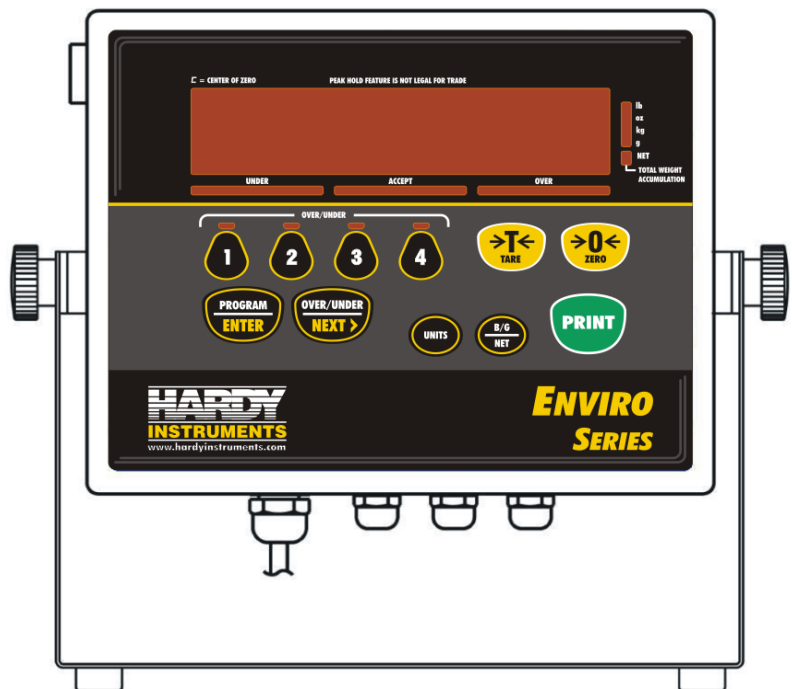


Enviro™ Series

Checkweighing Instrument



Enviro™ Series Instrument

Document Part Number 0596-0315-01 Revision B

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Created	12/09	Created Document
Revision B	12/09	Released Manual

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Section 1 General Information

1.1. INTRODUCTION

The Enviro™ Series instrument is designed for light capacity, general purpose use. It is also designed for use in wash-down Environments.

Features

- The Indicator has a capacity setting of up to six digits, using a six-digit amber LED display.
- Annunciators include, Net Weight, Units, Under, Accept, Over, and Accumulation.
- Checkweigh mode can store up to four Checkweigh recipes.

1.2. SPECIFICATIONS

FEATURE	DESCRIPTION
Display	<ul style="list-style-type: none">• 1.25" Segmented LED.— 12 amber segments for under-weighments.— 12 green segments for correct weighments.— 12 red segments for over-weighments.
Display Update Rate	<ul style="list-style-type: none">• 0.1 – 1.0 second, selectable
Capacity	<ul style="list-style-type: none">• Up to 999990 programmable
Resolution	<ul style="list-style-type: none">• 10,000 divisions, commercial.• 100,000 divisions, non-commercial.• 8,000,000 divisions, internal.
Division Sizes	<ul style="list-style-type: none">• 0.0001 – 50, selectable.
Load Cell(s)	<ul style="list-style-type: none">• Up to four (4) 350 ohm cells.
Electrical	<ul style="list-style-type: none">• 120 VAC or 240 VAC, selectable.
Dimensions	<ul style="list-style-type: none">• 9.8" x 7.6" x 3.3"
Environment	<ul style="list-style-type: none">• IP69K heavy washdown
Operating Temperature Range	<ul style="list-style-type: none">• -10° C to +40° C• 14° F – 104° F
Communications	<ul style="list-style-type: none">• RS232 or RS485 bidirectional serial communications port
Units	<ul style="list-style-type: none">• lbs, oz, kg, g and lbs/oz, or custom
Instrument Approvals	<ul style="list-style-type: none">• CC: 09-024• MC: Pending• ETL: ETL Listing Pending—

Section 2 Service Policy Information

2.1. GENERAL SERVICE POLICY

Customers are responsible to protect the equipment from accidental or malicious damage.

- Do not install or operate the equipment where the application requirements exceed the design specifications of the equipment.
- Do not make physical, electrical or program modifications to this equipment.

Failure to comply with this policy voids all implied and/or written warranties.

The installing technician should verify the equipment's capabilities and limitations as part of the installation process.

- All electrical assemblies must be returned intact for replacement credit using the standard procedures.
 - At the time of installation, all electronic and mechanical adjustments are considered to be part of the installation, and are included in the installation charge(s).
 - The AC receptacle/outlet shall be located near the Indicator and easily accessible.
 - Make no electrical connections that are not specified in the installation guidelines.
 - The equipment consists of printed circuit assemblies which must be handled using ESD handling procedures, and must be replaced as units.
- Replacement of individual components is not allowed.
- The assemblies must be properly packaged in ESD protective material and returned intact for replacement credit per normal procedures.

Hardy Instruments appreciates your business. Should you not understand any information in this manual or experience any problem with the product, contact our Customer Service Department at:

Phone: (858) 278-2900

FAX: (858) 278-6700

Web Site: www.hardyinst.com

Support e-mail address: support@hardyinst.com

Section 3 Installation

3.1. PRIOR TO INSTALLATION

1. Unpack and Check contents
2. Find best location

3.1.2 Unpacking

Follow these guidelines when unpacking all equipment:

- Check in all components and accessories according to your order.
- Keep the shipping container and packing material for future use.
- Remove all components from their packing material, checking against the invoice that they are accounted for and not damaged. If damage has occurred:
 - Advise the shipper immediately, if damage has occurred.
 - Order any parts necessary to replace those which have been damaged.

✓ Check the packing list.

- Collect all necessary installation manuals for the equipment and accessories.
- Open the equipment and perform an inspection, making certain that all hardware, electrical connections and printed circuit assemblies are secure.
- Do not reinstall the cover if the final installation is to be performed after the pre-installation Checkout.

3.1.3 Finding the Best Location

Position the equipment with these points in mind:

- Intense direct sunlight can harm the display.
- Do not locate near magnetic material or equipment/Indicators which use magnets in their design.
- Avoid areas which have extreme variations in room temperatures. Temperatures outside the Indicator's specifications will affect the weighing accuracy of this product.
- Do not open the Indicator if there is evidence of damage to it or any other scale component or supporting structure.
- When selecting the right location for the Indicator and the scale, keep the components completely away from all high water, such as low-lying areas that may flood, and away from any drain pipes.

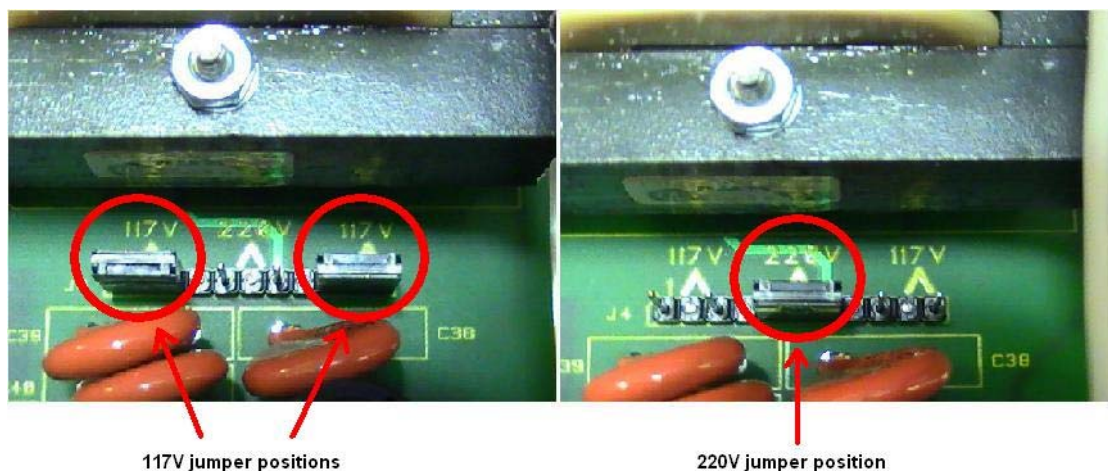
★ ★ IMPORTANT INSTALLATION NOTICE ★ ★

- All load cells, load cell cables, and interconnecting cables used to connect all scale components shall be located a **minimum of thirty-six (36") inches distance away** from all single and multiple phase high energy circuits and electric current carrying conductors.
 - This includes digital weight indicators, junction boxes, sectional controllers, and power supplies.
 - This includes any peripheral devices, such as printers, remote displays, relay boxes, remote terminals, card readers, and auxiliary data entry devices.
 - Also included is the scale components themselves, such as 120 volt AC, 240 volt AC, 480 volt AC and electric supply of higher voltage wiring runs and stations, AC power transformers, overhead or buried cables, electric distribution panels, electric motors, florescent and high intensity lighting which utilize ballast assemblies, electric heating equipment, traffic light wiring and power, and relay boxes.
 - All scale components, including digital weight indicators and peripheral devices are not designed to operate on internal combustion engine driven electric generators and other similar equipment.
- ✓ Electric arc welding can severely damage scale components such as digital weight indicators, junction boxes, sectional controllers, power supplies, and load cells. For additional information, please contact the Hardy Instruments Technical Services Department.

3.2. MOUNTING AND WIRING THE INDICATOR**3.2.1 Basic Installation Steps**

The Enviro™ Series Indicators arrive fully assembled. The factory default setting for the Enviro™ Series is 110 to 120 VAC. For 220 to 240 VAC operations, change the setting as shown below before powering up the unit.

- Ensure the AC power cord is disconnected from any power sources.
- Remove the cover and place the unit face down on a bench.
- On the main PC board, locate the jumpers at J4



1. Remove the jumpers from the 117V positions and replace one of them on the 220V position as shown.

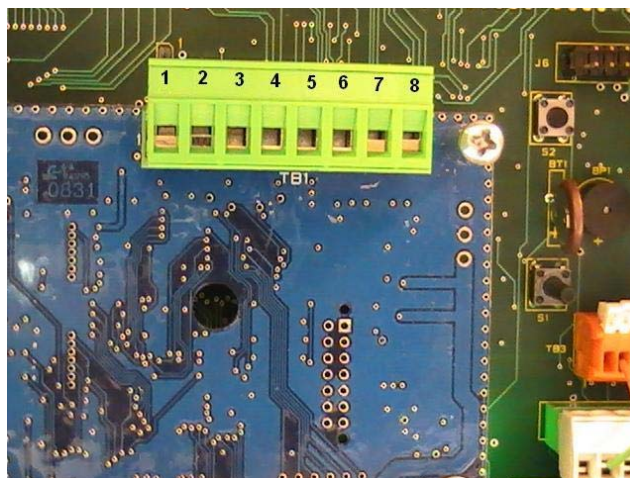
2. Remove the 120 VAC plug from the end of the power cord and attach a proper 220-240 VAC plug. Connect the green wire and the shield to the ground lug. Note: The original wiring connects brown to AC hot and blue to neutral.
3. Reattach all cables and replace the front cover assembly.

Caution: Improper connections at J4 can cause catastrophic damage to the Indicator

3.2.2 Connecting to the Load Cells

Connect the bench scale interface cable wires to the terminal strip TB1 on the **small block pcb** as follows:

TB1 Pin no.	FUNCTION
1	(-) Excitation
2	(+) Excitation
3	(+) Sense
4	(-) Sense
6	Shield
7	(+) Signal
8	(-) Signal



Pin numbers added for clarity

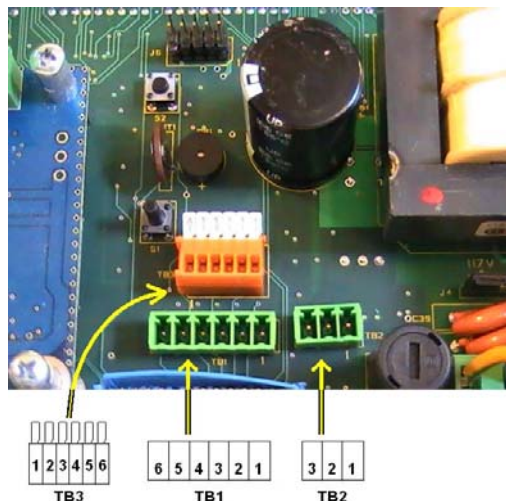
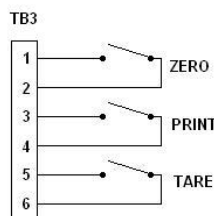
Notes: No internal sense jumpers are provided. Jumpers must be installed from +Excitation to +Sense and from -Excitation to -Sense if no sense leads are used.

Refer to the appropriate Enviro™ Series Bench Scale Service Manual for the proper interface wiring color code.

Reassemble housing and proceed with installation.

3.2.3 Remote switches

The Enviro™ Series has three available remote switch inputs. A dry contact normally open switch can be mounted and operated remotely using the connections on TB3.



3.2.4 Powering Up the Indicator

The Indicator performs a warm-up cycle.

- The Indicator initiates a test, displaying numbers **1** to **8**, and lights up all LED's.
- The **Program number** and **Revision Information** displays.
- The Indicator then displays the current weight on the scale

Section 4 Programming Configuration

4.1. OVERALL STEPS

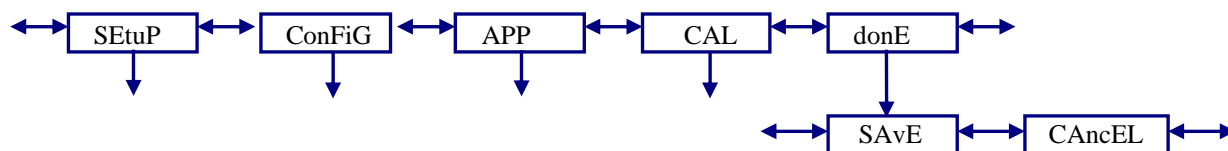
Follow these steps to program the **Enviro™ Series instrument**.

1. Configure the Enviro™ Series Instrument operating parameters.
2. Calibrate the Enviro™ Series Instrument.
3. Set up the Enviro™ Series Instrument options.

4.2. INTRODUCTION

- The program group is shown and accessed in steps.
- Each program group may be entered and modified, or skipped to the next group.
- At each step, a word or abbreviation displays, indicating the parameter to be set.
- Each step then may be viewed or modified.
- At the end of programming a **SAVE** prompt will be displayed.
- Press **Program/Enter** to **SAVE** and exit or scroll to **CANCEL** to disregard changes made.

The following is a rendering of the four programming groups. Pressing **Over/Under/Next** or **tare** will scroll through the choices listed. **Program/enter** will enter the program steps in a particular group. See chart in Sec 4.3 for full details of front panel pushbuttons for programming mode.



4.3. KEYPAD FUNCTIONS, PROGRAMMING MODE.

This chart shows what action will be taken when a front panel key is pressed in the programming mode.

KEY	ACTION
1	No function in programming mode. • Exception, decrements selected digit when entering numeric data.
2	No function in programming mode. • Exception exits to done prompt when entering numeric data.
3	No function in programming mode. • Exception, moves flashing digit to far left position when entering numeric data.
4	No function in programming mode.
TARE	Scrolls backwards through the choices for each program step. • Exception, moves flashing digit left when entering numeric data.
ZERO	Accepts the displayed value and advances to the next program step like enter . • Exception, resets all digits to zeroes when entering numeric data.
PROGRAM ENTER	Accepts the displayed value and advances to the next program step.
OVER/UNDER NEXT	Scrolls forward through the choices for each program step. • Exception, moves flashing digit right when entering numeric data.
UNITS	Scrolls forward through the choices for each program step • Exception, increments digit when entering numeric data.
B/G NET	Scrolls backward through programming steps. • Returns to the Weigh Mode after multiple pressings.
PRINT	No function in programming mode. Scrolls decimal point to the right in CAL mode.

4.4. MENU ACCESS

This chart shows which menus can be accessed from the front panel based on the security level setting and the internal jumper (JP1) position.

	SL0	SL0	SL1	SL1	SL2	SL2	SL3	SL3	SL4	SL4	SL5	SL5
	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1
MENU	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In
SEtUP	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
ConFiG	Y	N	Y	N	Y	N	N	N	N	N	N	N
APP	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
CAL	Y	N	Y	N	N	N	N	N	N	N	N	N

4.5. PROGRAMMING STEPS

Setup Menu

1. Press and hold the **Program/Enter** key or press **S1** on the main PCB to display **SEtuP**.
2. Press the **Program/Enter** key to enter setup mode.
3. Press **Zero** to set the desired Programming Menu.

Default selections are shown underlined.

Programming time format: This will determine whether the clock is displayed and printed in 24 hour (military) or 12 hour (AM/PM) format. The display will indicate either **12 hour** or **24 hour**. Press **Over/Under/Next** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Set-ti: Programming the Time: Time is set as HH.MM.SS and must be entered in military format. The display will indicate **set-ti** followed by the current time with the 10s digit of the hour flashing. Press **units** to increase the digit or the **1** button to decrease the digit. Press **Over/Under/Next** to move the flashing digit right or press **tare** to move the flashing digit left. When the time is correct, press **Program/Enter** to accept the time and go to the next step.

Set-da: Programming the date: Date is set as MM.DD.YY format. The display will indicate **set-da** followed by the current date with the 10s digit of the month flashing. Press **units** to increase the digit or the **1** button to decrease the digit. Press **Over/Under/Next** to move the flashing digit right or press **tare** to move the flashing digit left. When the date is correct, press **Program/Enter** to accept the date and go to the next step.

Id: Scale ID: This step sets the scale ID from 1-32. The display will indicate **id xx** where **xx** is the current ID setting. Press **Over/Under/Next** or **units** to increase the setting, or press **tare** to decrease the setting. When the correct ID is displayed, press **Program/Enter** to enter the value. The default Id is 01.

Port 1: Programming Port 1: The display will indicate **port 1**, then **output**, then the current setting. Press **over/under/next**, **units** or **tare** to scroll through the available choices. Press **Program/Enter** to enter the correct selection. Available selections are:

OFF	Function is not active.
<u>PoLL</u>	<u>Computer demand mode.</u>
PoLLid	Computer demand mode with ID.
Contin	Continuous output.
button	Transmit when print is pressed.
Auto	Transmit occurs when Autoprint threshold is met or exceeded.
diS	Continuous output using remote display format.

Baud: Programming Port 1 baud rate: The display will indicate **baud** then the current setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

300	600	1200	2400	4800
<u>9600</u>	19200	38400	57600	115200

Dbit: Programming Port 1 data bits: The display will indicate **dbit x** where **x** is either 7 or 8. Press **Over/Under/Next**, **units**, or **tare** to select proper value. Press **Program/Enter** to enter proper selection.

P: Programming Port 1 Parity setting: The display will indicate **p** along with the current setting. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available selections are:

P_nonE P odd P EvEn

Busy: Programming Port 1 handshaking: The display will indicate **xxbusy**, where **xx** is either no, **lo**, or **hi**. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Opti: Include time data with transmitted data: This determines whether or not to include the time in the data string for Port 1. Display will indicate **opti** followed by the current selection of Y for yes to include, or **n** for no to exclude. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Opda: Include date data with transmitted data: This determines whether or not to include the date in the data string for Port 1. Display will indicate **opda** followed by the current selection of Y for yes to include, or **n** for no to exclude. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Opid: Include ID data with transmitted data: This determines whether or not to include the ID in the data string for Port 1. Display will indicate **opid** followed by the current selection of Y for yes to include, or **n** for no to exclude. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Port 2: Programming Port 2: The display will indicate **port 2**, then **output**, then the current setting. Press **over/under/next**, **units** or **tare** to scroll through the available choices. Press **Program/Enter** to enter the correct selection. Available selections are:

OFF Function is not active.
PoLL Computer demand mode.
 PoLLid Computer demand mode with ID.

Note: If **b/g / net** is pressed after Port 2, the indicator will revert back to ID.

Baud: Programming Port 2 baud rate: The display will indicate **baud** then the current setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

300	600	1200	2400	4800
<u>9600</u>	19200	38400	57600	115200

Dbit: Programming Port 2 data bits: The display will indicate **dbit x** where **x** is either 7 or 8. Press **over/under/next**, **units**, or **tare** to select proper value. Press **Program/Enter** to enter proper selection.

P: Programming Port 2 Parity setting: The display will indicate **p** along with the current setting. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available selections are:

P_nonE P odd P EvEn

Opti: Include time data with transmitted data: This determines whether or not to include the time in the data string for Port 2. Display will indicate **opti** followed by the current selection of Y for yes to include, or **n** for no to exclude. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Opda: Include date data with transmitted data: This determines whether or not to include the date in the data string for Port 2. Display will indicate **opda** followed by the current selection of Y for yes to include, or **n** for no to exclude. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Opid: Include ID data with transmitted data: This determines whether or not to include the ID in the data string for Port 2. Display will indicate **opid** followed by the current selection of **Y** for yes to include, or **n** for no to exclude. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Int: Display brightness setting: This changes the intensity of the display brightness. The display will indicate **int** followed by the intensity setting from **1-7**, with **7** being the brightest. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. The default setting is **4**.

The Enviro™ Series indicator will now return to the **setup** prompt. Navigate to the desired menu heading to continue programming, or to **done** to finish.

Config Menu

1. Press and hold the **Program/Enter** key or press **S1** on the main PCB to display **SEtUP**.
2. Press **Units** or **Over/Under/Next** to display **ConFiG**.
3. Press the **Program/Enter** key to enter setup menu.

Cap: Programming the scale capacity: The display will indicate **cap** followed by the current setting with the most significant digit blinking. Press **units** to scroll up, or the **1** to scroll down to the desired numeric value. The **Over/Under/Next** key will move the flashing digit to the right, and the **tare** key will move it left. Press **Program/Enter** when the display shows the correct capacity setting.

Note: Capacity can be up to six displayed digits (999999).

Units: Programming the scale units: The display will indicate **units**, and the current setting by displaying a lit LED symbol next to the printed unit legend beside the display. Press **over/under/next**, **units** or **tare** to scroll through all the possible choices. Press **Program/Enter** to enter the selection. Available selections are:

<u>lb/oz/kg/g</u>	lb/oz/kg	lb/oz/g	lb/oz
lb/kg/g	lb/kg	lb/g	lb
oz/kg/g	oz/kg	oz/g	oz
kg/g	kg	g	

Notes:

1. The lb-oz and custom unit settings cannot be used as the Primary Unit in the Enviro™ Series.
2. The lb-oz and custom unit settings are **not legal for trade**.

P-unit: Programming the primary unit: (the unit that the instrument will default to upon power up) The display will indicate **p-unit** and indicate the current setting by displaying the lit LED next to the printed unit legend beside the display. Press **over/under/next**, **units** or **tare** while observing the LED which will change to indicate the selection. Press **Program/Enter** to enter the selection. Available selections are:

<u>lb</u>	g	kg	oz
-----------	---	----	----

Note: Selection availability dependant upon programmed **units** selection.

lboz: pounds-ounces mode: The display will indicate **lboz** and the current selection, either **y** for enable or **n** for disable. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Cust: Custom units. The display will indicate **cust** and the current selection, either **y** for enable or **n** for disable. Press **over/under/next, units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Note: When custom units are active, units LED indicators are off in the weigh mode.

Azt: Programming the Automatic Zero Tracking band: (this feature will maintain zero when small amounts of material are placed on the scale, such as rain, snow, debris, etc.) The display will indicate **azt x** where **x** is the current setting. Press **over/under/next, units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available selections are:

OFF	Function is not active.
0.5	half of a division / increment / graduation
1	one division / increment / graduation
<u>3</u>	three divisions / increments / graduations

Bal: Programming the motion band (the range in divisions/increments/graduations that weight must be stable before a print, zero, or tare function will be allowed). The display will indicate **bal x** where **x** is the current setting. Press **over/under/next, units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available selections are:

OFF	Function is not active.
0.5	half of a division / increment / graduation
1	one division / increment / graduation
<u>3</u>	three divisions / increments / graduations

O.r: Programming the zero range: (the percentage of scale capacity that may be removed by pressing the Zero Key). The display will indicate **o.r x** where **x** is the current setting. Press **over/under/next, units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available selections are:

<u>100</u>	100 percent zero range
2	2 percent zero range

D: Programming the division size: The display will indicate **d** followed by the current division size setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

50	20	10	5	2	1
0.5	0.2	0.1	0.05	0.02	<u>0.01</u>
0.005	0.002	0.001	0.0005	0.0002	0.0001

Filter: Programming the filter setting: (intended to minimize the effects of motion, vibration, and wind currents) The display will indicate **filter** followed by the current filter setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

1	3	5	<u>11</u>	15	20	30	50
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Flf: Flush filter factor: Allows indicator to switch to fast filter rate if weight change exceeds the number of divisions in setting. The display will indicate **flf** followed by the current setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

<u>oFF</u>	1	2	5	10	20	50	100
------------	---	---	---	----	----	----	-----

Tare: Programming the tare setting: (the means by which a container's weight may be removed, to set the indicator to display the net weight only) The display will indicate **tare** followed by the current tare setting.

Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available selections are:

OFF Tare is disabled.
ON Tare is active.
On-CLr Tare automatically clears when Gross weight returns to Zero

HI: Overload limit: The actual value at which the display goes to **ol** (represented as a percentage of capacity). The display will indicate **hi** followed by the current setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

102.5 103 105 110 300

UI: Underload limit: The actual value at which the display goes to **ul** (represented as a percentage of capacity behind zero). The display will indicate **ul** followed by the current setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

5.5 10 25 50 100

D rate: Programming the display update rate: The times between display updates in seconds. The display will indicate **d rate** and then the current setting. Press **Over/Under/Next** or **units** to scroll up, or **tare** to scroll down through the available choices. Press **Program/Enter** to enter the selection. Available selections are:

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

P1: Output format of Port1, GTN or net only: This determines whether the output from Port1 will be transmitted as a net weight only or a gross/tare/net weighment. The display will indicate **p1** followed by the current setting. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available choices are:

Gtn nEt

P2: Output format of Port2, GTN or net only: This determines whether the output from Port2 will be transmitted as a net weight only or a gross/tare/net weighment. The display will indicate **p1** followed by the current setting. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection. Available choices are:

Gtn nEt

The Enviro™ Series indicator will now return to the **config** prompt. Navigate to the desired menu heading to continue programming, or to **done** to finish.

APP Menu

1. Press and hold the **Program/Enter** key or press **S1** on the main PCB to display **SEtUP**.
2. Press **Units** or **Over/Under/Next** twice to display **APP**.
3. Press the **Program/Enter** key to enter **APP** menu.

X.xxupd: Display microvolts per division: This is a reference to display the current microvolts per division. The display will indicate **x.xxupd** where **x.xx** is a numeric value of the microvolts per division. Press any front panel pushbutton other than **b/g / net** to continue.

Acc: Accumulate feature enabled: Enables or disables the accumulate feature. The display will indicate **acc** followed by the current setting of **y** for enable and **n** for disable. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

A thld: Autoprint and accumulate threshold: This is the number of divisions the indicator must meet or exceed for an autoprint or an auto-accumulation to occur. The display will indicate **a thld**, followed by the current setting in divisions with the left digit flashing. Press **units** to increase the digit, press the **1** key to decrease the flashing digit. Press **Over/Under/Next** to move the flashing digit to the right or press the **tare** to move it to the left. Press **Program/Enter** when the display shows the correct threshold setting. The acceptable range is 1 to 1000 and default value is 10 divisions.

Aout: Autoprint and autoaccumulate output: This setting will determine whether the indicator will autoprint during an automatic accumulation. This setting is only active if port 1 is set to **auto** and accumulation is enabled. The display will indicate **aout** followed by a **y** for enable or an **n** for disable. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

Beep: Audible tone when key is pressed: This will enable or disable the audible tone to acknowledge pressing a front panel key. The display will indicate **beep** followed by a **Y** for enable or an **n** for disable. Press **over/under/next**, **units** or **tare** to change the selection. Press **Program/Enter** to enter the selection.

C-fact: Conversion factor for custom units: The primary units divided by this value will determine the custom units if it is enabled. The display will indicate **c-fact** followed by a value with the left digit flashing. Press **units** to increase the digit, press the **1** key to decrease the flashing digit. Press **Over/Under/Next** to move the flashing digit to the right or press the **tare** to move it to the left. Press **print** to move the decimal point to the right. Press **Program/Enter** when the display shows the correct conversion factor.

Note: An example of custom units might be to display the weight in tons. In this case the conversion factor is 2000.0 if the primary unit is lb.

The default conversion factor is 8.3333.

The Enviro™ Series indicator will now return to the **setup** prompt. Navigate to the desired menu heading to continue programming, or to **done** to finish.

Section 5 Calibrating the Indicator

5.1 Introduction

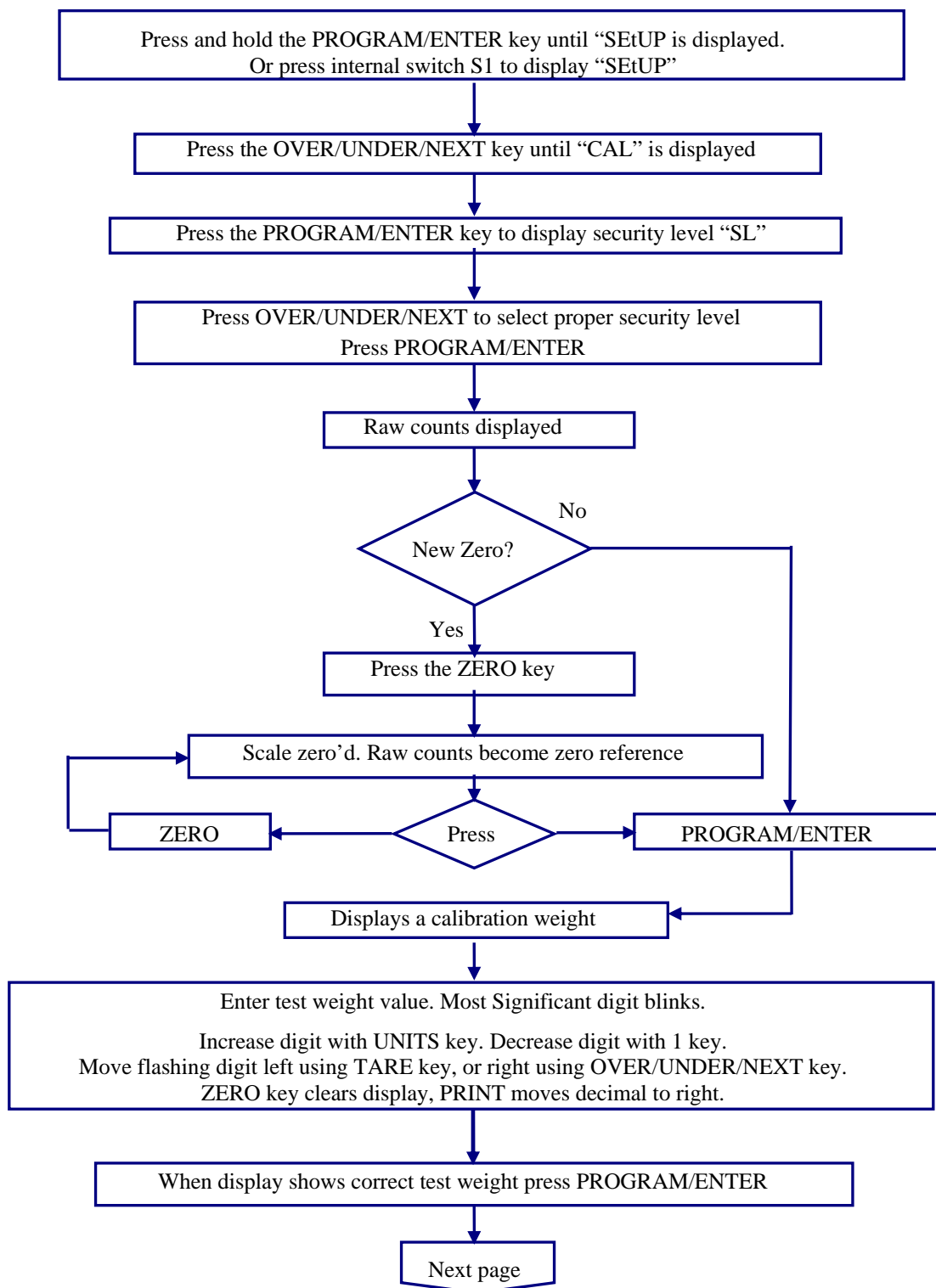
- Calibration can be performed entirely from the front panel or locked out with security levels 2-5 or internal jumper JP1.
- Calibration can be performed with a single calibration point, or using up to four calibration points.

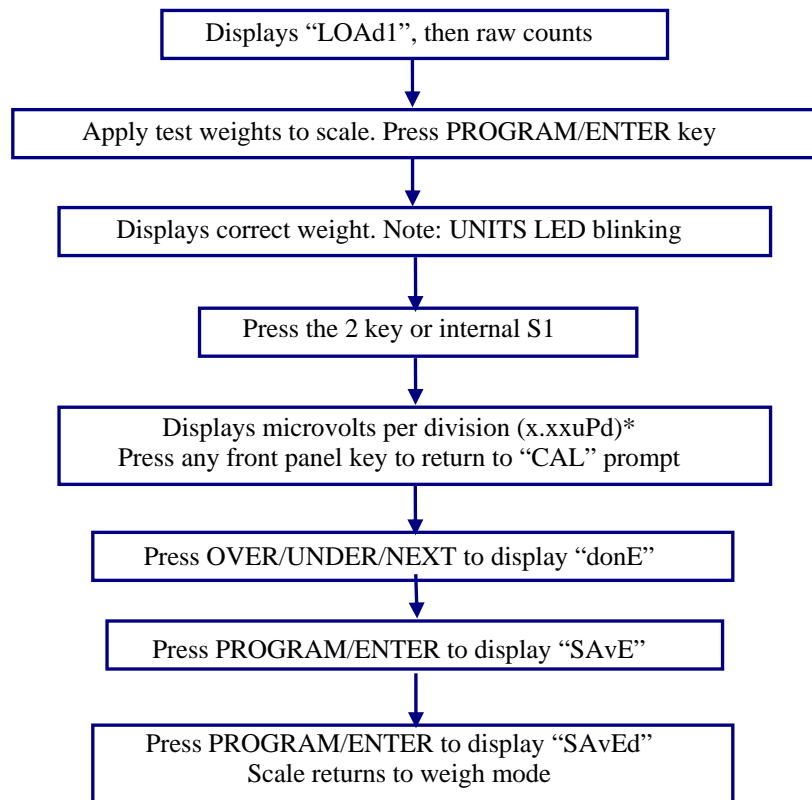
	SL0	SL0	SL1	SL1	SL2	SL2	SL3	SL3	SL4	SL4	SL5	SL5
	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1	JP1
MENU	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In
SEtUP	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
COnFIG	Y	N	Y	N	Y	N	N	N	N	N	N	N
APP	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
CAL	Y	N	Y	N	N	N	N	N	N	N	N	N

Menu access based on security level (SL) and internal calibration jumper (JP1)

The following flow charts show step by step instructions for a single point calibration, and a multipoint calibration.

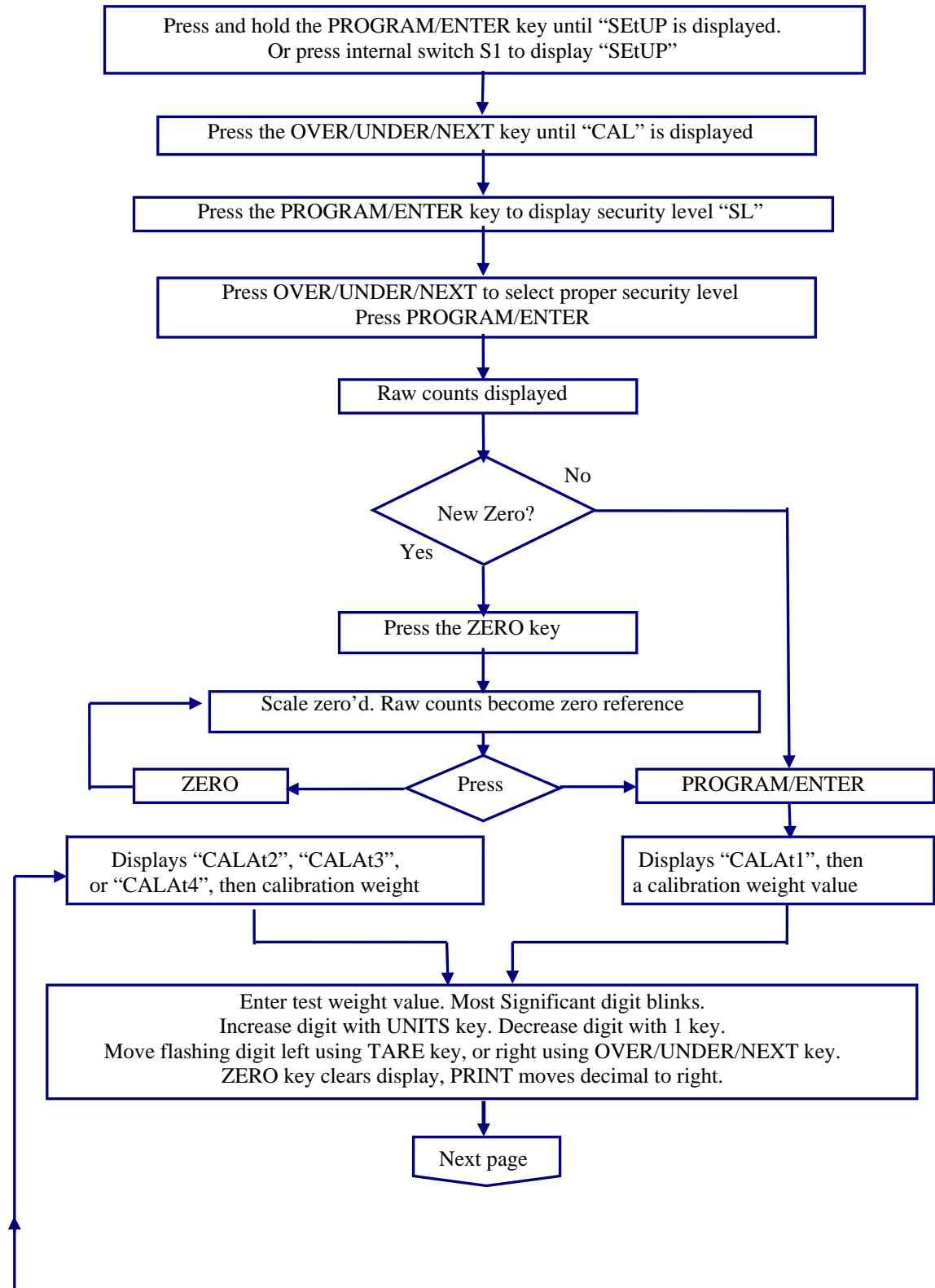
5.2 Single Point Calibration Procedure

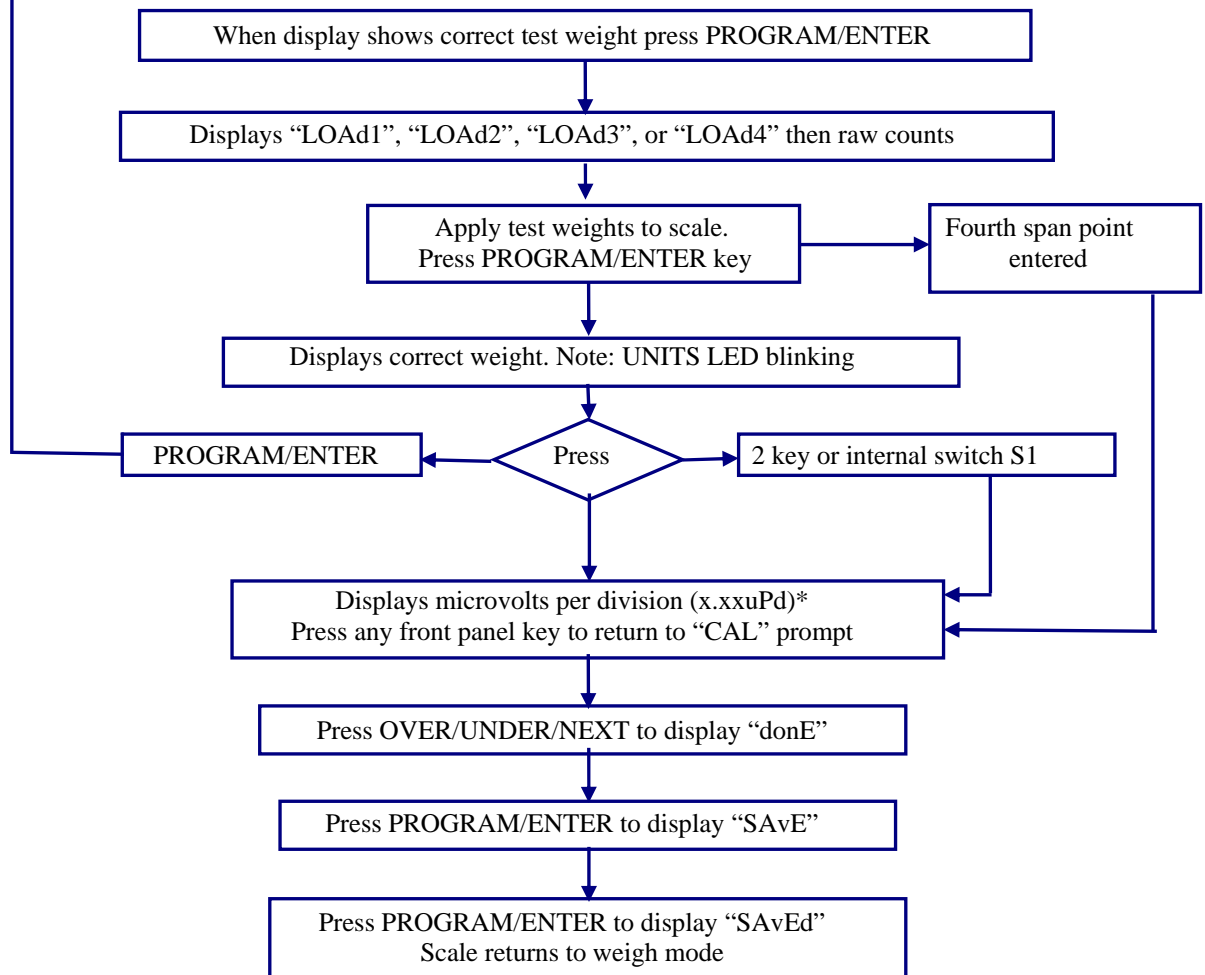




*The "**uPd**" (microvolts per division) must be **one (1.0)** or greater for proper operation.

5.3 Multipoint Calibration





*The "**uPd**" (microvolts per division) must be **one (1.0)** or greater for proper operation.

5.4 Service Sealing

Commercial Applications

Scales used in a **commercial application** must be "*placed in service*" in accordance to local **weights and measures guidelines**.

Four sealing screws are provided on the back cover to allow a lead seal to be installed if required.

An audit trail is provided to track changes in programming and calibration. Access to the audit trail is as follows:

1. Press and hold **b/g / net** for approximately 10 seconds.
2. Indicator will display **cfgctr**. This is for the configuration audit.
3. Press **Over/Under/Next** to toggle to **calctr**. This is for the calibration audit. Repeated pressing of this button will toggle between the two choices.
4. At either prompt, **cfgctr** or **calctr**, press **program/enter**. This will display the audit counter for that particular audit trail.
5. If connected to a printer, **print** may be pressed at this time to print both audit trail counters.
6. Press **Program/Enter** again to return to **cfgctr** or **calctr**. Both audit trails can be viewed without returning to the weigh mode.
7. When finished viewing audit trails, press **units** to return to normal weighing.

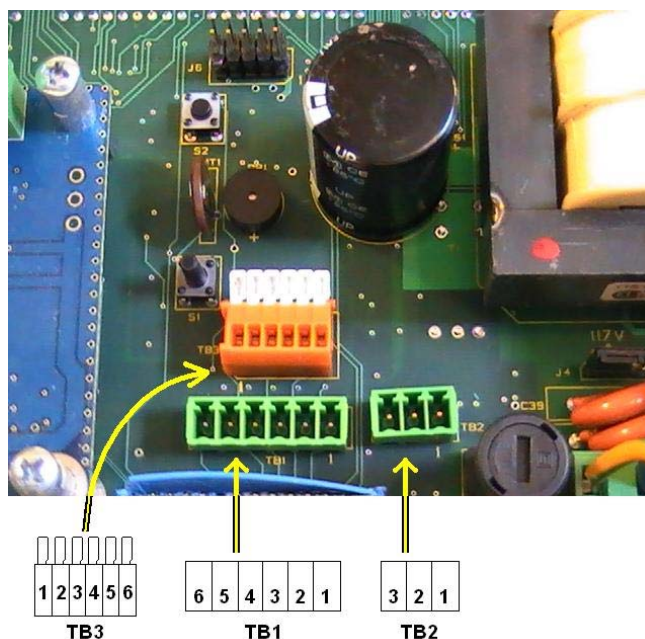
Section 6 Serial I/O

6.1 INTRODUCTION

The Enviro™ Series Indicator is equipped with 2 serial output ports. Port 1 is a bidirectional rs232 port, and Port 2 is a bidirectional rs485 port. Port 1 can be configured to operate with a variety of printers, computer applications, and remote displays.

6.2 CONNECTIONS

Tb1 pin	Port 1 designation	Tb2 pin	Port 2 designation
1	Chassis ground	1	RS485+
2	Receive data (RX)	2	RS485-
3	Transmit data (TX)	3	Signal ground
4	Clear to send (CTS)		
5	Signal ground (GND)		
6	Request to send (RTS)		



6.3 PRINTERS

Printers

Please see the Enviro™ Series Printer Addendum for a list of suggested 3rd party printers and how to configure the Enviro™ Series check weighing instrument to work with them.

Remote display

Please see the Enviro™ Series Printer Addendum for a list of suggested 3rd party remote displays and how to configure the Enviro™ Series check weighing instrument to work with them.

Computer output

The Enviro™ Series can be connected to a variety of computer systems utilizing the continuous or polled outputs. Connections to computers are done using the wiring chart provided earlier in this section. Ensure that all protocol (baud rate, parity, etc) matches at both devices connected.

Up to 6 data items are available for transmission; Gross, Tare, Net, Time, Date, and ID in that order. Each item is separated by a carriage return (CR) and a line feed (LF). All items enabled in the setup menu will be sent. If the indicator is in Gross mode, only gross weight will be sent. If the indicator is in Net mode, gross, tare and net will be sent if GTN is selected in config menu, or net only if NET is selected.

The table below shows a typical wiring diagram to a computer equipped with a db9 connector.

Enviro™ Series tb1	Computer
2 RX	3 TX
3 TX	2 RX
5 Gnd	5 Gnd

Section 7 Operations

7.1. BASIC SCALE OPERATIONS

Upon power up the Indicator performs a warm-up cycle.

- The Indicator initiates a test, displaying numbers **1** to **8**, and lights up all LED's.
- The **Program number** and **Revision Information** displays.
- The Indicator then displays the current weight on the scale

7.2. KEYPAD FUNCTIONS, WEIGH MODE

KEY	ACTION
Recipe 1-4	Enables or disables programmed recipe in Checkweigh mode. <ul style="list-style-type: none">• In peak weigh mode, 1 enables peak, 2 disables, and 3 resets peak.
TARE	Automatically tares off the displayed weight. <ul style="list-style-type: none">• If held for 3 seconds, enables or disables accumulate function.
ZERO	Resets gross weight to center of zero.
PROGRAM/ENTER	Captures weight and adds to accumulation if enabled.
OVER/UNDER/NEXT	Displays accumulated weight and number of weighments if enabled. <ul style="list-style-type: none">• If held for 3 seconds, enters Checkweigh or peak weight setup.
UNITS	Switches between selected weighting units.
B/G – NET	Toggles between gross and net weights . <ul style="list-style-type: none">• If held for 10 seconds, displays audit trail functions.
PRINT	Transmits transaction data out com port 1 if button is selected.

7.3. INSTRUMENT WEIGHING FUNCTIONS

Basic Weighing

Ensure that the bench scale is empty, power on the indicator, press the **zero** key and the display indicates “0” and is ready for use.

Gross Weighing

1. Press the **b/g / net** key, if required, to set the display to GR (gross).
2. Press the **zero** key, if required, to set scale to “0.”
3. Place container/object on the scale platform.
4. Read the gross weight on the display.

Net Weighing

1. Press the **b/g / net** key, if required, to set display to GR (gross).
2. Press the **zero** key, if required, to set scale to “0.”

3. Place container/object on scale (Tare weight).
4. Press the **tare** key.
5. Place material in container or add objects (Net weight).
6. Read the net weight on the display.

Gross/Tare/Net Weighing

1. Press the **B/G / Net** key, if required, to set display to GR (gross).
2. Press the **Zero** key, if required, to set scale to “0.”
3. Place container/object on scale (Tare weight).
4. Press the **Tare** key.
5. Place material in container or add objects (Net weight).
6. Read the net weight on the display.
7. Press the **B/G / Net** key to switch to Gross and view Gross weight.

Weight Accumulation

Starting accumulation mode

1. If indicator is not in accumulate mode, press and hold **tare** to enable accumulate mode. Indicator will display **acc on** briefly.

Note: If Accumulate function is not enabled in **setup** menu, display will flash and return to displaying current weight without showing **acc-on**.
2. Press **zero**, if required, to set scale to “0.”
3. If accumulation is using a container, apply container and press **tare** to place scale in net mode.
4. Put the product to be accumulated on the bench scale.

There are four possibilities of configuring the accumulation function. Each one will be addressed separately as follows:

Port 1 set to auto and aout set to yes.

1. After weight is applied, and if the weight is greater than the accumulate threshold, the indicator will flash all the green ACCEPT LEDs for one second showing that the weight has been stored as an accumulation and then transmit the following data string:

“Weight nn = wwwwww uu GR/NT”

nn is the number of the current accumulated weight in numerical order.

wwwwww is the last accumulated weight.

uu is the unit of weight accumulated.

GR or NT represent whether accumulated weight is gross or net respectively.
2. Weight on the scale must now be removed to less than .5 grads before the next accumulation can occur.
3. If a reprint of the last accumulated weight is required, press **print** and port 1 will retransmit the string indicated above.
4. Repeat steps 1-3 to continue accumulations (up to 99).

Port 1 set to Auto and Aout set to no.

1. After weight is applied, and if the weight is greater than the accumulate threshold, the indicator will flash all the green ACCEPT LEDs for one second showing that the weight has been stored as an accumulation.
2. If a print is to occur, press **print** and port 1 will transmit the following:
“Weight nn = wwwwww uu GR/NT”
nn is the number of the current accumulated weight in numerical order.
wwwwww is the last accumulated weight.
uu is the unit of weight accumulated.
GR or NT represent whether accumulated weight is gross or net respectively.
3. Weight on the scale must now be removed to less than .5 grads before the next accumulation can occur.
4. Repeat steps 1-3 to continue accumulations (up to 99).

Port 1 set to button and Aout set to yes.

1. After weight is applied, and if the weight is greater than the accumulate threshold press **program/enter**. The indicator will check to ensure there is no motion. If scale is in motion, the indicator will wait up to 10 seconds for motion to stop. If the weight is not stable after 10 seconds, the scale will disregard the request for accumulation. If stability occurs, the green ACCEPT LEDs will flash for 1 second showing that the weight has been stored as an accumulation.
2. If a print is to occur, press **print** and port 1 will transmit the following:
“Weight nn = wwwwww uu GR/NT”
nn is the number of the current accumulated weight in numerical order.
wwwwww is the last accumulated weight.
uu is the unit of weight accumulated.
GR or NT represent whether accumulated weight is gross or net respectively.
3. Weight on the scale must now be removed to less than .5 grads before the next accumulation can occur.
4. Repeat steps 1-3 to continue accumulations (up to 99).

Port 1 set to button and Aout set to no.

After weight is applied, and if the weight is greater than the accumulate threshold press **program/enter**. The indicator will check to ensure there is no motion. If scale is in motion, the indicator will wait up to 10 seconds for motion to stop. If the weight is not stable after 10 seconds, the scale will disregard the request for accumulation. If stability occurs, the green ACCEPT LEDs will flash for 1 second showing that the weight has been stored as an accumulation.

1. If a print is to occur, press **print** and port 1 will transmit the following:
“Weight nn = wwwwww uu GR/NT”
nn is the number of the current accumulated weight in numerical order.
wwwwww is the last accumulated weight.
uu is the unit of weight accumulated.
GR or NT represent whether accumulated weight is gross or net respectively.

2. Weight on the scale must now be removed to less than .5 grads before the next accumulation can occur.
3. Repeat steps 1-3 to continue accumulations (up to 99).

Displaying Accumulated Weight and Count.

1. Press and release **Over/Under/Next**. The indicator will alternately display the total accumulated weight and the number of accumulations for two seconds each. The count is left justified followed by **Acc**, and the total weight is right justified.
2. The indicator will continue to alternately display the weight and count for 30 seconds or until **Over/Under/Next** is pressed again.

Note: The indicator must be displaying gross zero to display totals. An error of "not 00" will display if weight is not removed.

Clearing accumulated weight and total.

1. With total/count displayed (see Displaying accumulated weight and count above), Press **zero**.
2. The indicator will display **Clr N** prompting the operator to not clear total count and accumulation. If the totals are to be cleared, toggle to display **Clr Y** by pressing **Over/Under/Next**. With the correct choice displayed, press **Program/Enter**.
3. The indicator will briefly display **Cleared** when the accumulator is cleared.

Printing accumulated weight and total.

4. With total/count displayed (see Displaying accumulated weight and count above), press **Print**.
5. Indicator will display **All Y**, prompting the operator to print all the individual weighments and the total accumulation. If only the totals are desired, toggle to display **All N** by pressing **Over/Under/Next**. With the correct choice displayed, press **Program/Enter**.
6. The indicator will print the accumulated weighments, if selected, followed by the total.
7. After the print has occurred, the indicator will display **Clr N** prompting the operator to not clear total count and accumulation. If the totals are to be cleared, toggle to display **Clr Y** by pressing **Over/Under/Next**. With the correct choice displayed, press **Program/Enter**.
8. The indicator will briefly display **Cleared** when the accumulator is cleared.

Deactivating accumulation

To deactivate the accumulation mode, press and hold **Tare** for 3 seconds. The indicator will display **Accoff** briefly to indicate accumulation function has been deactivated.

Accumulation Notes

1. No units switching is allowed if Accumulation is currently activated, or if an accumulation has been stored and not cleared. The message **Nounts** will be displayed if **Units** is pressed.
2. On power up or return from Program mode or Checkweigh Setup mode, if an accumulation has been stored in units other than Primary Units (PU in config menu), the accumulation units will be automatically selected.
3. If the accumulation units are no longer enabled on power up or return from Program mode or Checkweigh Setup mode, the accumulated values will be cleared and Primary Units will be selected.

Peak Hold Weighing

To enable peak hold:

1. Press and hold **Over/Under/Next** until display indicates **Chec**.
2. Press **Over/Under/Next** to display **hold**.

3. Press **Program/Enter** to display **Hold X**, where **X** is either **Y** or **N**.
4. Press **Over/Under/Next** to display **Hold Y** if necessary.
 - Note: Peak Hold function must not be used with Checkweighing.
5. Press **Program/Enter** to display **CSaved**, and returns to weigh mode.

Indicator is now in Peak Hold mode.

To operate peak hold:

1. Press the **1** button to activate Peak Hold mode. The first three indicators for UNDER, ACCEPT and OVER will flash indicating Peak Hold is active. Also the indicators on the **1**, **2**, and **3** buttons will be on.
2. The display will now freeze on the largest weight applied to the bench scale. It will remain there even after weight is removed.
3. To deactivate the Peak Hold function while retaining the current peak weight, press the **2** button. Indicator will now return to normal weigh mode. Any weight applied now will **not** affect the stored peak weight.
4. To deactivate Peak Hold and clear the current peak weight, press the **3** button. Indicator now returns to normal weigh mode.
5. To reactivate Peak Hold after pressing either **2** or **3**, press **1**.

Check Weighing

The Enviro™ Series indicator uses a three color bar graph to indicate an item's weight within three bands, Under, Accept, and Over. It is capable of storing four "recipes" or different Checkweigh configurations for four different products. Default selections are underlined.

Configuring Checkweigh mode:

1. Press and hold **Over/Under/Next** until display indicates **Chec**.
2. Press **Program/Enter** to display **rec 1**. This indicates that the indicator is ready to accept configuration of recipe 1.
3. If another recipe is to be configured, press **Over/Under/Next** to scroll through to **rec 2**, **rec 3**, or **rec 4**.
4. With the desired recipe displayed, press **Program/Enter** to display **EnA Y**, or **ENA N**.
 - **Note:** If **ENA N** is selected in this step, the indicator will advance to the next enabled recipe, or return to the **Chec** prompt if none are enabled.
5. To toggle between choices press **over/under/next**. Selecting **Y** will enable the current recipe, and selecting **N** will disable it.
6. Press **Program/Enter** to advance to **nEt n**, or **net y**.
7. Press **Over/Under/Next** to toggle between **nEt n**, (Checkweigh in gross mode) or **net y**, (Checkweigh in net mode).
8. Press **Program/Enter** to display **diS Y**, or **dis n**. This will determine whether the numeric display is active or not while Checkweighing is active.
9. Press **Over/Under/Next** to toggle between **diS Y**, and **dis n**.
 - **Note:** If weighing in net mode and numeric display is active, the indicator can accidentally be placed in the GROSS mode and the display then might not match the Checkweigh indication.

10. With the desired selection displayed, press **Program/Enter** to display **units**. With **units** displayed, one of the units legends will be lit. This is the weigh units the Checkweigh limits will be defined by in the following steps.
11. Press **Over/Under/Next** to scroll through the choices, including custom units.
12. With the desired units legend lit, press **Program/Enter** to display **hand y**, or **hAnd n**. This determines the method for defining the acceptance band. Using **hand y** provides the user the ability to enter all ranges manually, whereby **hAnd n** provides the user the ability to use a sample weight for the accept target range.
13. Press **Over/Under/Next** to toggle between the two choices.
14. With the desired selection displayed, press **program/enter**.

If **hand y** is selected, go to step 21.

15. If **hand n** is selected, the indicator will display live weight along with scrolling under, accept, and over indicators. The indicator is waiting for an acceptance range weight to be applied. Apply a sample weight of an acceptable value and press **program/enter**. This weight will be used to assist defining the start of accept and end of accept values.
16. The entire **under** bar graph and the first segment of the **accept** bar graph will be illuminated. The captured weight value is displayed with the leftmost digit flashing. This is the start of **accept** point. If the weight displayed needs to be altered, press **units** to increase the digit, or press **1** to decrease it. Press **Over/Under/Next** to move flashing digit to the right, or press **tare** to move it to the left. Press **print** to move the decimal point to the right. Press **zero** to display all zeroes on the display. When the correct start of accept value is displayed, press **program/enter**.
17. The first segment of the **under** will be illuminated along with a number with the leftmost digit flashing. This is the start of **under** point. Using the same procedure as identified in step 16 above, enter the correct value for the beginning of the under range, this could be 0. When the correct start of under value is displayed, press **program/enter**.
18. The entire **under** bar graph, the entire **accept**, and the first segment of the **over** bar graph will be illuminated. The captured weight value is displayed with the leftmost digit flashing. This is the end of **accept** point. If required using the same procedure as identified in step 16 above, enter the correct value for the end of the accept range. When the correct end of accept value is displayed, press **program/enter**.
19. The entire **under** bar graph, the entire **accept**, and the entire **over** bar graph will be illuminated. The last weight value is displayed with the leftmost digit flashing. This is the end of **over** point. Using the same procedure as identified in step 16 above, enter the correct value for the end of the accept range. When the correct end of over value is displayed, press **program/enter**.
20. The indicator will briefly display **CSaved**, then return to the weigh mode with the most recently configured recipe active.
21. If **h and y** is selected, the first segment of the **under** bar graph will be illuminated. A previously programmed weight value is displayed with the leftmost digit flashing. This is the start of **under** point. If the weight displayed needs to be altered, press **units** to increase the digit, or press **1** to decrease it. Press **Over/Under/Next** to move flashing digit to the right, or press **tare** to move it to the left. Press **print** to move the decimal point to the right. Press **zero** to display all zeroes on the display. When the correct start of under value is displayed, press **program/enter**.
22. The entire **under** bar graph and the first segment of the **accept** bar graph will be illuminated. A previously programmed weight value is displayed with the leftmost digit flashing. This is the start of **accept** point. If required using the same procedure as identified in step 21 above, enter the correct value for the start of the accept range. When the correct start of accept value is displayed, press **program/enter**.

23. The entire **under** bar graph, the entire **accept**, and the first segment of the **over** bar graph will be illuminated. A previously programmed weight value is displayed with the leftmost digit flashing. This is the end of **accept** point. If required using the same procedure as identified in step 21 above, enter the correct value for the end of the accept range. When the correct end of accept value is displayed, press **program/enter**.
24. The entire **under** bar graph, the entire **accept**, and the entire **over** bar graph will be illuminated. A previously programmed weight value is displayed with the leftmost digit flashing. This is the end of **over** point. Using the same procedure as identified in step 21 above, enter the correct value for the end of the accept range. When the correct end of over value is displayed, press **program/enter**.
25. The indicator will briefly display **CSaved**; then return to the weigh mode with the most recently configured recipe active.

Checkweigh mode operation:

1. With the scale empty, press **zero** to zero the display if required.
2. Press the appropriate recipe button to enable the Checkweigh mode and that recipe. If recipe is enabled, the indicator above that button will illuminate.
3. Place object to be weighed on the bench scale. The appropriate LED's in the bar graph will illuminate to show the weight of the object relative to its target acceptance range. If no green LED's are lit up, the object is under the target weight. If some of the green LED's are lit, the object is within the acceptance range. If one or more red LED's light up, the object is above the acceptance range.
4. When finished Checkweighing, simply press the recipe button that was enabled to exit Checkweigh mode, or press a different recipe button to use a different programmed recipe.

Section 8 Service & Maintenance

8.1 EXPANDED DISPLAY MODE

The Enviro™ Series can be placed in expanded resolution mode to assist in troubleshooting and maintenance. Simply press S2 on the main PCB and the display indicator will immediately display the weight in 10X resolution. For example if the division size is programmed at 1lb, pressing S2 will display the weight in 0.1lb divisions.

8.2 SCALE MAINTENANCE

8.2.1 Cleaning the Scale and Indicator

Use a moist cotton cloth to clean the scale.

- If spray cleaner is needed for shoe sole marks, squirt it into the cloth, and not directly onto the scale.
- Use only tap water in the cloth to wipe off the indicator's clear plastic display.

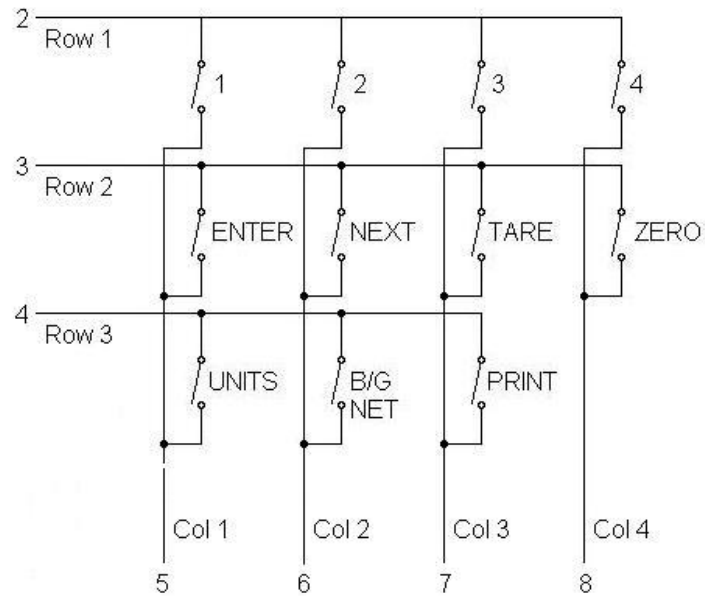
Section 9 Parts List

IP 69k Model

ITEM	PART #	QTY	DESCRIPTION
1	29006	1	FRONT PANEL ASSY
2	28117	1	PCB ASSY, DISPLAY I/O CONTROLLER A1
3	29146	1	PCB ASSY, SMALL BLOCK (NON-POTTED) A2
7	15131	1	POWER CORD ASSY W1
8	11926	AR	ADHESIVE, STUD LOCK
9	29008	4	SPACER, ROUND #10-32 X 2.75 LG
10	30298	1	KEYBOARD
12	29007	1	GASKET
16	11998	9	SPACER, HEX #6-32 X .50 LG
17	17545	3	CONNECTOR, LIQUID TIGHT
18	15851	3	RING, "0" .375 I.D.
19	17534	1	CONNECTOR, LIQUID TIGHT
20	12342	1	RING, "0" .625 I.D.
21	17503	1	BLOCK, TERMINAL, PLUG 3 TERM .295 CC (XTB4 FOR A1-TB4)
22	17496	1	BLOCK, TERMINAL, PLUG 8 TERM .197 CC (XTB1 FOR A2-TB1)
23	20963	1	BLOCK, TERMINAL, PLUG 6 TERM .150 CC (XTB1 FOR A1-TB1)
24	20965	1	BLOCK, TERMINAL, PLUG 3 TERM .150 CC (XTB2 FOR A1-TB2)
26	11495	4	WASHER, NYLON No. 10
28	14083	4	SCREW, SEALING 10-32 X .50
30	11191	10	WASHER-LOCK-EXT. TOOTH #6
31	11102	3	NUT-HEX 6-32
32	11124	1	WASHER, PLAIN #6
35	11150	4	SCREW-MACH-PH-PHIL 6-32 X .31
37	24366	1	LABEL, GROUND SYMBOL
39	29081	1	ETL MARK LABEL
40	12609	2	ROD .25 OD X 1"
42	25355	1	VENT, MEMBRANE
43	25356	1	NUT, VENT
44	12189	2	SEAL, HEAVY METER
52	052-0086-01-0	1	MANUAL. CD

Appendix I Keypad Reference

Tb3 connections to keypad shown below.





Enviro Series Instrument

USER'S GUIDE

Document Part Number 0596-0315-01 B