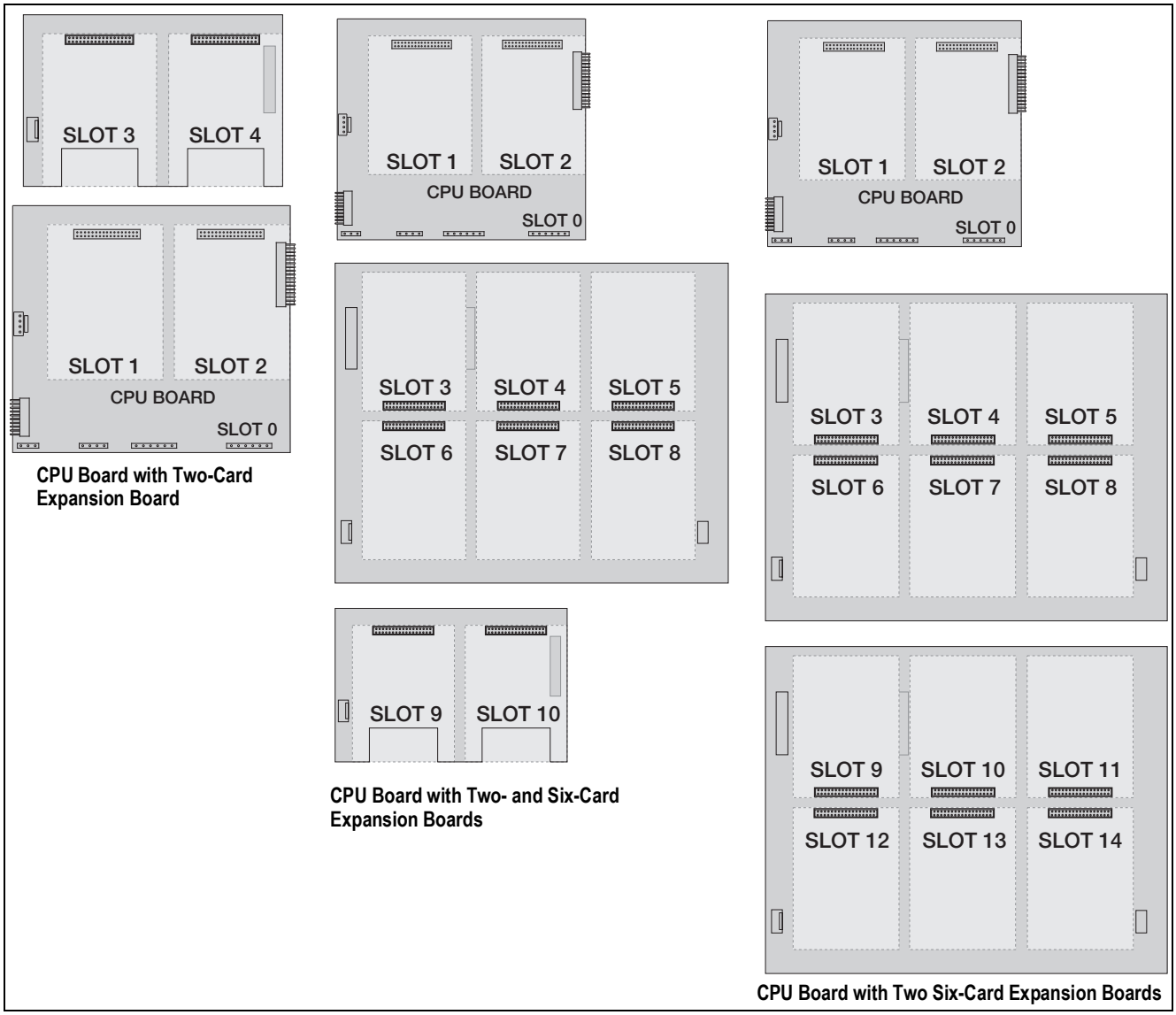

Figure 3-11. CPU Board with Expansion Cards

Note

The maximum number of option board slots is fourteen: two onboard slots, plus two six-card expansion boards.

The two-card expansion board is always placed at the end of the expansion bus. No more than one two-card expansion board can be used in any system configuration.

The panel mount enclosure can accommodate a single two-card expansion board.

The wall mount enclosure can accommodate a two-card and/or a six-card expansion board.

Systems using two six-card expansion boards are housed in a custom enclosure.

3.6.1 Expansion Board Serial Port Assignments

Serial port numbers are reserved for each option card slot, regardless of the type of cards actually installed. Two port numbers are reserved for each slot that could contain a dual-channel serial expansion card. Table 3-8 shows the port numbers assigned to each slot.

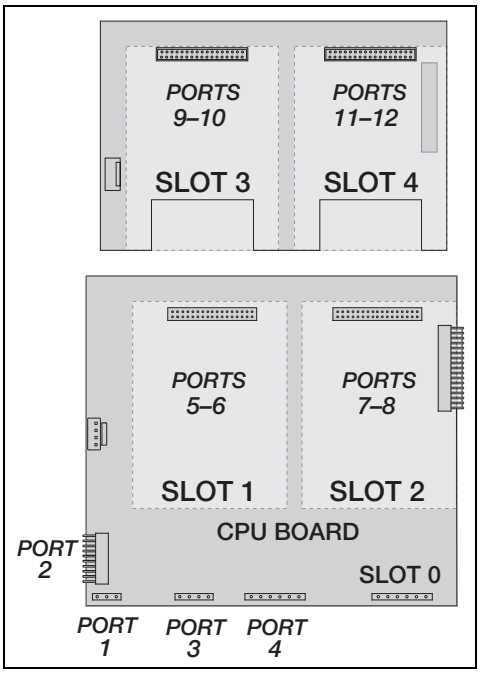

Figure 3-12. Serial Port Assignments, Two-Card Expansion Board

Slot Number	Serial Port Assignments
CPU board	1–4
1	5–6
2	7–8
3	9–10
4	11–12
5	13–14
6	15–16
7	17–18
8	19–20
9	21–22
10	23–24
11	25–26
12	27–28
13	29–30
14	31–32

Table 3-8. Expansion Board Serial Port Assignments

Example:
In a system with a two-card expansion board, port assignments are reserved as illustrated in Figure 3-12. If the only serial card installed in this system is in SLOT 4 of the expansion board, the system consists of serial ports 1–4 (on the CPU board) and ports 11–12.

3.7 CPU Board Removal

To remove the 920i CPU board, use the following procedure:

1. Disconnect power to the indicator. Remove backplate as described in Section 3.2 on page 6.
2. Unplug connectors J9, J10, and J11 (serial communications), J2 (digital I/O), P1 (power supply), and connectors to any installed option cards.
3. Remove any installed option cards.
4. Remove the screws and nuts securing the CPU board.
5. Gently lift the CPU board and disconnect connectors J12 (power to display), J4 (ribbon cable), J3 (keypad connector) and the cable in J8 (Port 2 serial port).
6. 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.

3.8 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 by the CPU board battery includes time and date, truck and tare memory, onboard database information and setpoint configuration.

Use iRev 4 to store a copy of the indicator configuration on a PC before attempting battery replacement. If any data is lost, the indicator configuration can be restored from the PC.

Note ***Memory option card data is also protected by a lithium battery. All database information stored on a memory card is lost if the memory card battery fails.***

Watch for the low battery warning on the LCD display and periodically check the battery voltage on both the CPU board and on any installed memory option cards. Batteries should be replaced when the indicator low battery warning comes on, or when battery voltage falls to 2.2 VDC. Life expectancy of the battery is 10 years.

Battery Removal

Place the tip of a finger in notched area near the battery retaining spring and slide the battery out of position on the CPU board.

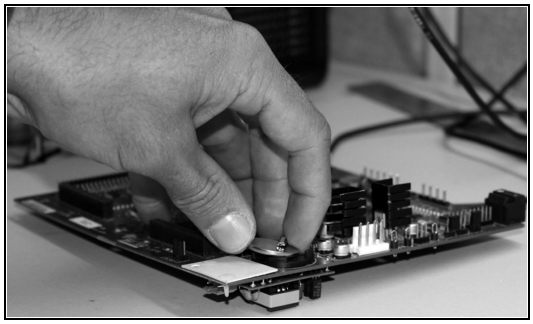

Figure 3-13. Battery Removal

3.8.1 Replacement

Before replacing the battery, place the indicator in setup mode, then press SAVE/EXIT to save battery-backed memory (NVRAM) to flash. This operation saves the latest configuration information, including setpoint values, stored strings and data, and the onboard database, to flash memory.

Return to weigh mode, power off the indicator, and replace the battery. Use care not to bend the battery retaining spring.

When power is restored, a message is shown stating that battery-backed memory is corrupt. Press **Enter** to restore the values saved in flash memory.

See Figure 3-7 on page 12 for CPU board battery location and orientation (positive side up).

CAUTION ***Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of unused batteries according to the manufacturer's instructions.***

3.9 Parts Kit

Table 3-9 lists the parts kit contents for the universal model.

Part No.	Description	Qty
42149	Bumper, Rubber Grommet	4
103610	Knob, Black 1/4-20	2
103988	Washer, Nylon 0.515 - 0.52	2
14626	Nut, Kep 8-32NC HEX	4
14862	Screw, Mach 8-32NC x 3/8	12
15133	Washer, Lock NO 8 Type A	4
15631	Cable Tie, 3" Nylon	4
15665	Gland, Reducing 1/2NPT	2
15887	Terminal Block, 6 Position	1
174928	Label, NOM/NYCE 920i	1
19538	Post Plug, Slotted Black	4
30623	Screw, Mach 8-32NC x 7/16	2
53075	Clamp, Ground Cable Shield	4
70599	Conn, 6 Pos Screw Terminal	1
71125	Conn, 3 Pos Screw Terminal	1
71126	Conn, 4 Pos Screw Terminal	1
75062	Washer, Bonded Sealing #8	14
77180	Conn, 8 Pos Screw Terminal	1
94422	Label, Capacity 0.40 x 5.00	1

Table 3-9. Parts Kit Contents (PN126285)

3.9.1 LED Backlight

The 920i display is now shipped with an improved LED backlight, replacing the CCFL (Fluorescent) backlight. The improved LED backlight is compatible with all older CPU boards (green solder mask), however, a new power supply cable is required. For the Blue CPU board (PN 180902) a retrofit cable is not required.

Note ***The CCFL (Fluorescent) backlight is still available for purchase.***

Power AC Original Power Cable	Where Used	LED Backlight on Green CPU
67796	Universal	186464
71430	Panel Mt, Deep Univ	186278
71431	Wall Mt	186760
71757	2 Slot Wall Mt	188716
71758	2 Slot Panel Mt, Deep Univ	188717
71430	6 Slot Wall Mt	186278
71759	Expansion	188774

Power DC/DC Original Power Cable	Where Used	LED Backlight on Green CPU
67796	Universal	186464
175824	Panel Mt, Deep Univ	187603
158620	Wall Mt	188345
179487	2 Slot Wall Mt DC/DC	189424
181032	2 Slot 180047 Panel Mt DC/DC	189425

Table 3-10. Retrofit Cables for Display with LED Backlight, Used with Green CPU Only

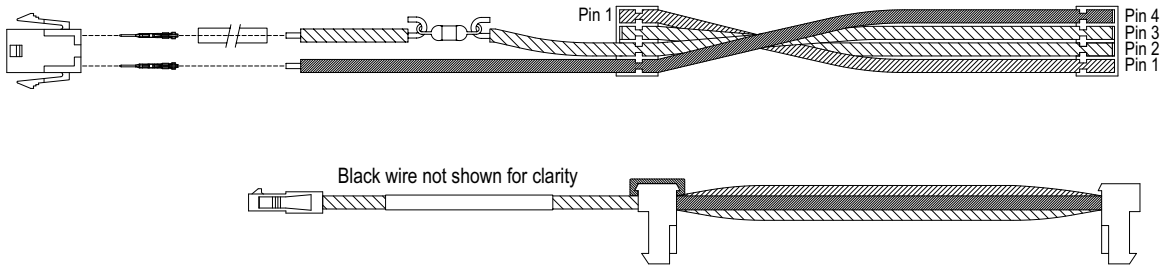

Figure 3-14. Retrofit Wire Harness for LED Backlight Display with Green CPU Board

3.10 Replacement Parts Illustrations

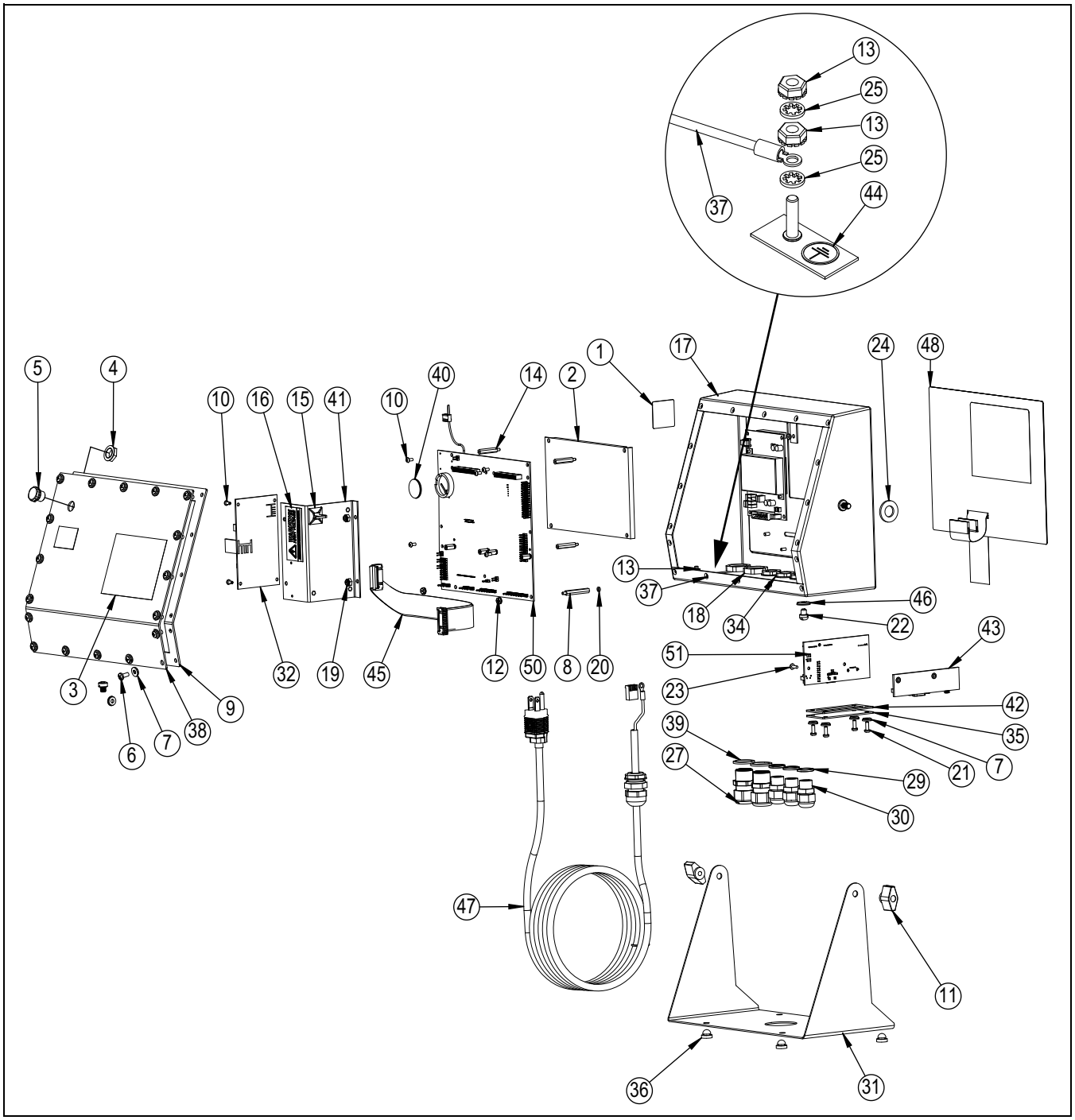

Figure 3-15. Universal Enclosure Parts Illustration

Note ***Replacement parts information for other enclosures:***

* *Panel Mount Installation Instructions, PN 69989*
* *Wall Mount Installation Instructions, PN 69988.*

Item No.	Part No.	Description	Qty
1	53308	Label,1.25 x 1.25	1
2	186275 186276	Display, Module Transmissive, LED B/L Display, Module Transflective, LED B/L	1
3	53307	Label, 4.000 x 2.875	1
4	88734	Nut, Breather Vent	1
5	88733	Vent, Breather Sealed	1
6	14862	Screw, Mach 8-32NC x 3/8	4
7	75062	Washer, Bonded Sealing #8	8
8	68661	Standoff, Male-Fem 4-40NC	2
9	67532	Gasket Back Plate	1
10	14822	Screw, Mach 4-40 NC x 1/4	11
11	103610	Knob, Black 1/4-20	2
12	14618	Nut, Kep 4-40NC HEX	2
13	14626	Nut, Kep 8-32NC HEX	3
14	67886	Standoff, Male-FEM 4-40NC	4
15	15631	Cable Tie, 3" Nylon	1
	15650	Mount, Cable Tie 3/4"	1
16	16861	Label, Warning High	1
17	67529	Enclosure, Universal	1
18	15630	Locknut,1/2 NPT Black	2
19	58248	Nut, Lock 6-32NC HEX Nylon	2
20	69898	Washer, Nylon #4 ID = 0.112	2
21	14845	Screw, Mach 6-32NC x 3/8	4
22	42640	Screw, Mach 1/4-28NF x 0.25	8
23	55708	Screw, Mach 4-40NC x 0.38	2
24	103988	Washer, Nylon 0.515 -0.52	2
25	15134	Washer, Lock NO 8 Type A	3
27	15628	Cord Grip,1/2 NPT Black	2

Item No.	Part No.	Description	Qty
28	67610	Card, A/D Single Channel	1
29	30375	Seal Ring, Nylon PG9	3
30	15626	Cord Grip, Black PG9	3
31	67531	Stand, Tilt	1
32	67613 132791	Power Supply, 120-240VAC, 25W Power Supply, 12-24 VDC, 25W	1
33	186464 67796	Wire Harness for Universal, Green CPU Wire Harness for Universal, Blue CPU	1
34	15627	Locknut, Black PCN9	3
35	67530	Plate, Interface Board	1
36	42149	Bumper, Rubber Grommet	4
37	45043	Wire Assembly, Ground 4"	1
38	68424	Backplate, Universal	1
39	30376	Seal Ring, Nylon 1/2 NPT	2
40	69290	Battery, 3V Coin Lithium	1
41	94392	Bracket, 25W Power Supply	1
42	67535	Gasket, Interface Board	1
43	111109	Board Interface USB	1
	67869	Board Assembly, PS2/DB-9	1
44	16892	Label, Ground Protective	1
45	68662	Cable, Ribbon Interface	1
46	44676	Washer, Bonded Sealing	1
47	85202 85203	Power Cord Assy,120VAC Power Cord Assy, 240VAC Euro Plug	1
48	66502	Overlay, Membrane Switch	1
49	68216	Nameplate, Rice Lake	1
50	117930 186272	Board Assembly, Green CPU for CCFL B/L Board Assembly, Blue CPU for LED B/L	1

Table 3-11. Universal Enclosure Parts

CAUTION ***To protect against the risk of fire, replace fuses only with same type and rating fuse. See the 920i technical manual (PN 67887) for complete fuse specifications.***

4.0 Configuration

The 920i 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 menus is described in this section.

Configuration using the serial port can be accomplished using either the serial command set or the iRev 4 configuration utility.

4.1 iRev™ Configuration

The 920i display and widgets, cannot be accessed through the configuration menus. iRev 4 provides the most complete and efficient configuration interface for the 920i.

Note ***See the 920i technical manual (PN 67887) for more information on iRev configuration.***

The iRev configuration utility provides the preferred method for configuring the 920i indicator. iRev 4 runs on a personal computer to set configuration parameters for the indicator. When iRev 4 configuration is complete, configuration data is downloaded to the indicator.

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

4.2 Serial Command Configuration

The serial command set can be used to configure the 920i indicator using either a personal computer, terminal, or remote keyboard. Like iRev 4, serial command configuration sends commands to the indicator serial port; unlike iRev 4, 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.

Note ***See the 920i technical manual (PN 67887) for more information on serial configuration.***

4.3 Configuration Switch

To configure the 920i indicator, the indicator must be placed in configuration mode.

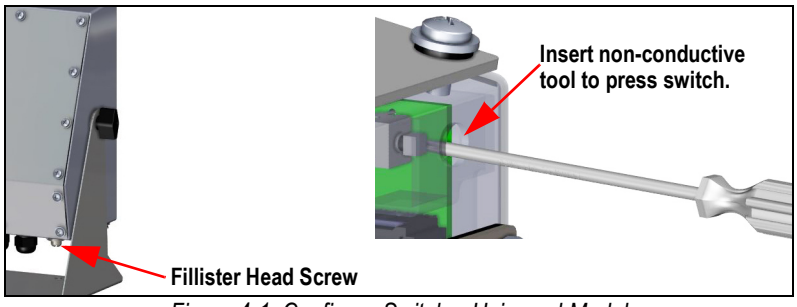

Figure 4-1. Configure Switch – Universal Model

1. Remove the setup switch access screw on the bottom of the universal enclosure.
2. Insert a small non-conductive tool into the access hole to press the switch. The main menu displays.
3. Set parameters as required for scales/system being used.
4. Once configuration is complete, press the **Save and Exit** softkey to exit setup mode.
5. Replace the setup switch access screw.

IMPORTANT ***To maintain NTEP certification requirements and to use the scale to record Legal for Trade transactions, the scale must be properly sealed.***

- ***If updating and/or configuring the scale, the seal may need to be broken to enter the menu structure.***
- ***Removing or altering the seal voids the NTEP approval. For continued certification the unit must be resealed, by an authorized agent, when configuration is complete.***
- ***There are menus that must be set per NTEP standards, ensure these settings remain NTEP accepted values.***
- ***Calibration must be performed by a qualified technician familiar with state and local regulations.***

4.4 Front Panel Configuration

Use the ***CONFIG*** menu under the ***SCALES*** to configure A/D scales.

1. Place the indicator in configuration mode. The main menu displays.

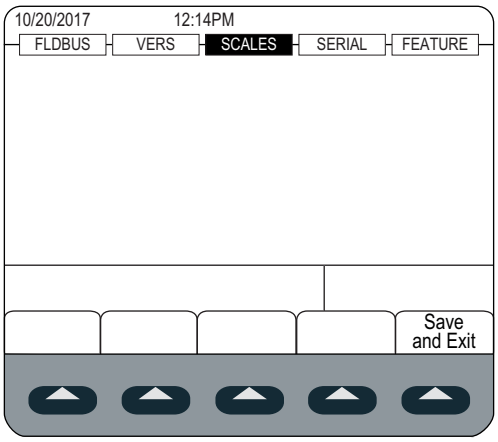

Figure 4-2. Main Menu Display

2. Ensure that ***SCALES*** is highlighted and press enter. The scales menu displays the scales that have been set up. If no scales have been setup, only ***CONFIG*** is displayed.
3. Press left or right to highlight a scale to revise or highlight ***CONFIG*** to setup a new scale.
4. Press enter. The scale configuration menu displays.

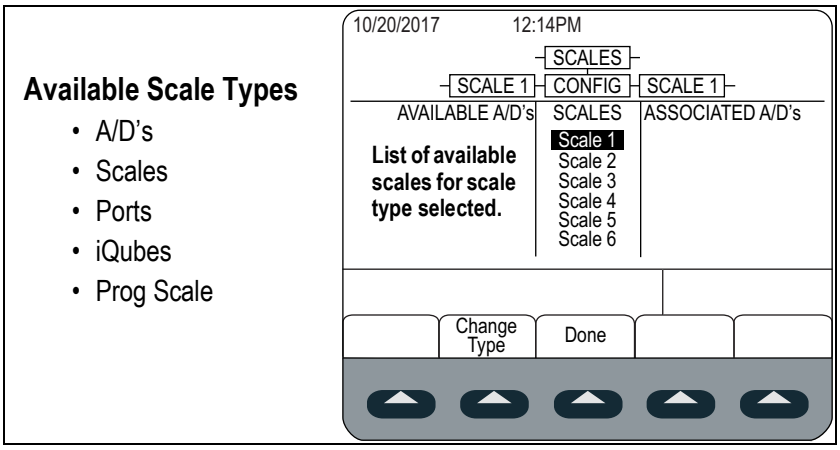

Figure 4-3. Scale Configuration Display

5. Press down to highlight the scale to configure.
6. Press the **Change Type** softkey to select one of the available scale types.
7. Press left and use up or down to highlight the desired scale.
8. Press the **Add** softkey. The selected type displays under Associated A/D's.
9. Press **Add** to associate another A/D or right to the scale #n.
10. Press the **Done** softkey.
11. Repeat Step 2 through Step 10 for each scale.

Note ***See the 920i technical manual (PN 67887) for more information on serial configuration.***

4.5 Main Menu

The 920i indicator can be configured using a series of menus accessed through the indicator front panel when the indicator is in setup mode.

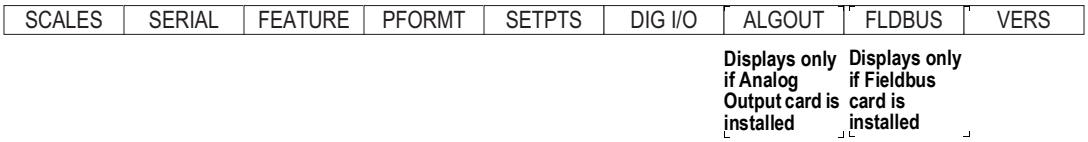

Figure 4-4. Configuration Menu Flow

Menu	Menu Function
SCALES	Configuration – configure and calibrate scales; see Section 4.6 on page 23
SERIAL	Serial – configure communications ports; see Section 4.7 on page 30
FEATURE	Features – set date and time, truck mode, passwords, keyboard locks, regulatory mode, initial consecutive number value, define softkeys and setpoint prompts; see Section 4.8 on page 37
PFORMT	Print Format – set print format used for header, gross, net, truck in/out, setpoint, and auxiliary ticket formats; see Section 4.9 on page 42
SETPTS	Setpoints – configure setpoints and batching mode; see Section 4.10 on page 43
DIG I/O	Digital I/O – assign digital input/output functions; see Section 4.11 on page 43
ALGOUT	Analog Output – configure analog output module; displayed only if analog output option is installed; see Section 4.12 on page 45
FLDBUS	Fieldbus – configure fieldbus parameters for PROFIBUS, PROFINET, DeviceNet, EtherNet/IP and ControlNet communications; displayed only if one of the listed fieldbus cards is installed
VERSION	Version – displays installed software version number; the **Reset Config** softkey on the Version menu can be used to restore all configuration parameters to their default values

Table 4-1. 920i Menu Summary

4.6 Scales Menu

The ***Scale x*** menu allows configuration and calibration of each scale. ***Config*** lists available and associated A/Ds.

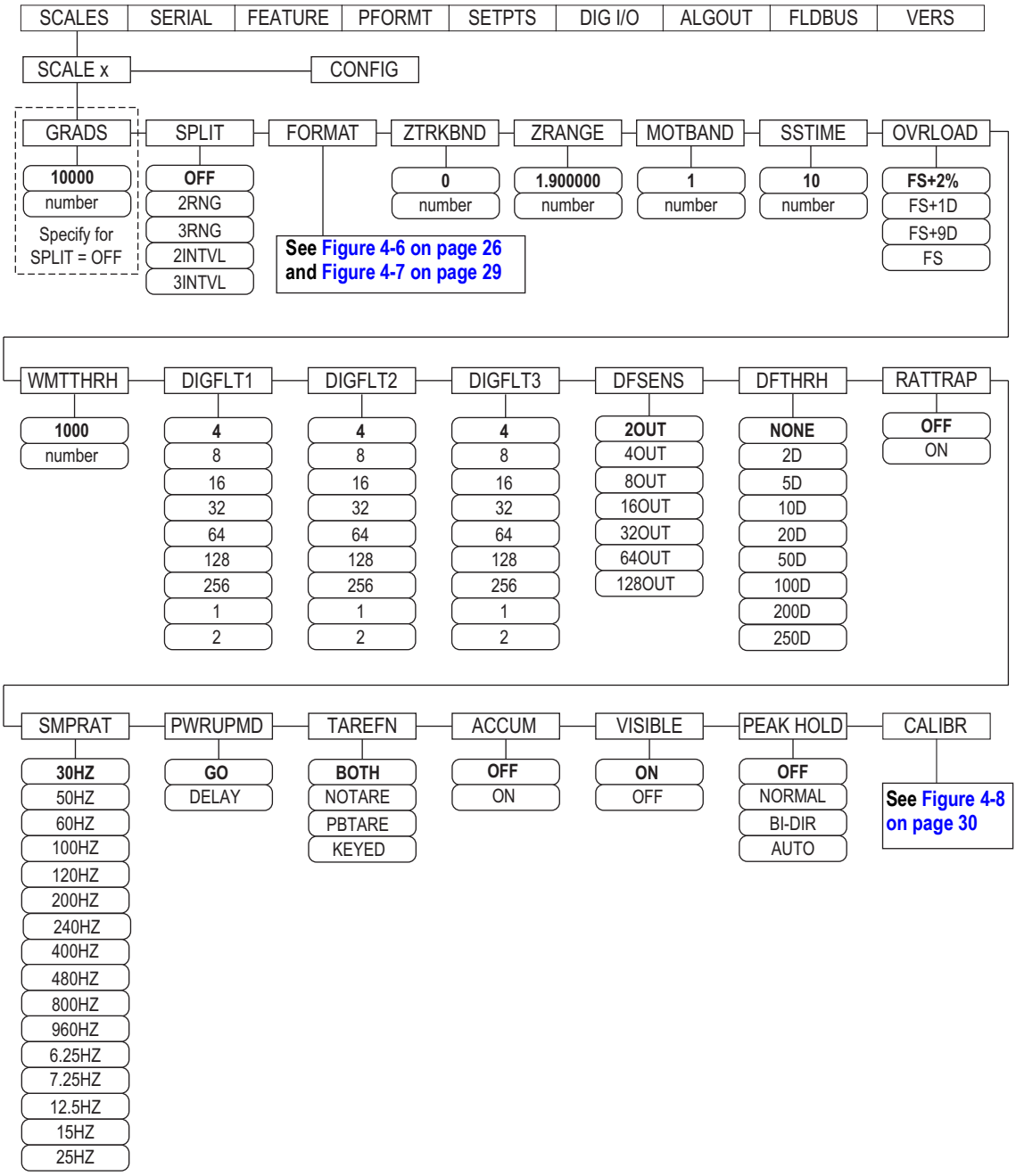

Figure 4-5. Scales Menu

Parameter	Description
GRADS	Graduations – specifies number of full scale ***GRADS*** if ***SPLIT = OFF***; ***GRADS = Capacity / Display Divisions,*** see Figure 4-7 on page 29 for display divisions Settings: 1–9999999 (**10000** default), must be consistent with legal requirements and environmental limits on system resolution; For Multi-range and Multi-interval scales (***SPLIT*** ≠ ***OFF***), the ***GRADS*** is calculated using the capacity and display divisions specified for the range or interval

Table 4-2. Scale x Menu Parameters

Parameter	Description
SPLIT	Split – specifies the range or interval of the scale; Settings: • **OFF** = full-range (default) • 2RNG, 3RNG = multi-range • 2INTVL, 3INTVL = multi-interval For Multi-range and Multi-interval scales, see Table 4-4 on page 27 and Table 4-6 on page 29
FORMAT	Format – specifies scale units: Primary (***PRIMAR*** default), Secondary (***SECNDR***), Tertiary (***TERTIA***) or Rate of Change (***ROC***); • ***SPLIT = OFF*** – see Table 4-4 on page 27 • ***SPLIT ≠ OFF –*** multi-range and multi-interval scales; see Table 4-6 on page 29
ZTRKBND	Zero Track Band – automatically zeros scale when in a specified range, as long as the input is in the range and scale is at standstill; zero tracking band is specified in ± display divisions; maximum legal value varies depending on local regulations; Enter Value: **0 (**default) ***NOTE: For scales using linear calibration, do not set zero tracking band to a value greater than the value set for the first point.***
ZRANGE	Zero Range – specifies the range within which the scale can be zeroed Enter Value: **1.900000** (default), *Example: ± 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	Motion Band – sets the level, in display divisions, at which scale motion is detected; if motion is not detected for the SSTIME (default of 1 second) or more, the standstill symbol lights; some operations, including print, tare, and zero, require the scale to be at standstill; the value entered must be in the range of 0-100; maximum legal value varies depending on local regulations ***NOTE: If set to 0, the standstill annunciator is set continuously on, and operations including zero, print, and tare will be performed regardless of scale motion. If 0 is selected, ZTRKBND must also be set to 0.***
SSTIME	Stand Still Time – 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; Enter Value: **10 (**default), values greater than 10 (1 second) are not recommended
OVRLOAD	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; Settings: **FS+2%** (default), FS+1D, FS+9D, FS
WMTTHRH	Weighment Threshold – specifies minimum number of grads required to add weighment to the recorded number of weighments Enter Value, **1000 (**default)
DIGFLT1 DIGFLT2 DIGFLT3	Digital Filtering – selects the digital filtering rate used to reduce the effects of mechanical vibration from the immediate area of the scale; selected setting indicates 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 noisy readings, but slows down the settling rate of the indicator Settings: 1, 2, **4** (default), 8, 16, 32, 64, 128, 256; See Section 4.6.1 on page 25 for more information about digital filtering ***NOTE: When configuring non-A/D scales, set the DIGFLTx parameters to 1 to disable filtering.***
DFSENS	Digital Filter Cutout Sensitivity – specifies the number of consecutive readings that must fall outside the filter threshold (***DFTHRH*** parameter) before digital filtering is suspended; Settings: **2OUT**(default), 4OUT, 8OUT, 16OUT, 32OUT, 64OUT, 128OUT See Section 4.6.1 on page 25 for more information about digital filtering
DFTHRH	Digital Filter Cutout Threshold – specifies the filter threshold, in display divisions; when a specified number of consecutive scale readings (**DFSENS** parameter) fall outside of the threshold, digital filtering is suspended; If **NONE** is selected, the filter is always enabled; Settings: **NONE** (default), 2D, 5D, 10D, 20D, 50D, 100D, 200D, 250D; See Section 4.6.1 on page 25 for information about digital filtering.
RATTRAP	RATTLETRAP® – the most effective at filtering repeating vibrations caused by mechanical noise from nearby machines, but may increase settling times over standard digital filter selections; Settings: **OFF** (default), ON – enables RATTLETRAP
SMPRAT	Sample Rate – selects measurement rate, in samples per second, of the analog-to-digital converter; lower sample rate values provide greater signal noise immunity; Settings: 6.5HZ, 7.5HZ, 12.5HZ, 15HZ, 25HZ, **30HZ** (default), 50HZ, 60HZ, 100HZ, 120HZ, 200HZ, 240HZ, 400HZ, 480HZ, 800HZ, 960HZ ***NOTE: The maximum total sample rate for all configured A/D channels—the sum of the sample rates for all scales—is 1200 Hz.*** Example: up to ten scales can be configured with 120 Hz sample rates, or up to twenty scales with 60 Hz sample rates
PWRUPMD	Power Up Mode – sets the indicator to go into operation immediately after a brief power up display test; Settings: • **GO** (default) – indicator goes into operation immediately after a brief power up display test • DELAY – indicator performs a power up display test and enters a 30-second warm-up period. If no motion is detected during warm up, the indicator becomes operational; if motion is detected, the delay timer is reset and the warm up is repeated
TAREFN	Enables or disables push-button and keyed tares; Settings: • **BOTH** (default)- - -both push-button and keyed tares are enabled • NOTARE - - - - - - -no tare allowed (gross mode only) • PBTARE - - - - - - -push-button tares enabled • KEYED - - - - - - - -keyed tare enabled
ACCUM	Accumulator – specifies if the scale accumulator is enabled or not. If it is, accumulation occurs whenever a print operation is performed; Settings: **OFF** (default), ON
VISIBL	Scale Visibility – specifies whether scale data is displayed. Settings: **ON** (default), OFF

Table 4-2. Scale x Menu Parameters (Continued)

Parameter	Description
PEAK HOLD	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 **Zero** or **Print**; press **Gross/Net** to display gross weight data when using the peak hold function • **OFF** (default) - - - - Peak hold function is off • NORMAL - - - - - - - Positive peak, manual reset; greatest net weight is held in memory until the weight is removed from the scale and either the **Zero** or **Print** key is pressed • BI-DIR - - - - - - - - - Bi-directional peak, manual reset; same as **NORMAL**, but peak value can be either positive or negative, determined by absolute value • AUTO - - - - - - - - - Positive peak, auto print, auto reset. Automatic print occurs when scale load is 0 ± 10 display divisions and at standstill; following the print command, the peak value is cleared and reset automatically ***NOTE: If the 920 is connected to multiple scales, the auto print function occurs on the displayed scale.***
CALIBR	Calibration – set parameters for calibration; see Table 4-7 on page 30

Table 4-2. Scale x Menu Parameters (Continued)

4.6.1 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.

DIGFLTx 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 x DIGFLT2 x 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 eliminates the frequency of a repeating vibration then displays 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.

Digital Filter Sensitivity and Digital Filter Threshold 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 DFTHRH (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 (DFTHRH) before digital filtering is suspended.
- DFTHRH 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 DFTHRH 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. Place the indicator into setup mode. See Section 4.3 on page 20.
2. Set the digital filter parameters (DIGFLT1–DIGFLT3) to 1.
3. Set DFTHRH to NONE.
4. Return indicator to weigh mode.

5. Remove all weight from the scale and watch the display to determine the magnitude of vibration effects on the scale.
6. Record the weight below which all but a few readings fall. This value is used to calculate the DFTHRH parameter value in Step 8.

   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.
7. Place the indicator in setup mode and set the DIGFLTx parameters to eliminate the vibration effects on the scale. (Leave DFTHRH set to NONE.) Find the lowest effective value for the DIGFLTx parameters.
8. Calculate the DFTHRH parameter value by converting the weight value recorded in Step 6 to display divisions:

   threshold_weight_value / display_divisions

   In the example in Step 6, with a threshold weight value of 50 lb and a display divisions value of 5 lb: 50 / 5 = 10. DFTHRH should be set to 10D for this example.
9. 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.

4.6.2 Format Menu

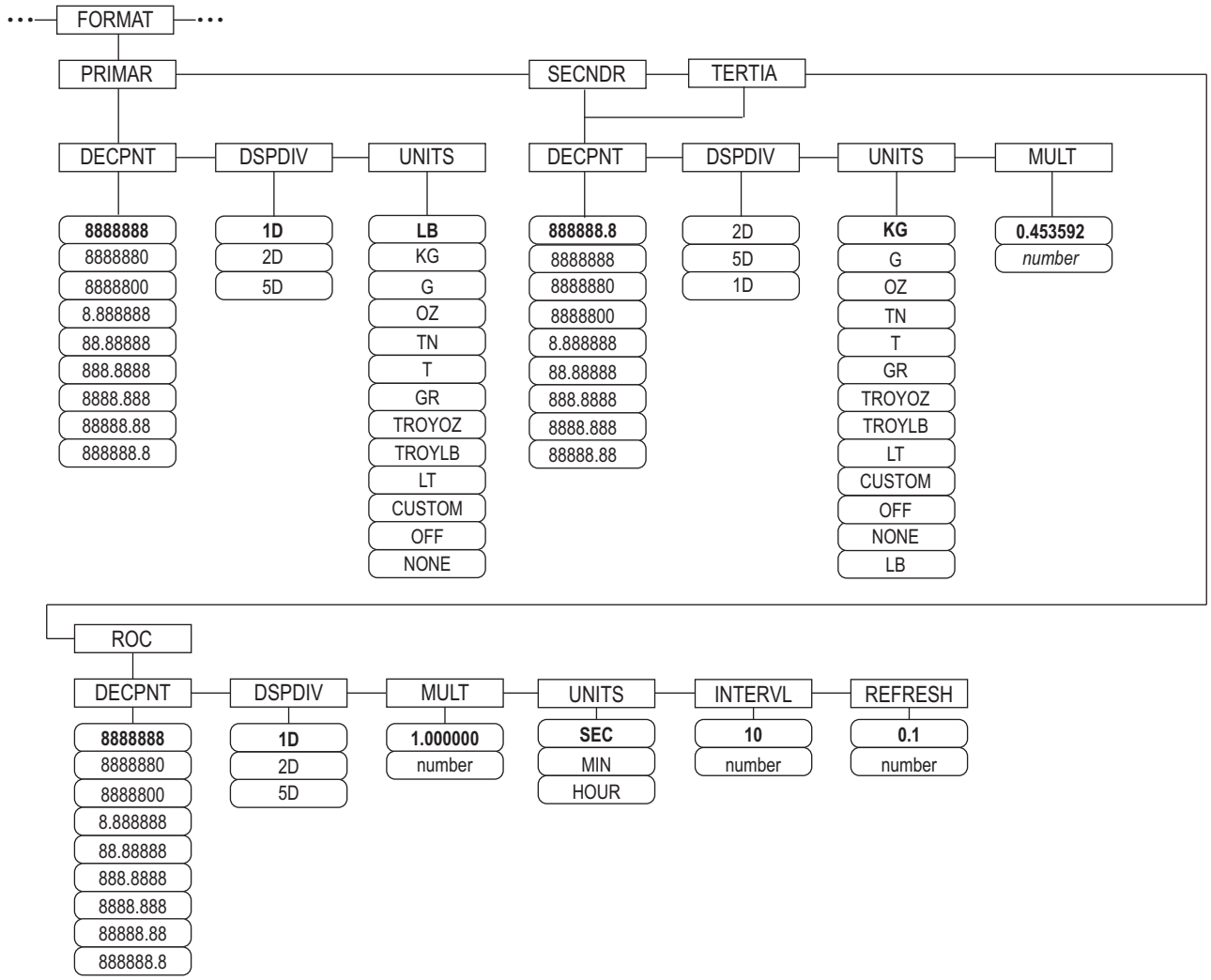

Figure 4-6. Format Menu, SPLIT = OFF

Parameter	Description
PRIMAR	Specifies the decimal position, display divisions, and units used for the primary units
SECNDR	Specifies the decimal position, display divisions, units, and conversion multiplier used for the secondary units
TERTIA	Specifies the decimal position, display divisions, units, and conversion multiplier used for the tertiary units
ROC	Rate of Change – specifies the decimal position, display divisions, conversion multiplier, time units, update interval, and refresh interval used for the rate of change units

Table 4-3. Format Menu Parameters

Format Menu if Split = OFF

Parameter	Description
DECPNT	Decimal Point Location – specifies the location of the decimal point or dummy zeros in the unit display; value should be consistent with local legal requirements; Settings: 8888888-888888.8; Defaults: **8888888** (primary and ROC), **888888.8** (secondary and tertiary)
DSPDIV	Display Divisions – select the minimum division size for the units displayed weight; Settings: 1d (default Primary and ROC), 2d (default Secondary), 5d (default Tertiary)
UNITS	Units for displayed and printed weight; settings: **LB** = pound (default Primary); **KG** = kilogram (default Secondary and Tertiary); G = gram; OZ = ounce; TN = short ton; T = metric ton; GR = grain; TROYOZ = troy ounce; TROYLB = troy pound; LT = long ton, CUSTOM, NONE, OFF ***NOTE: See below for ROC units***
Secondary and Tertiary Only	
MULT	Multiplier – specifies the conversion factor by which the primary units are multiplied to obtain the secondary or tertiary units; the entered value is the conversion factor for changing pounds to kilograms; Settings: 0.000001-9999999, **0.453592** (default); See Section 4.6.3 on page 28 for a list of multipliers To shift between primary, secondary, and tertiary units, press the **UNITS** key
Rate of Change (ROC) Only	
MULT	Multiplier – specifies the conversion factor by which the primary units are multiplied to obtain displayed rate of change units; Setting: 0.000001-9999999, **1.000000** (default); See Section 4.6.3 on page 28 for information about conversion factors
UNITS	Rate-of-Change units; Settings: **SEC** (default), MIN, HOUR
INTERVL	Update Interval – specifies the number of refreshes over which the rate-of-change is calculated, Enter Value: 10 (default) Example: ***REFRESH*** set to 0.1 second and ***INTERVL*** set at 60, each weight value takes 6 seconds (0.1 * 60) to be flushed from ROC data
REFRESH	Refresh interval – specifies the number of seconds between Rate-of-Change samples; Setting: **0.1**(default)-60
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: (updates_per_ROC_UNIT) * (PRIMARY_resolution / ROC_resolution) Example, with INTERVL=30; REFRESH=0.1; UNITS=MIN; PRIMARY resolution at 0.1 LB and ROC resolution at 1.0 (LB/ MIN) • INTERVL * REFRESH = 30 * 0.1 = 3.0 seconds per update (ROC data is flushed every 3.0 seconds) • With UNITS = MIN, there are 20 ROC data updates per ROC time unit: 60 seconds / 3.0 seconds per update • The resolution ratio of PRIMARY to ROC units is 0.1 (0.1 / 1.0) • This configuration provides a step size in the ROC display of 2 LB (2 LB increments between displayed values)	

Table 4-4. Format Parameters – SPLIT = OFF

Multi-Range and Multi-Interval Scales

The 920i supports multi-range and multi-interval scales.

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, 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 allows specification of decimal point, display divisions and maximum capacity for each range or interval.

4.6.3 Unit Conversion Factors

The 920i has the capability to mathematically convert and display weight in other units. Press UNITS Units to scroll through available units.

Set secondary (***SECNDR***) and tertiary (***TERTIA***) units using serial commands.

- To configure secondary or tertiary units using the front panel menus, use the Table 4-5 to find the conversion multiplier for the MULT parameter.

  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 4-5 to find the conversion multiplier for the SC.SEC.MULT or SC.TER.MULT command.

  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).

Setting the units is for the display and printed output, it does not change the defaulted units in the stream format. See Section 4.7.8 on page 35.

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/ 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
	0.000453	metric tons

Primary Unit	x Multiplier	Secondary/ Tertiary Unit
grams	15.4324	grains
	0.035274	ounces
	0.002205	pounds
	0.001000	kilograms
	0.032151	troy ounces
	0.002679	troy pounds
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

Primary Unit	x Multiplier	Secondary/ Tertiary Unit
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 4-5. Conversion Factors

Format Menu if Split ≠ OFF

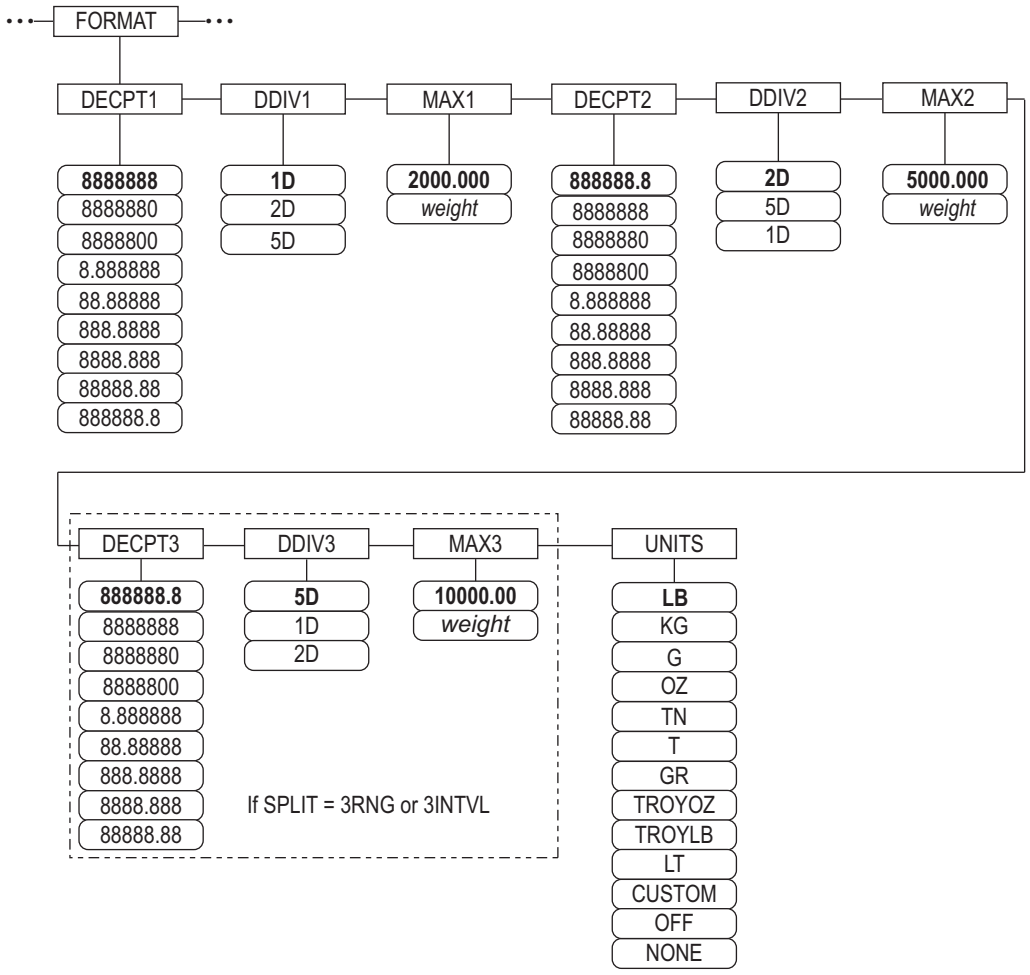

Figure 4-7. Format Menu, SPLIT ≠ OFF – 2 or 3 RNG, 2-3 INTVL

Parameter	Description
DECPNT 1-3	Decimal Point Location – specifies the location of the decimal point or dummy zeros in the unit display; value should be consistent with local legal requirements; Settings 8888888-888888.8; Defaults: **8888888** (DDIV1), **888888.8** (DDIV2 and DDIV3) ***NOTE: Decimal point location for third range or interval (SPLIT = 3RNG or 3INTVL only)***
DDIV 1-3	Display Divisions – for range or interval; selects the minimum division size for the primary units displayed weight; Settings: 1D (DDIV1 Default), 2D (DDIV2 Default), 5D (DDIV3 Default); ***NOTE: Display divisions for third range or interval (SPLIT = 3RNG or 3INTVL only)***
MAX 1-3	Maximum weight for first range or interval; Setting: weight, **50.00000** (default) ***NOTE: Maximum weight for third range or interval (SPLIT = 3RNG or 3INTVL only)***
UNITS	Units for displayed and printed weight; values are: **LB** = pound (default); KG = kilogram; G = gram; OZ = ounce; TN = short ton; T = metric ton; GR = grain; TROYOZ = troy ounce; TROYLB = troy pound; LT = long ton, Custom, None, Off

Table 4-6. Format Menu, SPLIT ≠ OFF

4.6.4 Calibration Menu

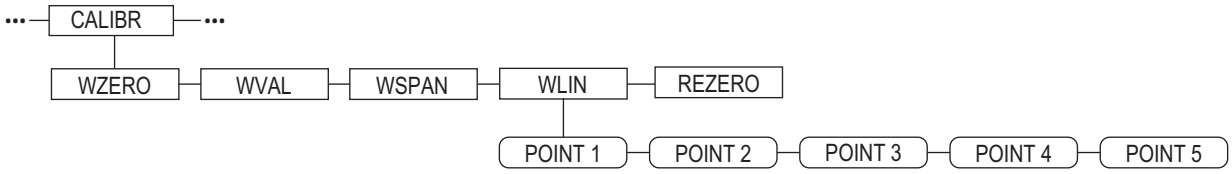

Figure 4-8. Calibration Menu

Parameter	Description
WZERO	Press **Enter** to display and edit the zero calibration A/D raw 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	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. Settings: POINT 1 — POINT 5
REZERO	Press **Enter** to remove an offset value from the zero and span calibrations. ***NOTE: Use this parameter only after WZERO and WSPAN have been set.***

Table 4-7. Calibration Menu Parameters

For information on configuring an iQUBE^2 scale, see the iQUBE^2 manual, PN 106113.

4.7 Serial Menu

Note ***See the 920i technical manual (PN 67887) for more information on serial data formats.***

4.7.1 Ports

Parameter	Description
PORT 1 PORT 2 Serial PORT 3 PORT 4 … PORT x	Specifies the type of data received by the port: • CMD: - - - - - - - - - Remote command input • PROGIN: - - - - - - Input routed to user program instead of core • SCALE:- - - - - - - - Legal-for-trade serial scale input (ports 3 and higher only) • IND SC: - - - - - - - Industrial (non-legal-for-trade) scale input (ports 3 and higher only) • DISPLAY: - - - - - - Display data input for remote units in local/remote configurations (ports 3 and higher only) • IQUBE2: - - - - - - - iQUBE2 serial scale input (ports 3 and higher only); see iQube^2 manual, PN 106113 • INCLIN:- - - - - - - - Special mode for use with Rice Lake inclinometer (port 1 only) • KEYBD: - - - - - - - Remote keyboard input (PS/2) (port 2 only) • KBDPRG: - - - - - - Remote keyboard input for user programs (PS/2) (port 2 only)
PORT 2 USB	Specifies the type of data received by the port: ***NOTE: These selections for port 2 are available only if the USB interface card is installed.*** • DEVICE: - - - - - - - Sets target USB device to use: AUTO, NODEVICE, HOSTPC, PRINTER1, PRINTER2, KEYBOARD, or DRIVE • TERMIN: - - - - - - - Indicates whether files have CR/LF (Windows) or CR (Macintosh previous to OS X) as the line terminator • ECHO: - - - - - - - - Specifies whether characters received by the port are echoed back to the sending unit • RESPONSE: - - - - Specifies whether the port transmits replies to serial commands • EOLDLY: - - - - - - End-of-line delay. Sets the delay period, in 0.1-second intervals, from when a formatted line is terminated to the beginning of the next formatted serial output. • STREAM: - - - - - - Specifies what data, if any, is streamed from the port. • INPUT: - - - - - - - - Determines whether the input will be handled by the core or routed to a user program (if present)

Table 4-8. Serial Menu – Port Parameters

4.7.2 Port 1

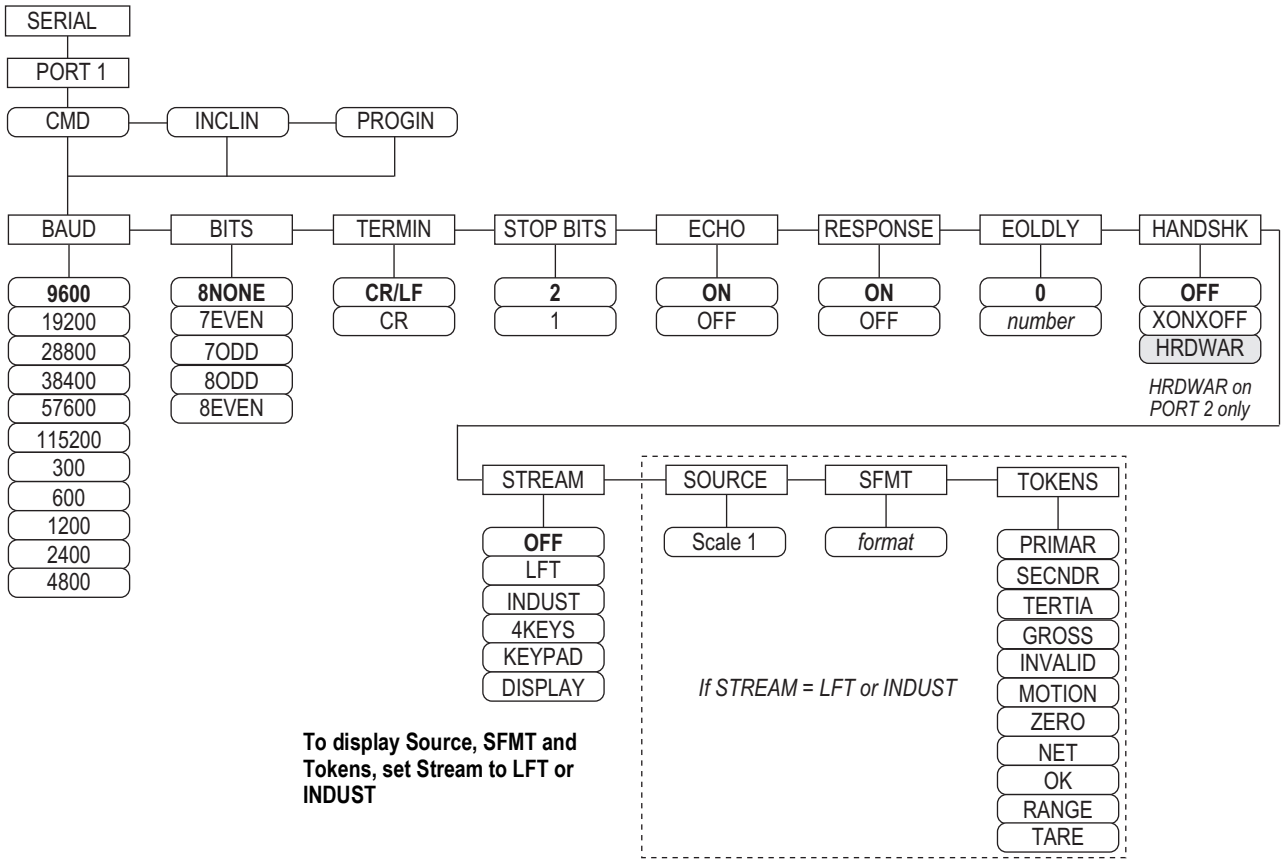

Figure 4-9. Serial Menu, Port 1 Menu Layout

4.7.3 Port 2 with Serial Interface Option

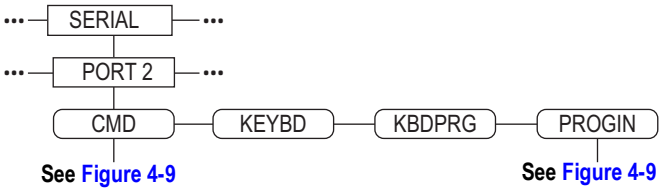

Figure 4-10. Port 2 (with Serial Interface Option) Menu Layout

4.7.4 Port 2 with USB Interface Option

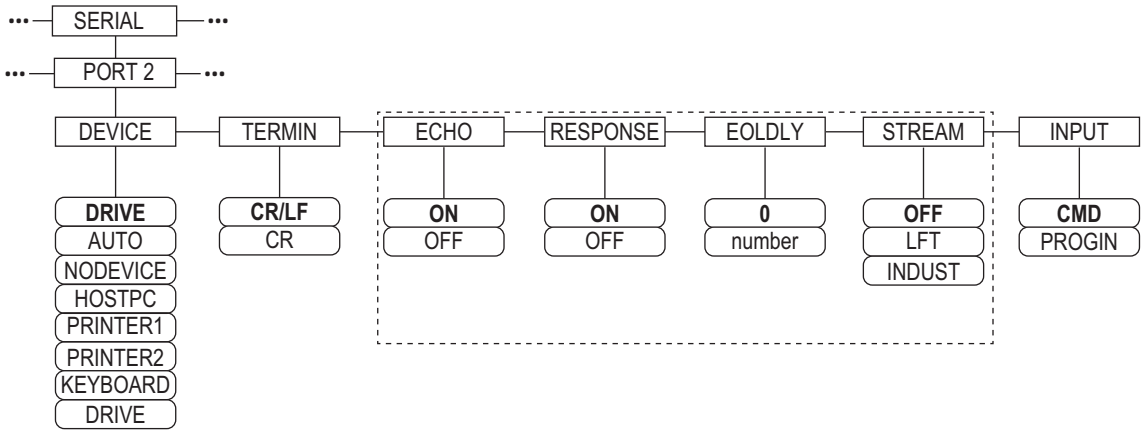

Figure 4-11. Port 2 (with USB Interface Option) Menu Layout

Device	Menu Parameters
DRIVE	TERMIN, INPUT, DEVICE
AUTO	TERMIN, ECHO, RESPONSE, EOLDLY, STREAM, INPUT, DEVICE If STREAM is set to LFT or INUST, SOURCE, SFMT and TOKENS display after STREAM
NODEVICE	No parameters available
HOSTPC	TERMIN, ECHO, RESPONSE, EOLDLY, STREAM, INPUT, DEVICE If STREAM is set to LFT or INUST, SOURCE, SFMT and TOKENS display after STREAM
PRINTER1	TERMIN, EOLDLY, STREAM If STREAM is set to LFT or INUST, SOURCE, SFMT and TOKENS display after STREAM
PRINTER2	TERMIN, EOLDLY, STREAM If STREAM is set to LFT or INUST, SOURCE, SFMT and TOKENS display after STREAM
KEYBOARD	INPUT, DEVICE

Table 4-9. Menu Parameters for Device Selected

4.7.5 Port 3 and 4 Menu Structure

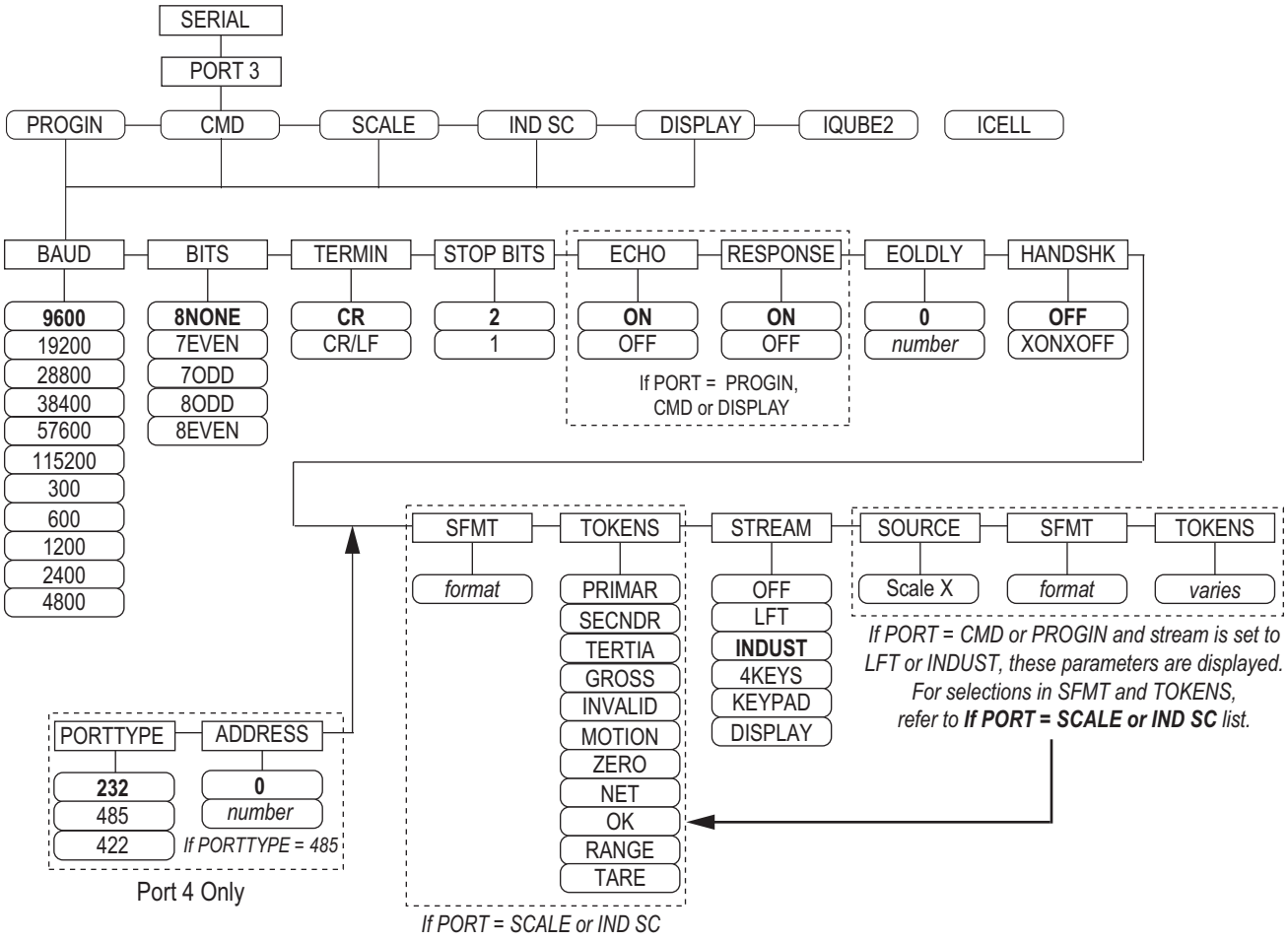

Figure 4-12. Port 3 & 4 Menu Layout

Port	Menu Parameters
PROGIN	BAUD, BITS, TERMIN, STOP BITS, ECHO, RESPONSE, EOLDLY, HANDSHK, PORTTYPE (Port 4 Only), STREAM If STREAM is set to LFT or INDUST – SOURCE, SFMT, TOKENS display after STREAM
CMD	BAUD, BITS, TERMIN, STOP BITS, ECHO, RESPONSE, EOLDLY, HANDSHK, PORTTYPE (Port 4 Only), STREAM If STREAM is set to LFT or INDUST – SOURCE, SFMT, TOKENS display after STREAM
SCALE	BAUD, BITS, TERMIN, STOP BITS, EOLDLY, HANDSHK, SFMT, TOKENS, PORTTYPE (Port 4 Only), STREAM
IND SC	BAUD, BITS, TERMIN, STOP BITS, EOLDLY, HANDSHK, SFMT, TOKENS, PORTTYPE (Port 4 Only), STREAM
DISPLAY	BAUD, BITS, TERMIN, STOP BITS, ECHO, RESPONSE, EOLDLY, HANDSHK, PORTTYPE (Port 4 Only), STREAM
IQUBE2	CONFIG, COMM SEL UPDATE

Table 4-10. Port 3 and 4 Menu Parameters

Parameter	Description
BAUD	Baud Rate – select transmission speed for port; Settings: **9600** (default),19200, 28800, 38400, 57600, 115200, 300, 600, 1200, 2400, 4800 ***NOTE: The maximum baud rate for ports on serial expansion cards (port number greater than 4) is 19200***
BITS	Data Bits – selects number of data bits and parity of data transmitted or received by the port. Settings: **8NONE** (default), 7EVEN, 7ODD, 8ODD, 8EVEN

Table 4-11. Port 1–Port 32 Menu Parameters

Parameter	Description
DEVICE (Port 2 - only with USB)	Device – selects the target USB device to be used; Settings: • AUTO – automatically detects the device (default) • NODEVICE – is used for iRite programming and for safely removing a flash drive • HOSTPC – is used when connecting directly to a PC. The PC will automatically assign a virtual comm port. Check • PC – settings to determine which port is assigned • PRINTER1 – used if one printer is connected • PRINTER2 – used only if a USB hub is connected; allows more than one Type-B connection; lowest printer ID# is Printer1 • KEYBOARD – supports USB keyboards • DRIVE – supports USB 2.0 flash drives formatted to the FAT-32 or FAT-16 file system up to 4 Gig maximum
ECHO	Echo – specifies if characters received by the port are echoed back to the sending unit; Settings **ON** (default), OFF
EOLDLY	End-of-Line Delay – sets the delay period, in 0.1 second intervals, from when a formatted line is terminated to the beginning of the next formatted serial output; value is displayed in tenths of a second (10 = 1 second); Enter Value: 0-255, **0** (default)
HANDSHK	Handshaking – specifies whether XON/XOFF flow control characters or hardware handshaking (available only on Port 2) is used; Settings: **OFF** (default), XONOFF, HRDWAR
PORTTYPE	Port Type – specifies what Port 4 is used for; if 485 is selected, follow the prompts to specify RS-485 address, see Table 4-12; Settings: **232** (default), 485, 422; ***NOTE: RS-485 communications is compatible with iQUBE^2. It can be specified for Port 4, and for odd numbered expansion ports 5 and higher.***
RESPONSE	Response – sets the port to transmits replies to serial commands; Settings: **ON** (default) OFF
SFMT	Stream Format – used for streamed data (SCALE or IND SC scale types); **Consolidated Controls** format is default; see Section 4.7.8 on page 35 custom stream formatting
SOURCE	Source – specifies the source scale for data streamed from the port, if **STREAM** is set to LFT or INDUST
STOP BITS	Stop Bite – selects number of stop bits transmitted or received by the port; Settings: **2** (default), 1
STREAM	Stream – specifies what data, if any, is streamed from the port; Settings: • OFF - - - - - - - - - - no streaming • LFT - - - - - - - - - - streams data at the display rate specified by the DSPRATE parameter • INDUST - - - - - - - streams data at the A/D update rate specified by the SMPRATE parameter ***NOTE: Streaming is not supported for RS-485 connections.***
TERMIN	Termination Character – selects termination character for data sent from the port; Settings: **CR/LF** (default), CR
TOKENS	TOKENS – (if STREAM is set to LFT or INDUST) parameter can be used to replace tokens used in the data stream from the indicator front panel. See Section 4.7.8 on page 35 for more information about custom stream formatting. Settings: PRIMAR, SECNDR, TERTIA, GROSS, INVALID, MOTION, ZERO, NET, OK, RANGE, TARE

Table 4-11. Port 1–Port 32 Menu Parameters (Continued)

4.7.6 *RS-485 Port Parameters*

Parameter	Description
DUPLEX	Duplex – sets the RS-485 communications; Settings: **HALF** (default), FULL
ADDRESS	Address – sets the decimal indicator address for RS-485 connections; Enter Value: 0-255, **0** (default) RS-232 communications is disabled if an address other than zero is specified for this parameter

Table 4-12. RS-485 Port Parameters

4.7.7 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 iRev to set the Local Unit serial parameters shown in Table 4-13. 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*	OFF	ON
#*p* = port number		

Table 4-13. Local/Remote Configuration Parameters

4.7.8 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.

Note ***See the 920i technical manual (PN 67887) for more information on custom stream formatting.***

Table 4-14 lists the format identifiers used to configure a custom stream format. See Section 4.7.8 on page 35 for examples of custom stream formats.

Format Identifier	Defined By	Description
<P[G | N | T]>	STR.POS# n STR.NEG# n	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#n), or – (for STR.NEG#n)
<U[P | S | T]>	STR.PRI# n STR.SEC# n STR.TER# n	Units – specifies primary, secondary, or tertiary units for the current or specified weight on the source scale.
<M[G | N | T]>	STR.GROSS# n STR.NET# n STR.TARE# n	Mode – specifies gross, net, or tare weight for the current or specified weight on the source scale.
<S>	STR.MOTION# n STR.RANGE# n STR.OK# n STR.INVALID# n STR.ZERO# n	Status for the source scale. Default values and meanings for each status: • STR.MOTION# n - M In motion • STR.RANGE# n - - O Out of range • STR.OK# n - - - - - <space>OK • STR.INVALID# n - I Invalid • STR.ZERO# n - - - Z COZ
<B [–]n,…>	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

Table 4-14. Custom Stream Format Identifiers

Format Identifier	Defined By	Description
B9	Dynamic	=1 if tare in system
B10	Dynamic	=1 if tare is keyed
B11	Dynamic	=00 if MODE=GROSS =01 if MODE=NET =10 if MODE=TARE =11 (not used)
B12	Dynamic	=00 if UNITS=PRIMARY =01 if UNITS=SECONDARY =10 if UNITS=TERTIARY =11 (not used)
B13-B16	Configuration	=00 (not used) =01 if current DSPDIV=1 =10 if current DSPDIV=2 =11 if current DSPDIV=5
B17-B19	Configuration	=000 if current DECPNT=8888800 =001 if current DECPNT=8888880 =010 if current DECPNT=8888888 =011 if current DECPNT=888888.8 =100 if current DECPNT=88888.88 =101 if current DECPNT=8888.888 =110 if current DECPNT=888.8888 =111 if current DECPNT=88.88888
B20	Configuration	=000 if tertiary DECPNT=8888800 =001 if tertiary DECPNT=8888880 =010 if tertiary DECPNT=8888888 =011 if tertiary DECPNT=888888.8 =100 if tertiary DECPNT=88888.88 =101 if tertiary DECPNT=8888.888 =110 if tertiary DECPNT=888.8888 =111 if tertiary DECPNT=88.88888
<wspec [–] [0] digit[[.]digit]>	Scale weight	Weight for the source scale. wspec is defined as follows: • **wspec** indicates if 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 specify left-justified • 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 • [–] Enter a minus sign (–) to include sign for negative values • [0] Enter a zero (0) to display leading zeros • digit[[.][.]digit] The first digit indicates the field width in characters; decimal point only indicates floating decimal; decimal point with following digit indicates fixed decimal with n 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 4-14. Custom Stream Format Identifiers (Continued)

4.8 Feature Menu

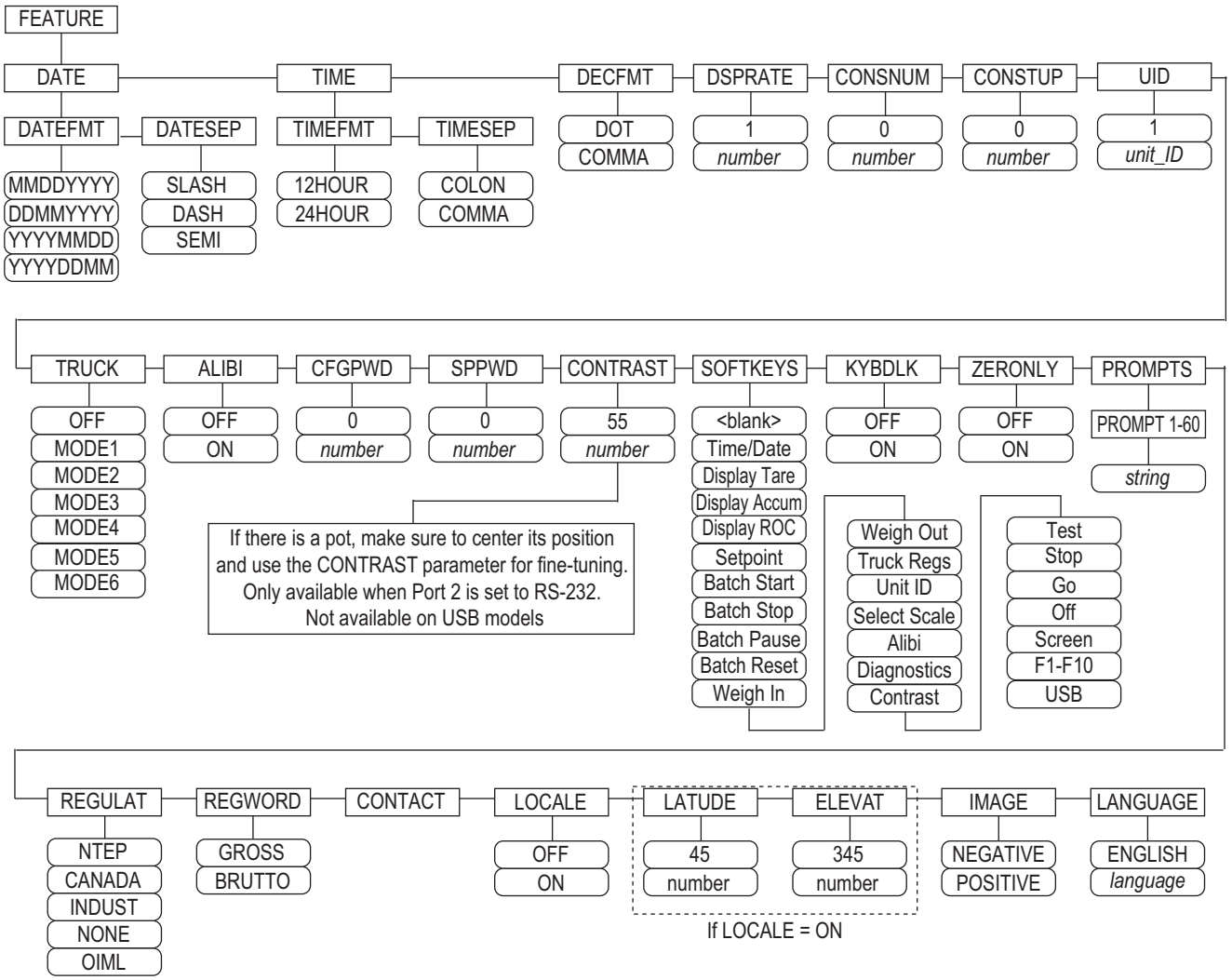

Figure 4-13. Feature Menu

Parameter	Description
DATE	Date Format – set date format and date separator character; Settings: DATEFMT, DATESEP Use the **Time/Date** softkey or the SD serial command to set the date
TIME	Time Format – set time format and separator character; Settings: TIMEFMT, TIMESEP Use the **Time/Date** softkey or the ST serial command to set the time
DECFMT	Decimal Format – set decimal symbol; Settings: DOT, COMMA
DSPRATE	Display Update Rate – set display update rate, in number of 100-millisecond intervals between updates; Enter Value: 1-80, **1** (default) Example: 1 provides about 10 updates per second, the maximum value updates the display every 8 seconds
CONSNUM	Consecutive Numbering – allows sequential numbering for print operations; the consecutive number value is incremented following each print operation including <CN> in the ticket format; when the consecutive number is reset, it is reset to the value specified on the ***CONSTUP*** parameter; Enter Value: 0-9999999, **0** (default)
CONSTUP	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; Enter Value: 0-9999999, **0** (default)
UID	Unit Identification Number – value specified can be any alphanumeric value, up to eight characters; this number is also used as a folder name when the USB file system is used; Enter Value: unit-ID, **1** (default)

Table 4-15. Feature Menu Parameters

Parameter	Description
TRUCK	Truck Mode – if selected, the indicator switches from normal mode to the selected truck mode; Settings: **OFF** (default) MODE1: Auto clear ID, keyed tares, value swapping MODE2: Auto clear ID, no keyed tares, value swapping MODE3: Stored ID, keyed tares, value swapping MODE4: Stored ID, no keyed tares, value swapping MODE5: Stored ID, keyed tares, no value swapping MODE6: Stored ID, no keyed tares, no value swapping ***NOTE: See the 920i technical manual (PN 67887) for more information on Truck mode.***
ALIBI	Alibi Feature – specifies if data storage is used to allow reprinting of any transaction; Settings: **OFF** (default), ON Use the softkey parameter to set a softkey to recall alibi for print transactions
CFGPWD	Configuration Password – specify a non-zero value to restrict access to all configuration menus; Enter Value: 0-9999999, 0 (default) To clear the indicator: press the setup switch, enter 999999 (six nines) at the configuration password prompt; unit performs a ***RESET-CONFIGURATION*** and returns to configuration mode display ***NOTE: Record the password and keep it in a safe place; if lost or unavailable, the indicator must be cleared (reset configuration and calibration parameters) to continue use***
SPPWD	Setpoint Password – set a value, above zero, to restrict access to the setpoint menu; it is shared by and can be used to protect the truck register; if a setpoint password is specified, the password must be entered before deleting entries from the truck register; Enter Value: 1-9999999, **0** (indicates no password is in place)
CONTRAST	Contrast Level – adjusts contrast of display; a **Contrast** softkey can be set; Enter Value: 0-127, **55** (default)
SOFTKEYS	Use the **Add** and **Remove** softkeys to set softkeys to be displayed in weighing mode; Settings: <blank>, Time/Date, Display Tare, Display Accum, Display ROC, Setpoint, Batch Start, Batch Stop, Batch Pause, Batch Reset, Weigh In, Weigh Out, Truck Regs, Unit ID, Select Scale, Alibi, Diagnostics, Contrast, Test, Stop, Go, Off, Screen, F1–F10, USB
KYBDLK	Keyboard Lock – disables the keypad in normal mode; Settings; **OFF** (default), ON
ZERONLY	Zero Key Only – disables all front panel keys except ***ZERO*** in normal mode; Settings; **OFF** (default), ON
PROMPTS	Prompts – for use in setpoint names; prompts are referenced by the ***NAME*** parameter under the ***SETPTS*** menu; prompts can be shown on the display during setpoint execution; Settings: PROMPT 1-60
REGULAT	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 sub-parameters to allow customization of tare, clear, and print functions in non Legal-for-Trade scale installations; see Section 4.8.2 on page 40 The value specified for this parameter affects the function of the front panel **Tare** and **Zero** keys. See Table 4-19 on page 41 for a complete description of **Tare** and **Zero** key functions for each of the regulatory modes.
REGWORD	Regulation Word – sets the term displayed when weighing in gross mode; Settings: **GROSS** (default) BRUTTO
CONTACT	Contact – allows specification of contact information for use in iQUBE^2 alert messages; see Table 4-17 on page 39.
LOCALE	Locale – enables the ***LATUDE*** and ***ELEVAT*** parameters; specifying latitude and elevation of the scale site provides compensation for gravitational effects; Settings; **OFF** (default), ON ***NOTE: Attached scales must be re-calibrated after changing this parameter from OFF to ON; Gravitational compensation settings do not affect iQUBE^2 scales.***
LATUDE	Latitude – specify the latitude of the scale site in degrees; only displayed if LOCALE=ON; Enter Value: 0-90°, **45°** (default)
ELEVAT	Elevation – specify the elevation of the scale site in meters; Enter Value: –9999 through 9999. only displayed if LOCALE=ON; Enter Value: –9999 through 9999 m, **345 m** (default)
IMAGE	Image – specifies if the indicator display is presented as blue-on-white or white-on-blue; Settings: • Negative (default) – displays blue-on-white when using the stock LCD display, the optional outdoor display uses white-on-blue • Positive – when using the outdoor display, blue-on-white displays, use the LCD contrast potentiometer to adjust for optimal viewing
LANGUAGE	Language – set the language and character set used for prompts and printing; Settings: **ENGLISH** (default), language

Table 4-15. Feature Menu Parameters (Continued)

Parameter	Description
DATEFMT	Specifies the format used to display or print the date; Settings: MMDDYYYY (default), DDMMYYYY, YYYYMMDD, YYYYDDMM
DATESEP	Specifies the date separator character; Settings: **SLASH** (default), DASH, SEMI
TIMEFMT	Specifies the format used to display or print the time; Settings: 12HOUR (default), 24HOUR
TIMESEP	Specifies the time separator character; Settings: **COLON** (default), COMMA

Table 4-16. Date and Time Format Parameters

4.8.1 Contact Menu

The contact menu allows entry of contact information.

- Display contact information, in setup mode, by entering the Version menu and pressing the **Contacts** softkey.
- Display contact information, in weigh mode, by pressing the **Diagnostics** softkey.

Note ***See the 920i technical manual (PN 67887) for more information to add contact information to print formats.***

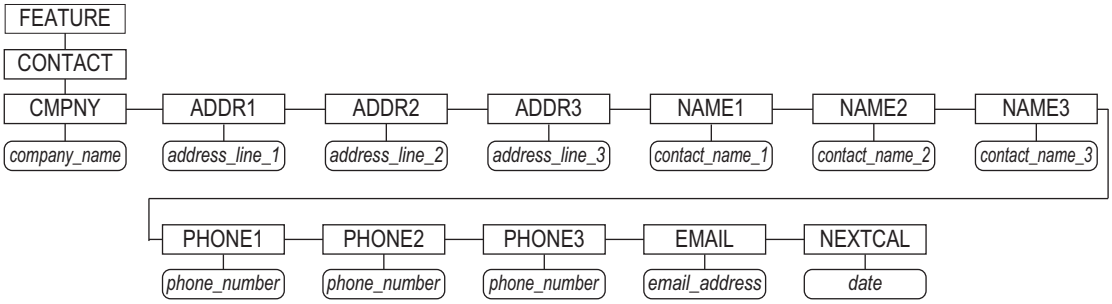

Figure 4-14. Contact Menu

Parameter	Description
CMPNY	Company Name – enter the name of the contact company or dealer
ADDR1–ADDR3	Address – enter up to three lines of address information for the contact company
NAME1–NAME3	Name – enter names of up to three contact persons
PHONE1–PHONE3	Phone – enter phone numbers for each of the contact persons specified for the ***NAMEx*** parameter
EMAIL	Email – enter the email address of the contact company or dealer If the iQUBE^2 alert support is used to send automated alert email messages, enter the email address to send the messages to; see the iQUBE^2 Installation Manual (PN 106113) for more information
NEXTCAL	Next Calibration – enter the next scheduled calibration date using the month/day/year format of the **DATEFMT** parameter; separator characters are not required

Table 4-17. Contact Menu Parameters

4.8.2 Regulatory/Industrial Menu

The Industrial setting of the Regulation parameter allows customization of several tare, clear, and print functions for use in non Legal for Trade scale installations. See Section 4.8.3 on page 41 for more information about regulatory mode functions.

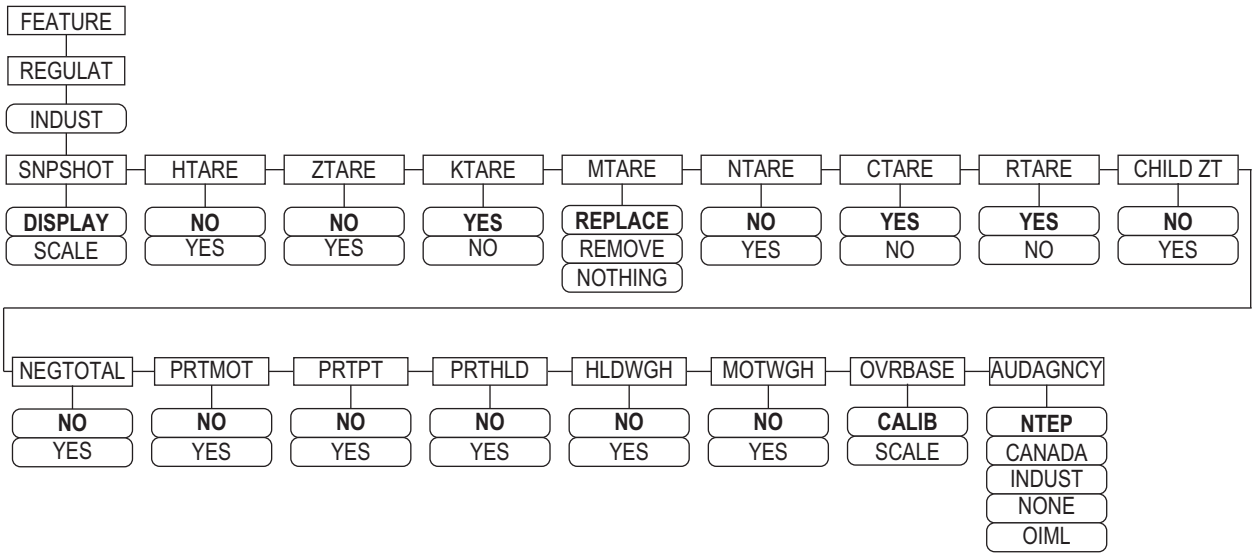

Figure 4-15. Regulatory/Industrial Menu Layout

Parameter	Description
SNPSHOT	Snap Shot – display or scale weight source; Settings: **DISPLAY** (default), SCALE
HTARE	Hold Tare – allow tare in display hold; Settings: **NO** (default), YES
ZTARE	Zero Tare – remove tare on **Zero**; Settings: **NO** (default), YES
KTARE	Keyed Tare – always allow keyed tare; Settings: **YES** (default), NO
MTARE	Multiple Tare – replaces existing Tare when the Tare key is pressed; Settings: **Replace** (default), Remove Nothing
NTARE	Negative Tare – allow negative or zero tare; Settings: **NO** (default), YES
CTARE	Clear Tare – allow **Clear** key to clear tare/accumulator; Settings: **YES** (default), NO
RTARE	Round Tare – round semi-automatic (pushbutton) tare to the nearest display division; Settings: **YES** (default), NO
CHILD ZT	Child Zero Tare – clear child scales individually; Settings: **NO** (default), YES
NEGTOTAL	Negative Total – allow total scale to display negative value; Settings: **NO** (default), YES
PRTMOT	Print Motion – allow print while in motion; Settings: **NO** (default), YES
PRTPT	Print Preset Tare – add PT to keyed tare print; Settings: **NO** (default), YES
PRTHLD	Print Hold – print during display hold; Settings: **NO** (default), YES
HLDWGH	Hold Weighment – allow truck weighment during display hold; Settings: **NO** (default), YES
MOTWGH	Motion Weighment – allow truck weighment in motion; Settings: **NO** (default), YES
OVRBASE	Over Base – sets an industrial scale to function like an OIML or NTEP scale (see Table 4-20 on page 41) Settings: **CALIB** (default), SCALE
AUDAGNCY	Audit Agency – Audit trail display agency format; Settings: **NTEP** (default), CANADA, INDUST, NONE, OIML

Table 4-18. Regulatory/Industrial Menu Parameters

4.8.3 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 4-19 describes the function for the NTEP, CANADA, OIML, and NONE regulatory modes. **Tare** and **Zero** key functions are configurable when the REGULAT mode is set to INDUST.

REGULAT 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 • if weight is outside of ZRANGE, no action
NONE	zero or negative	no	TARE	ZERO
		yes	CLEAR TARE	
	positive	no	TARE	
		yes	CLEAR TARE	

Table 4-19. Tare and Zero Key Functions for REGULAT Parameter Settings

Table 4-20 includes the default values of the INDUST sub-parameters 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
RTARE	Round semi-automatic (pushbutton) tare to nearest display division	YES	YES	YES	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
OVRBASE	Zero base for overload calculation	CALIB ZERO	CALIB ZERO	CALIB ZERO	SCALE ZERO	CALIB ZERO

Table 4-20. Regulat / Indust Mode Parameters, Comparison with Effective Values of Other Modes

4.9 Print Format Menu

Note ***See the 920i technical manual (PN 67887) for more information on custom print formatting.***

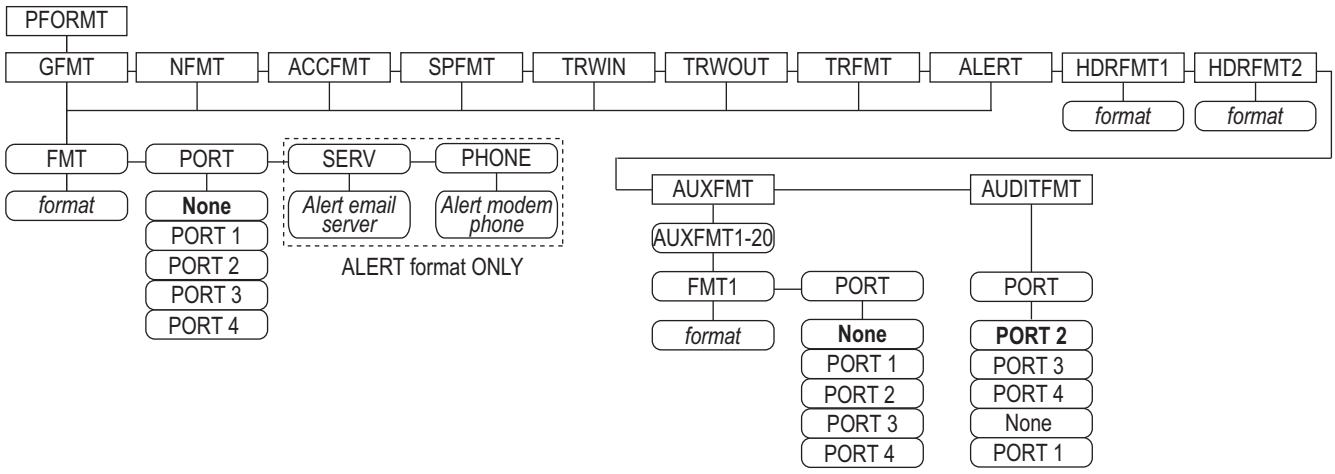

Figure 4-16. Print Format Menu

Parameter	Description
GFMT NFMT ACCFMT SPFMT TRWIN TRWOUT TRFMT ALERT	Available Formats; Settings: • FMT – Enter desired formant • PORT – Select appropriate PORT 1-4 or NONE • SERV – enter an email server for alerts (ALERT format only) • PHONE – enter a phone number for alerts (ALERT format only)
HDRFMT1	Header Format 1 – enter header format
HDRFMT2	Header Format 2 – enter header format
AUXFMT	Aux format 1-20 – enter the format and select the port as needed
AUDITFMT	Audit format – select the port as needed

Table 4-21. Print Format Menu

4.10 Setpoints Menu

Note ***See the 920i technical manual (PN 67887) for information about configuring and using setpoints.***

4.11 Digital I/O Menu

The Digital I/O menu is used to assign functions to digital inputs and outputs. SLOT 0 represents the six I/O bits available on the CPU board (connector J2); additional slots, each with 24 I/O bits, are displayed only if one or more digital I/O expansion cards are installed.

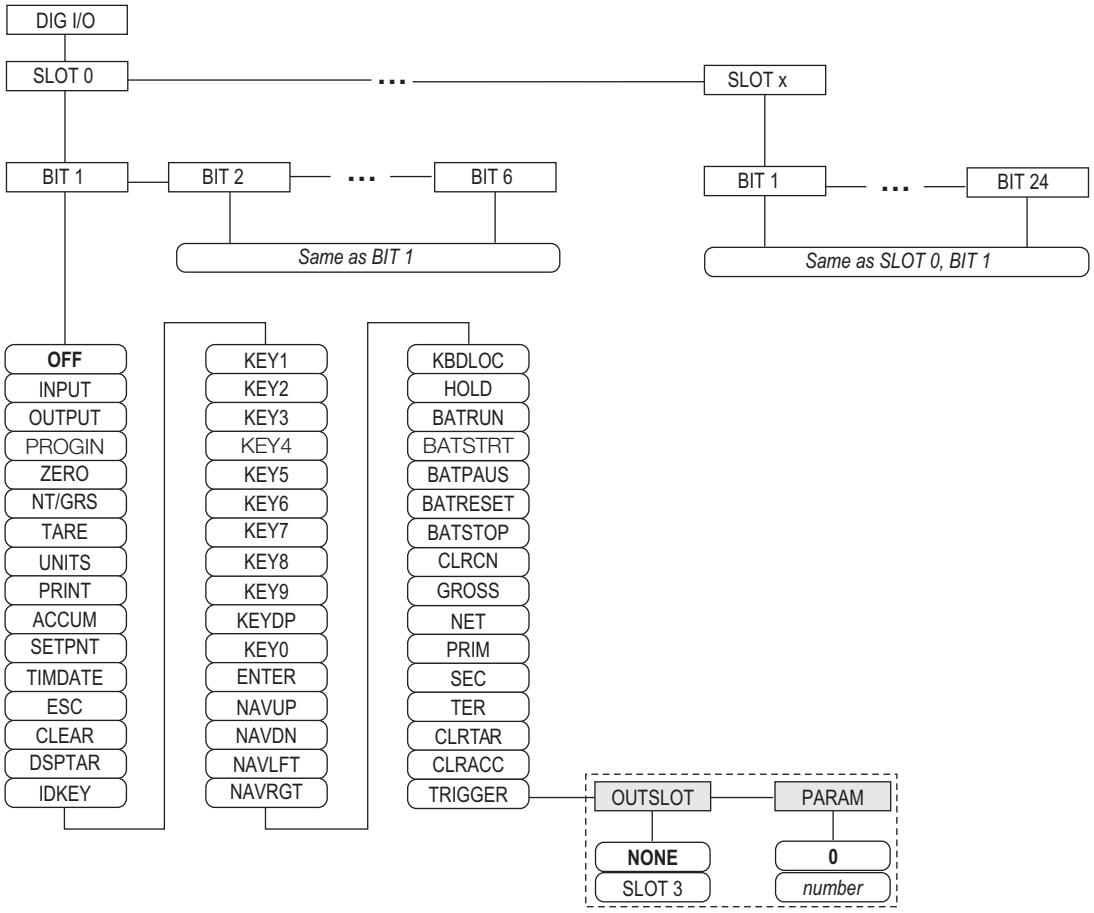

Figure 4-17. DIG I/O Menu

SLOTx – BIT *n*: lists available digital I/O slots.

If iQUBE^2 is configured on an optional serial card, that slot will also be listed for available iQUBE^2 digital I/O bits.

Parameter	Description
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	Provides the same function as the front panel **ZERO** key
NT/GRS	Provides the same function as the front panel **NET/GROSS** key (net/gross mode toggle)
TARE	Provides the same function as the front panel **TARE** key
UNITS	Provides the same function as the front panel **UNITS** key
PRINT	Provides the same function as the front panel **PRINT** key

Table 4-22. Digital I/O Bit Parameters

Parameter	Description
ACCUM	Adds the current scale weight to the accumulator, if the scale accumulator is enabled
SETPNT	Provide the same functions as the **Setpoint** softkey
TIMDATE	Provide the same functions as the **Time/Date** softkey
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
KEY0-9	Simulates pressing a numerical key (KEY1 = pressing the 1 key)
KEYDP	Simulates pressing the decimal point key on the numeric keypad
ENTER	Simulates pressing the front panel **ENTER** key
NAVUP	Simulates pressing the up arrow key
NAVDN	Simulates pressing the down arrow key
NAVLFT	Simulates pressing the left arrow key
NAVRGT	Simulates pressing the right arrow key
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 in the ***CONSTUP*** parameter (FEATURE menu)
GROSS	Sets display to Gross mode
NET	Sets display to Net mode
PRIM	Sets display to primary units
SEC	Sets display to secondary units
TER	Sets display to tertiary units
CLRTAR	Clears the current tare for the active scale
CLRACC	Clears the active accumulator
TRIGGER	Used for custom applications only; see Table 4-23

Table 4-22. Digital I/O Bit Parameters (Continued)

Parameter	Description
OUTSLOT	Specifies the card slot receiving the trigger output; Settings: **NONE** (default), PORT3
PARAM	Specifies the value passed as a parameter to the option card in the specified slot; Enter Value: **0** is default

Table 4-23. Digital I/O – Trigger Parameters

4.12 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, PN 69089, for more information.

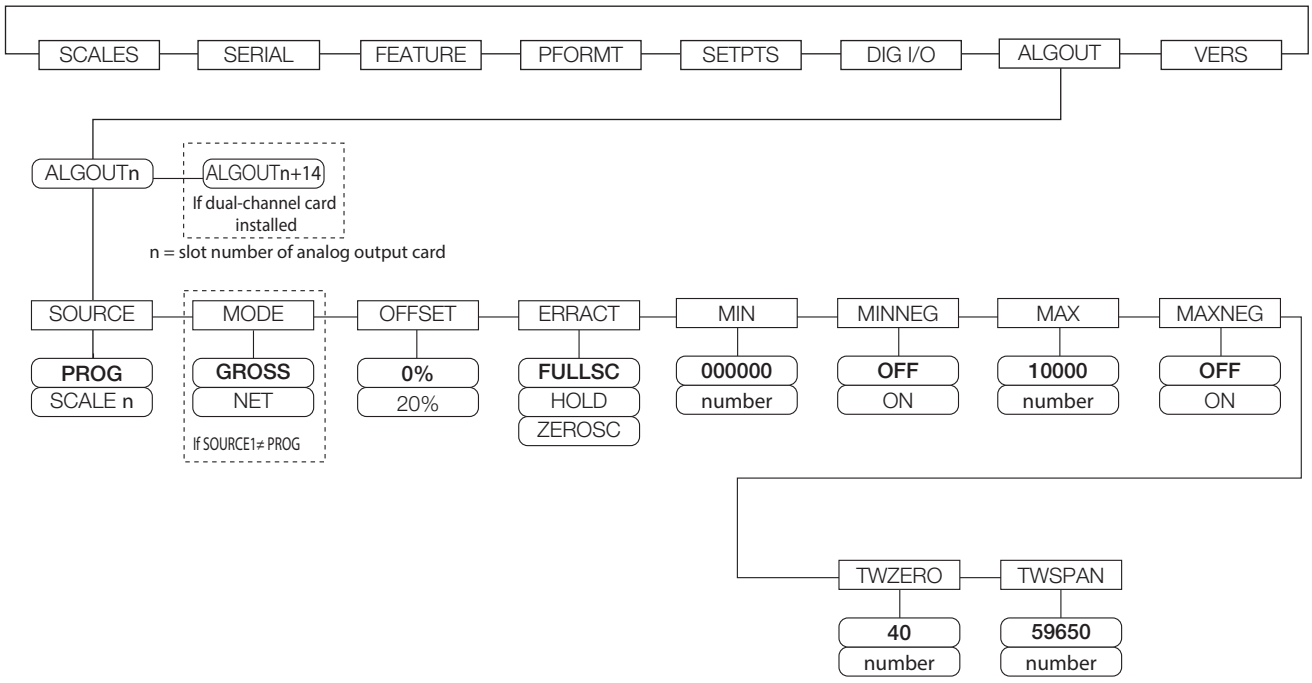

Figure 4-18. Analog Output Menu

Parameter	Description
SOURCE	Source – specifies the scale tracked by the analog output; Settings: • **PROG** (default) indicates that the analog output is under program control • SCALEn = 1-32
MODE1	Mode – specifies the weight data tracked by the analog output; Settings: **GROSS** (default), NET
OFFSET	Zero Offset – select 0% for 0–10 V or 0–20 mA output; select **20%** (default) for 4–20 mA output; this parameter must be set before calibrating the analog output
ERRACT	Error Action – specifies how the analog output responds to system error conditions; Settings: • **FULLSC** (default) – set to full value (10 V or 20 mA) • HOLD – hold current value • ZEROSC – set to zero value (0 V or 4 mA)
MIN	Specifies the minimum weight value tracked by the analog output; Enter value: 0–9999999, **000000** (default)
MINNEG	Specify ON if the minimum weight (MIN parameter) is a negative value; Settings: **OFF** (default), ON
MAX	Specifies the maximum weight value tracked by the analog output; Enter value: 0–9999999, **10000** (default)
MAXNEG	Specify ON if the maximum weight (MAX parameter) is a negative value; Settings: **OFF** (default), ON
TWZERO	Tweak Zero – enter tweak value to adjust the analog output zero calibration; use a multimeter to monitor the analog output value; Enter value: 0–65535, **40** (default)
TWSPAN	Tweak Span – enter tweak value to adjust the analog output span calibration; use a multimeter to monitor the analog output value; Enter value: 0–65535, **59650** (default)

Table 4-24. Analog Output Menu Parameters

4.13 Fieldbus Menu

The Fieldbus menu is only displayed if a DeviceNet, PROFIBUS®, EtherNet/IP, or ControlNet option card is installed. The SWAP parameter on the FLDBUS menu enables byte swapping by the *iRite* BusCommand handler rather than requiring a SWP (SWAPBYTE) instruction in the PLC. Byte swapping is enabled by default for DeviceNet cards; for all other fieldbus cards, byte swapping is disabled by default.

- BYTE swaps bytes within the word before transmission to the scanner
- WORD swaps words 1 and 2, 3 and 4, within a 4-word packet
- BOTH performs both operations, swapping bytes within a word and swapping words within the packet
- NONE disables swapping

The DATASIZE parameter sets the size of the BusCommand handler data transfers. The default value (8 bytes) matches the default data size specified in the EDS and GSD files, and used by the standard discrete transfer commands. DATASIZE can be set to any value from 2–128 bytes (1–64 words), but the value specified must match the data size set for the PLC Scanner I/O data size.

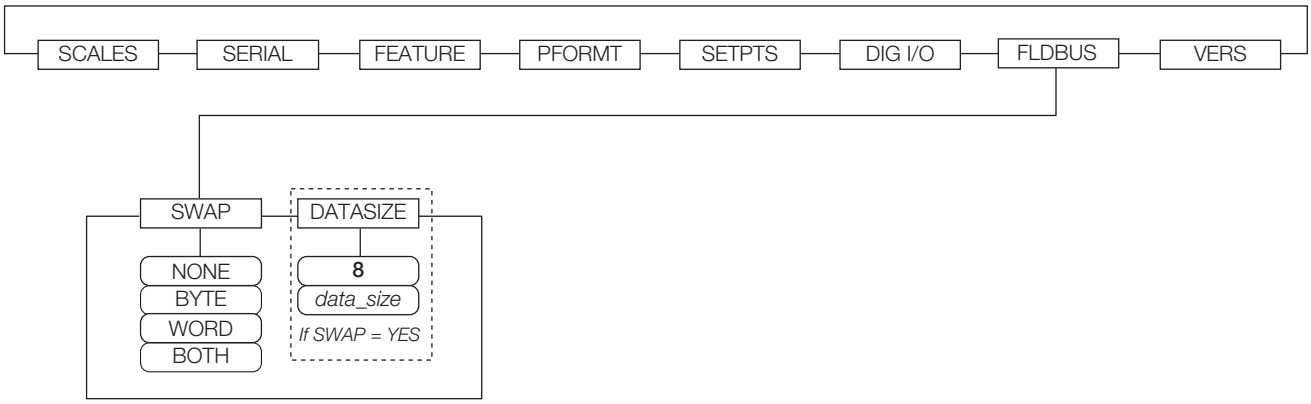

Figure 4-19. Fieldbus Menu

Parameter	Description
SWAP	Specifies byte-swapping used for the fieldbus card; Settings: NONE, BYTE, WORD, BOTH (Default for DeviceNet is **BYTE**; default for all other cards is **NONE)** ***NOTE: In Version 3.08 firmware, this parameter supports values of YES (byte swapping) or NO. Version 3.09 replaces YES with BYTE, NO with NONE, and adds the values WORD and BOTH.***
DATASIZE	Data Size – specifies the data size, in bytes, that the BusCommand handler transfers; Settings: 2-12, **8** (default); if parameter is set to a value other than the default (8 bytes), ensure that it matches the Scanner I/O data size specified for the PLC

Table 4-25. Fieldbus Menu Parameters

4.14 Version Menu

The Version 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.

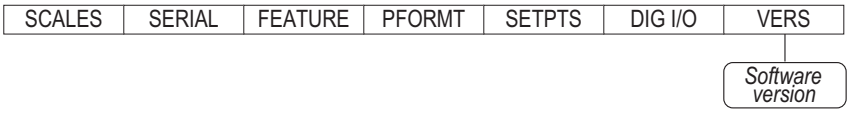

Figure 4-20. Version Menu

The **Contacts** softkey on the Version menu allows display of contact information (see Section 4.8.1 on page 39). If an *iQUBE*^{2} scale is configured, a **Diagnostics** softkey also provides access to *iQUBE2* diagnostic information.

5.0 Maintenance/Troubleshooting

Note See the 920i technical manual (PN 67887) for section references not found in this manual.

5.1 Troubleshooting

Table 5-1 lists general troubleshooting tips for various hardware and software error conditions. See the following pages for additional information about specific diagnostic tools. Additionally, the CPU board has diagnostic LEDs that flash when sending/receiving data, and a heartbeat LED for troubleshooting.

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; if power supply appears bad, check the small glass fuse (2.5A, 5x20mm PN 85791) 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	Check LCD contrast pot (under interface board access cover); possible corrupt core software; reset or reload software
A critical configuration error has been detected	Indication of a bad battery; press **Enter** to retrieve the last Save and Exit contents
Hangs in **888** display	Corrupt core software; reset or reload software
Tare and truck data pointers are corrupt, Tare storage is corrupt 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
Divide by zero error message at startup	User program error; see Section 12.1.3 on page 118
ERROR message in weight display	Excitation voltage too low or off; excitation voltage is provided by the A/D card
Dashes in weight display	Over-range or under-range scale condition; check scale for out-of -range conditions in total scale display, check all scale inputs for positive weight values
Display reads ***0.000000***	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, un-configure 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 *920i*: Check SFMT specification under SERIAL menu
Option ***x*** Error	Field bus card (PROFIBUS, DeviceNet, or Remote I/O) in slot **x** failed to initialize
Option card failure	Possible defective card or slot; disconnect power, install card in different slot, then apply power again
Option card hardware diagnostic error	Required option card not found; see Section 5.2 on page 21
Expansion board does not power up	Check expansion board power supply
Download error during PLOAD command	Insufficient memory for PLOAD mapping due to older CPU board; large programs may require Rev E or later *920i* CPU board

Table 5-1. Basic Troubleshooting

5.2 Specifications

Power

AC voltages: 100-240 VAC Frequency: 50-60 Hz

DC voltages: 12-24 VDC

Consumption: AC: 25W universal, 65W panel & wall mount

DC: 25W

Excitation Voltage

10 ± VDC 8 x 350 Ω or 16 x 700 Ω load cells per A/D card

Analog Signal Input Range

-45 mV to +45 mV

Analog Signal Sensitivity

0.3 µV/graduation minimum at 7.5 Hz

1.0 µV/graduation recommended

A/D Sample Rate

7.5 to 960 Hz, software selectable

Resolution

Internal: 8 million counts

Display: 9,999,999

System Linearity

± 0.01% full scale

Digital I/O

Six I/O channels on CPU board; optional 24-channel I/O expansion boards available

Communication Ports

Four ports on CPU board support up to 115,200bps

Port 1: Full duplex RS-232

Port 2: RS-232 with CTS/RTS; PS/2 keyboard interface via DB-9 connector

Port 3: Full duplex RS-232, 20 mA output

Port 4: Full duplex RS-232, 2-wire RS-485,

20 mA output

Optional dual-channel serial expansion boards available

Channel A: RS-232, RS-485, 20 mA

Channel B: RS-232, 20 mA

Display

4.6" x 3.4" (116 mm x 86 mm), 320 x 240 pixel LCD module with adjustable contrast.

Transmissive display

Transflective display (optional)

Keys/Buttons

27-key membrane panel, tactile feel, PS/2 port for external keyboard connection

Temperature Range

Certified: 14° to 104° F (-10° to +40° C)

Operating: 14° to 122° F (-10° to +50° C)

Weight

Universal enclosure: 9.5 lb (4.3 kg)

Wall mount enclosure: 23.0 lb (10.4 kg)

Panel mount enclosure: 8.5 lb (3.9 kg)

Deep universal: 11 lb (5.0 kg)

Rating/Material

NEMA Type 4X/IP66, stainless steel

Warranty

Two-year limited warranty

EMC Immunity

EN 50082 Part 2 IEC EN 61000-4-2, 3, 4, 5, 6, 8, and 11

Approvals

NTEP

CoC Number . . . 01-088

Accuracy Class III/IIILnmax : 10 000

Measurement Canada

Approval. AM-5426

Accuracy Class III . . . . . n_{max} : 10 000

UL

Universal and Deep Universal

File Number:. . . E151461

Panel mount

File Number:. . . E151461, Vol 2

Wall mount

UL 508A control panel approved

File Number:. . . E207758

OIML

GB-1140. . . . . n_{max} : 6 000

GB-1135. . . . . n_{max} : 10 000

CE

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