Avery Weigh-Tronix

PC-820/821 Parts Counter User's Manual

UNITED STATES

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la Class A prescrites dans le Reglement sur le brouillage radioelectrique que edicte par le ministere des Communications du Canada.

EUROPEAN COUNTRIES

WARNING

This is a Class A product. In a domestic environment this product may cause radio interference in which the user may be required to take adequate measures.

CAUTION

Risk of electrical shock. Do not remove cover. No user service-able parts inside. Refer servicing to qualified service personnel.

Weigh-Tronix reserves the right to change specifications at any time.

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Specifications

Capacities and Resolutions

Capacity	Resolution	Expanded Resolution
10 lb	.001 lb	.00005lb
50 lb	.005 lb	.0002 lb
100 lb	.01 lb	.0005 lb
5 Kg	.0005 Kg	.00002 Kg
25 Kg	.002 Kg	.0001 Kg
50 Kg	.005 Kg	.0002 Kg

Power
In-line transformer, 115 VAC, 50/60 Hz
Optional 230 VAC, 50/60 Hz

Operational keys
Zero, Tare, Enter, Escape, Clear, 0-9, Decimal Point, Previous, Next, and 5 Softkeys

All keys provide users with tactile and (configurable) audio acknowledgment when they are activated

Annunciators
Display symbols include Stability, Active Tare, Current Base, Center of Zero, Low Battery, Unit of Measure and Display Label

Display
240 x 64 dot matrix LCD display
5" x 1.33" displayable area
PC-820: Cold cathode fluorescent backlit (white on blue)

Display rate
Selectable, 0.1 to maximum readable updates

Units of measure
Pounds, kilograms, grams, ounces, pounds and ounces, and two fully customizable units of measure

Displayed resolution
Up to 1 part in 500,000

Time and date
Battery protected real time clock (Y2K compliant)

Internal resolution
Quartzell: 1 part in 2,000,000
Analog (optional): 1,000,000 counts analog

Harmonizer digital filtering
Fully selectable to ignore noise and vibration

Memory
Capable of storing 1000 records including part number,description, count accumulator, tare, and piece weight. (Database is very flexible and number of records is dependent upon record content)

Power saving
Scale has 2 power-saving timers; one controls backlight and another has capability of shutting the scale off. Any keypress wakes the scale.

Standard input and output	Com1: RS-232 or RS-485; can be used for printing, bidirectional communications Com2: RS-232; bidirectional port or capability of connecting to a serial keyboard (TTL or RS-232), scanner, and printer at the same time I/O: I^2C connection capable of connecting remotely to as many as 32 OPTO 22 I/O modules or TTL I/O Board
Available options	• Remote scale card with connections for an analog base and an external Quartzell interface • Remote expanded control interface for 8, 16, 24, or 32 OPTO 22 I/O modules (SSCU-8) or TTL I/O Board • Analog to digital conversion rate: 60 times per second • External battery: BP-25R 12-Volt battery with built-in charger. Up to 40 hours continuous operation • Internal battery: Two 6-Volt batteries with internal charger. Up to 23 hours continuous operation • 230 VAC in-line transformer • Ball top (N/A on 10-lb. scale) • Alphanumeric, serial keyboard • Draft shield for 10-lb. scale (recommended for display resolution above 10,000 divisions)
Operating temperature	14°F to 104°F (-10°C to 40°C), 10 to 90% RH non-condensing
Dimensions	Platform 12" x 14" (50- and 100-lb models) Platform 8.5" dia. (10-lb. model) Overall 14" W x 17" D x 4.5" H
Weight	18.5-lbs. (Internal options increase weight)
Agencies	UL CE CUL pending

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Introduction

References to the PC-820 also apply to the PC-821.

If you upgrade the firmware in the scale, you must download your software program from SimPoser.

This manual explains the operation of the PC-820 parts counting scale. The PC-820 is a computer-based counting scale which can be configured and programmed for many applications and to your specific needs.

Due to the unlimited variety of applications available for the PC-820, it is not practical to describe in this manual all the possible specialized operations. This manual explains only the basic application which ships from the factory and also assumes all the functions of the scale are enabled. Your scale, which has been configured for your particular application, may not have the same displays or enabled functions.

Major sections of this manual are headed by titles in a black bar like *Introduction* above. Subheadings appear in the left column. Instructions and text appear on the right side of the page. Notes, tips, warnings and special instructions appear in the left column.

This manual is divided into the following main sections:

- Unpacking and Preparing the PC-820
- PC-820 Description
- Weighing Operations
- Counting Operations
- PC-820 Menus
- Serial Communication

Unpacking and Preparing the PC-820

Warning

The unit must be plugged into an easily accessible outlet that is earth grounded and of the appropriate voltage.

When you receive your PC-820, unpack the unit and save all shipping materials. Remove the protective plastic from the scale platform.

Place the scale on a level, vibration free surface. Level the scale with the help of the bubble level under the scale platform. Turn the screw feet until the bubble is centered and the scale does not rock. Tighten the knurled locking knobs above each foot against the scale base.

Plug the unit into the appropriate power source. Keep in mind that the power receptacle must be earth grounded and easily accessible to the user.

Press any key to activate the scale.

Upon power up the unit will briefly display an opening screen, then show the default display mode. The scale is now ready for use. After several minutes of inactivity the scale will go into a sleep mode. Press any key to reactivate the scale.

PC-820 Description

The PC-820 is a 12” x 14” scale with an attached 5” x 12” display housing. See Figure 1. The scale base is cast aluminum enclosing a QDT® (Quartzell® Digital Technology) weight sensor and electronics package. The scale platter is stainless steel.

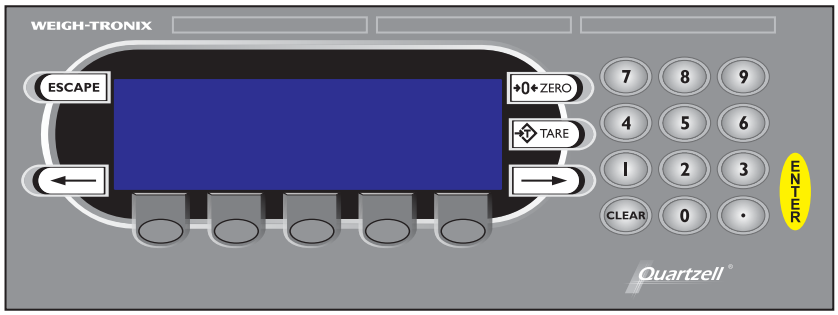


Figure 1
PC-820 front panel

The display is a 64 x 240 dot matrix which allows several lines of text and the ability to display graphics. See *Appendix A: Available PC-820 Displays*.

There are five softkeys located directly below the display, a numeric keypad to the right and six other labeled keys. The keys will be described in the next section.

Built into the PC-820 are two RS-232 serial ports (Com1 and Com2). Com1 can also be used as an RS-485 port. See the *PC-820 Service Manual* for information on setting up Port 1 as RS-485. Com2 can be a bidirectional RS-232 port or a printer, keyboard and scanner port.

This scale has an internal database and can have an option card to support a remote Quartzell® or analog base.

Display Contrast

To increase the contrast of the display, press and hold the ***CLEAR*** and ***9*** keys until the desired contrast is reached. To decrease contrast, press and hold the ***CLEAR*** and ***3*** keys.

Front Panel Keys

The keys on the front panel of the PC-820 are of two types; hard keys and softkeys. Hard keys are labeled directly and softkey labels appear on the display. Softkeys function differently at different times and their labels change as needed.

Hard Keys

Below are brief descriptions for each of the hard key functions:

ESCAPE Press the **ESCAPE** key to back out of menus or cancel a numeric entry without accepting the value.

ZERO Press the **ZERO** key to establish a zero reference. When the scale is at zero, ±¼ division, the center-of-zero icon will be displayed. When the scale is in motion the stable scale icon will disappear. See note at left.

Stable scale icon

→0← *Center of zero icon*

TARE With an empty container on the scale, press the **TARE** key to enter an active tare weight. The display shows net weight.

ENTER Press the **ENTER** key to accept displayed information, whether it is numeric characters you have keyed in or if it is a choice displayed while in the menus.

CLEAR Press the **CLEAR** key to clear keys digits from a displayed number.

0-9 & **.** Use the numeric keys for entering in numbers or a decimal.

Right Arrow Press this key to scroll through extra softkeys available in some applications. (NEXT)

Left Arrow Press this key to scroll through extra softkeys available in some applications and to move to the left in the menu. (PREVIOUS)

.

Softkeys

Attention

Your scale may not show all these softkeys due to your scale's individualized configuration. Remember, when there are extra softkeys which overflow the display, a small arrow appears to the right of the softkey names. Press the **Right Arrow** *key to view the extra keys.*

There are two types of Accumulator data; general accumulators and database accumulators. General accumulator data appears in the upper right portion of the display when Count Total and Transaction Total are enabled. If you are using the database and have the accumulators enabled, the database accumulator data appears in the bottom portion of the display.

These are two different accumulators and the totals will not match unless you clear the general accumulator before you start pressing **ACCUM***. Or, you can clear the General Accumulator before you recall. Do not clear your Data Base Accumulators unless you want them gone.*

Softkeys are so named because their function is not set but changes as the programming directs. If there are more than five softkeys at one time, a small arrow appears next to the list of softkey names. Press the **Right** or **Left Arrow** key to scroll to the extra key labels.

The softkeys which appear in the default application are as follows:

SAMPLE Press this key to take counting samples.

UNITS Press this key to change the unit of measure.

PRINT Press this key to send a formatted output to a label printer, tape printer, or computer.

RECALL Repeatedly press this key to scroll through the following values:

- Gross weight
- Net weight
- Tare weight
- Minimum
- Maximum
- Rate of Change
- Gross Total
- Net Total
- Count Total
- Transaction Total
- Count
- Value
- Piece Weight
- QDT cell counts

Press **ESCAPE** to return to the count/weight display.

DBASE Press this key to access the internal data base. See *Using the Database* for more information. See note at left.

ACCUM+ Press this key to add current information to the accumulator total. See note at left.

ACCUM- Press this key to subtract current information from the accumulator total. See note at left.

CLEAR Press this key to clear the accumulators.

OFF Press this key to turn the scale off.

These keys will be described in detail as scale operation is described in the following sections.

Weighing Operations

Gross Weighing

Key names are shown in **bold** *letters. Hard keys are always in* **UPPERCASE**. **Softkey** *names are printed as they appear on the display.*

Displayed characters are shown in ***bold and italic*** *letters.*

Follow these steps for performing a gross weighing operation:

1. With the scale powered up, zero the scale if the display does not already show zero by pressing the **ZERO** key. . .	Display shows ***0*** weight.
2. Place the item to be weighed on the scale platform. . .	Gross weight is displayed.
3. Remove the item and repeat all three steps for the next item.	

Net Weighing

There are two types of TARE:

semi-automatic tare (SAT is a European term—same as push-button tare in USA)

SAT or push-button tare annunciator

preset tare (PST is a European term—same as entered or recalled tare in USA)

PST or entered/ recalled tare annunciator

Follow these steps for performing a net weighing operation:

1. With the scale powered up, zero the scale if the display does not already show zero by pressing the **ZERO** key. . .	Display shows ***0*** weight.
2. Place the container to be tared on the scale platform. . .	Gross weight is displayed.
3. Press the **TARE** key. . .	The weight is tared, **0** weight is displayed and the tare and net annunciators appear on the display.
4. Place the material to be weighed in the container. . .	Net weight is displayed.
5. To remove the tare weight from memory, empty the scale platform and press the **TARE** key. . .	Scale returns to gross weighing mode.

Entering a Known Tare Weight

To enter a known tare weight, follow these steps:

1. Key in the known tare weight on the numeric keypad. . .	When you press a numeric key, the softkey selections change. One of the softkeys is **TARE**.
2. Press the **TARE** softkey. . .	The keyed in value becomes the active tare weight and the display changes to net weighing mode.

Removing an Active Tare Weight

To remove an active tare weight, empty the scale platform and press the **TARE** key or key in **0** on the numeric keypad and press the **TARE** softkey. The display returns to gross weighing mode.

Counting Operations

Counting Overview

A Piece Weight LookUp (PWLU) option is available for the PC-820.

Some softkeys may not be enabled in your configuration. Disregard references to these softkeys in the manual.

To perform a counting operation the first step is to obtain the average weight of each piece or the piece weight, abbreviated as pcwt. You can key in a known piece weight or you obtain a piece weight by sampling.

Sampling consists of placing a known number of pieces on the scale and letting the scale determine the individual piece weight. The scale uses this to determine the count of pieces placed on the scale. The piece weight is kept in memory until a new sample is taken.

Piece weights and other information can be stored in an internal database. **Information is stored under part numbers.** When you recall a part number from the database, the piece weight, tare weights, etc. become active. This means you do not have to resample parts each time you want to count them.

You can sample parts using the bulk or dribble modes. In bulk mode you are prompted to place a specific number of parts on the scale all at one time. After motion ceases the scale automatically calculates the piece weight and goes into the count mode. This means you must have the counted parts or sample ready to place on the scale all at once.

In dribble mode the scale prompts you to place the sample of parts on the platform and when you are done, press the **ENTER** key. The scale calculates the piece weight and puts the display into the count mode. This allows you to count out your sample parts onto the platform.

When you press the **SAMPLE** softkey you are given two new softkey choices. One is **sMode**. This stands for sample mode. Press this and you can choose between Bulk or Dribble sampling modes. The other softkey offered is **sWeight**. This stands for sample weight and lets you choose from four minimum samples weights based on the shown percent of full scale capacity.

Counting in Bulk Mode

Follow these steps to perform a counting operation using the bulk mode:

1. Press the **SAMPLE** softkey. . .	The scale zeroes itself and the display prompts you to: ***Load all samples or key in sample size. Sample Size = 5***. Five is the default sample size.
2. You can place all the items or parts on the scale or key in a new sample size, X, press the **ENTER** key, then place all X samples on the scale. . .	The display shows ***Standby. . . computing piece weight***, then the display shows the weight and count.
3. Place the items to be counted on the scale. . .	Count and weight are displayed.
4. Repeat step three until you are done with all identical items.	

Counting in Dribble Mode

Follow these steps to perform a counting operation using the dribble mode:

1. Press the **SAMPLE** softkey. . . — The scale zeroes itself and the display prompts you to: ***Load sample, (key in size), press ENTER. Sample Size = 5***. Five is the default sample size.

2. Count out five samples or parts onto the scale

   or

   key in a new sample size, X, press the **ENTER** key, then count out X samples or parts onto the scale and press **ENTER**. . . — The display shows ***Standby. . . computing piece weight***, then the display shows the weight and count.

3. Place the items to be counted on the scale. . . — Count and weight are displayed.

4. Repeat step three until you are done with all identical items.

Counting While Using a Container

To perform a count while using a container, place the container on the scale and press the **SAMPLE** key. The scale automatically zeroes and the scale is ready for bulk or dribble sampling as described in the previous sections.

Entering Numeric Values

When you key in a number on the numeric key pad the display shows new softkey choices. The choices are **P/N**, **PCWT**, **TARE**, **DESC**, **NAME**, **ID**, and **LOC/LOT**, **SET A**, **SET B**. Press one of these softkeys to assign the keyed-in value to that function. The display returns to normal operating mode with the value active as:

P/N = part number

PCWT = piece weight

TARE = tare weight

DESC = part description

NAME = part name

ID = ID number

LOC/LOT = Location/Lot number

SET A = setpoint A
SET B = setpoint B
} (Based on Count Value entered)

Reference the* Service Manual *for hardware interfacing of setpoint I/Os:

Local scale SET A = setpoint I/O #1
Local scale SET B = setpoint I/O #2
Remote scale #1 SET A = setpoint I/O #3
Remote scale #1 SET B = setpoint I/O #4
Remote scale #2 SET A = setpoint I/O #5
Remote scale #2 SET B = setpoint I/O #6

Reverse Counting

If you have a tare weight entered into the PC-820, you can determine the entire count of the container without emptying the container. This is called reverse counting.

1. Place an empty container on the scale and press **TARE** or enter the tare wiehgt via the numeric keypad.

2. Place all parts on the scale and press **SAMPLE**.

3. Remove the sample amount and wait for the scale to re-zero.

4. Place the sample back on the scale. . . — The scale will determine the correct count.

Using the Database

The database is part of the BASIC application which ships with each PC-820 from the factory. Your particular scale's application program may not include this database feature.

All database items are referenced by the PN, therefore the PN is a mandatory item. All other items are optional

The database can hold up to 1000 records. A record can consist of the following:

- Part Number (P/N)
- Tare Weight
- Piece Weight
- Piece Count
- Accumulated Net Weight
- Description
- Transaction Counter

A record in the database can have a maximum of 16 alphanumeric characters for each part number and 16 characters for a description. Following are the steps in entering a part number into the database (The Dbase softkey must be turned on in the configuration menu):

1. Press the **Dbase** softkey.

2. Key in the part number via the keypad and press **Enter**. . . — Scale will respond ***P/N Not Found; Add?***

3. Press the **Yes** softkey and key in the description via the keypad and press **Enter**. . . — The display prompts for a series of information. Ignore these prompts unless you want to enter piece weight, tare weight, etc. If you do follow the screen prompts. If not, got to step 4.

4. Press **Escape**. . . — The PC-820 will store the P/N and Description and will ask if you want to select the P/N.

5. Press **Yes**

6. Place an empty container on the scale and press the **Tare** key. . . — The PC-820 will prompt to see if you want to update the tare weight.

7 Press **Yes**. . . — The tare weight is now updated in the Database.

8. Press **Sample** and perform the sample process. . . — The PC-820 will prompt to see if you want to update the piece weight in the Database

9. Press **Yes**. . . — The piece weight is now updated in the Database

To view the updated record, press the **DBASE** softkey, key in the part number and press **ENTER**, then press the **EDIT** softkey. Press **ENTER** to scroll through the record information.

Below are examples of database records as they would be printed out to a WP-23x printer or a computer.

To eliminate database items from appearing on the printout, do not enter a value for that item. PN is mandatory for database use and will appear in the printout.

Database record as WP-23x output

```
--------------------------------
* MODEL PC-820 ITEM DATA BASE *
LIST:   1-1000
TOTS:   7/1000
TIME: 03:15 PM   DATE: 10-01-98
--------------------------------

P/N : 1

DESC: PETERSON PARTS

PCWT:   0.000350000 lb
TARE:   0.680 lb
TOTNET : 4.95 lb
TOTCOUNT: 14154
TOTTRANS: 3
```

Database record as Computer output

```
Pd 1
dd PETERSON PARTS
tr 0.68 lb
CP  0.000350000  lb
aw 4.98 lb
ar 14154
at 3
```

PC-820 Menus

Information about the scale, testing functions, scale configuration, and calibration are accessed through menus, some of which are protected by passwords. Contact your local Weigh-Tronix distributor for assistance.

Entering the Menu

The display will instruct you how to exit from a display screen. Press **ESCAPE** *to back out of most screens. This will cancel any values you've keyed in. Press* **ENTER** *to accept changed values.*

To enter the menu, press and hold the **ESCAPE** key until the unit beeps. The menu structure is pictured in Figure 2. The words in the rectangles represent softkeys you will see on the display.

Upon entering the menu the display shows the following softkeys:

About Press this softkey to see the scale model name, firmware version, license number and license company of the downloader program, the file name, download time and date the file was downloaded.

Audit Press this softkey to display the calibration and configuration audit counters. The configuration counter increments each time the configuration menu is accessed or when a new configuration file is downloaded. The calibration counter increments each time a base is calibrated. These numbers cannot be erased or changed by the user.

Test Press this softkey to access the test menus for the display, keypad, base QDT® cell or remote loadcells, serial ports, outputs and inputs. Follow prompts on the display to accomplish these tests.

Under BASES the Fc and Ft readings should 47,200 ± 2,000 and raw counts should be 270,000 ± 20,000. The raw counts should also be stable starting with the third digit from the right.

Under SERIAL, Port 1 is COMM#1. Short pins 2 (XMT) and 3 (Recv) to show LOOP.

Port 2 is COMM#2. Short pins 3 (XMT) and 5 (Recv) to show LOOP.

Setup Press this softkey to access the password protected menus. The password for the User menu is 111. Figure 2 illustrates all the items you access in the User menu. Each is explained in the next section: *User Menu*.

The Configuration and Calibration menus are covered in the *Service Manual*.

Off Press this softkey to turn the PC-820 off. Pressing any key will turn the scale on.

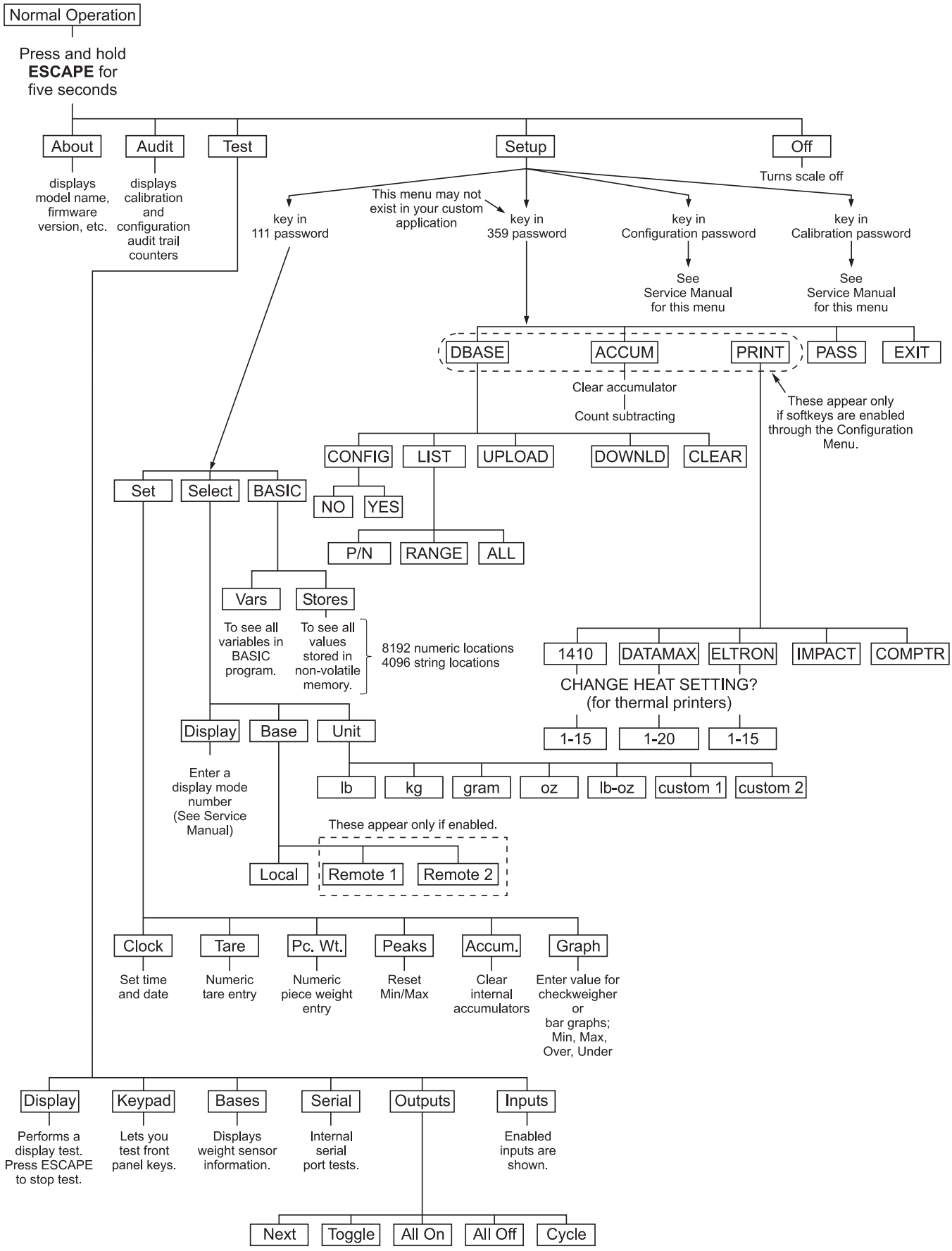


Figure 2
Menu structure

User Menu (Password is 111)

This section covers the User menu. Refer to Figure 2. Access this menu by following these steps:

1. Press and hold the **ESCAPE** key until the scale beeps and new softkeys appear.
2. Press the **SETUP** softkey. . . Scale prompts for a password.
3. Key in 111 and press **ENTER**. . . New softkeys appear: **Set**, **Select** and **BASIC**. Each of these are discussed below.

Set Softkey

Press **Set**:

The following softkeys are displayed:

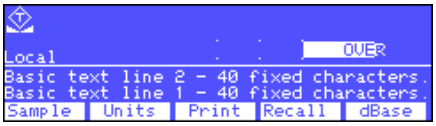
Clock Follow the prompts on the screen to set the time and date.

Tare Prompts you to enter a tare value. Use this when you want to set a long term tare value for all scales. If you set this tare you should disable the **TARE** key. See the Configuration Menu.

Pc. Wt. Prompts you to enter a piece weight value. Use this when you want to set a long term piece weight value. If you set this piece weight you should disable the **SAMPLE** softkey. See the Configuration Menu.

Peaks Prompts if you want to clear the minimum and maximum peak values in memory. Display gives you **YES** and **NO** softkeys.

Accum. Prompts if you want to clear all accumulators. Display gives you **YES** and **NO** softkeys. You are then asked if you want to enable or disable count subtracting. Choose from **YES** or **NO**.



Graph Prompts you to key in values for each of the following values used when in checkweigher display (see sample display at left):

Min for minimum value
Under for lowest acceptable target weight
Over for highest acceptable target weight
Max for maximum value
Basis select the basis from this list of values:

0 = Gross
1 = Net
2 = Tare
3 = Min
4 = Max
5 = ROC
6 = Gross total
7 = Net total
8 = Count total
9 = Transaction total
10 = Count
11 = Variable
12 = Piece weight
13 = ADC

Select Softkey

Press **Select**:

The following softkeys are displayed:

Display You are prompted to enter a display mode number (1-20). See *Appendix A: Available PC-820 Displays* in the *Service Manual*.

Base You are asked to pick the active scale base. Only active bases are offered as choices.

Unit You are asked to select the active unit of measure from this list:

lb, kg, gram, oz, lb-oz, custom 1, custom 2

BASIC Softkey

In this selection you can view the values of all the variables in the BASIC program (**Vars**) and all the values stored in nonvolatile memory (**Stores**).

Under **Vars** are softkeys for moving through the list of variable values:

FIRST Moves to the first variable in the list.

NEXT Moves to the next variable in the list.

EXIT Returns to the previous menu.

Under **Stores** there are two types of volatile memory you can choose to see; numerics or strings. Under each you are given these softkey choices:

Prev Moves to the previous indexed location.

Next Moves to the next variable in the list.

Select Lets you enter the index number you want to recall.

Exit Returns to the BASIC menu.

Below are the memory locations for standard and expanded memory:

	Numeric	String
Standard	0-8191	0-4095
Expanded	0-16383	0-8191

Data Menu (Password is 359)

The data menu is part of the BASIC application which ships with the PC-820. If you are using your own custom application, this menu and these softkeys may not be present on your unit.

Following are instructions for accessing the data menu and descriptions of the items you find there. See important note at left.

1. From normal operation mode, press and hold the **ESCAPE** key until you hear a beep and the softkey selections change. . .
   These softkeys appear: **About**, **Audit**, **Test**, **Setup**, **Off**.
2. Press the **Setup** softkey. . .
   The display prompts you to enter a password.
3. Key in 359 to enter the data menu. . .
   These softkeys appear if your unit has all the functions enabled: **DBASE**, **ACCUM**, **PRINT**, **PASS**, and **EXIT**. See Figure 2.

DBASE Softkey

The **DBASE** softkey is used to access the internal database. These softkeys appear to help manage the database; **CONFIG**, **LIST**, **UPLOAD**, **DOWNLD**, **CLEAR**. Their functions are described below.

CONFIG softkey — Press this and you are asked to answer YES/NO questions. The first is if you want managerial lockout. If you select NO you will see to other questions. The second is if you want to be prompted before updating the piece weight. The first is if you want to be prompted before updating the tare weight.

If you say YES to managerial lockout, data can be recalled from the database but your database is locked and no one can change any entry until the lockout is removed.

LIST softkey — Press the **LIST** softkey to see choices for printing out the database records. Your choices are:

- choose to print an individual record by choosing a single part number
- print a range of records by choosing the first and last part number in the range
- print all the records

UPLOAD softkey — Press this key to transfer database information to a PC or another PC-820 scale. The original database remains in place and a copy is sent to the other device. See *Appendix A* for hyperterminal configuration.

DOWNLD softkey — Press this key to transfer database information from a PC or another PC-820 scale. **If you download, the current database will be erased.**

CLEAR softkey — Press this key and you are given a YES/NO choice about clearing all the database records.

ACCUM Softkey

The **ACCUM** softkey lets you reset or zero all the accumulators. Choose **YES** to clear the accumulators. Choose **NO** to leave them as they are. You are then given the YES/NO option of disabling the Accumulator Count Subtracting function. Enable this to allow subtracting from the Accumulator. Disable it to disallow subtracting from the Accumulator.

PRINT Softkey

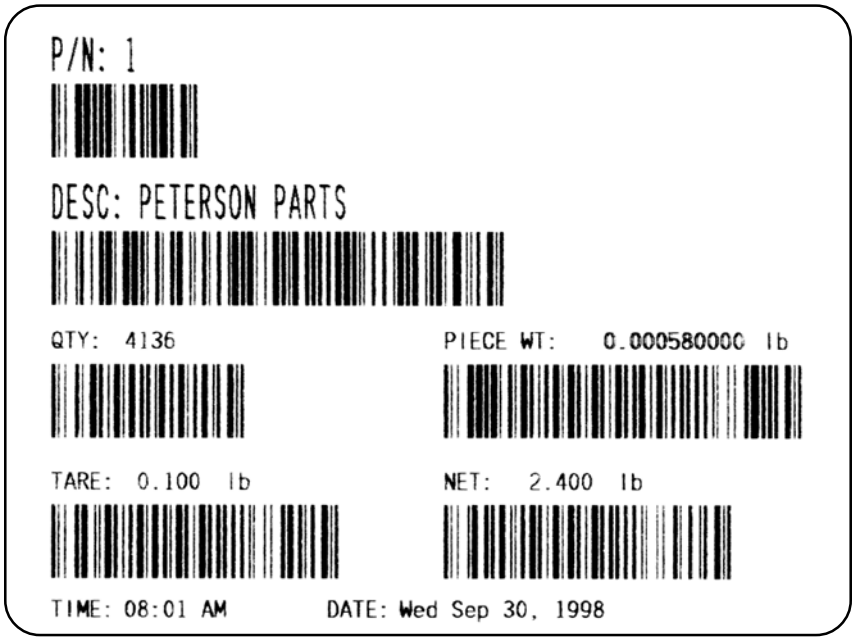
Some softkeys may not be enabled in your configuration. Disregard references to these softkeys in the manual.

Attention

In its from-the-factory configuration, the PC-820 may be connected to one of following label printers —Eltron, Datamax, or 1410, through COM Port 2 only. Impact printers and Computers must be connected through COM Port 1 only.

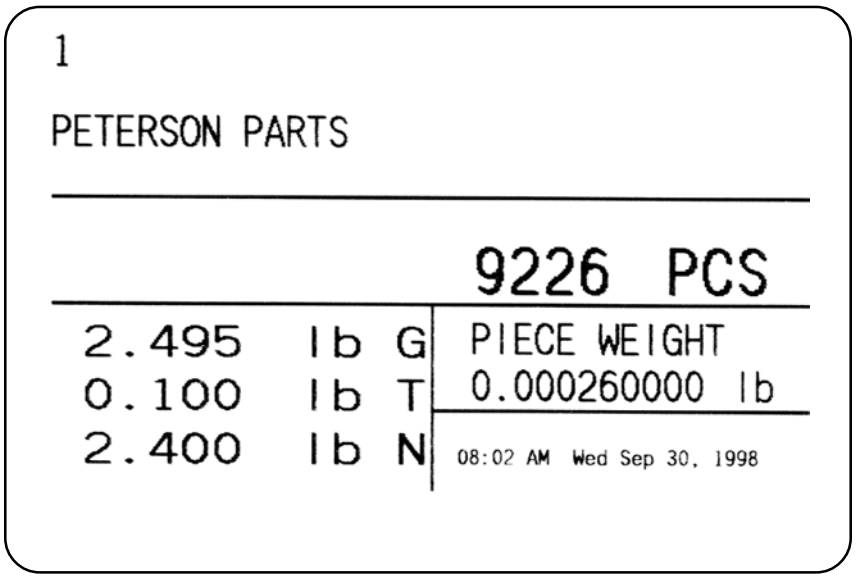
The PC-820 will send a pre-selected print format to a connected printer or computer when the **PRINT** softkey is pressed. (The **PRINT** softkey must be enabled for this to happen. See the *Service Manual*). See Figure 2 to select printer type. Print format for the thermal label is a configuration item. See the *Service Manual*. Below are examples of the different outputs to label printers, tapes printers and a computer. The font size on your label may vary from the examples shown below.

Label Printer Format 1 (4x6 Bar Code Label)



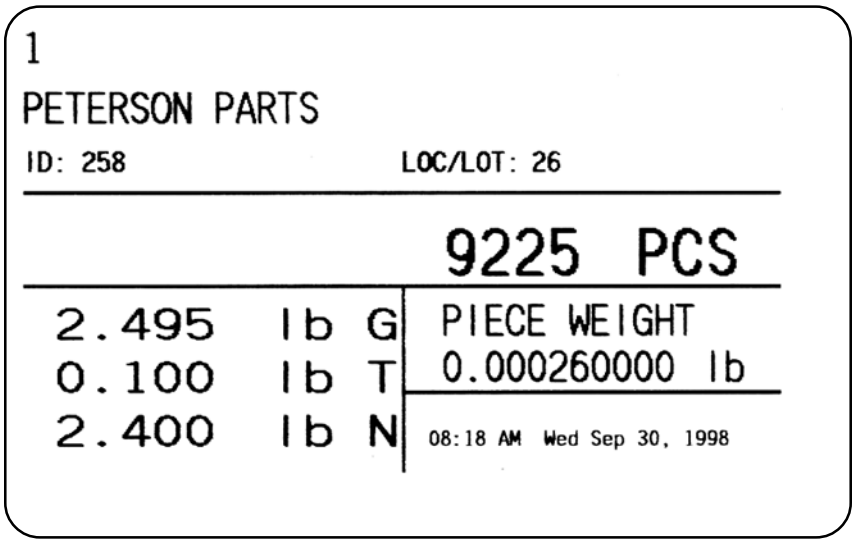
The label contains part number, description, count quantity, piece weight, tare weight, net weight, time and date.

Label Printer Format 2 (4x6 Data Label)



The label contains part number, description, count quantity, piece weight, gross weight, tare weight, net weight, time and date.

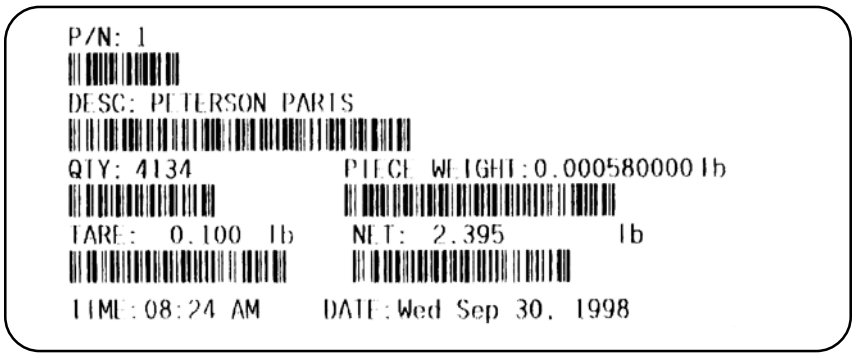
Label Printer Format 3 (4x6 Data Label + ID)



The label contains part number, description, ID number, location/lot number, count quantity, piece weight, gross weight, tare weight, net weight, time and date.

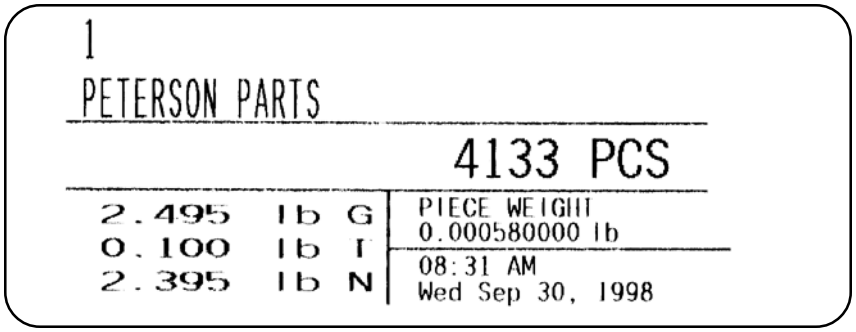
Label Printer Format 4 (2.25x4 Bar Code Label)

Using the Datamax printer will limit the Desc. Barcode to a maximum of 16 characters.



The label contains part number, description, count quantity, piece weight, gross weight, tare weight, net weight, time and date.

Label Printer Format 5 (2.25x4 Data Label)



The label contains part number, description, count quantity, piece weight, tare weight, net weight, time and date.

Impact

When the format is set to Impact (a Lister or WP-23x style impact tape printer), the output will include everythingin the database with a current value and any item currently enabled by your unit's configuration. If everything is enabled, the print output will resemble this example:

PN is mandatory for database operation and will be printed.

```
11:01 AM Wed Sep 30, 1998
P/N :7
DESC: PETERSON PARTS
ID  : 258
LOC/LOT: 26
GROSS :  8.500 lb
TARE  :  1.005 lb
NET   :  7.495 lb
PCWT  : 0.099875833 lb
COUNT :    75
MIN   :  1.015 lb
MAX   :  87.430 lb
ROC   : 0.02
TOTGROSS: 14.495 lb
TOTNET  : 14.295 lb
TOTCOUNT:    125
TOTTRANS:      2
```

If you are outputting to a computer with WP-23x chosen as your default format, the above example will be displayed on your computer screen. Remember, your output will be made up of just the parts of the above list that your PC-820 is configured to show.

The following is an example of on-screen computer responses when sending the commands listed in *Table 3 Computer commands and responses*:

```
pd 7
dd PETERSON PARTS

id 258
lt 26
wg  8.500 lb
tr  1.005 lb
we  7.495 lb
cp 0.099875833 lb
cc   75
aw  14.495 lb
ar   125
at     2
td 11:02 AM Wed Sep 30, 1998
```

After you choose Impact printer as your printer of choice, you are asked if you want 80/132 Column Line Print. Choose Yes or No.

Changing Heat Settings

If you choose one of the thermal printers (1410, Datamax or Eltron), you are given the chance to change the heat setting. This affects the contrast of the printed output. Choose higher numbers for darker printing. See the menu in Figure 2.

PASS Softkey

The **PASS** softkey allows you to change the 359 password to whatever you would like. When you press this softkey you are asked if you want to change the password. If so, press the **YES** softkey. You can key in a new password, press **ENTER** and the unit returns to the data menu with the new password in effect. If the user's password is changed and forgotten, the scale must be reprogrammed by your Weigh-Tronix representative. **All data may be lost.**

EXIT Softkey

Press the **EXIT** softkey to return to normal operation mode.

Serial Communication

Com1 is a 9-pin DE type connector at the rear of the PC-820. The functional pin out is as follows:

PIN NO.	RS-232	QDT
1	No conn.	+7.5 VDC
2	RECV	RECV B (RS485)
3	XMIT	XMIT B (RS485)
4	No conn.	No connection.
5	Sig gnd	Sig gnd
6	+5.0 VDC	No connection.
7	RTS	XMIT A (RS485)
8	CTS	REC A (RS485)
9	No conn.	No connection.

Table 1
Com 1 pin outs

Com 2 is a 15 pin DE type connector at the rear of the PC-820. The functional pin out is as follows:

PIN NO.	SIGNAL NAME	DEVICE USED WITH	SPECIAL NOTES
1	RECV (TTL)	Keyboard: TTL	DATA IN (do not gnd)
2	RECV (RS-232-B)	Magnetic Card Reader, Keyboard: RS-232	DATA IN (do not gnd)
3	RECV (RS-232-A)	Scanner: RS-232	DATA IN (do not gnd)
4	+5.0 VDC	Scanner	(do not gnd)
5	XMIT	Printer, Computer, Remote Display, Modem RF link, IR link: RS-232	DATA OUT
6	SDA	SSCU	EXTERNAL I/O CONTROL
7	SCL	SSCU	EXTERNAL I/O CONTROL
8	INT #	SSCU	EXTERNAL I/O CONTROL
9	+5.0 VDC	Keyboard	
10	GROUND (GND)	Keyboard	
11	GROUND (GND)	Scanner	
12	GROUND (GND) (RS-232)	Printer, Computer, Remote Display, Modem RF link, IR link: RS-232	
13	GROUND (GND)	SSCU	EXTERNAL I/O CONTROL
14	+5.0 VDC	SSCU	EXTERNAL I/O CONTROL
15	RESET #	SSCU	EXTERNAL I/O CONTROL

NOTE: "# " designates "Active Low Signal"

Table 2
Com 2 pin outs

This section describes the command set and protocol for interfacing a personal computer (PC) or a Bar Code Scanner with the PC-820.

The computer interface for the PC-820 will support bidirectional communication in a master/slave protocol. The computer (master) will send a command code sequence to the scale (slave) which will respond by returning the requested data or by performing the specified scale function. Commands to the scale will be in uppercase and will be terminated with a carriage return character. Scale responses will begin with the lowercase equivalent of the command code.

COMMAND	RESPONSE	DESCRIPTION
AC<CR>		Accumulate present count/weight
AR<CR>	ar_xxxxx<CR>	Request accumulator count
AW<CR>	aw_x.xx_U<CR>	Request accumulator weight with units
AT<CR>	at_xxx<CR>	Request accumulator transaction count
AZ<CR>		Clear accumulator & transaction counter
CA<CR>		Clear sample
CC<CR>	cc_xxxxxxx<CR>	Request count value
CP<CR>	cp_x.xx_U<CR>	Request piece weight value
DB<CR>		Sound beeper
DC<CR>		Clear description
DD<CR>	dd_sssssss<CR>	Request description
DSssssssss<CR>		Enter description
IC<CR>		Clears invalid information
ID<CR>	id_ssssssss<CR>	Requests stored ID
LT<CR>	lt_xxxxxx<CR>	Requests stored lot number
NM<CR>	nm_sssssss<CR>	Requests stored name
PC<CR>		Clear part number
PD<CR>	pd_sssssss<CR>	Requests part number
PSssssssss<CR>		Enter part number
PWx.xx_U<CR>		Enter piece weight
TD<CR>	td_hh:mm_AP_www_dd._yy	Requests time and date
TR<CR>	tr_x.xx_U<CR>	Request tare value
TZ<CR>		Clear current tare value
Tx.xx_U<CR>		Enter tare value
T<CR>		Tare the scale
U<CR>		Changes unit of measure
WB<CR>	wb_x<CR>	Request base number
WCx<CR>		Switch to base x
WD<CR>	wd_x.xx<CR>	Request net weight
WE<CR>	we_x.xx_U<CR>	Request net weight with units
WG<CR>	wg_x.xx_U<CR>	Request gross weight with units
WR<CR>	wr_x.xx<CR>	Request net weight (unrounded in current unit of meas.)
WS<CR>	ws_HML<CR>	Request scale status
WZ<CR>		Zero the scale
W<CR>	w_x.xx_U_HML<CR>	Request net weight with units and status
ZZ<CR>	zz_sss<CR>	Shows software revision
UNRECOGNIZED	<LF>?<CR>	Unrecognized command response

'_' ASCII space character

'U' units of measure characters:
"LB" for pounds
"KG" for kilograms
"GM" for grams

<CR> ASCII carriage return character

HML represents the three bytes of scale status information as described on the next page.

x.xx represents a floating point ASCII string value that can have a varying number of digits to the left and right of the decimal point location. Also there may be a leading '-' (minus sign) character to indicate negative polarity.

s alphanumeric characters

hh hours

mm minutes

AP AM or PM

www day of week

dd day of month

yyy year

Table 3
Computer commands and responses

Scale Status Byte Definitions

Status allows for the detection of scale conditions by way of serial transmission of bytes.

1 is a Logic Hi
0 is a Logic Low

This serial data may be used by a computer.

Status Byte H:

bit: 76543210
set: 0011XXXX

- 1: in motion
- 1: at zero (center zero)
- 1: under capacity
- 1: tare active

Status Byte M:

bit: 76543210
set: 0011XXXX

- 1: negative
- 1: over capacity
- 1: PROM checksum error
- 1: faulty calibration

Status Byte H:

bit: 76543210
set: 0011XXX0

- 1: low battery
- 1: unused
- 1: unused
- 1: unused

Power and Battery Information

Power Supply

The PC-820 and PC-821 have (2) configurable power saving sleep modes to extend the battery life; (1) to turn off the backlight and (1) to shut down the scale.

The following table shows the capabilities of the PC-820 regarding the options the standard power supply (730mA) can support:

System Number	Remote Quartzell Bases	Remote Analog Load Cells	Scanner	Keyboard	Opto 22 Modules (Cutoffs)
1	1	4	Yes	Yes	18
2	1	8	Yes	No	6
3	1	8	No	Yes	0
4	0	8	Yes	Yes	4
5	0	10	Yes	No	0
6	0	10	No	Yes	0
7	0	10	No	No	5

The following table shows the capabilities of the PC-821 regarding the options the standard power supply (730mA) can support:

System Number	Remote Quartzell Bases	Remote Analog Load Cells	Scanner	Keyboard	Opto 22 Modules (Cutoffs)
1	1	12	Yes	Yes	13

Battery Power

The PC-820 uses two 6 volt 3.2 amp-hour rechargeable gel-cell lead acid batteries wired in series for 12 volts. Internal battery option should reach full charge in 4-6 hours.

The BP-25R uses a 12 volt 6.5 amp-hour rechargeable gel-cell lead acid battery. The PB-25R for the PC-820 comes with a cable that has a connector that plugs directly into the PC-820. The BP-25R should fully recharge in 8-10 hours. The LED may not come one for several minutes if the battery is extremely low.

Frequently Asked Questions

How does dual scale operation affect battery life?

Scale	Internal 3.2 A-Hr	BP-25R 6.5 A-Hr
PC-821	19 Hours	38 Hours
PC-821 with Remote Base	14 Hours	28 hours
PC-820	9 Hours	18 Hours
PC-820 with Remote Base	7 hours	14 Hours

Can I add an internal battery?
You can add an internal battery at a later date by ordering a battery kit that is installed by removing the weigh bridge.

What does the on/off switch on the front of the BP-25R do?
The switch controls the DC power out of the battery pack.

Can I charge the BP-25R while running the PC-820/821?
No. When you charge the BP-25R you must disconnect it from the PC-820/821. If you charge the BP-25R while it is connected to the PC-820/821 the battery pack will be damaged.

How do you know if the internal battery is charging?
Make sure the unit is plugged-in by pressing any key to verify that the unit turns on and that ***low batt*** is not visible on the display. To enable the maxi

mum amount of current to charge the battery, press the **OFF** key. Lift off the platter and look into the hole near the live-end of the Quartzell. When the green light emitting diode (LED) is off, the battery is charging. When the green LED is flashing, the battery is about 90% charged. (Note that the battery is only maintained while the unit is operating while plugged-in, it may not recharge unless the unit is turned off.)

How do I know if the BP-25R is charging?
To monitor the recharging of the BP-25R, the LED on the front of the battery pack next to the on/off switch remains steadily lit as the battery is being charged. The LED then begins blinking as the battery nears its full charge. This is at approximately 90% of full charge.

How do we know if the internal battery is charged?
With the unit plugged-in and turned off, lift off the platter and look into the hole near the live-end of the Quartzell, when the green light emitting diode (LED) is on, the battery is fully charged. When the green LED is flashing, the battery is about 90% charged. When the voltage reaches 14.5 volts, the charger turns off and the LED turns on. When the battery voltage drops below 13.5 volts, the charger turns back on and the LED turns off. This feature makes it impossible to over-charge the battery.

How do I know if the BP-25R is charged?
The annunciator on the front panel of the BP-25R turns off when the battery pack is fully charged and ready to be reconnected to the PC-820/821. With this charger, the battery pack cannot be overcharged. After recharging, the battery can be left “on charge” indefinitely.

How do we know if the battery is out of juice and/or dead?
The PC-820/821 will flash ***low batt*** when it is time to recharge the battery at about 11.5 volts. After 'low batt' comes on, the PC-821 will operate about 4 more hours and the PC-820 will operate about 2 more hours. If the unit is allowed to keep operating, it will turn itself off when the battery is fully discharged at about 10.5 volts. If the battery is discharged, the unit may turn on when a key is pressed and then turn off right away.

How can we extend the useful life on the battery?
Even if the unit is used for only a few hours, it is best to plug it in to bring the battery to full charge. The number of charge/discharge cycles goes from 200 to 500 if the battery is discharged to 50% of its capacity versus discharging it until it is dead.

Since the amount of energy storage per pound or cubic inch is a little higher for the nicad batteries, why do we use the lead acid batteries?
(a.) The cost of the lead acid battery is about one half that for the NiCad battery.

(b.) The lead acid battery is easier to recharge and doesn't require a fancy (smart) charger. When the lead acid battery is fully charged, its voltage increases so with a constant voltage charger, the charging current automatically decreases to zero when the battery is fully charged.

(c.) The lead acid battery only loses 0.2% of its charge per day just sitting there while a nicad loses 1 to 2% per day.

Appendix A: Hyperterminal Configuration For Upload/Download Of PC-820 Database Text Files

Direct to Com1 or Com2	9600 Baud
Under properties	8 Data Bits
"Phone number"	No Parity
	1 Stop Bit
	Hardware Flow Control (Requires CTS & RTS Lines)

Under "Settings"
Function & Ctrl keys act as "Terminal Keys"
VT100 Emulation

Under "Terminal Setup"	ASCII Character Setup
Under "ASCII Setup"	Send line ends with line feeds (CHECK)
Sending.	ECHO typed characters locally (CHECK)
	200 Milliseconds line delay
	0 Milliseconds character delay
ASCII Receiving.	Remove check for " Append line feeds to incoming line ends"

To Download A Database Text File

Open hyperterminal
Select "transfer"
Select "send text file"
Setup pc820 for "download
Select appropriate database text file (*.txt) & open

Download/Upload Database Text File Format

Each item of a database record should be followed by a comma (",") except for the last item of the record which should be followed by a carriage return (ascii decimal 13) and a line feed (ascii decimal 10). An additional carrage return (ascii decimal 13) and a line feed (ascii decimal 10) should be appended to the last record in the database file.

Each record **must** contain the following (variable length) items in the following order:

- Part number (alphanumeric;up to 16 characters)
- Tare weight (in calibration unit)
- Piece weight (in calibration unit)
- Total piece count (integer)
- Accumulated total net weight
- Part description (alphanumeric; up to 32 characters)
- Total number of transactions (integer)

The pc application used for database transfer must have cts/rts handshaking enabled.

Transfer Times

Download transfers (from pc to pc 820) will require approximately *20 minutes for every 500 records.

Upload transfers (from pc 820 to pc) will require approximately 15 minutes for every 500 records.

Avery Weigh-Tronix

Avery Weigh-Tronix USA
1000 Armstrong Dr.
Fairmont MN 56031 USA
Tel: 507-238-4461
Fax: 507-238-4195
Email: usinfo@awtxglobal.com
www.wtxweb.com

Avery Weigh-Tronix UK
Foundry Lane,
Smethwick, West Midlands,
England B66 2LP
Tel: +44 (0) 8453 66 77 88
Fax: +44 (0)121 224 8183
Email: info@awtxglobal.com
www.averyweigh-tronix.com

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