PENNSYLVANIA

Pennsylvania Scale Company

Model 7500 Scales
&
7500/4 Indicator
Operation
&
Calibration
Manual

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SECTION 1

INTRODUCTION

This manual covers the **Operations and Programming/Calibration of the Pennsylvania Model 7500 series scales and indicators.**

The **7500** is designed to be simple and easy to operate. But has many features that make it extremely versatile to use, such as:

- Standard RS-232 Interface with a selectable output for communications with a computer or printer
- Adjustable response time
- Optional remote displays
- Single board electronics for ease of servicing
- Simple one button counting operation
- Weight reading may be switched between two weighing units

In addition, the **7500** employs a digital calibration technique that allows calibration with the keypad or through the RS-232 Interface. The calibration is designed to simplify matching the scale to the requirements of your application.

INSTALLATION and SET-UP INSTRUCTIONS (Scale Version)

The 7500 Series Scale has been packaged for shipment to ensure safe, damage-free arrival. Please use reasonable care when removing the unit from the shipping carton and retain the original packaging materials in case reshipment is required.

NOTE: TO PROTECT THE WARRANTY, FILL OUT AND RETURN THE WARRANTY CARD AND THE SCALE CONDITION REPORT.

To prepare the 7500 for operation, follow the procedure outlined below:

1. After opening the shipping carton, remove the molded foam top from the carton. (*On 2# and 5# capacity scales, the platform is packaged on top of this foam. Remove it first and lay it aside.*)

2. Gently lift and remove the stainless steel platform cover only. (*On 2# and 5# capacity scales, the platform is packaged separately and does not need to be removed.*)

3. Remove any options which may be packed with the scale.

4. Carefully remove scale from the packaging by grasping both sides of the base.

NOTE: DO NOT LIFT THE SCALE BY THE TOP SPIDER OR THE SUB-PLATFORM ASSEMBLY.

5. Place the scale on a stable, level surface for operation.

6. Adjust the corner leveling feet until the level bubble indicates the unit is level. Firmly tighten hex jam nuts on the leveling feet. (*Any time the scale is relocated, it should be leveled.*)

7. Remove the protective plastic wrap from the platform and place the platform on the spider.

To activate the scale, plug the line cord into any grounded 50/60 hertz 120 volt outlet. The scale will first display the version number of the software installed followed by its diagnostic countdown process. During this countdown, the display will show 9.9.9.9.9.9. through 0.0.0.0.0.0., each number representing a self-diagnostic test which verifies scale operation. If the scale should fail any of these tests the display will freeze on that number.

(*The diagnostic failure may be bypassed by pressing the ZERO button.*) The serial interface on all models will also transmit the test numbers.

INSTALLATION AND SET-UP INSTRUCTIONS (7500/4 Indicator)

The **7500/4** Indicator has been packaged for shipment to ensure safe, damage-free arrival. Please use reasonable care when removing the unit from the shipping carton, and retain the original packaging materials in case reshipment is required.

NOTE: TO PROTECT THE WARRANTY, FILL OUT AND RETURN THE WARRANTY CARD AND THE SCALE CONDITION REPORT.

The **7500/4** Indicator is designed to be used with a standard load cell type weighing platform. This platform may have a 1, 2 or 3 mv/v sensitivity and a bridge resistance of 87 to 2000 ohms.

CONNECTING THE 7500/4 IN NON-WASHDOWN APPLICATIONS

All Pensylvania Scale non-washdown weighing platforms are shipped with the proper mating connector and need only to be plugged into the round CPC style connector on the bottom of the indicator.

If your 7500/4 indicator is to be attached to a platform of a manufacture other that Pennsylvania, a mating CPC connector may be ordered and attached top the platform cable.(This connector is available as a kit form your Pennsylvania distributor, order Part Number 48445). Or you may follow the connecting instructions for washdown applications, this will not require the CPC connector. The CPC connector wiring assignments are as follows:

CONNERTOR PIN #	FUNCTION
1	+ Signal
2	- Signal
3	Ground
4	Key
5	- Sense
6	- Excitation
7	+ Signal
8	+ Excitation

NOTE: If a four wire hook up is used, short connector pins 7 and 8 together.

CONNECTING THE 7500/4 IN WASHDOWN APPLICATIONS:

Open the 7500/4 enclosure by removing the screws holding on the back plate. Carefully remove the back plate from the indicator. The main circuit board is mounted to the back plate. On the main circuit board, locate the load cell terminal block labeled P11. A white dot on the circuit board denotes the location of pin #1 on the terminal block. Insert the scale platform cable through the watertight Heyco bushing supplied on the indicator housing and feed it up to the load cell terminal block. Insert the wires from the load cell cable into the terminal block using a small screwdriver to tighten the connection for each wire. The following chart shows the proper wiring for the terminal block.

WIRE COLOR *(Pennsylvania Scale Platforms)*	**FUNCTION LOCATION**	**TERMINAL**
GREEN	+ SIGNAL	# 1
WHITE	- SIGNAL	# 2
SHIELD	SHIELD	# 3
-------	-------	# 4
BLACK	- SENSE	# 5
BLUE	- EXCITATION	# 6
RED	+ SENSE	# 7
BROWN *(or ORANGE)*	+ EXCITATION	# 8

A four wire load cell hook up may be used but is not recommended. If a four wire hook up is necessary, short the + EXCITATION to the + SENSE on the terminal block.

After attaching your 7600/4 Indicator to a platform, it may be activated by plugging the line cord into any grounded 50/60 hertz 120 volt outlet (220 volts, if this option was ordered). The 7600/4 will begin a diagnostic countdown. During this countdown, the display will first show the version number of the software, followed by 9.9.9.9.9.9. through 0.0.0.0.0.0. Each number representing a self -diagnostic test to verify operation of important unit functions. If the indicator should fail any of these tests, the display will freeze on that number. (A diagnostic failure may be by-passed by pressing the CHECK button.)

The serial interface will also transmit the test numbers. The following table lists each test and it corresponding display.

DIAGNOSTICS

DISPLAY	DIAGNOSTIC FUNCTION
9.9.9.9.9.9.	EPROM Checksum, light all LEDS
8.8.8.8.8.8.	RAM check
7.7.7.7.7.7.	No Test
6.6.6.6.6.6.	Check switches not shorted
5.5.5.5.5.5.	No Test
4.4.4.4.4.4.	Check load cell excitation voltage
3.3.3.3.3.3.	Analog verify (checks output from analog to digital)
2.2.2.2.2.2.	Load CFG EEPROM, test virgin, checksum, initialize on error
1.1.1.1.1.1.	Load CAL EEPROM, test virgin, checksum, initialize on error
0.0.0.0.0.0.	No Test
- - - - - -	Initializing system (may take several seconds)

After the countdown is completed, the scale performs an initial zeroing of the system. No weight should be on the platform at this time.

NOTE: Allow at least 20 minutes for initial warm-up and load cell stabilization.

If you have the scale version of the 7600, it will have already been calibrated at the factory. If your 7600 is an indicator and was matched to its platform at the factory or by your distributor, it is now ready for operation. If not, please refer to Section II of this manual, the "Calibration & Programming", for instructions on matching and calibrating the system.

OPERATION

OPERATIONAL FEATURES

The following features are available on the 7500 series.

Overload - If the weight exceeds 105% of full capacity, the scale will read out "OLOLOL", meaning overload.

Underload - If the weight is below -3% of full capacity, the scale will read out "ULULUL", meaning system underload.

Automatic Zero Tracking - Maintains the system zero to within +/- 1/4 of the display resolution (The resolution being the smallest increment the scale is programmed to read). AZT increases the overall accuracy of the system by removing errors at zero caused by accumulation of debris on the base/container or minor drifts in the electronics or load cell.

Four Selectable Sample Sizes - Four different sample sizes may be entered into the scale memory during programming.

Sample Update - Piece weight accuracy may be improved after the initial sample by adding a quantity of parts to the platform less then the original sample. When this is done the scale will recalculate the piece weight, display the message "UPdAtE" for 2 seconds and then return to the counting mode.

Disable Count - The counting mode may be turned off during programming, allowing the **7500** to be used as a weigh only indicator or scale. (Refer to the Calibration and Programming Manual in Section 2 of this manual for further information.)

CONNECTORS

The following connectors may be accessed through the opening on the bottom of the scale version, or internally on the 7500/4.

D-Subminiature Connector (9-pin) - Used with RS-232 Interface. (found on the inside of the stainless steel models)

Remote Display Connector - Used to connect a remote display option to the indicator. (found on the inside of the stainless steel models)

DISPLAYS AND INDICATORS

Weight Display - Indicates weight when the scale is weighing. Indicates count when scale is in the counting mode, and displays messages during calibration and sample set operations.

Zero Indicator - Illuminates when the weight is within +/-1/4 of the display resolution of system zero.

Count Indicator - Illuminates when the scale is in the count mode.

Primary Weighing Unit Indicator - Illuminates when the weight displayed is in the primary weighing unit.

Secondary Weighing Unit Indicator - Illuminates when the weight displayed is in the secondary weighing unit.

PUSH-BUTTON FUNCTIONS

ZERO Push-button - Sets scale to zero, functions as a CONTINUE switch during the self-diagnostic check. (i.e. If the meter stops at a diagnostic, check number. The switch may be pressed to resume the count down).

SAMPLE SET Push-Button - When being used as a counting indicator, this button enters the scale into the sampling mode.

UNITS Push-button - Pressing this button cycles the scale between the Primary weighing unit, the secondary weighing unit and the count mode. Pressing and holding this button for four seconds will cause the current software version to be displayed.

PRINT Push-button - Transmits formatted print to any device connected to the RS-232 port. Holding this push-button for four seconds will access the count and RS-232 configuration modes. (Refer to the Calibration and Programming Manual for further information.)

WEIGHING

WEIGHING WITHOUT TARE

- Remove any items setting on the weighing platform
- Press the UNITS button to select either the Primary or secondary weighing unit (Associated indicator will be lit.)
- Establish a base zero by pressing the ZERO button with nothing on the weighing platform. (This clears any existing weights.)
- Place the item(s) to be weighed on the platform and read the weight on the display.

NOTE: **If very light items (less then 1/4 of the display resolution) are placed on the platform individually, the weight may be zeroed off by the AZT feature. Add light items to the platform simultaneously.**

WEIGHING WITH TARE

- Remove any items from the weighing platform and press ZERO.
- Press the UNITS button to select either the Primary or the Secondary weighing unit. (Associated indicator will be lit.)
- Establish the tare weight by placing the container or object to be tared-off on the platform and press ZERO. The scale will display the net weight.
- Place the objects to be weighed in the container and read the net weight on the display. To clear a tare value, remove all weight from the scale, press ZERO.

COUNTING

COUNTING WITHOUT SAMPLE UPDATE

- Remove all objects from the weighing platform and press ZERO.
- If a container will be used to hold the parts being counted, place the empty container onto the platform at this time.
- Press the SAMPLE SET button. (Anything sitting on the scale at this time will be zeroed off.)
- Scale will display "Add xx" (xx is one of the four samples entered into the scale during programming. As the scale is shipped from the factory, "Add 10" will be displayed first.) In this mode, each time the SAMPLE SET button is pressed the next sample size will be displayed. The larger the sample size, the more accurate the count. This is especially true for very light parts.
- Count out the quantity of parts displayed and place them onto the platform all at one time.
- Scale will display "- - - - - -" for about 2 seconds and then display the count. The remainder of the parts to be counted may now be added to the scale at any time.

COUNTING WITH SAMPLE UPDATE

- Remove all objects from the scale platform and press ZERO.
- If a container will be used to hold the parts being counted, place the empty container onto the platform at this time.
- Press the SAMPLE SET button. (Anything sitting on the scale at this time will be zeroed off.)
- Scale will display "Add xx" (xx is one of the four samples entered into the scale during programming. As the scale is shipped from the factory. "Add 10" will be displayed first.) In this mode, each time the SAMPLE SET button is pressed the next sample size will be displayed. The larger the sample size, the more accurate the count. This is especially true for very light parts.
- Count out the quantity of parts displayed and place them onto the platform all at one time.

COUNTING WITH SAMPLE UPDATE *(cont'd.)*

- Scale will display "- - - - - -" for about 2 seconds and then display the count.

- The count accuracy can now be improved by randomly adding quantities of parts that are greater then one but less then the original sample. The scale will count these parts as they are placed onto the platform and then display "UPdAtE" for 2 seconds, during which time the scale will recalculate the piece weight using the new, larger sample. This may continue indefinitely during the counting process as long as the amount of parts added is less then the original sample.

The update feature is disabled when a quantity of parts greater then the original sample is added to the scale all at one time or the original sample is removed from the scale and the scale is allowed to return to zero. Once the update has been disabled, it will remain so until the SAMPLE SET button is used to acquire a new sample.

With the update feature, it is not necessary to hand count large quantities of small parts in order to improve the count accuracy when sampling.

BI-DIRECTIONAL SERIAL ASCII INTERFACE

INTRODUCTION

The **7500** Serial Ascii Interface is an RS-232C, TTL-compatible, asynchronous serial interface capable of bi-directional transmission of scale data.

This interface features programmable baud rates, word lengths, stop bits, parity, address number and a formatted print.

COMMUNICATION CAPABILITIES

The interface provides three basic types of communication with the Model **7500:**

1. Transmission of a predetermined (at set-up time) array of information for formatted printing. This may be initiated by pressing the PRINT push-button or by sending "SRP"<CR> ("Send Requested Print") command to the unit. The scale is shipped from the factory set up to send the gross weight when the PRINT button is pressed.

2. Transmission and alteration of specific data upon request from an external device.

3. Alteration of the unit's operating mode upon request from an external device.

4. Alteration of scale Calibration and RS-232 communications parameters and print formatting information. *(Refer to the "Programming and Calibration – Section 2" of this manual for more information.)*

RS-232 PIN ASSIGNMENTS AND IMPLEMENTED FUNCTIONS

Connection to the Serial Port is made via a DB-9 female connector found inside the indicator or on the bottom access on the scale.

PIN	EIA CODE	FUNCTION	DIRECTION
2	BB	Transmit Data	Output
3	BA	Receive Data	Input
5	AB	Signal Ground	-
6	CC	Data-Set Ready (DSR)	Output
7	CB	Clear to Send (CTS)	Input
8	CA	Request to Send (RTS)	Output

NOTE: All remaining pins are currently unused and unconnected. For simple terminal usage where the data rate does not exceed either machine's capacity to process it, only pins 2, 3 and 5 have to be connected.

TYPICAL CABLE WIRING: To connect to an IBM AT or compatible use a cable with one male and one female DB-9 connector with all nine pins connected straight through.

RS-232 COMMUNICATIONS PARAMETERS

The unit leaves the factory with the following default communication settings :

BAUD	300
WORD LENGTH	7 bits
STOP BITS	1
PARITY	ODD

These settings may be changed using the local or remote display keyboard, or RS-232 Interface commands. If the RS-232 Interface is used, initial communication with the computer or terminal must be established using the above settings. To return the RS-232 settings to the above default values:

1. Unplug the unit power cord or otherwise remove power.
2. Depress the internal Calibrate button.
3. Plug in (or energize) the unit and continue to hold the calibrate button for 5 seconds.

For information on how to reconfigure the RS-232 parameters, refer to the "Calibration and Programming Manual".

COMMAND FORMATS

The Model **7500** can be controlled from an external device (such as a computer or terminal) by various commands, each three letters long, which represent related English phrases or words. For example, to tell the scale to zero, type ZRO followed by a carriage return.

When the scale receives command strings, they are first placed in a 125-character buffer. If many commands are sent to the scale at high baud rates, it is possible to completely fill this buffer and data will be lost. Be sure to send commands to the scale at a rate which does not exceed 125 characters every 500 ms.

The basic command formats are:

1. [<add>]<cmd><cr>
2. <cmd> [<flt>]<cr>

Where <cmd> is a three-letter command, <add> is a scale address number (0-255), <cr> represents a carriage return, and <flt> is a mixed number, the brackets [ ] are used to indicate an optional part of the command.

The following are some examples of command formats:

Command format 1:

SRP<cr>	Send a formatted print

Command format 2:

ITW 13.43<cr>	Instructs scale to set tare weight to 13.43 in the current unit

Command format 3:

5 SGW<cr>	Instructs the scale with address #5 to send the gross weight

MODEL 7500 RS-232 SCALE COMMANDS

General Commands

ATW	Acquire Tare Weight
CHK	Initiate self-diagnostics CHecK
LCK	LoCK out keypad
PON	Power ON
POF	Power OFf
RES	RESet, clears tare weight and piece weight
SCM	Select Count Mode
SSS	Select Sample Size
SWM	Select Weight Mode
UCK	UnloCK keypad
UNP	UNit Primary
UNS	UNit Secondary
ZRO	ZeRO scale

Commands Which Enter Information into the Unit

IPW [FLOATING POINT NUMBER]	Input Piece Weight
ITW [FLOATING POINT NUMBER]	Input Tare Weight

Commands Which Request Information

SAI	Send All Information
SAO	Send Abbreviated Output (same as SRP)
SCI	Send Configuration Information
SCO	Send COunt
SDT	Send DaTe (with time and date option only)
SGW	Send Gross Weight
SMI	Send Metrological Information
SNW	Send Net Weight
SPC	Send Print Codes
SPW	Send Piece Weight
SRP	Send Requested Print
SSZ	Send Sample siZe
STM	Send TiMe (with time and date option only)
STW	Send Tare Weight
SVN	Send Software Version Number

Calibrate and Configure Commands

CAL	CALibrate - Same as pressing SW4 button.
CFC	ConFigure Communication - To set baud rate etc.
CFP	ConFigure Print codes - To enter print codes.
CLE	CaLibration End - To save calibration data.
CLP	CaLibrate Primary - To set-up primary calibration data.
CLS	CaLibrate Secondary - To set-up secondary calibration data.
CLU	CaLibration Unstable - To set-up print stable/unstable.
CLW	CaLibration Weight - To calibrate with weights.

NOTES: **All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.**

All calibrate and configure commands are further explained in the "Calibration and Programming Section of this Manual".

SAMPLE COMPUTER PROGRAM

The **7500** Series RS-232 Interface may be tested by connecting it to a terminal with an RS-232 port or a computer with an RS-232 and a terminal program. If a terminal program is not available, the following program is provided for an IBM PC or compatible using BASICA, MBASIC or QuickBASIC.

```
10 ' Terminal Program written for BASIC Programming Language
20 ' provided by Pennsylvania Scale Company
30 '
40 DEFINT A-Z
50 FALSE = 0: TRUE = NOT (FALSE)
60 KEY OFF: CLS : LOCATE 25, 1
70 PRINT SPACE$(20); "Press Alt-X to Exit Terminal Program"
80 LOCATE 1, 1
90 OPEN "Com1:300,o,7,1" FOR RANDOM AS #1 'Handshaking Enabled
100 OPEN "test.dta" FOR OUTPUT AS #2
110 WHILE NOT (QUIT)
120 KEYBOARDINPUT$ = INKEY$
130 IF KEYBOARDINPUT$ = CHR$(0) + CHR$(45) THEN QUIT = TRUE
140 IF KEYBOARDINPUT$ <> " " THEN PRINT #1, KEYBOARDINPUT$;
150 IF LOC(1) > 0 THEN
160 SCALEINPUT$ = INPUT$ (LOC(1), #1)
170 PRINT SCALEINPUT$;       'Writes data from scale to screen
180 LPRINT SCALEINPUT$;      'Writes data from scale to printer
190 PRINT #2, SCALEINPUT$; 'Writes data from scale to file
200 END IF
210 WEND
220 END
```

See notes on following page.

NOTES:

Omit line 180 if data is not to be sent to the printer.

Omit lines 100 and 190 if data is not to be written to a file.

In line 100, the word "OUTPUT" opens the file "test.dta", deleting any data that was in the file before this program was started. If you want to preserve the contents on the file "test.dta" from one session to another, replace the word OUTPUT with APPEND on line 100.

Line 90 opens the serial communications port, using 300 baud, Odd parity, 7 data bits and 1 stop bit. These represent the default settings for the scale, other entries may be used if the scale settings have been changed. Valid entries for baud rate are 300, 600, 2400, 4800, 9600 or 19200. Valid entries for parity are N (none), E (even), or O (odd). Valid entries for data bits are 7 or 8. Valid entries for stop bits are 1 or 2. Com2 may be used if the scale is attached to serial communications port #2.

To eliminate the need for attaching the handshaking lines in the cable between the scale and the computer, change line 90 to read:

90 OPEN "Com1:300,o,7,1,RS,DS0" FOR RANDOM AS #1 'Handshaking Disabled

ERROR MESSAGE LIST

During Diagnostics:

Err1.CA	Scale Calibration
Err2.00 to Err2.63	EEPROM Write Failure
Err2.rS	Serial Interface Setup
Err3.Hd	Deadload too High
Err3.nS	No Sense Line Connected
Err3.-d	Negative Deadload
Err4.Sh	Load Cell Excitation Shorted
Err6.-1 to Err6.-4	Switch SW1-SW4 Shorted
Err8.00 to Err8.FF	RAM Test Error
Err9.CS	Eprom Checksum Error

All Other Times:

Message on Display	**Explanation**	**Message From ASCII Port**
Err2.00 to Err2.FF	EEPROM read error	"Err2.? EEPROM"
Err 10	Count too large	none
Err 11	Keyboard Entry Error	none
Err 13	Negative number less then - 99,999 *(will not fit on display)*	
Err 30	Illegal Zero	none
Err 31	Illegal Tare	none
Err 40	Load Cell error	none
Err 80	RS - 232 Input Error	none
Err 81	RS - 232 Input Error	none
Err 82	RS - 232 Overflow	none
Err Cnf	Config load error on startup	"Err 85 Reset to 300 baud"
Err xx*	Undefined (Consult Factory)	none
ULULUL	Load Cell Underload	"Err 41"
OLOLOL	Load Cell Overload	"Err 42"
CalErr	RS - 232 Cal Error	"Calibration Command Error"
none	Bad Print Code	"Err 83 Print Code"
none	No End Code	"Err 84 No Code 99"

*** Where "xx" equals any number or character not shown on the above list.**

7500 SERIES - PROGRAMMING/CALIBRATION

SECTION 2

INTRODUCTION

This manual covers the **programming and calibration of the Pennsylvania Scale Model 7500 series.**

The **7500** can be calibrated from the keypad, or through the RS-232 Interface. A digital calibration technique is employed that makes it very versatile when matching the indicator to the requirements of the application at hand.

7500 SERIES CALIBRATION

Before attempting to calibrate the 7500, a thorough understanding of the method of data entry is required. Below is an explanation of the switches and their function.

When the calibration mode is entered, the front keypad buttons will be redefined to allow data entry. The function of the four buttons will be as follows:

- The **ZERO** button will become the **DECIMAL/CLEAR** button.
- The **SAMPLE SET** button will become the **INCREMENT** button.
- The **UNITS** button will become the **ADVANCE** button.
- The **PRINT** button will become the **ENTER** button.

Below is a description of the function of each button.

DECIMAL POINT/CLEAR (D.P./CLR)

Pressing this push-button once enters a decimal point onto the display. If an error is made at any time during data entry, pressing this push-button twice will clear the display. The correct data can then be entered.

INCREMENT (INC)

This button is used to key numbers onto the display. The value of the number increases by one each time the button is pressed. Holding the button will engage automatic incrementing.

NOTE: This switch will also act as a scroll push-button, used to make calibration selections where noted in the instructions. For all other calibration steps, it acts as the increment push-button.

ADVANCE (ADV)

The advance switch multiplies any number keyed into the scale by 10 (the number will shift one digit to the left each time the button is pressed). If this switch is pressed when the display shows "0", the digit will not shift. If it is pressed when the display is filled, the display will be cleared and the input procedure may be restarted.

ENTER (ENT)

When this push-button is pressed the data currently displayed is committed to system memory and the calibration automatically advances to the next calibration step.

DATA ENTRY EXAMPLE

The following example describes the switch-closure sequence needed to enter the number 320.0.

1 While the display is alternately flashing the calibration step number and the data stored, press the INC button to start the data input sequence . The display will stop flashing and show "0".

2. Press INC three more times or hold INC closed until a "3" appears.

3. Press ADV. The display will show "30".

4. Press INC two times or hold INC closed until a "2" appears in the right-most position. The display will show "32".

5. Press ADV. The display will show "320".

6. Press D. P. / CLR for the decimal point. The display will show "320.0".

7. Press ENT to commit this value to the system memory. At this point the next calibration step will appear.

7500 SERIES CALIBRATION

The calibration of the **7500** is divided into seven major categories. The entry point to each of these categories is the calibration step that is evenly divisible by ten.

STEP DESCRIPTION

Cal 20 Entry point

(20) = Manual CAL (Input operational features)

(30) = Secondary units calibration

(40) = Load Cell (Calibrates the scale weights)
This mode requires the use of "F" class weights to be completed.

(50*) = Set sample sizes.

(60*) = RS-232 CAL (Setup RS-232 interface parameters)

(70*) = Setting the time, date (with time & date option) and sleep mode time.

(80*) = Print CAL (Setup printer output format)

At any of the above steps:

- Press ENTER to access that category.
- Key in number of any other category and press ENTER to move to that category.
- Key in a "0" and press ENTER to leave calibration.

When the last calibration step of each category is reached, the calibration automatically advances to the next category.

- **Calibration categories 50, 60, 70, and 80** may be accessed form the front panel of the scale. This is done by pressing and holding the PRINT button for 5 seconds. The scale will then display CFG 50. At this point, you can press ENT to select this category or key in the number of any of the other accessible categories. All other categories may only be accessed through the calibration switch on the main PC board.

CALIBRATION PROCEDURE

To begin calibration 7500 scale:

The calibration switch on the 7500 Series Scale is located below an access plate on the top, front, center of the scale. The access plate is held in place by a sealing screw that passes up through the bottom of the scale. Remove the scale's platform and stand the scale on it's side. Remove the sealing screw form the bottom, front edge of the scale. Return the scale to an upright position and remove the calibration access plate.

The CAL button is located directly below where the access plate was. Press this button and return the platform to the top of the scale.

The display will prompt "CAL 20". At this point, you can either:
1) Push "ENT" to select this category **OR**
2) Select another category as described above.

To begin calibration (**7500/4**):

- Remove the fastening screws holding the back plate of the indicator and carefully lift off the back plate.

- The main circuit board is mounted to this back plate. Turn the plate and locate the calibration button on the main circuit board. This button is labeled SW4 and CAL/SEL.

CAUTION: Since this must be done with the indicator turned on, care MUST be taken not to come in contact with the 110 volt power supply.

- Enter calibration by pressing the CAL/SEL button. The display will prompt with CAL 20..

- Replace the back plate and replace the fastening screws.

- The calibration steps are described below.

Note: Of your 7500/4 was ordered with the front panel calibration access software, the above procedure is not necessary. Calibration may be accessed by pressing and holding the PRINT button for 15 seconds. The indicator will then jump to program step “CFG 50”. At this point, key in the number 20 and press ENTER and the indicator will go to “CAL 20”.

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CALIBRATION STEPS

NOTE: During the calibration procedure each calibration step will be printed to any device interfaced to the RS-232 port. *(Refer to page 24 for a sample print out.)*

STEP DESCRIPTION *(Press ENTER after each entry.) (* = normal entry)*

CAL 20 Manual Calibration entry point

CAP 21 - Full Capacity - Input full capacity of scale

rES 22 - Resolution - Input Scale Resolution. Standard entry is the capacity of the scale divided by 5000* and rounded to the nearest 1, 2, or 5.

-0- 23 - Zero Range - Input the Zero Range. The amount of weight the scale is allowed to Zero off. (99.8 % is the maximum value that may be zeroed off, even if full capacity is entered.)

UnS 24 **Units** - Select the weighing units from the following chart with the INC button:

1 = lb*	5 = lb t	9 = c	13 = tons
2 = kg	6 = g	10 = oz f	14 = lb/oz split display (special order
3 = g	7 = dwt	11 = ml	only)
4 = oz t	8 = oz	12 = l	

Prt 25 - Print Stable*/First/Unstable - Use the INC button to select whether the scale will respond to a print request only when stable (StAbLE), is to print the first stable; non zero weight (FirSt), or any time a print is requested (UnStbL).

Cnd 26 - Configure scale for Canadian specifications, use the INC button to select "Yes" or "No"*.

0 - t 27 - Zero tracking value entered as a percentage of one display resolution.

EXAMPLES: Entering a .25 represents a zero tracking value of 25% of one display resolution and entering a 0 will disable the zero tracking feature.
CAUTION: It is not recommended that a value larger than 5.00 be entered in this step, as it may cause errors in the weight readings. (.25*).

CAL 30 **Entry point for secondary weighing unit.**

2Un 31 - Select secondary weighing unit from the following chart with the INC button:

1 = lb	5 = lb t	9 = c	13 = tons
2 = kg*	6 = g	10 = oz f	
3 = g	7 = dwt	11 = ml	
4 = oz t	8 = oz	12 = l	

2rE 32 - Secondary weighing resolution. Key in the resolution for the secondary weighing unit.

CAL 40 **Load Cell Calibration entry point**

FIL 41 - Response time - use the INC button to select a response time, 0 to 9, for the scale. A "0" will give very fast response and less immunity to vibrations. A "9" is the slowest response, but very stable. ("3" is the standard entry*.)

nol 42 - No Load - With no weight on the weighing platform, press ENTER.

HLF 43 - Half Capacity - Apply a half capacity weight to the platform and press ENTER. If a 1/2-capacity weight is unavailable, place a substitute weight on the platform, key in the amount of weight being used and press ENTER.

FUL 44 - Full Capacity - Apply a full capacity weight to the platform and press ENTER. If a full-capacity weight is unavailable, place a substitute weight on the platform, key in the amount of weight being used and press ENTER.

WARNING!!! **When using a substitute weight for ½and full capacity, you must use weights which meet the specifications in either 1 or 2 below, or the scale may not calibrate properly.**

1. Two weights (one for 1/2 capacity, one for full capacity) that are greater than 25% of full capacity and differ by at least 50% of full capacity.
EXAMPLE: The weights used for a 100-lb scale could be 30 lb and 80 lb.

2. One weight which is preferably greater than 50% of full capacity.

nol 45 - No Load - Remove all weight from the platform and press ENTER.

CFG 50 **Entry point for sample sizes.**
(May be accessed from the front panel by pressing and holding the PRINT button for 2 seconds.)

SS1 51 - Key in first sample size. (Normal entry is 10*)
NOTE: ENTERING A "0" FOR THIS STEP WILL DISABLE THE COUNT MODE.

SS2 52 - Key in sample size number two. (normal entry is 20*)

SS3 53 - Key in sample size number three (normal entry is 50*)

SS4 54 - Key in sample size number four (normal entry is 100*)

CFG 60 **RS-232 Configuration**
(This step can also be reached from the front panel by pressing and holding the PRINT button for 2 seconds.) Press ENTER. (* = default)

bAU 61 BAUD RATE: Select a baud rate from the table below using the INC button to view the options; press ENTER when you reach the desired baud rate.

300 baud*	4800 baud
600 baud	9600 baud
1200 baud	19200 baud
2400 baud	

LEn 62 - WORD LENGTH: Select the word length from the table below using the INC button to view the options; press ENTER when you reach the desired word length.

7 bits*
8 bits

SPb 63 - STOP BITS: Select the stop bits from the table below using the INC button to view the options; press ENTER when you reach the desired stop bits.

1 stop bit*
2 stop bits

PAr 64 - PARITY: Select the parity from the table below using the INC button to view the options; press ENTER when you reach the desired parity.

None
Even parity
Odd parity*

Ech 65 - ECHO: Use the INC button to select whether the scale is to echo input data back to the sending device.

no Ech (No echo)*
Ech (Echo)

Cdr 66 - COMM (Network) ADDRESS:
If the scale is used in a networking situation it may be assigned an address number. When an address number is assigned, the scale will ignore any commands not preceded by that number. Key in a number from 0 to 255. (0 is the normal entry and disables this feature).

Pd 67 - Select whether the power on diagnostics will be sent from the RS-232 port. ("Yes" or * "No")

CAL 70 **Setting of time and date.**
(Steps 71, 72, and 73 will only appear if scale has the time and date option installed.)

StF 71 - Select type of clock.

0 = Time and date OK, skip to SLP 74
1 = 24 hour clock
2 = 12 hour clock, currently AM
3 = 12 hour clock, currently PM

td1 72 - Enter the current time as HHMMSS. Based on the type of clock selected in step 71. Clock will begin with the pressing of the ENTER button.

CAL 70 **Setting of time and date.** (cont'd.)

td2 73 - Enter the current date as MMDDYY.

Setting battery saver time:

SLP 74 - For AC/DC versions of the scale, enter the amount of time the display is to remain on before going into the battery saver sleep mode. The time is entered in number of minutes from .5 to 12. Entering a zero will disable the sleep mode for AC only scales.

CAL 80 **Formatted print slot programming. Press ENT to access the first print slot.**

Before continuing, an explanation of formatted printing is necessary.

BUILDING A FORMATTED PRINT

The user defined formatted print is the string of information sent from the RS-232 port when the PRINT button is pressed or the indicator receives an SRP command from a computer or terminal. The user selects the format of this string by entering two digit print codes into the 21 available print slots, PSL 81 through PSL 102. The print codes which represent various types of scale information, RS-232 page and line positioning commands are divided into several categories, i.e. prefix and suffix labels, scale data only, scale data with prefix and suffix labels, page and line formatting characters and repeat codes.

To build a formatted print, refer to "Formatted Print Codes" following this section. Select the desired code for the current slot and key it in. Press ENTER to move to the next print slot. (If a print code is entered that is not legal, the message "Illegal Print Code!" will be sent out with the Formatted Print.)

When you are finished entering data to construct the formatted print, "99" is entered to mark the end of print formatting.

NOTE: **The code "0" allows you to exit the building or examining of a formatted print at any time without destroying or altering print codes already entered.**

EXAMPLE OF BUILDING A FORMATTED PRINT

To build a simple formatted print that might be sent to a ticket printer the following print codes could be entered:

PSL 81 - 65 (This is a carriage return and line feed.)
PSL 82 - 30 (Prints the gross weight with prefix and suffix.)
PSL 83 - 65 (Sends another carriage return and line feed.)
PSL 84 - 32 (Prints the net weight with prefix and suffix.)
PSL 85 - 65 (Sends a carriage return and line feed.)
PSL 86 - 31 (Prints the tare weight with the prefix and suffix.)
PSL 87 - 65 (Sends a carriage return and line feed.)
PSL 88 - 65 (Sends a carriage return and line feed.)
PSL 89 - 99 (Ends the print format)

The result of the above formatted print is:

GROSS 1.205 LB
NET 0.205 LB

TARE 1.000 LB

FORMATTED PRINT CODES

Print Prefix and Suffix Formatted Print Codes

02 = Current Time (Time and Date option only)
03 = Current Date (Time and Date option only)
04 = Current weighing unit suffix label
05 = "GROSS" prefix label
06 = "TARE" prefix label
07 = "NET" prefix label
08 = "COUNT" prefix
09 = "PIECE WEIGHT" prefix
10 = "SAMPLE SIZE" prefix
19 = "Pcs" suffix

ELTRON LP 2642 Print Commands

14 = Prologue
15 = Epilogue

Print Data Only Formatted Print Codes

20 = Print Current gross weight
21 = Print Current tare weight
22 = Print Current net weight
23 = Print Current Count
24 = Print Piece Weight
25 = Print Sample Size

Print Prefix, Data, and Suffix Formatted Print Codes

30 = Print Gross weight prefix, data and suffix
31 = Print Tare weight prefix, data and suffix
32 = Print Net weight prefix, data and suffix
33 = Print Count prefix, data and suffix
34 = Print Piece Weight prefix, data, and suffix
35 = Print Sample Size prefix, data, and suffix

FORMATTED PRINT CODES (cont'd.)

Continuous Output Print Codes

50 = Continuous output (Formatted print will be sent continuously as long as scale is turned on.)

51 = Toggled continuous output (The formatted print will be sent continuously after the PRINT button is pressed or an SRP command is received by the scale. Pressing the PRINT or sending SRP a second time will turn off the continuous output.)

52 = Status Character (May be used by a computer to determine the condition of the scale at any given moment. The characters are:

@ Gross, primary, stable, non-zero weight
A Gross, primary, stable, zero weight
B Gross, primary, unstable, non-zero weight
C Gross, primary, unstable, zero weight
D Gross, secondary, stable, non-zero weight
E Gross, secondary, stable, zero weight
F Gross, secondary, unstable, non-zero weight
G Gross, secondary, unstable, zero weight
H OL/UL, gross, primary, stable
J OL/UL, gross, primary, unstable
L OL/UL, gross, secondary, stable
N OL/UL, gross, secondary, unstable
P Net, primary, stable, non-zero weight
Q Net, primary, stable, zero weight
R Net, primary, unstable, non-zero weight
S Net, primary. unstable, zero weight
T Net, secondary, stable, non-zero weight
U Net, secondary, stable, zero weight
V Net, secondary, unstable, non-zero weight
W Net, secondary, unstable, zero weight
X OL/UL, net, primary, stable
Z OL/UL, net, primary, unstable
\ OL/UL, net, secondary, stable
^ OL/UL, net, secondary, unstable
' Count, primary, stable, non-zero weight
a Count, primary, stable, zero weight
b Count, primary, unstable, non-zero, weight
c Count, primary, unstable, zero weight
d Count, secondary, stable, non-zero weight
e Count, secondary, stable, zero weight
f Count, secondary, unstable, non-zero weight
g Count, secondary, unstable, zero weight
h OL/UL, count, primary, stable
j OL/UL, count, primary, unstable

FORMATTED PRINT CODES (cont'd.)

Continuous Output Print Codes (cont'd.)

l OL/UL, count, secondary, stable
n OL/UL, count, secondary, unstable
p Net, count, primary, stable, non-zero weight
q Net, count, primary, stable, zero weight
r Net, count, primary, unstable, non-zero weight
s Net, count, primary, unstable, zero weight
t Net, count, secondary, stable, non-zero weight
u Net, count, secondary, stable, zero weight
v Net, count, secondary, unstable, non-zero weight
w Net, count, secondary, unstable, zero weight
x OL/UL, net, count, primary, stable
z OL/UL, net, count, primary, unstable
OL/UL, net, count, secondary, stable
OL/UL, net, count, secondary, unstable
53 = ABO Checksum (May be used in building a continuous output compatible with other Pennsylvania Scales.)
54 = Select Leading Zeros
59 = No Operation

Print Special ASCII Characters Formatted Print Codes

60 = Print an ASCII space (SP)
61 = Print an ASCII horizontal tab (HT)
62 = Print an ASCII line-feed (LF)
63 = Print an ASCII start of header (SOH)
64 = Print an ASCII carriage return (CR)
65 = Print an ASCII carriage return and line feed (CR LF)
66 = Print an ASCII form-feed (FF)
67 = Turn on large print (PA Scale printer)(SO, HEX 0EH)
68 = Turn off large print (PA Scale printer)(SI, HEX 0FH)
69 = Print an ASCII null (NUL)
78 = Invert print (PA Scale printer)(DC3, HEX 13H)
79 = End inverted print (PA Scale printer)(DC4, HEX 14H)

Formatted Print Codes

0 = Exits building of formatted print without loss of previously entered print codes
91-98 = Repeat Codes (repeats previous entry 1 to 8 times.)
99 = Marks the end of the formatted print

CAL 0 **Press ENTER to exit calibration.**

COMMAND FORMATS

The Pennsylvania Scale Model **7500/4** Indicator may be calibrated and programmed through the RS-232 Interface using a terminal or computer. The scale is controlled by various commands, each three letters long, that represent related English phrases or words.

When the scale receives command strings, they are first placed in a 125-character buffer. If many commands are sent to the scale at high baud rates, it is possible to completely fill this buffer and data will be lost. Be sure to send commands to the scale at a rate which does not exceed 125 characters every 500 ms.

The basic command formats are:

1. [<add>]<cmd><cr>
2. [<add>]<cmd> [<flt>]<cr>

Where <cmd> is a three-letter command, <add> is a scale address number (0-255), <cr> represents a carriage return, and <flt> is mixed number, the brackets [ ] are used to indicate an optional part of the command.

The following are some **EXAMPLES** of command formats:

Command format 1:

SRP<cr>	Send a formatted print

Command format 2:

ITW 13.43<cr>	Instructs scale to set tare weight to 13.43 in the current unit

Command format 3:

5 SGW<cr>	Instructs scale with address #5 to send the gross weight.

MODEL 7500/4 RS-232 SCALE COMMANDS

General Commands

ATW	Acquire Tare Weight
CHK	Initiate self-diagnostics CHecK
LCK	LoCK out keypad
PON	Power ON
POF	Power OFf
RES	RESet, clears tare weight and piece weight
SCM	Select Count Mode
SSS	Select Sample Size
SWM	Seclect Weight Mode
UCK	UnloCK keypad
UNP	UNit Primary
UNS	UNit Secondary
ZRO	ZeRO scale

Commands Which Enter Information into the Unit

IPW [FLOATING POINT NUMBER]	Input Piece Weight
ITW [FLOATING POINT NUMBER]	Input Tare Weight

Commands Which Request Information

SAI	Send All Information (All setup information)
SAO	Send Abbreviated Output (Same as SRP)
SCI	Send Configuration Information
SCO	Send COunt
SDT	Send DaTe (Time and Date option only)
SGW	Send Gross Weight
SMI	Send Metrological Information
SNW	Send Net Weight
SPC	Send Print Codes
SPW	Send Piece Weight
SRP	Send Requested Print
SSZ	Send Sample siZe
STM	Send TiMe (Time and Date option only)
STW	Send Tare Weight
SVN	Send Software Version Number

MODEL 7500/4 RS-232 SCALE COMMANDS (cont'd.)

Calibrate and Configure Commands *(* requires CAL switch to be pressed)*

CAL*	CALibrate - Scale will follow push button cal.
CFC	ConFigure Communication - To set baud rate etc.
CFL	ConFigure sLeep mode
CFP	ConFigure Print codes - To enter print formatting.
CFT	ConFigure Time and date (Time and Date option only)
CLE	CaLibration End - To save calibration data.
CLM*	CaLibrate Modes - To set Auto zero, Count, PcWt/1000
CLP*	CaLibration Primary - To set-up primary calibration data.
CLS*	CaLibrate Secondary - To set up secondary calibration data.
CLU*	CaLibration Unstable - To set-up print stable/unstable.
CLW*	CaLibration Weight - To calibrate with weights.

NOTE: **All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.**

CONFIGURATION OF RS-232 COMMUNICATION PARAMETERS

The unit leaves the factory with the following default communication settings :

BAUD	300
WORD LENGTH	7 bits
STOP BITS	1
PARITY	ODD

These settings may be changed using the local or remote display keyboard as described above or RS*232 Interface commands. If the RS-232 Interface is used, initial communication with the users computer or terminal must be established using the above settings. To return the RS-232 settings to the above default values:

1. Unplug the unit power cord or otherwise remove power.
2. Depress the internal Calibrate button.
3. Plug in (or energize) the unit and continue to hold the calibrate button for 5 seconds.

When communication with the scale has been established, the CFC (ConFigure Communication) command may be used as described under the RS-232 command section.

COMMAND	FORMAT	DESCRIPTION
CFC	CFC 9600 8 1 0 0 5 <ENT>	Selects 9600 Baud, 8 bit word length, 1 stop bit, no parity, no echo, and address #5. Other baud rates that can be used are: 300, 600, 1200, 2400, 4800 & 19200. Parity choices are: 0 is no parity, 1 is odd, 2 is even. Word length, 7 or 8. Stop bits, 1 or 2. Echo, 0 is off and 1 is on. Scale address # (0-255).

NOTE: **Spaces must separate the settings and there must be 6 values.**

CONFIGURATION OF RS-232 PRINT CODES

These print code settings may be changed using either the local or remote display push-buttons or through RS-232 Interface commands. When communication with the unit has been established, the CFP (ConFigure Print code) command may be used as follows:

COMMAND	FORMAT	DESCRIPTION
CFP	CFP 30 65 31 99 <ENT>	Send gross weight, CR\LF, Send the net weight, End.

Up to 21 print codes can be entered. Refer to the Formatted Print Code List for additional print codes.

NOTE: **Spaces must separate the settings and a "99" must be the final print code. Refer to page 8 for further information on formatted print codes.**

CONFIGURATION OF SLEEP MODE AND TIME/DATE

(IF OPTION IS INSTALLED)

COMMAND	FORMAT	DESCRIPTION
CFL	CFL 5 <ENT>	Scale will enter sleep mode 5 minutes after last usage. A "0" will disable the sleep mode and any number from .5 to 12 will determine how many minutes the scale will remain on.

CFT	CFT 2 11 00 11 05 94 <ENT>	Scale will set the clock to 12 hour, currently AM, the hour to 11:00, minutes to 0, month to Nov., day to 5, and year to 1994.

NOTE: Spaces must separate the settings and there must be 6 entries, followed by a carriage return. The first number is the type of clock where: 1 = 24 hour clock mode, 2 = 12 hour clock mode (currently AM), and 3 = 12 hour clock mode (currently PM). The second entry is the hour, the third is the minutes, fourth is the month, fifth is the day, and the sixth is the year.

CALIBRATION USING RS-232 SERIAL INTERFACE

The calibration feature is designed to prevent unauthorized personnel from changing any of the parameters that would affect the accuracy of the unit. This includes the full capacity, weighing resolution, zero range, units, filter response, weight calibration and whether printing is allowed when unit is stable or not. In order to change these parameters, the internal calibration switch (SW4) must be pressed. Refer to page 5 for instructions on accessing the calibration switch.

To begin calibration, enter any of the Calibration commands. The Model 7X00 Series Product will prompt to the terminal one of the following messages:

RESPONSE TO TERMINAL*(parenthesis indicate scale display message):*

"Push CALIBRATION SELECT Switch" (CALSEL)	Push the Calibrate Button now. This only has be done once. After this, other commands can be entered.
OR	
W? Calibration Command Error" (CALErr)	If illegal values for the settings, incorrect number of settings, spaces not used between the settings, etc.

NOTE: BEFORE EXITING CALIBRATION, THE "CLE" COMMAND (CALIBRATION END) MUST BE SENT TO SAVE THE CALIBRATION DATA (EXCEPT WHEN "CAL" COMMAND IS USED)!

Unless otherwise indicated, the terminal responses and displays for the following serial interface commands are shown here (parenthesis indicate messages on scale display):

CR/LF
"Waiting for Calibration Command" (-232-)

If settings are acceptable.

OR

"? Calibration Command Error" (CALErr)

If illegal values for the settings, incorrect number of settings, spaces not used between the settings, etc.

NOTE: Spaces must separate the command and settings. And each command string must be terminated with a carriage return.

CALIBRATION COMMANDS

4. **CLP** - CaLibration Primary

COMMAND: CLP 10.0 0.002 5.0 1 <ENT>

Enters the Calibration Factors for the Primary weighing mode.

The example shown selects:

10.0 = Full scale Capacity
0.002 = Resolution
5.0 = Zero Range
1 = Units code (LBS)

2. **CLU** - CaLibration Print when Stable or Unstable

COMMAND: CLU 0 <ENT>

Selects print when stable or unstable

Options:0 = Selects print when NOT stable
1 = Selects print when Stable (Required for NTEP)

3. **CLW** - CaLibration Weight

COMMAND: CLW 3 <ENT>

Enters the Standard Two (2) Point Weight Calibration using a filter response time of 3.

COMMAND: CLW 3 5.0<ENT>

Enters the Weight Calibration with a filter response of 3, and a single point Calibration using a 5 lb. weight.

COMMAND: CLW 3 1 10 <ENT> Enters the Weight Calibration a filter response of 3, and using a 1 lb. and 10 lb. weight.

NOTE: Unless Calibration points are entered as part of the CLW command, Calibration points will default to one half, and one, times the full scale primary weighing range.

RESPONSE TO TERMINAL*(parenthesis indicate local display message):*

"Internal A/D Calibration.- Please Wait
(------)

Place the following weights on the platform, press ENTER (either on terminal or scale) after each:

0.000 lb* (LoAd 0.000)
5.000 lb* (LoAd 5.000) (* = Current weighing unit
10.000 lb* (LoAd 10.000) selected will be displayed.)
0.000 lb* (LoAd 0.000)

4. **CLS** - CaLibrate Secondary
COMMAND: CLS 2 0.002 Sets secondary weighing unit to KG and resolution to .002 KG.

Refer to page 6 for a chart showing possible weighing unit entries.

5. **CLM** - CaLibrate Modes
COMMAND: CLM 0 0 1 <ENT> Turns off Canadian specs
(0=no, 1=yes)
Turns off auto zero (0=no, 1=yes)
Turns on count mode (0=no, 1=yes)

6. **CLE** - CaLibration End
COMMAND: CLE <ENT> Ends the calibration process and stores the results in the unit's internal memory. The unit will then self-test and return to normal operation.

RESPONSE TO TERMINAL:

"Saving CAL Data CAL Completed"	If data acceptable.

CALIBRATION EXAMPLE

Using the example commands from above, a typical sequence of calibration commands might be:

CLP 10.0 0.002 5.0 1	Enters the primary calibration factors
CLU 0	Selects print while Unstable for non-NTEP
CLW 3	Enters the weight calibration mode
CLS 2 0.001	Enters the secondary calibration factors
CLE	Ends the calibration process, stores results

See the individual command descriptions for complete command and response information.

USING THE "CAL" COMMAND

The "CAL" command may also be used to calibrate the scale. This command will cause the scale to enter the same calibration routine as the push button calibration process.

After the "CAL" command is sent to the scale it will prompt the operator to press the calibration select button on the main PCB (SW4). After SW4 is pressed the scale will prompt with:(Brackets [] indicate scale display message)

Calibration Step (20)?
[CALSEL]

At this point the operator may: *(These steps may also be performed from the scale keypad.)*

1. Press return to go to calibration step 21.
2. Key in the number of another calibration category and press return.
3. Key in a "0" and press return to leave calibration.

The following is a list of prompts the terminal or computer would receive after calibration mode has been entered. The parenthesis indicates the current entry in the scale. Words inside of {} will not appear on the screen but indicate possible entries. The list below uses the standard entries for a 25 LB capacity scale as an example.

Calibration Step (20)? 20*
21 Capacity (25.000) ? 25.000
22 Primary Resolution (0.005)? 0.005 {Enter display resolution}
23 Zero Range (25.000)? 25.000 {Zero to full capacity}
24 Primary Unit (1)? 1 {Refer to chart on p. 5}
25 Print Operation (StAbLE)? 1 {1=stable, 0=unstable}
26 Canadian Unit (no)? 0 {1 = Yes, 0 = no}
27 Zero Tracking (.25)? .25 {Key in % of one display resolution}

Calibration Step (30)? 30*
31 Secondary Unit (2)? 2 {Refer to chart on p. 5}
32 Secondary Resolution (0.002)? 0.002 {Enter display resolution}

Calibration Step (40)? 40*
41 Filter Speed (3)? 3 {0(less filter) to 9}
42 No Load (0.000)? 0.000 {No weight on scale}
43 Half Load (12.500)? 12.500 {Place weight on scale}
44 Full Load (25.000)? 25.000 {Place weight on scale}
45 No Load (0.000)? 0.000 {Remove weight from scale}

USING THE "CAL" COMMAND (cont'd.)

Configuration Step (50)? 50*
51 Sample size #1 (10)? 10 {#1 Sample set number}
52 Sample size #2 (20)? 20 {#2 Sample set number}
53 Sample size #3 (50)? 50 {#3 Sample set number}
54 Sample size #4 (100)? 100 {#4 Sample set number}

Configuration Step (60)? 60*
61 Baud Rate (300)? 0 {Selections on p. 6 (begin with 0)}
62 Word Lenght (8 bit) ? 1 { 0=7 bit, 1=8 bit }
63 Stop Bit (1) ? 1 { 1 or 2 }
64 Parity (nonE) ? 0 { 0=none, 1=odd, 2=even }
65 Echo (no Ech)? 0 {0=no echo, 1=echo}
66 Comm Address (0)? 0 {0 to 255}
67 Power Diagnostics (0)? 0 {0=no, 1=yes}

Configuration Step (70)? 70*
71 Set Time Flag (1)? 1 {Selections on page 7} (T & D option)
72 Set Time (135056)? 135056 {Enter time HHMMSS} (T & D Option)
73 Set Date (11894)? 110894 {Enter date MMDDYY}(T & D Option)
74 Sleep Time (0.0)? 0 {Sleep time in minutes (.5 to 12)}

Configuration Step (80)? 80*
81 Print Slot (65)? 65 {Print codes on p. 10}
82 Print Slot (30)? 30 {Print codes on p. 10}
83 Print Slot (65)? 65 {Print codes on p. 10}
84 Print Slot (99)? 99 {Print codes on p. 10}

Configuration Step (0)? 0

Diagnostic...
8.7.6.5.4.3.2.1.0.
Wait.. Ready for Command

- **At these steps:**

1. Pressing return will enter that calibration category.
2. Keying any of the following numbers (20,30,40,50,60,70,80) and pressing return will access that category.
3. Keying in "0" and pressing return will end calibration.

7500 Series – Addendum
Section 3
Special Programs

INTRODUCTION

The 7500 may be ordered with a number of different software program options for special application use. This addendum to the manual provides instructions on operational differences between these scales and the standard scale. The addendum instructions cover only the differences in operation and are meant to be used in conjunction with the rest of this manual.

7XOO Series AD/DC Scales

NOTE: These instructions cover only the operational differences between the AC/DC and the AC only scale. They are meant to be used in conjunction with the standard operator's manual.

UNPACKING AND SET-UP:

This scale has been shipped with the battery installed and ready for operation. Although the battery was fully charged when the scale was packed, it is recommended that the scale be plugged in and the battery charged for a full 12 hours before using on DC for the first time. The scale will operate for approximately 10 hours on a fully charged battery before needing to be recharged. (Typical charging time for a completely discharged battery is 7 to 8 hours.)
Refer to the standard operator's manual and follow the installation and set-up instructions (Please note that the AC/DC scale has a power supply/line cord packed separately that needs to be removed from the box.) up to Step 8 (activating the scale). -

To operate the scale on AC:

1. Remove the platform and stand the scale on its right side. This will allow access to the line cord socket on the bottom of the scale.

2. Plug the DIN type connector on the line cord into the mating connector on the scale and return the scale to an upright position,

3. Replace the platform on top of the scale and plug the power supply end of the line cord into a grounded 110V AC outlet.

4. An ON/OFF switch is provided on the back of the scale. This is a momentary rocker switch. To turn the scale on, press the switch to the "ON" position and hold it until the display comes on. The scale will display the version number of the software, and then start a diagnostic count down.

5. From here on the operation of the scale is the same as the AC unit, please refer to the standard operator's manual.

6. To turn the scale off, press the momentary switch to the "OFF" position until the display goes out.

To operate the scale on DC:

1. Disconnect the AC power supply/line cord from both the AC outlet and the scale. Press the ON/OFF switch on the back of the scale to "ON" and hold it until the display lights up, then release the switch. The scale will first display the version number of the software, and then begin a diagnostic count down.

2. As the scale is shipped from the factory there is a timed battery saver feature that is set for 30 seconds. If the scale sits unused for more then 30 seconds the display will blank out, except for a row of decimal points across the bottom. Pressing any button on the scale, or pressing on the platform will bring the display back on again. From here on the operation is the same as the AC unit, please refer to the standard operator's manual.

3. To turn the scale off, press and hold the momentary switch in the "OFF" until the display goes out.

4. To recharge the battery after use reconnect the power supply/ line cord to the scale and to a grounded AC outlet. The battery will be charging as long as the scale is plugged in. (The scale does not have to be turned on to charge the battery.) **(It is strongly recommended the scale battery be recharged after every use.)**

NOTICE: The battery used in the 7XOO series AC/DC scales is a sealed, lead acid, Gel-Cell type battery. It is important that this type of battery not be allowed to go into a deep discharge state. If this should occur the life of the battery will be severely shortened. To avoid this, the scale is designed to shut itself off after the battery reaches a state of discharge that is still within the safe limits. It is strongly recommended that the scale be plugged in as soon as possible after this shutdown occurs. It is also recommended that the scale be left plugged in when not in use for long periods to keep the battery from discharging itself over time.

WARRANTY NOTICE

The battery in the AC/DC series scales is not covered under the standard scale warranty.

Any battery in a 7XOO series scale that fails due to materials and workmanship within a period of 6 months from the purchase date of the scale will be replaced at no charge for the part.

7500-5BW – Basis Weight scale

This Pennsylvania Scale Model 7500 has special software installed that provides for three basis weights.

When the scale is turned on, it displays the actual weight on the platform. Press the UNITS switch once to display the first basis weight (multiplied by 480). The “x480” LED indicator will light. Press the UNITS switch again to display the second basis weight (multiplied by 500). The “x500” LED indicator will light. Press the UNITS switch once more to display the third basis weight (multiplied by 1000). The “x1000” LED indicator will light. Press the UNITS switch again to return to the normal weight display.

If the count mode has been enabled (by pressing the SAMPLE SET button and adding the sample weight), pressing the UNITS switch after displaying the third basis weight will display the count. Press the UNITS switch again to return to normal weight display.

The multipliers and and the display resolutions for the basis weight are programmable. Using Calibration steps 31, 32 and 33 the user may specify nay multiplier from 1 to 10000, and any display resolution from 0.00001 to 1.

Calibration Step	Prompt	Notes
31	B1 31	Enter First Basis Wt Multiplier (default = 480)
	B1r31	Enter First Basis Wt Resolution (default = 0.1)
32	B2 32	Enter Second Basis Wt (default = 500)
	B2r32	Enter Second Resolution (default = 0.1)
33	B3 33	Enter Third Basis Wt (default = 1000)
	B3r33	Enter Third Resolution (default = 0.2)

Refer to the Calibration and Programming portion of this manual for details on how to access the calibration mode and enter data.

7500M Money Manager Scale

The Pennsylvania Scale Model 7500 M is a 7500 scale with all of the counting functions removed, and replaced with money management software for 4 user defined coin values.

To enter the Coin Weighing mode, press the UNITS button twice. The units will switch from Primary Units, to Secondary Units, Coin Value. Pressing the UNITS button again will place the scale back in Primary Units.

Once in Coin Weighing mode, press the COIN button to switch between weighing "Coin A", "Coin B", "Coin C", or "Coin D". The display will show the value, in U.S. Dollars, of the coins on the platform, and the appropriate LED Indicator will be lit. The largest possible coin value is $650. The smallest possible coin value is $0.01.

The following are the default values and piece weights for the indicated coins:

Coin	Value	Piece Weight (g)
A	$0.25	5.6160
B	$0.10	2.2730
C	$0.05	5.0000
D	$0.01	2.8190

The default coins may be set by holding the internal calibration button down while powering on the scale. Enter calibration, and set options as desired, except for cal steps 50 -54. It is necessary to skip this block, as the sampling will over-ride the default piece weights. (When calibration gets to step 50, enter 0 to end calibration, or 60 to skip coin configuration and continue with calibration.)

The value and piece weights for the coins may be calibrated, using Calibration Steps 50 – 54. Refer to the Programming and Calibration section of this manual for instructions on entering data in the Calibration Mode (Note: The standard SAMPLE SET button has been replaced by the COOIN button in this scale.).

To Re-calibrate a coin piece weight value:

1. Access the internal Calibration button of the scale, and press it once.The display will show "CAL" for two seconds and then alternate between "Cal" and "20" (the first calibration group). Key in "50" to enter Calibration Group 50.

2. The display will show "CAL 50", and then alternate between "Cn 51" and the current coin selected. [Note: "Coin A" corresponds to the first LED, "Coin b" is the second LED, "Coin C" is the third, and "Coin d" is the fourth.] Use the COIN button to select the coin to be re-calibrated. Press the PRINT button to enter the selection.

3. The display will alternate between “VAL 51” the current coin value. The appropriate LED will also be lit. Key in the value of the coin if different, and press the PRINT button to continue.

4. The display will alternate between “SS 52” and the current sample size. Key in the number of coins in the sample. (Max sample size is 250).

5. The display will alternate between “nol 53” and “0.0”. Make sure that no weight is on the platform and press the PRINT button to enter the “no load” condition.

6. The display will alternate between “add” and the sample size entered in step 5 above. Place the indicated number of coins on the platform, and press the PRINT button to enter the sample weight.

7. The display will show calculated piece weight, in grams, for two seconds. The scale will then be at Configuration Group 60. You may now key in “0” to exit calibration, return to step 2 above and key in “50” to re-calibrate another coin piece weight, or press PRINT to enter Configuration Group 60.

8. When you exit calibration, the new piece weights will be stored in the scale memory. The display will blank, and then the diagnostics countdown will begin.

9. To restore the default coin piece weights and values (Quarter, Dime, Nickel, Penny), Unplug the scale and press the internal calibration button while plugging the scale back in. NOTE: This will also restore the default RS-232 setup (300 baud, 7 data bits, 1 stop bit, odd parity) and print formats.

The following RS-232 Interface Commands have been added or modified for this application:

SCM – Select Coin Mode – Same as pressing the COIN button on the keypad.
SWM – Select Weigh Mode – Same as pressing the UNITS button on the keypad.
IPW [coin] [pc wt] – Input piece weight – Modified to require specifying the coin for which the piece weight is being entered, using 0 for Coin A, 1 for Coin B, 2 for Coin C, and 3 for Coin D. For example, entering “IPW 2 5.00” enters a piece weight of 5.00 grams for Coin C. (NOTE: the piece weight is always specified on grams.)
SGW – Send Gross Weight _ Modified to send the Gross value of the coins on the platform, if the scale is in the coin mode.
SNW – Send Net Weight – Modified to send the Net value of the coins on the platform, if the scale is in the Coin mode.
SCO – Send Count – Modified to include a suffix indicating the current Coin selected.
SPW – Send Piece Weight – Modified to include a suffix indicating the current Coin selected.

The following Print Format Codes have been added or modified for this application:

20 – Send Gross Weight – Modified to send the Gross value of the coins on the platform, if

the scale is in the Coin mode.

22 – Send Net Weight – Modified to send the Net value of the coins on the platform, if the scale is in the Coin node.

30 – Send Gross Weight with prefix and suffix – Modified to send the Gross value of the coins on the platform, if the scale is in the Coin mode and a prefix indicating the current Coin.

32 – Send Net Weight with prefix and suffix – Modified to send the Net value of the coins selected on the platform, if the scale is in the Coin mode, and a prefix indicating the current Coin.

33 – Send Count with prefix and suffix – Modified to include a suffix indicating the current Coin selected.

34 – Send Piece Weight with prefix and suffix – Modified to include a suffix indicating the current Coin selected.