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Manual 7600TM2021REV7**

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## Unpacking and Startup

### Unpack the Scale

- DO NOT LIFT SCALE BY THE TOP SPIDER OR SUB PLATFORM!
- Remove the molded foam top from the carton. On 2 lb. and 5 lb. capacity scales the platform is packaged on top of this foam. Gently lift and remove the stainless-steel platform cover only.
- Remove any options which may be packed with the scale.
- Carefully remove scale from the packaging by grasping both sides of the base.



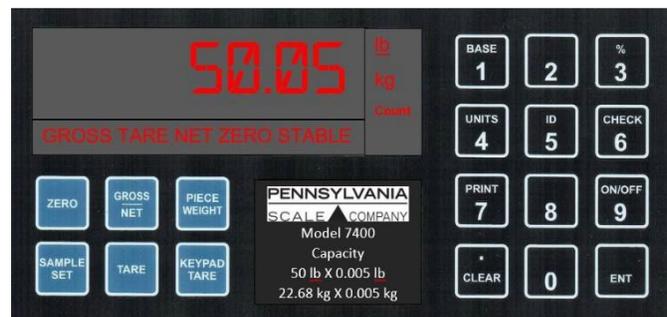
### Scale Setup

- Place the scale on a stable, level surface for operation.
- Adjust the corner leveling feet until the level bubble indicates the unit is level.
- Firmly tighten hex jam nuts on the leveling feet. (Any time the scale is relocated, it should be leveled.)
- Remove the protective plastic wrap from the platform and place the platform on the spider.
- Plug the scale into 110/120 VAC



### Scale Operation

- Press the ZERO button to zero the scale
- Press the UNITS button to cycle through units of measure
- Press the PRINT button to send scale data to a printer or connected software
- Press SAMPLE SET to Create a Piece Weight and Count
- Press TARE or KEYPAD TARE to enter a tare weight

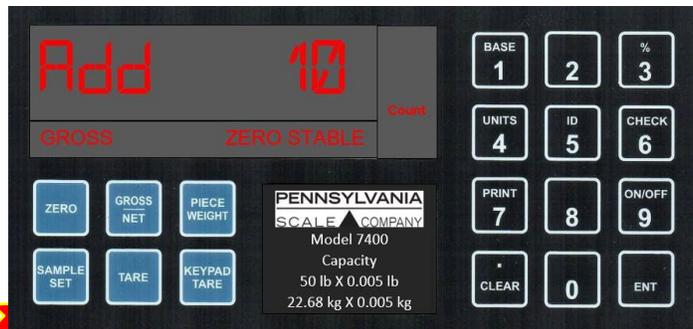


## Basic Counting Operation

- ✓ If a container will be used to hold items being counted, place it on the platform.



- ✓ Press the SAMPLE SET button, press repeatedly to scroll to the desired sample size. OR key in the sample size and press ENTER



- ✓ Place the sample quantity on the scale platform all at once



- ✓ Piece weight is calculated, and count displayed. All the remaining parts may now be added to the scale and counted.



## 7600 Advanced Operation.

See the 7600 Technical Manual for detailed configuration and setup information

### Advanced Counting Operations

- Auto Sample Update** (In **CAL 10**, **ENH 15** select **YES** and in **CFG 50**, **YPR 57** select **P ERR** or **P ACC** to enable.) After the initial sample and piece weight calculation placing additional parts on the scale platform at a quantity less than the original sample size results in the scale recalculating the piece weight resulting in a higher % off accuracy or lower % of error.
- 2 Step Counting** (In **CFG 50**, **25 56** select **YES** to enable.) Press the  button and place a sample quantity of the items to be counted on the scale platform. Key in the number of pieces and press the  button. Piece weight is calculated, and scale will display count.
- Counting with A Piece Weight and Tare Weight** Press the  button, key in the piece weight and press the  button. Press the  button, key in the tare weight and press the  button **OR** place the empty container (or representative container) on the scale platform and press the  button. This information may also be scanned into the scale with a barcode scanner and barcode that has the input piece weight and input tare weight commands embedded.
- Negative Counting** (In **CFG 50**, **25 56** select **YES** and **NEG 59** select **YES** to enable.) Negative counting allows a negative or count out of a full container. Place the container and parts on the scale, press the  button and remove a sample quantity from the container. Key in the number of pieces and press the  button. Piece weight is calculated, and scale will display count removed as a negative number.
- Top End Counting** (In **CFG 50**, **25 56** select **YES** and **NEG 59** select **NO** to enable.) Top end counting is an easy way to determine the count of a container of parts without having to remove them from the container. Place the container and parts on

- the scale, Press the **KEYPAD TARE** button, key in the tare weight and press the **SAMPLE SET** button and remove a sample quantity from the container. Key in the number of pieces and press the **ENT** button. Piece weight is calculated, and scale will display count of the parts in the container.
- Auto Sample to Bulk** (In **CFG 50, ASb 58** select **YES** to enable.) This counting method is designed for a two-scale base system. Sampling occurs on the light capacity higher resolution scale base for improved piece weight calculation accuracy then automatically switches to the second heavier capacity base for bulk counting.
- Product ID and Piece Weight Database Store and Recall** (In **CFG 10, STR 16** select **A** to enable.). Press the **ID** button, key in the product ID and press the **ENT** button. If this product ID is not in memory the scale will go to the piece weight calculation function and display **Add %%**. Perform a sample by scrolling to the desired sample size and placing the parts on the scale platform. The scale will calculate the piece weight and store it with the product ID in memory. Perform counting functions as needed for this part. Repeat the above steps for each new product ID and piece weight to store in memory. You can store a total of 250 pieces. To recall an ID and Piece Weight from memory press the **ID** button, key in the product ID and press the **ENT** button. Product ID and piece weight will be loaded and scale will be in count mode ready to count this part. This may also be configured to enter a piece weight instead of using the sample process to establish a piece weight. In **CFG 10, STR 16** select **b** to enable.

## Accumulation

- The accumulation function will keep a running total of what has been weighed or counted. As an example, if you're weighing 10 boxes that each have a piece count of 100, the accumulation feature would allow you to see the total of 100 pieces for each box and a total of 1000 pieces for all the boxes. Additionally, when using a printer in the above scenario an individual box label showing a quantity of 100 and a pallet label showing 10 boxes of 100 for a total of 1000. The 7600 can be set up for:
  - Manual Accumulation press the **2** button to accumulate. In **CAL 1, ACC 6**, select **PRI** to enable manual accumulation of weight or **CAL 1, ACC 6**, select **CNT** to enable manual accumulation of count
  - Auto Accumulation occurs on first stable non-zero weight. In **CAL 1, ACC 6**, select **A-PRI** to enable auto accumulation of weight or **CAL 1, ACC 6**, select **A-CNT** to enable auto accumulation of count
- To clear the accumulation, register press and hold the **2** button. The display will flash **CLR.ACC** and **NO.** press the **UNIT 4** button to select **YES** and the **ENT** button to clear the accumulation totals.
- When using accumulation and with the optional printer the system can be configured to print a box label and pallet label.

## Setpoint Entry

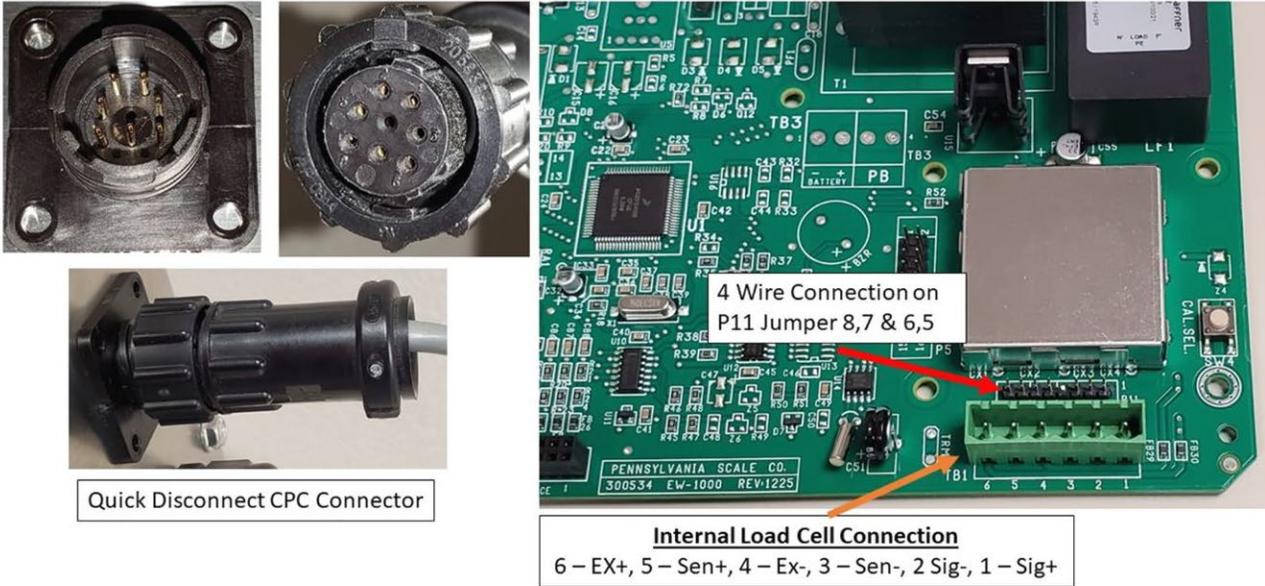
- When the setpoint relay option is installed enter the setpoint values by pressing and holding the **SAMPLE SET** button, keying in values and press the **ENT** button

## SPECIFICATIONS

- **LOAD CELL A/D CONVERTER**
- **TYPE:** 24-bit delta sigma (1:16,777,216)
- **EXCITATION:** 5 VDC, 120 mA max.
- **SIGNAL INPUT:** 16 mv
- **SENSITIVITY:** 0.1 Uv/grad
- **UPDATE RATE:** 30 update/second
- **DISPLAY:** Six (6) Digits, 0.6-inch LED
- **KEYPAD:** Full numeric plus controls
- **POWER INPUT:** 117/217 VAC, 50–60 HZ, 20 watts, fuse 0.50 A Slo-Blow.
- **SERIAL PORTS:** RS232C
- **ENCLOSURE:** Cast Aluminum Chassis and Load Cell Spider, Stainless Steel Platter.
- **NTEP:** Class III/IIIL, 10,000 divisions CoC 91-149A7
- **MEASUREMENT CANADA:** MAL-AM-4869
- **OPTIONS:**
  - **ANALOG OUTPUT:** 0-10v, 4-20ma (16-bit D/A).
  - **ETHERNET TCP/IP**
  - **REMOTE DISPLAY MINI TOWER**
  - **AC/DC OPERATION WITH BUILT IN RECHARGEABLE BATTERY**

## Connections:

### Remote Base Connection



## RS-232 PIN ASSIGNMENTS AND IMPLEMENTED FUNCTIONS

Connection to the Serial Port is made via a DB-9 female connector found in the access area under the scale. Internal Instrument connection is on the main board,

TB2-1,2,3.

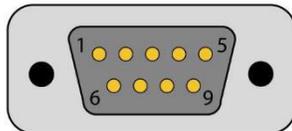
PIN FUNCTION

5 Signal Ground

2 Transmit Data

3 Receive Data

**DB9M Connector**



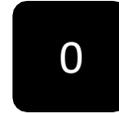
## Calibration/Configuration Access, Selecting/Changing Parameters Navigating the Menus

**To access instrument configuration, calibration:**

Press and Hold the ZERO button for 5 seconds



The Audit Trail counters [ P x C x ] are displayed first followed by access code request [ AC P ]. Key in 0000 until ~~0000~~ is displayed then press the ENT button



**7600 Keypad access functions:**

Scroll through fixed selections



Enter the Selection



Key in Values or Selection



Example: To enter [ ~~150~~ ], use the keypad to key in 150 and the button to enter



## Menu Layout

<b>CAL 10</b>	Capacity, Zero Tracking, Counting Functions
<b>CAL 20</b>	Capacity, Resolution, Zero Range, Units, Print, Overrange
<b>CAL 30</b>	Secondary Resolution and Setup
<b>CAL 40</b>	Filter Settings, Load Cell Zero/Deadload and Span Calibration
<b>CAL 50</b>	Counting Configuration
<b>CFG 60</b>	RS232 Configuration: Baud Rate, Word, Stop, Parity, Echo, Address
<b>CFG 70</b>	Battery Operation and Time/Date Configuration
<b>CFG 80</b>	Formatted Data Output
<b>CAL 0</b>	Save and Exit Calibration
<b>CAL 1</b>	Options: Dual / Triple Range, Peak Hold, Remote Inputs, Setpoints, UPS WorldShip, Accumulate, Analog Output
<b>CAL 200</b>	Remote Serial Display Set Up

- Configuration/Calibration Main Blocks: 10, 20, 30, etc. can be stepped to directly by keying in the main block number and “**ENT(enter)**”.
- The sub parameters need to step through to the next “main” before a direct change.
- From any “main” point, exit by changing to [**CAL 0**] and “**ENT(enter)**”.
  - A [**SAVE NO**] will need to be changed to [**SAVE YES**] by using the UNITS button scroll then “**ENT(enter)**”. to save any changes and exit.
- Changing to [**CAL 0**] from within [**CAL 40**] allows exit prior to adjusting span.

EXAMPLE: To go directly to Load Cell calibration [**CAL 40**] from [**CAL 10**] key in “40” then



to enter.

**NOTE:** During the setup procedure each step will be printed to any device interfaced to the RS-232 port. If options are not present, steps will not appear.

## Configuration Calibration Menus

**CAL 10** Calibration setting entry point. Use  to enter this menu and enter selections

STEP	Parameter	Description
<b>CAP 11</b>	Full capacity of the scale	Standard capacities are 2, 5, 10, 20, 50, 100, 150 and 200 lbs.
<b>ACL 12</b>	YES, NO	Auto configuration. Use the UNITS button to select YES or NO. If YES, the scale will jump to Cnt 14, EnH, Prt 25 and CAL 40 storing the factory defaults. If NO is selected the scale will proceed to the next step.
<b>A-0 13</b>	YES, NO	Select if scale is to auto zero when first turned on. Use the UNITS button to select YES or NO
<b>CNT 14</b>	YES, NO	Turn the counting function on or off. Use the UNITS button to select YES or NO.
<b>ENH 15</b>	YES, NO	Enhanced mode enables Auto Sample Update and % error or accuracy. Select YES to turn on or NO to disable
<b>S:R 16</b>	OFF, A, B	Enable Product ID and Piece Weight Database Store and Recall. Select A to enable sampling to establish and save Piece Weight, B to manually enter a piece weight or OFF to disable

**CAL 20** Calibration setting entry point. Use  to enter this menu and enter selections

STEP	Parameter	Description
<b>E5 22</b>	Displayed resolution or count by, rounded up to nearest 1, 2 or 5	Default entry is scale capacity divided by 10,000 as a bench scale, 5,000 as indicator with most bases and floor scales. (NTEP – Legal for trade configuration). In some applications and environments up to 20,000 divisions of capacity may be possible non legal for trade
<b>-0- 23</b>	1 – 99	Zero Range - Input the Zero Range in % of full scale. The amount of weight the scale can Zero.
<b>UNS 24</b>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,	Select the primary weighing unit by keying in a number :1 = lb.*, 2 = kg, 3 = g, 4 = oz t, 5 = lb. t, 6 = g, 7 = dwt, 8 = oz, 9 = c, 10 = oz f, 12 = l, 11 = ml, 13 = tons, 14 = lb. – oz
<b>PRN 25</b>	Stable, First, Unstbl, nTEP, Auto, Prn-1	Select whether the scale will respond to a data output/print request when stable, first (positive) stable, any time (unstable), or NTEP. Auto: Data output/print when stable and min 10 grads above zero, prints again with min 25 grad change from last print. Does not need to return to zero data output/print again. Stable: Single stable data output/print, must return to zero to data output/print again.
<b>CNd 26</b>	YES, NO	Measurement Canada legal for trade overrange configuration: Select YES (9d) or NO (105%) *
<b>0-? 27</b>	0.00 – 5.00	Zero tracking value entered as a percent of display resolution. Entering a 0.25* equals 25% of one display graduation. “0” disables the zero tracking feature.
<b>SbL 28</b>	OFF, 1, 3, 5, 10	Stable/Motion configuration in grads/sec.

**CAL 30** Secondary units, resolution. Use **ENT** to enter this menu and enter selections

STEP	Parameter	Description
<b>2UN 31</b>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,	Select the secondary weighing unit by keying in a number :1 = lb.* , 2 = kg, 3 = g, 4 = oz t, 5 = lb. t, 6 = g, 7 = dwt, 8 = oz, 9 = c, 10 = oz f, 12 = l, 11 = ml, 13 = tons, 14 = lb. – oz
<b>E 32</b>	Displayed resolution or count by, rounded up to nearest 1, 2 or 5	Default entry is scale capacity divided by 5,000 (NTEP – Legal for trade configuration). In some applications and environments up to 20,000 divisions of capacity may be possible non legal for trade
<b>PUd 39</b>	Prl, SEC, SEC On, COUnt, SELEct	Power up: Primary units, Secondary units, Secondary units only (Locks out Primary Units) and Count, Count.

**CAL 40** Load Cell Calibration. Use **ENT** to enter this menu and enter selections

STEP	Parameter	Description
<b>FIL 41</b>	1-15	Response time: 0-9 selects conversions to average directly. 11-15 correspond to 25, 30, 35, 40, & 50 conversions for extended filtering.
<b>ADJ CAL</b>	NO, YES, 11 Pnt Use SAMPLE SET button to select	Select yes to enter calibration. <b>Select "11 Pnt" when optional high resolution load cell is installed. See page 38 for details</b>
<b>NOL 42</b>	Zero/Dead Weight Calibration	With the platform in place but no weight on the scale, press PRINT. Display will indicate ----- and advance to Span Calibration if successful
<p><b>NOTE:</b> Dead Load Zero can be updated without changing span by keying in a "0" and <b>ENTER</b> to jump back to starting point (<b>CAL 40</b>) and repeating to exit. Note on exit to change [<b>SAVE NO</b>] to [<b>SAVE YES</b>] with <b>UNITS</b> key before <b>ENTER</b> to save changes.</p>		
<b>HLF 43</b>	Span Calibration	Apply a half capacity weight to the platform and Press <b>ENTER</b> . If ½-capacity weight is unavailable, place a substitute weight on the platform and key in the amount of weight being used and press <b>ENTER</b> . * Display will indicate ----- and advance to Span Calibration if successful.
<b>FUL 44</b>	Span Calibration	Apply a full capacity weight to the platform and press <b>ENTER</b> . If a full-capacity weight is unavailable, place a substitute weight on the platform, key in the amount of weight being used and press <b>ENTER</b> . * Weight used in 43 can be keyed in again.
<b>NOL 45</b>		Remove all weight from the platform and enter, or just use <b>ENTER</b> to skip this step.

**CFG 50** Counting Configuration Use  to enter this menu and enter selections

STEP	Parameter	Description
<b>551 51</b>	10 (Or the value to use for the first preset sample size)	Key in the value, use "0" to disable counting press the <b>ENTER</b> button enter
<b>552 52</b>	20 (Or the value to use for the second preset sample size)	Key in the value, press the <b>ENTER</b> button enter
<b>553 53</b>	50 (Or the value to use for the third preset sample size)	Key in the value, press the <b>ENTER</b> button enter
<b>554 54</b>	100 (Or the value to use for the fourth preset sample size)	Key in the value, press the <b>ENTER</b> button enter
<b>PCY 55</b>	YES, NO	Enable Piece Weight displayed X1000. Use the <b>UNITS</b> key to select then <b>ENTER</b>
<b>ENH 55</b>	YES, NO	Select YES for enhanced counting mode Use the <b>UNITS</b> key to select then <b>ENTER</b>
<b>25 56</b>	YES, NO	Enable 2 Step Counting Use the <b>UNITS</b> key to select then <b>ENTER</b>
<b>PR 57</b>	P Err, P Acc, Disable	Enable % of error, % of accuracy or disable Use the <b>UNITS</b> key to select then <b>ENTER</b>
<b>ASb 59</b>	YES, NO	Enable Auto Sample to Buk operation Use the <b>UNITS</b> key to select then <b>ENTER</b>
<b>NEG 59</b>	YES, NO	Select YES to enable negative counting mode Use the <b>UNITS</b> key to select then <b>ENTER</b>

**CFG 60** RS-232 Port Configuration. Use  to enter this menu and enter selections

STEP	Parameter	Description
<b>BAU 61</b>	300,600,1200,2400, 4800, 9600, 19200, 38400	Baud Rate Setting. Use <b>UNITS</b> button to select.
<b>LEN 62</b>	7, 8	Word Length 7 or 8 bits. Use <b>UNITS</b> button to select.
<b>SPb 63</b>	1, 2	Stop Bits 1 or 2. Use <b>UNITS</b> button to select.
<b>PAR 64</b>	None, Odd, Even	Parity None, Even, Odd. Use <b>UNITS</b> button to select.
<b>ECH 65</b>	No Ech, Ech	No Echo or Echo Use <b>UNITS</b> button to select.
<b>ADR 66</b>	0 – 255	Address, Key in a number from 0* to 255, 0 disables this feature.



**CAL 70** OPTIONAL when the unit has the built-in rechargeable battery or clock. Use to enter this menu and enter selections

STEP	Parameter	Description
S:F 71	0, 1, 2, 3	Select type of clock: 0 = Time and date OK, skip to SLP 74, 1 = 24-hour clock, 2 = 12-hour clock, currently AM, 3 = 12 hour clock, currently PM.
T: 72	7, 8	Enter the current time as HHMMSS. Based on the type of clock selected in step 71. Clock will begin with the pressing of the <b>ENTER</b> button
T:D 73	1, 2	Enter the current date as MMDDYY.
SLP 74	0, .5 - 12	NOTE: is dependent on the battery being enabled by parameter "bat 1.". For AC/DC versions of the scale, enter the amount of time the display is to remain on before going into the battery saver sleep mode. The time is entered in number of minutes, from .5 to 12. Entering a zero will disable the sleep mode for AC only scales.

**CR** **80** Programmable data output. Use **ENT** to enter this menu and enter selections

### Building a programmable data output.

The user programmable data output feature is the string of information sent from the RS-232 port (Or optional Ethernet, Wi-Fi and USB) when the PRINT button is pressed, scale is setup to auto output or the scale receives an SRP command from a computer or terminal. Select the format of this string by entering two-digit print codes into the 30 available data output slots, PSL 81 through PSL 119. When finished entering data to construct the programable data output, "99" is entered to mark the end of print formatting.

Example: To build a programable data output to send to a printer the following print codes could be entered

PSL	Data Output Code	Description
PSL81	30	Gross Weight with Prefix, Data and Suffix
PSL82	65	Carriage Return Line Feed
PSL83	03	Date (Optional on 7300 & 7500)
PSL84	65	Carriage Return Line Feed
PSL85	99	End

Would print the following:

Gross 100.55 lb.  
04/13/2020

Or send a data string to a program to a program:  
Gross(sp)(sp)100.55(sp)lb.(cr)(lf)04/12/2020(cr)(lf)

### Special Data Output Codes

Code	Description
<b>50</b>	Continuous output. Data output will be sent continuously while the scale is turned on.
<b>51</b>	Toggled continuous output. The data output will be sent continuously after the PRINT button is pressed or an SRP command is received by the scale. Pressing the PRINT or sending SRP a second time will turn off the continuous output.
<b>52</b>	Status Character. May be used by a computer to determine the condition of the scale at any given moment.
<b>53</b>	ABO Checksum. May be used in building a continuous output compatible with other Pennsylvania Scales.
<b>54</b>	Select Leading Zeros for weight and count data. Example, "7.00 lbs." on scale data outputted is "007.00"

<b>58</b>	Entering this data output code at the beginning of on the data string will transmit the Gross, Net, Tare and Count values with leading zeros and no decimal place. Example: 75.00 Gross Weight is transmitted as 0007500
<b>95 70</b>	Special date output code. Date is outputted as mm/dd/yy (08/18/20)
<b>95 71</b>	Special date output code. Date is outputted as mm/dd/yyyy (08/18/2020)
<b>95 72</b>	Special date output code. Date is outputted as month/dd/yy (August 18, 2020)
<b>95 73</b>	Special date output code. Date is outputted as mmddy (081820)
<b>95 2</b>	Special time output code, time is outputted without the colon separator hhmss (034513)

## Data Output Codes

Data Output Code	Description	Data Output Code	Description
<b>02</b>	OPTIONAL time	<b>03</b>	OPTIONAL date
<b>04</b>	Unit of measure suffix label	<b>05</b>	"Gross" prefix
<b>06</b>	"Tare" prefix	<b>07</b>	"Net" prefix
<b>08</b>	"Count" prefix	<b>09</b>	"Piece Weight" prefix
<b>10</b>	"Sample Size" prefix	<b>11</b>	"% Error" or "% Accuracy" prefix
<b>14</b>	FR"F1" for use with Barcode Printer programming	<b>15</b>	? for use with Barcode Printer programming
<b>16</b>	P1 for use with Barcode Printer programming	<b>19</b>	"Pieces" prefix
<b>20</b>	Gross weight data	<b>21</b>	Tare Weight data
<b>22</b>	Net or Peak weight data	<b>23</b>	Count data
<b>24</b>	Piece Weight data	<b>25</b>	Sample Size data
<b>26</b>	% of Error or Accuracy data	<b>27</b>	Base Number in lse
<b>28</b>	ID Number	<b>30</b>	Gross weight, prefix, data, and suffix
<b>31</b>	Tare weight, prefix, data, and suffix	<b>32</b>	Net weight, prefix, data, and suffix
<b>33</b>	Count, prefix, data, and suffix	<b>34</b>	Piece weight, prefix, data, and suffix

ASCII Characters			
<b>60</b>	ASCII space (SP)	<b>61</b>	ASCII horizontal tab (HT)
<b>62</b>	ASCII line-feed (LF)	<b>63</b>	ASCII start of header (SOH)
<b>64</b>	ASCII carriage return (CR)	<b>65</b>	ASCII carriage return and line feed (CR LF)
<b>66</b>	ASCII form-feed (FF)	<b>67</b>	Turn on large print (PA Scale printer)(SO, HEX 0EH)
<b>68</b>	Turn off large print (PA Scale printer)(SI, HEX 0FH)	<b>69</b>	ASCII null (NUL)
<b>72</b>	STX – Start of text code	<b>73</b>	ETX – End of text code
<b>74</b>	TAB code all lines	<b>75</b>	RP-DIO cut command
<b>78</b>	Invert print (PA Scale printer)(DC3, HEX 13H)	<b>79</b>	End inverted print (PA Scale printer)(DC4, HEX 14H)
<b>80</b>	Accumulator name, value and units	<b>81</b>	Output “Accumulator Total”
<b>82</b>	Output accumulator value	<b>83</b>	Command to clear accumulator and transaction counter
<b>84</b>	Command Prompt to clear accumulator and transaction counter	<b>85</b>	Output transaction name and counter
<b>86</b>	Output “Transaction”	<b>87</b>	Output transaction counter
<b>98</b>	Second data output triggered by accumulator	<b>99</b>	End of programmable data output
<b>35</b>	Sample Size, Prefix, data, and suffix	<b>36</b>	% of Error or Accuracy, prefix, data, and suffix
<b>37</b>	Base in Use, Prefix, data, and suffix	<b>38</b>	ID Number, prefix, data, and suffix
<b>39</b>	UPS WorldShip Format	<b>40</b>	User defined data string 1
<b>41</b>	User defined data string 2	<b>42</b>	User defined data string 3
<b>43</b>	User defined data string 4	<b>44</b>	User defined data string 5
<b>45</b>	User defined data string 6	<b>46</b>	User defined data string 7
<b>47</b>	User defined data string 8	<b>48</b>	User defined data string 9
<b>49</b>	User defined data string 10	<b>59</b>	Print Display

NOTE: After **PSL 119** or after data output code **99** the display will show **SET.RSd**. Use the **UNIT** button to select YES and **ENT** button to go to **CAL 200** Remote Serial Display. Instructions for these configuration steps are found on page 22 below. To skip press the **ENT** button

**CAL 1** Option Configuration. Key in 1 and Use **ENT** to enter this menu and enter selections.

STEP	Parameter	Description
<b>BA: 1</b> <i>When optional AC/DC is installed. See figure 4 page 37</i>	Off, On	AC/DC board select charger “on” when battery is included, circuit may be used to drive status light in “off” state. See Battery Charger Output (BCO).
<b>dTR 2</b>	0 – 15	Dual/Triple Auto Range (0 = off), range is per dtr 1-15 table below if 2.1 and 2.2 are set to 0 (See chart below)
<b>PNT: 2.1</b>	0 – 99%	Sets low range of dtr. (See chart below)
<b>PNT: 2.2</b>	0 – 99%	Sets mid-range of dtr, if 11-15 selected. (See chart below)

## Dual and Triple Ranging Setup – Based upon the displayed resolution setting in res 22

DTR Setting	High Resolution up to % of capacity	Resolution Increase Factor	Medium Resolution	Resolution Increase Factor
0				
1	50%	2		
2	50%	5		
3	25%	2		
4	25%	5		
5	20%	2		
6	20%	5		
7	20%	10		
8	10%	2		
9	10%	5		
10	10%	10		
11	25%	5	50%	2
12	10%	5	50%	2
13	25%	10	50%	2
14	10%	10	50%	2
15	1%	100	10%	10

### Dual and Triple Ranging Example

Scale Capacity 100		RES 22 (Displayed resolution 0.01)		
DTR Setting	High Resolution Up To lbs.:	High Resolution at This Setting:	Medium Resolution Up To lbs.:	Medium Resolution at This Setting:
0				
1	50	0.005		
2	50	0.002		
3	25	0.005		
4	25	0.002		
5	20	0.005		
6	20	0.002		
7	20	0.001		
8	10	0.005		
9	10	0.002		
10	10	0.001		
11	25	0.002	50	0.005
12	10	0.002	50	0.005
13	25	0.001	50	0.005
14	10	0.001	50	0.005
15	1	0.0001	10	0.001

## CAL 1 Option Configuration Continued

<p><b>PHd 3</b></p>	<p>OFF, Peak-H, Hold, Hold.Ur</p>	<p>Peak/Hold function, zero key clears current peak, tare function is disabled, print code 22 and 32 are modified to value and value with labels (xx.xxx / Peak xx.xxx lb.) Only Peak displayed, "Sample" recalls prior reading (5 sec) unless new weight is on scale for new peak, Zero zeros scale only and AZ functions. Use <b>UNITS</b> button to select.</p>
<p><b>RIN 4</b> <i>When optional remote switch option (57888) is installed. See figure 1 page 36</i></p>	<p>No, Yes</p>	<p>Remote inputs, (with DIO option) Input 1: Gross/net, Input 2: Tare, Input 3: Zero, Input 4: Print</p>
<p><b>Hds 3.1</b></p>	<p>0 – 240</p>	<p>Hold after "samples": Weight must be stable for 0 – 240 samples to "hold".</p>
<p><b>SER 5</b></p>	<p>Nor, UPS, Fed 12, Fed 96, PurOL, Toledo</p>	<p><b>Nor – Output as configured in CFG 80</b>  <b>UPS - <u>UPS WorldShip</u></b>  <b>Fed 12 - <u>Federal Express 1200 baud rate</u></b>  <b>Fed 96 – <u>Federal Express 9600 baud rate</u></b>  <b>PurOL - <u>Purolator</u></b>  <b>Toledo – <u>Toledo Emulation</u></b>  <b>NCI – <u>NCI Protocol</u></b>  <i><b>See below for more detailed information</b></i></p>
<p><b>ACC 6</b></p>	<p>Prl, A-Prl, Cnt, A-Cnt, OFF</p>	<p>Prl: Manual primary units accumulator (Press 2 on keypad)  A-Pri: Auto primary units accumulator (First stable non zero Weight)  Cnt: Manual count accumulator (Press 2 on keypad)  A-Cnt: Auto count accumulator (First stable non zero count)  OFF: Accumulation disabled</p>

<b>AOS 7</b> <i>When optional analog output (57811) is installed. See figure 2 page 36</i>	Gross, Net, Display	Sets the weight that the output represents: Gross, Net, or Display.
<b>ZR 7.1</b>	0.00	Sets the value of weight that is equal to 4mA or 0-VDC.
<b>FS 7.2</b>	Full Scale Capacity	Sets the value of weight that is equal to 20mA or 10VDC.
<b>ZR.A 7.3</b>	Zero Cal Adjust	With nothing on the scale platform or base use the <b>UNIT</b> to adjust up or the <b>PRINT</b> to adjust down
<b>SP.A 7.4</b>	Span Cal Adjust	With full capacity on the scale platform or base use the <b>UNIT</b> to adjust up or the <b>PRINT</b> to adjust down

## Set Point Relay Setup and Operation

<b>SPT 8</b> <i>When optional Setpoint/Relay option (57818 or 57880) is installed. See figure 3 on page 37</i>	
<b>TR</b>	Weight Only simple setpoint operation, one setpoint (K1). Setpoint/Relay is active when below the setpoint target and off when above
<b>PRTR</b>	Weight only setpoint operation with preact, one Setpoint/Relay (K1). Setpoint/Relay 1 (K1) is active when below the setpoint target (preact subtracted from setpoint target) and off when above. <b>Example:</b> Setpoint target 2, preact .2 Setpoint/Relay 1 active until 1.8 is on the scale then off.
<b>DRTR</b>	Weight only setpoint operation with dribble two setpoint (K1 & K2). Setpoint/Relay 1 and 2 are active when below setpoint and dribble targets. <b>Example:</b> target of 2, dribble of 0.5, Setpoint/Relay 1 and 2 (K1, K2) are active until 1.5. Setpoint/Relay 2 (K2) is off Setpoint/Relay 1 (K1) active from 1.5 to 2.0

## **DRTK**

Weight only setpoint operation with dribble and trickle, three Setpoint/Relays (K1, K2 & K3). Setpoint/Relay 1, 2 & 3 are active when below setpoint, dribble and trickle targets.

**Example:** target of 2.5, dribble of 0.5 and trickle of 0.5, Setpoint/Relay 1, 2 and 3 (K1, K2, K3) are active until 1.5. Setpoint/Relay 2 (K2) is off and Setpoint/Relay 1 (K1) and 3 (K3) are active from 1.5 to 2.0. from 2.0 to 2.5 only Setpoint/Relay 1 (K1) is active.

## **CTR**

Count Only simple setpoint operation, one setpoint (K1). Setpoint/Relay is active when below the setpoint target and off when above

## **CPRT**

Weight only setpoint operation with preact, one Setpoint/Relay (K1). Setpoint/Relay 1 (K1) is active when below the setpoint target (preact subtracted from setpoint target) and off when above.

**Example:** Setpoint target 100, preact 10 Setpoint/Relay 1 active until 90 is on the scale then off.

## **CDRT**

Count only setpoint operation with dribble two setpoint (K1 & K2). Setpoint/Relay 1 and 2 are active when below setpoint and dribble targets.

**Example:** target of 200, dribble of 50, Setpoint/Relay 1 and 2 (K1, K2) are active until 150. Setpoint/Relay 2 (K2) is off Setpoint/Relay 1 (K1) active from 150 to 200

## **CDRTK**

Count only setpoint operation with dribble and trickle, three Setpoint/Relays (K1, K2 & K3). Setpoint/Relay 1, 2 & 3 are active when below setpoint, dribble and trickle targets.

**Example:** target of 250, dribble of 50 and trickle of 50, Setpoint/Relay 1, 2 and 3 (K1, K2, K3) are active until 150. Setpoint/Relay 2 (K2) is off and Setpoint/Relay 1 (K1) and 3 (K3) are active from 150 to 200. from 200 to 250 only Setpoint/Relay 1 (K1) is active.

## **CRANG**

Counting only Setpoint/Relay 1 (K1) active when within a range.

**Example:** target of 100 and range of 25, Setpoint/Relay 1 is active from 75 to 125 and off when under or over that range

## **CRABT**

Counting only Setpoint/Relay 1, 2 and 3 (K1, K2, K3) active in ranges for over/under accept operation.

**Example:** target of 100, range of 20, Setpoint/Relay 2 (K2) active from 0 – 80, Setpoint/Relay 2 (K1) active from 80 – 120, Setpoint/Relay 3 (K3) active from 120 and above. When not in the defined “Range” Setpoint/Relays are off

## **AbTR** (Firmware version 4.72 and above)

Weighing only Setpoint/Relay 1, 2 and 3 (K1, K2, K3) active in ranges for over/under accept operation.

**Example:** target of 100, range of 20, Setpoint/Relay 2 (K2) active from 0 – 80, Setpoint/Relay 2 (K1) active from 80 – 120, Setpoint/Relay 3 (K3) active from 120 and above. When not in the defined “Range” Setpoint/Relays are off

## **4-LVL**

**SAE-5122** Weigh Only Setpoint/Relay. Relays programmed normally open/normally closed in the configuration step “POL 8.3”. Number of relays to use configured in configuration step “rLY 8.4”

When at Zero Band (Zero Annunciator is on) no setpoints or relays are active  
Setpoint/Relay 1 ONLY is active when above zero until target weight achieved.  
Setpoint/Relay 2 ONLY is active when above SP1 until target weight achieved.  
Setpoint/Relay 3 ONLY is active when above SP2 until target weight achieved.  
Setpoint/Relay 4 ONLY is active when above SP3 until target weight achieved.

**Example:** With 4 Setpoint/Relays enabled, Target weight of 10 for setpoint 1, 20 setpoint 2, 30 setpoint 3 and 40 for setpoint 4. Setpoint/Relay 1 active when above Zero until 10, Setpoint/Relay 2 active above 10 until 20, Setpoint/Relay 3 active above 20 until 30 and Setpoint/Relay 4 active above 30 to 40.

## **[4-LVL**

**SAE-5122** Count Only Setpoint/Relay. Relays programmed normally open/normally closed in the configuration step “POL 8.3”. Number of relays to use configured in configuration step “rLY 8.4”.

When at Zero Band (Zero Annunciator is on) no setpoints or relays are active  
Setpoint/Relay 1 ONLY is active when above zero until target weight achieved.  
Setpoint/Relay 2 ONLY is active when above SP1 until target weight achieved, if enabled.  
Setpoint/Relay 3 ONLY is active when above SP2 until target weight achieved, if enabled.  
Setpoint/Relay 4 ONLY is active when above SP3 until target weight achieved, if enabled.

**Example:** With 4 Setpoint/Relays enabled, Target weight of 10 for setpoint 1, 20 setpoint 2, 30 setpoint 3 and 40 for setpoint 4. Setpoint/Relay 1 active when above Zero until 10, Setpoint/Relay 2 active above 10 until 20, Setpoint/Relay 3 active above 20 until 30 and Setpoint/Relay 4 active above 30 to 40.

## **4-bAT**

**SAE-5122** Simple Batching Weigh Only Setpoint/Relay. Relays are normally open. Number of relays to use configured in configuration step “rLY 8.4”. Preacts enabled or disabled in configuration “PrE 8.5”. Empty container high/low threshold or minimum weight on weighbridge threshold is configured in “ChK 8.6”. To use positive values for gain in weight or negative values for loss in weight batching/filling is configured in “dIr 8.6”

To initiate the batch a remote START/PAUSE button is pressed connected to IN4 (Remote Switch Input TARE) on the Setpoint/Relay board. This is also used to pause/resume a batch operation  
To cancel or stop a batch a remote STOP button is pressed, connected to IN3 (Remote Switch Input GROSS/NET) on the Setpoint/Relay board. (See figure 3 on page 38)

Setpoint/Relay 1 ONLY is active after START button is pressed until target weight achieved.  
Setpoint/Relay 2 ONLY is active after SP1 until target weight achieved, if enabled.

Setpoint/Relay 3 ONLY is active after SP2 until target weight achieved, if enabled.

Setpoint/Relay 4 ONLY is active after SP3 until target weight achieved, if enabled.

**Example:** with 4 Setpoint/Relays enabled, Target weight of 10 for setpoint 1, 20 setpoint 2, 30 setpoint 3 and 40 for setpoint 4. Press START, Setpoint/Relay 1 active when above Zero until 10, Setpoint/Relay 2 active above 10 until 20, Setpoint/Relay 3 active above 20 until 30 and Setpoint/Relay 4 active above 30 to 40.

## 4-BA:

**SAE-5122** Simple Batching Count Only Setpoint/Relay. Relays are normally open. Number of relays to use configured in configuration step “rLY 8.4”. Preacts enabled or disabled in configuration “PrE 8.5”. Empty container high/low threshold or minimum weight on weighbridge threshold is configured in “ChK 8.6”. To use positive values for gain in weight or negative values for loss in weight batching/filling is configured in “dlr 8.6”

To initiate the batch a remote START/PAUSE button is pressed connected to IN4 (Remote Switch Input TARE) on the Setpoint/Relay board. This is also used to pause/resume a batch operation  
To cancel or stop a batch a remote STOP button is pressed, connected to IN3 (Remote Switch Input GROSS/NET) on the Setpoint/Relay board. (See figure 3 on page 38)

Setpoint/Relay 1 ONLY is active after START button is pressed until target weight achieved.

Setpoint/Relay 2 ONLY is active after SP1 until target weight achieved, if enabled.

Setpoint/Relay 3 ONLY is active after SP2 until target weight achieved, if enabled.

Setpoint/Relay 4 ONLY is active after SP3 until target weight achieved, if enabled.

**Example:** with 4 Setpoint/Relays enabled, Target weight of 10 for setpoint 1, 20 setpoint 2, 30 setpoint 3 and 40 for setpoint 4. Press START, Setpoint/Relay 1 active when above Zero until 10, Setpoint/Relay 2 active above 10 until 20, Setpoint/Relay 3 active above 20 until 30 and Setpoint/Relay 4 active above 30 to 40.

## 64-BA:

**SAE-5122** Advanced Batching Weigh Only Setpoint/Relay with Empty Container Inhibit.

Relays are normally open. Number of relays to use configured in configuration step “rLY 8.4”.

Preacts enabled or disabled in configuration “PrE 8.5”. Empty container high/low threshold or minimum weight on weighbridge threshold is configured in “ChK 8.6”. To use positive values for gain in weight or negative values for loss in weight batching/filling is configured in “dlr 8.6”

To initiate the batch a remote START/PAUSE button is pressed connected to IN4 (Remote Switch Input TARE) on the Setpoint/Relay board. This is also used to pause/resume a batch operation

To cancel or stop a batch a remote STOP button is pressed, connected to IN3 (Remote Switch Input GROSS/NET) on the Setpoint/Relay board. (See figure 3 on page 38)

When entering setpoint target values fields an additional low and high threshold for an empty container may entered **BIN LO** and **BIN HI**. This is to ensure that an empty container of the correct size is on the weighbridge and ready for the fill process to begin. This prevent the process from starting with no container or a full container.

To initiate the batch a remote START/PAUSE button is pressed connected to IN4 (Remote Switch Input TARE) on the Setpoint/Relay board. This is also used to pause/resume a batch operation

To cancel or stop a batch a remote STOP button is pressed, connected to IN3 (Remote Switch Input GROSS/NET) on the Setpoint/Relay board. (See figure 3 on page 38)

If the weight of the container is between the **BIN LO** and **BIN HI** threshold will perform a TARE function and activate Setpoint/Relay 1

Setpoint/Relay 1 ONLY is active after START button is pressed until target weight achieved. There is a 5 second delay then TARE Function

Setpoint/Relay 2 ONLY is active until target weight achieved. There is a 5 sec delay then TARE

Setpoint/Relay 3 ONLY is active until target weight achieved. There is a 5 sec delay then TARE

Setpoint/Relay 4 ONLY is active until target weight achieved. Batch complete

**Example:** with 4 Setpoint/Relays enabled, Target weight of 10 for setpoint 1, 20 setpoint 2, 30 setpoint 3 and 40 for setpoint 4. **BIN LO** and **BIN HI** threshold of 5 and 10 respectively.

- Press START, if empty container weight is within the **BIN LO** and **BIN HI** threshold Setpoint/Relay 1 active until 10, 5 sec delay TARE.
- Setpoint/Relay 2 active above 20, 5 sec delay TARE.
- Setpoint/Relay 3 active until 30, 5 sec delay TARE.
- Setpoint/Relay 4 active to 40, Batch Complete

## **BC4-BA:**

**SAE-5122** Advanced Batching Count Only Setpoint/Relay with Empty Container Inhibit.

Relays are normally open. Number of relays to use configured in configuration step "rLY 8.4".

Preacts enabled or disabled in configuration "PrE 8.5". Empty container high/low threshold or minimum weight on weighbridge threshold is configured in "ChK 8.6". To use positive values for gain in weight or negative values for loss in weight batching/filling is configured in "dlr 8.6"

To initiate the batch a remote START/PAUSE button is pressed connected to IN4 (Remote Switch Input TARE) on the Setpoint/Relay board. This is also used to pause/resume a batch operation

To cancel or stop a batch a remote STOP button is pressed, connected to IN3 (Remote Switch Input GROSS/NET) on the Setpoint/Relay board. (See figure 3 on page XX)

When entering setpoint target values fields an additional low and high threshold for an empty container may entered **BIN LO** and **BIN HI**. This is to ensure that an empty container of the correct size is on the weighbridge and ready for the fill process to begin. This prevent the process from starting with no container or a full container.

To initiate the batch a remote START/PAUSE button is pressed connected to IN4 (Remote Switch Input TARE) on the Setpoint/Relay board. This is also used to pause/resume a batch operation

To cancel or stop a batch a remote STOP button is pressed, connected to IN3 (Remote Switch Input GROSS/NET) on the Setpoint/Relay board. (See figure 3 on page 38)

If the weight of the container is between the **BIN LO** and **BIN HI** threshold will perform a TARE function and activate Setpoint/Relay 1

Setpoint/Relay 1 ONLY is active after START button is pressed until target weight achieved. There is a 5 second delay then TARE Function

Setpoint/Relay 2 ONLY is active until target weight achieved. There is a 5 sec delay then TARE

Setpoint/Relay 3 ONLY is active until target weight achieved. There is a 5 sec delay then TARE

Setpoint/Relay 4 ONLY is active until target weight achieved. Batch complete

**Example:** with 4 Setpoint/Relays enabled, Target weight of 10 for setpoint 1, 20 setpoint 2, 30 setpoint 3 and 40 for setpoint 4. **BIN LO** and **BIN HI** threshold of 5 and 10 respectively.

- Press START, if empty container weight is within the **BIN LO** and **BIN HI** threshold Setpoint/Relay 1 active until 10, 5 sec delay TARE.
- Setpoint/Relay 2 active above 20, 5 sec delay TARE.
- Setpoint/Relay 3 active until 30, 5 sec delay TARE.
- Setpoint/Relay 4 active to 40, Batch Complete

**Loss in Weight Filling or Batching** – This is a Setpoint/Relay operation to fill or batch out of a tank, silo or hopper using negative weights. Example: From a tank that has Load Cells or is on a scale base, operator enters 100 and presses the START button. Indicator performs a TARE function and activates Setpoint/Relay 1 which is on until display shows – 100. Loss in weight filling or batching may be used with 4-BAT, C4-BAT, B4-BAT and BC4-BAT Setpoint/Relay operation and use the following settings for loss in weight filling or batching:

<b>RLY 8.4</b>	1-4	Enable Setpoint/Relays 1-4
<b>PRE 8.5</b>	YES,NO	Enable Preacts if required
<b>CHK 8.6</b>	BIN, LOW	LOW – Weight on weighbridge must be above the LOW setting before the batch will initiate
<b>DIR 8.7</b>	OUT, IN	OUT – Loss in weight batching, Setpoint/Relay values are assumed negative

STEP	Parameter	Description
<b>OUT 8.1</b> <i>(Not available when 4-LVL, C4-LVL, 4-bAt, C4-bat B4-nat or Bc4-bat are selected in SPT 8)</i>	d10 FLASH CHG-nC CHG	d10 – Setpoint/Relay board installed and are used for up to 4 Setpoint/Relays CHG - The battery charger output (TB3 + & -) is used as a single set point output active when at or above the Setpoint/Relay target value FLASH – The battery charger output (TB3 + & -) is used as a single set point output active and flashing on/off when at or above the Setpoint/Relay target value CHG-nC - The battery charger output (TB3 + & -) is used as a single set point output active when at or below the Setpoint/Relay target value
<b>SRC 8.2</b> <i>(Not available when 4-LVL, C4-LVL, 4-bAt, C4-bat B4-nat or Bc4-bat are selected in SPT 8, target weights will always be NET)</i>	Gr nEt	Gr - Selects setpoint target as a gross weight nEt – Selects setpoint as a net weight
<b>POL 8.3</b> <i>(Only available on SAE-5122 if 4-LVL or C4-LVL is selected in SPT 8, relays will be nOr – Normally Open)</i>	nOr nEG	nOr – Normally open relay NeG – Normally closed relay
<b>RLY 8.4</b>	1-4	Enable Setpoint/Relays 1-4

<b>PRE 8.5</b>	YES,NO	Enable Preacts
<b>CHK 8.6</b>	BIN, LOW	BIN - Weight on weighbridge must be between the set Bin Low and Bin High settings before the Batch will initiate LOW – Weight on weighbridge must be above the LOW setting before the batch will initiate
<b>DIR 8.7</b>	OUT, IN	OUT – Loss in weight batching, Setpoint/Relay values are assumed negative IN – Normal batching, Setpoint/Relay Values are positive weights
<b>T 10 9</b>	YES, NO	YES – Enables expanded weighing resolution (X10 of RES 22 setting) for testing and trouble shooting No – Disables expanded weighing resolution

## 7600 Special data input/output emulations

### UPS Worldship Emulation

Data 18 bytes, six data with decimal and leading zero blanking

Command	Description	Response Format
(cr) Carriage Return	Request weight on scale	(sp)(sp)0.00(sp)lb.(sp)GR(sp)(sp)(cr)(lf)(etx)  Example, with 10.55 lbs. on scale: (sp)10.55(sp)lb.(sp)GR(sp)(sp)(cr)(lf)(etx)
(cr) Carriage Return	When in Overload/Underload condition	(cr)(etx)
(cr) Carriage Return	When scale in motion	(sp)(sp)0.00(sp)lb.(sp)gr(sp)(sp)(cr)(lf)(etx) “GR” becomes “gr”
<p>Minus sign: included in data as “-0.10”, in place closest blank position. Default settings: 9600 - 7 - odd - 2</p>		

## FedEx Emulation (FED12 & FED96)

Data 14 bytes, including start (LF), space, six data (five plus decimal), LB/KG (upper case), <CR>, two status characters, and stop (ETX).

Command	Description	Response Format
W(cr) Capital "W"	Request weight on scale	(lf)(sp)000.00(Unit of Measure) (cr)(Status Character)(etx) Example, with 10.55 lbs. on scale: (lf)(sp)10.55LB(cr)00(etx)
ASCII Status Characters		Description
	00	Normal weight - <30><30>
	1X	Motion - <31><30>
	2X	Center of Zero - <32><30>
	3X	Not Center of Zero - <33><30>
	X1	Under load - <30><31>
	X2	Over load - <30><32>
	X3	Motion/Over load - <31><32>
	Data sent during any error	<000.00>
Default settings FED12: 1200 - 8 - N - 1, Default settings FED96: 9600 - 7 - E - 1		

## Purolator Emulation

Data 16 bytes, including start (LF), space, six data (five plus decimal), LB/KG (upper case), <CR>, <LF>two status characters, <CR>, and stop (ETX).

Command	Description	Response Format
W(cr) Capital "W"	Request weight on scale	(lf)(sp)000.00(Unit of Measure)(cr)(lf)(Status Character)(cr)(etx) Example, with 10.55 lbs. on scale: (lf)(sp)10.55LB(cr)(lf)00(etx)
ASCII Status Characters		Description
	00	Normal weight - <30><30>
	1X	Motion - <31><30>
	2X	Center of Zero - <32><30>
	3X	Not Center of Zero - <33><30>
	X1	Under load - <30><31>
	X2	Over load - <30><32>
	X3	Motion/Over load - <31><32>
	Data sent during any error	<000.00>
Default settings 1200 - 8 - N - 1		

## Toledo Emulation:

Toledo Protocol Host Commands Following is a listing of host commands and scale responses. ASCII Start of Text character:(stx)<HEX 02>. ASCII Carriage Return: (cr)<HEX 0D>.

Command	Description	Response Format
W*	Send normal resolution weight data	(stx)XXXX.X(cr) for 300 X 0.1 lbs. capacity (stx)XXX.XX(cr) for 150 X 0.05 kg. capacity (stx)?(statusbyte)(cr) if current weight not valid
H	Send high resolution weight data	(stx)XXXX.XX(cr) for 300 X 0.1 lbs. capacity (stx)XXX.XXX(cr) for 150 X 0.05 kg. capacity (stx)?(statusbyte)(cr) if current weight not valid
Z	Zero the scale unless in motion or out of range under or over capacity	(stx)?(statusbyte)(cr)

Note:\* A status byte message (STX)?(status byte)(CR) is sent in place of the requested weight data field if the scale is in motion, under zero, or over capacity when the weight data request is sent. The question mark “?” indicates that the following data is a non-ASCII status byte after than weight data. See below for status:

Bit No:	Description	Bit No:	Description
6	Always 1	5	Always 1
4	1 = Center of Zero 0 = Not at center of Zero	3	1 = Outside Zero capture range 0 = Within range
2	1 = Under Zero 0 = Within weighing range	1	1 = Over capacity 0 = Within weighing range
0	1 = Scale in motion 0 = Stable weight data		

**NCI Emulation:**

Command	Description	Response Format
W	Sends weight and three-character status information. Note: lb.-oz is transmitted as oz only.	(lf)XXXXXXXX(Unit of Measure)(cr)(lf)(Status Character)(cr)(etx). Example: 10.135 lbs. on scale transmits: (lf)(sp)10.135lb(cr)(lf)0p0(cr)(etx) If count is displayed, it is transmitted as: (lf)xxxxxxxct(cr)(lf)hhh(cr)(etx)
Z	Zero the scale unless in motion or out of range under or over capacity and sends two-character status	(lf)(status character)(cr)(etx) Example if successful scale transmits: (lf)00(cr)(etx)
T	Tares the scale unless in motion or out of range under or over capacity and sends two-character status	(lf)(status character)(cr)(etx) Example if successful scale transmits: (lf)00(cr)(etx)

**CAL 200** Remote Serial Display. Key in 200 and Use  to enter this menu and enter selections. This may also be accessed after **PSL 119**

STEP	Parameter	Description
<b>SET:RSD</b>	Yes, No	Changes to Remote Serial Display Mode. Use <b>UNITS</b> button to select.
<b>RSD200</b>	OFF, En, Ser rt	En = RSD mode, Ser rt = Main unit setting for Tx/Rx with RSD.
<b>EN 201</b>	No, Yes	Enable remote keypad Use <b>UNITS</b> button to select.
<b>ZRO 202</b>	No, Yes	Enable zero button Use <b>UNITS</b> button to select.
<b>TAR 203</b>	Off, Autotr, Key-tr, On	Auto tare, keypad tare, both Use <b>UNITS</b> button to select.
<b>UNY 204</b>	No, Yes	Enable unit button Use <b>UNITS</b> button to select.
<b>PRN 205</b>	No, Yes	Enable print button Use <b>UNITS</b> button to select.
<b>FNC 206</b>	No, Yes	Enable function button Use <b>UNITS</b> button to select.

## Scale Remote Command Formats

Pennsylvania Scale Bench Weighing and Counting Scales or Indicators can be controlled from an external device (such as a computer, terminal or barcode scanning) by various commands, each three letters long sending with a Carriage Return or Enter (cr)

### Examples:

- ZERO the scale: ZRO(cr)
- Send programmed data: SRP(cr)
- Acquire a TARE WEIGHT: ATW(cr)

### Remote Scale Commands <XXX>(cr) XXX = Command

Command	Description	Command	Description
<b>ATW</b>	Acquire Tare Weight	<b>CHK</b>	Initiate self-diagnostics Check
<b>LCK</b>	Lock Out Keypad	<b>RES</b>	Reset, clears tare weight and count information
<b>SCM</b>	Selects Count Mode (7500 & 7600)	<b>SCI</b>	Output Configuration
<b>SSS</b>	Selects Sample Size (7500 & 7600)	<b>SWM</b>	Selects Weigh Mode
<b>UCK</b>	Unlocks Keypad	<b>UNP</b>	Select Primary Weighing Unit
<b>UNS</b>	Select Secondary Weighing Unit	<b>ZRO</b>	Zero the Scale

### Remote Scale Commands to Enter Data into Scale

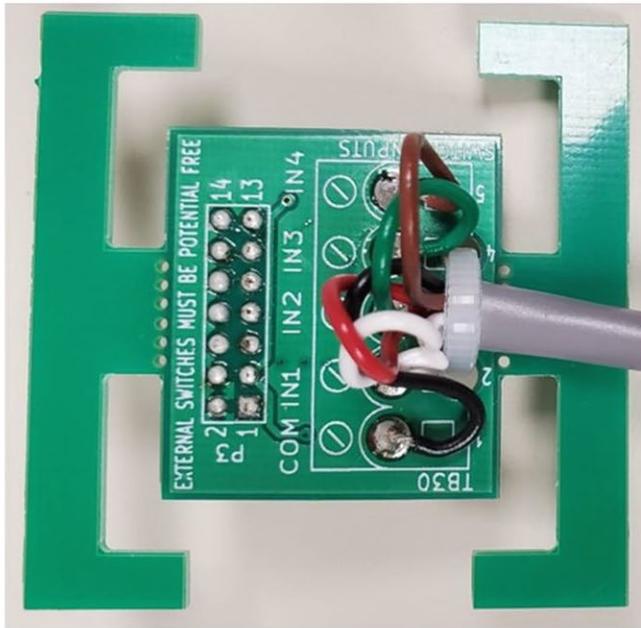
Command	Description	Format
<b>IBA</b>	Input Base Number 1 or 2. With installed remote base option on 7600	<b>IBA(sp)X(cr) X= 1 or 2</b>
<b>IPW</b>	Input Piece Weight and Enter Count Mode. 7600 Only	<b>IPW(sp)XXXXX(cr) XXXXX = Piece Weight Value, Example: .00015</b>
<b>ITW</b>	Input Tare Weight and Enter Net Weight Mode. 7600 Only	<b>ITW(sp)XXXX(cr) XXXX = Tare Weight Value, Example: 10.5</b>
<b>IID</b>	Input Product ID, up to 15 Alphanumeric Characters and Hyphen (-). 7600 Only	<b>IID(sp)XXXXXXXXXX(cr) XXXXXXXXXXXX = Product ID, Example: 123456-ABC</b>
<b>IUS(X)</b>	Input User Defined Data String, 1-9 these correspond to data output codes 40 – 49 up to 22 alphanumeric characters. X = 1-9	<b>IUS1(sp)XXXXXXXXXX(cr) = XXXXXXXXXXXX = User defined Data String, Example: 456-DEF-12</b>

## Remote Scale Commands Which Request Information

Command	Description	Response Format
<b>SBA</b>	Send Base in use with second base option, 7600 ONLY	<b>Base(sp)1(cr)(lf) Base(sp)1(cr)(lf)</b>
<b>SCO</b>	Send Count, 7500 and 7600 only	<b>Count(sp)XXXXXXXX Pieces(cr)(lf)</b>
<b>SDT</b>	Send Date, 7600 Only	<b>XX/XX/XX(cr)(lf)</b>
<b>SGW</b>	Send Gross Weight, 7600 only	<b>Gross(sp)XXXXXXXX(cr)(lf)</b>
<b>SID</b>	Send Product ID, 7600 only	<b>ID(sp)XXXXXXXXXXXXXXXXX(Cr)(lf)</b>
<b>SMI</b>	Send Metrological or Load Cell Calibration Information	
<b>SNW</b>	Send Net Weight	<b>Net(sp)XXXXXXXX(cr)(lf)</b>
<b>SPC</b>	Send Data Output Codes	
<b>SPR</b>	Send Percentage of Error or Accuracy, 7600 only	<b>Error(sp)XXXXXXXX(cr)(lf) Accuracy(sp)XXXXXXXX(cr)(lf)</b>
<b>SPW</b>	Send Piece Weight, 7600 only	<b>Piece Weight(sp)XXXXXXXX(cr)(lf)</b>
<b>SRP</b>	Send Formatted Data Output	
<b>SSZ</b>	Send Sample Size, 7600 only	<b>Sample Size(sp)XXXXXXXX(cr)(lf)</b>
<b>STM</b>	Send Time, 7600 only	<b>XX:XX:XX(cr)(lf)</b>
<b>STW</b>	Send Tare Weight, 7600 only	<b>Tare(sp)XXXXXXXX(cr)(lf)</b>
<b>SVN</b>	Send Firmware Version	<b>V(sp)X.XX.X(cr)(lf)</b>

## Option Boards Connections

### Remote Switch Input Option Part Number 57888

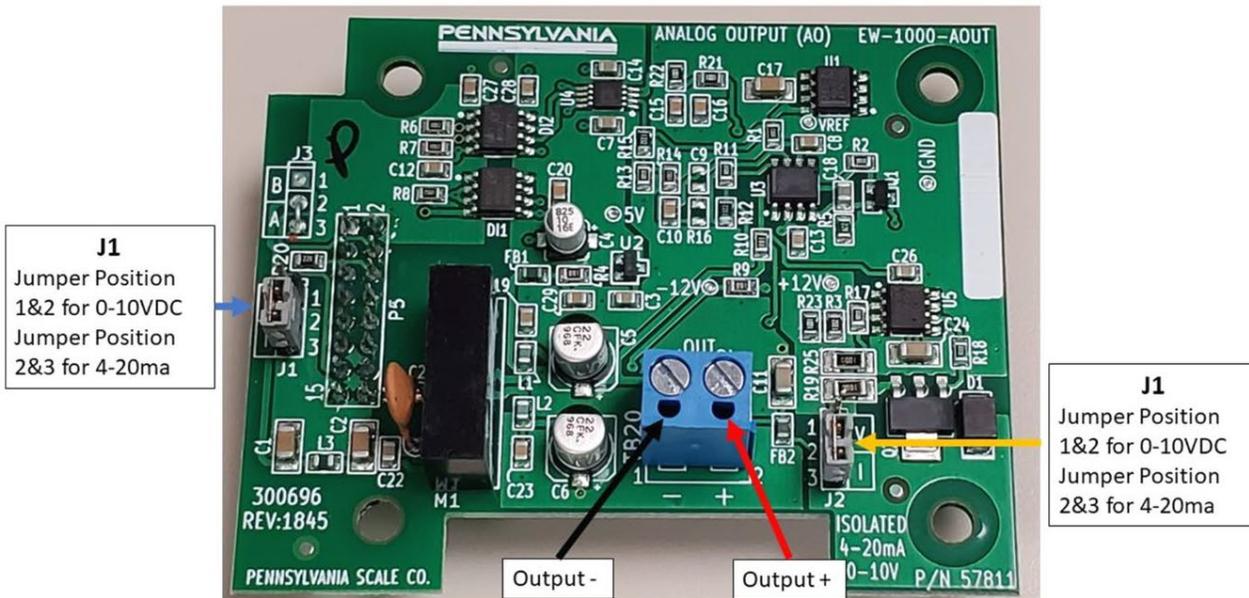


### Wiring Code

Function	Wire Color
Common	Black
Input 1 Gross/Net	White
Input 2 Tare	RED
Input 3 Zero	Green
Input 4 Print	Brown

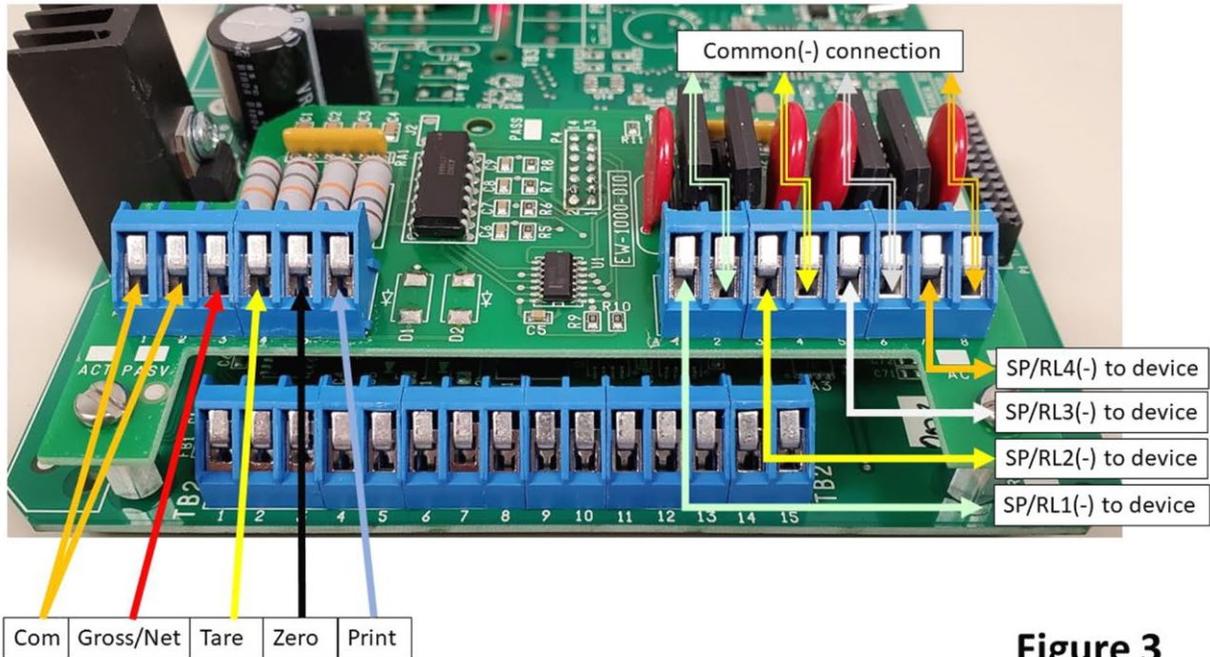
**Figure 1**

### Analog Output Option Part Number 57811



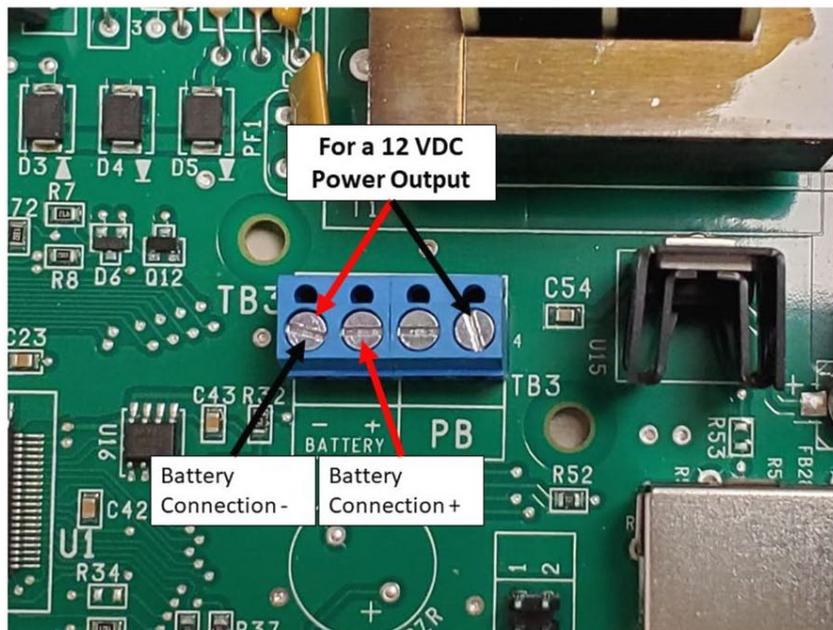
**Figure 2**

## Setpoint Relay Option Part Number 57881(AC) or 57880 (DC)



**Figure 3**

## AC/DC Option Main Board



**Figure 4**

## High Resolution Load Cell Option Calibration Instructions.

Go to CAL 40 and in step **ADJ CAP** select “**11 PNT**”

Scale will Display: **0.000**

Press the **ZERO** button and “CLr.Pts”, press the **UNIT** button to select YES to clear stored calibration data.

Scale will display **0.000**. Use the chart below to perform a 10 point span calibration. Key

in the weight on the scale and press the **ENT** button at each interval. Example with a 7600-

50HR. Cal Point 1, 5 lbs on scale platform, key in “5” and **ENT**. Cal Point 2, 10 lbs on scale

platform, key in 10 and **ENT**. Repeat until all 10 calibration points have been entered.

Capacity lbs.	Calibration Increments	Calibrate at:
10	1 lbs.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (lbs.)
20	2 lbs.	2, 4, 6, 8, 10, 12, 14, 16, 18, 20 (lbs.)
50	5 lbs.	5, 10, 15, 20, 25, 30, 35, 40, 45, 50 (lbs.)
100	10 lbs.	10, 20, 30, 40, 50, 60, 70, 80, 90, 100 (lbs.)

**NOTE:** If the scale does not register the calibration weight correctly re-enter the weight value until there is no error displayed then move to the next calibration point.

After all calibration points have been entered, press the **ENT** button without entering a value

and the scale will advance to CAL 50. Key in “0” and press the **ENT** button. Use the **UNIT**

button to select YES, press the **ENT** twice to exit calibration.

**Note:** High Resolution weighing and counting can be adversely affected by the application environment. Air currents, vibrations, non-repeatable piece weights and the condition of the scale may affect the performance of the system.

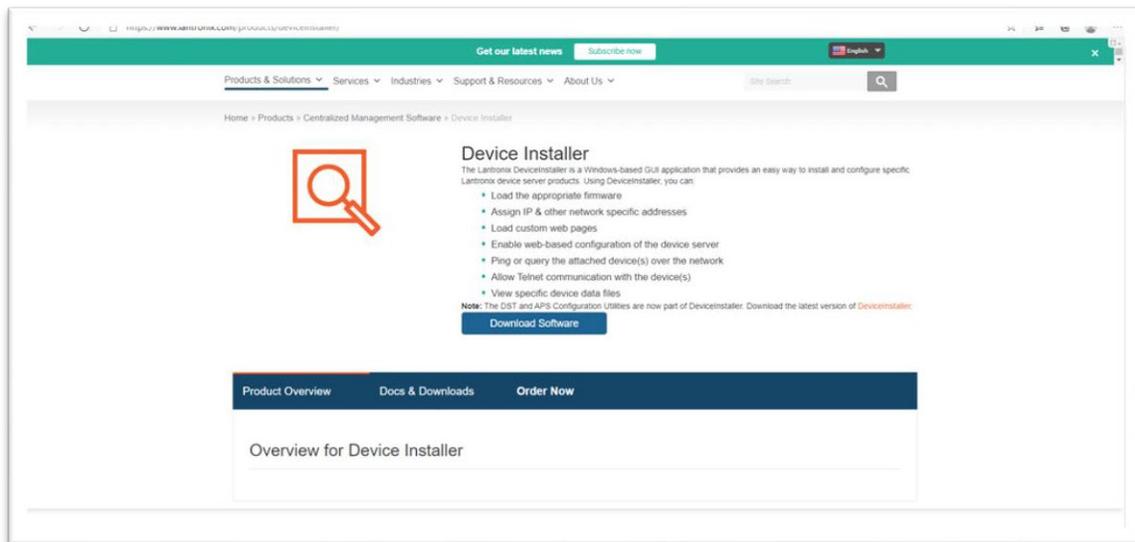
## Wired Ethernet Option

### Configuring the Pennsylvania Scale Wired Ethernet Option

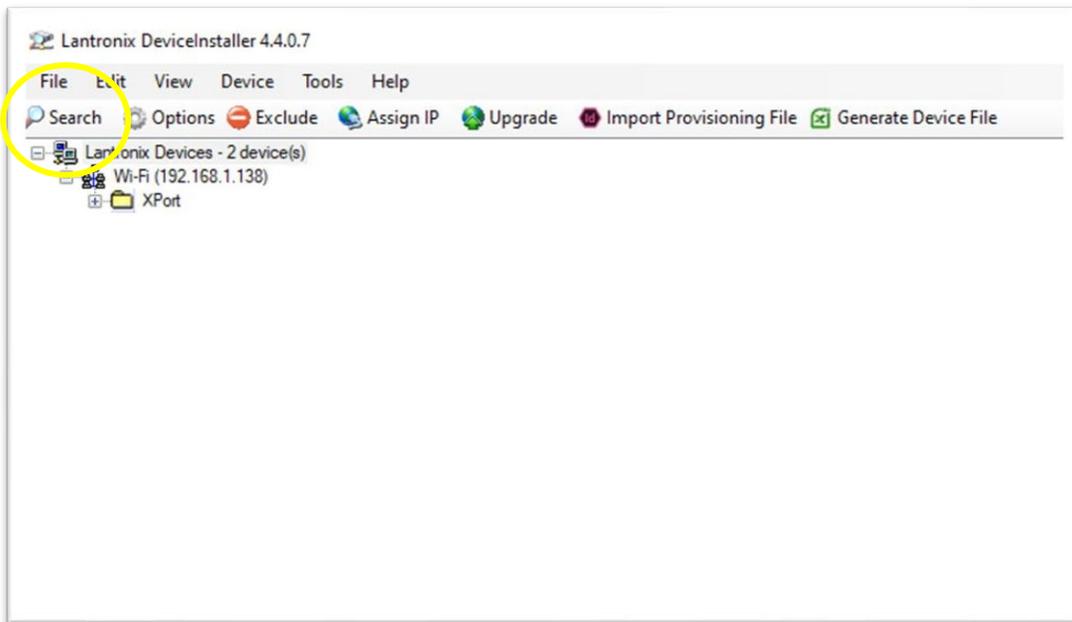
**Note:** Please consult with IT or Network administrator to determine the network protocols required for connection on the local area network and/or interface to software programs.

***The Default Port number for the Pennsylvania Scale Wired Ethernet Option is 10001***

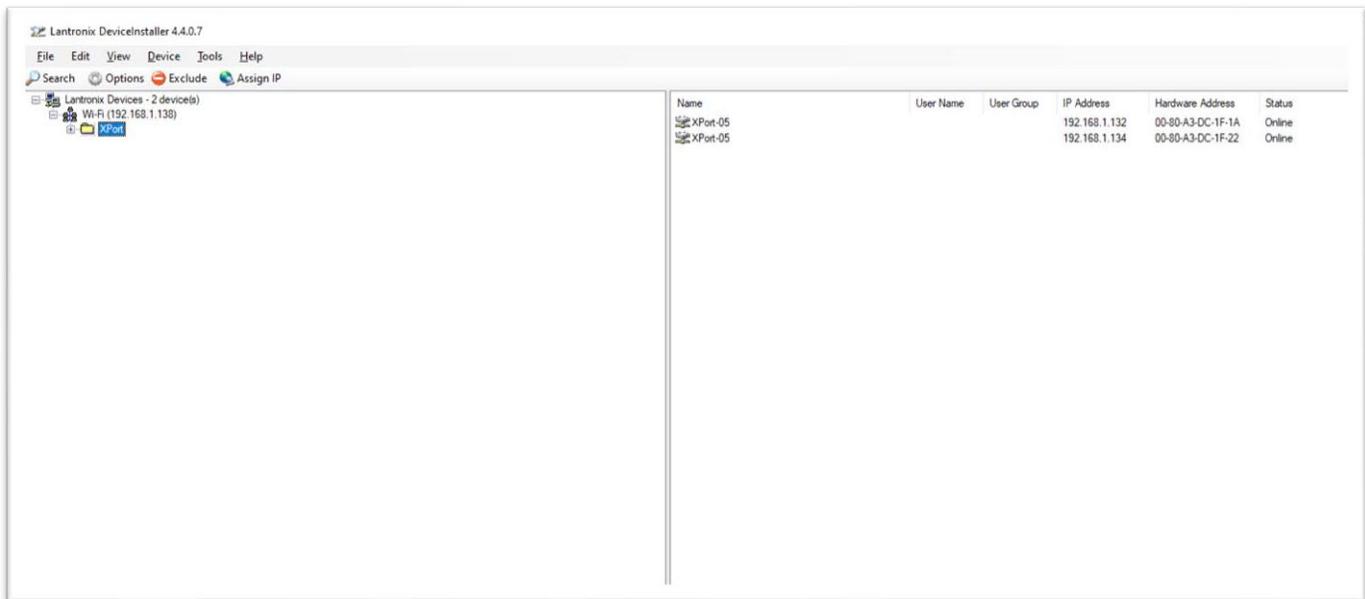
Go to <https://www.lantronix.com/products/deviceinstaller/> and download the device installer application.



Install and run the Device Installer program and connect the scale and PC to the network. Click on the SEARCH function to discover Pennsylvania Scale Ethernet options that are on the network.

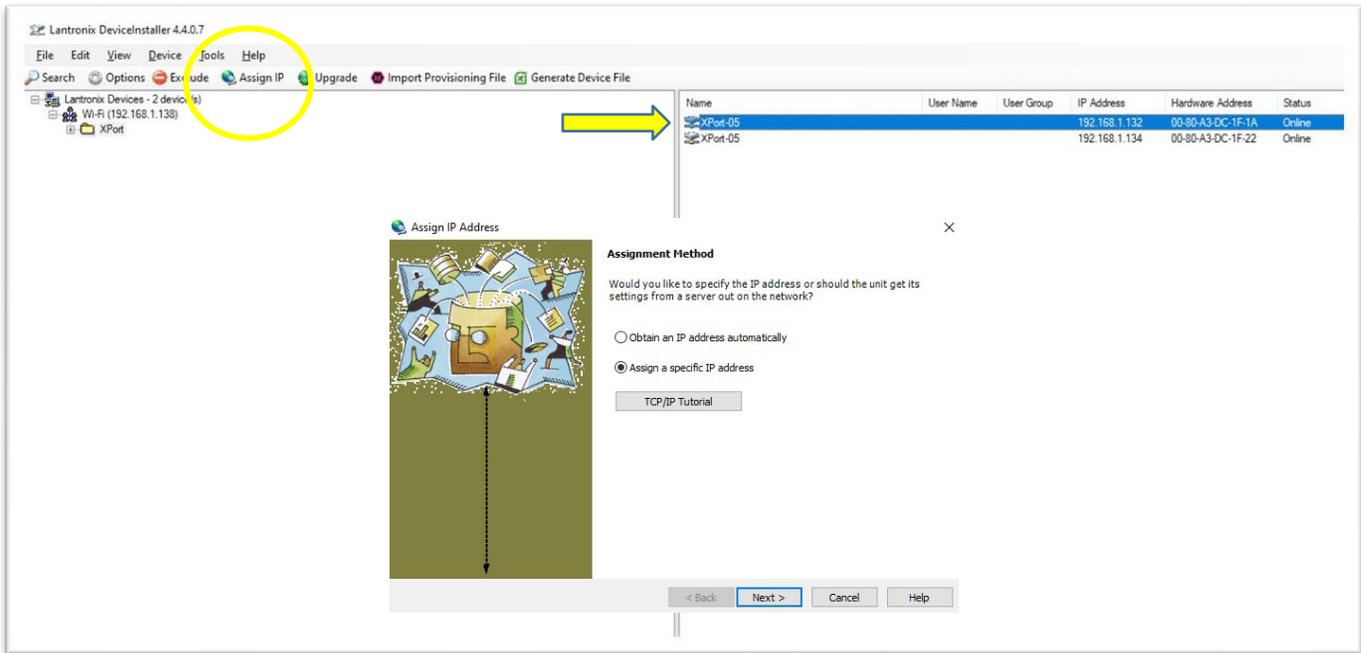


Any Pennsylvania Scale Ethernet Options that are reachable on the network will be shown on the Device Installer program.

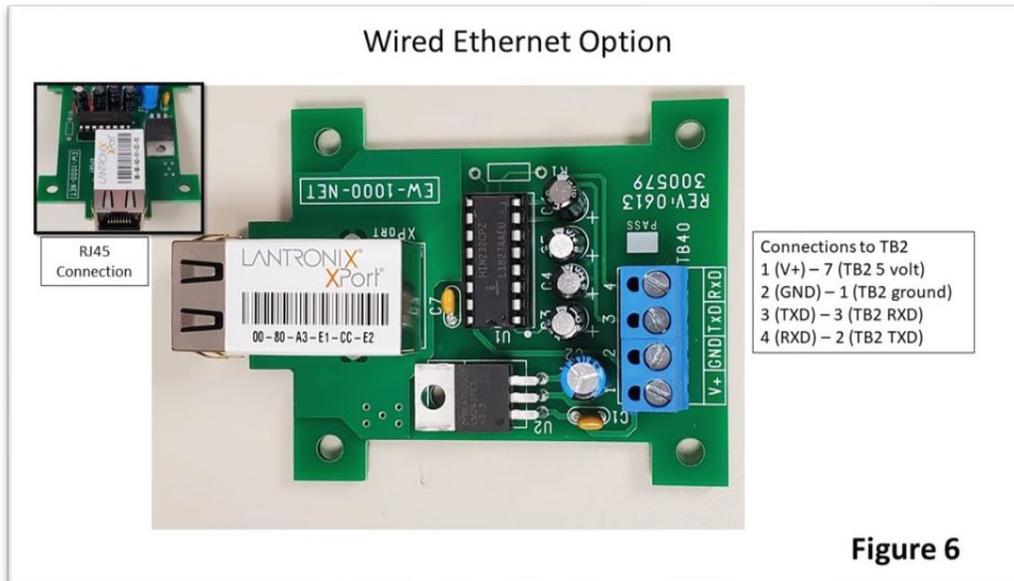


*Note the factory default network protocol is DHCP, IP Address, Subnet and Default Gateway are assigned by the server. The Default port is 10001*

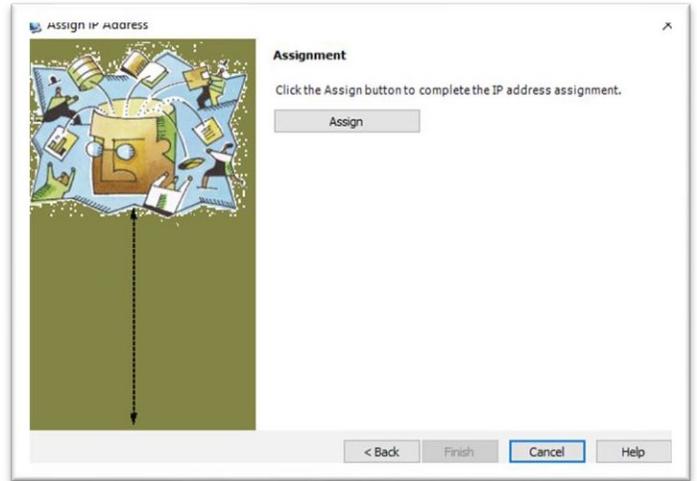
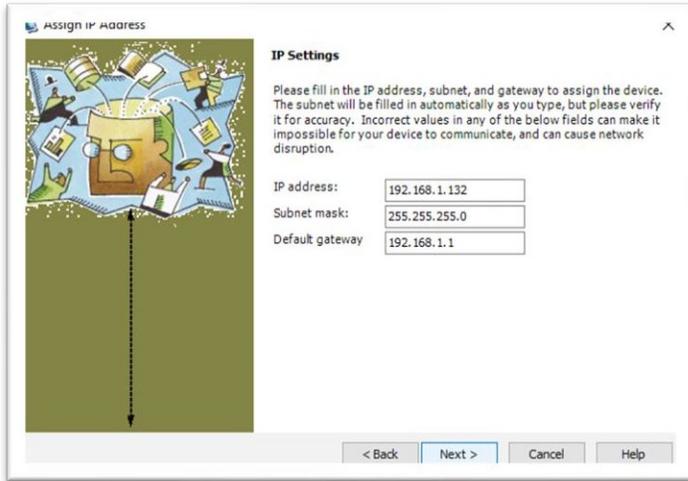
To change from DHCP to a Static IP, Subnet and Default gateway click on the connection to configure, then click on ASSIGN IP. Select ASSIGN A SPECIFIC IP ADDRESS and NEXT



## Wired Ethernet Board

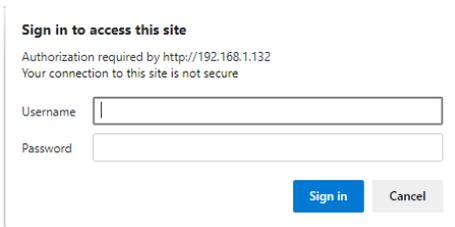


Enter the static IP Address, Subnet Mask and Default Gateway, then click NEXT, then ASSIGN.

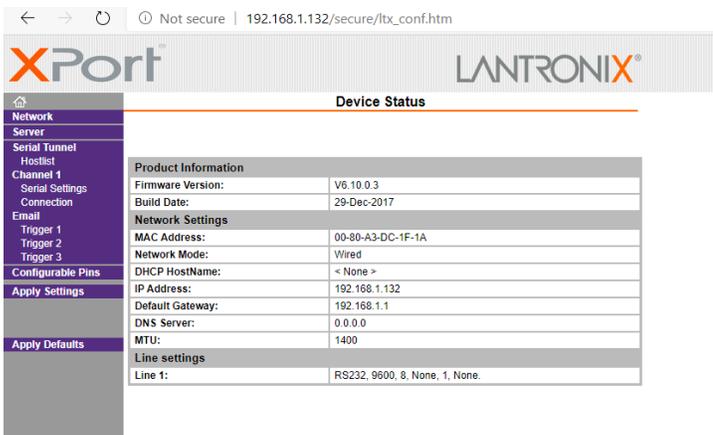


The Pennsylvania Scale Ethernet Option will be configured with these IP Settings and reboot.

If the IP address is known you can also login into the device and configure through a web browser. Key in the IP into the web browser address bar. The Lantronix log in window appears, factory default is no user name and password, leave blank and click on SIGN IN



The Lantronix Xport program will open and more advanced settings can be accessed for configuring the Pennsylvania Scale ethernet option.



## Wireless Ethernet Option - Wi-Fi

### Configuring the Pennsylvania Scale Wireless Ethernet Option

**Note:** Please consult with IT or Network administrator to determine the network protocols required for connection on the local area network and/or interface to software programs.

***The Default Port number for the Pennsylvania Scale Wi-Fi Ethernet Option is 2000***

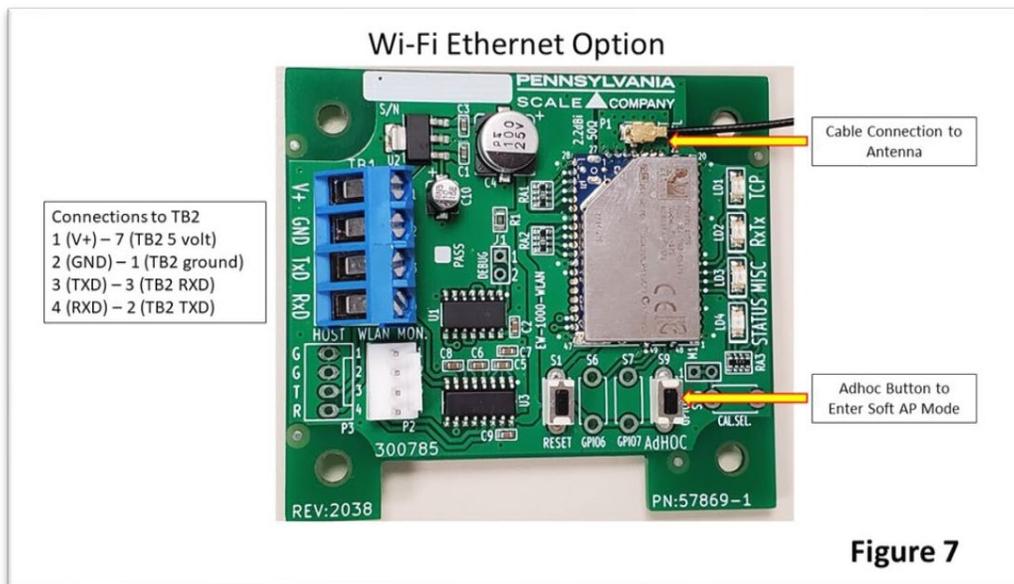
Scale/Indicator communications that must be configured for Wi-Fi operation:

#### In CFG 60

- **BAU 61** (Baud Rate) 9600
- **LEN 62** (Data bits) 8
- **SPb 63** (Stop Bits) 1
- **PAR 64** (Parity) None
- **ECH 65** (Echo) No
- **CdR 66** (Com address) 0

#### Initial configuration and soft AP usage

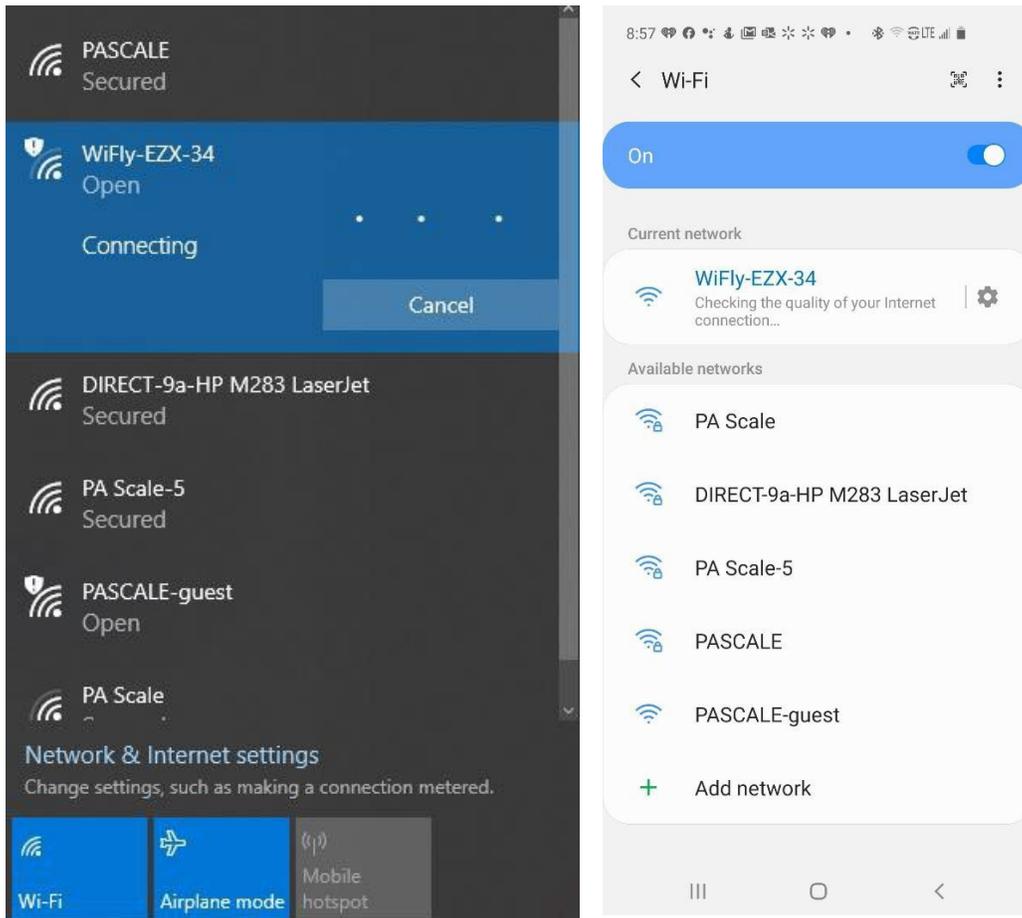
The quickest way to configure the module dynamically or in the field is to use its built-in webserver (soft AP mode). After powering on the module press and hold for 1 second the J1/adhoc button on the wireless board.



**Figure 7**

This will start the web app program on the module itself and create a standalone wireless network. This network can then be joined by any computer or device (Tablets, Cell Phones Etc.) that have a wireless connection by the standard methods of joining any normal wireless network.

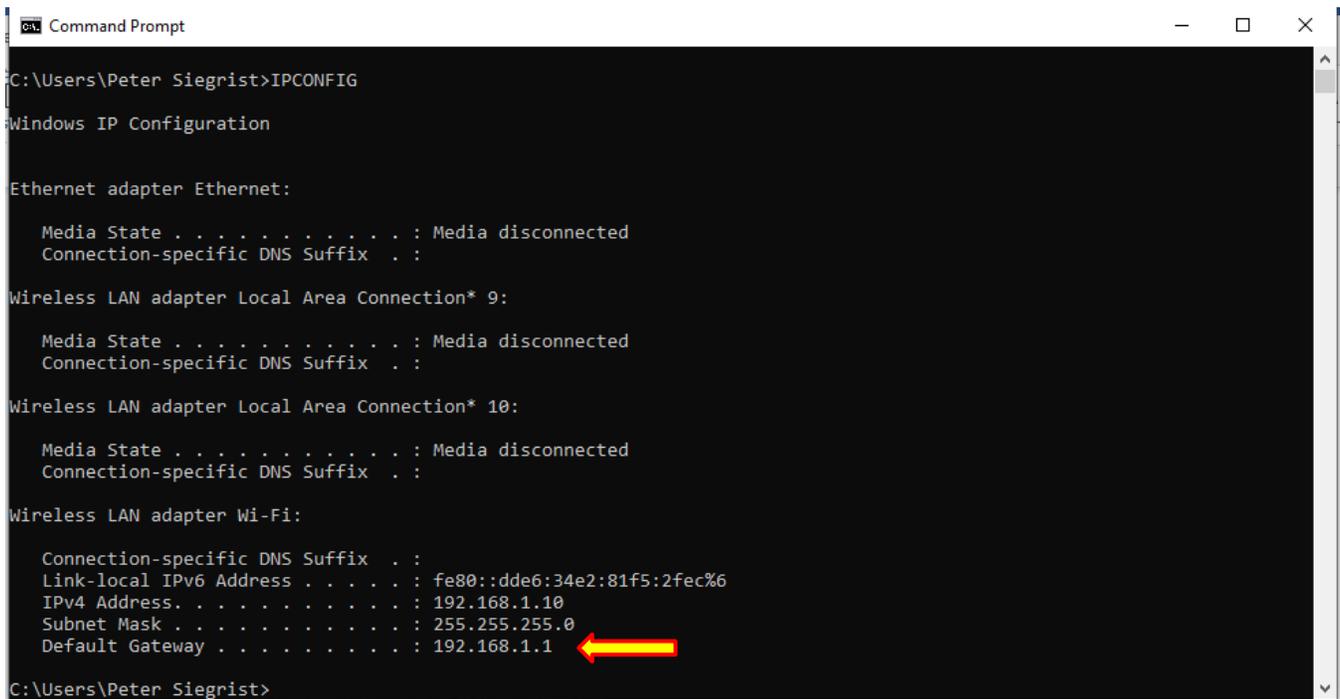
For a PC running Windows, Open the wireless network selection in the system tray (lower right of the screen) and selecting WiFly-EZX-(XX) where the last two characters are the mac address of the module. With Android devices swipe down and press and hold the Wireless icon to view available networks.



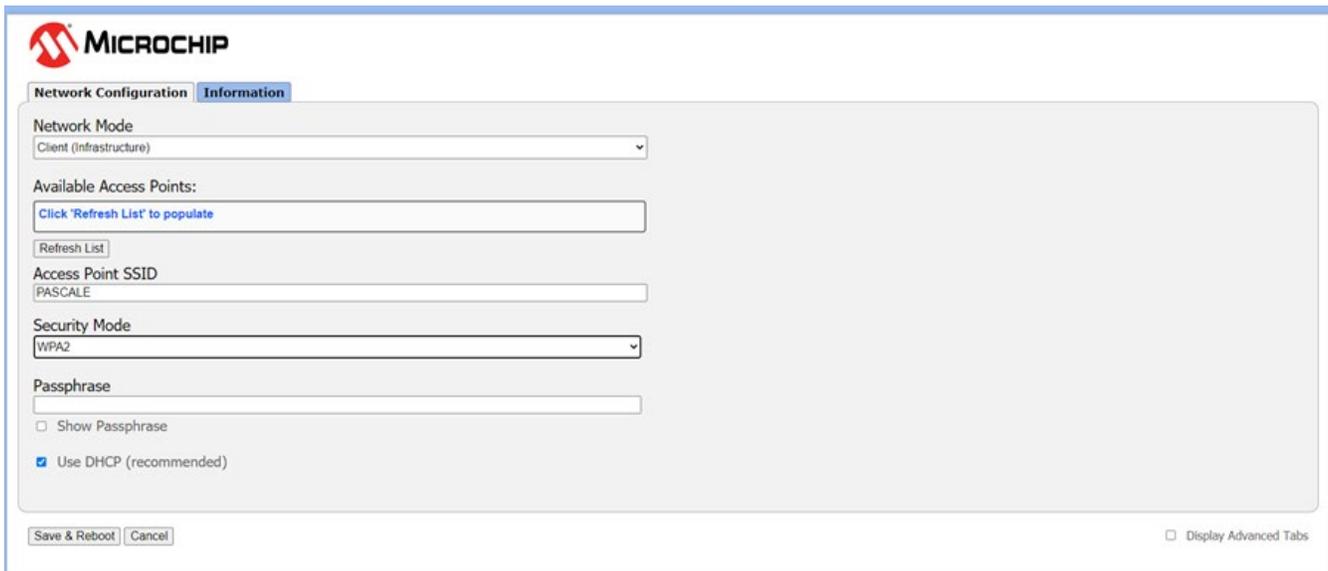
When the connection has been made the configuration webpage of the module can be opened by any web browser using the following methods.

- It is possible to directly type in `http://config` to navigate to the configuration app, however this is not always reliable depending on network and browser configurations.
- The more reliable way is to access the configuration webpage requires the following steps:
  - Check what the actual IP address of the gateway (AP) is for the device being used to connect with the scale Wi-Fi.

- In windows open a command prompt and type ipconfig to record the gateway IP address. Currently the default is 192.168.1.1.



- Then type into the web browser address the gateway IP followed by80, as an example: 192.168.1.1:80. This will open the configuration webpage:



- In the “NETWORK CONFIGURATION” tab you can configure Access Point SSID, Security Mode

**MICROCHIP**

Network Configuration Information

Network Mode  
Client (Infrastructure)

Available Access Points:  
Click "Refresh List" to populate  
Refresh List

Access Point SSID  
PASCAL

Security Mode  
WPA2  
Open  
WPA1  
WPA Mixed  
WPA2  
 Use DHCP (recommended)

The authentication method of the network.  
Checking from the "Available Access Points" list automatically populates this field.

Save & Reboot Cancel  Display Advanced Tabs

- DHCP or Static IP Address

**MICROCHIP**

Network Configuration Information

Network Mode  
Client (Infrastructure)

Available Access Points:  
Click "Refresh List" to populate  
Refresh List

Access Point SSID  
PASCAL

Security Mode  
WPA2

Passphrase  
 Show Passphrase  
 Use DHCP (recommended)

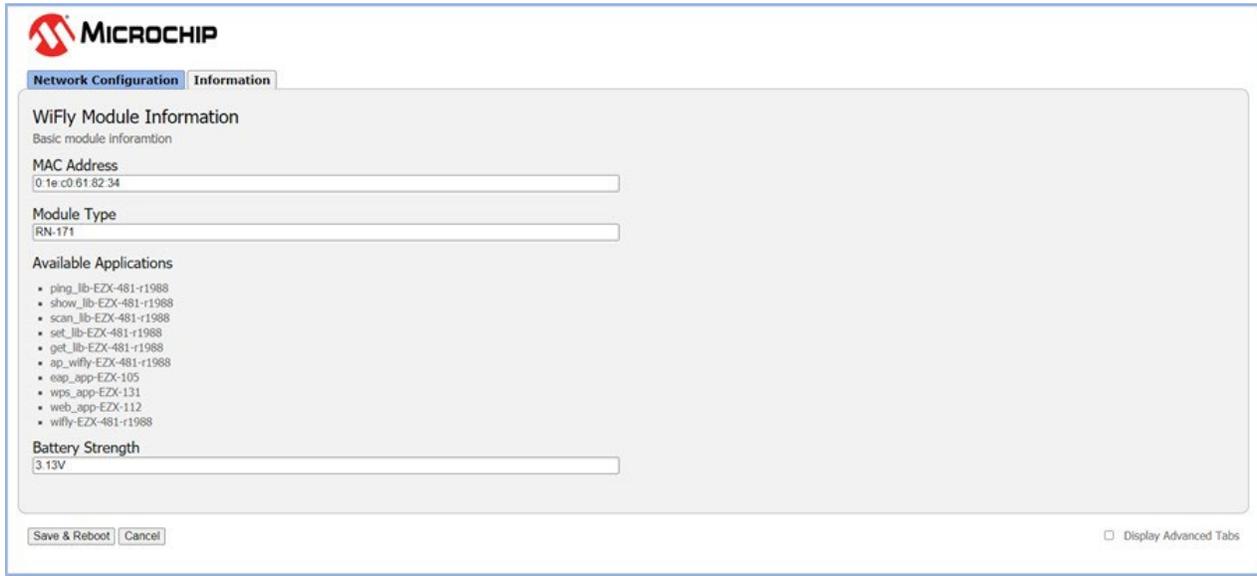
Static IP Address  
192.168.1.115

Network Mask  
255.255.255.0

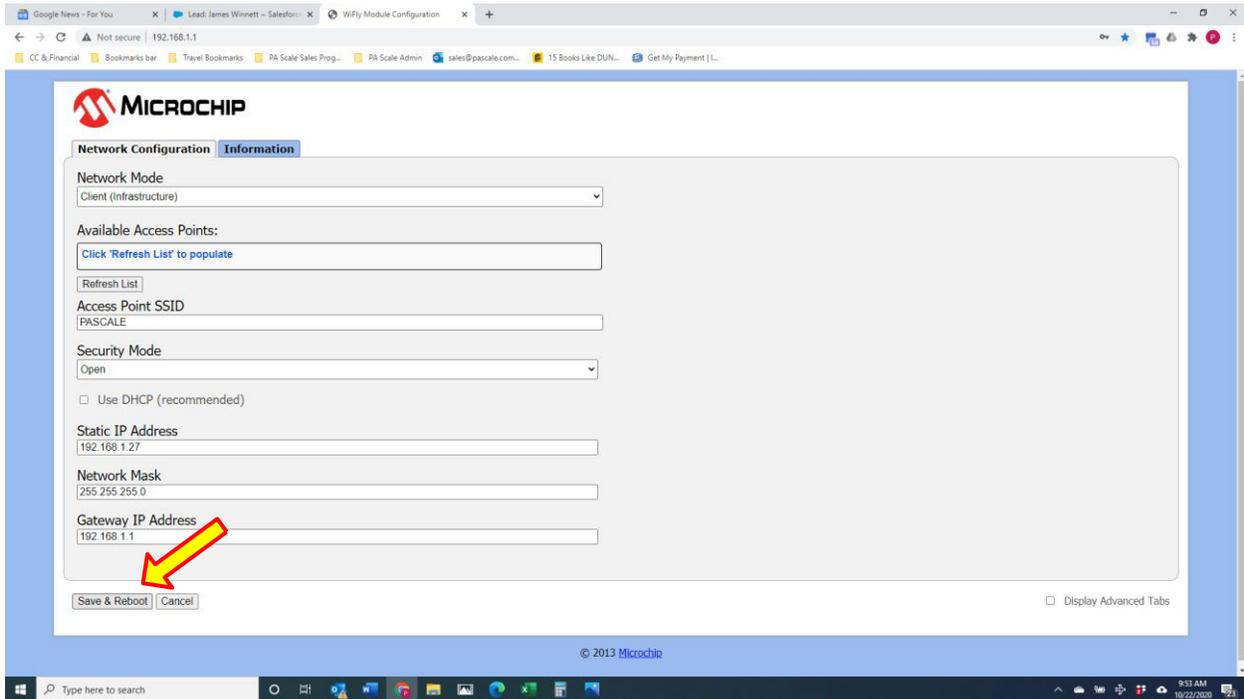
Gateway IP Address  
192.168.1.1

Save & Reboot Cancel  Display Advanced Tabs

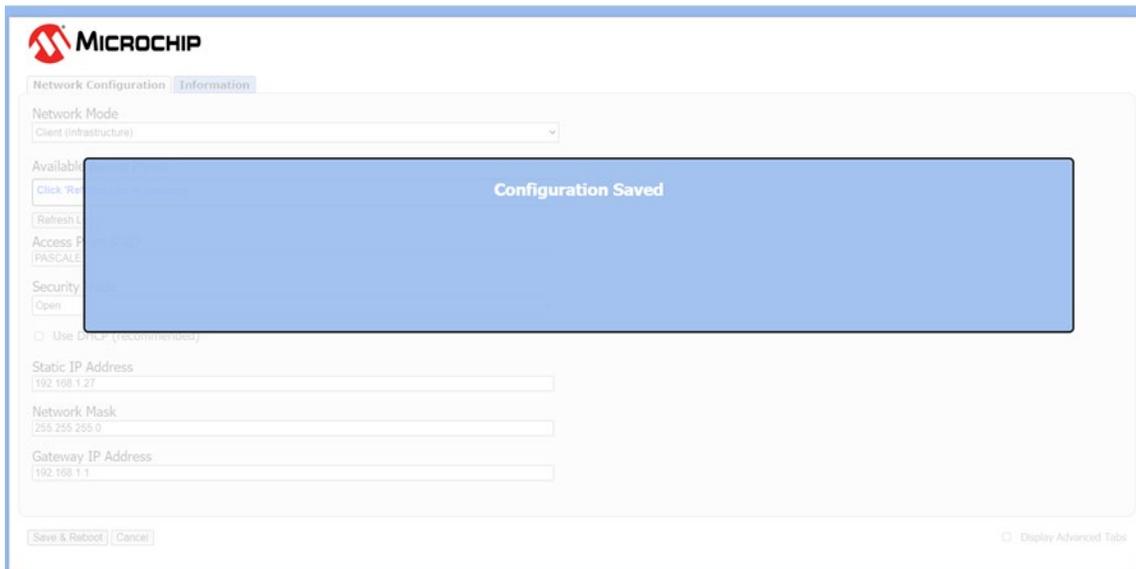
- Selecting the INFORMATION tab will show the unit's MAC address, Module Type and Battery Strength



- When configuration and setup is complete click on the SAVE & REBOOT button



- Then Wi-Fi option will save the changes, reboot, and attempt to connect to the Network SSID programmed.



## Led Status codes

### Wi-Fi Ethernet Option



Normal Mode
LD1/TCP Blinking When Searching for Network Solid When Connected
LD2/RxTx On When Transmitting or Receiving Data
LD3/RxTx On When Transmitting or Receiving Data

Soft AP Mode
AP mode has launched - LD1, LD3 blink alternatively
Client has joined the modules AP/network - LD3 solid, LD2 blinks
Web browser launched - LD1, LD4 solid, LD2 blinks

**Figure 8**

## Scale Displayed Status and Error Messages

Error Message	Description
D/A	D/A card detected - Displayed under the check function.
IIC.ERR	IIC short - Power-up hardware failure indication.
ON	Displayed on power-up when the DC power push-button is pressed.
AUTO	EEPROM is reset - Power-up message
ERR6.X	A Key-pad button is stuck.
-232-	Serial calibration/setup is active
UPDATE	Enhancement calculation in progress
LO.BATT	Low battery
d BATT	Dead battery
ULULUL	Under-load (-400 graduations under dead-zero)
OLLOLO	Over-load (+9 graduations or 105% from dead-zero reference)
-----	A/D acquisition is in progress.
7x00	Instrument mode selection.
ERR 10	Number > 999999
ERR 13	Number < -99999
A/D.C.ERR	A/D hardware failure (channel one only)
CHECK	Check mode accessed.
RC.XXXX	Lower four-digits of the ROM checksum
ERR.80	Serial command data error
ERR.81	Unknown serial command.
-CAL-	Remote Calibration
ERR.OFF	Hardware failure of the D.C. power on/off circuitry
RTC.RST	The clock is reset to 01:01:04 12:00:00am
RST ID	The ID EEPROM has been reset since it was detected as corrupt.
AC OK	Access code entered has been accepted.
E- 1234	EEPROM set 1,2,3, and/or 4 have been fixed.
ERR 40	Positive or negative signal overload (check sense connections).
ERR 31	Incorrect tare entry
ERR 30	Push to Zero out of range
PC ERR	Piece Weight Entry is out of range
NO SER	No Remote Serial Display detected. (Refer to CAL200 options on page



## Replacement Parts List

Part No:	Description	Notes
57817	Universal replacement Main Board for 7X00 AC applications. Includes time/ date and nylon standoffs (for pre-PLUS+ series applications)	Retrofits old-style board (with certain exceptions, contact factory)
57812	AC/DC versions only 7X00 applications using integrated 12 VDC battery pack	Plus+ Series only.
57512-3	Display Board 7500+ and 7600+ Scale and Indicators – all models	RED high intensity LED display. Specify if LED block labels are to be included
57514	7600+ and 7600EXP Keypad Overlay – Scales and Indicators including 7600EXP	All models – Full keypad/expanded features. Fits all models.
47451-1	Compression fitting for power cord #3214 Heyco w/nut	Back panel – indicators
48673-1	Compression fitting #3210 Heyco w/nut	Back panel – indicators
44766	2-Pin Power connector, nylon	Included n/c with 57434 10' HD AC line cord
10402-20	Leveling Foot, 7X00 series	All Bench Scales includes jam nut, thread: ¼-20 UNF x 1" high
48230	Fisheye Level	Replacement, all series
10657	Carton + Foam Inserts, 7500, 7600, 7300 and 7000 12" x 14"	Complete shipping carton kit
48105-11	8 x 8" Platform, 7X00	2 + 5 lbs. applications, Aluminum alloy
49892-1	8" Sub Platform	2 + 5 lbs. applications, Aluminum alloy
57583	Platform, SS, 7X00, 12 x 14"	10 – 200 lbs. applications, SS
57563	12 x 14" Sub Platform, 7X00	All 12 x 14" bench scales, Cast aluminum
57827	1/2A Slow Blow	Standard 7X00 applications
57434	10' AC Heavy Duty Line Cord	All 7X00 – requires (1) 44766* n/c
57403-5A	2 and 5 lbs. capacity models replacement cell	2.5 kg
57403-10A	10 lbs. capacity replacement	10 kg
57403-20A	20 lbs. capacity models replacement cell	15 kg
57403-50A	50 lbs. capacity	30 kg
57403-100A	100 lbs. capacity	50 kg
57403-150A 57403-200A	150 and 200 lbs. capacity models replacement cell	100 kg
49667	Load Cell Spacer	Fits all models