

# 7400 Series

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Checkweigh Indicator

## Technical Manual



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## **Introduction**

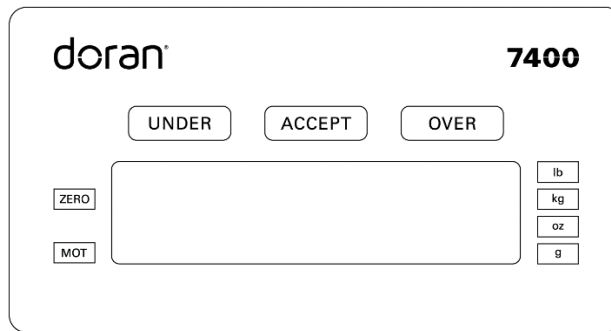
Thank you for purchasing a Doran Scales product. Please read this manual to ensure obtaining all the benefits that the indicator can provide. This manual is intended for revision 4.8 and greater scales. If required, Doran can upgrade the software in your scale to the current revision. Please contact the Doran Scales Technical Support Department at [tech@doranscales.com](mailto:tech@doranscales.com) for upgrade details.

### **Unpacking Your Scale**

Before unpacking your Doran scale, please read the instructions in this section. Your new scale is a durable industrial product, but it is also a sensitive weighing instrument. Normal care should be taken when handling and using this product. Improper handling or abuse can damage the scale and result in costly repairs that will not be covered by the warranty. If you notice any shipping damage, notify the shipper immediately. Please observe the following precautions to insure years of trouble-free service from your new scale.

- DO NOT drop the scale.
- DO NOT immerse the scale.
- DO NOT drop objects on the platform.
- DO NOT pick up the scale by the top of the weighing platform.
- Carefully remove the scale from the shipping carton.

<b>7400 Indicator Specifications</b>	
NTEP Certificate	Class III – 10,000d; Cert. #99-129A4
Enclosure	304 Stainless Steel
Product Dimensions	10" W x 6.75" H x 3.5" D
Environmental Protection	IP69K
Legal for Trade Temperature Range	14 F to 104F (-10 C to +40 C)
Resolution Range	200d to 50,000d
Analog Signal Sensitivity	0.16 $\mu$ V/e minimum, 0.5 $\mu$ V/e typical
System Linearity	0.01% full scale
Analog Signal Range	-0.5mV/V to 5 mV/V with 4 and 6 wire input
Excitation Voltage	5 VDC
Number of Load Cells	Up to 8 350 Ohm
Scale Inputs	One
Calibration Range	Calibrate between 100% and 2% of capacity
Power Input	100 – 240VAC 50/60Hz
Display	0.8" high, 6 digit LED
Displayed Units	lb, kg, oz, g, lb:oz
Capacity Range	1 to 999,000 lb
Serial Interface	Two Bi-directional RS-232 ports standard
Controls	ZERO Internal UNITS, PRINT, OVER, UNDER
Digital IO	Two remote switch inputs Eight outputs – 4.7 or 12 VDC configurable up to 800mA. Current-sinking Darlington pair



ZERO

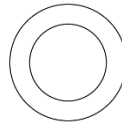


Fig. 1: Model 7400 Front Panel Layout

The operational controls for the Model 7400 by default is the ZERO button. An internal board comes installed to access the UNITS, PRINT, OVER, and UNDER buttons

### **Scale Annunciators**

- |               |  |
|---------------|--|
| <b>ZERO</b>   | Center of zero. The annunciator will illuminate while the scale is displaying a zero weight.   |
| <b>MOT</b>    | Motion indicator. This symbol represents motion or instability of the weight. The annunciator will illuminate when motion is sensed on the platform. Changes in weight, vibration or air currents can cause the scale to go into motion. |
| <b>UNDER</b>  | Under illuminates to indicate weight is below the Under target and above the Low target or flashes if below the Low target.  |
| <b>ACCEPT</b> | Accept illuminates to indicate weight is at or above the Under target and at or below the Over target.   |
| <b>OVER</b>   | Over illuminates to indicate weight is above the Over target and below the High target or flashes if above the High target.  |

## **Power Up**

Connect the cord to a compatible power source.

For indicators with battery option, press and hold ZERO.

## **Basic Weighing Operation**

- 1) Remove all items from the scale platform
- 2) Press the ZERO button to zero the scale
- 3) The weight display now reads zero
- 4) Place an item on the scale platform and wait for the motion annunciator to turn off, indicating an accurate, stable weight

## **ZERO**

ZERO is used to zero the scale. To zero the scale, wait until the scale is stable and press the ZERO button. The scale will not zero if the scale is in motion. The zero function will operate over the entire capacity of the scale.

The scale is equipped with a Zero on Demand parameter which zeros the scale upon the next stable reading after ZERO is pressed.

## **UNITS (Internal)**

UNITS selects the current unit of measure. Press UNITS to change the current unit. The units annunciator to the right of the display will indicate the current unit or measure: lb, oz, kg, g or lb:oz.

Each unit can be enabled or disabled in the scale parameter setup. Lb:oz is disabled by default. Lb:oz not available for tolerance values. Lb:oz not available for tolerance values or checkweigh limits and cannot be transmitted as data.

## **PRINT (Internal)**

PRINT transmits data to a printer or other external devices. When the data is transmitted, the leftmost display digit will momentarily display an "r" to confirm data transmission.

There are many parameters that customize the control of manual and automatic transmission of data. Data can be transmitted via standard RS232. See parameters settings for how to configure communication ports.

## **OVER (Internal)**

OVER allows entry of the upper checkweighing limits. It is also used to increment a checkweighing value that is being modified.

## **UNDER (Internal)**

UNDER allows entry of the lower checkweighing limits. It is also used to decrement a checkweighing value that is being modified.

## Three Band Checkweighing

Three band checkweighing classifies weighments into over, accept and under. The default configuration is three band checkweighing. Note that lb:oz is not supported for checkweighing limits.

### Three Band Checkweighing (9.1 L.O. set to operation starting with 3)

1. Remove all items from the scale platform
2. Press ZERO and the display will read zero weight
3. Place an item on the scale platform and wait for the scale to stabilize
4. Accept, Over or Under annunciators indicate checkweigh status

### Enter and Display of Checkweigh Limits (9.2 L.E. default value 5Lr)

1. Press OVER or UNDER
2. The display will briefly read over or under followed by the current limit
3. Press either OVER to increase the weight value or press UNDER to decrease the weight value. Pressing and holding will accelerate the weight scroll.
4. Press ZERO to save the value or press PRINT to exit without saving
5. 5RULd is displayed if saved or 5RULt is shown if aborted

**NOTE:** To digitally adjust the platform weight for OVER and UNDER limits, the parameter L.E. must be set to 5L5.

### Weight Reference and Digital Entry of Checkweigh Limits (9.2 L.E. set to 5L5)

1. Press ZERO
2. Place a target item on the scale
3. Press OVER or UNDER
4. The display will briefly read over or under followed by the weight on the platform
5. Press either OVER to increase the weight value or press UNDER to decrease the weight value. Pressing and holding will accelerate the weight scroll.
6. Press ZERO to save the value or press PRINT to exit without saving
7. 5RULd is displayed if saved or 5RULt is shown if aborted

**NOTE:** To digitally adjust the platform weight for OVER and UNDER limits, the parameter L.E. must be set to 5L5.

### Weight Reference Entry of Checkweigh Limits (9.2 L.E. set to Pb)

1. Press ZERO
2. Place a weight equal to the desired OVER or UNDER limit on the platform
3. Press OVER or UNDER
4. over or under is displayed and then 5RULd to indicate the new OVER limit was saved.

**NOTE:** To enable Push-button entry of OVER and UNDER limits, the L.E. parameter must be set to Pb.



## Five Band Checkweighing

Five band checkweighing classifies weighments into high, over, accept, under and low. Note that lb:oz is not supported for checkweighing limits.

### Five Band Checkweighing (9.1 L.a. set to operation starting with 5)

1. Press ZERO
2. Place an item on the scale
3. Checkweigh status is indicated as follows
  - a. Flashing OVER = HIGH
  - b. Solid OVER = OVER
  - c. Solid ACCEPT = ACCEPT
  - d. Solid UNDER = UNDER
  - e. Flashing UNDER = LOW

### Enter and Display of High and Low Limits (9.2 L.E. default value 50r)

1. Press and hold the OVER or UNDER until the display reads H 9h or Lowu respectively
2. The current weight value of the saved limit is displayed and checkweigh status annunciators will flash
3. Press either OVER to increase the weight value or press UNDER to decrease the weight value. Pressing and holding will accelerate the weight scroll.
4. Press ZERO to save the value or press PRINT to exit without saving
5. 50000 is displayed if saved or 9h or 9u is shown if aborted

**NOTE:** To digitally adjust the platform weight for OVER and UNDER limits, the parameter L.E. must be set to 50r.

### Weight Reference and Digital Entry of High and Low Limits (9.2 L.E. set to 505)

1. Press ZERO
2. Place an item of the desired weight on the scale platform
3. Press and hold the OVER or UNDER until the display reads H 9h or Lowu respectively
4. The current weight value of the saved limit is displayed and checkweigh status annunciators will flash
5. Press either OVER to increase the weight value or press UNDER to decrease the weight value. Pressing and holding will accelerate the weight scroll.
6. Press ZERO to save the value or press PRINT to exit without saving
7. 50000 is displayed if saved or 9h or 9u is shown if aborted

**NOTE:** To digitally adjust the platform weight for OVER and UNDER limits, the parameter L.E. must be set to 505.

### **Weight Reference Entry of High and Low Limits (9.2 C.E. set to Pb)**

1. Press ZERO
2. Place an item of the desired weight on the scale platform
3. Press and hold the OVER or UNDER until the display reads H, Gh or Lowu respectively
4. The display will briefly read OVER or UNDER followed by the weight on the platform and checkweigh status annunciators will flash
5. Press either OVER to increase the weight value or press UNDER to decrease the weight value. Pressing and holding will accelerate the weight scroll.
6. Press ZERO to save the value or press PRINT to exit without saving
7. SUCCESS is displayed if saved or Abort is shown if aborted

**NOTE:** To enable Push-button entry of OVER and UNDER limits, the C.E. parameter must be set to Pb.

### **Zero Band Checkweighing**

Basic checkweighing - simply set the desired weight on the platform, press zero and checkweigh based upon the standard tolerances in the O.U. parameter (9.3 O.U.).

### **Zero Band Checkweighing (9.4 C.O. set to operation starting with 0)**

1. Remove all items from the scale platform
2. Place the target weight on the scale platform
3. Press ZERO and the display will read zero weight
4. Remove the target weight
5. Place an item on the scale platform and wait for the scale to stabilize
6. A zero weight will indicate the item is exactly the target weight. Any weight above or below zero indicates the amount of weight away from the target weight.
7. Accept, Over or Under will be displayed

# Installation Guide

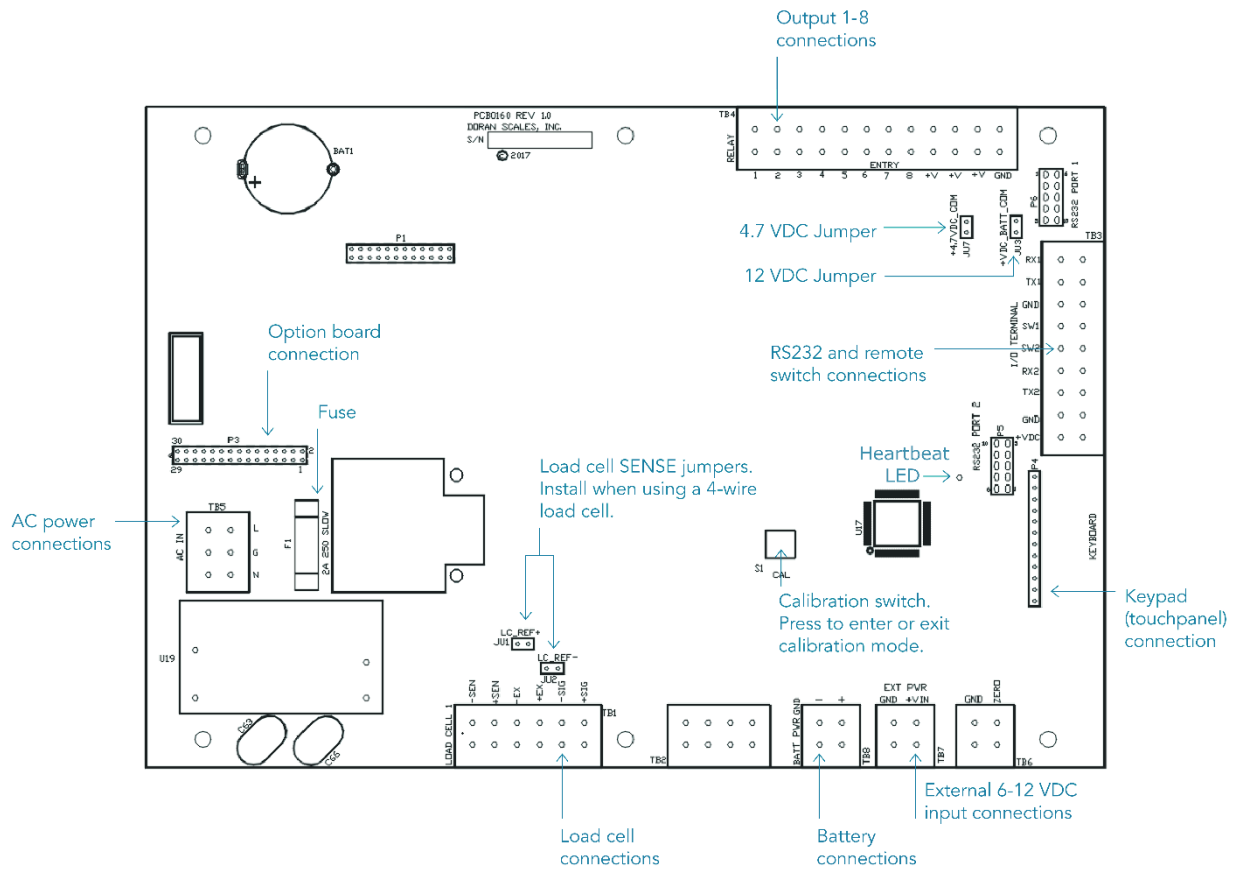


Fig. 2: Motherboard Layout

## Removing and Replacing the Rear Panel

Before you remove the rear panel, remove AC power. Power down the scale if the optional battery power is present. Removing the rear panel requires a 5/16" nut driver.

To replace the rear panel and achieve a tight seal, each screw requires a rubber bonded washer and the gasket needs to be in place. Tighten screws to 20 in-lb to achieve proper sealing. Tighten all watertight glands until the cable exiting the watertight can no longer slide through the watertight – this is usually finger tight plus a quarter turn with a wrench for a seal.

## Load Cell Connection

Load cell connections are made through terminal block TB1. The power cord connects to terminal block TB5 adjacent to the transformer.

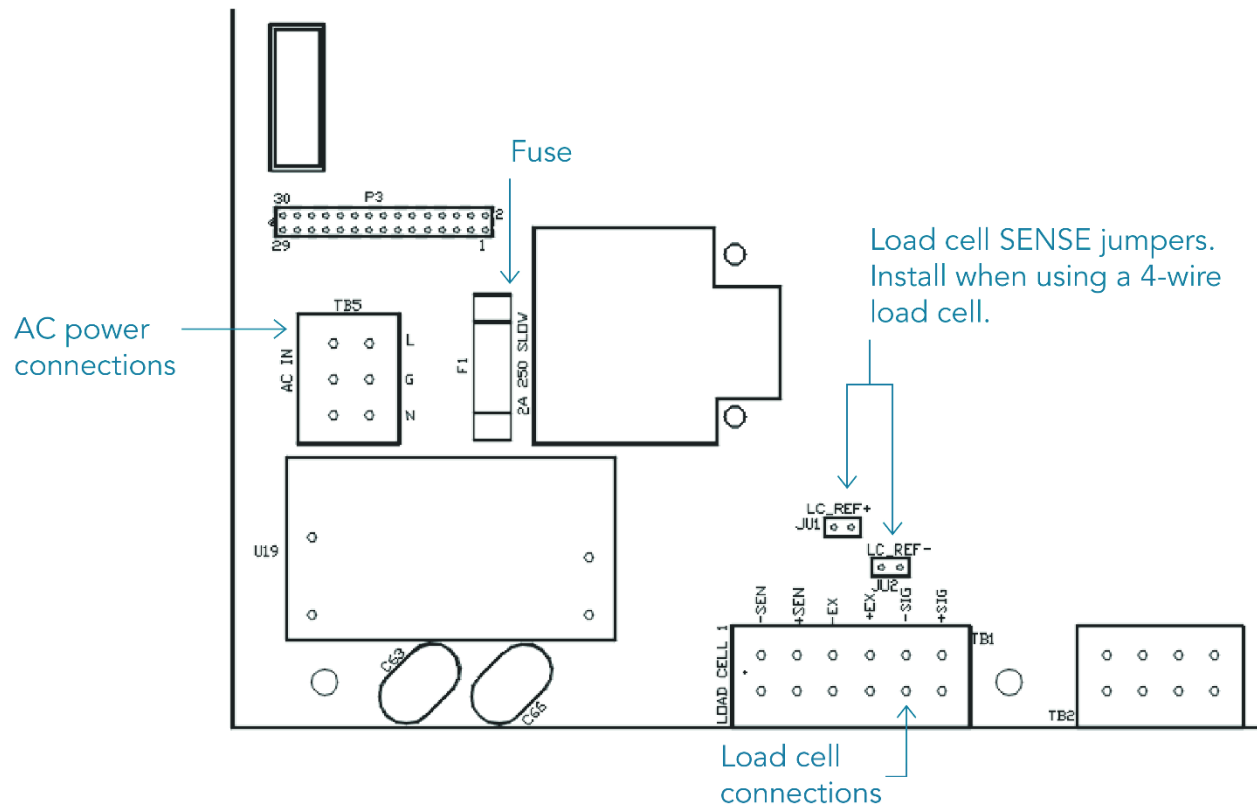


Fig. 3: Load Cell and Power (lower left of board)

	4 wire load cell	6 wire load cell
<b>J1 Jumper</b>	In	Out
<b>J2 Jumper</b>	In	Out

Load Cell Input (TB1)		
	Description	Load Cell Color Code
+ SIG	+ Signal	Red
- SIG	- Signal	White
+ EX	+ Excitation	Green
- EX	- Excitation	Black
+ SEN	+ Sense Signal	Blue
- SEN	- Sense Signal	Brown

## Power Connection and Fuse

Power input is located at terminal block TB5, next to the fuse and black transformer.

Neutral	Ground	Line (Hot)
N	G	L

Make sure power is off before replacing the fuse. The scale's fuse (F1) is located next to the power terminal (J1).

The scale has a filtered power supply to reduce the effects of normal line noise, but it cannot limit severe fluctuations. Be sure the AC power is not excessively noisy. If problems occur, noise producing devices may have to be suppressed to minimize their effect.

## RS232 and Remote Switch Connection

The Remote Switch and Serial Communications are located in the TB3 terminal block. Option cables are passed through watertight glands mounted on the rear cover of the indicator.

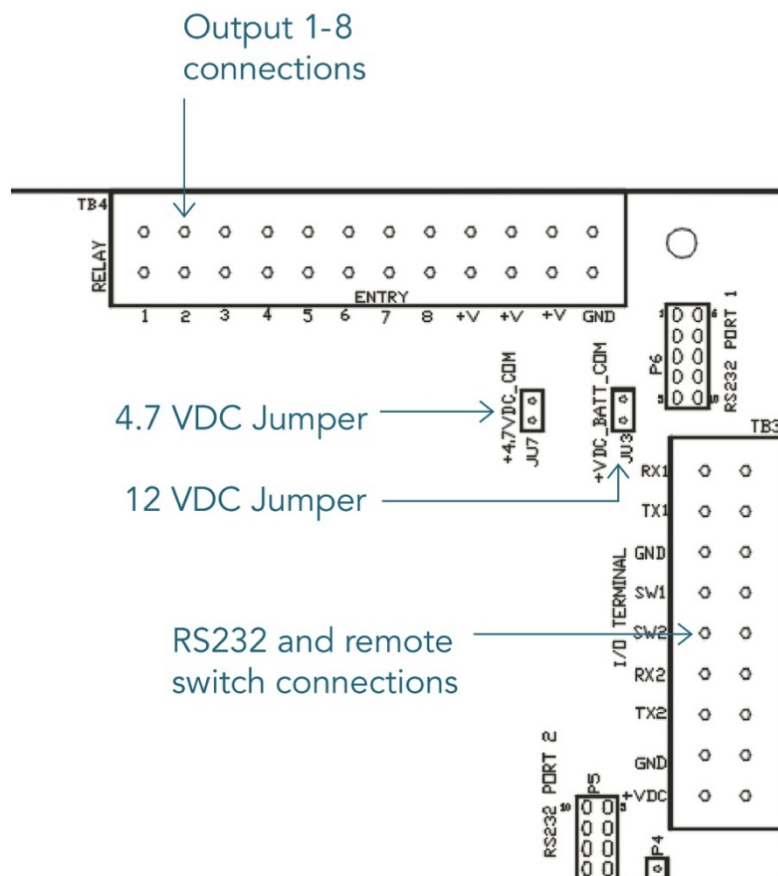
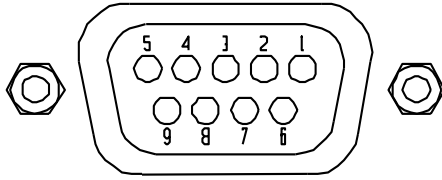
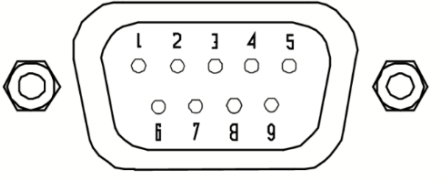


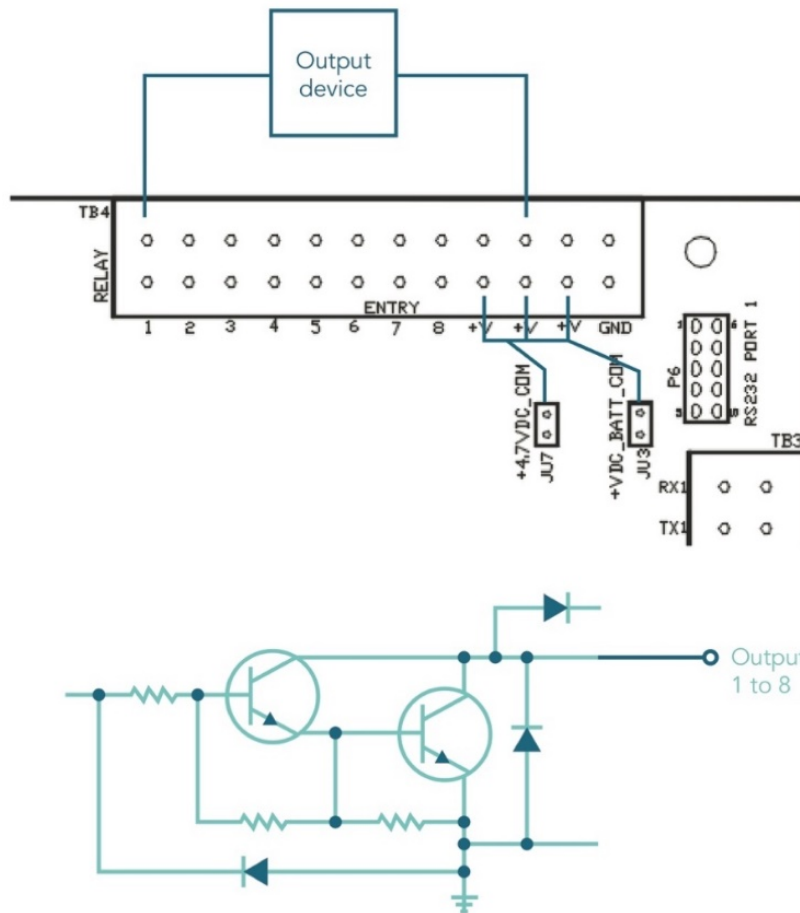
Fig. 4: Output Serial and Remote Switch Connection (upper right of board)

<b>TB3 RS232 and Remote Switch Connections</b>	
	<b>Description</b>
RX1	RS232 Port 1 Receive (RXD)
TX1	RS232 Port 1 Transmit (TXD)
GND	Common Ground
SW1	Remote Switch 1 Input
SW2	Remote Switch 2 Input
RX2	RS232 Port 2 Receive (RXD)
TX2	RS232 Port 2 Transmit (TXD)
GND	Remote Switch Common
VDC	4.7Vdc

<b>RS232 Output DB9 Female Connector Wiring</b>		<b>RS232 Output DB9 Male Pin Wiring</b>	
			
	<b>Female Description</b>	<b>Male Description</b>	
2	(TXD) Transmitted Data	(RXD) Received Data	
3	(RXD) Received Data	(TXD) Transmitted Data	
5	(GND) Ground	(GND) Ground	

## Output Connections

Each output point consists of a current-sinking Darlington pair with a transient – suppression diode connected to +V. Jumpers JU7 and JU3 control whether +V is board-supplied 4.7 VDC or 12 VDC. One or the other jumper needs to be installed for output operation, but never both. The maximum current sinkable through a single output is 500mA. If using board-supplied voltage, the maximum total current available is 800 mA.



## Calibration Guide

Note: To calibrate, remove the backplate and use the internal button board, which gives access to the PRINT, UNITS, OVER, and UNDER buttons.

### Entering Calibration and Parameter Setup Mode

The calibration push button is located near the center of the board and labeled CAL. Press this button to enter calibration and setup.

### Exit Calibration and Parameter Setup Mode

The calibration push button is located near the center of the board and labeled CAL. Press this button to exit calibration and save settings.

### Set Scale Capacity

The Capacity selection is displayed after entering the Calibration and Setup mode.

1.  $\uparrow$  CAP is displayed
2. Press ZERO
3. The display will alternate between CAP and the currently selected capacity
4. Press ZERO to change the capacity
5. The units annunciator will flash indicating the unit of measure for the capacity. Press ZERO to change the unit of measure if required.
6. Press PRINT
7. The right most digit will flash. Press ZERO to change this number from 0 to 9.
8. Press PRINT to move to the next digit to the left.
9. Repeat until all digits have been set to the desired scale capacity.
10. Once the digits have been set, the display will return to alternately displaying CAP and the new capacity value.

### Set Scale Count By

After the capacity has been entered, count by (resolution) will automatically be set for a legal for trade 5000 division level.

1. After calibration, press UNITS.
2. The display will alternate between CNT BY and the current count by
3. Press ZERO to select the desired count by
4. To exit and save changes, press UNITS until 5000 is displayed.
5. Press ZERO
6. 5000 will be displayed
7. Press UNITS to return to the run mode



## **Calibration**

After count by has been set, calibration is required

1. Press UNITS until  $\text{CAL } 0$  appears on the display
2. Remove all weight from the scale platform
3. Press ZERO and wait for the display to count down to 0
4. The display will alternate between  $\text{CAL } F\%$  and the scale capacity
5. Place the calibration weight on the scale platform (2% of capacity to full capacity)
6. If calibrating at scale capacity, press ZERO to begin calibration and move to step 12. If not calibrating at the scale capacity, continue to step 7.
7. Press PRINT
8. The right most digit will flash. Press ZERO to change this number from 0 to 9.
9. Press PRINT to move to the next digit to the left
10. Repeat until all digits have been set to the desired calibration weight
11. Press PRINT and the calibration process will begin and the display will count down to zero.
12. The display will momentarily display  $d\text{d}n\%$ , followed by  $\text{SPAN}\%$  and return to the normal weighing mode
13. Verify scale calibration

**NOTE:** Calibration at 2% of capacity has been provided as a convenience to customers with scales in inaccessible locations. Scales calibrated at 2% will not be as accurate at full capacity compared to scales calibrated at full capacity. It is the responsibility of the installer to ensure that scale accuracy is achieved after any calibration.

<b>Calibration Error Codes</b>	
<b>Code</b>	<b>Solution</b>
$r\% \text{Err}$	The calibration zero is out of range. Press ZERO to clear error. Refer to the Scale Calibration Error Troubleshooting section.
$\text{Err } n\%$	The calibration span is in a negative range. Check polarity of load cell connection and repeat calibration.
$\text{SPAN } \%$	The calibration span is out of range. Press ZERO to clear this error. Refer to the Scale Calibration Error Troubleshooting section.
$\text{Err } n\%$	The scale is sensing an unstable weight. Remove any vibration or air currents to continue calibration.



## Scale Parameter Setup

Note: To enter parameter setup, remove the backplate and use the internal button board, which gives access to the PRINT, UNITS, OVER, and UNDER buttons.

### Entering Calibration and Parameter Setup Mode

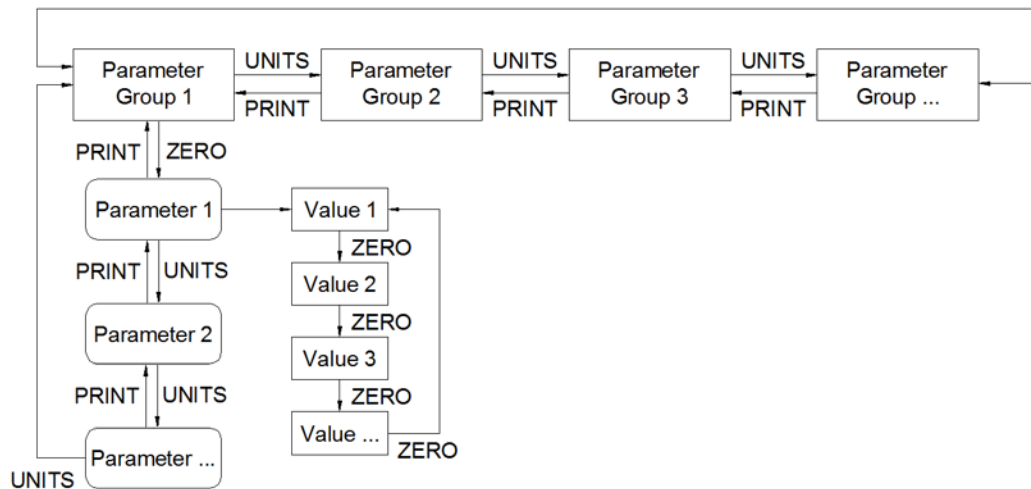
The calibration push button is located near the center of the board and labeled CAL. Press this button to enter calibration and setup.

### Exit Calibration and Parameter Setup Mode

The calibration push button is located near the center of the board and labeled CAL. Press this button to exit calibration and save settings.

### Navigating Parameter Menu

Press UNITS and PRINT to navigate to the desired top level parameter group. Enter the group by pressing ZERO. Once within a group, press UNITS to advance, PRINT to back up and ZERO to change the currently displayed parameter setting.



### Parameter Groups

The scale parameters are divided up into eight parameter groups. Each group contains related parameters. Below is a brief list describing each parameter group.

1 CAL	Capacity and Calibration
2 CONF	General Settings
3 SER 1	Serial port #1
4 SER 2	Serial port #2
9 OPER	Checkweigh Operation
99 don	Exit Setup

### **Legal for Trade Restrictions**

When the Legal for Trade mode is enabled, it automatically disables some menus and parameter options. This is done to comply with NTEP and CWM requirements. The menus and parameter sections are shown on the following pages. Menus and parameters not available when in the Legal for Trade mode are marked by an asterisk.

### **Audit Counters**

When entering calibration mode, the Parameter audit counter and the Calibration audit counter will momentarily be displayed. The Parameter audit counter increments when legal for trade values are changed. The Calibration audit counter increments when the scale is calibrated.

### **Software Part Number and Revision Level**

During the front panel access procedure, the scale will display the software number and revision. The software number is  $5.0 \cdot 10^4$  followed by the software revision level  $\cdot 10^0$  or higher.

Please have the software number  $10^4$  and the revision level available when contacting our technical support department.

## Capacity and Calibration - [CAL]

<b>[CAP AD]</b>	<b>Capacity Adjustment</b>
1 - 999000	1 lb / kg to 999,000 lb / kg Refer to calibration guide for more detail

<b>[CntBy]</b>	<b>Count By Setup Menu</b> Also known as resolution or division
0.00002 5000	Selection limited by scale capacity  Capacity/resolution (scale divisions) maximum value is 50,000d and minimum value is 200d

<b>[CAL]</b>	<b>Calibration Mode</b>
0	<b>Calibration Zero</b> Press ZERO to perform calibration of the scale zero Successful calibration is indicated by "[CAL FS]"
XXXXXX	Only appears after a successful zero calibration  Enter calibration weight through keypad and decimal point if required.

<b>AD9</b>	<b>Display Filter Setting</b> Determines speed of digital filtering
1	Fastest display updates, most sensitive setting
2	<b>Default Setting</b>
4	
8	
16	
32	
64	Slowest display updates, least sensitive setting

<b>RZt*</b>	<b>Automatic Zero Tracking Range</b> Weight within the specified number of divisions are automatically zeroed
OFF	Zero tracking is off, no automatic zeroing
<b>0.5</b>	<b>Zero tracking to within 0.5 division</b>
1*	Zero tracking to within 1 division
3*	Zero tracking to within 3 divisions
5*	Zero tracking to within 5 divisions
10*	Zero tracking to within 10 divisions
20*	Zero tracking to within 20 divisions

<b>nn.R.*</b>	<b>Motion aperture*</b> Determines the number of divisions that consecutive readings must change before the scale is considered to be in motion
0.5*	0.5 divisions
1	<b>1 division</b>
2*	2 divisions
3*	3 divisions
5*	5 divisions
10*	10 divisions

<b>nn.d*</b>	<b>Motion Delay*</b> Length of a motion indication display.
1 - 9	Length of a motion indication display, in 100ms intervals. Default is <b>3</b> . (Locked to 3 in Legal for Trade mode)

<b>SU0*</b>	<b>Start Up Zero</b> Controls the zero point when the scale is turned on
on	<b>Zeros on the first stable reading on power up</b>
CL0	Loads the calibration zero point
Pb0*	Loads the last pushbutton zero

\*Parameters not available in Legal for Trade mode

<b>Zod</b>	<b>Zero on Demand</b> Enables or disable zero latching
on	If ZERO is pressed, it is saved until the scale becomes stable.
off	<b>If the scale is in motion, the zero request is discarded.</b>

<b>Pod</b>	<b>Print on Demand</b> Enables or disables print latching
on	If PRINT is pressed, the print request is saved until the scale becomes stable.
off	<b>If the scale is in motion, the print request is discarded.</b>
not	Print when requested, whether the scale is in motion or not

<b>oP</b>	<b>Operating Mode</b>
Std	<b>Standard operation</b>
44	NTEP legal-for-trade. Restricts parameters to keep them within NTEP limits.
445	CWM legal-for-trade. Restricts parameters to keep them within CWM limits.

<b>donE</b>	<b>Exit Calibration and Setup</b>
y	Saves and exits setup when PRINT or UNITS is pressed.
n	<b>Remains in setup</b>

## General Settings - 2 CF9

<b>CSL</b>	<b>Unit Enable and Disable</b> Determines which unit selections will be active	
<b>no</b>	<b>Do not enter Convert selection menu</b>	
<b>YES</b>	Enter Convert selection menu	
	<b>lb</b>	<b>pounds menu</b>
	<b>on</b>	<b>lb is active</b>
	<b>off</b>	lb is non active
	<b>kg</b>	<b>kilograms menu</b>
	<b>on</b>	<b>kg is active</b>
	<b>off</b>	kg is non active
	<b>oz</b>	<b>ounces menu</b>
	<b>on</b>	<b>oz is active</b>
	<b>off</b>	oz is non active
	<b>gr</b>	<b>grams menu</b>
	<b>on</b>	<b>g is active</b>
	<b>off</b>	g is non active
	<b>lo</b>	<b>pound:ounce menu</b>
	<b>on</b>	lb:oz is active
<b>off</b>	<b>lb:oz is non active</b>	

**NOTE:** oz units are disabled for capacities greater than 60,000 lb  
grams units are disabled for capacities greater than 2000 lb  
lb:oz are only available for capacities between 10 and 1000 lb

<b>Unit 5</b>	<b>Start Up Units Select Mode</b> Configures selection of startup units
	The unit annunciator, to the right of the display, indicates the active unit on power up. Press ZERO to change the selection.



<b>P.b.</b>	<b>Push Button Enable and Disable</b> Determines which buttons are active or inactive	
<b>no</b>	<b>Do not enter push button selection menu</b>	
<b>YES</b>	Enter push button selection menu	
	<b>P<sub>r</sub></b>	<b>PRINT button</b>
		<b>on</b> pb is active
		<b>off</b> pb is non active
	<b>U<sub>t</sub></b>	<b>UNITS button</b>
		<b>on</b> pb is active
		<b>off</b> pb is non active
	<b>Z<sub>r</sub></b>	<b>ZERO button</b>
		<b>on</b> pb is active
		<b>off</b> pb is non active
	<b>r 1, r 2</b>	<b>REMOTE SWITCH 1 and 2 function</b>
		<b>off</b> Remote pb is non active
		<b>Z<sub>r</sub></b> ZERO
		<b>P<sub>r</sub></b> PRINT
		<b>U<sub>t</sub></b> UNITS
	<b>ou</b>	<b>Over and Under buttons</b>
	<b>on</b> pb is active	
	<b>off</b> pb is non active	

<b>t<sub>dy</sub></b>	<b>Automatic off Timer</b> Only visible when <b>o<sub>off</sub></b> parameter is set to <b>Y</b>
<b>on</b>	Unit will remain on, On timer is off
<b>0.5</b>	30 second On timer
<b>1</b>	<b>1 minute On timer</b>
<b>1.5</b>	1.5 minute On timer
<b>2</b>	2 minute On timer
<b>3</b>	3 minute On timer
<b>5</b>	5 minute On timer
<b>10</b>	10 minute On timer
<b>30</b>	30 minute On timer
<b>1hr</b>	1 hour On timer
<b>2hr</b>	2 hour On timer
<b>4hr</b>	4 hour On timer
<b>8hr</b>	8 hour On timer

<b>th5</b>	<b>Threshold Level Entry</b> Controls automatic printing features starting with A.P.
<b>0.1 - 9.9</b>	$\pm 0.1\%$ to $\pm 9.9\%$ of capacity <b>Default setting is 1%</b>

<b>dEft</b>	<b>Default</b> Used to set parameters to factory default values
<b>n</b>	Do not default
<b>y</b>	Set parameters to default values

<b>Counts</b>	<b>Raw counts from the AD converter</b> Used for troubleshooting during calibration
<b>xxxxxx</b>	-99999 to 999999

<b>brt</b>	<b>Controls the brightness of all LEDs</b>
<b>1- 15</b>	Can be set to a value of 1 to 15 with 15 being the brightest. Default value is <b>9</b> . Note: Decreasing brightness conserves battery life.

<b>bRtE</b>	<b>Enable or disable battery operation</b>
<b>n</b>	Battery option not installed
<b>y</b>	Battery option installed

**Serial (RS232) Port 1 - 3 Hex :**

<b>d.o. :</b>	<b>Data Output Mode Port 1</b>
<b>t.o.d.</b>	<b>Transmit on demand. Transmit when the PRINT button is pressed.</b>
<b>A.P.1</b>	Auto Print 1. Transmit once only when scale becomes stable.
<b>A.P.2</b>	Auto Print 2. Transmit once only when scale becomes stable. Scale must return to, or below, the threshold range.
<b>A.P.3</b>	Auto Print 3. Transmit once when the scale stabilizes within the ACCEPT range. Weight must fall below the threshold value before transmitting again.
<b>A.P.4</b>	Auto Print 4. Transmit first stable weight outside of threshold. Transmission happens when weight returns to threshold range.
<b>A.P.5</b>	Auto Print 5. Transmit the last stable weight outside of threshold. Transmission happens when weight returns to threshold range.
<b>t1</b>	Transmits every 1 second.
<b>t5</b>	Transmits every 5 seconds.
<b>t60</b>	Transmits every 60 seconds.
<b>C.P.</b>	Continuous Print. Transmit when display is updated.
<b>off</b>	Port disabled

<b>For. :</b>	<b>Data Output Format Port 1</b>
<b>F0</b>	<b>Basic output format</b>
<b>2d</b>	Basic Dual Print Format. Includes Kilogram weight.
<b>55P</b>	Basic Output for label printer
<b>F9</b>	Model 8000 emulation
<b>Lb1</b>	User definable print string with default values
<b>Lb2</b>	User definable print string with default values
<b>Lb3</b>	User definable print string with default values
<b>Lb4</b>	User definable print string
<b>ba</b>	WinSPC compatibility format

<b>br. 1</b>	<b>Baud Rate Port 1</b>
12	1200 baud
24	2400 baud
48	4800 baud
<b>96</b>	<b>9600 baud</b>
144	14,400 baud
192	19,200 baud
288	28,800 baud
384	38,400 baud

### Serial (RS232) Port 2 - 4 5Er2

<b>d.o. 2</b>	<b>Data Output Mode Port 2</b>
<b>t.o.d.</b>	<b>Transmit on demand. Transmit when the PRINT button is pressed.</b>
A.P.1	Auto Print 1. Transmit once only when scale becomes stable.
A.P.2	Auto Print 2. Transmit once only when scale becomes stable. Scale must return to, or below, the threshold range.
A.P.3	Auto Print 3. Transmit once when the scale stabilizes within the ACCEPT range. Weight must fall below the threshold value before transmitting again.
A.P.4	Auto Print 4. Transmit first stable weight outside of threshold. Transmission happens when weight returns to threshold range.
A.P.5	Auto Print 5. Transmit the last stable weight outside of threshold. Transmission happens when weight returns to threshold range.
t1	Transmits every 1 second.
t5	Transmits every 5 seconds.
t60	Transmits every 60 seconds.
C.P.	Continuous Print. Transmit when display is updated.
oFF	Port disabled

<b>For. 2</b>	<b>Data Output Format Port 2</b>
<b>F0</b>	<b>Basic output format</b>
<b>2d</b>	Basic Dual Print Format. Includes Kilogram weight.
<b>55P</b>	Basic Output for label printer
<b>F9</b>	Model 8000 emulation
<b>Lb1</b>	User definable print string with default values
<b>Lb2</b>	User definable print string with default values
<b>Lb3</b>	User definable print string with default values
<b>Lb4</b>	User definable print string
<b>ba</b>	WinSPC compatibility format

<b>br. 2</b>	<b>Baud Rate Port 2</b>
<b>12</b>	1200 baud
<b>24</b>	2400 baud
<b>48</b>	4800 baud
<b>96</b>	<b>9600 baud</b>
<b>14.4</b>	14,400 baud
<b>19.2</b>	19,200 baud
<b>28.8</b>	28,800 baud
<b>38.4</b>	38,400 baud

## Checkweigh and Output Operation – 9 OPER

C.o.	Checkweigh Operation
3A	Three band checkweighing Checkweigh status continuously active.
3S	Three band checkweighing Only active while weight is stable and inactive while the scale is in motion.
3E	Three band checkweighing Only active while the weight is above the threshold value (TH5 parameter) and inactive when below.
3EL	Three band checkweighing Only active while weight is above the threshold value. Once OVER is activated, it will remain active until the weight falls below the threshold.
3b	Three band checkweighing Only active while weight is stable and above the threshold value. Inactive while the scale is in motion or below the threshold value.
3bL	Three band checkweighing Only active while the weight is stable and above the threshold value. OVER will remain active until the weight falls below the threshold. UNDER and ACCEPT deactivate while the scale is in motion or below the threshold value.
5A	Five band checkweighing Continuously active
5S	Five band checkweighing Only active while weight is stable and inactive while the scale is in motion.
5E	Five band checkweighing Only active while the weight is above the threshold value (TH5 parameter) and inactive when below.
5b	Five band checkweighing Only active while weight is stable and above the threshold value. Inactive while the scale is in motion or below the threshold value.
0A	Zero band checkweighing Continuously active See 0.U. parameter for tolerance values
0S	Zero band checkweighing Active only when the scale is stable See 0.U. parameter for tolerance values
oFF	<b>Checkweighing feature not active</b>

<b>☐.☐.</b>	<b>Checkweigh Limit Entry</b>
<b>5☐r</b>	Scroll from recalled value: Use the OVER or UNDER button to recall a limit. Then use the OVER and UNDER buttons to increase or decrease the recalled target value.
<b>5☐5</b>	Scroll from reference weight: Place an item on the platform and press the OVER or UNDER button to enter that weight as a target value. The OVER and UNDER buttons can then be used to increase or decrease the value.
<b>☐☐</b>	Reference weight only: Place an item on the platform and press the OVER or UNDER button to enter that weight as a target value.

<b>☐.☐.</b>	<b>Zero Band Checkweighing Limits</b> Only applicable when ☐.☐ is set to ☐☐ or ☐5.
<b>1</b>	+/- 1 division
<b>2</b>	+/- 2 divisions
<b>3</b>	+/- 3 divisions
<b>4</b>	+/- 4 divisions
<b>5</b>	+/- 5 divisions
<b>7</b>	+/- 7 divisions
<b>10</b>	<b>+/- 10 divisions</b>
<b>15</b>	+/- 15 divisions
<b>20</b>	+/- 20 divisions
<b>30</b>	+/- 30 divisions

<b>☐☐☐</b>	<b>Output Configuration</b>	
<b>☐☐</b>	<b>Do not enter Output selection menu</b>	
<b>☐☐5</b>	Enter menu	
	<b>☐ : ☐</b>	<b>Output Configuration</b>
	<b>☐ : ☐FF</b>	<b>Output is deactivated</b>
	<b>☐ : ☐☐</b>	Low annunciator used for output logic
	<b>☐ : ☐☐r</b>	Under annunciator used for output logic
	<b>☐ : ☐☐☐</b>	Accept annunciator used for output logic
	<b>☐ : ☐☐r</b>	Over annunciator used for output logic
	<b>☐ : ☐☐</b>	High annunciator used for output logic

**Exit - ☐☐☐☐**

<b>☐☐☐☐</b>	<b>Exit and save changes</b>
<b>☐</b>	Do not exit
<b>☐</b>	Save changes and exit

## Data Communications

To confirm data has been transmitted, the display will show a "r" in the leftmost

### **Transmit on Demand (t o d)**

In this mode, scale data is transmitted whenever PRINT is pressed, a remote switch configured for a PRINT command is pressed, or a print request is received at the serial port. The scale must be stable and the scale value must be valid before the data is transmitted.

### **Continuous Data Transmission (c P)**

Data is transmitted each time the scale display updates, approximately every 0.1 seconds. Readings which occur when the scale is in motion are indicated out by the abbreviation "MOT." after the weight data.

### **Auto Print 1 (A P 1)**

Auto Print 1 transmits the first stable scale reading each time the scale leaves motion.

### **Auto Print 2 (A P 2)**

Auto Print 2 transmits the first stable scale reading following the scale leaving motion and above the adjustable threshold level. To adjust the Threshold level as a % of capacity, see the Threshold Level parameter. In Auto Print 2, no further readings will be sent until the scale returns to weight reading that is below the adjustable threshold level.

### **Auto Print 3 (A P 3)**

Auto Print 3 transmits the first stable scale reading following the scale leaving motion, within the ACCEPT band and above the adjustable threshold level. To adjust the Threshold level as a % of capacity, see the Threshold Level parameter. In Auto Print 3, no further readings will be sent until the scale returns to weight reading that is below the adjustable threshold level.

### **Auto Print 4 (A P 4)**

Auto Print 4 transmits the first stable scale reading following the scale leaving motion that is above the adjustable threshold level. Transmission does not occur until the scale returns below the threshold value. To adjust the threshold level as a % of capacity, see the Threshold Level parameter.

### **Auto Print 5 (A P 5)**

Auto Print 5 transmits the last stable scale reading following the scale leaving motion that is above the adjustable threshold level. Transmission does not occur until the scale returns below the threshold value. To adjust the threshold level as a % of capacity, see the Threshold Level parameter.

### **Timer 1 (t 1)**

Transmits every 1 second.



### Timer 5 (t5)

Transmits every 5 seconds.

### Timer 60 (t60)

Transmits every 60 seconds.

### Data String Formatting

Many predefined data formats are available with the 7400. This allows for flexibility when communicating with a database, printer, remote display or other devices.

The LB1-4 custom data strings provide the opportunity to define a custom print string up to 64 characters in length.

Note: Lb:oz unit is not supported in data strings.

	<b>Print String</b>	<b>Description</b>
F0	<p>Standard Output Format</p> <p>&lt;STX&gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;uu&gt;&lt;SP&gt; &lt;MOT&gt;&lt;CR&gt;&lt;LF&gt;</p> <p>Sample Print String ±--10.05-lb</p> <p>Note: "-" represents a space</p>	<p>&lt;STX&gt; Start of Text (02h) &lt;p&gt; Weight Polarity Negative weight "-", positive weight space (20h) &lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h). &lt;uu&gt; Displayed Units "lb", "kg", "oz", "g" &lt;MOT&gt; (Available only in Continuous print mode) Motion Status Appends "MOT" to the print string when printing while in motion &lt;SP&gt; Line Space (20h) &lt;CR&gt; Carriage Return (0dh) &lt;LF&gt; Line Feed (0Ah)</p>
2d	<p>Dual Unit lb and kg Print Output Format</p> <p>&lt;STX&gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;uu&gt;&lt;SP&gt; &lt;MOT&gt;&lt;CR&gt;&lt;LF&gt; &lt;( &gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;kg&gt;&lt;SP&gt;&lt; &gt;&lt;MOT&gt;&lt;CR&gt;&lt;LF&gt;</p> <p>Sample Print String ±--10.05-lb ±---4.56-kg</p>	<p>&lt;STX&gt; Start of Text (02h) &lt;p&gt; Weight Polarity Negative weight "-", positive weight space (20h) &lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h) &lt;uu&gt; Displayed Units "lb", "kg", "oz", "g" &lt;MOT&gt; (Available only in Continuous print mode) Motion Status Appends "MOT" to the print string when printing while in motion &lt;SP&gt; Line Space (20h)</p>

	Note: "-" represents a space	<CR> Carriage Return (0dh) <LF> Line Feed (0Ah)
	<b>Print String</b>	<b>Description</b>
55P	<p>Label Printer Output Format</p> <pre>&lt;FR"L1"&gt;&lt;LF&gt;&lt;?&gt;&lt;LF&gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;LF&gt; &lt;uu&gt;&lt;LF&gt;&lt;"GS"&gt;&lt;LF&gt;&lt;MOT&gt;&lt;LF&gt;&lt;p&gt; &lt;xxxx.xx&gt;&lt;LF&gt;&lt;kg&gt;&lt;LF&gt;&lt;P1,1&gt;&lt;LF&gt;</pre> <p>Sample Print String</p> <pre>FR"L1"   ?     ±--10.05       lb         GS           MOT             ±--4.56               kg                 P1,1</pre> <p>Note: "-" represents a space</p>	<p>&lt;p&gt; Weight Polarity Negative weight "-", positive weight space (20h)</p> <p>&lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h)</p> <p>&lt;uu&gt; Displayed Units "lb", "kg", "oz", "g"</p> <p>&lt;MOT&gt; (Available only in Continuous print mode) Motion Status Appends "MOT" to the print string when printing while in motion</p> <p>&lt;SP&gt; Line Space (20h)</p> <p>&lt;CR&gt; Carriage Return (0dh)</p> <p>&lt;LF&gt; Line Feed (0Ah)</p>
F9	<p>Prints current weight, units, and "grs".</p> <pre>&lt;STX&gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;uu&gt;&lt;SP&gt;&lt;grs&gt; &lt;MOT&gt;&lt;CR&gt;&lt;LF&gt;</pre> <p>Sample Print String</p> <pre>±--10.05-lb-grs</pre> <p>Note: "-" represents a space</p>	<p>&lt;STX&gt; Start of Text (02h)</p> <p>&lt;p&gt; Weight Polarity Negative weight "-", positive weight space (20h)</p> <p>&lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h)</p> <p>&lt;uu&gt; Displayed Units "lb", "kg", "oz", "g"</p> <p>&lt;MOT&gt; (Available only in Continuous print mode) Motion Status Appends "MOT" to the print string when printing while in motion</p> <p>&lt;SP&gt; Line Space (20h)</p> <p>&lt;CR&gt; Carriage Return (0dh)</p> <p>&lt;LF&gt; Line Feed (0Ah)</p>

	Print String	Description
1b1	<p>Custom Data String 1 (\x\w \u \m\r\l)</p> <p>&lt;STX&gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;uu&gt;&lt;SP&gt;&lt;MOT&gt;&lt;CR&gt;&lt;LF&gt;</p> <p>Sample Print String ±--10.05-lb</p> <p>Note: "-" represents a space</p>	<p>&lt;STX&gt; Start of Text (02h)</p> <p>&lt;p&gt; Weight Polarity Negative weight "-", positive weight space (20h)</p> <p>&lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h)</p> <p>&lt;uu&gt; Displayed Units "lb", "kg", "oz", "g"</p> <p>&lt;MOT&gt; (Available only in Continuous print mode) Motion Status Appends "MOT" to the print string when printing while in motion</p> <p>&lt;SP&gt; Line Space (20h)</p> <p>&lt;CR&gt; Carriage Return (0dh)</p> <p>&lt;LF&gt; Line Feed (0Ah)</p>
1b2	<p>Custom Data String 2 (\x\w \u \m\r\l)</p> <p>&lt;STX&gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;uu&gt;&lt;SP&gt;&lt;MOT&gt;&lt;CR&gt;&lt;LF&gt;</p> <p>Sample Print String ±--10.05-lb-ACCEPT</p> <p>Note: "-" represents a space</p>	<p>&lt;STX&gt; Start of Text (02h)</p> <p>&lt;p&gt; Weight Polarity Negative weight "-", positive weight space (20h)</p> <p>&lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h)</p> <p>&lt;uu&gt; Displayed Units "lb", "kg", "oz", "g"</p> <p>&lt;MOT&gt; (Available only in Continuous print mode) Motion Status Appends "MOT" to the print string when printing while in motion</p> <p>&lt;SP&gt; Line Space (20h)</p> <p>&lt;CR&gt; Carriage Return (0dh)</p> <p>&lt;LF&gt; Line Feed (0Ah)</p>

	Print String	Description
1b3	<p>Custom Data String 3 (xID:i  w  u  m r l)</p> <p>&lt;STX&gt;&lt;"ID:"&gt;            &lt;SP&gt;&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;uu&gt;&lt;SP&gt;&lt;MOT&gt;&lt;CR&gt;&lt;LF&gt;</p> <p>Sample Print String            ID:00-±--10.05-lb</p> <p>Note: "-" represents a space</p>	<p>&lt;p&gt; Weight Polarity            Negative weight "-", positive weight space (20h)            &lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h)            &lt;SP&gt; Line Space (20h)            &lt;uu&gt; Displayed Units            "lb", "kg", "oz", "g"            &lt;MOT&gt; (Available only in Continuous print mode , non-LFT) Motion Status Appends "MOT" to the print string when printing while in motion.            &lt;CR&gt; Carriage Return (0dh)            &lt;LF&gt; Line Feed (0Ah)</p>
1b4	<p>Custom Data String 4</p>	<p>No default string.</p>
1b0	<p>Prints weight with polarity and units</p> <p>&lt;p&gt;&lt;xxxx.xx&gt;&lt;SP&gt;&lt;uu&gt;&lt;SP&gt;&lt;CR&gt;&lt;LF&gt;</p> <p>Sample Print String            ±--10.05-lb</p> <p>Note: "-" represents a space</p>	<p>&lt;p&gt; Weight Polarity            Negative weight "-", positive weight space (20h)            &lt;xxxx.xx&gt; Weight Data fixed field of 6 digits plus decimal. In overload or underload "-----". Leading zeros are spaces (20h).            &lt;SP&gt; Line Space (20h)            &lt;uu&gt; Displayed Units            "lb", "kg", "oz", "g"            &lt;CR&gt; Carriage Return (0dh)            &lt;LF&gt; Line Feed (0Ah)</p>

## Custom Data String Configuration

Command	Length	Description
\BS	4	Battery Status. Low: "batt" OK: "BATT"
\d	1-3	Motion aperture ("0.5", "1", "2", "3", "5", "10")
\e	4	Threshold: 2 digits, decimal, and "%"
\hxx	1	HEX byte. "xx" can be 00 through FF
\l	1	Linefeed. ASCII 0x0A
\m	0 or 3	Motion status. "MOT" if in motion, no output if stable
\oLx	8-10	Checkweigh LOW value, with weight format "x" (x = 1-5)
\oUx	8-10	Checkweigh UNDER value, with weight format "x" (x = 1-5)
\pOx	8-10	Checkweigh OVER value, with weight format "x" (x = 1-5)
\pHx	8-10	Checkweigh HIGH value, with weight format "x" (x = 1-5)
\r	1	Carriage return. ASCII 0x0D
\s	6	Checkweigh status. 6 characters with trailing spaces ("LOW", "UNDER", "ACCEPT", "OVER", "HIGH")
\u	1-2	Current unit. "lb", "kg", "g", "oz". Two characters except for grams which is one
\wx	6-8	Current weight: weight format "x" (x = 1-5)
\x	1	Start of text character. ASCII 0x02
\y	1	Current weight polarity. "-" or a space
\y0	1	Current weight polarity. "-" or "0"
\Z	0	ZERO command

<b>"x" Weight Formats</b>	
1	8 total characters. Polarity, 6 digits + decimal with leading spaces.
2	8 total characters. Polarity, 6 digits + decimal with leading zeros.
3	7 total characters. No polarity, 6 digits + decimal with leading spaces.
4	7 total characters. No polarity, 6 digits + decimal with leading zeros.
5	6 total characters. No polarity, 6 digits no decimal with leading zeros

Plain text can be inserted into the data string. No control character or slash is necessary for plain text entry.

To download a custom data string, the string must be prefaced by a command to tell the indicator to expect a custom print string.

ELx<string>↵      Enter (Download) custom data string  
RLx↵              Read (Upload) custom data string

x is the label buffer number (1 to 4)

↵ is carriage return or enter key in terminal program

The data string can have up to 62 control characters. For example, the following string is 8 characters in length “\w\u\r\|”. The custom string is terminated and download by pressing the enter. To program this string for Lb1 location in the scale’s memory, send the following string: EL1\u\r\|↵

Once programmed, set the Output Format **For** parameter to **LB 1** to activate the print string.

## Indicator Commands

All serial commands require a carriage return (0x0D) as a terminator. Commands can be entered on any communication option or serial port.

W, w	Weight is transmitted out all enabled ports in the format selected for each port.
Wx, wx	Custom data string Lb1-4 can be requested to transmit out all ports. x = 1, 2, 3 or 4.
P, p	Weight data is sent out serial port 2 only
Px, px	Customer data string Lb1-4 can be requested to transmit out serial port 2 only. x = 1, 2, 3, or 4.
U, u	Causes the scale to switch to the next unit of measure. Same as if the UNITS button is pressed.
Ux, ux	Causes the scale to switch to the unit of measure specified by x. x = 1, 2, 3, or 4 where 1=lb, 2=kg, 3=g, 4=oz.
Z, z	Issues a ZERO command to the scale. Note: Scale will not zero if in motion or if an error is displayed.
MD	The scale will transmit its model number
RV	The scale will transmit its revision number
ELx<data>	Load the user data string, specified by x (1-4), with the data in <data>. <data> can be up to 64 bytes. The indicator responds with an '*' if the command is successful or '?' if unsuccessful.
RLx	Transmit the User data string stored in the location referenced by x.
^Rxx.yy.	Request parameter setting in the format of calibration/setup menu group xx, sub-menu yy. For example:^R02.05<0x0D> will cause the scale to transmit its threshold value on the port that this command was received on.
^Exx.yy.	This command will enter data to the scale in calibration/setup menu group xx, menu yy. Scale must be in CAL menu.
^RFx	Report remote button function 'x' (x = 1 or 2)
^EFx<data>	Enter remote button function 'x' (x = 1 or 2)
x1	Port 1 is echoed to port 2


x2	Port 2 input is echoed to port 2
x5	Scale displays raw counts
xc	Clears all 'x' commands

For a complete protocol, please request this document from Doran Technical Support  
tech@doranscales.com.



## Troubleshooting

If any problem persists, contact Doran Tech Support at [tech@doranscales.com](mailto:tech@doranscales.com)

Problem	What to Do or Check
Weight reading will not repeat or does not return to zero when weight is removed	Examine the weighing platform for any interferences. Be sure that nothing is inside the platform, under the load cell or the weigh bridge structure
Scale overloads before reaching full capacity	Make sure all four corner overload stops are properly set, if present. Take the platter off the scale, invert it and place it on the platform. With 1/2 of the scale's capacity in test weights concentrated over a corner of the platform, there should be approximately 1/32" of clearance between the stop and the bottom of the spider. Check all four corners then recalibrate the scale.
Scale will not indicate full capacity or go into overload	Make sure that there is nothing caught in the scale under or around the load cell or spider, which would interfere with their movement. If not, check the overload stops using the above procedure.
Scale will not zero when the ZERO button is pressed	Make sure that the scale is stable (  annunciator is off) when ZERO is pressed. If excessive motion is a problem, then it may be necessary to activate the Zero on Demand or change the Display Filter parameter.
Weight readings don't seem to be correct	Check the scale's accuracy with a test weight. Recalibrate if necessary.
Scale drifts off of zero	Check for air currents and/or vibration around the scale. If that is the cause, it may be necessary to set the AZT parameter to a wider setting to compensate
Scale reading is bouncing	Check for air currents and/or vibration around the scale. If that is the cause, it may be necessary to change the Display Filter parameter.

## Scale Messages

Message	Meaning
"done" Function complete	The scale has successfully completed the requested action.
"Abort" Aborted function	The requested action has been canceled prior to completion.
"SAVED" Parameter value saved	The scale has successfully store and verified parameter value in nonvolatile memory.
"REL PB" Release push button	The scale has detected that a front panel button has been depressed for more than 3 seconds.
"SU NEW" New firmware installed	This message appears when the scale detects that new firmware has been loaded into flash memory.

## Error Messages

Message	What to Do or Check
oUr Ld Scale overload	The scale is in overload. The load on the scale exceeds the capacity by more than 103%. Remove excess weight from scale.
uDr Ld Scale underload	The scale is in underload. The load on the scale is less than the minimum scale capacity by more than -20%. Recalibrate scale or add additional dead load.
GrS oL Gross overload	The scale is in gross overload. The load exceeds the scale ratings and might result in damage to the scale. Remove excess weight immediately.
GrS uL Gross underload	The scale is in gross underload. The load exceeds the minimum scale ratings and might result in damage to the scale. Load cell connections may be mis-wired.
SU O E Startup zero error	The scale was not stable on startup. <u>This error will only occur in Legal for Trade applications.</u> The scale will zero once it becomes stable.
Er Ad A/D failure	The scale has detected a failure in A/D circuit. Have scale serviced by a qualified scale repair technician.
Err EP EEPROM error	The setup parameters loaded in nonvolatile memory have become corrupted. The scale requires recalibration by a qualified scale technician.

Err 1 Program ROM error	The program memory in the scale has become corrupted. Have scale serviced by a qualified scale repair technician.
Ld9 0 Loading zero.	The scale is attempting to load power up zero. This message will remain until scale is stable.
SPAn E Calibration Range Error	Calibration zero is out of range, refer to Scale Calibration Error Troubleshooting section for additional information.
Er nE9 Negative Calibration Span Error	Calibration Span is in negative range. Load cell signal wires are backwards, refer to Scale Calibration Error Troubleshooting section for additional information.
Er nno Motion Calibration Error	Calibration weight readings are unstable. Too much vibration during the Calibration or load cell signal wires are not connected.
rR Err Calibration Span Error	Calibration Span is out of range, refer to Scale Calibration Error Troubleshooting section for additional information.
no 5AU Parameter value not saved	The scale has <u>not</u> successfully stored or verified parameter value in nonvolatile memory.
CRP r9 Capacity Range Error	Capacity weight entered, has more than three non-zero digits in a row.

## **Default to Factory Settings**

To return the setup parameters to factory default, follow these steps. When reset to default settings, the CAL menu items and setpoints/outputs are reset. The scale will maintain the calibration settings previously used. A reference for each CAL menu default value can be found the Scale Parameter Menu Setup, listed in bold.

1. Enter Calibration

### **Internal Calibration Button**

The calibration push button is located near the center of the board and labeled CAL. Press this button to enter calibration and setup.

2. Press ZERO to enter the **2** **[nFg]** parameter group
3. Press UNITS to scroll to menu item **dEFe n**.
4. Press ZERO to change selection to **dEFe Y**.
5. Display will return to **dEFe n**. Press ZERO to change selection to **dEFe Y**.
6. The scale will then show **5RUEd**.
7. After the **5RUEd** message is displayed, the scale then performs its normal power up routine and enters the Calibration mode. At this time, all the parameters will have been reset to their factory default settings.

## **Scale Default Settings**

When reset to default settings, the CAL menu items are reset. The scale will maintain the calibration settings previously used.

A reference for each CAL menu default value can be found the Scale Parameter Menu Setup, listed in bold.

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