



## **PT300 Weighing System Users Manual**

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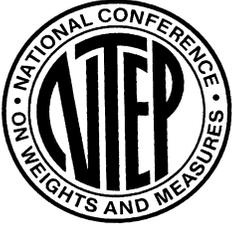
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# Introduction

## Weights and Measures



The PT300 meets or exceeds class III standards for 400 division accuracy from 0 lb to 20,000 lb. The certification was completed by the National Type Evaluation Program (NTEP); in accordance with the National Institute of Standards and Technology (NIST) Handbook 44. A NTEP Certificate of Conformance Number 90-106P was issued under the National Conference of Weights and Measures.

This operations manual describes the Intercomp Model PT300 platform specifications, detailed operating procedures, and calibration.

This manual is separated into several sections, each containing information on a different aspect of the scale. The specifications outline the design parameters for the scale. The detailed operation section outlines the correct use of the scale for most applications. The calibration section explains how to set the platform's adjustments.

**Caution:** Your PT300 scale is covered by a one year warranty and should be referred to the factory for maintenance within the warranty period. Attempts to make any extensive repairs within the warranty period may invalidate the warranty. If repairs are needed after the warranty period, only qualified technicians should attempt such repairs.

## Features

lb or kg programmable readout.

Ability to display total weight.

Accumulating total function.

Auto zero tracking automatically corrects zero-weight display shifts.

5½ digit, 1 inch LCD readout, with automatic back lighting.

5-15 VDC and 120 VAC 60 Hz power sources standard.

RFI/EMI protection.

Low battery detection with automatic shutoff to protect batteries.

Built-in self-diagnostics to check: Load cells, Memory, Display, AD converter, and Power supply.

Weigh pads manufactured from high strength aluminum alloys.

# Specifications

## Controls

General	On/Off, Print/Accumulate, Local/Total, Zero
Display	5 1/2 digit, 1 inch liquid crystal display (LCD), with automatic back lighting.
Indicators:	local weight, total weight, accumulated total weight

## Electrical

Power source required	5 - 15 VDC, 120 VAC, optional 240 VAC.
Charging Voltage	10 - 15 V DC.
Batteries	4-AA size NiCd, NiMH, or alkaline cells.
Charging Current	50 mA.
Charging Time	16 hours if the batteries are discharged.
Battery endurance	Radio off: 400 hours with alkaline or NiMH 150 hours of continuous use with Ni-Cads Radio on: 300 hours with alkaline or NiMH 125 hours of continuous use with Ni-Cads  NOTE: For special setups that require a scale wireless 'host', that scale's battery life is 40 hours (alkaline).
Filtering	Adjustable averaging up to 30 seconds.
Auto-Zero	Satisfies all HB-44 requirements.

## Performance

Speed	4 display updates per second
Accuracy	± 1% of reading or ± display graduation, whichever is greater.
Calibration interval	Twelve months recommended

## Environmental

Humidity	10 to 95% Non-Condensing.
Temperature	Operating: -28 C to +65 C. / -20 F to +150 F.
	Storage: -40 C to +75 C. / -40 F to +170 F.
EMI/RFI	Meets Mil Spec 461

## Physical

Dimensions (PT300):	Overall: 3 x 16 x 20 in. / 76 x 406 x 508 mm Pad: 12 x 12 in. / 305 x 305 mm
Weight (PT300):	37 lb / 16.8 kg
Dimensions (PT300DW):	Overall: 3 x 26 x 20 in. / 76 x 660 x 508 mm Pad: 22 x 14 in. / 559 x 356 mm
Weight (PT300DW):	49 lb / 22 kg

## Radio (optional)



**WARNING:** This equipment has been approved for mobile applications where the equipment should be used at distances greater than 20cm from the human body (with the exception of hands, wrists, feet, and ankles). Operation at distances less than 20cm is strictly prohibited.

Radio frequency	ISM 2.4GHz, 802.15.4
License requirements	None. Pre-approved US/FCC, CAN/IC, EUR/CE
Range	200' / 60m indoor, 300' / 90m line of sight



## **Optional Equipment**

**PDA with Vehicle Weigh Software and Wireless Node (140661)**

**Laptop computer with Vehicle Weigh Software and Wireless Node (140667)**

**PT20 CPU (100540)**

**PT20 CPU Wireless Node (140659)**

**Charger and Cable (100480)**

120/220V plug in transformer with international plugs, cable and PT connection.

**2 scale carrying case (100047)**

**4 scale carrying case (100048)**

**6 scale carrying case (100049)**

**Interconnecting cable for 2 scales, 15 ft (101029)**

**Interconnecting cable for 4 scales (101032)**

15, 25, 15 ft. spacing.

**Interconnecting cable for 6 scales (101035)**

15, 25, 15, 25, 15 ft. spacing.

**Interconnecting/Charging Cable for 2 scales, 120/220V, international plugs (101030)**

**Interconnecting/Charging Cable for 4 scales, 120/220V, international plugs (101033)**

**Interconnecting/Charging Cable for 6 scales, 120/220V, international plugs (101036)**

**PT300 Dummy pad (100088)**

Cast aluminum replica.

**PT300DW Ramp (100072)**

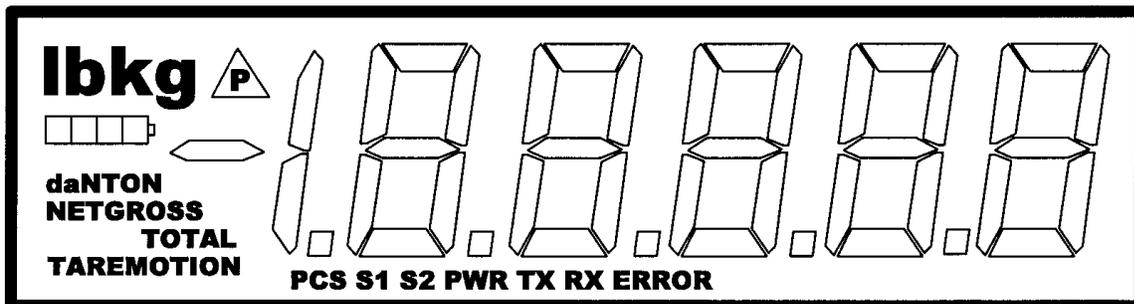
# Scale Operations

## Operational Overview

The control panel for the weighing platform is in the front section of the pad, along with the electronics of the system. The control panel has a liquid crystal display (LCD) screen and several control switches.

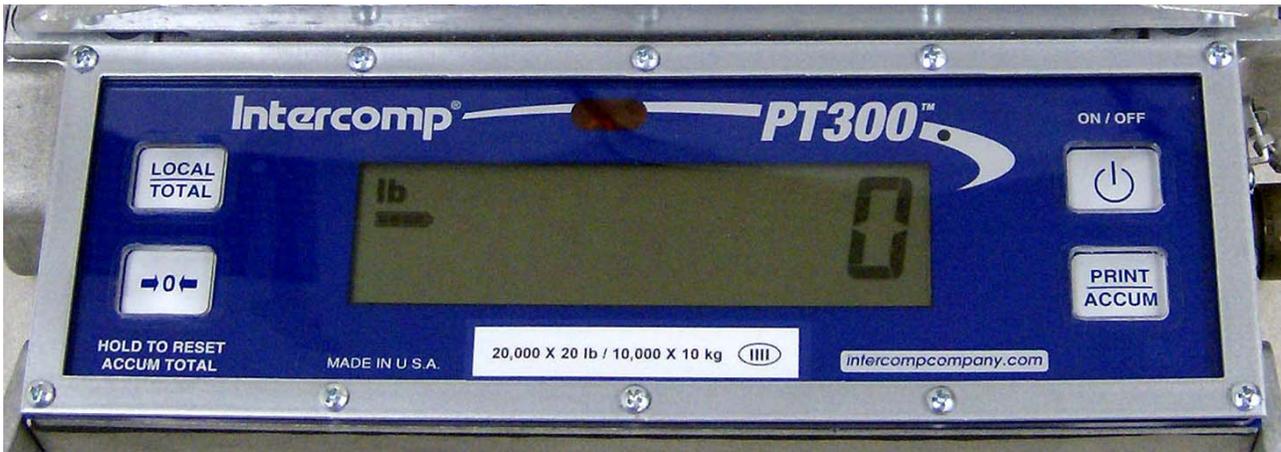
## Display Description

The display is a Liquid Crystal Display unit, providing one line of 5 1/2 digits. The screen shows the weights read from the pad. The TOTAL icon indicates measurement mode as in the table below the PT300 display. Information displayed includes indicators for both “lb” and “kg”, a segment bar to show battery charge level, error conditions and set-point indicators when set-point thresholds are reached. The display contains an automatic backlight for use in low-light conditions.



Mode status	Setting
TOTAL not lit	Local
TOTAL lit	Total
TOTAL flashing	Accumulated Total

## Controls



### ON / OFF

Press and hold this key to apply power to the weighing system electronics. Make sure to hold this key until the display responds (up to 1 second). When power is first applied, the weighing system rapidly performs self-tests of the pad and the internal electronics. When the tests have completed successfully, the system begins weighing. If a problem is detected, the screen displays an error message.

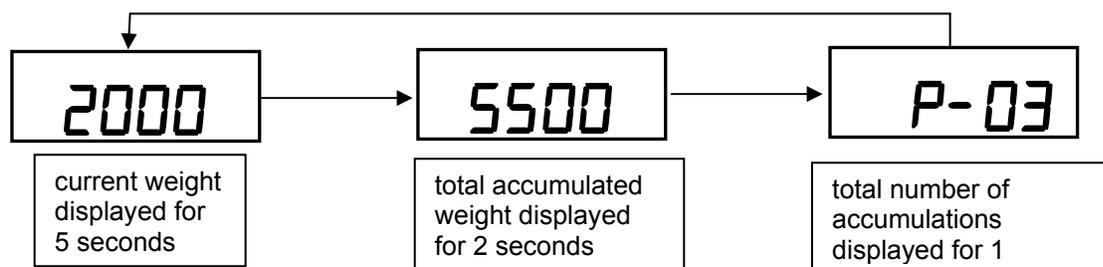
If the PT300 is powered up, press this button to turn the scale off. The PT300 retains the setup information, and calibration in a special memory device (non-volatile memory) that is not affected by power loss or battery condition.

### PRINT / ACCUMULATE

Press this button to print. When using the accumulated total function: press the PRINT / ACCUMULATE button to add the total to the accumulated total. See section titled "Using Accumulated Total".

New accumulated total = total weight (all scales in system) + old accumulated total

Once a successful accumulation has occurred, the scale will automatically toggle its display to show the current weight, accumulated total, and number of accumulations.



**Note:** The scale will not accumulate and will display the error message "Ac.Err" if the current weight is negative, zero, or if the weight is in motion. These Protections are added to ensure that only valid readings are accumulated into the total. Also, after a successful accumulation, ALL scales in the system must return to zero before you accumulate the next

weight. If you attempt to accumulate the next weight before allowing the scale(s) to return to zero, the error message "Ac.Err" will be displayed.

The accumulated total weight can be viewed only on the scale you are accumulating from. After the PRINT/ACCUMULATE button is first pushed; the display will show "Ac. X" as the system will accumulate the next reading and send it to print. (X will show the number of accumulations this session) Once a successful accumulation has occurred, pressing the LOCAL/TOTAL button will cycle the display to show number of accumulations, current local weight, current total weight on all scales, and the accumulated total. When the local weight, current total weight, or accumulated total is displayed, the total icon will be lit up, flashing, or off. (as shown in the display description).

## LOCAL / TOTAL

The local weight is the weight on that scale only. The total weight is the weight on all of the scales in your system. Pressing the LOCAL / TOTAL button toggles between local weight and total weight. The indicator bars (as shown in the display description) will show whether the scale is displaying the local or total weight.

**Note:** If the system is not setup correctly, the "error" icon and message "Err" will be displayed when trying to view the total weight. See section titled "Totalizing Setup".

## ZERO

Sets the weighing system to read zero pounds or kilograms. If pressed while a pad holds weight, that weight becomes the zero condition for the pad. This can be useful to cancel the weight of any weighing fixtures, such as tail cones or wheel chocks. When the weight is removed, a negative weight displays until the system is re-zeroed. This switch is used any time the scale shows a non-zero value with no weight on the pads.

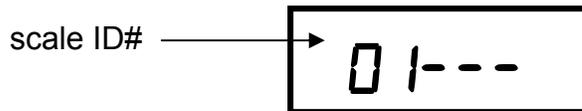
**Note:** This system contains a feature called Auto Zero Tracking (AZT), which corrects for slight zero changes during normal operation. An example of a zero change could be a buildup of dirt on the pads.

Another function of the zero key is to clear the accumulated total. Press and hold the ZERO key until the display reads "Err" and release the ZERO key. This will reset the accumulated total and the accumulation number. All other scales you have connected will also be zeroed through the interconnect cables. This allows you to zero your entire system with one key press.

## Totalizing Setup

This section covers configuring a scale set for either self-totalizing or connection to a PC/PDA for advanced display features. For accumulating multiple weights on a scale or scale set, see the "Using Accumulated Total" section. In 'self-totalizing' mode, the LOCAL/TOTAL button works to switch between weight on that particular scale (LOCAL) and the total weight of connected scales (TOTAL). If the system is not setup correctly, the "error icon" and message "E0E" will be displayed when trying to view the total weight.

1. To enter into totalizing setup: Simultaneously press the LOCAL/TOTAL and ZERO buttons.
2. Message "5C id" will be displayed. Press PRINT/ACCUMULATE button. A number will be displayed with 3 dashes following it. This is the scale number (ID). Use the LOCAL/TOTAL button to increment and the ZERO button decrement the number. When the desired number is displayed, press the PRINT/ACCUMULATE.



3. Message "5LL5" will be displayed. Press the PRINT/ACCUMULATE button. The display will show three dashes and then a number. This number is the total number of scales in the system. Use the LOCAL/TOTAL button to increment and the ZERO button decrement the number. When the desired number is displayed, press the PRINT/ACCUMULATE button. The maximum number of scales is 32.



4. If the scale# is '1', the display will ask if the scale is the "HOST". Press the PRINT/ACCUMULATE button. Use the LOCAL/TOTAL or the ZERO button to toggle the display "YES" or "no". A 'Host' controls the scale network, and this setting should be set to "yes" if the scale network consists of scales only. If your system uses an external device such as a PDA or PC to view the weights, this setting should be set to "no" since the external host controls the network. Press the PRINT/ACCUMULATE button to save the setting.

Example 1 of correct scale settings: 4 pad system with PDA or PC:

	<u>Scale ID</u>	<u>Number of Scales</u>	<u>*Host setting</u>
Scale #1:	[01---]	[---04]	[ no ]
Scale #2:	[02---]	[---04]	
Scale #3:	[03---]	[---04]	
Scale #4:	[04---]	[---04]	

Example 2 of correct settings: 4 pad totalizing system using scales only:

	<u>Scale ID</u>	<u>Number of Scales</u>	<u>*Host setting</u>
Scale #1:	[01---]	[---04]	[ YES ]
Scale #2:	[02---]	[---04]	
Scale #3:	[03---]	[---04]	
Scale #4:	[04---]	[---04]	

\* Host setting is only available when scale ID is set to '01'

## Serial Output Setup

There are three different serial output modes for the PT300, "on-demand", "continuous", and "accumulating print". The rest of this section provides more information on these modes.

**To setup the serial output mode:** Press the PRINT/ACCUMULATE and ZERO buttons simultaneously until the display shows "b.L tE", Press the PRINT/ ACCUMULATE button to scroll through the menu (12 times) until the display shows "PrE t". Press the PRINT/ACCUMULATE button once to display setting number. Set print mode to the number of the print mode wanted by using the LOCAL/TOTAL button to increment and the ZERO button decrement the number. .

Communication Mode	Setting
On-Demand	0
Continuous	1
Accumulating Print Axle	2
Accumulating Print Standard	3

**Note:** For best results, only set **one** scale to '1, '2 or '3. This should also be the scale you are printing from. '0' is the default setting.

Press the PRINT/ACCUMULATE button. Now the display will display "PbAUd". Press the PRINT/ACCUMULATE button to change the baud rate set, press the LOCAL/ TOTAL or the ZERO button to cycle through the baud rates available. The baud rates available are: 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200. When the desired baud rate is displayed, press the PRINT/ACCUMULATE button. The baud rate only needs to be set on the scale doing the printing. The settings are saved once PRINT/ACCUMULATE is pressed to advance the menu, and the scale can then be turned off to exit the Mode Menu.

### On-Demand

The weight is transmitted every time the PRINT/ACCUMULATE key is pressed. Press PRINT/ACCUMULATE to print either the local or total weight (depending on the local/total setting of the scale). This is the default print mode.

### Continuous

The PT300 automatically and continuously outputs the weight at a rate of about once per second.

## Data Format

When the serial output is set to either on-demand or continuous mode, the transmitted data is in the format shown below:

AAAAAAA BB<cr><lf>

Item	Meaning	ASCII Hex	ASCII Decimal
AAAAAAA	weight		
BB	units "lb" or "kg"		
<cr>	carriage return	0D	13
<lf>	linefeed	0A	10

The AAAAAAA field will vary in length depending on the length of the number and could contain a decimal point and/or a minus sign. The weight will either be local weight or total weight, depending on which mode you're in.

## Accumulating Print

See section titled "Using Accumulated Total" for both the Axle and the standard formats.

## Using Accumulated Total

The PT300 platforms can be used separately, in pairs, or in groups to measure a support load or the total weight in one measuring procedure.

To use the Accumulated Total feature, the scales need to be numbered correctly and the scale you intend to print from or display the accumulated total must have it's print mode set to one of two 'Accumulating Print' modes. See the "Totalizing Setup" and "Serial Output Setup" sections for details.

## Accumulating Print Axle

Press the PRINT/ACCUMULATE button to add the current total weight to the accumulated total weight. At the same time, a print ticket will be generated (assuming you have a printer in the system). The print ticket format is in respect to a vehicle's individual wheels and axles or a standard weight accumulation mode.

For example wheel and axle, think of "WHL 1" as scale 1 and "AXL 1" as the total weight of scale 1 and scale 2. The following print ticket example is a 4 scale system:

PRINT / ACCUMULATE  
button has been pressed

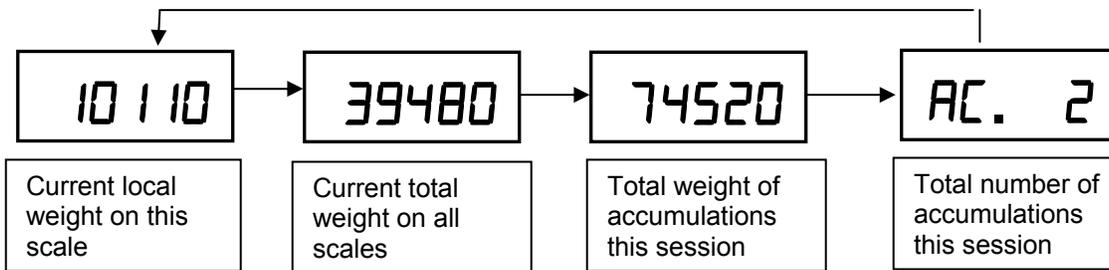
PRINT / ACCUMULATE  
button has been pressed

```

WHL 1: 7460   WHL 2:
7400
  AXL 1: 14860
WHL 3: 10110  WHL 4:
10070
  AXL 2: 20180
SUBTOTAL GRP 1: 35040
ACCUM TOTAL: 35040

WHL 1: 10110  WHL 2:
10070
  AXL 1: 20180
WHL 3: 9800   WHL 4:
9500
  AXL 2: 19300
SUBTOTAL GRP 2: 39480
ACCUM TOTAL: 74520
  
```

Once a successful accumulation has occurred, press the LOCAL/TOTAL button to toggle the display through the current local weight, current total weight, accumulated total, and the number of accumulations that make up the total.

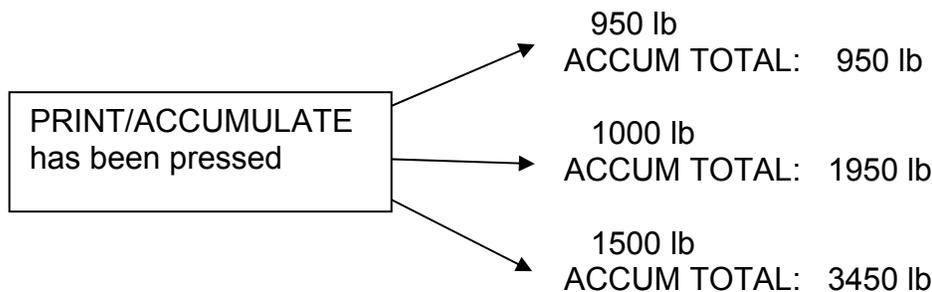


**Note:** The scale will not accumulate and will display the error message "Ac.Err" if the current weight is negative, zero, or if the weight is in motion. These Protections are added to ensure that only valid readings are accumulated into the total. Also, after a successful accumulation, ALL scales in the system must return to zero before you accumulate the next weight. If you attempt to accumulate the next weight before allowing the scale(s) to return to zero, the error message "Ac.Err" will be displayed.

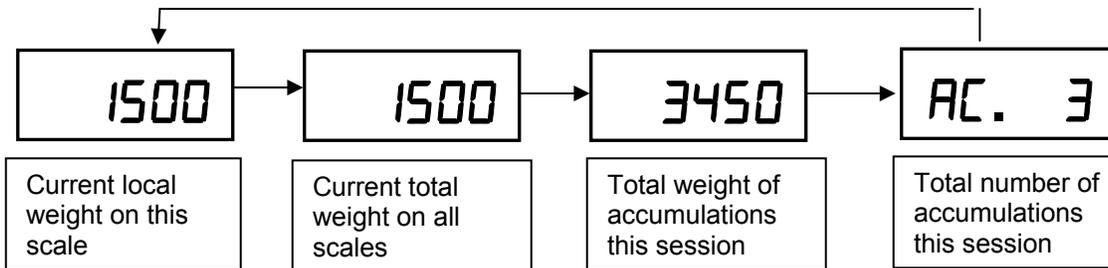
The accumulated total weight can be viewed only on the scale you are accumulating from. After the PRINT/ACCUMULATE button is first pushed; the display will show "Ac. X" as the system will accumulate the next reading and send it to print. (X will show the number of accumulations this session) Once a successful accumulation has occurred, pressing the LOCAL/TOTAL button will cycle the display to show number of accumulations, current local weight, current total weight on all scales, and the accumulated total. When the local weight, current total weight, or accumulated total is displayed, the total icon will be lit up, flashing, or off. (as shown on page)

### Accumulating Print Standard

A standard accumulation shows total weight of multiple items weighed on 1 or more scales. The following print ticket example is a 1 scale system after 3 items are weighed: (950lb, 1000lb, and 1500lb)



Once a successful accumulation has occurred, press the LOCAL/TOTAL button to toggle the display through the current local weight, current total weight, accumulated total, and the number of accumulations that make up the total.



**Note:** The scale will not accumulate and will display the error message “*Ac.Err*” if the current weight is negative, zero, or if the weight is in motion. These Protections are added to ensure that only valid readings are accumulated into the total. Also, after a successful accumulation, ALL scales in the system must return to zero before you accumulate the next weight. If you attempt to accumulate the next weight before allowing the scale(s) to return to zero, the error message “*Ac.Err*” will be displayed.

The accumulated total weight can be viewed only on the scale you are accumulating from. After the PRINT/ACCUMULATE button is first pushed; the display will show “*Ac. X*” as the system will accumulate the next reading and send it to print. (X will show the number of accumulations this session) Once a successful accumulation has occurred, pressing the LOCAL/TOTAL button will cycle the display to show number of accumulations, current local weight, current total weight on all scales, and the accumulated total. When the local weight, current total weight, or accumulated total is displayed, the total icon will be lit up, flashing, or off. (as shown in the display description).

**Note:** In print-mode 3 it can accumulate either in local or total weight, but not when viewing the accumulated total.

To clear the accumulated total weight, press and hold the ZERO button until the display shows “*CLr.t*”.

## Accumulating Procedure:

1. With your system setup correctly, decide which scale you will accumulate from. This can be any scale, but once you choose, you must only accumulate with that scale until the weighing is complete. This scale needs to be set to your desired accumulate mode, 2 or 3 (See “Serial Output Setup”). If you are using a printer, select the scale directly connected to the printer.
2. With the first group of items stable on the scales, press the PRINT/ACCUMULATE button. If you are using a printer, a print ticket with all weights will now be printed. The display will return to the setting that the accumulation was taken from. This first group’s weight will become the accumulated total, which can be seen on the display by pressing the LOCAL/TOTAL button as described in the previous section with the TOTAL icon flashing. Another accumulation can not be made in the standard mode if the scale is in the

Accumulation Print mode. (TOTAL icon flashing). After accumulation, remove the first group of items from the scale(s).

3. With the next group of items stable on the scale(s), press the PRINT/ACCUMULATE button. This will add the total weight to the accumulated total. If you are using a printer, a print ticket with all weights will now be printed.
4. Repeat step 3 as needed. If the accumulated total becomes too large to display, the “*d 5P*” message and error icon will be displayed.
5. When finished, you may clear the accumulated total weight by pressing and holding the ZERO button until the display show “*Err*”. The display will clear the accumulated total and the number of accumulations.

**Note:** The scale will not accumulate when the weight is negative, zero, or if the weight is in motion. A display message “*Acc.Err*” with error icon will be displayed if any of those conditions are present. After a successful accumulation the scale must return to zero before you accumulate the next weight. If you attempt to accumulate the next weight before allowing the scale to return to zero, a display message “*Acc.Err*” with error icon will be displayed.

## Weighing procedures

The PT300 platforms can be used separately, in pairs, or in groups of 4, 6, or more to measure a support load, wheel load, axle load, axle group load, or the total weight of a multi-axle truck in one measuring procedure.

Ideally, all wheels of a vehicle should be measured at the same time in order to avoid measuring errors due to the suspension system.

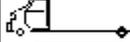
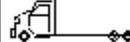
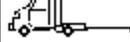
If you are not able to weigh the wheels of a tandem or triple axle simultaneously, the difference in height must be compensated for by using dummy plates (grids, wood or rubber plates) of the same height. The wheel load scales are put in front of the wheels of a vehicle, the driver then drives on the scales/plates and stops within the active weighing area. To avoid improper weighing which might be caused by wheel or axle load displacements, the vehicle brakes should be released before reading the weight values.

### **NOTES:**

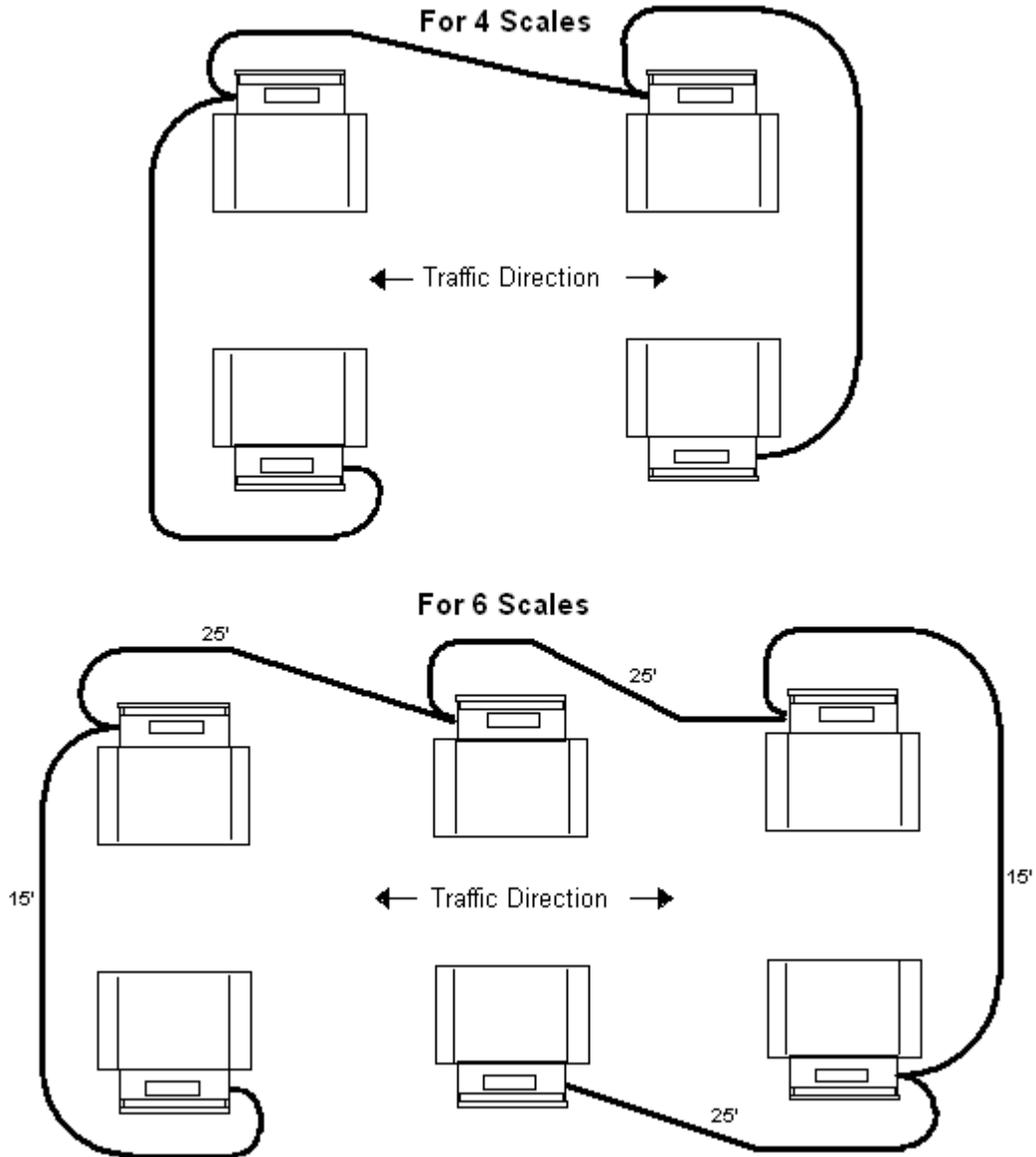
1. It is recommended to weigh the wheels of one axle at the same time.
2. The dummy plates can be omitted if the scales are embedded in recesses in the road surface at the same levels as the road surface.

***Please see tables on the following page***

**Table 1: Weighing Combinations**

		 = Scale  = Dummy plate for height compensation		
	1st weighing	2nd weighing	3rd weighing	
1 pair of scales	   	   		 2-axle truck or trailer  2-axle trailer  2-axle semi-trailer
	     	     	     	 3-axle truck or tractor  3-axle tractor  3-axle trailer  3-axle semi-trailer
2 pairs of scales	   			 2-axle truck or trailer  2-axle trailer  2-axle semi-trailer
	     	     		 3-axle truck or tractor  3-axle tractor  3-axle trailer  3-axle semi-trailer
3 pairs of scales	     			for all types mentioned above

## Typical Scale Layouts



# Mode Menu

## Mode Menu

To access the mode menu simultaneously press the PRINT/ACCUMULATE and ZERO buttons. The display will show “b.L tE”. If it doesn’t, go to Calibration Enable Jumper section and verify the scale is in the RUN position. (shorting pins 2 and 3(RUN))

At times it will be necessary to enter up to a five digit number. When this is necessary the current number will be displayed with the right most digit flashing. The flashing digit may be incremented by pressing the LOCAL/TOTAL button. To move one digit to the left, press the ZERO key. When you have finished entering a number press the PRINT/ ACCUMULATE button. The settings are saved once PRINT/ACCUMULATE is pressed to advance the menu, and the scale can then be turned off.

Step	Function	Note	Default
<i>b.L tE</i>	Backlight	<i>AUt o, oN, oFF</i>	<i>AUt o</i>
<i>SEtP1</i>	Set Point 1	0 to 199999	<i>199999</i>
<i>SEtP2</i>	Set Point 2	0 to 199999	<i>199999</i>
<i>vEr.</i>	Firmware Version	View only	XXXXX
<i>A. r t</i>	Average rate	1 to 120	<i>008</i>
<i>A.tHrS</i>	Average threshold	1 to 10000	<i>200</i>
<i>A oFF</i>	Auto off	000 = off, 1 to 240	<i>060</i>
<i>Pr t t</i>	Print Mode	0 = On-demand, 1 = Continuous, 2 = Accumulating Total Axle, 3 = Accumulating Total Standard	<i>0</i>
<i>PbAUd</i>	Printer baud rate	1200, 2400, 4800, 9600, 19200, or 38400, 57600, 115200	<i>9600</i>
<i>Un tS</i>	Measurement units	lb or kg	lb
<i>Pr o t o</i>	Protocol	<i>StAnd, Lo Pr, C.LOOP, or nonE</i>	<i>Lo Pr</i>
<i>.bAUd</i>	Interface baud rate	9600 or 115200	<i>9600</i>
<i>rAd io</i>	Radio Enable	Yes or no	<i>no</i>
<i>rF CH</i>	Radio Channel	01 to 12	<i>1</i>
<i>rF.PAn</i>	Radio Network ID	0 to 65534	<i>8000</i>
<i>rF.ECP</i>	Radio encryption enable	Yes or no	<i>no</i>
	Radio Encryption Key	0 to 65534	<i>00000</i>
<i>rF.dEF</i>	Restore Radio Defaults	0 or 3	<i>0</i>

## Setting the Mode Menu Parameters

1. Simultaneously press the PRINT/ACCUMULATE and ZERO buttons. The display will show "b.L tE". Press the PRINT/ACCUMULATE button. The flashing display shows the current setting. Press the ZERO or the LOCAL/TOTAL buttons to toggle between Auto, on, and off. With 'Auto' selected (default), the backlight will automatically light up when low level light conditions are detected. When the desired setting is displayed, press the PRINT/ACCUMULATE button.
2. The display will show "SEtP 1". Press the PRINT/ACCUMULATE button. The flashing digit shows the current setting. When the weight displayed is equal to or greater than the set point, the corresponding icon is displayed on the LCD. During normal weighing mode, the S1 icon on the display will light when the weight is greater than or equal to set point 1. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. When the display shows the desired number, press the PRINT/ACCUMULATE button.
3. The display will show "SEtP2". Press the PRINT/ACCUMULATE button. The flashing digit shows the current setting. During normal weighing mode, the S2 icon on the display will light when the weight is greater than or equal to set point 2. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. When the display shows the desired number, press the PRINT/ACCUMULATE button.
4. The display will show "vEr". Press the PRINT/ACCUMULATE button and the display will show the current version of firmware loaded in the scale. Press the PRINT/ACCUMULATE button.
5. The display will show "R. rE". Press the PRINT/ACCUMULATE button. The flashing digit shows the current setting. This number is how many readings will be averaged together before the reading is sent to the display. Higher values will result in a more stable reading, but will take longer to settle to the final value. Note that the scale updates at 4Hz, so an Average Rate of '8' equates to 2 seconds of averaging. Enter a '1' to effectively disable averaging. Use the Lb/Kg button to advance the number and the ZERO button to move the number flashing to the left. When the display shows the desired number, press the PRINT/ACCUMULATE button.
6. The display will show "R.tHr5". Press the PRINT / ACCUMULATE button. The flashing digit shows the current **Average Threshold** setting. This setting enables dynamic averaging, which can improve the settling time of a large Average Rate. If the scale senses a large weight change, it will temporarily suspend averaging, jump to the new weight, and resume averaging. Enter a value of 1-10000 to set the threshold (in display divisions) at which the dynamic averaging triggers. Enter '0' to disable dynamic averaging. When disabled, the averaging will never be suspended. When the display shows the desired number, press the PRINT/ACCUMULATE button.
7. The display will show "R. oFF". Press the PRINT/ACCUMULATE button. The flashing digit shows the current setting. The number displayed is the minutes that the scale can remain idle before it automatically shuts down. Setting this number to "000" will disable the

function, meaning the scale will never shut itself off. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. When the display shows the desired number, press the PRINT/ACCUMULATE button.

8. The display will show "PrE t". Press the PRINT/ACCUMULATE button. The flashing digit shows the current setting. The number enables the scales different print modes. (0 for on-demand, 1 for continuous, 2 for accumulating total axle format, and 3 for accumulating total standard format) Use the LOCAL/TOTAL button to increment and the ZERO button to decrement the number. When the display shows the desired number, press the PRINT/ACCUMULATE button.
9. The display will show "PbAUd". Press the PRINT/ACCUMULATE button. The flashing display shows the current setting of the printer baud rate. The baud rates available are: 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200. Use the LOCAL/TOTAL button or the ZERO button to toggle through the available rates. When the display shows the desired number, press the PRINT/ACCUMULATE button.
10. The display will show "Un tS". Press the PRINT/ACCUMULATE button. The lb or the kg icon will flash in the upper left of the display. This will set the scale to measure pounds (lb) or kilograms (kg). Use the LOCAL/TOTAL button or the ZERO button to toggle between the settings. When the desired icon is flashing, press the PRINT/ACCUMULATE button.
11. The display will show "PrOtO". Press the PRINT/ACCUMULATE button. The flashing display shows the current setting. There are 4 protocol settings for the scale, Standard ("StAnd"), Low Power ("Lo Pr"), Current Loop ("C.LOOP"), or "nonE".  
**Standard** is a setting for use in specific wireless and wired scale networks. **Low Power** will significantly improve the wireless battery life for all non-'host' scales (maximum number of scales in this mode is 32).

**Current Loop** is used when connecting to older legacy PT300 scales. The legacy cables (part #'s 100488, 100489, or 100490) must be used when in this communication mode. See section titled "Totalizing/Printing in Current Loop Mode" for more information.

When scales are not part of a totalizing network, battery life will be improved if "nonE" is chosen. Use the LOCAL/TOTAL button or the ZERO button to cycle through the settings. When the desired protocol is flashing, press the PRINT/ ACCUMULATE button.

12. The display will show "iBAUd". Press the PRINT/ACCUMULATE button. The display will show the current setting flashing. This is the setting of the interface baud rate. There are two settings available, 9600 and 115200. Use the LOCAL/TOTAL button or the ZERO button to toggle between the settings. When the desired baud rate is flashing, press the PRINT/ ACCUMULATE button.
13. The display will show "rAd iO". Press the PRINT/ACCUMULATE button. The display will show the current setting flashing. This is the radio enable status and is either on or off. Use the LOCAL/TOTAL button or the ZERO button to toggle between the settings. When the desired status is flashing, press the PRINT/ ACCUMULATE button. If you select "no" the scale will skip the rest of the settings and return to normal weighing.

14. The display will show “rF CH”. Press the PRINT/ACCUMULATE button. The flashing digit shows the current setting. All scales in a system must be set to the same radio channel setting in order to communicate with each other. Use the LOCAL/TOTAL button to increment and the ZERO button to move the number flashing to the left. When the display shows the desired number, press the PRINT/ACCUMULATE button.
15. The display will show “rF.PAn”. Press the PRINT/ACCUMULATE button. The display will show the current setting with the number on the right flashing. All scales in a system must be set to the same Personal Area Network ID setting in order to communicate with each other. Use the LOCAL/TOTAL button to increment and the ZERO button to move the number flashing to the left. When the display shows the desired number, press the PRINT/ACCUMULATE button.
16. The display will show “rF.ECP”. Press the PRINT/ACCUMULATE button. The display will show the current setting flashing. This is the encryption enable status and is either on or off. Use the LOCAL/TOTAL button or the ZERO button to toggle between the settings. When the desired status is flashing, press the PRINT/ ACCUMULATE button. If “YES” was selected go to the next step. If “no” was selected got to step 17.
17. The display will show “00000” with the number on the right flashing. Use the LOCAL/TOTAL button to increment and the ZERO button to move the number flashing to the left. Enter any number from 0 to 65534. This is the encryption key. For security purposes, this setting is not accessible to view and will always show as “00000”. If you don’t want to change the key enter “00000” to leave it unchanged. All scales in a system must be set to the same encryption key setting in order to communicate with each other. When the desired encryption key is displayed, press the PRINT/ ACCUMULATE button.
18. The display will show “rF.dEF”. Press the PRINT/ACCUMULATE button. The display will show “0” with the number flashing. Use the LOCAL/TOTAL button to increment and the ZERO button to decrement the number. Setting the number to 3 will restore the default radio settings. All other numbers will have no affect on the radio set-up. When the desired number is flashing, press the PRINT/ ACCUMULATE button. The scale will return to normal weighing.

If the scale does not have the radio option installed, the “rF CH”, “rF PAn”, “rF ECP” and the Encryption key will be view only.

## Cabled Scale Usage



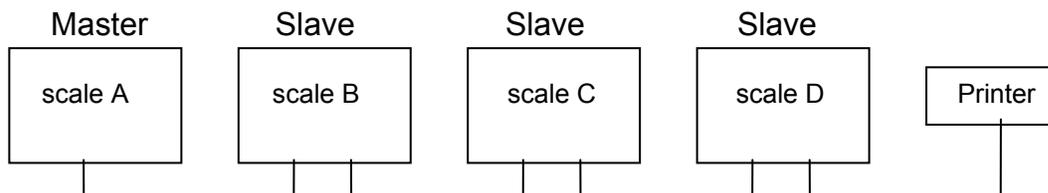
Legacy PT300

## Totalizing/Printing in Current Loop Mode

To use your next generation PT300 scales with the older legacy PT300 scales, the scales need to be set to Current Loop ("CLDP") mode. Change the protocol ("Proto") option in the mode menu. Before you attempt to do either of these, a few terms and definitions must be understood. These terms **only** apply to scales that are cabled together. Also, legacy cables (part #'s 100488, 100489, 100490) are wired differently than the next generation PT300 cables (part #'s 101029, 101032, 101035) and must be used in Current Loop communication mode.

**Master Scale:** If more than one scale is being used, the first scale in line is referred to as the Master Scale. Normally these scales have continuous output, If you requested a demand output use the print button on this scale when printing or totalizing.

**Slave Scale:** If more than one scale is being used, any scale that is not the master scale is referred to as a Slave Scale.



Example of Master/Slave designations

The master and slave designations are determined by the cable and not the scale itself. The cable also determines if the scale transmits data on demand (when the print button is pushed) or continuously. If continuous, the print button doesn't have to be activated to totalize or print.

*Please refer to the cabling diagrams*

## Totalizing

When more than one scale is being used, the last one in line can be used to show the total weight of all the scales added together. To totalize, turn on the scales in sequential order starting with the master scale ("scale A") and make sure all of the slave scales are in the total mode. The indicating bar on the upper left side of the display is on when in the total mode. *This does not mean that the scale is receiving; only that it is capable of receiving.*

If transmitting on demand, press the print button on the master scale and the last scale in line (slave scale D in the diagram) will show the total weight of all the scales.

Example:     Scale A will display the total of A only.  
                  Scale B will display the total of A + B.  
                  Scale C will display the total of A + B + C.  
                  Scale D will display the total of A + B + C + D.

## Printing

Use the print button on the **master** scale when printing. If more than one scale is being used, put the slave scale(s) in the total mode. This will allow the printer to print the total weight of all the scales.

**NOTE: The important thing to remember is that the printer will print whatever is displayed on the last scale in line before the printer.**

In addition to the weight, the printer will print a letter that signifies the number of scales that it printed the weight from.

Example: The letter A signifies the weight is from one scale. The letter B signifies the weight is from two scales etc..

## Data Interface

Serial ASCII

20 mA current loop, active or passive. (The PT300 supplies the current for active current loop, and an external current is used for passive current loop. Passive is preferred for longer battery use between charges.)

1200 Baud

8 data bits

1 start bit

2 stop bits

no parity

**Transmission Format:** A<sub>M</sub><sub>O</sub><sub>Z</sub>-XXXXXXXX.Lb<CR><LF>

Format explanation:

A = Scale code (Signifies the scale, could be  
A for scale A, B for scale B etc..)

Space

M,O,Z = Error code (M = motion, O = over-capacity,  
Z = zero, space = no error)

Space

Minus sign if negative, space if positive.

8 data bits

Space

Pounds/Kilograms

Carriage return

Line feed

# Calibration

**Note:** The PT300 scale is calibrated by the factory prior to shipment.

**Note:** The calibration will achieve the best accuracy if calibration loads are applied to PT300 platform through a metal block, separated from the platform by a thick piece of firm rubber; this setup best simulates the load applied by a tire. Loading without a block can damage the scale. See Tool List below for complete specifications.

## Procedure: Calibration (Verification)

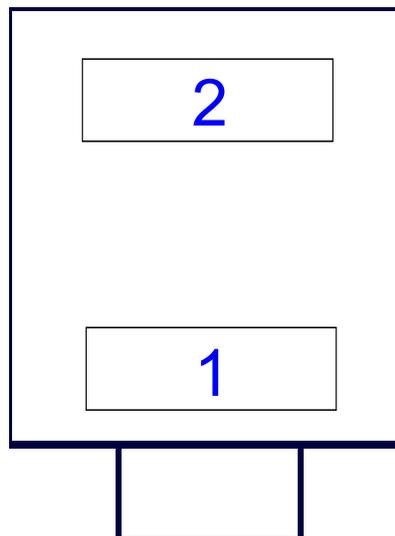
### Check front/back load cell balance

#### Tools required

Twenty thousand pound calibration press.  
1.5" x 1.5" x 12" aluminum loading block.  
Static dissipation station.  
#2 Phillips screwdriver for bezel and board mounts.  
Small slotted blade screwdriver.  
Torque-seal potentiometer shaft sealer.

#### Caution:

The following procedure must be performed at a static controlled workstation.  
Load cell locations used in the following procedure are shown below.



**Load Cell Placement**

1. Position the corner fixture with rubber pad on the scale position #1. Apply 2500 lbs to the loading block. Annotate the reading.
2. Repeat for the #2 position.
3. If all readings are within 5 pounds and the previous calibration passed all of the readings continue with the rest of the calibration verification. If the corner check fails go to the corner adjust calibration procedure.

## Scale Span Calibration

### Tools required:

- Calibration force generator; press or deadweights. This calibration source must cover the range of 10% to 100% of nominal capacity with an accuracy of 0.25% of reading or better.  
**PT300**
  - 100027 - 8" ( $\pm 0.25$ ") x 8" ( $\pm 0.25$ ") x 1.75" (minimum) aluminum loading block.
  - 100028-A - 8" ( $\pm 0.25$ ") x 8" ( $\pm 0.25$ ") x 0.5" ( $\pm 0.125$ ") rubber loading scale. (40 to 70 Shore A rating)  
**PT300DW**
  - 100029 - 12" ( $\pm 0.25$ ") x 12" ( $\pm 0.25$ ") x 1.75" (minimum) aluminum loading block.
  - 100030-A - 12" ( $\pm 0.25$ ") x 12" ( $\pm 0.25$ ") x 0.5" ( $\pm 0.125$ ") rubber loading scale. (40 to 70 Shore A rating)
4. Bring the scales to the calibration site. If there is more than 5°F difference in temperature between the scale temperature and the calibration site allow the scales to reach room temperature.
  5. Place scale on calibration fixture. Turn scale on. Wait 3 minutes for warm-up.
  6. Using the following table, apply the specified test forces:

20K Capacity		
Test force (lb)	Lower limit (lb)	Upper Limit (lb)
0	0	0
2000	1995	2005
4000	3995	4005
6000	5995	6005
8000	7990	8010
10000	9990	10010
12000	11990	12010
14000	13985	14015
16000	15985	16015
18000	17980	18020
20000	19980	20020
0	-20	20

7. Verify that each display value is within the limits shown.
8. If any value is out of acceptable limits proceed to the adjust calibration procedure.
9. If all values are within acceptable limits unit passes calibration verification.

## Procedure: Calibration (Adjustment)

### Tools required:

- Calibration force generator; press or deadweights. This calibration source must cover the range of 10% to 100% of nominal scale capacity with a certified accuracy of 0.25% of reading or better.

#### **PT300**

- 100027 - 8" ( $\pm 0.25$ ") x 8" ( $\pm 0.25$ ") x 1.75" (minimum) aluminum loading block.
- 100028-A - 8" ( $\pm 0.25$ ") x 8" ( $\pm 0.25$ ") x 0.5" ( $\pm 0.125$ ") rubber loading scale. (40 to 70 Shore A rating)

#### **PT300DW**

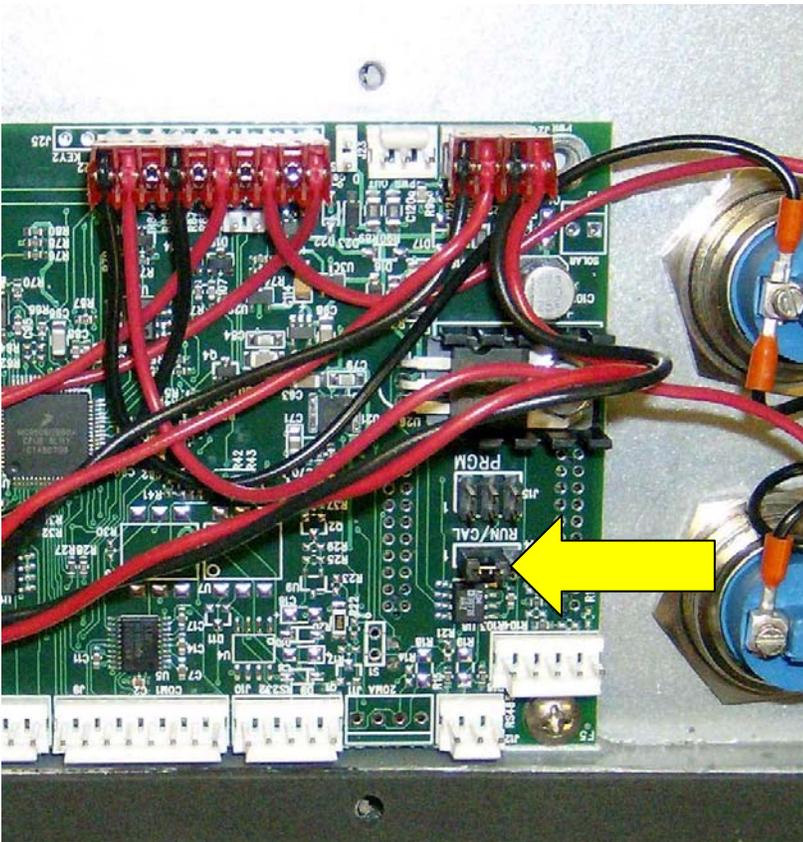
- 100029 - 12" ( $\pm 0.25$ ") x 12" ( $\pm 0.25$ ") x 1.75" (minimum) aluminum loading block.
- 100030-A - 12" ( $\pm 0.25$ ") x 12" ( $\pm 0.25$ ") x 0.5" ( $\pm 0.125$ ") rubber loading scale. (40 to 70 Shore A rating)
- 140208 - #2 Phillips screwdriver.
- 140210 - Static dissipation station.

## Calibration Enable Jumper

To access the calibration mode the shorting strap labeled “RUN/CAL”, located on the right-middle of the circuit board (Intercomp, A/D 20 BIT rev E), it must be moved from shorting pins 2 and 3(RUN); to shorting pins 1 and 2(CAL). To access the shorting strap, remove the 10 screws on the outside edges of the display assembly. Carefully lift the display assembly up and place the assembly, display side down, on top of the weighing platform.

Following calibration, replace the strap to shorting pins 2 and 3 (RUN); replace the assembly and reattach the assembly with the screws. This will ensure that the calibration information of the scale is protected from being changed.

**Note:** Care must be taken to ensure the wire harness is seated properly to prevent it from being pinched between the display assembly and the scale casing.



## Calibration menu

To initiate calibration simultaneously press the PRINT/ACCUMULATE and ZERO buttons. The display will show “STEP”, if it does not, the calibration strap is incorrectly placed to allow calibration. Return to ‘Calibration Enable Jumper’ section to verify correct setting. Press the PRINT/ACCUMULATE button to access the parameter setting.

At times it will be necessary to enter up to a five digit number. When this is necessary the current number will be displayed with the right most digit flashing. The flashing digit may be incremented by pressing the LOCAL/TOTAL button. To move one digit to the left, press the ZERO key. When you have finished entering a number press the PRINT/ ACCUMULATE button. The settings are saved once PRINT/ACCUMULATE is pressed to advance the menu, and the scale can then be turned off.

Step	Function	Note	Default
<b>STEP</b>	skip	000= no skip 001= skip to Weight Calibration 003= skip to cornering routine	<b>000</b>
<b>U. EnA</b>	Unit enable	Yes or no	<b>YES</b>
<b>bP 1</b>	grad break point 1	Enter weight	<b>00000</b>
<b>bP 2</b>	grad break point 2	Enter weight	<b>00000</b>
<b>bP 3</b>	grad break point 3	Enter weight	<b>00000</b>
<b>AdC.r.t</b>	ADC rate	0 or 1	<b>1</b>
<b>AZt</b>	AZT (auto zero tracking)	1 d, 3 d, .5 d, oFF, or.6 d	<b>1 d</b>
<b>ZErO.r</b>	Zero range	0= off, 1= 1%, 2= 2%, 3= 5%, 4 = 1%	<b>0</b>
<b>GrAd</b>	graduation size	0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, or 100	<b>d 1</b>
	<b>SAuE</b>	Displays for 1 sec and advances	
<b>CAP</b>	capacity	Enter scale capacity	<b>20000</b>
<b>LL-01</b>	No weight applied		
<b>HH-01</b>	First weight	Enter first weight	
<b>LL-01</b>	First weight	Load first weight	
<b>HH-02</b>	Second weight	Enter second weight	
<b>LL-02</b>	Second weight	Load second weight	
<b>HH-03</b>	Third weight	Enter third weight	
<b>LL-03</b>	Third weight	Load third weight	
<b>HH-04</b>	Fourth weight	Enter fourth weight	
<b>LL-04</b>	Fourth weight	Load fourth weight	
	10 points available to enter	3 minimum recommended	

## Setting the Calibration Parameters

1. At any point in the following steps, data will be retained by the scale at the step completed if the power is cycled off. To initiate calibration simultaneously press the PRINT/ACCUMULATE and the ZERO buttons. The scale shows "STEP". Press the PRINT/ACCUMULATE button. The scale shows "000" with the far right number flashing. To go through all of the calibration parameters, press PRINT/ ACCUMULATE with the display showing "000". To skip the first 8 calibration parameters and proceed to step 11 enter "00 1". See Diagnostics section for additional codes available. Use the LOCAL/TOTAL button to increment and the ZERO button to decrement the number. Press the PRINT/ ACCUMULATE button when the desired number is displayed.
3. The display shows "U. ENR" if proceeding through all parameters. Press the PRINT/ ACCUMULATE button. The display will read "YES". Pressing LOCAL/TOTAL or the ZERO button will toggle the display to "no". With the display showing "YES", press the PRINT/ACCUMULATE button.
4. The display now shows "bP 1". Press the PRINT/ACCUMULATE button. The display will read the current setting with the far right number flashing. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. When the desired graduation break point is displayed press the PRINT/ ACCUMULATE button.
5. The display shows "bP 2". Press the PRINT/ACCUMULATE button. Repeat the process in step 3 for graduation break point 2. When the desired graduation break point is displayed press the PRINT/ACCUMULATE button.
6. The display shows "bP 3". Press the PRINT/ACCUMULATE button. Repeat the process in step 3 for graduation break point 3. When the desired graduation break point is displayed press the PRINT/ACCUMULATE button.

### Multiple Graduation Break Points

The **PT300** has the ability to have multiple graduation values set. Following is an example of setting graduation break points. Example:

Grad = Initial graduation equals by 0.1 lb
Cap = 10000 (Capacity equals 10,000 lb)
bP 1 = 1000
bP 2 = 2000
bP 3 = 5000

The scale would then display the following:

up to 1000 lb	by 0.1 lb;	up to 453.55 kg	by 0.05 kg
1000+ to 2000 lb	by 0.2 lb;	453.55+ to 907.1 kg	by 0.1 kg
2000+ to 5000 lb	by 0.5 lb;	907.1+ to 2267.8 kg	by 0.2 kg
5000+ lb	by 1.0 lb;	2267.8+ kg	by 0.5 kg

To disable the breakpoints the graduation break points should be set to 110% of the capacity. The scale uses the same graduation from zero to capacity. This turns off the breakpoint feature.

7. The display shows “*AdC.rE*”. Press the PRINT/ACCUMULATE button. The display shows the current setting flashing. This sets the internal A/D conversion time at one of two choices. An entry of ‘0’ results in the full conversion time for the most stable results. An entry of ‘1’ results in a reduced conversion time which extends battery life. For the **PT300** it is recommended to leave this set to ‘1’. Note that if this setting is changed, the scale must be recalibrated. Use the LOCAL/TOTAL button to increment and the ZERO button to decrement the number. When the desired ADC rate is displayed press the PRINT/ACCUMULATE button.
8. The display shows “*AZt*”. Press the PRINT/ACCUMULATE button. The display shows the current setting. Press the LOCAL/TOTAL or the Zero button to cycle through the auto zero tracking options. (*1 d*, *3 d*, *.5 d*, *oFF*, or *6 d*) If the displayed weight is less than the number of grads shown for a given amount of time, the weight will be zeroed off. When the desired auto zero tracking setting is displayed press the PRINT/ACCUMULATE button.
9. The display shows “*ZE-D.r*”. Press the PRINT/ACCUMULATE button. The display shows the current setting flashing. Use the LOCAL/TOTAL button to increment and the ZERO button to decrement the number. The zero range is the percentage the zero can move from the original zero obtained at calibration. The zero button will not work if outside the zero range; and the display will show “*ZE-D.r*” with the error icon lit if the zero range is set to 1, 2, or 3. If 4-6 is selected, the zero button will simply not function when an attempt is made to zero the scale outside the range. When the number for desired zero range number is displayed press the PRINT/ACCUMULATE button. (0=off, 1=1%, 2=2%, and 3=5%, 4=1%, 5=2%, 6=5%)
10. The display shows “*GrAd*”. Press the PRINT/ACCUMULATE button. The display shows the current setting with the number flashing. Press the LOCAL/TOTAL or the Zero button to cycle through the graduation options. When the desired graduation setting is displayed press the PRINT/ACCUMULATE button. (grad options 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, or 100)

**Note: The numbering for the “setting the calibration parameters” continues at Span Calibration.**

At this point the display will show “*SRuE*” for about 1 second and advance to show “*CRP*”.

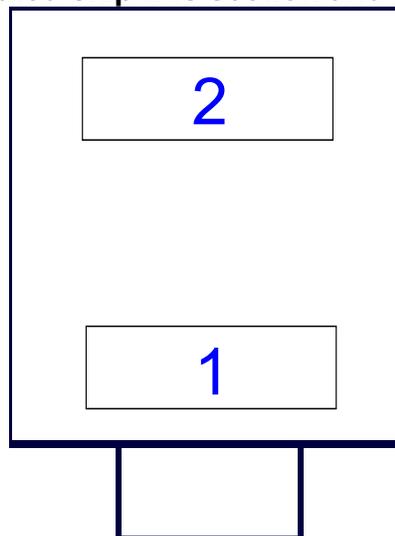
## Weight Calibration

One to ten load weights need to be applied to calibrate the scale. Using multiple point calibration allows the unit to weigh more accurately; by removing undesirable characteristics of load cells. A typical weight calibration is a three point calibration. This means three different and optimal loads are applied and entered (not including the zero point). If you do not conveniently have the three different weights available, you may also use one or two point calibration. To calibrate with one point, simply turn off the scale after completing step 13 as listed below. To calibrate with two points, turn off the scale after completing step 15 as listed below. The **PT300** has the capability to apply and load up to 10 calibration points.

### Corner Calibration (Both load cells)

**Caution:** Avoid directly touching any exposed circuitry. Use cotton gloves or similar protection. Oils from the fingers will cause unacceptable performance in high humidity conditions. This degradation may not be obvious at the time of contamination. If the circuitry becomes contaminated it must be cleaned using isopropanol or an equivalent cleaner.

**Note:** If the scale fails corner verification perform the following routine. If the span is the only thing that need to be calibrated skip this section and go to span calibration.



1. Turn scale ON.
2. Press the PRINT / ACCUMULATE button. The display should show "STEP". If not return to the Cal Enable Switch Access section and press the cal enable switch. Press the PRINT / ACCUMULATE button.
3. The display shows "000" with the most right digit flashing. Increase the number with the Lb/Kg button until the display shows "003". This will access the **Load Cell Balance** routine. Press the PRINT / ACCUMULATE button.
4. The display shows "LC.bAL". Press the PRINT / ACCUMULATE button and the display will show one digit flashing. This is the number of load cells in the scale. Increase the number

with the Lb/Kg button or decrease the number with the Zero button until the display shows “2”. This is the number of load cells in the PT300. (Unless you have a 30K or 40K PT300DW, which has 4 load cells, enter “4” in this case) If the number was changed the scale will save and restart. If this happens go back to step 2. If the number isn’t changed the display will show “LC 00”.

5. Press PRINT / ACCUMULATE to read the zero load. For this step it doesn’t matter if there are loading blocks on the scale or not.
6. The display will show “LC 1-0”. Prepare load cell 1 using the loading block and the rubber pad as per figure above. With no weight on the scale except the loading block fixture, press the PRINT ACCUMULATE button.
7. The display will show “LC 1-L”. Apply ¼ of the capacity of the scale to load cell 1 using the same loading fixture. Once the load is applied press the PRINT ACCUMULATE button.
8. The display will show “LC 2-0”. Prepare load cell 2 using the loading block and the rubber pad as per figures 1 and 2 above. With no weight on the scale except the loading block fixture, press the PRINT ACCUMULATE button.
9. The display will show “LC 2-L”. Apply ¼ of the capacity of the scale to load cell 2 using the same loading fixture. Once the load is applied press the PRINT ACCUMULATE button.
10. The display will show “SCALE” and then return to normal weighing mode. The cornering has now been internally compensated and saved. Perform corner calibration verification in normal weighing mode. This concludes the corner calibration.
11. To access the Span calibration, simultaneously press the PRINT/ACCUMULATE and the ZERO buttons. The scale shows “STEP”. Press the PRINT/ACCUMULATE button. The scale shows “000” with the far right number flashing. To go through all of the calibration parameters, press PRINT/ ACCUMULATE with the display showing “000”. To skip the first 8 calibration parameters and proceed to span calibration enter “00 1”.

### **Corner Calibration (Single load cell)**

1. Position the scale, loading block and pad to apply weight on the corner requiring adjustment.
2. Enter Cal mode.
3. Enter “20x” at “STEP” choice to adjust a single corner. The cell number to adjust is entered in the code as ‘x’. (Example: Enter “202” to enter mode to adjust cell #2).
4. The display will appear to return to normal mode, except that now the ‘S1’ and ‘S2’ segments are blinking to indicate you are now in corner adjust mode for your selected corner.
5. Apply ¼ of the scales capacity to the loading pad over the corner to be adjusted.
6. Press LOCAL/TOTAL to increase or ZERO to decrease the corner’s weight. (Each press adjusts the display approximately 0.01%)
7. When the desired weight is showing on the display, press PRINT / ACCUMULATE to save the results and return to normal weighing. Return to calibration verification section and ensure all calibration parameters are met.

## Span Calibration

**Note: The numbering from the “setting the calibration parameters” continues here.**

11. The display will show “*SCALE*” for about 1 second and advance to show “*CAP*”. Press the PRINT/ ACCUMULATE button. The display will show the current capacity setting with the far right number flashing. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. Enter the capacity of the scale and press the PRINT/ACCUMULATE button when the scale capacity is displayed.
12. The display shows “*LL-00*”. With no weight applied to the scale press the PRINT/ ACCUMULATE button.
13. The display shows “*HH-01*”. Press the PRINT/ACCUMULATE button. The display will show “*00000*” with the far right number flashing. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. Enter the value of the first load and press the PRINT/ACCUMULATE button when the value of the first load is displayed.
14. The display shows “*LL-01*”. Apply the first load to the scale. With the first load applied to the scale press PRINT/ACCUMULATE button.
15. The display shows “*HH-02*”. Press the PRINT/ACCUMULATE button. The display will show “*00000*” with the far right number flashing. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. Enter the value of the second load and press the PRINT/ACCUMULATE button when the value of the second load is displayed.
16. The display shows “*LL-02*”. Apply the second load to the scale. With the second load applied to the scale press PRINT/ACCUMULATE button.
17. The display shows “*HH-03*”. Press the PRINT/ACCUMULATE button. The display will show “*00000*” with the far right number flashing. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. Enter the value of the third load and press the PRINT/ACCUMULATE button when the value of the third load is displayed.
18. The display shows “*LL-03*”. Apply the third load to the scale. With the third load applied to the scale press PRINT/ACCUMULATE button.
19. The display shows “*HH-04*”. Press the PRINT/ACCUMULATE button. The display will show “*00000*” with the far right number flashing. Use the LOCAL/TOTAL button to advance the number and the ZERO button to move the number flashing to the left. Enter the value of the fourth load and press the PRINT/ACCUMULATE button when the value of the fourth load is displayed.

- 20.** The display shows “LL-04”. Apply the forth load to the scale. With the forth load applied to the scale press PRINT/ACCUMULATE button.

Repeat step 12 and 13 for each additional “HH-05” – “HH 10” and “LL-05”- “HH 10” combination. If the scale is turned off at any time the calibration data acquired to that point will be retained. After the PRINT/ACCUMULATE button is pressed after “LL-10”, the display will return to normal weighing.

### ***Finished***

Following calibration, replace the strap to shorting pins 2 and 3 (RUN); replace the assembly and reattach the assembly with the screws. This will ensure that the calibration information of the scale is protected from being changed.

**Note: Care must be taken to ensure the wire harness is seated properly to prevent it from being pinched between the display assembly and the scale casing.**

# Troubleshooting

## Problem Table

The following table describes some symptoms with possible causes and solutions.

<b>Symptom</b>	<b>No power up, nothing on display</b>
<p>If any power reaches the control panel, the display driver turns on some random segments. Since we are not seeing this we will assume that no power is reaching the scale circuitry.</p> <p>Some possible causes:</p> <ul style="list-style-type: none"> <li>Defective wiring harness: Inspect for damaged wiring.</li> <li>Defective battery pack: Measure battery voltage, charge or repair as needed.</li> <li>Defective ON switch: Bridge switch to see if unit turns on.</li> <li>Defective circuitry: Replace control panel.</li> </ul> <p>The power supply may be delivering power, but it might be eaten up with a defective circuit board or cable. Unplug the load cell cable. If the scale turns on at this point, a load cell lead is shorted. Turn the power off and try each cell lead in turn. If it is the load cell cable, look for a crushed cable.</p>	
<b>Symptom</b>	<b>Power up to random display</b>
<p>We know that some power is reaching the display driver circuit, but the control panel is not working correctly. Test for low battery voltage. Inspect for visible damage. If this fails replace the control panel.</p>	
<b>Symptom</b>	<b>Scale shuts off</b>
<p>If the scale turns off IMMEDIATELY after you take your finger off the off button, you may have very low batteries. If this is not the cause replace the control panel.</p>	
<b>Symptom</b>	<b>"Locks up"</b>
<p>The scale may be mis-programmed. This can be corrected by restoring the correct control parameters. If the Average Rate setting is very high, an active load may not update the display quickly which may be interpreted as a lock up</p>	
<b>Symptom</b>	<b>No backlight</b>
<p>Cover the light sensor window. If the light does not turn on, replace the control panel. Please note that the light is not visible in bright sunlight.</p>	
<b>Symptom</b>	<b>Slow operation</b>
<p>This may be caused by a programmed change in the filter setting. There is a tradeoff between speed and stability of the display reading. This can be tuned by changing the "Average Rate" setting.</p>	
<b>Symptom</b>	<b>Low battery indicator won't turn off</b>
<p>It is possible that the output from the batteries is really low. Look at the cells and charger circuit for these problems. If the battery voltage is correct then you will need to replace the control panel.</p>	
<b>Symptom</b>	<b>Jumpy or drift weights</b>
<p>This can usually be traced to contamination on circuit boards or a bad load cell. This can also be caused by a rapid change in temperature. The scales need at least one-hour acclimation time for each 10 degrees Fahrenheit of temperature change. Another possibility is powerful radio interference.</p>	
<b>Symptom</b>	<b>No response to one or more keys</b>
<p>The switch may be defective. The control panel may be defective. The zero key does not function while the scale is in motion, this is not a defect. Also, the scale may be programmed to ignore the zero key if there is more than a certain amount of weight on the platform.</p>	
<b>Symptom</b>	<b>"Bad" weights</b>
<p>First, check weighing technique. Are there air currents around the vehicle being weighed? Are the operators using dummy blocks on the un-weighed wheels? (<b>NOT</b> a recommended technique) Are the scales being used on level ground? Is the scale set on the wrong units settings? Is a new operator using the scales? If on a calibration press, are you using weight distribution blocks and rubber scales? Is the reference scale correct? Assuming all this, is the scale spanned correctly? If the reading is exactly 3/4 of the expected value, one of the cells leads may not be providing signal. This would probably be in the load cell or control circuit. The interconnecting wiring or cables may be pinched, cut or crushed.</p>	
<b>Symptom</b>	<b>Batteries won't charge</b>
<p>Check for bad batteries. The charger circuit could be out. Check for bad connections or a defective charging cable. Look at the power source, whether it's a plug-in transformer, transport cart, or automotive ignition. Remove the battery cap with the scale plugged into the charger. If the scale turns on then the charger is working.</p>	

**Caution:** Changing any circuit board or load cell will affect the calibration. The calibration should be verified after any repairs.

## Error Messages

Error messages displayed can be a helpful diagnostic tool. The following table describes some possible causes and solutions.

Message	Meaning
'EPE'	<b>EEPROM FAILURE Calibration information lost or corrupted</b>
Calibration information is held in a special permanent memory area. A checksum code is generated and written to this memory during the calibration process. Each time the power is turned on this code is regenerated and compared to the stored value. If a change is found this error message is displayed. Recalibration may clear the error display, but if the problem persists the control panel will have to be replaced.	
'Ad I'	<b>A/D converter failure</b>
The A/D circuit board has indicated a fault and needs to be repaired or replaced.	
'L[bxx]'	<b>Power-up Self Test has detected one or multiple load cell errors</b>
A load cell may have failed or there is a bad connection. The "xx" shows which cell or connection has failed: xx=1-8 (single digit) if there is a single load cell failure. A two-digit value for "xx" is a code to indicate multiple cells have failed or are disconnected	
'L xx'	<b>Run-time checking has detected one or multiple load cell errors</b>
A load cell circuit may have failed or there is a bad connection. The "xx" shows which cell or connection has failed: xx=1-8 (single digit) if there is a single load cell failure. A two-digit value for "xx" is a code to indicate multiple cells have failed or are disconnected	
'Lo.bAt'	<b>Low battery voltage</b>
This message indicates that the control panel has measured the battery voltage and found it to be too low. The most likely cause is that the batteries need to be charged. If the charge indicator fails to light up when the charger is plugged in, then the charger or cable may be defective. If the batteries have been charged for the recommended time and fail to run for the specified duration, then the batteries may need to be changed. If a new set of batteries fail to correct the situation, then the control panel may need to be replaced. Also check the battery holder and wiring.	
'CAP'	<b>Overload or calibration information lost or bad load cell</b>
The control panel has detected a weight reading that is larger than expected. This may be caused by the application of too much weight to the platform. If this display is seen when there is no weight on the platform, then the most likely causes are a defective load cell or defective control panel. To isolate the problem, measure the signal across pins two and three on the load cell connector on the control panel. This should be between zero and one millivolt. If found to be higher or lower, then the load cell system must be checked. See procedure elsewhere in this manual. If the signal is within this range then the calibration data may be lost. Attempt to recalibrate the scale. If this does not clear the problem, then replace the control panel.	
'ZER.r'	<b>Zero Range Error</b>
Scale tried to zero off a load outside the range specified in the zero range setting. Remove any load and press zero.	
'd,SP'	<b>Number can't be displayed (such as -9999)</b>
The most common cause of this error is pressing the zero key with a full load on the scale. When the load is removed, the full number with a minus sign will not fit on the display. Pressing the zero key again will clear this display.	
'COP' or 'LOC'	<b>Diagnostic power-up message</b>
This won't affect normal operations and can typically be ignored.	

## Diagnostic tests and voltage measurements

### Charger voltage

Ensure the scale is off during the entire test. Remove the batteries and connect a meter across the battery compartment observing correct polarity. Plug the battery charger in, the voltage should measure 5.8V DC or more. Unplug the battery charger and reinstall the batteries. Measure the voltage across the batteries. Depending on the state of charge on the batteries the voltage should be between 3.6 to 5.8V DC. Plug the charger back in. The voltage across the batteries should increase. If the correct voltage response is not observed, unplug the battery charger. Remove one of the batteries and connect a meter, set to measure current to the battery compartment connectors, observing correct polarity. Plug the battery charger in. The meter should read between 25 and 75 mA DC.

### Lamp

Cover the light sensor. The backlight should light up. Please note that it is difficult to see the backlight in sunlight.

### Keys

Press **On/Off button**, the scale should turn on. Press **lb-kg**, the scale should change units of measure. Apply 50 lb to 250 lb to the scale. After you get a stable display, press the **ZERO** key. The scale should go to a zero indication. Press the **On/Off button** and the scale should turn off.

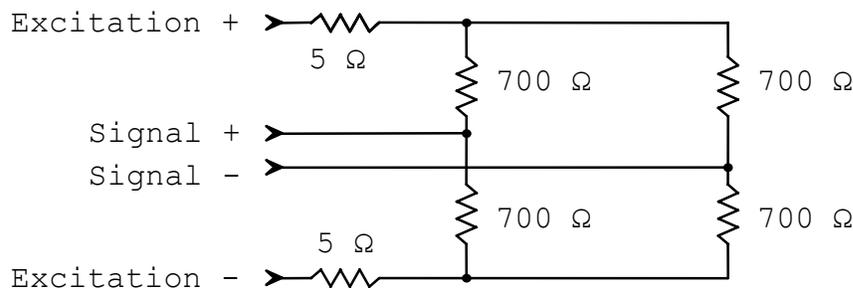
### Power down shutoff

Connect a variable supply to the input connector and remove the batteries. Connect the meter to the positive battery lead. Set the supply to 6 V and turn the scale on. Reduce the input voltage until the scale turns off. The voltage at shutoff should be between 3.2 and 3.5 Volts.

### Load Cells

Each PT300 scale has two load cells. These load cells are the transducers that convert mechanical energy (weight) to electrical energy.

Each load cell has 4 strain gages ( $700\ \Omega$ ) and two temperature compensation thermistors. The four strain gages are wired together to form a Wheatstone bridge.



Schematic Diagram (typical values)

The 5  $\Omega$  thermistors in series with the Excitation leads are for temperature compensation. They are balco thermistors that change resistance with temperature to maintain a constant signal voltage. These thermistors are specially manufactured for Intercomp load cell material and strain gage types.

### Load cell leads color coding

- Red :** + Excitation (3.3 Volts)
- Green :** + Signal
- White :** - Signal
- Black :** - Excitation (ground)

### Check load cell zero output value

The signal at the main circuit board with the signal leads in place should be approximately 0.1 millivolts with no load applied to the cell. Larger values could indicate a defective load cell, wiring, or circuit board. The load cell must be tested separately to determine the source of the zero shift.

### Check zero output from the load cell

You can use a power supply set to 3.3 Volts to provide the excitation voltage for this measurement. Connect plus 3.3 volts to the red lead and ground to the black lead or use the scale to provide the excitation by connecting the two excitation leads only (Black and Red). Turn the scale on to apply excitation voltage.

Connect a meter capable of monitoring millivolt readings between the plus and minus signal leads (Green and White) The zero signal output (With excitation voltage applied) should measure approximately -1.00 to 1.00 millivolts). Larger values would indicate a defective load cell. This is most likely the result of an overload of the cell during use.

### Check load cell resistance values

Load cell resistance can vary depending on the model and capacity. The load cells will be one of the standard resistance values given in the table below.

<b>Nominal Cell Resistance</b>		<b>350 <math>\Omega</math></b>	<b>700 <math>\Omega</math></b>	<b>1000 <math>\Omega</math></b>
<b>Black – Red</b>	<b>=</b>	385 $\Omega$	770 $\Omega$	1082 $\Omega$
<b>Black – Green</b>	<b>=</b>	285 $\Omega$	595 $\Omega$	748 $\Omega$
<b>Black – White</b>	<b>=</b>	285 $\Omega$	595 $\Omega$	748 $\Omega$
<b>White - Green</b>	<b>=</b>	350 $\Omega$	701 $\Omega$	1000 $\Omega$

With the load cells disconnected, the resistance readings should be as specified. It is normal for **all** of the readings to be higher or lower than the values given by several percent. If there is several Ohm **difference** between the Black-Green and Black-White measurements the cell is defective. This test is most useful to detect a catastrophic failure of the cell or lead; you are typically looking for an open or a short when using this check.

## Step Entries

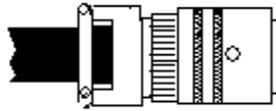
The 'step' choice that starts the calibration menu also allows special codes for technical diagnostic work. Typically only scale technicians should use these features. Here is the list of possible entries to the 'step' choice related to the PT300:

<b>Message</b>	<b>Meaning</b>
<b>000</b>	Simply advance to the first Calibration Menu step.
<b>001</b>	Advance to weight calibration.
<b>003</b>	Enter corner calibration. (Also set the number of load cell inputs here.)
<b>005</b>	This brings you to the Mode Menu, just as if the cal strap had been left in the RUN position.
<b>121</b>	Raw counts display diagnostic
<b>131</b>	Constant power to all cells diagnostic
<b>201-208</b>	Corner adjust cell 1-8. (Example: 202 will enter mode to adjust cell #2).
<b>311</b>	Restore all radio settings to defaults (CH = 1, Network ID = 8000, and Encryption disabled). Display will then show 'save' if successful, or "no rF" if there is no radio installed or some other radio failure.
<b>711</b>	Restore all settings to defaults, but leave weight calibration untouched.
<b>911</b>	Restore all settings to default settings, including weight calibration. It is recommended that this only be used as a last resort, as your previous calibration and settings will be lost after running this.

### Step Choice Table

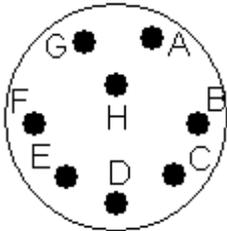
# Connector

The diagram below shows the pin-out for the PT connector on the side of the PT300:



***PT connector***

- A:** RS-485 A
- B:** 20 mA (-I)
- C:** - Charging Voltage
- D:** 20 mA (-0)
- E:** +Charging Voltage
- F:** 20 mA (+I)
- G:** RS485 B
- H:** RS232 TXD



# How to reach Intercomp Service

Things to know:

- Inform the Service Dept. that the product is a next generation PT300 scale system (ADrevE version)
- When was the system purchased?
- Where was the system purchased?

For Intercomp Service call or fax:

FAX # (763)-476-2613  
(763)-476-2531  
**1-800-328-3336**

or fill out Service Support Form at :

[www.intercompcompany.com](http://www.intercompcompany.com)

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