



Pennsylvania Scale Company

Model 7600 Scales & 7600/4 Indicator Operation & Calibration Manual

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7600 SERIES - OPERATIONS SECTION 1

INTRODUCTION

This manual covers the **Operations and Programming/Calibration of the Pennsylvania Model 7600 Series Scale.**

The **7600** has been designed to be simple and easy to operate. It also 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
- Single board electronics for ease of servicing.
- Simple one button counting operation.
- Weight reading may be switched between two weighing units.
- May be programmed as either weigh and count or weigh only.
- Keypad entry of tare weight.
- Keypad entry of piece weight.
- Optional second weighing platform.

In addition, the **7600** can be calibrated with the keypad or through the RS-232 Interface to match the requirements of the application on hand, as it employs a digital calibration technique that eliminates dip switches and potentiometers.

INSTALLATION and SET-UP INSTRUCTIONS (Scale Version)

The 7600 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 7600 for operation, follow the procedure outlined below.

1. After opening the shipping carton, remove the molded foam top from the carton. (On 2 lb. and 5 lb. capacity scales the platform is packaged on top of this foam, remove it first and lay it aside.)
2. Gently lift and remove the stainless steel platform cover only. (On 2 lb. and 5 lb. 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.
DO NOT LIFT SCALE BY THE TOP SPIDER OR 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.
8. To activate the scale, plug the line cord into any grounded 50/60 hertz 120 volt outlet. The scale will 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. through 0.0.0.0.0., each number representing a self-diagnostic test to verify the operation of important unit functions. If the scale should fail any of these tests the display will freeze on that number and display an error message, refer to page 23 for a list of error messages. (The diagnostic failure may be bypassed by pressing the CHECK button.) The serial interface on all models will also transmit the test numbers. The following table lists each test and its corresponding display.

INSTALLATION and SET-UP INSTRUCTIONS (7600/4 Indicator)

The 7600/4 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 7600/4 Indicator is designed to be used with a standard load cell type weighing platform. This platform may be a 1, 2 or 3 mv/v sensitivity and a bridge resistance of 87 to 2000 ohms.

CONNECTING THE 7600/4 IN NON-WASHDOWN APPLICATIONS

All Pennsylvania 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 7600/4 indicator is to be attached to a platform of a manufacture other than Pennsylvania, a mating CPC connector may be ordered and attached to the platform cable. (This connector is available as a kit from 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 7600/4 IN WASHDOWN APPLICATIONS:

Open the 7600/4 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.

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

PLATFORM CONNECTION (cont'd.)

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. through 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.

<u>DISPLAY</u>	<u>DIAGNOSTIC FUNCTION</u>
9.9.9.9.9.	EPROM Checksum, light all LEDS
8.8.8.8.8.	RAM check
7.7.7.7.7.	Novram check
6.6.6.6.6.	Check switches not shorted
5.5.5.5.5.	No Test
4.4.4.4.4.	Check load cell excitation voltage
3.3.3.3.3.	Analog Verify (checks output from a-d)
2.2.2.2.2.	Load CFG EEPROM, Test Virgin, Checksum, Initialize on error
1.1.1.1.1.	Load CAL EEPROM, Test Virgin, Checksum, Initialize on error
0.0.0.0.0.	Test RS-232 connections
- - - - -	Initializing system (may take several seconds)

NOTE: **Allow at least 20 minutes for initial warm-up and load cell stabilization.**
The system should now be ready for operation.

OPERATION

OPERATIONAL FEATURES

The following features are available on the 7600 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 (AZT) - Maintains the system zero and is normally set to +/- 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.

Count/Weigh - Scale is capable of both counting and weighing functions. The count may be turned off in calibration if not needed.

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

Counting Functions - A variety of different counting methods may be employed, depending on type of counting selected during calibration.

Sample Update - Piece weight accuracy may be improved after the initial sample by adding a quantity of parts between 10% and 100% of the original sample to the platform. When this is done the scale will recalculate the piece weight, display the new percent error/accuracy for 2 seconds and then return to the counting mode.

Second Base - An optional second base is available to expand the capacity of the scale.

EXTERNAL CONNECTORS (7600 Scale Version)

The following connectors may be accessed through the opening on the bottom of the scale.

D-Subminiature Connector (9-pin) - Used with RS-232 Interface.

Remote Display Connector - Used to connect a remote display option to the scale.

REMOTE BASE PIN-OUT

Round CPC Style connector (8 pin) - Only found on scales with second base option installed.

This connector is the mating connector for Pennsylvania remote bases, if the 7600 is to be attached to a base of another manufacture a mating connector kit, part number 48445 may be ordered from your Pennsylvania Scale distributor. For wiring purposes the following chart provides the pin out for the Remote Base Connector:

<u>PIN NUMBER</u>	<u>FUNCTION</u>
1 -----	+ Signal
2 -----	- Signal
3 -----	Ground
4 -----	Not Used
5 -----	- Sense
6 -----	- Excitation
7 -----	+ Sense
8 -----	+ Excitation

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 data entry operations.

Gross Indicator - Illuminates when the weight displayed is the Gross weight.

Tare Indicator - Illuminates when ever a tare weight is entered in memory.

Net Indicator - Illuminates when the weight displayed is the Net weight.

Zero Indicator - Illuminates when the weight is within the programmed limit of system zero. (Normally 1/4 of one display resolution.)

Stable Indicator - Illuminates when the weight on the display is stable within the programmed limit. (Normally 1/4 of one display resolution.)

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

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

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

Base 2 Indicator - Illuminates when the optional second base has been selected.

PUSH-BUTTON FUNCTIONS

ZERO Button - Sets the scale to zero.

SAMPLE SET Button - Places the scale in the sample set mode for counting operations.

GROSS/NET Button - Switches the scale display between Gross weight and Net weight.

PIECE WEIGHT Button - Will cause the scale to display the presently stored piece weight, if any, and puts it into the piece weight entry mode.

TARE Button - Will tare off any weight setting on the platform and enter it into the tare memory.

KEYPAD TARE Button - Will display whatever tare is presently stored in the tare memory and puts the scale into the keypad tare entry mode.

BASE/1 Button - Used to switch the scale between base 1 and base 2, when the second base option is installed.

%/3 Button - Used to display the percent of error, or percent of accuracy. (Only if these features have been selected during programming.)

UNITS/4 Button - Used to switch the scale between the primary weighing unit, secondary weighing unit, and the count mode.

ID/5 Button - Will display whatever ID number is presently stored in the ID memory and puts the scale into the ID entry mode.

CHECK/6 Button - Pressing this button will cause the scale to initiate the diagnostic countdown. It may also be used as a continue key if the scale should freeze on any of the diagnostic numbers during countdown.

PRINT/7 Button - Transmits formatted print to any device connected to the RS-232 port. Holding this push-button for four seconds will access the RS-232 configuration mode.

/CLEAR Button - Used when the scale is in one of the data entry modes. Pressing this button once will put a decimal point onto the display and pressing it a second time will clear the display.

ENT Button - Used when the scale is in one of the data entry modes. Button is used to enter information into the system memory.

WEIGHING

WEIGHING WITHOUT TARE

1. If the second base option has been installed, press the BASE button to select base 1 or base 2. When base 2 is selected the base 2 LED will be lit. When base one is selected the base 2 LED will be out. If base 2 has been locked out during calibration, the word "Error" will momentarily show on the display.
2. Press the UNITS button to select either the Primary weighing unit or the secondary weighing unit. (Associated indicator will be lit.)
3. Verify that the "GROSS" indicator is lit. If not, press the GROSS/NET button to light this indicator and put the scale into the gross weight mode.
4. Establish a base zero by pressing ZERO with nothing on the scale platform to clear any existing weight readings.
5. Place the item(s) to be weighed on the platform and read the weight on the display.

NOTE: **If very light items (less than 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

1. If the second base option has been installed, press the BASE button to select base 1 or base 2. When base 2 is selected the "base 2" LED will be lit. When base one is selected the base 2 LED will be out. If base two has been locked out during calibration, the word "Error" will momentarily show on the display.
2. Press the UNITS button to select either the Primary or the Secondary weighing unit. (Associated indicator will be lit.)
3. Press the ZERO button with nothing on the platform to establish a base zero.
4. A tare weight may be acquired using one of the following methods:
 - a. Place the container or object to be tared off on the platform and press TARE; or
 - b. Press the KEYPAD TARE button and then key in the weight of the container or object, and press ENT.
5. The net weight value will be displayed on the weight display and the NET indicator will be lit.
6. Pressing the GROSS/NET button will toggle between gross weight and net weight.
7. When a tare value is stored in the system, the TARE indicator will be illuminated.
8. 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 and press TARE, or press KEYPAD TARE, key in 0 and press ENT.

NOTE: **IF the tare has been acquired using the TARE button, the tare value may be viewed by pressing KEYPAD TARE. Press ENT to return to the weight display without altering the tare weight.**

COUNTING

An electronic counting scale counts parts by knowing the weight of a single piece, dividing that into the total weight on the scale and displaying the result. With the 7600, this piece weight may be entered into the scale by one of two methods:

FIRST: Counting out a "sample" quantity of the parts and placing them onto the scale.

The scale will take the weight of the sample, divide it by the known quantity and derive a piece weight used to count the rest (or "bulk") of the parts.

SECOND: If the individual piece weight of the parts is already known, this weight value may be entered into the scale via the keypad.

SAMPLE SIZE:

If the "sample" method of piece weight entry is used, the total weight of the sample must be at least 0.04% of platform capacity or the scale will not recognize the sample. When sampling, it is always advantageous to use the largest sample possible. Not only does the larger quantity tend to average variations in the weight of individual pieces, but the heavier sample weight improves the counting accuracy of the scale itself.

NORMAL COUNTING PROCEDURE

ONE SWITCH COUNTING - The 7600 is normally shipped from the factory set up to follow this counting procedure. Unless your 7600 has been programmed for one of the alternate counting choices, this procedure is the only one necessary to learn.

NORMAL COUNTING - Using Sample

1. If a container will be used to hold items being counted, place it on the platform.
2. Press the SAMPLE SET button. The scale zeroes. "AddXXX" appears on the display (where "XXX" is one of the four pre-programmed sample sizes.). Repeated pressing of the switch successively displays the four sample sizes entered during calibration.
3. If a different sample size is required, key in the desired sample size (do not press ENT).
4. Place the entire sample on the platform at one time. (If the scale has been programmed to show the percent of error; this value will be displayed momentarily at this time.) The scale will now automatically switch to the count mode, displaying the number of parts in the sample.
5. All of the remaining parts may now be added to the scale and counted. ZERO, TARE and KEYPAD TARE buttons may now be used without affecting the piece weight.
6. To count a different part, return to step one.

NORMAL COUNTING - Keypad Piece Weight Entry

If the individual weight of the parts being counted is known in advance the piece weight may be entered through the keypad. This eliminates the need for the sample set operation. (If the percent of error feature has been selected in programming, the scale will not calculate the percent of error when keypad entry of piece weight is used.)

1. Select the appropriate weighing unit (primary or secondary) for the piece weight being entered by pressing the UNITS/4 switch.
2. Press the PIECE WEIGHT switch. The display will alternately show "PC" and any previously stored piece weight.
3. Key in the weight of one piece and press ENT.

4. The scale will go into the count mode.
5. If a container will be used to hold the parts, place it onto the scale and use the ZERO and/or TARE buttons to zero the scale. Add the parts to the scale at this time. NOTE: The parts in a full container may also be counted by placing the full container onto the scale and using KEYPAD TARE to key in the tare weight of the container.

ALTERNATE COUNTING METHODS

The 7600 may be programmed to perform a wide variety of different counting methods. the following section describes these counting methods, refer to the "Calibration and Programming Manual" for information on setting your scale to perform one of these.

Two Switch Counting

The 7600 can be programmed so that when the scale is in the sample set mode, the sample will not be accepted until the ENT button is pressed. This allows parts to be added to the platform one at a time, where as with the one switch method all of the sample must be added at once.

Top-End Counting

The total number of items in an unsealed container can be determined without removing the items from the container (except a sample). The container with parts is placed on the platform and the piece weight is calculated when a sample quantity is either added to (one switch) or removed from (two-switch operation) the container. Based on the piece weight, the total number of items in the container is displayed.

Automatic Sample-to-Bulk Counting

This method requires that the scale be configured with two bases, a "sample" and a "bulk" base. The lighter capacity "sample" base is used to calculate the piece weight, and the parts are counted on a heavier capacity "bulk" base. In most cases, higher counting accuracy is achieved with this method because the calculated piece is more precise when the sample is weighed on the light-capacity sample base. In normal operation, when the sample is placed on the sample base, the scale automatically switches to the bulk base and items to be counted are placed on the bulk base.

Counting by First Determining Error of Count (One-Switch Method using Automatic Sample Update)

The percent error/accuracy of count can be updated by adding more items to the sample after the initial sample size is placed on the platform and the percent error/accuracy has been displayed. In normal operation, the sample is placed on the platform and a percent error/accuracy is momentarily displayed, followed by the count. More pieces are then placed on the platform in the range of 10% to 100% of the original sample. A new piece weight is calculated based on the larger sample size, and the new percent of error/accuracy will be momentarily displayed. This may continue until a satisfactory percent of error/accuracy is achieved.

Counting by First Determining Error of Count (Two-Switch Method)

The percent error of count can be determined before the piece weight is established. Sample pieces are added to the platform until the percent of error/accuracy is acceptable. The sample size (number of pieces) is then keyed-in and entered, and the scale is ready to be used for counting.

Piece Weight Displayed as Weight Per 1000 Pieces

If selected in calibration, the piece weight can be displayed as weight per 1000 pieces. This option is useful when the items being counted are very light and the piece weight for one item would be an extremely small number. When entering the piece weight through the keypad (for normal counting), enter the weight for 1000 items if the piece weight is to be displayed as weight per 1000 pieces.

Negative Counting

This method is used to count the number of items removed from a container without first knowing the piece weight. The number of items removed from the container is shown on the display as a negative number.

Normal Operation with Two Switch Counting

1. If a container will be used to hold items being counted, place it on the platform.
2. Press the SAMPLE SET button. The scale zeroes. "AddXXX" appears on the display (Where "XXX" is one of the four pre-programmed sample sizes.). Repeated pressing of the switch successively displays the four sample sizes entered during calibration.
3. If desired, a different sample size may be keyed into the scale. As this number is entered, the word "Add" will disappear and only the count indicator will be lit to indicate that the scale is in the sample entry mode.
4. The sample may now be placed onto the scale, all at once or one at a time. (If the percent of error feature has been selected in programming, the percent of error will be displayed as the parts are placed onto the platform. The more parts that are added, the lower the percent of error will be.)
5. Press the ENT button. The scale will switch to the count mode and display the sample count.
6. The remaining parts to be counted may now be placed onto the scale.

Normal Operation with Automatic Sample to Bulk Feature

The second base option needs to be installed and calibrated for automatic sample to bulk to operate. Base one is always the sample base and base two is always the bulk base.

1. Press the BASE/1 switch to select the bulk base. (Base two indicator should be lit)
2. Press the ZERO switch to zero the bulk base.
3. If an empty container will be used to hold items on the bulk base place it on the platform and press either the ZERO or TARE switch.
4. If a full container will be counted on the bulk base. Place the container on the platform, press the KEYPAD TARE switch and key in the weight of the container, press ENT.
5. If a container will be used to hold the sample on base 1, place the container on the scale at this time.
6. Press the SAMPLE SET button. The scale will switch to the sample base (base 1). "AddXXX" will appear on the display (where "XXX" is one of the four pre-programmed sample sizes). Select the desired sample size by repeatedly pressing the SAMPLE SET switch, or key in an alternative sample size.
7. If the scale is programmed for a one-switch operation place the entire sample on the sample base all at one time. The scale will momentarily display the percent error/accuracy (If selected in calibration.), switch to the bulk base and enter the counting mode. The bulk base is now ready to count the parts.

8. If the scale is programmed for a two switch operation, place the sample parts onto the platform all at once or one at a time. The display will show the percent of error/accuracy (If selected in calibration.). When all of the sample parts are on the scale press ENT. The scale will switch to the bulk base and enter the count mode. The bulk base is now ready to count the parts.
9. At this point ZERO and TARE switches may be used without affecting the piece weight.

Top-End Counting (One-Switch Method; Sample Added)

1. Press ZERO to zero the scale.
2. Place container with parts on the platform.
3. Press KEYPAD TARE, key in the tare weight of the container, then press ENT.
4. Remove the sample from the container.
5. Press the SAMPLE SET switch. "AddXXX" will appear on the display (where "XXX" is one of the four pre-programmed sample sizes). Select the desired sample size by repeatedly pressing the SAMPLE SET switch, or key in an alternative sample size. **IMPORTANT: The displayed sample size must equal the number of sample items removed.**
6. Place the sample pieces that were removed back into the container. The scale will momentarily display the percent error/accuracy (If selected in calibration.) and enter the count mode.
7. The display will show the total count for the items in the container.

Top-End Counting (Two-Switch method; Sample Removed)

1. Press ZERO to zero the scale.
2. Press KEYPAD TARE, key in the tare weight of the container, then press ENT.
3. Place the container with contents on the platform and press the SAMPLE SET switch. "AddXXX" will appear on the display (where "XXX" is one of the four pre-programmed sample sizes). Select the desired sample size by repeatedly pressing the SAMPLE SET switch, or key in an alternative sample size.
4. Remove the displayed sample quantity from the container. The display will show the percent error/accuracy (If selected in calibration.). Press ENT.
5. The scale will enter the count mode and display the number of parts in the container.
6. Return the sample pieces to the container.

Counting by First Determining Error of Count using Automatic Sample Update (Normal Operation; One-Switch Method)

1. If a container will be used to hold items being counted, place it on the platform.
2. Press the SAMPLE SET switch. "AddXXX" appears on the display (where "XXX" is one of the pre-programmed sample sizes). Select the desired sample size by repeatedly pressing the SAMPLE SET switch, or key in an alternative sample size.
3. Place the sample pieces on the platform simultaneously. The Percent error/accuracy will be momentarily displayed and the scale will enter the counting mode.
4. To either decrease the percent of error or increase the percent of accuracy, place more items on the platform in the range of 10% to 100% of the original sample quantity. A new piece weight is calculated based on the larger sample size, the new percent of error/accuracy is momentarily displayed and the scale returns to the count mode. This may continue until the desired percent error/accuracy is achieved.
5. Removing the original sample or adding a quantity of parts greater than the original sample will disable the automatic update feature.

Counting by First Determining Error of Count (Two-Switch Method)

1. If a container will be used to hold the items being counted, place it on the platform.
2. Press the SAMPLE SET switch for two seconds. "AddXXX" will appear on the display (where "XXX" is one of the pre-programmed sample sizes). Select the desired sample size by repeatedly pressing the SAMPLE SET button or key in a new sample size.
3. Place the sample onto the platform all at one time (this should be done if the parts are extremely small) or count them onto the platform one at a time.
4. The display will show the percent error/accuracy. Continue to count parts onto the platform, as the sample increases the percent error will decrease and accuracy will increase. When the percent error/accuracy is acceptable key in the quantity of parts on the platform and press ENT.

Counting by First Determining Error of Count with Automatic Sample-To-Bulk Feature (Two-Switch-Method)

1. Press the BASE/1 switch to select the bulk base. (BASE 2 light should be lit)
2. Press the ZERO to zero the bulk base.
3. If a container will be used to hold items on the bulk base, place the container on the platform and press ZERO or TARE.
4. If a container will be used to hold the sample parts, place it onto the sample base at this time.
5. Press the SAMPLE SET switch for two seconds. "AddXXX" will appear on the display (where "XXX" is one of the pre-programmed sample sizes). Select the desired sample size by repeatedly pressing the SAMPLE SET switch or key in a new sample size.
6. Place the sample onto the platform all at once (this should be done if the parts are extremely small) or count them onto the platform one at a time.
7. The display will show the percent error/accuracy. If the percent error/accuracy is not acceptable, continue to count parts onto the platform, as the sample increases the percent error will decrease and the percent accuracy will increase. When the percent error/accuracy is acceptable, key in the quantity of parts on the platform and press ENT.
8. The scale will switch to the bulk base. Items may now be counted on the bulk base.

Negative Counting, Sample Removed (Two Switch Method)

1. With nothing on the scale platform, press the TARE to set tare to zero.
2. Place the container with contents on the platform.
3. Press the SAMPLE SET switch. "AddXXX" will appear on the display (where "XXX" is one of the four pre-programmed sample sizes). Select the desired sample size by repeatedly pressing the SAMPLE SET switch, or key in an alternative sample size.
4. Remove the displayed sample quantity from the container. The display will show the percent error/accuracy (If selected in calibration). Press ENT.
5. The scale will enter the count mode and display the number of parts removed from the container as a negative number. Removing pieces increases the negative count.

BI-DIRECTIONAL SERIAL ASCII INTERFACE

INTRODUCTION

The 7600 Scale Serial Ascii Interface is an RS-232C, TTL-compatible, asynchronous serial interface capable of bidirectional transmission of scale data.

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

COMMUNICATION CAPABILITIES

1. The interface provides three basic types of communication with the Model 7600:
2. Transmission of a predetermined (at set-up time) array of information for formatted printing.
3. 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
4. Gross weight when the PRINT button is pressed.
5. Transmission and alteration of specific data upon request from an external device.
6. Alteration of the unit's operating mode upon request from an external device.
7. Alteration of scale Calibration, RS232 communications parameters and print formatting information. (Refer to "Programming and Calibration 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 in the access area on the bottom of the scale.

<u>PIN</u>	<u>EIA CODE</u>	<u>FUNCTION</u>	<u>DIRECTION</u>
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 need 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 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 scale keyboard, or RS232 interface commands. If the RS232 interface is used, initial communication with the users computer or terminal must be established using the above settings. To return the RS232 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.
4. For information on how to reconfigure the RS-232 parameters, refer to the "Calibration and Programming Manual".

COMMAND FORMATS

The Model 7600 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 7600 SERIES 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 count information
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

IBA [FLOATING POINT NUMBER]	Input BAse number (with option)
IPW [FLOATING POINT NUMBER]	Input Piece Weight
ITW [FLOATING POINT NUMBER]	Input Tare Weight
IID [FLOATING POINT NUMBER]	Input ID number

Commands Which Request Information

SAI	Send All Information
SAO	Send Abbreviated Output (same as SRP)
SBA	Send BAse in use (with second base option)
SCI	Send Configuration Information
SCO	Send COunt
SDT	Send DaTe
SGW	Send Gross Weight
SID	Send Part ID
SMI	Send Metrological Information
SNW	Send Net Weight
SPC	Send Print Codes
SPR	Send PeRcent error or accuracy
SPW	Send Piece Weight
SRP	Send Requested Print
SSZ	Send Sample siZe
STM	Send TiMe
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.
CLM	CaLibrate Modes - To set Auto zero, Count, PcWt/1000
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 Manual".

SAMPLE COMPUTER PROGRAM

The 7600 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
```

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
Err7.nr	Defective NOV RAM
Err8.00 to Err8.FF	RAM Test Error
Err9.CS	Eprom Checksum Error

All Other Times:

<u>Message on Display</u>	<u>Explanation</u>	<u>Message From ASCII Port</u>
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 than - 99,999 (Will not fit on display.)	none
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.

7600 SERIES - PROGRAMMING/CALIBRATION

SECTION 2

INTRODUCTION

This section covers the **Programming and Calibration** of the **Pennsylvania Model 7600 Series Scale**. The 7600 can be calibrated from the keypad or through the RS-232 Interface. The scale employs a digital calibration technique that makes it very versatile when matching the scale to the requirements of the application at hand.

7600 SERIES CALIBRATION

The calibration of the 7600 is divided into eight major categories. The entry point for each of these categories are the calibration steps that are evenly divisible by ten.

<u>STEP</u>	<u>DESCRIPTION</u>
-------------	--------------------

bAS ?	Entry point - Base Selection
(10)	= Auto calibration (Also used to turn count on or off.)
(20)	= Manual CAL (input operational features)
(30)	= Secondary Units Calibration
(40)	= Load Cell (Calibrates the scale weight readings) This mode requires the use of "F" class weights to be completed.
(50*)	= Set counting type and functions
(60*)	= RS-232 CAL (setup RS-232 Interface parameters)
(70*)	= Setting the time, date and sleep mode time
(80*)	= Print CAL (setup printer output format)
(0)	= Exit Point

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 2 seconds. The scale will then display CFG 60. 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 be accessed only with the calibration switch on the main PC board.

At any of the above steps:

- Press ENT to access that category.
- Key in the number of any other category and press ENT to move to that category.
- Key in a "9" to return to base selection.
- Key in a "0" and press ENT to leave calibration.
- When the last calibration step of each category is reached, the calibration automatically advances to the next category.

CALIBRATION PROCEDURE

To begin calibration for the 7600 Scale:

The calibration switch on the 7600 series scale is located below an access plate located 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 platform and stand the scale on it's side. Remove the sealing screw from the bottom, front edge of the scale. Return the scale to an upright position and slide out 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 "bAS ?". The calibration steps are described below.

To begin calibration for the 7600/4 Indicator:

- 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 "bas ?"
- Replace the back plate and replace the fastening screws.
- The calibration steps are described below.

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 22 for a sample print out.)

<u>STEP</u>	<u>DESCRIPTION</u> <i>(Press ENT after each entry)</i>
--------------------	---

bAS ?	Select which base is to be calibrated
--------------	---------------------------------------

1 = Base 1

2 = Base 2 (Base 2 option must be installed)

3 = Locks out base 2 (Will jump to "CAL 0")

CAL 10	Entry point for capacity and automatic calibration. Press ENT.
---------------	---

CAP 11	Full Capacity - Key in the capacity of the base.
---------------	--

ACL 12	Auto calibration of primary and secondary units. Use the UNITS/4 button to select YES or NO. If YES is selected the scale will jump to CAL 40 and will store all entries below marked with an "*". If NO is selected the scale will proceed to the next step.
---------------	---

A-0 13 Select if scale is to auto zero when first turned on. Use the UNITS/4 button to select YES or NO*.

Cnt 14 Turn count mode on or off. Use the UNITS/4 button to select YES* or NO.
(*This step is only available on base one.*)

CAL 20 Manual Calibration entry point

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 % of capacity is the maximum value the scale will zero, even if full capacity* is entered.)

UnS 24 Units - Select the primary weighing unit by keying in a number from the following chart: (*Only available on base 1.*)

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		

Prt 25 Print Stable*/First/Unstable - Use the UNITS/4 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). (*Only available on base 1.*)

Cnd 26 Canadian Specifications - Use the UNITS/4 button to select YES or NO*.

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

EXAMPLES: Entering a .25 represents a zero tracking value of 25% of one display resolution and entering 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 weight readings. 0.25* is the standard entry.*

CAL 30 Entry point for secondary weighing unit.

2Un 31 Select secondary weighing unit by keying in a number from the following chart:
(*Only available on base 1.*)

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 - Enter a number from 0 to 9 to select the response time of 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 the platform in place but no weight on the scale, press ENT.

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

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

WARNING!!! When using a substitute weight for 1/2 and 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.

OR

2. One weight which is preferably greater than 50% of full capacity.
nol 45 No Load - Remove all weight from the platform and press ENT.

All remaining calibration entries are only available on base 1.

CFG 50 Entry point for programming counting functions. (Can not be accessed if count is turned off in step "Cnt 14".)

SS1 51 Key in first sample size. (Normal entry is 10)

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)

PCt 55 Select if piece weight is to be displayed as weight per 1000. Use UNITS/4 button to select YES or NO*

2S 56 Enable Two Switch counting method. Use the UNITS/4 key to select YES or NO*

Pr 57 Percent of error selection. Use the UNITS/4 key to select "P Err" (will be displayed as percent of error), "P Acc" (will be displayed as percent accuracy), "dISAbL"* (will disable the percent error feature and the word ERROR will be momentarily displayed when the %/3 key is pressed).

ASb 58 Select automatic sample-to-bulk. Use the UNITS/4 key to select YES or NO*.

nEG 59 Select if negative sampling will be allowed during two switch, top end counting. Use the UNITS/4 button to select YES or NO*.

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 ENT. (* = default)

bAU 61 BAUD RATE: Select a baud rate from the table below using the UNITS/4 button to view the options. Press ENT when you reach the desired baud rate.

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

LEn 62WORD LENGTH: Select the word length from the table below using the UNITS/4 button to view the options. Press ENT 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 UNITS/4 button to view the options. Press ENT 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 UNITS/4 button to view the options. Press ENT when you reach the desired parity.

None
Even parity
Odd parity*

Ech 65 ECHO: Use the UNITS/4 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 the scale is assigned an address number it 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

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 ENT button.

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 scale 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 20 available print slots, PSL 81 through PSL 101. The print codes, which represent various types of scale information and 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 ENT 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 could 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
03 = Current Date
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
11 = "err" or "acc" prefix (for percent error/accuracy)
12 = "Base" prefix
13 = "ID" prefix
19 = "Pcs" suffix

ELTRON LP 2642 Print Commands

14 = Prologue (File name "L1")
15 = Epilogue (P1, prints 1 label)

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
26 = Print Percent Error or Accuracy
27 = Print Current Base in use
28 = Print ID Number

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
36 = Print Percent Error/Accuracy prefix, data, and suffix

37 = Print Base in Use prefix and data

38 = Print ID Number prefix, data

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. This list of characters may be found in Appendix 1.

53 = ABO Checksum (May be used in building a continuous output compatible with other Pennsylvania Scales.)

54 = Select Leading Zeros

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

80 = Print all set-up information

81 = Print List of print codes

82 = Print all metrological information

83 = Print communication information

84 = Print software version number

85 = Print network address

91-98 = Repeat codes (repeats previous entry 1 to 8 times)

99 = Marks the end of the formatted print

CAL 0 Press ENT to exit calibration.

CALBRATING THE 7600 SCALE WITH THE RS 232 PORT

The 7600 Scale may be calibrated through the RS 232 port using a computer or terminal.

Calibrate and Configure Commands (* requires SW4 to be pressed)

CAL*	CALibrate - Scale will follow push button cal.
CFC	ConFigure Communication - To set baud rate etc.
CFL	ConFigure sLeep mode (For AC/DC Scales)
CFN	ConFigure couNt modes
CFP	ConFigure Print codes - To enter print formatting.
CFT	ConFigure Time and date
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.
4. When communication with the scale has been established, the CFC (ConFigure Communication) command may be used as described under the RS-232 command section.

<u>COMMAND</u>	<u>FORMAT</u>	<u>DESCRIPTION</u>
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:

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

Up to 20 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.

CONFIGURATION OF SLEEP MODE AND TIME/DATE

<u>COMMAND</u>	<u>FORMAT</u>	<u>DESCRIPTION</u>
CFL	CFL 5 <ENT>	Scale will enter sleep mode 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.
CFN	CFN 0 0 1 0 <ENT>	Turns off weight per 1000 (0 = no, 1 = yes) Disables two switch counting (0 = no, 1 = yes) Percent display set to percent error (0 = disable, 1 = error 2 = Accuracy) Turns off auto sample to bulk (0 = no, 1 = yes)
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.

Before starting calibration:

- **For the 10 LB thru 200 LB capacity** - Remove the stainless steel platform from the scale to expose the calibration access plate on the top, front, center of the scale. Remove the sealing bolt, nut and the access plate. This will expose the calibration switch (SW4) on the main PCB. Then place the stainless steel platform upside down onto the spider so that SW4 may be accessed when needed.
- **For the 2 LB and 5 LB capacity** - Remove the aluminum platform from the load cell. Remove the two Phillips head screws holding the top plate in place and lift front of the top plate. This will allow access to the calibration switch (SW4) on the front center of the main PC board when needed.

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.

CALIBRATION COMMANDS

NOTE: Spaces must separate the command and settings. And each command string must be terminated with a carriage return. (Use IBA 1<ENT> or IBA 2<ENT> to select base 1 or 2 before the CLP, CLW command.)

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)

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)

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 <EN> 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 a 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)	

CLM - CaLibrate Modes

COMMAND: CLM 0 0 1 <ENT> Turns off Canadian Legal for tradeconfiguration.
(0 = no, 1 = yes) turns off auto zero (0 = no,

CLS - CaLibrate Secondary

COMMAND: CLS 0.002 2

1 = yes) turns on count mode (0 = no, 1 = yes).

Sets secondary weighing res. to .002KG and units to KG.

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 the previous page, a typical sequence of calibration commands might be:

1. CLP 10.0 0.002 5.0 1 Enters the primary calibration factors
2. CLU 0 Selects print while Unstable for non-NTEP
3. CLW 3 Enters the weight calibration mode
4. CLM 0 1 1 Enters no Canadian, auto zero, count yes
5. CLS 2 0.001 Enters the secondary calibration factors
6. 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 key (SW4). (Brackets [] indicate scale display message)

Push CALIBRATION SELECT Switch [*CALSEL*]

The following is a list of prompts the terminal or computer would receive after calibration mode has been entered. The parenthesis indicate 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.

Base Selection (1) ? {Enter # of base, a "3" will disable base two}

Calibration Step (10) ? 10*

11 Full Capacity (25.000)? 25.000 {Enter scale capacity}

12 Auto Calibration (no)? 0 {0 = no, 1 = yes}

13 Auto Zero (no)? 0 {0 = no, 1 = yes}

14 Count Mode (YES)? 1 {0 = no, 1 = yes}

Calibration Step (20)? 20*

22 Primary Resolution (0.002)? 0.002 {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 {0=unstable, 1=stable}

26 Canadian Unit (no) ? 0 {0 = no, 1 = yes }

27 Zero Tracking (0.25)? .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 (0.001)? 0.001 {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, press ENTER}

43 Half Load (12.500)? 12.500 {Place weight on scale, press ENTER}

44 Full Load (25.000)? 25.000 {Place weight on scale, press ENTER}

45 No Load (0.000)? 0.000 {Remove weight from scale, ENTER}

Configuration Step (50)? 50*

51 Sample size (10)? 10 {#1 Sample set number}

52 Sample size (20)? 20 {#2 Sample set number}

53 Sample size (50)? 50 {#3 Sample set number}

54 Sample size (100)? 100 {#4 Sample set number}

55 Piece Weight x 1000 (no) ? 0 {0 = no, 1 = yes}

56 Two Switch Enable (no) ? 0 {0 = no, 1 = yes}

57 Percent Mode (dISAbL) ? 0 {0 = disable, 1 = enable}

58 Auto Sample to Bulk (no) ? 0 {0 = no, 1 = yes}

59 Negative Count (no)? 0 {0 = no, 1 = yes}

Configuration Step (60)? 60*

61 Baud Rate (300)? 0 {Selections on p. 6 (begin with 0)}

62 Word Length (7 bit)? 0 {0=7 bit, 1=8 bit}

63 Stop Bit (1)? 1 {1 or 2}

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

64 Parity (odd) ? 1 {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}

72 Set Time (135056)? 135056 { Enter time HHMMSS}

73 Set Date (11894)? 110894 { Enter date MMDDYY}

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}

Calibration Step (0)? 0

Dagnostic...

8.7.6.5.4.3.Wait for update display.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 (10,20,30,40,50,60,70,80) and pressing return will access that category.
3. Keying in a "9" will return to base selection.
4. Keying in "0" and pressing return will end calibration.

7600 Series – Addendum

Section 3

Special Programs

INTRODUCTION

The 7600 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 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.

Model 7600 4-20ma Analog Output

This version 7600 is designed to output a 4-20ma analog signal, proportional to the weight on the scale in relation to full capacity.

Operating Instructions:

1. Calibrate Using the Procedures Outlined in the 7600 Calibration Manual with the following exceptions:
 - a. Cal Step 25 For a faster analog output response select “UNSTABLE”
 - b. BAU 61 Select 300 Baud Rate
 - c. LEN 62 Select 8 Data Bits
 - d. SPB 63 Select 1 Stop Bits
 - e. PAR 64 Select None for Parity
 - f. ECH 65 Select No Echo
 - g. CDR 66 Select 0 Com Address
 - h. PD 67 Select NO diagnostic information sent to serial port during power up
2. Set up the Print Slots and Codes as follows:
 - a. PSL 81 - 50
 - b. PSL 82 - 15
 - c. PSL 83 - 65
 - d. PSL 84 - 99
3. Connect the two 4-20ma output wires to the device reading the signal.

NOTE: All RS-232 commands are disabled on this version. For more information on 7600 operation, please refer to the 7600 operators manual.

Model 7600 15 Digit ID, 2 Print Formats

This version 7600 is designed to allow the storage and output of 2 print formats and entry of a 15-digit numeric Part ID.

Operating Instructions:

Entering An ID Number:

1. Press the ID button and key in the ID Number. During the keypad ID input, the display will show the 6 right-most digits of the ID.
2. If the ID is greater than 6 digits, the display will shift the digits to the left. Entering a 16th digit will clear the ID allowing the operator to re-enter the ID without leaving ID input mode.
1. Pressing the “.” (Decimal) button during ID input will enter a “-” (Hyphen).

Printing:

1. To print the 1st stored print format press the PRINT/8 button.
2. To print the 2nd stored print format press the PRINT/7 button.

Note: All other scale functions are available and operate normally. For more information on other 7600 scale functions please refer to the 7600 Operators Manual.

MODEL 7600 SERIES RS-232 SCALE COMMANDS

Unique to this model

The Following RS-232 Commands found in the 7600 calibration manual are not available on this version

Input Commands

CFC
CFL
CFT
CAL
CLD
CLP
CLU
CLW
CLE
CFS
CLS
CLM
CFN

NOTE: All RS-232 commands for counting functions have been changed as listed above or disabled. Please refer to the 7600 Calibration manual for a complete list of all RS-232 commands. All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.

MODEL 7600 FORMATTED PRINT CODES (15 Digit ID Scale)

Unique to this model

<i>Code</i>	<i>Description</i>	<i>Code</i>	<i>Description</i>
2	<i>Print Time</i>	30	<i>Print "GROSS", weight, units</i>
3	<i>Print Date</i>	31	<i>Print "TARE", weight, units</i>
4	<i>Print All Scale Information</i>	32	<i>Print "NET", weight, units</i>
5	<i>Print Formatted Print Codes</i>	33	<i>Print "COUNT", count, pieces</i>
6	<i>Print Metrological Information</i>	34	<i>Print "PC WT", weight, units</i>
7	<i>Print Communication Information</i>	35	<i>Print "SS", Count, pieces</i>
8	<i>Print Version Number</i>	36	<i>Print "PERCENT", accuracy</i>
9	<i>Print Network Address</i>	37	<i>Print "BASE", base</i>
		38	<i>Print "ID", product ID</i>
40	<i>Print User String #1</i>		
41	<i>Print User String #2</i>	60	<i>ASCII Space</i>
42	<i>Print User String #3</i>	61	<i>ASCII Horizontal Tab</i>
43	<i>Print User String #4</i>	62	<i>ASCII Line Feed</i>
44	<i>Print User String #5</i>	63	<i>ASCII Start Of Header</i>
45	<i>Print User String #6</i>	64	<i>ASCII Carriage Return</i>
46	<i>Print User String #7</i>	65	<i>ASCII Carriage Return-Line Feed</i>
47	<i>Print User String #8</i>	66	<i>ASCII Form Feed</i>
48	<i>Print User String #9</i>	69	<i>ASCII Null</i>
49	<i>Print User String #10</i>		
		98	<i>End of first print format, beginning of second print format</i>
20	<i>Print Gross Weight Data</i>	99	<i>End Formatted Print Codes</i>
21	<i>Print Tare Weight Data</i>		
22	<i>Print Net Weight Data</i>		
23	<i>Print Count Data</i>		
24	<i>Print Piece Weight Data</i>		
25	<i>Print Sample Size Data</i>		
26	<i>Print % Error Data</i>		
27	<i>Print Base In Use Data</i>		
28	<i>Print Product ID Data</i>		

Note: to end the 1st print code and begin the 2nd print code use print code 98. As an example to output Gross weight when the PRINT/8 button is pressed and to output Net weight when the PRINT/7 button is pressed the print slots would be formatted as follows:

PSL81 - 30, PSL82 - 98, PSL83 - 32, PSL84 - 99

NOTE: All Print codes have been changed as listed above or disabled.

Model 7600 40 Piece Weight Storage and Recall

This version 7600 is designed to allow storage and recall of up to 40 piece weights with a 6 digit numeric ID. **NOTE: For this model the 2nd Base option is not available.**

Operating Instructions:

Store Piece Weights Using Sample:

1. Select the unit of measure to establish the piece weight in by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Press the SAMPLE button repeatedly, until the desired sample size is displayed OR use the numeric keypad to enter a unique sample size. Place the sample on the scale all at once. The scale will determine the piece weight and enter count mode.
3. Press the STORE/8 button and enter the ID number for this piece weight. The scale will alternately display ID and the last ID number used. Key in the new ID Number and ENTER. The scale will now display the piece weight established through sampling in step 2. To use this piece weight press the ENTER button.
4. The piece Weight is now stored in memory and may be recalled.

Store A Manually Entered Piece Weight:

1. Select the unit of measure to establish the piece weight in by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Press the PIECE WEIGHT Button, key in the piece weight and press the ENTER button.
3. Press the STORE/8 button and enter the ID number for this piece weight. The scale will alternately display ID and the last ID number used. Key in the new ID Number and ENTER. The scale will now display the piece weight manually entered in step 2. To use this piece weight press the ENTER button.
4. The piece Weight is now stored in memory and may be recalled.

Recall A Piece Weight:

1. Press the ID/5 button, key the ID number and press the ENTER. The display will flash RECALL then go into count mode using the piece weight that was previously stored.
2. If an ID number is entered that is not stored in memory the display will flash NOT FOUND and return to normal weighing or counting mode.

To Clear A Piece Weight:

1. Press the STORE/8 button, key the ID number and press the ENTER. The display will flash PC and the Piece Weight in memory. Press the “.” (decimal) button and ENTER. The Piece Weight and ID number is now removed from the scale memory.

Note: For this Model the part ID functions as described above. For more information on other 7600 scale functions please refer to the 7600 Operators Manual.

MODEL 7600 SERIES PRINT CODES (40 ID Piece Weight Scale)

Unique to this model

Print Prefix and Suffix Formatted Print Codes

09 = "PIECE WEIGHT" prefix

13 = "ID" prefix

Print Data Only Formatted Print Codes

24 = Print Current Piece Weight and Units

28 = Print Current ID Number

Print Prefix, Data, and Suffix Formatted Print Codes

34 = Print "Piece Weight", piece weight in use and current unit

38 = Print "ID" and ID number in use.

NOTE: All other print codes operate as on a standard 7600. Please refer to the 7600 Calibration manual for a complete list of all print codes.

MODEL 7600 SERIES RS-232 SCALE COMMANDS

Unique to this model

Input Commands	Description	Format
<i>IID</i>	<i>Input ID and Piece Weight</i>	<i>IID(Space) IDNUMBER(Space) Piece Weight(Carriage Return)</i>
<i>RID</i>	<i>Recall ID</i>	<i>RID(Space) IDNUMBER(Carriage Return)</i>
<i>SPW</i>	<i>Send Current Piece Weight</i>	<i>SPW(Carriage Return)</i>
<i>SID</i>	<i>Send Current ID</i>	<i>SID(Carriage Return)</i>
<i>SIP</i>	<i>Send All ID's and Piece Weights</i>	<i>SIP(Carriage Return)</i>
<i>CIP*</i>	<i>Clear all ID's and Piece Weights</i>	<i>CIP(Carriage Return) *Caution:</i>

This command can not be undone!

NOTE: All other RS-232 commands operate as on a standard 7600. Please refer to the 7600 Calibration manual for a complete list of all RS-232 commands. All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.

Model 7600 Price Computing By Count

This version 7600 is designed for ticket, coupon or game card counting with the option of entering a unit price and viewing the count, weight and total value.

Operating Instructions:

Counting And Price Computing Weights Using Sample:

1. Select the unit of measure to establish the piece weight in by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Press the SAMPLE Button repeatedly, until the desired sample size is displayed OR use the numeric keypad to enter a unique sample size. Place the sample on the scale all at once. The scale will determine the piece weight and enter count mode.
3. Press the ID button and key in the unit price and ENTER. To view the Total Price for all items on the scale press the UNITS/4 Button repeatedly to cycle through Price, Primary Weighing Units, Secondary Weighing Units and Count.
4. To view or change the Unit Price, press the ID/5 button.

Store A Manually Entered Piece Weight:

1. Select the unit of measure to establish the piece weight in by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Press the PIECE WEIGHT Button, key in the piece weight and press the ENTER button.
3. Press the ID button and key in the unit price and ENTER. To view the Total Price for all items on the scale press the UNITS/4 Button repeatedly to cycle through Price, Primary Weighing Units, Secondary Weighing Units and Count.
4. To view or change the Unit Price, press the ID/5 button.

Note: For this Model the part ID function is not available. All other scale functions are available and operate normally. For more information on other 7600 scale functions please refer to the 7600 Operators Manual.

MODEL 7600 SERIES PRINT CODES (Price Computing by Count Scale)

Unique to this model

Print Prefix and Suffix Formatted Print Codes

13 = "UNIT PRICE" prefix

14 = "TOTAL PRICE" prefix

Print Data Only Formatted Print Codes

28 = Print Unit Price Data

29 = Print Total Price Data

Print Prefix, Data, and Suffix Formatted Print Codes

34 = Print "UNIT PRICE", and Unit Price Data

38 = Print "TOTAL PRICE" and Total Price Data

NOTE: All other print codes operate as on a standard 7600. Please refer to the 7600 Calibration manual for a complete list of all print codes.

MODEL 7600 SERIES RS-232 SCALE COMMANDS

Unique to this model

<u>Input Commands</u>	<u>Description</u>	<u>Format</u>
<i>IID</i>	<i>Input ID Unit Price</i>	<i>IID(Space) Unit Price(Carriage Return)</i>

NOTE: All other RS-232 commands operate as on a standard 7600. Please refer to the 7600 Calibration manual for a complete list of all RS-232 commands. All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.

Model 7600 Accumulation

This version 7600 is designed to allow accumulation of Count or Weight manually or automatically and provide a transaction register to record the number of accumulations.

Operating Instructions:

Using Manual Accumulate:*

1. Establish a Piece weight through Sampling or manually entering a Piece weight, establish a Tare weight through digital Tare or manually entering a Tare Weight.
2. Place the items to be weighed or counted on the scale. When the display is stable press the ACCUM/2 button. The display will show the accumulated total for two seconds and the Transaction Counter will be incremented by one.

Using Automatic Accumulate:*

1. Establish a Piece weight through Sampling or manually entering a Piece weight, establish a Tare weight through digital Tare or manually entering a Tare Weight.
2. Place the items to be weighed or counted on the scale. The scale will automatically accumulate the first stable non-zero weight. The display will show the accumulated total for two seconds and the Transaction Counter will be incremented by one.

To Clear Accumulated Totals And Transaction Register:

1. Press and hold the TARE button for 3 seconds until the display flashes RESET.
2. Press the ACCUM/2 button with the accumulated count or weight displayed press the ZERO button.

***Note: To select Manual or Automatic Accumulation, use the calibration instructions below. For more information on other 7600 scale functions please refer to the 7600 Operators Manual.**

MODEL 7600 SERIES CALIBRATION STEPS

Unique to this model

ACC 59 Entry point for programming Accumulation Parameters

Use the UNITS/4 to scroll through the possible Choices:

LB	Manually Accumulate Weight. (Note: the scale will accumulate in any weighing unit, LB is just used to represent the weight accumulation mode.)
CNT	Manually Accumulate Count
A LB	Automatically accumulates the first stable non-zero weight
A CNT	Automatically accumulates the first stable non-zero count

NOTE: Please refer to the 7600 Calibration manual for a complete list of all calibration steps.

MODEL 7600 FORMATTED PRINT CODES (7600 with Accumulation)

Unique to this model

Print Prefix and Suffix Formatted Print Codes

14 = "ACCUM TOTAL" prefix

15 = "TRANSACTION" prefix

Print Data Only Formatted Print Codes

29 = Print Current Accumulation Total value

56 = Print Current Transaction Register value

Print Prefix, Data, and Suffix Formatted Print Codes

57 = Print "ACCUM TOTAL", Accumulation Value, Units

58 = Print "TRANSACTION", Transaction Register Value

NOTE: Please refer to the 7600 Calibration manual for a complete list of all print codes.

MODEL 7600 SERIES RS-232 SCALE COMMANDS

Unique to this model

<u>Input Commands</u>	<u>Description</u>	<u>Format</u>
<i>SAC</i>	<i>Send Accumulated Count or Weight</i>	<i>SAC(Carriage Return)</i>
<i>STR</i>	<i>Send Transaction Register</i>	<i>STR(Carriage Return)</i>
<i>CAC</i>	<i>Clear Accumulate & Transaction Registers</i>	<i>CAC(Carriage Return)</i>
<i>ACC</i>	<i>Accumulate Count or Weight On Scale</i>	<i>ACC(Carriage Return)</i>

NOTE: Please refer to the 7600 Calibration manual for a complete list of all RS-232 commands. All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.

Model 7600 Basis Weight

This version 7600 is designed to allow user-defined and preset basis weighing as well as normal gross, tare and net weighing. This allows an easy and accurate determination of lbs per dozen, KG per gross, lbs per linear foot and so on.

Operating Instructions:

Using A preset Conversion Factor.

1. Select the unit of measure to perform the conversion with by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Press the SAMPLE Button repeatedly until the desired conversion factor is displayed. Place 1 (One) of the items on the scale platform. Press the ENTER button.
3. The scale will now display the “Basis” weight of the selected conversion factor. As an example if the operator selected a conversion factor of 20, the scale will now display the basis weight of 20 pieces.
4. To view the weight press the UNITS Button repeatedly to cycle through PRIMARY, SECONDARY and BASIS WEIGHT.

Using An Unique Conversion Factor.

1. Select the unit of measure to perform the conversion with by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Press the SAMPLE Button and place 1 (One) of the items on the scale platform. Key in the conversion factor and press the ENTER button.
3. The scale will now display the “Basis” weight of the selected conversion factor. As an example if the operator entered a conversion factor of 100, the scale will now display the basis weight of 100 pieces.
4. To view the weight press the UNITS Button repeatedly to cycle through PRIMARY, SECONDARY and BASIS WEIGHT.

OR

1. Select the unit of measure to perform the conversion with by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Press the PIECE WEIGHT Button and place 1 (One) of the items on the scale platform. Key in the conversion factor and press the ENTER button.
3. The scale will now display the “Basis” weight of the selected conversion factor. As an example if the operator entered a conversion factor of 100, the scale will now display the basis weight of 100 pieces.
4. To view the weight press the UNITS Button repeatedly to cycle through PRIMARY, SECONDARY and BASIS WEIGHT.

Note: For this Model the COUNTING features are not available. All other scale functions are available and operate normally. For more information on other 7600 scale functions please refer to the 7600 Operators Manual.

MODEL 7600 SERIES CALIBRATION STEPS

Unique to this model

CFG 50 Entry point for programming Basis Weight functions. (Can not be accessed of count is turned off in step "Cnt 14".)

- SS1 51 Key in First Conversion Factor. (Normal entry is 10)
- SS2 52 Key in Conversion Factor number two. (Normal entry is 20)
- SS3 53 Key in Conversion Factor number three (normal entry is 50)
- SS4 54 Key in Conversion Factor number four (normal entry is 100)

NOTE: All Sample Size calibration steps have been changed as listed above. Please refer to the 7600 Calibration manual for a complete list of all calibration steps.

MODEL 7600 SERIES FORMATTED PRINT CODES

Unique to this model

Print Prefix and Suffix Formatted Print Codes

08 = "CONVERSION" prefix

09 = "BASIS" prefix

Print Data Only Formatted Print Codes

23 = Print Current Conversion Factor

24 = Print Current Basis Weight

Print Prefix, Data, and Suffix Formatted Print Codes

33 = Print Conversion Factor with prefix

34 = Print Basis Weight with prefix

NOTE: All Print codes for counting functions have been changed as listed above or disabled. Please refer to the 7600 Calibration manual for a complete list of all print codes.

MODEL 7600 RS-232 SCALE COMMANDS (7600 Basis Weight Scale)

Unique to this model

<u>Input Commands</u>	<u>Description</u>	<u>Format</u>
<i>SCM</i>	<i>Select Basis Weight Mode</i>	<i>SCM(Space)Basis(Carriage Return)</i>
<i>SBW</i>	<i>Send Basis Weight</i>	<i>SBW(Carriage Return)</i>
<i>SCO</i>	<i>Send Conversion Factor</i>	<i>SCO(Carriage Return)</i>
<i>CFN</i>	<i>Configure Conversion Factors</i>	<i>CFN(Carriage Return)</i>

NOTE: All RS-232 commands for counting functions have been changed as listed above or disabled. Please refer to the 7600 Calibration manual for a complete list of all RS-232 commands. All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.

Model 7600 Process Loss/Dockage/Comparative Weighing

This version 7600 is designed to allow loss in process, dockage calculations and comparative weighing. This is helpful in any application where a comparative measurement is necessary. Using this system will allow the operator to determine dockage, shrinkage or lost in process calculations.

Operating Instructions:

Using The Comparative Functions.

1. Select the unit of measure to perform the conversion with by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
2. Place the sample on the scale and press SAMPLE SET.
3. Remove the sample and process.
4. Place the processed sample on the scale and press the % button. The scale will now show the percentage of the processed samples weight compared to the original non-processed sample's weight.
5. To view the weight press the UNITS Button repeatedly to cycle through PRIMARY, SECONDARY and DOCKAGE %.

OR

5. Select the unit of measure to perform the conversion with by pressing the UNITS button to cycle through the primary and secondary-weighing units. Default is LBS for primary, KG for secondary.
6. Press the PIECE WEIGHT Button and key in the sample weight and press the ENTER button.
7. Process the sample and place the processed material on the scale platform.
6. Press the % button. The scale will now show the percentage of the processed samples weight compared to the original non-processed sample's weight.
8. To view the weight press the UNITS Button repeatedly to cycle through PRIMARY, SECONDARY and DOCKAGE %.

Note: For this Model the COUNTING features are not available. All other scale functions are available and operate normally. For more information on other 7600 scale functions please refer to the 7600 Operators Manual.

Calibration (Dockage Scale)

FORMATTED PRINT CODES

Print Prefix and Suffix Formatted Print Codes

08 = "PERCENT" prefix

09 = "MEMORY" prefix

Print Data Only Formatted Print Codes

23 = Print Current Percent Dockage

24 = Print Current Memory Weight

Print Prefix, Data, and Suffix Formatted Print Codes

33 = Print Percentage Dockage with prefix

34 = Print Memory Weight with prefix

NOTE: All Print codes for counting functions have been changed as listed above or disabled. Please refer to the 7600 Calibration manual for a complete list of all print codes.

MODEL 7600 SERIES RS-232 SCALE COMMANDS

Unique to this model

<u>Input Commands</u>	<u>Description</u>	<u>Format</u>
<i>SDK</i>	<i>Send Dockage Percentage</i>	<i>SDK(Carriage Return)</i>
<i>SME</i>	<i>Send Memory weight</i>	<i>SME(Carriage Return)</i>

NOTE: All RS-232 commands for counting functions have been changed as listed above or disabled. Please refer to the 7600 Calibration manual for a complete list of all RS-232 commands. All commands and parameters must be separated by spaces. The entire command string must be terminated with a carriage return.

Model 7600 UPS Worldship

This version 7600 is designed to interface with UPS Worldship Software while maintaining the normal weighing and counting features of the 7600.

Operating Instructions:

1. Calibrate as a standard 7600
2. The communication protocols are fixed for use with UPS Worldship
3. Connect with a straight through DB-9 cable on pins 2, 3, 5 and 8
4. Install UPS Worldship using instructions provided with the software.
5. After installing, select **TOOLS, SYSTEM PREFERENCES** and select **TOLEDO PS60** and **COM1** (or the correct serial port on the computer). Then select **TEST SCALE** and place weight on scale to verify communications are working.
6. Make sure that the **ELCTRONIC SCALE ACTIVATED** checkbox is selected.

NOTE: All RS-232 commands are disabled on this version. For more information on 7600 operation, please refer to the 7600 operators manual.

Model 7600 Advanced Digital Filtering/Display Lock

This version 7600 is designed an advanced digital filtering while maintaining the normal weighing and counting features of the 7600. This software is intended for any scale application that has environmental instability factors such as: Animal weighing, ship board or on-board vehicle weighing, in heavy air currents or in normal applications where the weighing or counting resolution are at the upper end of load cell performance.

Operating Instructions:

All normal 7600 functions are available on this special configuration.

Calibration Instructions:

Two Calibration Steps are added on this software:

1. STT 28 Enter the STABLE threshold. The default setting is 1 displayed graduation. It may be set to a minimum of .25 or a maximum of 2 displayed graduations. Caution: Setting this value above 1 displayed graduation will negatively effect counting performance.
2. DL 28 Display lock settings. This is to set up the display lock after a specified number of stable readings. Any number from 0 to 255 may be entered for this calibration step.
3. AVG 28 Advanced Digital Filtering level. The number of weight readings averaged to produce the final weight displayed is adjustable. Enter the number of weights to average from 4 to 64. The default is 16. Increasing the number of weights to average will provide a more stable reading in adverse "Stability" conditions and allow the performance of the scale to be stretched in normal conditions. Increasing this number may also increase the time required for the scale to indicate "STABLE"
4. FIL 41 Normal filter setting. The default value is 3, to increase scale performance in adverse "Stability" conditions set this filter rate to 9.

NOTE: To disable display lock set calibration step 28A to 0. For maximum filtering set calibration step 28B to 64 and FIL 41 to 9. All other scale functions are available and operate normally. For more information on other 7600 scale functions please refer to the 7600 Operators Manual.