CW-90/90X

Checkweigher

Firmware Version 1.05

Installation Manual

REVOLUTION® SCALE SOFTWARE

WeighVault™

RICE LAKE®
WEIGHING SYSTEMS
To be the best by every measure®

105942

Contents

About This Manual 1

1.0 Introduction 1

1.1 Operating Modes 1
1.2 Keypad Functions 1
1.3 Tare Recall 2
1.4 Annunciators LEDs 2
1.5 Bar Graph LEDs 3

2.0 Installation 4

2.1 Unpacking and Assembly 4
2.2 Leveling 5
2.3 Making Power Connections 5
2.4 Enclosure Disassembly 5
2.5 Load Cell Wiring 5
2.6 Wire Specifics 5
2.7 Cable Grounding 5
2.7.1 Serial Communications 6
2.7.2 Digital I/O 6
2.8 Enclosure Reassembly 7
2.9 Board Removal 7
2.10 Battery Replacement 7
2.11 Installing Option Cards 7
2.12 Replacement Parts and Assembly Drawings 9

3.0 Configuration 13

3.1 Menu Navigation 13
3.2 Audit Menu 14
3.3 Calibration Menu 14
3.4 Setup Menu 16
3.4.1 SCALE Submenu 16
3.4.2 FEATUR Submenu 21
3.4.3 FEATUR Menu, REGULA / INDUST Submenu 25
3.4.4 Serial, PFORMT, DIG I/O, VERS Submenus 27
3.5 Test Menu 31
3.6 Time and Date Menu 32
3.7 ACCUM Menu 32
3.8 BRIGHT Menu 32
3.9 ID Menu 33

4.0 Calibration 34

4.1 Front Panel Calibration 34
4.2 EDP Command Calibration 35
4.3 Revolution® Calibration 36
4.4 More About Calibration 36
4.4.1 Adjusting Final Calibration 36

5.0 Checkweigher Operation 37

5.1 Range Mode . . . 37
5.1.1 Value Set: Keyed . . . 37
5.1.2 Value Set: Push . . . 38
5.2 Target Weight Mode . . . 38
5.2.1 Value Set: Keyed . . . 38
5.2.2 Value Set: Push . . . 39
5.3 Target Percent Mode . . . 39
5.3.1 Value Set: Keyed . . . 40
5.3.2 Value Set: Push . . . 40
5.4 IDs . . . 41
5.4.1 Setting an ID . . . 41
5.4.2 Using a Stored ID . . . 42
5.4.3 WeighVault . . . 43
5.5 Negative Checkweighing . . . 43
6.0 Serial Commands . . . 45
6.1 The Serial Command Set . . . 45
6.1.1 Key Press Commands . . . 45
6.1.2 ID Commands . . . 46
6.1.3 Reporting Commands . . . 46
6.1.4 Clear and Reset Commands . . . 46
6.1.5 Parameter Setting Commands . . . 46
6.1.6 Normal Mode Commands . . . 50
6.1.7 Unique Commands . . . 50
6.2 Custom Stream Formatting . . . 50
7.0 Print Formatting . . . 53
7.1 Print Formatting Commands . . . 53
7.2 Customizing Print Formats . . . 54
7.2.1 Using the EDP Port . . . 54
7.2.2 Using the Front Panel . . . 54
7.2.3 Using *Revolution*® . . . 55
8.0 WLAN Option Card . . . 56
8.1 WLAN Card Installation . . . 56
9.0 Appendix . . . 57
9.1 Error Messages . . . 57
9.2 Using the XE EDP Command . . . 58
9.3 Status Messages . . . 58
9.3.1 Using the P EDP Command . . . 58
9.3.2 Using the ZZ EDP Command . . . 58
9.4 Continuous Output (Stream) Format . . . 59
9.5 Digital Filtering . . . 59
9.5.1 DIGFL*x* Parameters . . . 60
9.5.2 DFSENS and DFTHRH Parameters . . . 60
9.5.3 Setting the Digital Filter Parameters . . . 60
9.5.4 Audit Trail Support . . . 60
9.6 Regulatory Mode Functions . . . 61
9.7 Updating CW-90/90X Firmware . . . 62
9.8 Specifications . . . 64
CW-90/90X Limited Warranty . . . 66

Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit www.ricelake.com/webinars.

About This Manual

This manual is intended for use by qualified service technicians responsible for installing and servicing the CW-90/CW-90X checkweighing scale.

Caution *Do not open the indicator enclosure! Refer all repairs and modifications to your distributor or qualified service technician. Ensure power is disconnected prior to installing, servicing, transporting, or storing equipment.*

Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at **www.ricelake.com/manuals**.

1.0 Introduction

The CW-90/CW-90X is a high-speed digital weight indicator and scale base programmed to compare weight readings with predetermined tolerance limits defining an “accept” band.

If the current weight reading is within the acceptable range, the green “ACCEPT” LED is illuminated. If the current weight reading is less than the acceptable range, one or more of the red “UNDER” segments is illuminated. If the current weight reading is greater than the acceptable range, one or more of the yellow “OVER” segments is illuminated.
Features include:

- Large .8” (20.3 mm) LED display with “under,” “accept,” and “over” bands
- Full numeric keypad (CW-90 only)
- Four configurable digital inputs/outputs
- Two independent communication ports (2) full duplex, (1) unidirectional active 20 mA current loop

1.1 Operating Modes

The CW-90/CW-90X has two modes of operation:

Normal (Weighing) Mode

Normal mode is the “production” mode of the indicator. The indicator displays the gross or net weight, depending on whether a tare has been entered. LED annunciators indicate the type of weight value.

Menu mode

Most of the procedures described in this manual, including configuration and calibration, require the indicator to be in *Menu* mode.To enter *Menu* mode, press the MENU key (if the Audit jumper is in the “ON” position).The indicator displays “AUDIT.”
If the Audit jumper is in the “OFF” position, remove the large fillister head screw from the bottom of the enclosure. Insert a screwdriver into the access hole and press the setup switch once to enter *Menu* mode.

1.2 Keypad Functions

Key	Function
	Turns the CW-90/CW-90X unit on/off. **Note** If the PC jumper is set to SW, the POWER button must be used to turn the unit on and off. If the PC jumper is set to ON, the unit will automatically power on when it’s plugged in and the only way to turn it off is to unplug power.
	Enters Menu mode, allowing configuration if the Audit jumper is in the “ON” position. Also used as an “escape” key in Menu mode.
	Sets the current gross weight to zero, provided the amount of weight to be removed or added is within the specified zero range and the scale is not in motion. The zero band is defaulted to 1.9% of full scale, but can be configured for up to 100% of full scale. **Note** 1.9% is required for legal for trade applications.
	Switches the weight display to an alternate unit. The alternate unit is defined in the Setup menu, and could be kg, g, lb, oz, or lb/oz. Conversions of the weight reading, the Tare value, the Over value, and the Under value occur when the unit of measure is changed with the Units key. **Note** When working in lb/oz, any entered values need to be entered in ounces. This applies when entering over, under, target, and tare values.
	Sends “on-demand” serial information out the serial port, provided the conditions for standstill are met. PRINT will be displayed while the unit prints.

Table 1-1. Keypad functions

Key	Function
TARE	Performs one of several predetermined Tare functions dependent on the mode of operation selected in the TAREFN parameter (See Section 3.4.1 on page 16). To view a stored tare, see Section 1.3 on page 2.
OVER	Allows the display of the current “over tolerance” value, or allows setting the “over tolerance” value.
UNDER	Allows the display of the current “under tolerance” value, or allows setting the current “under tolerance” value.
TARGET	When the MODE parameter is set to TARGWT or TARG% (see Section 3.4.2 on page 21), this key is used to acquire a weight value and assign it as the desired “target” value. The *CW-90/CW-90X* then computes the final over/under values using the target value and the over/under tolerance settings defined during the weighing operation.
ID	Selects a particular over/under/tare/units register set to be retrieved and used.
ENTER	Used to accept entries and move down to below parameters in Menu mode.
CLR	CW-90 only. Clear key. Used to backspace on entries
Numeric keypad (see Figure 1-1)	CW-90 only. Used to enter values directly.

Table 1-1. Keypad functions (Continued)

Figure 1-1. CW-90 numeric keypad

1.3 Tare Recall

When a stored tare is displayed, the Gross and Net annunciators will be turned off and the PT annunciator will be turned on. To display a stored tare,

1. Press the MENU button.
2. Press the TARE button.
   The tare value will be displayed for 10 seconds. If there is no tare in the system, pressing the TARE button will have no effect.

1.4 Annunciators LEDs

LED	Description
→0← G/B N T PT	**→0← Zero (Center of Zero) LED** While in gross weight display mode, this LED indicates that the current displayed weight reading is within +/-0.25 display divisions of the acquired zero, or is within the center of zero band. When in the net weight display mode, it indicates that the current net weight reading is within +/-0.25 display divisions of the center of net zero. A display division is the resolution of the displayed weight value, or the smallest incremental increase or decrease that can be displayed or printed. **G/B LED** Gross weight mode (or Brutto in OIML mode) **N LED** Net weight display mode. **T LED** Indicates that a tare has been acquired and stored by the system. **PT LED** Indicates that a preset tare weight has been keyed in or entered via the EDP serial port.
% kg g lb oz	Displays which unit of measure is being used. **% LED** Percent mode **kg LED** Kilograms **g LED** Grams **lb LED** Pounds **oz LED** Ounces

Table 1-2. Annunciator LEDs

1.5 Bar Graph LEDs

The bar graph LEDs provide you with a fast way of determining if a container is too heavy (OVER), too light (UNDER), or is within an acceptable weight range (ACCEPT).

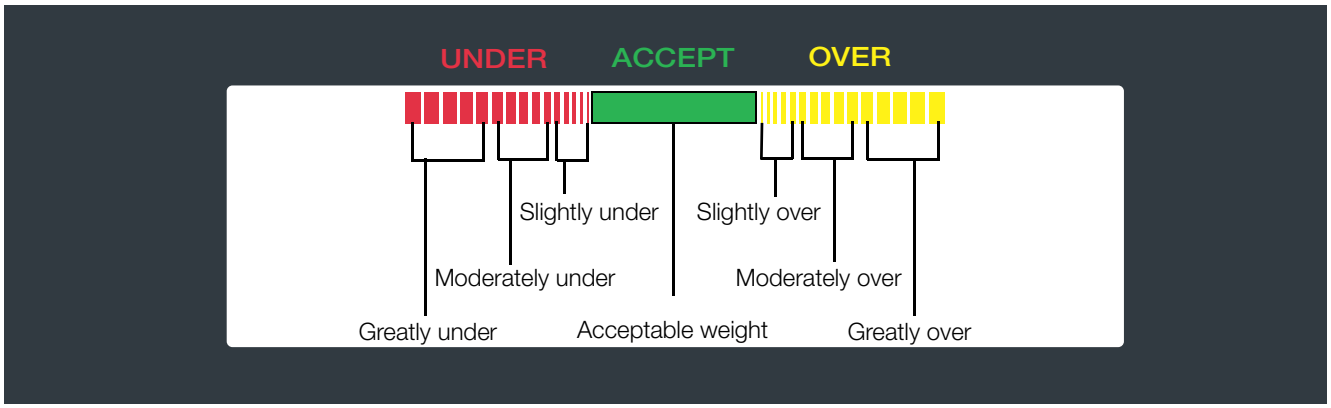


Figure 1-2. Bar graph LEDs

You can enable the UNDER and OVER lights to act as a graph as illustrated in Figure 1-2, or to appear as one a solid bar regardless to how far over/under a weighment is. They can also be disabled so no illumiation is provided. This is done by accessing the Feature menu (see Section 3.4.2 on page 21).

Red Segments

When illuminated, this indicates an underweight condition; the container weighs less than the lowest acceptable value. The leftmost red segments indicate that the container weight is far below the acceptable weight band (greatly under); the rightmost segments indicate that the container weight is almost in the acceptable weight band, but still under (slightly under). Illuminating the center segments indicates middle-ground, or moderately under.

Green Segment

Indicates an acceptable value. When lit, the green segment (one solid bar) indicates that the container weight is within the actual acceptable band of weight limits.

Yellow Segments

When illuminated, this indicates an overweight condition; the container weighs more than the highest acceptable value. The rightmost yellow segments indicate that the container weight is far above the acceptable weight band (greatly over); the leftmost segments indicate that the container weight is almost in the acceptable weight band, but still over (slightly over). Illuminating the center segments indicates middle-ground, or moderately over.

2.0 Installation

This section contains instructions on unpacking and assembly, leveling, making power connections, load cell wiring, wiring standard serial port, optional network communications, wiring optional digital outputs, optional backup battery operation, board diagrams, and power-up sequence.

Caution Do not pick up the scale by the “spider” assembly which supports the platter. Lifting by the spider may damage the load cell. Lift the scale from under the base to move it. If the rear panel of the indicator is removed, align the gasket holes carefully to prevent driving a screw through the gasket and causing a leak. Tighten screws to 15 in/lbs (1.7 N-m) in alternating patterns shown Figure 2-1.

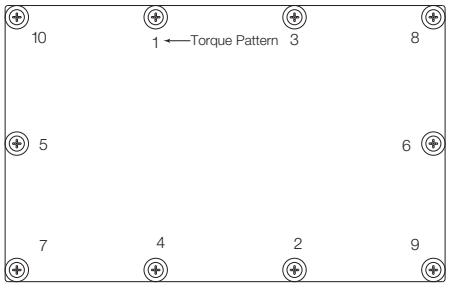


Figure 2-1. Indicator back panel screw tightening sequence

2.1 Unpacking and Assembly

The indicator head and support column or stand are shipped detached from the scale platform.

3. Remove all assemblies from the shipping carton. Notice that the head and scale platform are joined by a load cell cable. This cable is correctly wired to the load cell terminal in the indicator head. Do not pull with excessive force on the connections at either end of this cable.
4. If mounting the head onto a column, remove the platter from the scale platform and set aside.
5. Invert the platform to access the column mounting holes on the rear and bottom of the platform.
6. Position the column over the four mounting holes. Install (2) 1/4-20 x 3/4” cap screws and (2) lock washers in mounting holes on bottom side of the platform. Install (2) 1/4-20 x 1-3/4”cap screws, (2) lock washers, and (2) column supports in mounting holes on rear of platform. Install coupling nuts, counter bored end first, onto threaded stem of rubber feet. Install feet onto bottom side of the column.
7. Turn the CW-90/90X upright and replace the platter on the platform.
8. Attach indicator to the column with the two knobs and nylon washers provided. Position nylon washers between indicator enclosure and column mounting holes.

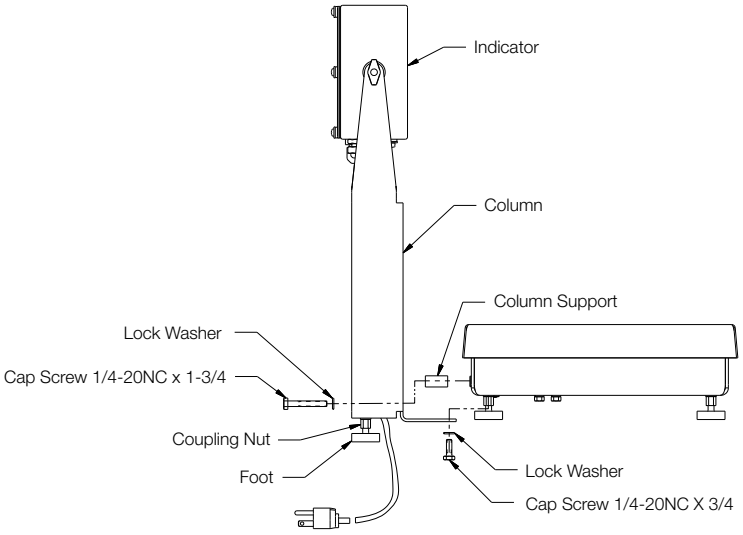


Figure 2-2. Mounting column to scale platform

2.2 Leveling

Select a location for the *CW-90/90X* that is reasonably level and free of vibrations and air currents. Adjust the four corner feet on the base and refer to the bubble level on the inside frame. The base should not rock and the feet should have solid contact with the surface. If using a column, adjust the two column feet until they make solid contact with the support surface.

Note *Ensure the nut on each foot's bolt is secured flush against the scale base.*

2.3 Making Power Connections

The power source used for the CW-90 must be properly grounded to an acceptable earth ground. If the indicator is remotely mounted, the platform must be separately grounded from the chassis ground screw located on the bottom of the platform. Connect this screw with 18 gauge wire to the same earth ground system as the AC power source. Failure to ground the base may cause static buildup and incorrect weights.

Note *The CW-90 must be installed near an easily accessible power outlet to allow for quick disconnect in case of emergency.*

2.4 Enclosure Disassembly

The indicator enclosure must be opened to connect cables for load cells, communications, and digital inputs/outputs.

Warning ***Before opening the unit, ensure the power cord is disconnected from the power outlet. The power outlet must be located near the indicator to allow the operator to easily disconnect power to the unit.***

Ensure power to the indicator is disconnected, then place the indicator face-down on an antistatic mat. Remove the screws holding the backplate to the enclosure body, then lift the backplate away from the enclosure and set it aside.

2.5 Load Cell Wiring

On all complete units (indicator head and base), the load cell has been wired to the indicator's CPU load cell terminal at the factory. If you have purchased just the indicator head, you must wire the load cell.

Wire the cable to the CPU board's J1 connector as shown in Table 2-1. Leave any excess cable outside of the indicator head during installation

Note *If using a 4-wire connection, set JP1 and JP2 to ON. If using a 6-wire connection, set JP1 and JP2 to OFF.*

J1 Pin	Function
1	+ Signal
2	- Signal
3	+ Sense
4	- Sense
5	+ Excitation
6	- Excitation

Table 2-1. J1 pin assignments

2.6 Wire Specifics

Wires connecting to J1, J2, J3, or J4 should adhere to the following specifications:

Wire Range	Wire Strip Length
28~12 AWG stranded or solid wire	5~6 mm (3/16" ~ 1/4")

Table 2-2. Wire specifications for connectors

2.7 Cable Grounding

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

- Use the lockwashers, clamps, and kep nuts provided in the parts kit to install grounding clamps on the enclosure studs adjacent to cord grips. Install grounding clamps only for cord grips that will be used; do not tighten nuts.
- Route cables through cord grips and grounding clamps to determine cable lengths required to reach cable connectors. Mark cables to remove insulation and shield as described below:
- For cables with foil shielding, strip insulation and foil from the cable half an inch (15 mm) past the grounding clamp (see Figure 2-3). Fold the foil shield back on the cable where the cable passes through the clamp. Ensure silver (conductive) side of foil is turned outward for contact with the grounding clamp.
- For cables with braided shielding, strip cable insulation and braided shield from a point just past the grounding clamp. Strip another half inch (15 mm) of insulation *only* to expose the braid where the cable passes through the clamp (see Figure 2-3 on page 6).
- Finish installation using cable mounts and ties to secure cables inside of indicator enclosure.

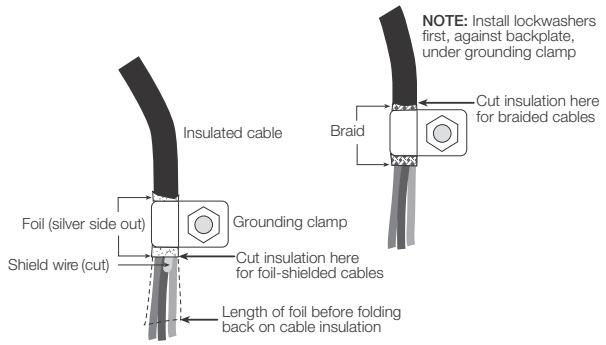


Figure 2-3. Grounding Clamp Attachment for Foil-Shielded and Braided Cabling

2.7.1 Serial Communications

Wire the serial communications cables to J2, which is Port 1 (5-wire RS-232 port). J3 is Port 2 (RS-232 and 20 mA). Connect communications cables to J2 and J3 as shown in Table 2-3.

Use cable ties to secure serial cables to the inside of the enclosure.

Port 1 supports full duplex RS-232 communications only; Port 2 provides either active 20 mA output or duplex RS-232 transmission. Both ports are configured using the SERIAL menu. See Section 3.4.4 on page 27.

Connector	Pin	Signal	Port
J2	1	Ground	1
	2	Ground	
	3	Tx	
	4	Rx	
	5	DTR	
	6	RTS	
J3	1	20mA+	2
	2	Ground	
	3	Tx	
	4	Rx	
	5	CTS	
	6	RTS	

Table 2-3. J2 and J3 pin assignments

2.7.2 Digital I/O

The Digital I/O can be configured as either digital inputs or digital outputs as determined by the DIO menu (see Section 3.4.4 on page 27). The inputs are active (on) with low voltage (0 VDC) and can be driven by TTL or 5V logic without additional hardware. Use the DIG I/O menu (see Section 3.4.4 on page 27) to configure the digital inputs. LEDs on the CPU board light when digital inputs are active (see Figure 2-4).

Digital outputs are typically used to control relays that drive other equipment. Outputs are designed to sink not source, switching current. Each output is a CMOS 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 5 VDC supply. LEDs on the CPU board light up when the digital outputs are active (see Figure 2-4).

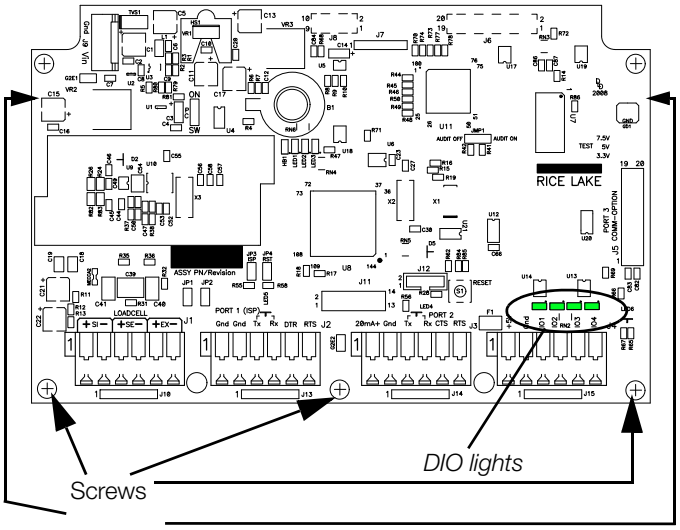


Figure 2-4. Digital I/O lights and screw locations

Connector	Pin	Signal
J4	1	+5V
	2	Ground
	3	DIG I/O 1
	4	DIG I/0 2
	5	DIG I/O 3
	6	DIG I/O 4

Table 2-4. J4 Pin Assignments (Digital I/0)

2.8 Enclosure Reassembly

Once the cabling is complete, position the backplate over the enclosure and reinstall the screws. Use the torque pattern shown in Figure 2-1 on page 4 to prevent distortion. Torque to 15 in/lbs (1.7 N-m).

2.9 Board Removal

If you must remove the *CW-90/90X* CPU board, use the following procedure:

1. Disconnect power to the indicator. Remove backplate as described in Section 2.4 on page 5.
2. Disconnect power supply cable from connector J9 on the *CW-90/90X* CPU board.
3. Disconnect the wires at the following connectors: J1, J2, J3, J4.
4. There are two boards: the CPU board and the keypad display board. Remove the five screws connecting the CPU board (see Figure 2-4), then lift the board out of the enclosure.

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

2.10 Battery Replacement

Caution *Risk of explosion if battery is replaced with incorrect type.*
Dispose of batteries per manufacturer instructions.

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 this battery includes time and date, IDs, and configuration information. If any data is lost, the indicator configuration can be restored from the PC. Watch for the low battery warning on the LCD display and periodically check the battery voltage on the CPU board. 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. Use Revolution to store a copy of the configuration before attempting to replace the battery.

For best results, replace the battery while in weigh mode and with AC power applied. use care not to bend the battery retaining spring.

2.11 Installing Option Cards

Caution Option cards are not hot-pluggable. Disconnect power cord entirely before installing option cards.

Note *Ethernet port is not suitable for connection to circuits used outside the building and is subject to lightning or power faults.*

Each option card is shipped with installation instructions specific to that card. For specific instructions on the WLAN card, refer to Section 8.0 on page 56.
The general procedure for all option cards is:

1. Disconnect power cord from the indicator.
2. Remove the backplate as described in Section 2.4.
3. Install the plastic standoffs in the standoff holes (shown as black-shaded circles in Figure 2-5).
4. Carefully align the option card connector with the J5 connector on the CPU board.
5. Press down firmly to seat the option card in the CPU board connector.
6. Make connections to the option card as required. Use cable ties to secure loose cables inside the enclosure. When installation is complete, reassemble the enclosure as described in Section 2.8.

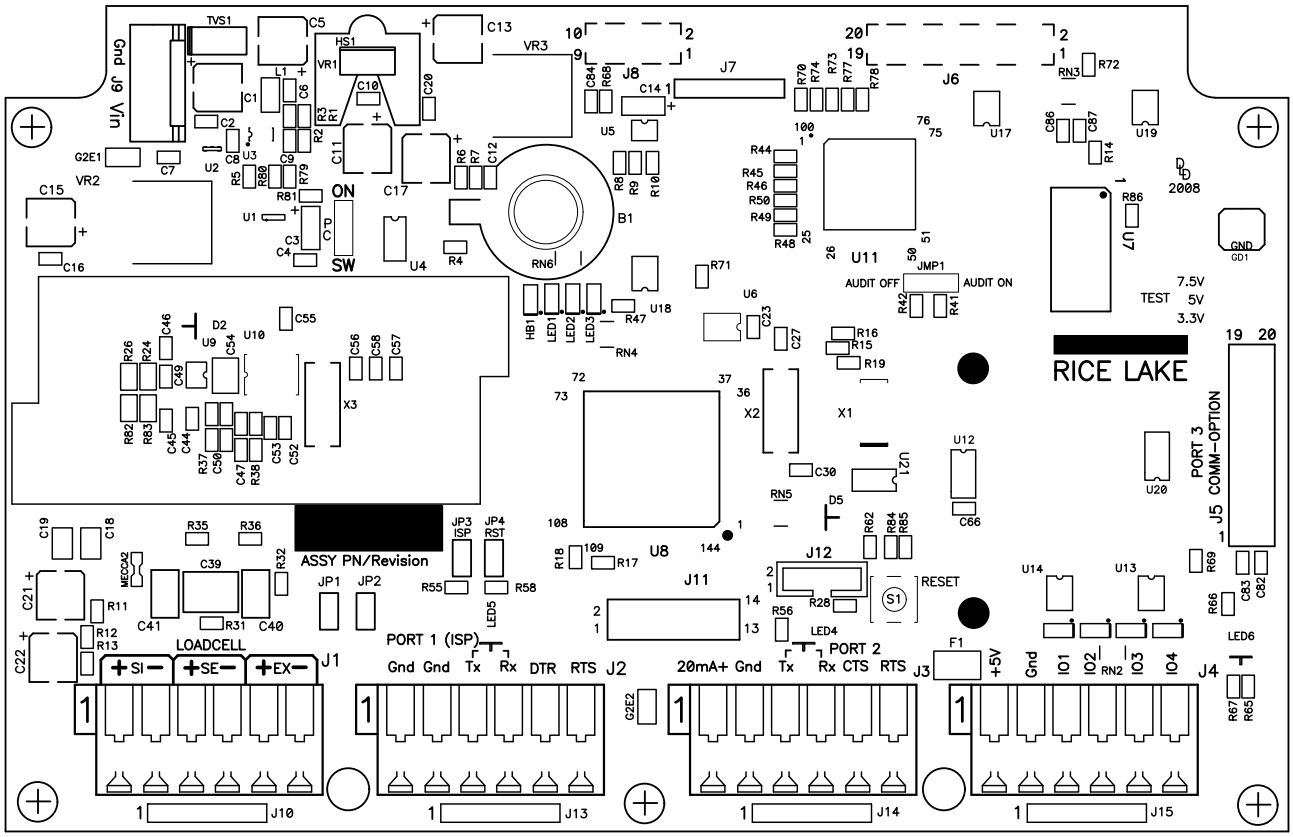


Figure 2-5. CW-90/90X CPU board

Jumper	Description
JP1/JP2	Jump excitation to sense. If using a 4-wire load cell cable, leave JP1 and JP2 on. If using a 6-wire load cell cable, take JP1 and JP2 off. Default is ON.
JP3/JP4	Used when upgrading firmware. The jumpers should be on when upgrading firmware and off when the update is complete.
PC	Power control. If the jumper is set to SW, the POWER key can be used to turn the unit on/off. If set to ON, the unit will power on when plugged in and can only be powered off by unplugging.
JMP1	If set to Audit ON, calibration and configuration can be acessed through the front keypad. If set to Audit OFF, calibration and configuration can only be accessed by removing the screw on the base of the unit and pressing the Setup switch with a screwdriver. Default is Audit ON.

Table 2-5. Jumper descriptions

Note *If the RESET button on the CPU board is pressed, the indicator will perform a reboot.*

2.12 Replacement Parts and Assembly Drawings

Ref Number	Part Number	Description (Quantity)
31	103610	Knob, Black 1/4-20 (2)
30	103988	Washer, Nylon .52 ID x (2)
13	104914 104915	Overlay, Membrane Switch (CW-90) Overlay, Piezo (CW-90X)
--	105945	Parts Kit, CW-90/90X (1)
18	105976	Cable ASSY, Power Supply (1)
19A	102354	CPU (1)
19B	105741	Display (1)
3	14621	Nut, Kep 6-32NC HEX (2)
11	14626	Nut, Kep 8-32NC HEX (3)
16	14822	Screw, MACH 4-40NCx1/4 (6)
17	14825	Screw, MACH 4-40NCx1/4 (4)
27	14862	Screw, MACH 8-32NCx3/8 (4)
10	15134	Washer, Lock NO 8 Type A (3)
34	16861	Label, Warning High (1)
9	16892	Label, Earth Ground (1)
29	29635	Stand, Tilt SST (1)
21	42640	Screw, MACH 1/4-28NF X 1/4 (1)
22	44676	Washer, Bonded Sealing (1)
28	45042	Washer, Bonded Sealing SST (4)
12	45043	Wire, Ground 4in W/No.8 (1)
--	50425	Carton, 13.14x9.00x7.11 (1)
--	53452	Insert, Carton N.J. D/C (1)
8	58983	Cable Grip, SL-7 w/Nut (3)
6	68599	Seal Ring, Nylon PG-11 (1)
5	68600	Cord Grip, PG11 (1)
7	68601	Nut, PG11 (1)
20	69291	Battery, 3v Coin Lithium (1)
15	76556	Power Supply, Switching (1)
24	84388	Gasket, Backplate 420 (1)
4	85202 85203	Power Cord ASSY, 120VAC (1) Power Cord ASSY, 230VAC (1)
25	88733	Vent, Breather Sealed (1)
26	88734	Nut, Breather Vent (1)
--	107476	Bench Scale Foot
--	105555	Coupling Nut for Feet and Overload Stops

Figure 2-6. CW-90/90X replacement parts

Scale Capacity	Load Cell Part Number
5 lb	107174
10 lb	107174
25 lb	107175
50 lb	107176
100 lb	107177

Table 2-6. CW-90X Load Cells

Scale Capacity	Load Cell Part Number
5 lb	107756
10 lb	107757
25 lb	107758
50 lb	107759
100 lb	107760

Table 2-7. CW-90 Load Cells

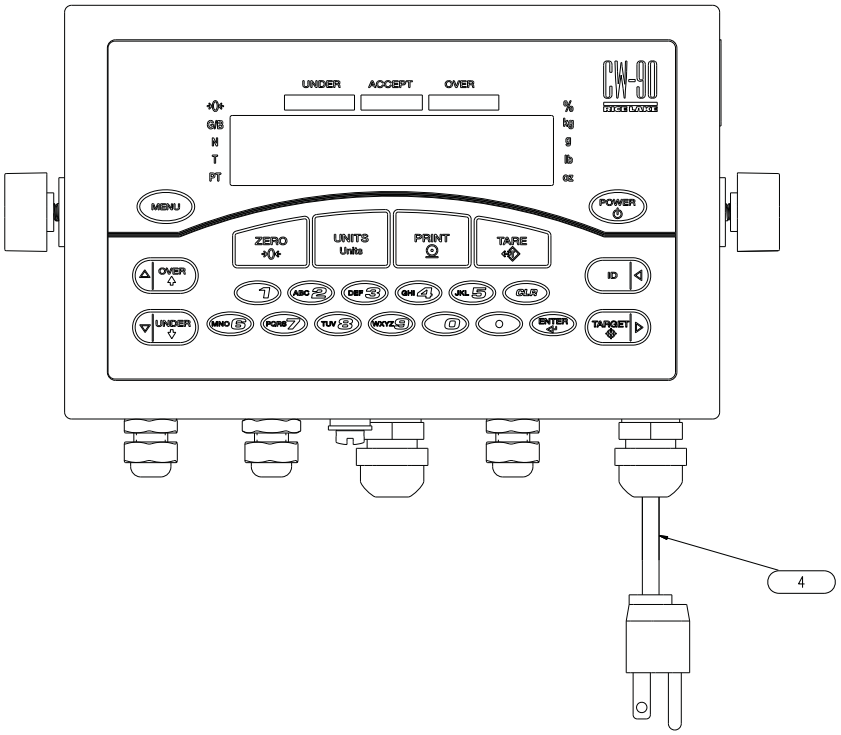


Figure 2-7. CW-90/90X front view

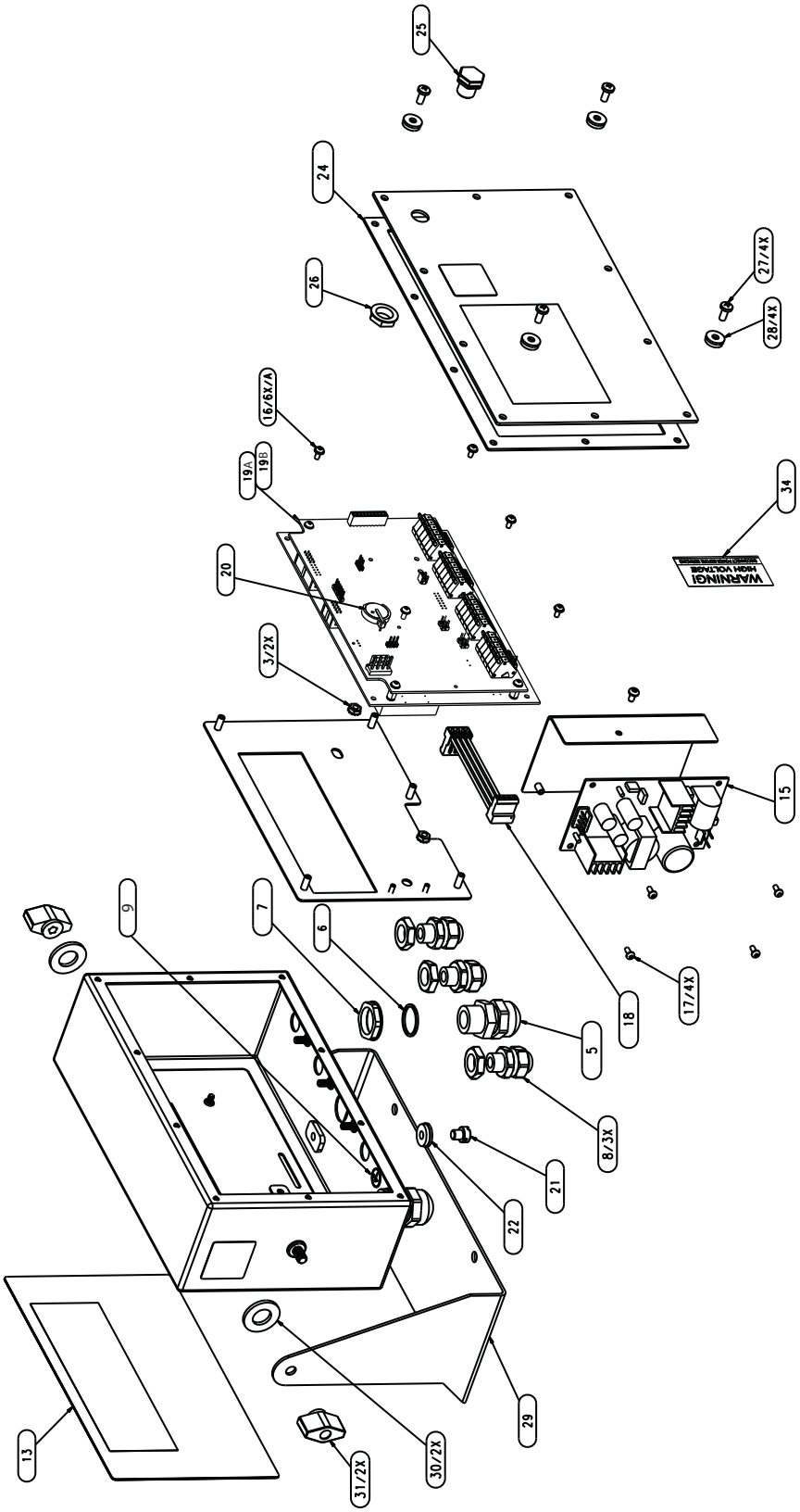


Figure 2-8. CW-90/90X assembly and components

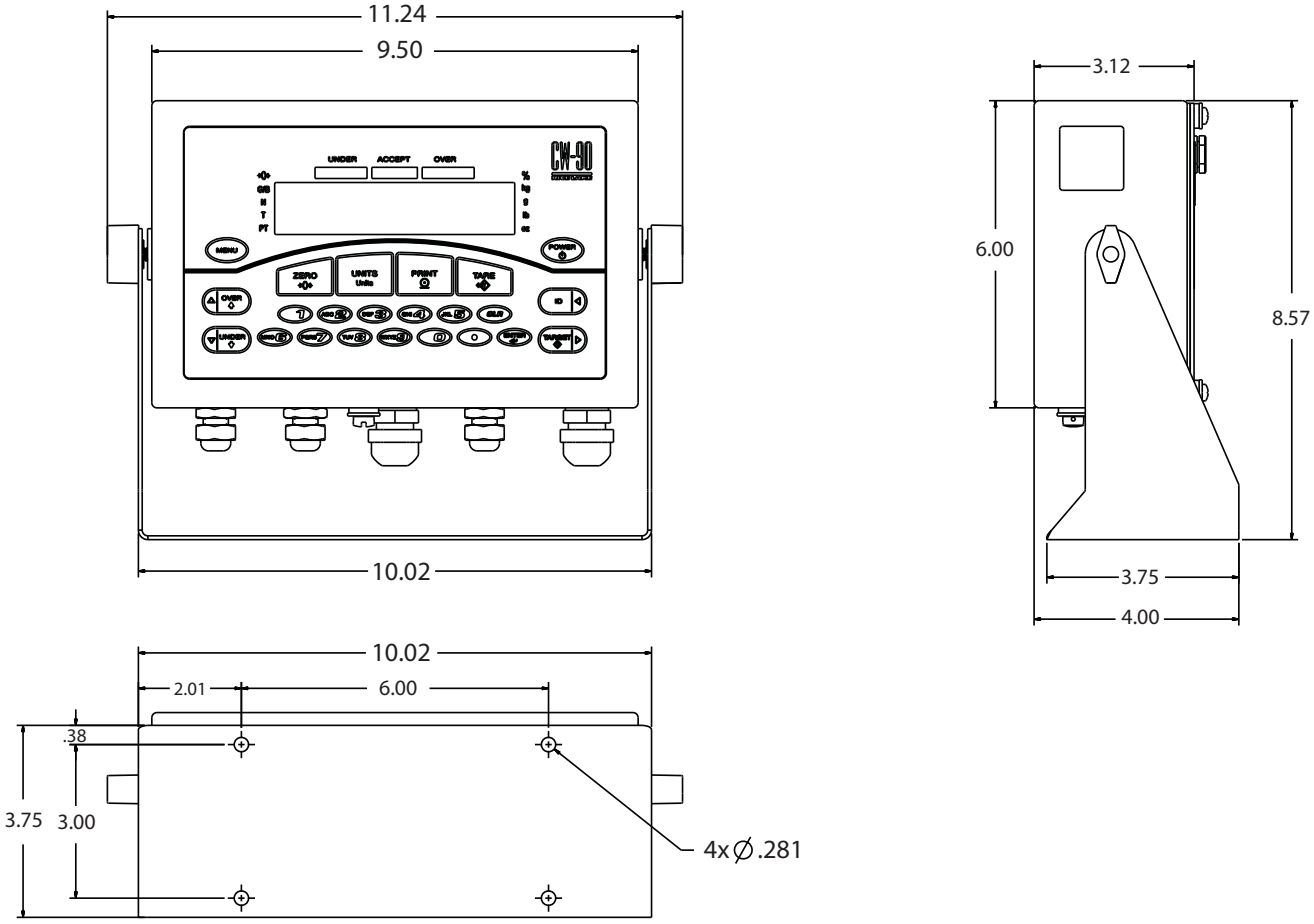


Figure 2-9. CW-90/90X dimensions

3.0 Configuration

To set up and configure the CW-90/90X checkweigher, you will either use the Menu key on the front panel or press the setup switch on the bottom of the indicator. The indicator is defaulted at the factory with the audit trail jumper (JMP1) in the ON position, allowing configuration access by pressing the Menu key. Pressing the Menu key will take you to the *Audit* menu selection. Use the **ID** (◁) and **TARGET** (▷) navigation keys to move to other menu selections. Use the **UNDER** (▽) and **OVER** (△) navigation keys to enter and exit menu selections, respectively.

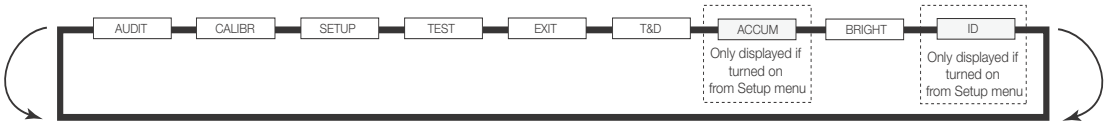


Figure 3-1. Menu mode navigation structure

Menu		Function
AUDIT	Audit Trail	Displays the legally relevant (LR) firmware version, configuration count, and calibration count.
CALIBR	Calibrate	Calibrates the scale.
SETUP	Setup	Accesses setup options for the scale, features, serial output, print format, digital inputs and outputs, and displays the version number.
TEST	Test	Performs a basic test on the A/D, digital inputs and outputs, communication ports, RAM, and keypad.
EXIT	Exit	Exits Configuration mode and returns to the weigh screen.
T&D	Time & Date	Allows you to view and change time and date.
ACCUM	Accumulator	Displays the current accumulator value.
BRIGHT	Brightness	Adjusts display intensity on a scale from 0 (dimmest) to 7 (brightest).
ID	ID	Allows you to setup or edit IDs.

Table 3-1. Menu menu summary

3.1 Menu Navigation

Once you have entered the menus, you can use the front panel buttons to navigate. Note the looped menu structure shown in Figure 3-1. This provides a shortcut for accessing the rightmost menu items by navigating to the left, and vice-versa for the opposite side of the menu. This shortcut also holds true for sub-menu navigation.

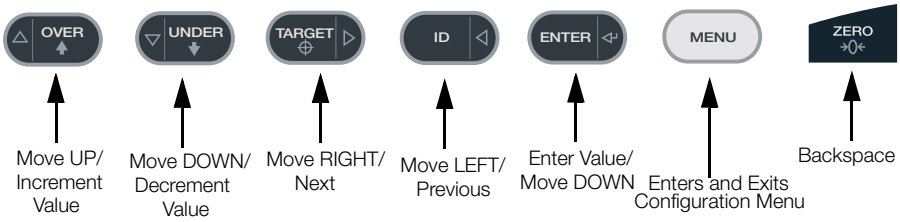


Figure 3-2. Front Panel Key Functions in Menu mode

During calibration, the ENTER key acts as a data entry confirmation key. It also acts as an EXECUTE key and accepts the value upon successful calibration. On the CW-90, the ZERO or CLR key can be used for a backspace.

Various keys are used as directional keys to navigate through the menus (see Figure 3-2). The **ID** (◁) and **TARGET** (▷) keys scroll left and right (horizontally) on the same menu level; **OVER** (△) and **UNDER** (▽) move up and down (vertically) to different menu levels. These keys have a directional symbol indicating its menu navigation function. The **ENTER** key has the same function as **UNDER** (▽) when navigating the menu; either will move down to access sub-categories of a main menu item. When adding or editing data using the CW-90X, the **OVER** (△) and **UNDER** (▽) keys will edit the blinking digit. The **ID** (◁) and **TARGET** (▷) keys navigate to another digit. This also applies to the CW-90, whose numeric keys can be used to insert a digit to the right of the blinking digit. Press **ENTER** to accept the data and return to the next menu item.

To exit Configuration and return to weighing, press the MENU *key or navigate to the* EXIT *menu and press* ENTER.

3.2 Audit Menu

The audit menu accesses audit trail support. It provides tracking information for configuration and calibration events. To prevent potential misuse, all configuration and calibration changes are counted as change events. Audit information can be printed by pressing the PRINT key while displaying the audit trail items beneath the AUDIT menu.

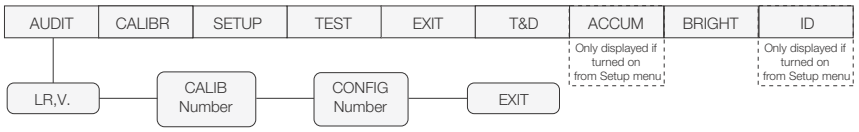


Figure 3-3. Audit menu

AUDIT Menu	
Parameter	Description
LR.V.	Legally relevant firmware version.
CALIB Number	Displays total calibration events. The display alternates (in one-second intervals) between CALIB and the four-digit number.
CONFIG Number	Displays total configuration events. The display alternates (in one-second intervals) between CFG and the four-digit number.
EXIT	Exits the audit trail and returns to weigh mode.

Table 3-2. Audit menu parameters

3.3 Calibration Menu

See Section 4.0 on page 34 for calibration procedures. The *Calibration* menu can be protected by assigning a password in the Feature menu.

Note

*When entering a floating point value, the decimal point will appear and flash on the far right (if it is not already on the screen). To move the decimal, press **ENTER**, then use the ◁ and ▷ keys to move the decimal to the desired location.*

The CW-90/90X requires the WZERO and WSPAN points to be calibrated. The linearity points are optional, but must NOT duplicate zero or span. During calibration, the ENTER key acts as a data entry confirmation key. It also acts as an EXECUTE key, and accepts the value if calibration was successful.

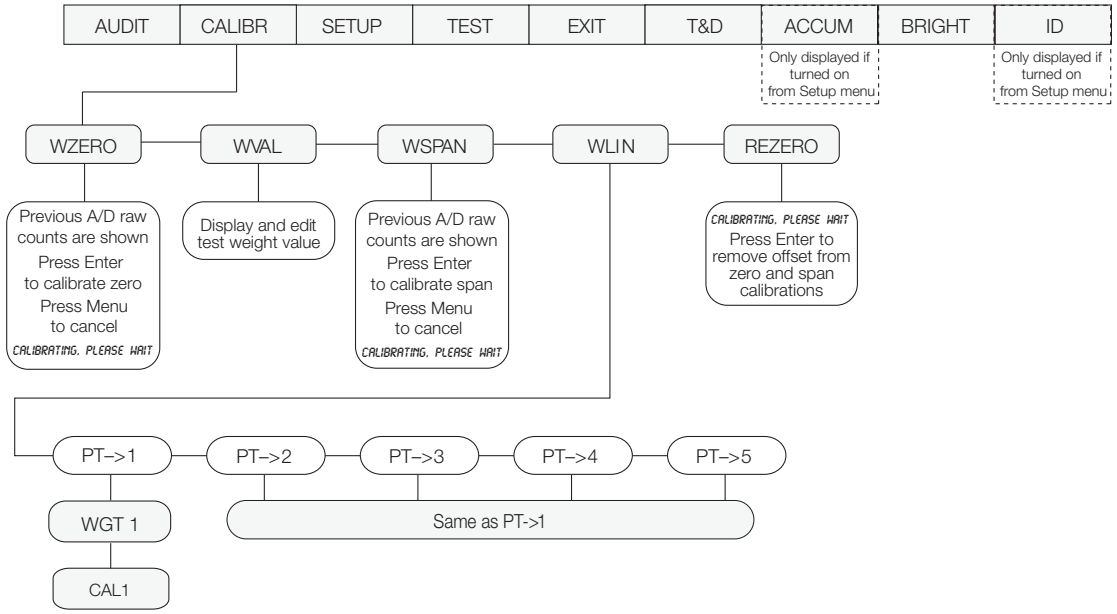


Figure 3-4. Calibration menu

CALIBR Menu		
Parameter	**Choices**	**Description**
Level 2 submenus		
WZERO	—	Press ENTER and the A/D raw counts will be displayed. Press ENTER again to calibrate zero, or press MENU to cancel. “CALIBRATING, PLEASE WAIT” will be appear prior to automatically moving to WVAL.
WVAL	—	Press ENTER to display and edit the test weight value. Press ENTER again to move to WSPAN.
WSPAN	—	Press ENTER and the A/D raw counts will be displayed. Press ENTER to calibrate the span or press MENU to cancel. “CALIBRATING, PLEASE WAIT” will be appear prior to automatically moving to WLIN.
WLIN	PT->1 — PT->5	WGT 1 allows you to display and edit the test weight value. Press ENTER to edit the value. CAL1 allows you to calibrate and display the raw A/D value. Press TARE to perform calibration. Press ENTER to will move to the next calibration point. Note *The linearity points are optional, but must NOT duplicate zero or span. They must be between zero and span.*
REZERO	—	Press ENTER to remove an offset value from the zero and span calibrations (e.g. if hooks or chains are being used during calibration). Note Use this parameter only after WZERO and WSPAN have been set. See Section 4.1 on page 34 for more information about using this parameter.

Table 3-3. Calibration menu parameters

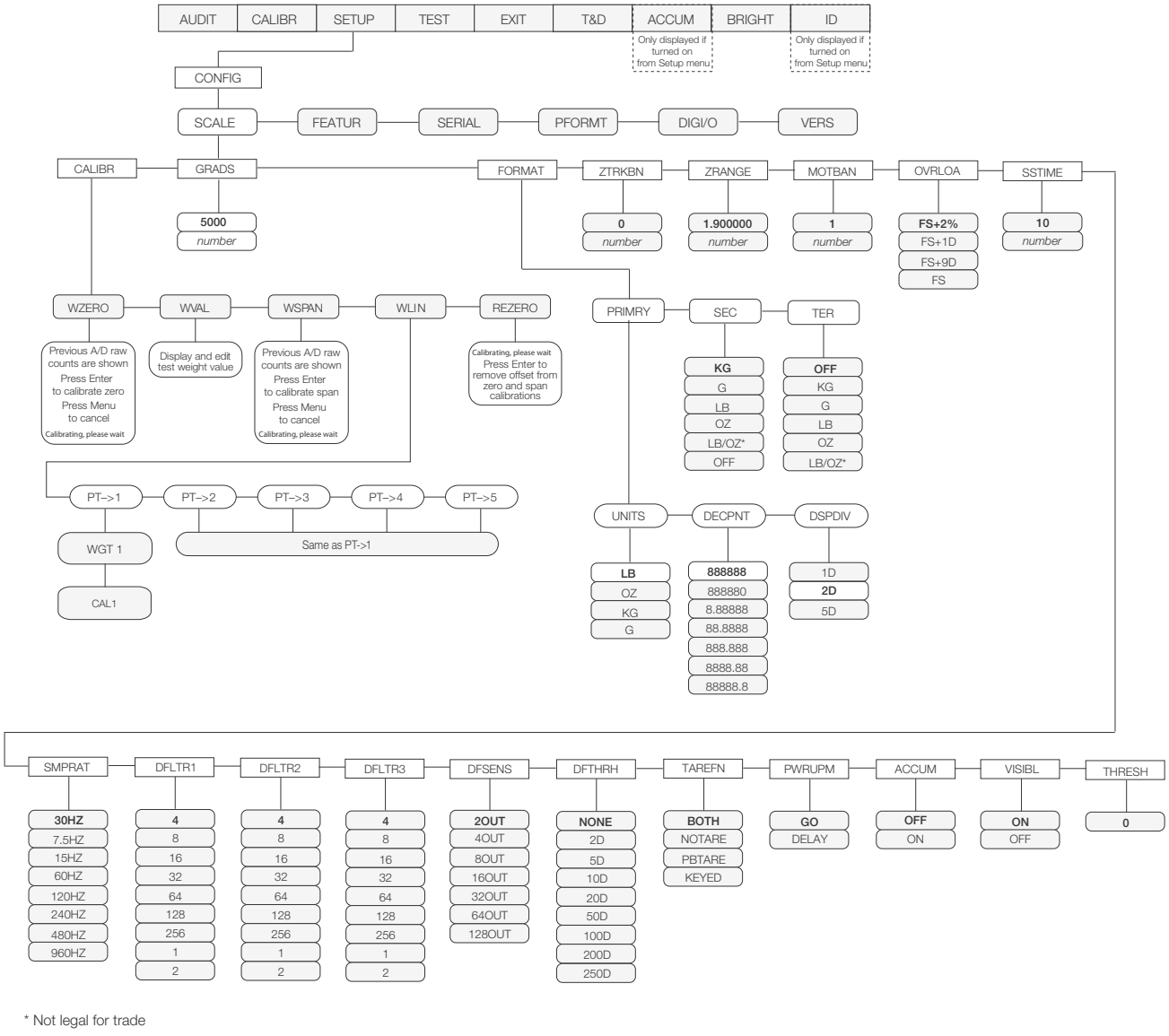
3.4 Setup Menu

The setup menu allows you to configure settings for the scale, features, serial port settings, print format, and digital inputs and outputs. You can also view the software and regulatory versions, and revert to default settings.

If RANGE is displayed after a setup value is entered, the value is too large or small for the given parameter.

3.4.1 SCALE Submenu

Calibration can be performed in two places within the menu: the CALIBR menu shown in Figure 3-5 is an in-depth scale setup and calibration. A “quick access” calibration is shown in *Figure 4-1 on page 34*.



* Not legal for trade

Figure 3-5. Setup menu: Scale submenu

SCALE Menu		
Parameter	**Choices**	**Description**
Level 3 submenus		
CALIBR	WZERO WVAL WSPAN WLIN REZERO	See Section 3.3 on page 14 for descriptions, and see Section 4.0 on page 34 for calibration procedures. Calibration can be performed in two places within the menu: the CALIBR menu shown in Figure 3-5 is an in-depth scale setup and calibration. A “quick access” calibration is shown in *Figure 4-1 on page 34*.
GRADS	**10000** *1–100000*	Specifies the number of full scale graduations. The value entered must be in the range 1–100000 and should be consistent with legal requirements and environmental limits on system resolution. **To calculate GRADS, use the formula: GRADS = *Capacity / Display Divisions*.** Display divisions are specified under the FORMAT submenu. Note *If RANGE is displayed after the value is entered, the value is too large or small for the given parameter.*
FORMAT	PRIMRY SEC TER	Select your primary, secondary, and tertiary units of measure. Sub-choices include lb, kg, oz, and g. Secondary and tertiary units can also be set to lb/oz (lb/oz is not legal for trade), or off.
ZTRKBN	**0** *number*	Automatically zeroes the scale when within the range specified, as long as the input is within the ZRANGE and scale is at standstill. Specify the zero tracking band in ± display divisions. Maximum legal value varies depending on local regulations. Note *For scales using linear calibration, do not set the zero tracking band to a value greater than that specified for the first linearization point.*
ZRANGE	**1.900000** *number*	Selects the range within which the scale can be zeroed. The 1.900000 default value is ± 1.9% around the calibrated zero point, for a total range of 3.8%. Indicator must be at standstill to zero the scale. Use the default value for legal-for-trade applications.
MOTBAN	**1** *number*	Sets the level, in display divisions, at which scale motion is detected. If motion is not detected for 1 second or more, the standstill symbol lights. Some operations, including print, tare, and zero, require the scale to be at standstill. Maximum legal value varies depending on local regulations. If this parameter is set to 0 the standstill annunciator does not light; operations normally requiring standstill (zero, tare, print) are performed regardless of scale motion. If 0 is selected, ZTRKBND must also be set to 0.
OVRLOA	**FS+2%** FS+1D FS+9D FS	Overload. 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.
SSTIME	**10** *number*	Specifies the length of time the scale must be out of motion, in 0.1-second intervals, before the scale is considered to be at standstill. Values greater than 10 are not recommended.
SMPRAT	**30HZ** 7.5HZ 15HZ 60HZ 120HZ 240HZ 480HZ 960HZ	Sample rate. Selects measurement rate, in samples per second, of the analog-to-digital converter. Lower sample rate values provide greater signal noise immunity. Note Settings of 120Hz or above may be too fast to provide the desired stability in some static weighing applications.

Table 3-4. Scale menu parameters

SCALE Menu		
Parameter	**Choices**	**Description**
DFLTR 1-3	**4** 8 16 32 64 128 256 1 2	Selects the digital filtering rate used to reduce the effects of mechanical vibration from the immediate area of the scale. The overall filtering effect can be expressed by adding the values assigned to the three filter stages: DFLTR1 + DFLTR2 + DFLTR3 See Section 9.5 on page 59 for information on digital filtering. Choices indicate the number of A/D conversions per update that are averaged to obtain the displayed reading. A higher number gives a more accurate display by minimizing the effect of a few noisy readings, but slows down the settling rate of the indicator.
DFSENS	**2OUT** 4OUT 8OUT 16OUT 32OUT 64OUT 128OUT	Digital filter cutout sensitivity. Specifies the number of consecutive readings that must fall outside the filter threshold (DFTHRH parameter) before digital filtering is suspended.
DFTHRH	**NONE** 2D 5D 10D 20D 50D 100D 200D 250D	Digital filter cutout threshold. Specifies the filter threshold, in display divisions. When a specified number of consecutive scale readings (DFSENS parameter) fall outside of this threshold, digital filtering is suspended. If NONE is selected, the filter is always enabled.
TAREFN	**BOTH** NOTARE PBTARE KEYED	Enables or disables push-button and keyed tares. Possible values are: BOTH: Both push-button and keyed tares are enabled. NOTARE: No tare allowed (gross mode only) PBTARE: Push-button tares enabled KEYED: Keyed tare enabled
PWRUPM	**GO** DELAY	Power up mode. In GO mode, the indicator goes into operation immediately after a brief power up display test. In DELAY mode, the indicator performs a power up display test, then enters a 30-second warm up period. If no motion is detected during the warm up period, the indicator becomes operational when the warm up period ends; if motion is detected, the delay timer is reset and the warm up period repeated.
ACCUM	**OFF** ON	Accumulator. Specifies whether the scale accumulator is enabled. If enabled, accumulation occurs whenever a print operation is performed. Scale must return to zero to re-arm a new print.
VISIBL	**ON** OFF	Scale visibility. Specifies whether weight data is displayed. Status annunciators, under/accept/over lights remain on in weigh mode even if VISIBL is set to OFF.
THRESH	**0**	Enter a value to be used as display divisions. Zero threshold allows you to select a threshold or reset point where automatic printing functions reset themselves to be retriggered. When a display division value is entered, anything that would normally require the scale to reach zero before it happens/rearms (except for LFT parameters) now only needs to go below this display division value and then above it again. Note *If checkweighing is used, THRESH should be less than the under value or it can disable the digital I/O points from tripping.*

Table 3-4. Scale menu parameters (Continued)

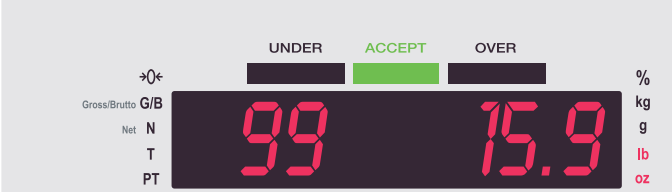
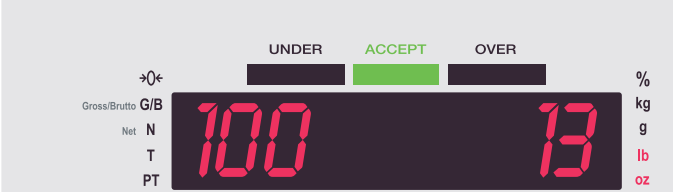
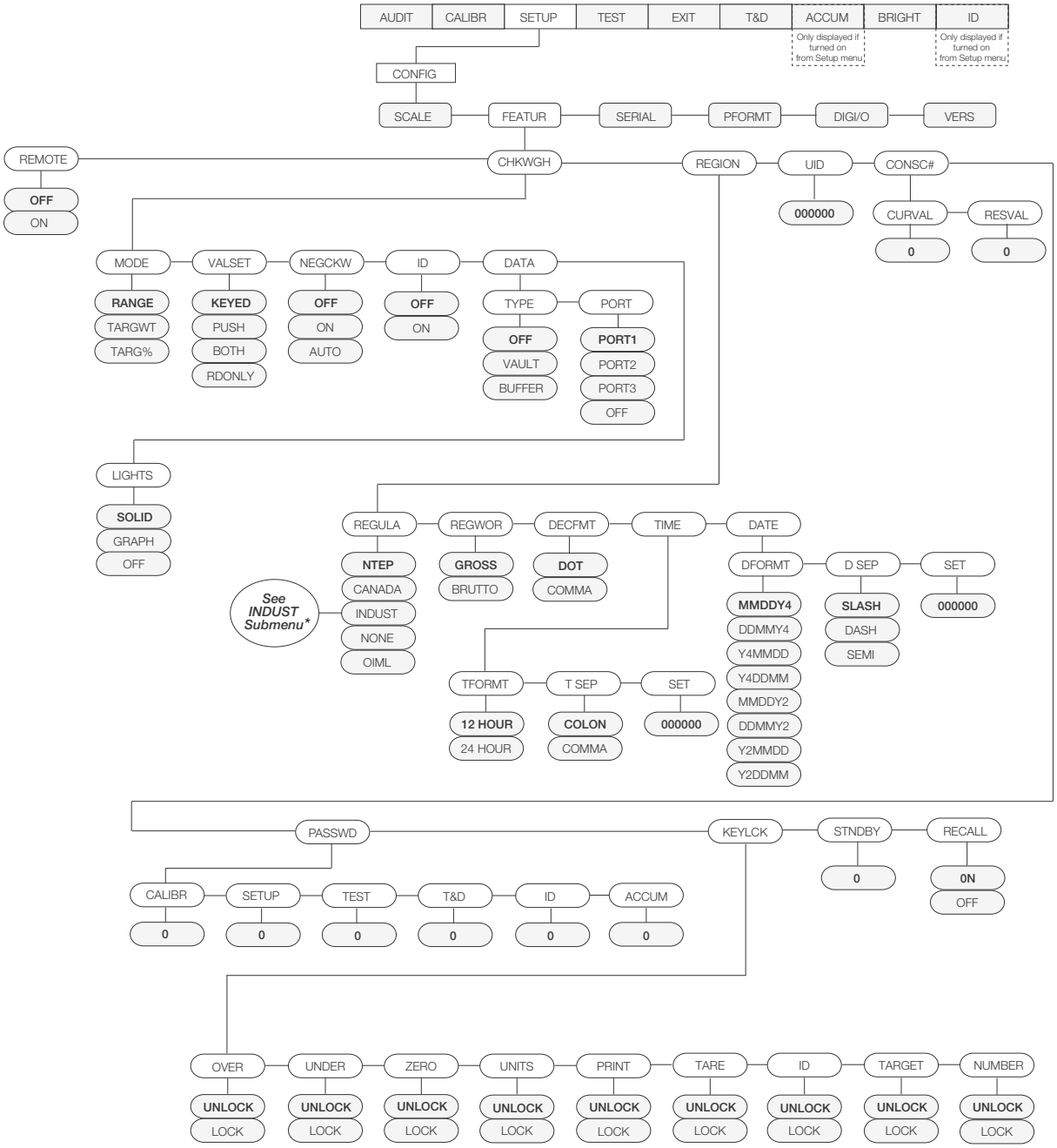
SCALE Menu		
Parameter	**Choices**	**Description**
Level 4 submenus		
PRIMRY	UNITS DECPNT DSPDIV	Allows you to set the primary units, decimal point format, and display divisions.
SEC	**KG** G LB OZ LB/OZ* OFF	Allows you to set the secondary units. Decimal point format and display divisions are selected automatically. Values are kg=kilogram (default); g=gram; lb=pound; oz=ounce; lb/oz=pound/ounce; and off. Note If using the <cu> token and secondary or tertiary values are changed, the stream tokens must be changed to match in order to stream secondary or tertiary. ***LB/OZ is not legal for trade.** When in LB/OZ mode, the display shows a decimal place for ounces through 99 pounds. If the pounds reach three digits (100 and above), the ounces' decimal place is dropped to accommodate the extra pounds' digit.  *Figure 3-6. LB/OZ mode display through 99 pounds*  *Figure 3-7. LB/OZ mode display for 100 pounds and above*
TER	**OFF** KG G LB OZ LB/OZ*	Allows you to set the tertiary units. Decimal point format and display divisions are selected automatically. Values are off (default); kg=kilogram; g=gram; lb=pound; oz=ounce; lb/oz=pound/ounce. Note *If using the <cu> token and secondary or tertiary values are changed, the stream tokens must be changed to match in order to stream secondary or tertiary.* ***LB/OZ is not legal for trade.** When in LB/OZ mode, the display shows a decimal place for ounces through 99 pounds. If the pounds reach three digits (100 and above), the ounces' decimal place is dropped to accommodate the extra pounds' digit (see Figure 3-6 and Figure 3-7).
WZERO		Allows you to view or change the zero calibration a/d count value.
WVAL		Allows you to view and edit the test weight value. Note *If RANGE is displayed after the value is entered, the value is too large or small for the given parameter.*
WSPAN		Allows you to view or change the span calibration a/d count value.

Table 3-4. Scale menu parameters (Continued)

SCALE Menu		
Parameter	**Choices**	**Description**
WLIN	PT->1 PT->2 PT->3 PT->4 PT->5	Press ENTER to display and edit test weight and calibration values for up to five linearization points. Perform linear calibration only after WZERO and WSPAN have been set.
REZERO		Removes offset from zero and span calibrations.
Level 5 submenus		
UNITS	**LB** OZ KG G	Specifies primary units for displayed and printed weight. Values are lb=pound; oz=ounce; kg=kilogram; g=gram.
DECPNT	**888888** 88888.8 8888.88 888.888 888880 8.88888 88.8888	Allows you to place the decimal point position. Use the ID (◁) and TARGET (▷) keys to place the decimal point where desired.
DSPDIV	**1D** 2D 5D	Display divisions. Selects the minimum division size for the primary unit's displayed weight.

Table 3-4. Scale menu parameters (Continued)

3.4.2 FEATUR Submenu



*INDUST Submenu is in Section 3.4.3 on page 25.

Figure 3-8. FEATUR submenu

FEATUR Menu		
Parameter	**Choices**	**Description**
Level 2 submenus		
CHKWGH	MODE VALSET NEGCKW ID DATA LIGHTS	Selects the checkweighing mode (range, target weight, or target percent); controls how values are set; enables/disables negative checkweighing; enables/disables IDs; turns data parameters on/off; and sets the lights as a solid bar or graph representation. See Level 3 submenus. Note The buffer can store approx. 64KB of information, which is 500 transactions using a format with 120 characters of output.
REGION	REGULA REGWRD DECFMT TIME DATE	Selects regional settings. See Level 3 submenus.
UID	**000000**	Sets the unit ID, a string of up to 6 ASCII characters, which can be set via serial port or keypad. This will be used in place of the <UID> token in a print format. The default value is "1."
CONSEC #	CURVAL RESVAL	Allows sequential numbering for print operations (CURVAL is the current value and RESVAL is the reset value). The consecutive number value is incremented following each print operation that includes <CN> in the ticket format. When the consecutive number is reset, it is reset to the RESVAL specified on the parameter.
PASSWD	CALIBR SETUP TEST T&D ID ACCUM	Creates a password to access the CALIBR, SETUP, TEST, T&D, ID, and ACCUM menus. Specify a non-zero value to restrict access to all configuration menus. Passwords can be overridden by loading new firmware or entering 999999. Note *Overriding passwords will clear configuration and calibration settings. To preserve settings (i.e., ID information), use Revolution software to upload your data to a PC, then download it back to the CW-90 after the password override is performed.*
KEYLCK	OVER UNDER ZERO UNITS PRINT TARE ID TARGET NUMBER	Disables the OVER, UNDER, ZERO, UNITS, PRINT, TARE, ID, TARGET, and/or numeric (CW-90 only) key(s). Select Lock to disable the key, and Unlock to enable the key.
STNDBY	**0**	Standby mode delay. Specifies the number of minutes the indicator must be inactive before entering standby mode. Valid values are 0 (off) through 255 minutes. When in standby mode, power is still supplied to the CPU and draws 1/2 of the current as when the display is powered. The annunciators are still lit, but no weight is displayed. Press any key to exit standby mode and reactivate the display. The indicator enters standby mode if no key presses, serial communications, or scale motion occur for the length of time specified in this parameter. Set to 0 to disable standby mode. Note Standby mode will not be implemented if there is weight on the scale.

Table 3-5. FEATUR submenu parameters

FEATUR Menu		
Parameter	**Choices**	**Description**
RECALL	**ON** OFF	ON allows the Tare, Zero, and Units values to be maintained across a power cycle. Over/Under/Target/ID values are also maintained. OFF clears the values on a power cycle. Zero is reset to calibrated zero and Units are reset to Primary. Over/Under/Target/ID values are reset as well.
Level 3 submenus		
MODE	**RANGE** TARGWT TARG%	Sets checkweighing mode to range, target weight, or target percent. See Section 5.0 on page 37 for more information.
VALSET	**KEYED** PUSH BOTH RDONLY	**KEYED** allows the operator to digitally set the Accept band tolerance values using keypad buttons while in Normal Weighing mode. **PUSH** prohibits the operator from digitally entering values with the keypad. Requires the operator to place actual weights on the scale, then press keypad buttons to acquire lower and upper Accept band tolerance values. **BOTH** is a combination mode that allows the operator to have the *CW-90/90X* acquire Accept band tolerances from actual weights on the scale, but then gives the operator an opportunity to digitally modify those values directly afterward. **RDONLY** is a "read only" mode which allows the operator to see but not change values.
NEGCKW	**OFF** ON AUTO	Sets whether negative checkweighing mode is off, on, or is using auto-tare.
ID	**OFF** ON	Turns IDs on or off. See Section 5.4 on page 41 for more information on IDs. if IDs are turned off, the ID selection will not appear in the main menu structure.
DATA	TYPE PORT	Selects the data type and port number for that data type.
LIGHTS	**SOLID** GRAPH OFF	Select SOLID if you want the checkweigher to display a solid light bar for over and under weights; select GRAPH if you want it to illuminate lights in increments relative to how close the weight is the acceptance band; Select OFF if you want the lights to never be illuminated. See Section 1.5 on page 3 for an illustration of graph LEDs.
REGULA	**NTEP** CANADA REGULA NONE OIML	Regulatory mode. Specifies the regulatory agency having jurisdiction over the scale site. Note The value specified for REGULA affects the function of the front panel TARE and ZERO keys. • OIML, NTEP, and CANADA modes allow a tare to be acquired at any weight greater than zero. NONE allows tares to be acquired at any weight value. • OIML, NTEP, and CANADA modes allow a tare to be cleared only if the gross weight is at no load. NONE allows tares to be cleared at any weight value. • NTEP and OIML modes allow a new tare to be acquired even if a tare is already present. In CANADA mode, the previous tare must be cleared before a new tare can be acquired. • NONE, NTEP and CANADA modes allow the scale to be zeroed in either gross or net mode as long as the current weight is within the specified ZRANGE. In OIML mode, the scale must be in gross mode before it can be zeroed; pressing the ZERO key in net mode clears the tare. • INDUST provides a set of subparameters to allow customization of tare, clear, and print functions in non-legal-for-trade scale installations.
REGWOR	**GROSS** BRUTTO	Sets the term displayed when weighing in gross mode. Selecting BRUTTO replaces the *Gross* annunciator with *Brutto*.

Table 3-5. FEATUR submenu parameters (Continued)

FEATUR Menu		
Parameter	**Choices**	**Description**
DECFMT	**DOT** COMMA	Specifies whether decimal numbers are displayed using a period (DOT) or a comma.
TIME	TFORMT TSEP SET	Allows you to set the current time, and the time format and separator character.
DATE	DFORMT D SEP SET	Allows you to set the current date, and date format and date separator character.
Level 4 submenus		
TYPE	**OFF** VAULT BUFFER	Selects the data type as off, VAULT, or Buffer. VAULT (WeighVault; see Section 5.4.3 on page 43) uses an Ethernet card to access unlimited network ID storage. The buffer can store approx. 64KB of information, which is 500 transactions using a format with 120 characters of output.
PORT	**PORT1** PORT2 PORT3 OFF	Specifies the port number for the data type.
TFORMT	**12 HOUR** 24 HOUR	Sets the time format as 12-hour format or 24-hour format.
T SEP	**COLON** COMMA	Sets the time separator as a colon or comma.
SET	**000000**	Sets the current time.
DFORMT	**MMDDY4** DDMMY4 Y4MMDD Y4DDMM MMDDY2 DDMMY2 Y2MMDD Y2DDMM	Sets the date format. Y4 will use a four-digit year value, such as 2009, while Y2 will use a two-digit value, such as 09.
D SEP	**SLASH** DASH SEMI	Sets the date separator as a slash, dash, or semicolon.
SET	**000000**	Sets the current date.
CALIBR SETUP TEST T&D ID ACCUM	**0**	Sets a password for the Calibrate, Setup, Test, T&D, ID, and Accum menu(s). Specify a non-zero value to restrict access. Passwords can be overridden by loading new firmware or entering 999999.  *Overriding passwords will clear configuration and calibration settings. To preserve settings (i.e., ID information), use Revolution software to your data to a PC, then load it back to the CW-90 after the password override is performed.*

Table 3-5. FEATUR submenu parameters (Continued)

FEATUR Menu		
Parameter	**Choices**	**Description**
OVER UNDER ZERO UNITS PRINT TARE ID TARGET NUMBER	**UNLOCK** LOCK	Locks or unlocks the OVER, UNDER, ZERO, UNITS, PRINT, TARE, ID, TARGET, and numeric button(s).

Table 3-5. FEATUR submenu parameters (Continued)

3.4.3 FEATUR Menu, REGULA / INDUST Submenu

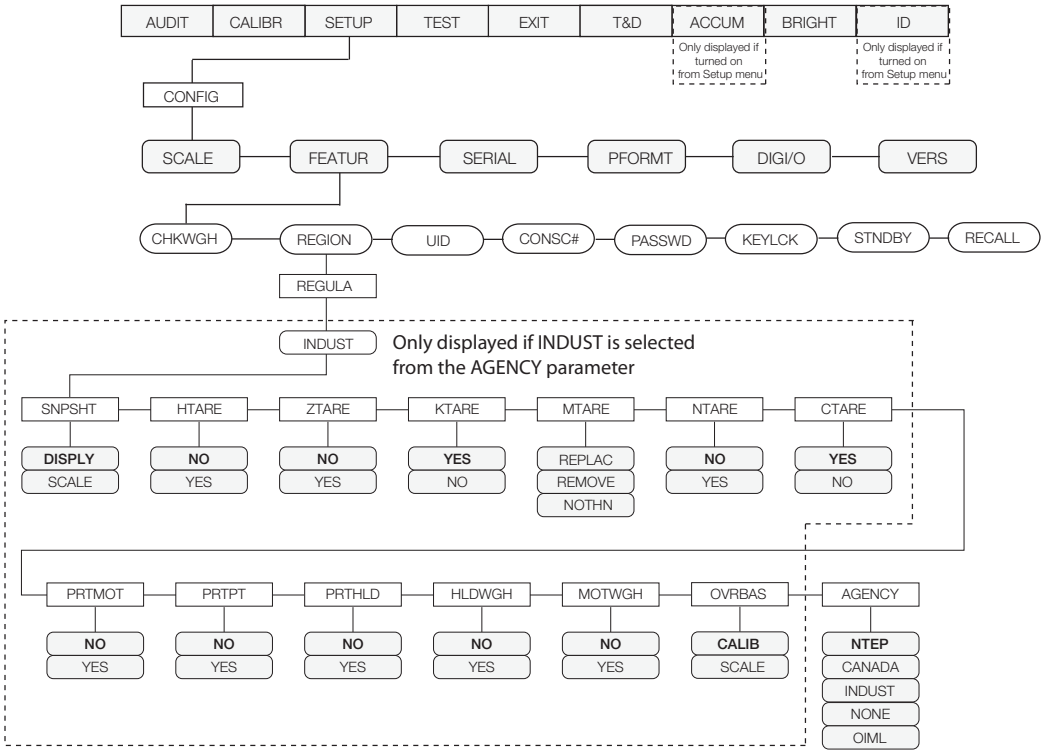


Figure 3-9. FEATUR menu, REGACY/INDUST submenu

FEATUR Menu, REGULA / INDUST Submenu		
Parameter	Choices	Description
LEVEL 4, REGULA / INDUST submenu		
SNPSHT	**DISPLY** SCALE	Display or Scale weight source.
HTARE	**NO**, YES	Allow tare in display hold.
ZTARE	**NO**, YES	Remove tare on ZERO.
KTARE	**YES**, NO	Always allow keyed tare.

Table 3-6. REGACY / INDUST submenu parameters

FEATUR Menu, REGULA / INDUST Submenu		
Parameter	Choices	Description
LEVEL 4, REGULA / INDUST submenu		
MTARE	**REPLAC** REMOVE NOTHIN	Multiple tare action.
NTARE	**NO**, YES	Allow negative or zero tare.
CTARE	**YES**, NO	Allow CLEAR key to clear tare/accumulator.
PRTMOT	**NO**, YES	Allow print while in motion.
PRTPT	**NO**, YES	Add PT to keyed tare print.
PRTHLD	**NO**, YES	Print during display hold.
HLDWGH	**NO**, YES	Allow weighment during display hold.
MOTWGH	**NO**, YES	Allow weighment in motion.
OVRBAS	**CALIB** SCALE	Zero base for overload calculation. CALIB = Calibrate Zero SCALE = Scale Zero
AGENCY	**NTEP** CANADA INDUST NONE OIML	Selects the 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. A tare can 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 OIML mode, printing is not allowed if the scale is more than -20dd. 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 ZERO in net mode clears the tare. • INDUST provides a set of subparameters to allow customization of tare, clear, and print functions in non-legal-for-trade applications. The value specified for this parameter affects the function of the front panel TARE and ZERO keys. See Section 9.6 on page 61 for more information.

Table 3-6. REGACY / INDUST submenu parameters (Continued)

3.4.4 Serial, PFORMT, DIG I/O, VERS Submenus

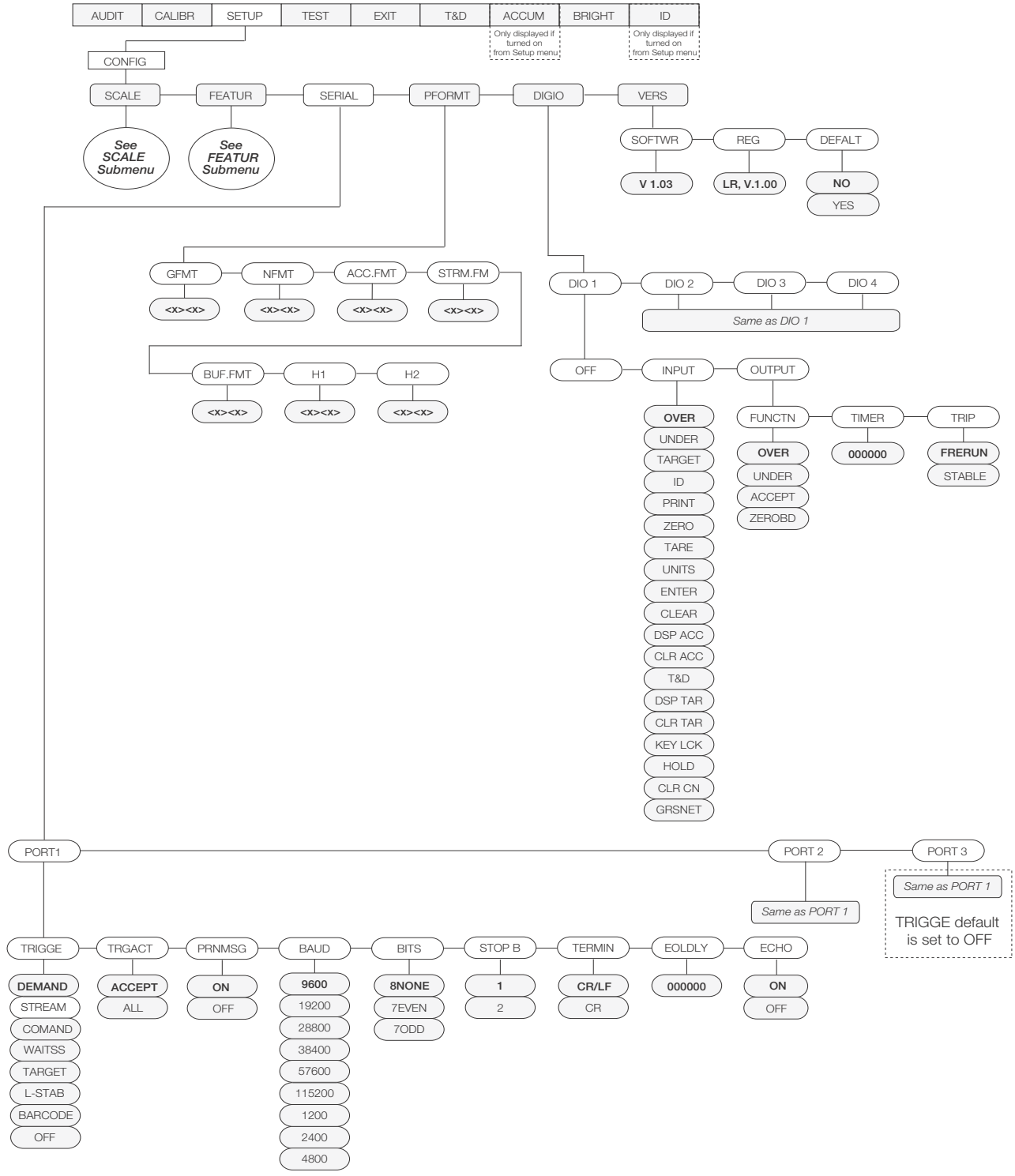


Figure 3-10. Serial, PFORMT, DIG I/O, VERS submenus

SETUP Menu		
Parameter	**Choices**	**Description**
Level 2 submenus		
SCALE	See Section 3.4.1 on page 16	Configure scale settings. See the level 3 submenus of Table 3-4 on page 17 for parameter descriptions.
FEATUR	See Section 3.4.2 on page 21	Set checkweighing options, region settings, view Unit ID, and set consecutive numbering. See level 3 submenus of Table 3-5 on page 22 for parameter descriptions.
SERIAL	PORT 1 PORT 2 PORT 3 (Option Card)	Configure communications ports. See level 3 submenus below for parameter descriptions.
PFORMT	GFMT NFMT ACCFMT STRM.FM BUF.FMT H1 H2	Sets the print format for gross weight, net weight, accumulated weight, stream, buffer, Header 1 and Header 2.
DIG IO	DIO 1 DIO 2 DIO 3 DIO 4	Assign digital input/output functions.
VERS	SOFTWR REG DEFALT	Displays the software version. Displays the regulatory version. Restores settings to their default values.
Level 3 submenus		
PORT 1	*TRIGGE* *PRNMSG* *BAUD* *BITS* *STOP B* *TERMIN* *EOLDLY* *ECHO*	*Specifies Port 1's mechanism for triggering a transmission of data, print message, baud rate, bits, stop bits, termination character, end-of-line delay, and echo.See level 4 submenu for parameter descriptions.* Note *If any port is set to PRNMSG=ON, PRINT will display.*
PORT 2	*TRIGGE* *PRNMSG* *BAUD* *BITS* *STOP B* *TERMIN* *EOLDLY* *ECHO*	*Specifies Port 2's mechanism for triggering a transmission of data, print message, baud rate, bits, stop bits, termination character, end-of-line delay, and echo.See level 4 submenu for parameter descriptions.* Note *If any port is set to PRNMSG=ON, PRINT will display.*
PORT 3	*TRIGGE* *PRNMSG* *BAUD* *BITS* *STOP B* *TERMIN* *EOLDLY* *ECHO*	*Specifies Port 3's mechanism for triggering a transmission of data, print message, baud rate, bits, stop bits, termination character, end-of-line delay, and echo.See level 4 submenu for parameter descriptions.* Note *If any port is set to PRNMSG=ON, PRINT will display.*
SOFTWR	***V 1.00***	*Displays the software version.*

Table 3-7. Serial, PFORMT, DIG I/O, VERS submenu parameters

SETUP Menu		
Parameter	**Choices**	**Description**
REG	***LR,V.1.00***	*Displays the legally relevant version.*
DEFALT	***NO*** *YES*	*Resets settings to default values if YES is selected.*
Level 4 submenus		
OFF		*Turns the Digital input/output off.*
INPUT	***OVER*** *UNDER* *TARGET* *ID* *PRINT* *ZERO* *TARE* *UNITS* *ENTER* *CLEAR* *DSP ACC* *CLR ACC* *T&D* *DSP TAR* *CLR TAR* *KEY LCK* *HOLD* *CLR CN* *GRSNET*	*Digital input functions.*
OUTPUT	*FUNCTN* *TIMER* *TRIP*	*Digital output functions. See Level 5 submenus for information on FUNCTN, TIMER, and TRIP.*
TRIGGE	***DEMAND*** *STREAM* *COMAND* *WAITSS* *TARGET* *L-STAB* *BARCODE* *OFF*	DEMAND will send information out of the port only when the Print key is pressed. STREAM allows a continuous flow of information out of the port. COMAND allows operation of EDP commands, but will not print (DEMAND accepts commands and prints). WAITSS prints after a stable reading is reached, then rearms as soon as it goes back in motion. TARGET rearms as soon as the weight goes below the threshold, and will print when the weight goes above the threshold again. The weight must be within the target/accept range to print. BARCODE handles incoming data as if the ID was just pressed. Numbers are treated as the ID number. The barcode can be composed of only four numbers with a CR. Leading zeroes are automatically removed. L-STAB will print the last stable weight and is rearmed when the weight goes in motion. The weight must be within the target/accept range to print.
TRGACT	***ACCEPT*** *ALL*	Accept will only trigger on values in the acept range. ALL works with Accept, Under, and Over. **Note** DEMAND, STREAM, COMMAND, and BARCODE ignore how TRGACT is set. TRGACT relates only to WAITSS, TARGET, and L-STAB.
PRNMSG	***ON*** *OFF*	Print message. ON will show the print message on the display every time the unit sends the Print command. OFF will not display the print message.

Table 3-7. Serial, PFORMT, DIG I/O, VERS submenu parameters (Continued)

SETUP Menu		
Parameter	**Choices**	**Description**
BAUD	***9600*** *19200* *28800* *38400* *57600* *115200* *1200* *2400* *4800*	Baud rate. Selects the transmission speed for the port.
BITS	***8NONE*** *7EVEN* *7ODD*	Selects number of data bits and parity of data transmitted from the port.
STOP B	***1*** *2*	Stop bits. Sets the number of stop bits to 1 or 2.
TERMIN	***CR/LF*** *CR*	Termination character. Selects termination character for data sent from the port.
EOLDLY	***000000***	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 specified must be in the range 0-255, in tenths of a second (10 = 1 second). **Note** An EOL may be required for continuous transmission at slower baud rates to ensure the receiving buffer is empty before another string is transmitted
ECHO	***ON*** *OFF*	This command enables or disables echoing of the serial commands sent to the indicator.
PRNMSG	***ON*** *OFF*	This parameter enables or disables the print message being displayed momentarily when the unit receives a Print command.
Level 5 submenus		
FUNCTN	***OVER*** *UNDER* *ACCEPT* *ZEROBD*	Sets the output to function when a value in the over, under, accept, or zero band is reached.
TIMER	***000000***	Set the timer to 0 for output to remain on until the function state changes. Enter a value (in 20-millisecond increments, maximum 65535) to turn the digital output off after the specified time (even though the function state has not changed).
TRIP	***FRERUN*** *STABLE*	FRERUN allows the output to toggle in motion; STABLE waits for standstill.

Table 3-7. Serial, PFORMT, DIG I/O, VERS submenu parameters (Continued)

3.5 Test Menu

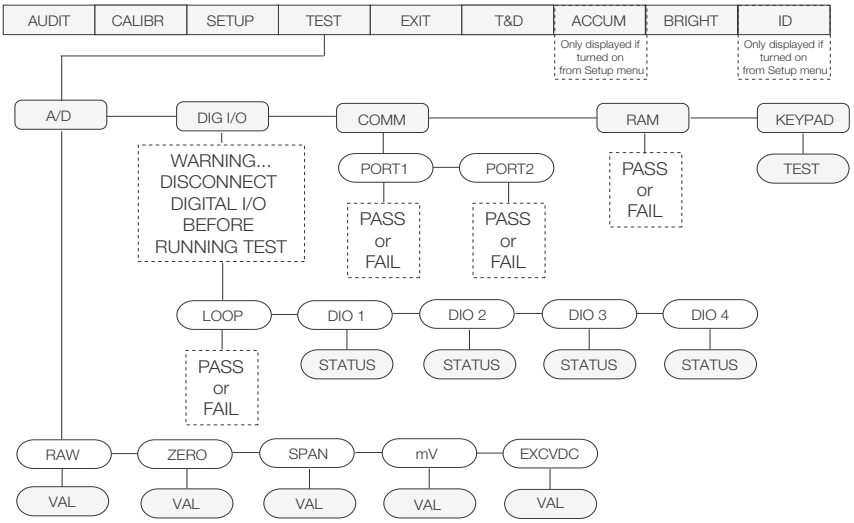


Figure 3-11. Test menu

TEST Menu		
Parameter	**Choices**	**Description**
Level 2 submenus		
A/D	RAW ZERO SPAN mV EXCVDC	Gives details of current or live A/D counts as well as stored zero and span A/D values. Shows voltage levels for signal and excitation voltages.
DIG I/O	LOOP DIO 1 DIO 2 DIO 3 DIO 4	Tests your digital I/O ports. If they are functioning, “PASS” is displayed. If they are not functioning, “FAIL” is displayed. **Note** Both inputs and outputs are active low. They go to a ground state when active. **Warning** The I/O ports become activated when the test is performed. Ensure all equipment is disconnected prior to performing this test to avoid it being activated.
COMM	PORT1 PORT2	Performs a loopback test on the serial ports. If they are functioning, “PASS” is displayed. If they are not functioning, “FAIL” is displayed.
RAM	TEST	Tests the unit’s memory. if it is functioning, “PASS” is displayed. If it is not functioning, “FAIL” is displayed.
KEYPAD	TEST	Tests the unit’s individual keypad buttons by displaying the name of the key pressed. If nothing is displayed, the key is not functioning. Press the Menu key to exit the test.
Level 3 submenus		
RAW	*VAL*	Displays the live current raw A/D count.
ZERO	*VAL*	Displays the captured A/D Zero calibration value.
SPAN	*VAL*	Displays the captured A/D Span calibration value.
mV	*VAL*	Displays the live current millivolt signal voltage.
EXCVDC	*VAL*	Displays the current excitation voltage.

Table 3-8. TEST menu parameters

TEST Menu		
Parameter	**Choices**	**Description**
LOOP	*TEST*	Perorms a loop test on dig I/O cards.
DIO 1 *DIO 2* *DIO 3* *DIO 4*	*STATUS*	Displays the status of each individual digital I/O port. If set as input, the display shows input stats IN HI or IN LO. If set as output, pressing Enter toggles the output beween HI and LO. OUT HI or OUT LO. OUT LO is active.
PORT1 *PORT2*	*TEST*	Performs a loopback test on serial port 1 or 2. Connect jumper TX and RX together on port 1 or port 2 before testing.

Table 3-8. TEST menu parameters

3.6 Time and Date Menu

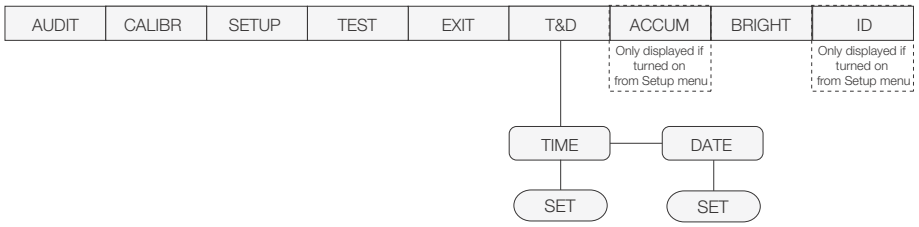


Figure 3-12. Time and Date menu

3.7 ACCUM Menu

In order for the ACCUM menu to appear, ON must be selected from the SETUP » CONFIG » SCALE » ACCUM parameter (see Figure 3-5 on page 16).

Figure 3-13. ACCUM menu

3.8 BRIGHT Menu

There are eight brightness settings on the CW-90/90X (0-7). If a number greater than 7 is selected, “RANGE” will be displayed because the number is out of range.

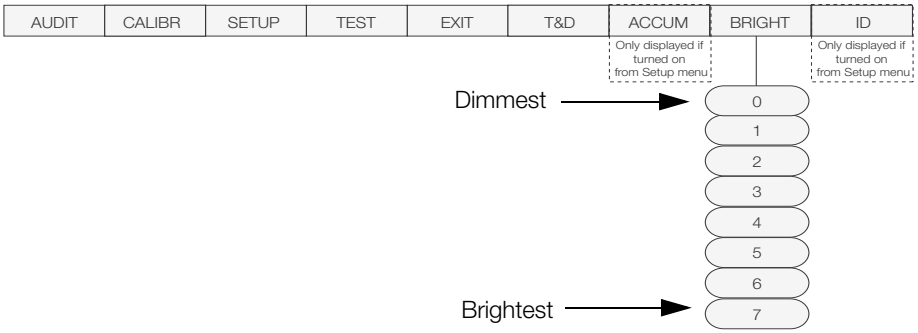


Figure 3-14. BRIGHT menu

3.9 ID Menu

In order for the ID menu to appear, ON must be selected from the SETUP » CONFIG » FEATUR » CHKWGH » ID menu (see Figure 3-8 on page 21).

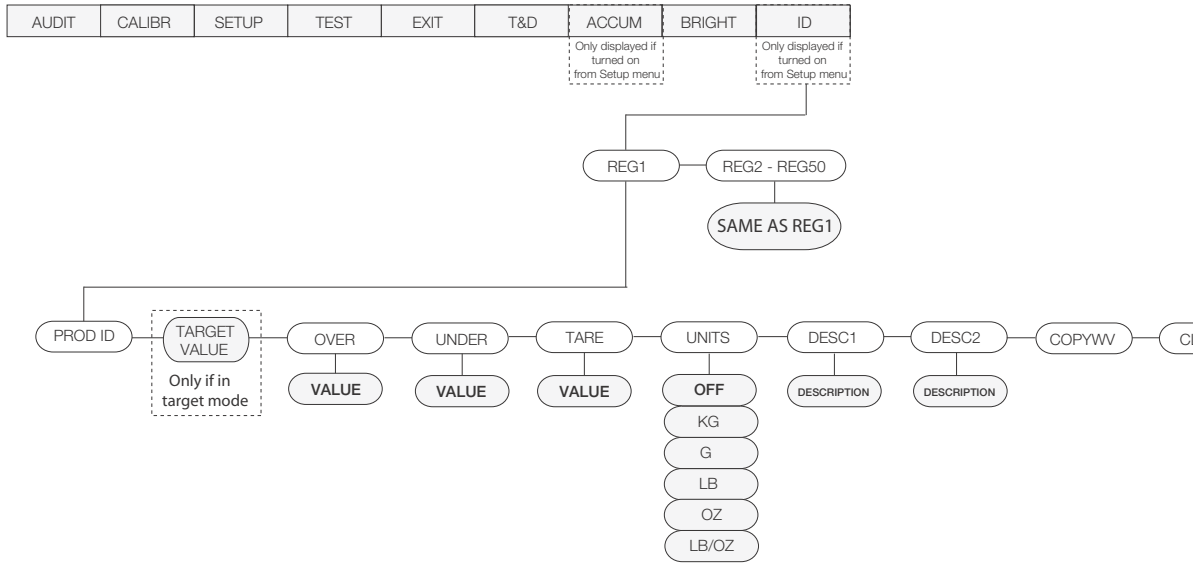


Figure 3-15. ID menu

ID Menu		
Parameter	**Choices**	**Description**
Level 2 submenus		
REG 1-50	PROD ID	Sets the product ID number.
	TARGET (VALUE)	TARGET value recalled with the ID.
	OVER (VALUE)	OVER value recalled with the ID.
	UNDER (VALUE)	UNDER value recalled with the ID.
	TARE (VALUE)	TARE value recalled with the ID.
	UNITS	UNITS selects the unit of measure for the stored ID values.
	DESCR1 (DESCRIPTION)	DESCR1 description recalled with the ID.
	DESCR2 (DESCRIPTION)	DESCR2 description recalled with the ID.
	COPYWV	COPYWV copies the working values of Target, Over, Under, Tare, Units, Description 1 and 2 into the ID.
	CLEAR	CLEAR clears all values and descriptions in the ID.

Table 3-9. ID menu parameters

4.0 Calibration

The CW-90/90X can be calibrated using the front panel, EDP commands, or Revolution®.

Calibration can be performed in two places within the menu: the CALIBR menu shown in Figure 4-1 and the SCALE submenu shown in Figure 3-5 on page 16. The CALIBR menu is a "quick access" calibration; for more in-depth scale setup and calibration, use the menus found under SETUP»CONFIG»SCALE.

Calibration consists of the following steps:

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

The CW-90/90X requires the WZERO and WSPAN points to be calibrated. The linearity points are optional, but must NOT duplicate zero or span. During calibration, the ENTER key acts as a data entry confirmation key. It also acts as an EXECUTE key, and accepts the value if calibration was successful.

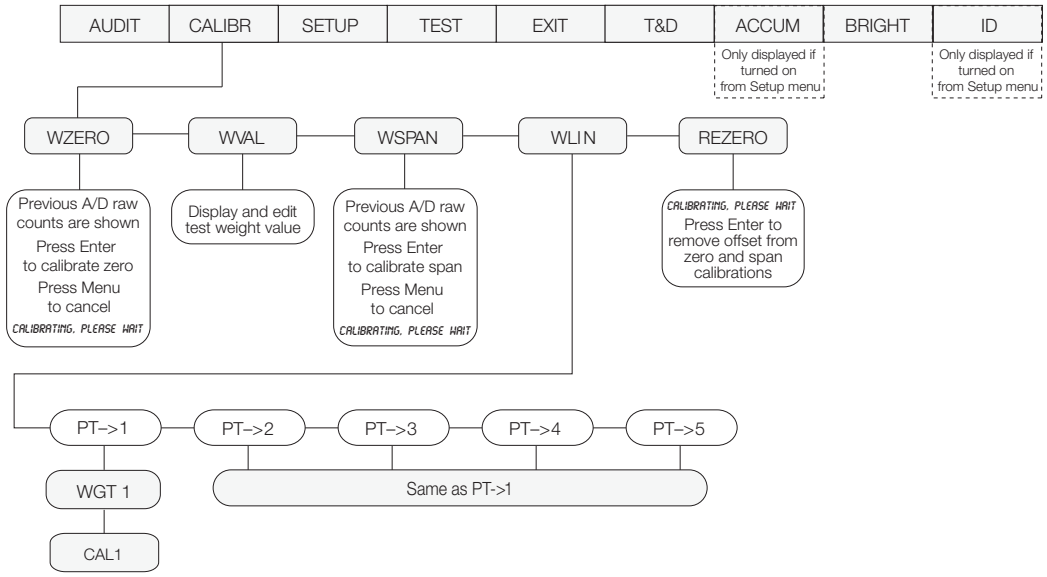


Figure 4-1. Calibration (CALIBR) menu

4.1 Front Panel Calibration

1. Press the MENU button, then press ▷ until the display reads *CALIBR* (see Figure 4-1).
2. Press Enter or ▽ to go to the *WZERO* parameter.
3. Press Enter or ▽ to view the A/D count. *Press Enter Key to Calibrate WZERO.*

   If do not want to calibrate zero, press Menu to exit.

4. The indicator displays *CALIBRATING, PLEASE WAIT* while calibration is in progress. When complete, you are advanced to the next prompt (*WVAL*).

   To view the new A/D count, repeat Step 3, but instead of pressing Enter while viewing the value, press Menu to exit.

5. With *WVAL* displayed, press Enter to display the stored calibration weight value. Use the procedure shown in Figure 4-2 to enter the value of the test weights used for the span calibration. Press Enter to store the *WVAL* value and advance to *WSPAN*.
6. With *WSPAN* displayed, press Enter or ▽ to view the A/D count. Place test weights on the scale equal to WVAL. Press Enter to calibrate WSPAN.

   If do not want to calibrate span, press Menu to exit.

7. After Enter is pressed, the indicator displays *CALIBRATING, PLEASE WAIT*. When complete, you are advanced to the next prompt (*WLIN*).
8. To view the new A/D count, navigate back to the WSPAN and repeat step 6; however, instead of pressing Enter while viewing the value, press Menu to exit.

Figure 4-2. Editing procedure for numeric values

9. Five-point linearization (using the WLIN parameter) provides increased scale accuracy by calibrating the indicator at up to five additional points between the zero and span calibrations.
   Linearization is optional: if you choose not to perform linearization, skip the WLIN parameter; if linearization values have previously been entered, these values are reset to zero during calibration. To perform linearization, follow the procedure below.

   Note *The linearity points must be less than the WSPAN point.*

   - With *WLIN* displayed, Press ▽ to go to the first linearization point (*PT-> 1*).
   - Place test weights on the scale and press Enter.
   - Use the procedure shown in Figure 4-2 to enter the actual test weight value.The indicator will display *Press Enter Key to Calibrate WLIN*.
   - Press Enter to calibrate. The indicator displays *Calibrating, Please Wait* while calibration is in progress. When complete, the A/D count for the linear calibration is displayed. Press Enter again to advance to the next prompt (*PT-> 2*).
   - Repeat for up to five linearization points. To exit the linearization parameters, press △ to return to WLIN.

10. The rezero function is used to remove a calibration offset when hooks or chains are used to hang the test weights. If no other apparatus was used to hang the test weights during calibration, remove the test weights and press △ to return to the CALIBR menu.
    - With REZERO displayed, press Enter or ▽ to access the rezero function.
    - If hooks or chains were used during calibration, remove these and the test weights from the scale. The indicator will display *Press Enter Key to REZERO*.
    - With all weight removed, press Enter to rezero the scale. This function adjusts the zero and span calibration values. The indicator displays *Calibrating, Please Wait* while the zero and span calibrations are adjusted. When complete, the adjusted A/D count for the zero calibration is displayed. Press Enter, then press △ to return to the CALIBR menu.

11. Press △ or the Menu button to return to weigh mode.

4.2 EDP Command Calibration

To calibrate the indicator using EDP commands, the indicator EDP port must be connected to a terminal or personal computer. See Section 2.7.1 on page 6 for EDP port pin assignments.

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

1. Place the indicator in config mode (display must read *CONFIG* - see Figure 3-5 on page 16) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. Send the SC.WZERO command to calibrate zero. The indicator displays *CALIBRATING, PLEASE WAIT* while calibration is in progress.
3. Place test weights on the scale and use the SC.WVAL command to enter the test weight value in the following format:

   SC.WVAL=*nnnnnn*<CR>

4. Send the SC.WSPAN command to calibrate span. The indicator displays *CALIBRATING, PLEASE WAIT* while calibration is in progress.
5. Up to five linearization points can be calibrated between the zero and span calibration values. Use the following commands to set and calibrate a single linearization point:

   SC.WLIN.V1=*nnnnn*<CR>
   SC.WLIN.C1<CR>

   The SC.WLIN.V1 command sets the test weight value (*nnnnn*) for linearization point 1. The SC.WLIN.C1 command calibrates the point. Repeat using the SC.WLIN.V*x* and SC.WLIN.C*x* commands as required for additional linearization points.
6. To remove an offset value, clear all weight from the scale, including hooks or chains used to hang test weights, then send the SC.REZERO command. The indicator displays *CALIBRATING, PLEASE WAIT* while the zero and span calibrations are adjusted.
7. Send the SC.KUPARROW or SC.KEXIT EDP command to return to normal mode.

4.3 Revolution® Calibration

To calibrate the indicator using Revolution, the indicator EDP port must be connected to a PC running the Revolution configuration utility.

1. Place the indicator in config mode (display reads *CONFIG*, *see* Figure 3-5 on page 16) and remove all weight from the scale platform.
2. From Revolution, select File » New.
   The *Select Indicator* dialog box appears.
3. Select CW-90 and click OK.
4. From the *Communications* menu, select Connect.
5. From the left pane, expand the *Scale* selection and click the Scale button.

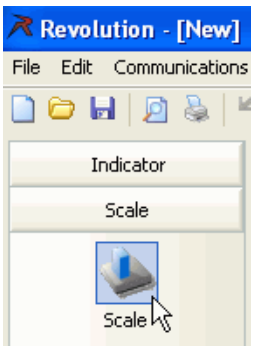


Figure 4-3. Scale button

6. From the *Tools* menu, select *Calibration Wizard*.
7. Click *NEXT* to begin the Calibration Wizard.
8. Select whether you want to perform a standard calibration or a standard with multi-point linearization and click *NEXT*.
9. In the text box, enter the test weight value be used for span calibration.
10. Select the checkbox if you are using chains or hooks during the calibration, then click *NEXT*.
11. Remove all weight from the scale and click *Click to Calibrate Zero* to begin zero calibration. If your test weights require hooks or chains, place them on the scale for zero calibration.
12. When zero calibration is complete, the Calibration Wizard prompts you to place test weights on the scale. Place the test weights on the scale, then click *Click to Calibrate Span*.
13. If you chose to perform linear calibration, the Calibration Wizard now displays prompts (1–5). Enter the weight value for Linear Point #1, place test weights on scale and click *GO*. Repeat for additional linearization points, then click *NEXT*.
14. The new and old calibration settings are displayed. To accept the new values, click Finish. To exit and restore the old values, click Cancel.

4.4 More About Calibration

The following topics provide additional information about compensating for environmental factors (Section 4.4.1) and diagnostic information for determining expected zero and span coefficients.

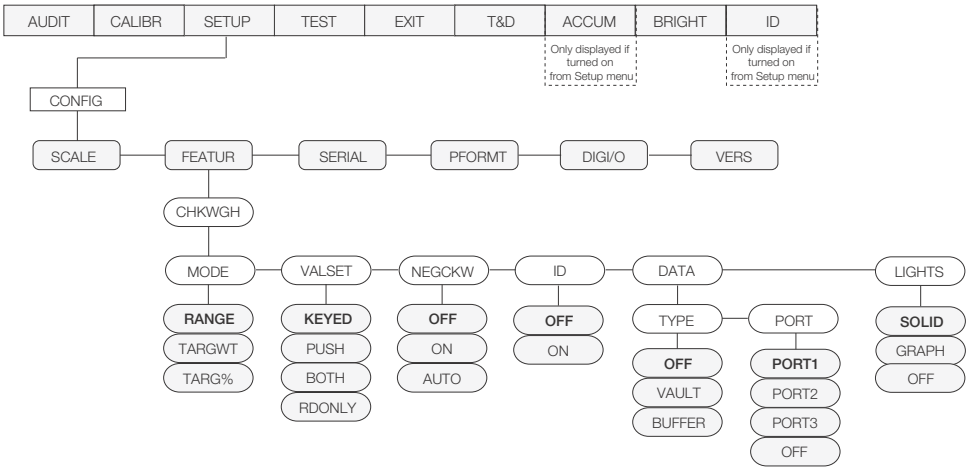
4.4.1 Adjusting Final Calibration

Calibration may be affected by environmental factors including wind, vibration, and angular loading. For example, if the scale is calibrated with 1000 lb, a strain test may determine that at 2000 lb the calibration is 3 lb high. In this case, final calibration can be adjusted by tweaking WVAL to 998.5 lb. This adjustment provides a linear correction of 1.5 lb per 1000 lb.

To adjust the final calibration, return to the *WVAL* prompt and press ENTER to show the test weight value. Press △ or ▽ to adjust calibration up or down. Press ENTER to save the value, then press △ to return to the CALIBR menu.

5.0 Checkweigher Operation

The CW-90/90X can be configured for one of the three modes of operation: range, target weight, and target percent. Selecting which operation mode is done under the CHKWGH menu, MODE submenu (Figure 5-1).



If using weight on the scale to set your over/under values, select VALSET»PUSH.

If you want to manually enter your over/under values without weight on the scale, select VALSET»KEYED.

If you want to use weight on the scale to set your over/under values, but be able to edit the values captured, select VALSET»BOTH.

Figure 5-1. CHKWGH menu

5.1 Range Mode

In Range mode, the *over* and *under* values must be set.
The *Accept* band is determined as the gap between these settings.

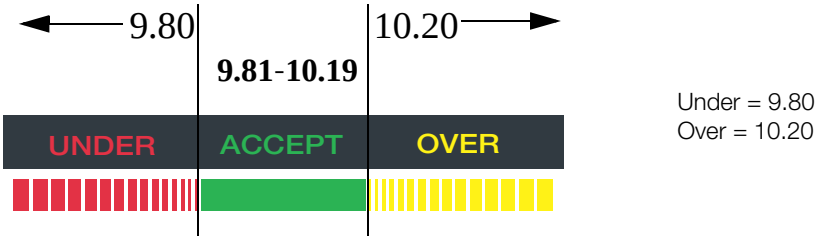


Figure 5-2. Example of Accept band determined by under/over settings in Range mode.

5.1.1 Value Set: Keyed

To manually set the *over/under* values with no weight on the scale:

1. Press the OVER key. The OVER light begins flashing and the value with flashing digit is shown.
2. Enter the desired *over* value by using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits. The CW-90's numeric keypad can also be used to enter desired value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

3. When the desired value is displayed, press Enter. The decimal point flashes.
4. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
5. Press Enter again to accept the value and return to *weigh* mode.
6. Press the UNDER key. The UNDER light begins flashing and the value with flashing digit is shown.
7. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired *under* value. If using the CW-90, you can also use the numeric keypad to enter the desired *under* value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

8. When the desired value is displayed, press Enter. The decimal point flashes.
9. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
10. Press Enter again to accept the value and return to *weigh* mode.

5.1.2 Value Set: Push

To set the *over/under* values using weight on the scale:

1. Place the weight you want to be determined as "over" on the scale.
2. Press the OVER key.
3. The weight is captured and set as the *over* value.
   The display will read "Stored" and the *over* light flashes.
4. Place the weight you want to be determined as "under" on the scale.
5. Press the UNDER key.
6. The weight is captured and set as the *under* value.
   The display will read "Stored" and the *under* light flashes.
7. The *Accept* band is set as the gap between the *over* and *under* settings. See Figure 5-2 for an example.

5.2 Target Weight Mode

In Target Weight mode, the *over* and *under* values can only be set by keying in the values. The VALSET parameter only pertains to setting the target weight value. The *Accept* band is determined based on a desired target weight.

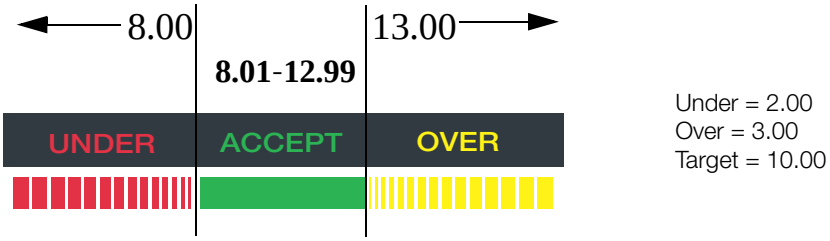


Figure 5-3. Example of under/over/target settings in Target Weight mode.

5.2.1 Value Set: Keyed

1. Press the TARGET key. The Accept light begins flashing and a flashing digit is shown.
2. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value. If using the CW-90, you can also use the numeric keypad to enter the desired *target weight* value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

3. When the desired value is displayed, press Enter.
   The decimal point flashes.
4. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
5. Press Enter again to accept the value and return to *weigh* mode.
6. Press the OVER key. The Over light begins flashing and a flashing digit is shown.
7. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value. If using the CW-90, you can also use the numeric keypad to enter the desired *over* value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

8. When the desired value is displayed, press Enter.
   The decimal point flashes.
9. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.

10. Press Enter again to accept the value and return to *weigh* mode.
11. Press the UNDER key. The Under light begins flashing and a flashing digit is shown.
12. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value. If using the CW-90, you can also use the numeric keypad to enter the desired *under* value.

To discard any changes and return to weigh mode, press the Menu button.

13. When the desired value is displayed, press Enter.
    The decimal point flashes.
14. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
15. Press Enter again to accept the value and return to *weigh* mode.

5.2.2 Value Set: Push

1. Place the weight you want to be used as the "target" on the scale.
2. Press the Target key. The Accept light flashes and the indicator displays "STORED." The weight has been captured and stored as the target weight.
3. Press the OVER key. The Over light begins flashing and a flashing digit is shown.
4. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value. If using the CW-90, you can also use the numeric keypad to enter the desired *over* value.

To discard any changes and return to weigh mode, press the Menu button.

5. When the desired value is displayed, press Enter.
   The decimal point flashes.
6. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
7. Press Enter again to accept the value and return to *weigh* mode.
8. Press the UNDER key. The Under light begins flashing and a flashing digit is shown.
9. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value. If using the CW-90, you can also use the numeric keypad to enter the desired *under* value.

To discard any changes and return to weigh mode, press the Menu button.

10. When the desired value is displayed, press Enter. The decimal point flashes.
11. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
12. Press Enter again to accept the value and return to *weigh* mode.

5.3 Target Percent Mode

In Target Percent mode, the *over* and *under* values can only be set by keying in the values (in percentages). The VALSET parameter only pertains to setting the target weight value. The *Accept* band is determined based on a percentage of the desired target weight.

The % annunciator will be lit during target percent setup in menu mode, but not in weigh mode.

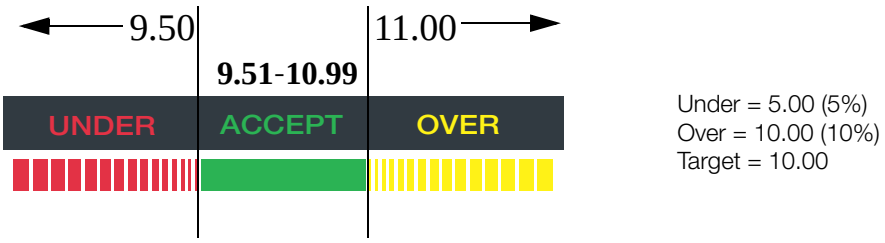


Figure 5-4. Example of under/over/target settings in Target Weight mode.

5.3.1 Value Set: Keyed

1. Press the TARGET key. The Accept light begins flashing and a flashing digit is shown.
2. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value. If using the CW-90, you can also use the numeric keypad to enter the desired *target percent* value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

3. When the desired value is displayed, press Enter.
   The decimal point flashes.
4. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
5. Press Enter again to accept the value and return to *weigh* mode.
6. Press the OVER key. The Over light begins flashing and a flashing digit is shown.
7. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value, in percent (entering 10 equals 10%). If using the CW-90, you can also use the numeric keypad to enter the desired *over* value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

8. When the desired value is displayed, press Enter.
   The decimal point flashes.
9. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
10. Press Enter again to accept the value and return to *weigh* mode.
11. Press the UNDER key. The Under light begins flashing and a flashing digit is shown.
12. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value, in percent (entering 5 equals 5%). If using the CW-90, you can also use the numeric keypad to enter the desired *under* value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

13. When the desired value is displayed, press Enter.
    The decimal point flashes.
14. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
15. Press Enter again to accept the value and return to *weigh* mode.

5.3.2 Value Set: Push

1. Place the weight you want to be used as the “target percent” value on the scale.
2. Press the Target key. The Accept light flashes and the indicator displays “STORED.” The weight has been captured and stored as the target percent value.
3. Press the OVER key. The Over light begins flashing and a flashing digit is shown.
4. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value, in percent (entering 10 equals 10%). If using the CW-90, you can also use the numeric keypad to enter the desired *over* value.

Note *To discard any changes and return to weigh mode, press the Menu button.*

5. When the desired value is displayed, press Enter.
   The decimal point flashes.
6. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
7. Press Enter again to accept the value and return to *weigh* mode.
8. Press the UNDER key. The Under light begins flashing and a flashing digit is shown.
9. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired value, in percent (entering 5 equals 5%). If using the CW-90, you can also use the numeric keypad to enter the desired *under* value.

To discard any changes and return to weigh mode, press the Menu button.

10. When the desired value is displayed, press Enter.
    The decimal point flashes.
11. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
12. Press Enter again to accept the value and return to *weigh* mode.

5.4 IDs

IDs are used to save and recall previously set over/under/tare settings, descriptions, and units preferences. The CW-90/90X has the capacity to store up to 50 individual IDs. Make sure you have IDs enabled under the CHKWGH menu shown in Figure 5-1 on page 37 or the menu will not appear. To store more than 50 IDs, WeighVault and an Ethernet option card are required (see Section 5.4.3 on page 43).

Note To clear over/under/tare settings, set *the ID* number to *0.*

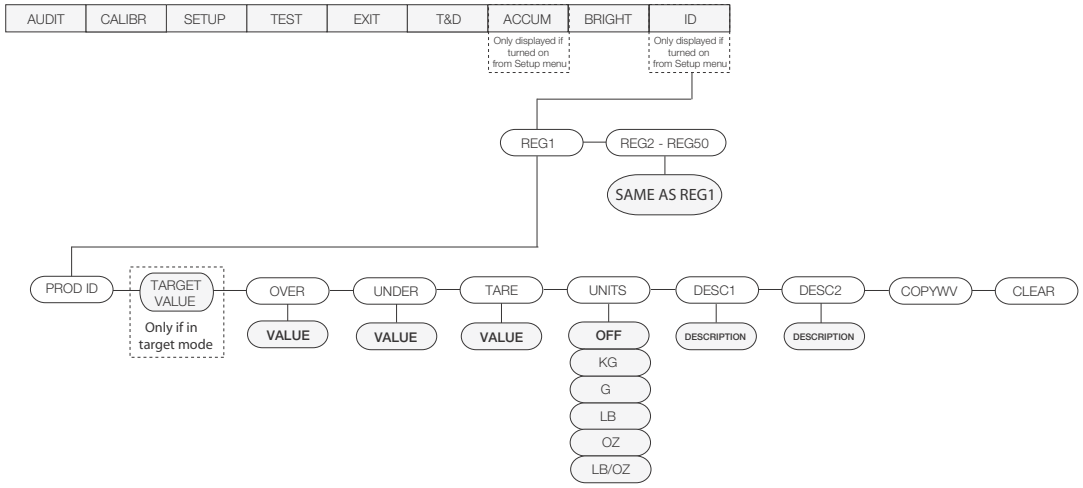


Figure 5-5. ID menu

5.4.1 Setting an ID

1. From the ID menu, press Enter and you will be at REG1.
2. Navigate to the REG number you want to use (1-50) by using the △ and ▽ keys.

All menus have wrap-around functionality. If you are at REG1 and want to access REG50, you can quickly do so by moving backwards through the menu.

3. When you have reached the REG number you want to set, press Enter to select that REG.
4. Use the △ and ▽ keys to set the PROD ID and press Enter.
5. If in Target mode, "TARGET" will be displayed. If mode is not set to Target, skip to Step 9. If you do not need to adjust the value, use the ◁ and ▷ keys to move to the next parameter. To adjust the value, press Enter and use the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits. If using the CW-90, you can also use the numeric keypad to enter the desired value.

To discard any changes and return to weigh mode, press the Menu button.

6. When the desired value is displayed, press Enter.
   The decimal point flashes.
7. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
8. Press Enter again to accept the value.
9. "OVER" will be displayed. If you do not need to adjust the value, use the ◁ and ▷ keys to move to the next parameter. To adjust the value, press Enter and use the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits. If using the CW-90, you can also use the numeric

keypad to enter the desired value.

To discard any changes and return to weigh mode, press the Menu button.

10. When the desired value is displayed, press Enter. The decimal point flashes.
11. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
12. Press Enter again to accept the value.
13. "UNDER" will be displayed. Press Enter and use the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits. If using the CW-90, you can also use the numeric keypad to enter the desired value.

To discard any changes and return to weigh mode, press the Menu button.

14. When the desired value is displayed, press Enter. The decimal point flashes.
15. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
16. Press Enter again to accept the value.
17. "TARE" will be displayed. Press Enter and use the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits. If using the CW-90, you can also use the numeric keypad to enter the desired value.

To discard any changes and return to weigh mode, press the Menu button.

18. When the desired value is displayed, press Enter. The decimal point flashes.
19. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
20. Press Enter again to accept the value.
21. "UNITS" will be displayed. Press Enter and use the ◁ and ▷ keys to move between units (LB, OZ, LB/OZ, OFF, KG, G).
22. When the desired unit is displayed, press Enter.
23. "DESC1" will be displayed. If the value does not need adjustment, use the ◁ and ▷ keys to move to the next parameter. To adjust the value, press Enter to create an ID description.
24. Use the △ and ▽ keys to increment/decrement description entry characters and the ◁ and ▷ keys to move between placeholders.
25. When the desired description is displayed, press the Enter key to accept.

To discard any changes and return to weigh mode, press the Menu button.

26. "DESC2" will be displayed. If you do not need to adjust the value, use the ◁ and ▷ keys to move to the next parameter. To adjust the value, press Enter to create a secondary ID description. A flashing placeholder is displayed.
27. Use the △ and ▽ keys to increment/decrement description entry characters and the ◁ and ▷ keys to move between placeholders.
28. When the desired description is displayed, press the Enter key to accept.

To discard any changes and return to weigh mode, press the Menu button.

29. "COPYWV" is displayed. This feature copies the current over/under/tare values, units, description 1 and description 2 being used in normal weighing mode and saves them into the current ID number. If you do not want to copy the working values into this ID, use the ◁ and ▷ keys to move to the next parameter. Press the Enter key to copy the current values into the ID. The indicator will display SAVING and return to COPYWV when complete.

5.4.2 Using a Stored ID

1. Press the ID key. The last PROD ID being used is displayed with the leftmost digit flashing.
2. Use the △ and ▽ keys to increment/decrement values and the ◁ and ▷ keys to move between digits until the desired PROD ID value is displayed, or use the numeric keypad to enter the desired PROD ID.

If an ID does not have values assigned, NO ID is displayed. The ZERO key acts as a backspace on the CW-90X. Use this key to navigate from a two-digit ID to a one-digit ID. On the CW-90, use the CLR or ZERO key.

3. Press Enter to start using the PROD ID. “LOADING” is displayed, as well as the PROD ID number and Description Field 1 (i.e., LOADING ID1 HAM). The indicator returns to weigh mode when the PROD ID has been loaded.

5.4.3 WeighVault

WeighVault is a PC program which allows CW-90/90X users to add, edit, and access IDs over a network connection. WeighVault surpasses the CW-90/90X's 50 ID limitation and eliminates front-panel entry of ID parameters. It also collects data as transactions occur, and provides detailed transaction and productivity reports which can be exported to Excel, Word, or PDF. For WeighVault to function, the following criteria must be met:

- Ethernet card (wired or wireless) installed in the CW-90/90X (Refer to PN72117 *Ethernet TCP/IP Interface Installation and Configuration Manual* or PN108680 *WLAN Installation Instructions*).
- PC running the WeighVault service must have a static IP address
- IP address assigned to the CW-90/90X
- WeighVault enabled in the CW-90/90X menu (VAULT parameter; see Section 3.4.2 on page 21)
- Port corresponding to the Ethernet card must be selected in the CW-90/90X menu (see Section 3.4.2 on page 21)

Once the above criteria have been met, IDs can then be entered into WeighVault and saved on the PC’s hard drive. The *Edit Product* dialog box in Figure 5-6 shows ID parameters which can be saved in WeighVault.

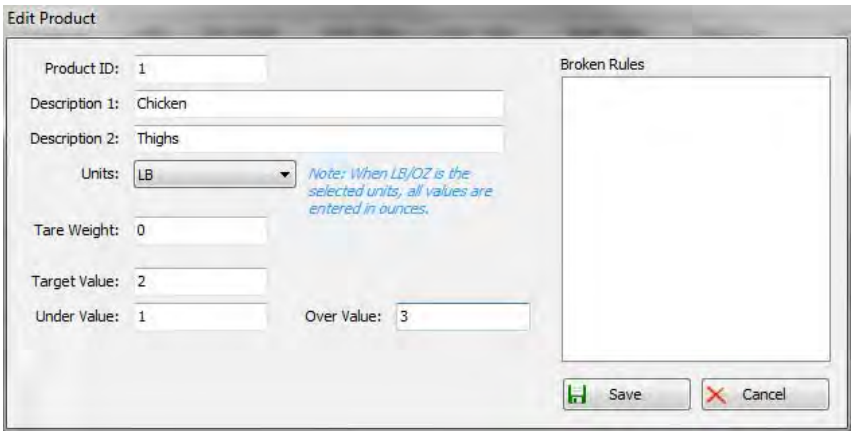


Figure 5-6. WeighVault Edit Product dialog box

To access a saved ID from WeighVault over the network connection,

1. Using the CW-90/90X front panel, press the ID key.
2. Use the △ and ▽ keys to select an ID to be loaded.
3. Press the ENTER key.
   The ID is loaded and ready to use.

5.5 Negative Checkweighing

You can use negative checkweighing if you have an item which you want to take weight away from. For example, if a product on the CW-90/90X weighs 20 pounds and you want to remove weight in 2 pound increments, with negative checkweighing enabled, the *Over* value could be set to -3 and the *Under* value could be set to -1. The *Accept* band would therefore be -2, illuminating the green LED when the desired weight is removed from the product.

Negative checkweighing is only operable in Range mode. The Target key is not used.
When entering Over/Under values and printing, the negative symbol is not displayed. These numbers are still treated as negative values despite the symbol not being displayed. COM port settings are limited to L-Stab, Demand (only if NEGCKW is set to ON rather than AUTO), and Wait SS (see Figure 3-10 on page 27).

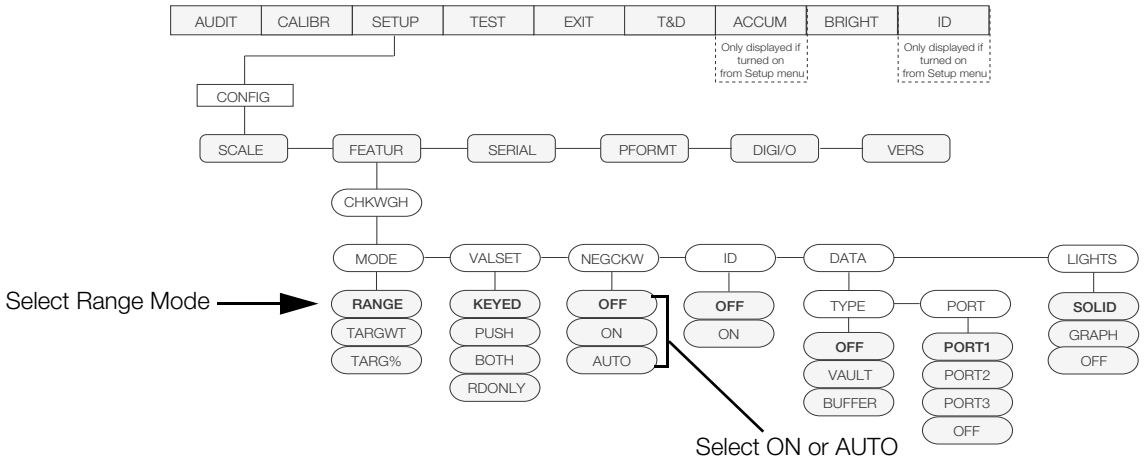


Figure 5-7. CHKWGH menu

To use negative checkweighing:

1. Ensure Range is selected under *Mode* (See Figure 5-7).
2. Under the *NEGCKW* parameter, select ON or AUTO.

Note *If ON is selected, you have to manually tare when the Accept band is reached. If AUTO is selected, it will automatically tare when the Accept band is reached and is stable.*

3. Press the OVER key.
4. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired *over* value. If using the CW-90, you can also use the numeric keypad to enter the desired *over* value.

Note *The Over value you are entering is a negative value. However, it will appear to be a higher number than the Under value on the display because the negative symbol is not displayed. An example of Over/Under negative checkweighing values as they appear on the display would be Over: 3 (actually recorded as -3) and Under: 1 (actually recorded as -1).*
To discard any changes and return to weigh mode, press the Menu button.

5. When the desired value is displayed, press Enter.
The decimal point flashes.
6. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
7. Press Enter again to accept the value and return to *weigh* mode.
8. Press the UNDER key.
9. Using the △ and ▽ keys to increment/decrement the values and the ◁ and ▷ keys to move between digits, enter the desired *under* value. If using the CW-90, you can also use the numeric keypad to enter the desired *under* value.

Note *The Under value you are entering is a negative value. However, it will appear to be a lower number than the Over value because the negative symbol is not displayed. An example of Over/Under negative checkweighing values as they appear on the display would be Over: 3 (actually recorded as -3) and Under: 1 (actually recorded -1).*
To discard any changes and return to weigh mode, press the Menu button.

10. When the desired value is displayed, press Enter.
The decimal point flashes.
11. To change the position of the decimal point, use the ◁ and ▷ keys until it is in the desired position.
12. Press Enter again to accept the value and return to weigh mode.
13. Place the weight on the scale and press the TARE key to begin negative checkweighing.
14. Begin removing product from the scale until the *Accept* band is reached.
15. If AUTO was selected in Step 2, the weight will be tared automatically. If ON was selected, press TARE to tare the weight.
16. Repeat Steps 14-15 as needed.

6.0 Serial Commands

The CW-90/90X can be controlled by a PC or remote keyboard connected to an indicator serial port. Control is provided by a set of serial commands that can simulate front panel key press functions, display and change setup parameters, and perform reporting functions. This provides the ability to print configuration data or to save to your hard drive.

6.1 The Serial Command Set

The serial command set can be divided into five groups: key press commands, reporting commands, the RESETCONFIGURATION special function command, parameter setting commands, and transmit weight data commands. When a serial command is processed, the CW-90/90X responds with the message *OK*. The *OK* response verifies that the command was received and has been executed. If the command is unrecognized or cannot be executed, the CW-90/90X responds with *??*.

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

6.1.1 Key Press Commands

Key press serial commands (see Table 6-1) simulate pressing the keys on the front panel of the indicator. These commands can be used in both setup and normal (weighing) mode. Several of the commands serve as "pseudo" keys, providing functions that are not represented by a key on the front panel.

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

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

Command	Function
KMENU	Press the MENU key
KZERO	In weighing mode, press the ZERO key
KUNITS	In weighing mode, press the UNITS key
KPRINT	In weighing mode, press the PRINT key
KTARE	Press the TARE key
KOVER	Press the OVER key
KUNDER	Press the UNDER key
KID	In weighing mode, press the ID key. In menu mode, move left in the menu. In data entry mode, move to previous digit.
KTARGET	Press the TARGET key
KGROSSNET	In weighing mode, press the GROSS/NET key (pseudo key)

Table 6-1. Serial Key Press Commands

Command	Function
KGROSS	Go to gross mode (pseudo key)
KNET	Go to net mode (pseudo key)
KDISPACCUM	Display ACCUM (pseudo key)
KDISPTARE	Display tare (pseudo key)
KCLR	Press the CLEAR key
KCLRCN	Reset consecutive number (pseudo key)
KCLRTAR	Clear tare from system (pseudo key)
KLEFT	In menu mode, move left in the menu
KRIGHT	In menu mode, move right in the menu
KUP	In weighing mode, press the UNDER key. In menu mode, move down in the menu. In data entry mode, decrement the current digit.
KDOWN	In weighing mode, press the UNDER key. In menu mode, move down in the menu. In data entry mode, decrement the current digit.
KSAVE	In menu mode, saves the current configuration
KEXIT	In menu mode, saves the current configuration then exits to normal mode
KCLRNV	In menu mode, clears non-volatile RAM
K0–K9	Press number 0 (zero) through 9
KDOT	Press the decimal point (.)
KENTER	Press the ENTER key
KLOCK	Lock specified front panel key. For example, to lock the ZERO key, enter KLOCK=KZERO.
KUNLOCK	Unlock specified front panel key. For example, to unlock the PRINT key, enter KUNLOCK=KPRINT.
KDATE	Display date (pseudo key)
KTIME	Display time (pseudo key)
KESCAPE	Exits the selected parameter. Returns to weigh mode if a parameter is not selected (functions identical to the MENU key in menu mode)

Table 6-1. Serial Key Press Commands (Continued)

6.1.2 ID Commands

Command	Function
ID.PRODID#N	(4 numeric digits max.)
ID.DESC1#N	(32 characters max.) (#N = ID number referenced)
ID.DESC2#N	(32 characters max.)
ID.OVER#N	(weight value)
ID.UNDER#N	(weight value)
ID.TARE#N	(weight value)
ID.TARGET#N	(weight value)
ID.UNITS#N	(same in alternate units)
ID.SELECT#N	Selects a new ID
ID.CLEAR#N	Clears a single ID
ID.CLRALL	Clears all IDs (only if in menu mode)
ID.COPYWV#N	Copies working values to a specified ID
ID.SELECT=XX	Loads IDXX into the working register. If the ID is not found, the display will show ??
ID.FINDPROD=XX	Returns the index where the ID is found. If the ID is not found, the display will show ??

Table 6-2. ID Commands

6.1.3 Reporting Commands

Reporting commands send specific information to the serial port. The commands listed in Table 6-3 can be used in all modes.

Command	Function
DUMPALL	List all parameter values
DUMPAUDIT	List audit trail information
DUMPBUFFER	Lists buffer information
DUMPIDS	List all ID information
VERSION	Write *CW-90/90X* software version
P	Write current displayed weight with units identifier. See Section 9.3.1 on page 58.
ZZ	Write current weight and annunciator status. See Section 9.3.2 on page 58.
XE	Returns a 10-digit code representing any error conditions currently shown on the front panel.

Table 6-3. Reporting Commands

Transmitting all configuration settings can be achieved by the DUMPALL command or by pressing PRINT while in menu mode.

6.1.4 Clear and Reset Commands

The following commands can be used to clear and reset the CW-90/90X:

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

RESETCONFIGURATION: Restores all configuration parameters to their default values (menu mode only). The RESETCONFIGURATION function can also be initiated by pressing navigating to the **DEFALT** parameter under the VERS menu and selecting YES. Then press **ENTER** to reset the indicator.

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

CLEARBUFFER: Clears the buffer information.

6.1.5 Parameter Setting Commands

Parameter setting commands allow you to display or change the current value for a particular configuration parameter (Tables 6-4 through 6-9).

Current configuration parameter settings can be displayed in all modes using the following syntax: *command*<ENTER>

Most parameter values can be changed in menu mode only.

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

For example, to set the motion band parameter to 5 divisions, type the following:

SC.MOTBAND=5<ENTER>

For parameters with selectable values, enter the command and equal sign followed by a question mark: *command*=?<ENTER> to see a list of those values. The indicator must be in menu mode to use this function.

Some parameters are valid only if other parameters or parameter values are specified. Restrictions for front-panel configuration also apply to serial command configuration.

Command	Description	Values
SC.GRADS	Graduations	*1–100000*
SC.ZTRKBND	Zero track band	0, *0–100*
SC.ZRANGE	Zero range	1.900000, *0–100*
SC.MOTBAND	Motion band	1, *0–100*
SC.SSTIME	Standstill time	*1–65535*
SC.OVRLOAD	Overload	FS+2%, FS+1D, FS+9D, FS
SC.DIGFLTR1 SC.DIGFLTR2 SC.DIGFLTR3	Digital filtering	1, 2, 4, 8, 16, 32, 64, 128, 256
SC.DFSENS	Digital filter cutout sensitivity	2OUT, 4OUT, 8OUT, 16OUT, 32OUT, 64OUT, 128OUT
SC.DFTHRH	Digital filter cutout threshold	NONE, 2D, 5D, 10D, 20D, 50D, 100D, 200D, 250D
SC.THRESH	Zero threshold	*0–9999999*
SC.SMPRAT	Sample rate	30HZ, 60HZ, 120HZ, 240HZ, 480HZ, 960HZ
SC.PWRUPMD	Power up mode	GO, DELAY
SC.TAREFN	Tare function	BOTH, NOTARE, PBTARE, KEYED
SC.PRI.DECPNT	Primary units decimal position	8.888888, 88.88888, 888.8888, 8888.888, 88888.88, 888888.8, 8888888, 8888880, 8888800
SC.PRI.DSPDIV	Primary units display divisions	1D, 2D, 5D
SC.PRI.UNITS	Primary units	lb, kg, g, oz, lb/oz, CUSTOM, OFF
SC.PRI.CUNITS	Primary custom units	Specify units if SC.PRI.UNITS=CUSTOM
SC.ACCUM	Accumulator enable	ON, OFF
SC.VISIBLE	Scale visibility	ON, OFF
SC.WZERO	Zero calibration	—
SC.WVAL	Test weight value	*test_weight_value*
SC.WSPAN	Span calibration	—
SC.WLIN.F1– SC.WLIN.F5	Actual raw count value for linearization points 1–5	*0–16777215*
SC.WLIN.V1 SC.WLIN.V5	Test weight value for linearization points 1–5	*0.000001–9999999*
SC.WLIN.C1– SC.WLIN.C5	Calibrate linearization points 1–5	—
SC.LC.CD	Deadload coefficient	—
SC.LC.CW	Span coefficient	—
SC.LC.CZ	Temporary zero	—
SC.REZERO	Rezero	—
SC.SEC	Secondary units	lb, kg, g, oz, lb/oz, CUSTOM, OFF
SC.TER	Tertiary units	lb, kg, g, oz, lb/oz, CUSTOM, OFF

Table 6-4. SCALES Serial Commands

Command	Description	Values
EDP.BAUD#p	Port baud rate	1200, 2400, 4800, 9600, 19200, 28800, 38400, 57600, 115200
EDP.BITS#p	Port data bits/parity	8NONE, 7EVEN, 7ODD

Table 6-5. SERIAL Port Serial Commands

Command	Description	Values
EDP.TERMIN#p	Port termination character	CR/LF, CR
EDP.STOPBITS#p	Port stop bits	2, 1
EDP.PRNMSG#P	Print message	ON, OFF
EDP.ECHO#p	Port echo	ON, OFF
EDP.EOLDLY#p	Port end-of-line delay	*0–255* (0.1-second intervals)
EDP.TRIGGER#x	Port trigger	*DEMAND, STREAM, COMAND, WAITSS, TARGET, L-STAB, OFF*
STR.POS	Custom stream identifiers	*None, Space, +*
STR.NEG		*None, Space, +*
STR.PRI		*8 alphanumeric characters*
STR.SEC		*8 alphanumeric characters*
STR.TER		*8 alphanumeric characters*
STR.GROSS		*8 alphanumeric characters*
STR.NET		*8 alphanumeric characters*
STR.TARE		*8 alphanumeric characters*
STR.MOTION		*2 alphanumeric characters*
STR.RANGE		*2 alphanumeric characters*
STR.OK		*2 alphanumeric characters*
STR.INVALID		*2 alphanumeric characters*
STR.ZERO		

Table 6-5. SERIAL Port Serial Commands (Continued)

Command	Description	Values
BUFFER	Turns buffer off or on	OFF, PORT 1, PORT 2, PORT 3
MODE	Sets checkweighing mode	RANGE, TARGWT, TARG%
VALSET	Value set	KEYED, PUSH, BOTH, RDONLY
NEGCKW	Sets negative checkweighing	OFF, ON, AUTO
ID	Turns IDs off or on	OFF, ON
LIGHTS	Sets the lights display	SOLID, GRAPH, OFF
CFGPWD	Configuration password	0, 1–9999999
CONSNUM	Consecutive numbering	0–9999999
CONSTUP	Consecutive number start-up value	0–9999999
DATEFMT	Date format	MMDDYYYY, DDMMYYYY, YYYYMMDD, YYYYDDMM
DATESEP	Date separator	SLASH, DASH, SEMI
DECFMT	Decimal format	DOT, COMMA
DSPBRIGHT	Sets display intensity	0 (dimmest), 1, 2, 3, 4, 5, 6, 7 (brightest)
KYBDLK	Keyboard lock (disable keypad)	OFF, ON
REGULAT	Regulatory compliance	NONE, OIML, NTEP, CANADA, INDUST
REG.HLDWGH	Allow weighment during display hold	NO, YES
REG.CTARE	Allow clear keyed tare	NO, YES
REG.HTARE	Allow tare in display hold	NO, YES
REG.KTARE	Always allow keyed tare	NO, YES

Table 6-6. FEATURE Serial Commands

Command	Description	Values
REG.MTARE	Multiple tare action	REPLACE, REMOVE, NOTHING
REG.NTARE	Allow negative tare	NO, YES
REG.ZTARE	Remove tare on ZERO	NO, YES
REG.MOTWGH	Allow weighment in motion	NO, YES
REG.OVRBASE	Zero base for overload calculation	CALIB ZERO, SCALE ZERO
REG.PRTMOT	Allow print while in motion	NO, YES
REG.PRINTPT	Add PT to keyed tare print	NO, YES
REG.PRTHLD	Print during display hold	NO, YES
REG.SNPSHOT	Display or Scale weight source	DISPLAY, SCALE
REGWORD	Regulatory word	GROSS, BRUTTO
SD	Set date	*MMDDYY*, *DDMMYY, YYMMDD,* or *YYDDMM.* Enter six-digit date using the year-month-day order specified for the DATEFMT parameter, using only the last two digits of the year.
ST	Set time	*hhmm* (enter using 24-hour format)
TIMEFMT	Time format	12HOUR, 24HOUR
TIMESEP	Time separator	COLON, COMMA
ZERONLY	Disable all keys except ZERO	OFF, ON

Table 6-6. FEATURE Serial Commands (Continued)

Command	Description	Values
GFMT.FMT	Gross demand print format string	See Section 7.0 on page 53 for information about demand print format strings.
NFMT.FMT	Net demand print format string	
ACC.FMT	Accumulator print format string	
BUF.FMT	Buffer print format string	
STRM.FMT	Streaming Format	See Section 6.2 on page 50 for information about custom stream formatting.
HDRFMT1	Header 1 Format	Enter the data you want displayed in Header 1
HDRFMT2	Header 2 Format	Enter the data you want displayed in Header 2

Table 6-7. PFORMT Serial Commands

Command	Description	Values
DIO#*b*	Digital input function	OFF, ZERO, NT/GRS, TARE, UNITS, PRINT, ACCUM, TIMDATE, ESC, CLEAR, DSPTAR, IDKEY, KEY0–KEY9, KEYDP, ENTER, NAVUP, NAVDN, NAVLFT, NAVRGT, KBDLOC, HOLD, CLRCN, GROSS, NET, PRIM, SEC, CLRTAR, CLRACC, TRIGGER
DIO#*b*	Digital output function	OVER, UNDER, ACCEPT, ZEROBD
DIO.TIMER#b	Digital output timer function	
DIO.TRIP#x	Digital output trip functionality	STABLE FRERUN
Digital inputs and outputs are specified by bit number		

Table 6-8. DIG I/O Serial Commands

6.1.6 Normal Mode Commands

The normal mode print commands (see Table 6-9) transmit data to the serial port on demand in either setup or normal mode.

Command	Description	Values
CONSNUM	Set consecutive number	*0–9 999 999*
UID	Set unit ID	*nnnnnnn*
SD	Set date	*MMDDYY*, *DDMMYY, YYMMDD,* or *YYDDMM.* Enter six-digit date using the year-month-day order specified for the DATEFMT parameter, using only the last two digits of the year.
ST	Set time	*hhmm* (enter using 24-hour format)
SX#*p*	Start serial port streaming	OK *or* ??
EX#*p*	Stop serial port streaming	The port TRIGGE parameter (EDP.TRIGGER#*p*) for the streaming port must be set to STREAM before using these commands. An EX command sent while in menu mode does not take effect until the indicator is returned to normal mode.
XG	Transmit gross weight in displayed units	nnnnnn UU where nnnnnn is the weight value, UU is the units. Note You can also send XGP, XGS, XGT, XTP, etc. to specify primary, secondary or tertiary (P.S.T.).
XN	Transmit net weight in displayed units	
XT	Transmit tare weight in displayed units	
XA	Transmit acculator value	
RS	Reset system	Soft reset. Used to reset the indicator without resetting the configuration to the factory defaults.
BUFFER	Buffer commands	Displays on/off status of the buffer
DUMPBUFFER		Reads the buffer
CLEARBUFFER		Clears the entire buffer

Table 6-9. Normal Mode Serial Commands

6.1.7 Unique Commands

Command	Description
EDP.PORT	Returns the port you are currently connected to

Table 6-10. Unique commands

6.2 Custom Stream Formatting

Each port can be independently configured to stream a default frame format or can be customized to stream a user-defined format. Custom formatting is very similar to the standard print formatting described in Section 7.0 on page 53. Table 6-11 lists the format identifiers used to configure a custom stream format.

Format Identifier	Defined By	Description
<P[G | N | T]>	STR.POS STR.NEG	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), or – (for STR.NEG*)*
<CU>	STR.PRI STR.SEC STR.TER	Units. Specifies primary, secondary, or tertiary units for the current or specified weight on the source scale.

Table 6-11. Custom Stream Format Identifiers

Format Identifier	Defined By	Description
<U[P | S | T]>	Dynamic	=L if Units=LB =K if Units=KG =G if Units=G =O if Units=OZ =space if Units=LB/OZ
<M[G | N | T]>	STR.GROSS STR.NET STR.TARE	Mode. Specifies gross, net, or tare weight for the current or specified weight on the source scale.
<S>	STR.MOTION STR.RANGE STR.OK STR.INVALID	Status for the source scale. Default values and meanings for each status: STR.MOTION M In motion STR.RANGE O Out of range STR.OK *<space>* OK STR.INVALID I Invalid
<CW>	—	Status of over/under/accept. O=Over, U=Under, A=Accept.
<B [–]n,…>	*See descriptions below*	Bit fields. Comma-separated sequence of bit field specifiers. Must be exactly 8 bits. Minus sign ([–]) inverts the bit.
B0	—	Always 0
B1	—	Always 1
B2	Configuration	=1 if even parity
B3	Dynamic	=1 if MODE=NET
B4	Dynamic	=1 if COZ
B5	Dynamic	=1 if standstill
B6	Dynamic	=1 if gross negative
B7	Dynamic	=1 if out of range
B8	Dynamic	=1 if secondary/tertiary
B9	Dynamic	=1 if tare in system
B10	Dynamic	=1 if tare is keyed
B11	Dynamic	=00 if MODE=GROSS =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	Configuration	=00 (*not used*) =01 if current DSPDIV=1 =10 if current DSPDIV=2 =11 if current DSPDIV=5
B14	Configuration	=00 (*not used*) =01 if primary DSPDIV=1 =10 if primary DSPDIV=2 =11 if primary DSPDIV=5
B15	Configuration	=00 (*not used*) =01 if secondary DSPDIV=1 =10 if secondary DSPDIV=2 =11 if secondary DSPDIV=5

Table 6-11. Custom Stream Format Identifiers

Format Identifier	Defined By	Description
B16	Configuration	=00 (*not used*) =01 if tertiary DSPDIV=1 =10 if tertiary DSPDIV=2 =11 if tertiary DSPDIV=5
B17	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
B18	Configuration	=000 if primary DECPNT=8888800 =001 if primary DECPNT=8888880 =010 if primary DECPNT=8888888 =011 if primary DECPNT=888888.8 =100 if primary DECPNT=88888.88 =101 if primary DECPNT=8888.888 =110 if primary DECPNT=888.8888 =111 if primary DECPNT=88.88888
B19	Configuration	=000 if secondary DECPNT=8888800 =001 if secondary DECPNT=8888880 =010 if secondary DECPNT=8888888 =011 if secondary DECPNT=888888.8 =100 if secondary DECPNT=88888.88 =101 if secondary DECPNT=8888.888 =110 if secondary DECPNT=888.8888 =111 if secondary 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 whether the weight is the current displayed weight (W, w), gross (G, g), net (N, n), or tare (T, t) weight. Upper-case letters specify right-justified weights; lower-case are left-justified. 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 zeroes. *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 6-11. Custom Stream Format Identifiers

7.0 Print Formatting

The CW-90/90X provides seven print formats, GFMT, NFMT, ACC.FMT, STRM.FM, BUS.FMT, HDRFMT1 and HDRFMT2. These determine the format of the printed output when the PRINT key is pressed or when a KPRINT EDP command is received. The GFMT and NFMT will print to all ports assigned as DEMAND in the TRIGGE parameter, based on whether a tare is in the indicator. The ACCFMT will print to all DEMAND ports when the ACCUM is displayed. The SFMT will be sent as a STREAM if TRIGGE is set to STREAM on any port. The HDRFMTs must be called from another format.

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

Note Print formats are limited to 300 characters. Press the down arrow to cycle to the previous character. Press the up arrow to cycle to the next character. To send a decimal point, enclose it in brackets e.g., <.> or cycle through the characters until the decimal point is displayed.

7.1 Print Formatting Commands

Table 7-1 lists commands you can use to format the gross, net and count print formats. Commands included in the format strings must be enclosed between < and > delimiters. Any characters outside of the delimiters are printed as text on the ticket. Text characters can include any ASCII character that can be printed by the output device.

Command	Description
<G>	Gross weight in displayed units
<N>	Net weight in displayed units
<T>	Tare weight in displayed units
<A>	Accumulated weight in displayed units
<CKS>	Status of over/under/accept. O=Over, U=Under, A=Accept space=Zero band
<CKOV>	Over value
<CKUV>	Under value
<CKTV>	Target value
<CKID>	Loaded ID number
<CKD1>	Description 1
<CKD2>	Description 2
<CKU>	Units
<CKT>	Tare
<AC>	Number of accumulator events (5-digit counter)
<AD>	Date of last accumulator event
<AT>	Time of last accumulator event
<UID>	Unit ID number
<CN>	Consecutive number
<NL*nn*>	New line (*nn* = number of termination (<CR/LF> or <CR>) characters)*
<SP*nn*>	Space (*nn* = number of spaces)*
<SU>	Toggle weight data format (formatted/unformatted)**
<TI>	Time
<DA>	Date
<TD>	Time & Date
<H1>	Header 1
<H2>	Header 2
Gross, net, and tare weights are 8 digits in length, including sign and decimal point, followed by a space and a one- to five-digit units identifier. Total field length with units identifier is 10-14 characters. Depending on what units are configured, the units identifier will be lb/oz, lb, oz, g, or kg.	
Gross, net, tare, and accumulator weights can be printed in any configured weight units by adding the following modifiers to the gross, net, tare, and accumulator weight commands: /P (primary units), /D (displayed units), /S (secondary units), /T (tertiary units). If not specified, the current displayed units (/D) is assumed. Example: To format a ticket to show net weight in secondary unitsm, use the following command: <N/S>.	
ID and consecutive number (CN) fields are 1–6 characters in length, as required.	
* If *nn* is not specified, 1 is assumed. Value must be in the range 1–99.	
** After receiving an SU command, the indicator sends unformatted data until the next SU command is received. Unformatted data omits decimal points, leading and trailing characters.	

Table 7-1. Print Format Commands

The default CW-90/90X print formats are shown in Table 7-2:

Format	Default Format String	Sample Output
GFMT	<G> GROSS<NL>	2046.81 lb GROSS
NFMT	<G> GROSS<NL> <T> TARE<NL> <N> NET<NL>	4053.1 lb GROSS 15.6 lb TARE 4037.5 lb NET

Table 7-2. GFMT, NFMT, H1, H2, BUF, and ACC Formats

Format	Default Format String	Sample Output
H1	Company Name <NL> Street Address <NL> City, ST ZIP <NL2>	Company Name, Street Address, City, ST ZIP
H2	Company Name <NL> Street Address <NL> City, ST ZIP <NL2>	Company Name, Street Address, City, ST ZIP
BUF.FMT	<CKID><G><NL>	ID1 3.00 lb
ACC.FMT	ACCUM<A><NL> <DA><TI><NL>	ACCUM 27.00 lb 06/03/2010 10:01AM

Table 7-2. GFMT, NFMT, H1, H2, BUF, and ACC Formats

Note The 300-character limit of each print format string includes the output field length of the print formatting commands, not the command length. For example, if the indicator is configured to show a decimal point, the <G> command generates an output field of 13 characters: the 10-character weight value (including decimal point), one space, and a two-digit units identifier.

7.2 Customizing Print Formats

The following sections describe procedures for customizing the GFMT, NFMT and CFMT formats using the EDP port, the front panel (PFORMT menu), and the Revolution® configuration utility.

7.2.1 Using the EDP Port

With a personal computer, terminal, or remote keyboard attached to the CW-90/90X EDP port, you can use the EDP command set to customize the print format strings.

To view the current setting of a format string, type the name of the string (GFMT or NFMT) and press **ENTER**. For example, to check the current configuration of the GFMT format, type GFMT and press **ENTER**. The indicator responds by sending the current configuration for the gross format:

GFMT=<G> GROSS<NL>

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

Note Indicator must be placed in the config mode with *CONFIG* shown on the display.

GFMT=FINE TRANSFER CO<NL>32400 WEST HIGHWAY ROAD<NL>SMALLTOWN<NL2><G> GROSS<NL>

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

FINE TRANSFER CO
32400 WEST HIGHWAY ROAD
SMALLTOWN

1345 lb GROSS

7.2.2 Using the Front Panel

If you have no access to equipment for communication through the EDP port or are working at a site where such equipment cannot be used, you can use the PFORMT menu (see Figure 7-1) to customize the print formats.

Using the PFORMT menu, you can edit the print format strings by changing the decimal values of the ASCII characters in the format string.

Note Lower-case letters and some special characters cannot be displayed on the CW-90/90X front panel and are shown as blanks. The CW-90/90X can send or receive any ASCII character; the character printed depends on the particular ASCII character set implemented for the receiving device.

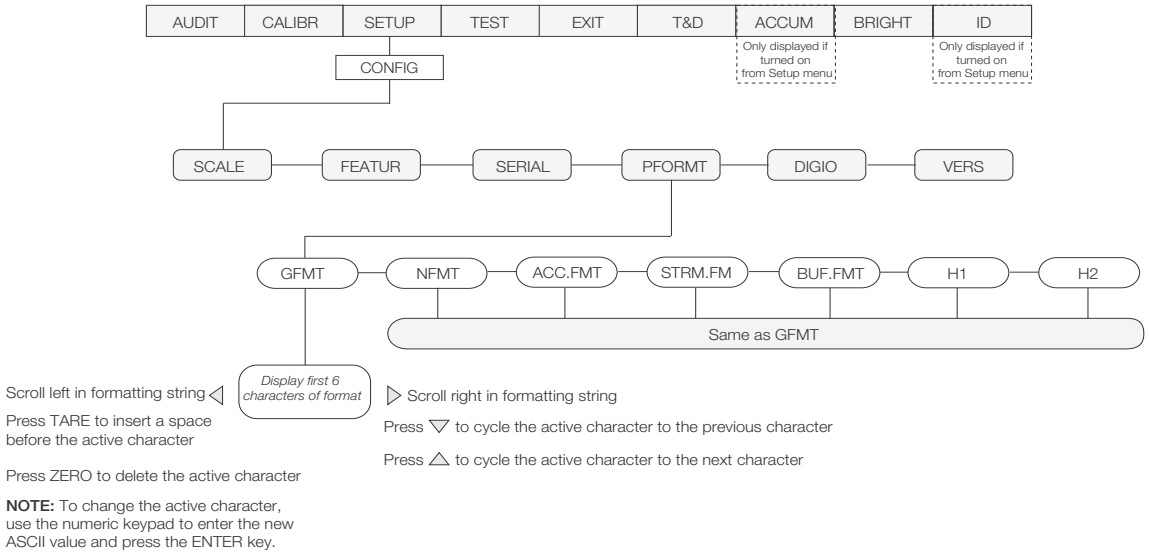


Figure 7-1. PFORMT Menu, Showing Alphanumeric Character Entry Procedure

7.2.3 Using Revolution®

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

Figure 7-2 shows an example of the Revolution print formatting grid.

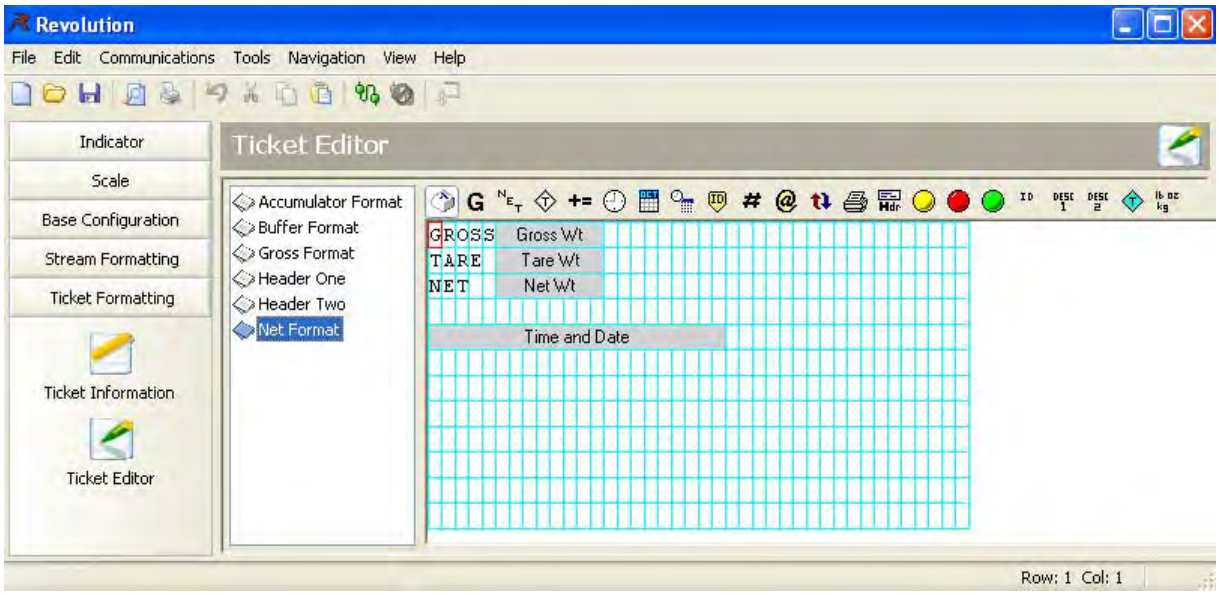


Figure 7-2. Revolution Print Format Grid

8.0 WLAN Option Card

The optional Lantronix® WiPort™ wireless networking device (PN 108671) can be installed inside the *CW-90/90X* checkweigher. This option is used to communicate with a serial port on the host indicator. The Windows®-based configuration software, DeviceInstaller™ (available on the CD that comes with the kit) can be used for installation and setup after the option card is connected to your wireless network. The WLAN option can be factory installed or can be purchased separately and installed on site.

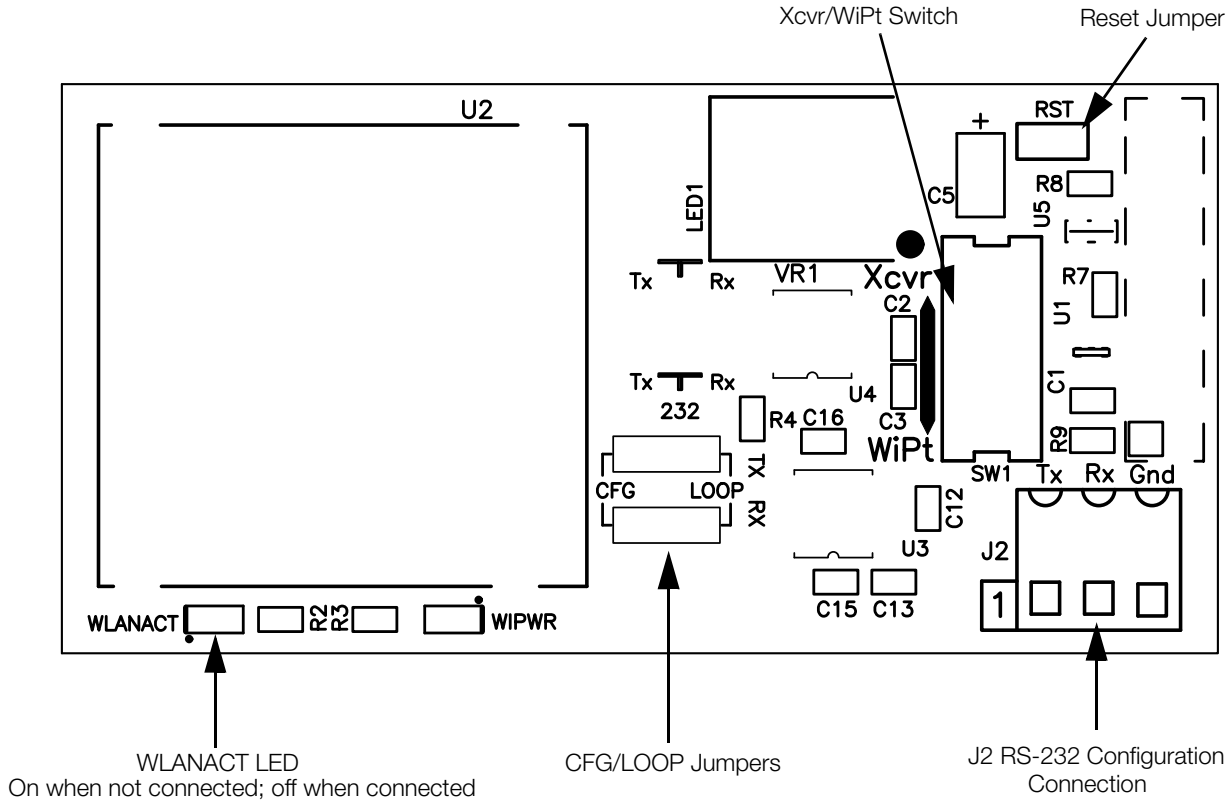


Figure 8-1. WLAN board

8.1 WLAN Card Installation

Refer to *CW-90/90X, 720i, 820i, iQUBE2, LaserLT WLAN Installation Instructions* PN 108680 included with the WLAN option card for installation and configuration instructions.

9.0 Appendix

9.1 Error Messages

If an error code appears on the display, use the information in Table 9-1 as a troubleshooting guide. If you cannot clear the error, call RLWS Service for assistance.

Error Display	Description	Solution
	Over range	• Check load cell wiring, including sense jumpers. • Check configuration, including number of grads, channel selection, display divisions. • Check calibration, including W ZERO and W SPAN values. • Under range can be caused by OIML setting and weight less than -20 display divisions • Check for scale binding or damage. • Check for proper excitation voltage. • Call RLWS Service for assistance.
	Under range	
	A/D out of range	
CHKERR - BATTERY BACK LOST	Battery Error	Press ENTER after replacing the battery to restore defaults to battery backed storage.
E A/D	A/D physical error	Call Rice Lake Weighing Systems (RLWS) Service.
EEEROM	EEPROM physical error	
EVIREE	Virgin EEPROM	Use TEST menu to perform DEFLT (restore defaults) procedure, then recalibrate load cells.
EPCKSM	Parameter checksum error	
EACKSM	A/D calibration checksum error	A/D converter requires recalibration. Call RLWS Service.
EFCKSM	Printer format checksum error	Call RLWS Service.
ELCKSM	Load cell calibration checksum error	Recalibrate load cells.
EIDATA	Internal RAM checksum error	Call RLWS Service.
E REF	A/D reference error	A/D converter requires recalibration. Call RLWS Service.
ERROR	Internal program error	Check configuration. Run XE command (see Section 9.2 on page 58) to determine error type. Call RLWS Service if unable to clear error by cycling power or if error recoccurs.
HWFERR	Hardware error	Reboot the unit. Call RLWS Service if unable to clear error by cycling power or if error recoccurs.
INVALID UNITS	ID uses unassigned units	Modify the ID to use a configured unit.
NOTARE	Tare is prevented	Change regulatory mode settings or the TAREFN parameter.
OVERFL	Overflow error	Weight value too large to be displayed.
RANGE	GRADS > 100,000 WVAL > 100,000	Only shows up in Config mode.
EEPERR	EEPROM error	Call Rice Lake Weighing Systems (RLWS) for service
VERSION UPDATED	Core has been updated or memory has been corrupted.	Press the ENTER key. If the message persists, call RLWS for service.

Table 9-1. CW-90/90X Error Messages

9.2 Using the XE EDP Command

The XE EDP command can be used to remotely query the *CW-90/90X* for the error conditions shown on the front panel. The XE command returns a 5-digit number in the format:

xxxxx yyyyy

where *xxxxx* contains a decimal representation of any existing error conditions as described in Table 9-2.

If more than one error condition exists, the number returned is the sum of the values representing the error conditions. For example, if the XE command returns the number 1040, this value represents the sum of an A/D reference error (1024) and an A/D calibration checksum error (16).

XE Error Code	Description	XEH Hex Value
1	VIRGERR	0x00000001
2	PARMCHKERR	0x00000002
4	LOADCHKERR	0x00000004
8	PRINTCHKERR	0x00000008
16	ENVRAMERR	0x00000010
32	ENVCRCERR	0x00000020
64	BATTERYERR	0x00000040
32768	GRAVERR	0x00008000
65536	ADPHYSICALERR	0x00010000
131072	TAREERR	0x00020000
262144	EACCOVER	0x00040000
524288	STRINGERR	0x00080000
1048576	RESERVED_PF	0x00100000
2097152	RTCERR	0x00200000
4194304	MISSINGHWERR	0x00400000
8388608	CFGCONFLICTERR	0x00800000
16777216	UNRECOVERABLEERR	0x01000000
0x10000 - 0x80000000		*Reserved*

Table 9-2. Error Codes Returned on XE Command

9.3 Status Messages

Two EDP commands, P and ZZ, can be used to provide status about the indicator. These commands are described in the following sections.

9.3.1 Using the P EDP Command

The P EDP command returns the current displayed weight value to the EDP port, along with the units identifier. If the indicator is in an underrange or overload condition, the weight value is replaced with ^^^^^ (overload) or _ _ _ _ _ (underrange).

9.3.2 Using the ZZ EDP Command

The ZZ EDP command can be used to remotely query which annunciators are currently displayed on the indicator front panel. The ZZ command returns the currently displayed weight and a decimal number representing the LED annunciators currently lit. The format of the returned data is:

wwwwww uu zzz

where *wwwwww uu* is the current displayed weight and units, *zzz* is the annunciator status value (see Table 9-3). If more than one annunciator is lit, the second number returned is the sum of the values representing the active annunciators.

Example: If the annunciator status value returned on the ZZ command is 145, the gross, standstill, and lb annunciators are lit. 145 represents the sum of the values for the standstill annunciator (128), gross mode annunciator (16), and the lb/primary units annunciator (1).

Decimal Value	Annunciator
1	lb/primary units
2	kg/secondary units
4	Count
8	Tare entered
16	Gross
32	Net
64	Center of zero
128	Standstill

Table 9-3. Status Codes Returned on the ZZ Command

9.4 Continuous Output (Stream) Format

Figure 9-1 shows the continuous output format sent to a CW-90/90X port when that port's TRIGGE parameter (SERIAL menu) is set to STREAM.

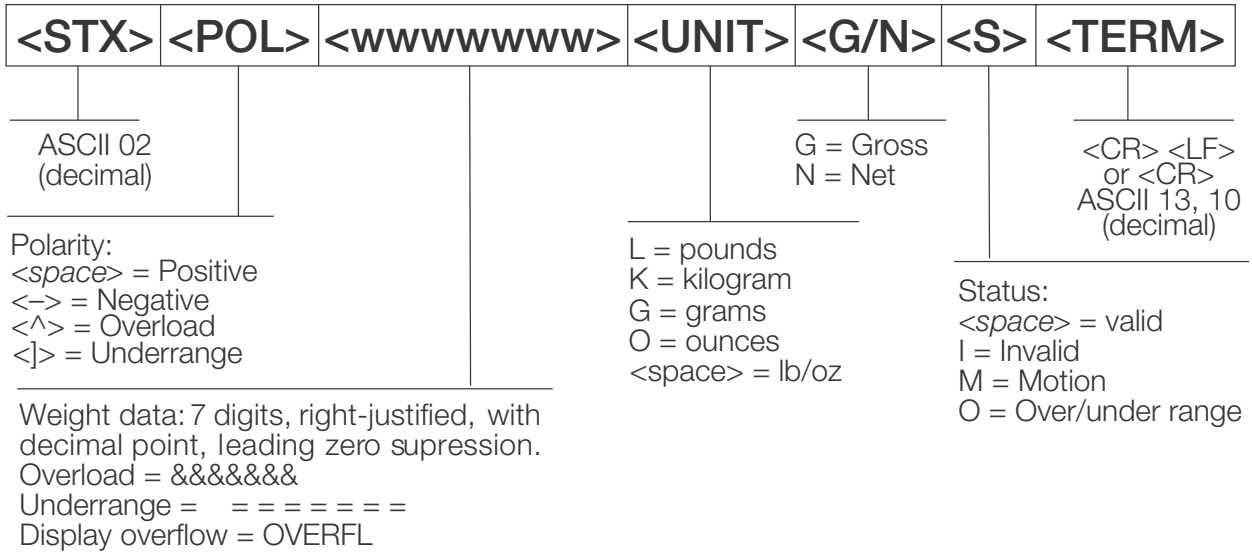


Figure 9-1. Continuous Output Data Format

9.5 Digital Filtering

The CW-90/90X uses averaged digital filtering to reduce the effect of vibration on weight readings. Adjustable threshold and sensitivity functions allow quick settling by suspending filter averaging, allowing the weight reading to jump to the new value. Figure 9-2 shows the digital filter parameters on the CONFIG menu.

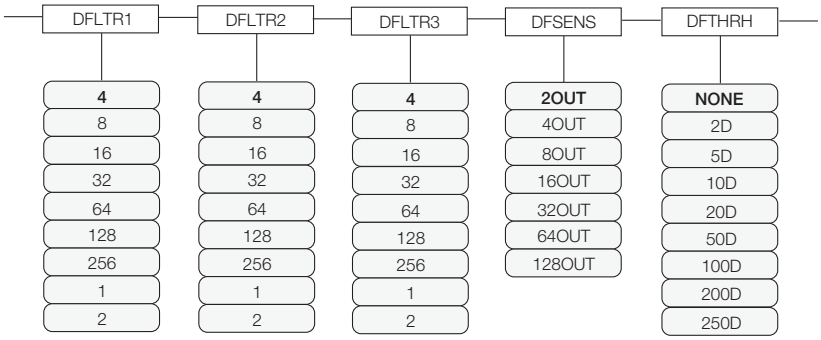


Figure 9-2. Digital Filtering Parameters on the Configuration (CONFIG) Menu

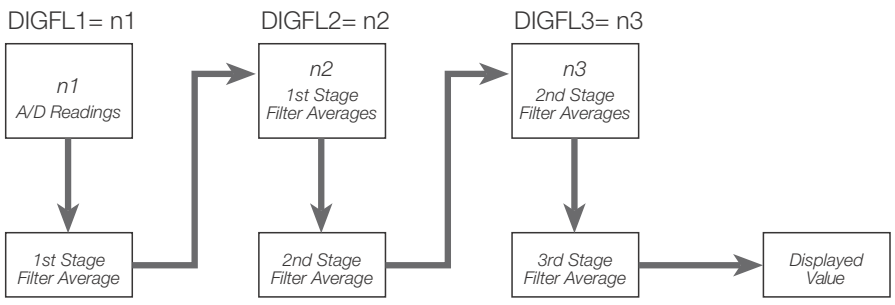


Figure 9-3. Flow Diagram for CW-90/90X Digital Filters

9.5.1 DIGFLx Parameters

The first three digital filtering parameters, DFLTR1, DFLTRL2, and DFLTR3, 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 (see Figure 9-3).

The overall filtering effect can be expressed by adding the values assigned to the three filter stages:

DFLTR1 + DFLTR2 + DFLTR3

For example, if the filters are configured as DFLTR1=4, DFLTR2=8, DFLTR3=8, the overall filtering effect is 20 (4 + 8 + 8). With this configuration, each A/D reading has a 1-in-20 effect on the displayed weight value. Setting the filters to 1 effectively disables digital filtering.

9.5.2 DFSENS and DFTHRH Parameters

The three digital filters can be used by themselves 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.

9.5.3 Setting the Digital Filter Parameters

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

1. In menu mode, set all three digital filters (DFLTR1, DFLTRL2, DFLTR3) to 1. Set DFTHRH to NONE. Return indicator to normal mode.
2. Remove all weight from the scale, then watch the indicator display to determine the magnitude of vibration effects on the scale. Record the weight below which all but a few readings fall. This value is used to calculate the DFTHRH parameter value in Step 4.

   For example, if a heavy-capacity scale produces vibration-related readings of up to 50 lb, with occasional spikes to 75 lb, record 50 lb as the threshold weight value.
3. Place the indicator in menu mode and set the digital filters (DFLTR*x*) to eliminate the vibration effects on the scale. (Leave DFTHRH set to NONE.) Reconfigure as necessary to find the lowest effective values for the DFLTR*x* parameters.
4. With optimum values assigned to the DFLTR*x* parameters, calculate the DFTHRH parameter value by converting the weight value recorded in Step 2 to display divisions:

   threshold_weight_value / DSPDIV

   In the example in Step 2, with a threshold weight value of 50 lb and a display division value of 5lb: *50 / 5lb = 10DD*. DFTHRH should be set to 10DD for this example.
5. Finally, set the DFSENS parameter high enough to ignore transient peaks. Longer transients (typically caused by lower vibration frequencies) will cause more consecutive out-of-band readings, so DFSENS should be set higher to counter low frequency transients.

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

9.5.4 Audit Trail Support

Audit trail support provides tracking information for configuration and calibration events. To prevent potential misuse, all configuration and calibration changes are counted as change events.

Use the Audit menu or Revolution to display audit trail information. This includes the legally relevant (LR) version number (software version for the code that provides audit trail information), a calibration count and, if REGULA=NTEP, a configuration count. The exact format of the information shown depends on the regulatory agency specified for the REGULA parameter (FEATUR menu).

Audit trail information can be printed from Revolution or by sending the DUMPAUDIT serial command.

9.6 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 9-4 describes the function of these keys for the NTEP, CANADA, OIML, and NONE regulatory modes. **TARE** and **ZERO** key functions are configurable when the REGULAT mode is set to INDUST (see Table 9-5 on page 61).

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 (not to exceed -20dd)	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. *No action* if weight is outside of ZRANGE
NONE	zero or negative	no	TARE	ZERO
		yes	CLEAR TARE	
	positive	no	TARE	
		yes	CLEAR TARE	

Table 9-4. TARE and ZERO Key Functions for REGULAT Parameter Settings

Table 9-5 lists the subparameters available when configuring a scale using INDUST mode. The table includes the default values of the INDUST subparameters and the effective (not configurable) values used by the NTEP, CANADA, OIML, and NONE regulatory modes.

REGULAT / INDUST Parameter		REGULAT Mode				
Parameter Name	Text Prompt	INDUST	NTEP	CANADA	OIML	NONE
SNPSHOT	Display or Scale weight source	DISPLAY	DISPLAY	DISPLAY	DISPLAY	SCALE
HTARE	Allow tare in display hold	NO	NO	NO	NO	YES
ZTARE	Remove tare on ZERO	NO	NO	NO	YES	NO
KTARE	Always allow keyed tare	YES	YES	NO	YES	YES
MTARE	Multiple tare action	REPLACE	REPLACE	NOTHING	REPLACE	REMOVE
NTARE	Allow negative tare	NO	NO	NO	NO	YES
CTARE	Allow CLEAR key to clear tare/ accumulator	YES	YES	NO	NO	YES
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 9-5. REGULAT / INDUST Mode Parameters, Comparison with Effective Values of Other Modes

9.7 Updating CW-90/90X Firmware

To update firmware of the CW-90/90X, you must have Revolution installed and a .hex file on your computer. Visit **www.ricelake.com** to download this free configuration software and the latest .hex file.

If the .hex file is the same version as is currently in the indicator, the firmware update will not reset the configuration. This is helpful if the firmware becomes corrupt and you want to reload the same firmware. However, it is always recommended that configuration be backed up in Revolution to avoid any data loss.

1. Unplug power to the CW-90/90X and remove the back plate.
2. Wire the serial cable to the CW-90/90X's Port 1. Refer to Table 9-6 for cable connection settings.

DB9 Cable				CW-90/90X Connector (J2)		
Pin/Color	Signal	In/Out	Description	Pin	Description	In/Out
1/Brown	DCD	In	Data Carrier Detect	NC	NA	NA
2/Red	RxD	In	Receive Data	3	Tx	Out
3/Orange	TxD	Out	Transmit Data	4	Rx	In
4/Yellow	DTR	Out	Data Terminal Ready	5	DTR	In
5/Green	GND	--------	Ground	1 or 2	Gnd	--------
6/Blue	DSR	In	Data Set Ready	NC	NA	NA
7/Purple	RTS	Out	Request to Send	6	RTS	In
8/Gray	CTS	In	Clear to Send	NC	NA	NA
9/Black	RI	In	Ring Indicator	NC	NA	NA

Table 9-6. Cable connection settings

3. Install jumpers on JP3 and JP4 as shown in Figure 9-4.

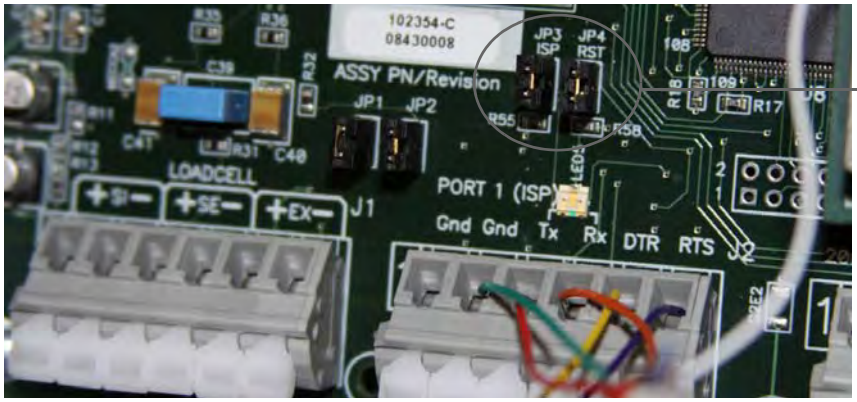


Figure 9-4. Jumpers installed on JP3 and JP4

4. Plug in power to the CW-90/90X and press the indicator's Power button.
5. With Revolution open, begin a new configuration file for the CW-90/90X.
6. Click Update CW90 Firmware.

Figure 9-5. Revolution CW-90/90X screen.

7. The *Rice Lake CW90 Updater* screen appears. Specify the COM port the CW-90/90X is connected to, change the baud rate if needed, and click the ellipses (...) to browse to and select the desired .hex file.

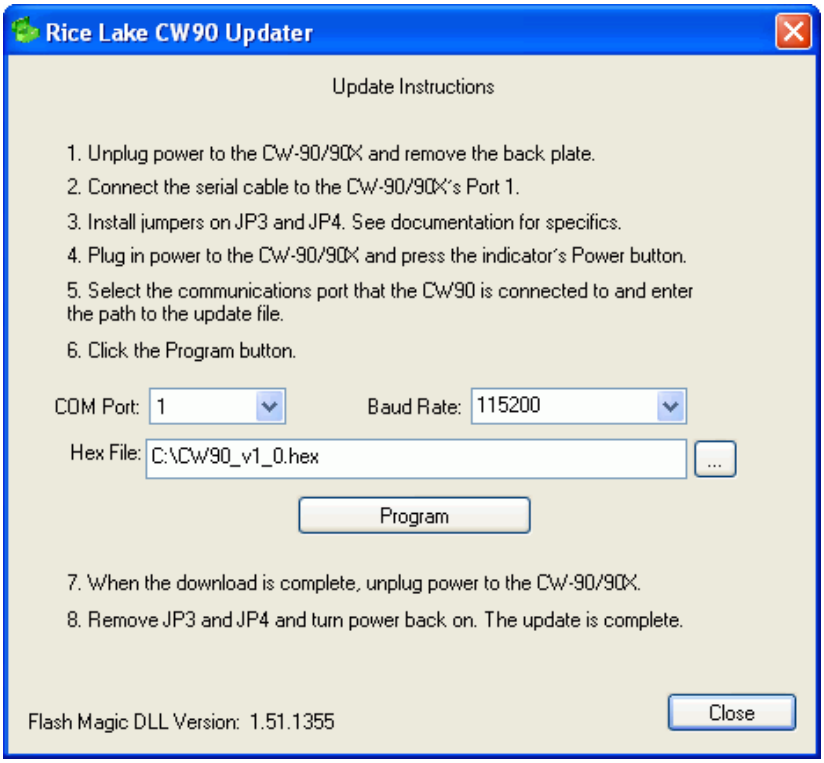


Figure 9-6. Rice Lake CW90 Updater screen

8. Click the Program button. The update will take several moments.
9. When complete, remove the jumpers shown in Figure 9-4 on page 62 and press the Power button to power up the indicator.

9.8 Specifications

(115 VAC)				
Part #	Capacity	Platform Dimensions	Column Height	Est. Ship Weight
105957	5 lb x 0.001 lb (2.5 x 0.0005 kg) 80 x 0.02 oz	10 in x 10 in x 4.25 in	12 in	29 lb
105958	10 lb x 0.002 lb (5 x 0.001 kg) 160 x 0.05 oz	10 in x 10 in x 4.25 in	12 in	29 lb
105959	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	10 in x 10 in x 4.25 in	12 in	29 lb
105960	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	12 in x 12 in x 4.25 in	12 in	33 lb
105961	50 lb x 0.01 lb (25 x 0.005 kg) 800 x 0.2 oz	12 in x 12 in x 4.25 in	12 in	33 lb
105962	100 lb x 0.02 lb (50 x 0.01 kg) 1600 x 0.5 oz	12 in x 12 in x 4.25 in	12 in	33 lb
(230 VAC)				
Part #	Capacity	Platform Dimensions	Column Height	Est. Ship Weight
106123	5 lb x 0.001 lb (2.5 x 0.0005 kg) 80 x 0.02 oz	10 in x 10 in x 4.25 in	12 in	29 lb
106124	10 lb x 0.002 lb (5 x 0.001 kg) 160 x 0.05 oz	10 in x 10 in x 4.25 in	12 in	29 lb
106125	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	10 in x 10 in x 4.25 in	12 in	29 lb
106126	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	12 in x 12 in x 4.25 in	12 in	33 lb
106127	50 lb x 0.01 lb (25 x 0.005 kg) 800 x 0.2 oz	12 in x 12 in x 4.25 in	12 in	33 lb
106128	100 lb x 0.02 lb (50 x 0.01 kg) 1600 x 0.5 oz	12 in x 12 in x 4.25 in	12 in	33 lb

Table 9-7. CW-90 specifications

(115 VAC)				
Part #	Capacity	Platform Dimensions	Column Height	Est. Ship Weight
105963	5 lb x 0.001 lb (2.5 x 0.0005 kg) 80 x 0.02 oz	10 in x 10 in x 4.25 in	12 in	29 lb
105965	10 lb x 0.002 lb (5 x 0.001 kg) 160 x 0.05 oz	10 in x 10 in x 4.25 in	12 in	29 lb
105966	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	10 in x 10 in x 4.25 in	12 in	29 lb
105967	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	12 in x 12 in x 4.25 in	12 in	33 lb
105968	50 lb x 0.01 lb (25 x 0.005 kg) 800 x 0.2 oz	12 in x 12 in x 4.25 in	12 in	33 lb
105969	100 lb x 0.02 lb (50 x 0.01 kg) 1600 x 0.5 oz	12 in x 12 in x 4.25 in	12 in	33 lb
(230 VAC)				
Part #	Capacity	Platform Dimensions	Column Height	Est. Ship Weight
106129	5 lb x 0.001 lb (2.5 x 0.0005 kg) 80 x 0.02 oz	10 in x 10 in x 4.25 in	12 in	29 lb
106130	10 lb x 0.002 lb (5 x 0.001 kg) 160 x 0.05 oz	10 in x 10 in x 4.25 in	12 in	29 lb
106131	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	10 in x 10 in x 4.25 in	12 in	29 lb
106132	25 lb x 0.005 lb (10 0.005 kg) 400 x 0.1 oz	12 in x 12 in x 4.25 in	12 in	33 lb
106133	50 lb x 0.01 lb (25 x 0.005 kg) 800 x 0.2 oz	12 in x 12 in x 4.25 in	12 in	33 lb
106134	100 lb x 0.02 lb (50 x 0.01 kg) 1600 x 0.5 oz	12 in x 12 in x 4.25 in	12 in	33 lb

Table 9-8. CW-90X specifications

Power - AC

Line Voltages	115 or 230 VAC
Frequency	50 or 60 Hz
Power Consumption	1.5 A @ 115 VAC (8W) 0.75 A @ 230 VAC (8W)
Fusing	2.5 A 5 x 20 mm fuse

Power - DC

Line Voltages	9-36 VDC DC Input
Power Consumption	1.5 A Max
Fusing	Internal short circuit protection

Analog Specifications

Full Scale Input Signal	Up to 22.5 mV
Excitation Voltage	+5V single sided 8 x 350Ω or 16 x 700Ω load cells
Sense Amplifier	Differential amplifier with 4- and 6-wire sensing
Analog Signal Input Range	–0.5 mV/V to +4.5 mV/V
Analog Signal Sensitivity	0.3 µV/graduation minimum, 1.5 µV/grad recommended
Input Impedance	200 MΩ, typical
Noise (ref to input)	0.3 µV p-p with digital filters at 4-4-4
Internal Resolution	8,000,000 counts
Display Resolution	100 000 dd
Measurement Rate	Up to 60 measurements/sec
Input Sensitivity	10 nV per internal count
System Linearity	Within 0.01% of full scale
Zero Stability	150 nV/°C, maximum
Span Stability	3.5 ppm/°C, maximum
Calibration Method	Software, constants stored in EEPROM
Common Mode Voltage	–2.35 to +3.45 V, referred to ground
Common Mode Rejection	130 dB minimum @ 50 or 60 Hz
Normal Mode Rejection	90 dB minimum @ 50 or 60 Hz
Input Overload	± 12 V continuous, static discharge protected
RFI Protection	Signal, excitation, and sense lines protected by capacitor bypass

Serial Communications

Port 1	Full duplex RS-232
Port 2	Full duplex RS-232 Output only active 20 mA current loop
Port 3	Optional Ethernet, USB, or fiber optic card

Operator Interface

Display	6-digit LED display. 14-segment, 0.8 in (20 mm) digits
LED annunciators	Center of zero, gross, net, tare, preset tare; percent, kg, g, lb, oz
Keypad	21-key flat membrane panel (CW-90) Piezo membrane panel (CW-90X)

Environmental

Operating Temperature	–10 to +40°C (legal); –10 to +50°C (industrial)
Storage Temperature	–25 to +70°C
Humidity	0–95% relative humidity

Enclosure

Enclosure Dimensions	9.5 in x 6 in x 3.12 in 24 cm x 15 cm x 8 cm
Weight	2.8 Kg (6.1 lb)
Rating/Material	UL Type 4X

Certifications and Approvals

CW-90/90X Indicator
NTEP
CoC Number 08-092
Accuracy Class III/IIIL n_{max} : 10 000

CW-90/90X Scale
NTEP
CoC Number 95-072A2
Accuracy Class III n_{max} : 5 000

c UL us LISTED File Number E151461-A7

CE

NSF Visit www.nsf.org and search by manufacturer. Or visit the direct link at:
http://www.nsf.org/Certified/food/Listings.asp?CompanyName=Rice+Lake%25&

OIML (Pending)

Approval No. AM-5710

Caution Do not use any parts on this scale that may contain lead.

CW-90/90X Limited Warranty

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

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

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

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS'S SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

NO TERMS, CONDITIONS, UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF RLWS AND THE BUYER.

RICE LAKE WEIGHING SYSTEMS • 230 WEST COLEMAN STREET • RICE LAKE, WISCONSIN 54868 • USA

230 W. Coleman St. • Rice Lake, WI 54868 • USA
U.S. 800-472-6703 • Canada/Mexico 800-321-6703
International 715-234-9171

www.ricelake.com

mobile: m.ricelake.com